Device Support Facilities (ICKDSF)
Version Release 17

User's Guide and Reference



GC35-0033-42

Note

Before using this information and the product it supports, read the information in “Notices” on page 679.

This edition applies to Release 17 of the Device Support Facilities program and to all subsequent releases and modifications until otherwise indicated in new editions.

Last updated: 2019-02-16

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Contents

List of Figures ..... **xxxv**
List of Tables ..... **xxxvii**

About this document ..... **xxxix**
ICKDSF product library xxxix
Additional reference information xxxix
Hardware documents xl
Software documents xlii
Terminology xliii
How to use this document for your operating environment xliii
How to send your comments to IBM ..... **xlv**
If you have a technical problem xlv
Summary of changes ..... **xlvi**
General changes xlvi
Message changes xlvi

Part 1. Introducing ICKDSF **1**

Chapter 1. Introduction to ICKDSF 3
About ICKDSF 3
Verifying your ICKDSF version 3
Running multiple ICKDSF jobs 3
Running ICKDSF on Dual Copy volumes 4
ICKDSF commands 4
Operating systems that support ICKDSF 5
Versions that support ICKDSF commands 6
Storage requirements 6
Devices supported by ICKDSF 6
ICKDSF support of the RAMAC Array family 8
ICKDSF support of the Internal Disk 9
ICKDSF support of the 2105, 2107, and 1750 9
Additional ICKDSF support information 10
Configuration checking 10
Processing on XRC volumes 10
Tasks you can perform with ICKDSF 10

Chapter 2. About DASD storage media 13
DASD physical characteristics 13
Data checks 14
Degree of repeatability 14
Degree of visibility 14
Correctable versus uncorrectable 14
Temporary versus permanent 14
Error notification 15

Chapter 3. Understanding ICKDSF command statements 17
ICKDSF command statement syntax 17
Conflicting keyword parameters 18
Abbreviating commands and parameters 18
Separating commands and parameters 18

Continuing lines..... 18
Commenting your code.....19
Ending a command..... 19
Writing statements to control ICKDSF processing.....19
Writing a SET statement..... 20
Writing the IF-THEN-ELSE statement..... 21
Writing the DO-END statement..... 22
Writing a null THEN and ELSE.....23

Chapter 4. Getting started with the MVS version of ICKDSF..... 25
Overview of the ICKDSF tasks using the MVS version..... 25
Using JCL to run ICKDSF..... 26
Printed output data set.....27
Using ISMF panels to run ICKDSF.....27
Protecting MVS volumes and data sets..... 30
Protecting data sets in an offline mode..... 31
Protecting data sets in an online mode.....31
Authorizing access with RACF..... 31
Limiting the use of resources with the Authorized Program Facility (APF).....33
Protecting ICKDSF commands with RACF.....34
Processing in a shared environment.....34
Preserving data during INSPECT.....35
Preserving data during INSPECT under concurrent media maintenance.....35
Operator's intervention consideration.....35

Chapter 5. Getting started with the CMS version.....37
Definition of a minidisk and dedicated device.....37
Overview of ICKDSF tasks using the CMS version.....37
Invoking ICKDSF under CMS from the console..... 39
Example of invoking ICKDSF from the console.....39
Invoking ICKDSF with a CMS EXEC.....40
Invoking ICKDSF with an input file..... 41
Using parameters to select the input and output devices..... 42
Supporting minidisks under the CMS version.....42
Supporting general users without special authority.....43
Using DEVMAINT authority.....43
Supporting dedicated devices under the CMS version.....44

Chapter 6. Getting started with the VSE version.....47
Overview of the ICKDSF tasks using the VSE version..... 47
Running the VSE version of ICKDSF in batch mode..... 48
Operator intervention..... 49
Running the VSE version of ICKDSF in command mode..... 49
Use of VSE ICKDSF command mode during VSE install process..... 50
Command mode restrictions..... 50
Verifying identification and preventing data loss..... 50
Processing in a shared environment.....51
Sharing across multiple processors..... 51
Sharing across multiple users and partitions in a single processor..... 51

Chapter 7. Getting started with the Stand-Alone version.....53
About the Stand-Alone version..... 53
Overview of the ICKDSF tasks using the Stand-Alone version..... 54
Creating an ICKDSF Stand-Alone IPL tape using MVS..... 55
Creating an ICKDSF Stand-Alone IPL tape using CMS..... 56
Preparing to use the Stand-Alone.....56
IPLing the Stand-Alone ICKDSF.....57
IPLing the Stand-Alone from a tape library..... 57

IPLing the Stand-Alone from SAPL ... 58
IPLing the Stand-Alone with a load parm specified ... 58
IPLing the Stand-Alone with no load parm specified ... 59
Loading the Stand-Alone ICKDSF from CD-ROM ... 60
Defining the input and output device ... 60
Interpreting error conditions ... 61
Performing ICKDSF tasks on minidisks with the Stand-Alone version ... 63

Chapter 8. ICKDSF versions supported as guests under VM ... 65
Problem solving under VM ... 66

Part 2. Using ICKDSF to install and maintain CKD devices ... 67

Chapter 9. Examples of ICKDSF tasks—CKD devices ... 69
Installing devices ... 69
Completing the installation procedure ... 69
Installing a device from the factory ... 69
Setting an IBM 3390 to 3380 track compatibility mode ... 70
Installing a 3375 or older HDA from the factory ... 70
Resuming initialization from a checkpoint location ... 71
Validating and writing the FFVDP ... 71
Validating part of a volume ... 71
Writing the FFVDP on part of a volume ... 71
Writing the FFVDP regardless of previous processing ... 72
Validating from a specific point ... 72
Validating to a specific point ... 73
Validating and writing the FFVDP for one head ... 73
Validating the last heads of a device ... 73
Formatting devices ... 74
Formatting minidisks ... 74
Formatting an entire volume in the CMS version ... 74
Formatting part of a volume in the CMS version ... 74
Writing the VTOC ... 75
Placing a VTOC at the end of a volume ... 75
Determining the VTOC size and location ... 75
Expanding the VTOC at Its current location ... 75
Changing the volume serial number and owner identification ... 76
Adding IPL text to a volume ... 76
Converting a volume to indexed format ... 76
Problem determination ... 77
Investigating suspected drive problems ... 77
Scanning data on part of a volume ... 78
Checking disk surfaces with INSPECT ... 78
Surface checking part of a volume ... 78
Media maintenance ... 79
Conditionally assigning alternate tracks ... 80
Unconditionally assigning alternate tracks ... 80
Reclaiming a single flagged track ... 80
Reclaiming alternate tracks with INSPECT ... 81
Finding where INSPECT failed ... 81
Saving data during surface checking ... 81
Emulating devices ... 82
Using a 3995 Model 151 or 153 device ... 83
Initializing an emulated CKD device on a 3370 FBA device ... 83
Initializing an emulated CKD Device on an IBM 9313, 9332, or 9335 FBA device ... 83
Media maintenance on an emulated device ... 84
Performing miscellaneous tasks with ICKDSF ... 85

Clearing a storage path fence status....85
Erasing a volume....85
Printing a track assignment map....85

Chapter 10. AIXVOL command—CKD....87
Syntax....87
Required parameters....87
Optional parameters....88
Formatting a cylinder with AIXVOL....89
Errors reported by EXAMINE....90
Minidisk support....91
Examples of the AIXVOL command....91
Formatting an entire volume....91
Formatting part of a volume....91
Inspecting a range of cylinders for errors....91
Rewriting the volume label....91

Chapter 11. ANALYZE command—CKD....93
Protecting the ANALYZE command with RACF....93
Syntax....93
Required parameters....93
Optional parameters....94
Detecting hardware problems with DRIVETEST....100
Testing the drive and logical volume with ANALYZE....100
Path control under ANALYZE drive test....101
Verifying data records with ANALYZE....101
Data verification output....102
Unexpected I/O errors....102
RANGE Parameters: specifying part of a volume....103
CMS version minidisk support....104
Dual copy volumes....104
Examples of the ANALYZE command....104
Analyzing volumes with the Stand-Alone version....104
Analyzing volumes with the CMS version....105
Analyzing volumes with the MVS version....105
Analyzing a volume with the VSE version....106
Examples of path control under the ANALYZE drive test....106
Diagnostic messages....107
Drive test error summary....107
Movable head error table....107
Fixed-head error table....108
Pathing reports....109
Path status table....109
Logical path status table....111
Interface information....112
Host interface information....112
Fiber channel connection information....113
Example....113
Host access information....114

Chapter 12. BUILDIX command—CKD....115
Protecting the BUILDIX command with RACF....115
Syntax....115
Required parameters....115
Optional parameters....116
Processing in a Shared Environment....116
Converting an OSVTOC to an indexed VTOC....116
Converting an indexed VTOC to an OSVTOC....117

Examples of the BUILDIX command....117
Changing an IXVTOC to an OSVTOC without operator's intervention....117
Building a VTOC index on a volume without an index allocated....118
Building a VTOC index on a volume with an index allocated....118

Chapter 13. CONTROL command—CKD....119
Protecting the CONTROL command with RACF....119
Syntax....119
Required parameters....119
Optional parameters....120
Clearing a storage control without performing an IML....122
Allowing write operations through a storage control....122
Clearing a fenced path or device....123
Discarding data pinned in cache....123
Examples of the CONTROL command....124
Clearing a WRITE INHIBITed storage control....124
Clearing a storage path fence status....124
Resetting indefinite status condition....124
Resetting a fence status....125
Display subsystem information....125

Chapter 14. CPVOLUME command—CKD....127
Formatting CP-owned volumes....127
Formatting CP-owned volumes for a specific VM operating system....127
Protecting the CPVOLUME command with RACF....127
Syntax....128
Required parameters....128
Optional parameters....129
Formatting cylinders....131
Formatting cylinder 0, track 0....132
Updating the allocation map....133
Examining volumes for errors....133
Displaying volume information....133
Rewriting the volume label....133
Copying data to a different device size....133
Creating a minidisk allocation map....134
Examples of the CPVOLUME command....134
Formatting an entire volume....134
Formatting part of a volume....135
Changing volume allocation....135

Chapter 15. FLASHCPY commands—CKD for Asynchronous PPRCOPY....137
Protecting the FLASHCPY command with RACF....137
FLASHCPY ESTABLISH....137
Syntax....138
Required parameters....138
Optional parameters....139
Examples of Flashcopy Establish....144
Flashcopy Establish for Flashcopy of a PPRC Secondary....144
Flashcopy Establish with Fast Reverse Restore....145
Flashcopy Establish used to reverse a Flashcopy relationship....146
Flashcopy Establish used to establish incremental Flashcopy....146
FLASHCPY QUERY....146
Syntax....147
Required parameters....147
Optional parameters....148
Examples of Flashcopy Query....148
FLASHCPY QUERY INCREMENTSTATUS....149

Syntax ... 150
Required parameters ... 150
Optional parameters ... 150
Examples of FLASHCPY QUERY INCREMENTSTATUS ... 151
FLASHCPY QUERY RELATIONS ... 151
Syntax ... 152
Required parameters ... 152
Optional parameters ... 152
Example of FLASHCPY Query Relations ... 153
FLASHCPY WITHDRAW ... 153
Syntax ... 154
Required parameters ... 154
Optional parameters ... 155
Examples of Flashcopy Withdraw ... 158
Flashcopy Withdraw with PPRC Secondary as Flashcopy Source ... 159

Chapter 16. INIT command—CKD ... 161
Protecting the INIT command with RACF ... 162
Syntax ... 162
Required parameters ... 162
Optional parameters ... 163
Initializing volumes ... 178
Minimal initialization ... 178
Medial initialization ... 179
Initialization for open-system DASD ... 179
Processing in a shared environment ... 180
Processing in a shared DFSMS environment ... 180
Resuming after a job or system failure ... 181
RANGE parameters: specifying part of a volume ... 182
CMS version minidisk support ... 183
Restoring FFVDP to a volume ... 183
Dual copy volumes ... 183
Examples of the INIT command ... 183
Initializing volumes for the MVS operating system ... 184
Initializing volumes with the Stand-Alone version ... 186
Initializing a minidisk in the CMS version ... 187
Initializing volumes with the VSE version ... 187

Chapter 17. INSPECT command—CKD ... 189
Protecting the INSPECT command with RACF ... 189
Understanding which INSPECT parameters to use ... 189
Syntax ... 191
Required parameters ... 191
Optional parameters ... 192
Controlling the level of surface checking ... 202
RANGE parameters: part of a volume ... 203
Assigning alternate tracks ... 204
Resource serialization when using INSPECT ... 205
Recovering data after a job or system failure ... 205
Preserving data during INSPECT ... 206
Keeping your data in storage or in storage and backup ... 207
Preserving data under Concurrent Media Maintenance ... 207
Dual copy volumes ... 208
CMS version minidisk support ... 208
Examples of the INSPECT command ... 209
Inspecting volumes with the MVS version ... 209
Producing a volume map of an entire volume in a Stand-Alone version ... 210
Inspecting volumes with the CMS version ... 211

Checking tracks for defects in the VSE version....211

Chapter 18. INSTALL command—CKD....213
Protecting the INSTALL command with RACF....214
Installing relocated devices....214
3380....214
3390....214
9345....214
Changing the mode of 3390 volumes....214
Syntax....214
Required parameters....214
Optional parameters....215
Resuming after a job or system failure....216
Processing in a shared environment....216
Examples of the INSTALL command....216
Installing and initializing a volume....217
Converting an IBM 3390 to 3380 track compatibility mode....217

Chapter 19. IODELAY command—CKD....219
Protecting the IODELAY command with RACF....219
Syntax....219
Required parameters....219
Optional parameters....219
Examples of the IODELAY command....220
Delaying 100 ms after every 20 operations with the MVS version....220

Chapter 20. PPRCOPY commands—CKD....223
Protecting the PPRCOPY command with RACF....224
PPRCOPY Overview....224
Non-cascading....224
Cascading....225
Extended Distance Mode....225
Setting up your environment to use PPRCOPY extended distance....225
Using PPRCOPY extended distance....226
Establishing PPRCOPY volume pairs....226
Using synchronous and asynchronous PPRCOPY....226
Using cascading....226
Establishing PPRCOPY cascaded pairs....227
Long distance data migration....228
Converting from one PPRCOPY volume state to another....228
Monitoring PPRCOPY volume pairs....230
PPRCOPY FAILOVER, FAILBACK and FAILOVERMT....230
Using Freeze/Run....231
ICKDSF Peer-to-Peer Remote Copy command functions....231
Peer-to-Peer Remote Copy hardware requirements....232
Peer-to-Peer Remote Copy (PPRCOPY) restrictions....232
Setting up the PPRCOPY environment....233
Identifying volume pairs....233
Establishing the PPRCOPY configuration....234
Configuring storage subsystem resources for PPRCOPY....234
Controlling ICKDSF activity to PPRCOPY volumes....235
PPRCOPY DEFINESESSION....236
Syntax....237
Required parameters....237
Optional parameters....238
Examples of PPRCOPY DEFINESESSION....238
PPRCOPY DELPAIR–deleting pairs....238
Syntax....238

Required parameters....238
Optional parameters....239
Examples of PPRCOPY DELPAIR....240
PPRCOPY DELPATH–deleting paths....240
Syntax....240
Required parameters....240
Optional parameters....241
Examples of PPRCOPY DELPATH....242
PPRCOPY ESTPAIR–establishing pairs....243
Syntax....244
Required parameters....244
Optional parameters....245
Examples of PPRCOPY ESTPAIR....250
PPRCOPY ESTPATH–establishing paths....251
Syntax....252
Required parameters....252
Optional parameters....257
Examples of PPRCOPY ESTPATH....258
PPRCOPY FREEZE–suspend all operations for all PPRCOPY volumes on a single storage control.259
Syntax....259
Required parameters....259
Optional parameters....260
Example of PPRCOPY FREEZE....261
PPRCOPY POPULATESESSION....261
Syntax....261
Required parameters....262
Optional parameters....264
Examples of PPRCOPY POPULATESESSION....264
PPRCOPY QUERY–querying status....265
Syntax....265
Required parameters....265
Optional parameters....266
Using PPRCOPY QUERY without the PATHS parameter....266
Using PPRCOPY QUERY with the PATHS parameter....273
Using PPRCOPY QUERY with the multi-target support....280
PPRCOPY QUERY ASYNCCOPY....281
Syntax....284
Required parameters....284
Optional parameters....284
Examples of PPRCOPY QUERY ASYNCCOPY....284
PPRCOPY QUERY OUTOFSYNCSTATE....285
Syntax....285
Required parameters....286
Optional parameters....286
Examples of PPRCOPY QUERY OUTOFSYNCSTATE....286
PPRCOPY QUERY SESSIONSDEVICES....287
Syntax....288
Required parameters....288
Optional parameters....288
Examples of PPRCOPY QUERY SESSIONSDEVICES....288
PPRCOPY RECOVER–recovering data on the recovery system....288
Syntax....288
Required parameters....288
Optional parameters....289
Examples of PPRCOPY RECOVER....290
PPRCOPY RUN–resume all operations for all PPRCOPY volumes on a single storage control....291
Syntax....291
Required parameters....291

Optional parameters....292
Example of PPRCOPY RUN....292
PPRCOPY SETCHARACTERISTICS....293
Syntax....293
Required parameters....293
Optional parameters....295
Example of PPRCOPY SETCHARACTERISTICS....295
PPRCOPY STARTASYNCCOPY....295
Syntax....296
Required parameters....297
Optional parameters....298
Examples of PPRCOPY STARTASYNCCOPY....300
PPRCOPY SUSPEND–suspending pairs....300
Syntax....301
Required parameters....301
Optional parameters....301
Examples of PPRCOPY SUSPEND....302
PPRCOPY TERMASYNCCOPY....303
Syntax....303
Required parameters....304
Optional parameters....306
Examples of PPRCOPY TERMASYNCCOPY....307
Establishing and managing PPRCOPY volumes and paths....307
Managing the PPRCOPY system....307
Identifying Peer-to-Peer Remote Copy volume states....308
Details for setting cache and non-volatile storage....309
Obtain SSID, serial number, CCA, and LSS....311
Obtain physical 3990 interface and ESCON Director address....311
Establishing paths....312
Managing volumes and paths....313
Examples for using FAILOVER and FAILBACK....318

Chapter 21. Asynchronous PPRCOPY....321
Introduction....321
Background....321
Asynchronous PPRCOPY Solution....321
Typical Scenario for establishing an Asynchronous PPRCOPY session....322
Disaster Recovery for Asynchronous PPRC Processing....322
Recovering when Flashcopy target volumes are inconsistent....322
Asynchronous Peer-to-Peer Remote Copy Recovery from an unplanned outage....323
Examples of creating Asynchronous PPRCOPY configurations....324
Example 1: All volumes are contained within one ESS....324
Example 2: All PPRCOPY primary volumes on one ESS, PPRCOPY secondaries and Flashcopy targets on another ESS....327

Chapter 22. REFORMAT command—CKD....331
Protecting the REFORMAT command with RACF....331
Syntax....331
Required parameters....332
Optional parameters....333
Processing in a shared environment....341
Examples of the REFORMAT command....341
Reformatting volumes with the MVS version....341
Using the REFORMAT command with the CMS version....343
Changing the volume serial number in the VSE version....344

Chapter 23. REVAL command—CKD....345
Protecting the REVAL command with RACF....345

Syntax....346
Required parameters....346
Optional parameters....347
Formatting tracks and reassigning alternate tracks....348
Repairing the cause of specific '4E4E' SIMS....348
Recommendation....349
Resuming after a job or system failure....349
Examples of the REVAL command....349
Running REVAL with FIXSIM....349
Reinitializing a volume....350

Chapter 24. TRKFMT command—CKD....351
Protecting the TRKFMT command with RACF....351
Syntax....351
Required parameters....351
Optional parameters....354
Handling of checkpoint data from a previous command....355
RANGE parameters: part of a volume....356
Resource serialization when using TRKFMT....356
Examples of the TRKFMT command....357
Processing tracks with the MVS version....357
Processing tracks in a Stand-Alone version....358
Processing tracks in a CMS version....358
Processing tracks in the VSE version....358

Part 3. Using ICKDSF to install and maintain FBA devices....359

Chapter 25. Examples of ICKDSF tasks—FBA devices....361
Installing new devices....361
Initializing a replaced HDA with a minimal INIT....361
Resuming initialization from a checkpoint location....362
Formatting devices....363
Formatting FBA minidisks....363
Formatting an entire volume with the CMS version....363
Changing the volume serial Number and owner identification....363
Placing an FBAVTOC at the end of a volume....363
Writing the FBAVTOC....364
Problem determination....364
Investigating suspected drive problems....364
Finding where INSPECT failed....365
Checking disk surfaces....365
Media maintenance....366
Conditionally assigning alternate blocks....366
Unconditionally assigning alternate blocks....366
Reclaiming flagged blocks....366
Saving data during surface checking....367
Performing miscellaneous tasks with ICKDSF....368
Erasing a volume....368
Printing a block assignment map....368
Emulating a CKD device on an FBA device....369

Chapter 26. ANALYZE command—FBA....371
Syntax....371
Required parameters....371
Optional parameters....372
Detecting hardware problems with DRIVETEST....373
Testing the drive and logical volume with ANALYZE....373

Verifying data records with ANALYZE ... 374
Solving problems with ANALYZE output ... 374
Assumed conditions when running ANALYZE ... 374
CMS version minidisk support ... 374
Examples of the ANALYZE command ... 375
Analyzing volumes with the Stand-Alone version ... 375
Analyzing volumes with the CMS version ... 376
Analyzing a VSE version volume ... 376
Diagnostic messages ... 376

Chapter 27. CONTROL command—FBA ... 379
Syntax ... 379
Required parameters ... 379
Optional parameters ... 380
Examples of the CONTROL command ... 381
Display subsystem information and microcode lic and bundle level ... 381

Chapter 28. CPVOLUME command—FBA ... 383
Formatting CP volumes for a specific VM operating system ... 383
Syntax ... 383
Required parameters ... 383
Optional parameters ... 384
Formatting pages ... 386
Formatting blocks 0-15 ... 387
Updating the allocation map ... 388
Examining pages for errors ... 388
Displaying volume information ... 388
Rewriting the volume serial ... 388
Copying data to a different device size ... 388
Creating a minidisk allocation map ... 389
Examples of the CPVOLUME command ... 389
Formatting an entire volume ... 389
Formatting part of a volume ... 389
Changing volume allocation ... 389

Chapter 29. INIT command—FBA ... 391
Syntax ... 391
Required parameters ... 392
Optional parameters ... 392
Initializing a volume at the minimal level ... 396
Initializing a volume at the maximal level ... 396
Resuming after a job or system failure ... 396
CMS version minidisk support ... 397
Examples of the INIT command ... 397
Initializing volumes with the Stand-Alone version ... 397
Initializing a VSE version FBA volume ... 398
Initializing a minidisk in the CMS version for a VSE environment ... 398

Chapter 30. INSPECT command—FBA ... 399
Understanding which INSPECT parameters to use ... 399
Syntax ... 400
Required parameters ... 400
Optional parameters ... 401
Assigning alternate blocks ... 404
Preserving data during INSPECT ... 405
Writing data from a backup or storage location ... 405
Retrieving data from the backup location ... 405
Recovering data after a job or system failure ... 406

CMS version minidisk support ... 407
Examples of the INSPECT command ... 407
Inspecting volumes with the Stand-Alone version ... 407
Inspecting volumes with the VSE version ... 408
Inspecting volumes with the CMS version ... 408

Chapter 31. IODELAY command—FBA ... 409
Syntax ... 409
Required parameters ... 409
Optional parameters ... 409
Examples of the IODELAY command ... 410
Delaying 100 ms after every 20 operations ... 410

Chapter 32. MAPALT command—FBA ... 411
Syntax ... 411
Required parameters ... 411
Optional parameters ... 412
Reading the MAPALT report output ... 412
MAPALT diagnostic output ... 413
Examples of the MAPALT command ... 413
Mapping volumes with the Stand-Alone version ... 413
Mapping a full VSE version volume ... 414

Chapter 33. REFORMAT command—FBA ... 415
Syntax ... 415
Required parameters ... 415
Optional parameters ... 416
Examples of the REFORMAT command ... 416
Reformatting volumes with the VSE version ... 417
Reformatting a minidisk in the CMS version ... 417

Appendix A. Device Support Facilities messages (ICK) ... 419
Message routing and descriptor codes ... 419
ICK001D ... 420
ICK002D ... 420
ICK003D ... 421
ICK004D ... 421
ICK005E ... 421
ICK006E ... 421
ICK007E ... 421
ICK008E ... 422
ICK009I ... 422
ICK010I ... 422
ICK011E ... 422
ICK012E ... 422
ICK013E ... 423
ICK014D ... 423
ICK015E ... 423
ICK016E ... 423
ICK017D ... 423
ICK018D ... 424
ICK019D ... 424
ICK020D ... 424
ICK024I ... 424
ICK030E ... 425
ICK031E ... 425
ICK033E ... 425

ICK035I....425
ICK036I....426
ICK037I....426
ICK057I....426
ICK058I....426
ICK059I....426
ICK061I....427
ICK062I....427
ICK091I....427
ICK126D....427
ICK130D....428
ICK158D....428
ICK159D....428
ICK177D....429
ICK203I....429
ICK210I....429
ICK231I....429
ICK316I....429
ICK318I....430
ICK401I....430
ICK404I....430
ICK407I....430
ICK411I....431
ICK412I....431
ICK416D....431
ICK417D....431
ICK418I....431
ICK419I....432
ICK420I....432
ICK430I....432
ICK431I....432
ICK440I....432
ICK501I....432
ICK502I....433
ICK503I....433
ICK504I....433
ICK505I....433
ICK508A....433
ICK509I....433
ICK510I....434
ICK511I....434
ICK512I....434
ICK513I....434
ICK514I....434
ICK515I....435
ICK516I....435
ICK517I....435
ICK518I....435
ICK519I....435
ICK520I....436
ICK521I....436
ICK522I....436
ICK523I....436
ICK526I....436
ICK528I....436
ICK529I....437
ICK600I....437
ICK602I....437

ICK603I....437
ICK604I....437
ICK605I....437
ICK606I....438
ICK607I....438
ICK608I....438
ICK609I....438
ICK611I....438
ICK705I....439
Messages received at the output printer....439
ICK00001I....439
ICK00002I....439
ICK00091I....440
ICK00100I....440
ICK00101I....440
ICK00204I....440
ICK00206I....440
ICK00215I....441
ICK00222I....441
ICK00233I....441
ICK00546I....441
ICK00700I....441
ICK00701I....442
ICK00702I....442
ICK00703I....442
ICK00704I....443
ICK00705I....443
ICK00706I....443
ICK00707I....444
ICK00708I....444
ICK00709I....444
ICK01016I....444
ICK01018I....444
ICK01020I....445
ICK01021I....445
ICK01022I....445
ICK01135I....445
ICK01136I....446
ICK01305I....446
ICK01306I....446
ICK01307I....446
ICK01308I....446
ICK01309I....446
ICK01310I....447
ICK01311I....447
ICK01312I....447
ICK01313I....447
ICK01314I....447
ICK01315I....448
ICK01316I....448
ICK01317I....448
ICK01318I....448
ICK01319I....448
ICK01320I....449
ICK01321I....449
ICK01322I....449
ICK01323I....449
ICK01328I....449

ICK01331I....449
ICK01332I....450
ICK01334I....450
ICK01336I....450
ICK01380I....450
ICK01381I....451
ICK01400I....451
ICK01405I....451
ICK01406I....451
ICK01407I....452
ICK01408I....452
ICK01409I....452
ICK01410I....452
ICK01411I....453
ICK01412I....453
ICK01413I....453
ICK01414I....453
ICK01415I....453
ICK01416D....453
ICK01417D....454
ICK01418I....454
ICK01419I....454
ICK01420I....454
ICK01421I....454
ICK01422I....455
ICK01425I....455
ICK01430I....455
ICK01431I....455
ICK01432I....455
ICK01440I....455
ICK01501I....456
ICK01502I....456
ICK01503I....456
ICK01504I....456
ICK01508A....456
ICK01513I....457
ICK01520I....457
ICK01600I....457
ICK01606I....457
ICK01608I....457
ICK01609I....457
ICK01701I....458
ICK01704I....458
ICK01708I....458
ICK01714I....458
ICK01715I....458
ICK01725I....459
ICK01726I....459
ICK01727I....459
ICK01729I....459
ICK01730I....459
ICK01731I....459
ICK01732I....460
ICK01754I....460
ICK01759I....460
ICK01760I....460
ICK01761I....460
ICK01765I....460

ICK01781I....461
ICK01795I....461
ICK01832I....461
ICK01833I....461
ICK01841I....461
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ICK02101I....462
ICK02103I....462
ICK02104I....462
ICK02105I....462
ICK02128I....462
ICK02129I....463
ICK02150I....463
ICK02156I....463
ICK02163I....463
ICK02164I....463
ICK02166I....463
ICK02174I....464
ICK02200I....464
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ICK02203I....464
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ICK02230I....469
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ICK03070I....473
ICK03080I....474
ICK03090I....474
ICK03091I....474
ICK03092I....474
ICK03093I....474
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ICK03095I....475
ICK03096I....475
ICK04000I....475
ICK04001I....475
ICK04002I....475
ICK04003I....476
ICK04004I....476
ICK04005I....476
ICK04006I....476
ICK04007I....476
ICK04008I....476
ICK04009I....477
ICK04010I....477
ICK04013I....477
ICK04020I....477
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ICK04030I....478
ICK04031I....478
ICK04032I....478
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ICK04034I....478
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ICK11019I....482
ICK11038I....483
ICK11048I....483
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ICK11130I....484
ICK11306I....484
ICK11315I....484
ICK11328I....485
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ICK11392I....485
ICK11400I....486
ICK11411I....486
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ICK11414I....486
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ICK11425I....487
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ICK11436I....490
ICK11437I....490
ICK11438I....490
ICK11439I....490
ICK11440I....491
ICK11441I....491
ICK11450I....491
ICK11451E....491
ICK11452I....491
ICK11453I....492
ICK11454I....492
ICK11455I....492
ICK11456I....492
ICK11457I....493
ICK11458I....493
ICK11459I....493
ICK11460I....493
ICK11461I....494
ICK11462I....494
ICK11467I....494
ICK11468I....494
ICK11741I....494
ICK11743I....495
ICK11745I....495
ICK11752I....495
ICK11782I....496
ICK11784I....496
ICK11826I....496
ICK11827I....496
ICK11841I....497
ICK12105I....497
ICK12107I....497

ICK12108I....497
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ICK12111I....498
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ICK12120I....499
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ICK12124I....500
ICK12125I....500
ICK12126D....500
ICK12128I....501
ICK12130I....501
ICK12151I....501
ICK12153I....501
ICK12154I....501
ICK12155I....502
ICK12157I....502
ICK12159D....502
ICK12161I....502
ICK12162I....502
ICK12168I....503
ICK12171I....503
ICK12172I....503
ICK12173I....503
ICK12179I....503
ICK12180I....504
ICK12181I....504
ICK12182I....504
ICK12183I....504
ICK12184I....504
ICK12185I....505
ICK12200I....505
ICK12202I....505
ICK12204I....505
ICK12316I....505
ICK13010I....506
ICK13015I....506
ICK13016I....506
ICK13018I....506
ICK13019I....506
ICK13020I....506
ICK14000I....507
ICK14001I....507
ICK14002I....507
ICK14003I....507
ICK14004I....507
ICK14006I....508
ICK14007I....508
ICK14008I....508
ICK14009I....508
ICK14010I....508
ICK14020I....508

ICK14021I....509
ICK14022I....509
ICK20011I....509
ICK20100I....509
ICK20101I....509
ICK20200I....510
ICK20201I....510
ICK20800I....510
ICK20801I....510
ICK20802I....510
ICK20803I....511
ICK20804I....511
ICK20805I....511
ICK20806I....511
ICK20807I....511
ICK20810I....512
ICK20950I....512
ICK20951I....512
ICK20952I....512
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ICK20954I....513
ICK20955I....513
ICK21000I....513
ICK21001I....513
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ICK21003I....514
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ICK21007I....515
ICK21008I....515
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ICK21055I....520
ICK21060I....520
ICK21065I....520
ICK21070I....520
ICK21080I....520
ICK21316I....521
ICK21317I....521
ICK21318I....521
ICK21319I....521

ICK21320I....521
ICK21321I....522
ICK21322I....522
ICK21323I....522
ICK21350I....522
ICK21351I....522
ICK21394I....523
ICK21398I....523
ICK21401I....523
ICK21402I....523
ICK21403I....524
ICK21404I....524
ICK21405I....524
ICK21406I....524
ICK21407I....524
ICK21408I....525
ICK21409I....525
ICK21410I....525
ICK21420I....525
ICK21421I....526
ICK21422I....526
ICK21423I....527
ICK21424I....527
ICK21425I....527
ICK21454I....527
ICK21461I....527
ICK21601I....528
ICK21721I....528
ICK21723I....528
ICK21725I....528
ICK21727I....528
ICK21729I....529
ICK21731I....529
ICK21733I....529
ICK21735I....529
ICK21736I....529
ICK21737I....529
ICK21738I....530
ICK21739I....530
ICK21750I....530
ICK21752I....530
ICK21754I....530
ICK21755I....530
ICK21756I....531
ICK21758I....531
ICK21760I....531
ICK21762I....531
ICK21764I....532
ICK21765I....532
ICK21766I....532
ICK21768I....532
ICK21770I....532
ICK21772I....533
ICK21774I....533
ICK21775I....533
ICK21776I....533
ICK21778I....533
ICK21786I....534

ICK21798I....534
ICK21826I....534
ICK21831I....534
ICK21832I....535
ICK21833I....535
ICK21834D....535
ICK21835D....535
ICK21836D....535
ICK21837I....536
ICK21850I....536
ICK22130D....536
ICK22131I....537
ICK22158D....537
ICK22176I....537
ICK22201I....537
ICK22205I....538
ICK22206I....538
ICK22207I....538
ICK24000I....538
ICK24001I....538
ICK24002I....539
ICK24003I....539
ICK24004I....539
ICK24005I....539
ICK24050I....539
ICK24051I....540
ICK24052I....540
ICK30003I....540
ICK30004I....540
ICK30008I....541
ICK30009I....541
ICK30091I....541
ICK30101I....541
ICK30111I....542
ICK30112I....542
ICK30113I....542
ICK30114I....542
ICK30115I....542
ICK30116I....543
ICK30130I....543
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ICK30200I....543
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ICK30203I....544
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ICK30211I....545
ICK30212I....545
ICK30213I....545
ICK30214I....546
ICK30216I....546
ICK30217I....546
ICK30218I....546
ICK30219I....546

ICK30220I....547
ICK30221I....547
ICK30223I....547
ICK30225I....547
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ICK30228I....548
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ICK30300I....548
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ICK30337I....552
ICK30500I....552
ICK30699I....552
ICK30700I....552
ICK30701I....552
ICK30702I....552
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ICK30731I....557
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ICK30800I....557
ICK31004I....558
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ICK31006I....558
ICK31007I....558
ICK31011I....558
ICK31012I....559
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ICK31015I....559
ICK31016I....559
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ICK31082I....567
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ICK31300I....568
ICK31301I....568
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ICK31551I....582
ICK31560I....582
ICK31565I....582
ICK31602I....583
ICK31603I....583
ICK31604I....583
ICK31605I....583
ICK31607I....583
ICK31611I....584
ICK31700I....584
ICK31701I....584
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ICK31816I....596
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ICK31851I....598
ICK32106I....598
ICK32110I....598
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ICK32115I....599
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ICK32160I....600
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ICK32166I....600
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ICK32178I....602
ICK32179I....602
ICK32180I....602
ICK32181I....602
ICK32182I....603
ICK32190I....603
ICK32203I....603
ICK32310I....603
ICK32315I....603
ICK32316I....604
ICK32317I....604
ICK32318I....604

ICK32345I....604
ICK32347I....604
ICK32364I....605
ICK33000I....606
ICK33001I....606
ICK33005I....606
ICK33010I....606
ICK33011I....606
ICK33020I....607
ICK33030I....607
ICK33040I....607
ICK33050I....607
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ICK33070I....608
ICK33080I....608
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ICK34031I....616
ICK34032I....616
ICK34033I....616
ICK34034I....617
ICK34035I....617

ICK34036I....617
ICK34037I....617
ICK34038I....617
ICK34039I....617
ICK34040I....618
ICK34041I....618
ICK34042I....618
ICK34043I....618
ICK34044I....618
ICK34045I....619
ICK34046I....619
ICK34047I....619
ICK34048I....619
ICK34049I....620
ICK34050I....620
ICK34051I....620
ICK34052I....620
ICK34053I....620
ICK34054I....621
ICK34055I....621
ICK34056I....621
ICK34057I....621
ICK34058I....622
ICK34059I....622
ICK34060I....622
ICK34061I....622
ICK34062I....622
ICK34063I....623
ICK34064I....623
ICK34065I....623
ICK34066I....623
ICK34067I....623
ICK34068I....623
ICK34069I....624
ICK34070I....624
ICK34071I....624
ICK34072I....624
ICK34073I....624
ICK34074I....625
ICK34075I....625
ICK34076I....625
ICK34077I....625
ICK34078I....625
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ICK34080I....626
ICK34081I....626
ICK34082I....626
ICK34083I....626
ICK34084I....626
ICK34085I....627
ICK34086I....627
ICK34087I....627
ICK34088I....627
ICK34089I....627
ICK34090I....628
ICK34091I....628
ICK34092I....628
ICK34093I....628

ICK34094I....629
ICK34095I....629
ICK34096I....629
ICK34097I....629
ICK34098I....630
ICK34099I....630
ICK34100I....630
ICK34101I....630
ICK34102I....630
ICK34103I....631
ICK34104I....631
ICK34105I....631
ICK34106I....631
ICK34107I....632
ICK34108I....632
ICK34109I....632
ICK34110I....632
ICK34111I....632
ICK34112I....634
ICK34113I....634
ICK34114I....634
ICK34115I....634
ICK34116I....634
ICK34117I....635
ICK34118I....635
ICK34119I....635
ICK34120I....635
ICK34121I....636
ICK34122I....636
ICK34123I....636
ICK34124I....636
ICK34125I....636
ICK34126I....637
ICK34127I....637
ICK34128I....637
ICK34129I....637
ICK34130I....637
ICK34131I....638
ICK34132I....638
ICK34133I....638
ICK34134I....638
ICK34135I....639
ICK34136I....639
ICK34137I....639
ICK34139I....639
ICK34140I....640
ICK34141I....640
ICK34142I....641
ICK34143I....641
ICK34144I....641
ICK34146I....641
ICK34147I....642
ICK34148I....642
ICK34149I....642
ICK34150I....643
ICK34151I....643
ICK34152I....644
ICK34153I....645

ICK40227I....645
ICK40228I....645
ICK40229I....645
ICK40230I....646
ICK40232I....646
ICK40236I....646
ICK40237I....646
ICK40300I....646
ICK40305I....647
ICK40310I....647
ICK40315I....647
ICK40317I....647
ICK40320I....647
ICK40999I....648

Appendix B. Volume layout and record formats on CKD Devices.... 651
Example of a 3380 volume map.... 651
Track contents after initialization....653
IPL bootstrap record contents.... 653
How track associations are recorded....654

Appendix C. VTOC index.... 655
Calculating the size of the VTOC.... 655
Calculating the size of the VTOC index.... 655
Calculating the number of tracks for the index....656
Determining how many VIERs you need....657
How ICKDSF determines the default index size....658
Index terminology and calculations:.... 658

Appendix D. Fixed block architecture VTOC (FBAVTOC)....661
Label record format.... 661
FBAVTOC space requirements....662

Appendix E. Surface checking....663
Surface checking for possible defects.... 663
Primary checking.... 663
Primary checking for CKD devices.... 664
Primary checking for FBA devices.... 664
Skip displacement checking....664
CHECK(n) values.... 665

Appendix F. User security exit module....667
Loading registers.... 667
Return codes for password-protected data sets.... 668
Return codes for VSAM and unexpired data sets.... 668
Return codes for the IBM module.... 668
Replacing the IBM-supplied user exit routine.... 669

Appendix G. ICKMCLVL macro....671

Appendix H. Calling ICKDSF from an application program....673

Appendix I. Accessibility.... 675
Accessibility features.... 675
Consult assistive technologies.... 675
Keyboard navigation of the user interface.... 675

Dotted decimal syntax diagrams....675
Notices....679
Terms and conditions for product documentation....680
IBM Online Privacy Statement....681
Policy for unsupported hardware....681
Minimum supported hardware....682
Programming interface information....682
Trademarks....682
Glossary....683
Index....697

List of Figures

1. A DASD read-write head positioned on a disk....13
2. How service information messages are generated....15
3. ICKDSF command statement....17
4. IF-THEN-ELSE statement....21
5. DO-END statement....22
6. IF-THEN-ELSE DO-END statement....23
7. ICKDSF tasks using the MVS version....26
8. Running ICKDSF with JCL....26
9. ISPF PRIMARY OPTION MENU panel....28
10. ISMF PRIMARY OPTION MENU - z/OS DFSMS V1 R3 panel....29
11. VOLUME LIST SELECTION MENU....29
12. VOLUME SELECTION ENTRY PANEL....29
13. VOLUME LIST....30
14. ICKDSF tasks using the CMS version Part 1 of 2....38
15. ICKDSF tasks using the CMS version Part 2 of 2....38
16. Invoking ICKDSF interactively from the console....40
17. CPLIST EXEC....40
18. FMTMDVOL INPUT A....41
19. Invoking ICKDSF interactively with input file FMTMDVOL....41
20. ICKDSF tasks using the VSE version of ICKDSF....48
21. Example of executing the VSE version of ICKDSF in batch mode....49
22. Example of executing the VSE version of ICKDSF in command mode....50
23. ICKDSF tasks using the Stand-Alone version....55
24. MVS JCL to copy Stand-Alone ICKDSF to tape....56
25. CMS EXEC to copy Stand-Alone ICKDSF to tape....56
26. Drive test error summary for the IBM 3380 and 3390....107
27. Movable head error table—CKD....108
28. Fixed-head error table....109
29. Example of Flashcopy Withdraw....158
30. Example of Flashcopy Withdraw with PPRC Secondary....159
31. Volume state transitioning....229
32. Example PPRCOPY QUERY SESSIONSDEVICES....287
33. Movable-head error table—FBA....377
34. CKD track and record formats....651
35. Volume map output (CKD devices)....652
36. Cylinder 0, track 0 layout (CKD devices)....653
37. Primary/alternate track association (3390 model 2)....654
38. Format of a FBAVTOC control interval....661
39. Overriding ICKUSER1 to change return codes....669

40. Link-edit for ICKUSER1.....669
41. Expansion of macro ICKMCLVL.....672
42. ICKDSF invocation parameter list..... 673

List of Tables

1. Storage hardware documents xl
2. Storage subsystem library xl
3. Tape library information xli
4. 3990 storage control documents xli
5. Physical planning and reference information xlii
6. Interactive Storage Management Facility (ISMF) information xlii
7. VSE system information xlii
8. Icon symbols xliv
9. ICKDSF commands 4
10. Commands supported by each version of ICKDSF 6
11. CKD devices and storage subsystems supported by ICKDSF commands 7
12. CKD devices and storage subsystems supported by ICKDSF commands 7
13. FBA devices supported by ICKDSF commands 8
14. Errors that prevent reading and writing of data 13
15. Command-statement elements 17
16. ICKDSF MVS RACF authorization table 31
17. Codes returned by the user security exit module for password protected data sets 33
18. RACF facility class profile names for ICKDSF commands 34
19. Devices supported by ICKDSF commands (minidisks under CMS) 42
20. ICKDSF Commands available to general users without special authority 43
21. ICKDSF Commands available to users with DEVMAINT authority 44
22. Using ICKDSF command parameters for security 51
23. IPL error PSW codes 62
24. ICKDSF commands 63
25. ICKDSF Commands that operate on a minidisk from a guest operating system 65
26. Problem solving under VM 66
27. Number of CKD records formatted per track by AIXVOL command 90
28. Parameter conditions 103
29. Path controls when running ANALYZE drive test 106
30. Path controls when running ANALYZE drive test 106
31. Path status table for the IBM 3380 and 3390 109
32. Path status table for the IBM 9345 110
33. Logical path status table 111
34. Interface information 112
35. Host interface information 113
36. Number of CKD records formatted by CPVOLUME command 132
37. Maximum size permitted for the IPL program record 170
38. Parameter conditions when specifying part of a volume 182
39. Performing tasks with INSPECT parameters 189

40. Parameter conditions when specifying part of the volume..... 203
41. Assigning alternate tracks with INSPECT parameters.....204
42. Where INSPECT rewrites the data of a defective track..... 204
43. Transitioning between volume states..... 229
44. PPRCopy ICKDSF commands..... 231
45. 3990 NVS and cache requirements for PPRCOPY..... 235
46. Field descriptions.....267
47. Path status codes.....279
48. 3990 Model 6 NVS and cache requirements..... 309
49. Determining LCU and CCA values for RVA.....317
50. Determining SAID values for RVA.....317
51. Maximum size for IPL program record..... 336
52. Maximum block and page numbers for FBA devices.....387
53. Performing tasks with INSPECT parameters..... 399
54. Assigning alternate blocks with INSPECT parameters.....404
55. MAPALT report (first part).....413
56. IPL bootstrap records..... 654
57. Table of maximum VTOC and VTOC index sizes..... 656
58. Offsets of return codes for the IBM-supplied user exit module.....668

About this document

This document describes the IBM Device Support Facilities (ICKDSF) product used with IBM direct access storage device (DASD) subsystems.

This document is for system programmers, system operators, and other data processing personnel who manage, maintain, or use DASD.

If you are experiencing problems

This document is a reference for ICKDSF. If you have device errors or media maintenance problems:

- For IBM 9345 DASDs, see:
  - *9340 Customer Guide for Using SIMs*, GC26-4858
- For any other IBM DASDs, see:
  - *Maintaining IBM Storage Subsystem Media*, GC26-4495
- For the Internal Disk Feature of the S/390® Multiprise 2000 and Multiprise 3000, see:
  - *Internal Disk Subsystem Reference Guide, S/390*, SA24-4260
  - *Internal Disk Subsystem User's Guide, S/390*, SA24-4261
  - *Internal Disk Reference Guide, S/390 Multiprise 3000*, SA22-1025
  - *Internal Disk User's Guide, S/390 Multiprise 3000*, SA22-1026

For information about the accessibility features of z/OS®, for users who have a physical disability, see Appendix I, “Accessibility,” on page 675.

ICKDSF product library

The documents in the ICKDSF library are:

Device Support Facilities User's Guide and Reference, GC35-0033. This document gives detailed instructions for using the ICKDSF product.

Device Support Facilities Release 17 System Control Programming Specifications, GC26-3946. This document gives the specifications on the ICKDSF program.

Additional reference information

To use this product effectively, you should read, or have for reference, the following documents.

9340 Customer Guide for Using SIMs, GC26-4858, for information on error conditions and guidelines for performing media maintenance on 9340 subsystems.

Internal Disk Subsystem Reference Guide, S/390, SA24-4260, *Internal Disk Subsystem User's Guide, S/390*, SA24-4261, *Internal Disk Reference Guide, S/390 Multiprise 3000*, SA22-1025, *Internal Disk User's Guide, S/390 Multiprise 3000*, SA22-1026, for information and guidelines for using the Internal Disk feature of the S/390 Multiprise 2000 and Multiprise 3000.

Maintaining IBM Storage Subsystem Media, GC26-4495, for information on error conditions and guidelines for performing media maintenance on IBM subsystems other than the 9340.

EREP Reference and *EREP User's Guide* for detailed information on the many reports to monitor system activity.

You should also have a complete set of documents about your operating system.

For more information, refer to “Hardware documents” on page xl and “Software documents” on page xlii.

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Hardware documents

The documents listed below contain detailed information on hardware-related subjects.

Table 1: Storage hardware documents

Title	Order Number	Contents
9340 Customer Guide for Using SIMs	GC26-4858	Information on using SIMs to recognize and respond to 9340 subsystem problems.
EREP User's Guide	GC35-0151	Description of EREP functions and commands for DASD media reporting.
EREP Reference	GC35-0152	Description of EREP functions and commands for DASD media reporting.
Maintaining IBM Storage Subsystem Media	GC26-4495	Description of DASD media maintenance and error handling.
Device Support Facilities Release 17 System Control Programming Specifications	GC26-3946	Description of DASD media maintenance and error handling.
Internal Disk Subsystem User's Guide, S/390	SA24-4261	Description of S/390 Multiprise Internal Disk Subsystem.
Internal Disk Subsystem Reference Guide, S/390	SA24-4260	Description of S/390 Multiprise Internal Disk Subsystem.
Internal Disk Reference Guide, S/390 Multiprise 3000	SA22-1025	Description of S/390 Multiprise Internal Disk Subsystem.
Internal Disk User's Guide, S/390 Multiprise 3000	SA22-1026	Description of S/390 Multiprise Internal Disk Subsystem.

Table 2: Storage subsystem library

Title	Order Number	Contents
Using the IBM RAMAC Array Subsystem in an MVS, VM, or VSE Environment	GC26-7005	Information about using SIMs.
3380 DASD Introduction	GC26-4491	Overview of all 3380 models.
3380 Model CJ2 Introduction and Reference	GC26-4497	Overview of functions and reference information for 3380 Model CJ2.
IBM 3390 Direct Access Storage Introduction	GC26-4573	Overview of all 3390 models.
3390 Reference Summary	GX26-4577	Summary card containing 3390 device characteristics.
3380, 3390, and 3990 Master Index and Glossary	GC26-4496	Index to information in Storage Subsystem Library documents.
Using IBM 3390 in an MVS Environment	GC26-4574	Discussion of 3390 use under MVS.
Using IBM 3390 Direct Access Storage in a VM Environment	GC26-4575	Discussion of 3390 use under VM.
Using IBM 3390 Direct Access Storage in a VSE Environment	GC26-4576	Discussion of 3390 use under VSE.

Table 2: Storage subsystem library (continued)

Title	Order Number	Contents
IBM 9340 Direct Access Storage Subsystems Introduction	GC26-4694	Overview of 9340 models.
IBM 9340 DASD Subsystems Reference Summary	GX26-3778	Reference of device characteristics, channel commands, and sense byte information.
Introduction to Nonsynchronous Direct Access Storage Subsystems	GC26-4519	Provides specific information for programmers responsible for writing DASD channel programs that operate in a nonsynchronous environment.
Using 9340 DASD Subsystems in an MVS Environment	GC26-4646	Discussion of 9340 use under MVS.
Using IBM 9340 Direct Access Storage Subsystems in a VM/ESA Environment	GC26-4644	Discussion of 9340 use under VM/ESA.
Using IBM 9340 Direct Access Storage Subsystems in a VSE/ESA Environment	GC26-4645	Discussion of 9340 use under VSE/ESA.
IBM 9340 Direct Access Storage Subsystems Reference	GC26-4647	Contains reference information for the 9340 subsystem.
IBM 9340 DASD Subsystems Reference Summary	GX26-3778	Summarizes 9340 subsystem information and characteristics.

Table 3: Tape library information

Title	Order Number	Contents
IBM TotalStorage Enterprise Automated Tape Library (3494) Operator's Guide	GA32-0449	Provides details on how to set up and use a stand-alone device.
IBM TotalStorage Enterprise Automated Tape Library (3494) Introduction and Planning Guide	GA32-0448	Provides details on how to set up and use a stand-alone device.

Table 4: 3990 storage control documents

Title	Order Number	Contents
IBM Cache Device Administration	GC35-0101	Describes the IDCAMS cache utility commands necessary to manage cache and to obtain information about cache status and performance.
IBM 3990/9390 Storage Control Introduction	GA32-0098	Overview of 3990/9390 storage control unit functions.
IBM 3990/9390 Storage Control Planning, Installation, and Storage Administration Guide	GA32-0100	Detailed information on installation and use of the 3990/9390 storage control.
IBM 3990 Storage Control Reference (Models 1, 2, and 3)	GA32-0099	Information on the 3990 channel interface (channel commands and sense bytes).
Introduction to Nonsynchronous Direct Access Storage Subsystems	GC26-4519	Describes nonsynchronous operation and provides descriptions of the ECKD command set and ECKD channel programs.

Table 4: 3990 storage control documents (continued)

Title	Order Number	Contents
z/OS DFSMS Advanced Copy Services	SC23-6847	Describes remote copy functions and how to implement both Peer-to-Peer Remote Copy and extended remote copy for backup and recovery of data should a disaster occur to your data center.

Table 5: Physical planning and reference information

Title	Order Number	Contents
IBM 3390 Direct Access Storage Migration Guide	GG24-3373	Provides guidelines and detailed procedures for moving MVS and VM data to 3390 from other DASD.

Note: This reference document is no longer orderable.

Software documents

The documents listed below contain detailed information on software-related subjects described in this document.

Table 6: Interactive Storage Management Facility (ISMF) information

Title	Order Number	Contents
z/OS DFSMS Using the Interactive Storage Management Facility	SC23-6856	Describes how to use ISMF to perform data and storage management tasks.

Table 7: VSE system information

Title	Order Number	Contents
IBM VSE/Enterprise Systems Architecture Messages and Codes Volume 1 Version 2 Release 6	SC33-6796	Provides explanations for messages issued by VSE/ESA and its component programs.
IBM VSE/Enterprise Systems Architecture Messages and Codes Volume 2 Version 2 Release 6	SC33-6798	Provides explanations for messages issued by VSE/ESA and its component programs.
IBM VSE/Enterprise Systems Architecture Messages and Codes Volume 3 Version 2 Release 6	SC33-6799	Provides explanations for messages issued by VSE/ESA and its component programs.
VSE/ESA System Utilities	SC33-6517	Description of VSE/ESA utilities, including Fast Copy.
IBM VSE/Enterprise Systems Architecture VSE Central Functions Supervisor Diagnosis Reference Version 6 Release 4	SC33-6323	Contains information related to VSE supervisor services.
IBM VSE/Enterprise Systems Architecture VSE Central Functions Initial Program Load and Job Control Diagnosis Reference Version 6 Release 6	SC33-6325	Describes the diagnosis reference material for the VSE central functions initial program load and job control.

Table 7: VSE system information (continued)

Title	Order Number	Contents
IBM VSE/Enterprise Systems Architecture VSE Central Functions Diagnosis Reference LIOCS Version 6 Release 4	SC33-6336	Contains information related to the VSE logical IOCS support.

Terminology

You should understand what the following terms mean in this document:

Dedicated device refers to a device dedicated to a virtual machine by either a DEDICATE control statement in the VM user directory or the CP ATTACH command.

Device refers to a uniquely addressable part of the DASD unit that includes a set of access arms, their associated surfaces, and the electronic circuitry needed to locate, read, and write data.

Formatting a volume refers to making a volume usable in a specific operating environment.

Maximal initialization or **maximal INIT** refers to using the INIT command to check the track surface and then perform the minimal INIT. You can only perform maximal INIT on 3370 and 9335 devices.

Medial initialization or **medial INIT** refers to using the INIT command to validate the home address and record 0, and then perform a minimal INIT on a volume.

The medial INIT is recommended for 3375 and older devices, such as:

- A new DASD unit
- A replaced or upgraded head disk assembly (HDA)
- A DASD unit that has been physically relocated

For 3380, 3390, and 9345 devices, use the INSTALL command.

Minimal initialization or **minimal INIT** refers to using the INIT command to write the volume label and volume table of contents (VTOC) on volumes for use by BookManager® or VSE operating systems.

MVS refers to the OS/390 and z/OS operating systems.

SA refers to the ICKDSF Stand-Alone version.

Volume refers to the DASD space identified by a common label and accessed by any of a set of related addresses.

VM refers to the VM/ESA and z/VM operating systems.

VSE refers to the VSE/ESA operating systems.

Additional terms used in this document are given in the glossary.

How to use this document for your operating environment

This document is organized for quick retrievability of ICKDSF information.

In addition, icon symbols begin sections, paragraphs, and list items that describe specific ICKDSF versions or operating systems information. An icon, or set of icons indicates information that is specific to a version or operating system. If placed in the left margin it references the paragraph to its right, if placed above a section it references that section, and if placed in the left margin next to a list item it references that list item.

This document is designed so you can discard those pages that do not pertain to your installation. For example, if you are running exclusively in an MVS environment, you can discard the chapters that describe

using ICKDSF in other environments, and Part 3, “Using ICKDSF to install and maintain FBA devices,” on page 359.

Table 8 on page xliv contains the icon symbols and describes how they are used in this document.

Table 8: Icon symbols

Icon symbol	Description
	MVS version of ICKDSF **Note:** When MVS is referenced in this document, it includes OS/390 and z/OS unless specifically indicated otherwise.
	CMS version of ICKDSF
	VM operating environment **Note:** When VM is referenced in this document, it includes VM/ESA and z/VM unless specifically indicated otherwise.
	VSE version of ICKDSF
	Stand-Alone version of ICKDSF **Note:** When Stand-Alone/XA is referenced in this document, it also applies to Stand-Alone/ESA.

How to send your comments to IBM

We invite you to submit comments about the z/OS® product documentation. Your valuable feedback helps to ensure accurate and high-quality information.

Important: If your comment regards a technical question or problem, see instead "If you have a technical problem" on page xlv.

Submit your feedback by using the appropriate method for your type of comment or question:

Feedback on z/OS function
If your comment or question is about z/OS itself, submit a request through the IBM RFE Community (www.ibm.com/developerworks/rfe/).

Feedback on IBM® Knowledge Center function
If your comment or question is about the IBM Knowledge Center functionality, for example search capabilities or how to arrange the browser view, send a detailed email to IBM Knowledge Center Support at ibmkc@us.ibm.com.

Feedback on the z/OS product documentation and content
If your comment is about the information that is provided in the z/OS product documentation library, send a detailed email to mhvrcfs@us.ibm.com. We welcome any feedback that you have, including comments on the clarity, accuracy, or completeness of the information.

To help us better process your submission, include the following information:

- Your name, company/university/institution name, and email address
- The following deliverable title and order number: ICKDSF R17 User's Guide, GC35-0033-42
- The section title of the specific information to which your comment relates
- The text of your comment.

When you send comments to IBM, you grant IBM a nonexclusive right to use or distribute the comments in any way appropriate without incurring any obligation to you.

IBM or any other organizations use the personal information that you supply to contact you only about the issues that you submit.

If you have a technical problem

If you have a technical problem or question, do not use the feedback methods that are provided for sending documentation comments. Instead, take one or more of the following actions:

- Go to the IBM Support Portal (support.ibm.com).
- Contact your IBM service representative.
- Call IBM technical support.

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Summary of changes

This document contains terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change.

Changes made in Release 17, GC35-0033-42

This document contains information that was previously presented in *Device Support Facilities User's Guide and Reference Release 17*, GC35-0033-41.

General changes

New information

- The CONTROL command for FBA devices. For more information, see Chapter 13, “CONTROL command—CKD,” on page 119.
- z/architecture changes for the stand alone version of ICKDSF. See “About the Stand-Alone version” on page 53.
- DSEXIST parameter for the INIT command. See “DSEXIST parameter: override NODSEXIST parameter default allowing data sets to exist on the volume” on page 166.
- Value 11 for SUSPEND. See the table of field descriptions in “Using PPRCOPY QUERY without the PATHS parameter” on page 266.
- IPL error PSW code 000A0000 000000AA. See “Interpreting error conditions” on page 61.

Changed information

- NODSEXIST parameter for the INIT command. See “NODSEXIST parameter: verify no data sets exist on the volume” on page 169.
- SESECOK parameter for the INIT command. See “SESECOK parameter: specify track space efficient secondary volume” on page 250.
- VERIFY|NOVERIFYOFFLINE parameter. See “VERIFYOFFLINE|NOVERIFYOFFLINE parameter: verify device is offline to all other systems” on page 175.

Message changes

The following lists indicate the messages that are new, changed, or no longer issued in z/OS V2R3 and its updates. Messages that have been added, updated, or that are no longer issued in an updated edition of V2R3 are identified by the quarter and year that the message was updated, in parentheses. For example, (4Q2017) indicates that a message was updated in the fourth quarter of 2017.

For more information, see Appendix A, “Device Support Facilities messages (ICK),” on page 419.

New

The following messages are new.

ICK03096I
ICK11468I
ICK20807I
ICK32177I
ICK34151I
ICK34152I
ICK34153I

Changed

The following messages are changed.

ICK03095I
ICK31529I
ICK32177I
ICK34102I
ICK34104I
ICK34108I
ICK34109I
ICK34111I
ICK34141I

Deleted

The following messages were deleted.

None

Changes made in Release 17, GC35-0033-41

This document contains information that was previously presented in *Device Support Facilities User's Guide and Reference Release 17*, GC35-0033-40.

New information

- Support for SPID fencing, including changes to the CONTROL command, the ANALYZE HOSTACCESS command, and new message ICK04036I. For more information, refer to Chapter 13, "CONTROL command—CKD," on page 119, "HOSTACCESS parameter: obtain host access information" on page 97, and Appendix A, "Device Support Facilities messages (ICK)," on page 419.
- Message ICK30732I. For more information, refer to Appendix A, "Device Support Facilities messages (ICK)," on page 419.

Changed information

- The VERIFYOFFLINE parameter of the INIT and REFORMAT commands verifies that the device is offline to all other systems before the command is attempted. If the UNIT parameter is specified for the INIT or REFORMAT command, and the required storage control microcode support and software support exists, and the device is not a minidisk, the VERIFYOFFLINE parameter is now the default, meaning that verification that the device is offline occurs even if VERIFYOFFLINE is not specified. Previously, verification occurred only when VERIFYOFFLINE was specified. A new NOVERIFYONLINE parameter lets you specify that verification not occur.

Changes made in Release 17, GC35-0033-40

This document contains information that was previously presented in *Device Support Facilities User's Guide and Reference Release 17*, GC35-0033-39.

New information

- New FAILOVERMT parameter on the PPRCOPY ESTPAIR command, to request that a Multi-Target Mirror configuration should be created rather than the existing cascaded failover state when doing a failover. For more information, refer to "PPRCOPY ESTPAIR–establishing pairs" on page 243.

- New MTIVOLLIST and MTRVOLLIST parameters on the PPRCOPY POPULATESESSION command, for lists of individual volumes or ranges of volumes for a Multi-Target Mirror configuration. For more information, refer to "PPRCOPY POPULATESESSION" on page 261.
- New PPRCOPY SETCHARACTERISTICS command to allow management software to designate a Metro Mirror pair in a Multi-Target Mirror configuration that must remain full duplex when performing a Remote Pair FlashCopy (Preserve Mirror) operation. For more information, refer to "PPRCOPY SETCHARACTERISTICS" on page 293.
- Messages ICK02233I, ICK11467I, ICK30228I, ICK34150I, ICK34151I and ICK34149I are added. Refer to Appendix A, "Device Support Facilities messages (ICK)," on page 419.
- A new optional subparameter, V2, has been added to the CHANGERECORDING parameter of the FLASHCPY ESTABLISH command as part of the support for multiple Incremental FlashCopy relationships (Incremental FlashCopy Version 2). For more information, refer to "FLASHCPY ESTABLISH" on page 137.

Changed information

- The CONTROL CONFIG(DISPLAY) command displays microcode LIC and bundle levels, if they are available. For more information, refer to "CONFIGURE(DISPLAY) parameter: display subsystem information" on page 121.
- For the FLASHCPY ESTABLISH command, the restrictions for PRESERVEMIRROR have been updated to indicate that PREFERRED is not valid if the devices specified are in a peer-to-peer multi-target relationship. For more information, refer to "FLASHCPY ESTABLISH" on page 137.
- For multi-target support, the responses to the PPRCOPY QUERY, PPRCOPY QUERY PATHS, and PPRCOPY QUERY SESSIONSDEVICES commands have a new format. For more information, refer to "Using PPRCOPY QUERY with the multi-target support" on page 280 and "PPRCOPY QUERY SESSIONSDEVICES" on page 287.
- The number of control units is updated to 16 in these topics: "Establishing the PPRCOPY configuration" on page 234, "PPRCOPY ESTPATH–establishing paths" on page 251, "Establishing paths" on page 312, "Using PPRCOPY QUERY with the PATHS parameter" on page 273 and "PPRCOPY QUERY with the PATHS parameter" on page 314.
- The FLASHCPY QUERY RELATIONS command now displays a value of 2 for CRA when change recording version 2 is active. Refer to "FLASHCPY QUERY RELATIONS" on page 151 for more information.
- Messages ICK34028I, ICK34141I and ICK34111I were changed. Refer to Appendix A, "Device Support Facilities messages (ICK)," on page 419.

Part 1. Introducing ICKDSF

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Chapter 1. Introduction to ICKDSF

This chapter introduces the ICKDSF product. The information in this chapter is organized as follows.

- "About ICKDSF" on page 3
  - "Verifying your ICKDSF version" on page 3
  - "Running multiple ICKDSF jobs" on page 3
  - "Running ICKDSF on Dual Copy volumes" on page 4
- "ICKDSF commands" on page 4
- "Operating systems that support ICKDSF" on page 5
- "Devices supported by ICKDSF" on page 6
- "Tasks you can perform with ICKDSF" on page 10

About ICKDSF

ICKDSF is a program you can use to perform functions needed for the installation, use, and maintenance of IBM DASD. You can also use it to perform service functions, error detection, and media maintenance.

Verifying your ICKDSF version

You can verify the version, release, modification level of ICKDSF, and the environment supported, by checking the format as follows at the top line of any printed page.

```
ICKDSF-xxx DEVICE SUPPORT FACILITIES yy.y
```

xxx
is MVS/XA/ESA (MVS), CMS/XA/ESA (VM/CMS), SA/XA/ESA (Stand-Alone/XA or Stand-Alone/ESA mode) or VSE (VSE/ESA).

Note:

1. When MVS is referenced in this document, it includes OS/390 and z/OS unless specifically indicated otherwise.
2. When VM is referenced in this document, it includes VM/ESA and z/VM unless specifically indicated otherwise.

yy.y
is the ICKDSF release and version (for example, Release 17.0)



You can also verify your ICKDSF version with the ICKMCLVL macro. For more details, see Appendix G, "ICKMCLVL macro," on page 671.

Running multiple ICKDSF jobs

Multiple concurrent ICKDSF jobs can cause contention for resources. This can occur when the number of ICKDSF jobs accessing devices on the same storage control or storage subsystem exceeds the number of paths to the devices. For example, if you are running in Device Level Selection Enhanced (DLSE) mode, the maximum number of copies you should use is four.

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Running ICKDSF on Dual Copy volumes

You can use different ways to establish or suspend a dual pair (for example, using IDCAMS for MVS or the DUPLEX command for VM). When you are establishing or suspending a dual pair, ICKDSF is unable to ensure the volume is in a usable state. You must allow the current ICKDSF command to run to its completion before changing the primary or secondary volume state (establishing or suspending a dual pair). Also, do not start ICKDSF until a dual volume change has completed. If an ICKDSF command function prematurely ends, examine the ICKDSF output carefully to determine the reason before you reissue the function. If the volume has changed from a duplex state to a suspended duplex state, the original primary and secondary may be swapped. Be sure you are reissuing ICKDSF to the correct volume. After you determine if it is the primary or the secondary having the problem, you can use the DIRECTIO parameter to issue the command to a secondary of the duplex pair.

ICKDSF commands

ICKDSF operates on both count key data (CKD) and fixed block architecture (FBA) devices. The commands, syntax, and functions are common to all the versions of ICKDSF, provided the operating system supports the device or function.

Table 9 on page 4 contains descriptions of each command.

Table 9: ICKDSF commands.

Command	Description
AIXVOL	Prepares a volume for use in an AIX® environment.
ANALYZE	Helps to detect and differentiate recording surface and drive-related problems on a volume. It can scan data to help detect possible media problems. It can also be used to obtain pathing information.
BUILDIX	Changes a standard MVS-format VTOC into an indexed VTOC, or an indexed VTOC into a standard MVS-format VTOC.
CONTROL	With the ALLOWWRITE parameter, this command allows subsequent writes to devices, if storage control has been WRITE INHIBITed by the error recovery procedures at the channel, director, or storage control level. With the CLEARFENCE parameter, CONTROL allows you to clear a fence status of a path and device that the subsystem has fenced off. The CONTROL command with the RESETICD parameter allows you to reset the 'indefinite condition of device' that was set by the subsystem. The CONFIGURE(DISPLAY) parameter allows you to display some subsystem information for a device.
CPVOLUME	Formats a volume for use in the VM environment as a CP volume.
FLASHCOPY	ICKDSF Flashcopy implementation will only produce full volume establishment, but the Withdraw will withdraw any relation, both full volume and dataset level relations. This function is intended to be used in setting up Asynchronous PPRCOPY configurations.
INIT	Initializes MVS and VSE volumes by writing the volume label and volume table of contents (VTOC).
INSPECT	Provides surface checking functions for blocks or tracks on a subset of a volume.
INSTALL	Performs verification procedures after installation or HDA replacement for 3380, 3390, and 9345 devices. Consult your IBM service representative to determine if INSTALL is required after physically moving your IBM 3380, 3390, and 9345 DASD.

Table 9: ICKDSF commands. (continued)

Command	Description
IODELAY	Allows functions other than ICKDSF more processing time by slowing down ICKDSF I/O operations. Instead of ICKDSF issuing consecutive I/Os, it allows other functions to process between ICKDSF I/Os.
MAPALT	Produces a report showing the assignment of primary blocks to alternate blocks on FBA devices.
PPRCOPY	PPRCOPY allows synchronous and asynchronous copying of a DASD volume from one subsystem to another subsystem volume, without host system dependencies, for those subsystems that support it.
REFORMAT	Updates portions of a previously initialized MVS or VSE volume. After issuing INIT to initialize a volume, use REFORMAT to change the volume serial number, owner identification, IPL bootstrap, program records, expand or refresh the VTOC, and expand the VTOC index.
REVAL	Performs three major functions: • DATA/NODATA – Performs a drive test – Validates home address and record zero – Performs data verification of the factory functional verification data patterns (FFVDP) • FIXSIM(4E4E) fixes specific 4E4E SIMs and performs surface checking on tracks for 3390 Models 1 and 2. • REFRESH rewrites user data for 3390 Model 3.
TRKFMT	Performs track-related functions on a subset of a volume.

For instructions about writing command statements, see Chapter 3, “Understanding ICKDSF command statements,” on page 17. For a detailed description and examples of each command, see:

Part 2, “Using ICKDSF to install and maintain CKD devices,” on page 67
Part 3, “Using ICKDSF to install and maintain FBA devices,” on page 359

Operating systems that support ICKDSF

ICKDSF versions are:

ICKDSF version	Program number
Stand-Alone	5747-DS1
MVS	5655-257
VM	5684-042
VSE/ESA	5747-DS2

Note:

1. When MVS is referenced in this document, it includes OS/390 and z/OS unless specifically indicated otherwise.
2. When VM is referenced in this document, it includes VM/ESA and z/VM unless specifically indicated otherwise.

The Stand-Alone version of ICKDSF runs in a virtual machine on VM, and on S/390 and zSeries Enterprise Servers, ES/9000 and newer.

370 mode is no longer supported by ICKDSF.

Note: The program directory that is shipped with the machine-readable material gives instructions about how to install ICKDSF versions.

Versions that support ICKDSF commands

Table 10 on page 6 shows which ICKDSF commands are supported by each ICKDSF version.

Table 10: Commands supported by each version of ICKDSF.

Command	MVS	CMS	VSE	Stand-Alone
AIXVOL	-	X	-	X
ANALYZE	X	X	X	X
BUILDIX	X	-	-	-
CONTROL	X	X	X	X
CPVOLUME	X	X	-	X
FLASHCPY	X	X	X	X
INIT	X	X	X	X
INSPECT	X	X	X	X
INSTALL	X	X	X	X
IODELAY	X	X	X	X
MAPALT	-	X	X	X
PPRCOPY	X	X	X	X
REFORMAT	X	X	X	X
REVAL	X	X	X	X
TRKFMT	X	X	X	X

Note:

1. An X indicates support and a hyphen (-) indicates nonsupport.
2. All ICKDSF commands are not always supported by the operating system under which they run. For example, you can initialize a 9313 FBA minidisk using the CMS version, but the VSE operating system will not operate correctly against that FBA device.

Storage requirements

ICKDSF requires the following approximate amounts of processor storage space for execution:

Operating System	Storage Requirement
MVS	2 MB virtual storage
CMS	2 MB user storage
VSE	2 MB minimum partition size
Stand-Alone	2 MB real storage

Devices supported by ICKDSF

Table 11 on page 7 and Table 12 on page 7 show the ICKDSF commands and the CKD devices each command supports, and Table 13 on page 8 shows similar information for FBA devices.

Before you run ICKDSF, make sure these DASD devices have reached thermal stability. You must power on all devices in the ready condition. Close all covers to establish thermal stability. To ensure thermal stability, the following is recommended.

Device	Time required
3380	2 hours 30 minutes
3390	1 hour 20 minutes
9345	10 minutes

Table 11 on page 7 contains the CKD devices and storage subsystems supported by ICKDSF commands.

Table 11: CKD devices and storage subsystems supported by ICKDSF commands.

Command	3375	3380	3390	3395[2]	9345
AIXVOL	-	X	X	X	X
ANALYZE	X	X	X	X	X
BUILDIX	X	X	X	X	X
CONTROL	X	X	X	X	-
CPVOLUME	X	X	X	X	X
INIT	X	X	X	X	X
INSPECT	X	X	X	-	X
INSTALL	-	X	X	-	X
PPRCOPY[1]	-	-	X	-	-
REFORMAT	X	X	X	X	X
REVAL	-	X	X	-	-
TRKFMT	-	X	X	-	X

Note:

1. An X indicates support and a hyphen (-) indicates nonsupport.
2. [1] 3990 Model 6 attached (for 3390 and 9391) or devices attached to 9393 (RVA), 2105, 2107. or 1750.
3. [2] Models 151 and 153.

Table 12 on page 7 contains additional CKD devices and storage subsystems supported by ICKDSF commands.

Table 12: CKD devices and storage subsystems supported by ICKDSF commands.

Command	9391	9394	Internal Disk[2]	9393	9396	9397	2105 2107 1750
AIXVOL	X	X	-	X	X	X	X
ANALYZE	X	X	X	X	X	X	X
BUILDIX	X	X	X	X	X	X	X
CONTROL	X	-	-	X	X	X	X
CPVOLUME	X	X	X	X	X	X	X
FLASHCPY	-	-	-	-	-	-	X
INIT	X	X	X	X	X	X	X
INSPECT	X	X	X	X	X	X	X
INSTALL	X	X	X	-	X	X	-
PPRCOPY[1]	X	-	-	X	-	-	X

Table 12: CKD devices and storage subsystems supported by ICKDSF commands. (continued)

Command	9391	9394	Internal Disk[2]	9393	9396	9397	2105 2107 1750
REFORMAT	X	X	X	X	X	X	X
REVAL	X	-	-	X	X	X	-
TRKFMT	X	X	X	X	X	X	X

Note:

1. An X indicates support and a hyphen (-) indicates nonsupport.
2. [1] 3990 Model 6 attached (for 3390 and 9391) or devices attached to 9393 (RVA), 2105, 2107, or 1750.
3. [2] Internal Disk Feature of the S/390 Multiprise 2000 and Multiprise 3000.

Table 13 on page 8 contains FBA devices supported by ICKDSF commands.

Table 13: FBA devices supported by ICKDSF commands.

Command	0671	3370	9313	9332	9335	9336
ANALYZE	-	X	-	-	X	-
CONTROL	-	X	-	-	-	-
CPVOLUME	X	X	X	X	X	X
INIT	X	X	X	X	X	X
INSPECT	X	X	X	X	X	X
MAPALT	-	X	-	-	X	-
REFORMAT	X	X	X	X	X	X

Note: An X indicates support and a hyphen (-) indicates nonsupport.

The Stand-Alone version of ICKDSF supports all the devices listed in Table 11 on page 7 and Table 12 on page 7. The operating system versions of ICKDSF support those devices that each operating system supports.

For DASD operating as a paging subsystem, all ICKDSF commands must be directed to the base address.

If the DASD are attached to a cached storage control, ICKDSF automatically bypasses the cache in all channel programs.

ICKDSF support of the RAMAC Array family

The RAMAC Array family consists of the following devices:

- RAMAC Array Subsystem (9394)
- RAMAC Array DASD (9391)
- RAMAC Virtual Array (9393)
- RAMAC Scalable Array (9396)
- RAMAC Electronic Array (9397)

The characteristics of the physical devices that make up the RAMAC Array Family do not require use of the ICKDSF commands that perform installation, media maintenance and problem determination functions. These functions are currently part of the following commands:

INSTALL[1]
ANALYZE

[1] INSTALL must be used to change 9391 devices to 3380 track format. INSTALL is not recommended otherwise.

INSPECT
REVAL

ICKDSF supports the command and parameter combinations of these commands whenever possible. For those command and parameter combinations that are not supported on the RAMAC Array DASD and the RAMAC Array Subsystem, ICKDSF detects the ones which cannot execute and posts an error condition.

For example, an INSPECT PRESERVE CHECK(1) is not supported on the RAMAC Array DASD. A message is issued indicating that the function is not supported for the device.

However, an INSPECT PRESERVE CHECK(1) on the RAMAC Array Subsystem issues commands to preserve data and surface check the track. No data check conditions will ever be indicated, since media maintenance is done by the subsystem.

When you use the following commands in support of devices emulated by the RAMAC products, they support the emulated device in the same way they support the native device.

INIT NOVALIDATE (minimal init)
CPVOLUME
AIXVOL
BUILDIX
PPRCOPY
REFORMAT

ICKDSF support of the Internal Disk

Whenever IDisk or Internal Disk is referenced throughout this document, it refers to the Internal Disk Feature of the S/390 Multiprise 2000 or Multiprise 3000.

The characteristics of the Internal Disk devices do not require use of certain ICKDSF commands and parameters that perform installation, media maintenance and problem determination functions. For those commands and parameter combinations that are not supported, ICKDSF detects which ones cannot execute and posts an error condition. If the device does not support ICKDSF checkpointing operators, all ICKDSF checkpointing functions are bypassed.

ICKDSF support of the 2105, 2107, and 1750

The characteristics of the 2105, 2107, and 1750 do not require use of the ICKDSF commands that perform installation, media maintenance, and problem determination functions. These functions are currently part of the following commands:

INSTALL
ANALYZE
INSPECT
REVAL

ICKDSF supports the command and parameter combinations of these commands whenever possible. For those command and parameter combinations that are not supported on the 2105, 2107, and 1750 ICKDSF detects the ones which cannot execute and posts an error condition. For example, the following command is not supported on the 2105, 2107, or 1750:

```
INSPECT PRESERVE CHECK(1)
```

A message indicates that the function is not supported for the device.

When running offline in an MVS environment, the Alias address of a Parallel Access Volume (PAV) cannot be specified for ICKDSF commands. An error message will result if specified. Instead, specify the base address.

Additional ICKDSF support information

If the device does not support ICKDSF checkpointing operations, or does not have CE cylinders, all ICKDSF checkpointing functions are bypassed. When the size of the volume is greater than 4 K cylinders or greater than 64 K tracks, the same rules and restrictions apply as for other devices with greater than 4 K cylinders or greater than 64 K tracks.

Configuration checking

ICKDSF checks for possible miscabled devices in the MVS offline environment (when running with the UNITADDRESS parameter specified), VM/CMS environment, and Stand-Alone environment. If the CKD device supports self description, ICKDSF will compare the Device NED (node element descriptor) for each available path. If the Device NED for all paths match, then ICKDSF will continue processing. If they do not all match, ICKDSF will terminate the command.

ICKDSF does not perform the miscable checking:

- When the device does not support self description
- When the device is online in the MVS environment
- When ICKDSF is running in the VSE environment
- For non-simplex volumes
- For FBA devices

If the Device NED information matches on all paths (or if only 1 path is available), ICKDSF will print the NED information as an informational message and continue processing.

If the Device NED information does not match on all paths, then ICKDSF will print the NED information for each path along with the CHPID number, and the ICKDSF command processing is terminated.

Processing on XRC volumes

Prior to APAR PQ73189 for release 17 when the subsystem status (Sense Subsystem Status Data) indicated that XRC was active on the volume, only ANALYZE, BUILDIX, CONTROL, and PPRCOPY commands were allowed to run on the volume unless you removed it from the XRC pair. With APAR PQ73189 for Release 17 all ICKDSF commands will be allowed to run, unless the JCL parameter PARM=NOXRC is specified.

If you only want to run the ANALYZE, BUILDIX, CONTROL, and PPRCOPY commands to XRC active volumes after applying APAR PQ73189 then you must code this new parm in your JCL as follows.

```
//stepname EXEC PGM=ICKDSF,PARM=NOXRC
```

Note: This applies only to the primary volume as there is no indication to ICKDSF that a volume is a secondary of an XRC pair. It is the responsibility of the user to control activity to the secondary volume of the XRC pair.

See *z/OS DFSMS Advanced Copy Services* for more information about running ICKDSF on XRC volumes.

Tasks you can perform with ICKDSF

ICKDSF is a program you can use to perform functions needed for the installation, use, and maintenance of IBM DASD. Short descriptions of some of the tasks follow:

Installing a device: After your IBM service representative completes the physical installation of a device, you may need to complete additional installation procedures for that device.

Initializing and formatting the volume: Once you have completed the installation of a device, you must initialize and format the volume so that it can be used by an AIX, MVS, VM, or VSE operating system.

Problem determination: You can use ICKDSF to help determine if the origin of a problem is hardware or recording media. For background information on problem determination for storage media, see Chapter 2, "About DASD storage media," on page 13. Some of the specific tasks you can perform for problem determination are:

- Perform surface checking functions.

  Note: The surface checking functions performed by ICKDSF are not equivalent to the surface checking that is performed on a volume at the factory. For more information, see Appendix E, "Surface checking," on page 663.
- Examine a device with a non-removable storage mechanism to determine if there are problems with the drive.
- Determine if there is a problem reading data stored on the volume.

Media maintenance: Some of the media maintenance tasks you can perform with ICKDSF are:

- Perform skip displacement checking
- Rewrite data
- Assign alternate tracks
- Reclaim a track

For information on the CKD and FBA device commands to use during the performance of these tasks, see Part 2, "Using ICKDSF to install and maintain CKD devices," on page 67 and Part 3, "Using ICKDSF to install and maintain FBA devices," on page 359.

Chapter 2. About DASD storage media

This chapter provides some background information on DASD, their storage media, and the errors that can occur during data storage and retrieval.

This information is basic to understanding how to use the ICKDSF commands for installation and maintenance of your data storage devices.

DASD physical characteristics

DASD use disks coated with magnetized material as the medium for storing data. Actuators, a combination of access arms and electronics, control the disk rotation and the movement of the heads that write and read data (bit patterns) on the disk surface. Figure 1 on page 13 shows the read-write heads positioned on a disk surface.

The disk surface is divided into separate concentric circles, or tracks, for storing data. Tracks are grouped into sets called cylinders; the tracks within a cylinder are numbered consecutively, starting with 0. This track address is used for data storage and retrieval and locating errors that occur on the disk surface (the storage media).

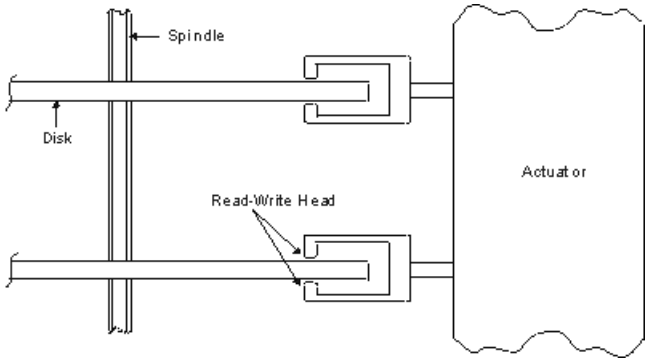


Figure 1: A DASD read-write head positioned on a disk

Errors can occur that prevent the reading or writing of data on the media. Table 14 on page 13 lists the types of errors and the action to take when they occur.

Table 14: Errors that prevent reading and writing of data

Error	Action
Data check on the media	Use ICKDSF to correct the media on which the data check occurs.
Error caused by DASD hardware	Your hardware service representative can assist you in handling it.
Randomly occurring data checks	Ignore (they do not affect the performance of your system).

See *Maintaining IBM Storage Subsystem Media* for more details on DASD media maintenance and error handling. For 9345 modules see *9340 Customer Guide for Using SIMs*.

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Data checks

A data check is an error detected in the bit pattern read from the disk. When it is a media problem, it is most likely to be caused by an imperfection on the disk surface.

Data checks can have the following attributes:

- Repeatable
- Visible
- Correctable (versus uncorrectable)
- Temporary (versus permanent)

Each of these attributes is described in the following sections.

Degree of repeatability

Every data check has a certain degree of repeatability. The higher the level of repeatability a data check has, the more likely it is that an error will be detected in any given read. For example, if a data check is 1% repeatable, then it will be read with an error 1 time out of every hundred times it is read. If a data check is 89% repeatable, then it is read with an error 89 times out of every hundred times it is read.

Degree of visibility

Data checks can be caused by media defects that are extremely small. In fact, they can be caused by defects that are smaller than the area of a single bit on the surface of the media.

Because defects are so small, the data can sometimes be rewritten to ‘straddle’ the defect. This straddling effect or skip displacement prevents subsequent reads from detecting the presence of the defect. The percentage of time that a data check is detected after multiple rewrites determines its degree of visibility. ICKDSF can perform skip displacement or assign an alternate track when skip displacement is not feasible.

Correctable versus uncorrectable

When data is written on a track, the DASD not only records the data, but also records error checking and correcting (ECC) bytes, known as *check bytes*. These check bytes make it possible to detect and correct data checks.

Along with the ability to detect the data check, these check bytes may provide sufficient information to reconstruct the data in error. When this reconstruction occurs, the data check is ECC correctable. ECC-correctable data checks are corrected either by the storage subsystem or by the operating system error recovery procedures (ERP).

When the check bytes are not sufficient to reconstruct the data, the data check is ECC-uncorrectable. Once a data check is found to be ECC uncorrectable, the storage subsystem or operating system invokes data recovery procedures in an attempt to read the data correctly. From the results of these procedures, the data checks can be classified as temporary or permanent.

Temporary versus permanent

Only ECC-uncorrectable data checks can be classified as temporary or permanent. Once an ECC-uncorrectable data check occurs, either the storage subsystem or the operating system executes a series of recovery attempts. The results of these attempts determine whether the data check is temporary or permanent. The classification conventions are described below.

Temporary data checks–If the subsystem or operating system error recovery procedures are successful, then the data check is temporary. Only the system sees a temporary data check; it is never returned to the application.

Permanent data checks–Permanent data checks can be viewed from the system or the application.

System view of a permanent data check–If error recovery procedures performed by the system or subsystem at the time the error occurred cannot successfully recover from the error condition, then the data check is permanent from the system perspective.

Application view of a permanent data check–If an error condition must be returned to the application, indicating unsuccessful completion of the I/O request, then the data check is permanent from an application perspective. The application is then responsible for determining how to deal with the error.

Error notification

Most devices notify you of error conditions on your storage media by service information messages (SIM). The subsystem sends the SIM to the operating system to report that service is required.

For device failures, the SIM is reported only on an I/O operation directed to the failing device. For attachment failures, the SIM is reported on any I/O operation directed to the subsystem.

The operating system's error recovery procedure (ERP) then notifies the operator that service is required by displaying a SIM alert message on the operator console. The operating system's ERP also adds the SIM to the error recording data set (ERDS) as shown in Figure 2 on page 15.

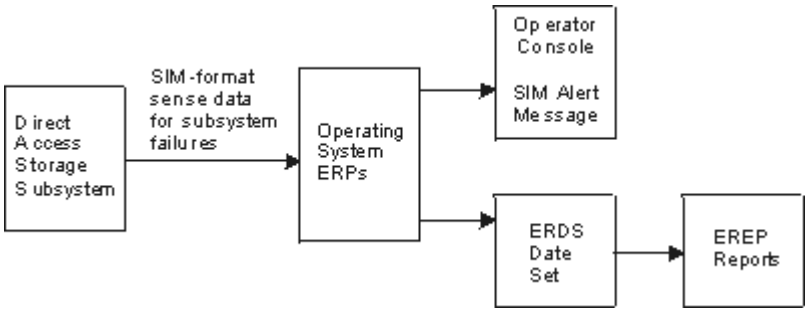


Figure 2: How service information messages are generated

Chapter 3. Understanding ICKDSF command statements

This chapter shows you how to use the ICKDSF commands and command parameters. It describes:

- Command statement syntax
  - The elements of a command statement
  - Conflicting keyword parameters
  - Abbreviating and separating commands and parameters
  - Ending a command
  - Continuing a command statement for more than one line
  - Commenting code
- Writing statements to control ICKDSF processing
  - Setting a condition code
  - Controlling the order in which ICKDSF commands run

ICKDSF command statement syntax

A command statement consists of a command name followed by one or more operands or parameters. All operands described in this book are called parameters. They provide the specific information needed for the command to perform the task you request.

Figure 3 on page 17 shows an example of an ICKDSF command statement. In this example, the parameters used with the INSPECT command indicate where the volume is mounted, which tracks are to be inspected, and whether the volume serial number and owner identification should be verified.

```
INSPECT DDNAME(VOL1) TRACKS((4,6),(4,10)) VERIFY(DSF123,SMITH)
```

DDNAME
DD statement that contains device description.

TRACKS
Inspect cylinder 4, track 6 and cylinder 4, track 10.

VERIFY
Verify volume serial number DSF123 and owner identification SMITH before inspection begins.

Figure 3: ICKDSF command statement

If you do not enter a parameter with the command, the parameter takes its default value.

Table 15 on page 17 shows you how to use the command-statement elements (symbols, character strings, or values) when writing ICKDSF command statements.

Table 15: Command-statement elements.

Element	What it means in a command statement
[ ] brackets	An optional field or parameter.

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Table 15: Command-statement elements. (continued)

Element	What it means in a command statement
{ } braces	Alternative items. Select one.
| (vertical bar)	A separator between alternative items. Select only one of the items.
... (ellipsis)	You can enter whatever immediately precedes the ellipsis a multiple number of times.
UPPERCASE	You must enter these exact characters. Enter such items as shown or in their abbreviated form.
BOLDFACE UPPERCASE	You can omit the parameter, and this value is assumed. It is the default option.
italics	You must supply these fields. These are parameter values. When a value consists of a list of items, you must enclose the list in parentheses.
Parentheses, commas, slashes, spaces, and other punctuation	You must enter as shown.
Numeric values	You can code numeric values in decimal or hexadecimal (X'n').
Character string	You can code character strings inside or outside single quotation marks.

Note: If a value contains commas, semicolons, blanks, parentheses, or slashes, enclose the entire value within single quotation marks.

When a field is enclosed within a single quotation mark, code a single quotation mark in the field as two single quotation marks, for example, **OWNERID**(*'SUSAN''S PACK'*).

Conflicting keyword parameters

Conflicting keyword parameters are identified by a logical or-sign (|) that represents alternative items. If conflicting keyword parameters are entered, the command terminates with an error message.

Abbreviating commands and parameters

You can abbreviate some commands and parameters. Abbreviations for each command appear in the command parameter tables that are included with each ICKDSF command described in this book. The full form of the parameter is given first, followed by acceptable abbreviations.

Separating commands and parameters

When you issue a command, you must separate the command name from the first parameter by one or more blanks. You must separate parameters from each other by one or more blanks or a comma. Do not use a semicolon as a delimiter because any characters that follow a semicolon are ignored.

Continuing lines

If you write a command statement, IF statement, or comment that requires entry of more than one line, continue the command or comment by ending each line, except the last, with a plus (+) or minus (-). This line continuation character must be the last character on the line, and it cannot be put in any columns after column 72. You must precede it with a space.

The minus character causes leading blanks in a following line to be read as part of the command. The plus character causes leading blanks in a following line to be ignored.

For example, if you enter:

```
INSPECT DDNAME(VOL1) TRACKS((4,6),(4,10)) VERIFY(DSF123,SM   +   ITH)
```

ICKDSF reads it as:

```
INSPECT DDNAME(VOL1) TRACKS((4,6),(4,10)) VERIFY(DSF123,SMITH)
```

If you use a minus instead of a plus, ICKDSF reads it as:

```
INSPECT DDNAME(VOL1) TRACKS((4,6),(4,10)) VERIFY(DSF123,SM   ITH)
```

When using an 80-column card format, you must enter ICKDSF commands between columns 2 and 72. If the length of the command exceeds column 72, you must enter a continuation character, and continue the command on the next line.



When you enter commands at the console in the Stand-Alone version of ICKDSF, they begin at the left margin and are also subject to the 72-character line maximum.



When you are entering ICKDSF commands under CMS, and you want a continuation line to follow (+ or -), press Enter, and then continue your next line.

Commenting your code

You can add comments to any of the commands wherever a blank character can appear. To distinguish your comments from the commands, surround them inside the comment delimiters /* and */. Continue a comment onto the next line by using a line continuation character at the end of the line.

Ending a command

End a command with a terminator. The terminator can be either an end-of-command condition (that is, a no continuation character) or a semicolon (;). If you use a semicolon as the terminator, do not enclose it in quotation marks or imbed it in a comment. Everything to the right of the semicolon is ignored.

For example, if you code:

```
REFORMAT UNITADDRESS(0353) VOLID(AA3390) NOVERIFY; /*REFMT 3390*/ -
INIT
REFORMAT UNITADDRESS(0354) VOLID(BB3390) NOVERIFY
```

The characters following the semicolon terminator on the same line are ignored.

Because the minus character causes the first line to continue, the INIT command is also ignored. ICKDSF then recognizes the REFORMAT command.

Writing statements to control ICKDSF processing

The following sections describe how to write ICKDSF command statements to set condition codes and to control the execution of ICKDSF command sequences.

The condition codes are:

Code
Description

LASTCC
Compares the condition code of the last completed ICKDSF command with the condition code you indicated. For example, LASTCC=4 indicates 4 is the condition code you selected for the comparison match.

MAXCC
Compares the condition code of the last completed ICKDSF command or SET sequence with the condition code you indicated as the maximum value. For example, MAXCC=8 indicates you selected condition codes 0, 4, and 8 as comparison matches.

Condition codes can have the following values:

Value
Indicates...

0
The command completed and might have issued informational messages.

4
An error occurred while executing the command, but ICKDSF processing continued. The command might not have completed your desired task, but no data or volume was permanently harmed. A warning message was issued.

For example, the system ignored a parameter that you specified, but that parameter did not apply.

8
The command completed, but some action was unavoidably bypassed. For example, ICKDSF was unable to reclaim an alternate track.

12
The command could not be completed. This condition code results from:

- A logical specification error. For example, inconsistent parameters were specified, a value specified was too large or small, or required parameters were missing.
- A problem during execution. For example, the volume label cannot be changed.

16
A severe error occurred, causing the remainder of the command stream to be flushed. For example:

- The system output data set could not be opened because the SYSPRINT DD statement was missing.
- An unrecoverable error occurred in a system data set.
- ICKDSF encountered improper IF-THEN-ELSE statement sequences.

Condition codes greater than 16 are reduced to 16. You can use one of the following six comparison operators when comparing them:

Operator	Means
= or EQ	Equal
¬= or NE	Not equal
> or GT	Greater than
< or LT	Less than
>= or GE	Greater than or equal

Writing a SET statement

The SET statement sets a condition code. For example:

```
SET LASTCC=8
```

Term
Description

SET
SET sets a condition-code value (8, in the example above).

If a SET statement follows a THEN or ELSE that is not executed because the comparison in the IF-statement does not allow it, the condition code specified with LASTCC or MAXCC is not set.

LASTCC=condition code
LASTCC indicates that the immediately preceding ICKDSF command sets the condition code.

MAXCC=condition code
MAXCC sets the condition code to the maximum condition code value. Setting MAXCC does not affect the condition code for LASTCC.

If the LASTCC condition code is greater than the MAXCC condition code, MAXCC assumes the LASTCC condition code.

You can end all processing by setting the MAXCC or LASTCC to 16.

Note: Use continuation lines cautiously when using SET statements, comments, and blank lines in the input stream. Always use a continuation mark to end:

- Blank lines
- Lines ending with comments that are in the middle of a command
- Lines ending with comments that are between the THEN and ELSE clauses of an IF statement
- Lines that end with partial comments

Be careful not to write a null THEN or ELSE clause inadvertently.

Writing the IF-THEN-ELSE statement

Use the IF-THEN-ELSE statement sequence to control the order in which your ICKDSF commands run. Figure 4 on page 21 shows an example of an IF-THEN-ELSE statement.

```
INIT DDNAME(VOLXYZ) VERIFY(VOLABC)
 IF LASTCC=0 -
   THEN REFORMAT DDNAME(VOL293) VOLID(SYX1) NOVERIFY
   ELSE REFORMAT DDNAME(VOL123) VOLID(SYX2) NOVERIFY
```

Figure 4: IF-THEN-ELSE statement

Term
Description

IF
IF selects one or more ICKDSF commands on the basis of a condition code value test. The condition code is set by a SET command or reflects the completion status of a previous ICKDSF command or sequence.

LASTCC=0
LASTCC, with its comparison operator (= in the above example) and the condition code you select (0 in the above example), determines whether the THEN or ELSE action can run. It compares the condition code value resulting from the last completed ICKDSF command with the condition code you selected.

You can also use MAXCC in place of LASTCC.

THEN
If the LASTCC comparison is true, THEN runs a single command or a group of commands introduced by DO. This would be the first REFORMAT command in the example.

You can follow THEN with another IF statement.

ELSE
If the LASTCC comparison is false, ELSE runs a single command or a group of commands introduced by DO. This is the second REFORMAT command in the example.

You can follow ELSE with another IF statement.

When an IF statement appears in a THEN or ELSE clause, it is called a nested IF statement. You are allowed as many as 10 nested IF statements, starting with the first time you use IF.

Within nested IF statements, the innermost ELSE is matched to the innermost THEN, the next innermost ELSE is matched to the next innermost THEN, and so on.

If the nested statements require a final ELSE, but the IF statement does not, you should follow THEN with a null ELSE.

Note: Use continuation lines cautiously when using IF-THEN-ELSE, statements, comments, and blank lines in the input stream. Always use a continuation mark to end:

- Blank lines
- Lines ending with comments that are in the middle of a command
- Lines ending with comments that are between the THEN and ELSE clauses of an IF statement
- Lines that end with partial comments

Be careful not to write a null THEN or ELSE clause inadvertently.

Writing the DO-END statement

Figure 5 on page 22 contains information about writing a DO-END statement.

```
IF MAXCC=05 THEN DO
                  ANALYZE UNITADDRESS(ccuu) SCAN
                  REFORMAT UNITADDRESS(ccuu) NOVERIFY
                END
```

Figure 5: DO-END statement

Term
Description

MAXCC
MAXCC, with its comparison operator (= in the above example) and the condition code you select (05 in the example), determines whether the THEN action will follow MAXCC compares the condition code of the last completed ICKDSF or SET command sequence with the condition code you indicated as the maximum value.

You can also use LASTCC in place of MAXCC.

THEN DO
THEN DO (and THEN ELSE), followed by ICKDSF commands executes a group of commands as a single unit. The commands run as a result of a single IF statement.

Commands following a DO must begin on a new line. You cannot use the continuation sign (-) after the DO statement except as a comment. If you follow the DO statement with a hyphen, the next line is ignored.

END
END stops those commands initiated by the nearest unended DO. END must be on a line by itself.

Figure 6 on page 23 shows an example of an IF-THEN-ELSE DO-END statement.

```
ANALYZE UNITADDRESS(ccuu)
  IF LASTCC>4 -
    THEN....
    ELSE DO
           MAPALT UNITADDRESS(ccuu) SCAN
           INIT UNITADDRESS(ccuu) NOVERIFY VOLID(SYSX1)
         END
```

Figure 6: IF-THEN-ELSE DO-END statement

Note: Use continuation lines cautiously when using IF-THEN-DO-END statements. Always use a continuation mark to end:

- Blank lines
- Lines ending with comments that are in the middle of a command
- Lines ending with comments that are between the THEN and ELSE clauses of an IF statement
- Lines that end with partial comments

Writing a null THEN and ELSE

When a THEN or ELSE clause is not followed by a continuation character or by a command in the same record, it results in no action. This is called a null THEN or null ELSE clause.

In the Figure 6 on page 23 example, the null THEN is without a continuation character or ICKDSF command. This null THEN clause allows the ICKDSF commands MAPALT and INIT to run if the condition code after ANALYZE completes is ≤ 4.

Chapter 4. Getting started with the MVS version of ICKDSF



There are two ways you can use the MVS version of ICKDSF:

- Execute ICKDSF as a job or job step using job control language (JCL). ICKDSF commands are then entered as part of the SYSIN data for MVS.
- In the MVS versions, you can use Interactive Storage Management Facility (ISMF) panels to schedule ICKDSF jobs.

This chapter describes these two ways and includes information on an MVS operating environment. This chapter is organized as follows:

- "Overview of the ICKDSF tasks using the MVS version" on page 25
- "Using JCL to run ICKDSF" on page 26
- "Using ISMF panels to run ICKDSF" on page 27

  This section includes information on entering an ICKDSF command against a volume under DFSMS/MVS.
- "Protecting MVS volumes and data sets" on page 30
- Limiting the use of resources
- "Processing in a shared environment" on page 34

Overview of the ICKDSF tasks using the MVS version

Before using any ICKDSF commands, see their descriptions in Part 2, "Using ICKDSF to install and maintain CKD devices," on page 67.

Figure 7 on page 26 is an example of the tasks you can perform using ICKDSF and the commands you need to complete each task. For information about specific ICKDSF commands, see:

Part 2, "Using ICKDSF to install and maintain CKD devices," on page 67
Part 3, "Using ICKDSF to install and maintain FBA devices," on page 359

Figure 7 on page 26 describes the general usage of ICKDSF commands. For detailed media maintenance procedures, see *Maintaining IBM Storage Subsystem Media*, GC26-4495. For the 9345 modules see *9340 Customer Guide for Using SIMs*, GC26-4858.

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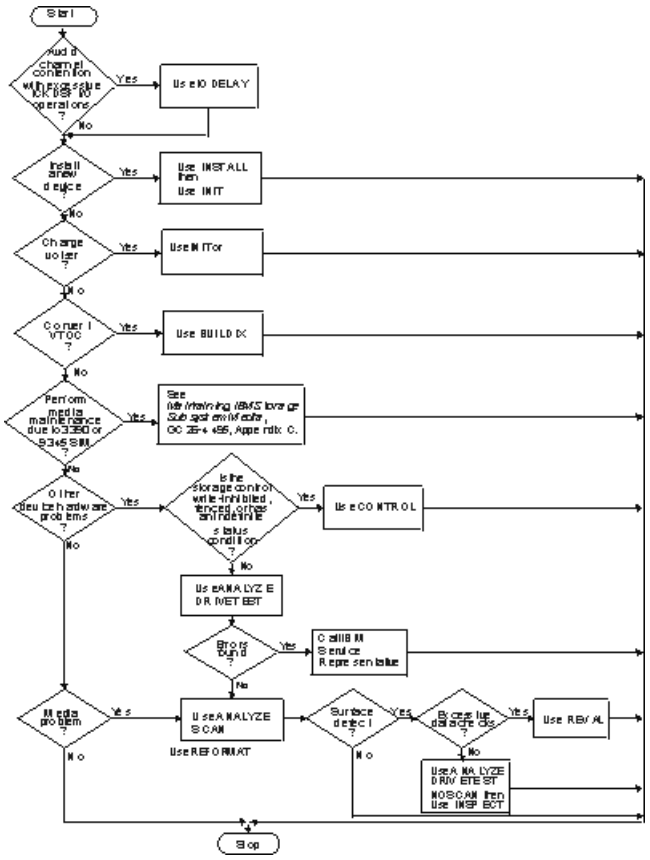


Figure 7: ICKDSF tasks using the MVS version

Using JCL to run ICKDSF

You enter the ICKDSF program by specifying PGM=ICKDSF in the EXEC statement as shown in Figure 8 on page 26.

```
//JOBNAME  JOB       YOUR INSTALLATION'S JOB-ACCOUNTING DATA
//JOBCAT   DD        DSNAME=YOUR.CATALOG,DISP=SHR
//STEP1    EXEC      PGM=ICKDSF
//MYVOL    DD        UNIT=devicetype,DISP=OLD,VOL=SER=VOL123
//STEPCAT  DD        DSNAME=ANOTHER.CATALOG,DISP=SHR
//SYSPRINT DD        SYSOUT=A
//SYSIN    DD        *
  ICKDSF commands
/*
```

Figure 8: Running ICKDSF with JCL

JCL Statement	Required or Optional	Explanation
//JOBNAME	Required	Describes your job to the MVS system. Follow the procedures at your installation to supply user identification, accounting, or authorization information with the JOB statement's parameters.

JCL Statement	Required or Optional	Explanation
//JOBCAT	Optional	Identifies a user catalog that each job step can use. If your job uses only the master catalog, do not specify the JOBCAT DD statement since the master catalog is always open and available to all the jobs on the system. The JOBCAT DD statement is not supported in a DFSMS (Data Facility Storage Management Subsystem) environment.
//STEP1	Required	The EXEC statement invokes ICKDSF to process the ICKDSF commands.
//MYVOL	Required	If you use the ICKDSF DDNAME parameter. Identifies the volume on which you want ICKDSF to run. **Not Necessary** if the volume is offline.
//STEPCAT	Optional	Identifies a user catalog that can be used when processing the job step. If user catalogs are identified with JOBCAT and STEPCAT DD statements, only the catalog identified with the STEPCAT DD statement and the master catalog are used with the job step. If your job step uses only the master catalog, do not specify the STEPCAT DD statement, because the master catalog is always open and available to all the jobs on the system. The STEPCAT DD statement is not supported in a DFSMS environment.
//SYSPRINT	Required	Identifies the output data set to which ICKDSF sends messages and output information.
//SYSIN	Required	Identifies the source of the input statements. An input statement to ICKDSF is a command. When you code SYSIN DD *, you identify the statements that follow as input.
/*	Optional	Indicates the end of data placed in the input stream. It appears in the first two columns of the following input record.

Note: The JOBCAT and STEPCAT keywords are not supported in z/OS R7 and above.

Printed output data set

The standard printed output data set is SYSPRINT. The default parameters for it are:

Record format of VBA
Logical-record length of 125 (121 + 4)
Block size of 629 (5 x (121 + 4) + 4)

The first byte of each record is the American National Standards Institute (ANSI) control character. The minimum logical-record length (LRECL) is 121 (U-format records only). If a smaller size is specified, it will be overridden to 121.

You can alter the above defaults by placing the desired values in the data control block (DCB) parameter of the SYSPRINT statement. However, if you specify the record format as F or FB, it will be changed to VBA.

Using ISMF panels to run ICKDSF

You can also enter ICKDSF commands with Interactive Storage Management Facility (ISMF), which is a component of DFSMS.

You can use ISMF menu-driven panels with these systems to build job streams for ICKDSF tasks. Fill in the values on the panels and ISMF generates the job stream. You can either submit the job or save the job stream for later use.

You can use the following ICKDSF commands with ISMF panels:

ANALYZE
BUILDIX
CONTROL
INIT
INSPECT
INSTALL
PPRCOPY
REFORMAT
REVAL
TRKFMT

For information on specific ICKDSF commands, see Part 2, “Using ICKDSF to install and maintain CKD devices,” on page 67. For information on ISMF, refer to the ISMF online help panels or *z/OS DFSMS Using the Interactive Storage Management Facility*.

Figure 9 on page 28 through Figure 13 on page 30 show you how to enter an ICKDSF command against a volume under MVS. The volume's serial number is HSM920.

1. To enter ICKDSF under ISMF, log on to TSO and select ISMF from the ISPF PRIMARY OPTION MENU. This procedure can vary, depending on your installation.
2. As shown in Figure 9 on page 28, select the ISMF application from the ISPF PRIMARY OPTION MENU panel. In the example, this selection is **9**. This takes you to the ISMF PRIMARY OPTION MENU - z/OS DFSMS V1 R3 panel which is at the z/OS DFSMS V1 R3 level.

```
  Menu  Utilities  Compilers  Options  Status  Help
------------------------   ISPF PRIMARY OPTION MENU  ------------------------

OPTION  ===> 9
                                                          USERID   - KOESTER
   0  ISPF PARMS  - Specify terminal and user parameters    TIME     - 13:01
   1  BROWSE      - Display source data or output listings  TERMINAL - 3278
   2  EDIT        - Create or change source data            PF KEYS  - 24
   3  UTILITIES   - Perform utility functions
   4  FOREGROUND  - Invoke language processors in foreground
   5  BATCH       - Submit job for language processing
   6  COMMAND     - Enter TSO Command, CLIST, or REXX exec
   7  DIALOG TEST - Perform dialog testing
   8  LM UTILITIES- Perform library management utility functions
   9  ISMF        - Invoke interactive storage management facility
   E  SMP/E       - SMP/E Dialogs
   H  DFHSM       - DFHSM space maintenance
   I  IPCS        - IPCS problem analysis services
   C  CHANGES     - Display summary of changes for this release
   T  TUTORIAL    - Display information about ISPF/PDF
   X  EXIT        - Terminate ISPF using log and list defaults



Enter END command to terminate ISPF.
```

Figure 9: ISPF PRIMARY OPTION MENU panel

3. As shown in Figure 10 on page 29, select the VOLUME application from the ISMF PRIMARY OPTION MENU - z/OS DFSMS V1 R3 panel. In the example, this selection is **2**.

```
 Panel  Help
-------------------------------------------------------------------------------
                ISMF PRIMARY OPTION MENU - z/OS DFSMS V1 R3
Enter Selection or Command ===> 2

Select one of the following options and press Enter:

0  ISMF Profile              - Specify ISMF User Profile
1  Data Set                  - Perform Functions Against Data Sets
2  Volume                    - Perform Functions Against Volumes
3  Management Class          - Specify Data Set Backup and Migration Criteria
4  Data Class                - Specify Data Set Allocation Parameters
5  Storage Class             - Specify Data Set Performance and Availability
6  Storage Group             - Specify Volume Names and Free Space Thresholds
7  Automatic Class Selection - Specify ACS Routines and Test Criteria
8  Control Data Set          - Specify System Names and Default Criteria
9  Aggregate Group           - Specify Data Set Recovery Parameters
10 Library Management        - Specify Library and Drive Configurations
11 Enhanced ACS Management   - Perform Enhanced Test/Configuration Management
C  Data Collection           - Process Data Collection Function
L  List                      - Perform Functions Against Saved ISMF Lists
R  Removable Media Manager   - Perform Functions Against Removable Media
X  Exit                      - Terminate ISMF
Use HELP Command for Help; Use END Command or X to Exit.
```

Figure 10: ISMF PRIMARY OPTION MENU - z/OS DFSMS V1 R3 panel

4. As shown in Figure 11 on page 29, generate a list of DASD volumes by selecting the DASD option. In the example, this selection is **1**.

```
 Panel  Help
-------------------------------------------------------------------------------
                          VOLUME LIST SELECTION MENU
ENTER SELECTION OR COMMAND ===>  1
SELECT ONE OF THE FOLLOWING:
  1  DASD               - Generate a list of DASD volumes
  2  MOUNTABLE OPTICAL  - Generate a list of Mountable Optical volumes
…
USE HELP COMMAND FOR HELP; USE END COMMAND TO EXIT.
…
```

Figure 11: VOLUME LIST SELECTION MENU

5. Figure 12 on page 29 shows how you build or generate a volume list. Enter the volume number in the space next to the label VOLUME SERIAL NUMBER on the VOLUME SELECTION ENTRY PANELl. In this example, the asterisk (*) in **HSM92*** indicates you are selecting all volumes from HSM920 to HSM925.

```
  Panel  Defaults  Utilities  Scroll  Help
-------------------------------------------------------------------------------
                          VOLUME SELECTION ENTRY PANEL              Page 1 of 3
Command ===>

Select Source to Generate Volume List  . . 2  (1 - Saved list, 2 - New list)
  1  Generate from a Saved List         Query Name To
       List Name  . .                   Save or Retrieve
  2  Generate a New List from Criteria Below
       Specify Source of the New List  . . 1  (1-Physical, 2-SMS, 3-LSA)
       Optionally Specify One or More:
       Enter "/" to select option    _  Generate Exclusive list
         Type of Volume List . . . 1          (1-Online,2-Not Online,3-Either)
         Volume Serial Number  . . HSM92*    (fully or partially specified)
         Device Type . . . . . .              (fully or partially specified)
         Device Number . . . . . .            (fully specified)
           To Device Number  . . .            (for range of devices)
         Acquire Physical Data . . N          (Y or N)
         Acquire Space Data  . . . N          (Y or N)
         Storage Group Name  . . .            (fully or partially specified)
         CDS Name . . . . . .
                                              (fully specified or 'Active')
Use ENTER to Perform Selection; Use DOWN Command to View next Selection Panel;
Use HELP Command for Help; Use END Command to Exit.
```

Figure 12: VOLUME SELECTION ENTRY PANEL

6. Figure 13 on page 30 shows how you can enter ICKDSF commands against a volume. Once you have generated the volume list, enter the ICKDSF command next to the volume serial you want ICKDSF to run against. In this example, ANALYZE was entered next to VOLUME SERIAL HSM920.

```
  Panel  List  Utilities  Scroll  Help
------------------------------------------------------------------------------
                               VOLUME LIST
Command ===>                                              Scroll ===> PAGE
                                                       Entries 1-6 of 6
Enter Line Operators below:                            Data Columns 3-8 of 40

     LINE       VOLUME FREE       %     ALLOC      FRAG   LARGEST    FREE
     OPERATOR   SERIAL SPACE      FREE  SPACE      INDEX  EXTENT     EXTENTS
    ---(1)----  -(2)-- ---(3)---  (4)-  ---(5)---  -(6)-  ---(7)---  --(8)--
    ANALYZE     HSM920    644498    23    2127002    356      82174       31
                HSM921    752513    27    2018987    264     501122      263
                HSM922    825336    30    1946164    230     406996       38
                HSM923    735581    27    2035919    207     436158       45
                HSM924    860861    31    1910639    191     555241       35
                HSM925    827604    30    1943896    115     659051       28
        ----------  ------ -----------  BOTTOM  OF  DATA  -----------  -----------
```

Figure 13: VOLUME LIST

Protecting MVS volumes and data sets

You can use ICKDSF commands to protect DASD volumes. Volume security with ICKDSF includes:

- VERIFY parameter: INIT, INSPECT, INSTALL, REVAL, REFORMAT, and TRKFMT

  Ensures that the volume serial number and owner identification supplied in the command match those found on the volume. If they match, the command continues to run. If not, the command terminates with an error message.

  Note: IBM highly recommends the use of this parameter when running ICKDSF to any volume.
- PASSWORDS parameter: INIT, INSPECT, and TRKFMT

  Ensures that the user of non-VSAM password-protected data sets is authorized to alter the data sets.
- User Exit Module

  A default user exit module is shipped with ICKDSF. You can tailor this module to suit the security needs of your installation. For more information, see Appendix F, “User security exit module,” on page 667.
- Resource Access Control Facility (RACF®), a component of the Security Server

  Determines whether the volume is RACF-protected (RACF DASDVOL is active) and whether the user has authority to access the volume. If the user has insufficient access authority to a RACF-protected volume, the command terminates with an error message. RACF is valid for INIT, INSPECT, and TRKFMT commands.

  Note: Since the ANALYZE command does not write on any user tracks and does not transmit any user data from the device, it requires no security measures.

  The system programmer or storage administrator uses ICKDSF to format tracks, write a volume label, and create a VTOC. The system programmer or storage administrator needs to have RACF DASDVOL authority to perform any of these tasks. No users need DASDVOL authority to allocate space on volumes. The system controls space on system-managed storage (SMS) volumes by other means, such as the ACS routines, storage group definitions, and ISMF commands.
- RACF protection of ICKDSF commands

  Individual ICKDSF commands can be RACF protected; see “Protecting ICKDSF commands with RACF” on page 34.

Protecting data sets in an offline mode

Data set security in an offline mode is limited to the PURGE parameter of the INIT command. Before the command starts processing the volume, message ICK003D requests permission to alter the volume contents (for more information, see this message in Appendix A, "Device Support Facilities messages (ICK)," on page 419. If you confirm that the volume contents can be changed, the command continues running and ICKDSF purges any data sets contained on the volume.

Protecting data sets in an online mode

For on-line volumes, data security checking occurs only when you issue the INSPECT command. The action taken depends on the type of data set, the expiration date, and whether the data set is RACF or password protected. The following sections describe the actions taken for:

RACF-protected data sets
Non-VSAM password-protected data sets
VSAM and unexpired data sets
VTOC and the VTOCIX data sets

Authorizing access with RACF

Table 16 on page 31 shows the required RACF authorization for each ICKDSF command.

Table 16: ICKDSF MVS RACF authorization table

ICKDSF Command/Function	Required RACF Volume Access Authority	Type of Access Used
ANALYZE	None	Read only
BUILDIX	ALTER	Alters VTOC
CONTROL	None	Does not access data on volume
CPVOLUME	Not applicable	Volume offline
FLASHCPY	None	Read only of primary
INIT	ALTER	Contents of volume destroyed
INSPECT	ALTER	Data unavailable; can be destroyed
INSTALL	Not applicable	Volume offline
PPRCOPY	None	Read only of primary
REFORMAT—IPLDD	UPDATE	Changes IPL text
REFORMAT—no IPLDD	Not applicable	Changes off-line volume label
REFORMAT-NEWVTOC	ALTER	Alters VTOC
REFORMAT-EXTVTOC	ALTER	Alters VTOC
REFORMAT-EXTINDEX	ALTER	Alters VTOC
REFORMAT-REFVTOC	ALTER	Alters VTOC
REVAL-DATA/NODATA	Not applicable	Volume offline
REVAL-FIXSIM(4E4E)	None	Data is rewritten
REVAL-REFRESH	None	Data is rewritten

Table 16: ICKDSF MVS RACF authorization table (continued)

ICKDSF Command/Function	Required RACF Volume Access Authority	Type of Access Used
TRKFMT	Alter	Data is unavailable; can be destroyed

RACF protected data sets

INIT
RACF is called for each RACF-protected data set on the volume to determine whether the user is authorized to access it.

INSPECT
RACF is called for each user-specified track that falls within any RACF protected data set to determine whether the user has authority to access and alter the data set.

TRKFMT
RACF is called for each user-specified track that falls within any RACF protected data set to determine whether the user has authority to access and alter the data set.

If the user has the appropriate authority, INIT, INSPECT, or TRKFMT continues to run; otherwise, the command terminates.

Non-VSAM password-protected data sets

INIT
All password-protected data sets on a volume are subject to the security function.

INSPECT
The security function is called for each track that falls within a password-protected data set. You can provide passwords by using the PASSWORDS parameter on the INIT, INSPECT, and TRKFMT commands.

When the first password-protected data set subject to the security function is encountered, ICKDSF issues a user-security-exit module to determine what needs to be done.

A default user-security-exit module, ICKUSER1, returns a code to ICKDSF indicating one of the actions in Table 17 on page 33. For more information about this module, see Appendix F, “User security exit module,” on page 667.

For normal checking, ICKDSF looks for a user-supplied password for the current data set. If unsuccessful, the command ends and ICKDSF checks the next data set. When ICKDSF finds a password, it then checks the system PASSWORD data set to see if the user-supplied password is authorized to alter the data set. If the password is not authorized, the command ends and ICKDSF checks the next data set.

As long as there is a return code indicating that ICKDSF should call the routine again, ICKDSF calls the user exit routine for each password-protected data set. Even if the command is targeted to end, password checking continues for all data sets on the volume. This ensures that all missing passwords are identified.

VSAM and unexpired data sets

INIT
Issues the security function against all VSAM and unexpired data sets on a volume.

INIT normally checks to see that PURGE has been specified. If it has not, INIT checks each data set and terminates.

INSPECT
Calls the security function for each VSAM/unexpired data set that contains a track for inspection. When the first VSAM/unexpired data set is encountered, ICKDSF issues a user-security-exit module, ICKUSER1, to determine what needs to be done. This module returns a code to ICKDSF indicating one of the actions in Table 17 on page 33. For more information about this module, see Appendix F, “User security exit module,” on page 667.

INSPECT normally checks each data set, and then terminates.

TRKFMT
Calls the security function for each VSAM/unexpired data set that contains a track for processing. When the first VSAM/unexpired data set is encountered, ICKDSF invokes a user-security-exit module, ICKUSER1, to determine what needs to be done. This module returns a code to ICKDSF indicating one of the actions in Table 17 on page 33. For more information about this module, see Appendix F, "User security exit module," on page 667.

TRKFMT normally checks each data set, and then terminates.

Table 17: Codes returned by the user security exit module for password protected data sets

Return Code	Meaning
0	Bypass checking of password-protected data sets on the volume, and do not call the exit routine again.
4	Bypass checking of the current password-protected data set, but call the exit routine for the next password-protected data set.
8	Check the current password-protected data set normally, and call the exit routine for the next password-protected data set.
12	Check all password-protected data sets on the volume normally, and do not call the exit routine again. (The default for ICKUSER1.)
16	Reject access to this data set, but return to the exit routine for the next data set.
20	End this command immediately.

VTOC and the VTOCIX data sets

INSPECT
When you enter NOPRESERVE, ICKDSF does not allow inspection of the following in an online mode:

- Tracks inside a VTOC or a VTOCIX data set
- Cylinder 0, track 0

TRKFMT
ICKDSF does not allow processing of the following in an online mode:

- Tracks inside a VTOC or a VTOCIX data set
- Cylinder 0, track 0

Limiting the use of resources with the Authorized Program Facility (APF)

The Authorized Program Facility (APF) limits the use of sensitive system services and resources to authorized system and user programs. For information about using APF for program authorization, refer to *z/OS MVS Programming: Authorized Assembler Services Guide*.

The ICKDSF load module is contained in SYS1.LINKLIB and link-edited with the SETCODE AC(1) attribute. This ensures that the ICKDSF module is correctly link-edited into an authorized program library. If you link-edit the ICKDSF module into an unauthorized library, the APF authorization of ICKDSF ends.

This authorization is established at the task level. If, while running the APF-authorized job step, a load request is satisfied from an unauthorized library, the task will end. Ensure that a load request cannot be satisfied from an unauthorized library during ICKDSF processing.

Protecting ICKDSF commands with RACF

You can protect certain ICKDSF commands by defining FACILITY class resource profiles and restricting access to those profiles. Table 18 on page 34 shows these commands and their associated RACF class profiles. Protection of an ICKDSF command occurs when the following conditions are met:

- RACF FACILITY class is active
- The FACILITY class profile has been defined

When FACILITY class is active and one of the profiles shown in Table 18 on page 34 is defined, you need access authority to that profile in order to use the associated command. Otherwise, any user can use that command.

Table 18: RACF facility class profile names for ICKDSF commands

ICKDSF Command	FACILITY Class Profile Name
ANALYZE	STGADMIN.ICK.ANALYZE
BUILDIX	STGADMIN.ICK.BUILDIX
CONTROL	STGADMIN.ICK.CONTROL
CPVOLUME	STGADMIN.ICK.CPVOLUME
FLASHCOPY	STGADMIN.ICK.FLASHCPY
INIT	STGADMIN.ICK.INIT
INSPECT	STGADMIN.ICK.INSPECT
INSTALL	STGADMIN.ICK.INSTALL
IODELAY	STGADMIN.ICK.IODELAY
PPRCOPY	STGADMIN.ICK.PPRCOPY
REFORMAT	STGADMIN.ICK.REFORMAT
REVAL	STGADMIN.ICK.REVAL
TRKFMT	STGADMIN.ICK.TRKFMT

Note: For additional information on FACILITY class profiles, refer to *z/OS Security Server RACF Security Administrator's Guide*.

Processing in a shared environment

During offline and online processing, the commands BUILDIX, INIT, INSPECT, INSTALL, REVAL, and REFORMAT issue the RESERVE macro to obtain control of the device. After processing on the device finishes, the DEQ macro is issued to release the device.

This procedure prevents other processors from accessing the volume, but does not guarantee exclusive access to the volume from the same processor.

When processing online, it is always possible that a particular track will be concurrently updated. The following actions minimize this impact:

BUILDIX or REFORMAT commands require additional serialization when issued on systems sharing the same volume. This additional serialization increases processing time by up to seven seconds per volume. If the volume is not being shared by other systems, or the volume has been varied offline to all other

systems, then the serialization is not needed and may be bypassed by using the JCL parameter PARM=NOSYSZ on your EXEC statement. For example:

```
//stepname EXEC PGM=ICKDSF,PARM=NOSYSZ
```

Note: After any ICKDSF command modifies the volume label, the VTOC, or the VTOC index, issue a MOUNT command from the processors that share the volume.

Preserving data during INSPECT

This section describes preserving data during INSPECT when your data is either:

- Not on the IBM 9345.
- Not on DASD attached to an IBM 3990 Storage Control that supports concurrent media maintenance.

When you use INSPECT SKIP to perform skip displacement processing and a track is part of a data set, INSPECT enqueues on the data set while processing that track.

INSPECT can expose user data. Exposure time depends on the device type and how busy your operating system is. If INSPECT exposes user data, ICKDSF enqueues for exclusive control of the data set containing the track to be processed. Data set enqueue takes place when:

- The device is online to the operating system.
- The track is part of a non-VSAM data set.
- The SKIP parameter is specified.
- NOSKIP is specified, but primary surface checking indicates that skip displacement processing is necessary for the track. TOLERATE(ENQFAIL) is assumed to be in effect.

If ICKDSF cannot obtain exclusive control of a data set, a message is issued, and processing continues on the next track.

- When you use SKIP, the TOLERATE(ENQFAIL) parameter allows INSPECT to continue processing if the data set enqueue fails.
- When processing online, always specify TOLERATE(ENQFAIL) for tracks in VSAM data sets.

Preserving data during INSPECT under concurrent media maintenance

Concurrent media maintenance allows user access to the data on a track while INSPECT is processing on that track. The entire volume is available to all users from all shared systems for the duration of the INSPECT job. Because the data on the track is always available, you can run INSPECT even when there is other activity on the volume.

Concurrent media maintenance is automatic with PRESERVE. INSPECT does not perform the hardware reserve or the VTOC ENQ for the volume. Data set ENQ and all restrictions on VSAM data sets are eliminated.

Concurrent media maintenance runs automatically when your data is either on:

- IBM 9345.
- DASD attached to an IBM 3990 storage control that supports concurrent media maintenance.

Operator's intervention consideration

Operator's intervention (reply U or T) is no longer required if VERIFY(volid) and EXEC PGM=ICKDSF,PARM='NOREPLYU' are specified in the JCL. This rule only applies to an offline device with the CPVOLUME, INIT, INSPECT, INSTALL, REFORMAT, REVAL, or TRKFMT commands. See the example in “Initializing a volume in offline mode without operator's intervention” on page 185.

The VERIFY(volid) parameter is not required if PARM='NOREPLYU,FORCE' is specified in the JCL.

Since there is no VERIFY/NOVERIFY parameter for the BUILDIX command, PARM='NOREPLYU' in the EXEC card must be specified in order to bypass the operator's intervention.

Chapter 5. Getting started with the CMS version

This chapter describes how the CMS version of ICKDSF operates for both minidisk and dedicated devices and the ways you can use the CMS version of ICKDSF. It includes the following information:

- "Definition of a minidisk and dedicated device" on page 37
- "Overview of ICKDSF tasks using the CMS version" on page 37
- "Invoking ICKDSF under CMS from the console" on page 39
- "Invoking ICKDSF with a CMS EXEC" on page 40
- "Invoking ICKDSF with an input file" on page 41
- "Using parameters to select the input and output devices" on page 42
- "Supporting minidisks under the CMS version" on page 42
- "Supporting dedicated devices under the CMS version" on page 44

For information about using the Stand-Alone version of ICKDSF, see Chapter 7, "Getting started with the Stand-Alone version," on page 53.

If you are experiencing problems running ICKDSF...

When you use ICKDSF under VM, you must follow any restrictions imposed by VM (such as levels of authority). For more information, see "Problem solving under VM" on page 66.

Definition of a minidisk and dedicated device

A **minidisk** is a portion of a disk that is linked to your virtual machine.

A **full-pack minidisk** is a virtual disk that contains all of the addressable cylinders of a real DASD volume and can also contain the alternate cylinder. INSPECT can use a track on the alternate cylinder when assigning an alternate track. For INSPECT to do this, the MDISK directory control statement definition for the full-pack minidisk must include the alternate cylinder.

Only the CMS and stand-alone versions of ICKDSF support minidisks. Only the CMS version supports minidisk media maintenance.

A **dedicated device** is an entire device for your exclusive use. A device is dedicated to a virtual machine when you use the CP ATTACH command or the DEDICATE directory control statement.

Overview of ICKDSF tasks using the CMS version

Figure 14 on page 38 is an example of the tasks you can perform using ICKDSF and the commands you need to complete each task. For information on specific ICKDSF commands, see:

Part 2, "Using ICKDSF to install and maintain CKD devices," on page 67
Part 3, "Using ICKDSF to install and maintain FBA devices," on page 359

Figure 14 on page 38 describes the general usage of ICKDSF commands. For detailed media maintenance procedures, see *Maintaining IBM Storage Subsystem Media*, GC26-4495. For the 9345 modules, see *9340 Customer Guide for Using SIMs*, GC26-4858.

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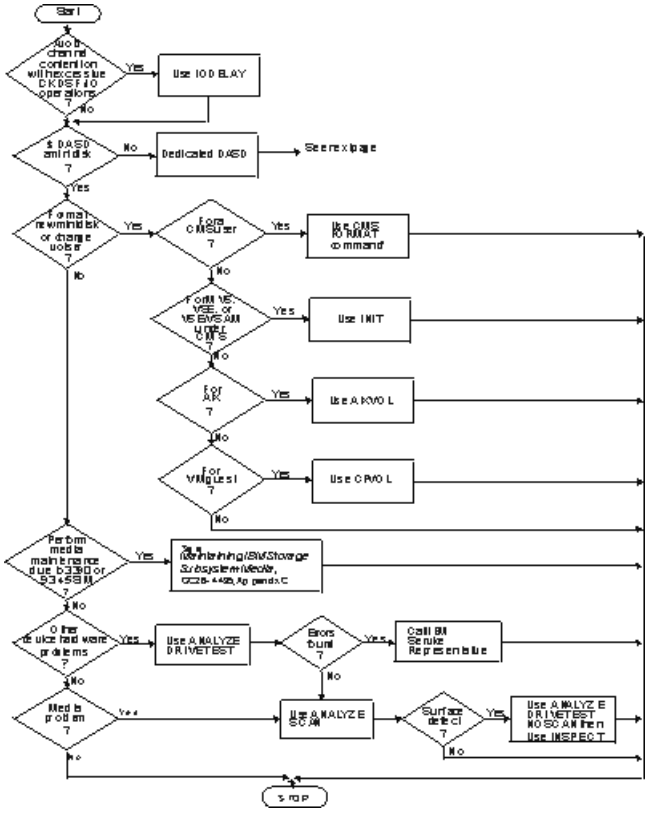


Figure 14: ICKDSF tasks using the CMS version Part 1 of 2

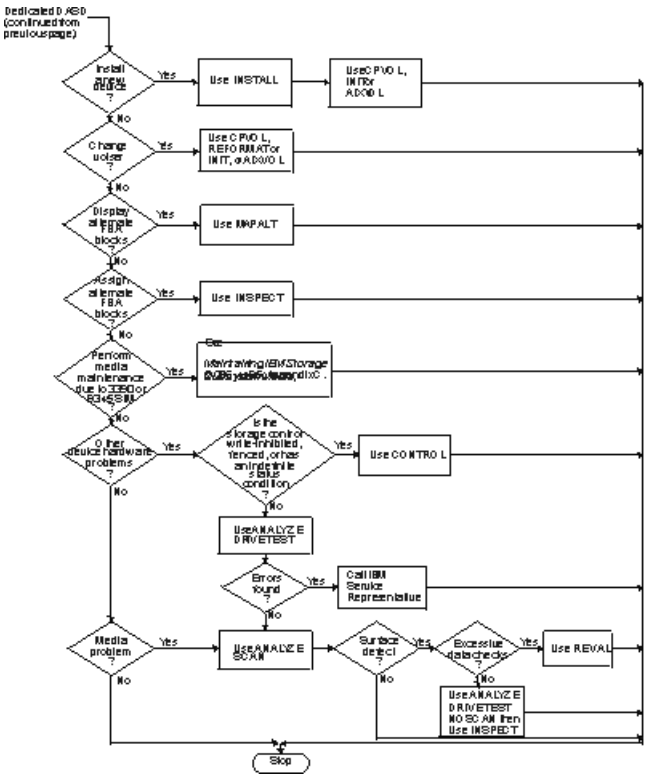


Figure 15: ICKDSF tasks using the CMS version Part 2 of 2

Invoking ICKDSF under CMS from the console

You can enter ICKDSF from a CMS operating system in two ways:

- Method 1
  1. Enter **ICKDSF** at the console, then press Enter.
  2. Enter the input or output device by selecting one of the following actions:
     a. Enter **CONSOLE** or enter a null line as the input device when the following message appears:

```
ICK030E DEFINE INPUT DEVICE: fn ft fm, 'CONSOLE', OR 'READER'
```

     You can also read commands and parameters from your virtual reader. Enter **READER** and ICKDSF uses your first reader file.

     b. Enter **CONSOLE** or a null line as the output device, when the following message appears:

```
ICK031E DEFINE OUTPUT DEVICE: fn ft fm, 'CONSOLE', OR 'PRINTER'
```

     You could also route the output to your virtual printer, by entering **PRINTER**.
  3. Enter the ICKDSF commands after the following message appears:

```
ICKDSF - CMS DEVICE SUPPORT FACILITIES Release 17.0Time: hh/mm/ss Date: mm/dd/yy
ENTER INPUT COMMAND:
```

- Method 2
  1. Enter **ICKDSF CONSOLE CONSOLE** as a single command, then press Enter.
  2. Enter the ICKDSF commands after the following message appears:

```
ICKDSF - CMS DEVICE SUPPORT FACILITIES Release 17.0  Time: hh/mm/ss Date: mm/dd/yy
ENTER INPUT COMMAND:
```

Getting Help: Before ICKDSF invocation, enter **ICKDSF ?** or **HELP ICKDSF** to display the online help panels. After you invoke ICKDSF and the "Enter input command" message appears, enter **?** to get online help.

Example of invoking ICKDSF from the console

Figure 16 on page 40 is an example of what appears on your console when you interactively issue the CPVOLUME command of ICKDSF with the LABEL parameter. In this example, the existing volume serial is verified, and a new volume serial is written to the volume label of the volume or minidisk.

```
ickdsf
ICK030E DEFINE INPUT  DEVICE: FN FT FM, "CONSOLE", OR "READER"
console
CONSOLE
ICK031E DEFINE OUTPUT DEVICE: FN FT FM, "CONSOLE", OR "PRINTER"
console
CONSOLE
ICKDSF - CMS/XA/ESA DEVICE SUPPORT FACILITIES 17.0 TIME: 11:17:13 6/06/02 PAGE 1

ENTER INPUT COMMAND:
cpvol label unit(9b2) vfy(vol001) volid(tst001)
 CPVOL LABEL UNIT(9B2) VFY(VOL001) VOLID(TST001)
ICK00700I DEVICE INFORMATION FOR 09B2 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 9345
          STORAGE CONTROLLER = 9343
          STORAGE CONTROL DESCRIPTOR = E0
          DEVICE DESCRIPTOR =  04
ICK03090I VOLUME SERIAL = VOL001
ICK003D REPLY U TO ALTER VOLUME 09B2 CONTENTS, ELSE T
u
U
ICK03000I CPVOL REPORT FOR 09B2 FOLLOWS:

          VOLUME SERIAL NUMBER IS NOW = TST001

ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
          11:18:06    06/06/02

ENTER INPUT COMMAND:
end
 END

ICK00002I ICKDSF PROCESSING COMPLETE. MAXIMUM CONDITION CODE WAS 0
Ready;
```

Figure 16: Invoking ICKDSF interactively from the console

Invoking ICKDSF with a CMS EXEC

You can invoke ICKDSF under CMS using an EXEC. The EXEC must:

- Contain the required statements to enter ICKDSF
- Identify the input and output devices
- Identify the ICKDSF commands and parameters for the task

When ICKDSF processing has completed, the highest condition code (MAXCC) set during the entire command processing is returned to CMS.

Figure 17 on page 40 shows an example of a CMS REXX named CPLIST. CPLIST EXEC issues the CPVOLUME command of ICKDSF with the LIST parameter. This displays the device information, volume serial, and allocation map of a control program (CP) formatted volume or minidisk given the virtual device number or virtual device address.

```
/* Sample CMS REXX procedure of the CPVOLUME command of ICKDSF  */

  Address 'COMMAND'
  Arg ccuu .

  Queue 'CPVOLUME LIST UNITADDRESS('ccuu') NOVERIFY'
  Queue 'END'
  'ICKDSF CONSOLE CONSOLE'

  Exit Rc
```

Figure 17: CPLIST EXEC

The EXEC:

1. Invokes ICKDSF.
2. Identifies the console as the input and output device.

3. Issues the CPVOLUME LIST command. You must supply the UNITADDRESS when you invoke the EXEC from the console. For example, if the UNITADDRESS was E45, you would enter **CPLIST E45** at the console to run the EXEC.
4. Terminates ICKDSF.

Invoking ICKDSF with an input file

You can call ICKDSF under CMS using a CMS file.

- INPUT is the file type default.
- **A** is the file mode default.
- The logical record size of the file must be 132 or less. However, as ICKDSF uses column 72 for a line continuation character, the input line is 70 characters. Use lines beyond 72 for comments. For more information on continuing lines, see “Continuing lines” on page 18.

You can also store your output in a CMS file.

- OUTPUT is the file type default.
- **A** is the file mode default.
- If the file already exists, the following message appears:

```
FILE ALREADY EXISTS, REPLY U TO ERASE, ELSE T
```

  Enter **U** to erase the file.

Figure 18 on page 41 is an example of an input file. The input file, FMTMDVOL, contains the CPVOLUME commands to format cylinder 0 of two volumes that will contain user minidisks.

```
/* ICKDSF input from a file must be between columns 2 and 72 */
CPVOLUME FORMAT UNITADDRESS(A00) NOVERIFY VOLID(ESAMD1) RANGE(0,0)
CPVOLUME FORMAT UNITADDRESS(A01) NOVERIFY VOLID(ESAMD2) RANGE(0,0)
```

Figure 18: FMTMDVOL INPUT A

Figure 19 on page 41 shows how you would interactively invoke ICKDSF from the console with the input file FMTMDVOL.

```
ickdsf
ICK030E DEFINE INPUT  DEVICE: FN FT FM, "CONSOLE", OR "READER"
fmtmdvol
FMTMDVOL
ICK031E DEFINE OUTPUT DEVICE: FN FT FM, "CONSOLE", OR "PRINTER"
103192 dsf1555 a
103192 DSF1555 A
Ready; T=0.11/0.21 15:58:46
```

Figure 19: Invoking ICKDSF interactively with input file FMTMDVOL

Figure 19 on page 41 shows how you would:

1. Invoke ICKDSF.
2. Identify **FMTMDVOL INPUT A** as the input device. The filetype default is INPUT, and the filemode default is A.
3. Identify **103192 DSF1555 A** as the output file. The output filename is the date, and the output file type represents ICKDSF and what time you ran the commands.

   If there already is an output file named 103192 DSF1555 A, respond **U** to the message to erase the file.
4. You do not have to enter **END** at the console to terminate ICKDSF. ICKDSF ends when it detects an end-of-file from the input file.

Using parameters to select the input and output devices

As described in "Invoking ICKDSF under CMS from the console" on page 39, you can enter the CMS version of ICKDSF with a single command (for example, ICKDSF CONSOLE CONSOLE). You can use the following parameters with the ICKDSF command to select your input and output devices.

Input Device	Output Device
CONSOLE	CONSOLE
READER	PRINTER
filename filetype filemode	filename filetype filemode

You cannot use READER, PRINTER, or CONSOLE as a filename. There are no default values.

Supporting minidisks under the CMS version

Table 19 on page 42 shows the ICKDSF-supported commands and their supported devices when you process minidisks under the CMS version.

Table 19: Devices supported by ICKDSF commands (minidisks under CMS).

Devices	AIXVOL	ANALYZE SCAN	ANALYZE DRIVETEST	CPVOLUME	INSPECT	Minimal INIT/ REFORMAT
CKD Devices						
	—	O	D,E	N	D,E	N
3375	N	O	D,E	N	D,E	N
3380	N	O	D,E	N	D,E	N
3390	N	O	D	N	D	N
9345	N	O	D	N	D	N
9391	N	O	D	N	D	N
9394						
FBA Devices						
	—	—	—	N	D	N
0671	—	O	D	N	D	N
3370	—	—	—	N	D	N
9313	—	—	—	N	D	N
9332	—	D	D	N	D	N
9335	—	—	—	N	D	N
9336						

Note: The IODELAY command supports minidisks of all device types and does not require DEVMAINT authority.

Values used in Table 19 on page 42:

—
Not supported.

D
Requires DEVMAINT authority.

E
Directory option LINKExclu is required.

N
No special authority is required.

O

No special authority is required when you process your own minidisks. Otherwise, DEVMAINT authority is required.

Supporting general users without special authority

Table 20 on page 43 describes the ICKDSF commands that support general users who own minidisks. Support includes the CPVOLUME, INIT, and REFORMAT commands, plus the data-scanning function of the ANALYZE command. You operate on minidisks that are linked to your ID and that you own.

Table 20: ICKDSF Commands available to general users without special authority.

Command	Description
AIXVOL	Formats a volume in CMS or stand-alone version for use in an AIX environment for 3380, 3390, and 9345 DASD.
ANALYZE SCAN	Provides information on readability of data on your minidisk. The IBM 0671, 9313, 9332, and 9336 are not supported for ANALYZE For more information about CKD devices, see "CMS version minidisk support" on page 104. For more information about FBA devices, see "CMS version minidisk support" on page 374.
CPVOLUME	Formats minidisks for use in the VM environment. For more information, see minidisk support in Chapter 14, "CPVOLUME command—CKD," on page 127 or Chapter 28, "CPVOLUME command—FBA," on page 383.
INIT	Performs a minimal INIT on minidisks for guest MVS or VSE use, or for VSE/VSAM under CMS. This allows you to write the IPL bootstrap records, the volume label and the IPL text, the new owner identification, and reserve space for the VTOC (and index data set). For more information about CKD devices, see "CMS version minidisk support" on page 183. For more information about FBA devices, see "CMS version minidisk support" on page 397.
IODELAY	Allows functions other than ICKDSF more processing time by slowing down ICKDSF I/O operations. For more information about IODELAY, see Chapter 19, "IODELAY command—CKD," on page 219 or Chapter 31, "IODELAY command—FBA," on page 409.
REFORMAT	For a guest MVS or VSE minidisk, it changes the volume serial number, owner identification, and IPL bootstrap records, and expands or refreshes the VTOC, that were previously initialized by the INIT command. For MVS volumes, it expands the index VTOC. For more information, see Chapter 22, "REFORMAT command—CKD," on page 331 or Chapter 33, "REFORMAT command—FBA," on page 415.

Using DEVMAINT authority

With DEVMAINT authority, you can perform:

- All the functions in Table 20 on page 43
- The drive test capability of the ANALYZE command
- The media maintenance functions of the INSPECT command for your own or another user's minidisks

When using the ANALYZE and INSPECT commands, you can designate the:

- Real address of a device
- Virtual address of a device
- Userid of the minidisk owner

DEVMAINT authority is not supported in VM/XA.

For information on how to obtain DEVMAINT authority, see the CP planning and administration document applicable to your VM operating system.

Besides having DEVMAINT authority, you must also have specified LNKExclu on the OPTION directory control statement in the user's directory definition when performing media maintenance on minidisks.

Table 21 on page 44 shows you the commands you can use with DEVMAINT authority (in addition to the ones listed in Table 20 on page 43).

Table 21: ICKDSF Commands available to users with DEVMAINT authority.

Command	With Parameters	Explanation
ANALYZE	USERID and UNITADDRESS	Provides information on readability of data on the minidisk.
	DRIVETEST	Ensures that a minidisk can perform basic operations, such as seeks, reads, and writes.
	REALADDR	Verifies the data on a minidisk is readable when the real cylinder and head (or block) are known but the virtual cylinder and head (or block) are not known. For more information about CKD devices, see "CMS version minidisk support" on page 104. For more information about FBA devices, see "CMS version minidisk support" on page 374.
INSPECT	REALADDR	Performs surface analysis of a minidisk when the real cylinder and head (or block) are known but the virtual cylinder and head (or block) are unknown.
	USERID and UNITADDRESS	Performs surface analysis of another user's minidisks. For more information about CKD devices, see "CMS version minidisk support" on page 208. For more information about FBA devices, see "CMS version minidisk support" on page 407.

Supporting dedicated devices under the CMS version

You can perform any ICKDSF function under VM when the volume is dedicated to your virtual machine. Your capability depends on the device type and VM system restrictions.

You might require special authorization to perform device support functions. You need MAINTCCW authority, which is defined in the OPTION statement in the CP directory.

Table 13 on page 8 lists the ICKDSF commands and the devices each command supports when you process dedicated devices under CMS.

Chapter 6. Getting started with the VSE version

This chapter gives an overview of ICKDSF tasks available to the VSE user, explains how to execute the VSE version of ICKDSF, describes how to prevent data loss, and provides guidelines for processing in a shared environment.

To use the VSE version of ICKDSF, you run it as a VSE job, either in "batch" mode, where ICKDSF commands are input by way of SYSIPT, or in "command" mode, where ICKDSF commands are input interactively from the console (SYSLOG).

For detailed information on how you can control ICKDSF command execution by using IF-THEN-ELSE statements, see “Writing statements to control ICKDSF processing” on page 19.

Note: There are some ICKDSF commands that render the device they are issued against to be unusable in its current form (for example, INIT, INSTALL). Before execution of these commands, make sure that no other users/jobs are currently accessing that device.

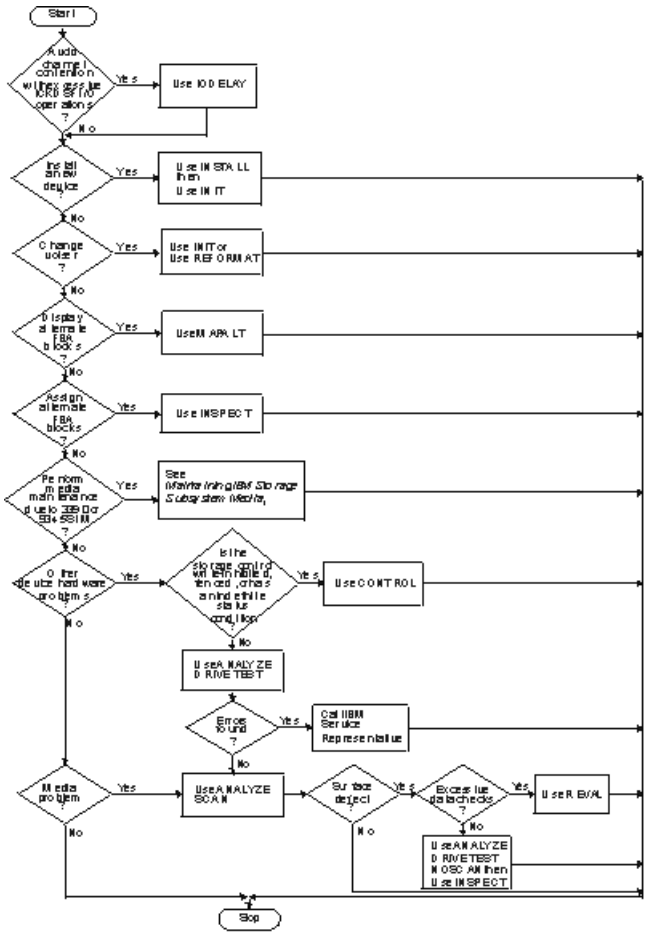
Overview of the ICKDSF tasks using the VSE version

Figure 20 on page 48 shows an example of the tasks you can perform using ICKDSF and the commands you need to complete each task. Before using any ICKDSF commands, see their descriptions in:

Part 2, “Using ICKDSF to install and maintain CKD devices,” on page 67
Part 3, “Using ICKDSF to install and maintain FBA devices,” on page 359

Figure 20 on page 48 also describes the general usage of ICKDSF commands. For detailed media maintenance procedures, see *Maintaining IBM Storage Subsystem Media*, GC26-4495. For the 9345 modules see *9340 Customer Guide for Using SIMs*, GC26-4858.

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GC35-0495 Appendix C.

Figure 20: ICKDSF tasks using the VSE version of ICKDSF

Running the VSE version of ICKDSF in batch mode

To run the VSE version of ICKDSF in batch mode, submit a job with an EXEC ICKDSF job control statement as shown in the example in Figure 21 on page 49. All printed output is directed to SYSLST.

Note: In batch mode, the device to be operated on is specified by the SYSNAME(SYSxxx) parameter, and must be online and "DVCUP".

```
// JOB      jobname   YOUR INSTALLATION'S JOB-ACCOUNTING DATA
// ASSGN    SYS010,353
// EXEC     ICKDSF,SIZE=AUTO
   other ICKDSF commands
/*
/&
```

Figure 21: Example of executing the VSE version of ICKDSF in batch mode

// JOB
Describes your job to the VSE system.

// ASSGN
Assigns the logical unit name SYS010 to the device with a channel and unit address of 353.

/*
Appears in the first two columns of the input record following the last input statement.

/&
Appears in the first two columns of the input record following the /* card to indicate end of job.

Operator intervention

To avoid the need for operator intervention (reply U or T), specify PARM='NOREPLYU' on the EXEC statement, for example:

```
// EXEC ICKDSF,SIZE=AUTO,PARM='NOREPLYU'
```

This causes the following messages to be bypassed:

```
ICK001D CONFIRM PURGING OF UNEXPIRED DATA SETS ON ccuu,
        REPLY U TO PURGE, ELSE T
ICK017D filename IS A SECURED FILE (associated with ICK018D)
ICK018D CONFIRM PURGING OF SPECIFIED FILE NAME, REPLY U TO
        PURGE, ELSE T
ICK019D CONFIRM PURGING OF ALL VSAM FILES ON ccuu, REPLY U
        TO PURGE, ELSE T
ICK020D DEVICE ccuu IS SHARED. REPLY U OR T
```

Running the VSE version of ICKDSF in command mode

To run the VSE version of ICKDSF in command mode, you use Job Control Commands (JCC) to both initiate ICKDSF and provide ICKDSF commands. To start ICKDSF execution in command mode, execute a job stream with a PAUSE JCL statement in it, such as the one shown in the example in Figure 22 on page 50.

Enter "n EXEC ICKDSF" on the VSE console (SYSLOG) when prompted by VSE for input for that partition. Then enter ICKDSF commands (preceded by the appropriate partition identifier) when prompted. Enter "n END" when finished. All ICKDSF command output is written to the console and to SYSLST.

Note: In command mode, the device to be operated on is specified by the UNIT(cuu)[2] parameter, and must be online and "DVCUP".

[2] VSE supports 3 digit addresses (cuu), but a leading 0 can be used (0cuu).

```
=> r rdr,ickdsf
   BG 0000 // JOB ICKDSF
        DATE 06/07/2002, CLOCK 09/54/00
   BG-0000 // PAUSE
=> 0 exec ickdsf
   BG 0000 ICKDSF - VSE        DEVICE SUPPORT FACILITIES 17.0       TIME
   BG 0000 : 09:54:42        06/07/02     PAGE   1
   BG 0000
   BG 0000 ENTER INPUT COMMAND:
   BG-0000
=> 0 init unit(e40) novfy volid(vse001)
   BG 0000  INIT UNIT(E40) NOVFY VOLID(VSE001)
   BG 0000 ................... (ICKDSF RESPONSE)
   BG 0000 ................... (ICKDSF RESPONSE)
   BG 0000 ICK003D REPLY U TO ALTER VOLUME 0E40 CONTENTS, ELSE T
   BG-0000
=> 0 u
   BG 0000  ............................(ICKDSF RESPONSE)
   BG 0000  ............................(ICKDSF RESPONSE)
   BG 0000
   BG 0000 ENTER INPUT COMMAND:
   BG 0000
=> 0 end       (ANOTHER COMMAND OR 'END' TO FINISH)
   BG 0000 ICK00002I ICKDSF PROCESSING COMPLETE. MAXIMUM CONDITION CODE ..
   BG 0000
   BG 0000 1S55I  LAST RETURN CODE WAS 0000
   BG-0000 1I00D  READY FOR COMMUNICATIONS.
=> 0
   BG 0000 EOJ ICKDSF    MAX.RETURN CODE=0000
         DATE 06/07/2002, CLOCK 09/55/37, DURATION   00/01/37
```

Figure 22: Example of executing the VSE version of ICKDSF in command mode

Use of VSE ICKDSF command mode during VSE install process

Command mode VSE ICKDSF is used in place of Stand-Alone ICKDSF during VSE's optional manual install process.

If the manual mode of installation is chosen, VSE issues the following messages:

```
SA09I SELECT ONE OF THE FOLLOWING PROGRAMS OR TYPE END
SA10D FASTCOPY, RESTORE, ICKDSF, DITTO, REIPL
```

To execute ICKDSF, reply to BG with "0 ickdsf."

You will then be prompted for ICKDSF commands. Enter them preceded by the BG partition designator: "0 init unit(cuu)....".

After all ICKDSF commands required to complete the ICKDSF phase of the install process have been entered, ICKDSF is terminated by entering "0 end".

Note: In command mode, the device to be operated on is specified by the UNIT(cuu) parameter.

Command mode restrictions

The input command may only be a maximum of 70 characters per line; if additional length is required, the continuation character ('-') must be used to denote that additional input needs to be entered for which the console will continue to be prompted.

Command mode supports the same commands and parameters that are supported in VSE ICKDSF batch mode.

Verifying identification and preventing data loss

In a VSE environment, only the online mode of operation is available.

Table 22 on page 51 shows the ICKDSF commands you can use to secure your data sets and prevent data loss on DASD volumes.

Because the ANALYZE and MAPALT commands do not write on any user tracks and do not transmit any user data from the device, they require no security measures.

Table 22: Using ICKDSF command parameters for security

If you specify the	It ensures...
VERIFY parameter of the INIT, INSPECT, REFORMAT, and TRKFMT commands	The volume serial number and owner identification supplied in the command match those found on the volume. If they match, the command continues to run. If they do not match, the command ends.
NOPURGE parameter of the INIT command	If unexpired files, data-secured files, or VSAM files are on the volume, INIT ends.
PURGE parameter of INIT or NOPRESERVE parameter of INSPECT, or TRKFMT command	If unexpired files, data-secured files, or VSAM files are on the volume, data loss is prevented.

PURGE or NOPRESERVE parameters prevent data loss as follows:

Unexpired files: Message ICK001D requests permission to purge the volume contents. Only one request is made, regardless of the number of unexpired files on the volume. ICKDSF does not provide a list of the unexpired files.

Data-secured files: Message ICK017D prompts you with the name of the secured file. Message ICK018D requests permission to purge the file. This sequence is repeated for each data-secured file on the volume.

VSAM files: If a single VSAM file is found on the volume, message ICK019D requests permission to purge all the VSAM files on the volume.

For more information on these messages, see Appendix A, “Device Support Facilities messages (ICK),” on page 419.

Processing in a shared environment

This section describes sharing across multiple processors and sharing across multiple users and partitions.

Sharing across multiple processors

ICKDSF requests permission to access a device that is being shared across multiple processors by issuing console message ICK020D. Processing continues only after you reply positively, else the request is terminated.

Sharing across multiple users and partitions in a single processor

During an INIT or REFORMAT process, ICKDSF issues OVTOC to gain exclusive control of the VTOC before starting its processing. After ICKDSF completes its processing, CVTOC is issued to release exclusive control. This ensures that no other user/partition (that uses OVTOC) has access to the volume while ICKDSF is changing the VTOC.

For media maintenance operations, if you are not running "concurrent media maintenance", simultaneous access to a particular track by ICKDSF and users/programs in another VSE partition can result in a data integrity exposure. To avoid this, make sure that when running ICKDSF you have exclusive use of those tracks. For more information, see “Preserving data under Concurrent Media Maintenance” on page 207.

Chapter 7. Getting started with the Stand-Alone version



This chapter describes how to use the Stand-Alone version of ICKDSF. It includes the following information:

- "About the Stand-Alone version" on page 53
- "Overview of the ICKDSF tasks using the Stand-Alone version" on page 54
- "Creating an ICKDSF Stand-Alone IPL tape using MVS" on page 55
- "Creating an ICKDSF Stand-Alone IPL tape using CMS" on page 56
- "Preparing to use the Stand-Alone" on page 56
- "IPLing the Stand-Alone ICKDSF" on page 57
- "IPLing the Stand-Alone from a tape library" on page 57
- "IPLing the Stand-Alone with a load parm specified" on page 58
- "IPLing the Stand-Alone with no load parm specified" on page 59
- "Loading the Stand-Alone ICKDSF from CD-ROM" on page 60
- "Defining the input and output device" on page 60
- "Interpreting error conditions" on page 61
- "Performing ICKDSF tasks on minidisks with the Stand-Alone version" on page 63

For other examples of ICKDSF tasks using the Stand-Alone version, see:

"Analyzing volumes with the Stand-Alone version" on page 104
"Initializing volumes with the Stand-Alone version" on page 186
"Analyzing volumes with the Stand-Alone version" on page 375
"Inspecting volumes with the Stand-Alone version" on page 407
"Mapping volumes with the Stand-Alone version" on page 413

About the Stand-Alone version

Use the Standalone version of ICKDSF only if the operating system version is unavailable.

The Stand-Alone version of ICKDSF runs independently of a system environment either as a "true" stand-alone system or under a z/VM system. With APAR PI46151, when IPLed, ICKDSF switches to z/Architecture mode. See APAR PI75033 for the ICKDSF CD-ROM version z/Architecture support.

You can run the Stand-Alone version of ICKDSF under an IBM System/390® in ESA, LPAR, or XA mode, and in a virtual machine on VM. However, it is recommended that you use the CMS version of ICKDSF under VM, as described in Chapter 5, "Getting started with the CMS version," on page 37.

You can run the Stand-Alone version of ICKDSF under VM three ways:

- IPL ICKDSF from a Stand-Alone tape.
- Using exec "ICKGENSA" to create module "ICKSADSF MODULE" from the ICKDSF Stand-Alone core image file, which is provided with the CMS version. This module may then be used by the Stand-Alone Program Loader (SAPL), which is available with VM/ESA 2.0 or higher. See the VM planning and Administrations document for your VM operating system for more information about the Stand-Alone Program Loader.

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- Punch the CMS file ICKSADSF COREIMAG to your virtual card reader and IPL the file from the virtual reader.

Note: The preferred method in a CMS environment is to use the CMS executable module.



Under VM, each device must either be dedicated to the virtual machine or linked as a minidisk. For more information on using ICKDSF under VM, see Chapter 8, “ICKDSF versions supported as guests under VM,” on page 65.



The Stand-Alone version of ICKDSF is no longer shipped with the VSE version (in DSFSA.Z). With VSE version 2 and above, the VSE Stand-Alone supervisor will load the VSE version of ICKDSF, rather than creating an IPLable Stand-Alone ICKDSF using BACKUP.

Overview of the ICKDSF tasks using the Stand-Alone version

Figure 23 on page 55 shows an example of the tasks you can perform using ICKDSF and the commands you need to complete each task. Before using any ICKDSF commands, see their descriptions in:

Part 2, “Using ICKDSF to install and maintain CKD devices,” on page 67
Part 3, “Using ICKDSF to install and maintain FBA devices,” on page 359

Figure 23 on page 55 also describes the general usage of ICKDSF commands. For detailed media maintenance procedures, see *Maintaining IBM Storage Subsystem Media*, GC26-4495. For 9345 devices see *9340 Customer Guide for Using SIMs*, GC26-4858.

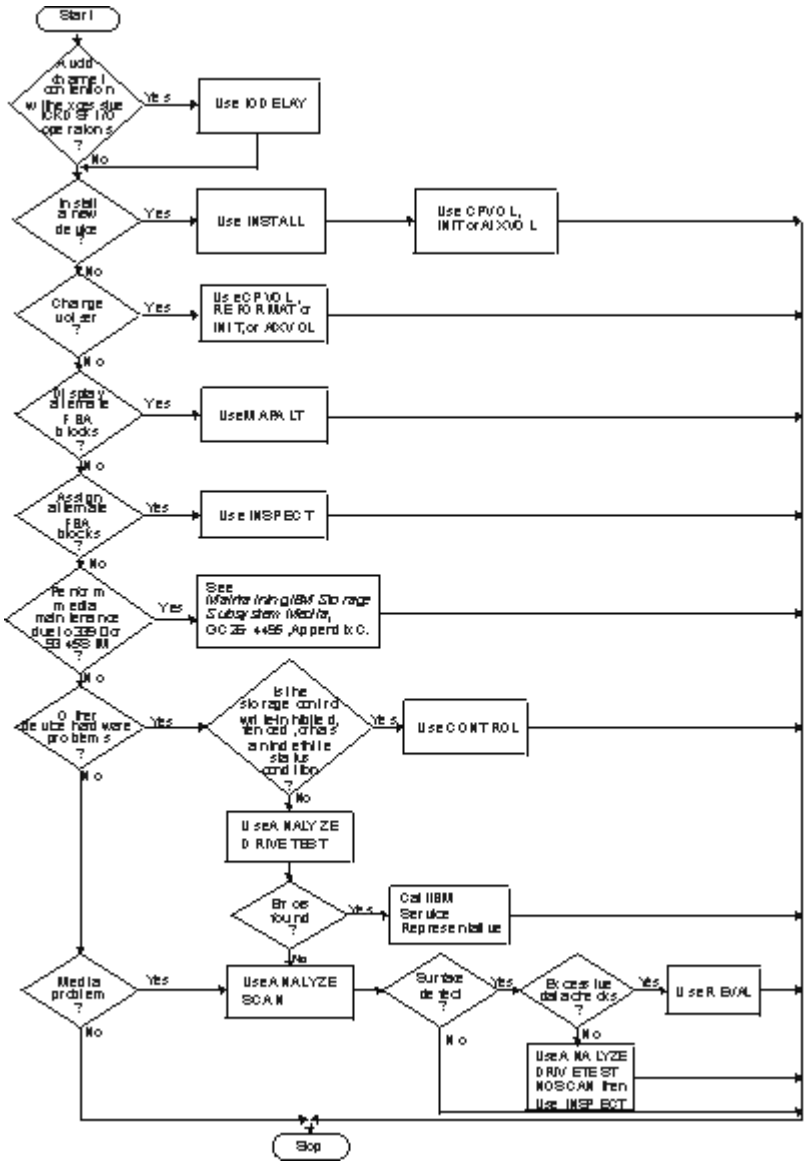


Figure 23: ICKDSF tasks using the Stand-Alone version

Creating an ICKDSF Stand-Alone IPL tape using MVS

MVS

For MVS, the Stand-Alone code is in SYS1.SAMPLIB as ICKSADSF. You can load the ICKDSF program from a file on tape or from a binary-card deck.

Figure 24 on page 56 is an example of how you can use MVS job control language (JCL) to copy the Stand-Alone ICKDSF code to an unlabeled tape. There should be only one file on the tape. BLKSIZE=80 is required on the tape data set.

```
//JOBNAME  JOB  JOB CARD PARAMETERS
//STEPNAME EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=A
//SYSIN    DD DUMMY,DCB=BLKSIZE=80
//SYSUT1   DD DSNAME=SYS1.SAMPLIB(ICKSADSF),UNIT=SYSDA,
//            DISP=SHR,VOLUME=SER=XXXXXX
//SYSUT2   DD DSNAME=ICKDSF,UNIT=3590-1,LABEL=(,NL),
//            DISP=(,KEEP),VOLUME=SER=YYYYYY,
//            DCB=(RECFM=F,LRECL=80,BLKSIZE=80)
```

Figure 24: MVS JCL to copy Stand-Alone ICKDSF to tape

Creating an ICKDSF Stand-Alone IPL tape using CMS



For CMS, the Stand-Alone code is in the CMS file ICKSADSF COREIMAG.

Figure 25 on page 56 is an example of how you can use an EXEC to copy the Stand-Alone program code to an unlabeled tape.

```
/* This EXEC creates an IPLable stand-alone Device Support Facilities  */
/* tape from the CMS file ICKSADSF COREIMAG.                           */

  Address 'COMMAND'
  'CP REWIND 181'
  If Rc = 0
    Then Do
      'FILEDEF INMOVE DISK ICKSADSF COREIMAG * ( LRECL 80 RECFM F'
      'FILEDEF OUTMOVE TAP1 ( LRECL 80 RECFM F BLOCK 80'
      'MOVEFILE'
      If Rc = 0
        Then Say '*** stand-alone ICKDSF successfully generated ***'
Else Say '*** error loading ICKSADSF COREIMAG to tape ***'
      End
    Else Say '*** tape at 181 not attached or not ready ***'
  Exit Rc
```

Figure 25: CMS EXEC to copy Stand-Alone ICKDSF to tape

Preparing to use the Stand-Alone

The ICKDSF Stand-Alone can be loaded in one of the following ways:

- It can be IPLed from a tape or card reader.
- It can be IPLed from the ICKDSF CD-ROM version by way of the Optical Media Attach (OMA). When you use OMA to IPL the Stand-Alone, the CD-ROM emulates a channel-attached 3422 tape drive.

  Note: When you IPL from the CDROM by way of OMA, if you are on a 2074 that has other systems attached, and the 2074 is busy because of other activity from those systems, then you may encounter a ‘load failed’ because the control unit is busy. If this occurs, you should retry the IPL, or wait until the 2074 is not busy.
- It can be loaded from the ICKDSF CD-ROM version by way of the ‘Load from CD-ROM or SERVER’ task on IBM processors that support this feature. This method cannot be used to load the Stand-Alone when running under VM.

IPLing the Stand-Alone ICKDSF

Stand-Alone ICKDSF requires the following conditions or preparation when you IPL (from tape, card reader, or by way of OMA on the ICKDSF CD-ROM):

- Use a Service Call Logical Processor Facility (SCLP) console or any console that is compatible with the IBM 327X. Remote devices are not supported.

When IPLing the Stand-Alone, there are 2 methods that can be used:

- You can enter a load parm on the IPL panel (on supported processors) prior to IPLing, to predefine the console that you want ICKDSF Stand-Alone to use. When you use this method, ICKDSF Stand-Alone will attempt to use the console you specified in the load parm.
- You can IPL the Stand-Alone without specifying a load parm. When you use this method, ICKDSF interprets the first interrupt it receives as the console device. Therefore, you must disconnect any device other than the console that can generate an interrupt before IPLing ICKDSF Stand-Alone.

IPLing the Stand-Alone from a tape library

Stand-Alone ICKDSF can be IPLed from the IBM 3494 Tape Library Dataserver (D/T3494) with the following limitations/restrictions:

- ICKDSF Stand-Alone must be at Release 16 or higher.
- Microcode levels must be at the following levels or higher:
  - Library Manager microcode level - 50C.00
  - D/T3490 microcode level - C05568R
- Supported only when running in XA or ESA mode.
- Drives to be used for Stand-Alone MUST be offline to other systems.
- When using the D/T3494 tape library for the IPL tape, the IPL tape must be mounted and ready prior to performing the IPL.
- Mounting of the IPL tape can be done by way of either:
  - MOUNTING TAPES INSIDE THE LIBRARY: Tapes inside the D/T3494 library can be mounted by way of the Library Manager Console 'Setup Stand-Alone Device' pop up window using the 'Mount a single volume' selection, and specifying the device and the volser.

    DeMOUNTING: Select the 'Demount a single volume' selection, specifying the device, to unload and demount the IPL tape after Stand-Alone completion.
  - MOUNTING TAPES NOT INSIDE THE LIBRARY: The transient mount operation can be used to mount tapes not inside the D/T3494 library, by way of the 'Library Manager Console Setup Stand-Alone Device' pop up window, using the 'Mount from Input Station' selection, and specifying the device.

    DeMOUNTING: Unload and demount the IPL tape after Stand-Alone completion by cancelling the mount from input station (cancel from library manager console).

Stand-Alone ICKDSF can also be IPLed from a 3584 (TS3500) Tape Library and the Virtual Tape Server. It may also be IPLed from virtual tape volumes in a TS7700 Virtualization Engine.

See *Magstar 3494 Tape Library Dataserver Operator's Guide*, GA32-0280, *3494 Tape Library Dataserver Intro and Plan Guide*, GA32-0279, and *IBM TS7700 with R3.3*, SG24-8122 Redbooks, for details on how to set up and use a Stand-Alone device.

IPLing the Stand-Alone from SAPL

When IPLing Stand-Alone from the stand alone program loader (SAPL) the load parameters and IPL parameters supported by SAPL will also be supported by ICKDSF. When IPLing Stand-Alone the following load parms may be specified:

```
CNSLxxxx
CONSxxxx
xxxx
```

Where:

1. 'CNSL' or 'CONS' identifies that load parm is a console.
2. 'xxxx' is the console address to use and must be:
   a. 'SCLP' or 'SYSC' to indicate that you want to use an SCLP (or HMC) console. For example, the load parm would be CONSSYSC to indicate that ICKDSF Stand-Alone should attempt to use the HMC console.

      Or

   b. 'ccuu', where ccuu is the device address of a channel attached console. For example, the load parm would be specified as 'CNSL9' or just '9' to indicate that ICKDSF Stand-Alone should attempt to use the console at address 9.

The following rules apply for specifying a 'ccuu':

'ccuu' must be specified as 1 to 4 digits.
The digits must be valid hex digits (0-9, A-F).
The device must be a valid supported console in the configuration and must be operational. If the address consists of valid hex digits ICKDSF will do the console I/O to the device and has no way to check if the device exists, or if it is working, or if in fact it is a console without doing I/O to it.

The following IPL parameters are also supported from the SAPL panel:

```
CON=xxxx
CONS=xxxx
```

Where:

1. 'CON' or 'CONS' identifies that ipl parm is a console.
2. 'xxxx' is the console address to use and must be:
   a. 'SYSC' to indicate that you want to use an SCLP (or HMC) console. For example, the ipl parm would be CONS=SYSC to indicate that ICKDSF Stand-Alone should attempt to use the HMC console.

      Or

   b. 'ccuu', where ccuu is the device address of a channel attached
   c. 'ccuu', where ccuu is the device address of a channel attached console. For example, the ipl parm would be specified as 'CONS=9' to indicate that ICKDSF Stand-Alone should attempt to use the console at address 9. The same rules that apply for load parm of 'ccuu' also apply to the ipl parm of 'ccuu'.

When a load or ipl parm is specified to indicate a console to be used, and an error occurs attempting initial communication with that device, a disabled wait is loaded to identify the type of problem. The user must correct the problem and re-IPL the Stand-Alone to identify the console to be used.

IPLing the Stand-Alone with a load parm specified

Prior to IPLing, specify the load parm to indicate the console you want ICKDSF to use.

The required format for the load parm for Stand-Alone ICKDSF is 8 characters specified as:

```
CNSLxxxx
```

Where

1. 'CNSL' is required as the first 4 characters to ensure residual data in the load parm field is not interpreted as the predefined console.
2. 'xxxx' indicates the console you want to use and must be either:
   a. 'SCLP' to indicate that you want to use an SCLP (or HMC) console. For example, the load parm would be specified as CNSLSCLP to indicate that ICKDSF Stand-Alone should attempt to use the HMC console.

      Or

   b. 'ccuu', where ccuu is the device address of a channel attached console. For example, the load parm would be specified as CNSL0521 to indicate that ICKDSF Stand-Alone should attempt to use the console at address 521.

The following rules apply for specifying a 'ccuu':

- 'ccuu' must be specified as 4 digits (a leading zero is required for a 3 digit device address).
- The digits must be valid hex digits (0-9, A-F).
- The device must be a valid supported console in the configuration and must be operational. If the address consists of valid hex digits, ICKDSF will do the console I/O to the device and has no way to check if the device exists, or if it is working, or if in fact it is a console without doing I/O to it.
- The console must be a 3270 type console (not a printer/keyboard type such as 3215, etc.).

When a load parm is specified to indicate a console to be used, and an error occurs attempting initial communication with that device, a disabled wait is loaded to identify the type of problem. The user must correct the problem and re-IPL the Stand-Alone to identify the console to be used.

IPLing the Stand-Alone with no load parm specified

IPL the ICKDSF Stand-Alone from your IPL device according to the procedures for your installation.

1. IPL the ICKDSF program from the tape unit according to the procedures for your installation. The program contains the instructions necessary to load and store itself in the lower addresses of main storage.

   When the program is loaded, the processor enters the WAIT state, and the program status word (PSW) contains the following:

   EC mode * 030E0000 XXFFFFFF

   An asterisk (*) before the PSW indicates the high-order bit is or is not on (either X'80' or X'00') in the byte designated by XX. For other wait PSW conditions, see "Interpreting error conditions" on page 61.

   Note: When you IPL the ICKDSF Stand-Alone from your IPL device (with no load parm specified) according to the procedures for your installation, ICKDSF interprets the first interrupt it receives as the console device. Therefore, you must disconnect any device other than the console that can generate an interrupt before IPLing ICKDSF. If this fails, try again using the load parm so that ICKDSF will attempt to do console I/O to the device specified.
2. Identify the console by pressing the Request or Enter key at the console.

Loading the Stand-Alone ICKDSF from CD-ROM

Stand-Alone ICKDSF requires the following conditions or preparation when you load from CD-ROM or SERVER:

- An SCLP console. If you do not have an SCLP console, this method of loading ICKDSF Stand-Alone is not supported.
- A processor that supports the 'Load from CD-ROM or SERVER' task.

Load the ICKDSF Stand-Alone according to the procedures for your installation.

When loading the ICKDSF Stand-Alone by way of ' load from CD-ROM or SERVER' the ICKDSF Stand-Alone will automatically attempt to use the SCLP type console as the operator console.

Defining the input and output device

Defining the input and output device information follows:

1. After you identify the console, the following message appears:

   ```
   ICK005E DEFINE INPUT DEVICE, REPLY "dddd,ccuu" or "CONSOLE"
   ```

   To specify the console as the input device, enter **CONSOLE** or a null line.

   To specify a different device type as the input device, enter **dddd,ccuu**, where **dddd** is one of the device types listed below, **cc** is the channel address, and **uu** is the unit address. For example, to select the 3505 Card Reader, enter **3505,ccuu**.

   - 1442 Model N1 Card Read Punch, Model N2 Card Punch
   - 2501 Models B1 and B2 Card Reader
   - 2520 Model B1 Card Read Punch, Models B2 and B3 Card Punch
   - 2540 Model 1 Card Read Punch
   - 3504 Models A1 and A2 Card Reader
   - 3505 Models B1 and B2 Card Reader
   - 3525 Card Punch (with card-read feature)
   - SCLP Hardware System Console (or compatible console) attached to an ES/9000 processor, supported as CONSOLE
   - CARD

2. After you identify the input device, the following message appears:

   ```
   ICK006E DEFINE OUTPUT DEVICE, REPLY "dddd,ccuu" or "CONSOLE"
   ```

   To specify the console as the output device, enter **CONSOLE** or a null line.

   To specify a different device type as the output device, enter **dddd,ccuu**, where **dddd** is one of the device types listed below, **cc** is the channel address, and **uu** is the unit address. For example, to select the 3800 Printing Subsystem, enter **3800,ccuu**.

   - 1403 Models 2, 7, and N1 Printer
   - 1443 Model N1 Printer
   - 3203 Models 1, 2, 4, and 5 Printer
   - 3211 Printer
   - 3800 Printing Subsystem
   - 3262 Line Printer
   - 3289 Model 4 Printer

- 4248 Printer
- 5203 Model 3 Printer
- 6262 Printer
- SCLP Hardware System Console (or compatible console) attached to an ES/9000 processor, supported as CONSOLE
- PRNT

3. The date and time are automatically picked up from the processor's time-of-day (TOD) clock. The clock usually indicates Greenwich Mean Time, and this date and time are reflected in any listings.

   If the TOD clock is in error or not set, the following message appears:

   ```
   ICK015E SUPPLY TODAY'S DATE, REPLY “MM/DD/YY”
   ```

   Enter today's date in the format indicated.

4. After you enter today's date, the following message appears:

   ```
   ICK016E SUPPLY TIME OF DAY, REPLY “HH:MM:SS”
   ```

   Enter the current time in the format indicated.

   If you press the Enter without specifying a date or time of day, they are set to 0.

   Messages ICK015E and ICK016E can reappear if you create a VTOC entry for a data set. Enter the information each time to ensure that the VTOC entry is correct.

5. You are now ready to enter ICKDSF commands from the input device.

   You can control ICKDSF command execution by using IF-THEN-ELSE statements. For more information, see “Writing statements to control ICKDSF processing” on page 19.

6. The ICKDSF program stops running at the end of the command input stream. If you are using the console as the input device, enter **EOF** when prompted for the next command.

   When the program stops, the processor is placed in a WAIT state, and the PSW should contain the following:

   EC mode * 030E0000 XXEEEE*zz*

   zz indicates the highest decimal condition code encountered while running.

zz	Indicates condition code
X'00'	0
X'04'	4
X'08'	8
X'0C'	12
X'10'	16

   For condition code values, see “Writing statements to control ICKDSF processing” on page 19.

Interpreting error conditions

Table 23 on page 62 shows the PSW error condition codes for ICKDSF and their meanings. An asterisk (*) before the PSW indicates the high-order bit might or might not be on (either X'80' or X'00') in the byte designated by XX.

Table 23: IPL error PSW codes.

PSW Error Condition (EC Mode)	Indicates...
*** 000A0000 XX000033**	Insufficient real storage available for ICKDSF. All input is read.
*** 000A0000 XX000022**	A unit check occurred on the IPL device during IPL.
*** 000A0000 XX000044**	A channel error occurred on the IPL channel during IPL.
*** 000A0000 XX000055**	The IPL device was not operational during IPL.
*** 000A0000 XX0000E2**	A machine check.
*** 020A0000 XX111111**	ICKDSF is waiting for an I/O interrupt. If ICKDSF stops running, a missing I/O interrupt condition has occurred. Re-IPL ICKDSF and rerun the failing command. If the problem persists, contact your IBM service representative.
*** 010A0000 XXF1F1F1**	Waiting for the operator to input data from the SCLP console.
*** 010A0000 XXF4F4F4**	Waiting for the SCLP external interrupt.
*** XXEE0040**	SCLP equipment check.
*** XXEE0340**	SCLP equipment check.
*** 010A0000 XXF3F3F3**	The Stand-Alone is waiting for a response from the processor in order to determine system features. If this wait state continues to persist, contact your IBM service representative to determine why the processor did not respond.
*** 010A0000 00999999**	A wait state.
*** 030E0000 XXEEEE*nn***	The processor is placed in a WAIT state. *nn* indicates the type of error: **nn** **Indicates** **X'13'** A supervisor call instruction (SVC) interrupt **X'14'** A program interrupt **X'15'** Insufficient main storage **X'16'** An I/O error **X'17'** Data set not open **X'18'** Console not defined **X'19'** No end-of-data routine **X'1A'** SCLP console not defined or not operational

Table 23: IPL error PSW codes. (continued)

PSW Error Condition (EC Mode)	Indicates...
* 000A0000 XXFAFAFA	'CNSLSCLP' was specified in the load parm, but the SCLP-type console cannot be used. Possible reasons are: it does not exist or is not supported on the processor, or an error occurred attempting to determine if the support exists.
* 000A0000 XXFBFBFB	A 'ccuu' was specified in the load parm to identify an I/O attached console. However, an error occurred trying to attempt initial communication with the device.
* 000A0000 XXFCFCFC	The Stand-Alone was unable to communicate with the console identified in the load parm because it is not attached or is not operational.
* 000A0000 XXFDFDFD	The load parm was specified incorrectly. The characters 'CNSL' must be the first 4 characters specified.
* 000A0000 XXFEFEFE	A 'ccuu' was specified in the load parm to identify an I/O attached console, but the 'ccuu' specified in the load parm is invalid.
* 000A0000 XXFFyyyy	'CNSLSCLP' was specified in the load parm to identify an SCLP-type console. However, an unexpected error occurred trying to attempt initial communication with the console. 'yyyy' represents the error code returned from the hardware.
* 000A0000 XXFF0040	'CNSLSCLP' was specified in the load parm to identify an SCLP-type console. However, aSCLP equipment check occurred trying to attempt initial communication with the console.
* 000A0000 XXFF0340	'CNSLSCLP' was specified in the load parm to identify an SCLP-type console. However, a SCLP equipment check occurred trying to attempt initial communication with the console.
* 000A0000 000000AA	The mode that you are running in does not allow for the switching to z/Architecture mode. You must run in a mode that will allow for ICKDSF to switch to z/Architecture mode when IPLed.
* XXEEyyyy	An unexpected error occurred when communicating with the SCLP-type console. 'yyyy' represents the error code returned from the hardware.

Note: ICKDSF Stand-Alone no longer supports 370 mode. If you IPL in 370 mode you will receive a wait psw with one of the following:

BC mode * 00020000 XX370370
EC mode * 000A0000 XX370370

Performing ICKDSF tasks on minidisks with the Stand-Alone version

Table 24 on page 63 shows the commands you can use to perform tasks on minidisks with the Stand-Alone version of ICKDSF.

If you need diagnostic or media maintenance on a device in the Stand-Alone version, the device must be dedicated to a virtual machine. However, the commands you use depend on the device type, VM system restrictions, and your need for special authorization.

Table 24: ICKDSF commands.

Command	Task
AIXVOL	You format 3380, 3390, and 9345 minidisks in a CMS or Stand-Alone version for use in the AIX/ESA environment by using the MIMIC parameter.

Table 24: ICKDSF commands. (continued)

Command	Task
ANALYZE	You can use ANALYZE with the SCAN parameter on minidisks, but you must always use LIMITS (or the equivalent range parameters). LIMITS must be within the bounds of the minidisk. If you do not set limits, I/O is attempted outside the range of the minidisk and apparent I/O errors will occur.
CPVOLUME	You can format minidisks for use in the VM environment by using the MIMIC parameter. For more information, see minidisk support in Chapter 14, "CPVOLUME command—CKD," on page 127 or Chapter 28, "CPVOLUME command—FBA," on page 383.
INIT	You can initialize minidisks at the minimal level for guest operating system use. This includes all current DASD. **CKD Devices**–To run a minimal INIT on CKD devices, enter: `MIMIC(MINI(n)) DEVTYPE(devicetype)` • n= number of cylinders • DEVTYPE(devicetype) is required If you omit the MIMIC parameter and attempt a minimal INIT, I/O errors occur because the device is recognized as a real device. **FBA Devices**–Minidisk processing for the INIT command for FBA devices is automatic. **Do not specify MIMIC(MINI(n))**. ICKDSF can dynamically determine the number of blocks allocated to the minidisk and can initialize the device accordingly. MAP is not supported.
REFORMAT	Operates on a minidisk exactly as it does on a real volume. Accesses only those areas where the volume serial number, owner identification, IPL bootstrap records, and VTOC and Index exist on the volume. REFORMAT generally does not include diagnostic channel command words (CCWs) and should complete without errors.

Chapter 8. ICKDSF versions supported as guests under VM

This chapter describes ICKDSF versions on guest operating systems and gives some guidelines for problem solving under VM.



The Stand-Alone version of ICKDSF supports minidisks, but cannot perform media maintenance to minidisks. All devices are treated as dedicated. For more information, see Chapter 7, “Getting started with the Stand-Alone version,” on page 53.





The MVS and VSE versions of ICKDSF treat all devices as real. Before you IPL the guest operating system, use the CMS or Stand-Alone version of ICKDSF to initialize (use the INIT command) a minidisk. You cannot perform media maintenance on minidisks or full-pack minidisks from a guest system.

A full-pack minidisk is treated the same as any other minidisk because it does not contain the service, diagnostic, or surface analysis cylinders necessary for device support purposes. A full-pack minidisk can contain the alternate cylinder depending on how it was defined in the user directory. In addition, the VM system restricts the use of certain types of channel command words (CCWs) on minidisks.

You can perform media maintenance only on a real device that is dedicated to the virtual machine. You might require special authorization to perform device support functions.

All devices are treated as real. Table 25 on page 65 shows the commands that can operate on a minidisk from a guest operating system. These commands and functions do not generally issue diagnostic type CCWs.

Table 25: ICKDSF Commands that operate on a minidisk from a guest operating system.

Command	Explanation
ANALYZE	You can use ANALYZE with the NODRIVE SCAN parameter on minidisks, but you must always use LIMITS (or the equivalent range parameters). LIMITS must be within the bounds of the minidisk. If you do not set limits, I/O is attempted outside the range of the minidisk, and apparent I/O errors will occur.
BUILDIX 	You can use BUILDIX to access only those areas where the VTOC and IXVTOC exist on the volume. BUILDIX generally does not issue diagnostic CCWs and completes without errors.
REFORMAT	You can use REFORMAT to access volume serial number, owner identification, IPL bootstrap records, and VTOC and Index on the volume. REFORMAT generally does not include diagnostic channel command words (CCWs) and should complete without errors.

Note: You can use an ICKDSF command on a minidisk from a guest operating system only if the ICKDSF version supports the command.

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Problem solving under VM

To perform device support functions, you might require special authorization. You need MAINTCCW authority, which is defined on the option statement in the CP directory.

In addition, the VM system restricts the use of certain types of CCWs.

If ICKDSF ends with an I/O error message, determine if the error is generated by the VM system or the device under test. Use a CP TRACE CCW command to recreate and determine the problem.

If the error is generated by the VM system, then the error is generally caused by either a command reject or channel program check.

If the error is caused by a command reject, then the I/O error sense information has byte 0 bit 0 on. Often, bytes 23 and 24 contain either X'0F00' or X'0F04'.

If the error is caused by a channel program check, it is sometimes reflected in the channel status word (CSW), such as CSW byte 4 and 5 as X'0020'.

Errors are most likely caused by one of the following:

Table 26: Problem solving under VM.

Error	Action
Your user ID does not have the required authorization and the CCW issued by ICKDSF is restricted by the VM system. The device can be a minidisk or a dedicated volume.	Contact the VM system programmer to obtain authorization.
The area that ICKDSF was trying to access does not exist on the volume. **When a device is a minidisk, it can contain alternate, service, diagnostic, or surface analysis cylinders which are necessary for device support purposes.**	• The command you are using is not supported in the current environment. Do not use that command. or • You need to use the MIMIC(MINI) parameter in the Stand-Alone version. Note that a full-pack minidisk is still a minidisk.
The actual size of the primary area of the minidisk is smaller than the requested ICKDSF function. For example, MIMIC(MINI(50)) is specified for a 20 cylinder minidisk.	Specify the correct size.

Part 2. Using ICKDSF to install and maintain CKD devices

Part 2. describes how to use the ICKDSF commands to install and maintain CKD devices. See Table 13 on page 8 for a list of CKD devices supported by ICKDSF.

Chapter 9, “Examples of ICKDSF tasks—CKD devices,” on page 69 is an overview of the tasks you perform for installation and maintenance of CKD devices. It provides guidelines to help you determine why, when, and how to run ICKDSF.

The other chapters in **Part 2.** list the commands in alphabetic order. Each command explanation includes:

- A table summarizing the syntax of the command

  For a detailed explanation of ICKDSF command syntax see Chapter 3, “Understanding ICKDSF command statements,” on page 17
- An explanation of required and option parameters
- A general description of the command and its use
- Examples.

Examples of ICKDSF commands used to install and maintain FBA devices appears in Part 3, “Using ICKDSF to install and maintain FBA devices,” on page 359.

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Chapter 9. Examples of ICKDSF tasks—CKD devices

The examples in this chapter show the commands and parameters needed for the following tasks:

- "Installing devices" on page 69
- "Resuming initialization from a checkpoint location" on page 71
- "Formatting devices" on page 74
- "Problem determination" on page 77
- "Media maintenance" on page 79
- "Emulating devices" on page 82
- "Performing miscellaneous tasks with ICKDSF" on page 85

Default parameters are included only when they produce additional output. For complete descriptions of each command and more examples, see the individual commands beginning with Chapter 10, "AIXVOL command—CKD," on page 87.

Installing devices

This section includes guidelines for:

- Completing the installation procedure after physical installation
- Installing devices from the factory
- Setting an IBM 3390 or 9391 to 3380 track compatibility mode or 3380 track format
- Installing older devices

See "Formatting devices" on page 74 for the tasks you perform after installation.

Note: These tasks are not required for any devices emulated by the 9394.

Completing the installation procedure

When your IBM service representative completes the physical installation of a new device, you must complete the recommended installation procedure for that device:

- For 3995-151, 3995-153, 9391, 9394, 9393, 9396, 9397, and Internal Disk devices installation procedures are not required. Use the procedures in "Formatting devices" on page 74 to initialize these devices for use in your operating environment.
- For 3380, 3390, and 9345 devices, use the INSTALL command.
- For all other devices, use the INIT command to perform a medial INIT.

After completing the installation process, you must format the volume, that is, make it usable in a specific operating environment.

Minimal INIT refers to using the INIT command to write the volume label and VTOC on volumes for use by MVS or VSE operating systems.

Medial INIT refers to using the INIT command to validate the home address and record 0, followed by a minimal INIT.

Installing a device from the factory

For 3380, 3390, and 9345 HDAs, use the INSTALL command to rewrite all home addresses and record 0s on the volume.

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In the following example, for all 3390 head-disk assemblies (HDA) except the 3390-9, you could also use the SETMODE parameter. For more information, see "Setting an IBM 3390 to 3380 track compatibility mode" on page 70. The 3390-9 device does not support 3380 track compatibility mode.

```
INSTALL UNITADDRESS(ccuu)
```

If you are installing a new 9345 device, you might not need to run the INSTALL command. Your IBM customer engineer will run a Track Center Test during the install process and give you a list of device addresses against which you need to run the INSTALL command. If no 9345 devices need the INSTALL command run, then you are ready to format the device for your operating environment. For more information about formatting volumes, see "Formatting devices" on page 74.

If you have physically moved the device and need to reinstall it, the volume has a volser. Because the volume has a volser, you must specify either the VERIFY or NOVERIFY parameter to process the volume.

Use CPVOL or AIXVOL to prepare a volume for use in a VM or AIX operating system environment.

Data on the volume is erased. If you want to preserve your data, copy it to a backup device before processing begins.

Setting an IBM 3390 to 3380 track compatibility mode



In this example, an IBM 3390 volume is changed from 3390 mode to 3380 track compatibility mode.

Note: The 3390-9 and 9394 devices do not support 3380 track compatibility mode.

After INSTALL command processing, the volume is not formatted. Because this is an MVS volume, a minimal INIT is issued. INIT formats the volume by specifying the volume identification and NOVERIFY.

```
//EXAMPLE   JOB
//          EXEC  PGM=ICKDSF
//SYSPRINT  DD    SYSOUT=A
//SYSIN     DD    *
 INSTALL UNITADDRESS(0353) SETMODE(3380)
   IF LASTCC<8 -
     THEN INIT UNIT(0353) NOVERIFY VOLID(ABCD4) NOVALIDATE
/*
```

To format the volume for other systems, use:

The INIT command for VSE or MVS volumes
The CPVOLUME command for VM volumes
The AIXVOL command for AIX volumes

For more information about formatting volumes, see "Formatting devices" on page 74 or the applicable command explanation.

Installing a 3375 or older HDA from the factory

For all 3375, or older volumes, you must use the INIT command to perform a medial INIT. medial INIT validates the home address and record 0, and then performs a minimal INIT on a volume.

```
INIT UNITADDRESS(ccuu) NOVERIFY VOLID(serial) OWNERID(owner) –
     VTOC(cylinder,track,extent) VALIDATE DATA
```

Usage Notes:

- **Data on the volume is erased.**
- This example establishes a volume ID, an owner ID, and a VTOC for the volume.
- The VALIDATE parameter ensures that potentially erroneous data on all tracks is erased by initializing at the medial level for the entire volume.



– To write IPL program records on the volume, add the IPLDD parameter to the end of the parameter list:

```
IPLDD(SYSIN,ABSFORMAT)
```

– The DATA parameter is valid only for the IBM 3375, 3380, 3390, and 9345 devices. If the example is run against a device other than the 3375, 3380, 3390, or 9345, DATA is ignored.

  The DATA parameter writes a full track of data on every track on the volume. This data is a predefined pattern similar to the data that is used to certify the volume at the factory. The data is referred to as **factory functional verification data patterns (FFVDP)**.

Resuming initialization from a checkpoint location

You can resume processing after ICKDSF automatically checkpoints itself while initializing a volume. For 3380, 3390, and 9345 volumes, you reissue your original INSTALL command. For other volumes, you use the INIT command. If the device does not support ICKDSF checkpointing operations, all ICKDSF checkpointing functions are bypassed.

The examples that follow show how you use the INIT command to resume processing from checkpoint cylinder 200, head 0.

Validating and writing the FFVDP

The following example shows you how to validate and write the FFVDP on a volume.

```
INIT UNIT(ccuu) NOVFY VALIDATE DATA
```

Validating part of a volume

You use the CONTINUE parameter of INIT to resume from the last checkpoint. For example, if processing is interrupted after you issue:

```
INIT UNIT(ccuu) NOVFY VALIDATE DATA
```

and you are unsure of the size of the track you are initializing, you can validate part of a volume by using the INIT command with the CONTINUE parameter.

```
INIT UNIT(ccuu) VALIDATE NODATA NOVERIFY –
     CYLRANGE(100,500) HEADRANGE(2,6) CONTINUE VOLID(volser)
```

Usage Notes:

- All tracks, starting at cylinder 200, head 0 (the last checkpointed location) and continuing for about 1000 tracks, are validated; and data is erased from those tracks. An IBM 3380 would be validated from cylinder 200, head 0 to cylinder 266, head 14.
- Validation (including erasing data) is also done for heads 2 through 6 for all cylinders beyond the last cylinder validated above, up to and including cylinder 500. For example, on a 3380, cylinders 267 to 500 are validated.
- The minimal initialization is then performed.

Writing the FFVDP on part of a volume

If after issuing:

```
INIT UNIT(ccuu) NOVFY VALIDATE DATA
```

processing is interrupted; you can write the FFVDP on part of a volume. The part of the volume specified in the above example was entirely completed before the last checkpointed location. You would then issue:

```
INIT UNIT(ccuu) NOVFY DATA VALIDATE –
     CYLRANGE(0,100) CONTINUE VOLID(volser)
```

Usage Notes:

- All tracks, starting at cylinder 200, head 0 (the last checkpointed location) and continuing for about 1000 tracks, are validated; and the FFVDP is written on them.
- There is no additional validation and writing of the FFVDP for the tracks in the specified range, because the specified range is entirely contained before the last checkpointed location.
- The minimal initialization is then performed.

Writing the FFVDP regardless of previous processing

If after issuing:

```
INIT UNIT(ccuu) NOVFY VALIDATE DATA
```

processing is interrupted; you can use the NOCONTINUE parameter to write the FFVDP on part of the volume, regardless of where previous processing was interrupted.

```
INIT UNIT(ccuu) NOVFY VALIDATE DATA –
     CYLRANGE(0,100) NOCONTINUE VOLID(volser)
```

Usage Notes:

- All tracks, starting at cylinder 200, head 0 (the last checkpointed location) and continuing for about 1000 tracks, are validated; and the FFVDP is written on them.
- Tracks are validated, and the FFVDP is written for the specified cylinders for all heads on the device:

  For a 3380 A04, AA4, and AD4, ICKDSF processes heads 0 through 14 for cylinders 0 through 100.
- The minimal initialization is then performed.

Validating from a specific point

If after issuing:

```
INIT UNIT(ccuu) NOVFY VALIDATE DATA
```

processing is interrupted; you can validate part of the volume from a specific point.

```
INIT UNIT(ccuu) NOVFY VALIDATE –
     FROMRANGE(500,6)  CONTINUE VOLID(volser)
```

Usage Notes:

- All tracks, starting at cylinder 200, head 0 (the last checkpointed location) and continuing for approximately 1000 tracks, are validated; and data is erased.
- All tracks are then validated, starting from cylinder 500 head 6 through the last head on the last alternate cylinder.

  For a 3380 A04, AA4, and AD4, ICKDSF processes all tracks on each cylinder starting from cylinder 500, head 6 through cylinder 885, head 14.
- The minimal initialization is then performed.

Validating to a specific point

If after issuing:

```
INIT UNIT(ccuu) NOVFY VALIDATE DATA
```

processing is interrupted; you can validate part of the volume to a specific point.

```
INIT UNIT(ccuu) NOVFY VALIDATE
     TORANGE(500,6) CONTINUE VOLID(volser)
```

Usage Notes:

- All tracks, starting at cylinder 200, head 0 (the last checkpointed location) and continuing for approximately 1000 tracks, are validated; and data is erased.
- Starting from cylinder 200, head 0 through cylinder 500, head 6, all tracks on each cylinder are validated; and data is erased from those tracks.

Validating and writing the FFVDP for one head

If after issuing:

```
INIT UNIT(ccuu) NOVFY VALIDATE DATA
```

processing is interrupted; you can validate and write the FFVDP for part of the volume, starting at a specific cylinder for only one head.

```
INIT UNIT(ccuu) NOVFY VALIDATE DATA -
     CYLRANGE(500,9999) HEADRANGE(6,6) CONTINUE VOLID(volser)
```

Usage Notes:

- All tracks, starting at cylinder 200, head 0 (the last checkpointed location) and continuing for approximately 1000 tracks, are validated; and the FFVDP is written on them.
- Tracks are validated and the FFVDP is written on head 6 only, from cylinder 500 through the last alternate cylinder.

  For a 3380 A04, AA4, and AD4, ICKDSF processes head 6 only, from cylinder 500 through cylinder 885.
- The minimal initialization is then performed.

Validating the last heads of a device

If after issuing:

```
INIT UNIT(ccuu) NOVFY VALIDATE DATA
```

processing is interrupted, you can validate the last few heads of a device.

```
INIT UNIT(ccuu) NOVFY VALIDATE -
     HEADRANGE(8,99) CONTINUE VOLID(volser)
```

Usage Notes:

- All tracks, starting at cylinder 200, head 0 (the last checkpointed location) and continuing for approximately 1000 tracks, are validated; and data is erased.
- Validation is performed and data is erased for all cylinders on the device, for heads 8 through n (where **n** is the maximum head number for the device).

  For a 3380 A04, AA4, and AD4, ICKDSF processes heads 8 through 14, from cylinder 200 through cylinder 885.
- The minimal initialization is then performed.

Formatting devices

Once your device is initialized, you must format it for your operating environment. To format your volume, use the:

INIT command for MVS or VSE
CPVOLUME command for VM
AIXVOL command for AIX

Formatting minidisks



With the CMS version of ICKDSF, you can use the INIT command to format a minidisk for MVS use.This example establishes a volume ID, an owner ID, and a VTOC for a minidisk.

```
INIT UNITADDRESS(ccuu) NOVERIFY VOLID(serial) OWNERID(owner) -
     VTOC(cylinder,track,extent)
```

To format minidisks for other environments, use:

- The CMS command FORMAT for a CMS user. For more information about the CMS FORMAT command, see the *CMS Command Reference* applicable to your installation.
- INIT for VSE or VSE/VSAM under CMS.
- AIXVOL for AIX.
- CPVOLUME for a VM guest.

Formatting an entire volume in the CMS version



In this example, all 3339 cylinders on a 3390 Model 3 volume are formatted for a VM guest. The allocation map will indicate that all 3339 cylinders on the volume are allocated as PERM space.

Because NOREADCHECK is specified, a read-back check of the volume does not occur.

Because NOVERIFY is specified, any existing volume label is ignored, and the volume is labeled "CPVOL1".

```
CPVOLUME FORMAT UNIT(0150) NOVERIFY VOLID(CPVOL1) NOREADCHECK
```

Formatting part of a volume in the CMS version



The device used in this example is a 3380 with 885 cylinders. The first 100 cylinders on the volume are formatted. The allocation map will indicate that cylinder 0 is PERM space, cylinders 1 through 99 are PAGE space, and cylinders 100 through 884 are PERM space.

Because NOVERIFY is specified, any existing volume label is ignored, and the volume is labeled "CPVOL1".

```
CPVOLUME FORMAT UNIT(0150) NOVERIFY VOLID(CPVOL1) RANGE(0,99) TYPE((PAGE,1,99))
```

Writing the VTOC





This example shows how you can write a VTOC.

```
INIT UNITADDRESS(ccuu) NOVERIFY VOLID(serial) -
     OWNERID(owner) VTOC(cylinder,track,extent)
```

Placing a VTOC at the end of a volume



In the following example, ICKDSF puts the VTOC at the end of the VSE volume on the last primary cylinder. The VTOC is one cylinder in length.

```
INIT UNIT(ccuu) NOVFY VOLID(volser) VSEVTOC(END)
```

This example allows ICKDSF to choose the location and size of the VTOC. It is valid for all devices except the 3390-9.

Determining the VTOC size and location



In the following example, ICKDSF determines the location and size of the VTOC for an MVS system. ICKDSF places the VTOC on the last primary cylinder of the volume. The VTOC is one cylinder in length.

```
INIT UNIT(ccuu) NOVFY VOLID(volser) VTOC(END)
```

This example allows ICKDSF to choose the location and size of the VTOC. It is valid for all devices except the 3390-9.

Expanding the VTOC at Its current location

In the following example, ICKDSF expands the VTOC at its current location. *n* is the total size in tracks of the new VTOC after the expansion.

```
REFORMAT UNIT(ccuu) NVFY EXTVTOC(n)
```

The following is an example of expanding the VTOC and the Index using the EXTVTOC and EXTINDEX parameters of the REFORMAT command.

```
//EXAMPLE   JOB
//          EXEC  PGM=ICKDSF
//VOLDD     DD DISP=SHR,UNIT=3380,VOL=SER=TMP121
//SYSPRINT  DD    SYSOUT=A
//SYSIN     DD    *
 REFORMAT DDNAME(VOLDD) VERIFY(TMP121) EXTVTOC(200) EXTINDEX(16)
/*
```

Changing the volume serial number and owner identification





Use the REFORMAT command to change the volume serial number and owner identification for MVS or VSE volumes.

You can use the VOLID and OWNERID parameters, or both. You can also add IPL text to the volume at the same time with the IPLDD(SYSIN) parameter.

No other data on the volume is changed.

```
REFORMAT UNITADDRESS(ccuu) NOVERIFY VOLID(newvol) -
         OWNERID(newowner)
```



Use AIXVOL LABEL to change the VOLID in an AIX/ESA environment.



Use CPVOL LABEL to change the VOLID for CP volumes.

Adding IPL text to a volume



Use the REFORMAT command to add IPL text to an already-initialized volume.

```
REFORMAT UNITADDRESS(ccuu) NOVERIFY BOOTSTRAP IPLDD(SYSIN)
```

Converting a volume to indexed format



To convert an OS VTOC to indexed format, use the BUILDIX command:

```
//jobname   JOB
//stepname  EXEC PGM=ICKDSF
//SYSPRINT  DD SYSOUT=A
//VOLDD     DD UNIT=(3390,,DEFER),VOL=(PRIVATE,SER=VL3390),
//          DSN=SYS1.VTOCIX.VL3390,DISP=OLD
//SYSIN     DD *
 BUILDIX  DDNAME(VOLDD)  IX
/*
```



To convert an indexed VTOC back to OS format, use the BUILDIX command:

```
//jobname   JOB
//stepname  EXEC PGM=ICKDSF
//SYSPRINT  DD SYSOUT=A
//VOLDD     DD UNIT=(3390,,DEFER),VOL=(PRIVATE,SER=VL3390),
//          DSN=SYS1.VTOCIX.VL3390,DISP=OLD
//SYSIN     DD *
```

```
 BUILDIX  DDNAME(VOLDD)  OS
/*
```

Problem determination

You can use ICKDSF to diagnose errors without the assistance of a service representative.

You can use the ANALYZE command to examine a device and the data on a volume to help determine the existence and the nature of errors.

You use two parameters with the ANALYZE command:

- DRIVETEST tests the hardware device
- SCAN reads data on a volume

You can use the DRIVETEST parameter to ensure that device hardware can perform basic operations, such as seeks, reads, and writes. DRIVETEST can impact your system performance, but does not alter data.

You can use ANALYZE SCAN to read data that currently exists on a volume. If ANALYZE SCAN reads the data successfully the first time, no further rereading of the track takes place.

A **data check** is an error detected in the bit pattern read from the disk. If a ANALYZE SCAN detects a data check on the first read, it issues further reads of the data. This ensures that the data check is not a random occurrence.

Data is read with subsystem and error recovery processes disabled to allow ANALYZE SCAN to identify all data checks. ANALYZE SCAN has no effect on user data on the volume.

ANALYZE SCAN can also detect 0F0B conditions.[3] This condition can arise during a dynamic sparing operation on a 9391 device if an error was detected on the original device during the copy operation. The corresponding track on the spare device will be put in an '0F0B' condition. At times this condition appears as a permanent data check instead of an "0F0B". You can issue INSPECT NOCHECK NOPRESERVE ASSIGN to fix the 0F0B condition. If applicable the name of the containing data set for each track that fails the scan will be printed.

You can enter DRIVETEST and SCAN independently or together. Data is never recorded in the error recording data set (ERDS) during ANALYZE SCAN or ANALYZE DRIVETEST processing. ERDS information is stored in SYS1.LOGREC by MVS, in SYSREC by VSE, and in the error recording area by VM.

Dual copy volumes that are in duplex or suspended duplex state are supported by the ANALYZE command.

Investigating suspected drive problems

If you suspect a problem with a drive, use the ANALYZE command to determine:

- If the drive can perform basic operating functions correctly
- If all data can successfully be read from the disk surface

```
ANALYZE UNITADDRESS(ccuu) SCAN
```

Usage Notes:

- The data on the volume is not altered.
- The drive test option of the ANALYZE command is valid only for the following devices with nonremovable media: IBM 3375, 3380, 3390, 9345, or any CKD emulated on CKD devices. The drive test option is not valid for the 3995 Models 151 and 153.
- Use the SPEED parameter to scan data one cylinder at a time rather than one track at a time.

[3] An 0F0B condition arises on a track when the home address appears to be defective, but record zero does not point to an alternate track.

- Use the LIMITS parameter to specify only a limited area for scanning.

Scanning data on part of a volume

The following examples show how you can use the ANALYZE command to scan selected tracks.

Scanning heads 5 and 6 only, cylinders 500 through 599

In this example, the data verification test is performed for heads 5 and 6 only, on cylinders 500 through cylinder 599.

```
ANALYZE UNIT(ccuu) SCAN NODRIVE -
        CYLRANGE(500,599) HEADRANGE(5,6)
```

Scanning from Head 14, Cylinder 500

In this example, after the drive test, the data verification test is performed for all heads starting at head 14, for all cylinders starting at cylinder 500.

```
ANALYZE UNIT(ccuu) SCAN -
        CYLRANGE(500,9999) HEADRANGE(14,9999)
```

Usage Notes:

After the drive test, all cylinders, from cylinder 500 until the last primary cylinder, are scanned for heads 14 through the last head for this device type.

- For a 3380 A04, AA4, and AD4, ICKDSF processes head 14 only, on cylinders 500 through 884 (alternate cylinder not processed).

Checking disk surfaces with INSPECT

Most media-related data checks are caused by small defective areas on track surfaces. The DASD subsystem can skip these areas. This is referred to as a **skip displacement**.

ICKDSF surface checking detects error sites that might produce data checks when user data is stored on the track. When errors are detected, ICKDSF assigns skip displacements for these error sites. If more than the allowed number of sites are detected for a track, ICKDSF can assign an alternate track.

The 3375, 3380, 3390, and the 9345 tracks contain skip displacement areas.

To check the disk surfaces of these devices, you can use INSPECT with the SKIP parameter. For example:

```
INSPECT UNIT(ccuu) NOVERIFY SKIP TRACKS(cccc,hhhh)
```

In this example, PRESERVE and ASSIGN are default parameters.

PRESERVE saves the data on the track by moving the data from the current track to an alternate track. **NOPRESERVE erases the data on the track.** Use this parameter only if there is no meaningful data on the track or if track errors prevent successful use of PRESERVE.

ASSIGN automatically assigns an alternate track if the track requires more than the device skip-area limit.

For the IBM 9345, you can use the SKIP or CHECK parameter to perform surface checking.

Note: The devices emulated by the 9394 and 9391 have no skip areas. Surface checking is not supported for these devices.

Surface checking part of a volume

Cylinder 4, head 6 through cylinder 50, head 8

In this example, primary checking begins at cylinder 4, head 6 and ends at cylinder 50, head 8. You can inspect up to 2500 tracks.

```
INSPECT UNIT(ccuu) NOVFY CHECK(2) NOSKIP –
     FROMRANGE(4,6) TORANGE(50,8) PRESERVE
```

All heads, cylinders 50 through 100

In this example, primary surface checking is performed on all the heads from cylinder 50 through cylinder 100.

```
INSPECT UNIT(ccuu) NOVFY CHECK(2) NOSKIP CYLRANGE(50,100) PRESERVE
```

Head 4 only on all cylinders

In this example, primary surface checking is performed on cylinder 0, head 4, to the last alternate cylinder, head 4. Data is saved at the backup location on each track processed.

```
INSPECT UNIT(ccuu) NOVFY CHECK(2) NOSKIP HEADRANGE(4,4) PRESERVE
```

Heads 5 and 6 only, cylinders 500 through 599

In this example, primary surface checking is performed on heads 5 and 6 only, from cylinder 500 to cylinder 599.

```
INSPECT UNIT(ccuu) NOVFY CHECK(2) NOSKIP –
     CYLRANGE(500,599) HEADRANGE(5,6) PRESERVE
```

All heads from 14, all cylinders from 500

In this example, all cylinders, from cylinder 500 through the last alternate cylinder, are processed for heads 14 through the last head for this device type.

For a 3390-2, ICKDSF processes cylinders 500 through 2226, head 14 only.

The total combination of tracks cannot exceed 2500.

```
INSPECT UNIT(ccuu) NOVFY CHECK(2) NOSKIP –
     CYLRANGE(500,9999) HEADRANGE(14,9999) PRESERVE
```

Alternate cylinders of 3380 Models A04, AA4, and AD4

In this example, skip-displacement surface checking occurs on all tracks on the alternate cylinder of an IBM 3380 Model A04, AA4, and AD4.

```
INSPECT UNIT(ccuu) NOVFY CHECK(1) SKIP CYLRANGE(885,885)
```

Media maintenance

Once you suspect media as a cause of data checks, you can use ICKDSF to assign skips, assign alternate tracks, rewrite the data, or reclaim the track. For more information about performing media maintenance, see:

- *9340 Customer Guide for Using SIMS*, GC26-4858, for 9345 DASD information.
- *Maintaining IBM Storage Subsystem Media*, GC26-4495, for any other IBM DASD information.

Conditionally assigning alternate tracks

Use the INSPECT command to check the surface of a track and to assign an alternate track if the surface-checking process indicates that the track is defective. When PRESERVE is used, the data is moved from the current track to the assigned alternate track.

```
INSPECT UNITADDRESS(ccuu) NOVERIFY CHECK(n) —
        TRACKS(cccc,hhhh) PRESERVE
```

Usage Notes:

- **n** can be any number from 1 through 10. For recommended values of **n** for specific devices, see Appendix E, “Surface checking,” on page 663.
- PRESERVE saves the data on the current track by moving it to an alternate track. **NOPRESERVE erases the data on the track.** Use this parameter only if there is no meaningful data on the track, or if track errors prevent successful use of PRESERVE.



- When ICKDSF runs online to an MVS operating system, data security procedures are issued. For more information, see “Protecting data sets in an online mode” on page 31.

Unconditionally assigning alternate tracks

Use the INSPECT command to unconditionally assign an alternate track regardless of the condition of the primary track. When you issue PRESERVE, ICKDSF moves the data from the current track to the assigned alternate track.

```
INSPECT UNITADDRESS(ccuu) VERIFY(serial,owner) NOCHECK —
        ASSIGN TRACKS(cccc,hhhh) PRESERVE
```

Usage Notes:

- If the track is an alternate, the primary track currently assigned to it is assigned a different alternate track.
- **NOPRESERVE erases the data on the track.** Use this parameter only if there is no meaningful data on the track or if track errors prevent successful use of PRESERVE.
- 

  When ICKDSF runs online to an MVS operating system, data security procedures are issued. For more information, see “Protecting data sets in an online mode” on page 31.

Reclaiming a single flagged track

Use the INSPECT command to check the surface of a track and to reclaim the track if it is currently flagged defective.

```
INSPECT UNITADDRESS(ccuu) NOVERIFY CHECK(n) —
        TRACKS(cccc,hhhh) RECLAIM PRESERVE
```

Usage Notes:

- Data from the alternate track is written onto the reclaimed track. Therefore, the data on the reclaimed track is first erased, and then replaced with the data from the alternate track.
- The maximum level of surface checking occurs for the track. If the track condition is good, and the track was assigned an alternate when processing began, reclamation takes place. If the track condition is defective, reclamation does not occur.

- If the above task is used for a track that is not flagged defective when processing begins, the results are the same as those described for "Conditionally assigning alternate tracks" on page 80.
- For recommended values of **n** for specific devices, see Appendix E, "Surface checking," on page 663.

Reclaiming alternate tracks with INSPECT

For 3375, 3380, 3390, and 9345 devices, use INSPECT to surface check and reclaim tracks. The 3995 Models 151 and 153 do not support surface checking. Existing data is read from the track and its surface is checked for high-repeatability, high-visibility error sites. The data is then rewritten to the track.

To rewrite data, enter the NOSKIP parameter on the INSPECT command by specifying:

```
INSPECT UNIT(ccuu) NOVERIFY NOSKIP TRACKS(cccc,hhhh)
```

The CHECK and PRESERVE parameters are defaulted in this example. The CHECK parameter ensures that rewrite checking is performed, and the PRESERVE parameter ensures that data is rewritten to the tracks. INSPECT provides a summary of all the currently assigned alternate tracks.

Finding where INSPECT failed

This example shows how the checkpoint processing works. It is not meant to show you how to use INSPECT to perform media maintenance procedures.

If you issued the following INSPECT command to perform surface checking on a 3380:

```
INSPECT UNIT(ccuu) NOVFY CHECK(2) SKIP -
        FROMRANGE(200,4) TORANGE(201,3) PRESERVE
```

and processing was interrupted on cylinder 201, head 1, you can use ANALYZE to locate the track that was being processed when the program stopped. For example, you can issue:

```
ANALYZE UNIT(ccuu) DRIVETEST
```

The DRIVETEST parameter is valid only for DASD with nonremovable storage media. For more information, see Chapter 11, "ANALYZE command—CKD," on page 93.

Saving data during surface checking

The following examples show how you can recover after an INSPECT fails. They show how the checkpoint processing works, and are not meant to show you how to use INSPECT to perform media maintenance procedures.

Use PRESERVE to save a copy of the data on the track at a backup location and in storage. If processing does not complete, ICKDSF finds and restores the track it was processing when the INSPECT was interrupted, provided PRESERVE was initially able to read the track successfully.

Example 1: The following example ensures that data is saved during surface checking for all tracks on cylinder 200. Use PRESERVE to save a copy of the data on the track at a backup location and in storage.

```
INSPECT UNIT(ccuu) NOVFY CHECK(1) SKIP —
        CYLRANGE(200,200) PRESERVE
```

Example 2: The following example performs skip-displacement surface checking on part of a 3380 volume. Processing was interrupted on cylinder 201, head 1. Use PRESERVE to save a copy of the data on the track at a backup location and in storage.

```
INSPECT UNIT(ccuu) NOVFY CHECK(2) SKIP —
        FROMRANGE(200,4) TORANGE(201,3) PRESERVE
```

Example 3: If this INSPECT command was interrupted:

```
INSPECT UNIT(ccuu) NOVFY CHECK(2) SKIP —
        FROMRANGE(200,4) TORANGE(201,3) PRESERVE
```

You can surface check a different portion of the volume, by issuing:

```
INSPECT  UNIT(ccuu) NOVFY CHECK(2) NOSKIP –
         CYLRANGE(498,500) HEADRANGE(2,6) KEEPIT
```

Usage Notes:

- Cylinder 201, head 1 is validated and the primary surface is checked.
- If primary surface checking for cylinder 201, head 1 fails, skip-displacement surface checking is issued.
- If there is data on cylinder 201, head 1 when processing is interrupted, it is rewritten on cylinder 201, head 1 from the backup location.
- Primary surface checking is then performed for all the tracks within the new range: heads 2 through 6 on cylinders 100 through 500.

Example 4: If this INSPECT command was interrupted:

```
INSPECT UNIT(ccuu) NOVFY CHECK(2) SKIP –
        FROMRANGE(200,4) TORANGE(201,3) PRESERVE
```

You can surface check the specified heads for part of the volume by issuing:

```
INSPECT  UNIT(ccuu) NOVFY CHECK(2) NOSKIP –
         CYLRANGE(498,500) HEADRANGE(2,6) PRESERVE
```

Usage Notes:

- Cylinder 201, head 1 is validated and the primary surface checked.
- If primary surface checking for cylinder 201, head 1 fails, skip displacement surface checking is issued.
- If any data existed for cylinder 201, head 1 when processing was interrupted, the data is rewritten on cylinder 201, head 1.
- Primary surface checking is then done for all the tracks within the new range.

Example 5: If this INSPECT command was interrupted:

```
INSPECT UNIT(ccuu) NOVFY CHECK(2) SKIP –
        FROMRANGE(200,4) TORANGE(201,3) PRESERVE
```

You can use INSPECT to restore any data that exists on the backup location, and ensure the usability of the volume. Issue:

```
INSPECT  UNIT(ccuu) NOVFY
```

Usage Notes:

- Cylinder 201, head 1 is validated and the primary surface checked.
- If primary surface checking for cylinder 201, head 1 fails, skip-displacement surface checking is issued.
- If there is data on cylinder 201, head 1 when processing is interrupted, it is rewritten on cylinder 201, head 1.

Emulating devices

ICKDSF operates on CKD devices that can be emulated on other CKD devices, and on CKD devices that can be emulated on FBA devices.

For CKD devices emulated on other CKD devices, the emulation is transparent. However, an emulated device works in the same manner as the device being emulated, not the native device.

Using a 3995 Model 151 or 153 device

The following ICKDSF functions are valid when you are emulating a 3390-2 on the 3995 Model 151 or 153:

AIXVOL (with no surface checking functions)
ANALYZE (SCAN function only)
BUILDIX
CONTROL
CPVOLUME (with no surface checking functions)
INIT (minimal initialization)
REFORMAT

The following ICKDSF functions are not valid when you are emulating a 3390-2 on the 3995 Model 151 or 153:

The drive test function of the ANALYZE command
The checkpoint CONTINUE function of the INIT command
INSPECT
INSTALL
REVAL

Initializing an emulated CKD device on a 3370 FBA device

To emulate a CKD device on a 3370 FBA device:

1. Use ICKDSF to initialize the FBA disk for use. If you have not already done so, initialize the FBA disk with the FBAVTOC in the standard location (FBAVTOC(2,56,1024)) and write a volume label. For an example of initializing, see Figure 38 on page 661.
2. Run the format-emulated extent utility (INITEM). For a description, see *VSE/ESA System Utilities*, SC33-6517.
3. If it is not already active, activate the Direct Access Storage Compatibility Feature.
4. Use the ICKDSF INIT command to initialize the emulated CKD disk for use.

   For fully-emulated CKD devices, use:

   ```
   INIT  UNITADDRESS(ccuu) NOVERIFY VALIDATE –
         VOLID(volser) MIMIC(EMUALL) DEVTYPE(type)
   ```

   For partially-emulated CKD devices, use:

   ```
   INIT  UNITADDRESS(ccuu) NOVERIFY VALIDATE –
         VOLID(volser) MIMIC(EMU(n)) DEVTYPE(type)
   ```

   Usage Notes:

   - For type, substitute the device type to be emulated.
   - For **n**, substitute the same number of cylinders that you gave as the size of the sub-disk during the INITEM program/operator dialog. ICKDSF does not check the validity of **n**.
   - INIT writes a special data set control block (DSCB) on the partial CKD device to ensure that the nonexistent cylinders are never accessed.
   - The drive test function of the ANALYZE command does not operate on CKD devices being emulated on FBA devices.

Initializing an emulated CKD Device on an IBM 9313, 9332, or 9335 FBA device

When you emulate a CKD device on the 9313, 9332, or 9335, you can use the same commands and parameters that you use when not emulating a CKD device. You do not need to:

- Use the MIMIC(EMU) or MIMIC(EMUALL) parameter.

- Perform any of the steps listed in "Initializing an emulated CKD device on a 3370 FBA device" on page 83.

Warning
To convert 9313, 9332, or 9335 devices to usable CKD devices, you must have loaded the correct microcode level. For more information, contact your IBM service representative. If the emulated device has never been initialized after conversion to CKD emulation, the device is unusable. To avoid unpredictable results, run a medial INIT before running any other command.

The following ICKDSF functions are valid when you are emulating CKD devices on the 9313, 9332, or 9335:

ANALYZE SCAN
Minimal or medial initialization
INSPECT, with no surface checking functions

The following ICKDSF functions are not valid when you are emulating CKD devices on the 9313, 9332, or 9335:

The drive test function of the ANALYZE command
The checkpoint CONTINUE function of the INIT command
Range parameters during a medial initialization

Initializing an emulated device at a medial level

To perform a medial initialization on a CKD device emulated on an IBM 9313, 9332, or 9335, enter:

```
INIT   UNITADDRESS(ccuu) NOVERIFY VALIDATE –
     VOLID(volser) VTOC(cylinder,track,extent)
```

Usage Notes:

- The VTOC is rewritten and access to data on the volume is lost.
- The volser you specify is checked against the volser of the volume.
- The checkpoint CONTINUE function of the INIT command is not supported.
- Maximal initialization is not supported.
- A medial initialization must process the whole volume. Range parameters are ignored.

Scanning data

To perform a data scan on a CKD device emulated on a 9313, 9332, or 9335 enter:

```
ANALYZE UNITADDRESS(ccuu) NODRIVETEST SCAN
```

Only the data verification test is supported. The drive test is not supported.

Assigning alternate tracks

To unconditionally assign alternate tracks on a CKD device emulated on a 9313, 9332, or 9335, enter:

```
INSPECT UNITADDRESS(ccuu) NOCHECK ASSIGN TRACKS(cccc,hhhh)
```

The surface checking functions of the INSPECT command are not valid when you are emulating CKD devices on the 9313, 9332, or 9335. Use the TRACKS parameter to specify the required tracks to be reassigned.

Media maintenance on an emulated device

When you perform media maintenance because of surface defects, use INSPECT or the FBA maximal INIT against the base address. INSPECT can assign an alternate track to the emulated device. This does,

however, have a greater performance impact than assigning alternates to blocks found defective on the base FBA device address.

Performing miscellaneous tasks with ICKDSF

The following examples show how you can:

- Clear a storage path fence status
- Erase a volume
- Print a track assignment map

Clearing a storage path fence status

In the following example, ICKDSF clears a fence status. When this command is issued, it clears all paths to all devices on the subsystem.

```
CONTROL  UNITADDRESS(0162) CLEARFENCE
```

When you issue the CLEARFENCE parameter of the CONTROL command, it is assumed the path or the device that has been fenced off by the subsystem has been repaired.

Erasing a volume

If the data is residual, you can reformat the volume.

Use the INIT command for MVS or VSE volumes
Use CPVOLUME FORMAT for MVS or VSE volumes



The following example shows you how to use INIT to erase data on an MVS volume. INIT restores the FFVDP on the volume. You can specify DATA or NODATA; either way, the volume is erased.

```
INIT UNITADDRESS(ccuu) NOVERIFY VALIDATE VOLID(serial) PURGE
```

You can also use REVAL to erase data from 3380 and 3390 volumes, see Chapter 23, “REVAL command—CKD,” on page 345.

You can also use the TRKFMT command to erase a track or tracks. See Chapter 24, “TRKFMT command—CKD,” on page 351.

Printing a track assignment map

Use the INSPECT command to format and print a report of alternate tracks assigned on the volume.

```
INSPECT UNITADDRESS(ccuu) NOVERIFY NOCHECK NOASSIGN –
        ALLTRACKS MAP
```

Data on the volume is not altered. For the IBM 9345, do not specify ALLTRACKS. Alternate track maps will not be printed for 9391 and 9394 because there are no alternate tracks.

Chapter 10. AIXVOL command—CKD



The AIXVOL command formats a volume for use in an AIX/ESA® environment. It writes 4096-byte records on all cylinders to be used by AIX. AIXVOL formats cylinder 0 with records that include the volume label. Use one of the parameters, FORMAT, LABEL, or EXAMINE, to complete your task.

FORMAT
Writes records required by AIX on cylinder 0. Writes the required number of 4096-byte records on each track of an entire volume or on a range of cylinders.

LABEL
Rewrites the volume serial number.

EXAMINE
Reads an AIXVOL-formatted volume to verify that it is properly formatted and that records can be read without error.

Use the RANGE parameter to format or examine an entire volume, or limit the operation to part of a volume. If you omit RANGE, AIXVOL assumes that the range is for the entire volume. If you choose a range that does not begin with cylinder 0, then cylinder 0 must have been previously formatted.

All of the cylinders on a volume do not have to be formatted with 4096-byte records. Only those cylinders that are to be used by AIX need to be formatted. You must, however, always format cylinder 0 before formatting any other cylinders.

For information on ICKDSF support of the 9391 and 9394, see “ICKDSF support of the RAMAC Array family” on page 8.

Syntax

AIXVOL
Required Parameters: FORMAT|LABEL|EXAMINE UNITADDRESS(*ccuu*) VERIFY({*serial*|*NONE*})|NOVERIFY
Optional Parameters: MIMIC(MINI(*nnnn*)) RANGE(*start,end*) **READCHECK**|NOREADCHECK VOLID(*serial*)

Required parameters

FORMAT|LABEL|EXAMINE parameter: specify function

Parameter/ Abbreviations	Description
FORMAT **FMT**	Required when you want to format a volume. You can format an entire volume or a range of cylinders.
LABEL	Rewrite the volume label of a previously formatted volume.

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Parameter/ Abbreviations	Description
EXAMINE **EXAM**	Inspect an entire volume or range of cylinders on a previously formatted volume for errors.
Default:	None.
Restrictions:	FORMAT, LABEL, and EXAMINE are mutually exclusive.

UNITADDRESS parameter: identify the device

Parameter/ Abbreviations	Description
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Specifies the address of the volume to be processed. For *ccuu*, use the virtual address of the volume.
Default:	None.

VERIFY|NOVERIFY parameter: verify the volume serial number

Parameter/ Abbreviations	Description
VERIFY(*serial*) **VFY**	Required when you want to verify the volume serial number before performing the requested function on the volume. If the volume serial number does not match that found on the volume, the AIXVOL command ends. For *serial*, substitute 1 to 6 alphanumeric characters for the volume serial number. To verify that a volume serial number does not exist, substitute the string *NONE* for *serial*. If no volume serial exists, or if the volume serial is actually "*NONE*", the AIXVOL operation continues. If a volume serial exists, the AIXVOL command ends.
NOVERIFY **NOVFY** **NVFY**	Required when you want to bypass verification of the volume serial number.
Default:	None. You must specify either VERIFY or NOVERIFY.
Restrictions:	None. When you use the VERIFY parameter and verification fails, the command stops running.

Optional parameters

MIMIC(MINI) parameter: specify a special volume usage



Parameter/ Abbreviations	Description
MIMIC(MINI(*nnnn*))	Specifies the number of cylinders to be processed. For *nnnn* specify the number of cylinders for the device.
Default:	If MIMIC(MINI) is not specified, the device is assumed to be dedicated.
Restrictions:	MIMIC(MINI) is valid only in the Stand-Alone version. It is unnecessary when Stand-Alone is running under VM.

RANGE parameter: specify the range of cylinders

Parameter/ Abbreviations	Description
RANGE*(start,end)*	Specifies the range of cylinders that are to be formatted or examined. Use *start,end* to specify a range of cylinders. Invalid range values are processed as follows: • If ending range > volume capacity, then the end range is set to the last cylinder on the volume and an informational message is issued. • If the starting range > volume capacity or ending range, then a message is issued and the command ends.
Default:	If RANGE is not specified, the default is the entire volume.
Restrictions:	RANGE is valid only when you specify either FORMAT or EXAMINE.

READCHECK|NOREADCHECK parameter: specify read-back check

Parameter/ Abbreviations	Description
READCHECK **READCHK** **RDCHECK** **READ**	Performs a read-back check for each cylinder after it is formatted. If read-back check media errors are detected, and the device supports media maintenance is not a minidisk, the INSPECT function is issued to repair the track. INSPECT performs skip-displacement surface-checking to eliminate data checks from the track, and will assign an alternate track if required. After the track is inspected, it is formatted once more and the FORMAT operation continues.
NOREADCHECK **NOREADCHK** **NOREAD** **NREAD**	Specifies that a read-back check is not to be performed.
Default:	READCHECK
Restrictions:	READCHECK is valid only when you specify FORMAT. The 3995-191, 3995-193, 9391, 9394, 2105, 2107, and 1750 do not support media maintenance. Therefore, if you specify READCHECK against any one of these devices and media maintenance errors are detected, the INSPECT function will not be issued and the AIXVOL command will end.

VOLID parameter: specify the volume serial number

Parameter/ Abbreviations	Description
VOLID(*serial*)	Specifies which volume serial number to write in the volume label.
Default:	If you do not specify a VOLID, the existing volume serial number is used. If there is no current volume serial number, then you must specify VOLID.
Restrictions:	VOLID is valid only when you specify FORMAT or LABEL.

Formatting a cylinder with AIXVOL

The AIXVOL command formats a cylinder by writing as many 4096-byte records as possible on each track of a cylinder. Each record is sequentially numbered within a track. For example, a 3390 volume has 12 records per track; therefore, each track contains records 1-12.

Table 27 on page 90 shows the number of records formatted on each of the CKD devices supported by the AIXVOL command:

Table 27: Number of CKD records formatted per track by AIXVOL command.

Device	Records Per Track	Tracks Per Cylinder	Records Per Cylinder	High Cylinder[1]	Records Per Volume
3380-A, B, D, J	10	15	150	884	132 750
3380-E	10	15	150	1 769	265 500
3380-K	10	15	150	2 654	398 250
3390-1	12	15	180	1 112	200 340
3390-2	12	15	180	2 225	400 680
3390-3	12	15	180	3 338	601 020
3390-9	12	15	180	10 016	1 803 060
9345-1	10	15	150	1 439	216 000
9345-2	10	15	150	2 155	323 400

[1] High cylinder is the highest address. The number of cylinders is one more.

AIXVOL formats track 0 on cylinder 0 with the following records:

Record	Description
IPL record	AIXVOL creates an IPL record and writes zeros in this record.
Checkpoint record	AIXVOL writes zeros in this record.
Volume Label record	The owner field of the label record contains "AIXES".
Format 4 DSCB	Contains device constant information.
Format 5 DSCB	The VTOC records created by AIXVOL indicate that no space is available on the volume.

Errors reported by EXAMINE

Use EXAMINE to ensure an entire volume or a range of cylinders is properly formatted for the AIX system.

Two types of errors are reported by the EXAMINE function: format errors and data checks. A **format error** occurs when a track does not have the correct number of 4096-byte records or if the records do not have the correct record number (record ID). Format errors are reported by cylinder range; cylinders within the reported range are improperly formatted.

Data checks are not reported for cylinders if EXAMINE reports that they have format errors. For more information about data checks, see *Customer Guide for Using 9340 Direct Access Storage Subsystems Service Information Messages*, for 9345 devices or *Maintaining IBM Storage Subsystem Media*, for 3380 and 3390 devices.

For cylinders that are properly formatted, EXAMINE will report the CCHH of the first track that contains a data check.

EXAMINE is read-only and will not write over any user data. For any errors reported by EXAMINE, you should take appropriate corrective action. For format errors, use AIXVOL to format the cylinders. For data check errors, use the INSPECT command to check the track surface.

Minidisk support



In the Stand-Alone version, use MIMIC(MINI(n)) to indicate the number of cylinders of the minidisk you want to format. If you do not specify MIMIC(MINI(n)) for a minidisk, AIXVOL assumes that the device is dedicated.For example, to format 5 minidisk cylinders, you enter the ICKDSF command:

```
AIXVOL UNIT(193) NVFY FORMAT MIMIC(MINI(5))
```



To format 5 minidisk cylinders with the CMS version, issue:

```
AIXVOL UNIT(193) NVFY FORMAT
```

Examples of the AIXVOL command

The following examples show different ways to code the AIXVOL command. The device used in the examples is a 3380 with 885 cylinders.

Formatting an entire volume

In this example all 885 cylinders on the volume are formatted. A read-back check is specified to verify that all of the formatted records can be read without error.

Because NOVERIFY is specified, any existing volume label is ignored, and the volume is labeled "AIXVL1".

```
AIXVOL FORMAT UNIT(0150) NOVERIFY VOLID(AIXVL1) READCHECK
```

Formatting part of a volume

In this example the first 100 cylinders on the volume are formatted. Cylinders 100 through 884 are available space.

Because NOVERIFY is specified, any existing volume label is ignored, and the volume is labeled "AIXVL1".

```
AIXVOL FORMAT UNIT(0150) NOVERIFY VOLID(AIXVL1) RANGE(0,99) NOREADCHECK
```

Inspecting a range of cylinders for errors

In this example, cylinders 100 through 150 are examined for errors.

Because NOVERIFY is specified, the volume serial number is not verified.

```
AIXVOL EXAM UNIT(129) NOVERIFY RANGE(100,150)
```

Rewriting the volume label

In this example, the volume label is changed from AIXTST to AIXFMT.

```
AIXVOL LABEL UNIT(129) VERIFY(AIXTST) VOLID(AIXFMT)
```

After this command is issued, the following message appears:

```
ICK003D REPLY U TO ALTER VOLUME 0129 CONTENTS, ELSE T
```

Reply U to message ICK003D, and ICKDSF will relabel the volume.

Chapter 11. ANALYZE command—CKD



The ANALYZE command examines the drive and the user's data on a volume to determine if errors exist. The output:

- Shows drive problems on nonremovable media
- Shows media problems
- Assists in locating and fixing problems

ANALYZE has two basic functions: drive test and data scan. For more general information on what ANALYZE does, see "Problem determination" on page 77.

For information about ICKDSF support of the RAMAC Array family, see "ICKDSF support of the RAMAC Array family" on page 8.

For information about ICKDSF support of the Internal Disk devices, see "ICKDSF support of the Internal Disk" on page 9.

Protecting the ANALYZE command with RACF

The MVS version of ICKDSF checks the general resource profile for a facility class profile of STGADMIN.ICK.ANALYZE. If RACF is not installed or the facility STGADMIN.ICK.ANALYZE is not created, the ANALYZE command executes with no authorization check. For additional information, see "Protecting ICKDSF commands with RACF" on page 34.

Syntax

ANALYZE
Required Parameters: DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*)|REALADDR(*ccuu*)
Optional Parameters: ALL ALLOWONLINE CHPID(*nn,nn,...*)|ALLCHPID DEVADDR(*lss,cca*) DIRECTIO(PRIMARY|SECONDARY) **DRIVETEST**|NODRIVETEST FROMRANGE(*cylinder,head*) HEADRANGE(*start,end*) HOSTACCESS(ALL|ONLINE|OFFLINE) LIMITS(*start,end*)|CYLRANGE(*start,end*) NOLPS PRINTDS SCAN|**NOSCAN** SECWWNN(*swwnn*) SPEED|**NOSPEED** SUBCHSET(*subchannelset-identifier*) TORANGE(*cylinder,head*) USERID(*user's ID*)

Required parameters

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DDNAME|SYSNAME|UNITADDRESS|REALADDR parameter: identify volume (or minidisk)

Parameter/ Abbreviations	Description
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and an attached CMS volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address (3 or 4 hexadecimal digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the minidisk or dedicated volume. The unit address is the device number.
REALADDR(*ccuu*) **RADDR**	Used to specify the real address of a volume. This parameter is valid only when you are running the CMS version of ICKDSF and you have DEVMAINT authority. For *ccuu*, specify the real address (3 or 4 hexadecimal digits) of the channel and unit of the volume. REALADDR is mutually exclusive with UNITADDRESS, DDNAME, SYSNAME, and USERID.
Default:	None.
Restrictions:	None.

Optional parameters

ALL parameter: specify the area of data verification

Parameter/ Abbreviations	Description
ALL	Reads all cylinders of the specified device during the data verification tests.
Default:	ALL is the default if you do not specify LIMITS or CYLRANGE.
Restrictions:	ALL applies only when you specify the SCAN parameter. You cannot specify ALL with FROMRANGE|TORANGE, CYLRANGE|HEADRANGE, or LIMITS.

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

CHPID|ALLCHPID parameter: specify path control

Parameter/ Abbreviations	Description
CHPID(*nn,nn,...*) **CHP**	Specifies the path control to be used for the drive test of a 3380, 3390, or 9345 device. CHPID specifies that the drive test is to process the specified CHPIDs. *nn* specifies the CHPID to be used. A maximum of eight CHPIDs can be specified. Valid values for CHPID are 00-FF and must match a valid CHPID in your configuration.

Parameter/ Abbreviations	Description
ALLCHPID **ALLCHP**	Specifies that all CHPIDs are to be processed.
Default:	None.
Restrictions:	CHPID|ALLCHPID is valid only in the MVS, Stand-Alone, or CMS environment. CHPID|ALLCHPID is valid only for 3380, 3390, and 9345 devices. CHPID|ALLCHPID is not valid for minidisks.

DEVADDR parameter: specify device address to query for host access information



Parameter/ Abbreviations	Description
DEVADDR(*lss*,*cca*)	Specifies the volume that you want host access information for. *lss* is a 2-digit hexadecimal value that identifies the logical subsystem (LSS) on the volume for which you would like query host access information, in the form X'*xx*'. *cca*, the channel connection address, is a 2-digit hexadecimal address that identifies the specific volume in the specified LSS that you would like query host access information for, in the form X'*xx*'.
Default:	None.
Restrictions:	The DEVADDR parameter requires that the HOSTACCESS parameter is also specified.

DIRECTIO parameter: specify primary or secondary volumes

Parameter/ Abbreviations	Description
DIRECTIO(PRIMARY) **DIO(PRI)**	Direct the I/O for the drive test or the data verification test to the primary volume of a dual copy pair.
DIRECTIO(SECONDARY) **DIO(SEC)**	Direct the I/O for the drive test or the data verification test to the secondary volume of a dual copy pair.
Default:	If the DIRECTIO parameter is not specified when you are using a dual copy pair, the default is: • The primary volume if the dual copy pair is in duplex state. • The secondary volume if the dual copy pair is in suspended duplex state.
Restrictions:	Effective only when the dual copy pair is in duplex or suspended duplex state. Ignored if the volume is in simplex state or the subsystem does not support dual copy.

DRIVETEST|NODRIVETEST parameter: specify the drivetest

Parameter/ Abbreviations	Description
DRIVETEST **DRIVE**	Runs the drive test. This parameter is valid only for the following IBM DASD that have nonremovable storage media: 3375, 3380, 3390, 9345, the RAMAC family of devices, the Internal Disk, and any supported DASD emulation where these devices are the native devices. The drive test function is not valid for the 3995-151, the 3995-153, the 2105, the 2107, and the 1750. If DRIVETEST is specified for a nonsupported device, a warning message is issued and processing continues.
NODRIVETEST **NODRIVE**	Bypasses the drive test.

Parameter/ Abbreviations	Description
Default:	DRIVETEST
Restrictions:	If path control is supported, NODRIVE NOSCAN prints the pathing reports that are applicable to the operating system environment, and the device or control unit type. If path control is not supported, NODRIVE NOSCAN performs no functions but will complete without error. For path control support information, see "Path control under ANALYZE drive test" on page 101.
CMS	DRIVETEST must be the only ICKDSF command running on a device. You cannot run multiple DRIVETESTs on a volume or minidisk. With the CMS version of ICKDSF, DRIVETEST is valid for dedicated devices. DRIVETEST is also valid for minidisks that are linked if the user has DEVMAINT authority.

FROMRANGE parameter: specify a specific starting location

Parameter/ Abbreviations	Description
FROMRANGE(*cylinder,head*) **FROMR** **FROM**	Use this parameter to specify the starting track (cylinder and head) to be scanned. For *cylinder,head* substitute decimal (**n**) or hexadecimal digits (for example, X'2AB',X'E') to identify the cylinder and head at which processing is to start. If you specify only one value, that value defaults to the cylinder and the head value is defaulted to 0. If you specify FROMRANGE and do not specify TORANGE, TORANGE is defaulted to the last cylinder of a volume or minidisk. For information on specifying the ending track (TORANGE) to go with the starting track, see "TORANGE parameter: specify a specific ending location" on page 100. For information on specifying part of a volume to be examined, see "RANGE Parameters: specifying part of a volume" on page 103.
Default:	None.
Restrictions:	FROMRANGE cannot be specified with CYLRANGE|HEADRANGE. FROMRANGE applies only when SCAN is specified.

HEADRANGE parameter: specify a range of heads

Parameter/ Abbreviations	Description
HEADRANGE(*start,end*) **HDRANGE** **HEADR** **HDR** **HD**	Use the HEADRANGE parameter to specify the starting and ending heads to be scanned. For *start,end* substitute decimal (**n**) or hexadecimal digits (for example, X'1',X'E') to identify the starting and ending heads to be examined. If you specify only one value, ICKDSF takes the value to be the starting range and defaults the ending range to the device maximum. If you specify HEADRANGE and do not specify CYLRANGE, the specified heads for all the cylinders on a volume or minidisk are processed. For information on specifying the starting and ending cylinders (CYLRANGE) to go with the starting and ending heads, see "LIMITS|CYLRANGE parameter: specify the area of data verification" on page 97. For information on specifying part of a volume, see "RANGE Parameters: specifying part of a volume" on page 103.
Default:	None.
Restrictions:	The starting value is required for HEADRANGE. If you specify an ending value greater than the maximum for the device, the device maximum is used for the ending value. HEADRANGE applies only when you specify SCAN. HEADRANGE cannot be specified with FROMRANGE|TORANGE. Because SPEED operates on one cylinder at a time, it is not valid with HEADRANGE, and is ignored if you specify both parameters.

HOSTACCESS parameter: obtain host access information



Parameter/ Abbreviations	Description
HOSTACCESS(*access*)	Obtains host access information for the device specified. *access* is ALL, ONLINE or OFFLINE. ALL obtains the host access information for both grouped and ungrouped paths for the device specified. ONLINE obtains the host access information for grouped paths for the device specified. OFFLINE obtains the host access information for ungrouped paths for the device specified. **Note:** 1. If the path is grouped it is assumed that the device is online to that path. 2. HOSTACCESS prints the SPID fence host token if the device is SPID-fenced. The token's hex value is shown first followed by printable characters. Unprintable characters may be printed as '.' The following is an example: `SPID FENCE HOST TOKEN=X'F1F2F3F4F5F6F7F8' 12345678`
Default:	None.
Restrictions:	The HOSTACCESS parameter is valid only when NODRIVE and NOSCAN are specified.In **Note:** If the DEVADDR parameter is not specified, the host information is obtained for the device that the I/O is issued to.

LIMITS|CYLRANGE parameter: specify the area of data verification

Parameter/ Abbreviations	Description
LIMITS(*start,end*) **LIMIT** **LIMS** **LIM**	Specifies the area of the disk where data verification is to be performed. Specifies the range of cylinders to be read during the data verification tests. *start and end* specifies the relative cylinder number for the start and end of the data verification tests. These values can be expressed in decimal (**n**) or hexadecimal (for example, X'2AB',X'3DE') form. The numbers *start* and *end* must be equal, or in ascending order.
CYLRANGE(*start,end*) **CYLR** **CYL**	For *start,end*, substitute decimal (**n**) or hexadecimal digits (for example, X'2AB',X'3DE') to identify the starting and ending cylinders to be examined. If you specify CYLRANGE and do not specify HEADRANGE, all the heads of the specified cylinders are processed. For information on specifying the starting and ending heads (HEADRANGE) to go with the starting and ending cylinders, see "HEADRANGE parameter: specify a range of heads" on page 96. For information about specifying part of a volume, see "RANGE Parameters: specifying part of a volume" on page 103.
Default: 	If you do not specify LIMITS or CYLRANGE, ALL is the default if SCAN is specified. With the CMS version, if you do not specify a range for a minidisk, the default is the entire specified minidisk.
Restrictions:	The LIMITS|CYLRANGE parameters apply only when the SCAN parameter has been specified. The starting value is required for LIMITS|CYLRANGE. If you do not specify an ending value, the last primary cylinder is used as the ending value. LIMITS or CYLRANGE cannot be specified with FROMRANGE|TORANGE.

NOLPS parameter: suppress printing of Logical Path Status Table

Parameter/ Abbreviations	Description
NOLPS	When used with the NODRIVE and NOSCAN parameters, this will suppress the printing of the Logical Path Status Table.
Default:	None.
Restrictions:	Valid only when NODRIVE and NOSCAN is specified.

PRINTDS parameter: print data set name

Parameter/ Abbreviations	Description
PRINTDS **PRINT** **PRTDS**	If an uncorrectable data check is found, and the track in error resides within a data set the data set name will be printed out.
Default:	None.
Restrictions:	Valid only when SCAN is specified.

SCAN|NOSCAN parameter: run data verification tests

Parameter/ Abbreviations	Description
SCAN SCN	Indicates that you want the data verification test to be run. Data verification is run if you specify SCAN and any of the following is true: The drive test completed successfully. The drive test is not supported for the input device type. The drive test has been bypassed. For 9345 and 9394 devices, SCAN reports those media service information messages (SIMs) that have not been closed. Scan will detect 0F0B errors[1] for all ICKDSF supported device types. It will report all 0F0B tracks and print the data set name (MVS version only) if the track was allocated to a data set.
NOSCAN NOSCN NSCAN NSCN	Indicates that you do not want the data verification test to be run.
Default:	NOSCAN
Restrictions:	None.

1 The 0F0B condition arises on a track when the home address appears to be defective, but record zero does not point to an alternate track.

SECWWNN parameter: specifies the WWNN of a volume

Parameter/ Abbreviations	Description
SECWWNN(*swwnn*) **SWWNN**	Specifies the World Wide Node Name (WWNN) of the volume for which you want fibre channel connection information. The WWNN you specify identifies a volume that you may wish to use as a secondary PPRCOPY volume connected through fibre channel protocol (FCP) paths to the volume to which the I/O is addressed. When PPRCOPY FCP support exists, the ANALYZE pathing reports includes the fibre channel connection Information Table. This information indicates the potential connectivity of the fibre channel ports in the ESS where the I/O is issued, to each system adapter port in the ESS specified by the secondary WWNN. Each WWNN is an 8-byte hexadecimal value wwwwwwwwwwwwwwww. *swwnn* represents the secondary WWNN.
Default:	None.
Restrictions:	Although the SECWWNN value is a hex value the leading X' and the trailing apostrophe are not allowed in the specification of the value.

SPEED|NOSPEED parameter: specify data verification tests

Parameter/ Abbreviations	Description
SPEED	I/O reads one cylinder for the data verification tests.
NOSPEED **NSPEED**	I/O reads one track for the data verification tests.
Default:	NOSPEED
Restrictions:	Because SPEED operates one cylinder at a time, it improves the performance of the scanning process, but it can severely degrade the performance of other users accessing the channel. This impact should be considered. SPEED is valid only when SCAN is specified. For the 9345, SPEED|NOSPEED are ignored if specified. When the data verification test is run for the 9345, one I/O is issued for each cylinder to be processed within the range you specify. For example, if you specify FROM(3,5) TO(13,4), 11 I/Os are issued (one I/O per cylinder, and 150 tracks are read). Similarly, if you specify CYLRANGE(20,21) HEADRANGE(1,2), two I/Os are issued. SPEED is not recommended for VM operating systems or guest minidisks that are part of a volume where other users are active.

SUBCHSET parameter: specify the subchannel set identifier



Parameter/ Abbreviations	Description
SUBCHSET(*subchset-identifier*)	Specifies the subchannel set identifier for the volume you want to analyze. For *subchset-identifier* substitute a decimal subchannel set identifier that is valid for the level of z/OS on which you are issuing the command.
Default:	None.
Restrictions:	The SUBCHSET parameter requires that the UNIT parameter is also specified. It is valid only with z/OS V1R10 and higher.

TORANGE parameter: specify a specific ending location

Parameter/ Abbreviations	Description
TORANGE(*cylinder,head*) **TOR** **TO**	Use this parameter to specify the ending track (cylinder and head) to be scanned. For *cylinder,head*, substitute the decimal (**n**) or hexadecimal digits (for example, X'2AC',X'E') to identify the cylinder and head where processing is to end. If you specify only one value, that value defaults to the cylinder and defaults the head to the device maximum. If you specify TORANGE and do not specify FROMRANGE, FROMRANGE is defaulted to cylinder 0, head 0 of the specified minidisk. For information on specifying the starting track of part of a volume (FROMRANGE) see "FROMRANGE parameter: specify a specific starting location" on page 96. For information on specifying part of a volume, see "RANGE Parameters: specifying part of a volume" on page 103.
Default:	None.
Restrictions:	None.

USERID parameter: specify another user's minidisk



Parameter/ Abbreviations	Description
USERID(*user's ID*) **UID**	Performs the ANALYZE data verification test on another user's minidisk. For *user's ID*, substitute the 1 to 8 characters of the ID of the user whose minidisk you want to verify.
Default:	If USERID is not specified, your own minidisk is verified.
Restrictions:	USERID can be specified only if you are using the CMS version of ICKDSF and have DEVMAINT authority. USERID is ignored in all other system environments. USERID and REALADDR are mutually exclusive. You must use UNITADDRESS with USERID. UNITADDRESS specifies the virtual address of the minidisk.

Detecting hardware problems with DRIVETEST

The drive test ensures that the device hardware can perform basic operations, such as seeks, reads, and writes. It is used with the following IBM DASD that have nonremovable storage media: the 3375, 3380, 3390, 9345, 9391, and 9394. The drive test function is not valid for the 3995-151, 3995-153, 2105, 2107, or 1750.



The drive test is supported if you are running ICKDSF under VM for dedicated devices. Minidisks and LINKed devices are also supported if the user has DEVMAINT authority.

The drive test runs with all system error recovery procedures disabled.

Testing the drive and logical volume with ANALYZE

ANALYZE determines that the drive is fully operational. ANALYZE tests the drive's functional capabilities by performing I/O operations on the CE track. Each I/O operation, called a channel command word (CCW) chain, tests a specific function of the drive and logical volume. Tests are executed in order of increasing complexity.

ANALYZE tests the following drive functions:

- Access arm positioning
- Ability to read and write on the CE cylinder
- Address mark detection
- Switching read/write heads in response to a multitrack command
- Sensing disk's rotational position
- Detecting and skipping over defective areas on a track

If PRESERVE or CONTINUE data exists on the CE cylinder, ANALYZE does not destroy this data. (PRESERVE or CONTINUE data is written on the CE cylinder by an INSPECT, INSTALL, REVAL, or INIT command.) ANALYZE bypasses writing over the data, and reports the presence of the data. Because this feature is part of the drive test, it is supported only where the drive test is supported.

The drive test is optional. It is controlled by the DRIVETEST|NODRIVETEST parameters.

WRITE commands are issued to the CE cylinder only. Wherever the CE cylinder is referred to, this can be either the CE, device support, or diagnostic cylinder depending on the device.

The drive test does not support the IBM 2305, 2105, 2107, or 1750.

Path control under ANALYZE drive test

Warning
If you specify path control when other programs are running on devices that share the same path, contention problems may arise.

The channel path sends signals and data between a processor and storage control to perform I/O requests. The device path is a connection between a storage control and a device. To use path control, specify the channel path or CHPID. When you are running the ANALYZE drive test, you can direct ICKDSF to process the drive test down every channel path; or you can limit processing to specific channel paths. All device paths on the selected channel path are processed.

Path control is provided to assist you in determining if errors are caused by the media or hardware. Use path control for all I/O to a device and to identify the path used when errors occur. If only one path to a device has errors and other paths do not, the media or the drive is probably not at fault. If all paths to a device have errors, the media or the drive is suspect.

Path control is valid only for IBM 3380, 3390, and 9345 devices. It is not performed:

- If path control parameters are not specified
- When you are processing minidisks
- Under the VSE version of ICKDSF

Path control is not supported on Internal Disk devices. Path parameters are ignored if specified.

When path control is specified, ICKDSF prints pathing tables with path information and status. The type and number of tables is dependent on the device type being processed and the operating system environment. See “Pathing reports” on page 109 for examples and information about the pathing tables. Print the pathing reports without executing the drive test by specifying NODRIVE NOSCAN.

The number of unique paths is limited by the number of channel paths accessible to ICKDSF.

ANALYZE path control processing is valid for the drive test only. Any errors that occur before or after this test cannot distinguish path control errors from other errors, and the "I/O Error" message is issued without regard to path.

Verifying data records with ANALYZE

The data verification test reads (without data transfer across the channel to the processor) all data records on the volume or minidisk if you are running ICKDSF under CMS.

The data verification test scans the current data on the volume for data checks. For 9345 and 9394 devices, the data verification test will report any media service information messages (SIMs) that are not closed. For more information on the 9345, see *9340 Customer Guide for Using SIMS*, GC26-4858. For more information about the 9394, see *Using the IBM RAMAC Array Subsystem*, GC26-7005.

Data verification ensures all the data is readable, but does not ensure that the volume is in standard IBM format.

ANALYZE data verification completes successfully, even if one or more of the following is true:

No data exists on the volume.
Data on the volume is written as nonstandard record 0's.
There are no record 0's on the volume.

Before running the ANALYZE data verification test (or any ICKDSF job), the devices must establish thermal stability. See "Devices supported by ICKDSF" on page 6.

Options for the data verification tests include:

- Specifying data verification of the whole volume (minidisk).
- Selecting a range of data to be verified:
  - By cylinders (LIMITS or CYLRANGE)
  - Cylinder,head to cylinder,head (FROMRANGE,TORANGE)
  - All heads within a range of cylinders, for example, cylinder to cylinder (CYLRANGE or LIMITS)
  - All cylinders for certain heads, for example, head 3 for all cylinders (HEADRANGE).
  - A range of heads within a range of cylinders, for example, heads 2 through 4 on cylinders 10 through 20 (CYLRANGE and HEADRANGE). Similarly, if you are running the CMS version of ICKDSF, you can select a range to be verified within a minidisk.
- Performing one I/O per cylinder for CKD devices on the data verification tests (SPEED).
- Performing one I/O per track for CKD devices on the data verification tests (NOSPEED).

  For the 9345 and 9394, SPEED and NOSPEED are ignored. For more information, see "SPEED|NOSPEED parameter: specify data verification tests" on page 99.

Data verification output

ANALYZE will report (in HEX format X'cccc' X'hhhh'):

- For 3380 and 3390 devices, only repeatable and duplicate ECC-correctable data checks
- For other IBM devices, the cylinder and head location of all error correcting code (ECC) correctable data checks
- The cylinder and head location of ECC-uncorrectable data checks
- The CCW, CSW, and sense bytes of the failing I/O

The data verification portion of ANALYZE runs without system error recovery procedures (regardless of the environment you are running in), and with storage control retry inhibited where possible. No data check error records are written to the ERDS.

If the surface defect can be corrected by storage control retry (that is, an error in a count field or a key field), ANALYZE will report the error as uncorrectable.

Subsequent I/O against the data in a standard operating system environment might detect the error as correctable, or might not detect the error at all.

Unexpected I/O errors

If the data verification test encounters an unexpected I/O error:

Error	ANALYZE
Equipment check	Issues a message and stops processing.
Invalid track format	Issues a message and continues.
Environmental data	Ignores the error and continues.

RANGE Parameters: specifying part of a volume

LIMITS, CYLRANGE|HEADRANGE, and FROMRANGE|TORANGE are optional parameters, used to limit the areas of a volume or minidisk that are to be scanned.

CYLRANGE|HEADRANGE–Specifies the starting and ending cylinders and starting and ending heads to be scanned.

FROMRANGE|TORANGE–Specifies the starting track (cylinder and head) and the ending track (cylinder and head) to be scanned.

The following table shows the parameter conditions when specifying part of the volume.

Table 28: Parameter conditions.

Parameter	Interchangeable?	Other Notes
LIMITS	With CYLRANGE	If you do not specify LIMITS or CYLRANGE, the default is ALL if SCAN is specified. If you are running under CMS and do not specify a range, the default is all of the specified minidisk.
CYLRANGE	With LIMITS	If you specify CYLRANGE and do not specify HEADRANGE, all the heads of the specified cylinders are processed. Both the starting and ending values are required for CYLRANGE. If you specify an ending value greater than the maximum for the device, the device (minidisk) maximum is used for the ending value.
HEADRANGE	No	If you specify HEADRANGE and do not specify CYLRANGE, the specified heads for all the cylinders on the volume (minidisk) are processed. Both the starting and ending values are required for HEADRANGE. If you specify an ending value greater than the maximum for the device, the device (minidisk) maximum is used for the ending value.
FROMRANGE	No	If you specify FROMRANGE and do not specify TORANGE, TORANGE is defaulted to the last cylinder of the device (minidisk).
TORANGE	No	If you specify TORANGE and do not specify FROMRANGE, FROMRANGE is defaulted to cylinder 0, track 0 (starting cylinder and track of the minidisk)

Note: CYLRANGE|HEADRANGE and FROMRANGE|TORANGE are mutually exclusive pairs. All parameters are valid only if SCAN is specified.

CMS version minidisk support



When you are using the CMS version of ICKDSF, you can use the ANALYZE command to perform the data verification test for a minidisk.

The following parameters are valid for minidisks:

ALL, CYLRANGE, NODRIVETEST, FROMRANGE, HEADRANGE, LIMITS, SCAN|NOSCAN, SPEED|NOSPEED, TORANGE, and UNITADDRESS

Note: DRIVETEST is valid only when operating under VM with DEVMAINT authority.

The following parameters are valid only when you are using the CMS version of ICKDSF and have DEVMAINT authority (as defined in the CP directory):

Parameter	Description
USERID	With DEVMAINT authority, you can use the USERID parameter to perform the data verification test on another user's minidisk. All of the parameters listed above are valid in this mode.
REALADDR	With DEVMAINT authority, you can use the REALADDRESS parameter to specify the real device address to perform the data verification test on a volume. UNITADDRESS is not valid in this mode. All of the other parameters listed above are valid.
DRIVETEST	With DEVMAINT authority, you can use the DRIVETEST parameter to ensure that the minidisk hardware can perform basic operations, such as seeks, reads, and writes.

For more information, see Chapter 5, “Getting started with the CMS version,” on page 37.

Dual copy volumes

When you process dual copy volumes using the ANALYZE command, specify the DIRECTIO parameter to select the primary or secondary volume. Otherwise, the default is selected depending on the mode of the device.

The ANALYZE command supports dual copy volumes that are in duplex or suspended duplex state.

Examples of the ANALYZE command

The following examples show different ways to use the ANALYZE command.

Any values specified here are examples only and should not necessarily be interpreted as the values for your system. Add your JCL or job control statement (JCS) to complete these examples.

Analyzing volumes with the Stand-Alone version



The following examples show how you can analyze a volume using the Stand-Alone version of ICKDSF.

Performing a drive test

In this example, only the DASD drive tests are performed.

```
ANALYZE UNITADDRESS(0141)
```

Using keyword abbreviations, you could have specified:

```
ANALYZE UNIT(0141)
```

Performing a drive test and data verification test

In this example, the DASD drive tests are performed and are followed by the data verification tests for the entire volume. ALL is the default.

```
ANALYZE UNITADDRESS(0141) SCAN
```

Bypassing the drive test and verifying part of a volume

In this example, the DASD drive tests are bypassed. A partial data verification test, starting at relative cylinder 6 and ending at relative cylinder 9, is performed.

```
ANALYZE UNITADDRESS(0351) LIMITS(6,9) SCAN NODRIVETEST
```

Analyzing a partial volume

In this Stand-Alone version example, the data verification test is performed for all heads starting at cylinder 500 head 14, to the end of the volume.

```
ANALYZE UNITADDRESS(0351) SCAN -
        FROMRANGE(500,14) TORANGE(9999,9999)
```

Analyzing volumes with the CMS version



The following examples show how you can analyze a volume using the CMS version of ICKDSF.

Analyzing another user's minidisk

In this CMS version example, the data verification test is performed for another user's minidisk. You specify the USERID parameter to ANALYZE the minidisk which is owned by user SMITH at the user's virtual address 0351. You must have DEVMAINT authority to specify the USERID parameter.

```
ANALYZE UNIT(0351) SCAN USERID(SMITH) NODRIVETEST
```

Analyzing a volume with a real address

In this CMS version example, the data verification test is performed for a volume at real address 290 by using the REALADDR parameter. You must have DEVMAINT authority to specify the REALADDR parameter.

```
ANALYZE REALADDR(290) SCAN NODRIVETEST
```

Analyzing volumes with the MVS version



The following examples show how you can analyze a volume using the MVS version of ICKDSF.

Analyzing the primary volume of a dual copy pair

In this example, the ANALYZE drive test is run on the primary volume of a dual copy pair with a primary address of 141. Note that the device must be in duplex or suspended duplex state.

```
ANALYZE UNITADDRESS(0141) DRIVETEST NOSCAN DIRECTIO(PRIMARY)
```

Analyzing the secondary volume of a dual copy pair

In this example, the ANALYZE drive test is run against the secondary volume of a dual copy pair with a primary address of 141.

```
ANALYZE UNIT(0141) DRIVE DIO(SEC)
```

In the MVS version, the data definition (DD) card should point to the primary volume of a dual copy pair. Note that the device must be in duplex or suspended duplex state.

Analyzing a volume with the VSE version



In this example, drive tests are performed on volume SYS001. Specification of the NOSCAN parameter indicates that data verification tests are not to be performed.

```
// JOB   jobname
// ASSGN SYS001,150
// EXEC  ICKDSF,SIZE=AUTO
   ANALYZE SYSNAME(SYS001) NOSCAN
/*
/&
```

Examples of path control under the ANALYZE drive test

Table 29 on page 106 and Table 30 on page 106 shows examples of ANALYZE drive test run with a variety of path controls.

Table 29: Path controls when running ANALYZE drive test

ANALYZE drive test runs...	**Command Entered**
System will select the first available CHPID	`ANALYZE UNIT(0141) DRIVE NOSCAN`

Table 30 on page 106 shows examples of ANALYZE drive test run with a variety of path controls.

Table 30: Path controls when running ANALYZE drive test

ANALYZE drive test runs on all device paths accessible through...	**Command Entered**
All CHPIDs in an MVS, CMS, or Stand-Alone environment.	`ANALYZE UNIT(0141) DRIVE NOSCAN ALLCHPID`

Table 30: Path controls when running ANALYZE drive test (continued)

ANALYZE drive test runs on all device paths accessible through...	Command Entered
CHPID 0E in an MVS, CMS, or Stand-Alone environment.	`ANALYZE UNIT(0141) DRIVE NOSCAN CHPID(0E)`

Diagnostic messages

ANALYZE prints diagnostic messages to the output device. You or your customer engineer can use them as an aid in determining if and what type of problem might exist on the volume.

The informational and diagnostic messages are listed and described in Appendix A, “Device Support Facilities messages (ICK),” on page 419.

In addition, ANALYZE produces a movable head and fixed-head error table that summarizes errors associated with the read/write circuitry and data verification. Figure 27 on page 108 and Figure 28 on page 109 are examples of these respective tables.

Note: The fixed-head error table may print even if the drive under test does not include the fixed-head feature. In that case, map the fixed-head numbers to the physical movable cylinder and head.

Drive test error summary

When you run the drive test for the IBM 3380 and 3390, a drive test error summary prints if any errors are detected during the read or write test on the CE cylinder.

The CE cylinder is device dependent, and can be the CE, device support, or diagnostic cylinder. (For the IBM 9345, the subsystem manages these functions.)

Figure 26 on page 107 is an example of the drive test error summary.

```
DRIVE TEST ERROR SUMMARY
|  HEAD  | WRTCE | RDCE  |
|--0000--|-------|-------|
|--0001--|-------|-------|
|--0002--|-------|-------|
|--0003--|-------|-------|
|--0004--|-------|-------|
|--0005--|-------|-------|
|--0006--|-------|-------|
|--0007--|---X---|-------|
|--0008--|-------|-------|
|--0009--|-------|-------|
|--000A--|-------|-------|
|--000B--|-------|-------|
|--000C--|-------|-------|
|--000D--|-------|-------|
|--000E--|-------|-------|
```

Figure 26: Drive test error summary for the IBM 3380 and 3390

X indicates that at least one error has occurred on the indicated head during the write tests (WRTCE column) or the read tests (RDCE column) to the CE cylinder (part of the drive test).

Movable head error table

Figure 27 on page 108 is an example of the movable head error table.

Figure 27: Movable head error table—CKD

```
                      MOVABLE HEAD ERROR TABLE
                       SEEK VERIFY                DATA CHK   DATA COMP  ERROR
HEAD NUMBER   DATA CHK      CHECK      WRITE CHK    CE CYL      ERROR    CODE
    00 -----|---TUC----|-------------|-----------|----------|-----------|------|
    01 -----|----------|-------------|-----------|----------|-----------|------|
    02 -----|----------|-------------|-----------|----------|-----------|------|
    03 -----|----U-----|-------------|-----------|----------|-----------|--B---|
    04 -----|----------|-------------|-----------|----------|-----------|--B---|
    05 -----|---T-C----|-------------|-----------|----------|-----------|------|
    06 -----|----------|-------------|-----------|----------|-----------|--B---|
    07 -----|-----C----|-------------|-----------|----------|-----------|------|
    08 -----|------UR--|-------------|-----------|----------|-----------|------|
    09 -----|---TU-----|-------------|-----------|----------|-----------|------|
    11 -----|----------|-------------|-----------|----------|-----------|------|
    12 -----|----------|-------------|-----------|----------|-----------|------|
    13 -----|---T------|-------------|-----------|----------|-----------|------|
    14 -----|----------|-------------|-----------|----------|-----------|------|
    15 -----|----------|-------------|-----------|----------|-----------|------|
    16 -----|----------|-------------|-----------|----------|-----------|------|
    17 -----|----------|-------------|-----------|----------|-----------|------|
    18 -----|----------|-------------|-----------|----------|-----------|------|
    19 -----|----------|-------------|-----------|----------|-----------|------|
    20 -----|----------|-------------|-----------|----------|-----------|------|
    21 -----|----------|-------------|-----------|----------|-----------|------|
    22 -----|----------|-------------|-----------|----------|-----------|------|
    23 -----|----------|-------------|-----------|----------|-----------|------|
    24 -----|----------|-------------|-----------|----------|-----------|------|
    25 -----|----------|-------------|-----------|----------|-----------|------|
    26 -----|----------|-------------|-----------|----------|-----------|------|
    27 -----|----------|-------------|-----------|----------|-----------|------|
    28 -----|-----C----|------X------|-----X-----|----X-----|-----X-----|------|
    29 -----|----U-----|------X------|-----X-----|----X-----|-----X-----|------|
```

In the data check column:

Symbol	Indicates...
T	Which heads exceeded the data check threshold error rate.
U	At least one ECC-uncorrectable or unrecoverable error occurred on this head.
C	At least one ECC-correctable error occurred on this head.
X	At least one error, as indicated by the column heading, has occurred on this head.
R	At least one recoverable error occurred on this head.
B	Indicates 0F0B error. A defective track was found without a valid alternate track pointer.

For the actual number of errors that occurred for a specific head, examine previous messages provided in the ANALYZE output.

Fixed-head error table

Figure 28 on page 109 is an example of the fixed-head error table.

```
                        FIXED-HEAD ERROR TABLE
                      SEEK VERIFY                          SEEK VERIFY
HEAD NUMBER  DATA CHECK    CHECK     HEAD NUMBER  DATA CHECK    CHECK
   00 -----|-----U-----|-----X-----|    30 -----|-----U-----|-----X-----|
   01 -----|------C----|-----X-----|    31 -----|------C----|-----X-----|
   02 -----|-----------|-----------|    32 -----|-----------|-----------|
   03 -----|-----------|-----------|    33 -----|-----------|-----------|
   04 -----|-----------|-----------|    34 -----|-----------|-----------|
   05 -----|-----------|-----------|    35 -----|-----------|-----------|
    .                                    .
    .                                    .
    .                                    .
   28 -----|-----------|-----------|    58 -----|-----------|-----------|
   29 -----|-----------|-----------|    59 -----|-----------|-----------|
```

Figure 28: Fixed-head error table

In the data check column:

Symbol	Indicates...
U	An ECC-uncorrectable error occurred on this head.
C	An ECC-correctable error occurred on this head.
X	At least one error, as indicated by the column heading, has occurred on this head.

Note: The fixed-head error table may be printed, although the drive under test does not include the fixed-head feature. The table then applies to movable heads 00 through 29.

Pathing reports

When path control is specified, ICKDSF prints pathing tables with path information and status. The type and number of tables is dependent on the device type being processed and the operating system environment.

Path status table

The path status table prints when you run the drive test for the IBM 3380, 3390, 9345, or 9391, with path control parameters. It also prints if you specify NODRIVE NOSCAN for the IBM 3380, 3390, 9345, 9391, 2105, 2107. or 1750. The path status table is not printed in the VSE environment. Table 31 on page 109 is an example of a path status table for the 3380 and 3390.

Table 31: Path status table for the IBM 3380 and 3390.

	Path Status							
CHPID	09	0D	0E	0F	–	–	–	–
AVAILABLE	YES	YES	YES	YES	–	–	–	–
ONLINE	YES	NO	YES	YES	–	–	–	–
STORAGE DIRECTOR	BC	BC	BD	BD	–	–	–	–
SUBSYSTEM ID	0060	0060	0060	0060	–	–	–	–
DLSE	YES	YES	YES	YES	–	–	–	–
CLUSTER	1	0	1	0	–	–	–	–
STORAGE PATH 0	A	AD	ADFC	A	–	–	–	–
STORAGE PATH 1	A	A F	A	A	–	–	–	–

Table 31: Path status table for the IBM 3380 and 3390. (continued)

Path Status
Legend: **–** Not applicable **A** Attached storage path **D** Disabled storage path **F** Device fenced from storage path **C** Channel fenced from storage path

Table 32 on page 110 is an example of a path status table for the 9345.

Table 32: Path status table for the IBM 9345.

	Path Status							
CHPID	–	–	3D	3E	–	–	–	–
AVAILABLE	–	–	YES	NO	–	–	–	–
ONLINE	–	–	YES	–	–	–	–	–
SUBSYSTEM ID	–	–	00AA	–	–	–	–	–

In Table 31 on page 109 and Table 32 on page 110, paths are displayed in the sequence the system returns path information. Depending on your system environment and storage control, certain lines in the table do not print. For example:

Item	Prints only if you are using...
CHPID	MVS, CMS or Stand-Alone
ONLINE	MVS
STORAGE DIRECTOR	IBM 3880 storage control
SUBSYSTEM ID	IBM 3990 storage control or 9340 subsystem, 2105, 2107, or 1750
DLSE	IBM 3990 storage control, 2105, 2107, or 1750
CLUSTER	IBM 3990 storage control, 2105, 2107, or 1750
STORAGE PATH 0	IBM 3990 storage control, 2105, 2107, or 1750
STORAGE PATH 1	IBM 3990 storage control, 2105, 2107, or 1750

In addition, DLSE, CLUSTER, STORAGE PATH 0, and STORAGE PATH 1 do not print if you are using an IBM 9345.

When you are using dual copy volumes:

- The path status table reflects only the path status for the volume being processed (primary or secondary). The table header indicates whether the primary or secondary volume is being processed.
- When you are processing a secondary volume, the line indicating online status is not printed.

Logical path status table

When you specify the NODRIVE NOSCAN parameters, ICKDSF will print the Logical Path Status Table if it is supported for the subsystem you are processing.

Table 33 on page 111 is an example of a logical path status table.

Table 33: Logical path status table.

LOGICAL PATH		SYSTEM ADAPTER ID	HOST LINK ADDRESS	SP FENCES 0 1 2 3	PATH GROUP ID			
NUMBER	TYPE				ID	SERIAL	CPU TYPE	CPU TIME STAMP
35	E	05	C500		xxxx	xxxxxx	2064	B7B1B137

Legend:

LOGICAL PATH
Storage Control Unit identification of its logical path resource.

NUMBER
A decimal number, specifying the sequence number of the logical path.

TYPE
One of the following values:

N/A = Logical Path not available
N/E = Logical Path not established
E = Logical Path is on an ESCON channel path
C = Logical Path is on an OEMI channel path
P = Logical Path is a parallel path
R = Logical Path is Peer to Peer Control Unit Path
E/L = ESCON-Established to another logical subsystem
E/A = ESCON-Peer-to-Peer Remote Copy-Control Unit mode
E/B = ESCON-Peer-to-Peer Remote Copy-Channel mode
F/N = FICON™-Not established
F/E = FICON-Established
F/L = FICON-Established to another local subsystem

SYSTEM ADAPTER ID
When the Logical Path type is E, C, P, R, E/L, F, or F/L, this field contains a single value identifying the physical system adapter on which the path was established. When the type is N/E or F/N, the field contains two values identifying the lowest and highest numbered system adapter on which the logical path might be established.

HOST LINK ADDRESS
When Logical Path type is E or E/L , the high order two characters contain a value in the range 00 through FF, identifying the ESCON link ID to which the using processor is attached. The low order two characters contain a value identifying the logical partition ID if the processor is operating in PR/SM™ mode.

When Logical Path type is F/E or F/L, the high order 6 characters contain a 3 byte FICON link address. The low order two characters contain a value identifying the logical partition ID if the processor is operating in PR/SM mode.

When Logical Path type is not E, E/L, F/E, or F/L, this field is blank.

SP FENCES
A value of Y indicates that the Logical Path is Fenced from, and therefore cannot be addressed by, the identified Storage Path. The 2105, 2107, and 1750 will print FENCED in the table and have Y if it is fenced.

PATH GROUP ID
When the path group is other than E/A, and path group information is available, then the host path group identification consists of:

CPU Serial No.
As received by way of a SPID command

CPU Type
As received by way of a SPID command

CPU Time Stamp
As received by way of a SPID command

When the logical path type is E/A, the ID field contains the 1 byte LSS number followed by the 2 byte SSID. The SERIAL field contains the subsystem serial number. The CPU type field will be blank, and the CPU Time Stamp field contains the last 3 bytes of the returned path group id information.

Interface information

When you specify the NODRIVE NOSCAN parameters on a 2105, 2107, or 1750, ICKDSF prints the Interface Information table. This information can be used to assist in determining the link address information for establishing PPRCOPY paths. The table indicates the type (such as ESCON or FICON), the system adapter ID's, and the corresponding port link address when connected to a switch. (The port link address is the destination address portion of the PPRCOPY link address.)

Note: A type of F will be indicated if the path is FICON, and a 3 byte FICON port link address will be printed. The legend will indicate F = FICON. The port link information in the table refers to the connection between the control unit and the switch. If the port information is not available or if it is not installed, the field will print N/A.

The following is an example of an Interface Information table:

Table 34: Interface information.

	SYSTEM	HOST
TYPE	**ADAPTER ID**	**LINK ADDRESS**
F	04	010A08
E	80	96

N/A = Not Available or Not Assigned
Interface Type:
E = ESCON
F = FICON

Host interface information

When you specify the NODRIVE NOSCAN parameters on a 2105, 2107, or 1750, ICKDSF prints the Host Interface Information table. The Host Interface Information table is not printed in the VSE environment.

When the table shows a value in the CHPID column with all other fields containing “-”, the CHPID may be defined but unavailable. You can reference the Path Status table printed at the beginning of the pathing reports to help determine if this is the case.

The following is an example of the Host Interface Information table.

Table 35: Host interface information.

TYPE	CHPID	HOST LINK ADDRESS	SYSTEM ADAPTER ID
E	D0	DB00	80
-	2C	-	-
F	F4	20010000	04
-	2D	-	-

Legend: for Table 35 on page 113:

-
Not Applicable

E (for Type)
ESCON

F (for Type)
FICON

Note: When a device/control unit is attached through 'FICON bridge', or in a mixed environment where some paths are attached through 'FICON bridge', paths attached through 'FICON bridge' will show as ESCON. The information printed is based on information returned by the control unit, and they will show as ESCON because it appears to the control unit as if it is connected through ESCON.

Fiber channel connection information

The fiber channel connection information table prints when you run ANALYZE NODRIVE NOSCAN and have specified the SECWWNN parameter. The table is printed only for 2105, 2107, and 1750 devices at the appropriate level of microcode.

The information indicates potential connectivity of the Fibre Channel ports in the ESS to each system adapter port in the ESS.

A parameter is added to the ANALYZE command to allow the user to specify the World Wide Node Name (WWNN) of the volume that they want to use as a secondary PPRCOPY volume connected by way of FCP paths. When PPRCOPY FCP support exists, the ANALYZE pathing reports will include the Fibre Channel Connection Information Table. This information indicates the potential connectivity of the Fibre Channel ports in the ESS where the I/O is issued, to each system adapter port in the ESS specified by the secondary WWNN.

Example

The information shown below is for example purposes only, the actual values would reflect the real devices used and values returned. The example is intended to show the format of the table and what the information represents.

In this example, the user would run

```
ANALYZE UNIT(DA01) NODRIVE NOSCAN SECWWNN(5005076300C0A222)
```

If the FCP support exists, the following table would be printed, showing that the addressed device DA01 with WWNN=5005076300C0A234 can potentially connect to the device with WWNN=5005076300C0A222 from:

```
PRI SAID 0000 TO THE SECONDARY TAGS 0000 THRU 000F
PRI SAID 0001 TO THE SECONDARY TAGS 0004, 0005, 0006
```

```
PRI SAID 0002 TO THE SECONDARY TAGS 000D, 000E, 000F
PRI SAID 0003 TO THE SECONDARY TAGS 0000 THRU 0002, 000E, 000F


FIBRE CHANNEL CONNECTION INFORMATION TABLE
PRIMARY WWNN = 5005076300C0A234, SECONDARY WWNN =5005076300C0A222
+------+-------------------------------------------------------------------+
| PRIM |                                                                   |
| SAID |                AVAILABLE SECONDARY SAIDS                          |
+------+-------------------------------------------------------------------+
| 0000 | 0000(0000) 0001(0000) 0002(0007) 0003(0002) 0004(0000) 0005(0001) |
|      | 0006(0006) 0007(0000) 0008(0001) 0009(0001) 000A(0001) 000B(0000) |
|      | 000C(0001) 000D(0000) 000E(0000) 000F(0001)                       |
+------+-------------------------------------------------------------------+
| 0001 | 0004(0000) 0005(0001) 0006(0006)                                  |
+------+-------------------------------------------------------------------+
| 0002 | 000D(0000) 000E(0000) 000F(0001)                                  |
+------+-------------------------------------------------------------------+
| 0003 | 0000(0000) 0001(0000) 0002(0007) 000E(0000) 000F(0001)            |
+------+-------------------------------------------------------------------+
       WHERE THE NUMBER IN PARENTHESIS IS THE RETURN CODE FOR THE SAID, AS FOLLOWS
         0000=POTENTIAL CONNECTION
         0001=NO POTENTIAL CONNECTION
         0002=PRIMARY ADAPTER OFFLINE
         0003=LINK FAILURE
         0004=INVALID TOPOLOGY
         0005=ERRORS DETECTED
         0006=SECONDARY WWNN INVALID
         0007=TIMEOUT DETECTED
```

Host access information

The host access information table indicates which systems have connectivity to the device you specified. The information prints when you run ANALYZE NODRIVE NOSCAN and have specified the HOSTACCESS parameter. The table is printed only for devices at the appropriate level of microcode.

Example

The user runs ANALYZE UNIT(DA01) NODRIVE NOSCAN HOSTACCESS(ALL). The resulting host access information table is as follows:

```
                    HOST ACCESS INFORMATION LSS=03 CCA=18
+----------------------------+----+--------+--------+------+--------+---------+
|       PATH GROUP ID        |    |        |        |      |        | MAXIMUM |
|------+------+----+--------+    |        |        |      | DEVICE |NUMBER OF|
|      |      |CPU |CPU TIME|PATH|SYSPLEX | SYSTEM |      |RESERVED|CYLINDERS|
|  ID  |SERIAL|TYPE|  STAMP |MODE|  NAME  |  NAME  |ONLINE|  TIME  |SUPPORTED|
+------+------+----+--------+----+--------+--------+------+--------+---------+
|880005|E2B7  |3906|D304C155|M   |N/A     |N/A     |YES   | ------ |FFFFC15  |
+------+------+----+--------+----+--------+--------+------+--------+---------+
|80000A|E2B7  |3906|D30A5C92|S   |PLEXM1  |MES3    |YES   | ------ |120936   |
+------+------+----+--------+----+--------+--------+------+--------+---------+
|800004|E2B7  |3906|D3067C6D|S   |PLEXFVT3|MES6    |NO    | ------ |120936   |
+------+------+----+--------+----+--------+--------+------+--------+---------+
|800009|E2B7  |3906|D30A570F|M   |PLEXM1  |MES2    +YES   | ------ |120936   |
+------+------+----+--------+----+--------+--------+------+--------+---------+
PATH MODE :
     S = SINGLE PATH
     M = MULTI PATH
SYSPLEX NAME :
     N/A = NOT AVAILABLE
SYSTEM NAME :
     N/A = NOT AVAILABLE
```

Chapter 12. BUILDIX command—CKD



The BUILDIX command builds a VTOC index using the MVS version of ICKDSF. Use BUILDIX to:

- Change direct access volumes from an OS format VTOC (OSVTOC) to an indexed format VTOC (IXVTOC).
- Build a VTOC index data set and format the VTOC to show that the volume is in IXVTOC format.
- Change a volume in IXVTOC format to OSVTOC format.

To build an index data set on a volume, the BUILDIX command requires that the host system contain indexed VTOC programming support. Without this support, BUILDIX will not run.

For more information about indexed format VTOCs, see Appendix C, “VTOC index,” on page 655.

Volumes containing split cylinder extents are not supported by the BUILDIX command.

BUILDIX supports dual copy volumes that are in duplex or suspended duplex state.

For information on ICKDSF support of the RAMAC family of devices, see “ICKDSF support of the RAMAC Array family” on page 8.

Protecting the BUILDIX command with RACF

The MVS version of ICKDSF checks the general resource profile for a facility class profile of STGADMIN.ICK.BUILDIX. If RACF is not installed or the facility STGADMIN.ICK.BUILDIX is not created, the BUILDIX command executes with no authorization check. For additional information, see “Protecting ICKDSF commands with RACF” on page 34.

Syntax

BUILDIX
Required Parameters: DDNAME(*dname*) IXVTOC|OSVTOC
Optional Parameters: PURGE|**NOPURGE**

Required parameters

DDNAME parameter: identify the volume

Parameter/ Abbreviations	**Description**
DDNAME(*dname*) **DNAME**	Must be specified to identify the volume where the VTOC is to be changed. Required for an online MVS volume. For *dname*, specify the MVS JCL DD statement that identifies the device.
Default:	None.
Restrictions:	The MVS volume must be online.

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IXVTOC|OSVTOC parameter: identify the BUILDIX function

Parameter/ Abbreviations	Description
IXVTOC **IX**	Causes an OSVTOC to be changed to the indexed format.
OSVTOC **OS**	Causes an indexed VTOC to be changed to an OSVTOC.
Default:	None.
Restrictions:	You must specify IXVTOC or OSVTOC for BUILDIX to run. IXVTOC can be specified only if indexed VTOC programming support is part of the host system. If this support is not available, BUILDIX will not run.

Optional parameters

PURGE|NOPURGE parameter: specify disposition of the index data set

Parameter/ Abbreviations	Description
PURGE **PRG**	Deletes the index data set when changing an indexed VTOC to an OSVTOC.
NOPURGE **NOPRG**	Leaves the index on the volume.
Default:	NOPURGE
Restrictions:	PURGE|NOPURGE is valid only when changing from an indexed VTOC to an OSVTOC. If specified with the parameter IXVTOC, the option is ignored.

Processing in a Shared Environment

When you invoke BUILDIX with the IXVTOC parameter for a volume that is shared by other systems additional serialization is needed. This additional serialization increases processing time by up to seven seconds per volume. Because of the additional serialization, you can run the BUILDIX command any time without taking the volume offline to the other systems that share it.

If the volume is not shared by other systems, or you have varied the volume offline to all other systems, then the serialization is not needed and can be bypassed by using the JCL parameter PARM=NOSYSZ on your EXEC statement. For example:

```
//stepname EXEC PGM=ICKDSF,PARM=NOSYSZ
```

Converting an OSVTOC to an indexed VTOC

Before you invoke BUILDIX to change an indexed VTOC, you must preallocate the index data set in a separate job or job step, or you must provide a DD card describing the index data set in the same job step so the scheduler allocates the index before the command runs.

Be sure that the name of the index data set begins with "SYS1.VTOCIX." and that each index data set in your installation has a unique third-level qualifier. The recommended convention is SYS1.VTOCIX.volser. This prevents ENQ lockouts on all other volumes needing IXVTOC services.

If the first character of the volser is numeric, use another convention. The convention used for the INDEX parameter of the INIT command is to replace the first character of the volser with the letter V; the last five characters of all volsers starting with a numeric character must be unique. The name SYS1.VTOCIX. is a reserved name in systems supporting the indexed VTOC, and only one data set per volume can begin with this prefix.

Space for the index must be reserved in one continuous extent. Allocate the index by absolute track or specify the CONTIG subparameter for all other requests. The amount of space to reserve for the index is device-dependent, as well as dependent upon the size (in tracks) of the VTOC. A reference table to aid in determining how much space to reserve for the index is found in Appendix C, “VTOC index,” on page 655.

When you convert the VTOC to OSVTOC or IXVTOC, BUILDIX performs a dummy allocation. The data set name used for the dummy allocation is SYS1.VTOCIX.Vxxxxx (see the INDEX parameter of the INIT command for the conventions followed for this data set name).

Converting an indexed VTOC to an OSVTOC

You can change an indexed VTOC to an OSVTOC.

You can leave the index allocated (NOPURGE) or delete it (PURGE). If you change the OSVTOC back to the IXVTOC format, NOPURGE allows for no calculation as to size and optimum location. If you temporarily move an IXVTOC volume to a location that does not have programming support for the indexed VTOC, NOPURGE allows you to easily return it to a location having such support.

Before you move IXVTOC volumes to nonindexed VTOC systems, run BUILDIX with the OSVTOC parameter to format them. Upon return of a volume, use BUILDIX to rebuild the index.

Be careful when temporarily moving IXVTOC volumes to nonindexed VTOC systems. If you do not change the volumes to OSVTOC format before moving them, serious errors can occur when the volumes are returned to the indexed VTOC system. Direct access device space management (DADSM) functions performed by the nonindexed VTOC system on the VTOC do not always force reconstruction of the VTOC to OSVTOC format. VTOC changes that do not reconstruct the VTOC are not recorded in the index and, in effect, invalidate the index.

Examples of the BUILDIX command

The following examples show how you can code BUILDIX in a variety of situations. They show the JCL statements you need to use when entering BUILDIX.

The data definition statement varies according to the function.

Changing an IXVTOC to an OSVTOC without operator's intervention

In this example, a 3390 volume with the volume identification VL3390 is changed to OSVTOC format. The DD statement simply identifies the volume.

```
//jobname   JOB
//stepname  EXEC PGM=ICKDSF,PARM='NOREPLYU'
//SYSPRINT  DD SYSOUT=A
//DDCARD    DD UNIT=(3390,,DEFER),VOL=(PRIVATE,SER=VL3390),
//          DISP=OLD
//SYSIN     DD *
 BUILDIX  DDNAME(DDCARD)  OS  NOPURGE
/*
```

- PARM='NOREPLYU' indicates that no operator intervention is required for this command. ICKDSF will not issue message ICK508A prompting for the reply.
- UNIT=(3390,,DEFER) specifies that mounting of the volume on the 3390 device type is to be deferred.
- VOL=(PRIVATE,SER=VL3390) identifies the volume and specifies a private mounting to prevent use of the volume for temporary data sets. The volume must have been mounted as PRIVATE.

- DISP=OLD specifies that allocation routines check the mount status of VL3390 and issue appropriate messages to the operator.
- NOPURGE in the BUILDIX command statement indicates that the index is to be left allocated. If you did not use NOPURGE, the command statement would have the same effect, since NOPURGE is the default. PURGE, as shown in the following command statement, deletes the index.

```
BUILDIX  DDNAME(DDCARD)  OSVTOC PURGE
```

Note: Whether the index is purged or left allocated is controlled by command parameters. Disposition of the index data set must not be specified in the DD statement.

Building a VTOC index on a volume without an index allocated

This option requires additional parameters on the DD statement to cause allocation of the index. The statement must contain data set information for the index.

```
//jobname   JOB
//stepname  EXEC PGM=ICKDSF
//SYSPRINT  DD SYSOUT=A
//VOLDD     DD UNIT=(3390,,DEFER),VOL=(PRIVATE,SER=339003),
//          DSN=SYS1.VTOCIX.V39003,DISP=(NEW,KEEP),
//          SPACE=(TRK,10,,CONTIG)
//SYSIN     DD *
 BUILDIX  DDNAME(VOLDD)  IXVTOC
/*
```

- DSN=SYS1.VTOCIX.V39003 specifies the name of the index data set. Because the INDEX parameter of INIT replaces the first character of the volume serial number with the letter V, the third-level qualifier appears as V39003. The recommended convention for naming the index is using the letter V as the first character, for example VL3390. For more information, see “Converting an OSVTOC to an indexed VTOC” on page 116.
- DISP=(NEW,KEEP) directs the system allocation routines to allocate the data set before running ICKDSF commands and to retain it upon termination of the task.
- SPACE=(TRK,10,,CONTIG) when location is not a primary concern, reserves ten contiguous tracks at some location. If you are processing system-managed volumes, you cannot specify ABSTR on the SPACE parameter.
- SPACE=(ABSTR,(10,1)) directs the allocation routines to allocate a ten track index starting at track 1. ABSTR is specified in the space request to ensure that the index space is a single continuous extent and is in the location desired.

Building a VTOC index on a volume with an index allocated

In this example, volume VL3390 was changed to an OSVTOC, either by the user or by a system routine that disabled the index and changed the VTOC to OSVTOC format. The index data set was left allocated on the volume. The DD statement required to change again to an IXVTOC is shown.

```
//jobname   JOB
//stepname  EXEC PGM=ICKDSF
//SYSPRINT  DD SYSOUT=A
//VOLDD     DD UNIT=(3390,,DEFER),VOL=(PRIVATE,SER=VL3390),
//          DSN=SYS1.VTOCIX.VL3390,DISP=OLD
//SYSIN     DD *
 BUILDIX  DDNAME(VOLDD)  IX
/*
```

Note: DISP=OLD specifies that the data set already exists.

Chapter 13. CONTROL command—CKD



You can use the CONTROL command to reset certain subsystem conditions that have been previously set. Use CONTROL after the condition has been repaired to reset them. For example, use CONTROL to:

- Reset a device that has been WRITE INHIBITed
- Reset an indefinite status condition
- Clear a fence status of a path or a device

The CONTROL command supports dual copy volumes that are in duplex or suspended duplex state. It can also be used to display some subsystem and device specific information such as serial numbers and the number of primary cylinders.



When you run the CMS version of ICKDSF, the CONTROL command is valid only with dedicated devices. For more information, see Chapter 5, “Getting started with the CMS version,” on page 37.

For information on ICKDSF support of the RAMAC family of devices, see “ICKDSF support of the RAMAC Array family” on page 8.

For information on ICKDSF support of the Internal Disk devices, see “ICKDSF support of the Internal Disk” on page 9.

Protecting the CONTROL command with RACF

The MVS version of ICKDSF checks the general resource profile for a facility class profile of STGADMIN.ICK.CONTROL. If RACF is not installed or the facility STGADMIN.ICK.CONTROL is not created, the CONTROL command executes with no authorization check. For additional information, see “Protecting ICKDSF commands with RACF” on page 34.

Syntax

CONTROL
Required Parameters: DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*)
Optional Parameters: ALLOWWRITE CLEARFENCE CONFIGURE(DISPLAY) RESETICD SCOPE(DEV|LSS) SERIAL(*serial-number*) **SOFT**|SPID|ALL SUBCHSET(*subchset-identifier*)

Required parameters

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DDNAME|SYSNAME|UNITADDRESS parameter: identify the volume

Parameter/ Abbreviations	Description
DDNAME(dname) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL DD statement that identifies the volume.
SYSNAME(sysxxx)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and an attached CMS volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address in hexadecimal (3 or 4 digits) of the channel and unit for the volume. For the CMS version, specify the virtual address of the dedicated volume. The unit address is the device number.
Default:	None.
Restrictions:	None.

Optional parameters

ALLOWWRITE parameter: clear a storage control

Parameter/ Abbreviations	Description
ALLOWWRITE **ALLOWWR**	Must be specified if you want to clear a storage control that has been WRITE INHIBITed.
Default: 	If you are running the MVS, CMS, or Stand-Alone version, ALLOWWRITE is the default. If you want to execute ALLOWWRITE and CLEARFENCE, both parameters must be specified.
Restrictions: 	Not valid for the VSE version. Valid only for DASD devices attached to an IBM 3880 or IBM 3990 Storage Control.

CLEARFENCE parameter: clear a fence status

Parameter/ Abbreviations	Description
CLEARFENCE **CLEARF** **CLRF**	Clears a fence status of a path or a device.
Default: 	If you are running the VSE version, CLEARFENCE is the default.
Restrictions:	If you want to run ALLOWWRITE and CLEARFENCE, you must specify both parameters. Valid only for DASD devices attached to an IBM 3990 Storage Control.

CONFIGURE(DISPLAY) parameter: display subsystem information

Parameter/ Abbreviations	Description
CONFIGURE(DISPLAY)	Use to display subsystem information, such as subsystem serial numbers, subsystem ID, channel connection address, machine type, and plant of manufacture which may be used with the PPRCOPY command. Also used to display microcode lic and bundle level if available.
Default:	None.
Restrictions:	CONFIGURE(DISPLAY) is not valid for RVA. If the microcode lic level is available but the bundle level is not, just the microcode lic level is displayed.

Note: The information displayed will vary depending on the device type.

RESETICD parameter: reset indefinite status condition

Parameter/ Abbreviations	Description
RESETICD	Use to reset a device indefinite status condition. Use when the status track of a device attached to an IBM 3990 Model 3 or Model 6 are unreadable, and the device is flagged as "status cannot be determined".
Default:	None.
Restrictions:	Valid only for devices attached to an IBM 3990 Model 3 or 6. RESETICD is not valid on a 2105, 2107, or 1750 device.

SCOPE parameter: clear the fenced state for a single device or all of the devices in a logical subsystem

Parameter/ Abbreviations	Description
SCOPE(*scope*)	Clears the fenced state (soft, SPID or both) for a single device or all of the devices in a logical subsystem. *scope* is DEV or LSS. DEV clears the fenced state for a single device identified by the UNITADDRESS parameter in the storage facility image (SFI) identified by the SERIAL parameter. LSS clears the fenced state for all of the devices in the logical subsystem containing the device identified by the UNITADDRESS parameter in the SFI identified by the SERIAL parameter. **Note:** When used with the SCOPE parameter, the UNITADDRESS parameter is allowed for online volumes.
Default:	None.
Restrictions:	The SCOPE parameter requires the CLEARFENCE, SERIAL and UNITADDRESS parameters.

SERIAL parameter: specify the subsystem image serial number

Parameter/ Abbreviations	Description
SERIAL(*serial*)	Specifies the serial number of the subsystem image. *serial* is the last 5 digits of the 12-digit subsystem image serial number. To obtain the subsystem image serial number, use the CONTROL CONFIGURE(DISPLAY) command.
Default:	None.
Restrictions:	The SERIAL parameter requires the CLEARFENCE and SCOPE parameters.

SOFT|SPID|ALL parameters: specify the fenced state to be cleared

Parameter/ Abbreviations	Description
SOFT	Clears the soft fenced state for a single device or all of the devices in a logical subsystem.
SPID	Clears the SPID fenced state for a single device or all of the devices in a logical subsystem.
ALL	Clears both the soft and SPID fenced state for a single device or all of the devices in a logical subsystem.
Default:	SOFT.
Restrictions:	The SOFT, SPID and ALL parameters require that the CLEARFENCE, SCOPE, and SERIAL parameters are also specified.

SUBCHSET parameter: specify the subchannel set identifier



Parameter/ Abbreviations	Description
SUBCHSET(*subchset-identifier*)	Specifies the subchannel set identifier for the volume you want to issue the CONTROL command to. For *subchset-identifier* substitute a decimal subchannel set identifier that is valid for the level of z/OS on which you are issuing the command.
Default:	None.
Restrictions:	The SUBCHSET parameter requires that the UNIT parameter is also specified. It is valid only with z/OS V1R10 and higher.

Clearing a storage control without performing an IML

The CONTROL command with the ALLOWWRITE parameter is valid for MVS, CMS (dedicated devices only), and Stand-Alone users only. This command and parameter combination allows subsequent writes to the devices controlled by an IBM 3880 or IBM 3990 Storage Control if the storage control has been WRITE INHIBITed by the error recovery procedures at the channel, director, or storage control level.

After WRITE INHIBIT, subsequent write operations to any device attached to the WRITE INHIBITed storage control will fail. CONTROL ALLOWWRITE clears all storage controls to which a specified device is attached for subsequent write operations. CONTROL ALLOWWRITE lets you clear a storage control that has been WRITE INHIBITed without having to perform an IML.

Allowing write operations through a storage control



In an MVS environment, the system error recovery procedures (ERPs) might detect an error condition in the storage control. Future write operations to some or all of the devices through the storage control might then fail.

If the ERPs detect such a condition, they can write-inhibit the storage control (at different levels), thereby inhibiting any further write operations to the devices through the failing storage control. If an alternate path exists through a different storage control, the devices can remain online and functional.

Maintenance is required on the failing storage control.

After you repair the failing storage control, use CONTROL to write-allow the storage control. Write operations through that storage control will be restored.

Because CONTROL operates on a device basis, if more than one storage control (that is, path) to a device is failing, all such storage controls must be repaired before executing the CONTROL command.



When running Stand-Alone ICKDSF, all storage controls attached to the specified device are cleared for subsequent write operations.



If you receive message IEA467E or IEA468I at the system console, perform maintenance on the failing storage control.

Clearing a fenced path or device

When an IBM 3990 Storage Control is in DLSE mode, an error can occur that causes the subsystem to fence off one particular path to a device or group of devices. The subsystem continues to function with the remaining paths.

Repair the condition that caused the FENCE on the failing storage control and device. After repairing the failing unit, if the path is still fenced, use the CONTROL command with the CLEARFENCE parameter to clear the fenced condition for the path.

The CONTROL command with the CLEARFENCE parameter will clear ALL paths to ALL devices on the subsystem. The specified device can be any device on the subsystem.

Warning
Make sure the CE panel on the control unit and DASD is inactive, or that the CE has finished the repair action panels and cleared the repair action, **before** the job is run.

The CLEARFENCE function is available in the CMS, VSE, MVS, and Stand-Alone environments.



Perform maintenance after receiving console message IEA473I, which indicates a fence condition has occurred.

Discarding data pinned in cache

When devices are attached to an IBM 3990 Model 3 or Model 6 Storage Control, errors can occur when the Storage Control attempts to read the device status track. If the device status track is unreadable, the device is placed in an indefinite status condition and all subsequent data transfer operations end with a unit check.

The unit check sense data indicates the error that prevents reading of the status track. Because of the indefinite status condition, Modified Cache Fast Write or DASD Fast Write data may exist in the 3990 Model 3 or Model 6 cache storage and cannot be written to the device.

Use RESETICD to reset the indefinite status condition.



Then use the SETCACHE command of the IDCAMS utility to destage or discard any data that is pinned in the cache because of the indefinite status condition.



For VM, use DESTAGE or DISCARD.

Examples of the CONTROL command





The following examples show you how to use the CONTROL command and the JCL statements you will need to use when running CONTROL.

Clearing a WRITE INHIBITed storage control

In the following example, a WRITE INHIBITed IBM 3880 or IBM 3990 Storage Control, attached to an IBM 3380 (or 3390) DASD volume with a volume serial number of ABCDEF, is to be cleared. The DD statement identified in the input stream identifies an online DASD volume.

```
//jobname   JOB
//stepname  EXEC PGM=ICKDSF
//SYSPRINT  DD SYSOUT=A
//DDCARD    DD UNIT=3380,DISP=OLD,VOL=SER=ABCDEF
//SYSIN     DD *
 CONTROL  ALLOWWR DDNAME(DDCARD)
/*
```

Clearing a storage path fence status

The following example shows the CONTROL command and JCL used to reset a fence status after the path and the device have been repaired. The DD statement identified in the input stream identifies an online DASD volume.

```
//jobname   JOB
//stepname  EXEC PGM=ICKDSF
//SYSPRINT  DD SYSOUT=A
//DDCARD    DD UNIT=3380,DISP=OLD,VOL=SER=ABCDEF
//SYSIN     DD *
 CONTROL  CLEARFENCE DDNAME(DDCARD)
/*
```

Resetting indefinite status condition

The following example shows the JCL and CONTROL command used to reset the indefinite status condition on device 162 where the status track is unreadable. Device 162 is attached to an IBM 3990 Model 3 or 6 Storage Control. Device 162 is offline to the MVS operating system.

```
//jobname   JOB
//stepname  EXEC PGM=ICKDSF
//SYSPRINT  DD SYSOUT=A
//SYSIN     DD *
 CONTROL  UNIT(0162) RESETICD
/*
```

Resetting a fence status



The following example shows the CONTROL command used to reset a fence status after the path and the device have been repaired. The example is for the CMS or Stand-Alone version of ICKDSF.

```
CONTROL CLEARFENCE UNITADDRESS(0162)
```

Display subsystem information

The following example shows the CONTROL command used with the CONFIGURE(DISPLAY) parameter to display subsystem information, such as the serial number of a control unit:

```
CONTROL UNIT(D43) CONFIGURE(DISPLAY)
```

```
 ICK00700I DEVICE INFORMATION FOR 0D43 IS CURRENTLY AS FOLLOWS:
           PHYSICAL DEVICE = 3390
           STORAGE CONTROLLER = 3990
           STORAGE CONTROL DESCRIPTOR = E9
           DEVICE DESCRIPTOR = 06
           ADDITIONAL DEVICE INFORMATION = 08001500
 ICK04000I DEVICE IS IN SIMPLEX STATE
 ICK00706I SUBSYSTEM INFORMATION FOR 0D43 IS CURRENTLY AS FOLLOWS:
           SUBSYSTEM SERIAL NUMBER = 90007
           SUBSYSTEM ID = 0057
           CHANNEL CONNECTION ADDRESS = 03
           PATHS/CLUSTER ID = C0
           SYSTEM ADAPTER ID = 04
           HOST LINK ADDRESS = C100
 ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

The following example shows the CONTROL command used with the CONFIGURE(DISPLAY) parameter on a 2105 device. PATHS/CLUSTER ID is not applicable to 2105. LSS NUMBER is the logical subsystem number.

```
      CONTROL  DDNAME(DD1) CONFIGURE(DISPLAY)

   ICK00700I DEVICE INFORMATION FOR 4F92 IS CURRENTLY AS FOLLOWS:
             PHYSICAL DEVICE = 3390
             STORAGE CONTROLLER = 2105
             STORAGE CONTROL DESCRIPTOR = E8
             DEVICE DESCRIPTOR = 06
             ADDITIONAL DEVICE INFORMATION = 42000035
   ICK00706I SUBSYSTEM INFORMATION FOR 4F92 IS CURRENTLY AS FOLLOWS:
             SUBSYSTEM SERIAL NUMBER = FCA29
             SUBSYSTEM ID = 06C7
             CHANNEL CONNECTION ADDRESS = 12
             PATHS/CLUSTER ID = N/A
             LSS NUMBER = 07
             SYSTEM ADAPTER ID = 40
             HOST LINK ADDRESS = DB01
   ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

The following example shows the CONTROL command used with the CONFIGURE(DISPLAY) parameter on a 2107 device.

```
   ICK00706I SUBSYSTEM INFORMATION FOR 5FAB IS CURRENTLY AS FOLLOWS:
             SUBSYSTEM SERIAL NUMBER = 14940
             SUBSYSTEM IMAGE SERIAL NUMBER = 14941
             SUBSYSTEM IMAGE MACHINE TYPE = 2107
             SUBSYSTEM IMAGE PLANT OF MANUFACTURE = 75
             SUBSYSTEM ID = 9407
             CHANNEL CONNECTION ADDRESS = 2B
             PATHS/CLUSTER ID = N/A
             LSS NUMBER = 07
             SYSTEM ADAPTER ID = 0088
```

```
              HOST LINK ADDRESS = 610A1305
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

The following example shows the CONTROL command used with the CONFIGURE(DISPLAY) parameter to display microcode lic and bundle level.

```
CONTROL UNIT(9016) CONFIG(DISPLAY)
ICK00700I DEVICE INFORMATION FOR 9016 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 2107
          STORAGE CONTROL DESCRIPTOR = E8
          DEVICE DESCRIPTOR = 0E
          ADDITIONAL DEVICE INFORMATION = 4A00003C
          TRKS/CYL = 15, # PRIMARY CYLS = 3339
ICK04000I DEVICE IS IN SIMPLEX
STATE
ICK03091I EXISTING VOLUME SERIAL READ = IN9016
ICK00706I SUBSYSTEM INFORMATION FOR 9016 IS CURRENTLY AS FOLLOWS:
          SUBSYSTEM SERIAL NUMBER = CCH80
          SUBSYSTEM IMAGE SERIAL NUMBER = CCH81
          SUBSYSTEM IMAGE MACHINE TYPE = 2107
          SUBSYSTEM IMAGE PLANT OF MANUFACTURE = 75
          SUBSYSTEM ID = 2400
          CHANNEL CONNECTION ADDRESS = 16
          PATHS/CLUSTER ID = N/A
          LSS NUMBER = 00
          SYSTEM ADAPTER ID = 0300
          HOST LINK ADDRESS = 00000206
          MICROCODE LIC LEVEL = 7.7.27.61
          BUNDLE LEVEL = 87.27.18.0
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

Chapter 14. CPVOLUME command—CKD



The CPVOLUME command is used to format a volume for use in a VM environment. It is used to perform the following functions associated with formatting VM volumes for CP use:

FORMAT
Write records required by CP on cylinder 0. Write 4096-byte CP page records on an entire volume or on a range of cylinders.

ALLOCATE
Update the allocation map to indicate how each cylinder on a CP-formatted volume is to be used.

EXAMINE
Read a CP-formatted volume to verify that it is properly formatted and that records can be read without error.

LIST
Display the allocation map, volume serial, and device information, such as the number of cylinders.

LABEL
Rewrite the volume serial.

For information on ICKDSF support of the RAMAC family of devices, see "ICKDSF support of the RAMAC Array family" on page 8.

For information on ICKDSF support of the Internal Disk devices, see "ICKDSF support of the Internal Disk" on page 9.

Formatting CP-owned volumes

CPVOLUME writes 4096-byte records on all of the cylinders to be used by CP. These records are referred to as **CP pages**. In addition to CP pages, cylinder 0 is formatted with records that include the volume label and the allocation map. The allocation map indicates how each cylinder on the volume is to be used by CP.

You can format or examine an entire volume, or you can limit the operation to part of a volume by specifying the RANGE parameter. If you omit the range parameter, CPVOLUME assumes that the range is for the entire volume. If you specify a range that does not begin with cylinder 0, then cylinder 0 must have been previously formatted.

All of the cylinders on a volume do not have to be formatted with CP pages. Only those cylinders that are to be used by CP need to be formatted. You must, however, always format cylinder 0, and it must be formatted before any other cylinders.

Formatting CP-owned volumes for a specific VM operating system

The CPVOLUME command formats volumes for use on VM/ESA or z/VM systems.

Protecting the CPVOLUME command with RACF

The MVS version of ICKDSF checks the general resource profile for a facility class profile of STGADMIN.ICK.CPVOLUME. If RACF is not installed or the facility STGADMIN.ICK.CPVOLUME is not created, the CPVOLUME command executes with no authorization check. For additional information, see "Protecting ICKDSF commands with RACF" on page 34.

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Syntax

The abbreviation for CPVOLUME is CPVOL.

CPVOLUME
Required Parameters: FORMAT|ALLOCATE|LABEL|LIST|EXAMINE|OWNER|REFVTOC UNITADDRESS(*ccuu*) VERIFY({*serial*}|*NONE*)|NOVERIFY
Optional Parameters: FILLER|NOFILLER MIMIC(MINI(*nnnn*)) NOSSI|SSINAME(*ssiname*) NOSYS|SYSNAME(*sysname*) RANGE(*start,end*) READCHECK|NOREADCHECK TYPE((*type of allocation,start,end*)...) VOLID(*serial*)

Required parameters

FORMAT|ALLOCATE|LABEL|LIST|EXAMINE|OWNER|REFVTOC parameter: specify function

Parameter/ Abbreviations	**Description**
FORMAT **FMT**	Formats a volume. An entire volume or a range of cylinders can be formatted.
ALLOCATE **ALLOC**	Updates the allocation map of a previously formatted volume.
LABEL	Rewrites the volume label of a previously formatted volume.
LIST	Displays volume information for a previously formatted volume.
EXAMINE **EXAM**	Examines an entire volume or range of cylinders on a previously formatted volume for errors.
OWNER	Used with SSINAME, NOSSI, SYSNAME and NOSYS, sets the VM SSI name and system name for the volume.
REFVTOC **RVTOC**	Refreshes the OS/VTOC Fmt4 and Fmt5 DSCBs on cylinder 0 track 0 to match the information returned by the device. **Note:** When the REFVTOC parameter is specified, the device size in the OS/VTOC is set to the device size that is returned by the read device characteristics CCW (RDC). If you have linked the volume as a non full pack minidisk, the RDC returns the minidisk size, but not the full volume size. For example, if you link to the volume as a one cylinder minidisk and then issue the CPVOLUME REFVTOC command, the device size to be placed in the OS/VTOC is one cylinder. When using DFSMSdss on MVS against this volume, a message may then be received if the device size in the OS/VTOC does not match the device size returned by RDC due to its being the full volume size.
Default:	None.
Restrictions:	FORMAT, ALLOCATE, LABEL, LIST, EXAMINE, OWNER and REFVTOC are mutually exclusive.

UNITADDRESS parameter: identify the device

Parameter/ Abbreviations	**Description**
UNITADDRESS*(ccuu)* **UNITADDR** **UNIT**	Required to specify the address of the volume to be processed. For *ccuu*, specify the address of the volume. The unit address is the device number.

Parameter/ Abbreviations	Description
Default:	None.
Restrictions:	None.

VERIFY|NOVERIFY parameter: verify the volume serial number

Parameter/ Abbreviations	Description
VERIFY*(serial)* **VFY**	Required when you want to verify the volume serial number before performing the requested function on the volume. If the volume serial number does not match that found on the volume, the CPVOLUME command ends. For *serial*, substitute 1 to 6 alphanumeric characters for the volume serial number. To verify that a volume serial number does not exist, substitute the string *NONE* for *serial*. If no volume serial exists, or if the volume serial is actually "*NONE*", the CPVOLUME operation continues. If a volume serial exists, the CPVOLUME command ends. Running in the offline mode, if VERIFY(*serial*) parameter is specified in the CPVOLUME command and PARM='NOREPLYU' is specified in the EXEC card in the JCL, no operator's intervention (Reply U or T) is required. If PARM='NOREPLYU,FORCE' is specified in the JCL, the VERIFY(*serial*) parameter is not required to bypass the operator's intervention (Reply U or T) message.
NOVERIFY **NOVFY** **NVFY**	Required when you want to bypass verification of the volume serial number.
Default:	None. You must specify either VERIFY or NOVERIFY.
Restrictions:	None. However, when you specify the VERIFY parameter and verification fails, the command stops running.

Optional parameters

FILLER|NOFILLER parameter: specify to include filler records

Parameter/ Abbreviations	Description
FILLER **FILL**	Includes filler records when 3380 or 3390 volumes in 3380 track compatibility mode are formatted.
NOFILLER **NOFILL** **NFILL**	Excludes filler records when 3380 or 3390 volumes in 3380 track compatibility mode are formatted.
Default:	NOFILLER is the default unless the volume was previously formatted with Filler records.
Restrictions:	FILLER|NOFILLER applies to the IBM 3380 or 3390 volumes in 3380 track compatibility mode only. The parameters are ignored for other devices. NOFILLER is not valid with the range parameters if the volume was previously formatted with Filler records. FILLER is not valid with the range parameters if the volume was previously formatted without Filler records.

MIMIC(MINI) parameter: specify a special volume usage



Parameter/ Abbreviations	Description
MIMIC(MINI(*nnnn*))	Specifies the number of cylinders to be processed. For *nnnn*, specify the number of cylinders for the device.
Default:	If MIMIC(MINI) is not specified, the device is assumed to be dedicated.
Restrictions:	Valid only in the Stand-Alone version.

NOSSI|SSINAME parameter: specify VM SSI name

Parameter/ Abbreviations	Description
NOSSI	Causes no VM single-system image (SSI) name to be assigned to the volume.
SSINAME(*ssiname*) **SSIN(*ssiname*)**	Causes a VM SSI name to be assigned to the volume. For *ssiname*, specify a 1 to 8 character VM SSI name.
Default:	None.
Restrictions:	Valid only when you specify OWNER. Also requires SYSNAME or NOSYS.

NOSYS|SYSNAME parameter: specify system name

Parameter/ Abbreviations	Description
NOSYS	Causes no system name to be assigned to the volume.
SYSNAME(*sysname*) **SYSN(*sysname*)**	Causes a system name to be assigned to the volume. For *sysname*, specify a 1 to 8 character system name.
Default:	None.
Restrictions:	Valid only when you specify OWNER. Also requires SSINAME or NOSSI.

RANGE parameter: specify the range of cylinders

Parameter/ Abbreviations	Description
RANGE*(start,end)*	Specifies the range of cylinders that are to be formatted or examined. Use *start,end* to specify a range of cylinders.
Default:	If RANGE is not specified, the default is the entire volume.
Restrictions:	Valid only when you specify either FORMAT or EXAMINE.

READCHECK|NOREADCHECK parameter: specify read-back check

Parameter/ Abbreviations	Description
READCHECK **READCHK** **RDCHECK** **READ**	Performs a read-back check for each cylinder after it is formatted. If read-back check media errors are detected and the device supports media maintenance and is not a minidisk, the INSPECT function is issued to repair the track.
NOREADCHECK **NOREADCHK** **NOREAD** **NREAD**	Specifies not to perform a read-back check.
Default:	NOREADCHECK if the device is a 2105, 2107 or 1750, else READCHECK.

Parameter/ Abbreviations	Description
Restrictions:	READCHECK is valid only when you specify FORMAT. The 3995-151, 3995-153, RAMAC array devices, Internal Disk devices, the 2105, 2107, and 1750 devices do not support media maintenance. Therefore, if you specify READCHECK against one of these devices and media maintenance errors are detected, the INSPECT function will not be issued, and the CPVOL command will end.

TYPE parameter: specify the type of allocation

Parameter/ Abbreviations	Description
TYPE((*type of allocation, start,end)...)	Specifies the type of allocation. Multiple statements of each *type of allocation* can be specified (up to 100). Be careful when you use multiple statements. Each succeeding statement modifies allocation without regard to previous statements. Use *start,end* to specify the cylinders required for the *type of allocation*. Specify *type of allocation* as follows: **Type** **Allocates...** **DRCT** Directory space **PAGE** Paging space **PARM** Disk space for the CP PARM **PERM** Permanent space **SPOL** Spooling space for VM **TDSK** Temporary disk space You can have back-to-back PARM disks.
Default:	None. You must specify *type of allocation* and *start,end*.
Restrictions:	Valid only with the FORMAT and ALLOCATE. When a volume is formatted for the first time, any space not specified by DRCT, PAGE, PERM, SPOL, and TDSK parameters is allocated as PERM. Subsequently, the allocation does not change unless you specify TYPE. Once you have allocated PARM as the *type of allocation*, you must reallocate the entire range if a change is required.

VOLID parameter: specify the volume serial number

Parameter/ Abbreviations	Description
VOLID *(serial)*	Writes the volume serial number in the volume label.
Default:	If VOLID is not specified, the existing volume serial number is used. If there is no current volume serial number, then you must specify VOLID.
Restrictions:	Valid only when you specify FORMAT or LABEL.

Formatting cylinders

The unit for formatting and allocation is the cylinder. CPVOLUME formats a cylinder by writing as many 4096-byte records as possible on each track of a cylinder. Each record is sequentially numbered within

the cylinder. For example, a 3380 volume has ten records per track, therefore the first track contains records 1-10, the second track contains records 11-20, and the last track contains records 141-150.

You specify a range of cylinders to be formatted, which may be the entire volume. CPVOLUME formats each cylinder by writing the required number of 4096-byte page records on each track of the cylinder. If you specify READCHECK, CPVOLUME will read check each cylinder to ensure there are no errors.

If you specify READCHECK and a data check is encountered on a track:

1. ICKDSF issues INSPECT to check the surface of the track for defects.
2. INSPECT performs skip displacement surface checking to eliminate data checks from the track
3. If required, INSPECT assigns an alternate track.
4. After the track has been inspected, it is formatted once more and the FORMAT operation continues.

When formatting is complete, the allocation map will be updated from any allocation TYPE statements that you specified in the CPVOLUME FORMAT command.

Table 36 on page 132 lists the number of records formatted on each of the CKD devices supported by the CPVOLUME command.

Table 36: Number of CKD records formatted by CPVOLUME command.

Device	Records Per Track	Tracks Per Cylinder	Records Per Cylinder	High Cylinder[1]	Records Per Volume
3375	8	12	96	958	92 064
3380-A, B, D, J	10	15	150	884	132 750
3380-E	10	15	150	1 769	265 500
3380-K	10	15	150	2 654	398 250
3390-1	12	15	180	1 112	200 340
3390-2	12	15	180	2 225	400 680
3390-3	12	15	180	3 338	601 020
3390-9	12	15	180	10 016	1 803 060
9345-1	10	15	150	1 439	216 000
9345-2	10	15	150	2 155	323 400

[1] High cylinder is the highest address. Number of cylinders is one more.

Formatting cylinder 0, track 0

CPVOLUME formats track 0 on cylinder 0 with the following records:

IPL record
CPVOLUME creates an IPL record that puts the system into a wait state if the volume is IPLed before the CP nucleus is built.

Checkpoint record
CPVOLUME writes zeros in this record. The checkpoint record is written by CP and used by CP to save and retrieve information for a warm start.

Volume Label record
The owner field of the label record contains "CP370" if the volume is formatted for use on a System/370 VM system. The owner field of the label record contains "CPVOL" if the volume is formatted for use on a VM/XA or VM/ESA system.

Allocation record
Contains the allocation map for the VM operating system.

OS/VTOC Format 4 DSCB
The VTOC records created by CPVOLUME indicate that no space is available on the volume.

OS/VTOC Format 5 DSCB
The VTOC records created by CPVOLUME indicate that no space is available on the volume.

Updating the allocation map

Use ALLOCATE to update the allocation map on cylinder 0. If the volume has never been used before, all cylinders on a volume are initially allocated as PERM by CPVOLUME. You tell the ALLOCATE function how the allocation map should be changed by specifying a *type of allocation* followed by a range of cylinders. For example, (TDSK,100,199) indicates that the 100 cylinders from 100 to 199 should be allocated as temporary disk space.

Examining volumes for errors

Use EXAMINE to verify that cylinders are CP-formatted and readable without error. You specify a range of cylinders to be examined, which may be the entire volume. CPVOLUME reads each track on each cylinder to be examined. Validation ensures that each track contains the correct number of 4096-byte page records, that each record has the correct record number, and that data contained in the record can be read without error.

Two types of errors are reported by the EXAMINE function: format errors and data checks. A **format error** occurs when a track does not have the correct number of 4096 byte records or if the records do not have the correct record number (record ID). Format errors are reported by cylinder range; all cylinders within the reported range are improperly formatted.

Cylinders formatted for use as CMS minidisks, and cylinders contained in minidisks used by guest operating systems cause format errors to be reported. You can ignore these errors because the cylinders are not CP-formatted.

Data checks are not reported for cylinders that have format errors reported against them. For cylinders that are properly formatted, EXAMINE will report the CCHH of the first track that contains a data check.

The EXAMINE function is read-only and will not write over any user data. You can use the EXAMINE function to inspect any CP-formatted volume for formatting or data check errors. For any errors reported by EXAMINE, you should take appropriate corrective action. For format errors, you can use CPVOLUME to format the cylinders. For data check errors, you can use the INSPECT command of ICKDSF to check the track surface.

Displaying volume information

Use LIST to display current volume information. Use this function to display the allocation map, volume label, and device information (for example, the number of cylinders).

Rewriting the volume label

Use LABEL to rewrite the volume label of a previously formatted volume. When the serial is rewritten, the remaining bytes of the volume label are unaltered.

Copying data to a different device size

On a CP-formatted volume, the size of the allocation map must match the number of cylinders on the volume. The map contains a one-byte allocation code for each cylinder and following the last byte is an "end-of-volume" code indicating that no more cylinders can be allocated.

When different models of the same device type are copied from one to another, the allocation map that is copied will no longer match the number of cylinders on the volume.

For example, if you copy a 3380 with 885 cylinders to a 3380 with 1770 cylinders, the allocation map will indicate that only 885 cylinders are allocated (even though the new volume has 1770 cylinders).

CPVOLUME will report such a mismatch; and if you allow CPVOLUME to continue, the allocation map will be expanded from 885 to 1770 cylinders. The expanded cylinders will be allocated as PERM space. The expanded cylinders will not be formatted as part of the expansion process. To format the expanded cylinders, issue CPVOLUME FORMAT RANGE(885,1769).

When data is copied from a large volume to a smaller volume, and cylinder 0 is included in the copy operation, the allocation map will map more cylinders than are on the volume.

Using the above example, the allocation map will indicate that 1770 cylinders are allocated, even though the new volume has only 885 cylinders. When CPVOLUME encounters a volume that has a mismatch, it is reported; and if you allow CPVOLUME to continue, the allocation map is reduced from 1770 to 885 cylinders. The allocation information for the last 885 cylinders is eliminated.

Creating a minidisk allocation map

The allocation map that CPVOLUME creates for a minidisk will map the number of cylinders of the minidisk. For example, for a 10-cylinder minidisk, CPVOLUME will create an allocation map that maps 10 cylinders. Likewise, CPVOLUME will not allow you to format cylinders beyond the bounds of the minidisk.



The Stand-Alone version of CPVOLUME is unable to determine the size of the minidisk. In the Stand-Alone version, use the MIMIC(MINI(n)) parameter to indicate the number of cylinders of the minidisk. If you do not specify MIMIC(MINI(n)) for a minidisk, CPVOLUME assumes that the device is dedicated.

For example, to format 5 minidisk cylinders, you enter the ICKDSF command:

```
CPVOL UNIT(193) NVFY FORMAT MIMIC(MINI(5))
```

If you then attempt to update the size by issuing:

```
CPVOL UNIT(193) NVFY FORMAT MIMIC(MINI(10))
```

The following messages appears:

```
ICK03030I ALLOCATION MAP WILL BE EXPANDED FROM 5 to 10 CYLINDERS
ICK003D   REPLY U TO ALTER VOLUME CONTENTS, ELSE T
```

Reply U to message ICK003D, and ICKDSF will update the allocation map.

Examples of the CPVOLUME command

The following examples show different ways to code the CPVOLUME command. The device used in the examples is a 3380 with 885 cylinders.

Formatting an entire volume

In this example, all 885 cylinders on the volume are formatted. A read-back check is specified to verify that all of the formatted records can be read without error. The allocation map will indicate that all 885 cylinders on the volume are allocated as PERM space.

Because NOVERIFY is specified, any existing volume label is ignored, and the volume is labeled "CPVOL1".

```
CPVOLUME FORMAT UNIT(0150) NOVERIFY VOLID(CPVOL1) READCHECK
```

Formatting part of a volume

In this example, the first 100 cylinders on the volume are formatted. The allocation map will indicate that cylinder 0 is PERM space, cylinders 1-99 are PAGE space, and cylinders 100-884 are PERM space.

Because NOVERIFY is specified, any existing volume label is ignored, and the volume is labeled "CPVOL1".

```
CPVOLUME FORMAT UNIT(0150) NOVERIFY VOLID(CPVOL1) RANGE(0,99) TYPE((PAGE,1,99))
```

Changing volume allocation

In this example, the allocation map on a 3390 Model 2 volume, which has already been formatted, is updated. The 426 cylinders that previously had been allocated as PERM are given a new allocation of TDSK, to be used as temporary disk space.

Because VERIFY is specified, CPVOLUME checks that the volume on unit address 9C4 has a volume label of ESA001.

```
CPVOLUME ALLOCATE UNITADDRESS(9C4) VERIFY(ESA001)-
 TYPE((TDSK,1800,2225))
```

Chapter 15. FLASHCPY commands—CKD for Asynchronous PPRCOPY



Flashcopy commands in ICKDSF are intended for creating and terminating Flashcopy relationships in an Asynchronous PPRC configuration.

Note: PPRC and PPRCOPY are synonymous.

This chapter provides the following commands to establish, query, and withdraw Flashcopy relations.

FLASHCPY ESTABLISH
Establishes full volume relationships. See “FLASHCPY ESTABLISH” on page 137.

FLASHCPY QUERY
Returns volume level data. See “FLASHCPY QUERY” on page 146.

FLASHCPY QUERY INCREMENTSTATUS
Returns information about consistency groups and out-of-sync tracks. See “FLASHCPY QUERY INCREMENTSTATUS” on page 149.

FLASHCPY QUERY RELATIONS
Determines status of Flashcopy relations and the state of inconsistent Flashcopy volumes when Asynchronous PPRCOPY fails. See “FLASHCPY QUERY RELATIONS” on page 151.

FLASHCPY WITHDRAW
Terminates Flashcopy relationships. See “FLASHCPY WITHDRAW” on page 153.

Protecting the FLASHCPY command with RACF

The MVS version of ICKDSF checks the general resource profile for a facility class profile of STGADMIN.ICK.FLASHCPY. If RACF is not installed or the facility STGADMIN.ICK.FLASHCPY is not created, the Flashcopy command completes with no authorization check. For additional information, see “Protecting ICKDSF commands with RACF” on page 34.

FLASHCPY ESTABLISH

Use the FLASHCPY ESTABLISH command to establish Flashcopy relationships.

All Flashcopy relations established will be full volume relationships. If your requirements meet these restrictions, then the FLASHCPY ESTABLISH command can be used for applications outside of the context of Asynchronous PPRC.

After establishing Flashcopy relations, Asynchronous PPRC Flashcopys are initiated by the Master ESS when a successful consistency group has been formed and all PPRCOPY secondary volumes in a session are consistent at the same time, referred to as 'point in time consistent'.

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Syntax

FLASHCPY ESTABLISH **FLASH ESTAB** **FC ESTAB**
FLASHCPY ESTABLISH FLASH ESTAB FC ESTAB
Required Parameters: DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) TARGETVOL(*lss*,*cca*,*cuuu*)
Optional Parameters: ALLOWONLINE CHANGERECORDING(**NO**|YES|V2) FASTREVERSERESTORE INHIBITTARGETWRITES(**NO**|YES) MODE(**COPY**|NOCOPY) ONLINTGT(**NO**|YES) PRESERVEMIRROR(REQUIRED|PREFERRED|**NO**) RESTORE SETGTOK(**NO**|YES) SOURCEVOL(*lss*,*cca*,*ssid*,*ser#*,*cuuu*) TGTCANCOMEONLINE(NO**|YES)** TGTOKASPPRCPRIM(**NO**|YES)

Required parameters

DDNAME|SYSNAME|UNITADDRESS: identify volume to which the I/O is issued

Parameter/ Abbreviations	Description
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and a VM volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a non-terminating wait state. For *ccuu*, specify the address (3 or 4 hex digits) of the channel and unit of the volume. This value should not be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. The unit address is the device number.
Default:	None
Restrictions:	None

TARGETVOL: identify Flashcopy target volume

Parameter/ Abbreviations	Description
TARGETVOL(*lss*,*cca*,*cuuu*) **TGTVOL**	Specifies the Flashcopy target volume. *lss* is a two digit hex value that identifies the logical subsystem number on the 2105, 2107, or 1750 target volume. If remote is implied through use of the SOURCEVOL keyword then this value is the LSS of the remote volume that will be the Flashcopy target volume for a PPRCOPY secondary volume. This value should be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. *cca*, the channel connection address, is a 2-digit hex address that identifies the specific volume in the specified lss that will be the Flashcopy target volume for a Peer-to-Peer Remote Copy secondary volume. This value should be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. *cuuu* is the device number. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. This value cannot be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. The *cuuu* value is required to accommodate VM when the Flashcopy source volume is actively attached to a VM operating system and the volume is supported by VM or if the device is actively attached and running on an MVS or VSE operating system that is itself a guest on a VM system. Otherwise, it is not required.
Default:	None
Restrictions:	None

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

CHANGERECORDING: enable Incremental FlashCopy (change recording with persistence)

Parameter/ Abbreviations	Description
CHANGERECORDING(NO|YES| V2) **CHANGERCD** **CHRCD**	**NO** Indicates that the Flashcopy relationship is not incremental (does not have change recording and is not persistent). **YES** Indicates that the Flashcopy relationship is incremental (change recording is active and persistence is active) using version 1 change recording. A volume can be the source of only one version 1 incremental relationship. **V2** Indicates that, if this feature is enabled, the Flashcopy relationship is incremental (change recording is active and persistence is active) using version 2 change recording. A volume can be the source of multiple version 2 incremental relationships. An incremental Flashcopy relationship is one where only those tracks that have changed since the last incremental Flashcopy request will be flashed. The original incremental Flashcopy request cannot have the RESTORE keyword specified; however, any subsequent incremental Flashcopy request must have the RESTORE keyword specified. If either of these provisions are violated the I/O command will be rejected with X'0F B6' sense, message ICK34111I will be issued, and processing of the command will terminate.
Default:	NO
Restrictions:	The Global Mirror Flashcopy relationship requires version 1 change recording. Therefore, use CHANGERECORDING(YES) rather than CHANGERECORDING(V2) when establishing the relationship for a Global Mirror session. If version 2 change recording is enabled, a source can have both a single version 1 incremental relationship and multiple version 2 incremental relationships. A version 1 incremental relationship cannot be converted to a version 2 incremental relationship and a version 2 incremental relationship cannot be converted to a version 1 incremental relationship. When used with the RESTORE parameter the YES and V2 keywords are ignored and the incremental relationship is established with the same type that was used for the original incremental Flashcopy request.

FASTREVERSERESTORE: quickly reverse Flashcopy direction during disaster recovery processing

Attention: See “Flashcopy Establish with Fast Reverse Restore” on page 145.

Parameter/ Abbreviations	Description
FASTREVERSERESTORE **FASTREVREST** **FRR**	This parameter is intended to quickly reverse the direction of an established Flashcopy pair during disaster recovery processing.
Default:	None
Restrictions:	The Flashcopy relation being reversed must be a full volume relation. After the Fast Reverse Restore is complete the contents of the source volume (the original target volume) will be unpredictable. Further steps must be taken to restore the volume to a usable state, see “Disaster Recovery for Asynchronous PPRC Processing” on page 322 for further information. The RESTORE keyword can be specified with FASTREVERSERESTORE, but is not necessary.

INHIBITTARGETWRITES: indicate whether the Flashcopy target volume can be written to once established

Parameter/ Abbreviations	Description
INHIBITTARGETWRITES(NO|YES) **INHIBWRTS** **NOTGTWR**	**NO** Indicates that the Flashcopy target volume will be able to accept write I/O. **YES** Indicates that the Flashcopy target volume cannot be written to, once established. Specifying YES will prevent the user from being able to write to the target volume, which includes being able to change the volser so that it can be brought online for use.
Default:	NO
Restrictions:	None

MODE: indicates whether to make a background copy of the source tracks

Parameter/ Abbreviations	Description
MODE(COPY|NOCOPY)	Specifies the type of Flashcopy operation **COPY** Indicates to make a background copy of all source tracks. The Flashcopy relationship ends when the background copy is complete or the FLASHCPY WITHDRAW command is issued. Note: when Asynchronous PPRC is started, the initial point in time copy will be destroyed; therefore, it is not necessary to start a background copy for the initial Flashcopy relationship of Asynchronous PPRC. **NOCOPY** Indicates that a background copy of source tracks is not to be made. Tracks are copied to the target device when updates to the source device requires the original copy to be stored on the target device.
Default:	COPY
Restrictions:	NONE

ONLINTGT: indicate whether I/O to online FLASHCOPY target volume is allowed

Parameter/ Abbreviations	Description
ONLINTGT(NO|YES) **ONTGT**	**NO** Specifies that, if the Flashcopy target volume appears to be online to a host system the command will fail with an error message. **YES** Specifies that the command will be processed even if the Flashcopy target volume is online to a host system.
Default:	NO
Restrictions:	ONLINTGT is valid on 2105, 2107, and 1750 devices only.

PRESERVEMIRROR: indicate the handling of the request based on whether the specified target is a PPRC primary device

Parameter/ Abbreviations	Description
PRESERVEMIRROR (REQUIRED|PREFERRED| NO) **PRESMIR**	**REQUIRED** Indicates that if the specified target device is a Metro Mirror primary device, the pair must not go into a Duplex Pending state as the result of this establish request. **PREFERRED** Indicates that if the specified target device is a Metro Mirror primary device, it would be preferable that the pair does not go into a duplex pending state as the result of the establish request, but if a Preserve Mirror operation cannot be accomplished, the establish request should still be performed. **NO** Indicates that the establish request is to be performed without considering a Preserve Mirror operation.
Default:	NO
Restrictions:	The REQUIRED and PREFERRED keywords are not valid if the FASTREVERSERESTORE parameter is specified. If REQUIRED or PREFERRED is specified then TGTOKASPPRCPRIM(YES) must be specified. PREFERRED is not valid if the devices specified are in a peer-to-peer multi-target relationship. **Note:** If REQUIRED is specified along with TGTOKASPPRCPRIM(YES) but the read features codes do not indicate that the preserve mirror operations is available, then TGTOKASPPRCPRIM will be set to (NO).

RESTORE: reverse Flashcopy direction or establish incremental Flashcopy

Parameter/ Abbreviations	Description
RESTORE	This parameter is intended to be used when reversing the direction of an established Flashcopy pair. It can also be used to indicate that an existing incremental relationship should be re-flashed. The restore may be specified using the original source and target volumes, or the restore may reverse the Flashcopy relation. The direction of the Flashcopy relation can be reversed only if the Flashcopy background copy has completed, or all source volume tracks are resident on the target volume.
Default:	None
Restrictions:	None. This keyword can be specified with the FASTREVERSERESTORE keyword, but is not necessary. RESTORE is required in two situations: 1. When incremental flashcopy is desired (see "CHANGERECORDING: enable Incremental FlashCopy (change recording with persistence)" on page 140 for details) and the request is not the first invocation. 2. When reversing the direction of the Flashcopy during disaster recovery.

SETGTOK: specify space efficient target volume

Parameter/ Abbreviations	Description
SETGTOK(NO|YES) **SEOK**	SETGTOK specifies: **NO** Indicates that the target can not be a space efficient volume. **YES** Indicates that the target can be a space efficient volume. If YES is specified and the target is not a space efficient volume, the command is processed as if the keyword is not specified. If the repository runs out of space, the relationship will be failed.
Default:	NO.
Restrictions:	Valid only for the 2107 device. SETGTOK is ignored for 2105 and 1750 devices.

SOURCEVOL: identify remote Flashcopy source volume

Parameter/ Abbreviations	Description
SOURCEVOL(*lss*,*cca*,*ssid*,*ser#*,*cuuu*) **SRCVOL**	Specifies the remote Flashcopy source volume. SOURCEVOL is required only if the volume that is to become the Flashcopy source volume is the PPRCOPY secondary of the volume to which the I/O is issued. The volume to which the I/O is issued is identified via the DDNAME, SYSNAME OR UNITADDRESS keyword. *lss* is a required two digit hex value that identifies the logical subsystem number of a remote Peer-to-Peer Remote Copy secondary volume that will be the Flashcopy source volume. This value should be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. *cca*, the channel connection address, is a required 2-digit hex address that identifies the specific volume in the specified LSS. This value should be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. *ssid*, the storage control subsystem ID, is a required 4-digit hexadecimal address that identifies the subsystem that contains the volume indicated by the CCA. This value should be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. *ser#*, the storage control serial number, is the required last five digits of the 12-digit machine serial number for the 2105, 2107, or 1750 containing the specified LSS. This value should not be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. *cuuu* is the device number. For the CMS version, specify the virtual address of the dedicated volume or full-pack minidisk. This value cannot be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. This value is required to accommodate VM when the Flashcopy source volume is actively attached to a VM operating system and the volume is supported by VM, or if the device is actively attached and running on an MVS or VSE operating system that is itself a guest on a VM system. It is not otherwise required. These values can be obtained with the **CONTROL CONFIGURE(DISPLAY)** command.
Default:	None
Restrictions:	None

TGTCANCOMEONLINE: indicate whether Flashcopy target volume can come online during IPL

Parameter/ Abbreviations	Description
TGTCANCOMEONLINE(NO|YES) **TGTONLINE**	**NO** Specifies that the Flashcopy target volume, once established, will be able to come online during subsequent IPLs. Specifying NO will prevent the operator from having to respond to messages 'IEA213A DUPLICATE VOLUME 'XXXXXX' FOUND ON DEVICES YYYY AND ZZZZ.' and 'IEA213A REPLY DEVICE NUMBER WHICH IS TO REMAIN OFFLINE **YES** Indicates that the Flashcopy target volume can come online.
Default:	**YES** Preserves behavior prior to introduction of this support.
Restrictions:	This parameter is for MVS only. It will not have an affect for other operating systems.

TGTOKASPPRCPRIM: Flashcopy target volume can be PPRCOPY primary volume

Parameter/ Abbreviations	Description
TGTOKASPPRCPRIM(NO|YES) **TGTOKPRIM**	**NO** Indicates that the Flashcopy target volume cannot be a PPRCOPY primary volume. **YES** Indicates that the Flashcopy target volume can be a PPRCOPY primary volume. However, the PPRC primary volume cannot also be an Asynchronous PPRC primary volume.
Default:	**NO** Do not allow Flashcopy if the target is already a PPRC primary.
Restrictions:	None

Examples of Flashcopy Establish

The following example shows establishing a Flashcopy relation between a volume at cuuu 5C06 that is to be the Flashcopy source and the volume at 5C87 that is to be the target. The target volume also has an LSS value of x'01' and a CCA of x'07'. In addition,

- ONLINTGT(YES) is specified so that if the target volume is online, the I/O will not fail.
- TGTCANCOMEONLINE(NO) is specified so that the host will not see duplicate volumes for Flashcopy target and source volumes during an IPL.
- TGTOKASPPRCPRIM(NO) is specified so that if the volume specified as the target volume is already a PPRC primary volume, the I/O will not fail. Note that if the volume is also part of an Asynchronous PPRC configuration, the I/O will fail anyway.
- INHIBITTARGETWRITES(YES) is specified so that the target volume, once established in the Flashcopy relation, will not accept write I/O.
- CHANGERECORDING(YES) is specified so that change recording will be started on the volume.

```
Environment: Flashcopy source volume: CUUU=5C06
             FLASHCOPY target volume: CUUU=5C87, LSS=x'01', CCA=x'07

FLASHCPY ESTABLISH UNIT(5C06) -
                   ONLINTGT(YES) -
                   TGTCANCOMEONLINE(NO) -
                   TARGETVOL(X'01',X'07',5C87) -
                   TGTOKASPPRCPRIM(NO) -
                   INHIBITTARGETWRITES(YES) -
                   CHANGERECORDING(YES)
```

Flashcopy Establish for Flashcopy of a PPRC Secondary

Flashcopy Establish issued to a PPRC secondary volume to establish a Flashcopy relationship between the PPRC secondary volume and a target volume

.
Environment:

PPRC Primary volume:
CUUU= 7401, LSS=x'04', SSID=x'7400', CUSN 27771

PPRC Secondary and Flashcopy source volume:
CUUU= 7C01, LSS=x'04', CCA=x'01', SSID=x'7C00', CUSN=27858

Flashcopy target volume:
CUUU=7D01, LSS=x'05', CCA=x'01', SSID=x'7D00', CUSN=27858

Example A: Issue FLASHCPY ESTABLISH directly to the PPRC secondary volume, which is also the Flashcopy source volume.

```
FLASHCPY ESTABLISH UNIT(7C01)  -
TGTVOL(X'05',X'01',7D01)
```

Example B: Inband Flashcopy issued to the PPRC primary volume at CUUU=7401 to establish the Flashcopy relation between the PPRC secondary volume at CUUU=7C01 and its Flashcopy target volume at CUUU=7D01. The UNIT keyword identifies the volume to which the I/O is issued. The SRCVOL keyword identifies the PPRC secondary volume to which the I/O is inbanded and which is to actually process the command and the TGTVOL keyword identifies the Flashcopy target volume.

```
FLASHCPY ESTABLISH UNIT(7401)      -
SRCVOL(X'04',X'01',X'7C00',27858)  -
TGTVOL(X'05',X'01',7D01
```

Note:

With the z/OS version of ICKDSF, if the ONLINTGT(YES) parameter is specified, then example B should be used to establish the Flashcopy relation. The ONLINTGT(YES) parameter is used to allow the FLASHCPY ESTABLISH to a target volume that is online. With new function APAR PI25913, if this parameter is specified, ICKDSF attempts to issue an event notification facility ENF64 signal to notify all systems in the sysplex that the UCB of the target volume should be updated to match the UCB of the source volume.

If the automatic UCB refresh function is enabled, the target volume's UCB may be refreshed. The automatic UCB refresh function may be enabled by using ENABLE(REFUCB) in the DEVSUPxx parmlib member. ENABLE(REFUCB) is the default action starting with z/OS 2.2.

By using example B, the volume record may be read from the PPRC primary device and the ENF64 signal can be sent. If you use example A, the ENF64 signal will not be sent, as the volume record cannot be read from the PPRC secondary device. With example A you will have to update the target UCB manually.

To update the target UCB manually, you will need to issue the `VARY ONLINE,dev,UNCOND` operator command on all systems that the target is online to.

Flashcopy Establish with Fast Reverse Restore

This example shows how a Flashcopy Establish with Fast Reverse Restore is used for disaster recovery to reverse the direction of a Flashcopy after a PPRC ESTPAIR with FAILOVER to 'B'.

Environment is A->B->C, where:

- Volume A - PPRC Primary = 7901: LSS '01', SSID 7900, sn 27858
- Volume B - PPRC Secondary and original Flashcopy source = 7101: CCA '01', LSS '01', SSID 7100, sn 27771
- Volume C - Original Flashcopy target = 7701: CCA '01', LSS '07', SSID 7700, sn 27771

Original Flashcopy was established from PPRC Secondary address 7101 as Flashcopy source and 7701 as Flashcopy target (B->C) using :

```
TGTVOL(X'07',X'01',7701)
```

This shows how FASTREVERSERESTORE is used to reverse the direction of the above Flashcopy pair from C->B. Because the example is used for disaster recovery after a PPRC ESTPAIR with FAILOVER to the 'B' volume. The 'B' volume will be a PPRC primary because of the PPRC Failover prior to the Flashcopy being issued. The TGTOKPRIM(YES) is specified to allow the Flashcopy to a PPRC primary. Because the

direction of the Flashcopy is being reversed, the FLASHCPY command is issued to the 'C' volume, with the TGTVOL parameter specifying the 'B' volume.

```
FLASHCPY ESTABLISH UNIT(7701)  -
TGTVOL(X'01',X'01',7101)       -
TGTOKPRIM(YES) FRR
```

Flashcopy Establish used to reverse a Flashcopy relationship

This example shows how to reverse a Flashcopy relationship where:

- Volume A = F001, LSS '00', CCA '01' (original source)
- Volume B = F701, LSS '07', CCA '01' (original target)

Original Flashcopy was established with F001 as source and F701 as target using:

```
TGTVOL(X'07',X'01',F701)
```

This shows how the Restore is used to reverse the direction of the above Flashcopy pair. The background copy must complete before you can reverse the order of the Flashcopy relationship. Before performing the reverse restore, wait for the out-of-sync tracks to go to zero.

```
FLASHCPY ESTABLISH UNIT(F701)  -
TGTVOL(X'00',X'01',F001) RESTORE
```

Flashcopy Establish used to establish incremental Flashcopy

This example shows how to do incremental Flashcopy, where::

- Volume A = F001, LSS '00', CCA '01' (original source)
- Volume B = F701, LSS '07', CCA '01' (original target)

1. You must specify Change recording when you establish the initial Flashcopy pair. This copies the entire source volume to the target volume and activates change recording.

   ```
   FLASHCPY ESTABLISH UNIT(F001) -
   TGTVOL(X'07',X'01',F701) CHRCD(YES)
   ```

2. Each time you make updates to the same source volume, but want only incremental updates made to the target volume, you must establish another Flashcopy relationship with Change recording specified. This copies only the data that has changed since the last incremental copy.

   ```
   FLASHCPY ESTABLISH UNIT(F001) -
   TGTVOL(X'07',X'01',F701) CHRCD(YES) RESTORE
   ```

You can also reverse an Incremental Flashcopy relationship to allow modified tracks to be copied from the target volume to the source volume. The background copy must complete before you can reverse the order of the Flashcopy relationship. Wait for the out-of-sync tracks to go to zero before performing the reverse restore. See “Flashcopy Establish used to reverse a Flashcopy relationship” on page 146 for more information.

FLASHCPY QUERY

FLASHCPY QUERY returns data for the addressed volume regarding the number of relations that already exist on the volume, the maximum number of relations that will be allowed on the volume and whether or not the volume can become a Flashcopy source or a Flashcopy target.

The displayed data will have the following format:

```
FLASHCOPY VOLUME CAPABILITY INFORMATION TABLE
              MAXIMUM      MAXIMUM
 EXISTING     ALLOWED      RELATIONS
```

```
 RELATIONS    RELATIONS    EXCEEDED     CAPABILITY
 ---------    ---------    ---------    ----------
    xxx          yyy          NO         SRC CAP
                           YES (VOL)     TGT CAP
                           YES (ESS)     NEITHER
                                         PPRC PRI
                                         PPRC SEC
                                         CC SRC
                                         XRC SRC
                                         INHIBIT
                                         MAX EXCD
                                                      PHASE 1
                                         INACCES
                                         ASY PVOL

CAPABILITY LEGEND
  ASY PVOL = ASYNCHRONOUS PPRC REMOTE COPY PRIMARY
  CC SRC   = CONCURRENT COPY SOURCE
  INACCESS = VOLUME INACCESSIBLE, DATA NOT OBTAINABLE
  INHIBIT  = FLASHCOPY INHIBITED ON THIS VOLUME
  MAX EXCD = MAXIMUM RELATIONS EXCEEDED AT VOLUME OR ESS LEVEL
  NEITHER  = VOLUME NEITHER FC SOURCE NOR FC TARGET CAPABLE
  PPRC PRI = PPRC PRIMARY
  PPRC SEC = PPRCOPY SECONDARY
  PHASE 1  = PHASE 1 (VERSION 1) RELATIONSHIP EXISTS ON VOLUME
  SRC CAP  = FLASHCOPY SOURCE CAPABLE
  TGT CAP  = FLASHCOPY TARGET CAPABLE
  XRC SRC  = XRC SOURCE
```

Syntax

FLASHCPY QUERY **FC QUERY**
Required Parameters: DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*)
Optional Parameters: ALLOWONLINE SOURCEVOL(*lss*,*cca*,*ssid*,*ser#*)

Required parameters

DDNAME|SYSNAME|UNITADDRESS: identify volume to which I/O is issued

Parameter/ Abbreviations	Description
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and a VM volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a non-terminating wait state. For *ccuu*, specify the address (3 or 4 hex digits) of the channel and unit of the volume. This value should **not** be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. The unit address is the device number.
Default:	None
Restrictions:	None

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

SOURCEVOL: identify remote Flashcopy source volume

Parameter/ Abbreviations	Description
SOURCEVOL(*lss*,*cca*,*ssid*,*ser#*) **SRCVOL**	Specifies the remote Flashcopy source volume. SOURCEVOL is required only if the volume that is the Flashcopy source volume is the PPRCOPY secondary of the volume to which the I/O is issued. The volume to which the I/O is issued is identified via the DDNAME, SYSNAME OR UNITADDRESS keyword. *lss* is a two digit hex value that identifies the logical subsystem number of a remote Peer-to-Peer Remote Copy secondary volume that will be the Flashcopy source volume. This value should be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. *cca*, the channel connection address, is a 2-digit hex address that identifies the specific volume in the specified LSS. This value should be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. *ssid*, the storage control subsystem ID, is a 4-digit hexadecimal address that identifies the subsystem that contains the volume indicated by the CCA. This value should be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. *ser#*, the storage control serial number, is the last five digits of the 12-digit machine serial number for the 2105, 2107, or 1750 containing the specified LSS. This value should not be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. These values can be obtained with the **CONTROL CONFIGURE(DISPLAY)** command.
Default:	None
Restrictions:	None

Examples of Flashcopy Query

Environment:

PPRC primary volume:
CUUU=5FAB

PPRC secondary volume/Flashcopy source volume:
CUUU=DA0E, LSS=X'04', CCA=X'0E', SSID=X'7404', CUSN=27774

Query the Flashcopy source volume:

```
FLASHCPY QUERY UNIT(DA0E)
```

Issue the same request to the primary volume that the Flash copy source is a secondary of:

```
FLASHCPY QUERY UNIT(5FAB) SRCVOL(X'04',X'0E',X'7404',27774)
```

FLASHCPY QUERY INCREMENTSTATUS

This command is for debug purposes when directed by service personnel only. To query information about the Flashcopy states, see “FLASHCPY QUERY RELATIONS” on page 151.

The FLASHCPY QUERYRELATIONS command is easier to use. The following documentation is for reference when directed by support personnel.

The following header message is displayed when using FLASHCPY QUERY INCREMENTSTATUS:

```
FLASHCOPY ASYNCHRONOUS PPRCOPY INCREMENT STATUS INFORMATION
```

If the information cannot be retrieved because the data structures are inaccessible, the following message is returned, return code 12 is set, and the command terminated:

```
FLASHCPY QUERY INCREMENTSTATUS FAILED, DATA STRUCTURES INACCESSIBLE
```

If information cannot be retrieved because the Asynchronous PPRC configuration for the specified session has not been started, the following message is returned, return code 12 is set, and the command terminated:

```
UNABLE TO ACQUIRE INFORMATION, ASYNCHRONOUS PPRC CONFIGURATION HAS NOT BEEN STARTED
FOR SPECIFIED SESSION
```

If the information is available, it will contain a session number and a description of the state of the consistency group with an indication of whether to REVERT or COMMIT (parameters on the FLASHCPY WITHDRAW command). The following are examples of text that can be returned:

```
SESSION NUMBER: xxx

THERE ARE NO VOLUMES IN THE SPECIFIED SESSION
                      or
SESSION IS REVERTIBLE OR NOT REVERTIBLE AND EQUAL (COMMIT)
                      or
SESSION IS NON-REVERTIBLE AND EQUAL (NO WITHDRAW REQUIRED)
                      or
SESSION IS REVERTIBLE AND NOT REVERTIBLE (REVERT)
                      or
SESSION IS ALL REVERTIBLE (REVERT)
                      or
CONSISTENCY GROUPS ARE CORRUPTED
```

The appropriate parameters to include with the FLASHCPY WITHDRAW command are indicated in the following table.

Indication	Parameters to include on FLASHCPY WITHDRAW
Revertible or Not Revertible and Equal	Commit
Non-Revertible and Equal	No Withdraw required
Revertible and Not Revertible	Revert
All Revertible	Revert
Consistency Group Corrupted	See“Disaster Recovery for Asynchronous PPRC Processing” on page 322 for information on Disaster Recovery.

Syntax

FLASHCPY QUERY INCREMENTSTATUS **FLASH QUERY INCRSTAT** **FC QUERY INCRSTAT**
Required Parameters: DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) SESSIONNO(*session number*)
Optional Parameters: ALLOWONLINE

Required parameters

DDNAME|SYSNAME|UNITADDRESS: identify volume to which I/O is issued

Parameter/ Abbreviations	Description
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and a VM volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a non-terminating wait state. For *ccuu*, specify the address (3 or 4 hex digits) of the channel and unit of the volume. This value should not be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. The unit address is the device number.
Default:	None
Restrictions:	None

SESSIONNO: session number for which information is desired

Parameter/ Abbreviations	Description
SESSIONNO(*session number*) **SESSNO**	*session number* is the identifying decimal number of the session for which information is desired. This value must be the session number of an existing session.
Default:	None.
Restrictions:	Must be an existing session on the addressed LSS with a value from 1 to 255 inclusive.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.

Parameter/ Abbreviations	Description
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

Examples of FLASHCPY QUERY INCREMENTSTATUS

Environment: The Master or Subordinate device at cuuu = 5C06 has session number 64 open on it.

```
FLASHCPY UNIT(5C06) -
         QUERY -
         INCREMENTSTATUS -
         SESSIONNO(64)
```

FLASHCPY QUERY RELATIONS

Use FLASHCPY QUERY RELATIONS to determine the status of Flashcopy relations when Asynchronous PPRC fails and the state of the Flashcopy volumes could be inconsistent. It can be also used to obtain space efficient volume information.

When a Flashcopy does not complete, this command will assist you with determining whether to include the REVERT or COMMIT parameter with the FLASHCPY WITHDRAW command.

The data displayed will be as follows:

```
FLASHCOPY RELATIONS INFORMATION TABLE
  ADDRESSED VOLUME CU SERIAL NUMBER: 0000027774
+-------------------------------------------------------------------------------------------------------------
---------+
|                                       ADDRESSED VOLUME INFORMATION                                          |
PARTNER  |
|-----------------------------------------------------------------------------------------------------------|
VOLUME   |
|FLASHCPY|   | |  |   |   |   |  |   |   | |      |START OF EXTENT   |# CONTIG|# TRACKS |    |   |
|    INFO    |
|SEQUENCE|   | |  |   |   |   |  |   |   | |    |--------------------|TRKS IN | YET TO  |    |   |
|------------|
|NUMBER  |R/T|R|FV|BCE|BCP|CRA|VR|SWI|TWP|P|SEVI|PM|SOURCE  | TARGET | EXTENT |BE COPIED|SSID|LSS|CCA|
SSID|LSS|CCA|
|--------+---+-+--+---+---+---+--+---+---+-+----+----------+--------+--------+---------+----+---+---
+----+---+---|
|00000000|SRC|F| T| F | F | T2| F|TFR| T |T|FTTT| R|00000000|00000000|  2250  |  2250   |7404| 04|0E |
7405| 05|0E |
+-------------------------------------------------------------------------------------------------------------
---------+
LEGEND
  R/T  = FLASHCOPY RELATIONSHIP TYPE OF ADDRESSED VOLUME (SRC = SOURCE, TGT = TARGET)
  R    = REVERTIBLE (TRUE | FALSE)
  FV   = FULL VOLUME RELATION (TRUE | FALSE)
  BCE  = BACKGROUND COPY ENABLED (TRUE | FALSE)
  BCP  = BACKGROUND COPY IN PROGRESS (TRUE | FALSE)
  CRA  = CHANGE RECORDING ACTIVE (TRUE | FALSE) (2 = CHANGE RECORDING VERSION
2)
  VR   = VALIDATION REQUIRED (T|F), REPORTED INFORMATION NOT CURRENT AND MAY NOT BE ACCURATE
  SWI  = SOURCE EXTENT WRITE INHIBITED (TRUE | FALSE | TFR = WRITE INHIBITED DUE TO FULL
REPOSITORY)
  TWP  = TARGET EXTENT WRITE PROTECTED (TRUE | FALSE)
  P    = EXTENTS IN PERSISTENT RELATION (TRUE | FALSE)
  SEVI = SPACE EFFICIENT VOLUME INFORMATION LEGEND:
     S = VOLUME QUERIED IS SPACE EFFICIENT (TRUE | FALSE)
     E = TARGET VOLUME IS SPACE EFFICIENT (TRUE | FALSE) WILL BE FALSE IF VOLUME QUERIED IS A TARGET
     V = FLASHCOPY RELATION WILL BE FAILED IF TARGET IS OUT OF SPACE (TRUE | FALSE)
     I = FLASHCOPY RELATION IS IN A FAILED STATE (TRUE | FALSE)
  PM   = PRESERVE MIRROR RELATIONSHIP INFORMATION LEGEND:
     N = NOT A MIRRORED RELATIONSHIP
     P = MIRRORED RELATIONSHIP, PREFERRED SPECIFIED
     R = MIRRORED RELATIONSHIP, REQUIRED SPECIFIED
     S = REMOTE MIRRORED RELATIONSHIP AT PPRC SECONDARY
     U = MIRRORED RELATIONSHIP UNDETERMINED
```

```
  N/A  = NOT AVAILABLE
The FLASHCPY SEQUENCE NUMBER and START OF EXTENT values are displayed in hex.
```

If any of the following conditions is true the indicated message will be displayed and the table will not be displayed.

- If the volume is not in a Flashcopy relationship, the following message is returned:

  ```
  VOLUME NOT IN A FLASHCOPY RELATION
  ```

- If the information cannot be retrieved because the data structures are inaccessible, the following message is returned, return code 12 is set, and the command terminated:

  ```
  FLASHCPY QUERY RELATIONS FAILED, DATA STRUCTURES INACCESSIBLE
  ```

- If the volume is in a Phase 1 Flashcopy relationship, the following message is returned:

```
VOLUME IS IN A PHASE 1 (VERSION 1) FLASHCOPY RELATIONSHIP. NOT ASYNCHRONOUS PPRC CAPABLE
```

- If the volume is in the extended long busy state, the following message is returned:

  ```
  VOLUME IS EXTENDED LONG BUSY FOR CONSISTENCY GROUPING
  ```

Syntax

FLASHCPY QUERY RELATIONS **FLASH QUERY RELS** **FC QUERY RELS**
Required Parameters: DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*)
Optional Parameters: ALLOWONLINE

Required parameters

DDNAME|SYSNAME|UNITADDRESS: identify volume to which I/O is issued

Parameter/ Abbreviations	Description
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and a VM volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a non-terminating wait state. For *ccuu*, specify the address (3 or 4 hex digits) of the channel and unit of the volume. This value should not be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. The unit address is the device number.
Default:	None
Restrictions:	None

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

Example of FLASHCPY Query Relations

Environment: The Flashcopy source volume at cuuu=5C06 is being queried.

```
FLASHCPY UNIT(5C06) -
         QUERY -
         RELATIONS
```

FLASHCPY WITHDRAW

FLASHCPY WITHDRAW is used to terminate Flashcopy relationships. Although ICKDSF supports only full volume Flashcopy establishment, FLASHCPY WITHDRAW withdraws all relationships including track level relationships to the specified volumes.

There are three forms of the FLASHCPY WITHDRAW command that are supported by ICKDSF, which are controlled through the use of the MODE keyword.

In the following explanation:

- the term 'addressed volume' refers to the device that is processing the command, i.e., the volume identified with UNIT, DDNAME, or SYSNAME keyword, if SOURCEVOL is not also specified, or the volume identified with the SOURCEVOL keyword if SOURCEVOL is specified.
- relations established with the persistent attribute will not be terminated except in case 1 below.

The three forms of FLASHCPY WITHDRAW are as follows:

1. MODE(NOCOPY) is the default if the MODE parameter is not specified. It indicates that all source relations between the addressed volume and the specified target are to be terminated, regardless of whether the data movement is in process for any relationship. No background copying is done. This also deletes persistent relations. If the addressed volume is the target volume, the source volume address will be determined within the control unit from stored information, and the relationship will be terminated.
2. MODE(COPY) indicates that the user wants to start background copies for all source relations on the addressed volume. Once the copy for a given **source** relation is complete the relation will be withdrawn. Note that termination of a non-persistent Flashcopy relation once a track has been copied is the normal course of events, independent of the use of the Withdraw command with MODE(COPY). All that specifying this keyword with the COPY parameter does is force the copying of the source tracks to the target tracks without waiting for an update to the source track that would normally launch the copying.
3. MODE(ALL) indicates the same thing that specifying MODE(COPY) does, but in addition all target relations on the addressed volume are also terminated.

Once Flashcopy relations are established it will not be typical for the relations to be withdrawn. Reasons for issuing Withdraws are migration to new DASD, DASD repair, or disaster recovery.

In cases where the Withdraw is intentional and planned the following process would be followed:

- Issue PPRCOPY POPULATESESSION REMOVE to depopulate the session.

- Issue PPRCOPY TERMASYNCCOPY to terminate Asynchronous PPRCOPY processing.
- Issue PPRCOPY DEFINESESSION CLOSE to terminate the session.
- Issue FLASHCPY WITHDRAW to terminate the Flashcopy relationship.

In such a case no special parameters need be set.

In the case of disaster recovery, however, the customer will need to be aware of the state of consistency groups in the affected session(s) and will need to indicate in the specification of the FLASHCPY WITHDRAW command how pending consistency groups are to be handled, specifically whether the state of the Flashcopy is to revert (change back) to a previous consistent state or to move forward, i.e., commit to the new state. The mechanism for doing this is to issue the FLASHCPY QUERY INCREMENTSTATUS or the FLASHCPY QUERY RELATIONS command to determine the state of consistency groups in the specified session and to then issue FLASHCPY WITHDRAW to each Flashcopy source volume in the session with the appropriate specification of REVERT or COMMIT. For disaster recovery information, see: "Disaster Recovery for Asynchronous PPRC Processing" on page 322 or *IBM TotalStorage Enterprise Storage Server User's Guide, SC26–7445, (Chapter 6: Disaster Recovery)*.

When establishing the Flashcopy relationship using the FLASHCOPY ESTABLISH command the INHIBITTARGETWRITES keyword can be specified to either inhibit or not inhibit write I/O to the Flashcopy target volume. One reason to not inhibit writes to the target volume is to be able to clip, i.e., change the volser, so that the volume can be brought online. However, during Asynchronous PPRCOPY configuration processing, the inhibition may be reinstated by Asynchronous PPRCOPY configuration processing itself. Operational control of this state is therefore provided with the Withdraw command. The keyword RESETTGTWRTINHIBIT is provided to allow the customer to reset Target Write inhibit without withdrawing the relation. When using this keyword, the I/O must be issued to the device from which the 'target write inhibit' is to be removed. Neither the SOURCEVOL nor TARGETVOL keywords are allowed to be specified with the RESETTGTWRTINHIBIT keyword.

If the volume to which this command is addressed does not have 'target write inhibit' active or if the volume only contains source relations, this command will have no effect.

Syntax

FLASHCPY WITHDRAW **FLASH WITHD** **FC WD**
Required Parameters: DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) TARGETVOL(*lss*,*cca*,*cuuu*)
Optional Parameters: ALLOWONLINE FORCE(**NO**|YES) MODE(COPY|**NOCOPY**|ALL) RELATSPACE RESETTGTWRTINHIBIT REVERT|COMMIT SOURCEVOL(*lss*,*cca*,*ssid*,*ser#*,*cuuu*)

Required parameters

DDNAME|SYSNAME|UNITADDRESS: identify volume to which the I/O is issued

Parameter/ Abbreviations	Description
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.

Parameter/ Abbreviations	Description
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and a VM volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a non-terminating wait state. For *ccuu*, specify the address (3 or 4 hex digits) of the channel and unit of the volume. This value should not be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. The unit address is the device number.
Default:	None
Restrictions:	None

TARGETVOL: identify Flashcopy target volume

Parameter/ Abbreviations	Description
TARGETVOL(*lss*,*cca*,*cuuu*) **TGTVOL**	Specifies the Flashcopy target volume. *lss* is a two digit hex value that identifies the logical subsystem number on the 2105, 2107, or 1750 target volume. If remote is implied through use of the SOURCEVOL keyword then this value is the LSS of the remote volume that will be the Flashcopy target volume for a PPRC secondary volume. This value should be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. *cca*, the channel connection address, is a 2-digit hex address that identifies the specific volume in the specified lss that will be the Flashcopy target volume for a Peer-to-Peer Remote Copy secondary volume. This value should be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. *cuuu* is the device number. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. This value cannot be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. This value is required to accommodate VM when the Flashcopy source volume is actively attached to a VM operating system and the volume is supported by VM or if the device is actively attached and running on an MVS or VSE operating system that is itself a guest on a VM system. It is not otherwise required.
Default:	None
Restrictions:	Required unless RESETTGTWRTINHIBIT is specified, in which case TARGETVOL cannot be specified.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

FORCE parameter: indicates to withdraw a mirrored relationship immediately instead of initializing a background copy

Parameter/ Abbreviations	Description
FORCE(NO|YES)	Indicates whether the withdraw of a mirrored relationship should be withdrawn immediately instead of initiating a background copy. **NO** Indicates that a background copy should be done on the local and remote relations. **YES** Indicates that a background copy should not be done.
Default:	NO
Restrictions:	If FORCE(YES) is specified with MODE(COPY) the FORCE parameter will be ignored. If FORCE(YES) is specified with MODE(ALL) the FORCE parameter will be ignored on the source relations and executed on the target relations for the volume.

MODE: indicate whether a background copy of source tracks is started and whether target relations are terminated

Parameter/ Abbreviations	Description
MODE(COPY|NOCOPY|ALL)	Specifies the type of Flashcopy operation **COPY** Indicates to start a background copy for all source relations on the addressed volume. Once the copy for a given source relation is complete, the relation will be withdrawn. Termination of a non-persistent Flashcopy relation once a track has been copied is the normal course of events, independent of the use of the FLASHCPY WITHDRAW command with MODE(COPY). Specifying MODE(COPY) forces the copying of the source tracks to the target tracks without waiting for an update to the source track that would normally launch the copying. **NOCOPY** All source relations between the addressed volume and the specified target are terminated regardless of whether the data movement is in process for any relationship. If the addressed volume is the target volume, the source volume address will be determined within the control unit from stored information, and the relationship will be terminated. No background copying is done. **ALL** Does the same thing that specifying MODE(COPY) does, but also terminates all Target relations on the addressed volume.
Default:	NOCOPY
Restrictions:	The MODE keyword is not allowed when REVERT is specified. MODE(ALL) is not allowed when COMMIT is specified.

RELATSPACE: release allocated target space if target is space efficient

Parameter/ Abbreviations	Description
RELATSPACE **RELATS** **RTS**	Indicates that allocated space associated with the target volume of the relationship, if the target is space efficient, should be released. The allocated space is released asynchronously and so may not be reported immediately.
Default:	None.
Restrictions:	Valid only for the 2107 device. RELATSPACE is ignored for 2105 and 1750 devices. Cannot be included with REVERT or RESETTGTWRTINHIBIT parameters.

RESETTGTWRTINHIBIT: reset target write inhibit

Parameter/ Abbreviations	Description
RESETTGTWRTINHIBIT **RESETTGTWRTINHB** **RTWI**	Resets target write inhibit on the Flashcopy target volume specified with the TARGETVOL keyword. Successful completion of this request will not withdraw the Flashcopy relation
Default:	None.
Restrictions:	The I/O must be issued to the device from which the 'target write inhibit' is to be reset. Cannot be included with: SOURCEVOL, TARGETVOL, REVERT, or COMMIT parameters.

REVERT/COMMIT: indicate that a pending consistency group Flashcopy state is to revert to a previous consistent version or move forward to the new state

Parameter/ Abbreviations	Description
REVERT|COMMIT	**REVERT** Indicates that the Flashcopy states are to be changed back (reverted) to the previous consistent state. **COMMIT** Indicates that the Flashcopy states are to be committed to the new consistent state.
Default:	None.
Restrictions:	Should be used only for disaster recovery. For disaster recovery information, see: “Disaster Recovery for Asynchronous PPRC Processing” on page 322 or *IBM TotalStorage Enterprise Storage Server User's Guide, SC26–7445, (Chapter 6: Disaster Recovery)*. REVERT cannot be included with the MODE parameter. COMMIT cannot be included with MODE(ALL). RESETTGTWRTINHIBIT cannot be included with either the REVERT or COMMIT parameters.

SOURCEVOL: identify remote Flashcopy source volume

Parameter/ Abbreviations	Description
SOURCEVOL(*lss*,*cca*,*ssid*,*ser#*,*cuuu*) **SRCVOL**	Specifies the remote Flashcopy source volume. SOURCEVOL is required only if the volume that is the Flashcopy source volume is the PPRCOPY secondary of the volume to which the I/O is issued. The volume to which the I/O is issued is identified via the DDNAME, SYSNAME OR UNITADDRESS keyword. *lss* is a two digit hex value that identifies the logical subsystem number of a remote Peer-to-Peer Remote Copy secondary volume that will be the Flashcopy source volume. This value should be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. *cca*, the channel connection address, is a 2-digit hex address that identifies the specific volume in the specified LSS. This value should be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. *ssid*, the storage control subsystem ID, is a 4-digit hexadecimal address that identifies the subsystem that contains the volume indicated by the CCA. This value should be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. *ser#*, the storage control serial number, is the last five digits of the 12-digit machine serial number for the 2105, 2107, or 1750 containing the specified LSS. This value should not be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. *cuuu* is the device number. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. This value cannot be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. This value is required to accommodate VM when the Flashcopy source volume is actively attached to a VM operating system and the volume is supported by VM or if the device is actively attached and running on an MVS or VSE operating system that is itself a guest on a VM system. It is not otherwise required. These values can be obtained with the **CONTROL CONFIGURE(DISPLAY)** command.
Default:	None
Restrictions:	Cannot be specified if RESETTGTWRTINHIBIT is specified.

Examples of Flashcopy Withdraw

Withdraw the existing Flashcopy relation between source volume at cuuu 5C06 and target volume at 5C87. The target volume also has an LSS value of x'01' and a CCA of x'07'.

Environment: Flashcopy source volume: CUUU=5C06
Flashcopy target volume: CUUU= 5C87, LSS=x'01', CCA=x'07'

```
FLASHCPY WITHDRAW UNIT(5C06) -
TARGETVOL(X'01', X'07',5C87)
```

Reset the target write inhibit on the Flashcopy target volume at cuuu 5C87.

Environment: Flashcopy source volume: CUUU=5C06
Flashcopy target volume: CUUU=5C87, LSS=x'01', CCA=x'07'

This will reset the write inhibition on the target volume and will not withdraw the Flashcopy relation.

```
FLASHCPY WITHDRAW UNIT(5C06) -
RESETTARGETWRITEINHIBIT
```

Figure 29: Example of Flashcopy Withdraw

Flashcopy Withdraw with PPRC Secondary as Flashcopy Source

Flashcopy Withdraw issued to a PPRC secondary volume to withdraw the Flashcopy relationship between Flashcopy source and target volume.

Environment:
PPRC Primary volume:
CUUU=7401, LSS=x'04', SSID=x'7400', CUSN=27771

PPRC Secondary and Flashcopy source volume:
CUUU=7C01, LSS=x'04', CCA=x'01', SSID=x'7C00', CUSN=27858

Flashcopy target volume
CUUU=7D01, LSS=x'05', CCA=''01', SSID='7D00', CUSN=27858

Example A: Flashcopy issued to PPRC secondary device 7C01 which is also Flashcopy source to Withdraw the Flashcopy relationship between Flashcopy source 7C01 and target device 7D01.

```
FLASHCPY WITHDRAW UNIT(7C01)  -
TGTVOL(X'05',X'01',7D01)
```

Example B: Inband Flashcopy issued to the PPRC primary volume at CUUU=7401 to withdraw the Flashcopy relation between the PPRC secondary volume at CUUU=7C01 and its Flashcopy target volume at CUUU=7D01. The UNIT keyword identifies the volume to which the I/O is issued. The SRCVOL keyword identifies the PPRC secondary volume to which the I/O is inbanded and which is to actually process the command. The TGTVOL keyword identifies the Flashcopy target volume.

```
FLASHCPY WITHDRAW UNIT(7401)  -
SRCVOL(X'04',X'01',X'7C00',27858)  -
TGTVOL(X'05',X'01',7D01)
```

Figure 30: Example of Flashcopy Withdraw with PPRC Secondary

Chapter 16. INIT command—CKD

If you are installing 3380, 3390, or 9345 devices...
You should use the INSTALL command. See Chapter 18, “INSTALL command—CKD,” on page 213.



You use the INIT command to initialize volumes. There are three levels of initialization.

1. **Minimal initialization** or **minimal INIT** refers to using the INIT command to write the volume label and VTOC on volumes for use by MVS or VSE operating systems. Minimal INIT is required for 3380, 3390, and 9345 devices after you use INSTALL or REVAL commands on MVS or VSE volumes. Minimal INIT is the only level of initialization valid for the 3995-151, 3995-153, and 3390-9 devices, and the minidisks.
2. **Medial initialization** or **medial INIT** refers to using the INIT command to validate the home address and record 0, and then perform a minimal INIT on a volume.

   For 3375 and older devices, medial INIT is recommended for:

   - A new DASD unit
   - Replaced or upgraded HDA
   - A DASD unit that has been physically relocated

   For 3380, 3390, and 9345 devices, use the INSTALL command.
3. **Initialization for open-system DASD** formats the volume for use as open-system DASD.

When initializing a volume, a flash copy withdraw is issued to release allocated space if the volume is a space efficient volume. The allocated space is released asynchronously and so may not be reported immediately. If the device being initialized is the source of a FlashCopy relationship, and the target of the relationship is a space efficient volume, the withdraw fails. In this case, ICKDSF fails the volume initialization and issues a message to the requestor that the relationship needs to be withdrawn prior to the initialization being processed.



Do not use the INIT command to perform a minimal INIT to volumes that are to be formatted for use in a VM environment. Use the CPVOLUME command instead.

When you initialize dual copy volumes, minimal initialization is the only level supported. Medial initialization requires that the volume is in simplex state.

For INIT support of minidisks and emulated devices, see:

- “MIMIC parameter: specify a special volume usage format” on page 171.
- Chapter 5, “Getting started with the CMS version,” on page 37.
- “Emulating devices” on page 82.

For information on ICKDSF support of the RAMAC family of devices, see “ICKDSF support of the RAMAC Array family” on page 8.

For information on ICKDSF support of the Internal Disk devices, see “ICKDSF support of the Internal Disk” on page 9.

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Protecting the INIT command with RACF

The MVS version of ICKDSF checks the general resource profile for a facility class profile of STGADMIN.ICK.INIT. If RACF is not installed or the facility STGADMIN.ICK.INIT is not created, the INIT command executes with no authorization check. For additional information, see "Protecting ICKDSF commands with RACF" on page 34.

Syntax

INIT

Required Parameters:
DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*)
VERIFY(*serial*|**NONE*[,owner]*)|NOVERIFY

Optional Parameters:
BOOTSTRAP|NOBOOTSTRAP
CLEAROWNERID
CONTINUE|NOCONTINUE
CYLRANGE(*start,end*)
DATA|NODATA
DEVICETYPE(*devtype*)
DOS[VSE]VTOC(END|*cylinder,head[,extent]*)
DSEXIST
FROMRANGE(*cylinder,head*)
HEADRANGE(*start,end*)
INDEX(*cylinder,head[,extent]*)|NOINDEX
IPLDD(*{dname|sysin}*[,OBJFORMAT|,ABSFORMAT])
LABELS(*n*)
MAP|NOMAP
MIMIC(*type*)
NOCHECK
NODSEXIST
OWNERID(*owner*)
PASSWORDS((*dsname/password*),...)
PURGE|NOPURGE
RESERVED
RESERVEPOOLNAME
SMSDSEXIST
STORAGEGROUP
SUBCHSET(*subchset-identifier*)
TORANGE(*cylinder,head*)
UNRESERVED
VALIDATE|NOVALIDATE
VERIFYOFFLINE|NOVERIFYOFFLINE
VOLID(*serial*)
VTOC(END|OPENDISK|*cylinder,head[,extent]*)

Required parameters

DDNAME|SYSNAME|UNITADDRESS parameter: identify the volume

Parameter/ Abbreviations	Description
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. Note that the volume must be online and mounted as PRIVATE. For *dname*, specify the MVS JCL statement that identifies the volume. **WARNING.** During online INIT processing, do not submit another job that will access the same volume. When you initialize a volume for the first time under MVS, the volume must be mounted offline because it contains no volume label and is not acceptable to an operating system.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.

Parameter/ Abbreviations	Description
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and an attached CMS volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address (3 or 4 hexadecimal digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated volume or minidisk. The unit address is the device number.
Default:	None.
Restrictions:	None.

VERIFY|NOVERIFY parameter: verify volser and ownerid

Parameter/ Abbreviations	Description
VERIFY(*serial[,owner]*) **VFY**	Required when you want to verify the volume serial number and owner identification before initializing the volume or minidisk. If the volume serial number or owner identification does not match that found on the volume or minidisk, INIT ends. For *serial*, substitute 1 to 6 alphanumeric characters for the volume serial number. To verify that a volume serial number does not exist, substitute the string *NONE* for *serial*. If no volume serial exists, or if the volume serial is actually "*NONE*", the INIT operation continues. If a volume serial exists, the INIT command ends. For *owner*, substitute 1 to 14 alphanumeric characters for the owner identification. Running in the offline mode, if VERIFY(*serial*) parameter is specified in the INIT command and PARM='NOREPLYU' is specified in the EXEC card in the JCL, no operator's intervention (Reply U or T) is required. If PARM='NOREPLYU,FORCE' is specified in the JCL, the VERIFY(*serial*) parameter is not required to bypass the operator's intervention (Reply U or T) message.
NOVERIFY **NOVFY** **NVFY**	Required when you want to bypass verification of the volume serial number.
Default:	None. You must specify either VERIFY or NOVERIFY.
Restrictions:	You cannot verify the owner identification separately from the volume serial number. Both the volume serial number and the owner identification must be verified when you want to verify the owner identification. When you specify the VERIFY parameter and verification fails, the command stops running.

Optional parameters

BOOTSTRAP|NOBOOTSTRAP parameter: write IPL records

Parameter/ Abbreviations	Description
BOOTSTRAP **BOOT**	Indicates that you are supplying the IPL bootstrap records that are written on the volume or minidisk during initialization. These records must be the first four records in the IPL program text. The first text record must have IPL1 in the first four columns, followed by 24 bytes of data. These 24 bytes have the same format as the first IPL record described under ABSFORMAT in "IPLDD parameter: write a user-supplied IPL program on the volume" on page 168. The next three text records must have IPL2 in their first four columns, followed by 68 bytes of data each in the second and third records and eight bytes of data in the last record. These 144 bytes of data have the same format as IPL record 2 described under ABSFORMAT.

Parameter/ Abbreviations	Description
NOBOOTSTRAP **NOBOOT** **NBOOT**	Indicates that you want the system to supply the IPL bootstrap records that are written on the volume during initialization.
Default:	NOBOOTSTRAP
Restrictions:	The BOOTSTRAP|NOBOOTSTRAP parameters apply only when the IPLDD parameter is specified. This parameter is ignored when the IPL program is supplied in absolute format. The BOOTSTRAP|NOBOOTSTRAP parameters are not valid for the 3995-151 and 3995-153 devices. **Note:** The BOOTSTRAP parameter cannot be specified without the IPLDD parameter.

CLEAROWNERID parameter: remove the owner identification

Parameter/ Abbreviations	Description
CLEAROWNERID **CLROWNER**	Removes the owner identification in the volume or minidisk label and replaces it with blanks.
Default:	None.
Restrictions:	Not valid with the OWNERID or RESERVEPOOLNAME parameter.

CONTINUE|NOCONTINUE parameter: resume from a checkpoint

Parameter/ Abbreviations	Description
CONTINUE **CONT**	Resumes processing from the last checkpointed location. Issues a message indicating where processing is resumed.
NOCONTINUE **NOCONT**	When you specify NOCONTINUE, INIT recovers approximately 1,000 tracks from the last checkpoint, and then processes the new range or full volume, as specified. For examples of this parameter, see “Resuming initialization from a checkpoint location” on page 71. Note that ICKDSF still goes to the backup location even if you issue NOCONTINUE. This is done to ensure no tracks are left in a nonstandard format.
Default:	CONTINUE
Restrictions:	These parameters are interrogated only if processing was previously interrupted during a medial or maximal initialization. The CONTINUE function does not support the 3995-151, 3995-153, 3390-9, or a CKD device emulated on an FBA device. CONTINUE is ignored for minidisks. When VTOC(OPENDISK) is specified, the CONTINUE and NOCONTINUE parameters are ignored. Checkpoint recovery may take place for a previous checkpoint, but the volume formatting will then resume from the beginning of the volume to ensure every track on the volume has the proper format.

CYLRANGE parameter: specify a range of cylinders

Parameter/ Abbreviations	Description
CYLRANGE(*start,end*) **CYLR** **CYL**	Used to specify what part of a volume is to be surface checked. Use the CYLRANGE parameter to specify the starting and ending cylinders to be examined before standard volume initialization is performed. For *start,end*, substitute decimal (**n**) or hexadecimal digits (for example, X'2AB',X'3DE') to identify the starting and ending cylinders to be examined. If you specify CYLRANGE and do not specify HEADRANGE, all the heads of the specified cylinders are processed. For information on specifying the starting and ending heads (HEADRANGE) to go with the starting and ending cylinders, see "HEADRANGE parameter: specify a range of heads" on page 167. For information on specifying part of a volume, see "RANGE parameters: specifying part of a volume" on page 182.
Default:	None.
Restrictions:	Only the starting value is required for CYLRANGE. If the user does not specify an ending value, the last cylinder is used as the ending value. By specifying an ending value greater than the maximum for the device, processing is performed to the maximum value for that device. CYLRANGE: • Cannot be specified with FROMRANGE/TORANGE. • Applies only when VALIDATE is specified.

DATA|NODATA parameter: write FFVDP

Parameter/ Abbreviations	Description
DATA	Writes the FFVDP on the specified tracks during the validate process.
NODATA	Indicates you do not want to write the FFVDP on the volume.
Default:	NODATA
Restrictions:	The DATA parameter applies only when the VALIDATE parameter has been specified. If DATA is specified with NOVALIDATE, the function ends with a condition code of 12. DATA: • Is valid for the IBM 3375, 3380, 9345, 9391, 9394, and the 3390 (models 1, 2, and 3), 9393, 9396, 9397, and Internal Disk devices. • Is not valid for the 3390-9 or when you are processing minidisks. When DATA is specified for other devices, the parameter is ignored and no data is written.

DEVICETYPE parameter: identify the type of device

Parameter/ Abbreviations	Description
DEVICETYPE(*devtype*) **DEVTYPE** **DEVTYP**	Required in the Stand-Alone version when the MIMIC(MINI) or MIMIC(EMU) parameter is specified. For *devtype*, substitute 1 to 8 characters for the type of device on which the volume is mounted. See Table 13 on page 8 for valid device types.
Default:	None.
Restrictions:	Applies only when you are initializing a volume in the Stand-Alone version and MIMIC(MINI) or MIMIC(EMU) is specified. If DEVICETYPE is specified when it does not apply, it will be ignored.

DOSVTOC|VSEVTOC parameter: specify the VTOC in VSE



Parameter/ Abbreviations	Description
DOSVTOC(END| *cylinder,head[,extent]*) DVTOC	Specifies the location and size of the volume or minidisk VTOC for a VSE system. For *cylinder,head*, specify decimal (**n**) or hexadecimal numbers (for example, X'AB',X'0') to identify the cylinder and head where the volume table of contents is to be placed. For *extent*, specify decimal (**n**) or hexadecimal numbers (for example, X'E') for the number of tracks that are to be reserved for the volume or minidisk VTOC. If extent is omitted, one track is reserved. When you specify DOSVTOC(END) or VSEVTOC(END), the VTOC is put on the last primary cylinder of the volume or minidisk and is one cylinder in length.
VSEVTOC(END| *cylinder,head[,extent]*)	VSEVTOC and DOSVTOC give the same results. See DOSVTOC explanation above.
Default:	If VTOC, DOSVTOC, or VSEVTOC, are not specified, the default taken is an MVS VTOC at cylinder 0, track 1. If VTOC, DOSVTOC, or VSEVTOC are not specified, and the device is not a minidisk, the size is defaulted to the number of tracks in a cylinder minus one.
Restrictions:	You cannot place a VTOC at cylinder 0, track 0. Specification of the INDEX parameter is invalid with DOSVTOC. For devices that have the ability to be configured as small volumes, do not use the ICKDSF default sizes if the volume is too small for them. The size must be specified to fit within the size of the device configured.

Note: For devices containing more than 64K tracks, there are special considerations for VTOC placement. The existing IBM software uses relative track addressing or the Track-Track-Record (TTR) format to process the VTOC. This restricts the highest address that can be referenced as a VTOC track to be 64K-1. Because of this, the entire VTOC must reside within the first 64K tracks; that is, the VTOC must end before cylinder 4369 (X'1111') head 1

DSEXIST parameter: override NODSEXIST parameter default allowing data sets to exist on the volume



Although DSEXIST is valid only in an MVS operating environment, you can issue it with the MVS, CMS, and Stand-Alone versions of ICKDSF.

Parameter/ Abbreviations	Description
DSEXIST **DS**	To override the NODSEXIST parameter default and allow the INIT command to a volume which contains data sets other than the VTOC index data set or VVDS. **Note:** The NODSEXIST parameter will not be defaulted if an online INIT is attempted on a volume that has been initialized as a Data Facility Storage Management Subsystem (DFSMS) managed volume. If data sets other than the VTOC index data set or VVDS exist on a DFSMS managed volume the command will be terminated and message ICK32177I DATA SETS EXIST ON DFSMS MANAGED VOLUME will be in the job output if an online INIT is attempted. If you wish to allow an online INIT to a DFSMS managed volume which contains data sets you must use the SMSDSEXIST parameter.
Default:	None.
Restrictions:	Not valid with the NODSEXIST parameter.

FROMRANGE parameter: specify a specific starting location

Parameter/ Abbreviations	Description
FROMRANGE(*cylinder,head*) **FROMR** **FROM**	Use this parameter to specify the starting track (cylinder and head) to be surface checked or examined before minimal volume initialization is performed. For *cylinder,head* substitute decimal (**n**) or hexadecimal digits (for example, X'2AB',X'E') to identify the cylinder and head at which processing is to start. If you specify only one value, ICKDSF takes it to be the cylinder and the head value is defaulted to 0. If you specify FROMRANGE and do not specify TORANGE, TORANGE is defaulted to the last alternate cylinder of a volume or minidisk. For information on specifying the ending track (TORANGE) to go with the starting track, see "TORANGE parameter: specify a specific ending location" on page 175. For information on specifying part of a volume to be examined, see "RANGE parameters: specifying part of a volume" on page 182.
Default:	None.
Restrictions:	FROMRANGE cannot be specified with CYLRANGE/HEADRANGE. FROMRANGE applies only when VALIDATE is specified.

HEADRANGE parameter: specify a range of heads

Parameter/ Abbreviations	Description
HEADRANGE(*start,end*) **HDRANGE** **HEADR** **HDR** **HD**	Use the HEADRANGE parameter to specify the part of a volume you want surface checked. For *start,end*, substitute decimal (**n**) or hexadecimal digits (for example, X'8',X'E') to identify the starting and ending heads to be examined. If you specify only one value, ICKDSF takes the value to be the starting range and defaults the ending range to the device maximum. If you specify HEADRANGE and do not specify CYLRANGE, the specified heads for all the cylinders on a volume or minidisk are processed. For information on specifying the starting and ending cylinders (CYLRANGE) to go with the starting and ending heads, see "CYLRANGE parameter: specify a range of cylinders" on page 165. For information on specifying part of a volume, see "RANGE parameters: specifying part of a volume" on page 182.
Default:	None.
Restrictions:	The starting value is required for HEADRANGE. If you do not specify an ending value, the highest head is used as the ending value. HEADRANGE: • Cannot be specified with FROMRANGE/TORANGE • Applies only when VALIDATE is specified • Is not valid for the minidisks

INDEX|NOINDEX parameter: creating a VTOC index



Parameter/ Abbreviations	Description
INDEX(*cylinder,head [,extent]*)	Specifies the starting location and size of the index data set. Values for subparameters *cylinder* and *head* are required; specification of *extent* is optional. For *cylinder,head*, specify decimal (**n**) or hexadecimal numbers (for example, X'1AB',X'E') to identify the cylinder and head, where the index is to start. For *extent*, specify decimal (**n**) or hexadecimal numbers (for example, X'E') for the number of tracks that are to be reserved for the index data set. If you specify cylinder and head but not extent, extent will be calculated based on the size of the VTOC. The default name of SYS1.VTOCIX.volser is used as the VTOC index name. If the *volser* begins with a numeric character, the default data set name will be SYS1.VTOCIX.Vxxxxx. For example, if the *volser* is 339001, the default data set name is SYS1.VTOCIX.V39001. For more information about indexed format VTOCs, see Appendix C, "VTOC index," on page 655. If you issue: `INDEX(10,11,12)` the index will be placed starting at cylinder 10, track 11 for a total of 12 tracks. Expressed in hexadecimal: `INDEX(X'A',X'B',X'C')`
NOINDEX NIX	Use this parameter when you do not want ICKDSF to generate an index.
Default:	If DOSVTOC or VSEVTOC is specified, the default is NOINDEX. Otherwise the default is INDEX. When the INDEX parameter is defaulted, the index is generated starting at the track following the end of the VTOC. However, if you specify VTOC(END), the default index is located in the cylinder that precedes the VTOC. For both instances the default size of the index is based on the required index records for a given volume size and the size of the VTOC.
Restrictions:	Specification of the INDEX parameter is invalid with the VSEVTOC or DOSVTOC parameters. The STORAGEGROUP and NOINDEX parameters are mutually exclusive. For devices that have the ability to be configured as small volumes, do not use the ICKDSF default sizes if the volume is too small for them. The size must be specified to fit within the size of the device configured. The Index data set has to be allocated within the first 65,520 cylinders on a volume and can not exceed 64K-1 tracks in size.
Note: The system generates SYS1.VTOCIX.volser as the name of VTOC index unless the volser begins with a numeric character, in which case the convention is SYS1.VTOCIX.Vxxxxx, where xxxxx is the volser with the first character overlaid by V. It is recommended that the index be placed starting at the track following the VTOC so that the VTOC can be expanded later if needed.	

IPLDD parameter: write a user-supplied IPL program on the volume

Parameter/ Abbreviations	Description
IPLDD(*{dname|sysin}*[, `OBJFORMAT`|,ABSFORMAT])	
IPLDD IPL	Allows you to supply an IPL program to be written on the volume or minidisk during initialization. For more detailed information, see "Writing an IPL program on the volume with IPLDD" on page 170.

OBJFORMAT
OBJECT
OBJ
	Specifies that IPL data is being supplied in object deck format; that is, cards will have one of the following strings of EBCDIC characters in columns 2 through 4:
	`TXT`
	`RLD`
	`ESD`
	`END`
	Note that only cards with TXT will be processed. All others will be ignored.

ABSFORMAT ABSOLUTE ABS	Specifies that IPL data is being supplied as variable-length records that contain executable instructions. For more detailed information, see "Supplying variable-length records as IPL data" on page 170.
Default:	OBJFORMAT The system provides special IPL bootstrap records if you specify the IPLDD parameter without specifying the BOOTSTRAP parameter.

Parameter/ Abbreviations	Description
Restrictions: 	In the CMS or Stand-Alone versions, the *dname* subparameter of IPLDD must be SYSIN. When an IPL program is included in the SYSIN stream, it must immediately follow the INIT command and end with an ENDIPLTEXT card. The ENDIPLTEXT card is optional when the IPL program is in a data set other than the one specified by SYSIN or when the end-of-file indicator (/*) immediately follows the data for the IPL program. The IPLDD parameter is not valid for 3995-151 or 3995-153. IPLDD is not valid in the VSE environment.

NOCHECK parameter: surface checking of the volume

Parameter/ Abbreviations	Description
NOCHECK **NOCHK** **NCHK**	Indicates that you do not want the tracks to be surface checked for recording errors during initialization. Initialization will be done at the medial or minimal level only, depending on the VALIDATE|NOVALIDATE specification.
Default:	NOCHECK
Restrictions:	The CHECK parameter is no longer supported.

NODSEXIST parameter: verify no data sets exist on the volume



Although NODSEXIST is valid only in an MVS operating environment, you can issue it with the MVS, CMS, and Stand-Alone versions of ICKDSF.

If NODSEXIST is specified or defaulted, the INIT command will terminate with message ICK32179I DATA SETS EXIST ON VOLUME if data sets other than the index data set and/or VVDS exist on the volume.

Parameter/ Abbreviations	Description
NODSEXIST **NODS**	To not allow INIT to a volume which contains data sets other than the VTOC index data set or VVDS.
Default:	None. **Note:** With APAR PI67283 and OA51084 the NODSEXIST parameter default may be enabled via the following DEVSUPxx parameter: `ICKDSF_NODSEXIST=` **YES** Enable the NODSEXIST parameter to be defaulted. To override the default you may specify the DSEXIST parameter. **NO** Disable the NODSEXIST parameter to be defaulted. Refer to *z/OS MVS Initialization and Tuning Reference* for additional information. **Note:** The NODSEXIST parameter will not be defaulted if an online INIT is attempted on a volume that has been initialized as a Data Facility Storage Management Subsystem (DFSMS) managed volume. If data sets other than the VTOC index data set or VVDS exist on a DFSMS managed volume the command will be terminated and message ICK32177I DATA SETS EXIST ON DFSMS MANAGED VOLUME will be in the job output if an online INIT is attempted.
Restrictions:	Not valid with the SMSDSEXIST or DSEXIST parameters.

Writing an IPL program on the volume with IPLDD

The following is an explanation of the results you can expect from the IPLDD and BOOTSTRAP parameters:

- If you specify IPLDD but do not specify BOOTSTRAP, ICKDSF supplies an IPL bootstrap that is written on the volume or minidisk during initialization together with the IPL text you supply.
- If you specify IPLDD and BOOTSTRAP, ICKDSF uses the IPL bootstrap and the IPL text you supply. If necessary, ICKDSF updates the bootstrap records to allow for possible user labels.
- If you do not specify IPLDD, ICKDSF writes special bootstrap records that cause the processing unit to be placed in a WAIT state if the volume or minidisk is specified during an attempt to load the system. Bit 12 of the wait state PSW is set on.

The maximum size permitted for the IPL program record depends upon the type of volume being initialized. The maximum sizes allowed are:

Table 37: Maximum size permitted for the IPL program record

Volume Type	Maximum Bytes for IPL Program
3375	33 984
3380	44 948
3390 (3380 mode)	44 948
3390	53 450
9345	49 938

Also, the number of additional user volume labels can further limit the size allowed for the IPL program. If you supply an IPL program that exceeds the size allowed, you receive an error message but initialization continues.



With the MVS version, use *dname*. For *dname*, substitute 1 to 8 alphanumeric characters for the DD statement identifying the data set that contains the IPL program you want written on the volume (or minidisk) being initialized. The IPL program can be included within the MVS JCL input stream (SYSIN). If the IPL program is in the MVS JCL input stream, the data must be included immediately after the INIT command.



With the CMS or Stand-Alone versions, use *sysin*. It must be the same device as the input device. The data must immediately follow the INIT command and end with an ENDIPLTEXT card. In a VM environment, the IPLDD data must be contiguous to the INIT command.

Supplying variable-length records as IPL data

ABSFORMAT specifies that IPL data is being supplied as variable-length records that contain executable instructions. When IPL data is supplied in this format, it is necessary to provide a minimum of three records. The maximum number of records supplied and their lengths are limited only by the track capacity of the volume or minidisk on which these records are to be written.

The first two records supplied must be the bootstrap records and are restricted to lengths of 24 and 144 bytes, respectively.

The contents of the IPL records and the contents of the program are not checked by ICKDSF. It is the user's responsibility to ensure that the IPL records can load an executable program. The first IPL record must contain a PSW followed by two CCWs (channel command words). The following is an example of CCWs in an IPL record:

First CCW
06xxxxxx 60000090

Second CCW
08xxxxxx 00000000

The first CCW is a command to read in the second IPL record at main storage address xxxxxx. The second CCW is a transfer-in-channel command (a branch) to the CCW that begins the second IPL record.

The second IPL record must be 144 bytes long. Bytes 32 through 42 (starting from byte 0) cannot be used. Bytes 32 through 42 are used by ICKDSF for the seek address (bytes 32 through 37) and the CCHHR (bytes 38 through 42) of the third IPL record.

The third through nth records that are supplied are assumed to be IPL program records and will be written on the volume, without any modification, after the standard volume label and any existing user volume labels. Note that the IPL program will be written only on the first track of the pack. If the records supplied exceed in length the remaining space on the first track, the function will end with an error message.

LABELS parameter: reserve space for additional volume labels

Parameter/ Abbreviations	Description
LABELS(*n*) **LABEL** **LBL**	Specifies that space on cylinder 0, track 0 is to be reserved for additional volume labels, also known as user volume labels. In addition to the label that must be written on the volume, a maximum of nine additional volume labels can be specified. To specify **n**, substitute a decimal number from 1 through 9 for the number of additional user volume labels to be placed on the volume during initialization.
Default:	None.
Restrictions:	If LABELS is not specified, user volume labels that existed from a previous initialization are destroyed. If a value greater than 9 is specified with the LABELS parameter, the INIT command ends.

MAP|NOMAP parameter: print a volume map

Parameter/ Abbreviations	Description
MAP	Prints a volume map during initialization. The volume map lists tracks that are found to be defective or inconsistent during initialization.
NOMAP	Indicates that you do not want to print a volume map during initialization.
Default:	MAP
Restrictions:	Potential entries in the MAP are limited to the scope of tracks that were referenced during processing. For minimal initialization, referenced tracks include only the alternate tracks and any primary tracks that might be associated with them. For medial and maximal initialization, this also includes all tracks in the specified range. Note that if there are primary tracks incorrectly associated with alternates, that information is not available in a minimal initialization MAP. MAP is ignored for 9391, 9393, 9396, 9397, Internal Disk devices, 2105, 2107, 1750, and minidisks. **Note:** The MAP parameter is ignored for devices that do not have alternate tracks.

MIMIC parameter: specify a special volume usage format



Parameter/ Abbreviations	Description
MIMIC(*type*)	Specifies a special usage format for the volume being initialized. For *type*, specify MINI(n), EMU(n), or EMUALL.
MINI(n) 	Indicates that a minidisk is to be initialized. **n** represents the number of cylinders that are to comprise the minidisk. For more information, see Chapter 7, "Getting started with the Stand-Alone version," on page 53. The MINI(n) parameter is valid in the Stand-Alone version only. You must specify the DEVICETYPE parameter with MINI(n). MINI(n) should be used only with minimal INIT for all devices. If media maintenance functions are required on a device in the VM environment, the device must be dedicated to the user ID that is executing ICKDSF. MIMIC(MINI(n)) is not required when running Stand-Alone under the VM operating system.
EMU(n)	Indicates that a partial CKD disk emulated on a 3370 FBA device is to be initialized. In the Stand-Alone version, you must also specify the DEVICETYPE parameter.
EMUALL	Indicates that a full CKD disk is emulated on a 3370 FBA device.
Default:	None.
Restrictions: 	If EMU(n) or EMUALL is specified for an emulated device, validation and surface checking functions are bypassed. Data checks should be handled using the INIT command against the base FBA device. MIMIC is not valid in the CMS version. When you emulate a CKD device on the 9313, 9332, or 9335, do not use MIMIC(EMU) or MIMIC(EMUALL). For more information, see "Initializing an emulated CKD Device on an IBM 9313, 9332, or 9335 FBA device" on page 83. To change the mode of an IBM 3390 to either 3390 mode or 3380 track compatibility mode, use INSTALL SETMODE, not INIT.

OWNERID parameter: specify the owner identification

Parameter/ Abbreviations	Description
OWNERID(*owner*) **OWNER**	Writes the owner identification in the volume or minidisk label. For *owner*, substitute 1 to 14 alphanumeric characters for the owner identification to be written in the volume or minidisk label. To assign a reserved volume to a reserve storage pool, specify IBMRSP*rspname* for *owner*, where *rspname* is the 1 to 8 character reserve storage pool name. Use the RESERVED parameter to mark a volume as reserved.
Default:	The default for *owner* during a first-time initialization is 14 blanks. If you do not specify OWNERID when reinitializing a previously initialized volume, the owner identification remains unchanged.
Restrictions:	Not valid with the CLEAROWNERID or RESERVEPOOLNAME parameter.

PASSWORDS parameter: provide passwords for data set security

Parameter/ Abbreviations	Description
PASSWORDS ((*dsname/password*),...) **PASSWORD** **PASSWD** **PWD** **PD**	Specifies passwords for non-VSAM password-protected data sets. The supplied passwords will be used to determine if the user has authority to alter the data sets. For *dsname*, substitute the fully qualified name of a password-protected data set. For *password*, substitute the password you wish to apply to this data set.
Default:	None.
Restrictions:	Up to a maximum of 512 passwords may be specified. This parameter is ignored in the CMS, VSE, and Stand-Alone versions.

PURGE|NOPURGE parameter: write over previously written data

Parameter/ Abbreviations	Description
PURGE **PRG**	Indicates that you want to write over the data in the following types of data sets during initialization: Unexpired VSAM Password-protected RACF-protected A volume that appears to contain real data cannot be initialized unless the PURGE parameter is specified. For more information about the actions taken when certain types of data are found on the volume, see "Protecting MVS volumes and data sets" on page 30.
NOPRG **NPRG**	Indicates that you do not want to write over existing data. If a volume appears to contain real data, it cannot be initialized unless the PURGE parameter is specified in the VSE environment. In the MVS environment, the volume can be initialized even with NOPURGE specified, if the user is authorized.
Default:	NOPURGE
Restrictions:	The NOPURGE parameter does not apply in offline mode or in the CMS or Stand-Alone versions. If you initialize a volume in offline mode or in the CMS or Stand-Alone versions, all existing data on the volume is purged, regardless of the data set security attributes.

RESERVED parameter: mark the volume as reserved so that it cannot come online

Parameter/ Abbreviations	Description
RESERVED	Marks the volume as reserved. A volume that is reserved cannot be brought online to any system. To assign a reserved volume to a reserve storage pool, use the OWNERID or RESERVEPOOLNAME parameter. For more information about reserve storage pools, see Defining reserve storage pools in *z/OS DFSMSdfp Storage Administration*. A volume that has been initialized as reserved is not to be confused with a device for which a system issues a hardware RESERVE, either through the RESERVE or ISGENQ macros, to ensure successful serialization of shared DASD. For more information, refer to *z/OS MVS Programming: Authorized Assembler Services Reference LLA-SDU* or *z/OS MVS Programming: Authorized Assembler Services Reference EDT-IXG*.
Default:	None.
Restrictions:	Requires the UNIT and VOLID parameters. Not valid with the UNRESERVED parameter.

RESERVEPOOLNAME parameter: specify the reserve storage pool name

Parameter/ Abbreviations	Description
RESERVEPOOLNAME (*pool-name*) **RSPNAME**	Writes the reserve storage pool name in the owner identification field of the volume or minidisk label. For *pool-name* substitute 1 to 8 alphanumeric characters for the reserve storage pool name. This pool name will be prefixed with 'IBMRSP' and written in the owner identification field of the volume or minidisk label.
Default:	None.
Restrictions:	Requires the RESERVED parameter. Not valid with the OWNERID or CLEAROWNERID parameter.

SMSDSEXIST parameter: Data sets exist on a SMS managed volume



Although SMSDSEXIST is valid only in an MVS operating environment, you can issue it with the MVS, CMS, and Stand-Alone versions of ICKDSF.

Parameter/ Abbreviations	Description
SMSDSEXIST SMSDS	Allows online init to a storage management subsystem (SMS) managed volume which contains data sets.
Default:	None.
Restrictions:	Not valid with the NODSEXIST parameter.

STORAGEGROUP parameter: initialize a volume that is system-managed



Although STORAGEGROUP is valid only in an MVS operating environment, you can issue it with the MVS, CMS, and Stand-Alone versions of ICKDSF.

Parameter/ Abbreviations	Description
STORAGEGROUP STGR SG	Specifies that the volume to be initialized is to be in a DFSMS environment.
Default:	None.
Restrictions:	The STORAGEGROUP parameter and the NOINDEX parameter are mutually exclusive.

SUBCHSET parameter: specify the subchannel set identifier



Parameter/ Abbreviations	Description
SUBCHSET(*subchset-identifier*)	Specifies the subchannel set identifier for the volume you want to initialize. For *subchset-identifier* substitute a decimal subchannel set identifier that is valid for the level of z/OS on which you are issuing the command.
Default:	None.
Restrictions:	The SUBCHSET parameter requires that the UNIT parameter is also specified. It is valid only with z/OS V1R10 and higher.

TORANGE parameter: specify a specific ending location

Parameter/ Abbreviations	Description
TORANGE(*cylinder,head*) **TOR** **TO**	Use this parameter to specify the ending track (cylinder and head) to be examined before minimal volume initialization is performed. For *cylinder,head*, substitute the decimal (**n**) or hexadecimal digits (for example, X'2AB',X'E') to identify the cylinder and head where processing is to end. If you specify only one value, ICKDSF takes it to be the cylinder and defaults the head to the device maximum. If you specify TORANGE and do not specify FROMRANGE, FROMRANGE is defaulted to cylinder 0, head 0 of the specified or minidisk. For information on specifying the starting track of part of a volume (FROMRANGE), see "FROMRANGE parameter: specify a specific starting location" on page 167. For information on specifying part of a volume, see "RANGE parameters: specifying part of a volume" on page 182.
Default:	None.
Restrictions:	Valid only when VALIDATE is specified.

UNRESERVED parameter: initialize a reserved volume as non-reserved

Parameter/ Abbreviations	Description
UNRESERVED	Specifies that the volume previously marked as reserved using the RESERVED parameter is to be initialized as a non-reserved volume. A volume that has been marked as reserved is not to be confused with a device for which a system issues a hardware RESERVE, either through the RESERVE or ISGENQ macros, to ensure successful serialization of shared DASD. For more information, refer to "RESERVED parameter: mark the volume as reserved so that it cannot come online" on page 173.
Default:	If you do not specify the OWNERID or CLEAROWNERID parameter, the owner identification in the volume or minidisk label is replaced by blanks if it begins with 'IBMRSP'.
Restrictions:	Not valid with the RESERVED parameter.

VALIDATE|NOVALIDATE parameter: validate home address/record 0

Parameter/ Abbreviations	Description
VALIDATE **VAL**	Performs a medial initialization when NOCHECK is specified. The home address and record 0 for each track in the specified range are read, validated, and rewritten. The data remaining on a track is erased. VALIDATE is less time-consuming than surface checking.
NOVALIDATE **NOVAL** **NVAL**	Indicates that you do not want to validate the home address and record 0 for each track during initialization. When you specify NOVALIDATE with the NOCHECK parameter, you initialize the volume at the minimal level.
Default:	NOVALIDATE
Restrictions:	VALIDATE is not valid for minidisks, 3995-151, 3995-153, and real 3390-9.

VERIFYOFFLINE|NOVERIFYOFFLINE parameter: verify device is offline to all other systems



Parameter/ Abbreviations	Description
VERIFYOFFLINE **VFYOFF** **VOFF**	Verifies that the device is offline to all other systems before the command is attempted. If the device is online to any other systems, message ICK31306I is issued and the command is terminated. **Note:** If the device is offline to all systems, or the device is in an active XRC session and the system it is online to is the XRC Data Mover host, the command is allowed to proceed.
NOVERIFYOFFLINE **NOVFYOFF** **NOVOFF**	Bypasses verification that the device is offline to all other systems before the command is attempted.
Default:	The VERIFYOFFLINE parameter is taken as the default for the z/OS version if all of the following are true: • UNIT parameter is specified • Storage control microcode support exists • z/OS software support exists • Device is not a minidisk The z/OS software support is provided in APAR OA40719 for z/OS V2R1 and V1R13, and incorporated into z/OS V2R2. The hardware support was provided in the following: • DS8870 R7.1 GA, Bundle 87.10.87.0, LIC 7.7.10.287 • DS8700 R6.3 SP6, Bundle 76.31.79.0, LIC 6.6.31.670 • DS8800 R6.3 SP6, Bundle 86.31.95.0, LIC 7.6.31.1150. **Note:** With APAR PI52935 and OA49448 the VERIFYOFFLINE parameter default may be disabled via the following DEVSUPxx parameter: `ICKDSF_VERIFYOFFLINE=` **YES** Enable the VERIFYOFFLINE parameter to be defaulted if all of the following are true: 1. UNIT parameter is specified 2. Storage control microcode support exists 3. z/OS software support exists 4. Device is not a minidisk **NO** Disable the VERIFYOFFLINE parameter as default. If you want to verify that the device is offline to all host systems, the VERIFYOFFLINE parameter must now be specified. Refer to *z/OS MVS Initialization and Tuning Reference* for additional information. **Warning**: The VERYIFYOFFLINE functionality was introduced to alert system programmers and storage administrators that the DASD being initialized is online to one or more systems. Initializing DASD that is online to other systems introduces a data integrity exposure. The data integrity exposure is because each z/OS system maintains in its UCB a pointer to the VTOC. This VTOC pointer can only be automatically refreshed on z/OS systems within the Sysplex where the initialization is being performed, if the DEVSUPxx member has REFUCB enabled AND if the device is not allocated. If the pointer to the VTOC is not refreshed and points to a different location than the newly initialized VTOC location it would continue to use the existing VTOC which could cause overlay problems.
Restrictions:	The VERIFYOFFLINE|NOVERIFYOFFLINE parameters require that the UNIT parameter is also specified. The VERIFYOFFLINE parameter is valid only in the z/OS version of ICKDSF. The NOVERIFYOFFLINE parameter is ignored in the CMS, VSE, and Stand-Alone versions.

VOLID parameter: specify the volume serial number

Parameter/ Abbreviations	Description
VOLID(*serial*)	Writes the volume serial number in the volume or minidisk label. For *serial*, substitute 1 to 6 alphanumeric, national ($, #, @), or special characters for the volume serial number. If fewer than 6 characters are specified, the serial is left-justified, and the remainder of the field is padded with blanks (X'40'). **Note:** Characters are not validated, so check your operating system guide for valid alphanumeric characters.
Default:	When you initialize a volume or minidisk that was previously initialized and do not specify the VOLID parameter, the old volume serial number remains unchanged.
Restrictions:	You cannot change the volume serial number of an online MVS volume. You must vary the volume offline to change the volume serial number.

VTOC parameter: specify the volume table of contents



Parameter/ Abbreviations	Description
VTOC(END|OPENDISK| *cylinder,head[,extent]*)	Specifies the location and size of the volume table of contents, or that the volume and VTOC are to be formatted for open-system use. Identify the *cylinder* and *head*, by specifying decimal (**n**) or hexadecimal numbers (for example, X'1AB',X'0') where the volume table of contents is to be placed. For *extent*, specify decimal (**n**) or hexadecimal numbers (for example, X'E') for the number of tracks that are to be reserved for the volume table of contents. For information on specifying the size of the VTOC index, see Appendix C, “VTOC index,” on page 655. When you specify VTOC(END), the VTOC is put on the last primary cylinder of the volume (or minidisk) and is one cylinder in length. Specify VTOC(OPENDISK) to indicate that the volume and VTOC should be formatted for use as an open-system DASD that is formatted for the 9399 IBM Cross Platform Extension.
Default:	The default for *cylinder,head* is 0,1. If you do not specify VTOC, DOSVTOC, or VSEVTOC, the default is an MVS VTOC at cylinder 0, track 1. If you do not specify VTOC, DOSVTOC, or VSEVTOC, and the device is not a minidisk, the size is defaulted to the number of tracks in a cylinder minus 1. For a 3390, the default is cylinder 0, track 1 for 14 tracks. If you specify cylinder and head but not the extent, the default for extent is one track. The default extent for minidisks is one track.

Parameter/ Abbreviations	Description
Restrictions:	• A VTOC cannot be placed at cylinder 0, track 0. • For the devices containing more than 64K tracks, the ending location of the VTOC must be below the 64K track line. For example, VTOC(4369,1,1) or above, are not valid (see the note below). • VTOC(END) is not valid for devices containing more than 64K tracks. • When VTOC(OPENDISK) is specified: – The following devices are supported, ONLY when the device is in 3390 track format, and ONLY when the device is operating as a real or emulated 3390 model 3 DASD. - 3390 model 3 (attached to 3990 model 6 unit only) - RAMAC 9391 DASD (attached to 3990 model 6 or 9390 control unit) - RAMAC Virtual Array (9393) - RAMAC Scalable Array (9396) – The following parameter restrictions apply: - INDEX, IPLDD, FROMRANGE, TORANGE, CYLRANGE, HEADRANGE, VALIDATE, MIMIC, DATA, BOOTSTRAP, NOINDEX, STORAGEGROUP are not allowed with VTOC(OPENDISK). - CONTINUE, NOCONTINUE parameters are ignored. Checkpoint recovery may take place for a previous checkpoint, but the volume formatting will then resume from the beginning of the volume to ensure every track on the volume has the proper format. – The volume is initialized as a non-SMS volume. If an SMS volume is desired, the volume must be varied online and a DFSMSdss CONVERTV can be run against the volume. For devices that have the ability to be configured as small volumes, do not use the ICKDSF default sizes if the volume is too small for them. The size must be specified to fit within the size of the device configured.

Note: For devices containing more than 64K tracks, there are special considerations for VTOC placement. The existing IBM software uses relative track addressing or the Track-Track-Record (TTR) format to process the VTOC. This restricts the highest address that can be referenced as a VTOC track to be 64K-1. Because of this, the entire VTOC must reside within the first 64K tracks; that is, the VTOC must end before cylinder 4369 (X'1111') head 1.

The VTOC placement restriction does not apply to the INDEX. The INDEX may be placed above the 64K track limit.

Allocating dummy data sets that are adjacent to the VTOC prior to allocating the index data set and/or allocating an index data set much larger than normal that is adjacent to the VTOC or these dummy data sets are ways to ensure a VTOC has a place to be expanded into. Another option is to create a VTOC that is much larger than normal allowing it to have the capacity in the future to support a larger number of data sets.

Initializing volumes

You use the INIT command to initialize volumes. There are three levels of initialization:

- Minimal initialization or minimal INIT
- Medial initialization or medial INIT
- Initialization for open-system DASD

Minimal initialization

A **minimal initialization** refers to using the INIT command to write a volume label and a VTOC on the device for use by MVS or VSE operating systems. Optionally, the minimal INIT writes other items that are needed by your operating environment, such as IPL text.

A volume is always initialized at least to the minimal level. When both the NOVALIDATE and NOCHECK parameters are specified, minimal initialization is all that is performed.

Minimal initialization creates the contents of cylinder 0, track 0 by writing:

IPL bootstrap records as records 1 and 2
A volume label as record 3
IPL text (optional)

Initialization also reserves and formats tracks for the VTOC at the location specified by the user and for the number of tracks specified. If no location is specified, tracks are reserved at the default location. The size and location can also be defaulted to the end of the volume. Access to a previous VTOC is destroyed by a minimal INIT; however, residual data can remain from previous use.

If the INDEX parameter of the INIT command is specified, the default data set name of SYS1.VTOCIX.volser is used in the VTOC to identify the space. If the *volser* begins with a numeric character, the default data set name will be SYS1.VTOCIX.Vxxxxx, where xxxxx is the volser with the first character overlaid by V. For example, if the *volser* is 339001, the default data set name is SYS1.VTOCIX.V39001. For more information about indexed format VTOCs, see Appendix C, “VTOC index,” on page 655.

If the IPLDD parameter is specified, the IPL text is added to the volume.

At the completion of the minimal initialization, defective primary tracks that were using an alternate are now assigned alternates in sequential order within the alternate track area.

Minimal initialization is the only level supported for dual copy volumes.

Medial initialization

Medial initialization includes the actions of minimal initialization, and the validation of the existence and content of the track's home address and record 0 for every track in the specified range. Validation ensures that the proper track address (cylinder and head) appears in both the home address and record 0 on the track, and that a standard record 0 exists on the track. Validation rewrites the home address and record 0.

A volume is initialized at the medial level when both the VALIDATE and NOCHECK options are specified.

At the completion of the medial initialization processing for the requested tracks, defective primary tracks that were using an alternate are now assigned alternates in sequential order within the alternate track area.

If a medial initialization does not run to completion, the CONTINUE function is provided to allow you to recover in a minimum amount of time, and to ensure the volume is usable. For more information concerning continuing after a failure, see “Resuming after a job or system failure” on page 181.

When you are performing a medial initialization for a CKD device that is being emulated on an IBM 9313, 9332, or 9335, the CONTINUE function is not supported and range parameters are ignored.

Before running a medial initialization (or any ICKDSF job), the devices must establish thermal stability. For more information, see “Devices supported by ICKDSF” on page 6.

Medial initialization is not supported for dual copy volumes or real 3390-9 devices.

Initialization for open-system DASD

Initialization for open-system DASD formats the volume and VTOC for use as an open-system DASD.

When VTOC(OPENDISK) is specified, formatting is performed, and required files are created for use with the 9399 IBM Cross Platform Extension.

Some restrictions apply when specifying VTOC(OPENDISK). Refer to the VTOC parameter for information on device types supported and the list of parameters that are not allowed with VTOC(OPENDISK).

When VTOC(OPENDISK) is specified, the CONTINUE, NOCONTINUE parameters are ignored. Checkpoint recovery may take place for a previous checkpoint, but the volume formatting will then resume from the beginning of the volume to ensure every track on the volume has the proper format.

A 1 track VTOC, and a 1 track VTOC index data set are created on cylinder 0. Some free space is left on cylinder 0 in case a VVDS needs to be created on the volume later. The VTOC is created to indicate that the remaining tracks on the volume are allocated.

The volume is initialized as a non-SMS volume. If an SMS volume is desired, the volume must be varied online and a DFSMSdss CONVERTV can be run against the volume.

Note: Existing ICKDSF commands that are supported on the device will be allowed to run on these volumes. The storage administrator must manage which ICKDSF commands are executed on these devices, because other ICKDSF functions can change the format of the volume or tracks. Some examples of this for an open-system formatted volume (but not the only cases) are:

- INSPECT NOPRESERVE will not save data on the track being inspected and will result in the format of the track as well as the data being destroyed.
- Depending on the parameters used, the BUILDIX and REFORMAT commands may result in a volume without an index.

When other ICKDSF commands are executed on an open-system formatted volume, the storage administrator may need to take additional steps to rebuild the VTOC index or restore the format and/or the data on one or more tracks. The storage administrator should set up procedures to handle situations when other ICKDSF functions are necessary on the volume.

Processing in a shared environment

When running a minimal INIT on a volume shared between systems, follow these guidelines:

1. Vary the device offline to the other systems.
2. Run the INIT command.
3. Format your volume for your operating system.
4. Vary the device back online to the other systems.

The other systems will then recognize the volume serial number and other system operating information of the volume. If you do not follow these guidelines, other systems accessing the volume may experience unpredictable results.

Processing in a shared DFSMS environment



If the volume to be initialized is system managed and shared between systems, then use one of the following methods:

- Spare or Empty Volume
  1. Vary the device offline to the other systems.
  2. Run the INIT command.
  3. Vary the device back online to the other systems.
  4. Define the volume to the storage group for use.
- Volume in Use
  1. Move data sets from the volume to be reinitialized to other volumes in the storage group.
  2. Change DFSMS status of the storage group from ENABLE to DISNEW for all systems. This will prevent new allocations to the storage group and, in particular, to the volume to be reinitialized.
  3. Vary the device offline to other the systems.
  4. Remove the volume definition from the storage group.
  5. Change DFSMS status of the storage group from DISNEW to ENABLE for all systems.

6. Run the INIT command specifying VTOC index.
7. Vary the device back online to the other systems.
8. Define the volume to the storage group for use.

System-managed volume initialization

You can initialize a volume that is to be managed in a DFSMS environment by specifying the STORAGEGROUP parameter.

ICKDSF marks the volume as being system managed during the initialization process. It also informs the operating system that the volume has been initialized for a DFSMS environment. If the volume you are initializing is online, ICKDSF will:

- Bypass RACF DASDVOL checks
- Check that there are no system-managed data sets on the volume

You can initialize previously system-managed volumes as system managed or nonsystem-managed.

Resuming after a job or system failure

If for any reason a medial initialization does not run to completion, subsequent processing can start from a checkpoint location. ICKDSF checkpoints itself automatically during processing and remembers where to resume processing.

After a job or system failure, you can submit a new job:

- At the minimal or medial level
- For the entire volume, or for a different specified range, or the same specified range (for medial INIT)
- To resume from the point of failure, or to ignore the previous processing and start to process a different range

Regardless of the job you choose to run after a failure, when processing completes, all tracks on the volume that ICKDSF might have operated on are in a usable condition. Note that, while ICKDSF will fix any tracks that were left unusable because of the failure, it cannot ensure the usability of any track that is not in the current specified range or that was not processed before the point of failure.

Because INIT processing always destroys the volume label, a subsequent invocation must include the VOLID parameter.

INIT checkpoints its current location not more than every 5 minutes. When INIT is run after a previous failure, it detects the checkpointed information, and then validates or skip analyzes (depending on the device type that failed) all the tracks from the last checkpoint. This is done for all levels of initialize, regardless of the CONTINUE|NOCONTINUE parameters. This ensures that ICKDSF has not left any tracks in an unusable condition because of the failure. Note that this adds additional run time to INIT and is most noticeable for minimal INIT.

After the tracks from the previous point of failure have been processed, if CONTINUE is specified, processing continues from the point of failure in correlation with the current specified range as follows:

- If the new range is entirely before the previous point of failure, no new tracks are processed.
- If the new range is entirely beyond the adjusted point of failure, then the entire new range is processed.
- The point of failure is adjusted if the new job specifies VALIDATE, since we have already validated the tracks to the next checkpoint location.
  - If the new job specifies a range that is entirely before where the next checkpoint should occur, there are no more tracks to process.
  - If the new job specifies a range that overlaps the point of failure, then processing begins from the point of failure.
- If NOCONTINUE is specified, processing begins with the first track in the current specified range.

RANGE parameters: specifying part of a volume

CYLRANGE|HEADRANGE, and FROMRANGE|TORANGE are optional parameters, used to limit the areas of a volume or minidisk that are to be processed.

CYLRANGE|HEADRANGE
–Specifies the starting and ending cylinders and starting and ending heads to be examined before minimal initialization.

FROMRANGE|TORANGE
–Specifies the starting track (cylinder and head) and the ending track (cylinder and head) to be examined before standard volume initialization.

Note that the VTOC and volume label are still written even when range parameters are specified.

The term "specified range" is used in this book to describe the tracks that are the result of the:

Combination of FROMRANGE and TORANGE, or
Combination of CYLRANGE and HEADRANGE, or
Entire volume, if all the range parameters are omitted.

The following table shows the parameter conditions when specifying part of a volume.

Table 38: Parameter conditions when specifying part of a volume.

Parameter	Other Notes
CYLRANGE	If you specify CYLRANGE and do not specify HEADRANGE, all the heads of the specified cylinders are processed. If you specify an ending value greater than the maximum for the device, the device (minidisk) maximum is used for the ending value.
HEADRANGE	If you specify HEADRANGE and do not specify CYLRANGE, the specified heads for all the cylinders on the volume (minidisk) are processed. If you specify an ending value greater than the maximum for the device, the device (minidisk) maximum is used for the ending value.
FROMRANGE	If you specify FROMRANGE and do not specify TORANGE, TORANGE is defaulted to the last cylinder of the device (minidisk).
TORANGE	If you specify TORANGE and do not specify FROMRANGE, FROMRANGE is defaulted to cylinder 0, track 0 (starting cylinder and track of the minidisk)

Note:

1. CYLRANGE|HEADRANGE and FROMRANGE|TORANGE are mutually exclusive pairs.
2. Primary tracks within the range specified have alternate tracks assigned as necessary.
3. Primary tracks outside the range specified are not read or validated and do not have their alternate track pointers verified.
4. If there is a need to verify the alternate tracks on a volume (that is, primary/alternate pairs are valid), you can specify the range parameters for the alternate cylinders.

If you specify:	Then...
NOCHECK VALIDATE	The home address and record 0 are rewritten only for those tracks within the range.
NOCHECK NOVALIDATE	The range parameters are ignored.
No range parameters	For medial initialization, operate on the entire volume.

CMS version minidisk support



For the CMS version of ICKDSF, only minimal INIT is supported.

When you initialize a minidisk at the minimal level, you can specify the minidisk volume label (VOLID), the VTOC, the index data set (INDEX), the owner identification (OWNERID), and whether you or the system will supply the IPL bootstrap records.

The following INIT parameters are supported by the CMS version of ICKDSF:

UNITADDRESS, BOOTSTRAP|NOBOOTSTRAP, DOSVTOC, INDEX|NOINDEX, IPLDD, LABELS, OWNERID, PASSWORD, PURGE, VERIFY, VOLID, and VTOC

For more information about running the CMS version, see Chapter 5, “Getting started with the CMS version,” on page 37.

Restoring FFVDP to a volume

If you need to ensure that data exists on every track of an IBM 3375, 3380, 3390, 9394, 9391, or 9345 volume (for example, for a subsequent ANALYZE SCAN after a volume has been moved elsewhere), the DATA parameter can be used. When you specify DATA, records are written that correspond to the FFVDP, which are written on the volume at the factory.

Dual copy volumes

Minimal initialization is the only level supported for dual copy volumes. The volume must be in duplex or suspended duplex state. Medial initialization requires the volume to be in simplex state.

Examples of the INIT command

The following examples show different ways to code the INIT command.

Any values specified here are examples only and should not necessarily be interpreted as the values for your system. Most examples are for the offline and online modes of MVS.



To initialize a volume in the Stand-Alone version:

1. Eliminate the MVS JCL.
2. Substitute the UNITADDRESS parameter for the DDNAME parameter.
3. Specify the DEVICETYPE parameter if the MIMIC(MINI) or MIMIC(EMU) parameter is also specified.
4. Use SYSIN if the IPLDD parameter is specified.



To initialize a VSE version volume:

1. Replace the MVS JCL statements with VSE system control statements.
2. Substitute the SYSNAME parameter for the DDNAME parameter.
3. Introduce the VSEVTOC or DOSVTOC parameter if a VSE type VTOC is required on the volume.

Initializing volumes for the MVS operating system



The following examples show you how to initialize volumes for use in the MVS operating system.

Initializing a volume for the first time in offline mode

In this example, a volume is initialized at the minimal level because the VALIDATE parameter is not specified. Because the volume is being initialized for the first time, it must be mounted offline, and the volume serial number must be specified. Because the VTOC parameter is not specified, the default volume table of contents size is the number of tracks in a cylinder minus one. For a 3390, the default is cylinder 0, track 1 for 14 tracks.

```
//EXAMPLE   JOB
//          EXEC  PGM=ICKDSF
//SYSPRINT  DD    SYSOUT=A
//SYSIN     DD    *
 INIT UNITADDRESS(0353) NOVERIFY VOLID(VOL123) -
      OWNERID(PAYROLL)
/*
```

Initializing two volumes in offline mode

In this example, the VALIDATE parameter in the first INIT command causes medial level initialization. The volume serial number is verified before initialization continues and is then replaced by the number supplied in the command. A default volume table of contents size is the number of tracks in a cylinder minus one. For a 3390, the default is cylinder 0, track 1 for 14 tracks. Four user volume labels are written in addition to the volume label. Because the volume is being reinitialized in offline mode, all existing data is purged, regardless of whether it is unexpired or password protected. The IPLDD parameter specifies that a user-supplied IPL program is to be written, and the BOOTSTRAP parameter specifies that the bootstrap records are also user supplied. (The IPL program and bootstrap records are indicated by the vertical ellipsis.)

The second INIT command initializes a volume at the minimal level. The volume serial number and owner identification remain unchanged. A default volume table of contents size is the number of tracks in a cylinder minus one. For a 3390, the default is cylinder 0, track 1 for 14 tracks. Because the volume is being reinitialized in offline mode, all existing data is purged, regardless of whether it is unexpired or password protected.

```
//EXAMPLE  JOB
//         EXEC  PGM=ICKDSF
//IPLDECK  DD    *
⋮
/*
//SYSPRINT DD    SYSOUT=A
//SYSIN     DD    *
 INIT UNITADDRESS(0353) VALIDATE VOLID(AAA789) -
      OWNERID(SMITH) VERIFY(XYZ123) -
      IPLDD(IPLDECK) BOOTSTRAP LABELS(4) NOMAP
 INIT UNITADDRESS(0271) NOVERIFY
/*
```

Initializing a volume using the VTOC(OPENDISK) parameter

In this example, the VTOC(OPENDISK) parameter is used to initialize a volume under MVS. Because the volume is being initialized in offline mode, all existing data is purged, regardless of whether it is unexpired or password protected.

```
//EXAMPLE  JOB
//         EXEC  PGM=ICKDSF
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
INIT UNITADDRESS(0F40) VERIFY(339003) VOLID(339003) VTOC(OPENDISK)
/*
```

Initializing a volume in offline mode without operator's intervention

In this example, a volume is reinitialized at the minimal level. The VOLID is specified; the volume serial will be changed. Because the VERIFY(*volser*) parameter is specified in INIT and 'NOREPLYU' is specified in the JCL, no reply U or T is necessary. If either one of the parameters is not specified, the user will be prompted for a reply U or T.

Changing volid with the INIT command can only be done in the offline mode. Therefore if you are running in online mode, you have to vary off the device to change the volser then vary back online to resume normal operation.

Note that if you specify PARM='NOREPLYU,FORCE', the VERIFY(*serial*) parameter is not required to bypass the operator's intervention (Reply U or T) message.

```
//EXAMPLE  JOB
//GENER1   EXEC  PGM=IEBGENER
//SYSPRINT DD    SYSOUT=*
//SYSIN    DD    DUMMY
//SYSUT2   DD    SYSOUT=(A,INTRDR)
//SYSUT1   DD    DATA,DLM='$$'
//INIT1    JOB   D77E,MSGCLASS=A,TYPRUN=HOLD
// VARY 0353,OFFLINE
//STEP1    EXEC  PGM=IEFBR14
$$
//STEP2    EXEC  PGM=ICKDSF,PARM='NOREPLYU'
//STEPLIB  DD    DSN=SYS1.LINKLIB,DISP=SHR,UNIT=3380,VOL=SER=USRPAK
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
  INIT UNIT(0353) VFY(XYZ123) VOLID(ABC456)
//*
//GENER3   EXEC  PGM=IEBGENER
//SYSPRINT DD    SYSOUT=*
//SYSIN    DD    DUMMY
//SYSUT2   DD    SYSOUT=(A,INTRDR)
//SYSUT1   DD    DATA,DLM='$$'
//INIT3    JOB   D77E,MSGCLASS=A,TYPRUN=HOLD
// VARY 0353,ONLINE
//STEP3    EXEC  PGM=IEFBR14
$$
```

Initializing a volume to be managed in a DFSMS environment

In the following example, a volume that is to be system managed is initialized. The volume is initialized in offline mode at the minimal level. The VTOC is placed at cylinder 2, track 1 and occupies ten tracks. The VTOC is followed by the VTOC index. The STORAGEGROUP parameter indicates the volume is to be managed in a DFSMS environment.

```
INIT UNIT(0353) NOVERIFY STORAGEGROUP -
       OWNERID(PAYROLL) VTOC(2,1,10) INDEX(2,11,5)
```

Initializing a volume previously system-managed in a DFSMS environment

The following example initializes a volume that has been previously initialized for a DFSMS environment. The volume is initialized at the minimal level in online mode. The VTOC is placed at cylinder 10 track 1 and is allotted 20 tracks. The VTOC index is placed at cylinder 11, track 6 and is allotted ten tracks. The STORAGEGROUP parameter specifies that the volume is to be a system-managed volume. When the

OWNERID is specified, the owner is changed. If there are any data sets on the volume, a reinitialize cannot be performed.

To initialize a previously system-managed volume to a nonsystem-managed volume, do not include the STORAGEGROUP parameter in this example.

```
//EXAMPLE     JOB
//            EXEC   PGM=ICKDSF
//DDN1        DD     UNIT=3380,DISP=OLD,VOL=SER=XXX001
//SYSPRINT    DD     SYSOUT=A
//SYSIN       DD     *
  INIT DDNAME(DDN1) NOVERIFY STORAGEGROUP -
       OWNERID(DBGROUP) VTOC(10,1,20) INDEX(11,6,10)
/*
```

Initializing a volume with an index

This example performs an online minimal initialization, and as a result of the command, an index to the VTOC is created.

```
//         JOB
//         EXEC  PGM=ICKDSF
//XYZ987   DD    UNIT=3375,DISP=OLD,VOL=SER=PAY456
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
 INIT DDNAME(XYZ987) NOVERIFY INDEX(X'A',X'B',X'2')
/*
```

Initializing a reserve storage pool volume

The following example initializes a volume as a reserve storage pool volume. It verifies that a volume label does not already exist and that no data sets other than the VTOC index data set or VVDS exist. It assigns an owner identification value of IBMRSPPOOL1 on the volume.

```
//EXAMPLE JOB
//        EXEC PGM=ICKDSF
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
INIT UNITADDRESS(1234) VERIFY(*NONE*) VOLID(XX1234) -
OWNERID(IBMRSPPOOL1) NODSEXIST RESERVED
/*
```

The following example initializes the reserve storage pool volume as an SMS-managed volume, after first verifying that the volume serial is VOL123 and that the owner identification is IBMRSPPOOL1. It changes the owner identification to a new value of STORAGEGROUP1.

```
//EXAMPLE JOB
//        EXEC PGM=ICKDSF
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
INIT UNITADDRESS(1234) VERIFY(VOL123,IBMRSPPOOL1) VOLID(SGR123) -
OWNERID(STORAGEGROUP1) NODSEXIST STORAGEGROUP
/*
```

Initializing volumes with the Stand-Alone version



The following examples show you how to initialize volumes with the Stand-Alone version of ICKDSF.

Initializing a volume at the medial level

In this example, a previously initialized volume is reinitialized at the medial level because the VALIDATE parameter is specified. The home address and record 0 on each track are read and validated. The volume serial number and owner identification are verified before initialization continues and, because a new

volume serial number or an owner identification is not specified, they remain unchanged on the reinitialized volume. Specification of the VTOC parameter causes a volume table of contents to be created at cylinder 42, track 12. The VTOC occupies three tracks. Because the volume is being reinitialized in the Stand-Alone version of ICKDSF, all existing data is purged, regardless of whether it is unexpired or password protected.

```
INIT UNITADDRESS(0272) -
    VERIFY(VOL123,PAYROLL) VALIDATE VTOC(42,X'C',3)
```

Reinitializing a volume at the medial level

In this example, a previously initialized 3375, 3380, 3390, or 9345 volume is reinitialized at the medial level because VALIDATE is specified. DATA is also specified, causing the FFVDP to be written on the volume. The home address and record 0 on each track are read and validated. The volume serial number and owner identification are verified before initialization continues and, because a new volume serial number or an owner identification is not specified, they remain unchanged on the reinitialized volume. Because the volume is being reinitialized in the Stand-Alone version of ICKDSF, all existing data is purged, regardless of whether it is unexpired or password protected.

```
INIT UNITADDRESS(0272) VOLID(338001) VALIDATE DATA -
    VERIFY(VOL222,MASTER)
```

Initializing a minidisk

In this example, a 3390 minidisk is initialized with an IPL program. It provides 30 primary and no alternate cylinders on unit 151. The VTOC is written at a default location of cylinder 0, track 1 for a length of one track. The volume is labeled 339000. The IPL program supplied as the input deck is written on cylinder 0, track 0. The label and VTOC are written in MVS format.

```
INIT  UNITADDRESS(0151) NOVERIFY DEVICETYPE(3390) -
     MIMIC(MINI(30)) VOLID(33900) IPLDD(SYSIN)
```

Initializing a minidisk in the CMS version



In this example, a minidisk is initialized at the minimal level. It establishes a VOLID, OWNERID, and the VTOC on a minidisk with a virtual address of 391. The VTOC is written at the default location of cylinder 0, track 1 of the minidisk for a length of one track. The minidisk is labeled 338012 and the owner ID is PAYROLL. The VTOC is written in MVS format.

After performing the INIT, the minidisk is ready for future use in an MVS operating system environment.

```
INIT  UNITADDRESS(0391) NOVERIFY VOLID(338012) OWNERID(PAYROLL)
```

Initializing volumes with the VSE version



The following examples show you how to initialize volumes with the VSE version of ICKDSF.

Initializing a volume at the minimal level

In this example, a volume is initialized at a minimal level under VSE. A VSE format VTOC is written on cylinder 32, track 0 for a length of 20 tracks. The volume is labeled 338001.

```
//  JOB      jobname
//  ASSGN    SYS002,151
```

```
//  EXEC     ICKDSF,SIZE=AUTO
      INIT SYSNAME(SYS002) NOVERIFY -
           VSEVTOC(X'20',X'0',X'14') VOLID(338001)
/*
/&
```

Initializing an emulated partial disk at the minimal level

In this example, an emulated partial disk is initialized under VSE. A VSE format VTOC is written at cylinder 0, track 1 for a length of one track. The volume is labeled AA3380.

```
//  JOB      jobname
//  ASSGN    SYS000,353
//  EXEC     ICKDSF,SIZE=AUTO
    INIT SYSNAME(SYS000) NVFY VSEVTOC(0,1,1) -
         VOLID(AA3380) MIMIC(EMU(20))
/*
/&
```

Chapter 17. INSPECT command—CKD



The INSPECT command inspects a subset of a volume and can:

- Check the surface of a track to determine if there is a defect
- Assign a skip to avoid a defect
- Assign an alternate track
- Reclaim a track that has been flagged defective
- Print a map of defective tracks on a volume

Before using the INSPECT command, you should first make sure there are no hardware problems. It is recommended that you issue ANALYZE DRIVETEST NOSCAN before any INSPECT operation.

The INSPECT command does not support the 3995-151 and 3995-153 devices.

For more general information about INSPECT, see “Problem determination” on page 77.

For information on ICKDSF support of the 9391 and 9394, see “ICKDSF support of the RAMAC Array family” on page 8.

Protecting the INSPECT command with RACF

The MVS version of ICKDSF checks the general resource profile for a facility class profile of STGADMIN.ICK.INSPECT. If RACF is not installed or the facility STGADMIN.ICK.INSPECT is not created, the INSPECT command executes with no authorization check. For additional information, see “Protecting ICKDSF commands with RACF” on page 34.

Understanding which INSPECT parameters to use

You can perform several functions using INSPECT with various options. Table 39 on page 189 shows you which parameters to use to perform certain tasks. For more details about these parameters, see the explanations that follow. The parameters appear in alphabetical order under “Optional parameters” on page 192.

Table 39: Performing tasks with INSPECT parameters.

To...	Use the INSPECT parameter...
Surface check individual tracks or groups of tracks.	CYLRANGE/HEADRANGE FROMRANGE/TORANGE TRACKS
Check each track surface. Permit optional specification of the number of checking cycles of each inspected track.	CHECK Alternate track assignment is done only after an inspection of the surface reveals defects.

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Table 39: Performing tasks with INSPECT parameters. (continued)

To...	Use the INSPECT parameter...
Suppress track checking.	NOCHECK Unless alternate track assignment is suppressed, an alternate will be unconditionally assigned to the primary track.
For the IBM 3375, 3380, 3390, and 9345, locate and skip over the defective areas on the track.	CHECK Only when the primary track contains more than the maximum number of allowable defects is it considered defective. SKIP The SKIP parameter controls the level of surface checking performed and, consequently, the total execution time required to inspect individual tracks or groups of tracks. **Note:** The SKIP parameter is more extensive and takes much longer than NOSKIP.
Save data that would normally be destroyed during the track inspection.	PRESERVE KEEPIT HOLDIT The NOPRESERVE parameter allows inspection of tracks when the data cannot be read. **CAUTION:** When you use HOLDIT, data is kept in storage only. If processing abnormally terminates before the data is rewritten, the track for which the data was preserved will not contain a standard record 0, and the data will be lost.
Write a copy of the data at a backup location as well as keep it in storage.	PRESERVE If processing ends abnormally, the next use of INSPECT detects the data at the backup location and automatically restores the data to the track on which processing previously ended abnormally.
Reclaim a track that was previously flagged defective if the track inspection has determined it is currently defect-free.	RECLAIM
Suppress automatic track reclamation.	NORECLAIM
Fix 0F0B errors (defective track without valid alternate track pointer).	TRACKS INSPECT TRACKS NOPRESERVE NOCHECK ASSIGN will rewrite the HA and R0 to fix the 0F0B error.
Assign alternates if required.	ASSIGN
Suppress the assignment of alternates	NOASSIGN
Print output of the detailed status of each track being inspected.	MAP
Suppress the printed output of detailed track status.	NOMAP

Table 39: Performing tasks with INSPECT parameters. (continued)

To...	Use the INSPECT parameter...
Note: When you are emulating CKD devices on IBM 0671, 3995-151, 3995-153, 9313, 9332, 9335, or 9336, you cannot use INSPECT for surface checking.	

For information on ICKDSF support of the 9391 and 9394, see "ICKDSF support of the RAMAC Array family" on page 8.

Syntax

INSPECT

Required parameters
DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*)|REALADDR(*ccuu*)
VERIFY(*serial|*NONE*[,owner]*)|NOVERIFY

Optional Parameters
ALLTRACKS
ASSIGN|NOASSIGN
AVAILABLE
CHECK(*n*)|NOCHECK
CYLRANGE(*start,end*)
DEVICETYPE(*devtype*)
DIRECTIO(PRIMARY|SECONDARY)
FORCE
FROMRANGE(*cylinder,head*)
HEADRANGE(*start,end*)
MAP|NOMAP
MIMIC(*type*)
PASSWORDS((*dsname/password*),...)
PRESERVE|KEEPIT|NOPRESERVE|HOLDIT
RECLAIM|NORECLAIM
SKIP|NOSKIP
TOLERATE(ENQFAIL|PRIFAIL)
TORANGE(*cylinder,head*)
TRACKS((*cylinder,head*)*[,...]*)
USERID(*user's ID*)

Required parameters

DDNAME|SYSNAME|UNITADDRESS|REALADDR parameter: identify volume (or minidisk)

Parameter/ Abbreviations	Description
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. Note that the volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.

Parameter/ Abbreviations	Description
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and an attached CMS volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address (3 or 4 hexadecimal digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated volume or minidisk. The unit address is the device number.
REALADDR(*ccuu*) **RADDR**	Used to specify the real address of a volume. This parameter is valid only when you are running the CMS version of ICKDSF and you have DEVMAINT authority. For *ccuu*, specify the real address (3 or 4 hexadecimal digits) of the channel and unit of the volume. REALADDR is mutually exclusive with UNITADDRESS, DDNAME, SYSNAME, and USERID.
Default:	None.
Restrictions:	None.

VERIFY|NOVERIFY parameter: verify volser and ownerid

Parameter/ Abbreviations	Description
VERIFY(*serial[,owner]*) **VFY**	Required when you want to verify the volume serial number and owner identification before inspecting a track on the volume or minidisk. If the volume serial number or owner identification does not match that found on the volume or minidisk, INSPECT ends. For *serial*, substitute 1 to 6 alphanumeric characters for the volume serial number. To verify that a volume serial number does not exist, substitute the string *NONE* for *serial*. If no volume serial exists, or if the volume serial is actually "*NONE*", the INSPECT operation continues. If a volume serial exists, the INSPECT command ends. For *owner*, substitute 1 to 14 alphanumeric characters for the owner identification. Running in the offline mode, if VERIFY(*serial*) parameter is specified in the INSPECT command and PARM='NOREPLYU' is specified in the EXEC card in the JCL, no operator's intervention (Reply U or T) is required. If PARM='NOREPLYU,FORCE' is specified in the JCL, the VERIFY(*serial*) parameter is not required to bypass the operator's intervention (Reply U or T) message.
NOVERIFY **NOVFY** **NVFY**	Required when you want to bypass verification of the volume serial number.
Default:	None. You must specify either VERIFY or NOVERIFY.
Restrictions:	You cannot verify the owner identification separately from the volume serial number. Both the volume serial number and the owner identification must be verified when you want to verify the owner identification. When you specify the VERIFY parameter and verification fails, the command terminates.

Optional parameters

ALLTRACKS parameter: inspect the total volume

Parameter/ Abbreviations	Description
ALLTRACKS **ALLTRACK** **ALLTRKS** **ALLTRK**	Specifies all tracks on the volume (or minidisk) are to be processed. ALLTRACKS is valid only when NOASSIGN and NOCHECK are specified. NOCHECK NOASSIGN with ALLTRACKS reads all home address records and record 0s on a volume (or minidisk) and issues messages if any discrepancies are found. A primary/alternate track assignment map is also produced.
Default:	None.
Restrictions:	Not valid for the IBM 9345, the RAMAC family of devices, the 2105, 2107, 1750, and Internal Disk devices.

ASSIGN|NOASSIGN parameter: specify assignment of alternate tracks

Parameter/ Abbreviations	Description
ASSIGN **ASGN**	Flags the specified tracks if they are found defective. If the specified track is a primary track, an alternate track is assigned to it. If the specified track is an alternate track that has a previously assigned primary track associated with it, then the primary track will have a new alternate assigned to it. When used with CHECK(**n**), any track that is declared defective will undergo assignment. For an explanation of how a track is declared defective, see Appendix E, “Surface checking,” on page 663. When used with NOCHECK, assignment takes place for all tracks being processed. For the RAMAC family of devices, and Internal Disk devices, ASSIGN with NOCHECK can be used to rewrite home address and record 0.
NOASSIGN **NOASGN** **NASGN**	Indicates that you do not want alternate tracks assigned. When used with NOCHECK, this combination will cause ICKDSF to read the home address and record 0 for the specified tracks and issue a message if anything invalid is detected. NOCHECK NOASSIGN with ALLTRACKS reads all home address records and record 0s on a volume. A primary/alternate track assignment map is also produced. **Note:** 1. If NOASSIGN is specified with the CHECK parameter, and the track is defective, the inspected track is not marked defective and an alternate is not assigned, regardless of the declared condition of the track. A message is issued for this condition. 2. If CHECK/PRESERVE or CHECK/HOLDIT is specified and user data cannot be rewritten because of surface defects, NOASSIGN is overridden and assignment takes place.
Default:	ASSIGN
Restrictions:	The combination of ASSIGN NOCHECK cannot be specified with the range parameters (FROMRANGE|TORANGE or CYLRANGE|HEADRANGE). The TRACKS parameter must be used for unconditional alternate track assignment.

AVAILABLE parameter: specify processing is to continue

Parameter/ Abbreviations	Description
AVAILABLE **AVAIL**	Ensures **concurrent media maintenance** for 3380, 3390, and 9345 devices during INSPECT processing. AVAILABLE specifies that INSPECT processing should continue only if the data for the track in process is continuously available during the INSPECT operation. For a simplex volume, if concurrent media maintenance cannot be performed for the track, processing for the track is not continued. For volumes which are part of a duplex pair, the AVAILABLE parameter is ignored because a copy of the data is always available. Use the AVAILABLE parameter when you are automating media maintenance procedures. It provides you the ability to control media maintenance being automatically issued for a track if there is a possibility of the data becoming unavailable for a period of time.
Default:	If you do not specify AVAILABLE during PRESERVE processing, concurrent media maintenance occurs if supported for the device. If concurrent media maintenance is not supported, then normal PRESERVE processing occurs.

Parameter/ Abbreviations	Description
Restrictions:	AVAILABLE is ignored if you specify NOPRESERVE.

CHECK|NOCHECK parameter: surface checking of the volume

Parameter/ Abbreviations	Description
CHECK(*n*) **CHK**	Indicates that you want each track to be surface checked for recording errors during inspection and declared defective only if the checked track appears defective. Each track is surface checked by writing and reading specially patterned records. Upon completion of surface checking, the home address and a standard record 0 are rewritten on the track. For **n**, substitute a decimal number from 1 to 10 for the number of times you want each track to be checked. For information on values of **n**, see Appendix E, “Surface checking,” on page 663. The level of surface checking to be performed is determined by the SKIP|NOSKIP parameters. For more information on these parameters, see “SKIP|NOSKIP parameter: specify the level of surface checking” on page 200. For the IBM 9345 and 9394, checking is performed if you specify either CHECK or SKIP. The **n** value of CHECK(n) is ignored.
NOCHECK **NOCHK** **NCHK**	Indicates that you do not want the tracks to be surface checked for recording errors during inspection. Alternate tracks are unconditionally assigned when NOCHECK and ASSIGN are specified. For the RAMAC family of devices, and Internal Disk devices, when NOCHECK and ASSIGN are specified, only home address and record 0 will be rewritten. NOCHECK ASSIGN cannot be specified with ALLTRACKS. NOCHECK NOASSIGN with ALLTRACKS reads all home addresses and record 0s on a volume (or minidisk) to ensure validity. A primary/alternate track assignment map is also produced. The TRACKS parameter must be used for unconditional alternate track assignment.
Default:	CHECK(1)
Restrictions:	The maximum number you can specify with the CHECK(n) parameter is 10. The CHECK parameter is invalid for the 9391, 9393, 9396, 9397, 2105, 2107, 1750, and Internal Disk devices.

CYLRANGE parameter: specify a range of cylinders

Parameter/ Abbreviations	Description
CYLRANGE(*start,end*) **CYLR** **CYL**	Used to specify what part of a volume or minidisk is to be inspected. Use the CYLRANGE parameter to specify the starting and ending cylinders. For *start,end*, substitute decimal (**n**) or hexadecimal digits (for example, X'1AB',X'2DE') to identify the starting and ending cylinders to be examined. If you specify CYLRANGE and do not specify HEADRANGE, all the heads of the specified cylinders are processed. For information on specifying the starting and ending heads (HEADRANGE) to go with the starting and ending cylinders, see “HEADRANGE parameter: specify a range of heads” on page 196. For information on specifying part of a volume or minidisk, see “RANGE parameters: part of a volume” on page 203.
Default:	None.
Restrictions:	Both the starting and ending values are required for CYLRANGE. By specifying an ending value greater than the maximum for the device, processing is performed to the maximum value for that device. However, if you specify REALADDR, the maximum is one cylinder. CYLRANGE cannot be specified with FROMRANGE|TORANGE or TRACKS. This parameter is not valid for the 9391, 9393, 9396, 9397, and Internal Disk devices.

DEVICETYPE parameter: identify the type of device

Parameter/ Abbreviations	Description
DEVICETYPE(*devtype*) **DEVTYPE** **DEVTYP**	Required in the Stand-Alone version when the MIMIC(MINI) or MIMIC(EMU) parameter is specified. For *devtype*, substitute 1 to 8 characters for the type of device on which the volume is mounted. See Table 13 on page 8 for valid device types.
Default:	None.
Restrictions:	Applies only when you are inspecting a volume in the Stand-Alone version and MIMIC(MINI) or MIMIC(EMU) is specified. If DEVICETYPE is specified when it does not apply, it will be ignored.

DIRECTIO parameter: identify volume of a dual copy pair

Parameter/ Abbreviations	Description
DIRECTIO(PRIMARY) **DIO(PRI)**	Directs I/O to the primary volume of a dual copy pair.
DIRECTIO(SECONDARY) **DIO(SEC)**	Directs I/O to the secondary volume of a dual copy pair.
Default:	If the DIRECTIO parameter is not specified when you are using a dual copy pair, the default operation is the: • Primary volume if the dual copy pair is in duplex state • Secondary volume if the dual copy pair is in suspended duplex state
Restrictions:	The DIRECTIO parameter is ignored if the subsystem does not support dual copy or the volume is in simplex state. HOLDIT and MIMIC are not valid with the DIRECTIO parameter. DIRECTIO(PRIMARY) and NOPRESERVE are mutually exclusive. DIRECTIO(SECONDARY) and PRESERVE are mutually exclusive. Only DIRECTIO(PRIMARY) is allowed if the device is in duplex state.

FORCE parameter: specify concurrent processing

Parameter/ Abbreviations	Description
FORCE	Used only in the recovery of a prior concurrent media maintenance failure on another processor.
Default:	None.
Restrictions:	Use FORCE only to recover from a prior concurrent media maintenance failure on another processor. Misuse of the parameter can cause loss of data.

FROMRANGE parameter: specify a specific starting location

Parameter/ Abbreviations	Description
FROMRANGE(*cylinder,head*) **FROMR** **FROM**	Use this parameter to specify the starting track (cylinder and head) to be inspected. For *cylinder,head* substitute decimal (**n**) or hexadecimal digits (for example, X'2AB',X'A') to identify the cylinder and head at which processing is to start. If you specify only one value, ICKDSF takes it to be the cylinder and the head value is defaulted to 0. If you specify FROMRANGE and do not specify TORANGE, TORANGE is defaulted to the last alternate cylinder of a volume or minidisk. For information on specifying the ending track (TORANGE) to go with the starting track, see "TORANGE parameter: specify a specific ending location" on page 201. For information on specifying part of a volume to be examined, see "RANGE parameters: part of a volume" on page 203.
Default:	None.
Restrictions:	FROMRANGE and CYLRANGE|HEADRANGE are mutually exclusive. This parameter is not valid for the 9391, 9393, 9396, 9397, and Internal Disk devices. CMS In the CMS version, if you specify REALADDR the range must be contained within one cylinder.

HEADRANGE parameter: specify a range of heads

Parameter/ Abbreviations	Description
HEADRANGE(*start,end*) **HDRANGE** **HEADR** **HDR** **HD**	Use the HEADRANGE parameter to specify the starting and ending heads to be inspected. For *start,end* substitute decimal (**n**) or hexadecimal digits (for example, X'B',X'E') to identify the starting and ending heads to be examined. If you specify only one value, ICKDSF takes the value to be the starting range and defaults the ending range to the device maximum. If you specify HEADRANGE and do not specify CYLRANGE, the specified heads for all the cylinders on a volume or minidisk are processed. For information on specifying the starting and ending cylinders (CYLRANGE) to go with the starting and ending heads, see "CYLRANGE parameter: specify a range of cylinders" on page 194. For information on specifying part of a volume, see "RANGE parameters: part of a volume" on page 203.
Default:	None.
Restrictions:	Both the starting and ending values are required for HEADRANGE. If you specify an ending value greater than the maximum for the device, the device maximum is used for the ending value. HEADRANGE is mutually exclusive with FROMRANGE|TORANGE and with TRACKS. HDRANGE is not valid for the 9391, 9393, 9396, 9397, 2105, 2107, 1750, and Internal Disk devices.

MAP|NOMAP parameter: print a volume map

Parameter/ Abbreviations	Description
MAP	Prints a volume or minidisk map during inspection. The volume map lists tracks that are found to be defective during inspection. Regardless of the tracks being inspected, MAP will list the defective tracks that are currently assigned alternates. The MAP parameter is ignored for devices that do not have alternate tracks.
NOMAP	Indicates that you do not want to print a volume map during inspection.

Parameter/ Abbreviations	Description
Default:	MAP **Note:** When INSPECT ends, the alternate tracks are examined for availability and primary track assignment, regardless of which tracks have been inspected. This information is printed in the map, but no cross check is done to determine if the primary tracks accurately reflect the alternate assignments. For a complete check of all primary and alternate tracks, enter: `INSPECT ALLTRACKS NOCHECK NOASSIGN MAP`
Restrictions:	MAP is ignored for 9391, 9393, 9396, 9397, 2105, 2107, 1750, minidisks, and Internal Disk devices.

MIMIC parameter: specify a special volume usage format

Parameter/ Abbreviations	Description
MIMIC(*type*)	Specifies a special usage format for the volume being inspected. For *type*, specify EMU(n), or EMUALL.
EMU(n) 	Indicates that a partial CKD disk emulated on a 3370 FBA device is to be inspected. In the Stand-Alone version, you must also specify the DEVICETYPE parameter.
EMUALL	Indicates that a full CKD disk is emulated on a 3370 FBA device.
Default:	None.
Restrictions: 	When you emulate a CKD device on the 9313, 9332, or 9335, do not use MIMIC(EMU) or MIMIC(EMUALL). For more information, see “Initializing an emulated CKD Device on an IBM 9313, 9332, or 9335 FBA device” on page 83. The EMU(n)|EMUALL subparameter is not recommended with INSPECT because inspecting an emulated device causes the device to operate inefficiently. Data checks should be handled using the INSPECT command against the base FBA device. For more information, see “Emulating devices” on page 82. MIMIC(*type*) is not valid in the CMS version of ICKDSF.

PASSWORDS parameter: provide passwords for data set security



Parameter/ Abbreviations	Description
PASSWORDS ((*dsname/password*),...) **PASSWORD** **PASSWD** **PWD** **PD**	Specifies passwords for non-VSAM password-protected data sets. The supplied passwords will be used to determine if the user has authority to alter the data sets. For *dsname*, substitute the fully qualified name of a password-protected data set. For *password*, substitute the password you wish to apply to this data set.
Default:	None.
Restrictions:	Up to a maximum of 512 passwords may be specified.

PRESERVE|KEEPIT|NOPRESERVE|HOLDIT parameter: preserve data

Parameter/ Abbreviations	Description
PRESERVE **PRSV**	Saves the data on the inspected tracks. Saves a copy of each track at a backup location on DASD as well as in storage (the storage copy is used to rewrite the data). If processing ends abnormally on a track, INSPECT detects the data at the backup location and automatically restores the data to that track. For more detailed information, see "Reading and saving data on inspected tracks" on page 198.  If a track is part of a data set, INSPECT will enqueue on the data set while processing that track.
KEEPIT **KEEP**	PRESERVE and KEEPIT are synonymous.
NOPRESERVE **NOPRSV** **NPRSV**	Indicates that you do not want to save the data on the inspected tracks. NOPRESERVE always destroys the current contents of the track: • If you specify CHECK. • If unconditional assignment of alternate tracks is taking place (ASSIGN NOCHECK).  Use NOPRESERVE only if data errors on a particular track make it impossible to preserve the data. When you specify NOPRESERVE, you cannot inspect tracks inside a VTOC or a VTOCIX data set in an online MVS mode. Also, cylinder 0, track 0 cannot be inspected with NOPRESERVE in an online mode.
HOLDIT **HOLD**	Indicates that you want to save the data on the inspected tracks. For more detailed information, see "Saving data on the inspected tracks" on page 199.
Default:	PRESERVE Minidisks are always processed as HOLDIT.
Restrictions:	HOLDIT is not valid for the IBM 9345, RAMAC family of devices, or Internal Disk. DIRECTIO(PRIMARY) and NOPRESERVE are mutually exclusive. DIRECTIO(SECONDARY) and PRESERVE are mutually exclusive. PRESERVE is invalid for 9391, 9393, 9396, 9397, 2105, 2107, 1750, and Internal Disk devices.

Reading and saving data on inspected tracks

PRESERVE and KEEPIT specify whether to read and save the data on the inspected tracks. Data read from the specified tracks is held in storage.

Data on a track can also be saved at a backup location as well as held in storage (the storage copy is used to rewrite the data). If processing ends abnormally, the next use of INSPECT detects the data at the backup location and restores the data to the track where processing ended abnormally.

When running online, certain security and integrity precautions are taken to prevent inadvertent destruction of data. When running offline (MVS) or in Stand-Alone, data destruction is not prevented. For more information about security, see:

- "Protecting MVS volumes and data sets" on page 30
- "Resource serialization when using INSPECT" on page 205

When you specify CHECK with either PRESERVE, HOLDIT, or KEEPIT, the data is still at varying degrees of risk.

Writing data from a backup location with PRESERVE or KEEPIT

The backup location and the storage copy of the track are erased at the completion of a command.

A performance degradation may be caused by the writing of the data at the backup location. The time duration of degradation depends on the total number of tracks being processed for the current INSPECT.

When the data is written at the backup location, it is read-back-checked to ensure it was written correctly. However, when the backup location is used to restore the data at the next use of the INSPECT command, there is no guarantee that the data can be recovered.

Writing data from a CE cylinder

For devices that use the CE cylinder as the backup cylinder, if data exists at the backup location, ANALYZE DRIVETEST, which writes on the CE cylinder, does not destroy the data. ANALYZE does indicate the cylinder and head of the track for which data exists. **Note, however, that the CE micro-diagnostics may destroy the data at the backup location**.

Therefore, if INSPECT processing does not complete because of a problem on the volume that requires the assistance of an IBM customer engineer, make every attempt to restore the data first, if necessary.

If errors occur while writing data with PRESERVE or KEEPIT

If permanent, uncorrectable data checks are occurring on a track, INSPECT cannot read the data from the track. Therefore, if PRESERVE or KEEPIT is specified, the command will stop processing before writing anything on the track.

If an error occurs when writing the user data back onto the track (or an assigned alternate), INSPECT assigns an alternate to the primary track and writes the data on the alternate. No surface checking takes place at this time, but, if the write to the alternate fails, a new alternate is assigned (up to three times).

When you specify PRESERVE or KEEPIT, and your DASD is an IBM 9345, 9394, or is attached to an IBM 3990 which supports concurrent media maintenance, concurrent media maintenance is automatically issued. This allows user access to the data on a track while INSPECT is processing on that track. Because the data on the track is always available, you can run INSPECT even when there is other activity on the volume.

For more information, see “Preserving data under Concurrent Media Maintenance” on page 207.

Saving data on the inspected tracks

HOLDIT reads the data and keeps it in storage. If processing for the track does not run to completion, the data is lost and record 0 for the track is in a nonstandard format. An INSPECT with NOPRESERVE can be run against the track to fix the record 0 condition. You can then restore the data from a user backup copy.

Canceling a job that contains an INSPECT HOLDIT is not recommended. When INSPECT HOLDIT is running against multiple tracks, ICKDSF cannot determine which, if any, of the tracks caused processing to stop. After an INSPECT HOLDIT command does not run to completion, determine the readability of the home address and record 0s on the volume by running:

```
INSPECT ALLTRACKS NOCHECK NOASSIGN
```

You will receive message ICK31064I for any track that ICKDSF was processing when the previous job ended. You can then fix the record 0 condition and restore data for that track, as described above.

If permanent, uncorrectable data checks are occurring on a track, INSPECT cannot read the data from the track. Therefore, if HOLDIT is specified, the command will stop processing before writing anything on the track.

If an error occurs when writing the user data back onto the track (or an assigned alternate), INSPECT assigns an alternate to the primary track and writes the data on the alternate. No surface checking takes place at this time, but, if the write to the alternate fails, a new alternate is assigned (up to three times).

RECLAIM|NORECLAIM parameter: reclaim defective tracks

Parameter/ Abbreviations	Description
RECLAIM **RCLM**	Indicates that you want to reclaim primary or alternate tracks that were flagged as defective in input but appear usable after surface checking. Reclamation occurs only if surface checking is performed without errors for that track. If a track is currently flagged defective, the maximum available surface checking procedure is used. If the checking process indicates that the track has no errors, the track is reclaimed.
NORECLAIM **NORCLM** **NRCLM**	Indicates that you want to suppress track reclamation during inspection.
Default:	NORECLAIM
Restrictions:	The RECLAIM parameter applies only when the CHECK parameter has been specified. If RECLAIM is specified with NOCHECK, it will be ignored. RECLAIM is ignored for the RAMAC family of devices, the 2105, 2107, 1750, and the Internal Disk devices.

SKIP|NOSKIP parameter: specify the level of surface checking

Parameter/ Abbreviations	Description
SKIP	When CHECK is specified, SKIP performs extensive surface checking on all tracks within the specified range. If a data check is detected on a track, skip displacement is performed for that track. If SKIP is specified, the maximum total number of tracks within the combination of range parameters cannot exceed the number of tracks contained in one cylinder for the specified device type. Because of this limitation, when you specify SKIP, you must also use the range parameters to specify part of a volume. Because SKIP does extensive surface checking for all tracks within the range, the run time can be excessive, even with the one cylinder limit. (Extensive surface checking can take up to 5 minutes per track or more, depending on the device type and system conditions.) When skip displacement processing is being performed for INSPECT, for every track that is part of a non-VSAM data set, the data set is enqueued while processing the track. If the track is part of a data set, INSPECT will enqueue on the data set while processing that track. For tracks in VSAM data sets, TOLERATE(ENQFAIL) must be specified when processing online. For the IBM 9345 and 9394, surface checking is performed by the subsystem when you specify either CHECK or SKIP. For more information on surface checking, see Appendix E, “Surface checking,” on page 663.
NOSKIP	Indicates that primary surface checking is to be performed for all tracks in the specified range. If a data check is detected on a track during primary checking, skip displacement checking is performed for that track. The total number of tracks that can be inspected when NOSKIP is specified is 2500.
Default:	If your job specifies TRACKS, the default is SKIP. If your job specifies a range of tracks, the default is NOSKIP.
Restrictions:	SKIP|NOSKIP is ignored if NOCHECK is specified. If SKIP is specified, the value of **n** in CHECK(n) is ignored. For the 9345 and the 9394, NOSKIP is ignored. SKIP processing is much more extensive and takes longer than NOSKIP. SKIP is ignored for the 9391, 9393, 9396, 9397, 2105, 2107, 1750, and Internal Disk devices.

TOLERATE parameter: specify continue processing

Parameter/ Abbreviations	Description
TOLERATE(ENQFAIL) **TOL(ENQF)**	Specifies that in the event exclusive access cannot be obtained for a data set, that processing is to continue for the track. If TOLERATE(ENQFAIL) is specified, processing continues on the next track. For tracks in VSAM data sets, TOLERATE(ENQFAIL) must be specified when processing online.
TOLERATE(PRIFAIL) **TOL(PRIF)**	Specifies that when you are processing the secondary volume of a dual copy pair, you wish to continue processing (on the same track) when the same data on the primary volume cannot be read. If TOLERATE(PRIFAIL) is not specified when you are processing the secondary volume of a dual copy pair and the corresponding track on the primary volume cannot be read, a warning message is issued and processing continues on the next track (current track is not processed).
Default:	None.
Restrictions:	TOLERATE(ENQFAIL) is ignored if NOSKIP is specified (MVS systems only). ICKDSF assumes TOLERATE(ENQFAIL) is in effect if NOSKIP is specified and a data check requires that an enqueue be performed. TOLERATE(ENQFAIL) is ignored for IBM 9345 and 9394 devices and devices attached to an IBM 3990 Storage Control that support concurrent media maintenance. TOLERATE(PRIFAIL) is: • Not valid when DIRECTIO(PRIMARY) is specified • Ignored for a simplex device

TORANGE parameter: specify a specific ending location

Parameter/ Abbreviations	Description
TORANGE(*cylinder,head*) **TOR** **TO**	Use this parameter to specify the ending track (cylinder and head) of the volume or minidisk to be inspected. For *cylinder,head*, substitute the decimal (**n**) or hexadecimal digits (for example, X'2AB',X'E') to identify the cylinder and head where processing is to end. If you specify only one value, ICKDSF takes it to be the cylinder and defaults the head to the device maximum. If you specify TORANGE and do not specify FROMRANGE, FROMRANGE is defaulted to cylinder 0, head 0 of the specified or minidisk. For information on specifying the starting track of part of a volume (FROMRANGE), see “FROMRANGE parameter: specify a specific starting location” on page 196. For information on specifying part of a volume, see “RANGE parameters: part of a volume” on page 203.
Default:	None.
Restrictions:	You cannot specify TORANGE with CYLRANGE|HEADRANGE or TRACKS. TORANGE is not valid for 9391, 9393, 9396, 9397, 2105, 2107, 1750, and Internal Disk devices.

TRACKS parameter: specify discrete tracks

Parameter/ Abbreviations	Description
TRACKS((*cylinder,head*) [,...]) **TRACK** **TRKS** **TRK**	Specifies discrete tracks to be inspected. For *cylinder,head*, specify decimal (**n**) or hexadecimal digits to identify the cylinder, and decimal (**n**) or hexadecimal digits (for example, X'2AB',X'E') to identify the track to be inspected. To inspect more than one track at a time, specify: `TRACKS((cylinder,head),(cylinder,head))` The TRACKS parameter is also used to fix tracks that have an 0F0B condition. In order to fix this condition the NOSKIP, NOASSIGN, and NOPRESERVE parameters must also be specified on the INSPECT command.
Default:	None.
Restrictions:	The maximum number of individual tracks that you can specify with TRACKS is 20. However, unless you specify NOSKIP, the maximum number of tracks is the number of tracks in a cylinder. TRACKS and the range parameters are mutually exclusive. If you do not specify TRACKS or the range parameters, INSPECT checks for the existence of backup data and performs the recovery functions if backup data exists. If you are trying to recover from a previous failure at this time, and have not specified tracks or a range, the track that was being processed at the time of failure is recovered. However, if you also want to perform an INSPECT function, you must specify TRACKS or a range.

USERID parameter: specify another user's minidisk

CMS

Parameter/ Abbreviations	Description
USERID(*user's ID*) **UID**	Performs the INSPECT function on another user's minidisk. For *user's ID*, substitute the 1 to 8 characters of the user ID of the owner of the minidisk you want to verify.
Default:	If USERID is not specified, your own minidisk is verified.
Restrictions:	USERID can be specified only if you are using the CMS version of ICKDSF and have DEVMAINT authority. USERID is ignored in all other system environments. USERID and REALADDR are mutually exclusive.

Controlling the level of surface checking

When you specify CHECK(n), the level of surface checking, which is performed for each track in a specified range, is controlled by the SKIP|NOSKIP parameters. If you specify NOCHECK, no surface checking is performed. For more information on surface checking, see Appendix E, “Surface checking,” on page 663.

NOSKIP indicates that primary surface checking is to be performed for all tracks in the specified range, and skip displacement surface checking is performed only if a data check is detected. NOSKIP is the default if you specify any of the range parameters.

SKIP indicates that skip displacement surface checking is to be performed for every track in the specified range. Although SKIP provides a more extensive check of the surface of a track, it runs for a longer period of time per track. If SKIP is specified, the total number of tracks in the specified range is limited to the number of tracks in a cylinder. SKIP is the default if you specify the TRACKS parameter.

For the IBM 9345 and 9394, surface checking is performed by the subsystem. There is only one level of surface checking, and it is issued by specifying either CHECK or SKIP. For the IBM 9345 and 9394, NOSKIP is ignored.

RANGE parameters: part of a volume

CYLRANGE|HEADRANGE and FROMRANGE|TORANGE are optional parameters used to limit the areas of a volume or minidisk that are to be inspected.

CYLRANGE|HEADRANGE–Specifies the starting and ending cylinders and starting and ending heads to be inspected.

FROMRANGE|TORANGE–Specifies the starting track (cylinder and head) and the ending track (cylinder and head) to be inspected.

Table 40 on page 203 shows the parameter conditions when specifying part of the volume.

Table 40: Parameter conditions when specifying part of the volume.

Parameter	NOCHECK ASSIGN Valid?	Other Notes
CYLRANGE	No	If you specify CYLRANGE and do not specify HEADRANGE, all the heads of the specified cylinders are processed. Both the starting and ending values are required. If you specify an ending value greater than the maximum for the device, the device (minidisk) maximum is used for the ending value.
HEADRANGE	No	If you specify HEADRANGE and do not specify CYLRANGE, the specified heads for all the cylinders on the volume (minidisk) are processed. Both the starting and ending values are required. If you specify an ending value greater than the maximum for the device, the device (minidisk) maximum is used for the ending value.
FROMRANGE	No	If you specify FROMRANGE and do not specify TORANGE, TORANGE is defaulted to the last cylinder of the device (minidisk).
TORANGE	No	If you specify TORANGE and do not specify FROMRANGE, FROMRANGE is defaulted to cylinder 0, track 0 (starting cylinder and track of the minidisk)

Note:

1. CYLRANGE|HEADRANGE and FROMRANGE|TORANGE are mutually exclusive pairs. Either pair is mutually exclusive with TRACKS.
2. If NOCHECK is specified with any of the range parameters, the home address and record 0 of all tracks in the specified range are read. This can be used to verify alternate/primary track assignments of a subset of a volume.
3. If you want to verify the alternate tracks on a volume (that is, primary/alternate pairs are valid), specify the range parameters for the alternate cylinders.
4. Range parameters used with NOPRESERVE can destroy large areas of a volume.
5. Use TRACKS with the NOCHECK and ASSIGN parameters to unconditionally assign alternate surfaces.
6. With NOSKIP, depending on which is greater, you can inspect:
   - Up to 2500 tracks, or

- The total number of cylinders per volume (if you have provided only one head).

With SKIP, the total cannot exceed the number of tracks in a cylinder for the specified device type.

Assigning alternate tracks

A track can be flagged as defective, and an alternate assigned either conditionally or unconditionally. The amount of surface checking done before an alternate is assigned is determined by multiple factors, including:

- The use of the CHECK or NOCHECK parameter
- The availability of skip displacement bytes for the device type
- The current condition of the track

In the following example, ICKDSF assigns the next available alternate track for track (2,3). Since NOPRESERVE is specified, the contents of track (2,3) are not copied to the alternate track; the data on the specified track is destroyed when the command completes:

```
INSPECT UNIT(0273) NOVERIFY TRACKS(2,3) NOCHECK NOPRESERVE
```

For a detailed description of the type of checking performed, see Appendix E, “Surface checking,” on page 663.

Table 41 on page 204 shows you how to control the assignment of alternate tracks. The parameter explanations appear in alphabetical order under “Optional parameters” on page 192.

Table 41: Assigning alternate tracks with INSPECT parameters.

To...	Use the INSPECT parameters...
Detect defective primary and alternate tracks and assign an alternate surface if the defective track is a primary one.	CHECK and ASSIGN
Unconditionally assign alternate surfaces for the tracks specified.	NOCHECK and ASSIGN
Inspect primary and alternate tracks, but prevent assignment of alternates.	CHECK and NOASSIGN
Assign an alternate surface when data cannot be rewritten because of surface defects, regardless of the ASSIGN|NOASSIGN value.	PRESERVE In the map, this option will indicate all defective tracks but alternates will not be assigned. Skip displacement will be assigned as required.

Table 42 on page 204 shows you where data is rewritten when INSPECT finds a defective track.

Table 42: Where INSPECT rewrites the data of a defective track.

If defective track is:	Then data is rewritten...
A primary track	On the assigned alternate.
An alternate track associated with a primary surface	To a different alternate, and the defective alternate is flagged.
A reclaimed primary track that was previously flagged as defective	From the alternate surface to the reclaimed primary surface, and the alternate surface is made available.

Resource serialization when using INSPECT



This section describes data integrity when you are processing DASD which is:

Not an IBM 9345, 9394, or on DASD attached to an IBM 3990 storage control, which supports concurrent media maintenance.

See "Preserving data under Concurrent Media Maintenance" on page 207 for information on the IBM 9345 or on DASD attached to an IBM 3990 storage control.

When INSPECT occurs, the RESERVE macro is issued to obtain control of the device. DEQ is issued to release the device after processing is completed.

When INSPECT is used to perform skip displacement processing (using the SKIP parameter), if a track is part of a data set, INSPECT will enqueue on the data set while processing that track.

Additionally, if the INSPECT command exposes user data for a relatively long period of time, ICKDSF enqueues for exclusive control of the data set containing the track which is to be processed. Data set enqueue takes place when any one of the following conditions is true:

- The device is online to the operating system.
- The track is part of a non-VSAM data set.
- The SKIP parameter is specified.
- NOSKIP is specified, but primary surface checking indicates that skip displacement processing is necessary for the track.

If exclusive control of a data set cannot be obtained, a message is issued and processing continues on the next track.

The TOLERATE(ENQFAIL) parameter is provided to indicate that processing is to continue if the data set enqueue fails when SKIP is specified.

If the enqueue is performed as a result of primary surface checking indicating the need for skip displacement surface checking, TOLERATE(ENQFAIL) is assumed to be in effect.

For tracks in VSAM data sets, TOLERATE(ENQFAIL) must always be specified when processing online.

Recovering data after a job or system failure

This section describes recovering data which is not on the IBM 9345, 9394, or on DASD attached to an IBM 3990

See "Preserving data under Concurrent Media Maintenance" on page 207 for information on recovering data, which is on the IBM 9345 or on DASD attached to an IBM 3990 storage control.

If an INSPECT command ends before completing, and PRESERVE was specified on the failing job, ICKDSF has saved the data. It will be automatically recovered on the next use of the INSPECT command.

After resolving the reason for the failure, you can submit:

- The same INSPECT job.

  This does a primary surface check of the track being processed at the time of failure, recovers the data, and inspects all the tracks in the specified range, including those tracks that were inspected prior to the previous failure.
- An INSPECT job for a entirely different or partially different range.

This does a primary surface check of the track being processed at the time of failure, recovers the data, and processes all tracks in the new range.

- An ANALYZE job (for nonemulated, nonremovable media devices only) to determine the track that failed.

  ANALYZE will print the cylinder and head of the track that was being processed at the point of failure.

  Then you can issue a new INSPECT job with a modified range, according to the previous point of failure.
- Enter INSPECT with neither TRACKS nor any of the range parameters specified.

  This does a primary surface check of the track being processed at the time of failure, and recovers the data.

Warning

Be careful about using the volume before recovering the data. In addition to the data being unavailable, the track may be unusable to the operating system, and any use of the track can cause I/O errors.

If you run INIT on this volume before the next INSPECT, INIT erased the data at the backup location.

Note:

1. Recovery is only possible if PRESERVE was specified on the job running at the time of failure. It is not possible if HOLDIT or NOPRESERVE were specified or if you were processing minidisks under CMS.
2. It is possible that the track that is being processed at the time of failure contained no data. In that case, recovery consists of only doing a primary surface check of the track. This ensures that the track is usable (that is, that the track now contains just a home address and a standard record 0).
3. It is possible that INSPECT was "between tracks" when the job failed, and there is no track or data to recover.
4. The restore function is not optional. If data exists at the backup location, it is restored.

   If there is data on the track being restored (that is, the track being processed at the point of failure), the operator is prompted either to restore the data or erase the data.

   If the data cannot be restored, for whatever reason, the operator is prompted for the next action.

   To put the restored data in storage, you can run a job that specifies HOLDIT.
5. When you are processing minidisks on devices that do not support concurrent media maintenance, data is not saved at the backup location. Therefore, no recovery of data is possible.

Preserving data during INSPECT

This section describes preserving data which is not on the IBM 9345, 9394, or on DASD attached to an IBM 3990 storage control, which supports concurrent media maintenance.

See “Preserving data under Concurrent Media Maintenance” on page 207 for information on recovering data, which is on the IBM 9345 or on DASD attached to an IBM 3990 storage control.

When you specify the PRESERVE parameter of the INSPECT command, a backup copy of the data on a track is stored at the backup location as well as held in storage. This backup location uses two tracks: the recovery track and the preserve track.

The recovery track contains the control information, and the preserve track contains the actual data. This information resides on:

- The CE cylinder of the volume, if there is a uniquely addressable CE cylinder on the volume.
- The SA cylinder of the volume, if there is no CE cylinder, but there is an SA cylinder with unused tracks.
- An alternate track, if the device does not have a CE cylinder or an SA cylinder.

If processing ended abnormally, the next use of INSPECT will:

- Detect the data at the backup location and determine the track to be recovered (the recovery track).
- Check the home address and record 0 of the recovery track for validity.
- Surface check the track to be restored at the primary level unless a data check is detected. If a data check is detected, INSPECT will perform skip displacement surface checking.
- Restore the data.

The restoration of the track from the preserved data is automatic, and is independent of the range specified in the current job. To perform only the restore function, run INSPECT with no tracks specified.

Keeping your data in storage or in storage and backup

INSPECT allows you to choose from two levels of data preservation:

- In storage only.

  HOLDIT specifies that a copy of the data on the track being processed is to be kept in storage only, with no copy being kept at the backup location.

- In storage and at a backup location.

  PRESERVE or KEEPIT specifies that a copy of the data on the track being processed is to be written at the backup location as well as kept in storage. The copy at the backup location is used only during the restore procedure.

  The backup location and the copy of the data in storage are erased at the completion of the command.

  Even when a track that contains no data is processed, the backup location is still accessed. This ensures that the integrity of the volume can be restored if a restart is necessary.

PRESERVE|KEEPIT is the default. When PRESERVE|KEEPIT is specified, you might notice a performance degradation caused by the writing of the data at the backup location. The performance degradation depends on the total number of tracks being processed by the current INSPECT command.

When using PRESERVE, be careful:

- When data is written at the backup location. **It cannot be guaranteed that the data is always retrievable from the backup location**.
- If the backup location is the CE cylinder. **The ANALYZE command (which writes on the CE cylinder) will not destroy restored data if it exists.** ANALYZE indicates the cylinder and head of the track that originally had the problem.

  CE micro-diagnostics may destroy the data at the backup location.

  Therefore, if INSPECT processing does not complete because of a problem on the volume that requires the assistance of an IBM customer engineer, issue INSPECT to restore the data first, if necessary.

Preserving data under Concurrent Media Maintenance

Concurrent media maintenance allows user access to the data on a track while INSPECT is processing on that track. In addition, the entire volume is available for use by all users from all shared systems for the duration of the INSPECT job. Because the data on the track is always available, you can run INSPECT even when there is other activity on the volume.



Concurrent media maintenance is automatically issued when you specify PRESERVE. INSPECT will no longer perform the hardware "reserve" or the VTOC ENQ for the volume. Data set ENQ is eliminated as well as all restrictions on VSAM data sets.

If your device is a 3380, it is recommended you use the INSPECT command with the AVAILABLE parameter.

Concurrent media maintenance is automatically performed when your data is on IBM 9345 or 9394 devices, or on DASD attached to an IBM 3990 storage control that supports concurrent media maintenance.



Minidisks are also supported. If you are trying to preserve data for minidisk 192, INSPECT will stop running if you have previously preserved data for a real volume, for example, minidisk 193. If this occurs, reissue the INSPECT PRESERVE command for minidisk 193 to recover the previously preserved data. Then you can issue the INSPECT PRESERVE command to preserve data for minidisk 192.

How Concurrent Media Maintenance is performed

Concurrent media maintenance allows continued data availability on DASD while an INSPECT is processing on the track. User data is moved to an alternate track and is accessed from that track by any user while INSPECT operates on the primary track. When surface checking is complete, the data is returned to the primary track.

If execution of the INSPECT should end before completion, the following should be noted:

- User data remains on the alternate track and will be accessed from there until a subsequent INSPECT is run for that device.
- If a subsequent INSPECT is started from the same processor, processing will automatically continue for the track that received the failure.
- If a subsequent INSPECT is started from a different processor, the FORCE parameter is required to support recovery of a prior concurrent media maintenance failure from another processor. This is necessary in order to prevent multiple INSPECT jobs from different processors accessing the same track simultaneously.

Warning

Use the FORCE parameter only to recover from a prior concurrent media maintenance failure on another processor. Misuse of this parameter can cause data integrity problems when two INSPECT jobs are running simultaneously.

Dual copy volumes

When you INSPECT dual copy volumes, you should specify the DIRECTIO parameter to select the primary or secondary volume, otherwise the default is selected depending on the mode of the device. If INSPECT cannot read from the primary volume, INSPECT will terminate.

CMS version minidisk support



The following parameters are valid only when you are using the CMS version of ICKDSF and have DEVMAINT authority (as defined in the CP directory):

USERID–With DEVMAINT authority, you can use the USERID parameter to perform the data verification test on another user's minidisk. The following parameters are valid:

ALLTRACKS, ASSIGN|NOASSIGN, CHECK|NOCHECK, CYLRANGE, FROMRANGE, HEADRANGE, HOLDIT, MAP|NOMAP, PRESERVE, RECLAIM|NORECLAIM, SKIP|NOSKIP, TORANGE, TRACKS, and UNITADDRESS.

REALADDR–With DEVMAINT authority, you can use the REALADDRESS parameter to specify the real device address. ALLTRACKS and UNITADDRESS are not valid in this mode. All of the other parameters listed above are valid.

Besides DEVMAINT authority, you must also have specified LNKExclu on the OPTION directory control statement in the user's directory definition when performing media maintenance on minidisks.

For more information, see Chapter 5, “Getting started with the CMS version,” on page 37.

Examples of the INSPECT command

The following examples show different ways to code the INSPECT command.

Any values specified here are examples only and should not necessarily be interpreted as the values for your system. Most show the use of the command in offline and online mode under MVS.



To inspect a volume in the Stand-Alone version:

1. Eliminate the MVS JCL.
2. Substitute the UNITADDRESS parameter for the DDNAME parameter.
3. Specify the DEVICETYPE parameter if the MIMIC(EMU) or MIMIC(MINI) parameter is also specified.



To inspect a VSE version volume:

1. Replace the MVS JCL statements with VSE system control statements.
2. Substitute the SYSNAME parameter for the DDNAME parameter.

Inspecting volumes with the MVS version



The following examples show you how to inspect volumes with the MVS version of ICKDSF.

Inspecting for conditional assignment of alternate tracks in online mode

In this example, the assignment of alternate tracks depends on the results of surface checking. The data on each specified track is copied to an alternate track if the track is defective or is written back to the primary track if the track is not defective. Volume PAY345 was previously mounted as PRIVATE.

```
//EXAMPLE  JOB
//       EXEC  PGM=ICKDSF
//VOLUMEG  DD    UNIT=3390,DISP=OLD,VOL=SER=PAY345
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
 INSPECT DDNAME(VOLUMEG) NOVERIFY CHECK(3) -
        TRACKS((1,3),(1,2),(2,0),(2,3),(3,2))
/*
```

Inspecting for unconditional assignment of alternate tracks in offline mode

In this example, the next available alternate track is assigned for the specified primary track. If the primary track is already assigned an alternate track, it will be reassigned a different alternate track. The

default parameter PRESERVE causes the contents of the specified primary track to be copied to the assigned alternate.

```
//EXAMPLE  JOB
//         EXEC  PGM=ICKDSF
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
 INSPECT UNITADDRESS(0273) NOVERIFY TRACKS(X'2',3) NOCHECK
/*
```

Reclaiming tracks in offline mode

In this example, a volume is inspected to reclaim tracks that were previously marked defective. The default parameter PRESERVE causes the contents of the alternate track to be copied to the primary track if the primary track is reclaimed. The alternate track then becomes available for future assignment.

```
//EXAMPLE  JOB
//         EXEC  PGM=ICKDSF
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
 INSPECT UNITADDRESS(0354) NOVERIFY TRACKS((2,3),(3,1),(1,3)) -
        RECLAIM
/*
```

Inspecting the secondary volume of a duplex pair in online mode

In this example, an INSPECT is specified on the secondary volume of a dual copy pair in suspended duplex state with a primary volume serial of PAY345.

```
//EXAMPLE  JOB    jobname
//         EXEC   PGM=ICKDSF
//VOLUME1  DD     UNIT=3380,DISP=SHR,VOL=SER=PAY345
//SYSPRINT DD     SYSOUT=A
//SYSIN    DD     *
    INSPECT DDNAME(VOLUME1) NVFY CHK(1) -
            TRACKS(6,3) DIRECTIO(SECONDARY) NOPRESERVE
/*
```

Inspecting the secondary volume of a duplex pair in offline mode

In this example, an INSPECT is specified on the secondary volume of a dual copy pair in suspended duplex state. The DIRECTIO and SECONDARY parameters are abbreviated.

```
//EXAMPLE  JOB    jobname
//         EXEC   PGM=ICKDSF
//SYSPRINT DD     SYSOUT=A
//SYSIN    DD     *
    INSPECT UNIT(0274) NVFY CHK(1) TRACKS(6,3) DIO(SEC) NOPRESERVE
/*
```

Producing a volume map of an entire volume in a Stand-Alone version



In this example, all the tracks on the volume are inspected to produce a volume map that lists all the defective tracks. No alternate tracks are assigned.

```
INSPECT UNITADDRESS(0353) NOVERIFY -
        ALLTRACKS NOASSIGN NOCHECK
```

Inspecting volumes with the CMS version



The following examples show you how to inspect volumes with the CMS version of ICKDSF.

Inspecting another user's minidisk

In this example, a minidisk that is owned by another user is inspected. You specify the USERID parameter to inspect the minidisk of a user named BROWN. You must have DEVMAINT authority for this example. TRACKS(3,1) is the cylinder and head address relative to the beginning of the minidisks.

```
INSPECT  UNITADDRESS(0391) NOVERIFY USERID(BROWN) TRACKS(3,1)
```

Inspecting a minidisk with a real address

In this example of batch mode execution, part of a volume with a real address of 290 is inspected. Cylinder 3, tracks 0 through 9 are inspected. If any of the inspected tracks are defective, an alternate is assigned. SKIP specifies that skip displacement checking is to be performed on the specified tracks. You must have DEVMAINT authority for this example.

```
INSPECT  REALADDR(290) NOVERIFY
          FROMRANGE(3,0) TORANGE(3,9) SKIP
```

Checking tracks for defects in the VSE version



In this example, a volume previously initialized under VSE is inspected. If any of the inspected tracks are defective, an alternate will be assigned. The SKIP parameter specifies that skip displacement surface checking is to be performed on the tracks specified.

```
//  JOB      jobname
//  ASSGN    SYS010,151
//  EXEC     ICKDSF,SIZE=AUTO
    INSPECT SYSNAME(SYS010) NVFY TRKS((2,3),(3,1),(1,3)) -
            SKIP
/*
/&
```

Chapter 18. INSTALL command—CKD



The INSTALL command is an enhanced installation procedure that includes the writing of home address and record 0 on every track of a 3380, 3390, and 9345 volume. You issue INSTALL before formatting 3380, 3390, and 9345 volumes on:

- A new DASD unit
- Replaced or upgraded HDA
- A DASD unit that has been physically relocated

For an example of using the INSTALL command on a new device, see "Installing a device from the factory" on page 69.

If you are installing a new 9345 device, you might not need to run the INSTALL command. Your IBM customer engineer will run a Track Center Test during the install process and give you a list of device addresses against which you need to run the INSTALL command. If no 9345 devices need the INSTALL command run, you are ready to format the device for your operating environment.

You also use the INSTALL command to change the mode of IBM 3390 or 9391 volumes to 3380 track compatibility mode (3380 track format). The 3390-9 and 9394 do not support 3380 track compatibility mode.

The INSTALL command is valid on IBM 3380, 3390, and 9345 volumes. If INSTALL is needed on dual copy volumes, the pair must be broken.

The INSTALL command is not recommended for use on the 9394.

The INSTALL command is not supported on 9393, 2105, 2107, and 1750 devices.

For information on ICKDSF support of the RAMAC family of devices, see "ICKDSF support of the RAMAC Array family" on page 8.

For information on ICKDSF support of the Internal Disk devices, see "ICKDSF support of the Internal Disk" on page 9.



When you are using the CMS version of ICKDSF, the INSTALL command is valid only with dedicated devices. For more information, see Chapter 5, "Getting started with the CMS version," on page 37.

Warning

After the install process is complete, you must initialize the volume for use in your operating environment. To initialize your volume, use the:

INIT command for MVS or VSE
CPVOLUME command for VM
AIXVOL command for AIX

Note: In MVS or VSE, if you want to erase the FFVDP on the volume, use INIT VALIDATE NODATA command, or use the TRKFMT command.

Multiple concurrent ICKDSF jobs can cause contention for resources. This can occur when the number of ICKDSF jobs accessing devices on the same storage control or storage subsystem exceeds the number of paths to the devices. For example, if you are running in device level selection enhanced (DLSE) mode, the maximum number of copies you should use is four.

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Protecting the INSTALL command with RACF

The MVS version of ICKDSF checks the general resource profile for a facility class profile of STGADMIN.ICK.INSTALL. If RACF is not installed or the facility STGADMIN.ICK.INSTALL is not created, the INSTALL command executes with no authorization check. For additional information, see “Protecting ICKDSF commands with RACF” on page 34.

Installing relocated devices

3380

When your IBM 3380 has been moved to a new location, you may need to run the INSTALL command. The model of your 3380 determines whether this INSTALL procedure is required, recommended, or optional. The INSTALL function is:

- Required for Models AJ4, BJ4, AK4, and BK4
- Recommended for Models AE4 and BE4
- Optional for all other 3380 models

3390

Before you move the 3390 to a new location, it is recommended that you transfer the data on the 3390 to another device in the event the 3390 is subject to severe shocks or vibrations during the move. After the 3390 is in its final location and your service representative completes the physical installation process, you must issue the INSTALL command to write the home address and record 0 at track center.

Note: If the 3390 is not subjected to severe shocks or vibration during the move, you may not need to transfer the data to another device or run the INSTALL command.

9345

When you move your 9345 to a new location, your IBM customer engineer will run a diagnostic to determine whether you need to run the INSTALL command. After running the diagnostic, your customer engineer will give you a list of device addresses against which you need to run the INSTALL command.

Changing the mode of 3390 volumes

To change the volume mode (3390 mode or 3380 track compatibility mode) of IBM 3390 devices (models 1, 2, and 3 only), or 9391 devices, use the SETMODE parameter. If a volume is in a transition state due to a previous INSTALL command where part of the volume has been converted, ICKDSF will detect and complete the conversion.

Syntax

INSTALL
Required Parameters: SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*)
Optional Parameters: SETMODE(3380|3390) VERIFY(*serial*|**NONE**)|NOVERIFY

Required parameters

SYSNAME|UNITADDRESS parameter: identify the volume

Parameter/ Abbreviations	Description
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and an attached CMS volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address (3 or 4 hexadecimal digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated volume or minidisk. The unit address is the device number.
Default:	None.
Restrictions:	You must run INSTALL offline.

Optional parameters

SETMODE parameter: set 3390 mode

Parameter/ Abbreviations	Description
SETMODE(3380|3390) **MODE**	Specifies the IBM 3390 or 9391 is to be set to 3390 mode, 3380 track compatibility mode (3380 track format). **Option** **Sets the volume to:** **3380** 3380 track compatibility mode. **3390** 3390 mode.
Default:	If you do not specify the SETMODE parameter, the device type is the default. If you specify the SETMODE parameter, you must specify either 3380 or 3390.
Restrictions:	Valid for IBM 3390 (models 1, 2, and 3 only), and IBM 9391. Not valid for 9394, 9393, 9396, 9397, and Internal Disk devices.

VERIFY|NOVERIFY parameter: verify the volume serial number

Parameter/ Abbreviations	Description
VERIFY(*serial*) **VFY**	Specify when you want to verify the volume serial number before installing a volume. If the volume serial number does not match that found on the volume, INSTALL terminates. For *serial*, substitute 1 to 6 alphanumeric characters for the volume serial number. To verify that a volume serial number does not exist, substitute the string *NONE* for *serial*. If no volume serial exists, or if the volume serial is actually "*NONE*", the INSTALL operation continues. If a volume serial exists, the INSTALL command ends. If VERIFY(*serial*) parameter is specified in the INSTALL command and PARM='NOREPLYU' is specified in the EXEC card in the JCL, no operator's intervention (Reply U or T) is required. If PARM='NOREPLYU,FORCE' is specified in the JCL, the VERIFY(*serial*) parameter is not required to bypass the operator's intervention (Reply U or T) message.
NOVERIFY **NOVFY** **NVFY**	Specify when you want to bypass verification of the volume serial number.
Default:	None.

Parameter/ Abbreviations	Description
Restrictions:	The command ends: • If you specify VERIFY and verification fails. • If you do not specify either VERIFY or NOVERIFY and a *volser* exists.

Resuming after a job or system failure

Warning
The INSTALL command must be run to complete the mode change before the volume can be used. If you issue a mode change, you must check the messages carefully to ensure the command completes.

This command should be allowed to run to completion. If processing is interrupted, restart the command. If you do not restart the command, the device might be left in an unusable state. If you subsequently try to run other ICKDSF commands on the device, ICKDSF will either ask or force you to enter an INSTALL command to return the device to its proper condition.

If INSTALL command processing is interrupted when you are converting an IBM 3390 or 9391 volume between 3390 mode and 3380 track compatibility mode (or the reverse), the device is left in an unusable state. Subsequent I/O operations to the device will fail.

Processing in a shared environment

When running the INSTALL command on a volume shared between systems, follow these guidelines:

1. Vary the device offline to the other systems.
2. Run the INSTALL command.
3. Format your volume for your operating system.
4. Vary the device back online to the other systems.

The other systems will then recognize the volume serial number and other system operating information of the volume. If you do not follow these guidelines, other systems accessing the volume may experience unpredictable results.

Examples of the INSTALL command

The following examples show different ways to code the INSTALL command.

Any values specified here are examples only and should not necessarily be interpreted as the values for your system. Most show the use of the command in offline and online mode under MVS.



To install a volume in the Stand-Alone version, eliminate the MVS JCL.



To install a VSE version volume:

```
// JOB      INSTALL
// LIBDEF   PHASE,SEARCH=(IJSYSRS.SYSLIB)
// OPTION   NODUMP
// ASSGN    SYS011,D40
// EXEC     ICKDSF,SIZE=AUTO
 INSTALL SYSNAME(SYS011) NVFY
/*
/&
```

Warning

After the install process is complete, you must format the volume for use in your operating environment. To format your volume, use the:

INIT command for MVS or VSE
CPVOLUME command for VM

Installing and initializing a volume



This example does not include the VERIFY or NOVERIFY parameters for the INSTALL command. Therefore, if the volume had a volume serial, the example would not run. The volume is then formatted for use in an MVS environment.

```
//EXAMPLE   JOB
//          EXEC  PGM=ICKDSF
//SYSPRINT  DD    SYSOUT=A
//SYSIN     DD    *
 INSTALL UNITADDRESS(0353)
   IF LASTCC<=4 (or <8)
     THEN INIT UNIT(0353) NOVERIFY VOLID(ABCD4) NOVALIDATE
/*
```

Converting an IBM 3390 to 3380 track compatibility mode



In this example, an IBM 3390 volume is converted from 3390 mode to 3380 track compatibility mode. This example does not include the VERIFY or NOVERIFY parameters. Therefore, if the volume had a volume serial, the example would not run.

```
INSTALL UNITADDRESS(0353) SETMODE(3380)
```



In the VM environment, once the mode is changed, you must vary the device offline and then online.



In the MVS environment, once the mode is changed, you must re-IPL the system or issue an ACTIVATE command to activate a new IODF.

Chapter 19. IODELAY command—CKD



ICKDSF issues very intensive I/O during processing. Sometimes this can degrade the performance of other users accessing the channel and impact your entire system throughput. The IODELAY command slows down ICKDSF processing by allowing time in between I/O rather than issuing consecutive I/O operations.

The IODELAY command allows you to specify:

- The number of consecutive I/Os that ICKDSF can issue
- The allowable time period between those I/Os

When ICKDSF is issued, the time delay is set to zero (same as current processing). Once you set the time delay with the IODELAY command, it remains set until you reset it.

Protecting the IODELAY command with RACF

The MVS version of ICKDSF checks the general resource profile for a facility class profile of STGADMIN.ICK.IODELAY. If RACF is not installed or the facility STGADMIN.ICK.IODELAY is not created, the IODELAY command executes with no authorization check. For additional information, see "Protecting ICKDSF commands with RACF" on page 34.

Syntax

IODELAY
Required Parameters: SET|RESET
Optional Parameters: PERIO(*n*) SECONDS(*n*)|MSECONDS(*n*)|USECONDS(*n*)

Required parameters

SET|RESET parameter: set an I/O delay

Parameter/ Abbreviations	Description
SET	Used to set a timed delay which will apply to all ICKDSF functions.
RESET	Used to reset the time delay. After issuing RESET, there is no time delay in effect.
Default:	None.
Restrictions:	None.

Optional parameters

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PERIO parameter: number of I/Os scheduled

Parameter/ Abbreviations	Description
PERIO(*n*)	Allows you to specify the number of I/Os to be scheduled between each time delay. The number specified here is the number of I/Os ICKDSF will schedule before it will quiesce and allow other functions to gain control. Specify **n** as the number of I/Os (1 to 1000) allowed before the time interval is reactivated.
Default:	If PERIO is not specified with SET, PERIO defaults to 1.
Restrictions:	None.

SECONDS|MSECONDS|USECONDS parameter: set the time period

Parameter/ Abbreviations	Description
SECONDS(*n*) **SEC**	Specifies the amount of time in seconds which is allowed between ICKDSF issuing I/Os. Specify **n** as the number of seconds (1 to 60) delay.
MSECONDS(*n*) **MILLI** **MSEC**	Specifies the amount of time in milliseconds which is allowed between ICKDSF issuing I/Os. Specify **n** as the number of milliseconds (1 to 1000) delay.
USECONDS(*n*) **MICRO** **USEC**	Specifies the amount of time in microseconds which is allowed between ICKDSF issuing I/Os. Specify **n** as the number of microseconds (1 to 1000) delay.
Default:	None.
Restrictions: CMS	Under the CMS version, an I/O delay time of less than 1 second might excessively use your processor. Because of this, use the PERIO and SECOND parameters together, instead of the MSECONDS or USECONDS parameters. For example, if you want 10 I/Os with a 1-second delay: `IODELAY SET PERIO(10) SECONDS(1)`

Examples of the IODELAY command

The following example shows how to code the IODELAY command.

Any values specified here are examples only and should not necessarily be interpreted as the values for your system. The example is for offline modes under MVS.

VSE

To run IODELAY in the VSE version:

1. Replace the MVS JCL statements with VSE system control statements.
2. Substitute the SYSNAME parameter for the UNITADDRESS parameter.

Delaying 100 ms after every 20 operations with the MVS version

MVS

In this example, the IODELAY command is used to set a delay of 100 ms after every 20 ICKDSF I/O operations. This allows functions other than ICKDSF to perform during this delay. The first IODELAY command is followed by the ANALYZE command, which has a delay of 100 ms after every 20 ICKDSF I/O

operations while it is processing. The second IODELAY command uses RESET, so that the medial initialization has no delay.

```
//EXAMPLE   JOB
//          EXEC  PGM=ICKDSF
//SYSPRINT  DD    SYSOUT=A
//SYSIN     DD    *
 IODELAY SET PERIO(20) MILLI(100)
 ANALYZE UNITADDRESS(0151) SCAN
 IODELAY RESET
 INIT UNITADDRESS(0151) CYLRANGE(50,51) VALIDATE NOVERIFY
/*
```

Chapter 20. PPRCOPY commands—CKD



Peer-to-Peer Remote Copy (PPRCOPY), also referred to as PPRC, allows synchronous and asynchronous copying of a DASD volume from one subsystem to another subsystem volume, without host system dependencies, for those subsystems that support it.

A detailed description of PPRCOPY can be found in *z/OS DFSMS Advanced Copy Services*. You need to read this before using the ICKDSF PPRCOPY commands.

This topic provides information on PPRCOPY and on the ICKDSF PPRCOPY commands, which initiates and supports the PPRCOPY functions:

- How PPRCOPY works
- Using synchronous and asynchronous PPRCOPY; see Chapter 21, “Asynchronous PPRCOPY,” on page 321 for additional information on Asynchronous PPRCOPY.
- Using cascading
- Converting from one PPRCOPY volume state to another
- PPRCOPY FAILOVER and FAILBACK
- Using Freeze/Run
- ICKDSF PPRCOPY Command Functions
- PPRCOPY Hardware Requirements
- PPRCOPY Software Requirements
- PPRCOPY Restrictions
- Setting Up the PPRCOPY Environment
- PPRCOPY commands



Attention: In the following commands, PPRCOPY is shown as the keyword before each command, you can use PPRC in place of PPRCOPY.

PPRCOPY DEFINESESSION
–Sessions are OPENed (created) and CLOSEd (terminated); see “PPRCOPY DEFINESESSION” on page 236.

PPRCOPY DELPAIR
–Deletes remote copy device pairs; see “PPRCOPY DELPAIR–deleting pairs” on page 238.

PPRCOPY DELPATH
–Deletes ESCON and FCP paths between two subsystems; see “PPRCOPY DELPATH–deleting paths” on page 240.

PPRCOPY ESTPAIR
–Establishes remote copy device pairs; see “PPRCOPY ESTPAIR–establishing pairs” on page 243.

PPRCOPY ESTPATH
–Establishes ESCON and fibre channel protocol (FCP) paths between two subsystems; see “PPRCOPY ESTPATH–establishing paths” on page 251.

PPRCOPY FREEZE
–Suspends all operations for all PPRCOPY volumes on a single storage control; see “PPRCOPY FREEZE–suspend all operations for all PPRCOPY volumes on a single storage control” on page 259.

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PPRCOPY POPULATESESSION
—Populates or depopulates a previously OPENed session with volumes; see "PPRCOPY POPULATESESSION" on page 261.

PPRCOPY QUERY
—Queries status; see "PPRCOPY QUERY—querying status" on page 265.

PPRCOPY QUERY ASYNCCOPY
—Queries data about the Asynchronous PPRCOPY configuration; see "PPRCOPY QUERY ASYNCCOPY" on page 281.

PPRCOPY QUERY OUTOFSYNCSTATE
—Queries data about the number of volumes in the specified session that are out of sync; see "PPRCOPY QUERY OUTOFSYNCSTATE" on page 285.

PPRCOPY QUERY SESSIONSDEVICES
—Queries status of the session open on the LSS; see "PPRCOPY QUERY SESSIONSDEVICES" on page 287.

PPRCOPY RECOVER
—Reestablishes access to a secondary volume; see "PPRCOPY RECOVER—recovering data on the recovery system" on page 288.

PPRCOPY RUN
—Resumes all operations for all PPRCOPY volumes on a single storage control; see "PPRCOPY RUN—resume all operations for all PPRCOPY volumes on a single storage control" on page 291.

PPRCOPY SETCHARACTERISTICS
-Allows management software to designate a Metro Mirror pair in a Multi-Target Mirror configuration that must remain full duplex when performing a Remote Pair FlashCopy (Preserve Mirror) operation.

PPRCOPY STARTASYNCCOPY
—Initializes or modifies and starts the configuration of an Asynchronous PPRCOPY session; see "PPRCOPY STARTASYNCCOPY" on page 295.

PPRCOPY SUSPEND
—Suspends pairs; see "PPRCOPY SUSPEND—suspending pairs" on page 300.

PPRCOPY TERMASYNCCOPY
—Pauses or terminates Asynchronous PPRCOPY for the specified session; see "PPRCOPY TERMASYNCCOPY" on page 303.

- Establishing and managing PPRCOPY volumes and paths

Protecting the PPRCOPY command with RACF

The MVS version of ICKDSF checks the general resource profile for a facility class profile of STGADMIN.ICK.PPRCOPY. If RACF is not installed or the facility STGADMIN.ICK.PPRCOPY is not created, the PPRCOPY command executes with no authorization check. For additional information, see "Protecting ICKDSF commands with RACF" on page 34.

PPRCOPY Overview

There are two types of PPRCOPY, non-cascading and cascading.

Non-cascading

The primary subsystem (application site) establishes the ESCON/FCP paths and links to a secondary subsystem (recovery site) and manages the copying of a DASD volume from the primary site to the secondary site either synchronously or asynchronously depending on the option specified when the pair was created.

From the primary host, the I/O operation to the secondary subsystem is transparent. A single interrupt is presented to the host to indicate successful completion of the operation.

Cascading

Cascading is a situation where a PPRCOPY secondary volume serves as PPRCOPY primary volume in another PPRCOPY relationship. The same volume serves as both. So a cascaded triad could be represented as follows.

```
A -> B -> C
```

Where volumes A and B form the so called local pair and volumes B and C form the remote pair. Volume A is the primary of the local pair, volume C is the secondary of the remote pair, and volume B is both the secondary of the local pair and the primary of the remote pair. The primary subsystem manages the copying of the volume from the primary site to the intermediate site and the intermediate subsystem manages the copying between the intermediate site to the remote site.

Although the subsystem manages virtually all the operation, PPRCOPY provides the means to initiate and terminate the functions, suspend a copy operation, query the status of volumes, and provide to a recovery host the ability to recover control of the secondary volume.

Extended Distance Mode

When the PPRCOPY extended distance feature is installed and enabled on the ESS, it provides an alternative to synchronous PPRCOPY. It also adds a new alternative in the ESS-to-ESS data mirroring capabilities. When PPRCOPY extended distance is enabled, updates made to a PPRCOPY primary volume are sent to a secondary volume asynchronously (for more information on Asynchronous PPRCOPY, see Chapter 21, “Asynchronous PPRCOPY,” on page 321). This helps minimize the impact on application throughput. When the PPRCOPY extended distance feature is enabled, the primary and recovery storage control sites can be separated by very long distances. Channel extender technology can be used to link the primary and recovery storage control sites. This technology allows these systems to be connected over large distances by using less expensive telecommunication lines, with little performance impact. Therefore, if your environment has bandwidth restrictions or has extended distance requirements, you may want to consider PPRCOPY extended distance. When operating in extended distance mode, the primary volume sends a periodic, incremental copy of updated tracks to the secondary volume instead of a constant stream of updates. This causes less impact to application writes for primary volumes and less demand for bandwidth resources, while allowing a more flexible use of the available bandwidth. In addition, the lower bandwidth requirement creates the potential for worldwide distance capability when using channel extenders.

During an extended distance operation, the ESS captures information about updates to the primary and periodically sends those updates to the secondary. After the initial copy of tracks, the ESS periodically starts a synchronization cycle where all updated tracks, in ascending order from the lowest numbered track, is copied from the primary volume to the secondary volume.

The ESS updates the secondary tracks with the current information for that track, regardless of the number of updates between the time it was last copied, the current time, and the order in which the updates occurred. When this process completes, the cycle is repeated. There is little response time degradation on application I/O while operating in extended distance mode. Write updates to the primary volume receive an immediate completion because the synchronization cycle is independent of the primary write updates.

Setting up your environment to use PPRCOPY extended distance

There are three requirements for setting up your environment to use PPRCOPY extended distance mode:

- A PPRCOPY link must be active between the primary storage control and recovery storage control.
- A PPRCOPY volume pair must be established with PPRCOPY ESTPAIR OPTION(XD).
- The primary and secondary devices must be in SIMPLEX state or in SUSPEND state at the beginning of the process.

Using PPRCOPY extended distance

The following sections contain information about using PPRCOPY extended distance.

Establishing PPRCOPY volume pairs

The PPRCOPY ESTPAIR command allows you to establish a PPRCOPY volume pair using PPRCOPY extended distance mode and then transition the volume pair to synchronous mode. The command now includes an OPTION parameter with the following values.

SYNC: This value establishes a PPRCOPY volume pair in synchronous mode. In this mode, the volume pair reaches DUPLEX status after the initial copy of the volume pair is completed and the primary updates are mirrored synchronously with the I/0 in progress. As a consequence, there is propagation overhead, manageable under 103 km, but which becomes progressively significant at very long distances. If a volume pair is established in extended distance mode, specifying this value causes the volume pair to change to synchronous mode.

XD: This value establishes a PPRCOPY volume pair in extended distance mode. In this mode, the volume pair does not reach DUPLEX state after the initial copy of the volume pair is completed. The volume remains in a PENDING XD state. The primary volume updates complete before they are mirrored to the secondary volume. These track updates are recorded into a bitmap and periodically copied to the secondary volume. As a consequence, there is no guarantee that application dependent writes are transferred in the same sequence that they have been applied to the primary volume. Because the contents of the copy are uncertain, the secondary copy is described as being fuzzy, as shown in "Converting from one PPRCOPY volume state to another" . Because mirroring in extended distance mode is done asynchronously with PPRCOPY volume pairs, CRIT(YES) is not valid for a volume pair established with OPTION(XD).

Using synchronous and asynchronous PPRCOPY

The enhanced flexibility with synchronous PPRCOPY means that you can have some volume pairs established in synchronous mode and others in PPRCOPY extended distance mode. For example, if you have an environment with restricted bandwidth but have volumes that are critical to your operation, you can establish those volumes in synchronous mode. Synchronous mode allows the recovery storage control to remain current with the primary storage control, which is critical should a disaster occur. Less critical volumes can be established in PPRCOPY extended distance mode.

In addition, you might also consider using PPRCOPY in synchronous and extended distance modes of operation during peak and nonpeak hours. For example, you might consider using PPRCOPY extended distance mode during peak work hours when minimal performance impact to primary applications is an important requirement. Then, during nonpeak hours, you can use synchronous mode, which allows your data to remain current at the recovery site in the event that an unplanned outage or disaster occurs. Another use of the synchronous and extended distance modes are in a cascading triad, where the connection between the local primary and the intermediate secondary is a synchronous one and that between the intermediate primary and the remote secondary is extended distance. The synchronous connection between the local primary and the intermediate secondary ensures that the two volumes are exact copies of each other. The extended distance connection between the intermediate primary and the remote secondary avoids the performance impact the primary site would otherwise experience in waiting for the I/O to complete on the remote secondary and requires much less bandwidth to operate.

Using cascading

PPRCOPY cascading is a PPRCOPY mode where a single volume can be both a PPRCOPY primary and a secondary. This allows for disaster recovery situations in which a primary volume can be PPRCOPYed to a secondary volume, which at the same time is operating as a PPRCOPY primary volume.

The intended benefits of such an arrangement are:

- Long distance remote copy solution with the performance impact of only a short distance synchronous PPRCOPY

- Three or two site configuration options where three sites provide zero data loss
- The intermediate site can be within synchronous PPRCOPY distance, but isolated such that a disaster at the local site would be unlikely to affect the intermediate site
- The remote site may be any distance away from the intermediate site
- Local to intermediate connection is PPRCOPY-SYNC so the intermediate site is an exact copy of the local site

A cascading configuration can be represented as follows:

```
A -> B -> C
```

Where volumes A and B form the so called local pair and volumes B and C form the remote pair. Volume A is the primary of the local pair, volume C is the secondary of the remote pair, and volume B is both the secondary of the local pair and the primary of the remote pair. The primary subsystem manages the copying of the volume from the primary site to the intermediate site and the intermediate subsystem manages the copying between the intermediate site to the remote site.

The individual pairs can be configured in synchronous or extended distance mode. The allowed configurations are as follows:

- SYNC -> XD

  Where there is a synchronous PPRCOPY relationship from the local site to the Intermediate site, and then an extended distance PPRCOPY relationship from the intermediate site to the remote site. In this case, the Intermediate site is an exact copy of the local site. If there is an outage at the local site, the intermediate site still contains all of the data. The intermediate site would complete sending the updates to the remote site and then the remote site would have a copy of the data up to the time of failure.
- XD -> XD

  Here there is an extended distance relationship from the local site to the intermediate site, and an extended distance relationship from the intermediate site to the remote site.
- SYNC -> SYNC

  It is allowed to have the local site to intermediate site be synchronous PPRCOPY and the intermediate site to remote site also be synchronous, although this will have a performance impact on the host I/O.

  If FCP paths are established between the local pair and the pair is then established in synchronous mode then the remote pair should be established in extended distance (XD) mode regardless of the pathing protocol used. If the remote pair is established in synchronous mode any I/O directed to the local primary will result in the remote pair being suspended. In such a case the remote pair should be reestablished in XD mode.

  FCP synchronous to synchronous mode is allowed to accommodate situations such as the following.

  A local pair is established FCP synchronous and it's remote pair in XD mode. At some later time backups at the remote secondary site are desired. To accomplish this the local pair could be FROZEN, which suspends the local primary. The remote pair can then be converted to synchronous mode with the ESTPAIR command. Once the volumes become synchronized the backups can be taken. Once the backups are completed, the remote pair can be returned to XD mode, the RUN command would then be issued to the local primary and paths and the pair could then be reestablished.
- XD-> SYNC

  It is not allowed.

Establishing PPRCOPY cascaded pairs

Cascade is a new keyword used in conjunction with the PPRCOPY ESTPAIR command.

The cascaded volumes can be established in either order:

- Recommended order
  1. Establish remote pairs with NOCOPY
  2. Establish local pairs
- Alternate order
  1. Establish local pairs
  2. Wait for the volumes to go **Full Duplex**
  3. Establish remote pairs

Note: It is possible to do other combinations, for example, in the first case above, the remote pairs do not have to be established with **NOCOPY, but it is a waste of bandwidth** to do so.

A pair can be made eligible to be a cascaded pair at the time the pair is established or at a later time. What this means is that when a PPRCOPY pair is initially established, the user can indicate that the pair is eligible for cascading. For an already established pair, the user can issue an establish command that makes it a cascaded pair without breaking the existing pair to do the reestablish.

Some examples of this are shown below, where, SITEA is the local site, SITEB is the intermediate site and SITEC is the remote site:

- SITEB -> SITEC is initially established with the indication that the volume at SITEB is eligible for cascading. When SITEA -> SITEB is established, this now becomes a cascaded relationship.
- SITEB -> SITEC was already established without the indication that it is eligible for cascading. An establish is reissued to the volume at SITEB to indicate that it is eligible for cascading, and the pair remains established. Then SITEA -> SITEB can be established, without breaking the SITEB -> SITEC pair. This now becomes a cascaded relationship.
- SITEA -> SITEB is already established. Then SITEB -> SITEC can be established with an indication that the volume at SITEB is eligible for cascading, without breaking the SITEA -> SITEB pair. This now becomes a cascaded relationship.

Long distance data migration

You can use PPRCOPY extended distance for long distance data migration. During the migration, application updates from the primary to the secondary can still occur. When the migration copy is complete, you can quiesce the applications to ensure that no further updates occur and that the updates are on the migration volumes. You can use the new volumes to start your applications at the new location.

Converting from one PPRCOPY volume state to another

You can convert PPRCOPY volume pairs from PPRCOPY extended distance mode to synchronous mode and vise versa on regular PPRCOPY pairs as well as on cascaded pairs. A switch to synchronous mode can be done using the PPRCOPY ESTPAIR command while the volume pair is active or after the volume pair has been suspended. Figure 31 on page 229 and Table 43 on page 229 explain the commands used to convert between PPRCOPY states, including PPRCOPY extended distance. Each number in the figure is listed in the table with the appropriate command for that state change.

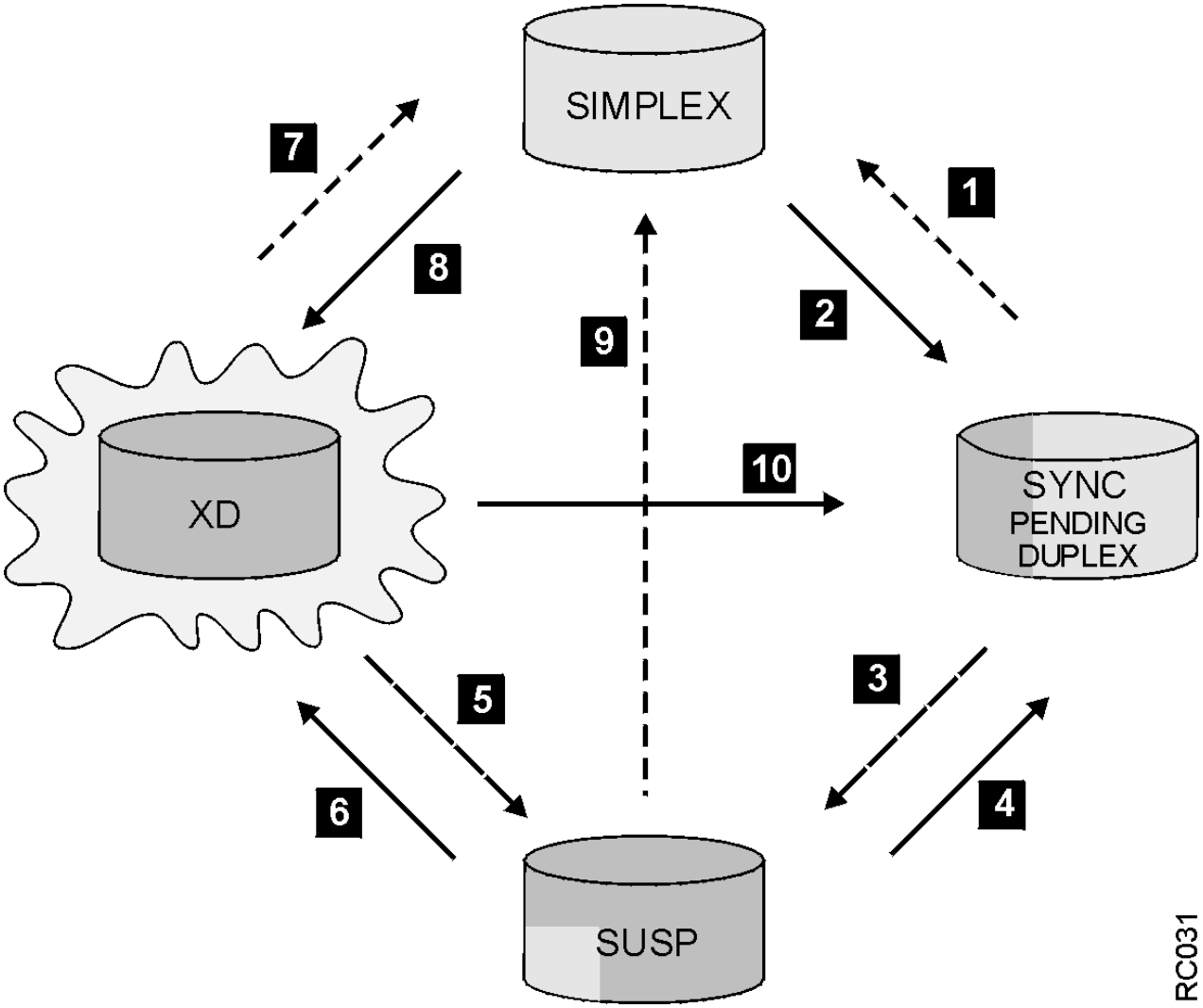


Figure 31: Volume state transitioning

Table 43: Transitioning between volume states.

	To transition from...	To...	Use the following command:
1	SYNC	SIMPLEX	DELPAIR
2	SIMPLEX	SYNC	ESTPAIR
3	SYNC	SUSP	SUSPEND
4	SUSP	SYNC	ESTPAIR MODE(RESYNC)
5	XD	SUSP	SUSPEND
6	SUSP	XD	ESTPAIR MODE(RESYNC) OPTION(XD)
7	XD	SIMPLEX	DELPAIR
8	SIMPLEX	XD	ESTPAIR MODE(COPY) OPTION(XD)

Table 43: Transitioning between volume states. (continued)

	To transition from...	To...	Use the following command:
9	SUSP	SIMPLEX	DELPAIR
10	XD	SYNC	ESTPAIR OPTION(SYNC)

Note:

1. To go from synchronous PPRCOPY to PPRCOPY extended distance mode (pending-XD), the pair must be in a suspended state, and then you can do an ESTPAIR and specify MODE(RESYNC) and OPTION(XD).
2. To go from PPRCOPY extended distance mode (pending-XD) to synchronous PPRCOPY, the pair must be in a pending-XD state, and then you can do an ESTPAIR and specify OPTION(SYNC).
3. To go to PPRCOPY extended distance mode (pending-XD) from a suspended state, you can do an ESTPAIR with MODE(RESYNC) and OPTION(XD).

Monitoring PPRCOPY volume pairs

To monitor the copy process of PPRCOPY volumes, issue the QUERY command. When PPRCOPY extended distance is enabled, you should monitor volumes that have the most out-of-sync tracks waiting to be transmitted because of the delays introduced before updates are received by the recovery site. The amount of data lost during a disaster increases with the number of out-of-sync tracks.

PPRCOPY FAILOVER, FAILBACK and FAILOVERMT

You can use these commands to revers the direction of PPRCOPY pairs:

- PPRCOPY ESTPAIR FAILOVER
- PPRCOPY ESTPAIR FAILBACK
- PPRCOPY ESTPAIR FAILOVERMT

Use FAILOVER to provide access to the data from the secondary site if the primary site fails. When the primary site access is lost, issue the PPRCOPY ESTPAIR FAILOVER to the original PPRCOPY secondary volumes.

If the volumes receiving this command are PPRCOPY secondary volumes, then they must be in the full duplex or suspended state, or a PPRC Extended Distance secondary in duplex pending state.

If those volumes are not cascaded, intermediate volumes then they will become PPRCOPY primary volumes and enter a suspended state. If they are cascaded, intermediate volumes then they will remain PPRCOPY secondary volumes and enter a suspended state, but they will also be Cascading FO enabled, which attribute will be displayed in the PPRCOPY QUERY output.

No checking for a secondary volume is performed and no active paths to a secondary volume are required. If the volumes are in full duplex or suspended state, it will go into PPRCOPY FAILOVER mode without requiring the PPRCOPY pair to be deleted.

Later when the primary site is accessible again issue a PPRCOPY ESTPATH and PPRCOPY ESTPAIR FAILBACK command to what is currently the suspended primary volume, that is, the original secondary volume, to reverse the original direction of the PPRCOPY pair. At the time of the establish if the indicated secondary volume is simplex the secondary volume to become a secondary in duplex pending mode and a full copy of the volume will be made. If the secondary volume is in a PPRCOPY full duplex or suspended state, the volume to become a secondary in duplex pending mode and only the changed tracks will be sent from the primary.

If the volume receiving this command is a Cascaded PPRCOPY volume, then the primary and secondary state must be suspended and the volume must be in a Cascading PPRC Failover Mode. If the state of the

local volume, ie, the original PPRCOPY primary volume, is simplex the local volume will become a secondary in duplex pending mode and a full copy of the volume will be made. If the local volume is in a PPRCOPY full duplex, duplex pending, or suspended state, the volume will become a secondary in duplex pending mode and only the changed tracks will be sent from the Cascading PPRC volume to the local volume. The Cascading PPRC volume will become a primary for the local volume of the Cascading Configuration, and will NOT be a primary to the remote volume of the cascading configuration. However, it will record in its structures that it is in a state that will allow Peer-to-Peer Remote Copy resynchronization between itself and the remote volume.

For devices that support a multi-target configuration, use the FAILOVERMT parameter to indicate that the multi-target configuration should be created rather than the existing cascaded failover state when doing a failover. The direction of the PPRC pair is to be reversed and change recording is to begin. Upon completion of the command, the specified primary device is a suspended primary of a PPRC pair. If the PPRC secondary was in a cascaded configuration, it is now the primary of a multi-target configuration.

Using Freeze/Run

PPRCOPY Freeze/Run is designed for data base consistency automation.

The PPRCOPY FREEZE command is issued to control operations for multiple PPRCOPY volume pairs on a **single storage control**. This allows you to suspend all operations for all PPRCOPY volumes on a single storage control. You must issue a separate FREEZE command to suspend operations on each storage control.

FREEZE specifies that PPRCOPY stop all updates to secondary storage controls that are related to this volume pair. PPRCOPY does not allow any activity to the secondary volumes. All the paths will be removed for the secondary controller.

The PPRCOPY RUN command indicates that the necessary work has been completed to ensure secondary PPRCOPY volume consistency across all controllers and devices that are related.

RUN is issued to control operations for multiple PPRCOPY volume pairs on a single storage control. This allows you to resume all operations for all PPRCOPY volumes on a single storage control. You must issue a separate RUN command to resume operations on each storage control.

Once the PPRCOPY RUN command has been successfully performed the paths and pairs must be reestablished.

ICKDSF Peer-to-Peer Remote Copy command functions

ICKDSF PPRCOPY commands initiate PPRCOPY subsystem activity. Table 44 on page 231 shows the PPRCOPY ICKDSF commands and the devices to which they can be issued. Commands are processed in the order that they are issued.

Table 44: PPRCopy ICKDSF commands.

Command	Function	Issue to Primary Device?	Issue to Secondary Device?
DELPAIR	Removes primary and secondary volumes from PPRCOPY and returns the devices to a simplex state.	Yes	No (unless cascaded intermediate)
DELPATH	Deletes all established ESCON/FCP paths between an application site (source) storage control and a recovery site (target) storage control.	Yes	No (unless cascaded intermediate)

Table 44: PPRCopy ICKDSF commands. (continued)

Command	Function	Issue to Primary Device?	Issue to Secondary Device?
ESTPAIR	Establishes a remote copy device pair.	Yes	No (unless cascaded intermediate)
ESTPATH	Establishes ESCON/FCP paths between an application site (source) storage control and a recovery site (target) storage control.	Yes	No (unless cascaded intermediate)
QUERY	Queries the status of one volume of a PPRCOPY volume pair and the status of paths associated with the storage control for the addressed device.	Yes	Yes
RECOVER	Allows the recovery site (target) system to regain control of a DASD volume on its storage control.	No (unless cascaded intermediate)	Yes
SUSPEND	Suspends PPRCOPY operation between a primary and secondary volume pair.	Yes	Yes

Peer-to-Peer Remote Copy hardware requirements

Peer-to-Peer Remote Copy hardware requirements for 3990 are:

- A 3990 Model 6 with PPRCOPY licensed internal code (LIC) is required to be installed on both application and recovery site storage control units
- Physical ESCON connections between PPRCOPY storage subsystems

Peer-to-Peer Remote Copy is supported by the following devices when they are attached to a 3990 Model 6 with remote copy-capable LIC:

- All models of the IBM 3390 DASD
- RAMAC Array DASD

Peer-to-Peer Remote Copy hardware requirements for RVA (9393) are:

- A RVA (9393) with PPRCOPY licensed internal code (LIC) is required to be installed on both application and recovery site storage control units
- Physical ESCON connections between PPRCOPY storage subsystems

Peer-to-Peer Remote Copy is supported by all devices that can be attached to a RVA (9393) with remote copy-capable LIC.

Peer-to-Peer Remote Copy hardware requirements for 2105, 2107, or 1750 are:

- A 2105, 2107, or 1750 with PPRCOPY licensed internal code (LIC) is required to be installed on both application and recovery site 2105, 2107, or 1750 devices
- Physical ESCON/FCP connections between PPRCOPY storage subsystems
- To establish pairs in extended distance mode, or to use the ESUSP parameter, the PPRCOPY licensed internal code (LIC) for PPRCOPY-extended distance support is required to be installed on both application and recovery site 2105, 2107, or 1750 devices.

Peer-to-Peer Remote Copy (PPRCOPY) restrictions

The RVA does not support parallel channels on subsystems that support PPRCOPY. RVA does not support cascading or FAILOVER/FAILBACK.

Primary and secondary volumes may either be members of a PPRCOPY pair or a dual copy pair, but not both, on a 3990-6.

An application system volume (primary) can be copied to only one secondary volume if the volume does not have multi-target support. A PPRCOPY volume can be only primary or secondary; it cannot be used for both functions at the same time if the volume does not support cascading.

A 3990 Model 6 can be the application storage control for some volumes and the recovery storage control for other volumes at the same time.

ESCON paths established by PPRCOPY provide connections between two or more 3990-6s. Specifically, a single path can be established, **in one direction**, to transfer a volume or volumes from, say, storage subsystem A to storage subsystem B. The same logical and physical path established from A to B **cannot** be used to transfer data from B to A; however, a separate path can be established to transfer data from subsystem B to subsystem A.

PPRCOPY secondary volumes act much like 3990 dual copy secondary volumes in that no read or write access is permitted. IBM recommends that you vary the attached secondary volumes offline to all attached systems. The PPRCOPY secondary volume IDs are the same as those on the application system (primary) volumes.

On RAMAC Array DASD, the dynamic sparing feature of RAMAC Array DASD is automatically disabled when the RAMAC volume is a member of a dual copy or PPRCOPY volume pair.

VM Note: When operating as a guest under VM:

- All PPRCOPY volumes must either be dedicated volumes, or defined as fullpack minidisks (including DEVNO-defined minidisks).
- The VM guest directory must include an entry stating "STDEVOPT DATAMOVER=YES".

Adding DASD channel extenders to a PPRCOPY configuration to support longer distances can seriously degrade the performance due to the additional time added to each copy write I/O. IBM therefore does not generally recommend using DASD channel extenders with PPRCOPY.

Setting up the PPRCOPY environment

This section describes how to set up the Peer-to-Peer Remote Copy environment, including how to:

- Identify volume pairs
- Establish the PPRCOPY configuration
- Configure the storage subsystems for PPRCOPY
- Control ICKDSF activity to PPRCOPY volumes

Identifying volume pairs

The storage administrator must identify application volumes to copy, and create Peer-to-Peer Remote Copy volume pairs. PPRCOPY provides an image copy of a volume on a record-for-record basis, with a one-to-one correspondence between the record on the primary volume track and the record on the secondary volume track. Because PPRCOPY writes data on the same tracks on the secondary DASD as it does on the primary DASD, the secondary DASD must have the same track sizes and number of tracks per cylinder, and the same or larger volume capacities, as the primary. If these criteria are not met, the PPRCOPY ESTPAIR command will fail.

Secondary volumes must be dedicated to PPRCOPY use only and should be varied offline to its host system. PPRCOPY secondary volumes are similar to 3390 dual copy secondary volumes in that all read and write host operations directed to these secondary volumes will be rejected.

Remote copy supports volumes, not data sets. As a result, all data sets on the volumes that are copied are part of remote copy activity, and are therefore copied to the recovery system. This support is application (IBM or non-IBM) independent and supports all data set types.

Because applications deal with data sets and not volumes, multivolume data sets require special attention. (Multivolume data set types include data sets that reside on multiple volumes, and for MVS, striped data sets, and VSAM spheres.) Unless all volumes of a multivolume data set are copied, then only part of the data set will be copied. Other data sets on the copied volume may be usable, but the multivolume data sets will not be. If multivolume data sets are critical for recovery, you must also copy the other volumes on which these data sets reside.

Carefully choose the volumes to copy so as not to unnecessarily impact overall PPRCOPY performance. For example, copying a volume containing page or other data sets specific to the application host system would not be a good use of PPRCOPY resources; copying page data sets can impact performance.

Establishing the PPRCOPY configuration

Plan your configuration to provide for capacity and redundancy requirements. Peer-to-Peer Remote Copy allows from one to four ESCON paths (IBM recommends at least two paths) from any application site storage control to a single recovery site storage control. A specific application site storage control can be attached to up to 16 different recovery site storage controls. A single 3990 subsystem at the recovery site, however, can be linked to a maximum of 64 application site 3990s. A large cache and nonvolatile storage (NVS) will help the recovery site 3990 to accept the copy workloads from multiple application site storage subsystems.

With the necessary licensed internal code installed in each 3990 Model 6 Storage Control, RVA, 2105, 2107, or 1750 you can establish PPRCOPY paths between these devices. You can either install dedicated ESCON channels between the 3990, RVA, 2105, 2107, or 1750, or use existing ESCON channels that are connected by a common ESCON Director or Directors.

The devices connected must be of the same type. That is, a 3990 must be connected to a 3990, an RVA to an RVA, and a 2105, 2107, or 1750 to a 2105, 2107, or 1750.

An ESCON path being used by PPRCOPY may also be used by a host to access a 3990, if that path is switched through an ESCON Director. This is not true for RVA or the 2105, 2107, or 1750.

For 3990 Model 6 and RVA, up to four paths can be established between a pair of storage controllers with each ICKDSF PPRCOPY ESTPATH command. Eight paths can be established with each ICKDSF PPRCOPY ESTPATH command for 2105, 2107, or 1750. The following information is required before you can issue a PPRCOPY ESTPATH command:

- Primary device number
- Primary device's storage subsystem ID (SSID)
- Primary device's storage control serial number
- Recovery storage subsystem ID (SSID)
- Recovery storage control serial number
- Link addresses between the two control subsystems
- Logical control unit number for RVA
- Logical subsystem number for 2105, 2107, or 1750

Configuring storage subsystem resources for PPRCOPY

Properly configured Peer-to-Peer Remote Copy resources provide the following benefits:

- Avoid unintended interruptions to remote copy resources
- Maximize data integrity on the secondary volumes
- Minimize impact on system performance as a result of remote copy activity

The following sections address these concerns.

Configuring the 3990 storage controls

The following 3990 configuration options can affect PPRCOPY operations at both sites:

- Availability of cache and NVS
- VPD settings for SIM alert reporting level

There are additional concerns for the storage controls at the recovery site:

- Attachment to at least one host for SIM reporting
- Use of remote power sequence control cables

Availability of cache and NVS

If commands that alter NVS or cache states are issued to a storage control with PPRCOPY-managed volumes, all volume pairs managed by that storage control are put into suspended duplex state, or ended. Because of this, be careful when using caching commands that deactivate the NVS or cache on 3990s that contain remote copy operations. Table 45 on page 235 shows when NVS and cache are required to run PPRCOPY. PPRCOPY on the RVA is not affected by subsystem settings for cache and NVS.

Table 45: 3990 NVS and cache requirements for PPRCOPY.

For 3990 Model 6 at:	Subsystem Cache	NVS	Volume Cache	DASD Fast Write
Application site	Required	Required	Recommended	Recommended
Recovery site	Required	Required	Required	Required

3990 VPD settings for SIM alerts

Specify that the VPD for all 3990 with PPRCOPY operations is set so that SIM alert messages are routed to a host system console. Do not select "No Alerts", as this option prohibits the 3990 from sending any SIM alert messages to attached host systems. In the event of a subsystem failure that affected PPRCOPY operation (such as a permanent error on a secondary volume), the subsystem must be able to alert an operator to the problem. This is especially critical at an unattended recovery site where a subsystem problem, if left unresolved, can jeopardize the entire PPRCOPY copy operation.

Recovery site 3990 attached to a host system

IBM recommends that you keep at least one host system attached to each recovery site 3990 Model 6. This is necessary so that the 3990s for the secondary volumes can offload important SIMs in the event of a problem on the recovery storage subsystem.

Use of Remote Power Sequence Control Cables: Make every effort to minimize power interruptions to PPRCOPY recovery site 3990 Model 6 Storage subsystems. IBM recommends that you do not use power sequence control cables between recovery site processors and attached 3990 Storage Controls that contain PPRCOPY secondary volumes.

These cables, when installed, allow an attached host processor to remotely remove power from the 3990 Model 6 Storage Control. If power sequence control cables are present, ensure that the power select switches (located on the 3990 power sequence control board) for both clusters are set to the “LOCAL” position. This setting removes the possibility that a processor at the recovery site can inadvertently power down a PPRCOPY recovery storage subsystem.

Accessing PPRCOPY secondary volumes

All PPRCOPY secondary volumes are dedicated exclusively to PPRCOPY use. Any host read or write access is automatically rejected regardless of whether the secondary volume is online or offline.

Controlling ICKDSF activity to PPRCOPY volumes

The storage administrator must control ICKDSF activity to primary and secondary PPRCOPY-managed volumes. Some ICKDSF operations are not copied from the primary to secondary volumes. If ICKDSF is

used to perform Media Maintenance functions on either a primary or secondary volume, remove the volume pair and reinitialize it with a PPRCOPY ESTPAIR operation.

Performing an ICKDSF repair on a PPRCOPY-managed primary volume

To perform an ICKDSF repair on a PPRCOPY-managed primary volume, proceed as follows:

Warning
Failure to follow step “1” on page 236 through step “3” on page 236 may result in potential data integrity exposures to offline volumes.

1. Issue the PPRCOPY SUSPEND command to the primary volume of the pair.

   Note: The volume may have already been suspended by the error when it first occurred.
2. When the pair is in the suspended state, use the recommended ICKDSF media maintenance procedure to correct the error.
3. Remove the volumes from the suspended state, using the PPRCOPY ESTPAIR command with the MODE(RESYNC) parameter, to resume operations.

   The RESYNC option specifies that all changed cylinders are copied to the secondary volume.

Performing an ICKDSF repair on a PPRCOPY-managed secondary volume

To perform an ICKDSF repair on a PPRCOPY-managed secondary volume, proceed as follows:

Warning
Failure to follow the step “1” on page 236 through step “4” on page 236b may result in potential data integrity exposures to offline volumes.

1. Issue the PPRCOPY SUSPEND command to the secondary volume of the pair, allowing change recording to continue.
2. Issue the PPRCOPY RECOVER command to the secondary volume, so repairs can be made. PPRCOPY puts the volume into simplex state to permit I/O access.
3. Use the recommended ICKDSF media maintenance procedure to correct the error.
4. Issue the PPRCOPY ESTPAIR command:
   a. If no data has been changed on the secondary volume, issue the PPRCOPY ESTPAIR command with the MODE(RESYNC) parameter.

      The RESYNC option specifies that all changed cylinders are copied to the secondary volume.
   b. If the repair action has caused the data to be changed on the secondary volume, issue the PPRCOPY ESTPAIR command with the MODE(COPY) parameter.

PPRCOPY DEFINESESSION

PPRCOPY DEFINESESSION is intended for the management of the formation of consistency groups (groups of volumes). A single grouping of volumes for which a single consistency group is formed is referred to as a session. Sessions are OPENed (created) and CLOSEd (terminated) using the PPRCOPY DEFINESESSION command. Membership in a session is controlled by the PPRCOPY POPULATESESSION command. Asynchronous PPRCOPY session topology and certain timing attributes are setup with the PPRCOPY STARTASYNCCOPY command, which also starts the processing.

A session is defined to a specific LSS and is identified with a session ID, a number from 1 to 255. Only one session can be opened per LSS. A session can be populated only by volumes in that LSS. However, the same session, i.e., a session with the same identifying number, can be defined to other LSSs either on the same ESS or on different ESSs. Each session can then be populated with volumes in those LSSs. When the

Asynchronous PPRCOPY process is started with the STARTASYNCCOPY command, the Master, which is associated with a specific session ID, will communicate with all its Subordinates. Each of the Subordinates, which are also associated with a specific session ID, know about all the sessions and their associated volumes on their ESS and will direct the processing dictated by the Master.

One session number per ESS is supported. All or some subset of the LSSs on an ESS can have the same session number opened on them, but only that session number can be opened on that LSS until the sessions are closed and another session number opened. Only one Master or one Subordinate can exist on an ESS box. One Subordinate is required to direct the activity of a single session ID regardless of how many LSSs or volumes are associated with that session ID on that ESS.

Sessions with a session ID for which Asynchronous PPRCOPY processing is in progress can be dynamically OPENed and CLOSEed on LSSs in an ESS that is already participating in an active configuration and they will automatically be included or excluded by the Asynchronous PPRCOPY processing. This dynamic inclusion does not extend to ESSs that are not already participating in the active configuration. Such a change is referred to as a change in topology, which is discussed in more detail in the section on the PPRCOPY STARTASYNCCOPY command (see “PPRCOPY STARTASYNCCOPY” on page 295).

A Master is associated with one or more Subordinates via the TOPOLOGY keyword of the PPRCOPY STARTASYNCCOPY command. This association is required to be explicit with the exception of the case where all the PPRCOPY primary volumes participating in Asynchronous PPRCOPY grouping are all on a single ESS. What this means is that the same session ID can be defined to different ESSs, but unless they are associated with each other by the TOPOLOGY keyword they will not participate together in the formation of Consistency Groups.

See “Examples of creating Asynchronous PPRCOPY configurations” on page 324 for further information.

Syntax

PPRCOPY DEFINESESSION **PPRCOPY DEFSESS**
Required Parameters: DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) OPEN|CLOSE SESSIONNO(*sessionnumber*)
Optional Parameters: ALLOWONLINE

Required parameters

DDNAME|SYSNAME|UNITADDRESS: identify volume to which I/O is issued

Same as for Flashcpy Establish.

OPEN/CLOSE: indicate whether opening or closing a session

Parameter/ Abbreviations	Description
OPEN	Indicates that a new session is to be opened.
CLOSED	Indicates that an existing session is to be closed.
Default:	None
Restrictions:	None

SESSIONNO: session number for which information is desired

Parameter/ Abbreviations	Description
SESSIONNO(*session number*) **SESSNO**	*session number* is an arbitrary integer between 1 and 255. It must be unique within the ESS box and it is the responsibility of the user to remember these values when required for use with other commands. The PPRCOPY QUERY SESSIONSDEVICES command will display session numbers.
Default:	None.
Restrictions:	Must be a value from 1 to 255 inclusive.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

Examples of PPRCOPY DEFINESESSION

```
PPRCOPY DEFINESESSION UNIT(5C06)            -
                      OPEN                  -
                      SESSIONNO(1)
```

PPRCOPY DELPAIR–deleting pairs

Use the PPRCOPY command DELPAIR function to specify the primary and secondary volumes to remove from PPRCOPY and return the devices to a simplex state. When this function is used, the duplex pair must not be in DASD Fast Write pending status.

If this command is received on the primary address, the primary and secondary device will be returned to simplex. The DASD Fast Write and caching status of the device on the primary address will be the same as the DASD Fast Write and caching status of the Duplex Pair.

Syntax

PPRCOPY DELPAIR
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) PRIMARY(*ssid,ser#,cca*) SECONDARY(*ssid,ser#,cca*)
Optional parameters ALLOWONLINE LSS(*X'pp',X'ss'*)

Required parameters

DDNAME|SYSNAME|UNITADDRESS parameter: identify the primary volume

Parameter/ Abbreviations	Description
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and a VM volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address (3 or 4 hex digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. The unit address is the device number.
Default:	None.
Restrictions:	None.

PRIMARY and SECONDARY parameter: identify control unit

Parameter/ Abbreviations	Description
PRIMARY(*ssid*,*ser#*,*cca*) **PRIM** **PRI**	Specifies the application site storage control subsystem ID, serial number, and channel connection address. The storage control subsystem ID (*ssid*) is a 4-digit hexadecimal address. The *ser#* is the storage control serial number, and is the last five digits of the 12-digit machine serial number for 3990 or the last seven digits of the 12-digit machine serial number for RVA. The channel connection address (*cca*) is a 2-digit hex address. The storage control subsystem id, storage control serial number, and channel connection address may be obtained with the CONTROL CONFIGURE(DISPLAY) command for 3990 or PPRCOPY QUERY without the PATHS parameter for RVA.
SECONDARY(*ssid*,*ser#*,*cca*) **SEC**	Specifies the recovery site storage control subsystem ID, serial number, and the secondary volume channel connection address (*cca*). The descriptions for the values are the same as for the PRIMARY parameter.
Default:	None.
Restrictions:	None.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

LSS parameter: identify logical subsystem number

Parameter/ Abbreviations	Description
LSS(*X'pp',X'ss'*)	LSS is required to identify the logical subsystem number on 2105, 2107, or 1750 devices. The *X'pp'* value is the primary logical subsystem number. The *X'ss'* value is the secondary logical subsystem number. Obtain the logical subsystem number with the following command: `CONTROL CONFIGURE(DISPLAY)`
Default:	None.
Restrictions:	LSS is valid only for 2105, 2107, and 1750 devices.

Examples of PPRCOPY DELPAIR

```
PPRCOPY DELPAIR UNIT(D42) PRIM(X'0057',90007,X'02') -
        SEC(X'053F',90014,X'0E')
```

Example for 2105, 2107, or 1750 using LSS parameter

The following example is valid for 2105, 2107, and 1750 and shows a DELPAIR command using the LSS parameter:

```
PPRCOPY DELPAIR UNIT(4C00) LSS(X'07',X'02') -
        PRI(X'06C7',FCA29,X'01') SEC(X'06C2',FCA29,X'01')
```

PPRCOPY DELPATH–deleting paths

Use the DELPATH command to delete all established ESCON paths between an application site (source) storage control and a recovery site (target) storage control. Only active paths to the specified recovery site storage control are affected; all other paths to other storage controls are unaffected.

You may delete one or more paths at a time if there are no other pairs of DASD in the "PPRCOPY active pair" state.

Syntax

PPRCOPY DELPATH
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) PRIMARY(*ssid,ser#*) SECONDARY(*ssid,ser#*) WWNN(*pwwnn,swwnn*)
Optional Parameters ALLOWONLINE FORCE LSS(*X'pp',X'ss'*)

Required parameters

DDNAME|SYSNAME|UNITADDRESS parameter: identify the primary volume

Parameter/ Abbreviations	Description
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.

Parameter/ Abbreviations	Description
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and a VM volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address (3 or 4 hex digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. The unit address is the device number.
Default:	None.
Restrictions:	None.

PRIMARY and SECONDARY parameter: identify control unit

Parameter/ Abbreviations	Description
PRIMARY(*ssid*,*ser#*) **PRIM** **PRI**	Specifies the application site storage control subsystem ID and serial number. The storage control subsystem ID (*ssid*) is a 4-digit hexadecimal address. The *ser#* is the storage control serial number, and is the last five digits of the 12-digit machine serial number for 3990, 2105, 2107, and 1750 or the last seven digits of the 12-digit machine serial number for RVA. The storage control subsystem id, and storage control serial number may be obtained with the CONTROL CONFIGURE(DISPLAY) command for 3990 2105, 2107, and 1750 or PPRCOPY QUERY without the PATHS parameter for RVA.
SECONDARY(*ssid*,*ser#*) **SEC**	Specifies the recovery site storage control subsystem ID (*ssid*) and serial number (*ser#*). The descriptions for the values are the same as for the PRIMARY parameter.
Default:	None.
Restrictions:	None.

WWNN parameter: identifies the World Wide Node Name (WWNN) of the primary and secondary

Parameter/ Abbreviations	Description
WWNN(*pwwnn*,*swwnn*)	Specifies the World Wide Node Name (WWNN) of the Primary and Secondary. Each WWNN is an 8-byte hexadecimal value wwwwwwwwwwwwwwww. *pwwnn* represents the Primary WWNN and *swwnn* represents the Secondary WWNN. The WWNN can be determined from using the ICKDSF PPRCOPY QUERY PATHS command.
Default:	None.
Restrictions:	Although the WWNN value is a hex value the leading X' and the trailing apostrophe are not allowed in the specification of the value.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

FORCE parameter: force removal of existing paths

Parameter/ Abbreviations	Description
FORCE	Indicates that you want to force removal of existing paths. The existence of PPRCOPY pairs will be ignored and the pairs will remain in the state prior to execution of this command. This parameter can be used to remove PPRCOPY paths from a secondary site as part of the procedure to return to the original primary site.
Default:	None.
Restrictions:	FORCE is only valid on 2105, 2107, and 1750 devices that have the FAILOVER and FAILBACK microcode support.

LSS parameter: identifies logical subsystem number

Parameter/ Abbreviations	Description
LSS(X'*pp*',X'*ss*')	LSS is required to identify the logical subsystem number on 2105, 2107, and 1750 devices. The X'*pp*' value is the primary logical subsystem number. The X'*ss*' value is the secondary logical subsystem number. Obtain the logical subsystem number with the following command: `CONTROL CONFIGURE(DISPLAY)`
Default:	None.
Restrictions:	LSS is valid only for 2105, 2107, and 1750 devices.

Examples of PPRCOPY DELPATH

The following command deletes all established ESCON paths between application site storage control 0057 and recovery site storage control 053F.

```
PPRCOPY DELPATH UNIT(0D42) PRIM(X'0057',90007) SEC(X'053F',90014)
```

PPRCOPY-FCP path example

The following example shows how to specify the PPRCOPY DELPATH to delete a PPRCOPY-FCP path.

```
PPRCOPY DELPATH UNIT(4C80) -
PRI(X'2901',FCA29) SEC(X'2905',FCA29) -
LSS(X'01',X'05') -
WWNN(5005076300123456,5005076300234567)
```

Example for 2105, 2107, and 1750 using the LSS parameter

The following example is valid for 2105, 2107 and 1750 and shows a DELPATH command using the LSS parameter.

```
PPRCOPY DELPATH UNIT(4C00) LSS(X'07',X'02') -
        PRI(X'06C7',FCA29) SEC(X'06C2',FCA29)
```

PPRCOPY ESTPAIR–establishing pairs

Use the ESTPAIR command to specify PPRCOPY primary and secondary volumes to establish a remote copy device pair.

The device track characteristics of the primary and secondary volumes must be equivalent. The following must be the same for both volumes:

- Tracks on each cylinder
- Bytes on each track

The primary and secondary control units must have active subsystem cache and NVS. Active volume cache and DASD Fast Write is recommended for the primary device; it is required for the secondary device. The secondary device must also have the same track format and at least as many cylinders as the primary device.

The DASD Fast Write status of the primary device does not change after you issue the ESTPAIR command. You can change the DFW status while in the Peer-to-Peer Remote Copy state.

Recovery related options are available for recovery in a Metro/Global Mirror environment, see the INCRESYNC and FORCE keywords below. A Metro/Global Mirror configuration consists of a synchronous PPRC relationship cascaded with a Global Mirror PPRC relationship. These recovery options allow for a more efficient recovery, by reducing the amount of data that must be copied when the intermediate volume in the cascaded triad is lost and the user wants to maintain a recovery configuration by connecting the local site primary volume directly to the remote site volume. Enabling this processing allows the hardware to keep track of the data that has been transferred from the intermediate volume to the remote volume, using a change recording mechanism.

Because this feature requires enablement of the change recording mechanism, no other functionality requiring this mechanism can be running at the same time, such as Incremental Flashcopy.

There is an underlaying feature of Global Copy, also known as PPRC-XD where if a pair suspends due to something other than a command, for instance the paths are lost, when the problem is corrected, the pair will automatically attempt to re-sync. This carries over to the Global Mirror environment, where the Global Copy function is a subset of the Global Mirror function.

In the case of Global Mirror or Global Copy where there is a FlashCopy relationship from the secondary of the Global Copy pairs, if the outage was for a long enough period resulting in accumulation of many updates that need to be copied when the pair is resynchronized, the space efficient repository could reach warning levels or even filled.

The AUTORESYNC keyword below provides the ability to turn off the auto resync properties associated with a Global Copy pair in a case where the secondary is or will be the source of a Space Efficient FlashCopy relationship.

For additional details on relevant recovery methodologies see *z/OS DFSMS Advanced Copy Services*.

Warning: Protect your data by ensuring your secondary device is correct; no checking is done at the secondary subsystem to protect the data on the secondary volume.

Some additional notes for the ESTPAIR command:

- Peer-to-Peer Remote Copy allows data to be copied from a smaller primary device (fewer cylinders) to a larger secondary device (more cylinders) as long as the tracks per cylinder and capacity of the devices are the same. The additional space on the secondary volume is not available until the PPRCOPY volumes in the pair are returned to simplex state and ICKDSF Release 16 or above is run against the secondary volume to rebuild the VTOC. When this is done, the additional capacity of the secondary volume is reflected in its free space.
- For VSE, special considerations apply to unlike-size volume copy operations if the primary volume contains VSE/VSAM space. VSE/VSAM catalog information will not be consistent with the new secondary volume's size, requiring that the catalog inconsistency be resolved before DEFINE SPACE or DELETE SPACE commands are issued.

To synchronize the catalog with the size of the new secondary volume, use either of the following methods:

– FASTCOPY the secondary volume to a volume of the same size as the smaller primary volume, and use this volume instead of the larger secondary volume.

  Or

– On the secondary volume:

  - Backup all VSE/VSAM files
  - Remove all VSAM objects (cluster, space, and catalog if present)
  - Redefine the space/catalog
  - Restore the backed-up VSAM files

- Because multivolume data sets span multiple volumes, they require special handling. To ensure that the data set is recoverable, copy all volumes of a multivolume data set.
- Peer-to-Peer Remote Copy only supports full pack minidisks.
- VM requires STDEVOPT DASDSYS DATAMOVER or STDEVOPT DASDSYS CONCOPY authorization in the Directory in order to successfully establish pairs for PPRCOPY.

Syntax

PPRCOPY ESTPAIR
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) PRIMARY(*ssid,ser#,cca*) SECONDARY(*ssid,ser#,cca*)
Optional Parameters ALLOWONLINE AUTORESYNC(**YES**/NO) CASCADE CRIT(**NO**|YES) ESUSP FAILOVER|FAILOVERMT|FAILBACK FORCE INCRESYNC(START|NOCOPY|INCRES|STOP|) LSS(*X'pp',X'ss'*) MODE(**COPY**|NOCOPY|RESYNC) MSGREQ(**NO**|YES) ONLINSEC(**NO**|YES) OPTION(SYNC|XD) PACE(1...**15**...255) SESECOK(**NO**|YES)

Required parameters

DDNAME|SYSNAME|UNITADDRESS parameter: identify the primary volume

Parameter/ Abbreviations	**Description**
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.

Parameter/ Abbreviations	Description
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and a VM volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address (3 or 4 hex digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. The unit address is the device number.
Default:	None.
Restrictions:	None.

PRIMARY and SECONDARY parameter: identify control unit

Parameter/ Abbreviations	Description
PRIMARY(*ssid*,*ser#*,*cca*) **PRIM** **PRI**	Specifies the application site storage control subsystem ID, serial number, and channel connection address. The storage control subsystem ID (*ssid*) is a 4-digit hexadecimal address. The *ser#* is the storage control serial number, and is the last five digits of the 12-digit machine serial number for 3990, 2105, 2107, and 1750 or the last seven digits of the 12-digit machine serial number for RVA. The channel connection address (*cca*) is a 2-digit hex address. The storage control subsystem id, storage control serial number, and channel connection address may be obtained with the CONTROL CONFIGURE(DISPLAY) command for 3990, 2105, 2107, and 1750 or PPRCOPY QUERY without the PATHS parameter for RVA.
SECONDARY(*ssid*,*ser#*,*cca*) **SEC**	Specifies the recovery site storage control subsystem ID, serial number, and the secondary volume channel connection address (*cca*). The descriptions for the values are the same as for the PRIMARY parameter. **Warning:** Protect your data by ensuring your secondary device is correct; No checking is done at the secondary subsystem to protect the data on the secondary volume.
Default:	None.
Restrictions:	None.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

AUTORESYNC parameter: provides the ability to turn off the auto resync properties associated with a Global Copy pair.

Parameter/ Abbreviations	Description
AUTORESYNC	AUTORESYNC specifies: NO specifies that the auto resync capability should be disabled for the Global Copy pair. YES specifies that the auto resync capability should be enabled for the Global Copy pair.
Default:	YES
Restrictions:	The AUTORESYNC parameter is valid only when OPTION(XD) is specified. Valid only for the 2107 device.

CASCADE parameter: make a volume eligible for or establish it as a cascading volume

Parameter/ Abbreviations	Description
CASCADE	This parameter indicates whether a volume is to be eligible for PPRCOPY cascading and become an intermediate volume. This parameter is issued to the volume that is to become the intermediate volume of a cascaded relationship. If ESTPAIR with CASCADE is issued to a volume is in simplex state, this parameter indicates only that the volume is eligible for cascading. The volume does not become part of a cascaded relationship until it is established as an intermediate volume with another site. If ESTPAIR with CASCADE is reissued to a volume that is eligible to be a CASCADE intermediate volume, and the volume is already the primary of an existing PPRCOPY pair, then the volume becomes eligible for cascading without breaking this existing pair. This allows you to make a volume eligible for cascading that was previously not eligible. If ESTPAIR with CASCADE is issued to a volume that is to become the intermediate volume and the volume is already the Secondary of an existing PPRCOPY pair, the volume becomes the primary of the remote pair and is then part of a cascaded relationship. If CASCADE is specified and the device is not an ESS or the device is an ESS without the PPRCOPY cascading microcode, the command will be terminated, with message ICK31054I 'DEVICE NOT SUPPORTED FOR SPECIFIED FUNCTION'. If ESTPAIR without CASCADE specified, is issued to a volume in simplex state, the volume is not eligible for cascading. If ESTPAIR without CASCADE specified, is issued to a volume that is part of a PPRCOPY pair, the cascading state remains unchanged. If the volume is already set to be eligible for cascading, you must break the pair in order to reset the cascading state.
Default:	None.
Restrictions:	CRIT(YES) is not valid when CASCADE is specified.

CRIT parameter: write update error processing

Parameter/ Abbreviations	Description
CRIT(NO|YES)	NO specifies that, following an I/O error attempting to write an update to the secondary, subsequent write requests to the primary volume in suspended duplex state are allowed without a unit check being issued. YES specifies that a failure to write update the secondary will result in a unit check and the primary will not be placed in a suspended duplex state.
Default:	NO
Restrictions:	When you reestablish a suspended pair that was originally established with CRIT(YES) specified, you must again specify CRIT(YES) with the PPRCOPY ESTPAIR command if you want this option to remain in effect. CRIT(YES) is not valid when either OPTION(XD) or CASCADE is specified.

ESUSP parameter: enable suspension after establishment

Parameter/ Abbreviations	Description
ESUSP	This parameter indicates that you want the volume to enter suspension after establishment of the volume.
Default:	None.
Restrictions:	EUSP is not valid with MODE(NOCOPY) or OPTION(XD). ESUSP is only valid on 2105, 2107, and 1750 devices that have PPRCOPY extended distance support.

FAILOVER|FAILBACK|FAILOVERMT parameter: reverse direction of PPRCOPY

Parameter/ Abbreviations	Description
FAILOVER **FO**	Indicates that you want to establish a PPRCOPY relationship without performing the checking normally done for a secondary volume. The FAILOVER is intended to be issued to the secondary of a PPRCOPY pair such that the PPRCOPY relationship suspends. If the volume is non-cascaded it becomes a primary volume. If the volume is cascaded it remains a secondary volume, but also enters the "Cascaded Failover Mode" See “PPRCOPY FAILOVER, FAILBACK and FAILOVERMT ” on page 230 for details of its use.
FAILOVERMT **FOMT**	Specifies that the direction of the PPRC pair is to be reversed and change recording is to begin. Upon completion of the command, the specified primary device is a suspended primary of a PPRC pair. If the PPRC secondary was in a cascaded configuration, it is now the primary of a multi-target configuration.
FAILBACK **FB**	Indicates that you want to change the state of a PPRCOPY pair that was previously set in FAILOVER mode. When FAILBACK is specified, OPTION(XD) or ESUSP are allowed.
Default:	None.
Restrictions:	• FAILOVER – If the volumes receiving this command are PPRCOPY secondary volumes, then they must be in the full duplex or suspended state, or a PPRC Extended Distance secondary in duplex pending state. – Not valid with ESUSP, MSGREQ(YES), CRIT(YES), MODE(COPY), or MODE(RESYNC) – Valid only on 2105, 2107, and 1750 devices that have the FAILOVER and FAILBACK microcode support. • FAILOVERMT – If the volumes receiving this command are PPRCOPY secondary volumes, they must be in the full duplex or suspended state, or a PPRC extended distance secondary in duplex pending state. – Not valid with ESUSP, MSGREQ(YES), CRIT(YES), MODE(COPY), or MODE(RESYNC) – Valid only on devices that have the multi-target microcode support. • FAILBACK – The volume must be a suspended PPRCOPY primary volume (the command is issued from the original secondary site). If the volume receiving this command is a Cascaded PPRCOPY volume, then the primary and secondary state must be suspended and the volume must be in a Cascading PPRC Failover Mode. – Not valid with MSGREQ(YES), CRIT(YES), MODE(COPY), or MODE(RESYNC) – Valid only on 2105, 2107, and 1750 devices that have the FAILOVER and FAILBACK microcode support

Note: When FAILOVER, FAILOVERMT or FAILBACK are specified, the parameters identifying the primary and secondary volume are specified such that they represent the volume you want to be the new primary and secondary volumes. In other words, with both FAILOVER and FAILBACK, the primary parameters for *ssid*, *lss*, serial number, *cca* are specified for the volume that is to be the new primary and the secondary parameters for *ssid*, *lss*, serial number, *cca* are specified for the volume that is to be the new secondary.

FORCE parameter: override 3-site incremental resync checking

Parameter/ Abbreviations	Description
FORCE	FORCE is used to indicate that no checking will be done to ensure that the local secondary volume and the remote primary volume are the same volume.

Parameter/ Abbreviations	Description
Default:	None.
Restrictions:	The FORCE parameter is ignored if FAILOVER, FAILBACK, or INCRESYNC(INCRES) has not been specified. Valid only for the 2107 device.

INCRESYNC parameter: manage 3-site Incremental Resync processing

Parameter/ Abbreviations	Description
INCRESYNC(START|NOCOPY|INCRES|STOP)	Specifies the mode in which 3-site incremental resync is to operate. START indicates that the change recording mechanism should start with the assumption that the primary and secondary volumes of the Global Mirror relationship (the intermediate and remote volumes of the Cascaded triad) are not synchronized, so that if Incremental Resync recovery is necessary immediately after the START has taken effect, all tracks from the local primary are copied to the remote secondary. NOCOPY indicates that the change recording mechanism should start with the assumption that the primary and secondary volumes of the Global Mirror relationship (the intermediate and remote volumes of the Cascaded triad) are identical at the point that the INCRESYNC(NOCOPY) is issued, so that if Incremental Resync recovery is necessary after the NOCOPY has taken effect, only those tracks that are changed since the NOCOPY has taken effect and are known to not have been transferred from the lost intermediate volume to the remote secondary, are copied to the remote secondary. INCRES indicates that Incremental Resync is to be done using the current state of the change recording mechanism so as to limit the number of tracks that must be copied from the local primary volume to the remote secondary volume. STOP indicates that the change recording mechanism should be stopped.
Default:	None.
Restrictions:	• If START is specified, FAILOVER cannot be specified, nor can FORCE. • If NOCOPY is specified, FAILOVER cannot be specified, nor can FORCE. • If INCRES is specified, FAILOVER cannot be specified, nor can FAILBACK. MODE(RESYNC) must also be specified when specifying INCRES. • If STOP is specified, FORCE cannot be specified. • Valid only for the 2107 device.

LSS parameter: identify logical subsystem number

Parameter/ Abbreviations	Description
LSS(X'*pp*',X'*ss*')	LSS is required to identify the logical subsystem number on 2105, 2107, and 1750 devices. The X'*pp*' value is the primary logical subsystem number. The X'*ss*' value is the secondary logical subsystem number. Obtain the logical subsystem number with the following command: `CONTROL CONFIGURE(DISPLAY)`
Default:	None.
Restrictions:	LSS is valid only for 2105, 2107, and 1750 devices.

MODE parameter: copy mode

Parameter/ Abbreviations	Description
MODE(COPY|NOCOPY|RESYNC)	MODE specifies one of the following modes: COPY specifies that all tracks on the primary are to be copied to the secondary volume. NOCOPY specifies that only those tracks on the primary volume that are updated after the pair is established are to be copied to the secondary volume. Specify this mode only if the volumes are exact copies of each other. **Note:** The NOCOPY option assumes that the specified volumes are fully synchronized at the time the copy is started. Ensure that no I/O operations occur to either volume prior to starting the copy operation. This is necessary in order to protect the data integrity of the two volumes. RESYNC specifies that a suspended copy be reestablished. Only those tracks updated during the period of suspension are copied from the primary volume to the secondary volume.
Default:	COPY
Restrictions:	NOCOPY is not valid when OPTION(XD) or ESUSP is specified. If the CASCADE support for ICKDSF is applied by way of APAR PQ72465 and the appropriate level of microcode is applied then OPTION(XD) with NOCOPY is allowed.

MSGREQ parameter: completion message processing

Parameter/ Abbreviations	Description
MSGREQ(NO|YES)	MSGREQ specifies: **YES** Specifies that PPRCOPY wait until the initial full-volume copy operation is complete before issuing completion messages. **NO** Specifies that the command is complete upon initiating the request to the storage control. PPRCOPY does not wait for the copy operation to complete before issuing completion messages.
Default:	NO
Restrictions:	The MSGREQ parameter is valid only with the MODE(COPY) option. MSGREQ(YES) is not valid when OPTION(XD) is specified.

ONLINSEC parameter: specify online secondary volume

Parameter/ Abbreviations	Description
ONLINSEC(NO|YES) **ONSEC**	ONLINSEC specifies: **NO** Specifies that, if the secondary volume appears to be online to a host system the command will fail with an error message and the PPRCOPY pair will not be established. **YES** Specifies that the command will be processed even if the secondary volume is online to a host system.
Default:	NO
Restrictions:	ONLINSEC is valid on 2105, 2107, and 1750 devices only.

OPTION parameter: additional options

Parameter/ Abbreviations	Description
OPTION(SYNC|XD)	Option specifies on of the following: **SYNC** If the PPRCOPY pair is already established in the extended distance mode, specifying this parameter will cause the pair to change to synchronous. The MODE parameter is ignored when OPTION(SYNC) is specified and the PPRCOPY pair is currently in the extended distance mode (for example, when currently in pending-XD state). **XD** Specifies that the PPRCOPY pair is to be established in extended distance mode on a subsystem that has the support for this feature. When XD is specified, one of the following conditions must exist: • Both the primary and secondary devices must be in Simplex state. • The primary and secondary devices must be in a Suspended state.
Default:	None.
Restrictions:	When OPTION(XD) is specified, MODE(NOCOPY), CRIT(YES) and MSGREQ(YES) are not valid. If the CASCADE support for ICKDSF is applied by way of APAR PQ72465 and the appropriate level of microcode is applied then OPTION(XD) with NOCOPY is allowed. OPTION is only valid on 2105, 2107, and 1750 devices that have PPRCOPY extended distance support.

PACE parameter: number of tracks to be copied

Parameter/ Abbreviations	Description
PACE(1...15...255)	PACE specifies the number of tracks to be copied at one time before allowing another host interrupt. The allowable range is from 1 to 255. A value of 1 will copy three tracks at a time. Value 2 to 255 will copy 15 tracks at a time.
Default:	15
Restrictions:	PACE is ignored if you specify MODE(NOCOPY). PACE is ignored for RVA, 2105, 2107, and 1750 devices.

SESECOK parameter: specify track space efficient secondary volume

Parameter/ Abbreviations	Description
SESECOK(NO|YES) **SEOK**	SESECOK specifies: **NO** Indicates that the secondary can not be a track space efficient volume. **YES** Indicates that the secondary can be a track space efficient volume. If YES is specified and the secondary is not a track space efficient volume, the command is processed as if the keyword was not specified.
Default:	NO.
Restrictions:	Valid only for the 2107 device. SESECOK is ignored for 2105 and 1750 devices. SESECOK is also ignored for extent space efficient volumes.

Examples of PPRCOPY ESTPAIR

The following command establishes a PPRCOPY pair:

```
PPRCOPY ESTPAIR UNIT(0D42) PRIM(X'0057',90007,X'02') -
        SEC(X'053F',90014,X'0E') MODE(COPY) PACE(15) CRIT(NO)
```

PPRCOPY extended distance examples

The following example shows how to specify the PPRCOPY ESTPAIR to go from a simplex state to PPRCOPY extended distance mode:

```
PPRCOPY ESTPAIR UNIT(4C80) LSS(X'01',X'05') -
PRI(X'2901',FCA29,X'00') SEC(X'2905',FCA29,X'00') -
MODE(COPY) OPTION(XD)
```

The following example shows how to specify the PPRCOPY ESTPAIR to go from synchronous PPRCOPY to PPRCOPY extended distance mode. The PPRCOPY pair must be in suspended state prior to invoking this command.

```
PPRCOPY ESTPAIR UNIT(4C80) LSS(X'01',X'05') -
PRI(X'2901',FCA29,X'00') SEC(X'2905',FCA29,X'00') -
MODE(RESYNC) OPTION(XD)
```

The following example shows how to specify the PPRCOPY ESTPAIR to go from PPRCOPY extended distance mode to synchronous PPRCOPY. The pair must be either in a ‘pending-XD’ state or in a suspended state, prior to invoking this command.

Note: When OPTION(SYNC) is specified, the MODE keyword is ignored if specified.

```
PPRCOPY ESTPAIR UNIT(4C80) LSS(X'01',X'05') -
PRI(X'2901',FCA29,X'00') SEC(X'2905',FCA29,X'00') -
OPTION(SYNC)
```

The following example shows how to specify the PPRCOPY ESTPAIR to go from a suspended state to PPRCOPY extended distance mode. The pair must be in a suspended state prior to invoking this command.

```
PPRCOPY ESTPAIR UNIT(4C80) LSS(X'01',X'05') -
PRI(X'2901',FCA29,X'00') SEC(X'2905',FCA29,X'00') -
MODE(RESYNC) OPTION(XD)
```

Example for 2105, 2107, and 1750 using LSS parameter

The following example is valid for 2105, 2107, and 1750 and shows an ESTPAIR command using the LSS parameter:

```
PPRCOPY ESTPAIR UNIT(4C00) LSS(X'07',X'02') -
        PRI(X'06C7',FCA29,X'01') SEC(X'06C2',FCA29,X'01') -
        MODE(COPY)
```

PPRCOPY ESTPATH–establishing paths

Use the ESTPATH command to establish ESCON or FCP paths between an application site (source) storage control and a recovery site (target) storage control.

Each ESTPATH command can establish up to four paths from one application site storage control to a single recovery site storage control for 3990-6 and RVA. For the 2105, 2107, and 1750, each ESTPATH command can establish up to eight paths from one application site storage control to a single recovery site storage control.

Note:

It is possible to attempt to establish a path using invalid information such as an existing LSS but one which does not correspond to the specified Subsystem ID. In such cases, the request is command rejected by the addressed volume with sense indicating 0x0F and 0x53 in bytes 7 and 8 respectively, followed by ICKDSF message `'ICK34046I NO MATCH IN CU FOR SSID OR SER# OF PRIMARY OR SECONDARY'`. If a PPRC QUERY PATHS is subsequently done, the resulting display shows the paths with status of `'07'` indicating `'SCU SSID MISMATCH'`. This indicates that although the path was not established, it is remembered by the control unit and it takes up a path `'slot'`.

It is necessary to delete the invalid paths using the DELPATH command and specifying the same relevant values used on the ESTPATH command.

If such invalid establishments are attempted enough times without intervening DELPATH requests, the path limit will be exceeded, subsequent ESTPATH requests can result in message `'ICK34044I ESTPATH FAILED - WOULD EXCEED UNITS/PATHS LIMITS'`, and sense indicating 0x0F and 0x51 in bytes 7 and 8 respectively.

The storage control for a specific primary (source) volume can, at any one time, be linked to a maximum of 16 storage control units for secondary (target) volumes. You need to use a separate PPRCOPY ESTPATH command to establish paths between each pair of controllers.

The ESTPATH command is a "replace" function. Specified paths that establish a link between an application site storage control and a recovery site storage control replace any previously established PPRCOPY paths. The paths you specify each time you issue a ESTPATH command replace the paths established by the last ESTPATH command issued.

Mixing of FCP and ESCON paths between logical control units (designated by the LSS values) is not allowed. So, for example, it is possible to establish FCP paths between LSS A and LSS B, and to establish ESCON paths between LSS A and LSS C. But it is not possible to establish FCP paths between LSS A and LSS B and ESCON paths between the same two LSSs.

If a switch from one type of path to the other type is desired then the paths must be disestablished using the DELPATH command and reestablished using the ESTPATH command.

For ESCON paths, the replacement takes place for the paths of the two subsystems, uniquely identified by their SSID and serial number. When other paths, which belong to other controllers, are present, they remain undisturbed. For FCP paths, the replacement takes place for the paths of the two subsystems, uniquely identified by their SSID and world wide node name (WWNN).

In a cascaded triad, if FCP paths are established between the local pair and the pair is established in synchronous mode then the remote pair should be established in extended distance (XD) mode. If the remote pair is established in synchronous mode any I/O directed to the local primary will result in the remote pair being suspended. In such a case the remote pair should be reestablished in XD mode. See “Using cascading” on page 226 for additional information.

Syntax

PPRCOPY ESTPATH
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) FCPPATHS(*path1*,*...path8*) LINK(*linkaddr1...linkaddr8*) PRIMARY(*ssid*,*ser#*) SECONDARY(*ssid*,*ser#*) WWNN(*pwwnn*,*swwnn*)
Optional Parameters ALLOWONLINE CGROUP(NO|YES) FORCE LSS(*X'pp'*,*X'ss'*)

Required parameters

DDNAME|SYSNAME|UNITADDRESS parameter: identify the primary volume

Parameter/ Abbreviations	**Description**
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.

Parameter/ Abbreviations	Description
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and a VM volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address (3 or 4 hex digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. The unit address is the device number.
Default:	None.
Restrictions:	None.

FCPPATHS parameter: establishes PPRCOPY with Fibre Channel Protocol (FCP) paths

Parameter/ Abbreviations	Description
FCPPATHS(*path1*,...*path8*) **FCPPS** **FCPP**	The FCPPATHS parameter is specified to indicate that PPRCOPY is to be established with FCP (Fibre Channel Protocol) paths. Specifies the addressing path from the application site storage control to the recovery site storage control. Up to 8 paths can be specified. Each path is an 8-digit hexadecimal address in the form X'aaaabbbb' where: • 'aaaa' is the Primary volume's cluster interface system adapter ID (SAID) • 'bbbb' is the secondary volume's (destination) SAID When FCPPATHS is specified, the WWNN parameter is required.
Default:	None.
Restrictions:	FCP paths and ESCON paths cannot be established between the same PPRCOPY pair or in the same ESTPATH command. Therefore, the FCPPATHS parameter is not valid with the LINK parameter. FCPPATHS is only supported on 2105, 2107, and 1750 with the PPRCOPY FCP microcode support. If the device is not a 2105, 2107, or 1750, or if the device is one of these but does not have PPRCOPY-FCP support, then message ICK31054I 'DEVICE NOT SUPPORTED FOR SPECIFIED FUNCTION' is issued and the command is terminated.

LINK parameter: specifies the addressing path

Parameter/ Abbreviations	Description
LINK(*linkaddr1... linkaddrx*) **For 3990**	LINK specifies the addressing path from the application site storage control to the recovery site storage control. Up to four path addresses can be specified with each LINK parameter. Each path address is an 8-digit hexadecimal address in the form X'aaaabbcc' where: **aaaa** Primary volume's 3990 Cluster/Interface "SAID" as shown below. **bb** ESCON Director "DESTINATION" address. "00" if directly attached pair of DASD control units or with static ESCON switch. **cc** Always "00" for a 3990-06. The LINK parameter address consists of: • An application system SAID (System Adapter ID) interface identifier, aaaa in this example, that uniquely identifies the physical location of the associated node interface. Corresponding to ESCON channel interfaces A through H, for each of the clusters, the SAID bytes are: 3990 Cluster/Interface SAID Bytes 0 Interface A X '0000' 0 Interface B X '0001' 0 Interface C * X '0002' 0 Interface D * X '0003' 0 Interface E X '0004' 0 Interface F X '0005' 0 Interface G * X '0006' 0 Interface H * X '0007' 1 Interface A X '0010' 1 Interface B X '0011' 1 Interface C * X '0012' 1 Interface D * X '0013' 1 Interface E X '0014' 1 Interface F X '0015' 1 Interface G * X '0016' 1 Interface H * X '0017' * These ports are supported on 3990-6s with 4-port ESCON SA cards. • A recovery site storage control ESCON link destination address, bb in this example. If the ESCON Director is installed, it assigns the recovery site storage control ESCON link destination address (bb). For direct fiber optic cable connections between storage controls or static connections through an ESCON Director, the link address value is zero. • A reserved address, cc in this example, which must be 00.

Parameter/ Abbreviations	Description

LINK(*linkaddr1... linkaddrx*)
 	
For RVA
	LINK specifies the addressing path from the application site storage control to the recovery site storage control. Up to four path addresses can be specified with each LINK parameter. Each path address is an 8-digit hexadecimal address in the form X'aaaabbcc' where:
	
	aaaa
	Primary volume's RVA Cluster/Interface "SAID" as shown below.
	
	bb
	ESCON Director "DESTINATION" address. "00" if directly attached pair of DASD control units or with static ESCON switch.
	
	cc
	Logical Subsystem Number for RVA.
	
	The LINK parameter address consists of:
	
	• An application system SAID (System Adapter ID) interface identifier, aaaa in this example, that uniquely identifies the physical location of the associated node interface. Corresponding to ESCON channel interfaces A through H, for each of the clusters, the SAID bytes are:
	
	`RVA  Cluster/Interface    SAID Bytes`
	
	`  0  Interface A           X '0000'`
	`  0  Interface B           X '0001'`
	`  0  Interface C           X '0020'`
	`  0  Interface D           X '0021'`
	`  0  Interface E           X '0040'`
	`  0  Interface F           X '0041'`
	`  0  Interface G           X '0060'`
	`  0  Interface H           X '0061'`
	
	`  1  Interface A           X '0010'`
	`  1  Interface B           X '0011'`
	`  1  Interface C           X '0030'`
	`  1  Interface D           X '0031'`
	`  1  Interface E           X '0050'`
	`  1  Interface F           X '0051'`
	`  1  Interface G           X '0070'`
	`  1  Interface H           X '0071'`
	
	• A recovery site storage control ESCON link destination address, bb in this example. If the ESCON Director is installed, it assigns the recovery site storage control ESCON link destination address (bb). For direct fiber optic cable connections between storage controls or static connections through an ESCON Director, the link address value is zero.
	
	• The RVA logical Subsystem Number, cc in this example.

Parameter/ Abbreviations	Description
LINK(*linkaddr1... linkaddrx*) **For 2105, 2107, and 1750**	LINK specifies the addressing path from the application site storage control to the recovery site storage control. Eight path addresses can be specified with each link character for the 2105, 2107, or 1750. Each path address is an 8-digit hexadecimal address in the form X'aaaabbcc', where: **aaaa** Primary volumes 2105, 2107, and 1750 cluster interface system adapter ID (SAID) as shown below. **bb** ESCON director "DESTINATION" address (X'00' if directly attached pair of DASD control units or static ESCON switch). **cc** Logical subsystem number for 2105, 2107, or 1750. The LINK parameter address consists of: • AN application system SAID (system adapter ID) interface identifier AAAA, that uniquely identifies the physical location of the associated node interface. Corresponding to ESCON channel interfaces the SAID bytes are: 2105 CLUSTER/INTERFACE SAID BYTES 1 BAY 1 CARD 1 LINK00 X'0000' 1 BAY 1 CARD 1 LINK01 X'0001' 1 BAY 1 CARD 2 LINK00 X'0004' 1 BAY 1 CARD 2 LINK01 X'0005' 1 BAY 1 CARD 3 LINK00 X'0008' 1 BAY 1 CARD 3 LINK01 X'0009' 1 BAY 1 CARD 4 LINK00 X'000C' 1 BAY 1 CARD 4 LINK01 X'000D' 1 BAY 2 CARD 1 LINK00 X'0020' 1 BAY 2 CARD 1 LINK01 X'0021' 1 BAY 2 CARD 2 LINK00 X'0024' 1 BAY 2 CARD 2 LINK01 X'0025' 1 BAY 2 CARD 3 LINK00 X'0028' 1 BAY 2 CARD 3 LINK01 X'0029' 1 BAY 2 CARD 4 LINK00 X'002C' 1 BAY 2 CARD 4 LINK01 X'002D' 2 BAY 3 CARD 1 LINK00 X'0080' 2 BAY 3 CARD 1 LINK01 X'0081' 2 BAY 3 CARD 2 LINK00 X'0084' 2 BAY 3 CARD 2 LINK01 X'0085' 2 BAY 3 CARD 3 LINK00 X'0088' 2 BAY 3 CARD 3 LINK01 X'0089' 2 BAY 3 CARD 4 LINK00 X'008C' 2 BAY 3 CARD 4 LINK01 X'008D' 2 BAY 4 CARD 1 LINK00 X'00A0' 2 BAY 4 CARD 1 LINK01 X'00A1' 2 BAY 4 CARD 2 LINK00 X'00A4' 2 BAY 4 CARD 2 LINK01 X'00A5' 2 BAY 4 CARD 3 LINK00 X'00A8' 2 BAY 4 CARD 3 LINK01 X'00A9' 2 BAY 4 CARD 4 LINK00 X'00AC' 2 BAY 4 CARD 4 LINK01 X'00AD'
	• A recovery site storage control ESCON link destination address, BB, in this example. If the ESCON director is installed, it assigns the recovery site storage control ESCON link destination address (bb). For direct cable connections between storage controls or static connections through an ESCON director, the link address value is zero. • The logical subsystem number of the destination, CC, in this example. This value must match the logical subsystem number of the secondary logical subsystem specified in the LSS parameter. To determine the logical subsystem number (LSS) for the 2105, 2107, or 1750 run the ICKDSF **CONTROL CONFIGURE(DISPLAY)** command which will print the LSS number.
Default:	None.
Restrictions:	FCPPATHS and WWNN cannot be specified with the LINK parameter.

PRIMARY and SECONDARY parameter: identifies control unit

Parameter/ Abbreviations	Description
PRIMARY(*ssid*,*ser#*) **PRIM** **PRI**	Specifies the application site storage control subsystem ID and serial number. The storage control subsystem ID (ssid) is a 4-digit hexadecimal address. The ser# is the storage control serial number, and is the last five digits of the 12-digit machine serial number for 3990, 2105, 2107, and 1750 or the last seven digits of 12-digit machine serial number for RVA. The storage control subsystem id, and storage control serial number may be obtained with the CONTROL CONFIGURE(DISPLAY) command for 3990, 2105, 2107, and 1750 or PPRCOPY QUERY without the PATHS parameter for RVA.
SECONDARY(*ssid*,*ser#*) **SEC**	Specifies the recovery site storage control subsystem ID (ssid) and serial number. The descriptions for the values are the same as for the PRIMARY parameter.
Default:	None.
Restrictions:	None.

WWNN parameter: establishes the World Wide Node Name (WWNN) of the primary and secondary

Parameter/ Abbreviations	Description
WWNN(*pwwnn*,*swwnn*)	Specifies the World Wide Node Name (WWNN) of the Primary and Secondary. Each WWNN is an 8-byte hexadecimal value wwwwwwwwwwwwwwww. *pwwnn* represents the primary WWNN and *swwnn* represents the Secondary WWNN. The WWNN can be determined from using the ICKDSF PPRCOPY QUERY PATHS command.
Default:	None.
Restrictions:	Although the WWNN value is a hex value the leading X' and the trailing apostrophe are not allowed in the specification of the value.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

CGROUP parameter: how an error that is related to a PPRCOPY device is reported by the 2105, 2107, and 1750

Parameter/ Abbreviations	Description
CGROUP(NO|YES)	CGROUP specifies: **NO** Specifies that error handling and reporting is performed the same way as a 3990 storage control with the automated recovery bit in the vital product data (VPD) set to Off. **YES** Specifies that the 2105, 2107, or 1750 subsystem responds to PPRCOPY pair errors with the same status that is returned from a 3990-6 storage control with the automated recovery bit in the vital product data (VPD) set to On. This bit enables the extended long busy condition for a consistency group. Automation products can detect PPRCOPY volume pair outages on these devices and take appropriate action.
Default:	NO
Restrictions:	CRIT(YES) is not valid when CASCADE is specified.

FORCE parameter: force removal of existing logical paths

Parameter/ Abbreviations	Description
FORCE	Used to force removal of existing logical paths. If the links used for PPRCOPY do not have existing logical paths established, then FORCE is not necessary. **Note:** When FORCE is used to remove existing logical paths, operating system messages may be issued stating that the removed paths are not operational or have been taken offline.
Default:	None.
Restrictions:	The FORCE parameter is ignored for all devices except the 2105, 2107, and 1750.

LSS parameter: identify logical subsystem number

Parameter/ Abbreviations	Description
LSS(X'*pp*',X'*ss*')	LSS is required to identify the logical subsystem number on 2105, 2107, and 1750 devices. The X'*pp*' value is the primary logical subsystem number. The X'*ss*' value is the secondary logical subsystem number. Obtain the logical subsystem number with the following command. `CONTROL CONFIGURE(DISPLAY)`
Default:	None.
Restrictions:	LSS is valid only for 2105, 2107, and 1750 devices.

Examples of PPRCOPY ESTPATH

```
PPRCOPY ESTPATH UNIT(0142) PRI(X'6060',62006) SEC(X'6061',68006) LINK(X'0004C400')
```

Multiple path example

The following command adds four ESCON paths between the application site storage control (SSID 6060, serial number ending with 62006) and the recovery site storage control (SSID 6061, serial number ending with 68006). The PPRCOPY ESTPATH command may be issued to any device on the application site storage control.

```
PPRCOPY ESTPATH UNIT(0142) PRIM(X'6060',62006) SEC(X'6061',68006) -
        LINK(X'0000B000',X'0001B000',X'0016B000',X'0017B000')
```

The examples assume that all of the physical and logical paths already exist.

PPRCOPY-FCP path example

The following example shows how to specify the PPRCOPY ESTPATH to establish a PPRCOPY-FCP path:

```
PPRCOPY ESTPATH UNIT(4C80) -
PRI(X'2901',FCA29) SEC(X'2905',FCA29) -
LSS(X'01',X'05') -
FCPPATHS(x'002000E6') -
WWNN(5005076300123456,5005076300234567)
```

Multiple PPRCOPY-FCP path example

The following example shows how to specify the PPRCOPY ESTPATH to establish multiple PPRCOPY-FCP paths:

```
PPRCOPY ESTPATH UNIT(4C80) -
PRI(X'2901',FCA29) SEC(X'2905',FCA29) -
LSS(X'01',X'05') -
FCPPATHS(x'002000E6', x'002000E7') -
WWNN(5005076300123456,5005076300234567)
```

Example for 2105, 2107, and 1750 using the LSS parameter

The following example is valid for 2105, 2107, and 1750 and shows an ESTPATH command using the LSS parameter. The secondary is LSS X'02'. The last byte of the link address is X'02', which must match the value that is specified for the secondary in the LSS parameter.

```
PPRCOPY ESTPATH UNIT(4C00) LSS(X'07',X'02') -
        PRI(X'06C7',FCA29) SEC(X'06C2',FCA29) -
        LINK(X'00A0E402')
```

PPRCOPY FREEZE–suspend all operations for all PPRCOPY volumes on a single storage control

The FREEZE command is designed for automating database consistency. The FREEZE command is issued to control operations for multiple PPRCOPY volume pairs on a single storage control. This command allows you to suspend all operations for all PPRCOPY volumes on a single storage control. You must issue a separate FREEZE command to suspend operations on each storage control.

FREEZE specifies that PPRCOPY stop all updates to secondary storage controls that are related to this volume pair. PPRCOPY does not allow any activity to the secondary volumes. All the paths are removed for the secondary controller.

Syntax

Note: The FREEZE command is supported on 3390, RVA, 2105, 2107, and 1750.

PPRCOPY FREEZE
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) LSS(*X'pp',X'ss'*) PRIMARY(*ssid,ser#*) SECONDARY(*ssid,ser#*) Optional Parameter ALLOWONLINE

Required parameters

DDNAME|SYSNAME|UNITADDRESS parameter: identify the primary volume

Parameter/ Abbreviations	Description
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and a VM volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address (3 or 4 hex digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. The unit address is the device number.
Default:	None.
Restrictions:	None.

LSS parameter: identify logical subsystem number

Parameter/ Abbreviations	Description
LSS(X'*pp*',X'*ss*')	LSS is required to identify the logical subsystem number on 2105, 2107, and 1750 devices. The X'*pp*' value is the primary logical subsystem number. The X'*ss*' value is the secondary logical subsystem number. Obtain the logical subsystem number with the following command: `CONTROL CONFIGURE(DISPLAY)`
Default:	None
Restrictions:	LSS is valid only for 2105, 2107, and 1750 devices.

PRIMARY and SECONDARY parameter: identifies the control unit

Parameter/ Abbreviations	Description
PRIMARY(*ssid*,*ser#*) **PRIM** **PRI**	Specifies the application site storage control subsystem ID, serial number, and channel connection address. The storage control subsystem ID (*ssid*) is a 4-digit hexadecimal address. The *ser#* is the storage control serial number, and is the last five digits of the 12-digit machine serial number for 3990, 2105, 2107, and 1750 or the last seven digits of the 12-digit machine serial number for RVA. The storage control subsystem id and storage control serial number may be obtained with the CONTROL CONFIGURE(DISPLAY) command for 3990, 2105, 2107, and 1750 or PPRCOPY QUERY without the PATHS parameter for RVA.
SECONDARY(*ssid*,*ser#*) **SEC**	Specifies the recovery site storage control subsystem ID and serial number. The descriptions for the values are the same as for the PRIMARY parameter. **Warning:** Protect your data by ensuring your secondary device is correct. No checking is done at the secondary subsystem to protect the data on the secondary volume.
Default:	None.
Restrictions:	None.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

Example of PPRCOPY FREEZE

```
PPRCOPY FREEZE UNIT(5401)    -
             PRI(X'2014',22010)     -
             SEC(X'6404',24264)     -
             LSS(04,04)
```

PPRCOPY POPULATESESSION

The PPRCOPY POPULATESESSION command is used to populate or depopulate a session that has been previously OPENed using the PPRCOPY DEFINESESSION COMMAND. The device to which the I/O is issued must be in the LSS on which the session to be populated is open, however, that device need not be one of the volumes that is to become a member of the session. The volume list can contain only CCAs that are resident in the specified LSS. A maximum of 255 individual volumes (if RANGE(NO)) is specified, or ranges of volumes (if RANGE(YES) is specified) can be specified on a single issuance of this command. The number of volumes that can be specified is arbitrary as long as the specified volume(s) exist, are resident in the addressed LSS and any single specification does not exceed the VOLCOUNT limit of 255.

When a volume is added to a session it will enter the 'join pending' state and will remain in that state until an Asynchronous PPRCOPY configuration is started that involves this volume and the first pass initial copy completes. Once the Asynchronous PPRCOPY configuration is started and any volumes are in the 'join pending' state they cannot be successfully removed from the session. If a JOIN is done and no Asynchronous PPRCOPY configuration is ever started then those volumes can be successfully REMOVEd despite being in the 'join pending' state.

If an Asynchronous PPRCOPY configuration has been started and a REMOVE is attempted the volumes will not actually be removed if formation of a consistency group is underway. In this case the volume(s) will enter the 'remove pending' state and remain there until the consistency group that is underway completes.

Volumes can be dynamically JOINed or REMOVEd to a session with a session ID for which Asynchronous PPRCOPY processing is already underway. These volumes will automatically be included or excluded in subsequent Asynchronous PPRCOPY processing.

Syntax

PPRCOPY POPULATESESSION **PPRCOPY POPSESS**
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) IVOLLIST*(volume list)* | RVOLLIST*(volume list)* | MTIVOLLIST(*primary volume list*, *secondary volume list*) | MTRVOLLIST(*primary volume list*, *secondary volume list*) JOIN|REMOVE SESSIONNO(*session number*) VOLCOUNT(*volcount*)

PPRCOPY POPULATESESSION **PPRCOPY POPSESS**
Optional Parameters ALLOWONLINE RANGE(**YES**|NO)

Required parameters

DDNAME|SYSNAME|UNITADDRESS: identify volume to which I/O is issued

Same as for Flashcpy Establish.

IVOLLIST | RVOLLIST | MTIVOLLIST | MTRVOLLIST: list of individual volumes or ranges of volumes

Parameter/ Abbreviations	Description

IVOLLIST(*vol list*)
IVOLIST
IVOLST
 	
RVOLLIST(*vol list*)
RVOLIST
RVOLST
	IVOLLIST must be specified when a list of individual volume CCAs are to be specified. (RANGE(NO) is specified.)
	
	RVOLLIST must be specified when ranges of volume CCAs are to be specified. (RANGE(YES) is specified or defaulted.)
	
	vol list is a list of CCAs resident in the specified LSS that are to become members of the indicated session. A CCA is the channel connection address of a volume. It is a two-digit hexadecimal address that identifies the specific volume in the specified LSS.
	
	If RANGE(NO) is specified a list is of up to 255 individual CCAs can be specified in the list. Each CCA must be enclosed in parentheses; they are separated by a single comma and no spaces. For example:
	
	`IVOLLIST((X'00'),(X'4B'),(X'D3'),...,(X'FE'))`
	
	If RANGE(YES) is specified or defaulted the list is composed of up to 255 ranges of volume CCAs. Each range must be enclosed in parentheses and consists of the CCA value that begins the range and the CCA value that ends the range, separated by a single comma. Each range specification must be separated by a single comma. For example,
	
	`RVOLLIST((X'00',X'07'),(X'CB',X'CF'),(X'52',X'5C'),...,(X'F3',X'FE'))`

Parameter/ Abbreviations	Description

MTIVOLLIST(*primary vol list*, *secondary vol list*)
MTIVOLIST
MTIVOLST
MTRVOLLIST(*primary vol list*, *secondary vol list*)
MTRVOLIST
MTRVOLST
	MTIVOLLIST must be specified when a list of individual volume CCAs are to be specified. (RANGE(NO) is specified.) MTRVOLLIST must be specified when ranges of volume CCAs are to be specified. (RANGE(YES) is specified or defaulted.)
	primary vol list is a list of CCAs resident in the LSS of the device specified with DDNAME|SYSNAME|UNITADDRESS that are to become members of the indicated session. It is a two-digit hexadecimal address that identifies the specific volume in the specified LSS.
	secondary vol list is a list of CCAs resident in the secondary control unit. This list is made up of:
	• The secondary volume's storage control serial number, which is the last five digits of the 12-digit machine serial number.
	• The secondary volume's logical subsystem number, which is a two-digit hexadecimal number.
	• The secondary volume's channel connection address, which is a two-digit hexadecimal address that identifies the specific volume in the specified LSS.
	If RANGE(NO) is specified, a list of up to 255 individual CCAs can be specified in the list. The primary volume CCA, secondary volume storage control serial number, secondary volume LSS, and secondary volume CCA must be separated by single commas and no blank spaces, with the set enclosed in parentheses. For example:
	`MTIVOLLIST((X'00',90007,X'02',X'01'),(X'01',BD321,X'01',X'4B'),….., (X'05',90007,X'02',X'FE'))`
	If RANGE(YES) is specified or defaulted, the list is composed of up to 255 ranges of volume CCAs. Each range must be enclosed in parentheses and consists of the CCA value that begins the range and the CCA value that ends the range, separated by a single comma. You must specify the beginning and ending range for the primary CCA and just the beginning range for the secondary CCA. Each range specification must be separated by a single comma. For example:
	`MTRVOLLIST((X'01',X'08',90007,X'02',X'00'), (X'BB',X'BF',90007,X'02',X'CB'),..., (X'D3',X'DE',BD321,X'01',X'F3'))`
	You may obtain the secondary volume's storage control serial number, logical subsystem and channel connection address with the following command issued against the secondary control unit volume:
	`CONTROL CONFIGURE(DISPLAY)`

Default:	None.
Restrictions:	None.

JOIN/REMOVE: indicate whether volumes are being added or removed from session

Parameter/ Abbreviations	Description
JOIN	Indicates that the specified volumes are to be added to the specified session.
REMOVE	Indicates that the specified volumes are to be removed from the specified session.
Default:	None
Restrictions:	None

SESSIONNO: session number for which information is desired

Parameter/ Abbreviations	Description
SESSIONNO(*session number*) **SESSNO**	*session number* must identify an existing session in the addressed LSS.
Default:	None.
Restrictions:	Must be an existing session on the addressed LSS with a value from 1 to 255 inclusive.

VOLCOUNT: count of volumes in VOLSLIST

Parameter/ Abbreviations	Description
VOLCOUNT(*volcount*) **VOLCNT**	*volcount* is the count of individual volumes or the number of ranges of volumes specified with the VOLSLIST keyword.
Default:	None.
Restrictions:	Value must be from 1 to 255 inclusive.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

RANGE: indicate whether ranges or individual volumes are specified

Parameter/ Abbreviations	Description
RANGE(NO|YES)	**NO** Specifies that the list of specified volumes are individual volumes. **YES** Specifies that the list of specified volumes are specified as ranges of volumes.
Default:	YES
Restrictions:	None

Examples of PPRCOPY POPULATESESSION

The following example shows PPRC POPULATESESSION commands with the RVOLLIST and IVOLLIST parameters.

```
PPRCOPY POPULATESESSION UNIT(5C06)        -
                        JOIN              -
                        SESSIONNO(1)      -
                        VOLCOUNT(1)       -
                        RVOLLIST((X'06',X'A'))

PPRCOPY POPULATESESSION UNIT(5C06)        -
                        JOIN              -
                        SESSIONNO(1)      -
                        VOLCOUNT(5)       -
                        IVOLLIST((X'06'),(X'07'),(X'08'),(X'09'),(,X'A'))
```

The following example shows the use of the MTIVOLLIST parameter.

```
PPRC POPULATESESSION JOIN      -
      UNIT(9000)                -
      SESSIONNO(1)              -
      VOLCOUNT(2)               -
      RANGE(NO)                 -
      MTIVOLLIST((X'30',CCH81,X'00',X'0D'), -
                 (X'31',CCH81,X'00',X'0E'))
ICK00700I DEVICE INFORMATION FOR 9000 IS CURRENTLY AS FOLLOWS:
```

```
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 2107
          STORAGE CONTROL DESCRIPTOR = E8
          DEVICE DESCRIPTOR = 0E
          ADDITIONAL DEVICE INFORMATION = 4A00003C
          TRKS/CYL = 15, # PRIMARY CYLS = 3339
ICK04030I DEVICE IS A PEER TO PEER REMOTE COPY VOLUME
ICK03091I EXISTING VOLUME SERIAL READ = IN9000
ICK02216I PPRCOPY POPULATESESSION FUNCTION COMPLETED SUCCESSFULLY
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

PPRCOPY QUERY–querying status

Use the PPRCOPY QUERY command to query the PPRCOPY and path status of a volume. Query can be issued to either a primary or secondary PPRCOPY volume. For 2105, 2107, and 1750, the LSS number will be displayed when it is available.

A host system that is attached only to a primary volume cannot obtain the status of the secondary volume for that pair. In the same way, a host that is attached only to the secondary volume cannot obtain the status of the primary volume.

For all outputs generated by the QUERY command with or without PATHS, the values indicated for the Primary and Secondary volumes refer to the primary or secondary volume in the PPRC relationship. So, for example, if volume 'A' is the primary volume and volume 'B' is the secondary volume in a PPRC relationship and we query the primary volume 'A' then the primary values in the output refer to volume 'A' and the secondary values refer to volume 'B'. Likewise, if we query volume 'B' in the same relationship, the primary values still refer to volume 'A' the primary volume of the relationship, and the secondary values refer to volume 'B' the secondary volume of the relationship.

If the queried device is simplex, a PPRC primary or queried as a PPRC primary (as is done for Cascaded volumes) then the WWNN for the secondary volume of the PPRC relationship will not be presented but those for paths defined from the device will be presented. It can be displayed for the secondary volume of the PPRC relationship as well as for any paths that are defined from the device. Currently, display of those values are mutually exclusive. That is to say, if the WWNN for the secondary volume of the PPRC relationship is present then those for any paths defined from the device will not be, and vice versa. The rules for the display of the WWNN value(s) are:

- If the queried device is a primary or queried as a primary (as is done for Cascaded volumes) then the WWNN for the secondary volume of the PPRC relationship will not be present but those for paths defined from the device will be.
- If the queried device is a secondary or queried as a secondary (as is done for Cascaded volumes) then the WWNN for the secondary volume of the PPRC relationship will be present but those for paths defined from the device, if any exist, will not be.

Syntax

PPRCOPY QUERY
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*)
Optional Parameters ALLOWONLINE PATHS

Required parameters

DDNAME|SYSNAME|UNITADDRESS parameter: identify the volume

Parameter/ Abbreviations	Description
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and a VM volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address (3 or 4 hex digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. The unit address is the device number.
Default:	None.
Restrictions:	None.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

PATHS parameter: display path status

Parameter/ Abbreviations	Description
PATHS	PATHS directs PPRCOPY to display all of the paths associated with the application site storage control (primary), and the status of each path.
Default:	None.
Restrictions:	None.

Using PPRCOPY QUERY without the PATHS parameter

Example 1: PPRC QUERY to a simplex volume

```
PPRC QUERY UNIT(3109)
ICK00700I DEVICE INFORMATION FOR 3109 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 2107
          STORAGE CONTROL DESCRIPTOR = E8
          DEVICE DESCRIPTOR = 0A
          ADDITIONAL DEVICE INFORMATION = 4A00243D
          TRKS/CYL = 15, # PRIMARY CYLS = 1113
ICK04000I DEVICE IS IN SIMPLEX STATE
ICK00091I 3109 NED=001750.500.IBM.13.000000000016

                    QUERY REMOTE COPY - VOLUME
```

```
                                                  (PRIMARY)    (SECONDARY)
                                                  SSID    CCA  SSID    CCA
DEVICE  LEVEL      STATE           PATH STATUS    SER #   LSS  SER #   LSS  AUTORESYNC
------  ---------  --------------  -----------  ----------  ----------  ----------
3109    N/A        SIMPLEX         N/A          1603    09   ....    ..   N/A
                                                00016   03   ....... ..

ICK02206I PPRCOPY QUERY FUNCTION COMPLETED SUCCESSFULLY
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

Note: On 2105, 2107, and 1750 devices, IF PENDING/SUSPEND: COUNT OF TRACKS REMAINING TO BE COPIED = , will be printed instead of First and Last Cyl out of sync. This is presented only on the primary volume.

Table 46 on page 267 describes the fields.

Table 46: Field descriptions.

Field	Description
DEVICE	Displays the 4-digit hexadecimal device address.
LEVEL	Displays whether the volume is a primary or secondary volume. When the device is simplex, this column is not applicable (N/A).

Table 46: Field descriptions. (continued)

Field	Description
STATE	Indicates whether the PPRCOPY volume is in simplex, duplex pending, duplex, or suspended duplex (suspend(n)) state. XD is indicated if the volume is in PPRCOPY extended distance mode. XDP is indicated if the volume is in pending PPRCOPY extended distance mode. PENDING FC is indicated if the volume is in duplex pending due to an Establish FlashCopy command which specified the PPRC primary volume as a FlashCopy target. If the pair is pending due to an Establish FlashCopy, it becomes full duplex (without operator intervention) once the FlashCopy tracks have been copied to the secondary. The value n for SUSPEND is one of the following: **(3)** Copy suspended. Host suspended the primary device. No read or write commands will be accepted. **(4)** Copy suspended. Host suspended the secondary device. Updates to the primary will be accepted and out of sync cylinders will be recorded. **(5)** Copy is suspended by the primary control unit update secondary device status command. This value is only returned by the secondary device. **(6)** Copy is suspended by internal conditions within the storage control. **(7)** Copy is suspended due to secondary control unit sending a state change interrupt to the primary control unit indicating a transition to simplex state. **(8)** Copy is suspended by internal conditions within the secondary device. **(9)** Copy is suspended as a result of an IML or power interruption to the primary site storage control. **(A)** Copy is suspended due to the host issuing a Freeze PPRCOPY group order. **(C)** Copy is suspended due to an Establish FlashCopy command with Preserve Mirror Required failing at the remote control unit. The Local B to Remote B Peer-to-Peer Remote Copy pair state was changed to suspended. **(F)** Copy is suspended due to Global Mirror Pause with Consistency. **(11)** Copy is suspended due to secondary device detecting media errors.
PATH STATUS	Displays whether the status is active or inactive. When device is a simplex or secondary volume, this column is not applicable (N/A).
PRIMARY SSID CCA Serial#	Displays the 4-digit hexadecimal subsystem ID (SSID) of the application site storage control, the 2-digit hexadecimal channel connection address (CCA) of the primary volume, and one of the following: • The last 5 digits of the storage control serial number for 3990, 2105, 2107, 1750. • The last 7 digits of the storage control serial number for RVA. • Dots, when the volume is a secondary.
SECONDARY SSID CCA Serial#	Displays the 4-digit hexadecimal subsystem ID (SSID) of the recovery site storage control, the 2-digit hexadecimal channel connection address (CCA) of the primary volume, and the last 5 digits of the storage control serial number for 3990 or the last 7 digits of the storage control serial number for RVA.

Table 46: Field descriptions. (continued)

Field	Description
PATHS	Displays the number of valid links, if there are any, between application site and recovery site storage controls. Note: When device is a simplex or secondary volume, no information below this point will be displayed unless the secondary volume resides in the same storage control with the primary volume.
SAID	Displays the 4-digit hexadecimal system adapter ID (SAID) of the application site storage control. SAID and DEST make up the link address.
DEST	Specifies up to four 4-digit, hexadecimal-character link addresses. The link addresses each consist of a 2-digit, hexadecimal-character ESCON port address followed by the 2-digit, hexadecimal-character logical storage control ID. DEST and SAID (described above) make up the link address.
STATUS	A 2-digit number indicating the detailed status of the path The following is a short description of status indicator: • 00 - No path • 01 - Established path • 02 - Initialization failed • 03 - Time out • 04 - No resources available at primary • 05 - No resources available at secondary • 06 - Serial number mismatch • 07 - SCU SSID mismatch • 08 - ESCON link is offline • 09 - Establish failed but will retry again when conditions change • 0A - System adapter has a host path already established • 0B - Path cannot be connected in the same cluster • 10 - Configuration error • 11 - Cannot establish between CKD and FBA • 12 - LSS and link address miscompare • 13 - Fibre path established • 14 - Fibre channel path link down • 15 - Fibre channel path retry exceeded • 16 - Fibre channel path secondary adapter not PPRCOPY capable. This problem could be due to one of the following: – - Secondary adapter not configured properly, does not have the correct microcode loaded Or - The secondary adapter is already a target of 32 different ESS boxes • 17 - Fibre channel path secondary adapter not available • 18 - Fibre channel path primary login exceeded • 19 - Fibre channel path secondary login exceeded • nn - Status is undetermined

Table 46: Field descriptions. (continued)

Field	Description
FIRST CYL...	This information, when available, is presented only for volumes in duplex pending and suspended duplex states. If the volume is a primary volume, this is the lowest cylinder number out of synchronization on the primary volume. If the volume is a secondary volume, this is the lower cylinder number received from the primary which is staged in cache and not yet written to the secondary volume. Users might receive this information intermittently due to the staging in cache.
LAST CYL...	This information, when available, is presented only for volumes in duplex pending and suspended duplex states. If the volume is primary volume, this is the highest cylinder number out of synchronization on the primary volume. If the volume is a secondary volume, this is the higher cylinder number received from the primary which is staged in cache and not yet written to the secondary volume. Users might receive this information intermittently due to the staging in cache.
TRACKS REMAINING...	'IF PENDING/SUSPEND: COUNT OF TRACKS REMAINING TO BE COPIED = ' This information, when available is presented only for primary volumes in duplex pending or suspended duplex states. This is printed on 2105, 2107, and 1750 devices instead of the First and Last Cyl Out of sync information.
SECONDARY SUSPENDED	When available, the Greenwich Mean Time (GMT) that this secondary volume was suspended. In the ISO form: "YYYY-MM-DD HH.MM.SS.NNNNNN". Note: This time stamp is the value from the clock of the system that issued the SUSPEND. It may not be the application system or even the same systems that are receiving the QUERY response, so you may not be able to correlate the time value with events on the application system or other systems.
AUTORESYNC	'ENABLE' means that the auto resync capability is enabled for the Global Copy pair. 'DISABLE' means that the auto resync capability is disabled for the Global Copy pair. If the PPRCOPY ESTPAIR command was issued with the AUTORESYNC(NO) parameter specified and the storage subsystem supports AUTORESYNC, it will show AUTORESYNC as 'DISABLE'. If the storage subsystem does not support the AUTORESYNC parameter for the PPRCOPY ESTPAIR command, it will also show AUTORESYNC as 'DISABLE'. An exception to this is when the Global Copy pair is in a suspended state and the cause of the suspension enables that pair for automatic resynchronization. In this case it will show AUTORESYNC as 'ENABLE'. Only the Primary device has the AUTORESYNC status, so if you query the Secondary you will always get AUTORESYNC as 'DISABLE'. 'N/A' means that Global Copy pair is in Simplex state; therefore, auto resync capability is not applicable (N/A).

Example 2: PPRC QUERY to the primary volume of a non-Cascaded PPRC pair, followed by a PPRC QUERY to the secondary volume of a non-Cascaded PPRC pair:

Display for primary volume:

```
  PPRC QUERY UNIT(3109)
ICK00700I DEVICE INFORMATION FOR 3109 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 2107
          STORAGE CONTROL DESCRIPTOR = E8
          DEVICE DESCRIPTOR = 0A
          ADDITIONAL DEVICE INFORMATION = 4A00243D
          TRKS/CYL = 15, # PRIMARY CYLS = 1113
ICK04030I DEVICE IS A PEER TO PEER REMOTE COPY VOLUME

                    QUERY REMOTE COPY - VOLUME
```

```
                                                (PRIMARY)    (SECONDARY)
                                                SSID    CCA  SSID    CCA
DEVICE  LEVEL      STATE           PATH STATUS  SER #   LSS  SER #   LSS  AUTORESYNC
------  ---------  --------------  -----------  ----------  ----------  ----------
3109    PRIMARY    PENDING         ACTIVE       1603    09   2400    09   DISABLE
                                                00016   03   02411   00

PATHS  SAID/DEST               STATUS  DESCRIPTION
-----  ---------               ------  ----------------
3      0000 0040               13      ESTABLISHED FIBRE CHANNEL PATH
       0100 0040               13      ESTABLISHED FIBRE CHANNEL PATH
       0100 0110               13      ESTABLISHED FIBRE CHANNEL PATH
1      0100 0200               13      ESTABLISHED FIBRE CHANNEL PATH

IF PENDING/SUSPEND: COUNT OF TRACKS REMAINING TO BE COPIED = 16620

ICK02206I PPRCOPY QUERY FUNCTION COMPLETED SUCCESSFULLY
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

Display for secondary volume:

```
  PPRC QUERY UNIT(9009)
ICK00700I DEVICE INFORMATION FOR 9009 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 3990
          STORAGE CONTROL DESCRIPTOR = E9
          DEVICE DESCRIPTOR = 0A
          ADDITIONAL DEVICE INFORMATION = 4A001F3C
          TRKS/CYL = 15, # PRIMARY CYLS = 1113
ICK04030I DEVICE IS A PEER TO PEER REMOTE COPY VOLUME
ICK04032I DEVICE SPECIFIED IS A PPRC SECONDARY

                  QUERY REMOTE COPY - VOLUME

                                                (PRIMARY)    (SECONDARY)
                                                SSID    CCA  SSID    CCA
DEVICE  LEVEL      STATE           PATH STATUS  SER #   LSS  SER #   LSS  AUTORESYNC
------  ---------  --------------  -----------  ----------  ----------  ----------
9009    SECONDARY  PENDING         N/A          1603    09   2400    09   DISABLE
                                                00016   03   02411   00

ICK02206I PPRCOPY QUERY FUNCTION COMPLETED SUCCESSFULLY
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

Example 3: PPRC QUERY to each volume in a Cascaded triad:

When devices are Cascaded the intermediate volume is both the secondary of the 'local' pair and the primary of the 'remote' pair. The QUERY output looks differently in this case. Following is the output generated for this case. In this example volume 'A' the local primary is unit 3109, volume 'B' the intermediate volume is unit 9009, and the remote secondary is unit D809.

The display for the local primary is:

```
  PPRC QUERY UNIT(3109)
ICK00700I DEVICE INFORMATION FOR 3109 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 2107
          STORAGE CONTROL DESCRIPTOR = E8
          DEVICE DESCRIPTOR = 0A
          ADDITIONAL DEVICE INFORMATION = 4A00243D
          TRKS/CYL = 15, # PRIMARY CYLS = 1113
ICK04030I DEVICE IS A PEER TO PEER REMOTE COPY VOLUME

                  QUERY REMOTE COPY - VOLUME

                                                (PRIMARY)    (SECONDARY)
                                                SSID    CCA  SSID    CCA
DEVICE  LEVEL      STATE           PATH STATUS  SER #   LSS  SER #   LSS  AUTORESYNC
------  ---------  --------------  -----------  ----------  ----------  ----------
```

```
3109    PRIMARY    PENDING         ACTIVE       1603    09   2400    09   DISABLE
                                                00016   03   02411   00

PATHS  SAID/DEST               STATUS  DESCRIPTION
-----  ---------               ------  ----------------
3      0000 0040               13      ESTABLISHED FIBRE CHANNEL PATH
       0100 0040               13      ESTABLISHED FIBRE CHANNEL PATH
       0100 0110               13      ESTABLISHED FIBRE CHANNEL PATH
1      0100 0200               13      ESTABLISHED FIBRE CHANNEL PATH

IF PENDING/SUSPEND: COUNT OF TRACKS REMAINING TO BE COPIED = 14979

ICK02206I PPRCOPY QUERY FUNCTION COMPLETED SUCCESSFULLY
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

The display for the intermediate volume is: (note that information for the volume as a secondary is presented first, followed by information for the volume as a primary)

```
  PPRC QUERY UNIT(9009)
ICK00700I DEVICE INFORMATION FOR 9009 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 3990
          STORAGE CONTROL DESCRIPTOR = E9
          DEVICE DESCRIPTOR = 0A
          ADDITIONAL DEVICE INFORMATION = 4A001F3C
          TRKS/CYL = 15, # PRIMARY CYLS = 1113
ICK04030I DEVICE IS A PEER TO PEER REMOTE COPY VOLUME

                  QUERY REMOTE COPY - VOLUME


ICK02215I INFORMATION FOR THIS VOLUME AS A SECONDARY FOLLOWS

                                                (PRIMARY)    (SECONDARY)
                                                SSID    CCA  SSID    CCA
DEVICE  LEVEL      STATE           PATH STATUS  SER #   LSS  SER #   LSS   AUTORESYNC
------  ---------  --------------  -----------  ----------  ----------   ----------
9009    SECONDARY  PENDING         N/A          1603    09   2400    09    DISABLE
                                                00016   03   02411   00


ICK02214I INFORMATION FOR THIS VOLUME AS A PRIMARY FOLLOWS

                                                (PRIMARY)    (SECONDARY)
                                                SSID    CCA  SSID    CCA
DEVICE  LEVEL      STATE           PATH STATUS  SER #   LSS  SER #   LSS   AUTORESYNC
------  ---------  --------------  -----------  ----------  ----------   ----------
9009    PRIMARY    PENDING    XDP  ACTIVE       2400    09   6800    09    ENABLE
                                                02411   00   01461   00

PATHS  SAID/DEST               STATUS  DESCRIPTION
-----  ---------               ------  ----------------
1      0110 0330               13      ESTABLISHED FIBRE CHANNEL PATH

IF PENDING/SUSPEND: COUNT OF TRACKS REMAINING TO BE COPIED = 372

ICK02206I PPRCOPY QUERY FUNCTION COMPLETED SUCCESSFULLY
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

The display for the remote secondary is:

```
  PPRC QUERY UNIT(D809)
ICK00700I DEVICE INFORMATION FOR D809 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 3990
          STORAGE CONTROL DESCRIPTOR = E9
          DEVICE DESCRIPTOR = 0A
          ADDITIONAL DEVICE INFORMATION = 4A001F3C
          TRKS/CYL = 15, # PRIMARY CYLS = 1113
ICK04030I DEVICE IS A PEER TO PEER REMOTE COPY VOLUME
ICK04032I DEVICE SPECIFIED IS A PPRC SECONDARY
```

```
                  QUERY REMOTE COPY - VOLUME

                                                    (PRIMARY)    (SECONDARY)
                                                    SSID    CCA  SSID    CCA
DEVICE  LEVEL      STATE           PATH STATUS      SER #   LSS  SER #   LSS  AUTORESYNC
------  ---------  --------------  -----------  -----------  -----------  ----------
D809    SECONDARY  PENDING    XDP  N/A          2400    09   6800    09   DISABLE
                                                 02411   00   01461   00

PATHS  SAID/DEST               STATUS  DESCRIPTION
-----  ---------               ------  ----------------
1      0200 0330               13      ESTABLISHED FIBRE CHANNEL PATH
1      0200 0100               13      ESTABLISHED FIBRE CHANNEL PATH


ICK02206I PPRCOPY QUERY FUNCTION COMPLETED SUCCESSFULLY
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

Using PPRCOPY QUERY with the PATHS parameter

The examples that follow illustrate use of the PPRCOPY QUERY command on a volume with the PATHS parameter.

If the device supports a multi-target configuration, the path information shows 16 paths. For more information, refer to “Using PPRCOPY QUERY with the multi-target support” on page 280.

Example 1: PPRC QUERY to a simplex volume:

```
  PPRC QUERY UNIT(3109) PATHS
ICK00700I DEVICE INFORMATION FOR 3109 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 2107
          STORAGE CONTROL DESCRIPTOR = E8
          DEVICE DESCRIPTOR = 0A
          ADDITIONAL DEVICE INFORMATION = 4A00243D
          TRKS/CYL = 15, # PRIMARY CYLS = 1113
ICK04000I DEVICE IS IN SIMPLEX STATE
ICK00091I 3109 NED=001750.500.IBM.13.000000000016

                        QUERY REMOTE COPY - PATHS

       PRIMARY (OR SIMPLEX) CONTROL UNIT INFORMATION

             SERIAL                 WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME
             -------  ----  ---  ----------------
             00016    1603  03   500507630EFFFC61


       SECONDARY CONTROL UNIT INFORMATION

             SERIAL                 WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME
             -------  ----  ---  ----------------
             .......  ....  ...  ................


       PATHS:
             SERIAL                 WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME      PATH  SAID  DEST  S*
             -------  ----  ---  ----------------  ----  ----  ----  --
       1ST:  01461    6806  06   5005076303FFC058    1   0100  0200  13
       2ND:  .......  ....  ...  ................  ....  ....  ....  00
       3RD:  .......  ....  ...  ................  ....  ....  ....  00
       4TH:  .......  ....  ...  ................  ....  ....  ....  00

       S*=PATH STATUS
         00=NO PATH
         01=ESTABLISHED
         02=INIT FAILED
         03=TIME OUT
         04=NO RESOURCES AT PRI
         05=NO RESOURCES AT SEC
         06=SERIAL# MISMATCH
         07=SCU SSID MISMATCH
```

```
          08=ESCON LINK IS OFFLINE
          09=ESTABLISH FAILED BUT WILL RETRY AGAIN WHEN CONDITIONS CHANGE
          0A=SYSTEM ADAPTER HAS A HOST PATH ALREADY ESTABLISHED
          0B=PATH CANNOT BE CONNECTED IN THE SAME CLUSTER
          10=CONFIGURATION ERROR
          11=CANNOT ESTABLISH PATH BETWEEN CKD AND FBA
          12=LSS AND LINKADDRESS MISCOMPARE
          13=ESTABLISHED FIBRE CHANNEL PATH
          14=FIBRE CHANNEL PATH LINK DOWN
          15=FIBRE CHANNEL PATH RETRY EXCEEDED
          16=FIBRE CHANNEL PATH SECONDARY ADAPTER NOT PPRC CAPABLE
          17=FIBRE CHANNEL PATH SECONDARY ADAPTER NOT AVAILABLE
          18=FIBRE CHANNEL PATH PRIMARY LOGIN EXCEEDED
          19=FIBRE CHANNEL PATH SECONDARY LOGIN EXCEEDED

ICK02206I PPRCOPY QUERY FUNCTION COMPLETED SUCCESSFULLY
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

Example 2: PPRC QUERY to the primary volume of a non-Cascaded PPRC pair, followed by a PPRC QUERY to the secondary volume of the non-Cascaded PPRC pair:

Display for primary volume, Note that the WWNN for the secondary is not displayed but that they are in the pathing information.

```
  PPRC QUERY UNIT(3109) PATHS
ICK00700I DEVICE INFORMATION FOR 3109 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 2107
          STORAGE CONTROL DESCRIPTOR = E8
          DEVICE DESCRIPTOR = 0A
          ADDITIONAL DEVICE INFORMATION = 4A00243D
          TRKS/CYL = 15, # PRIMARY CYLS = 1113
ICK04030I DEVICE IS A PEER TO PEER REMOTE COPY VOLUME

                         QUERY REMOTE COPY - PATHS

       PRIMARY (OR SIMPLEX) CONTROL UNIT INFORMATION

             SERIAL                 WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME
             -------  ----  ---  ----------------
             00016    1603  03   500507630EFFFC61


       SECONDARY CONTROL UNIT INFORMATION

             SERIAL                 WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME
             -------  ----  ---  ----------------
             02411    2400  00   ................


       PATHS:
             SERIAL                 WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME      PATH  SAID  DEST  S*
             -------  ----  ---  ----------------  ----  ----  ----  --
       1ST:  02411    2400  00   5005076303FFC079    1   0000  0040  13
                                                     2   0100  0040  13
                                                     3   0100  0110  13
       2ND:  01461    6806  06   5005076303FFC058    1   0100  0200  13
       3RD:  .......  ....  ...  ................  ....  ....  ....  00
       4TH:  .......  ....  ...  ................  ....  ....  ....  00

       S*=PATH STATUS
         00=NO PATH
         01=ESTABLISHED
         02=INIT FAILED
         03=TIME OUT
         04=NO RESOURCES AT PRI
         05=NO RESOURCES AT SEC
         06=SERIAL# MISMATCH
         07=SCU SSID MISMATCH
         08=ESCON LINK IS OFFLINE
         09=ESTABLISH FAILED BUT WILL RETRY AGAIN WHEN CONDITIONS CHANGE
         0A=SYSTEM ADAPTER HAS A HOST PATH ALREADY ESTABLISHED
         0B=PATH CANNOT BE CONNECTED IN THE SAME CLUSTER
         10=CONFIGURATION ERROR
         11=CANNOT ESTABLISH PATH BETWEEN CKD AND FBA
         12=LSS AND LINKADDRESS MISCOMPARE
```

```
         13=ESTABLISHED FIBRE CHANNEL PATH
         14=FIBRE CHANNEL PATH LINK DOWN
         15=FIBRE CHANNEL PATH RETRY EXCEEDED
         16=FIBRE CHANNEL PATH SECONDARY ADAPTER NOT PPRC CAPABLE
         17=FIBRE CHANNEL PATH SECONDARY ADAPTER NOT AVAILABLE
         18=FIBRE CHANNEL PATH PRIMARY LOGIN EXCEEDED
         19=FIBRE CHANNEL PATH SECONDARY LOGIN EXCEEDED

ICK02206I PPRCOPY QUERY FUNCTION COMPLETED SUCCESSFULLY
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

Display for secondary volume: Note that in this case the WWNN of the secondary volume is displayed and those for the paths are not.

```
  PPRC QUERY UNIT(9009) PATHS
ICK00700I DEVICE INFORMATION FOR 9009 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 3990
          STORAGE CONTROL DESCRIPTOR = E9
          DEVICE DESCRIPTOR = 0A
          ADDITIONAL DEVICE INFORMATION = 4A001F3C
          TRKS/CYL = 15, # PRIMARY CYLS = 1113
ICK04030I DEVICE IS A PEER TO PEER REMOTE COPY VOLUME
ICK04032I DEVICE SPECIFIED IS A PPRC SECONDARY

                         QUERY REMOTE COPY - PATHS

       PRIMARY (OR SIMPLEX) CONTROL UNIT INFORMATION

             SERIAL                  WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME
             -------  ----  ---  ----------------
             00016    1603  03   500507630EFFFC61


       SECONDARY CONTROL UNIT INFORMATION

             SERIAL                  WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME
             -------  ----  ---  ----------------
             02411    2400  00   5005076303FFC079


       PATHS:
             SERIAL                  WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME      PATH  SAID  DEST  S*
             -------  ----  ---  ----------------  ----  ----  ----  --
       1ST:  01461    6800  00   ................    1   0110  0330  13
       2ND:  .......  ....  ...  ................  ....  ....  ....  00
       3RD:  .......  ....  ...  ................  ....  ....  ....  00
       4TH:  .......  ....  ...  ................  ....  ....  ....  00

       S*=PATH STATUS
         00=NO PATH
         01=ESTABLISHED
         02=INIT FAILED
         03=TIME OUT
         04=NO RESOURCES AT PRI
         05=NO RESOURCES AT SEC
         06=SERIAL# MISMATCH
         07=SCU SSID MISMATCH
         08=ESCON LINK IS OFFLINE
         09=ESTABLISH FAILED BUT WILL RETRY AGAIN WHEN CONDITIONS CHANGE
         0A=SYSTEM ADAPTER HAS A HOST PATH ALREADY ESTABLISHED
         0B=PATH CANNOT BE CONNECTED IN THE SAME CLUSTER
         10=CONFIGURATION ERROR
         11=CANNOT ESTABLISH PATH BETWEEN CKD AND FBA
         12=LSS AND LINKADDRESS MISCOMPARE
         13=ESTABLISHED FIBRE CHANNEL PATH
         14=FIBRE CHANNEL PATH LINK DOWN
         15=FIBRE CHANNEL PATH RETRY EXCEEDED
         16=FIBRE CHANNEL PATH SECONDARY ADAPTER NOT PPRC CAPABLE
         17=FIBRE CHANNEL PATH SECONDARY ADAPTER NOT AVAILABLE
         18=FIBRE CHANNEL PATH PRIMARY LOGIN EXCEEDED
         19=FIBRE CHANNEL PATH SECONDARY LOGIN EXCEEDED

ICK02206I PPRCOPY QUERY FUNCTION COMPLETED SUCCESSFULLY
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

Example 3: PPRC QUERY to each volume in a Cascaded triad:

The display for the local primary is: Once again, note that the WWNN for the secondary is not displayed but that they are in the pathing information. This is because we are querying the primary of a PPRC pair.

```
  PPRC QUERY UNIT(3109) PATHS
ICK00700I DEVICE INFORMATION FOR 3109 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 2107
          STORAGE CONTROL DESCRIPTOR = E8
          DEVICE DESCRIPTOR = 0A
          ADDITIONAL DEVICE INFORMATION = 4A00243D
          TRKS/CYL = 15, # PRIMARY CYLS = 1113
ICK04030I DEVICE IS A PEER TO PEER REMOTE COPY VOLUME

                         QUERY REMOTE COPY - PATHS

       PRIMARY (OR SIMPLEX) CONTROL UNIT INFORMATION

             SERIAL                  WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME
             -------  ----  ---  ----------------
             00016    1603  03   500507630EFFFC61


       SECONDARY CONTROL UNIT INFORMATION

             SERIAL                  WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME
             -------  ----  ---  ----------------
             02411    2400  00   ................


       PATHS:
             SERIAL                  WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME       PATH  SAID  DEST  S*
             -------  ----  ---  ----------------  ----  ----  ----  --
       1ST:  02411    2400  00   5005076303FFC079    1   0000  0040  13
                                                     2   0100  0040  13
                                                     3   0100  0110  13
       2ND:  01461    6806  06   5005076303FFC058    1   0100  0200  13
       3RD:  .......  ....  ...  ................  ....  ....  ....  00
       4TH:  .......  ....  ...  ................  ....  ....  ....  00

       S*=PATH STATUS
         00=NO PATH
         01=ESTABLISHED
         02=INIT FAILED
         03=TIME OUT
         04=NO RESOURCES AT PRI
         05=NO RESOURCES AT SEC
         06=SERIAL# MISMATCH
         07=SCU SSID MISMATCH
         08=ESCON LINK IS OFFLINE
         09=ESTABLISH FAILED BUT WILL RETRY AGAIN WHEN CONDITIONS CHANGE
         0A=SYSTEM ADAPTER HAS A HOST PATH ALREADY ESTABLISHED
         0B=PATH CANNOT BE CONNECTED IN THE SAME CLUSTER
         10=CONFIGURATION ERROR
         11=CANNOT ESTABLISH PATH BETWEEN CKD AND FBA
         12=LSS AND LINKADDRESS MISCOMPARE
         13=ESTABLISHED FIBRE CHANNEL PATH
         14=FIBRE CHANNEL PATH LINK DOWN
         15=FIBRE CHANNEL PATH RETRY EXCEEDED
         16=FIBRE CHANNEL PATH SECONDARY ADAPTER NOT PPRC CAPABLE
         17=FIBRE CHANNEL PATH SECONDARY ADAPTER NOT AVAILABLE
         18=FIBRE CHANNEL PATH PRIMARY LOGIN EXCEEDED
         19=FIBRE CHANNEL PATH SECONDARY LOGIN EXCEEDED

ICK02206I PPRCOPY QUERY FUNCTION COMPLETED SUCCESSFULLY
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

The display for the intermediate volume follows. Note that information for the volume as a secondary is presented first, followed by information for the volume as a primary. Also note that when the volume is queried as a secondary the WWNN for the secondary volume is present and that for the defined path is not and that the opposite is true when the volume is queried as a primary.

```
  PPRC QUERY UNIT(9009) PATHS
ICK00700I DEVICE INFORMATION FOR 9009 IS CURRENTLY AS FOLLOWS:
```

```
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 3990
          STORAGE CONTROL DESCRIPTOR = E9
          DEVICE DESCRIPTOR = 0A
          ADDITIONAL DEVICE INFORMATION = 4A001F3C
          TRKS/CYL = 15, # PRIMARY CYLS = 1113
ICK04030I DEVICE IS A PEER TO PEER REMOTE COPY VOLUME

                          QUERY REMOTE COPY - PATHS


ICK02215I INFORMATION FOR THIS VOLUME AS A SECONDARY FOLLOWS

       PRIMARY (OR SIMPLEX) CONTROL UNIT INFORMATION

             SERIAL                 WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME
             -------  ----  ---  ----------------
             00016    1603  03   500507630EFFFC61


       SECONDARY CONTROL UNIT INFORMATION

             SERIAL                 WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME
             -------  ----  ---  ----------------
             02411    2400  00   5005076303FFC079


       PATHS:
             SERIAL                 WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME      PATH  SAID  DEST  S*
             -------  ----  ---  ----------------  ----  ----  ----  --
       1ST:  01461    6800  00   .................    1   0110  0330  13
       2ND:  .......  ....  ...  .................  ....  ....  ....  00
       3RD:  .......  ....  ...  .................  ....  ....  ....  00
       4TH:  .......  ....  ...  .................  ....  ....  ....  00


ICK02214I INFORMATION FOR THIS VOLUME AS A PRIMARY FOLLOWS

       PRIMARY (OR SIMPLEX) CONTROL UNIT INFORMATION

             SERIAL                 WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME
             -------  ----  ---  ----------------
             02411    2400  00   5005076303FFC079


       SECONDARY CONTROL UNIT INFORMATION

             SERIAL                 WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME
             -------  ----  ---  ----------------
             01461    6800  00   .................


       PATHS:
             SERIAL                 WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME      PATH  SAID  DEST  S*
             -------  ----  ---  ----------------  ----  ----  ----  --
       1ST:  01461    6800  00   5005076303FFC058    1   0110  0330  13
       2ND:  .......  ....  ...  .................  ....  ....  ....  00
       3RD:  .......  ....  ...  .................  ....  ....  ....  00
       4TH:  .......  ....  ...  .................  ....  ....  ....  00

       S*=PATH STATUS
         00=NO PATH
         01=ESTABLISHED
         02=INIT FAILED
         03=TIME OUT
         04=NO RESOURCES AT PRI
         05=NO RESOURCES AT SEC
         06=SERIAL# MISMATCH
         07=SCU SSID MISMATCH
         08=ESCON LINK IS OFFLINE
         09=ESTABLISH FAILED BUT WILL RETRY AGAIN WHEN CONDITIONS CHANG
         0A=SYSTEM ADAPTER HAS A HOST PATH ALREADY ESTABLISHED
         0B=PATH CANNOT BE CONNECTED IN THE SAME CLUSTER
         10=CONFIGURATION ERROR
         11=CANNOT ESTABLISH PATH BETWEEN CKD AND FBA
```

```
         12=LSS AND LINKADDRESS MISCOMPARE
         13=ESTABLISHED FIBRE CHANNEL PATH
         14=FIBRE CHANNEL PATH LINK DOWN
         15=FIBRE CHANNEL PATH RETRY EXCEEDED
         16=FIBRE CHANNEL PATH SECONDARY ADAPTER NOT PPRC CAPABLE
         17=FIBRE CHANNEL PATH SECONDARY ADAPTER NOT AVAILABLE
         18=FIBRE CHANNEL PATH PRIMARY LOGIN EXCEEDED
         19=FIBRE CHANNEL PATH SECONDARY LOGIN EXCEEDED

ICK02206I PPRCOPY QUERY FUNCTION COMPLETED SUCCESSFULLY
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

The display for the remote secondary is:

```
  PPRC QUERY UNIT(D809) PATHS
ICK00700I DEVICE INFORMATION FOR D809 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 3990
          STORAGE CONTROL DESCRIPTOR = E9
          DEVICE DESCRIPTOR = 0A
          ADDITIONAL DEVICE INFORMATION = 4A001F3C
          TRKS/CYL = 15, # PRIMARY CYLS = 1113
ICK04030I DEVICE IS A PEER TO PEER REMOTE COPY VOLUME
ICK04032I DEVICE SPECIFIED IS A PPRC SECONDARY

                         QUERY REMOTE COPY - PATHS

       PRIMARY (OR SIMPLEX) CONTROL UNIT INFORMATION

             SERIAL                  WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME
             -------  ----  ---  ----------------
             02411    2400  00   5005076303FFC079


       SECONDARY CONTROL UNIT INFORMATION

             SERIAL                  WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME
             -------  ----  ---  ----------------
             01461    6800  00   5005076303FFC058


       PATHS:
             SERIAL                  WORLD WIDE
             NUMBER   SSID  LSS     NODE NAME      PATH  SAID  DEST  S*
             -------  ----  ---  ----------------  ----  ----  ----  --
       1ST:  01461    6806  06   .................    1   0200  0330  13
       2ND:  00016    1603  03   .................    1   0200  0100  13
       3RD:  .......  ....  ...  .................  ....  ....  ....  00
       4TH:  .......  ....  ...  .................  ....  ....  ....  00

       S*=PATH STATUS
         00=NO PATH
         01=ESTABLISHED
         02=INIT FAILED
         03=TIME OUT
         04=NO RESOURCES AT PRI
         05=NO RESOURCES AT SEC
         06=SERIAL# MISMATCH
         07=SCU SSID MISMATCH
         08=ESCON LINK IS OFFLINE
         09=ESTABLISH FAILED BUT WILL RETRY AGAIN WHEN CONDITIONS CHANG
         0A=SYSTEM ADAPTER HAS A HOST PATH ALREADY ESTABLISHED
         0B=PATH CANNOT BE CONNECTED IN THE SAME CLUSTER
         10=CONFIGURATION ERROR
         11=CANNOT ESTABLISH PATH BETWEEN CKD AND FBA
         12=LSS AND LINKADDRESS MISCOMPARE
         13=ESTABLISHED FIBRE CHANNEL PATH
         14=FIBRE CHANNEL PATH LINK DOWN
         15=FIBRE CHANNEL PATH RETRY EXCEEDED
         16=FIBRE CHANNEL PATH SECONDARY ADAPTER NOT PPRC CAPABLE
         17=FIBRE CHANNEL PATH SECONDARY ADAPTER NOT AVAILABLE
         18=FIBRE CHANNEL PATH PRIMARY LOGIN EXCEEDED
         19=FIBRE CHANNEL PATH SECONDARY LOGIN EXCEEDED

ICK02206I PPRCOPY QUERY FUNCTION COMPLETED SUCCESSFULLY
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

The logical subsystem number (LSS) will be printed for 2105, 2107, and 1750 devices, if available.

The display contains the following information for the application (PRIMARY) storage control:

- The last 5 digits of the application site storage control serial number for 3990, 2105, 2107, and 1750 or the last 7 digits of the application site storage control serial number for RVA.
- The 4-digit hexadecimal subsystem ID (SSID)

The display contains information for up to four recovery site (SECONDARY) storage controls. Under each storage control it lists:

- The last 5 digits of the serial number for 3990, 2105, 2107, and 1750
- The last 7 digits of the serial number for RVA
- The 4-digit hexadecimal subsystem ID (SSID)
- The count of the number of paths established for that subsystem
- Specific information for each path, with the SAID, followed by the link address (DEST), followed by the status of that path (S*)

Table 47 on page 279 explains the path status codes.

Table 47: Path status codes.

Path Status Code	Meaning
00 - NO PATH	The request to establish this path is in process, or no request has been made for this entry. (The SAID/DEST appears as "----" until the PPRCOPY ESTPATH command operation has completed.)
01 - ESTABLISHED	ESCON path is operational.
02 - INIT FAILED	An attempt to establish this path has failed. Verify the physical link, including ESCD ports, for the connection you are attempting. Verify the integrity of the fiber optic links between the requested source and the destination.
03 - TIME OUT	An attempt to establish this path has failed. Verify the physical link at the application storage control. Determine if non-PPRCOPY system activity has degraded link response times during the establish time. Retry the PPRCOPY ESTPATH command.
04 - NO RESOURCES AT PRI	An attempt to establish this path has failed. Verify that the application storage control does not already have the maximum number of logical paths already established. Verify the configuration and remove any unnecessary channel paths. When the problem is resolved, issue a PPRCOPY QUERY command with the PATHS option to verify that the path has been automatically established.
05 - NO RESOURCES AT SEC	An attempt to establish this path has failed. Verify that the recovery site storage control does not already have the maximum number of logical paths already established. Verify the configuration and remove any unnecessary channel paths. When the problem is resolved, issue a PPRCOPY QUERY command with the PATHS option to verify that the path has been automatically established.
06 - SERIAL # MISMATCH	The recovery site storage control specified by the SAID/DEST does not have the same serial number specified in the PPRCOPY ESTPATH command. Verify the SAID/DEST port and serial number parameters. A PPRCOPY QUERY command with the PATHS option from the host to a secondary volume can provide the serial number information.
07 - SCU SSID MISMATCH	Secondary Control Unit SSID mismatch.
08 - ESCON LINK IS OFFLINE	ESCON link is offline.

Table 47: Path status codes. (continued)

Path Status Code	Meaning
09 - ESTABLISH FAILED BUT WILL RETRY WHEN CONDITIONS CHANGE	The attempt to establish state will persist until a CU retry is successful or a PPRCOPY DELETE PATHS is executed.
0A - SYSTEM ADAPTER HAS A HOST PATH ALREADY ESTABLISHED	0A is returned if you try to establish a path on a link where a host connection exists.
0B - PATH CANNOT BE CONNECTED IN THE SAME CLUSTER	Path cannot be connected in the same cluster.
10 - CONFIGURATION ERROR	The SAID is invalid for the application site 3990 ESCON SA card, or a PPRCOPY path has already been established on this logical link. Verify the SAID is appropriate for the number of physical ESCON ports installed on the application storage control SA card. Issue a PPRCOPY QUERY command with the PATHS option to the indicated storage controls at both sites to determine if this is already a PPRCOPY logical path, possibly established in the other direction.
11 - CANNOT ESTABLISH BETWEEN CKD AND FBA	A PPRCOPY session cannot be established between CKD and FBA device.
12 - LSS AND LINK ADDRESS MISCOMPARE	The secondary LSS in the LSS parameter does not match the last byte of the LINK address. 'cc' in the LINK parameter of ESTPATH.
13 - ESTABLISHED FIBRE CHANNEL PATH	The fibre channel path is operational.
14 - FIBRE CHANNEL PATH LINK DOWN	The fibre channel path link is down.
15 - FIBRE CHANNEL PATH RETRY EXCEEDED	The fibre channel path retry is exceeded.
16 - FIBRE CHANNEL PATH SECONDARY ADAPTER NOT PPRCOPY CAPABLE	The fibre channel path secondary adapter not PPRCOPY capable. This problem could be due to one of the following: • – Secondary adapter not configured properly, does not have the correct microcode loaded Or – The secondary adapter is already a target of 32 different ESS boxes
17 - FIBRE CHANNEL PATH SECONDARY ADAPTER NOT AVAILABLE	The fibre channel path secondary adapter is not available.
18 - FIBRE CHANNEL PATH PRIMARY LOGIN EXCEEDED	The fibre channel path primary login is exceeded.
19 - FIBRE CHANNEL PATH SECONDARY LOGIN EXCEEDED	The fibre channel path secondary login is exceeded.

Using PPRCOPY QUERY with the multi-target support

If the feature codes indicate that multi-target PPRC is supported, and the function is enabled through the DEVSUP*xx* member of PARMLIB, the PPRCOPY QUERY command is performed with the appropriate scope, requesting that results be returned with, potentially, multiple relationships. The output is added to

the existing Query Remote Copy Volume table, representing a message block for each relationship, for example:

```
ICK00700I DEVICE INFORMATION FOR 3109 IS CURRENTLY AS FOLLOWS:
PHYSICAL DEVICE = 3390
STORAGE CONTROLLER = 2107
STORAGE CONTROL DESCRIPTOR = E8
DEVICE DESCRIPTOR = 0A
ADDITIONAL DEVICE INFORMATION = 4A00243D
TRKS/CYL = 15, # PRIMARY CYLS = 1113
ICK04030I DEVICE IS A PEER TO PEER REMOTE COPY VOLUME

                                          (PRIMARY)    (SECONDARY)
                                          SSID    CCA  SSID    CCA
DEVICE  LEVEL      STATE           PATH STATUS  SER #   LSS  SER #   LSS  AUTORESYNC PM
------  ---------  --------------  -----------  ------  ---  ------  ---  ---------- ---
3109    PRIMARY    DUPLEX          ACTIVE       1603    09   2400    09   DISABLE    NO
                                                00016   03   02411   00

                                          (PRIMARY)    (SECONDARY)
                                          SSID    CCA  SSID    CCA
DEVICE  LEVEL      STATE           PATH STATUS  SER #   LSS  SER #   LSS  AUTORESYNC PM
------  ---------  --------------  -----------  ------  ---  ------  ---  ---------- ---
3109    PRIMARY    DUPLEX          ACTIVE       1603    09   2408    00   DISABLE    YES
                                                00016   03   02412   01
```

The values for the PM column indicate whether the pair is to be used for a Preserve Mirror function in a multi-target PPRC configuration. A value of N/A means the device is in simplex state or the device does not support multi-target PPRC.

For the PPRCOPY QUERY PATHS command, up to 16 secondary control units can be defined to each primary control unit, and each can each have up to 8 FCP paths defined, for example:

```
PATHS:
      SERIAL                 WORLD WIDE
      NUMBER   SSID  LSS     NODE NAME       PATH  SAID  DEST  S*
      -------  ----  ---  ----------------  ----  ----  ----  --
1ST:  PH971    6808  08   5005076309FFC602    1   0040  0042  13
                                             2   0100  0040  13
                                             3   0100  0110  13
                                             4   0100  0120  13
                                             5   0100  0200  13
                                             6   0100  0210  13
                                             7   0100  0300  13
                                             8   0100  0310  13
2ND:  01461    6806  06   5005076303FFC058    1   0100  0200  13
3RD:  .......  ....  ...  ................  ....  ....  ....  00
4TH:  .......  ....  ...  ................  ....  ....  ....  00
5TH:  .......  ....  ...  ................  ....  ....  ....  00
6TH:  .......  ....  ...  ................  ....  ....  ....  00
7TH:  .......  ....  ...  ................  ....  ....  ....  00
8TH:  .......  ....  ...  ................  ....  ....  ....  00
9TH:  .......  ....  ...  ................  ....  ....  ....  00
10TH: .......  ....  ...  ................  ....  ....  ....  00
11TH: .......  ....  ...  ................  ....  ....  ....  00
12TH: .......  ....  ...  ................  ....  ....  ....  00
13TH: .......  ....  ...  ................  ....  ....  ....  00
14TH: .......  ....  ...  ................  ....  ....  ....  00
15TH: .......  ....  ...  ................  ....  ....  ....  00
16TH: .......  ....  ...  ................  ....  ....  ....  00
```

PPRCOPY QUERY ASYNCCOPY

PPRCOPY Query ASYNCCOPY returns a variety of data about the Asynchronous PPRCOPY configuration for the addressed ESS box.

A header indicating the results of the query will always be issued. It's format will be:

```
ASYNCHRONOUS PPRCOPY CONFIGURATION INFORMATION
```

This command can be issued to either a Master or Subordinate ESS, however, if it is issued to a Master ESS, then it must be issued to the same LSS that initially received the PPRCOPY STARTASYNCCOPY

command to set up the Asynchronous PPRCOPY configuration. If issued to a Master and this condition is not met or if there really are no Asynchronous PPRCOPY configurations defined to the ESS the following message will be issued:

```
THERE ARE NO ASYNCHRONOUS PPRCOPY CONFIGURATIONS DEFINED FOR THIS ESS
```

When there is an indication that no data is available for the ESS due to lack of data structures, the following message will be issued, return code 12 set and the command terminated:

```
UNABLE TO RETRIEVE INFORMATION, DATA STRUCTURES UNAVAILABLE
```

If there are no Masters defined to the addressed LSS then the following message will be issued:

```
THERE ARE NO MASTERS DEFINED TO THIS ESS
```

The data that will be displayed will have the following format when all sessions are returned:

```
ASYNCHRONOUS PPRC CONFIGURATION INFORMATION
 NUMBER OF MASTERS IN THIS ESS BOX : 3
 NUMBER OF OTHER MASTERS TO THIS SUBORDINATE: 0

+-------------------------------------+
|    |             MASTER             |
|SESS|--------------------------------+
| NO | CUSN   | LSS | POM | MACH TYPE |
|----+--------+-----+-----+-----------+
| 1  | 14940  |  07 |  75 | 2107      |
|----+--------+-----+-----+-----------+
| 2  | 14941  |  09 |  75 | 2105      |
|----+--------+-----+-----+-----------+
| 3  | 14942  |  09 |  75 | 2107      |
+----+--------+-----+-----+-----------+

 SESSION INFORMATION
 STORAGE SUBSYSTEM INTERNAL DATE & TIME = 2004.03.27.08:12:41

+-----------------------------------------------------------------------------------------------------------------------------+
|    |     |       |       |       |          | TOTAL #  |       |           | TOTAL #  |                           |
|    |     |       |       |       |          | GOOD CGS |       | # FAILED  | UNSUCCFL |                           |
|    |     |       | MAX   | MAX   |          | FORMED   |       | TRIES TO  | TRIES TO | THIS MASTER TO OTHER      |
|    |     | CG    | COORD | CG    | TIME     | SINCE    | %AGE  | FORM GC   | FORM CG  | SUBORDINATES DATA         |
|    |     | INTVL | INTVL | DRAIN | LAST     | LAST IML |  GOOD | SINCE     | SINCE    |---------------------------|
|SESS|     | TIME  | TIME  | TIME  | GOOD CG  | OR       |  CG   | LAST GOOD | LAST IML | MSTR   |SUBORD  | SUBORD |
| NO |STATE| (SEC) | (MSEC)| (SEC) | FORMED   | FAILOVER |  FRMD | CG FORMED |OR FAILOVR|SSID/LSS|SSID/LSS|CUSN/POM|
|----+-----+-------+-------+-------+----------+----------+-------+-----------+----------+--------+--------+--------|
| 1  |RUN  | 3071  | 55    | 22    | mm/dd/yy | 1        |  100  | 00        | 0        |1234/02 |2345/04 |23687/75|
|    |     |       |       |       | 14:38:35 |          |       |           |          |        |        |        |
+-----------------------------------------------------------------------------------------------------------------------------+
| 2  |RUN  | 3071  | 55    | 22    | mm/dd/yy | 1        |  100  | 00        | 0        |1235/02 |2346/04 |23688/76|
|    |     |       |       |       | 14:38:36 |          |       |           |          |        |        |        |
|    |     |       |       |       |          |          |       |           | 0        |1245/02 |2356/04 |23988/77|
|    |     |       |       |       |          |          |       |           |          |        |        |        |
+-----------------------------------------------------------------------------------------------------------------------------+
| 3  |RUN  | 3071  | 55    | 22    | mm/dd/yy | 1        |  100  | 00        | 0        |1236/02 |2347/04 |23689/78|
|    |     |       |       |       | 14:38:37 |          |       |           |          |        |        |        |
+-----------------------------------------------------------------------------------------------------------------------------+
LEGEND
  SESS NO
    UA : UNABLE TO RETRIEVE INFORMATION, DATA STRUCTURES UNAVAILABLE

  STATE
    RUN  : SESSION IS RUNNING
    PAUSE: SESSION IS PAUSED
    P PND: SESSION IS PAUSE PENDING
    PC   : SESSION IS PAUSED WITH CONSISTENCY
    PCPND: SESSION IS PAUSE PENDING WITH CONSISTENCY
    PUSF : SESSION IS PAUSED DUE TO UN-SUSPEND FAILURE
    UNOWN: SESSION IS NOT OWNED BY CLUSTER
    RECVR: SESSION IS RECOVERED BY MASTER
    FTL01: REVERT FLASHCOPY FAILED
    FTL02: ASYNCHRONOUS PPRC STRUCTURES INACCESSIBLE OR IN FAILED STATE
    FTL03: ASYNCHRONOUS PPRC CONSISTENCY CHECK OF SEQUENCE NUMBERS FAILED
    FTL04: ASYNCHRONOUS PPRC INVALID SESSION ID DETECTED
    FTL05: CONSISTENCY GROUP CORRUPTED
    FTL06: TIMEOUT DURING CONSISTENCY CHECK
    FTL07: COMMUNICATION FAILURE DURING CONSISTENCY CHECK
    FTL08: UNABLE TO COMPLETE CONSISTENCY CHECK
    FTL09: BUSY CONDITION PREVENTS CONSISTENCY CHECK
    FTL0A: REVERT FLASHCOPY FAILED DUE TO TIMEOUT
    FTL0B: SUBORDINATE TERMINATED BY PAUSE/TERMINATE COMMAND

TIME LAST GOOD GC FORMED, NUMBER FAILED TRIES TO FORM CG, %AGE TRIES FORMED GOOD CG
    HH:MM:SS: INDICATED TIME
```

```
    00      : CONSISTENCY GROUP NEVER FORMED (TIME LAST GOOD GC FORMED, ONLY)
    FL      : INFORMATION UNOBTAINABLE DUE TO FAILOVER OR IML OF ESS
```

```
 CONSISTENCY GROUP FAILURES REPORT
 +-------------------------------------------------------+
 |      |         |            |     |        | MASTER |
 | SESS |  WHICH  |            |     | ERROR  | STATE  |
 |  NO  | FAILURE |   CUSN     | LSS | REASON | CODE   |
 |------+---------+------------+-----+--------+--------|
 |   22 | FIRST   |   27774    | 00  | FCC    | 04     |
 |      |---------+------------+-----+--------+--------|
 |      | M RCNT  |   27774    | 00  | FCC    | 04     |
 +-------------------------------------------------------+
 |   23 | FIRST   |   27775    | 01  | FCC    | 03     |
 |      |---------+------------+-----+--------+--------|
 |      | M RCNT  |   27775    | 01  | FCC    | 03     |
 +-------------------------------------------------------+
 |   24 | FIRST   |   27776    | 02  | FCC    | 02     |
 |      |---------+------------+-----+--------+--------|
 |      | M RCNT  |   27776    | 02  | FCC    | 02     |
 +-------------------------------------------------------+
 LEGEND
   SESS NO
     UA   : UNABLE TO RETRIEVE INFORMATION, DATA STRUCTURES UNAVAILABLE

   WHICH FAILURE
     FIRST : FIRST CONSISTENCY GROUP FAILURE
     PREV  : PREVIOUS CONSISTENCY GROUP FAILURE
     M RCNT: MOST RECENT CONSISTENCY GROUP FAILURE

   LSS, ERROR REASON, OR MASTER STATE
CODE
     FO/IM : INFORMATION UNAVAILABLE DUE TO FAILOVER OR IML

   ERROR REASON
     01  : ASYNCHRONOUS PPRC STRUCTURES CANNOT BE ACCESSED
     02  : ASYNCHRONOUS PPRC COMMUNICATION PATH FAILURE
     03  : EXTENDED DISTANCE CONSISTENCY SESSION MEMBERS NOT IN CORRECT STATE
     04  : MAXIMUM CONSISTENCY GROUP DRAIN TIME EXCEEDED
     05  : MAXIMUM COLLISION SIDEFILE SIZE EXCEEDED
     400 : INVALID PARAMETER
     FYY : FORMAT 0X0F ERROR, WHERE YY IS THE REASON CODE
     7ZZZ: MICROCODE LOGIC ERROR - ZZZ DESCRIBES ERROR
     F005: TEMPORARILY UNAVAILABLE
     F01D: LONG BUSY

   MASTER STATE
     01: PAUSE/TERMINATE ASYNCHRONOUS PPRC IN PROGRESS
     02: START/RESUME ASYNCHRONOUS PPRC IN PROGRESS
     03: ASYNCHRONOUS PPRC IS BETWEEN CONSISTENCY GROUP FORMATIONS
     04: XDC START INCREMENT IN PROGRESS
     05: XDC RUN IN PROGRESS
     06: DRAIN IN PROGRESS
     07: DSO ESTABLISH FLASHCOPY WITH REVERTIBLE IN PROGRESS
     08: DSO WITHDRAW FLASHCOPY WITH COMMIT IN PROGRESS
     09: XDC INCREMENT COMPLETE IN PROGRESS
     0A: DSO WITHDRAW FLASHCOPY WITH REVERT IN PROGRESS
     0B: ASYNCHRONOUS PPRC IS PAUSED
     0C: ASYNCHRONOUS PPRC IS PERFORMING POST-CONSISTENCY GROUP TASKS
     0D: ASYNCHRONOUS PPRC IS FATAL
     0E: ASYNCHRONOUS PPRC IS COMPLETING ERROR RECOVERY


 OTHER MASTERS TO THIS SUBORDINATE ASSOCIATIONS
     +-------------------------+
     |      | MASTERS DATA     |
     |      | ---------------- |
     | SESS | MACH SERIAL      |
     | NO   | TYPE POM NUMBER  |
     |------+----------------- |
     |  16  | 2107 13 01461    |
     +-------------------------+
     |  17  | 2107 13 01462    |
     +-------------------------+
  LEGEND
    SESS NO
      UA   : UNABLE TO RETRIEVE INFORMATION, DATA STRUCTURES UNAVAILABLE. WAIT A FEW MINUTES AND RETRY.
```

Syntax

PPRCOPY QUERY ASYNCCOPY **PPRCOPY QUERY ASYNCC**
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*)|SESSIONNO(*session-number*)
Optional Parameter ALLOWONLINE

Required parameters

DDNAME|SYSNAME|UNITADDRESS|SESSIONNO: identify volume to which I/O is issued

Parameter/ Abbreviations	**Description**
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and a VM volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a non-terminating wait state. For *ccuu*, specify the address (3 or 4 hex digits) of the channel and unit of the volume. This value should not be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. The unit address is the device number.
SESSIONNO(*session-number*) **SESSNO**	Specifies the session number. If SESSIONNO is omitted, *session-number* will be zero, so that information for all sessions is returned.
Default:	None
Restrictions:	None

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	**Description**
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

Examples of PPRCOPY QUERY ASYNCCOPY

```
PPRCOPY QUERY ASYNCCOPY UNIT(5C06)
```

PPRCOPY QUERY OUTOFSYNCSTATE

PPRCOPY Query OUTOFSYNCSTATE returns information about the number of volumes in the specified session that are out of sync.

The data that will be displayed will have the following format:

- A header will always be displayed as follows:

```
ASYNCHRONOUS PPRCOPY OUT-OF-SYNC INFORMATION AT (LSS|ESS) LEVEL
```

  ESS is indicated if ESSLEVEL(YES) is specified.

- If no data was returned because the data structures were unavailable, issue the following message, set return code 12, and terminate the command.

```
UNABLE TO ACQUIRE INFORMATION, DATA STRUCTURES NOT ACCESSIBLE
```

- If we're unable to retrieve data because the Asynchronous PPRC configuration for the specified session has not been started, the following message will be issued, return code 12 will be set and the command terminated:

```
UNABLE TO ACQUIRE INFORMATION, ASYNCHRONOUS PPRC CONFIGURATION HAS NOT BEEN
STARTED FOR SPECIFIED SESSION
```

- If all volumes in the session are indicated to be in sync, issue the following message and return.

```
ALL VOLUMES FOR SESSION YYY ARE SYNCHRONIZED
```

- If there is an indication of the number of volumes in the session that are out of sync then, issue the following message and return.

```
xxx VOLUMES FOR SESSION yyy ARE OUT OF SYNC
```

- If there is an indication that consistency groups cannot be formed issue the following message and its associated legend, set return code 12, and terminate the command.

```
ASYNCHRONOUS PPRCOPY OUT-OF-SYNC INFORMATION AT LSS LEVEL
  SESSION 1   CANNOT FORM CONSISTENCY GROUPS, REASON = 2
    REASON CODE DEFINITIONS
      0 = UNKNOWN REASON
      1 = ONE OR MORE VOLUMES ARE SUSPENDED, SIMPLEX, FULL DUPLEX, TRANSITIONING TO
          SYNCHRONOUS PPRCOPY, OR THE LOCAL PAIR OF THE PPRCOPY CASCADING CONFIGURATION
          HAS TRANSITIONED TO DUPLEX PENDING
      2 = CHANGE RECORDING CANNOT BE ACTIVATED ON ONE OR MORE VOLUMES IN THE
          SESSION BECAUSE CHANGE RECORDING IS ALREADY ACTIVE FOR A FUNCTION OTHER
          THAN ASYNCHRONOUS PPRCOPY
      3 = ONE OR MORE VOLUMES IN THE SESSION ARE INACCESSIBLE, OFFLINE, IN A
          "STATUS CANNOT BE DETERMINED STATE", OR IN CE MODE
      4 = ONE OR MORE VOLUMES IN THE SESSION ARE NOT IN THE CORRECT STATE DUE TO A
          WRITE SAME OR FORMAT UNIT COMMAND IN PROGRESS
      5 = ONE OR MORE VOLUMES IN THE SESSION IS THE PRIMARY OF A PEER-TO-PEER
          REMOTE COPY PAIR THAT HAS BEEN ESTABLISHED WITH ESCON PATHS
      6 = THE GLOBAL MIRROR COLLISION SIDEFILE HAS EXCEEDED THE MAXIMUM
SIZE
```

Syntax

PPRCOPY QUERY OUTOFSYNCSTATE **PPRCOPY QUERY OOSSTATE** **PPRCOPY QUERY OOSS**
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) SESSIONNO(*session number*)

PPRCOPY QUERY OUTOFSYNCSTATE **PPRCOPY QUERY OOSSTATE** **PPRCOPY QUERY OOSS**
Optional Parameters ALLOWONLINE ESSLEVEL(**NO**|YES)

Required parameters

DDNAME|SYSNAME|UNITADDRESS: identify volume to which I/O is issued

Same as for Flashcpy Establish.

SESSIONNO: session number which is to be started or modified

Parameter/ Abbreviations	Description
SESSIONNO(*session number*) **SESSNO**	*session number* must identify an existing session in the addressed LSS.
Default:	None
Restrictions:	None

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

ESSLEVEL: indicate whether information is for LSS or entire ESS box

Parameter/ Abbreviations	Description
ESSLEVEL(NO|YES) **ESSLEV**	**NO** Specifies that the information returned is solely for the specified LSS rather than the entire ESS box. **YES** Specifies that the information returned is for the entire ESS box.
Default:	NO
Restrictions:	None

Examples of PPRCOPY QUERY OUTOFSYNCSTATE

```
PPRCOPY QUERY OUTOFSYNCSTATE UNIT(5C06) SESSIONNO(1)
```

PPRCOPY QUERY SESSIONSDEVICES

This order returns the status of the session open on the LSS of the device to which the I/O is issued as well as volume information in the form of LSS.CCA for all volumes composing the session, if applicable.

The resulting data is displayed in a table as shown in Figure 32 on page 287.

```
EXTENDED DISTANCE CONSISTENCY SESSIONS AND DEVICES TABLE
 +-------------------------------------------------------------------------------+
 | SESS | SESS |                                                                 |
 |  NO  | STAT | VOLUMES IN SESSION                                              |
 |------+------+-----------------------------------------------------------------|
 |  1   | NAV  |  00.06(JP,SX)   00.07(JP,SX)   00.08(JP,SX)   00.09(JP,SX)     |
 |      |      |  00.0A(JP,SX)                                                   |
 +-------------------------------------------------------------------------------+
 LEGEND
  SESSION STATUS
    CGIP = CONSISTENCY GROUP IN PROGRESS
    INAC = NO INFORMATION, DATA STRUCTURES INACCESSIBLE
    IP   = INCREMENT PENDING
    NAV  = NO ACTIVE VOLUMES IN SESSION
    N    = NORMAL
    NSES = NO SESSIONS DEFINED ON ESS
    UNKN = UNKNOWN

  VOLUMES IN SESSION
  FORMAT = AA.BB((XX,XX,...),YY,ZZ)
   WHERE AA = LSS, BB = CCA
         XX = VOLUME XDC STATUS (MULTIPLE STATES MAY BE INDICATED)
         YY = VOLUME STATE AS PRIMARY VOLUME
         ZZ = VOLUME STATE AS SECONDARY VOLUME WHEN IN CASCADED STATE

  VOLUME STATUS (1ST ENTRY IN PARENTHESES)
   IS   = IN EXTENDED DISTANCE CONSISTENCY GROUP SESSION
   CA   = CASCADING ALLOWED
   JP   = EXTENDED DISTANCE CONSISTENCY VOLUME IS JOIN PENDING
   RP   = EXTENDED DISTANCE CONSISTENCY VOLUME IS REMOVE PENDING
   1P   = PPRCOPY PAIR IS IN FIRST PASS OF INTIAL COPY
   --   = UNKNOWN

  VOLUME STATE (2ND ENTRY IN PARENTHESES)
   SX = PAIR IS SIMPLEX
   DP = PAIR IS DUPLEX PENDING
   FD = PAIR IS FULL DUPLEX
   SP = PAIR IS SUSPENDED
   --   = UNKNOWN OR NOT APPLICABLE
```

Figure 32: Example PPRCOPY QUERY SESSIONSDEVICES

If the feature codes indicate that multi-target is supported, and multi-target is enabled through use of the DEVSUP*xx* member of PARMLIB, the PPRCOPY QUERY SESSIONSDEVICES command requests the format for multi-target is to be returned. The resulting output is added to the existing EXTENDED DISTANCE CONSISTENCY SESSIONS AND DEVICES TABLE as follows:

```
EXTENDED DISTANCE CONSISTENCY SESSIONS AND DEVICES TABLE
+-------------------------------------------------------------------------------+
| SESS | SESS |                                |                               |
| NO   | STAT | VOLUMES IN SESSION             | GM Secondary                  |
+------+------+--------------------------------+-------------------------------|
| 1    | NAV  | 00.06(JP,SX)                   | serialno.lss.cca              |
+-------------------------------------------------------------------------------+
```

A legend follows the table to explain the values.

The header is always displayed.

If no sessions are defined on the addressed ESS box the 'SESS NO' entry is dashes.

Syntax

PPRCOPY QUERY SESSIONSDEVICES **PPRCOPY QUERY SESSDEV**
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*)
Optional Parameter ALLOWONLINE

Required parameters

DDNAME|SYSNAME|UNITADDRESS: identify volume to which I/O is issued

Same as for Flashcpy Establish.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

Examples of PPRCOPY QUERY SESSIONSDEVICES

```
PPRCOPY QUERY SESSIONSDEVICES UNIT(5C06)
```

PPRCOPY RECOVER–recovering data on the recovery system

Use the RECOVER command to allow the recovery system to regain control of a DASD volume. This command is issued from the recovery system. It signals the recovery site storage control to stop processing and force the secondary volume into simplex mode to reestablish recovery system control. During this process, you can verify the volser and relabel the volume if so desired.

Syntax

PPRCOPY RECOVER
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) PRIMARY(*ssid,ser#,cca*) SECONDARY(*ssid,ser#,cca*)
Optional Parameters ALLOWONLINE   LSS(*X'pp',X'ss'*) NOVERIFY|VERIFY(*serial*) VOLID(*serial*)

Required parameters

DDNAME|SYSNAME|UNITADDRESS parameter: identify the secondary volume

Parameter/ Abbreviations	Description
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and a VM volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address (3 or 4 hex digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. The unit address is the device number.
Default:	None.
Restrictions:	None.

PRIMARY and SECONDARY parameter: identify control unit

Parameter/ Abbreviations	Description
PRIMARY(*ssid*,*ser#*,*cca*) **PRIM** **PRI**	Specifies the application site storage control subsystem ID, serial number, and channel connection address. The storage control subsystem ID (*ssid*) is a 4-digit hexadecimal address. The *ser#* is the storage control serial number, and is the last five digits of the 12-digit machine serial number for 3990 or the last seven digits of the 12-digit machine serial number for RVA. The channel connection address (*cca*) is a 2-digit hex address. The storage control subsystem id, storage control serial number, and channel connection address may be obtained with the CONTROL CONFIGURE(DISPLAY) command for 3990 or PPRCOPY QUERY without the PATHS parameter for RVA. **Note:** The PRIMARY keyword is not required for 2105, 2107, and 1750 devices. If the keyword is specified for one of these devices it will be checked for correct syntax but will otherwise be ignored.
SECONDARY(*ssid*,*ser#*,*cca*) **SEC**	Specifies the recovery site storage control subsystem ID, serial number, and the secondary volume channel connection address (*cca*). The descriptions for the values are the same as for the PRIMARY parameter.
Default:	None.
Restrictions:	None.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

LSS parameter: identify logical subsystem number

Parameter/ Abbreviations	Description
LSS(*X'pp'*,*X'ss'*)	LSS is required to identify the logical subsystem number on 2105, 2107, and 1750 devices. The *X'pp'* value is the primary logical subsystem number. The *X'ss'* value is the secondary logical subsystem number. Obtain the logical subsystem number with the following command: `CONTROL CONFIGURE(DISPLAY)`
Default:	None.
Restrictions:	LSS is valid only for 2105, 2107, and 1750 devices.

VERIFY|NOVERIFY parameter: verify volser

Parameter/ Abbreviations	Description
VERIFY(*serial*) **VFY**	Required when you want to verify the volume serial number before relabeling it. If the volume serial number does not match that found on the volume, it will not be relabeled.
NOVERIFY **NOVFY** **NVFY**	Required when you want to bypass verification of the volume serial number.
Default:	None. You must specify either VERIFY or NOVERIFY.
Restrictions:	Valid only when you specify VOLID.

VOLID parameter: specify the volume serial number

Parameter/ Abbreviations	Description
VOLID(*serial*)	Writes the volume serial number in the volume label.
Default:	None.
Restrictions:	Valid only when you specify VERIFY or NOVERIFY. You cannot change the volume serial number of an online MVS volume. You must vary the volume offline to change the volume serial number.

Examples of PPRCOPY RECOVER

```
PPRCOPY RECOVER UNIT(0C04) VFY(OLDC04) VOLID(NEWC04) -
        PRIM(X'6060',62006,X'04') SEC(X'6061',68006,X'09')
```

Example for 2105, 2107, and 1750 using LSS parameter

The following example is valid for 2105, 2107, and 1750 and shows a RECOVER command using LSS parameter:

```
PPRCOPY RECOVER UNIT(4C00) LSS(X'07',X'02') -
        PRI(X'06C7',FCA29,X'01') SEC(X'06C2',FCA29,X'01') -
        VFY(OLDC00) VOLID(NEWC00)
```

PPRCOPY RUN–resume all operations for all PPRCOPY volumes on a single storage control

The RUN command is designed for automating database consistency. It indicates that the necessary work has been completed to ensure secondary PPRCOPY volume consistency across all controllers and devices that are related.

The RUN command is issued to control operations for multiple PPRCOPY volume pairs on a single storage control. This allows you to resume all operations for all PPRCOPY volumes on a single storage control. You must issue a separate RUN command to resume operations on each storage control.

RUN specifies that PPRCOPY resume all operations for all PPRCOPY volumes for the storage control. I/O to the primary volumes resumes, but the pairs remain suspended.

Syntax

Note: The RUN command is supported on 3390, RVA, 2105, 2107, and 1750.

PPRCOPY RUN
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) LSS(*X'pp',X'ss'*) PRIMARY(*ssid,ser#*) SECONDARY(*ssid,ser#*) Optional Parameters ALLOWONLINE

Required parameters

DDNAME|SYSNAME|UNITADDRESS parameter: identify the primary volume

Parameter/ Abbreviations	**Description**
DDNAME(*dname*) **DNAME**	The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume. **Note:** If the device you are issuing the RUN to is the device that you have issued the FREEZE to, and the device is online, use the UNIT parameter with the ALLOWONLINE parameter rather than DDNAME. If you use the DDNAME parameter, the opening of the volume will go through allocation, which will cause the device to experience a long-busy condition before the RUN can be executed.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and a VM volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address (3 or 4 hex digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. The unit address is the device number.
Default:	None.
Restrictions:	None.

LSS parameter: identify logical subsystem number

Parameter/ Abbreviations	Description
LSS(X'*pp*',X'*ss*')	LSS is required to identify the logical subsystem number on 2105, 2107, and 1750 devices. The X'*pp*' value is the primary logical subsystem number. The X'*ss*' value is the secondary logical subsystem number. Obtain the logical subsystem number with the following command: `CONTROL CONFIGURE(DISPLAY)`
Default:	None.
Restrictions:	LSS is valid only for 2105, 2107, and 1750 devices.

PRIMARY and SECONDARY parameter: identifies the control unit

Parameter/ Abbreviations	Description
PRIMARY(*ssid*,*ser#*) **PRIM** **PRI**	Specifies the application site storage control subsystem ID and serial number. The storage control subsystem ID (*ssid*) is a 4-digit hexadecimal address. The *ser#* is the storage control serial number, and is the last five digits of the 12-digit machine serial number for 3990, 2105, 2107, and 1750 or the last seven digits of the 12-digit machine serial number for RVA. The storage control subsystem id and storage control serial number may be obtained with the CONTROL CONFIGURE(DISPLAY) command for 3990, 2105, 2107, and 1750 or PPRCOPY QUERY without the PATHS parameter for RVA.
SECONDARY(*ssid*,*ser#*) **SEC**	Specifies the recovery site storage control subsystem ID and serial number. The descriptions for the values are the same as for the PRIMARY parameter. **Warning:** Protect your data by ensuring your secondary device is correct. No checking is done at the secondary subsystem to protect the data on the secondary volume.
Default:	None.
Restrictions:	None.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

Example of PPRCOPY RUN

The following is an example of a RUN command to resume PPRCOPY operations on the primary of a PPRCOPY pair on which the FREEZE command was previously run. The RUN command is followed by the ESTPATH and ESTPAIR commands required to reestablish the PPRCOPY pair.

```
PPRCOPY RUN UNIT(5401)         -
            PRI(X'2014',22010) -
            SEC(X'6404',24264) -
            LSS(04,04)

PPRCOPY ESTPATH UNIT(5401)                    -
                PRI(X'2014',22010)            -
                SEC(X'6404',24264)            -
                LINK(X'00210004',X'00A10004') -
```

```
                  LSS(X'04',X'04')

   PPRCOPY ESTPAIR UNIT(5401)                -
                   PRI(X'2014',22010,X'01')  -
                   SEC(X'6404',24264,X'01')  -
                   LSS(04,04)                -
                   MODE(RESYNC)              -
                   LOCAL
```

PPRCOPY SETCHARACTERISTICS

The PPRCOPY SETCHARACTERISTICS command allows management software to designate a Metro Mirror pair in a multi-target PPRC configuration that must remain full duplex when performing a Remote Pair FlashCopy (Preserve Mirror) operation.

Syntax

PPRCOPY SETCHARACTERISTICS **PPRCOPY SETC**
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) USEFORPM(YES|NO) LSS(X'*pp*',X'*ss*') PRIMARY(*ssid*,*ser#*,*cca*) SECONDARY(*ssid*,*ser#*,*cca*)
Optional Parameter ALLOWONLINE

Required parameters

DDNAME|SYSNAME|UNITADDRESS: identify the volume to which the I/O is issued

Parameter/ Abbreviations	**Description**
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and a VM volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a non-terminating wait state. For *ccuu*, specify the address (3 or 4 hex digits) of the channel and unit of the volume. This value should not be specified with the bounding hex indicators, i.e., the leading "X" and apostrophe and the trailing apostrophe. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. The unit address is the device number.
Default:	None
Restrictions:	None

USEFORPM: set remote pair Flashcopy characteristics

Parameter/ Abbreviations	Description
USEFORPM **USEPM**	Specifies whether the indicated pair is to be used for a Preserve Mirror function in a multi-target PPRC configuration. The values are: **NO** Specifies that this pair is not to be used for a Preserve Mirror function in a multi-target PPRC configuration. **YES** Specifies that this pair is to be used for a Preserve Mirror function in a multi-target PPRC configuration.
Default:	None
Restrictions:	None **Note:** If more than one pair in a multi-target configuration is set on, Flashcopy Establish requests with Preserve Mirror Required fail due to ambiguous settings.

LSS parameter: identify logical subsystem number

Parameter/ Abbreviations	Description
LSS(*X'pp'*,*X'ss'*)	LSS is required to identify the logical subsystem number. The *X'pp'* value is the primary logical subsystem number. The *X'ss'* value is the secondary logical subsystem number. Obtain the logical subsystem number with the following command: `CONTROL CONFIGURE(DISPLAY)`
Default:	None.
Restrictions:	None.

PRIMARY and SECONDARY parameter: identify control unit

Parameter/ Abbreviations	Description
PRIMARY(*ssid*,*ser#*,*cca*) **PRIM** **PRI**	Specifies the application site storage control subsystem ID, serial number, and channel connection address. The storage control subsystem ID (*ssid*) is a 4-digit hexadecimal address. The *ser#* is the storage control serial number, and is the last five digits of the 12-digit machine serial number. The channel connection address (*cca*) is a 2-digit hex address. Obtain the storage control subsystem id, storage control serial number, and channel connection address with the following command:`CONTROL CONFIGURE(DISPLAY)`
SECONDARY(*ssid*,*ser#*,*cca*) **SEC**	Specifies the recovery site storage control subsystem ID, serial number, and the secondary volume channel connection address (*cca*). The descriptions for the values are the same as for the PRIMARY parameter. **Warning:** Protect your data by ensuring your secondary device is correct. No checking is done at the secondary subsystem to protect the data on the secondary volume.
Default:	None.
Restrictions:	None. **Note:** The storage control subsystem ID (SSID) is not checked for the primary or secondary volume.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

Example of PPRCOPY SETCHARACTERISTICS

The following shows an example of the PPRCOPY SETCHARACTERISTICS command.

```
 PPRCOPY SETCHARACTERISTICS  -
 UNIT(9000)                  -
 USEFORPM(NO)                -
 LSS(X'00',X'00')            -
 PRIM(X'2400',CCH81,X'00')   -
 SEC(X'2400',CCH81,X'0D')
ICK00700I DEVICE INFORMATION FOR 9000 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 2107
          STORAGE CONTROL DESCRIPTOR = E8
          DEVICE DESCRIPTOR = 0E
          ADDITIONAL DEVICE INFORMATION = 4A00003C
          TRKS/CYL = 15, # PRIMARY CYLS = 3339
ICK04030I DEVICE IS A PEER TO PEER REMOTE COPY VOLUME
ICK03091I EXISTING VOLUME SERIAL READ = IN9000
ICK02233I PPRCOPY SETCHARACTERISTICS FUNCTION COMPLETED SUCCESSFULLY
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

PPRCOPY STARTASYNCCOPY

PPRCOPY STARTASYNCCOPY is used to initialize or modify the configuration of an Asynchronous PPRCOPY session and to start or resume the Asynchronous PPRCOPY formation of consistency groups.

This order **must** be issued to the ESS box that is to become (if START) or is already (if MODIFY) the Master of a set of other Subordinate ESS boxes. Once the initial Asynchronous PPRCOPY configuration is created, all subsequent PPRCOPY STARTASYNCCOPY commands must be issued to the same LSS or to an LSS in the same cluster as the original LSS as long as the configuration exists.

When START is specified the timing intervals can and the topology (identification of Masters and Subordinates) must be specified. When MODIFY is specified only the timing intervals can be specified and neither topology nor the Session number can be modified. Further, before a MODIFY is done, the session must be paused using the PPRCOPY TERMASYNCCOPY PAUSE command.

If it becomes necessary to change the topology of an Asynchronous PPRCOPY session, the user must terminate the session using the PPRCOPY TERMASYNCCOPY TERM command.

PPRCOPY links (paths) between the Master and Subordinate ESS boxes must have been established prior to issuance of this order. Such paths we refer to in this documentation as Asynchronous paths to distinguish them from the PPRCOPY paths that are established between PPRCOPY primary and PPRCOPY secondary volumes. Consideration should be given to separating Asynchronous paths from PPRCOPY paths in order to avoid performance impacts due to data transfer and control sharing the same PPRCOPY paths.

Asynchronous PPRCOPY can support up to 15 Subordinates, and only 1 Master can control any given Subordinate. The PPRCOPY STARTASYNCCOPY command must be issued to each individual Master to define its topology.

A maximum of 16 ESSs may be configured together in an Asynchronous PPRCOPY configuration. This means that 1 Master can direct up to 15 Subordinates. The PPRCOPY secondary volumes and their Flashcopy target volumes can and probably will reside in other distinct ESSs. ICKDSF imposes no constraint on this configuration other that what has been stated here.

If you use ICKDSF and the ESS Specialist, you should be aware of the following restriction. The ESS Specialist is able to view a total of 16 ESS boxes. There may also be restrictions with respect to symmetry, which would further restrict the possible configurations. As stated above these restrictions do not entirely apply to ICKDSF, however, if you intend to use the ESS Specialist, you should observe the restrictions imposed by the ESS Specialist. For more information on the ESS Specialist see *IBM TotalStorage Enterprise Storage Server Guide, SC26–7445*.

Formation of consistency groups involves the use of three customer specifiable timing values which can be indicated with this order:

1. **Extended Distance Consistency Maximum Coordination Interval**

   Also known as the 'host impact time', this is the amount of time allotted to allow the Master to communicate with its Subordinates in coordinating to begin forming a consistency group. During this time host write I/O to primary volumes in the session is delayed.

   This device default is 50 milliseconds, but can be set to a value from 1 millisecond to 65535 milliseconds, (approximately 65 seconds), inclusive.

2. **Maximum Consistency Group Drain Time**

   This is the amount of time relegated to allowing updated tracks to be transferred from member PPRCOPY primary volumes to their respective PPRCOPY secondaries. The default time is the larger of 4 minutes or twice the Consistency Group Interval Time. This value can be specified as a value from 1 to 65535 seconds (18 hours), inclusive. The default will be taken if the keyword MAXDRAINTIME is not specified or a value of 0 (zero) is specified with the keyword.

   When forming the first Consistency Group after issuing the STARTASYNCCOPY command, after IML or after an error recovery procedure such as warmstart, the Consistency Group Drain Time will not be enforced.

3. **Consistency Group Interval Time**

   This value is the amount of time between formation of consistency groups. The specification of this value is in seconds and can be a value from 0 to 65535, inclusive. A value of zero means that consistency groups will be formed continuously.

As a result of the multipleLPAR support on the 2107, each configured LPAR will take on a Storage Facility Image Sequence Number based upon the sequence number of the physical control unit, with a change to the last character of the number. It is this sequence number that will be required when a sequence number (also referred to as a serial number) is required to be specified for a command.

A situation, though rare, can occur in the field where two subsystems with different machine types have the same sequence number. In such a case it is not possible for the Master control unit attempting to process a STARTASYNCCOPY or TERMASYNCCOPY command to determine which of the two control units is the intended control unit. The request will fail with 0x0F message D4 sense. When this occurs you can indicate the intended control unit by specifying the machine type and plant of manufacture of each of the two control units. You specify this additional information with the CUSN variable associated with the TOPOLOGY keyword of the STARTASYNCCOPY or TERMASYNCCOPY command. See the TOPOLOGY keyword for more information.

Syntax

PPRCOPY STARTASYNCCOPY
PPRCOPY STASYNC

PPRCOPY STARTASYNCCOPY **PPRCOPY STASYNC**
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) SESSIONNO(*session number*) START | MODIFY
Optional Parameters ALLOWONLINE CGINTERVALTIME(*seconds*) MAXCOORDTIME(*milliseconds*) MAXDRAINTIME(*seconds*) TOPOLOGY(*msc1,msc2...msc16)*

Required parameters

DDNAME|SYSNAME|UNITADDRESS: identify volume to which I/O is issued

Same as for Flashcpy Establish.

SESSIONNO: session number which is to be started or modified

Parameter/ Abbreviations	**Description**
SESSIONNO(*session number*) **SESSNO**	*session number* must identify an existing session in the addressed LSS.
Default:	None
Restrictions:	None

START/MODIFY: indicate whether to start/resume or modify an Asynchronous PPRCOPY configuration

Parameter/ Abbreviations	**Description**
START	Indicates that Asynchronous PPRCOPY processing is to be started for the specified session. When this is specified the timing attributes can be specified, but the topology **must** be specified. Paths must have been established between Master and Subordinate ESS boxes before this order can be successfully issued. These paths are not the same paths as those between the PPRCOPY primaries composed of the Masters and Subordinates, and their PPRCOPY secondaries. Once the initial Asynchronous PPRCOPY configuration is created, all subsequent PPRCOPY STARTASYNCCOPY commands must be issued to the same LSS as long as the configuration exists.
MODIFY	Indicates that Asynchronous PPRCOPY configuration is to be modified for the specified existing session. When MODIFY is indicated, only the timing attributes can be specified. The topology of a session, i.e., specification of Masters and Subordinates cannot be changed in this way. If the topology requires modification the Asynchronous PPRCOPY must be using the TERMASYNCCOPY TERM command. Before an Asynchronous PPRCOPY session can be modified, the session must be paused using the PPRCOPY TERMASYNCCOPY PAUSE|CGPAUSE command.
Default:	None
Restrictions:	None **Note:** If the session was paused in a consistent manner using CGPAUSE, when the session is resumed it automatically unsuspends and resyncs the Global Copy pairs in the GM session suspended by the CGPAUSE.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

CGINTERVALTIME: indicate amount of time between consistency group formation

Parameter/ Abbreviations	Description
CGINTERVALTIME(*seconds*) **CGIT**	Consistency Group Interval Time. The amount of time in seconds between formation of consistency groups. Valid values from 0 to 65535 seconds (18 hours) inclusive. A value of zero indicates that consistency groups are to be formed continuously.
Default:	None
Restrictions:	None

MAXCOORDTIME: indicate amount of time host I/O to PPRCOPY primaries can be delayed

Parameter/ Abbreviations	Description
MAXCOORDTIME(*milliseconds*) **MXCT**	Extended Distance Consistency Maximum Coordination Interval. Valid values are from 1 to 65535 (approximately 65 seconds). Also known as 'host impact time' this is the amount of time allotted to allow the Master ESS to communicate with its Subordinates in coordinating to begin formation of consistency groups. During this time host I/O to Master and Subordinate volumes is delayed.
Default:	50 milliseconds
Restrictions:	None

MAXDRAINTIME: indicate amount of time to drain tracks to the PPRCOPY secondary device

Parameter/ Abbreviations	Description
MAXDRAINTIME(*seconds*) **MXDT**	Maximum Consistency Group Drain Time. Valid values are from 1 to 65535 seconds (18 hours) inclusive. This is the amount of time relegated to transferring updated track data from member PPRCOPY primary volumes to their respective PPRCOPY secondary volumes. If the MAXDRAINTIME keyword is defaulted, either by not being specified or by specifying a value of 0, the value used will be the larger of 4 minutes or twice the Consistency Group Interval Time value, i.e., the value specified with the CGINTERVALTIME keyword.
Default:	The larger of 4 minutes or twice the CGINTERVALTIME.
Restrictions:	None

TOPOLOGY: identify Master and Subordinate ESS boxes

Parameter/ Abbreviations	Description

TOPOLOGY(*msc1,msc2...msc16*)
TOPOL
	Identifies up to 16 ESS boxes as Masters or Subordinates and their respective relationships.
	
	mscX is a list of up to 16 triplets comprised of a Master SSID, a Subordinate SSID and the control unit serial number of the Subordinate ESS. Each triplet is enclosed in parentheses and triplets are separated by a single comma. The values within a triplet are separated by a single comma. For example:
	
	`TOPOLOGY((X'2018',X'9401',14940),(X'2018',X'9400',14940),...)`
	
	The Master and Subordinate SSIDs correspond to the SSIDs used for the Asynchronous path associations by which the Master and Subordinate communicate. They are NOT related to the LSSs which are participating in the Asynchronous PPRCOPY or Extended Distance Consistency session. In other words the SSID value indicated here will be the same SSID that was specified in the PPRCOPY ESTPATH command that was issued to establish paths between the Master and Subordinate ESSs.
	
	It is possible for an Asynchronous PPRCOPY configuration to contain ONLY a Master ESS at the local site (i.e., the Master ESS does not control any Subordinate ESS boxes). In such a case the topology keyword cannot be specified.
	
	Additional information can be specified with the subordinate CUSN fields. In particular the four character Machine type and two character Plant of Manufacture can be specified. The four character Machine Type comprises the first 4 characters of the CUSN field and the Plant of Manufacture the next two characters of the CUSN field, leaving the final 5 bytes for the control unit sequence number. For example:
	
	`TOPOLOGY((X '2018 ',X '9401 ',21077514940),(X '2018 ',X '320A ',17500112032))`
	
	Currently acceptable Machine Types are '1750', '2107', and '2105'.
	
	The rules for specifying this additional data are:
	
	1. The additional CUSN fields are optional. They are only required when the duplicate sequence number situation arises (as discussed below) and it is required to overcome the problem.
	2. If the additional data is specified for any Subordinate CU then it must be specified for all Subordinate control units. If this rule is violated then message ICK34132I will be issued and processing of this command will terminate.
	3. The five character sequence number can be specified alone.
	4. If either the plant of manufacture or machine type is specified then they must both be specified. If this rule is violated then message ICK34131I will be issued and processing of this command will terminate.
	5. For non-2105/2107/1750 devices, if the sequence number is greater than 10 characters then message ICK34134I will be issued and processing on the current command will terminate.

Parameter/ Abbreviations	Description

TOPOLOGY(*msc1,msc2...msc16*)
TOPOL
(continued)
	This additional information will be required when there two subsystems that share the same serial number. In such a case it isn't possible for the Master control unit attempting to process the STARTASYNCCOPY/TERMASYNCCOPY command to determine which of the two control units with the same serial number is the intended control unit, in which case the request will fail. When this occurs, specifying this additional information will exactly identify the intended control unit. The Machine type and Plant of Manufacture can be acertained by issuing the CONTROL CONFIGURE(DISPLAY) command to the affected control units. The output of this command has changed to display the Plant of Manufacture and Machine Type as well as the Storage Facility Image Sequence Number in addition to the already displayed Storage Facility Sequence Number when the two sequence numbers are different. The format of the message will be:
	`ICK00706I SUBSYSTEM INFORMATION FOR 5FAB IS CURRENTLY AS FOLLOWS:`
	`SUBSYSTEM SERIAL NUMBER = 14940`
	`SUBSYSTEM IMAGE SERIAL NUMBER = 14941`
	`SUBSYSTEM IMAGE MACHINE TYPE = 2107`
	`SUBSYSTEM IMAGE PLANT OF MANUFACTURE = 75`
	`SUBSYSTEM ID = 9407`
	`CHANNEL CONNECTION ADDRESS = 2B`
	`PATHS/CLUSTER ID = N/A`
	`LSS NUMBER = 07`
	`SYSTEM ADAPTER ID = 0088`
	`HOST LINK ADDRESS = 610A1305`
	`ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0`
	The Storage Facility Image Sequence Number comes about as a result of the multipleLPAR support on the 2107. Each configured LPAR will take on a sequence number based upon the sequence number of the physical control unit, with a change to the last character of the number. It is this sequence number that will be required when a sequence number (also referred to as a serial number in this document) is required to be specified for a command.

Default:	None
Restrictions:	None

Examples of PPRCOPY STARTASYNCCOPY

```
PPRCOPY STARTASYNCCOPY UNIT(5C06)                    -
                       START                         -
                       SESSNO(1)                     -
                       CGINTERVALTIME(3071)          -
                       MAXCOORDTIME(55)              -
                       MAXDRAINTIME(22)              -
                       TOPOLOGY((X'9400',X'9401',14940))
```

PPRCOPY SUSPEND–suspending pairs

Use the PPRCOPY SUSPEND command to suspend PPRCOPY operation between a primary and secondary volume pair. When the PPRCOPY SUSPEND command is directed to the primary or secondary device of a PPRCOPY volume pair, the pair is suspended, and data is no longer transferred to the secondary volume. The primary device records which cylinders are no longer synchronous. When the pair is reestablished with the PPRCOPY ESTPAIR command, you can use MODE(RESYNC) to synchronize the volume again.

When the PPRCOPY SUSPEND with the optional PRIMAINT parameter is specified, the pair is suspended, and all write data I/O directed to the primary device are unit checked, except for media maintenance channel programs, (when the maintenance panel has been set up to specify that writes are inhibited on any failure). When ICKDSF media maintenance operations have completed, the pair can be reestablished with the PPRCOPY ESTPAIR command specifying the MODE(RESYNC) parameter. The PRIMAINT option should only be used as a part of an ICKDSF media maintenance procedure. The PRIMAINT option is not valid on RVA, 2105, 2107, or 1750.

Syntax

PPRCOPY SUSPEND
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) PRIMARY(*ssid,ser#,cca*) SECONDARY(*ssid,ser#,cca*)
Optional Parameters ALLOWONLINE LSS(*X'pp',X'ss'*) PRIMAINT

Required parameters

DDNAME|SYSNAME|UNITADDRESS parameter: identify the volume

Parameter/ Abbreviations	Description
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. The volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and a VM volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address (3 or 4 hex digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated volume or fullpack minidisk. The unit address is the device number.
Default:	None.
Restrictions:	None.

PRIMARY and SECONDARY parameter: identify control unit

Parameter/ Abbreviations	Description
PRIMARY(*ssid*,*ser#*,*cca*) **PRIM** **PRI**	Specifies the application site storage control subsystem ID, serial number, and channel connection address. The storage control subsystem ID (*ssid*) is a 4-digit hexadecimal address. The *ser#* is the storage control serial number, and is the last five digits of the 12-digit machine serial number for 3990 or the last seven digits of the 12-digit machine serial number for RVA. The channel connection address (*cca*) is a 2-digit hex address. The storage control subsystem id, storage control serial number, and channel connection address may be obtained with the CONTROL CONFIGURE(DISPLAY) command for 3990 or PPRCOPY QUERY without the PATHS parameter for RVA.
SECONDARY(*ssid*,*ser#*,*cca*) **SEC**	Specifies the recovery site storage control subsystem ID, serial number, and the secondary volume channel connection address (*cca*). The descriptions for the values are the same as for the PRIMARY parameter.
Default:	None.
Restrictions:	None.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

LSS parameter: identify logical subsystem number

Parameter/ Abbreviations	Description
LSS(*X'pp'*,*X'ss'*)	LSS is required to identify the logical subsystem number on 2105, 2107, and 1750 devices. The *X'pp'* value is the primary logical subsystem number. The *X'ss'* value is the secondary logical subsystem number. Obtain the logical subsystem number with the following command: `CONTROL CONFIGURE(DISPLAY)`
Default:	None.
Restrictions:	LSS is valid only for 2105, 2107, and 1750 devices.

PRIMAINT parameter: reject write I/O

Parameter/ Abbreviations	Description
PRIMAINT **PRIMA** **PRM**	PRIMAINT directs PPRCOPY to reject all write data I/O to the primary volume except for ICKDSF media maintenance channel programs.
Default:	None.
Restrictions:	Use the PRIMAINT option only as part of an ICKDSF media maintenance procedure as it causes the 3990 storage control to unit check all application write I/O to the primary device. PRIMAINT is not valid for RVA, 2105, 2107, or 1750.

Examples of PPRCOPY SUSPEND

The following command suspends PPRCOPY operations between a volume pair. The PPRCOPY SUSPEND command must be issued to a valid primary or secondary PPRCOPY device.

```
PPRCOPY SUSPEND UNIT(0D42) PRIM(X'0057',90007,X'02') -
        SEC(X'053F',90014,X'0E')
```

A PPRCOPY ESTPAIR command specifying the RESYNC option must be issued to resume PPRCOPY operations for the volume pair.

Note: When you reestablish a suspended pair that was originally established with CRIT(YES) specified, you must again specify CRIT(YES) with the PPRCOPY ESTPAIR command if you want this option to remain in effect.

Example for 2105, 2107, and 1750 using LSS parameter

The following example is valid for 2105, 2107, and 1750 and shows a SUSPEND command using the LSS parameter:

```
PPRCOPY SUSPEND UNIT(4C00) LSS(X'07',X'02') -
        PRI(X'06C7',FCA29,X'01') SEC(X'06C2',FCA29,X'01')
```

PPRCOPY TERMASYNCCOPY

THE PPRCOPY TERMASYNCCOPY command pauses or terminates Asynchronous PPRCOPY for the specified session.

This order must be issued to the same LSS or to an LSS in the same cluster as the original LSS that received the PPRCOPY STARTASYNCCOPY that initiated or resume the Asynchronous PPRCOPY configuration, i.e., the original Master ESS.

A paused or terminated Asynchronous PPRCOPY configuration can be restarted or resumed via the PPRCOPY STARTASYNCCOPY order.

This order can be issued to a Master or Subordinate ESS. Normal processing dictates that the order be issued to the Master. Resulting processing by the Master will communicate the pause/terminate to the Subordinates and will pause/terminate the appropriate relationships.

However, because this order is asynchronous, it is possible for processing to not complete successfully before the command is terminated. In such a circumstance it may be necessary to issue the PPRCOPY Query ASYNCCOPY command to the Master or Subordinate to determine whether the relationships have been paused/terminated. If not, and the failure is due to an inability of the Master to communicate with the Subordinate then the terminate should be issued to the Subordinate to complete the processing.

In cases where the PPRCOPY TERMASYNCCOPY command issued to the Master does not complete successfully because the formation of consistency groups is underway, the user has two options:

1. Wait until the formation of the consistency group is complete and then reissue the PPRCOPY TERMASYNCCOPY command
2. Issue the PPRCOPY TERMASYNCCOPY command using the FORCE keyword to the Master. FORCE cannot be used with the Subordinate keyword. In this case the configuration will be terminated regardless of the state of the formation of the consistency groups. The user should then issue the FLASHCOPY QUERY RELATIONS command to all Flashcopy source volumes to determine the state of the Flashcopys and then issue the appropriate WITHDRAW REVERT or COMMIT per the indication of the INCREMENTSTATUS output

If the command is issued to a Subordinate the topology keyword is still required, however, only the first triplet will be processed and the third element of that triplet must be the control unit serial number of the associated Master ESS.

If an Asynchronous PPRCOPY configuration that involves only a Master with no Subordinates is being terminated then the TOPOLOGY keyword cannot be specified.

As a result of the multipleLPAR support on the 2107, each configured LPAR will take on a Storage Facility Image Sequence Number based upon the sequence number of the physical control unit, with a change to the last character of the number. It is this sequence number that will be required when a sequence number (also referred to as a serial number) is required to be specified for a command.

A situation, though rare, can occur in the field where two subsystems with different machine types have the same sequence number. In such a case it is not possible for the Master control unit attempting to process a STARTASYNCCOPY or TERMASYNCCOPY command to determine which of the two control units is the intended control unit. The request will fail with 0x0F message D4 sense. When this occurs you can indicate the intended control unit by specifying the machine type and plant of manufacture of each of the two control units. You specify this additional information with the CUSN variable associated with the TOPOLOGY keyword of the STARTASYNCCOPY or TERMASYNCCOPY command. See the TOPOLOGY keyword for more information.

Syntax

PPRCOPY TERMASYNCCOPY
PPRCOPY TMASYNC

PPRCOPY TERMASYNCCOPY **PPRCOPY TMASYNC**
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) PAUSE | TERMINATE | CGPAUSE SESSIONNO(*session number*) TOPOLOGY(*msc1,msc2...msc16)*
Optional Parameters ALLOWONLINE FORCE **MASTER** | SUBORDINATE

Required parameters

DDNAME|SYSNAME|UNITADDRESS: identify volume to which I/O is issued

Same as for Flashcpy Establish.

PAUSE/TERMINATE/CGPAUSE: indicate whether to pause or terminate an Asynchronous PPRCOPY configuration

Parameter/ Abbreviations	**Description**
PAUSE	Indicates that Asynchronous PPRCOPY processing for the specified session is to be paused.
TERMINATE **TERM**	Indicates that Asynchronous PPRCOPY processing for the specified session is to be terminated.
CGPAUSE	Indicates that Asynchronous PPRCOPY processing for the specified session is to be paused and the Global Copy pairs in the session are to be suspended so that the secondaries are consistent.
Default:	None
Restrictions:	None

SESSIONNO: session number which is to be paused or terminated

Parameter/ Abbreviations	**Description**
SESSIONNO(*session number*) **SESSNO**	*session number* must identify an existing session in the addressed LSS.
Default:	None
Restrictions:	None

TOPOLOGY: identify Master and Subordinate ESS boxes

Parameter/ Abbreviations	Description

TOPOLOGY(*msc1,msc2...msc16*)
TOPOL
	Identifies up to 16 ESS boxes that comprise the existing Masters and Subordinates and their respective relationships.
	
	mscX is a list of up to 16 triplets comprised of a Master SSID, a Subordinate SSID and the control unit serial number of the Subordinate ESS. Each triplet is enclosed in parentheses and triplets are separated by a single comma. The values within a triplet are separated by a single comma. For example:
	
	`TOPOLOGY((X'2018',X'9401',14940),(X'2018',X'9400',14940),...)`
	
	If, in a recovery scenario, the terminate request is issued to a Subordinate, then only the first triplet of the TOPOLOGY keyword specification is processed and the third element of that triplet must be the control unit serial number of the associated Master ESS. To determine the control unit serial number of the associated Master ESS, use the PPRC QUERY ASYNCCOPY command.
	
	The Master and Subordinate SSIDs correspond to the SSIDs used for the Asynchronous path associations by which the Master and Subordinate communicate. They are NOT related to the LSSs which are participating in the Asynchronous PPRCOPY or Extended Distance Consistency session. In other words the SSID value indicated here will be the same SSID that was specified in the PPRCOPY ESTPATH command that was issued to establish paths between the Master and Subordinate ESSs.
	
	It is possible for an Asynchronous PPRCOPY configuration to contain ONLY a Master ESS at the local site (i.e., the Master ESS does not control any Subordinate ESS boxes). In such a case the topology keyword cannot be specified.
	
	Additional information can be specified with the subordinate CUSN fields. In particular the four character Machine type and two character Plant of Manufacture can be specified. The four character Machine Type comprises the first 4 characters of the CUSN field and the Plant of Manufacture the next two characters of the CUSN field, leaving the final 5 bytes for the control unit sequence number. For example:
	
	`TOPOLOGY((X '2018 ',X '9401 ',21077514940),(X '2018 ',X '320A ',17500112032))`
	
	Currently acceptable Machine Types are '1750', '2107', and '2105'.
	
	The rules for specifying this additional data are:
	
	1. The additional CUSN fields are optional. They are only required when the duplicate sequence number situation arises (as discussed below) and it is required to overcome the problem.
	2. If the additional data is specified for any Subordinate CU then it must be specified for all Subordinate control units. If this rule is violated then message ICK34132I will be issued and processing of this command will terminate.
	3. The five character sequence number can be specified alone.
	4. If either the plant of manufacture or machine type is specified then they must both be specified. If this rule is violated then message ICK34131I will be issued and processing of this command will terminate.
	5. For non-2105/2107/1750 devices, if the sequence number is greater than 10 characters then message ICK34134I will be issued and processing on the current command will terminate.

Parameter/ Abbreviations	Description

TOPOLOGY(*msc1,msc2...msc16*)
TOPOL
(continued)
	This additional information will be required when there two subsystems that share the same serial number. In such a case it isn't possible for the Master control unit attempting to process the STARTASYNCCOPY/TERMASYNCCOPY command to determine which of the two control units with the same serial number is the intended control unit, in which case the request will fail. When this occurs, specifying this additional information will exactly identify the intended control unit. The Machine type and Plant of Manufacture can be acertained by issuing the CONTROL CONFIGURE(DISPLAY) command to the affected control units. The output of this command has changed to display the Plant of Manufacture and Machine Type as well as the Storage Facility Image Sequence Number in addition to the already displayed Storage Facility Sequence Number when the two sequence numbers are different. The format of the message will be:
	`ICK00706I SUBSYSTEM INFORMATION FOR 5FAB IS CURRENTLY AS FOLLOWS:`
	`SUBSYSTEM SERIAL NUMBER = 14940`
	`SUBSYSTEM IMAGE SERIAL NUMBER = 14941`
	`SUBSYSTEM IMAGE MACHINE TYPE = 2107`
	`SUBSYSTEM IMAGE PLANT OF MANUFACTURE = 75`
	`SUBSYSTEM ID = 9407`
	`CHANNEL CONNECTION ADDRESS = 2B`
	`PATHS/CLUSTER ID = N/A`
	`LSS NUMBER = 07`
	`SYSTEM ADAPTER ID = 0088`
	`HOST LINK ADDRESS = 610A1305`
	`ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0`
	The Storage Facility Image Sequence Number comes about as a result of the multipleLPAR support on the 2107. Each configured LPAR will take on a sequence number based upon the sequence number of the physical control unit, with a change to the last character of the number. It is this sequence number that will be required when a sequence number (also referred to as a serial number in this document) is required to be specified for a command.

Default:	None.
Restrictions:	None.

Optional parameters

ALLOWONLINE parameter: allow UNIT parameter to online volumes

Parameter/ Abbreviations	Description
ALLOWONLINE **ALLOWON** **AON**	The ALLOWONLINE parameter is used to allow the UNIT parameter to be specified for online volumes. If the volume is offline, the ALLOWONLINE parameter will be ignored.
Default:	None.
Restrictions:	Valid only when UNIT is specified. Not valid with DDNAME or SYSNAME.

FORCE: indicate that the termination is to proceed regardless of the state of the formation of consistency groups

Parameter/ Abbreviations	Description
FORCE	Indicates that the termination of the Asynchronous PPRCOPY configuration is to proceed regardless of the state of the formation of consistency groups. When this is used the user should then issue the FLASHCOPY QUERY INCREMENTSTATUS command to determine the state of the Flashcopys and then issue the appropriate WITHDRAW REVERT or COMMIT per the indication of the INCREMENTSTATUS output.
Default:	None
Restrictions:	FORCE is not valid when SUBORDINATE is specified.

MASTER/SUBORDINATE: indicate whether addressing a Master or Subordinate ESS

Parameter/ Abbreviations	Description
MASTER	Indicates that the request is to be processed by a Master ESS.
SUBORDINATE	Indicates that the request is to be processed by a Subordinate ESS.
Default:	MASTER
Restrictions:	SUBORDINATE is not valid when FORCE is specified.

Examples of PPRCOPY TERMASYNCCOPY

```
PPRCOPY TERMASYNCCOPY UNIT(5C06)                    -
                      TERM                          -
                      SESSNO(1)                     -
                      LEADER                        -
                      TOPOLOGY((X'9400',X'9401',14940))
```

Establishing and managing PPRCOPY volumes and paths

This section explains the major PPRCOPY system dependencies, and describes how to:

- Manage the PPRCOPY system
- Identify PPRCOPY volume states
- Set cache and non-volatile storage
- Obtain SSID, serial number, CCA, and LSS
- Obtain Physical Interface and ESCON Director Address
- Establish PPRCOPY paths
- Manage PPRCOPY volumes and paths
- Determining the Logical Subsystem Number (LSS) for 2105, 2107, and 1750
- Determining the Logical Control Unit (LCU) for RVA
- Determining the Channel Connection Address for RVA

Managing the PPRCOPY system

This section gives the PPRCOPY system management dependencies.

System IPL volumes

Because PPRCOPY secondary volumes are treated much like 3990 dual copy volumes, a limited set of I/O operations to these volumes is permitted. Therefore, during recovery, you can IPL a recovery system, one that is separate from all PPRCOPY volumes, in order to issue the PPRCOPY RECOVER command and remove all PPRCOPY volumes from secondary PPRCOPY volume status. As a result, SYSRES, PAGE, and SPOOL volumes, as well as all data sets required to initialize the recovery system (including those used to startup JES and TSO) should not be PPRCOPY secondary volumes.

Alternatively, you can have a second set of SYSRES, PAGE, and SPOOL volumes that are copied to as part of PPRCOPY and have a separate set of these volumes to use for recovery. When recovery is complete, the recovered set of SYSRES, PAGE, and SPOOL volumes can then be used to initialize the recovered system.

The PPRCOPY RECOVER command with the ICKDSF Stand-Alone version may also be used to remove the PPRCOPY volumes from secondary volume status.

ESCON Manager

PPRCOPY paths and operations are not known to the ESCON Manager. As a result, when making PPRCOPY changes to the ESCON Director, you must be aware of all of the existing physical path connections. This includes configuration changes made at the ESCON Director console or through the ESCON Manager's integrated systems management feature, because no protection (using ESCON Manager) is available.

Performance measurement data

Each application host system write I/O operation is directed through the PPRCOPY connection to the recovery site storage control, and then to the recovery system DASD. Activity on the PPRCOPY connection will not be reported in performance reports.

Performance reports list reasons for I/O operation delays, including storage control and ESCON Director port "busy" states. Even though PPRCOPY activity may be responsible for these busy conditions, PPRCOPY activity itself is not tracked by Performance measurement software explicitly. Application system I/O operations may be delayed due to PPRCOPY activity. You should consider this when you do your capacity planning as well as performance data interpretation.

Console device status commands

Existing MVS, VM, and VSE operator commands used to determine the status of IBM Storage Control 3990 dual copy pair, cache, NVS, and DASD Fast Write functions are not extended with PPRCOPY support. These facilities do not report PPRCOPY copy volume pairs or states. The PPRCOPY QUERY is the command that can display information about PPRCOPY volumes. In addition, the CONTROL CONFIG(DISPLAY) command can also display the volume SSID, CCA, serial number, the existing path SAID, and destination address for the specified volume. The CONTROL CONFIG(DISPLAY) command is not valid for RVA. The ANALYZE NODRIVE NOSCAN can also be used to display 3990, 2105, 2107, or 1750 Logical Path Status. If the WWNN keyword is used to identify an FCP capable device, a list of potential connectivity between SAIDs on the addressed device and SAIDs on the identified device is displayed. The ANALYZE NODRIVE NOSCAN is not valid for RVA.

Reset notification

Whenever the connectivity of a storage control or device changes, such as when they are moved from one system to another or they are varied offline or online, a reset notification is raised to all attached hosts. In some situations, such as when active volumes are switched to another system, the reset notification can invalidate the PPRCOPY synchronous copy operation. State changes are sent to all attached host systems through self description data.

Warning

Use caution when changing storage control, volume, or path connectivity for PPRCOPY-managed volumes. If access to secondary volumes is lost, the PPRCOPY volume pair goes into suspended duplex state.

Identifying Peer-to-Peer Remote Copy volume states

In order to manage Peer-to-Peer Remote Copy (PPRCOPY) operations, you need to know the state of PPRCOPY volumes. To determine the state of a volume, issue the PPRCOPY QUERY command to that volume.

At any given time a volume can be in one of the following states:

Simplex–The initial state of a volume.

Duplex–The state of a volume pair after copying is complete and the volume pair is in synchronization.

Duplex pending–The initial state of a defined volume pair. This state can also occur after a storage subsystem failure when the volume pair is reestablished. Data is copied to each volume in the pair.

Pending-XD–The volumes have been established in PPRCOPY extended distance mode.

Suspended duplex–The state of a volume pair when the 3990 Model 6 subsystems cannot keep the primary and secondary volumes synchronized, or when either the application host or recovery site host issues a PPRCOPY SUSPEND command. A PPRCOPY volume pair will go into suspended duplex state, for instance, when the application system 3990 Model 6 fails to complete a write operation to the recovery system 3990 Model 6. During this state, the primary volume's storage control records cylinders that have been updated so that, when a PPRCOPY ESTPAIR command with the RESYNC parameter is issued, only data in cylinders that have been changed is recopied to get both volumes back into a synchronized state.

Details for setting cache and non-volatile storage

This section gives the details for setting cache and NVS.

The cache and NVS requirements for the 3990 Model 6 at the application and recovery sites are shown in Table 48 on page 309.

Table 48: 3990 Model 6 NVS and cache requirements.

3990-6 Location	Subsystem Cache	NVS	Device Cache	DASD Fast Write
Application Site	Required	Required	Recommended	Recommended
Recovery Site	Required	Required	Required	Required

Use the following host processor SCP commands to set cache and NVS:

- On VM, the primary and secondary devices to be used should be varied on, and attached to your user ID, before beginning. Also, at times when status changes and VM is unaware of it (for example, re-IML, power cycle), you may need to detach the devices, vary them off, then vary them back on, and then attach to your user ID again.

  Note: The secondary does not need to be attached and on-line, but having it attached to the user prevents other users from being able to access and change the data on that device.
- In the following examples 0D48 is used for the CCUU of the primary, and 0D8C is the secondary CCUU.
- On VM, type CMS command:

```
q dasd details d48
0D48  CUTYPE = 3990-E9, DEVTYPE = 3390-06, VOLSER =
      CACHE DETAILS:  CACHE NVS CFW DFW PINNED CONCOPY
           -SUBSYSTEM   Y    Y   Y   -    N       N
              -DEVICE   Y    -   -   N    N       N
      DEVICE DETAILS: CCA = 08, DDC = 08
      DUPLEX DETAILS: SIMPLEX

q dasd details D8C
0D8C  CUTYPE = 3990-E9, DEVTYPE = 3390-0A, VOLSER =
      CACHE DETAILS:  CACHE NVS CFW DFW PINNED CONCOPY
           -SUBSYSTEM   Y    Y   Y   -    N       N
              -DEVICE   Y    -   -   N    N       N
      DEVICE DETAILS: CCA = 0C, DDC = 0C
      DUPLEX DETAILS: SIMPLEX
```

From the above VM responses, Device DFW on the secondary needs to be turned on:

```
#CP SET DASDFW ON D8C
0D8C DASD fast write function has been activated.
```

```
q dasd details D8C
0D8C  CUTYPE = 3990-E9, DEVTYPE = 3390-0A, VOLSER =
      CACHE DETAILS:  CACHE NVS CFW DFW PINNED CONCOPY
           -SUBSYSTEM   Y    Y   Y   -    N       N
              -DEVICE   Y    -   -  Y    N       N
      DEVICE DETAILS: CCA = 0C, DDC = 0C
      DUPLEX DETAILS: SIMPLEX
```

- The other relevant VM commands to use, in the event that cache and/or NVS are not active, would be:

```
#CP set cache subsystem on CUU    /* sets 'subsys' cache  on */
#CP set cache device on CUU       /* sets 'device' cache  on */
#CP set nvs     on CUU            /* sets 'subsys' NVS    on */
```

- On MVS, use the command DS p,cuu,1 (on TSO use /ds p,cuu,1)

```
 DS P,D48,1
 IEE459I 07.15.45 DEVSERV PATHS 799
 UNIT DTYPE  M CNT VOLSER  CHPID=PATH STATUS
      RTYPE   SSID CFW TC   DFW   PIN  DC-STATE CCA  DDC   ALT  CU-TYP
 0D48,33902 ,F,000,      ,20=+ 24=+
              0057  Y  YY.  NY.    N   SIMPLEX   08   08        3990-6
 F = OFFLINE                        + = PATH AVAILABLE

 DS P,D8C,1
 IEE459I 07.30.08 DEVSERV PATHS 823
 UNIT DTYPE  M CNT VOLSER  CHPID=PATH STATUS
      RTYPE   SSID CFW TC   DFW   PIN  DC-STATE CCA  DDC   ALT  CU-TYP
 0D8C,33903 ,F,000,      ,20=+ 25=+ 22=+ 27=+
              053F  Y  YY.  YY.    N   SIMPLEX   0C   0C        3990-6
                    |  ||   ||     |
                    |  ||   ||     +-- NO pinned data
                    |  ||   |+-- NVS is ACTIVE
                    |  ||   +--- DASDFW Vol. ELIGIBLE for DASD Fast Write
                    |  |+------- Track Caching ACTIVE for SUBSYS
                    |  +-------- Vol. ELIGIBLE for Track Caching
                   +----------- Cache Fast Write is ACTIVE
```

- On MVS, activate cache and/or NVS, from ISPF, select ISMF, then select number 2 ...

```
                          ISMF PRIMARY OPTION MENU
 ENTER SELECTION OR COMMAND ===> 2

 SELECT ONE OF THE FOLLOWING:

  0  ISMF PROFILE             - Change ISMF user profile
  1  DATA SET                 - Perform Functions Against Data Sets
  2  VOLUME                   - Perform Functions Against Volumes
```

  Then you see the following panel, select number 1 ...

```
                         VOLUME LIST SELECTION MENU
 ENTER SELECTION OR COMMAND ===>

 SELECT ONE OF THE FOLLOWING:

   1  DASD              - Generate a list of DASD volumes
```

  Continue by entering the appropriate values on the next panel, use 'help' if needed.

- On VSE, use the following AR commands to determine cache/NVS status:

```
(AR=Attention Routine commands)

               CACHE SUBSYS=D48,STATUS

                    SUBSYSTEM CACHING STATUS: ACTIVE
                           CACHE FAST WRITE: ACTIVE
                                 NVS STATUS: AVAILABLE

               CACHE UNIT=D48,STATUS

                       DEVICE CACHING STATUS: ACTIVE
                            DASD FAST WRITE: ACTIVE
                           DUAL COPY STATUS: SIMPLEX
```

- On VSE, activate cache and/or NVS with the following AR commands:

```
       CACHE UNIT=cuu,ON        Activates caching for the specified device.

       CACHE SUBSYS=cuu,ON      Activates caching for the entire specified
                                  subsystem.

       CACHE UNIT=cuu,FAST,ON   Enables DASD fast write access for the
```

```
                                  specified device.

      CACHE SUBSYS=cuu,NVS,ON  Makes non-volatile storage available
                                  for the subsystem.
```

Obtain SSID, serial number, CCA, and LSS

This section gives the details for obtaining SSID, Serial Number, CCA, and LSS for both primary and secondary sites.

Invoke ICKDSF and execute the following listed commands. Note and save the values indicated by **–»**; these values are required as parameters for issuing the ICKDSF PPRCOPY commands.

Note: If no Interface connection exists from the primary site CPU to the secondary control unit, the command must be issued at the secondary site for that secondary CU.

```
   ENTER INPUT COMMAND:

    CONTROL UNIT(DA06) CONFIG(DISPLAY)
   ICK00700I DEVICE INFORMATION FOR DA06 IS CURRENTLY AS FOLLOWS:
             PHYSICAL DEVICE = 3390
             STORAGE CONTROLLER = 2105
             STORAGE CONTROL DESCRIPTOR = E8
             DEVICE DESCRIPTOR = 0A
             ADDITIONAL DEVICE INFORMATION = 4A000035
   ICK04000I DEVICE IS IN SIMPLEX STATE
   ICK00091I DA06 NED=002105.000.IBM.13.000000025738
   ICK00706I SUBSYSTEM INFORMATION FOR DA06 IS CURRENTLY AS FOLLOWS:
–»           SUBSYSTEM SERIAL NUMBER = 25738
–»           SUBSYSTEM ID = 3805
–»           CHANNEL CONNECTION ADDRESS = 06
              PATHS/CLUSTER ID = N/A
–»           LSS NUMBER = 04
              SYSTEM ADAPTER ID = 08
              HOST LINK ADDRESS = 61141305
   ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0


   ENTER INPUT COMMAND:

    CONTROL UNIT(D8A6) CONFIG(DISPLAY)
   ICK00700I DEVICE INFORMATION FOR D8A6 IS CURRENTLY AS FOLLOWS:
             PHYSICAL DEVICE = 3390
             STORAGE CONTROLLER = 2105
             STORAGE CONTROL DESCRIPTOR = E8
             DEVICE DESCRIPTOR = 0A
             ADDITIONAL DEVICE INFORMATION = 4A000035
   ICK04000I DEVICE IS IN SIMPLEX STATE
   ICK00091I D8A6 NED=002105.000.IBM.13.000000028639
   ICK00706I SUBSYSTEM INFORMATION FOR DA06 IS CURRENTLY AS FOLLOWS:
–»           SUBSYSTEM SERIAL NUMBER = 28639
–»           SUBSYSTEM ID = 4306
–»           CHANNEL CONNECTION ADDRESS = 05
              PATHS/CLUSTER ID = N/A
–»           LSS NUMBER = 07
              SYSTEM ADAPTER ID = 06
              HOST LINK ADDRESS = 53241305
   ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

Obtain physical 3990 interface and ESCON Director address

This section gives the details for obtaining the physical 3990 cluster interface destination address (cluster port) and ESCON Director destination address (output port).

This information may be obtained from the system programmer and/or from the individual(s) that have the physical planning responsibility for the sites.

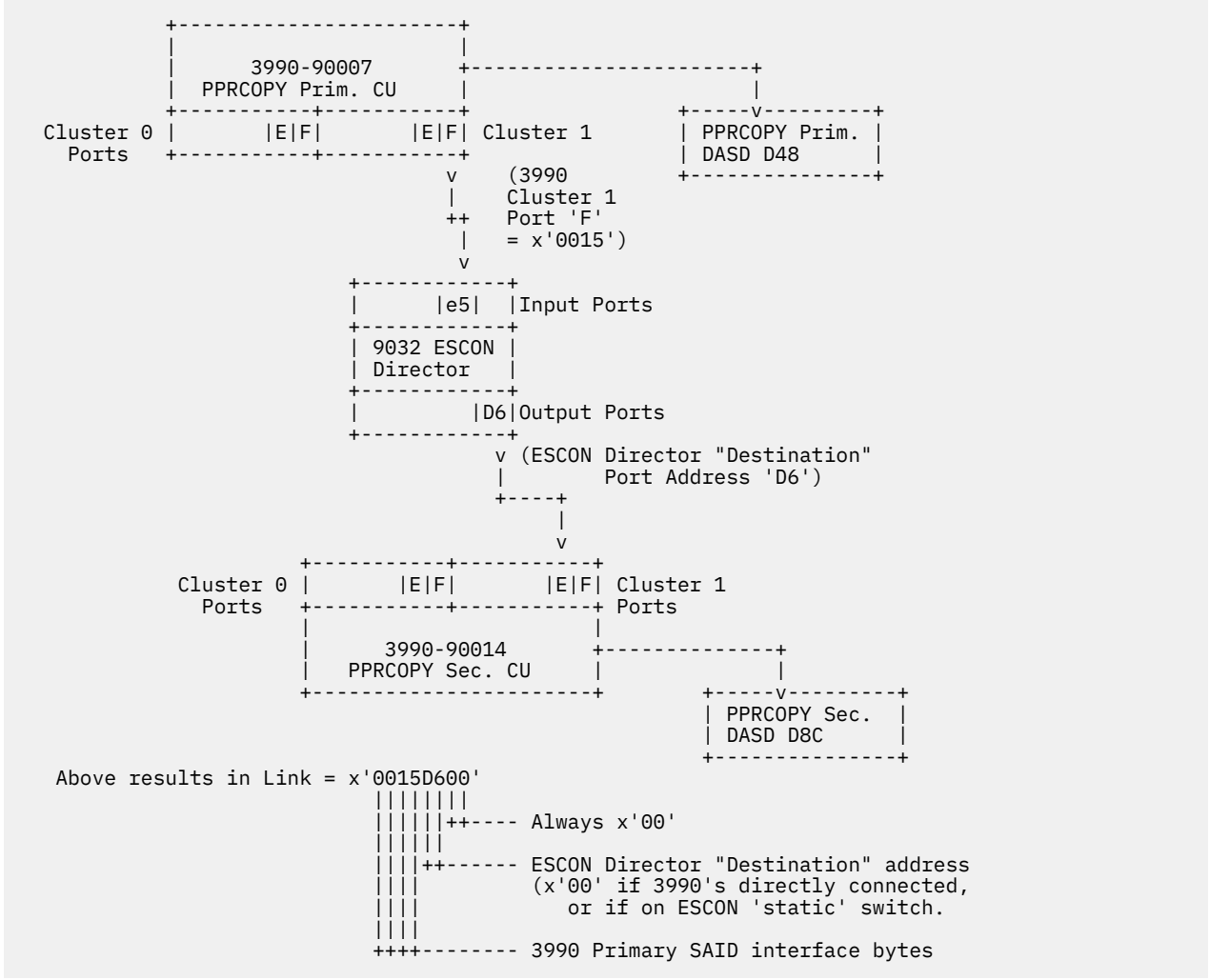
The destination address may be located at the secondary site, and the person(s) to be contacted may be at the remote location.

The following is an example of how to obtain the link parameters required by some of the ICKDSF PPRCOPY commands. This example shows:

- 3990 primary and secondary site control units connected by way of a 9032 ESCON Director.

- The cluster port address of the primary 3990 (you need this value) that is being connected to the secondary 3990 or ESCON Director.
- The output port address of the ESCON Director (you need this value)

  For two 3990-6 control units interconnected directly, the third byte value used is x'00'.



Establishing paths

Use the PPRCOPY ESTPATH command to establish paths between application site and recovery site. The storage control for a primary volume can have up to four paths established between it and the storage control for the pair's secondary volume for 3990-6 and RVA. The 2105, 2107, and 1750 can have up to eight paths.

Note:

It is possible to attempt to establish a path using invalid information such as an existing LSS but one which does not correspond to the specified Subsystem ID. In such cases, the request is command rejected by the addressed volume with sense indicating 0x0F and 0x53 in bytes 7 and 8 respectively, followed by ICKDSF message 'ICK34046I NO MATCH IN CU FOR SSID OR SER# OF PRIMARY OR SECONDARY'. If a PPRC QUERY PATHS is subsequently done, the resulting display shows the paths with status of '07' indicating 'SCU SSID MISMATCH'. This indicates that although the path was not established, it is remembered by the control unit and it takes up a path 'slot'.

It is necessary to delete the invalid paths using the DELPATH command and specifying the same relevant values used on the ESTPATH command.

If such invalid establishments are attempted enough times without intervening DELPATH requests, the path limit will be exceeded, subsequent ESTPATH requests can result in message 'ICK34044I ESTPATH FAILED - WOULD EXCEED UNITS/PATHS LIMITS', and sense indicating 0x0F and 0x51 in bytes 7 and 8 respectively.

The storage control for a specific primary (source) volume may, at any one time, be linked to a maximum of 16 storage controls for secondary (target) volumes. You must issue a separate PPRCOPY ESTPATH command to establish each inter-subsystem path. The primary volume's storage control retains information about the paths connecting it to the secondary volume's storage control. Following a path failure, the primary volume's storage control automatically attempts to restart the failed path, and resumes copy operations.

If all paths to the secondary volume fail, PPRCOPY suspends the pair. You must reestablish these paths with the PPRCOPY ESTPATH command after you have corrected the cause of the failed paths.

Prior to issuing the PPRCOPY ESTPATH command, it may be useful to issue a "CONTROL CONFIGURE(DISPLAY) UNIT(CCUU)" command in order to determine the subsystem ID and serial number, and the unit’s CCA.

Obtain the SAID values and DESTination address from the person who has physical cabling and connection information for the affected control units and the ESCON Director, if any, at the primary and secondary locations. You can use ANALYZE NODRIVE NOSCAN with the SECWWNN keyword to obtain information on the potential FCP connectivity between SAIDs on the addressed device and the device identified with the SECWWNN keyword.

Note: Do not use the HOST LINK ADDRESS from the CONTROL CONFIGURE(DISPLAY) for the SAID or DEST parameters, as the values from this command refer to the connection between processor and subsystem, not the connection between the subsystems. For 2105, 2107, and 1750 you can use the Interface Information from ANALYZE NODRIVE NOSCAN to help determine the DEST parameters when the device is connected through a switch. The port link information in this table refers to the connection between the control unit and the switch.

Multiple path example

The following command adds four ESCON paths between the application site storage control (SSID 6060, serial number ending with 62006) and the recovery site storage control (SSID 6061, serial number ending with 68006). The PPRCOPY ESTPATH command is issued to any device on the application site storage control.

```
PPRCOPY ESTPATH UNIT(0142) PRIM(X'6060',62006) SEC(X'6061',68006) -
        LINK(X'0000B000',X'0001B000',X'0016B000',X'0017B000')
```

The example assumes that all of the physical and logical paths already exist.

Managing volumes and paths

This section describes how to add, delete, and suspend volume pairs, query a Peer-to-Peer Remote Copy volume, and delete a PPRCOPY path.

Establishing a PPRCOPY volume pair

Use the PPRCOPY ESTPAIR command to specify the PPRCOPY primary and secondary volumes. The PPRCOPY ESTPAIR command is issued to the primary (source) device address.

Prior to issuing the PPRCOPY ESTPAIR command, it may be useful to issue a PPRCOPY QUERY command to each of the simplex devices that will become the PPRCOPY duplex pair. The returned information includes the device's storage control SSID and serial number, and the device's CCA. This information is required as part of the PPRCOPY ESTPAIR command.

The following command establishes a PPRCOPY volume pair.

```
PPRCOPY ESTPAIR UNIT(0D42) PRIM(X'0057',90007,X'02') -
        SEC(X'053F',90014,X'0E') MODE(COPY) PACE(15) CRIT(N)
```

Querying PPRCOPY volumes and paths

Issue the PPRCOPY QUERY command to query the status of one volume of a PPRCOPY volume pair, the status of all PPRCOPY paths established for a volume's storage control, or to collect information about a volume in the simplex state.

The following command queries volume 0D42:

```
PPRCOPY QUERY UNIT(0D42)
```

PPRCOPY QUERY without the PATHS parameter

When the PPRCOPY QUERY command is issued without the PATHS parameter, the following information is displayed to the ICKDSF user.

```
                    QUERY REMOTE COPY - VOLUME

                                              (PRIMARY)   (SECONDARY)
                                              SSID  CCA    SSID  CCA
DEVICE    LEVEL       STATE     PATH STATUS   SERIAL#      SERIAL#
------  ---------   ----------  -----------  ---------    ---------
 0D42    PRIMARY     PENDING       ACTIVE    0057  02     0000  00
                                               90007        …..

PATHS     SAID/DEST    STATUS    DESCRIPTION
-----     ---------    ------    ----------------
  1       0015 D600      01      PATH ESTABLISHED
          ---- ----      00      NO PATH
          ---- ----      00      NO PATH
          ---- ----      00      NO PATH

IF STATE=PENDING or SUSPEND:  FIRST CYL OUT OF SYNC = 00509
                               LAST CYL OUT OF SYNC = 02225
```

Note: On 2105, 2107, and 1750 devices, IF PENDING/SUSPEND: COUNT OF TRACKS REMAINING TO BE COPIED = , will be printed instead of First and Last Cyl out of sync. This is presented only on the primary volume. The STATE will also indicate XD if the volume is in PPRCOPY extended distance mode.

When the PPRCOPY QUERY command is issued without the PATHS parameter and to a simplex volume, the following information is displayed to the ICKDSF user.

```
                    QUERY REMOTE COPY - VOLUME

                                              (PRIMARY)   (SECONDARY)
                                              SSID  CCA    SSID  CCA
DEVICE    LEVEL       STATE     PATH STATUS   SERIAL#      SERIAL#
------  ---------   ----------  -----------  ---------    ---------
 0D42      N/A       SIMPLEX        N/A      0057  02     0000  00
                                               90007        …..
```

When the PPRCOPY QUERY command is issued without the PATHS parameter and to a secondary volume, the following information is displayed to the ICKDSF user.

```
                    QUERY REMOTE COPY - VOLUME

                                              (PRIMARY)   (SECONDARY)
                                              SSID  CCA    SSID  CCA
DEVICE    LEVEL       STATE     PATH STATUS   SERIAL#      SERIAL#
------  ---------   ----------  -----------  ---------    ---------
 0D42   SECONDARY    DUPLEX         N/A      0057  02     0000  00
                                               90007        …..
```

PPRCOPY QUERY with the PATHS parameter

When the PPRCOPY QUERY is issued, the output also reflects the FCP path information along with the world wide node name (WWNN).

```
 PPRCOPY QUERY UNIT(DA01) PATHS
ICK00700I DEVICE INFORMATION FOR DA01 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 3990
```

```
          STORAGE CONTROL DESCRIPTOR = E9
          DEVICE DESCRIPTOR = 0A
          ADDITIONAL DEVICE INFORMATION = 4A001B35
ICK04030I DEVICE IS A PEER TO PEER REMOTE COPY VOLUME
ICK02213I VOLUME IS ELIGIBLE FOR PPRCOPY CASCADING
ICK02214I INFORMATION FOR THIS VOLUME AS A PRIMARY FOLLOWS
```

The information shown below is for example purposes only; the actual values would reflect the real devices used. The example shows only two secondary control units. The third through sixteenth secondary would follow in a similar fashion. Only two paths are shown in this example, however all eight paths might be shown if they are available.

```
                   QUERY REMOTE COPY - PATHS

PRIMARY CONTROL UNIT INFORMATION
      SERIAL         LSS  WORLD WIDE
      NUMBER   SSID  NUM  NODE NAME
      -------  ----  ---  ----------------
      25738    3805  04   5005076300C0A222

SECONDARY CONTROL UNIT INFORMATION
      SERIAL          WORLD WIDE
      NUMBER   SSID  NODE NAME         PATH  SAID  DEST  S*
      -------  ----  ----------------  ----  ----  ----  --
1ST:  12032    320A  5005076300234567  1     0001  0009  01
                                       2     0081  0009  01
2ND:  25738    3806  5005076300C0A222  1     008C  002C  13
3RD:  .......  ....  ................  .     ....  ....  00
4TH:  .......  ....  ................  .     ....  ....  00
5TH:  .......  ....  ................  .     ....  ....  00
6TH:  .......  ....  ................  .     ....  ....  00
7TH:  .......  ....  ................  .     ....  ....  00
8TH:  .......  ....  ................  .     ....  ....  00
9TH:  .......  ....  ................  .     ....  ....  00
10TH: .......  ....  ................  .     ....  ....  00
11TH: .......  ....  ................  .     ....  ....  00
12TH: .......  ....  ................  .     ....  ....  00
13TH: .......  ....  ................  .     ....  ....  00
14TH: .......  ....  ................  .     ....  ....  00
15TH: .......  ....  ................  .     ....  ....  00
16TH: .......  ....  ................  .     ....  ....  00

S*=PATH STATUS
  00=NO PATH
  01=ESTABLISHED
  02=INIT FAILED
  03=TIME OUT
  04=NO RESOURCES AT PRI
  05=NO RESOURCES AT SEC
  06=SERIAL# MISMATCH
  07=SCU SSID MISMATCH
  08=ESCON LINK IS OFFLINE
  09=ESTABLISH FAILED BUT WILL RETRY AGAIN WHEN CONDITIONS CHANGE
  0A=SYSTEM ADAPTER HAS A HOST PATH ALREADY ESTABLISHED
  0B=PATH CANNOT BE CONNECTED IN THE SAME CLUSTER
  10=CONFIGURATION ERROR
  11=CANNOT ESTABLISH PATH BETWEEN CKD AND FBA
  12=LSS AND LINKADDRESS MISCOMPARE
  13=ESTABLISHED FIBRE CHANNEL PATH
  14=FIBRE CHANNEL PATH LINK DOWN
  15=FIBRE CHANNEL PATH RETRY EXCEEDED
  16=FIBRE CHANNEL PATH SECONDARY ADAPTER NOT PPRCOPY CAPABLE
  17=FIBRE CHANNEL PATH SECONDARY ADAPTER NOT AVAILABLE
  18=FIBRE CHANNEL PATH PRIMARY LOGIN EXCEEDED
  19=FIBRE CHANNEL PATH SECONDARY LOGIN EXCEEDED
```

Note: The logical subsystem number (LSS) will be printed for 2105, 2107, and 1750 devices, if available.

Suspending PPRCOPY volume pair operations

Issue the PPRCOPY SUSPEND command to suspend PPRCOPY operations between the primary and secondary of a volume pair. When you specify the SUSPEND parameter, this allows the primary applications to resume their read and write I/O to these volumes, and also directs the primary application storage subsystem to keep a record of cylinders that change on the primary volumes.

Access is permitted to the primary volumes and all changed tracks are logged on the primary storage control. For this example, you could next issue a PPRCOPY DELPAIR command or a PPRCOPY ESTPAIR command to continue in either simplex or duplex state.

The following command suspends PPRCOPY operations between a volume pair. The PPRCOPY SUSPEND command must be issued to a valid primary or secondary PPRCOPY device.

```
PPRCOPY SUSPEND UNIT(0D42) PRIM(X'0057',90007,X'02') -
        SEC(X'053F',90014,X'0E')
```

A PPRCOPY ESTPAIR command specifying the RESYNC option must be issued to resume PPRCOPY operations for the volume pair.

Note: When you reestablish a suspended pair that was originally established with CRIT(YES) specified, you must again specify CRIT(YES) with the PPRCOPY ESTPAIR command if you want this option to remain in effect.

Deleting a PPRCOPY volume pair

Issue the PPRCOPY DELPAIR command to delete PPRCOPY primary and secondary volumes. Direct the command to the primary device.

The following command deletes a PPRCOPY volume pair:

```
PPRCOPY DELPAIR UNIT(D42) PRIM(X'0057',90007,X'02') -
        SEC(X'053F',90014,X'0E')
```

Deleting a PPRCOPY path

Use the PPRCOPY DELPATH command to delete all established ESCON/FCP paths between application site storage controls and recovery site storage controls. The PPRCOPY DELPATH command must be issued only to a valid PPRCOPY primary device. In a cascaded triad, the remote pair can be broken leaving the intermediate volume a secondary in the local pair. In such a case the DELPATH command can be successfully issued to this intermediate volume.

Only active paths to the recovery site storage control are affected, all other paths to other storage controls are unaffected.

The following command deletes all established ESCON paths between application site storage control 0057 and recovery site storage control 053F.

```
PPRCOPY DELPATH UNIT(D42) PRIM(X'0057',90007) SEC(x'053F',90014)
```

Determining the logical subsystem number (LSS) for 2105, 2107, and 1750

Run the ICKDSF CONTROL CONFIGURE(DISPLAY) command to display the LSS number. The LSS number is also displayed when ANALYZE NODRIVE NOSCAN is run.

Determining the logical control unit (LCU) number for RVA

The LCU can be calculated from the output of the MVS DEVSERV PATHS command by substituting the DDC value for the last two digits of the device number in Table 6. For example, for a DDC address in the 00 - 3F range, use LCU0; in the 80 - BF range, use LCU2. Another way to determine the LCU number is to refer to the CUADD, which is specified in the IOCP/HCD configuration for each logical control unit. Each of the four CUADD's contain 64 devices. If the device numbers on the RVA subsystem have been generated as a contiguous group of 256 addresses, the LCU can be calculated from the last two digits of the device number. For example, for device numbers AA40-AA7F the corresponding LCU is LCU1. Table 6 shows which device numbers equate to which LCU's.

Determining the channel connection address (CCA) for RVA

The channel connection address (cca) on an RVA is relative to the LCU and is always between 00 and 3F. If the device numbers have been generated as a contiguous group of 256 addresses, the CCA can be calculated from the last two digits of the device number as shown in Table 6. For example, for device

numbers AAC0 - AAFF subtract X'C0' from the last two digits of the device number and the corresponding CCA'a are 00 - 3F.

Table 49: Determining LCU and CCA values for RVA.

Device Number	LCU =	CCA =
00 - 3F	LCU00	00 - 3F
40 - 7F	LCU01	00 - 3F subtract X'40' from device number
80 - BF	LCU02	00 - 3F subtract X'80' from device number
C0 - FF	LCU03	00 - 3F subtract X'C0' from device number

When you are running PPRCOPY on an RVA that supports 1024 addresses, you can determine the CCA by running the PPRCOPY QUERY (without the PATHS parameter) on the volume you will be using for the primary and also on the volume that you are using for the secondary. When run on each volume in simplex state, look in the Primary column for the information for the volume. You can then use the CCA value listed in this column for the PPRCOPY commands.

Determining the System Adapter ID (SAID) value for RVA

The System Adapter ID (SAID) is determined by the cluster and the ESCON channel adapter numbers, as shown in Table 50 on page 317

Table 50: Determining SAID values for RVA.

Cluster/Channel Interface	SAID Values for RVA
0/Interface A	0000
0/Interface B	0001
0/Interface C	0020
0/Interface D	0021
0/Interface E	0040
0/Interface F	0041
0/Interface G	0060
0/Interface H	0061
1/Interface A	0010
1/Interface B	0011
1/Interface C	0030
1/Interface D	0031
1/Interface E	0050
1/Interface F	0051
1/Interface G	0070
1/Interface H	0071

Examples for using FAILOVER and FAILBACK

The following examples show how the parameters for FAILOVER and FAILBACK are used. For these examples, SITE-A is the original primary site, and SITE-B is the original secondary site, with the following devices at each site:

SITE-A	SITE-B
DEVICE ADDR= 4C80	DEVICE ADDR= 4E80
LSS= 01	LSS= 05
SSID= 2901	SSID= 8605
SERIAL= FCA29	SERIAL= FCA86
CCA= 00	CCA= 00

INITIAL ESTABLISH: The PPRCOPY paths are established between SITE-A −> SITE-B using the ESTPATH command.

The PPRCOPY pair is established originally with the following parameters, making device 4C80 at SITE-A the primary:

```
PPRCOPY ESTPAIR UNIT(4C80) LSS(X'01',X'05') -
PRI(X'2901',FCA29,X'00') SEC(X'8605',FCA86,X'00') -
MODE(COPY)
```

SITE-A BECOMES UNAVAILABLE: When access to SITE-A becomes unavailable, the ESTPAIR command with the FAILOVER parameter is issued to the device 4E80 at SITE-B (at this time the current secondary), using the following command. After this command is issued, the 4E80 device at SITE-B becomes the new primary and becomes suspended.

```
PPRCOPY ESTPAIR UNIT(4E80) LSS(X'05',X'01') -
PRI(X'8605',FCA86,X'00') SEC(X'2901',FCA29,X'00') -
FAILOVER
```

SITE-A BECOMES AVAILABLE AGAIN: When access to SITE-A is available again, PPRCOPY paths are established between SITE-B −> SITE-A using the PPRCOPY ESTPATH command (ESTPATH issued to the volume at SITE-B).

Then the ESTPAIR command with the FAILBACK parameter is issued to the 4E80 device at SITE-B (this is now the current suspended primary), using the following command. After this command is issued, the 4E80 device at SITE-B becomes the primary in active duplex.

```
PPRCOPY ESTPAIR UNIT(4E80) LSS(X'05',X'01') -
PRI(X'8605',FCA86,X'00') SEC(X'2901',FCA29,X'00') -
FAILBACK
```

TO REMOVE PATHS WHEN PAIRS ARE ESTABLISHED: The PPRCOPY paths can be removed from SITE-B using the DELPATH FORCE as shown in the following command:

```
PPRCOPYOPY DELPATH UNIT(4E80) LSS(X'05',X'01') -
PRI(X'8605',FCA86) SEC(X'2901',FCA29) -
FORCE
```

TO GO BACK TO SITE-A AS PRIMARY: When it is desired to return to the original SITE-A as primary and SITE-B as secondary, the FAILOVER and FAILBACK can be done in reverse. (It is not necessary to delete the pairs from SITE-B before establishing from SITE-A again).

- ESTPAIR with FAILOVER is issued to device 4C80 at SITE-A. After this command is issued, the 4C80 device at SITE-A becomes the new primary and becomes suspended.

```
PPRCOPYOPY ESTPAIR UNIT(4C80) LSS(X'01',X'05') -
PRI(X'2901',FCA29,X'00') SEC(X'8605',FCA86,X'00') -
FAILOVER
```

- ESTPAIR with FAILBACK is issued to device 4C80 at SITE-A. After this command is issued, the 4C80 device at SITE-A becomes the primary in active duplex.

```
PPRCOPYOPY ESTPAIR UNIT(4C80) LSS(X'01',X'05') -
PRI(X'2901',FCA29,X'00') SEC(X'8605',FCA86,X'00') -
FAILBACK
```

Chapter 21. Asynchronous PPRCOPY

Introduction

This section describes the changes to ICKDSF to support Asynchronous PPRC, also referred to as Global Mirror for ESS. The Enterprise Storage Server's Licensed Internal Code (LIC) level must be at 2.4.0 or higher to support Asynchronous PPRC.

Note: PPRC and PPRCOPY are synonymous.

The following changes were made to ICKDSF to support Asynchronous PPRC (Global Mirror for ESS):

- Added Flashcopy commands to establish, query, and withdraw Flashcopy relations.
- Added PPRCOPY commands to create, terminate and query Asynchronous Consistency Group Sessions.
- Added a PPRCOPY command to populate or depopulate a previously opened session with volumes.

Background

Using PPRCOPY, you can establish PPRCOPY pairs in either synchronous or Extended Distance (XD) modes.

Synchronous mode holds Device End for I/O to the PPRCOPY primary volume until the same I/O completes on the PPRCOPY secondary volume. This ensures the volumes are synchronized, but causes performance degradation at the primary site because of waiting for the secondary I/O to complete and the communication of that completion to the primary device.

XD mode is an asynchronous transfer. I/O to the primary device is processed normally, with the device keeping track of which tracks have been updated and need to be transferred to the secondary device, in an Out-Of-Sync bit map (OOS). At predetermined times the primary device interrogates the OOS and transfers as many of the indicated tracks as possible to the secondary device without regard to order of update. If all updated tracks cannot be transferred, during the allotted time, the primary and secondary devices are not consistent.

Asynchronous PPRCOPY Solution

Asynchronous PPRCOPY resolves the Extended Distance inconsistency between devices. Asynchronous PPRCOPY allows the formation of 'consistency groups' which are managed by the subsystem with timing parameters that you specify. There is also a provision to allow Flashcopying of consistent volumes to target volumes which are consistent at the time of Flashcopy.

That consistency is usually desirable across multiple volumes as in a database. The subsystem architecture allows a definition of a topology that incorporates Master and Subordinate volumes in a session. Coordination within a session is administered by the Master which ensures that consistency group formation and transfer is simultaneous.

ICKDSF supports Asynchronous PPRCOPY (Global Mirror) by providing commands that allow you to:

1. Define and query session topology using the PPRCOPY DEFINESESSION, PPRCOPY POPULATESESSION and PPRCOPY QUERY SESSIONSDEVICES commands.
2. Establish, withdraw, and query Flashcopy relationships using the FLASHCPY ESTABLISH, FLASHCPY WITHDRAW and FLASHCPY QUERY commands.
3. Define the parameters for and start or resume an Asynchronous PPRCOPY session with PPRCOPY STARTASYNCCOPY.
4. Pause or terminate an Asynchronous PPRCOPY session with PPRCOPY TERMASYNCCOPY.

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5. Query the status of Asynchronous PPRCOPY processing using PPRCOPY QUERY OUTOFSYNCSTATE and PPRCOPY QUERY ASYNCCOPY.

Typical Scenario for establishing an Asynchronous PPRCOPY session

The following steps are an example of how to establish an Asynchronous PPRCOPY session:

1. Identify all volumes that will participate in a session, which includes identifying which volumes are to be Primary and Secondary PPRCOPY volumes, Flashcopy target volumes for the secondary PPRCOPY volumes and which ESS is to be the Master.
2. Establish paths between all primary and secondary PPRCOPY LSSs and Master and Subordinate LSSs using the ESTPATH command.
3. Establish the PPRCOPY pairs with the ESTPAIR command.
4. Establish Flashcopy relationships between the PPRCOPY secondaries and the Flashcopy target volumes using the FLASHCPY ESTABLISH command.
5. Define the same session on each LSS containing the Master and its Subordinates using PPRCOPY DEFINESESSION OPEN.
6. Populate each session on each LSS with the list of participating Master and Subordinate volumes that are to participate in the session using the PPRCOPY POPULATESESSION command.
7. Query the session to ensure that all is as it should be using the PPRCOPY QUERY SESSIONSDEVICES command.
8. Define parameters for and start the Asynchronous PPRCOPY process with the PPRCOPY STARTASYNCCOPY command.

Disaster Recovery for Asynchronous PPRC Processing

Recovering when Flashcopy target volumes are inconsistent

If something goes wrong during a Flashcopy process and all PPRC secondaries do not complete their Flashcopy processing, the Flashcopy target volumes can be inconsistent. Some target volumes could be at the new level and others at the previous level. If this happens, you should either:

- Issue FLASHCOPY WITHDRAW with the REVERT parameter to change back the Flashcopy target volumes from the new level to the previous level.
- Issue the FLASHCOPY WITHDRAW with the COMMIT parameter to commit those Flashcopy target volumes from the previous level to the new level.

Determining the state of the Flashcopy target volumes

Issue the FLASHCOPY QUERY RELATIONS command to each PPRC secondary, which is also a Flashcopy source volume. The information returned indicates whether the Flashcopy relationship should be changed back (revertable). Use the following information as a guide to determine whether to issue Flashcopy Withdraw and to specify REVERT or COMMIT.

- No action is required if:
  - All volumes are non revertable (one sequence number)
- No Recovery is possible if:
  - More than 2 sequence numbers exist
  - All sequence numbers are 0
  - Multiple revertable sequence numbers exist
  - Multiple non revertable sequence numbers exist
- Revert Flash Copy if:
  - All volumes are revertable (one sequence number)

  - All volumes in one sequence number are revertable (not equal sequence numbers)
- Commit Flash Copy if
  - Some volumes are revertable (one sequence number)

Asynchronous Peer-to-Peer Remote Copy Recovery from an unplanned outage

In many ways Asynchronous Peer-to-Peer Remote Copy recovery from an unplanned outage is very similar to the two-site synchronous Peer-to-Peer Remote Copy Failover/Failback procedure. However, Asynchronous Peer-to-Peer Remote Copy must consider the following:

- The Asynchronous Peer-to-Peer Remote Copy Master may still be running at the local site, especially if the disaster at the local site was a "rolling disaster" in which not all components fail simultaneously.
- The consistent copy at the remote site is NOT the Peer-to-Peer Remote Copy secondary, rather it is the FlashCopy target whose source is the Peer-to-Peer Remote Copy secondary.
- Formation of a Consistency Group may have been in progress at the time of the failure.

When a disaster affects a local Asynchronous Peer-to-Peer Remote Copy configuration, the following must occur. For ease of explanation, the local Peer-to-Peer Remote Copy primary volumes are designated as the "A Volumes", the remote Peer-to-Peer Remote Copy secondary/FlashCopy source volumes are designated as the "B Volumes" and the remote FlashCopy target volumes are designated as the "C Volumes".

1. Issue PPRC TERMASYNCCOPY to the Master to terminate the Asynchronous PPRC configuration. The command might fail if the Master is not operational. If this is the case, proceed with the next step. If the command is successful, then wait until the terminate processing completes. Use the PPRC QUERY ASYNCCOPY command to determine when the terminate has completed.
2. All Asynchronous PPRC sessions will return to PPRC Extended Distance mode. This return will be as a result of the PPRC TERMASYNCCOPY command or due to a timeout. Subordinates determine that the Master is no longer available.
3. Issue PPRC ESTPAIR with Failover specified to all of the B-volumes, i.e., those that were originally the PPRC secondary volumes. This command will make all of the B-Volumes Peer-to-Peer Remote Copy primaries in the suspended state to the PPRC secondary "A" volumes'. All "B" volumes must successfully process the Failover command before the next step in the recovery scenario is attempted
4. Asynchronous PPRC might have been in the process of forming a Consistency Group at the time of the failure. The state of the FlashCopy relations at the remote site must be determined. Please see “Recovering when Flashcopy target volumes are inconsistent” on page 322 for further information. If there was inconsistency in the Flashcopy states and FLASHCPY WITHDRAWs had to be issued then all Flashcopy background copies must complete before proceeding. Note, that once the process of recovering from any inconsistent Flashcopy states has completed successfully, then the "C" volumes should be backed up to tape to preserve a safe copy of the volumes before proceeding.
5. Issue FLASHCOPY ESTABLISH specifying FASTREVERSERESTORE and MODE(COPY). Since the relation must be reversed, the command should be issued to the C-volume, the original Flashcopy target volume and the TARGETVOL keyword should specify the attributes for the B-volume, the original Flashcopy source volume. This command ensures that the B-volume is made a physical copy of the former C-volume. After the execution of FRR FLC the C-volume is not usable. Also specify TGTOKASPPRCPRIM(YES) to allow the target to be a PPRC primary volume, which occurred when the PPRC ESTPAIR FAILOVER command completed successfully. **There should be NO I/O to the B or C volumes at this time.**
6. Wait until all the background copies complete on all the volumes. This can be monitored by issuing the FLASHCOPY QUERY RELATIONS command. When this has occurred the consistency group has been "hardened" on the B-volume(s). The C->B Flashcopy relationship will terminate when the background copy completes.
7. Reestablish the Flashcopy relation in the original direction, i.e., from the B-volume to the C-volume. Change recording will be set by default, but INHIBITTARGETWRITES(YES) must also be specified.

8. Host I/O can now resume on the B-volume.
9. When the original host has been recovered and the A-volume(s) is ready to return, issue the PPRC ESTPAIR specifying FAILBACK to the B-volumes. Recovery host I/O continues uninterrupted to the B-volume as the A-volume is made current.
10. Once B-volume(s) has completed the 1st pass of the synchronization process, then quiesce Host B operations. This can be monitored by issuing the PPRC QUERY to the B-volumes, a portion of the output looks like the following:

```
                                                    (PRIMARY)  (SECONDARY)
                                                    SSID  CCA  SSID  CCA
DEVICE  LEVEL       STATE           PATH STATUS     SERIAL#    SERIAL#
------  ---------   --------------  -----------     ---------  -----------
5E1C    PRIMARY     PENDING    XDP  ACTIVE          9404  1C   9405  1C
                                                     14940      14940
```

    If under state you see 'PENDING XDP' as above, the volume is performing the first pass synchronization. When the the first pass has completed the string 'XDP' will change to 'XD'.
11. Issue PPRC ESTPAIR with FAILOVER and OPTION(XD) specified to the A-volume(s) to force the termination of the B->A PPRC XD pair and establish A->B PPRC XD relationship. A PPRC ESTPAIR with FAILBACK command is then issued to the A-volume(s) to force the B-volume(s) to be secondary volume(s).
12. Restart the Asynchronous PPRC mechanism using the PPRC STARTASYNCCOPY command. As the consistency group is formed, change recording will be started for the A-volume(s) and a new CG will be formed on C-volumes. At this point A=B=C.
13. Resume primary host operations.

Examples of creating Asynchronous PPRCOPY configurations

This section provide examples of Asynchronous PPRCOPY configurations.



Attention: All of the examples in this section are for illustrative purposes only. Examples were not tested.

Example 1: All volumes are contained within one ESS

This example is the simplest and involves one ESS, although the structure is scalable to involve more than one ESS.

This example provides no disaster recovery capability, therefore would not likely be used in a customer environment. It illustrates certain important properties of Asynchronous PPRCOPY. In this one ESS configuration, all volumes in the configuration reside in the single ESS, therefore assume there is one ESS with 8 LSSs and each LSS has 16 drives associated with it.

ESS Serial number = ABCDE, WWNN = 5005076300C01F4C, FCP SAIDs = 002C, 003C, 004C, 005C

```
LSS 01, SSID = 1111
Drives: 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 10A, 10B, 10C, 10D, 10E, 10F
CCA:    10   11   12   13   14   15   16   17   18   19   1A   1B   1C   1D   1E   1F
```

```
LSS 02, SSID = 2222
Drives: 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 20A, 20B, 20C, 20D, 20E, 20F
CCA:    20   21   22   23   24   25   26   27   28   29   2A   2B   2C   2D   2E   2F
```

```
LSS 03, SSID = 3333
Drives: 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 30A, 30B, 30C, 30D, 30E, 30F
CCA:    30   31   32   33   34   35   36   37   38   39   3A   3B   3C   3D   3E   3F
```

ESS Serial number = ABCDE, WWNN = 5005076300C01F4C, FCP SAIDs = 002C, 003C, 004C, 005C
LSS 04, SSID = 4444 Drives: 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 40A, 40B, 40C, 40D, 40E, 40F CCA: 40 41 42 43 44 45 46 47 48 49 4A 4B 4C 4D 4E 4F
LSS 05, SSID = 5555 Drives: 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 50A, 50B, 50C, 50D, 50E, 50F CCA: 50 51 52 53 54 55 56 57 58 59 5A 5B 5C 5D 5E 5F
LSS 06, SSID = 6666 Drives: 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 60A, 60B, 60C, 60D, 60E, 60F CCA: 60 61 62 63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F
LSS 07, SSID = 7777 Drives: 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 70A, 70B, 70C, 70D, 70E, 70F CCA: 70 71 72 73 74 75 76 77 78 79 7A 7B 7C 7D 7E 7F
LSS 08, SSID = 8888 Drives: 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 80A, 80B, 80C, 80D, 80E, 80F CCA: 80 81 82 83 84 85 86 87 88 89 8A 8B 8C 8D 8E 8F

Because there is only one ESS, there is no decision about which ESS is the Master. However, we do need to decide on which volumes are to be PPRCOPY primary volumes, which are to be their PPRCOPY secondaries, and which are to be the Flashcopy target volumes.

The first five drives in LSS 01 and LSS 05 are the PPRCOPY primary volumes. Each PPRCOPY primary volume requires a PPRCOPY secondary volume, therefore the first five drives in LSS 03 and LSS 07 are designated as PPRCOPY secondary volumes. These PPRCOPY secondaries are also the Flashcopy source volumes, each of which requires a distinct Flashcopy target volume. The last five drives in LSS 04 and LSS 08 are designated as those Flashcopy target volumes.

1. Establish the PPRCOPY paths between LSS 01 and 03, and between LSS 05 and 07:.

```
PPRCOPY ESTPATH UNIT(100)                                  -
             PRI(X'1111',ABCDE)                       -
             SEC(X'3333',ABCDE)                       -
             FCPP(X'002C003C')                        -
             WWNN(5005076300C01F4C,5005076300C01F4C)  -
             LSS(X'01',X'03')

PPRCOPY ESTPATH UNIT(500)                                  -
             PRI(X'5555',ABCDE)                       -
             SEC(X'7777',ABCDE)                       -
             FCPP(X'004C005C')                        -
             WWNN(5005076300C01F4C,5005076300C01F4C)  -
             LSS(X'05',X'07')

PPRCOPY ESTPAIR UNIT(100)                                  -
             PRI(X'1111',ABCDE,X'10')                 -
             SEC(X'3333',ABCDE,X'30')                 -
             LSS(X'01',X'03')                         -
             ONLINSEC(YES)                            -
             OPTION(XD)

PPRCOPY ESTPAIR UNIT(101)                                  -
             PRI(X'1111',ABCDE,X'11')                 -
             SEC(X'3333',ABCDE,X'31')                 -
             LSS(X'01',X'03')                         -
             ONLINSEC(YES)                            -
             OPTION(XD)
                     .
                     .
                     .
PPRCOPY ESTPAIR UNIT(104)                                  -
             PRI(X'1111',ABCDE,X'14')                 -
             SEC(X'3333',ABCDE,X'34')                 -
             LSS(X'01',X'03')                         -
```

```
             ONLINSEC(YES)                              -
             OPTION(XD)

PPRCOPY ESTPAIR UNIT(500)                                  -
             PRI(X'5555',ABCDE,X'50')                   -
             SEC(X'7777',ABCDE,X'70')                   -
             LSS(X'05',X'07')                           -
             ONLINSEC(YES)                              -
             OPTION(XD)
                     .
                     .
                     .

PPRCOPY ESTPAIR UNIT(504)                                  -
             PRI(X'5555',ABCDE,X'54')                   -
             SEC(X'7777',ABCDE,X'74')                   -
             LSS(X'05',X'07')                           -
             ONLINSEC(YES)                              -
             OPTION(XD)
```

2. Establish the Flashcopy source and target volumes:

```
FLASHCPY ESTABLISH UNIT(300)                        -
                   TARGETVOL(X'04',X'4B',40B)

FLASHCPY ESTABLISH UNIT(301)                        -
                   TARGETVOL(X'04',X'4C',40C)       -
                   MODE(NOCOPY)

FLASHCPY ESTABLISH UNIT(302)                        -
                   TARGETVOL(X'04',X'4D',40D)       -
                   MODE(NOCOPY)                     -
                   ONLINTGT(NO)

FLASHCPY ESTABLISH UNIT(303)                        -
                   TARGETVOL(X'04',X'4E',40E)       -
                   MODE(NOCOPY)                     -
                   ONLINTGT(NO)                     -
                   TGTCANCOMEONLINE(NO)

FLASHCPY ESTABLISH UNIT(304)                        -
                   TARGETVOL(X'04',X'4F',40F)       -
                   MODE(NOCOPY)                     -
                   ONLINTGT(NO)                     -
                   TGTCANCOMEONLINE(NO)             -
                   TGTOKASPPRCPRIM(NO)

FLASHCPY ESTABLISH UNIT(700)                        -
                   TARGETVOL(X'08',X'8B',80B)
                     .
                     .
                     .
FLASHCPY ESTABLISH UNIT(704)                        -
                   TARGETVOL(X'08',X'8F',80F)
```

3. Define the sessions. Because there is only one Master, there is only one session ID, which must be defined on every LSS that contains a PPRCOPY primary volume, i.e., LSS 01 and 05:

```
PPRCOPY DEFINESESSION UNIT(100)         -
                   OPEN              -
                   SESSIONNO(1)

PPRCOPY DEFINESESSION UNIT(500)         -
                   OPEN              -
                   SESSIONNO(1)
```

4. Populate each session with the PPRCOPY primary volumes:

```
PPRCOPY POPULATESESSION UNIT(101)       -
                     JOIN              -
                     SESSIONNO(1)      -
                     VOLCOUNT(1)       -
                     RVOLLIST((X'10',X'14'))

PPRCOPY POPULATESESSION UNIT(504)       -
                     JOIN              -
                     SESSIONNO(1)      -
                     RANGE(NO)         -
```

```
                    VOLCOUNT(5)     -
                    IVOLLIST((X'50'),(X'51'),(X'52'),(X'53'),(X'54'))
```

5. Issue a query to confirm that the session exists and that the individual LSS sessions are populated with the appropriate volumes:

```
PPRCOPY QUERY SESSIONSDEVICES UNIT(100)
PPRCOPY QUERY SESSDEV UNIT(500)
```

6. Define and start the Asynchronous PPRCOPY configuration. Specify the Extended Distance Consistency Maximum Coordination Interval to be 100 milliseconds or twice the default of 50 milliseconds, the Maximum Consistency Group Drain Time to be 90 seconds or three times the minimum time of 30 seconds, and the Consistency Group Interval Time to be half an hour. Because there is no Subordinate on a different ESS, the TOPOLOGY keyword is not specified. This will result in an implicit Subordinate being created on this ESS, which will receive commands from the Master and will direct the Asynchronous PPRCOPY functions.

```
PPRCOPY STARTASYNCCOPY UNIT(100)             -
                    START                   -
                    SESSIONNO(1)            -
                    MAXCOORDTIME(100)       -
                    MAXDRAINTIME(720)       -
                    CGINTERVALTIME(1800)
```

This configuration can be repeated on other ESSs, even with the same session ID, and they will all operate independently of each other.

Example 2: All PPRCOPY primary volumes on one ESS, PPRCOPY secondaries and Flashcopy targets on another ESS



Attention: All the examples in this section are for illustrative purposes only. Examples were not tested.

The second scenario is more realistic because it provides for separation of the PPRCOPY primary volumes, which in a customer environment, would exist at the primary host site from their PPRCOPY secondary volumes, which would exist at a remote site along with the Flashcopy target volumes.

In this example, the is an ESS similar to that from the first example, but we introduced a second smaller ESS for simplicity..

ESSA Serial number = ABCDE, WWNN = 5005076300C01F4C, FCP SAIDs = 002A, 003A, 004A, 005A

```
LSS 01, SSID = A111
Drives: A10, A11, A12, A13, A14, A15, A16, A17, A18, A19, A1A, A1B, A1C, A1D, A1E, A1F
CCA:    10   11   12   13   14   15   16   17   18   19   1A   1B   1C   1D   1E   1F
```

```
LSS 02, SSID = A222
Drives: A20, A21, A22, A23, A24, A25, A26, A27, A28, A29, A2A, A2B, A2C, A2D, A2E, A2F
CCA:    20   21   22   23   24   25   26   27   28   29   2A   2B   2C   2D   2E   2F
```

```
LSS 03, SSID = A333
Drives: A30, A31, A32, A33, A34, A35, A36, A37, A38, A39, A3A, A3B, A3C, A3D, A3E, A3F
CCA:    30   31   32   33   34   35   36   37   38   39   3A   3B   3C   3D   3E   3F
```

```
LSS 04, SSID = A444
Drives: A40, A41, A42, A43, A44, A45, A46, A47, A48, A49, A4A, A4B, A4C, A4D, A4E, A4F
CCA:    40   41   42   43   44   45   46   47   48   49   4A   4B   4C   4D   4E   4F
```

```
LSS 05, SSID = A555
Drives: A50, A51, A52, A53, A54, A55, A56, A57, A58, A59, A5A, A5B, A5C, A5D, A5E, A5F
CCA:    50   51   52   53   54   55   56   57   58   59   5A   5B   5C   5D   5E   5F
```

ESSA Serial number = ABCDE, WWNN = 5005076300C01F4C, FCP SAIDs = 002A, 003A, 004A, 005A

```
LSS 06, SSID = A666
Drives: A60, A61, A62, A63, A64, A65, A66, A67, A68, A69, A6A, A6B, A6C, A6D, A6E, A6F
CCA:    60   61   62   63   64   65   66   67   68   69   6A   6B   6C   6D   6E   6F
```

```
LSS 07, SSID = A777
Drives: A70, A71, A72, A73, A74, A75, A76, A77, A78, A79, A7A, A7B, A7C, A7D, A7E, A7F
CCA:    70   71   72   73   74   75   76   77   78   79   7A   7B   7C   7D   7E   7F
```

```
LSS 08, SSID = A888
Drives: A80, A81, A82, A83, A84, A85, A86 ,A87, A88, A89, A8A, A8B, A8C, A8D, A8E, A8F
CCA:    80   81   82   83   84   85   86   87   88   89   8A   8B   8C   8D   8E   8F
```

ESSB Serial number = 12345, WWNN = 5005076300C01ABC, FCP SAIDs = 002B, 003B, 004B, 005B

```
LSS 01, SSID = B111
Drives: B10, B11, B12, B13, B14, B15, B16, B17, B18, B19, B1A, B1B, B1C, B1D, B1E, B1F
CCA:    10   11   12   13   14   15   16   17   18   19   1A   1B   1C   1D   1E   1F
```

```
LSS 02, SSID = B222
Drives: B20, B21, B22, B23, B24, B25, B26, B27, B28, B29, B2A, B2B, B2C, B2D, B2E, B2F
CCA:    20   21   22   23   24   25   26   27   28   29   2A   2B   2C   2D   2E   2F
```

```
LSS 03, SSID = B333
Drives: B30, B31, B32, B33, B34, B35, B36, B37, B38, B39, B3A, B3B, B3C, B3D, B3E, B3F
CCA:    30   31   32   33   34   35   36   37   38   39   3A   3B   3C   3D   3E   3F
```

```
LSS 04, SSID = B444
Drives: B40, B41, B42, B43, B44, B45, B46, B47, B48, B49, B4A, B4B, B4C, B4D, B4E, B4F
CCA:    40   41   42   43   44   45   46   47   48   49   4A   4B   4C   4D   4E   4F
```

With two ESSs, there is a need to decide on which is to be the Master. We designated ESSA as the Master and put all PPRCOPY primary volumes on this ESS, which again implies that there is no explicit Subordinate. ESSB contains the PPRCOPY secondary volumes and their Flashcopy target volumes. The only differences from our first example is that of the PPRCOPY paths and pairs, and the Flashcopy establishment.

- The PPRCOPY paths and pairs are established between LSS 01 on ESSA and LSS 03 on ESSB and between LSS 05 on ESSA and LSS 04 on ESSB.

```
PPRCOPY ESTPATH UNIT(A10)                                  -
             PRI(X'A111',ABCDE)                              -
             SEC(X'B333',12345)                              -
             FCPP(X'002A002B')                               -
             WWNN(5005076300C01F4C,5005076300C01ABC)    -
             LSS(X'01',X'03')

PPRCOPY ESTPATH UNIT(A50)                                  -
             PRI(X'A555',ABCDE)                              -
             SEC(X'B444',12345)                              -
             FCPP(X'004A005B')                               -
             WWNN(5005076300C01F4C,5005076300C01ABC)    -
             LSS(X'05',X'04')

PPRCOPY ESTPAIR UNIT(A10)                  -
             PRI(X'A111',ABCDE,X'10')      -
             SEC(X'B333',12345,X'30')      -
             LSS(X'01',X'03')          -
             ONLINSEC(YES)             -
             OPTION(XD)

PPRCOPY ESTPAIR UNIT(A11)                  -
             PRI(X'A111',ABCDE,X'11')      -
```

```
             SEC(X'B333',12345,X'31')     -
             LSS(X'01',X'03')          -
             ONLINSEC(YES)             -
             OPTION(XD)
                    .
                    .
                    .
PPRCOPY ESTPAIR UNIT(A14)                  -
             PRI(X'A111',ABCDE,X'14')   -
             SEC(X'B333',12345,X'34')   -
             LSS(X'01',X'03')           -
             ONLINSEC(YES)              -
             OPTION(XD)

PPRCOPY ESTPAIR UNIT(A50)                  -
             PRI(X'A555',ABCDE,X'50')     -
             SEC(X'B444',12345,X'40')     -
             LSS(X'05',X'04')             -
             ONLINSEC(YES)             -
             OPTION(XD)
                    .
                    .
                    .
PPRCOPY ESTPAIR UNIT(A54)                   -
             PRI(X'A555',ABCDE,X'54')   -
             SEC(X'B444',12345,X'44')   -
             LSS(X'05',X'04')           -
             ONLINSEC(YES)              -
             OPTION(XD)
```

- If we put all the Flashcopy targets in LSS 01 of ESSB, the Flashcopy establishment would be as follows:

```
FLASHCPY ESTABLISH UNIT(B30)                          -
                   TARGETVOL(X'01',X'10',B10)
                     .
                     .
                     .
FLASHCPY ESTABLISH UNIT(B34)                          -
                   TARGETVOL(X'01',X'14',B14)


FLASHCPY ESTABLISH UNIT(B40)                          -
                   TARGETVOL(X'01',X'15',B15)
                     .
                     .
                     .
FLASHCPY ESTABLISH UNIT(B44)                       -
                   TARGETVOL(X'01',X'19',B19)      -
                   MODE(COPY)
```

Everything else remains exactly the same as in our first example.

Chapter 22. REFORMAT command—CKD



The REFORMAT command updates:

- Portions of a previously initialized MVS or VSE volume
- A minidisk for a VSE or MVS guest operating system

After issuing INIT to initialize a volume, use REFORMAT to change the:

Volume serial number
Owner identification
IPL bootstrap
Program records
VTOC size

Only volumes that have been previously initialized can be reformatted.

After expanding a volume size using dynamic volume expansion, you must use the REFORMAT command to rebuild the VTOC and Index structures to accommodate the additional space on the volume. A REFORMAT command can be issued automatically by the system when a volume is expanded. You can enable this option using the following command:

```
DEVMAN ENABLE(REFVTOC)
```

For more information on DEVMAN refer to *z/OS MVS System Commands*.



Do not use REFORMAT to update volumes, which have been formatted with the CPVOLUME command for use in a VM environment. Use the CPVOLUME command instead.

The following REFORMAT parameters are supported for minidisks: BOOTSTRAP, EXTVTOC, IPLDD, NEWVTOC, OWNERID, PURGE, REFVTOC, VERIFY, VOLID, and UNITADDRESS. For more information, see Chapter 5, “Getting started with the CMS version,” on page 37.

The REFORMAT command supports dual copy volumes, which are in duplex or suspended duplex state.

For information on ICKDSF support of the RAMAC Array Family, see “ICKDSF support of the RAMAC Array family” on page 8.

Protecting the REFORMAT command with RACF

The MVS version of ICKDSF checks the general resource profile for a facility class profile of STGADMIN.ICK.REFORMAT. If RACF is not installed or the facility STGADMIN.ICK.REFORMAT is not created, the REFORMAT command executes with no authorization check. For additional information, see “Protecting ICKDSF commands with RACF” on page 34.

Syntax

The abbreviation for REFORMAT is RFMT.

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REFORMAT
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) VERIFY(*serial*|**NONE*[,owner]*)|NOVERIFY
Optional Parameters BOOTSTRAP|NOBOOTSTRAP CLEAROWNERID DUMPCOND(SET|CLEAR) EXTINDEX(*n*) EXTVTOC(*n*)|NEWVTOC(*cylinder,head,n*|ANY,*n*) IPLDD(*{dname|sysin}*[,OBJFORMAT|,ABSFORMAT]) IPLTXTEXIST OWNERID(*owner*) PURGE|NOPURGE REFVTOC REMOVEIPLTXT VERIFYOFFLINE|NOVERIFYOFFLINE VOLID(*serial*) VTOCPTR(END|*cylinder,head*) XRCLOGGER(SET|CLEAR)

Required parameters

DDNAME|SYSNAME|UNITADDRESS parameter: identify the volume

Parameter/ Abbreviations	Description
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. Note that the volume must be online and mounted as PRIVATE. For *dname*, specify the MVS JCL statement that identifies the volume. **Warning:** During online REFORMAT processing, do not submit another job that will access the same volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and an attached CMS volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address (3 or 4 hexadecimal digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated volume or minidisk. The unit address is the device number.
Default:	None.
Restrictions:	None.

VERIFY|NOVERIFY parameter: verify the volser and ownerid

Parameter/ Abbreviations	Description
VERIFY(*serial [,owner]*) **VFY**	Required when you want to verify the volume serial number and owner identification before reformatting the volume or minidisk. If the volume serial number or owner identification does not match that found on the volume or minidisk, REFORMAT ends. For *serial*, substitute 1 to 6 alphanumeric characters for the volume serial number. For *owner*, substitute 1 to 14 alphanumeric characters for the owner identification. Running in the online mode, if VERIFY(*serial*) parameter is specified in the REFORMAT command and PARM='NOREPLYU' is specified in the EXEC card in the JCL, no operator's intervention (Reply U or T) is required. If PARM='NOREPLYU,FORCE' is specified in the JCL, the VERIFY(*serial*) parameter is not required to bypass the operator's intervention (Reply U or T) message.
NOVERIFY **NOVFY** **NVFY**	Required when you want to bypass verification of the volume serial number.
Default:	None.
Restrictions:	You cannot verify the owner identification separately from the volume serial number. Both the volume serial number and the owner identification must be verified when you want to verify the owner identification. When you specify the VERIFY parameter and verification fails, the command stops running.

Optional parameters

BOOTSTRAP|NOBOOTSTRAP parameter: write IPL records

Parameter/ Abbreviations	Description
BOOTSTRAP **BOOT**	Indicates that you are supplying the IPL bootstrap records that are written on the volume or minidisk during reformatting. These records must be the first four records in the IPL program text. The first text record must have IPL1 in the first four columns, followed by 24 bytes of data. These 24 bytes have the same format as the first IPL record described in the description of the ABSFORMAT parameter. The next three text records must have IPL2 in their first four columns, followed by 68 bytes of data each in the second and third records and 8 bytes of data in the last record. These 144 bytes of data have the same format as IPL record 2 described in the description of the ABSFORMAT parameter.
NOBOOTSTRAP **NOBOOT** **NBOOT**	Indicates that you want the system to supply the IPL bootstrap records that are written on the volume during reformatting.
Default:	NOBOOTSTRAP
Restrictions:	The BOOTSTRAP|NOBOOTSTRAP parameters apply only when the IPLDD parameter is specified. This parameter is ignored when the IPL program is supplied in absolute format. The BOOTSTRAP|NOBOOTSTRAP parameters are not valid for 3995-151 and 3995-153.

CLEAROWNERID parameter: remove the owner identification

Parameter/ Abbreviations	Description
CLEAROWNERID **CLROWNER**	Removes the owner identification in the volume or minidisk label and replaces it with blanks.
Default:	None.
Restrictions:	Not valid with the OWNERID, VTOCPTR, EXTVTOC, NEWVTOC or REFVTOC parameters.

DUMPCOND parameter: Marks and unmarks a volume as a conditioned volume

Parameter/ Abbreviations	Description
DUMPCOND(SET) **DUMPC(SET)**	SET identifies a volume as a conditioned volume. A conditioned volume is for backup purposes, not production. Fast replication functions (Flashcopy, Global Mirror) duplicate a volume for backup and then transfer the backup volume to tape while the applications continue to access the original volume. This allows a backup to be done with minimal impact to applications. However, because the target volume of a copy, or the secondary volume of a mirror operation is a duplicate of the original volume, it must be offline in order to avoid a duplicate volser situation and therefore is not available for backup. Use the DUMPCOND and VOLID parameters to change the volser of the target volume and identify it as a conditioned volume. This allows you to bring the volume online and backed up with DFSMSdss. Because the volume is a conditioned volume, DFSMSdss makes the backup look as if it was taken from the original volume that the conditioned volume was copied or mirrored from. This simplifies the restore process because after the restore, the volume will have the original volser, eliminating the need to change the volume serial.
DUMPCOND(CLEAR) **DUMPC(CLR)**	Removes the identification that indicates a volume is a conditioned volume.
Default:	None.
Restrictions:	DUMPCOND(SET) is valid only when VOLID is specified and the volume serial specified in VOLID is different than the existing one. DUMPCOND is not valid with the EXTVTOC, NEWVTOC, or REFVTOC parameters.

EXTINDEX parameter: extend index

Parameter/ Abbreviations	Description
EXTINDEX(n) **XINDEX(n)**	If an index exists when you expand the VTOC, it must be deleted and rebuilt to reflect the VTOC changes. This parameter is used to specify the total track size of the index to be rebuilt. For 'n', substitute the decimal or hexadecimal digits (for example, X'1E') to specify the total number of tracks for the new index after expansion. If the value for 'n' is less than the current value, the current value is used.
Default:	None.
Restrictions:	Valid only when EXTVTOC or REFVTOC is specified.

EXTVTOC|NEWVTOC|REFVTOC parameter: expand VTOC in current or new location

Parameter/ Abbreviations	Description
EXTVTOC(*n*) **XVTOC**	Expands the VTOC at its current location. For *n*, substitute the decimal or hexadecimal digits (for example, X'AB') to specify the total size in tracks of the new VTOC after expansion. The value for *n* must be greater than the size of the old VTOC.
NEWVTOC(*cylinder,head*|ANY,*n*) **NVTOC**	Moves and expands the VTOC into a new location. For *cylinder,head,n*, substitute the decimal or hexadecimal digits (for example, X'1A',X'0',X'3B') to specify the beginning location and size of the new VTOC. The beginning and ending locations must not be the same as the old VTOC and a single extent free space must be available for the new VTOC. The *n* will specify the total size in tracks of the new VTOC. The value for *n* must be greater than the size of the old VTOC. If ANY is specified, the new VTOC is placed on the first available free space extent that is large enough.
REFVTOC **RVTOC**	Rebuilds the VTOC at its current location for the current track size. Use when you suspect there is a mismatch between your VTOC and VTOC INDEX, or between your VTOC or VTOC INDEX and a physical device.
Default:	None.

Parameter/ Abbreviations	Description
Restrictions: 	For MVS, the volume must be offline when you specify the NEWVTOC parameter. The FMT5/FMT7 free space chain will be updated when the volume is varied online and the next allocation occurs to the volume. If EXTVTOC is specified without the EXTINDEX parameter, and the volume is online to MVS in index format, ICKDSF will calculate the best index size to use, based on the size of the VTOC. The calculation that will be used is the same one that is used by the INIT command. REFVTOC is not valid with other VTOC parameters. To ensure that DFSMS space statistics are correctly updated and accurately reflect the space on the volume, run REFVTOC from a system within the production SMSPlex. If the VTOC is an indexed VTOC the index data set will be deleted. If the device is online to MVS, the index data set will be rebuilt. **Note:** For devices containing more than 64K tracks, there are special considerations for VTOC placement. The existing IBM software uses relative track addressing or the Track-Track-Record (TTR) format to process the VTOC. This restricts the highest address that can be referenced as a VTOC track to be 64K-1. Because of this, the entire VTOC must reside within the first 64K tracks; that is, the VTOC must end before cylinder 4369 X'1111' head 1.

IPLDD parameter: write a user-supplied IPL program on the volume

Parameter/ Abbreviations	Description
IPLDD(*{dname|sysin}*[,OBJFORMAT|,ABSFORMAT])	
IPLDD IPL	Allows you to supply an IPL program to be written on the volume or minidisk during reformatting. For more detailed information, see “Writing an IPL program on the volume with IPLDD” on page 336.

OBJFORMAT
OBJECT
OBJ
	Specifies that IPL data is being supplied in object deck format; that is, cards will have one of the following strings of EBCDIC characters in columns 2 through 4:
	
	`TXT`
	`RLD`
	`ESD`
	`END`
	
	Note that only cards with TXT will be processed. All others will be ignored.

ABSFORMAT ABSOLUTE ABS	Specifies that IPL data is being supplied as variable-length records that contain executable instructions. For more detailed information, see “Supplying variable-length records as IPL data” on page 337.
Default:	OBJFORMAT The system provides special IPL bootstrap records if you specify the IPLDD parameter without specifying the BOOTSTRAP parameter.
Restrictions:	When an IPL program is included in the SYSIN stream, it must immediately follow the INIT command and end with an ENDIPLTEXT card. The ENDIPLTEXT card is optional when the IPL program is in a data set other than the one specified by SYSIN, or when the end-of-file indicator (/*) immediately follows the data for the IPL program. The IPLDD parameter is not valid for 3995-151 and 3995-153. IPLDD is not valid in the VSE environment.

IPLTXTEXIST parameter: suppress WTOR message when IPL text exists

Parameter/ Abbreviations	Description
IPLTXTEXIST **IPLEXIST** **TXTEXIST**	If you use this parameter with the IPLDD parameter, it suppresses the write to operator with reply message ICK21836D, which is displayed if IPL text exists on the volume. Use of this parameter indicates that you are aware that the volume might already contain the IPL text that you want to overlay.
Default:	None.
Restrictions:	IPLTXTEXIST is not valid with the EXTVTOC, NEWVTOC, or REFVTOC parameters. Valid only when IPLDD is specified.

Writing an IPL program on the volume with IPLDD

The following is an explanation of the results you can expect from the IPLDD and BOOTSTRAP parameters:

- If you specify IPLDD but do not specify BOOTSTRAP, ICKDSF supplies an IPL bootstrap that is written on the volume or minidisk during initialization together with the IPL text you supply.
- If you specify IPLDD and BOOTSTRAP, ICKDSF uses the IPL bootstrap and the IPL text you supply. If necessary, ICKDSF updates the bootstrap records to allow for possible user labels.

Note: If you do not specify IPLDD, the existing bootstrap records remain unchanged. The BOOTSTRAP parameter cannot be specified without the IPLDD parameter.

The maximum size permitted for the IPL program record depends upon the type of volume being initialized. The maximum sizes allowed are:

Table 51: Maximum size for IPL program record

Volume Type	Maximum Bytes for IPL Program
3375	33 984
3380	44 948
3390 (3380 mode)	44 948
3390	53 450
9345	49 938

Also, the number of additional user volume labels can further limit the size allowed for the IPL program. If you supply an IPL program that exceeds the size allowed, you receive an error message but reformatting continues.



On the MVS version, use *dname*. For *dname*, substitute 1 to 8 alphanumeric characters for the DD statement identifying the data set that contains the IPL program you want written on the volume (or minidisk) being reformatted. The IPL program can be included within the MVS JCL input stream (SYSIN). If the IPL program is in the MVS JCL input stream, the data must be included immediately after the REFORMAT command.



You must specify SYSIN. It must be the same device as the input device. The data must immediately follow the REFORMAT command and end with an ENDIPLTEXT card. In a VM environment, the IPLDD data must be contiguous to the REFORMAT command.

Supplying variable-length records as IPL data

ABSFORMAT specifies that IPL data is being supplied as variable-length records that contain executable instructions. When IPL data is supplied in this format, it is necessary to provide a minimum of three records. The maximum number of records supplied and their lengths are limited only by the track capacity of the volume or minidisk on which these records are to be written.

The first two records supplied must be the bootstrap records and are restricted to lengths of 24 and 144 bytes, respectively.

The contents of the IPL records and the contents of the program are not checked by ICKDSF. It is the user's responsibility to ensure that the IPL records can load an executable program. The first IPL record must contain a PSW followed by two CCWs (channel command words). The following is an example of CCWs in an IPL record:

First CCW
06xxxxxx 60000090

Second CCW
08xxxxxx 00000000

The first CCW is a command to read in the second IPL record at main storage address xxxxxx. The second CCW is a transfer-in-channel command (a branch) to the CCW that begins the second IPL record.

The second IPL record must be 144 bytes long. Bytes 32 through 42 (starting from byte 0) cannot be used. Bytes 32 through 42 are used by ICKDSF for the seek address (bytes 32 through 37) and the CCHHR (bytes 38 through 42) of the third IPL record.

The third through nth records that are supplied are assumed to be IPL program records and will be written on the volume, without any modification, after the standard volume label and any existing user volume labels. Note that the IPL program will be written only on the first track of the pack. If the length of the records supplied exceeds the remaining space on the first track, the function will end with an error message.

OWNERID parameter: specify a new volume-owner identification

Parameter/ Abbreviations	Description
OWNERID(*owner*) **OWNER**	Writes a new volume-owner identification in the volume or minidisk label. For *owner*, substitute 1 to 14 alphanumeric characters to change the owner identification written in the volume or minidisk label.
Default:	If you do not specify a new owner identification when reformatting a volume or minidisk, the old owner identification remains unchanged.
Restrictions:	Not valid with the CLEAROWNERID parameter.

PURGE|NOPURGE parameter: rewrite user volume labels

Parameter/ Abbreviations	Description
PURGE **PRG**	Indicates that you want to write over existing volume labels during reformatting.
NOPURGE **NOPRG** **NPRG**	Indicates that you do not want to write over any user volume labels. If a volume or minidisk contains user volume labels and the IPLDD parameter is specified, the IPL program record is written following the last user volume label.
Default:	NOPURGE

Parameter/ Abbreviations	Description
Restrictions:	PURGE applies only when IPLDD is specified.

REMOVEIPLTXT parameter: remove IPL text

Parameter/ Abbreviations	Description
REMOVEIPLTXT **RIPLTXT**	Use this parameter to remove IPL text from a volume. To write over existing volume labels, use this parameter along with the PURGE parameter.
Default:	None.
Restrictions:	Not valid in the VSE environment, or for volumes that have been formatted with the CPVOLUME command. It is also not valid with the IPLDD, VTOCPTR, EXTVTOC, NEWVTOC, or REFVTOC parameters.

VERIFYOFFLINE|NOVERIFYOFFLINE parameter: verify device is offline to all other systems



Parameter/ Abbreviations	Description
VERIFYOFFLINE **VFYOFF** **VOFF**	Verifies that the device is offline to all other systems before the command is attempted. If the device is online to any other systems, message ICK31306I is issued and the command is terminated. **Note:** If the device is offline to all systems, or the device is in an active XRC session and the system it is online to is the XRC Data Mover host, the command is allowed to proceed.
NOVERIFYOFFLINE **NOVFYOFF** **NOVOFF**	Bypasses verification that the device is offline to all other systems before the command is attempted.

Parameter/ Abbreviations	Description
Default:	The VERIFYOFFLINE parameter is taken as the default for the z/OS version if all of the following are true: • UNIT parameter is specified • Storage control microcode support exists • z/OS software support exists • Device is not a minidisk The z/OS software support is provided in APAR OA40719 for z/OS V2R1 and V1R13, and incorporated into z/OS V2R2. The hardware support was provided in the following: • DS8870 R7.1 GA, Bundle 87.10.87.0, LIC 7.7.10.287 • DS8700 R6.3 SP6, Bundle 76.31.79.0, LIC 6.6.31.670 • DS8800 R6.3 SP6, Bundle 86.31.95.0, LIC 7.6.31.1150. **Note:** With APAR PI52935 and OA49448 the VERIFYOFFLINE parameter default may be disabled via the following DEVSUPxx parameter: `ICKDSF_VERIFYOFFLINE=` **YES** Enable the VERIFYOFFLINE parameter to be defaulted if all of the following are true: 1. UNIT parameter is specified 2. Storage control microcode support exists 3. z/OS software support exists 4. Device is not a minidisk **NO** Disable the VERIFYOFFLINE parameter as default. If you want to verify that the device is offline to all host systems, the VERIFYOFFLINE parameter must now be specified. Refer to *z/OS MVS Initialization and Tuning Reference* for additional information. **Warning**: The VERYIFYOFFLINE functionality was introduced to alert system programmers and storage administrators that the DASD being initialized is online to one or more systems. Initializing DASD that is online to other systems introduces a data integrity exposure. The data integrity exposure is because each z/OS system maintains in its UCB a pointer to the VTOC. This VTOC pointer can only be automatically refreshed on z/OS systems within the Sysplex where the initialization is being performed, if the DEVSUPxx member has REFUCB enabled AND if the device is not allocated. If the pointer to the VTOC is not refreshed and points to a different location than the newly initialized VTOC location it would continue to use the existing VTOC which could cause overlay problems.
Restrictions:	The VERIFYOFFLINE|NOVERIFYOFFLINE parameters require that the UNIT parameter is also specified. The VERIFYOFFLINE parameter is valid only in the z/OS version of ICKDSF. The NOVERIFYOFFLINE parameter is ignored in the CMS, VSE, and Stand-Alone versions.

VOLID parameter: specify a new volume serial number

Parameter/ Abbreviations	Description
VOLID(*serial*)	Writes a new volume serial number in the volume or minidisk label. For *serial*, substitute 1 to 6 alphanumeric characters for the volume serial number. If fewer than 6 characters are specified, the serial is left-justified, and the remainder of the field is padded with blanks (X'40'). **Note:** Characters are not validated, so check your operating system guide for valid alphanumeric characters.
Default:	When you reformat a volume or minidisk and do not specify the VOLID parameter, the old volume serial number remains unchanged.

Parameter/ Abbreviations	Description
Restrictions:	Any catalog that identifies the volume by its volume serial number must be changed to reflect the new volume serial number for any cataloged data sets that reside on the reformatted volume. No check is made to determine if the volume contains an indexed VTOC. If an indexed VTOC exists on the volume, the data set name of the index remains unmodified. (That is, the index may be named SYS1.IXVTOC.VOL001 but the new volume label is VOL002.) This does not cause any functional problems, but may have an impact on the uniqueness of indexed VTOC data set names. You cannot change the volume serial number of an online MVS volume. You must vary the volume offline to change the volume serial number.

VTOCPTR parameter: restore a destroyed volume serial

Parameter/ Abbreviations	Description
VTOCPTR(END|*cylinder,head*)	Restores the destroyed volume serial (*volser*) of a previously initialized volume (or minidisk). Use *cylinder,head* to specify the original location of the VTOC on the volume. Specify decimal (**n**) or hexadecimal numbers (for example, X'AB',X'E') to identify the cylinder and head. When you specify VTOCPTR(END), the original VTOC is assumed to have been located on the last primary cylinder of the volume or minidisk.
Default:	None.
Restrictions:	When you specify VTOCPTR, all of the following must be true: The device must be a CKD device. NOVERIFY, VOLID, and PURGE must be specified. There must be no *volser* on the volume (the key field and the first four bytes of the data field of VOL1 record are not "VOL1"). In the MVS environment, the device must be offline. If any of these conditions are not true, the restore function ends. REFORMAT checks the existence of a format-4 DSCB at the location you specify by examining the key field and the first four bytes of the data field. After the restore function is completed, the IPL1 and IPL2 records are rewritten and the existing records beyond the *volser* (if any) are erased. If the IPL record is required, you can specify the IPLDD parameter. RACF volume access authority checking is bypassed in the MVS environment.

XRCLOGGER parameter: marks and unmarks a volume as a XRC LOGPLUS designated volume.

Parameter/ Abbreviations	Description
XRCLOGGER(SET) **XRCLOG(SET)**	Marks the volume as a XRC LOGPLUS designated volume so that it can be used for Logger DRXRC-type staging data sets. For further details, refer to publications *z/OS DFSMS Advanced Copy Services* and *z/OS MVS Setting Up a Sysplex*.
XRCLOGGER(CLEAR) **XRCLOG(CLR)**	Unmarks the volume as a XRC LOGPLUS designated volume. This can be used if a volume state is left as L+ even after Logger is no longer actively using the volume.
Default:	None.
Restrictions:	XRCLOGGER is not valid with the EXTVTOC, NEWVTOC, or REFVTOC parameters.

Processing in a shared environment

When you invoke REFORMAT with the EXTVTOC or REFVTOC parameter for a volume that is shared by other systems additional serialization is needed. This additional serialization increases processing time by up to seven seconds per volume.

If the volume is not shared by other systems, or you have varied the volume offline to all other systems, then the serialization is not needed and can be bypassed by using the JCL parameter PARM=NOSYSZ on your EXEC statement. For example:

```
//stepname EXEC PGM=ICKDSF,PARM=NOSYSZ
```

Examples of the REFORMAT command

The following examples show different ways to code the REFORMAT command in offline and online mode (MVS), and for the VSE and CMS versions of ICKDSF.

Any values specified here are examples only and should not necessarily be interpreted as the values for your system.



To reformat a volume in the CMS or Stand-Alone version:

1. Eliminate the MVS JCL.
2. Substitute the UNITADDRESS parameter for the DDNAME parameter.
3. Specify the DEVICETYPE parameter if the MIMIC(EMU) or MIMIC(MINI) parameter is also specified.
4. Substitute SYSIN for *dname* in the IPLDD parameter.

Reformatting volumes with the MVS version



The following examples show you how to reformat volumes with the MVS version of ICKDSF.

Changing the volume serial number in offline mode

In this example, the volume serial number is being changed. Any catalogs that identify the volume by its old volume serial number must be modified. The VERIFY parameter is specified to ensure that the correct volume is being accessed before the volume serial number is changed.

```
//EXAMPLE  JOB
//         EXEC  PGM=ICKDSF
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
 REFORMAT UNITADDRESS(0353) VERIFY(OLDVOL) -
  VOLID(NEWVOL)
/*
```

Adding an IPL program in online mode

In this example, an IPL program is added to the volume, and the owner identification is changed. Volume VOL123 was previously mounted as PRIVATE. If any user volume labels exist on the volume, the IPL program is written over them because the PURGE parameter is specified. ICKDSF will supply the appropriate IPL bootstrap records.

If IPL text already exists on the volume, the operator will be prompted to specify whether or not to continue processing.

```
//EXAMPLE  JOB
//         EXEC  PGM=ICKDSF
//IPLDECK  DD    *
:
//VOLUMEL  DD    UNIT=3390,DISP=OLD,VOL=SER=VOL123
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
 REFORMAT DDNAME(VOLUMEL) IPLDD(IPLDECK) -
          OWNERID(BROWN) PURGE NOVERIFY
/*
```

Adding IPL text from another volume

In this example, IPL text is copied from one volume to another. The target volume's label is TARGET and its volume address is XXX. The source volume's label is SOURCE, and the IPL text is in the library SYS1.SAMPLIB.

If IPL text already exists on the volume, the operator will be prompted to specify whether or not to continue processing.

Note: Check your Program Directory for your operating system for specific examples for your operating environment.

```
//IPLTEXT  JOB <job parameters>
//*MESSAGE PLEASE AUTHORIZE IPLTEXT UPDATE FOR volser(JES2 user)
//*OPERATOR PLEASE AUTHORIZE IPLTEXT UPDATE FOR volser(JES3 user)
//STP1   EXEC PGM=ICKDSF,REGION=0M
//SYSPRINT DD SYSOUT=*
//IVOL DD VOL=SER=volser,UNIT=SYSALLDA,DISP=SHR
//SAMPLIB DD DSN=SYS1.SAMPLIB(IPLRECS),DISP=SHR,UNIT=SYSALLDA,
//           VOL=SER=vvvvvv
//        DD DSN=SYS1.SAMPLIB(IEAIPL00),DISP=SHR,UNIT=SYSALLDA,
//           VOL=SER=vvvvvv
//SYSIN DD *
  REFORMAT DDNAME(IVOL) VERIFY(volser) IPLDD(SAMPLIB,OBJ) -
  BOOTSTRAP
/*
```

Note:

1. Update the job parameters.
2. Replace vvvvvv with the volser of your volume.
3. Replace volser with the volser of your IPL volume.

Expanding the VTOC and the index

The following is an example of expanding the VTOC and the Index using the EXTVTOC and EXTINDEX parameters.

```
//EXAMPLE   JOB
//          EXEC  PGM=ICKDSF
//VOLDD     DD DISP=SHR,UNIT=3380,VOL=SER=TMP121
//SYSPRINT  DD    SYSOUT=A
//SYSIN     DD    *
 REFORMAT DDNAME(VOLDD) VERIFY(TMP121) EXTVTOC(200) EXTINDEX(16)
/*
```

An example of the ICKDSF output from the above job is as follows:

```
ICK00700I DEVICE INFORMATION FOR 0B00 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3380
          STORAGE CONTROLLER = 3990
          STORAGE CONTROL DESCRIPTOR = EC
          DEVICE DESCRIPTOR = 1E
ICK04000I DEVICE IS IN SIMPLEX STATE
ICK01520I THE VTOC-INDEX WAS DELETED
ICK01314I VTOC IS LOCATED AT CCHH=X'0000 0001' AND IS   200 TRACKS.
ICK01502I BUILDIX FUNCTION STARTED
```

```
ICK01503I 0B00 REQUEST RECEIVED TO CONVERT VTOC TO IXFORMAT
ICK01504I 0B00 VTOC FORMAT IS CURRENTLY OSFORMAT, REQUEST ACCEPTED
ICK01508A 0B00 SHOULD CONVERSION PROCEED? REPLY U TO CONTINUE, ELSE T
ICK01513I 0B00  BUILDIX PROCESSING COMPLETED: VTOC IS NOW IN IXFORMAT
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

Refreshing the VTOC and index

Use the REFVTOC parameter to rebuild the VTOC in its current location, using the same track size. The Fmt4 DSCB is rebuilt to reflect the real device capacity. If the VTOC is an indexed VTOC the index data set will be deleted. If the device is online to MVS, the index data set will be rebuilt to reflect the VTOC changes.

The following is an example of refreshing the VTOC and the Index on an online MVS volume, using the REFVTOC parameter:

```
//EXAMPLE   JOB
//          EXEC  PGM=ICKDSF
//VOLDD     DD DISP=SHR,UNIT=3380,VOL=SER=TMP121
//SYSPRINT  DD    SYSOUT=A
//SYSIN     DD    *
 REFORMAT DDNAME(VOLDD) VERIFY(TMP121) REFVTOC
/*
```

An example of the ICKDSF output from the above job:

```
ICK00700I DEVICE INFORMATION FOR 0B00 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3380
          STORAGE CONTROLLER = 3990
          STORAGE CONTROL DESCRIPTOR = EC
          DEVICE DESCRIPTOR = 1E
ICK04000I DEVICE IS IN SIMPLEX STATE
ICK01520I THE VTOC-INDEX WAS DELETED
ICK01314I VTOC IS LOCATED AT CCHH=X'0000 0001' AND IS   200 TRACKS.
ICK01502I BUILDIX FUNCTION STARTED
ICK01503I 0B00 REQUEST RECEIVED TO CONVERT VTOC TO IXFORMAT
ICK01504I 0B00 VTOC FORMAT IS CURRENTLY OSFORMAT, REQUEST ACCEPTED
ICK01508A 0B00 SHOULD CONVERSION PROCEED? REPLY U TO CONTINUE, ELSE T
ICK01513I 0B00  BUILDIX PROCESSING COMPLETED: VTOC IS NOW IN IXFORMAT
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

Using the REFORMAT command with the CMS version



The following examples show you how to use the REFORMAT command in the CMS version of ICKDSF.

Updating a minidisk in the CMS version

In this example, the volume serial number of an MVS minidisk at virtual address 291 is being changed from OLDVOL to NEWVOL and the owner identification from PAYROLL to NEWPAY. The VERIFY parameter is specified to ensure that the correct volume is being accessed before the volume serial and owner ID are changed.

```
REFORMAT UNITADDRESS(0291) VERIFY(OLDVOL,PAYROLL) -
          VOLID(NEWVOL) OWNERID(NEWPAY)
```

Adding IPL text to an MVS volume using the CMS version

In this example, ICKDSF is invoked using a CMS input file, and IPL text is added to an MVS volume. The IPL text is included in the input file after the REFORMAT command line:

```
 REFORMAT UNITADDRESS(A01) VERIFY(MVSRES) IPLDD(SYSIN)
     . . .
IPL text
     . . .
```

The CMS input file name is IPLTEXT INPUT A. ICKDSF is invoked with the following command and output goes to the console.

```
ICKDSF IPLTEXT INPUT A CONSOLE
```

Changing the volume serial number in the VSE version



In this example, the volume serial number is verified and a new volume serial number is assigned.

```
// JOB      jobname
// ASSGN    SYS010,151
// EXEC     ICKDSF,SIZE=AUTO
   REFORMAT SYSNAME(SYS010) VERIFY(OLDVOL) VOLID(NEWVOL)
/*
/&
```

Chapter 23. REVAL command—CKD



Use the REVAL command when some form of rewriting is necessary on all or part of a volume.

REVAL (DATA or NODATA) can perform the following combination of functions on 3380 and 3390 devices:

- A drive test
- Rewrite home address and record 0
- Data verification of the FFVDP
- Surface checking on tracks if required

When you are reinitializing a 3380 or 3390 volume, use REVAL DATA with the VERIFY parameter to ensure you are reinitializing the volume you want or to revalidate the volume's home address and record 0.

This command is valid on IBM 3380 and 3390 volumes only. For 9345 devices, use INSTALL. REVAL does not support dual copy volumes, 9394, or Internal Disk devices.

The REVAL command is not recommended for use on the 9391 and is not supported on 2105, 2107, or 1750 devices.



When you are using the CMS version of ICKDSF, REVAL is valid only with dedicated devices. For more information, see Chapter 5, “Getting started with the CMS version,” on page 37.

Warning
REVAL DATA or NODATA processing will destroy the volser, the VTOC pointer and all of the data in the range specified, so that no data on the volume will be accessible.

FIXSIM provides a nondisruptive method of repairing the cause of specific '4E4E' SIMs that would normally require you to move your data to another device and make this device available for service.

REVAL REFRESH is an enhanced process that provides the capability to rewrite user data.

Do not use the REVAL command as an alternative when media maintenance actions are required for the device. For more information on media maintenance, see:

- “Problem determination” on page 77.
- *Maintaining IBM Storage Subsystem Media*, GC26-4495.

For more information on using ANALYZE or INSPECT to perform media maintenance, see the chapters with their command descriptions.

For information on ICKDSF support of the 9391 and 9394, see “ICKDSF support of the RAMAC Array family” on page 8.

Protecting the REVAL command with RACF

The MVS version of ICKDSF checks the general resource profile for a facility class profile of STGADMIN.ICK.REVAL. If RACF is not installed or the facility STGADMIN.ICK.REVAL is not created, the REVAL command executes with no authorization check. For additional information, see “Protecting ICKDSF commands with RACF” on page 34.

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Syntax

REVAL
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) VERIFY(*serial*|**NONE*[,owner]*)|NOVERIFY
Optional Parameters CYLRANGE(*start,end*) DATA|NODATA|FIXSIM(4E4E)|REFRESH HEADRANGE(*start,end*)

Required parameters

SYSNAME|UNITADDRESS parameter: identify the volume

Parameter/ Abbreviations	Description
DDNAME(*dname*)	Required for an online MVS volume. The volume must be mounted as PRIVATE. For *dname* specify the MVS JCL statement that identifies the volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and an attached CMS volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address in hexadecimal (3 or 4 digits) of the channel and unit for the volume. For the CMS version specify the virtual address of the dedicated volume. The unit address is the device number.
Default:	None.
Restrictions:	DDNAME is valid only when FIXSIM(4E4E) or REFRESH is specified.

VERIFY|NOVERIFY parameter: verify the volser and ownerid

Parameter/ Abbreviations	Description
VERIFY(*serial[,owner]*) **VFY**	Required when you want to verify the volume serial number and owner identification before processing the volume or minidisk. If the volume serial number or owner identification does not match that found on the volume or minidisk, REVAL ends. For *serial*, substitute 1 to 6 alphanumeric characters for the volume serial number. To verify that a volume serial number does not exist, substitute the string *NONE* for *serial*. If no volume serial exists, or if the volume serial is actually "*NONE*", the REVAL operation continues. If a volume serial exists, the REVAL command ends. For *owner*, substitute 1 to 14 alphanumeric characters for the owner identification. Running in the offline mode, if VERIFY(*serial*) parameter is specified in the REVAL command and PARM='NOREPLYU' is specified in the EXEC card in the JCL, no operator's intervention (Reply U or T) is required. If PARM='NOREPLYU,FORCE' is specified in the JCL, the VERIFY(*serial*) parameter is not required to bypass the operator's intervention (Reply U or T) message.
NOVERIFY **NOVFY** **NVFY**	Required when you want to bypass verification of the volume serial number.
Default:	None.

Parameter/ Abbreviations	Description
Restrictions:	You cannot verify the owner identification separately from the volume serial number. Both the volume serial number and the owner identification must be verified when you want to verify the owner identification. When you specify the VERIFY parameter and verification fails, the command stops running.

Optional parameters

CYLRANGE parameter: specify a range of cylinders

Parameter/ Abbreviations	Description
CYLRANGE(*start,end*) **CYLR** **CYL**	Used to specify what part of a volume is to be surface checked. Use the CYLRANGE parameter to specify the starting and ending cylinders. For *start,end*, substitute decimal (**n**) or hexadecimal digits (for example, X'AB',X'DE') to identify the starting and ending cylinders to be examined. If you specify CYLRANGE and do not specify HEADRANGE, all the heads of the specified cylinders are processed. For information on specifying the starting and ending heads (HEADRANGE) to go with the starting and ending cylinders, see "HEADRANGE parameter: specify a range of heads" on page 348. For information on specifying part of a volume, see "RANGE parameters: specifying part of a volume" on page 182.
Default:	None.
Restrictions:	Only the starting value is required for CYLRANGE. If the user does not specify an ending value, the last cylinder is used as the ending value. By specifying an ending value greater than the maximum for the device, processing is performed to the maximum value for that device.

DATA|NODATA|FIXSIM|REFRESH parameter: rewrite home address and record Zero or user data

Parameter/ Abbreviations	Description
DATA	Writes the FFVDP on the specified tracks during the validate process for the IBM 3380 and 3390 devices.
NODATA	Indicates that you do not want to write the FFVDP on the volume.
FIXSIM(4E4E)	Provides a nondisruptive method of repairing the cause of specific '4E4E' SIMs that would normally require you to move your data to another device and make this device available for service. User data is rewritten for the range specified on the HEADRANGE parameter. The volume can be online running in concurrent mode or offline.
REFRESH	REVAL REFRESH is an enhanced process that provides the capability to rewrite user data. User data is rewritten for the range specified on the HEADRANGE parameter. This can be either done offline or online in concurrent mode.
Default:	DATA
Restrictions:	FIXSIM(4E4E) • **Caution:** Follow the checking procedure to determine if the device is a candidate of REVAL FIXSIM. • Is valid only for the 3390-1 and 3390-2. • If the previous FIXSIM(4E4E) did not complete, you must vary the device offline and reissue the REVAL FIXSIM (4E4E) command with a small range to recover it. REFRESH • Is valid only for the 3390-3. • If the previous REFRESH did not complete, you must vary the device offline and reissue the REVAL REFRESH command with a small range to recover it.

HEADRANGE parameter: specify a range of heads

Parameter/ Abbreviations	Description
HEADRANGE(*start,end*) **HDRANGE** **HEADR** **HDR** **HD**	Use the HEADRANGE parameter to specify the part of a volume you want surface checked. For *start,end* substitute decimal (**n**) or hexadecimal digits (for example, X'B',X'E') to identify the starting and ending heads to be examined. If you specify only one value, ICKDSF takes the value to be the starting range and defaults the ending range to the device maximum. If you specify HEADRANGE and do not specify CYLRANGE, the specified heads for all the cylinders on a volume are processed. For information on specifying the starting and ending cylinders (CYLRANGE) to go with the starting and ending heads, see "CYLRANGE parameter: specify a range of cylinders" on page 347. For information on specifying part of a volume, see "RANGE parameters: specifying part of a volume" on page 182.
Default:	None.
Restrictions:	The starting value is required for HEADRANGE. If you specify an ending value greater than the maximum for the device, the device maximum is used for the ending value.

Formatting tracks and reassigning alternate tracks

At the completion of the REVAL DATA, or NODATA process, all tracks in the specified range are initialized for use by IBM operating systems. Nonfactory alternate tracks are reset and reassigned if necessary. **However, the volume label, VTOC pointer, and all user data are destroyed**.

Follow REVAL with the command that formats the volume for your operating system. Use:

- The INIT command for MVS or VSE.
- The CPVOLUME command for VM. Use the FORMAT/ALLOCATE cylinder 0 for the entire volume.
- The AIXVOL command for AIX.

See the appropriate command chapters for more information on formatting your volumes.

Repairing the cause of specific '4E4E' SIMS

The FIXSIM(4E4E) parameter provides an enhanced process intended for use on specific 3390 Models 1 and 2 "4E4E" SIMS.

REVAL FIXSIM(4E4E) can be run on a single head or a range of heads. It can alleviate the situation that caused the SIM without affecting existing data on the volume. It will operate either offline, or online in concurrent mode.

The criteria for REVAL FIXSIM(4E4E) are:

1. The device type that surfaced the SIM is a 3390 Model 1/2 ONLY.
2. The SIM that has surfaced is 4E4E-80xx-xxx2, **OR**

   The SIM that has surfaced is 4E4E-xxxx-xxx9 AND your service representative has validated that REVAL FIXSIM(4E4E) is applicable for this device.

   Any device that does not meet criteria 1 and 2 should be handled using normal maintenance action(s). If criteria 1 and 2 are satisfied, proceed to next step.
3. Run ANALYZE SCAN NODRIVE on the entire volume that surfaced the 4E4E" SIM.

   If the ending CONDITION CODE from ANALYZE SCAN NODRIVE is 0 (CC=0), **OR**

   If the ending CONDITION CODE is 4 (CC=4), and there are NO "4XCX" ESCs indicated in ANALYZE SCAN NODRIVE output, the device qualifies for REVAL FIXSIM(4E4E).

Run REVAL FIXSIM(4E4E) on this device using the head number indicated in the SIM sense record (byte 31).

Any device that does not meet this criteria should be handled using normal maintenance action(s).

Recommendation

If the device is active and running in concurrent mode:

- The NOSPEED parameter must be added to the ANALYZE SCAN NODRIVE command to avoid the impact to other applications.
- IODELAY can be used before REVAL is issued to avoid performance impact to other applications. IODELAY should be reset when the REVAL command completes.

If the device is running in Stand-Alone mode, the SPEED parameter should be added to the ANALYZE SCAN NODRIVE command to improve the performance of the scanning process.

The REVAL command does not run on devices that are part of a dual copy pair. The dual copy pair should be terminated before REVAL FIXSIM(4E4E).

Resuming after a job or system failure

Let REVAL run to completion. If processing is interrupted, restart the command, otherwise the device may be left in an unusable state. Subsequent invocation of ICKDSF commands on behalf of the device will detect this condition and either ask or force you to enter a REVAL command to return the device to its proper condition.

Examples of the REVAL command

The following examples show how to code the REVAL command.

Any values specified here are examples only and should not necessarily be interpreted as the values for your system.

Running REVAL with FIXSIM



In this example REVAL processes head 4 beginning at cylinder 0 and continues to the last cylinder.

```
REVAL UNITADDR(ccuu) NVFY FIXSIM(4E4E) HEADRANGE(4,4)
```



To run the above example with the VSE version:

```
// JOB      REVAL
// LIBDEF   PHASE,SEARCH=(IJSYSRS.SYSLIB)
// OPTION   NODUMP
// ASSGN    SYS010,AAF
// EXEC     ICKDSF,SIZE=AUTO
 REVAL SYSNAME(SYS010) NVFY -
   FIXSIM(4E4E) HEADRANGE(4,4)
/*
/&
```

Reinitializing a volume



In this example, a volume is reinitialized by the REVAL command.

Warning

After REVAL runs, the volume is not formatted for the MVS environment. The contents of the volume are destroyed. In this example, INIT is issued after REVAL to format the volume.

```
//EXAMPLE   JOB
//          EXEC  PGM=ICKDSF
//SYSPRINT  DD    SYSOUT=A
//SYSIN     DD    *
 REVAL UNITADDRESS(0353) VERIFY(VOL123,PAYROLL)
   IF LASTCC<8 -
     THEN INIT UNIT(0353) NOVERIFY VOLID(ABCD4)
/*
```

Chapter 24. TRKFMT command—CKD



The TRKFMT command performs track-related functions on a subset of a volume.

When data is no longer needed, the ERASEDATA parameter overwrites a specified track or range of tracks, and upon completion performs an erase. The algorithms that are used to erase these tracks were developed by IBM working with the National Computer Security Center (NCSC). The number of times that you write these patterns is controlled by the CYCLES parameter.

The TRKFMT command can be used for 2105, 2107, 1750, 3380, 3390 and 9345 devices (except for devices attached to 3880 control units, and 3990-CJ2).

The TRKFMT command does not support the 3995-151 and 3995-153 devices.

Warning

TRKFMT ERASEDATA processing will destroy data on the tracks specified.

Protecting the TRKFMT command with RACF

The MVS version of ICKDSF checks the general resource profile for a facility class profile of STGADMIN.ICK.TRKFMT. If RACF is not installed or the facility STGADMIN.ICK.TRKFMT is not created, the TRKFMT command executes with no authorization check. For additional information, see “Protecting ICKDSF commands with RACF” on page 34.

Syntax

TRKFMT
Required Parameters DDNAME(*dname*)|SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) VERIFY(*serial*|**NONE*[,owner]*)|NOVERIFY ERASEDATA TRACKS((*cylinder,head*)*[,...]*)| CYLRANGE(*start,end*)| HEADRANGE(*start,end*)| FROMRANGE(*cylinder,head*)| TORANGE(*cylinder,head*)
Optional Parameters CYCLES(*n*) PASSWORDS((*dsname/password*),...) TOLERATE(ENQFAIL)

Required parameters

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CYLRANGE parameter: specify a range of cylinders

Parameter/ Abbreviations	Description
CYLRANGE(*start,end*) **CYLR** **CYL**	Used to specify what part of a volume or minidisk is to be processed. Use the CYLRANGE parameter to specify the starting and ending cylinders. For *start,end*, substitute decimal (**n**) or hexadecimal digits (for example, X'1AB',X'2DE') to identify the starting and ending cylinders to be processed. If you specify CYLRANGE and do not specify HEADRANGE, all the heads of the specified cylinders are processed. For information on specifying the starting and ending heads (HEADRANGE) to go with the starting and ending cylinders, see "HEADRANGE parameter: specify a range of heads" on page 353. For information on specifying part of a volume or minidisk, see "RANGE parameters: part of a volume" on page 356.
Default:	None.
Restrictions:	Both the starting and ending values are required for CYLRANGE. By specifying an ending value greater than the last primary cylinder for the device, processing is performed to the last primary cylinder for the device. CYLRANGE cannot be specified with FROMRANGE|TORANGE or TRACKS.

DDNAME|SYSNAME|UNITADDRESS parameter: identify volume (or minidisk)

Parameter/ Abbreviations	Description
DDNAME(*dname*) **DNAME**	Required for an online MVS volume. Note that the volume must be online. For *dname*, specify the MVS JCL statement that identifies the volume.
SYSNAME(*sysxxx*)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and an attached CMS volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address (3 or 4 hexadecimal digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated volume or minidisk. The unit address is the device number.
Default:	None.
Restrictions:	None.

ERASEDATA parameter: ERASE a track

Parameter/ Abbreviations	Description
ERASEDATA **ERASE**	Specifies each track to be overwritten. Each track will be overwritten with a set of special patterns. Upon completion of the overwrites, the track will be erased, leaving only the home address and record 0 on the track. Only the tracks specified will be erased. The CYCLES(n) parameter can be specified with ERASEDATA to write the set of patterns multiple times.
Default:	None.
Restrictions:	None.

FROMRANGE parameter: specify a specific starting location

Parameter/ Abbreviations	Description
FROMRANGE(*cylinder,head*) **FROMR** **FROM**	Use this parameter to specify the starting track (cylinder and head) to be processed. For *cylinder,head* substitute decimal (**n**) or hexadecimal digits (for example, X'2AB',X'A') to identify the cylinder and head at which processing is to start. If you specify only one value, ICKDSF takes it to be the cylinder and the head value is defaulted to 0. If you specify FROMRANGE and do not specify TORANGE, TORANGE is defaulted to the last primary cylinder of a volume or minidisk. For information on specifying the ending track (TORANGE) to go with the starting track, see "TORANGE parameter: specify a specific ending location" on page 353. For information on specifying part of a volume to be examined, see "RANGE parameters: part of a volume" on page 356.
Default:	None.
Restrictions:	FROMRANGE and CYLRANGE|HEADRANGE are mutually exclusive.

HEADRANGE parameter: specify a range of heads

Parameter/ Abbreviations	Description
HEADRANGE(*start,end*) **HDRANGE** **HEADR** **HDR** **HD**	Use the HEADRANGE parameter to specify the starting and ending heads to be processed. For *start,end* substitute decimal (**n**) or hexadecimal digits (for example, X'B',X'E') to identify the starting and ending heads to be processed. If you specify only one value, ICKDSF takes the value to be the starting range and defaults the ending range to the device maximum. If you specify HEADRANGE and do not specify CYLRANGE, the specified heads for all the cylinders on a volume or minidisk are processed. For information on specifying the starting and ending cylinders (CYLRANGE) to go with the starting and ending heads, see "CYLRANGE parameter: specify a range of cylinders" on page 352. For information on specifying part of a volume, see "RANGE parameters: part of a volume" on page 356.
Default:	None.
Restrictions:	Both the starting and ending values are required for HEADRANGE. If you specify an ending value greater than the maximum for the device, the device maximum is used for the ending value. HEADRANGE is mutually exclusive with FROMRANGE|TORANGE and with TRACKS.

TORANGE parameter: specify a specific ending location

Parameter/ Abbreviations	Description
TORANGE(*cylinder,head*) **TOR** **TO**	Use this parameter to specify the ending track (cylinder and head) of the volume or minidisk to be processed. For *cylinder,head*, substitute the decimal (**n**) or hexadecimal digits (for example, X'2AB',X'E') to identify the cylinder and head where processing is to end. If you specify only one value, ICKDSF takes it to be the cylinder and defaults the head to the device maximum. If you specify TORANGE and do not specify FROMRANGE, FROMRANGE is defaulted to cylinder 0, head 0 of the specified or minidisk. For information about specifying the starting track of part of a volume (FROMRANGE), see "FROMRANGE parameter: specify a specific starting location" on page 353. For information on specifying part of a volume, see "RANGE parameters: part of a volume" on page 356.

Parameter/ Abbreviations	Description
Default:	None.
Restrictions:	You cannot specify TORANGE with CYLRANGE|HEADRANGE or TRACKS. Only primary tracks can be specified.

VERIFY|NOVERIFY parameter: verify volser and ownerid

Parameter/ Abbreviations	Description
VERIFY(*serial[,owner]*) **VFY**	Required when you want to verify the volume serial number and owner identification before processing a track on the volume or minidisk. If the volume serial number or owner identification does not match that found on the volume or minidisk, TRKFMT ends. For *serial*, substitute 1 to 6 alphanumeric characters for the volume serial number. To verify that a volume serial number does not exist, substitute the string *NONE* for *serial*. If no volume serial exists, or if the volume serial is actually "*NONE*", the TRKFMT operation continues. If a volume serial exists, the TRKFMT command ends. For *owner*, substitute 1 to 14 alphanumeric characters for the owner identification. Running in the offline mode, if VERIFY(*serial*) parameter is specified in the TRKFMT command and PARM='NOREPLYU' is specified in the EXEC card in the JCL, no operator's intervention (Reply U or T) is required. If PARM='NOREPLYU,FORCE' is specified in the JCL, the VERIFY(*serial*) parameter is not required to bypass the operator's intervention (Reply U or T) message.
NOVERIFY **NOVFY** **NVFY**	Required when you want to bypass verification of the volume serial number.
Default:	None. You must specify either VERIFY or NOVERIFY.
Restrictions:	You cannot verify the owner identification separately from the volume serial number. Both the volume serial number and the owner identification must be verified when you want to verify the owner identification. When you specify the VERIFY parameter and verification fails, the command terminates.

Optional parameters

CYCLES parameter: number of iterations of overwrite

Parameter/ Abbreviations	Description
CYCLES(*n*)	Specified with the ERASEDATA parameter to indicate the number of times you want the set of data patterns to be written. Upon completion of all cycles, the track will be erased, (leaving the home address and record 0 on the track). For **n**, substitute a decimal number from 1 to 10 for the number of times you want the set of patterns to be written. The larger the value of **n**, the longer the execution time.
Default:	CYCLES(1)
Restrictions:	The maximum number you can specify with the CYCLES(n) parameter is 10.

PASSWORDS parameter: provide passwords for data set security



Parameter/ Abbreviations	Description
PASSWORDS ((*dsname/password*),...) **PASSWORD** **PASSWD** **PWD** **PD**	Specifies passwords for non-VSAM password-protected data sets. The supplied passwords will be used to determine if the user has authority to alter the data sets. For *dsname*, substitute the fully qualified name of a password-protected data set. For *password*, substitute the password you wish to apply to this data set.
Default:	None.
Restrictions:	Up to a maximum of 512 passwords may be specified. PASSWORD is valid only in the MVS version.

TOLERATE parameter: specify continue processing

Parameter/ Abbreviations	Description
TOLERATE(ENQFAIL)TOL(ENQF) MVS	Specifies that in the event exclusive access cannot be obtained for a data set, that processing is to continue for the track (MVS systems only). If TOLERATE(ENQFAIL) is not specified, processing continues on the next track. For tracks in VSAM data sets, TOLERATE(ENQFAIL) must be specified when processing online.
Default:	None.
Restrictions:	MVS

TRACKS parameter: specify discrete tracks

Parameter/ Abbreviations	Description
TRACKS((*cylinder,head*) *[,...]*) **TRACK** **TRKS** **TRK**	Specifies discrete tracks to be processed. For *cylinder,head*, specify decimal (**n**) or hexadecimal digits to identify the cylinder, and decimal (**n**) or hexadecimal digits (for example, X'2AB',X'E') to identify the track to be processed. To process more than one track at a time, specify: `TRACKS((cylinder,head),(cylinder,head))` The maximum number of individual tracks that you can specify is 20. Either the TRACKS parameter or the range parameters must be specified.
Default:	None.
Restrictions:	TRACKS and the range parameters are mutually exclusive. Only primary tracks can be specified.

Handling of checkpoint data from a previous command

The TRKFMT command will look for checkpoint data from a previous command that may not have completed. (When the volume being processed is a minidisk, TRKFMT will not look for previous checkpoint data.) If previous checkpoint data is determined to exist, a message is issued and the TRKFMT command is terminated. The failing command must be rerun prior to re-invoking the TRKFMT command.

RANGE parameters: part of a volume

CYLRANGE|HEADRANGE and FROMRANGE|TORANGE are optional parameters used to limit the areas of a volume or minidisk that are to be processed.

CYLRANGE|HEADRANGE–Specifies the starting and ending cylinders and starting and ending heads to be processed.

FROMRANGE|TORANGE–Specifies the starting track (cylinder and head) and the ending track (cylinder and head) to be processed.

The following table shows the parameter conditions when specifying part of the volume.

Parameter	Other Notes
CYLRANGE	If you specify CYLRANGE and do not specify HEADRANGE, all the heads of the specified cylinders are processed. Both the starting and ending values are required. If you specify an ending value greater than the last primary cylinder for the device, the last primary cylinder of the device (or minidisk) is used for the ending value.
HEADRANGE	If you specify HEADRANGE and do not specify CYLRANGE, the specified heads for all the primary cylinders on the volume (minidisk) are processed. Both the starting and ending values are required. If you specify an ending value greater than the maximum for the device, the device (minidisk) maximum is used for the ending value.
FROMRANGE	If you specify FROMRANGE and do not specify TORANGE, TORANGE is defaulted to the last primary cylinder of the device (minidisk).
TORANGE	If you specify TORANGE and do not specify FROMRANGE, FROMRANGE is defaulted to cylinder 0, track 0 (starting cylinder and track of the minidisk)

Note:

1. CYLRANGE|HEADRANGE and FROMRANGE|TORANGE are mutually exclusive pairs. Either pair is mutually exclusive with TRACKS. Either the TRACKS parameter or the range parameters must be specified.
2. Range parameters used with ERASEDATA can destroy large areas of a volume.
3. It is not recommended to process a large range of tracks online. If you process a range of more than 1000 cylinders online (in one invocation of the TRKFMT command), you may need to increase the amount of storage required to run (beyond the current 2M storage minimum needed for other commands).

Resource serialization when using TRKFMT



This section describes data integrity when you are processing DASD.

When TRKFMT processing occurs, the RESERVE macro is issued to obtain control of the device. DEQ is issued to release the device after processing is completed.

When TRKFMT is used, if a track is part of a data set, ICKDSF will enqueue on the data set while processing that track. Data set enqueue takes place when any one of the following conditions is true:

- The device is online to the operating system.

- The track is part of a non-VSAM data set.

If exclusive control of a data set cannot be obtained, a message is issued and processing continues on the next track.

The TOLERATE(ENQFAIL) parameter is provided to indicate that processing is to continue if the data set enqueue fails.

For tracks in VSAM data sets, TOLERATE(ENQFAIL) must always be specified when processing online.

Examples of the TRKFMT command

The following examples show different ways to code the TRKFMT command.

Any values specified here are examples only and should not necessarily be interpreted as the values for your system. Most show the use of the command in offline and online mode under MVS.



To process a volume in the Stand-Alone or CMS version:

1. Eliminate the MVS JCL.
2. Substitute the UNITADDRESS parameter for the DDNAME parameter.



To process a VSE version volume:

1. Replace the MVS JCL statements with VSE system control statements.
2. Substitute the SYSNAME parameter for the DDNAME parameter.

Processing tracks with the MVS version



The following examples show you how to process volumes with the MVS version of ICKDSF.

Processing of tracks in online mode

In this example, the volume is online to MVS. Each specified track is overwritten 1 time with the set of data patterns, and then the track is erased.

```
//EXAMPLE  JOB
//       EXEC  PGM=ICKDSF
//VOLUMEG  DD    UNIT=3390,DISP=OLD,VOL=SER=TST345
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
 TRKFMT DDNAME(VOLUMEG) VERIFY(TST345) ERASEDATA -
        TRACKS((9,2),(9,3),(12,0),(12,1))
/*
```

In this example, the volume is online to MVS. Because CYCLES(3) is specified, each specified track is overwritten 3 times with the set data patterns, and then the track is erased.

```
//EXAMPLE  JOB
//       EXEC  PGM=ICKDSF
//VOLUMEG  DD    UNIT=3390,DISP=OLD,VOL=SER=TST345
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
```

```
 TRKFMT DDNAME(VOLUMEG) VERIFY(TST345) ERASEDATA -
        TRACKS((9,2),(9,3),(12,0),(12,1)) CYCLES(3)
/*
```

Processing of tracks in offline mode

In this example, the volume is offline to MVS. Each specified track is overwritten 1 time with the set of data patterns, and then the track is erased.

```
//EXAMPLE  JOB
//         EXEC  PGM=ICKDSF
//SYSPRINT DD    SYSOUT=A
//SYSIN    DD    *
 TRKFMT UNITADDRESS(0345) VERIFY(TST345) ERASEDATA -
        TRACKS((12,3),(13,1),(11,3))
/*
```

Processing tracks in a Stand-Alone version



In this example, all tracks on cylinder 5 are processed.

```
TRKFMT UNITADDRESS(0345) VERIFY(TST345) ERASEDATA -
       CYLRANGE(5,5)
```

Processing tracks in a CMS version



In this example, all tracks on cylinder 5 are processed.

```
TRKFMT UNITADDRESS(0345) VERIFY(TST345) ERASEDATA -
       CYLRANGE(5,5)
```

Processing tracks in the VSE version



In this example, a volume previously initialized under VSE is processed. Each specified track is overwritten 1 time with the set of data patterns, and then the track is erased.

```
//  JOB      jobname
//  ASSGN    SYS010,345
//  EXEC     ICKDSF,SIZE=AUTO
    TRKFMT SYSNAME(SYS010) VERIFY(TST345) ERASEDATA -
           TRACKS((12,1),(12,2))
/*
/&
```

Part 3. Using ICKDSF to install and maintain FBA devices

Part 3. describes how to use ICKDSF commands to install and maintain FBA devices. For a list of FBA devices supported by ICKDSF, see Table 11 on page 7.

Chapter 25, “Examples of ICKDSF tasks—FBA devices,” on page 361 is an overview of the tasks you perform for installation and maintenance of the FBA devices. It provides guidelines to help you determine why, when, and how to run ICKDSF.

The other chapters in this section list the ICKDSF commands in alphabetic order. Each command explanation includes:

- A table summarizing the syntax of the command

  For a detailed description of the command syntax, see Chapter 3, “Understanding ICKDSF command statements,” on page 17.
- An explanation of required and optional parameters.
- A general description of the command and its use
- Examples

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Chapter 25. Examples of ICKDSF tasks—FBA devices

The examples in this chapter show the commands and parameters needed for the following tasks:

- Installing devices
- Resuming initialization from a checkpoint location
- Formatting devices for specific operating environments
- Problem determination
- Media maintenance
- Emulating devices
- Miscellaneous tasks

Default parameters are included only when they produce additional output. For complete descriptions of each command and more examples, see the individual commands beginning with Chapter 26, "ANALYZE command—FBA," on page 371.

Examples of ICKDSF commands used to install and maintain CKD devices appear in Part 2, "Using ICKDSF to install and maintain CKD devices," on page 67.

Installing new devices

When your IBM service representative completes the physical installation of a new device, you must complete the recommended installation procedure for that device. For all FBA devices, you use the INIT command.

For 3370, and 9335 devices, you use the INIT command to perform a maximal INIT. For all other FBA devices, you use the INIT command to perform a minimal INIT.

Minimal INIT–Refers to using the INIT command to write the volume label and FBAVTOC on volumes for use by VSE operating systems.

Maximal INIT–Refers to using the INIT command to check the block surface and then perform the minimal INIT.

Formatting a volume–Refers to making a volume usable in a specific operating environment.

Initializing a replaced HDA with a minimal INIT

INIT writes the volume label, VTOC, home address and record 0 on a volume. To surface check the volume for possible defects (not normally required for a new device), see "Checking disk surfaces" on page 365.

```
INIT UNITADDRESS(ccuu) NOVERIFY FBAVTOC(rbn,extent,cisize) -
     VOLID(serial) OWNERID(owner) NOMAP
```

Usage Notes:

- **Data on the volume is erased.**
- This example establishes a volume ID, an owner ID, and a FBAVTOC for the volume.
- 

If you operate in a VSE environment, add the PURGE parameter.

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Resuming initialization from a checkpoint location

You use the CONTINUE parameter to resume processing after ICKDSF automatically checkpoints itself while initializing a volume.

The examples that follow show how you use the INIT command with the CONTINUE parameter to resume processing from checkpoint block 5000. Checkpointing is assumed to occur every 20000 blocks.

- Example 1

  If after issuing:

```
INIT UNIT(ccuu) NOVFY CHECK(3)
```

  processing is interrupted, and you are unsure of the size of the block you are initializing, you can initialize part of the volume. Use CONTINUE to resume from the last checkpoint.

```
INIT UNIT(ccuu) NOVFY NOCHECK CONTINUE VOLID(volser) NOMAP
```

  Usage Notes:

  – Blocks 5000 through 24999 are processed to ensure that the data fields are readable.
  – The minimal initialization function is then performed.

- Example 2

  If after issuing:

```
INIT UNIT(ccuu) NOVFY CHECK(3)
```

  processing is interrupted, you can ensure processing starts from the beginning of the specified range.

```
INIT UNIT(ccuu) NOVFY CHECK(3) -
     BLOCKRANGE(3000,24000) NOCONTINUE VOLID(volser) NOMAP
```

  Usage Notes:

  – Blocks 3000 through 24000 are surface checked.
  – Blocks 24001 through 24999 are processed to ensure that the data fields are readable.
  – The minimal initialization function is then performed.

- Example 3

  If after issuing:

```
INIT UNIT(ccuu) NOVFY CHECK(3)
```

  processing is interrupted, you can surface check part of the volume.

```
INIT UNIT(ccuu) NOVFY CHECK(3) -
     BLOCKRANGE(3000,24000) CONTINUE VOLID(volser) NOMAP
```

  Usage Notes:

  – The blocks, starting at block 5000 and continuing for 20000 blocks, are surface checked.
  – No additional blocks are processed.
  – The minimal initialization function is then performed.

Formatting devices

Once your device is initialized, you must format it for your operating environment. To format your volume, use the:

INIT command for VSE
CPVOLUME command for VM

Formatting FBA minidisks



With the CMS or the stand-alone version of ICKDSF, you can use the INIT command to format an FBA minidisk for use.

This example initializes a minidisk at the minimal level by establishing a volume ID, an owner ID, and an FBA VTOC on the minidisk.

```
INIT UNITADDRESS(ccuu) NOVERIFY FBAVTOC(rbn,extent,cisize) -
     VOLID(serial) OWNERID(owner)
```

Formatting an entire volume with the CMS version



In this example, all 69750 pages on a 3370-1 volume are formatted. The allocation map indicates that all 69750 pages on the volume are allocated as PERM space.

Because NOREADCHECK is specified, a read-back check of the volume does not occur.

Because NOVERIFY is specified, any existing volume label is ignored, and the volume is labeled 'ESARES'.

```
CPVOLUME FORMAT UNIT(0150) NOVERIFY VOLID(ESARES) NOREADCHECK
```

Changing the volume serial Number and owner identification



You may specify either VOLID or OWNERID, or both. No other data on the volume is changed.

```
REFORMAT UNITADDRESS(ccuu) VERIFY(serial,owner) -
         VOLID(newserial) OWNERID(newowner)
```

Placing an FBAVTOC at the end of a volume



In the following example, ICKDSF puts the FBAVTOC at the end of the volume. This example allows ICKDSF to choose the location and size of the FBAVTOC. It is valid for any device.

```
INIT SYSNAME(sysxxx) NOVFY VOLID(volser) FBAVTOC(END) NOMAP
```

Writing the FBAVTOC



This example shows how you can write a FBAVTOC.

```
INIT SYSNAME(sysxxx) NOVERIFY VOLID(serial) -
     OWNERID(owner) FBAVTOC(rbn,extent,cisize) NOMAP
```

Problem determination

You can use ICKDSF to diagnose errors without the assistance of a service representative.

You can use the ANALYZE command to examine a device and the data on a volume to help determine the existence and the nature of errors. Dual copy volumes, which are in duplex or suspended duplex state, are supported by the ANALYZE command.

You use two parameters with the ANALYZE command:

- DRIVETEST which tests the hardware device
- SCAN which reads data on a volume

You can use the DRIVETEST parameter to ensure that device hardware can perform basic operations, such as seeks, reads, and writes. DRIVETEST can impact your system performance, but does not alter data.

You can use ANALYZE SCAN to read data that currently exists on a volume. If ANALYZE SCAN reads the data successfully the first time, no further rereading of the block takes place.

A **data check** is an error detected in the bit pattern read from the disk. If ANALYZE SCAN detects a data check on the first read, it issues further reads of the data. This ensures that the data check is not a random occurrence.

Data is read with subsystem and error recovery processes disabled to allow ANALYZE SCAN to identify all data checks. ANALYZE SCAN has no affect on user data on the volume.

You can enter DRIVETEST and SCAN independently or together. Data is never recorded in the error recording data set (ERDS) during ANALYZE SCAN or ANALYZE DRIVETEST processing. ERDS information is stored in SYSREC by VSE and in the error recording area by VM.

Investigating suspected drive problems

If you suspect a problem with a drive, use the ANALYZE command to determine:

- If the drive can perform basic operating functions correctly
- If all data can successfully be read from the disk surface

```
ANALYZE UNITADDRESS(ccuu) SCAN
```

Usage Notes:

- The data on the volume is not altered.
- Add the SPEED parameter to scan the maximum number of data blocks on each pass.



This option is not recommended for VM users; although SPEED makes the scanning process faster, it also keeps the drive busy and therefore degrades the performance of other VM users.

- Add the LIMITS parameter to specify only a limited area for scanning.
- For information on ANALYZE output, see to Chapter 26, “ANALYZE command—FBA,” on page 371.

Finding where INSPECT failed

This example shows how the checkpoint processing works. It is not meant to show you how to use INSPECT to perform media maintenance procedures.

If you issued the following INSPECT command to perform surface checking on an FBA device:

```
INSPECT UNIT(ccuu) NOVFY CHECK(3) -
        BLOCKRANGE(5000,25000) PRESERVE
```

and processing was interrupted on block 13656, you can use ANALYZE to locate the block that was being processed when the program stopped. For example, you can issue:

```
ANALYZE UNIT(ccuu) DRIVETEST
```

The DRIVETEST parameter is valid only for devices that have nonremovable storage media. For more information, see Chapter 26, “ANALYZE command—FBA,” on page 371.

Checking disk surfaces

Use the INIT command to check the surface of all blocks during initialization. INIT writes test patterns and then reads them back for every block on the volume. An alternate block is assigned for any primary block that is indicated as defective. For example:

```
INIT UNITADDRESS(ccuu) VERIFY(serial,owner) -
     FBAVTOC(rbn,extent,cisize) CHECK(3)
```

For more information, see “Conditionally assigning alternate blocks” on page 366.

Usage Notes:

- **Data on the volume is erased.** If you do not want to erase your data, dump it before processing begins.
- The CHECK(3) parameter ensures that all three data patterns available for surface checking are used. A value higher than 3 merely repeats the three basic patterns. If you select 1 or 2 for the number of patterns, ICKDSF needs less time to run, but the surface checking is less thorough.
- 

  If you operate in VSE, add the PURGE parameter.
- The MAP parameter is a default. MAP prints a volume map of alternate blocks assigned during this process.
- No attempt is made to reclaim defective blocks; for the recommended procedure, see “Reclaiming flagged blocks” on page 366.

Media maintenance

Once you suspect media as a cause of data checks, you can use ICKDSF to assign alternate blocks, rewrite the data, or reclaim the block. For more information about performing media maintenance, see *Maintaining IBM Storage Subsystem Media*, GC26-4495.

Conditionally assigning alternate blocks

Use the INSPECT command to check the surface of a block and to assign an alternate block if the surface-checking process indicates that the block is defective. When PRESERVE is used, the data is moved from the current block to the assigned alternate block.

```
INSPECT UNITADDRESS(ccuu) VERIFY(serial,owner) BLOCKS(rbn) -
        CHECK(3) NOPRESERVE|PRESERVE
```

Usage Notes:

- The CHECK(3) parameter ensures that the three data patterns available for surface checking are all used. A value higher than 3 merely repeats the three basic patterns. If you select 1 or 2 for the number of patterns, ICKDSF needs less time to run, but the surface checking is less thorough.
- You may specify up to 20 blocks for conditional assignment by adding them to the BLOCKS parameter (separated by commas).
- **NOPRESERVE erases the data on the block.** Use this parameter only if there is no meaningful data on the block or if block errors prevent successful use of PRESERVE.
- For IBM 3370 FBA devices, assignment of an alternate block is generally done on the same physical cylinder on which the defective block resides, thereby minimizing any performance degradation experienced when seeking to an independent alternate cylinder.

  A block is therefore considered defective for correctable data checks as well as for uncorrectable data checks when the correctable data check is made visible to ICKDSF.

Unconditionally assigning alternate blocks

Use the INSPECT command to unconditionally assign an alternate block regardless of the condition of the primary block.

```
INSPECT UNITADDRESS(ccuu) VERIFY(serial,owner) BLOCKS(rbn) -
        ASSIGN NOCHECK
```

Usage Notes:

- If the inspected block has a current alternate, a new alternate is assigned.
- You may specify up to 20 blocks for unconditional assignment by adding them to the BLOCKS parameter (separated by commas).

Reclaiming flagged blocks

In general, a block should be flagged defective only if ICKDSF finds a known defect. If a volume contains multiple-flagged blocks that no longer need to be flagged, the defective blocks may be reclaimed.

To reclaim blocks, first use the ANALYZE command to verify that the device is operative. Then, if there are no problems with the device, use the INIT command to reclaim previously flagged blocks.

```
ANALYZE UNITADDRESS(ccuu)

IF LASTCC ≤ 4 THEN -
INIT UNITADDRESS(ccuu) VERIFY(serial,owner) -
     FBAVTOC(rbn,extent,cisize) CHECK(3) RECLAIM
```

Usage Notes:

- **Data on the volume is erased.** If you do not want to erase your data, dump it before processing begins.
- After all assigned alternate blocks (except factory-flagged blocks) become unassigned, the INIT command makes a thorough surface check of all nondefective primary blocks and factory-assigned alternate blocks. Any block found defective and any block previously flagged defective at the factory are assigned alternate blocks.
- The CHECK(3) parameter ensures that the three data patterns available for surface checking are all used. A value higher than 3 merely repeats the three basic patterns. If you select 1 or 2 for the number of patterns, ICKDSF needs less time to run, but the surface checking is less thorough.
- 

If you operate in VSE, add the PURGE parameter.
- The MAP parameter is a default. MAP prints a volume map of alternate blocks assigned during this process.
- If a maximal initialization, with the RECLAIM parameter, ends with an I/O error before INIT ends, the volume might have one or more defective primary blocks with invalid alternate block pointers. If this occurs, determine what caused INIT to end, then rerun the maximal INIT RECLAIM again. Any future attempt to initialize the volume will force the maximal INIT RECLAIM to continue.

Saving data during surface checking

The following examples show how you can recover after an INSPECT fails. They show how the checkpoint processing works and are not meant to show you how to use INSPECT to perform media maintenance procedures.

Use PRESERVE to save a copy of the data on the block at a backup location and in storage. If processing does not complete, ICKDSF finds and restores the block it was processing when the INSPECT was interrupted. (Provided PRESERVE was initially able to read the track successfully.)

- Example 1

  In the following example, INSPECT surface checks all blocks from the beginning of the volume through block 25000. PRESERVE saves the data during surface checking at the backup location and in storage.

```
INSPECT UNIT(ccuu) NOVFY CHECK(1) -
        BLOCKRANGE(0,25000) PRESERVE NOMAP
```

- Example 2

  In the following example, INSPECT surface checks an FBA device and is interrupted on block 13656. PRESERVE saves the data during surface checking at the backup location and in storage.

```
INSPECT UNIT(ccuu) NOVFY CHECK(3) -
        BLOCKRANGE(5000,25000) PRESERVE
```

- Example 3

  If after issuing:

```
INSPECT UNIT(ccuu) NOVFY CHECK(3) -
        BLOCKRANGE(5000,25000) PRESERVE
```

  processing is interrupted on block 13656, you can surface check a different part of the volume:

```
INSPECT  UNIT(ccuu) NOVFY CHECK(3) -
         BLOCKRANGE(50000,100000) PRESERVE NOMAP
```

  Usage Notes:

  - Block 13656 is surface checked. If any data existed for block 13656 when processing was interrupted, the data is rewritten on block 13656.
  - Surface checking is then performed for all the blocks within the new range.
- Example 4

  If after issuing:

```
INSPECT UNIT(ccuu) NOVFY CHECK(3) -
        BLOCKRANGE(5000,25000) PRESERVE
```

  processing is interrupted on block 13656, you can ensure the usability of the block and recover the data.

```
INSPECT  UNIT(ccuu) NOVFY
```

  13656 is surface checked. If any data existed for block 13656 when processing was interrupted, the data is rewritten on block 13656.
- Example 5

  The following example performs the data verification test for blocks 0 to 100000. The drive test is not performed. You can substitute LIMITS for BLOCKRANGE.

```
ANALYZE UNIT(ccuu) SCAN NODRIVE BLOCKRANGE(0,100000)
```

Performing miscellaneous tasks with ICKDSF

The following examples show how you can:

- Erase a volume
- Print a block assignment map

Erasing a volume

If the data is residual, you can reformat the volume.

For VSE volumes, use the INIT command.
For VM volumes use CPVOLUME FORMAT.



The following example shows you how to use INIT to erase data on an VSE volume. INIT restores the FFVDP on the volume.

```
INIT SYSNAME(sysxxx) NOVERIFY VOLID(serial) PURGE
```

Printing a block assignment map

Use the MAPALT command to format and print a detailed report of alternate block assignment status for the volume.

```
MAPALT UNITADDRESS(ccuu) DETAIL
```

Usage Notes:

- The data on the volume is not altered.
- Add the LIMITS parameter to restrict the report to a specific range of blocks.

- To produce only a summary report, remove the DETAIL parameter.
- You can also use INIT or INSPECT to get a map of alternate blocks assigned.

Emulating a CKD device on an FBA device

For more information, see “Emulating devices” on page 82.

Chapter 26. ANALYZE command—FBA



The ANALYZE command examines the drive and the user's data on a volume to determine if errors exist. The output:

- Shows drive problems on nonremovable media
- Shows media problems
- Assists in locating and fixing problems

The IBM 0671, 9313, 9332, and 9336 are not supported by the ANALYZE command.

ANALYZE has two basic functions: drive test and data scan. For more general information on what ANALYZE does, see “Problem determination” on page 364.

Syntax

ANALYZE
Required Parameters SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*)|REALADDR(*ccuu*)
Optional Parameters DRIVETEST|NODRIVETEST LIMITS(*start,end*)|BLOCKRANGE(*start,end*)|ALL SCAN|NOSCAN SPEED|NOSPEED USERID(*user's ID*)

Required parameters

SYSNAME|UNITADDRESS|REALADDR parameter: identify the volume

Parameter/ Abbreviations	Description
SYSNAME(*sysxxx*)	Required to identify a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for a minidisk, Stand-Alone, or CMS version volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. For *ccuu*, specify the address (3 or 4 hexadecimal digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated volume or minidisk. The unit address is the device number.
REALADDR(*ccuu*)RADDR CMS	Used to specify the real address of a volume. This parameter is valid only when you are running the CMS version of ICKDSF and you have DEVMAINT authority. For *ccuu*, specify the real address (3 or 4 hexadecimal digits) of the channel and unit of the volume. REALADDR is mutually exclusive with UNITADDRESS, SYSNAME, and USERID.
Default:	None.
Restrictions:	None.

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Optional parameters

DRIVETEST|NODRIVETEST parameter: specify the drive test

Parameter/ Abbreviations	Description
DRIVETEST **DRIVE**	Runs the drive test.
NODRIVETEST **NODRIVE**	Bypasses the drive test.
Default:	DRIVETEST
Restrictions:	NODRIVE NOSCAN performs no functions. You cannot run multiple DRIVETESTs on a volume or minidisk. With the CMS version of ICKDSF, DRIVETEST is valid for dedicated devices.

LIMITS|BLOCKRANGE|ALL parameter: specify data verification area

Parameter/ Abbreviations	Description
LIMITS(*start,end*) **LIMIT** **LIMS** **LIM**	Specifies the area of the disk where data verification is to be performed. *start,end* specifies the relative starting and ending block numbers of the data verification tests. The values can be expressed in decimal or hexadecimal, must be equal or in ascending order, and must fall within the device address limits. For device limits, see Table 52 on page 387.
BLOCKRANGE (*start,end*) **BLKRANGE** **BLOCKR** **BLKR**	For *start,end*, specify the starting and ending relative block numbers to be verified. The values can be expressed in decimal or hexadecimal and must fall within the device limits. See Table 52 on page 387 for device limits. BLOCKRANGE is identical in function to LIMITS and is included for consistency with other ICKDSF commands.
ALL	Reads all blocks of a volume or minidisk during the data verification tests.
Default:	All blocks is the default if you do not specify LIMITS or BLKR.
Restrictions:	LIMITS, BLOCKRANGE, or ALL apply only when the SCAN parameter has been specified. LIMITS, BLOCKRANGE, and ALL are mutually exclusive.

SCAN|NOSCAN parameter: run data verification tests

Parameter/ Abbreviations	Description
SCAN **SCN**	Indicates that you want the data verification test to be run. Data verification is run if you specify SCAN, and any of the following is true: • The drive test completed successfully. • The drive test has been bypassed (NODRIVE).
NOSCAN **NOSCN** **NSCAN** **NSCN**	Indicates that you do not want the data verification test to be run.
Default:	NOSCAN
Restrictions:	None.

SPEED|NOSPEED parameter: specify data verification tests

Parameter/ Abbreviations	Description
SPEED	Specifies that each I/O will read the maximum number of blocks: 744 blocks for the 3370, and 426 blocks for the 9335.
NOSPEED **NSPEED**	Specifies that each I/O will read the minimum number of blocks: 248 blocks for the 3370, and 71 blocks for the 9335.
Default:	NOSPEED
Restrictions: 	SPEED is not recommended for VM operating system or guest minidisks that are part of a volume where other users are active.

USERID parameter: specify another user's minidisk



Parameter/ Abbreviations	Description
USERID(*user's ID*) **UID**	Performs the ANALYZE data verification test on another user's minidisk. For *user's ID*, substitute the 1 to 8 characters of the ID of the user whose minidisk you want to verify. For more information on processing minidisks, see Chapter 8, "ICKDSF versions supported as guests under VM," on page 65.
Default:	If USERID is not specified, your own minidisk is verified.
Restrictions:	USERID can be specified only if you are using the CMS version of ICKDSF and have DEVMAINT authority. USERID is ignored in all other system environments. USERID is mutually exclusive with REALADDR. You must use UNITADDRESS with USERID. UNITADDRESS specifies the virtual address of the minidisk.

Detecting hardware problems with DRIVETEST

The drive test is a general exercising of the storage device by issuing locate, read, and write commands. From the results, ANALYZE determines the drive's ability to perform expected actions.

ANALYZE does not require exclusive control of the drive under test. Most of ANALYZE's channel command word (CCW) chains (its channel programs) do not hold the drive busy for longer than 0.5 seconds. However, if the operating system runs error recovery procedures as a result of I/O errors detected during ANALYZE processing, the error recovery procedures may hold the drive busy for a longer period of time.

ANALYZE supports FBA block devices in fixed block mode only. This mode is based on data transfers of 512-byte blocks for storing and retrieving data.

Testing the drive and logical volume with ANALYZE

ANALYZE determines that the drive is fully operational by performing I/O operations on the CE block that test the drive's functional capabilities. Each I/O operation, called a CCW chain, tests a specific function of the drive and logical volume. Tests are executed in order of increasing complexity.

Drive problems that can be detected during ANALYZE's initial tests are access arm positioning errors and the ability to read and write.

If you have issued PRESERVE or CONTINUE for the data that exists on the CE cylinder, ANALYZE does not destroy this data. This data is written by an INSPECT or INIT. If this data exists, ANALYZE bypasses writing over the data and reports the presence of the data.

The drive test is optional. It is controlled by the DRIVETEST|NODRIVETEST parameters.

Verifying data records with ANALYZE

The ANALYZE data verification test determines the status of the drive's storage medium by reading (without data transfer across the channel to the processor) all data records on the volume or minidisk if you are running the CMS version of ICKDSF. If a data check is detected during the test, both the address and relative block number are noted in a diagnostic message on the printer. When a block is found to be defective, you can bypass the defect by assigning an alternate block to it.

Options for data verification include:

- Specifying data verification of the whole volume (or minidisk for the CMS version).
- Selecting a range of data to be verified by blocks (LIMITS or BLOCKRANGE parameters).
- Controlling the duration of each I/O by specifying either SPEED or NOSPEED.

  NOSPEED–Specifies that each I/O will read the minimum number of blocks: 248 blocks for the 3370, and 71 blocks for the 9335.

  SPEED–Specifies that each I/O will read the maximum number of blocks: 744 blocks for the 3370, and 426 blocks for the 9335.

Solving problems with ANALYZE output

The ANALYZE command is designed to produce output that can be used to aid in problem determination for a current volume. Certain errors that might occur are correctable by the device and its storage control. These errors are normally never seen by the software. Other errors are never seen by the user. They can be corrected by the software usually under the operating system error recovery procedures.

Some errors are unrecoverable under all procedures. Errors that are persistent and that cannot be corrected by the device's internal error-correction circuitry result in messages to the output device.

As part of an installation's operating procedure, ANALYZE output can assist in determining whether or not recovery procedures can or should be executed. However, the use of ANALYZE output by customer engineers to isolate and to repair drive malfunctions should not replace the use of more detailed diagnostic tools. ANALYZE output in such instances should serve only as an initial reference. It may indicate the final problem symptom but does not specifically isolate the problem source.

Assumed conditions when running ANALYZE

When you run ANALYZE, the following conditions are assumed to exist:

- Each block has a properly formatted ID field and 512-byte data area.
- The blocks used by ANALYZE in the CE area are defect-free.

ANALYZE performs two testing procedures to detect errors—the drive test and the data verification test.

CMS version minidisk support



When you are using the CMS version of ICKDSF, you can use the ANALYZE command to perform the data verification test for a minidisk.

The following parameters are valid for minidisks:

ALL, LIMITS|BLOCKRANGE, SCAN|NOSCAN, SPEED|NOSPEED, and UNITADDRESS

Note: You must have DEVMAINT authority to issue the ANALYZE command for the IBM 9335.

The following parameters are valid only when you are using the CMS version of ICKDSF and have DEVMAINT authority (as defined in the CP directory):

USERID: With DEVMAINT authority you can use the USERID parameter to perform the data verification test on another user's minidisk. All of the parameters listed above are valid in this mode.

REALADDR: With DEVMAINT authority you can use the REALADDRESS parameter to specify the real device address to perform the data verification test on a volume. UNITADDRESS is not valid in this mode. All of the other parameters listed above are valid. For more information, see Chapter 5, “Getting started with the CMS version,” on page 37.

Examples of the ANALYZE command

The following examples show different ways to use the ANALYZE command.

Any values specified here are examples only and should not necessarily be interpreted as the values for your system.

Analyzing volumes with the Stand-Alone version



The following examples show how you can analyze a volume using the Stand-Alone version of ICKDSF.

Performing a drive test

In this example, the 3370 Direct Access Storage drive tests are performed:

```
ANALYZE UNITADDRESS(0141)
```

Using keyword abbreviations, you could have specified:

```
ANALYZE UNIT(0141)
```

Performing a drive test and data verification test

In this example, the 3370 Direct Access Storage drive tests are performed and are followed by the data verification tests for the entire 3370 volume. ALL is the default.

```
ANALYZE UNITADDRESS(0141) SCAN
```

Performing a partial data verification test

In this example, the 3370 Direct Access Storage drive tests are performed, followed by partial data verification tests starting at relative block number 25 and ending at relative block number 50. Abbreviations have been used.

```
ANALYZE UNIT(0141) LIMS(X'19',X'32') SCN
```

Analyzing volumes with the CMS version



The following examples show how you can analyze a volume using the CMS version of ICKDSF.

Analyzing another user's minidisk

In this CMS version example, the data verification test is performed for another user's minidisk. You specify the USERID parameter to ANALYZE the minidisk which is owned by user SMITH at the user's virtual address 0351. You must have DEVMAINT authority (as defined in the CP directory) to specify the USERID parameter.

```
ANALYZE UNIT(0351) SCAN USERID(SMITH) NODRIVETEST
```

Analyzing a volume specifying a real address

In this CMS version example, the data verification test is performed for a volume at real address 290 by using the REALADDR parameter. You must have DEVMAINT authority (as defined in the CP directory) to specify the REALADDR parameter.

```
ANALYZE REALADDR(290) SCAN NODRIVETEST
```

Analyzing a VSE version volume



In this example, drive tests are performed on the volume SYS001. Specification of the NOSCAN parameter indicates that data verification tests are not to be performed.

```
// JOB   jobname
// ASSGN SYS001,150
// EXEC  ICKDSF,SIZE=AUTO
   ANALYZE SYSNAME(SYS001) NOSCAN
/*
/&
```

Diagnostic messages

ANALYZE prints diagnostic messages to the output device. You or your customer engineer can use them as an aid in determining what type of problem might exist on the volume.

The informational and diagnostic messages are listed and explained in Appendix A, “Device Support Facilities messages (ICK),” on page 419.

In addition, ANALYZE produces a movable-head and fixed-head error table that summarizes errors associated with the read/write circuitry and data verification. This table is printed on the system printer after all tests are completed.

Figure 33 on page 377 shows the format of the movable-head error table. The physical heads are listed in the first column on the left. A character 'X' is placed in the column corresponding to the type of error detected for a particular head.

```
                        MOVABLE HEAD ERROR TABLE
                         SEEK VERIFY                DATA CHK   DATA COMP
HEAD NUMBER   DATA CHK      CHECK      WRITE CHK     CE CYL     ERROR
    00 -----|----------|-------------|-----------|----------|----------|
    01 -----|----------|-------------|-----------|----------|----------|
    02 -----|----------|-------------|-----------|----------|----------|
    03 -----|----------|-------------|-----------|----------|----------|
    04 -----|----------|-------------|-----------|----------|----------|
    05 -----|----------|-------------|-----------|----------|----------|
    06 -----|----------|-------------|-----------|----------|----------|
    07 -----|----------|-------------|-----------|----------|----------|
    08 -----|----------|-------------|-----------|----------|----------|
    09 -----|----UC----|-------------|-----------|----------|----------|
    10 -----|----U-----|------X------|-----X-----|----X-----|-----X----|
    11 -----|-----C----|------X------|-----X-----|----X-----|-----X----|
```

In the data check column:

U
Indicates at least one ECC uncorrectable error occurred on this head.

C
Indicates at least one ECC correctable error occurred on this head.

UC
Indicates at least one ECC correctable and one ECC uncorrectable error occurred on this head.

X
Indicates at least one error, as indicated by the column heading, has occurred on this head.

For the actual number of errors that occurred for a specific head, examine previous messages provided in the ANALYZE output.

Figure 33: Movable-head error table—FBA

Chapter 27. CONTROL command—FBA



You can use the CONTROL command to clear a SOFT or SPID fenced state for a single device or all of the devices in a logical subsystem. The CONTROL command can also be used to obtain device configuration information.

The CONTROL command can be used for 2107-FBA devices only.

Syntax

CONTROL
Required Parameters: SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*)
Optional Parameters: CLEARFENCE CONFIGURE(DISPLAY) SCOPE(DEV|LSS) SERIAL(*serial-number*) **SOFT**|SPID|ALL SUBCHSET(*subchset-identifier*)

Required parameters

SYSNAME|UNITADDRESS parameter: identify the volume

Parameter/ Abbreviations	**Description**
SYSNAME(sysxxx)	Required for a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for an offline MVS volume, a Stand-Alone volume, and an attached CMS volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. In MVS, the volume must be on a path that is online. If the volume is on a path that is offline, the program might enter a nonterminating wait state. For *ccuu*, specify the address in hexadecimal (3 or 4 digits) of the channel and unit for the volume. For the CMS version, specify the virtual address of the dedicated volume. The unit address is the device number.
Default:	None.
Restrictions:	None.

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Optional parameters

CLEARFENCE parameter: clear a fence status

Parameter/ Abbreviations	Description
CLEARFENCE **CLEARF** **CLRF**	Clears a fence status of a path or a device.
Default:	None
Restrictions:	The CLEARFENCE parameter requires the SOFT, SPID or ALL parameter.

CONFIGURE(DISPLAY) parameter: display subsystem information

Parameter/ Abbreviations	Description
CONFIGURE(DISPLAY) **CONFIG(DISP)** **CFG(DISP)**	Use to display subsystem information, such as subsystem serial numbers, subsystem ID, channel connection address, machine type, and plant of manufacture. Also used to display microcode lic and bundle level if available.
Default:	None.
Restrictions:	If the microcode lic level is available but the bundle level is not, just the microcode lic level is displayed.

SCOPE parameter: clear the fenced state for a single device or all of the devices in a logical subsystem

Parameter/ Abbreviations	Description
SCOPE(*scope*)	Clears the fenced state (soft, SPID or both) for a single device or all of the devices in a logical subsystem. *scope* is DEV or LSS. DEV clears the fenced state for a single device identified by the UNITADDRESS parameter in the storage facility image (SFI) identified by the SERIAL parameter. LSS clears the fenced state for all of the devices in the logical subsystem containing the device identified by the UNITADDRESS parameter in the SFI identified by the SERIAL parameter. **Note:** When used with the SCOPE parameter, the UNITADDRESS parameter is allowed for online volumes.
Default:	None.
Restrictions:	The SCOPE parameter requires the CLEARFENCE, SERIAL and UNITADDRESS parameters.

SERIAL parameter: specify the subsystem image serial number

Parameter/ Abbreviations	Description
SERIAL(*serial*)	Specifies the serial number of the subsystem image. *serial* is the last 5 digits of the 12-digit subsystem image serial number. To obtain the subsystem image serial number, use the CONTROL CONFIGURE(DISPLAY) command.
Default:	None.
Restrictions:	The SERIAL parameter requires the CLEARFENCE and SCOPE parameters.

SOFT|SPID|ALL parameters: specify the fenced state to be cleared

Parameter/ Abbreviations	Description
SOFT	Clears the soft fenced state for a single device or all of the devices in a logical subsystem.
SPID	Clears the SPID fenced state for a single device or all of the devices in a logical subsystem.
ALL	Clears both the soft and SPID fenced state for a single device or all of the devices in a logical subsystem.
Default:	SOFT.
Restrictions:	The SOFT, SPID and ALL parameters require that the CLEARFENCE, SCOPE, and SERIAL parameters are also specified.

SUBCHSET parameter: specify the subchannel set identifier



Parameter/ Abbreviations	Description
SUBCHSET(*subchset-identifier*)	Specifies the subchannel set identifier for the volume you want to issue the CONTROL command to. For *subchset-identifier* substitute a decimal subchannel set identifier that is valid for the level of z/OS on which you are issuing the command.
Default:	None.
Restrictions:	The SUBCHSET parameter requires that the UNIT parameter is also specified. It is valid only with z/OS V1R10 and higher.

Examples of the CONTROL command

Display subsystem information and microcode lic and bundle level

The following example shows the CONTROL command used with the CONFIGURE(DISPLAY) parameter to display subsystem information, such as the serial number of a control unit and the microcode lic and bundle level:

```
CONTROL UNIT(EC01) CONFIG(DISPLAY)
```

```
 ICK00700I DEVICE INFORMATION FOR EC01 IS CURRENTLY AS FOLLOWS:
           PHYSICAL DEVICE = 3370-2
           STORAGE CONTROLLER = 3880
           STORAGE CONTROL DESCRIPTOR = 01
           DEVICE DESCRIPTOR = 04
 ICK04000I DEVICE IS IN SIMPLEX STATE
 ICK00706I SUBSYSTEM INFORMATION FOR EC01 IS CURRENTLY AS FOLLOWS:
           SUBSYSTEM SERIAL NUMBER = TN140
           SUBSYSTEM IMAGE SERIAL NUMBER = TN141
           SUBSYSTEM IMAGE MACHINE TYPE = 2107
           SUBSYSTEM IMAGE PLANT OF MANUFACTURE = 75
           SUBSYSTEM ID = FF11
           CHANNEL CONNECTION ADDRESS = 01
           PATHS/CLUSTER ID = N/A
           LSS NUMBER = 11
           SYSTEM ADAPTER ID = 0032
           HOST LINK ADDRESS = 000C0009
           MICROCODE LIC LEVEL = 7.8.20.221
           BUNDLE LEVEL = 88.20.91.0
```

Chapter 28. CPVOLUME command—FBA



The CPVOLUME command is used to format a volume for use in a VM environment. It is used to perform the following functions associated with formatting VM volumes for CP use:

FORMAT
Write records required by CP on page 0. Write 4096-byte CP page records on an entire volume or on a range of pages. For more information about CP page records, see "Formatting pages" on page 386.

ALLOCATE
Update the allocation map to indicate how each page on a CP-formatted volume is to be used.

EXAMINE
Read a CP-formatted volume to verify that it is properly formatted and that records can be read without error.

LIST
Display the allocation map, volume serial, and device information, such as the number of pages.

LABEL
Rewrite the volume serial.

Formatting CP volumes for a specific VM operating system

The CPVOLUME command formats volumes for use on VM/ESA or z/VM systems.

Syntax

CPVOLUME
Required Parameters FORMAT|ALLOCATE|LABEL|LIST|EXAMINE| OWNER UNITADDRESS(*ccuu*) VERIFY(*serial*/**NONE**)|NOVERIFY
Optional Parameters NOSSI|SSINAME(*ssiname*) NOSYS|SYSNAME(*sysname*) RANGE(*start,end*) READCHECK|NOREADCHECK TYPE((*type of allocation,start,end*)...) VOLID(*serial*)

Required parameters

FORMAT|ALLOCATE|LABEL|LIST|EXAMINE|OWNER parameter: specify function

Parameter/ Abbreviations	**Description**
FORMAT **FMT**	Formats a volume. An entire volume or a range of pages can be formatted.

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Parameter/ Abbreviations	Description
ALLOCATE **ALLOC**	Updates the allocation map of a previously formatted volume.
LABEL	Rewrites the volume serial of a previously formatted volume.
LIST	Displays volume information for a previously formatted volume.
EXAMINE **EXAM**	Examines entire volume or range of pages on a previously formatted volume for errors.
OWNER	Used with SSINAME, NOSSI, SYSNAME and NOSYS, sets the VM SSI name and system name for the volume.
Default:	None.
Restrictions:	FORMAT, ALLOCATE, LABEL, LIST, EXAMINE and OWNER are mutually exclusive.

UNITADDRESS parameter: identify the volume

Parameter/ Abbreviations	Description
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required to specify the address of the volume to be processed. For *ccuu*, specify the virtual address of the volume. The unit address is the device number.
Default:	None.
Restrictions:	None.

VERIFY|NOVERIFY parameter: verify the volume serial number

Parameter/ Abbreviations	Description
VERIFY(*serial*) **VFY**	Required when you want to verify the volume serial number before performing the requested function on the volume. If the volume serial number does not match that found on the volume, the CPVOLUME command ends. For *serial*, substitute 1 to 6 alphanumeric characters for the volume serial number. To verify that a volume serial number does not exist, substitute the string *NONE* for *serial*. If no volume serial exists, or if the volume serial is actually "*NONE*", the CPVOLUME operation continues. If a volume serial exists, the CPVOLUME command ends.
NOVERIFY **NOVFY** **NVFY**	Required when you want to bypass verification of the volume serial number.
Default:	None. You must specify either VERIFY or NOVERIFY.
Restrictions:	When you specify the VERIFY parameter and verification fails, the command stops running.

Optional parameters

NOSSI|SSINAME parameter: specify VM SSI name

Parameter/ Abbreviations	Description
NOSSI	Causes no VM single-system image (SSI) name to be assigned to the volume.
SSINAME(*ssiname*) **SSIN(*ssiname*)**	Causes a VM SSI name to be assigned to the volume. For ssiname, specify a 1 to 8 character VM SSI name.
Default:	None.

Parameter/ Abbreviations	Description
Restrictions:	Valid only when you specify OWNER. Also requires SYSNAME or NOSYS.

NOSYS|SYSNAME parameter: specify system name

Parameter/ Abbreviations	Description
NOSYS	Causes no system name to be assigned to the volume.
SYSNAME(*sysname*) **SYSN(*sysname*)**	Causes a system name to be assigned to the volume. For *sysname*, specify a 1 to 8 character system name.
Default:	None.
Restrictions:	Valid only when you specify OWNER. Also requires SSINAME or NOSSI.

RANGE parameter: specify the range of pages

Parameter/ Abbreviations	Description
RANGE*(start,end)*	Specifies the range of pages that are to be formatted or examined. Use *start,end* to specify a range of pages.
Default:	If RANGE is not specified, the default is the entire volume.
Restrictions:	Valid only when you specify either FORMAT or EXAMINE.

READCHECK|NOREADCHECK parameter: specify read-back check

Parameter/ Abbreviations	Description
READCHECK **READCHK** **RDCHECK** **READ**	Performs a read-back check for each page after it is formatted. If read-back check media errors are detected, it issues the INSPECT command to repair the block.
NOREADCHECK **NOREADCHK** **NOREAD** **NREAD**	Specifies not to perform a read-back check.
Default:	READCHECK
Restrictions:	READCHECK is valid only when you specify FORMAT.

TYPE parameter: specify the type of allocation

Parameter/ Abbreviations	Description
TYPE((*type of allocation, start,end)...)	Specifies the type of allocation. Multiple statements of each *type of allocation* can be specified (up to 100). Be careful when you use multiple statements. Each succeeding statement modifies allocation without regard to previous statements. Use *start,end* to specify the pages required for the *type of allocation*. Specify *type of allocation* as follows: **Type** **Allocates...** **DRCT** Directory space **PAGE** Paging space **PARM** Disk space for CP PARM **PERM** Permanent space **SPOL** Spooling space for VM **TDSK** Temporary disk space You can have back-to-back PARM disks.
Default:	None. You must specify *type of allocation* and *start,end*.
Restrictions:	When a volume is formatted for the first time, any space not specified by DRCT, PAGE, PERM, and TDSK parameters is allocated as PERM. Subsequently, the allocation does not change unless you specify TYPE. Once you have allocated PARM as the *type of allocation*, you must reallocate the entire range if a change is required. DRCT, SPOL, and PAGE may not exceed 1,677,215 pages.

VOLID parameter: specify the volume serial number

Parameter/ Abbreviations	Description
VOLID	Writes the volume serial number in the volume label.
Default:	If VOLID is not specified, the existing volume serial number is used. If there is no current volume serial number, then the system issues 'NONE'.
Restrictions:	If VOLID is not specified, the existing volume serial number is used. If there is no current volume serial number, then the system issues 'NONE'.

Formatting pages

FBA volumes store data in 512-byte blocks. A CP-formatted volume stores data in 4096-byte logical records. These records are referred to as **CP pages**. Eight FBA blocks hold one CP page record.

The unit for formatting and allocation is the page. CPVOLUME formats a page by writing 0s in each of the 512-byte blocks assigned to the page. Pages are numbered sequentially beginning with page 0. Blocks are also numbered sequentially beginning with block 0. For example, to format page 2, CPVOLUME writes 0s in blocks 16-23.

The first 32 blocks (pages 0, 1, 2, and 3) are reserved for system use. These reserved pages are formatted with records that include the volume label and allocation map. The allocation map indicates how each page on the volume is to be used by CP. Always format pages 0 and 1 before any other pages.

All of the pages on a volume do not have to be formatted, only those pages that you want initialized with 0s. To format an entire volume or limit the operation to part of a volume, issue the RANGE parameter. If you omit the range parameter, CPVOLUME assumes that the range is for the entire volume. If you specify a range that does not begin with page 0, then pages 0 and 1 must have been previously formatted.

If you specify READCHECK, CPVOLUME reads and checks the pages to ensure that there are no errors.

If you specify READCHECK and a data check is encountered on a page:

1. ICKDSF issues INSPECT to check the surface of the blocks in the page.
2. INSPECT performs skip displacement surface checking to eliminate data checks from the blocks
3. If required, INSPECT will assign an alternate block.
4. After the blocks have been inspected, the page is formatted again, and the FORMAT operation continues.

When formatting is complete, the allocation map is updated from any allocation TYPE statements that you specified in the CPVOLUME FORMAT command.

The maximum block/page numbers for FBA devices are shown in Table 52 on page 387.

Table 52: Maximum block and page numbers for FBA devices

Device	High Block	High Page
0671-0	574 559	71 819
0671-4	615 383	76 922
0671-8	513 071	64 133
3370-1	557 999	69 749
3370-2	712 751	89 093
9313	246 239	30 779
9332-400/402	360 035	45 003
9332-600/602	554 799	69 349
9335	804 713	100 588
9336-10	920 114	115 013
9336-20	1 672 880	209 109
FBA—SCSI	2 147 483 640	268 435 455

Formatting blocks 0-15

CPVOLUME formats blocks 0-15 with the following records:

BLOCK	Record Created	Description
0	IPL record	CPVOLUME creates an IPL record that puts the system into a wait state if the volume is IPLed before the CP nucleus is built.

BLOCK	Record Created	Description
1	Volume Label record	The owner field of the label record contains "CP370" if the volume is formatted for use on a System/370 VM system.
2	OS/VTOC Format 4 and Format 5 DSCBs	The VTOC records created by CPVOLUME indicate that no space is available on the volume.
3-4	Allocation Map	Consists of 12-byte entries, each of which describes a range of pages on the volume and the usage of those pages (PERM, DRCT, SPOL, etc.). The map can describe up to 85 allocation ranges.
5-12	Checkpoint record	CPVOLUME writes 0s in this record. The checkpoint record is used by CP to save and retrieve information for a warm start.
13-15	Reserved	
16-31	Reserved for VM system use.	

Updating the allocation map

Use ALLOCATE to update the allocation map. All pages on a volume are initially allocated as PERM by CPVOLUME. To make a change to the allocation map, specify *type of allocation* followed by a range of pages. For example, CPVOLUME ALLOCATE TYPE(TEMP,100,1999) indicates that the 1900 pages from 100 to 1999 should be allocated as temporary disk space.

Examining pages for errors

Use EXAMINE to verify that pages are CP-formatted and readable without error. You specify a range of pages to be examined, which may be the entire volume. CPVOLUME reads each page to ensure that the data in each block of a page can be read without error. EXAMINE will report the block number of each block that contains a data check.

The EXAMINE function is read-only and will not write over any user data. For any errors reported by EXAMINE, you should take appropriate corrective action. Use INSPECT to check for any blocks reporting data checks.

Displaying volume information

Use LIST to display current volume information. Use this function to display the allocation map, volume label, and device information, such as the number of pages.

Rewriting the volume serial

Use LABEL to rewrite the volume serial of a previously formatted volume. When the serial is rewritten, the remaining bytes of the volume label are unaltered.

Copying data to a different device size

On a CP-formatted volume, the size of the allocation map must match the number of pages on the volume. The map contains at least 1 and at most 85 entries. Each entry contains a starting and ending page number and a code indicating how the pages within the range are allocated.

When pages 0 and 1 (blocks 0-15) are copied from one device type to another, the allocation map that is copied may no longer match the number of pages on the volume.

For example, if you copy a 3370-1 with 69750 pages to a 3370-2 with 89094 pages, the allocation map will indicate that only 69750 pages are allocated (even though the new volume has 89094 pages).

CPVOLUME will report such a mismatch. If you allow CPVOLUME to continue, the allocation map will be expanded from 69750 to 89094 pages. The expanded pages will be allocated as PERM space. The expanded pages will not be formatted with 0s as part of the expansion process. To format the expanded pages issue CPVOLUME FORMAT RANGE(69750,89093).

When data is copied from a large volume to a smaller volume, and pages 0 and 1 are included in the copy, the allocation map will map more pages than are on the volume.

Using the above example, the allocation map will indicate that 89094 pages are allocated, even though the new volume has only 69750 pages. CPVOLUME reports such a mismatch. If you allow CPVOLUME to continue, the allocation map is reduced from 89094 to 69750 pages. CPVOLUME eliminates the allocation information for the last 19344 pages.

Creating a minidisk allocation map

The allocation map that CPVOLUME creates for a minidisk will map the number of pages of the minidisk. For example, for a 100-page minidisk, CPVOLUME will create an allocation map that maps 100 pages. Likewise, CPVOLUME will not allow you to format or allocate pages beyond the bounds of the minidisk.

Examples of the CPVOLUME command

The following examples show different ways to code the CPVOLUME command. The device used in the examples is a 3370-1 with 69750 pages.

Formatting an entire volume

In this example, all 69750 pages on the volume are formatted. As READCHECK is specified, a read-back check is performed to verify that all of the formatted pages can be read without error. The allocation map indicates that all 69750 pages on the volume are allocated as PERM space.

Because NOVERIFY is specified, any existing volume label is ignored, and the volume is labeled 'ESARES'.

```
CPVOLUME FORMAT UNIT(0150) NOVERIFY VOLID(ESARES) READCHECK
```

Formatting part of a volume

In this example, the first 100 pages on the volume are formatted. The allocation map indicates that pages 0 and 1 are PERM space, pages 2-99 are TEMP space, and pages 100-69749 are PERM space.

Because NOVERIFY is specified, any existing volume label is ignored, and the volume is labeled 'ESARES'.

```
CPVOLUME FORMAT UNIT(0150) NOVERIFY VOLID(ESARES) RANGE(0,99) TYPE(TEMP,2,99)
```

Changing volume allocation

In this example, the allocation map on a volume that has already been formatted is updated. 9750 pages of previously formatted but unused space that had been allocated as PERM are given a new allocation of PAGE, to be used as paging disk space.

Because VERIFY is specified, CPVOLUME checks that the volume on unit address 150 has a volume label of 'FBACP1' before making any changes to the allocation map.

```
CPVOLUME ALLOCATE UNITADDRESS(150) VERIFY(FBACP1)-
 TYPE((PAGE,60000,69749))
```

Chapter 29. INIT command—FBA



You use the INIT command to initialize volumes. For FBA devices, there are two levels of initialization.

1. 

   Minimal initialization or **minimal INIT** refers to using the INIT command to write the volume label and FBAVTOC on volumes for use by VSE operating systems.

   For FBA devices, minimal INIT is recommended for:

   - A new DASD unit
   - Replaced or upgraded HDA
   - A DASD unit that has been physically relocated
2. **Maximal initialization** or **maximal INIT** refers to using the INIT command to check the block surface, and then perform the minimal INIT. The maximal INIT is valid only for 3370, and 9335 FBA devices.



Do not use the INIT command to perform a minimal INIT on volumes that are to be formatted for use in a VM environment. Use the CPVOLUME command instead.

For a general description of these levels of initialization, see Figure 1 on page 13 and “Formatting devices” on page 363.

For INIT support of minidisks see:

- “CMS version minidisk support” on page 397
- Chapter 5, “Getting started with the CMS version,” on page 37

Syntax

INIT
Required Parameters SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) VERIFY(*serial*|**NONE*[,owner]*)|NOVERIFY
Optional Parameters BLOCKRANGE(*start,end*) CHECK(*n*)|NOCHECK CONTINUE|NOCONTINUE FBAVTOC(END|*rbn[,extent[,cisize]]*) FORMAT LABELS(*n*) MAP|NOMAP OWNERID(*owner*) PURGE|NOPURGE RECLAIM|NORECLAIM VOLID(*serial*)

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Required parameters

SYSNAME|UNITADDRESS parameter: identify the volume

Parameter/ Abbreviations	Description
SYSNAME(*sysxxx*)	Required to identify a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for a Stand-Alone or CMS version volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. For *ccuu*, specify the address (3 or 4 hexadecimal digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated device or minidisk. The unit address is the device number.
Default:	None.
Restrictions:	None.

VERIFY|NOVERIFY parameter: verify volser and ownerid

Parameter/ Abbreviations	Description
VERIFY(*serial[,owner]*) **VFY**	Required when you want to verify the volume serial number and owner identification before initializing the volume or minidisk. If the volume serial number or owner identification does not match that found on the volume or minidisk, INIT ends. For *serial*, substitute 1 to 6 alphanumeric characters for the volume serial number. To verify that a volume serial number does not exist, substitute the string *NONE* for *serial*. If no volume serial exists, or if the volume serial is actually "*NONE*", the INIT operation continues. If a volume serial exists, the INIT command ends. For *owner*, substitute 1 to 14 alphanumeric characters for the owner identification.
NOVERIFY **NOVFY** **NVFY**	Required when you want to bypass verification of the volume serial number.
Default:	None. You must specify either VERIFY or NOVERIFY.
Restrictions:	You cannot verify the owner identification separately from the volume serial number. Both the volume serial number and the owner identification must be verified when you want to verify the owner identification. When you specify the VERIFY parameter and verification fails, the command stops running.

Optional parameters

BLOCKRANGE parameter: specify part of the volume

Parameter/ Abbreviations	Description
BLOCKRANGE (*start,end*) **BLKRANGE** **BLOCKR** **BLKR**	Specifies that part of a volume is to be surface checked before medial initialization is performed. For *start,end*, specify the starting and ending relative block numbers to be verified. The values can be expressed in decimal or hexadecimal and must fall within the device limits. For device limits, see Table 52 on page 387.
Default:	All blocks.

Parameter/ Abbreviations	Description
Restrictions:	RECLAIM is not valid with BLOCKRANGE because RECLAIM must operate on the entire volume. Not valid for the IBM 0671, 9313, 9332, or 9336. Ignored for minidisks.

CHECK|NOCHECK parameter: surface checking of the volume

Parameter/ Abbreviations	Description
CHECK(*n*) **CHK**	Indicates that maximal initialization is to take place. Each block is checked for recording errors during initialization. Each block is surface checked by writing and reading specially patterned records. This parameter destroys the contents of each block that it processes. If surface checking identifies a defective block, the block is flagged and an alternate is assigned. For **n**, substitute a decimal number from 1 through 10 for the number of times you want each block to be checked. For information on **n** values, see Appendix E, “Surface checking,” on page 663.
NOCHECK **NOCHK** **NCHK**	Indicates that you do not want the blocks to be surface checked for recording errors during minimal initialization.
Default:	NOCHECK
Restrictions:	The maximum number you can specify with the CHECK parameter is 10. CHECK is not valid for minidisks or for the IBM 0671, 9313, 9332, or 9336.

CONTINUE|NOCONTINUE parameter: resume from a checkpoint

Parameter/ Abbreviations	Description
CONTINUE **CONT**	Resumes processing from the last checkpointed location. Issues a message indicating where processing is resumed.
NOCONTINUE **NOCONT**	Use when you do not want to start from the last checkpointed location, but want to start processing the specified range or full volume. Note that ICKDSF still goes to the backup location even if you issue NOCONTINUE. This is done to ensure no blocks are left in a nonstandard format.
Default:	CONTINUE
Restrictions:	These parameters are interrogated only if processing was previously interrupted during a maximal initialization. CONTINUE is not valid for the IBM 0671, 9313, 9332, or 9336. CONTINUE is ignored for minidisks.

FBAVTOC parameter: specify an FBAVTOC



Parameter/ Abbreviations	Description
FBAVTOC(END| *rbn[,extent[,cisize]]*) **FBVTOC**	Specifies the starting location, number of label records, and control interval size of the volume table of contents (VTOC). For more information about the FBAVTOC, see Appendix D, “Fixed block architecture VTOC (FBAVTOC),” on page 661. When you specify FBAVTOC(END), ICKDSF automatically determines the size and location of the VTOC. The VTOC is put on the last blocks of the volume or minidisk; it is 99 VTOC entries in length and has a control interval size of 1024. For *rbn*, substitute decimal (**n**) or hexadecimal characters (for example, X'2E') for the relative block number of the start of the VTOC. For *extent*, substitute decimal (**n**) or hexadecimal characters (for example, X'2E') for the number of label records in the VTOC. The valid range is from 3 to 999; however, the number you specify is rounded up to an integral multiple of the number of labels per control interval. For *cisize*, substitute decimal (**n**) or hexadecimal characters (for example, X'E') for the size of the control interval in bytes. The value specified must be an integral multiple of the device's physical block size, and must not exceed a value of 8192. For FBAVTOC format and size calculations, see Appendix D, “Fixed block architecture VTOC (FBAVTOC),” on page 661.
Default:	FBAVTOC(2,56,1024)
Restrictions:	A VTOC cannot be placed at blocks 0 and 1, which are reserved for the IPL block and the volume label blocks (VLB), respectively.

FORMAT parameter: format volume

Parameter/ Abbreviations	Description
FORMAT **FMT**	FBA volumes store data in 512–byte blocks. The entire volume will be formatted by writing zeros in each block across the volume.
Default:	None.
Restrictions:	Valid only on FBA-SCSI devices emulating 9336 model 20.

LABELS parameter: reserve space for additional volume labels

Parameter/ Abbreviations	Description
LABELS(*n*) **LABEL** **LBL**	Specifies that space on block 1 is to be reserved for additional volume labels, also known as user volume labels. In addition to the label that must be written on the volume or minidisk, a maximum of five additional volume labels can be specified. To specify **n**, substitute a decimal number from 1 through 5 for the number of additional user volume labels to be placed on the volume or minidisk during initialization.
Default:	None.
Restrictions:	If LABELS is not specified, user volume labels that existed from a previous initialization are destroyed. If a value greater than 5 is specified with the LABELS parameter, a message is printed, and the command continues.

MAP|NOMAP parameter: print an alternate block map

Parameter/ Abbreviations	Description
MAP	Prints an alternate block map during initialization. The alternate block map lists the primary blocks on the volume that have alternates assigned. The format of this map is the same as that printed by the MAPALT command when DETAIL is specified.
NOMAP	Indicates that you do not want to print a block map during initialization.
Default:	MAP

Parameter/ Abbreviations	Description
Restrictions:	MAP is not valid for the IBM 0671, 9313, 9332, 9336, or minidisks.

OWNERID parameter: specify the volume-owner identification

Parameter/ Abbreviations	Description
OWNERID(*owner*) **OWNER**	Writes the owner identification in the volume label. For *owner*, substitute 1 to 14 alphanumeric characters for the owner identification to be written in the volume label.
Default:	The default for *owner* during a first-time initialization is 14 blanks. If you do not specify OWNERID when reinitializing a previously initialized volume, the owner identification remains unchanged.
Restrictions:	None.

PURGE|NOPURGE parameter: rewrite data on a volume

Parameter/ Abbreviations	Description
PURGE **PRG**	Indicates that you want to write over the data in the following types of data sets during initialization: Unexpired VSAM Data secured A volume that appears to contain real data cannot be initialized unless the PURGE parameter is specified.
NOPRG **NPRG**	Indicates that you do not want to write over existing data. If a volume appears to contain real data, it cannot be initialized unless the PURGE parameter is specified.
Default:	NOPURGE
Restrictions: CMS SA	The NOPURGE parameter does not apply in the CMS or Stand-Alone versions. If you initialize a volume in the CMS or Stand-Alone version, all existing data on the volume is purged, regardless of the data set security attributes.

RECLAIM|NORECLAIM parameter: reclaim defective blocks

Parameter/ Abbreviations	Description
RECLAIM **RCLM**	Indicates that you want to reclaim primary or alternate blocks that were flagged as defective in input but appear usable after surface checking. FBA device blocks that were flagged at the factory are not reclaimed. Should INIT RECLAIM not complete, defective primary blocks might remain that do not have valid alternate pointers. Any subsequent INIT forces the reclaim process to complete.
NORECLAIM **NORCLM** **NRCLM**	Indicates that you want to suppress block reclamation during initialization.
Default:	NORECLAIM
Restrictions:	The RECLAIM parameter applies only when the CHECK parameter has been specified. If RECLAIM is specified with NOCHECK, it will be ignored. RECLAIM is not valid with BLOCKRANGE because RECLAIM must operate on the entire volume. RECLAIM is not valid for the IBM 0671, 9313, 9332, 9335, 9336 devices, and minidisks.

VOLID parameter: specify the volume serial number

Parameter/ Abbreviations	Description
VOLID(*serial*)	Writes the volume serial number in the volume or minidisk label. For *serial*, substitute 1 to 6 alphanumeric characters for the volume serial number. If fewer than six characters are specified, the serial is left-justified, and the remainder of the field is padded with blanks (X'40').
Default:	When you initialize a volume or minidisk that was previously initialized and do not specify the VOLID parameter, the old volume serial number remains unchanged.
Restrictions:	When you initialize a volume or minidisk for the first time, you must specify the VOLID parameter or the INIT command ends.

Initializing a volume at the minimal level

Minimal initialization refers to using INIT NOCHECK to write the volume label and FBAVTOC on volumes for use by a VSE operating system. Note that minimal initialization does not delete any previous IPLTEXT that is on the volume.

The FBAVTOC parameter is used to specify the space for the VTOC for an FBA device. This parameter allows you to:

Specify the starting block number
Specify the number of label records
Control the interval size of the VTOC

You can default the VTOC location, or you can have ICKDSF determine the size and location by specifying FBAVTOC(END). For more information about the FBAVTOC, see Appendix D, “Fixed block architecture VTOC (FBAVTOC),” on page 661.

For the IBM 0671, 9313, 9332, 9336, and minidisks, you can perform a minimal initialization only.

Initializing a volume at the maximal level

Maximal initialization refers to using the INIT command to surface check each block for recording errors and assign alternate blocks to those with errors, and perform the minimal initialization. The CHECK parameter is specified at the maximal level. Maximal initialization is valid only for 3370 and 9335 devices. Maximal initialization is not valid for minidisks.

If you specify RECLAIM with CHECK, an attempt is made to reclaim the primary surface of blocks that have had alternates assigned previously by INIT or INSPECT. Any blocks that were previously marked defective but pass the surface checking test in this run are marked available. However, any primary or alternate blocks that were flagged defective by the factory will not be reclaimed by the INIT command. RECLAIM support is not valid for the 9335.

If a maximal initialization does not run to completion, use CONTINUE to recover in a minimum amount of time and ensure the volume is usable. For more information about continuing after a failure, see “Resuming after a job or system failure” on page 396.

Resuming after a job or system failure

If a maximal initialization does not run to completion for any reason, the job does not need to be restarted from the beginning of the volume. ICKDSF checkpoints itself automatically during processing and can determine where it is to resume.

After a job or system failure, you can submit a new job:

- At the minimal or maximal level

- For the entire volume, for a different specified range, or for the same specified range (maximal INIT)
- To resume from the point of failure or to resume from the start of the current specified range (the job which was running when the job or system failed)

Because INIT processing always destroys the volume label, when you issue INIT again, you must include the VOLID parameter.

After a previous failure, if CONTINUE is specified, processing continues from the point of failure in correlation with the current specified range as follows:

- If the new range is entirely before the previous point of failure, no new blocks are processed.
- If the new range is entirely beyond the point of failure, then the entire new range is processed.
- If the new range specification overlaps the point of failure, then processing begins from the point of failure.
- If NOCONTINUE is specified, processing begins from the current specified range.
- If the previous INIT specified RECLAIM:
  - If processing failed during the actual reclaim procedure, processing starts from the beginning of the reclaim procedure and runs for the entire volume.
  - If processing failed after the actual reclaim procedure was complete, processing begins from the continue location, but is forced to the end of the volume, to ensure that RECLAIM has processed to completion.

CMS version minidisk support



For the CMS version of ICKDSF, only minimal INIT is supported for minidisks.

When you initialize a minidisk at the minimal level, you can specify the minidisk volume label (VOLID), the VTOC, and the owner identification (OWNERID).

The UNITADDRESS, FBAVTOC, LABELS, MAP, OWNERID, VERIFY, and VOLID parameters are supported by the CMS Version.

For more information about running the CMS version, see Chapter 5, “Getting started with the CMS version,” on page 37.

Examples of the INIT command

The following examples show different ways to code the INIT command.

Any values specified here are examples only and should not necessarily be interpreted as the values for your system.

Initializing volumes with the Stand-Alone version



The following examples show you how to initialize volumes with the Stand-Alone version of ICKDSF.

Initializing a volume at the minimal level

In this example, a FBA device is initialized at a minimal level. The volume is labeled 331022. The owner ID of SMITH is written in the volume label. Space is reserved for three additional user volume labels

starting at block 1, and a FBAVTOC starting at block 2 for 100 label records with a VTOC control interval size of 512. NOMAP suppresses the list of alternates.

```
INIT   UNITADDRESS(02E4) NOVERIFY NOCHECK VOLID(331022) -
      OWNERID(SMITH) LABELS(3) FBAVTOC(2,100,512) NOMAP
```

Initializing a minidisk

In this example, a FBA 3370 minidisk is initialized in the Stand-Alone version. The volume ID and owner ID are checked. Space is reserved for a FBAVTOC starting at block 2 for 100 label records with a VTOC control interval size of 512. The volume is labeled 337019. Space is reserved for 3 user volume labels. The size of the minidisk is obtained from VM.

```
INIT  UNITADDRESS(0151) VERIFY(337022,PSMITH) -
    FBAVTOC(X'2',X'64',X'200') VOLID(337019) LABELS(3)
```

Initializing a VSE version FBA volume



In this example, a FBA device is initialized at the maximal level by specifying CHECK and VERIFY. The volume serial and owner ID are verified before initialization begins. Surfaces are checked and, if any blocks are found to be defective, alternate blocks are assigned. An FBAVTOC is located starting at block 2 for 100 label records with a VTOC control interval size of 1024. MAP specifies that a detailed map is to be printed. Any blocks that were previously flagged defective but now appear to be usable after surface checking are reclaimed.

```
//  JOB      jobname
//  ASSGN    SYS005,353
//  EXEC     ICKDSF,SIZE=AUTO
      INIT  SYSNAME(SYS005) VERIFY(337011,JONES) CHECK(3) -
            FBAVTOC(2,100,1024) MAP RECLAIM
/*
/&
```

Initializing a minidisk in the CMS version for a VSE environment



In this example, a minidisk is initialized at the minimal level. It establishes a VOLID, OWNERID, and the VSE VTOC on a minidisk with a virtual address of 391. The minidisk is labeled 337012 and the owner ID is PAYROLL.

After performing the INIT, the minidisk is ready for future use in an VSE operating system environment.

```
INIT  UNITADDRESS(0391) NOVERIFY VOLID(337012) OWNERID(PAYROLL) FBAVTOC(END)
```

Chapter 30. INSPECT command—FBA



The INSPECT command inspects a subset of a volume and can:

- Check the surface of a block to determine if there is a defect
- Assign an alternate block
- Print a map of defective blocks on a volume

Before using the INSPECT command, ensure that there are no hardware problems. It is recommended that you issue ANALYZE DRIVETEST NOSCAN before any INSPECT operation.

For more general information about INSPECT, see “Problem determination” on page 364.

Warning

Use caution when running INSPECT against an entire or major portion of a FBA volume. It can be time-consuming.

Understanding which INSPECT parameters to use

You can perform several functions using INSPECT with various options. Table 53 on page 399 shows you which parameters to use to perform certain tasks. For more details about these parameters, see the explanations that follow. The parameters appear in alphabetical order under “Optional parameters” on page 401.

Table 53: Performing tasks with INSPECT parameters

To...	Use the INSPECT parameter...
Identify the blocks you want to inspect.	BLOCKS BLOCKRANGE
Check each block surface. Permit optional specification of the number of checking cycles of each inspected block.	CHECK Alternate block assignment is done only after an inspection of the surface reveals defects.
Suppress block checking	NOCHECK Unless alternate block assignment is suppressed, an alternate will be unconditionally assigned to the primary block. For the IBM 0671, 9313, 9332, and 9336, you can only unconditionally assign alternate blocks. (INSPECT ASSIGN NOCHECK BLOCKS)

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Table 53: Performing tasks with INSPECT parameters (continued)

To...	Use the INSPECT parameter...
Save data that would normally be destroyed during block inspection.	PRESERVE KEEPIT HOLDIT The NOPRESERVE parameter allows inspection of blocks when the data cannot be read. For the IBM 0671, 9313, 9332, and 9336 PRESERVE, KEEPIT, and HOLDIT are all processed as HOLDIT. The data is lost if processing ends before the data is rewritten. **CAUTION:** When you use HOLDIT, data is kept in storage only. If processing abnormally terminates before the data is rewritten, the block for which the data was preserved will not contain a standard record 0; and the data will be lost.
Write a copy of the data at a backup location as well as keep it in storage.	PRESERVE If processing abnormally terminates, the next use of INSPECT detects the data at the backup location and automatically restores the data to the block on which processing previously ended abnormally.
Assign alternates if required.	ASSIGN
Suppress the assignment of alternates	NOASSIGN
Print output of the detailed status of each block being inspected.	MAP
Suppress the printed output of detailed block status.	NOMAP

Syntax

INSPECT

Required Parameters
SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*)|REALADDR(*ccuu*)
VERIFY(*serial|*NONE*[,owner]*)|NOVERIFY

Optional Parameters
ASSIGN|NOASSIGN
BLOCKRANGE(*start,end*)|
BLOCKS(*rbn[,...]*)
CHECK(*n*)|NOCHECK
MAP|NOMAP
PRESERVE|KEEPIT|HOLDIT|NOPRESERVE
USERID(*user's ID*)

Required parameters

SYSNAME|UNITADDRESS|REALADDR parameter: identify the volume

Parameter/ Abbreviations	Description
SYSNAME(*sysxxx*)	Required to identify a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for a Stand-Alone or CMS version volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. For *ccuu*, specify the address (3 or 4 hexadecimal digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the dedicated device or minidisk. The unit address is the device number.
REALADDR(*ccuu*) **RADDR** CMS	Used to specify the real address of a volume. This parameter is valid only when you are running the CMS version of ICKDSF and you have DEVMAINT authority. For *ccuu*, specify the real address (3 or 4 hexadecimal digits) of the channel and unit of the volume. REALADDR is mutually exclusive with UNITADDRESS, SYSNAME, and USERID.
Default:	None.
Restrictions:	The maximum number of blocks that you can INSPECT using REALADDR is 1.

VERIFY|NOVERIFY parameter: verify volser ownerid

Parameter/ Abbreviations	Description
VERIFY(*serial[,owner]*) **VFY**	Required when you want to verify the volume serial number and owner identification before inspecting the volume or minidisk. If the volume serial number or owner identification does not match that found on the volume or minidisk, INSPECT ends. For *serial*, substitute 1 to 6 alphanumeric characters for the volume serial number. To verify that a volume serial number does not exist, substitute the string *NONE* for *serial*. If no volume serial exists, or if the volume serial is actually "*NONE*", the REFORMAT operation continues. If a volume serial exists, the REFORMAT command ends. For *owner*, substitute 1 to 14 alphanumeric characters for the owner identification.
NOVERIFY **NOVFY** **NVFY**	Required when you want to bypass verification of the volume serial number.
Default:	None. You must specify either VERIFY or NOVERIFY.
Restrictions:	You cannot verify the owner identification separately from the volume serial number. Both the volume serial number and the owner identification must be verified when you want to verify the owner identification. When you specify VERIFY, the volume label must exist for the volume.

Optional parameters

ASSIGN|NOASSIGN parameter: specify assignment of alternate blocks

Parameter/ Abbreviations	Description
ASSIGN **ASGN**	Indicates that you want alternates to be assigned when defective primary and assigned alternate blocks are detected.
NOASSIGN **NOASGN** **NASGN**	Indicates that you do not want alternate blocks assigned. If PRESERVE is specified and user data cannot be rewritten because of surface defects, an alternate is assigned.

Parameter/ Abbreviations	Description
Default:	ASSIGN
Restrictions:	If NOASSIGN is specified with the CHECK parameter, an inspected block is not marked defective and an alternate is not assigned. The combination of ASSIGN NOCHECK cannot be specified with the BLOCKRANGE parameter. .

BLOCKRANGE|BLOCKS parameter: specify which blocks to inspect

Parameter/ Abbreviations	Description
BLOCKRANGE (*start,end*) **BLKRANGE** **BLOCKR** **BLKR**	Specifies that part of a volume is to be inspected before the volume is processed. For *start,end*, specify the starting and ending relative block numbers to be verified. The values can be expressed in decimal or hexadecimal and must be within the device limits. For device limits, see Table 52 on page 387.
BLOCKS(*rbn[,...]*) **BLOCK**	Specifies each discrete block to be inspected. For *rbn*, substitute the relative block number of each block to be inspected. Specify the block numbers in decimal or hexadecimal.
Default:	None.
Restrictions:	BLOCKS and BLOCKRANGE are mutually exclusive. BLOCKRANGE is not valid with ASSIGN NOCHECK. BLOCKRANGE is not valid for the IBM 0671, 9313, 9332, or 9336. The number of blocks specified by the *rbn* of the BLOCKS parameter cannot exceed 20. The maximum range of blocks that can be specified in the BLOCKRANGE parameter is 80,000. Maximum block numbers for FBA devices are shown in Table 52 on page 387.
CMS	When you are processing minidisks under the CMS version, if you specify the USERID parameter you can INSPECT the whole minidisk. If you specify the REALADDR parameter, the maximum you can INSPECT is 1 block.

CHECK|NOCHECK parameter: surface checking of the volume

Parameter/ Abbreviations	Description
CHECK(*n*) **CHK**	Indicates that each block is to be checked for recording errors. Each block is surface checked by writing and reading specially patterned records. If surface checking identifies a defective block, the block is flagged and an alternate is assigned. For **n**, substitute a decimal number from 1 through 10 for the number of times you want each block to be checked. For information about **n** values, see Appendix E, “Surface checking,” on page 663.
NOCHECK **NOCHK** **NCHK**	Indicates that you do not want the blocks to be surface checked for recording errors during inspection. Alternate blocks are unconditionally assigned as a result of inspection when NOCHECK and ASSIGN are specified.
Default:	CHECK(1)
Restrictions:	The maximum number you can specify with the CHECK parameter is 10. CHECK is not valid for the IBM 0671, 9313, 9332, or 9336.

MAP|NOMAP parameter: print an alternate block map

Parameter/ Abbreviations	Description
MAP	Prints an alternate block map during inspection. The alternate block map lists inspected blocks on the volume that have alternates assigned. The format of this map is the same as that printed by the MAPALT command when DETAIL is specified.
NOMAP	Indicates that you do not want to print a block map during initialization.
Default:	MAP
Restrictions:	MAP is not valid for the IBM 0671, 9313, 9332, 9336, or minidisks.

PRESERVE|KEEPIT|HOLDIT|NOPRESERVE parameter: preserve data

Parameter/ Abbreviations	Description
PRESERVE **PRSV**	Saves the data on the inspected blocks. Saves a copy of each block at a backup location as well as in storage (the storage copy is used to rewrite the data). If processing abnormally terminates on a block, INSPECT detects the data at the backup location and automatically restores the data to that block. For more detailed information, see "Reading and saving data on inspected blocks" on page 403.
KEEPIT **KEEP**	PRESERVE and KEEPIT are synonymous.
NOPRESERVE **NOPRSV** **NPRSV** VSE	Indicates that you do not want to save the data on the inspected blocks. NOPRESERVE always destroys the current contents of the block: • If you specify CHECK, or • If you specify ASSIGN NOCHECK (the ASSIGN NOCHECK combination of parameters specifies unconditional assignment of alternate blocks). Use NOPRESERVE only when the data is nonexistent or unnecessary, or if data errors on a particular block make it impossible to preserve the data. Note that the VTOC can also be destroyed. Be careful when inspecting a volume in a VSE environment.
HOLDIT **HOLD**	Indicates that you want to save the data on the inspected blocks. HOLDIT reads the data and keeps a copy in storage only. If processing for the block does not run to completion, the data is lost and must be restored from a backup copy.
Default:	PRESERVE
Restrictions:	For the IBM 0671, 9313, 9332, 9336, and minidisks, the PRESERVE, KEEPIT, and HOLDIT parameters are processed as HOLDIT.

Reading and saving data on inspected blocks

PRESERVE and KEEPIT specify whether to read and save the data on the inspected blocks. Data read from the specified blocks is held in storage.

Data on a block is also saved at a backup location as well as held in storage (the storage copy is used to rewrite the data). If processing abnormally terminates, the next use of INSPECT detects the data at the backup location and restores the data to the block where processing ended abnormally.

For the IBM 0671, 9313, 9332, 9336, and minidisks, the PRESERVE, KEEPIT, and HOLDIT parameters are processed as HOLDIT.

Writing data from a backup location with PRESERVE or KEEPIT

The backup location and the storage copy of the block are erased at the completion of a command.

You might notice a performance degradation caused by the writing of the data at the backup location. The time duration of degradation depends on the total number of blocks being processed for the current INSPECT.

When the data is written at the backup location, it is read-back-checked to ensure it was written correctly. However, when the backup location is used to restore the data at the next use of the INSPECT command, there is no guarantee that the data can be recovered.

Writing data from a CE cylinder

For devices that use the CE cylinder as the backup cylinder, if data exists at the backup location, the ANALYZE command, which writes on the CE cylinder, does not destroy the data. ANALYZE does indicate the cylinder and head of the block for which data exists. **Note, however, that the CE microdiagnostics may destroy the data at the backup location**.

Therefore, if INSPECT processing does not complete because of a problem on the volume that requires the assistance of an IBM customer engineer, make every attempt to restore the data first, if necessary.

USERID parameter: specify another user's minidisk



Parameter/ Abbreviations	Description
USERID(*user's ID*) **UID**	Performs the INSPECT command on another user's minidisk. For *user's ID*, substitute the 1 to 8 characters of the ID of the user whose minidisk you want to verify. For more information about processing minidisks, see Chapter 5, “Getting started with the CMS version,” on page 37.
Default:	If USERID is not specified, your own minidisk is verified.
Restrictions:	USERID can be specified only if you are using the CMS version of ICKDSF and have DEVMAINT authority. USERID is ignored in all other system environments. When you specify the USERID parameter, you can INSPECT the whole minidisk.

Assigning alternate blocks

A block can be flagged as defective and an alternate assigned either conditionally or unconditionally. The amount of surface checking done before an alternate is assigned is determined by multiple factors, including:

- The use of the CHECK or NOCHECK parameter
- The availability of skip displacement bytes for the device type
- The current condition of the block

Table 54 on page 404 shows you how to control the assignment of alternate blocks. The parameter explanations appear in alphabetical order under “Optional parameters” on page 401.

Table 54: Assigning alternate blocks with INSPECT parameters

To...	Use the INSPECT parameters...
Detect defective blocks and assign an alternate block if the block is defective.	CHECK and ASSIGN
Unconditionally assign alternate blocks for the blocks specified.	NOCHECK and ASSIGN
Inspect primary and alternate blocks, but prevent assignment of alternates.	CHECK and NOASSIGN

Table 54: Assigning alternate blocks with INSPECT parameters (continued)

To...	Use the INSPECT parameters...
Assign an alternate block when data cannot be rewritten because of defects, regardless of the ASSIGN|NOASSIGN value.	PRESERVE

Preserving data during INSPECT

When you specify the PRESERVE or KEEPIT parameter of the INSPECT command, a backup copy of the data is stored on the same volume and in storage. The backup location uses two blocks on the CE cylinder. One block (the backup block) contains the control information, and another block (the preserve block) contains the actual data.

If processing terminates abnormally, the next use of INSPECT will:

1. Detect the data at the backup location, and determine the block to be recovered (the recovery block).
2. Surface check the block to be restored. If a data check is detected, skip displacement surface checking is performed.
3. Restore the data from the preserve block.

The restoration of the block from the preserved data is automatic and is independent of the range specified in the current job. When you run INSPECT without specifying any blocks, only the restore function is performed.

Writing data from a backup or storage location

INSPECT allows you to choose from two levels of data preservation:

HOLDIT–Keeps a copy of the data from the block being processed in storage only. No copy is kept at the backup location.

PRESERVE or KEEPIT–Writes a copy of the data from the block being processed at the backup location as well as in storage. The copy at the backup location is used only during the restore procedure. The backup location and the copy of the data in storage are erased at the completion of the command.

When PRESERVE|KEEPIT is specified, you might notice a performance degradation caused by the writing of the data at the backup location. The time duration of degradation depends on the total number of blocks being processed by the current INSPECT command.

For the IBM 0671, 9313, 9332, and 9336, the PRESERVE, KEEPIT, and HOLDIT parameters are processed as HOLDIT. The data is lost if processing abnormally terminates before the data is rewritten.

Retrieving data from the backup location

When data is written at the backup location, it is read-back-checked to ensure it was written correctly. However, at the time of recovery, **it cannot be guaranteed that the data is always retrievable from the backup location**.

Warning
Although the backup block and the preserve block are located on the CE cylinder, the ANALYZE command, which writes on the CE cylinder, does not destroy the data. ANALYZE does indicate the cylinder and head of the block for which data exists. **Note, however, that the CE microdiagnostics may destroy the data at the backup location**.

Therefore, if INSPECT processing does not complete because of a problem on the volume that requires the assistance of an IBM customer engineer, make every attempt to restore the data first, if necessary.



When you are processing minidisks under the CMS version, data is not saved at the backup location. Therefore, no recovery of data is possible.

Recovering data after a job or system failure

If an INSPECT command ends before completing, and PRESERVE was specified on the failing job, ICKDSF has saved the data, and it will be automatically recovered on the next use of the INSPECT command.

After resolving the reason for the failure, you can submit:

- The same INSPECT job.

  This will do a primary surface check of the block being processed at the time of failure, recover the data, and then inspect all the blocks in the specified range, including those blocks that were inspected prior to the previous failure.
- An INSPECT job for a entirely different, or partially different, range.

  This will do a primary surface check of the block being processed at the time of failure, recover the data, and then process all blocks in the new range.
- An ANALYZE job (for nonemulated nonremovable media devices only) to determine the block that failed.

  ANALYZE will print the cylinder and head of the block that is being processed at the point of failure.

  – Then you can run a new INSPECT job with a modified range according to the previous point of failure.

    This will do a primary surface check of the block being processed at the time of failure, recover the data, and then process all blocks in the new range.
- Enter an INSPECT with neither BLOCKS nor BLOCKRANGE specified.

  This will do a primary surface check of the block being processed at the time of failure, and recover the data.

Note:

1. Recovery is only possible if PRESERVE was specified on the job running at the time of failure. It is not possible if HOLDIT or NOPRESERVE were specified.
2. It is possible that INSPECT was "between blocks" when the job failed, and there is no block or data to recover.
3. The data at the recovery block may be invalid. In this case, in addition to the data being unavailable, the block may be unusable to the operating system and any use of the block can cause I/O errors.
4. If you run INIT on this volume before the next INSPECT, INIT will erase the recovery data.
5. The restore function is not optional. If data exists at the backup location it is restored.

   If the data on the preserve block is different than the data on the block being restored (that is, the block being processed at the point of failure), the operator is prompted either to restore or erase the data.
6. If the data cannot be restored, for whatever reason, the operator is prompted for the next action.

   To put the restore data in storage, you can run a job that specifies HOLDIT.
7. When you are processing minidisks under the CMS version, data is not saved at the backup location. Therefore, no recovery of data is possible.

CMS version minidisk support



The following parameters are valid only when you are using the CMS version of ICKDSF and have DEVMAINT authority (as defined in the CP directory):

USERID: With DEVMAINT authority you can use the USERID parameter to inspect another user's minidisk. The following parameters are valid:

ASSIGN|NOASSIGN, BLOCKRANGE|BLOCKS, CHECK|NOCHECK, HOLDIT, MAP|NOMAP, PRESERVE|NOPRESERVE VERIFY|NOVERIFY, and UNITADDRESS.

REALADDR: With DEVMAINT authority you can use the REALADDRESS parameter to INSPECT a volume using the real device address. All of the other parameters listed above are valid. The maximum number of blocks you can INSPECT in this mode is one.

For more information, see Chapter 5, “Getting started with the CMS version,” on page 37.

Examples of the INSPECT command

The following examples show different ways to code the INSPECT command.

Any values specified here are examples only and should not necessarily be interpreted as the values for your system.

Inspecting volumes with the Stand-Alone version



The following examples show you how to inspect volumes with the Stand-Alone version of ICKDSF.

Inspecting for defective blocks

In this example, an FBA device is inspected for defective blocks. It provides surface checking of the blocks specified in the BLOCKS parameter and conditional assignment of alternate blocks for any blocks that are found defective. The data on the inspected blocks is preserved. A detailed map of the inspected blocks is printed.

```
INSPECT  UNITADDRESS(0150) BLOCKS(50,55,57,58) CHECK(1) -
         ASSIGN PRESERVE MAP NOVERIFY
```

In this example, an FBA device that has already been initialized is inspected for defective blocks. The blocks specified in the BLOCKS parameter are surface checked for errors, but an inspected block is not marked defective and an alternate is not assigned.

```
INSPECT  UNITADDRESS(02E4) BLOCKS(2000,2020,2021,2022) -
         CHECK(1) NOASSIGN NOMAP NOVERIFY
```

Unconditional alternate block assignment

In this example, an inspection is performed on an FBA device that has already been initialized. The blocks specified in the BLOCKS parameter are unconditionally assigned the next available alternate blocks.

```
INSPECT  UNITADDRESS(0380) BLOCKS(X'FA',X'10E',X'118') -
         NOVERIFY NOCHECK ASSIGN
```

Inspecting volumes with the VSE version



The following examples show you how to inspect volumes with the VSE version of ICKDSF.

Unconditionally assigning alternate blocks

In this example, an FBA volume previously initialized under VSE is inspected. The specified blocks are unconditionally assigned the next available blocks. PRESERVE specifies that data is to be saved at the backup location as well as in storage.

```
//  JOB      jobname
//  ASSGN    SYS010,151
//  EXEC     ICKDSF,SIZE=AUTO
    INSPECT SYSNAME(SYS010) NVFY BLOCKS(100,200,300) -
            NOCHECK ASSIGN PRESERVE NOMAP
/*
/&
```

Inspecting an FBA volume to check blocks for defects

In this example, an FBA volume previously initialized under VSE is inspected. It provides surface checking of the specified blocks and conditional assignment of alternate blocks that are found defective. PRESERVE specifies that data is to be saved at the backup location as well as in storage. A detailed map of the inspected blocks is included.

```
//  JOB      jobname
//  ASSGN    SYS010,151
//  EXEC     ICKDSF,SIZE=AUTO
    INSPECT SYSNAME(SYS010) NVFY BLOCKS(50,60,70) -
            CHECK(1) ASSIGN PRESERVE MAP
/*
/&
```

Inspecting volumes with the CMS version



The following examples show you how to inspect volumes with the CMS version of ICKDSF.

Inspecting another user's minidisk

In this example, a minidisk that is owned by a another user is inspected. You specify the USERID parameter to inspect the minidisk of a user named BROWN at virtual address 391. You must have DEVMAINT authority to specify USERID.

Blocks 50 and 55 of the minidisk are inspected. If the inspected block is defective, an alternate is assigned.

```
INSPECT  UNITADDRESS(0391) NOVERIFY USERID(BROWN) BLOCKS(50,55)
```

Inspecting a minidisk specifying a real address

In this example, part of a volume with a real address of 290 is inspected. You must have DEVMAINT authority to specify REALADDR.

Block 1000 is inspected. If the inspected block is defective, an alternate is assigned.

```
INSPECT  REALADDR(290) NOVERIFY BLOCKS(1000)
```

Chapter 31. IODELAY command—FBA



ICKDSF issues very intensive I/O during processing. Sometimes this can degrade the performance of other users accessing the channel and impact your entire system throughput. The IODELAY command slows down ICKDSF processing by allowing time between I/O rather than issuing consecutive I/O operations.

The IODELAY command allows you to specify:

- The number of consecutive I/Os that ICKDSF can issue
- The allowable time period between those I/Os

When ICKDSF is issued, the time delay is set to zero (same as current processing). Once you set the time delay using the IODELAY command, it remains set until you reset it.

Syntax

IODELAY
Required Parameters: SET|RESET
Optional Parameters: PERIO(*n*) SECONDS(*n*)|MSECONDS(*n*)|USECONDS(*n*)

Required parameters

SET|RESET parameter: set an I/O delay

Parameter/ Abbreviations	**Description**
SET	Used to set a time delay which will apply to all ICKDSF functions.
RESET	Used to reset the time delay. After issuing RESET, there is no time delay in effect.
Default:	None.
Restrictions:	None.

Optional parameters

PERIO parameter: number of I/Os scheduled

Parameter/ Abbreviations	**Description**
PERIO(*n*)	Allows you to specify the number of I/Os to be scheduled between each time delay. The number specified here is the number of I/Os ICKDSF will schedule before it will quiesce and allow other functions to gain control. Specify *n* as the number of I/Os (1 to 1000) allowed before the time interval is reactivated.
Default:	If PERIO is not specified with SET, PERIO defaults to 1.
Restrictions:	None.

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SECONDS|MSECONDS|USECONDS parameter: set the time period

Parameter/ Abbreviations	Description
SECONDS(*n*) **SEC**	Specifies the amount of time in seconds, which is allowed between ICKDSF issuing I/Os. Specify *n* as the number of seconds (1 to 60) delay.
MSECONDS(*n*) **MSECOND** **MILLI** **MSEC**	Specifies the amount of time in milliseconds, which is allowed between ICKDSF issuing I/Os. Specify *n* as the number of milliseconds (1 to 1000) delay.
USECONDS(*n*) **USECOND** **MICRO** **USEC**	Specifies the amount of time in microseconds, which is allowed between ICKDSF issuing I/Os. Specify *n* as the number of microseconds (1 to 1000) delay.
Default:	None.
Restrictions: CMS	Under the CMS version, an I/O delay time of less than 1 second might excessively use your processor. Because of this, use the PERIO and SECOND parameters together, instead of the MSECONDS or USECONDS parameters. For example, if you want to delay I/O every tenth of a second, issue: `IODELAY SET PERIO(10) SECONDS(1)`

Examples of the IODELAY command

Any values specified here are examples only and should not necessarily be interpreted as the values for your system.

Delaying 100 ms after every 20 operations

In this example, the IODELAY command is used to set a delay of 100 ms after every 20 ICKDSF I/O operations. This allows functions other than ICKDSF to perform during this delay. The IODELAY command is followed by the ANALYZE command, which has a delay of 100 ms after every 20 ICKDSF I/O operations while it is processing. The second IODELAY command resets the delay. The next ICKDSF command issued would not have any delay set.

```
IODELAY SET PERIO(20) MILLI(100)
ANALYZE UNITADDRESS(ccuu) SCAN
IODELAY RESET
```

Chapter 32. MAPALT command—FBA



The MAPALT command performs the following functions:

- Maps alternate block assignments.
- Produces a printed report, or map, of the primary blocks that have been assigned to alternate blocks on the device.
- Allows you to specify that a limited range of primary blocks or the entire volume be mapped.

You can run MAPALT against either a newly installed device or a device that already contains user data. You do not need to create backup copies of the data on the volume before issuing the command.

The MAPALT command can read the identification fields of the primary blocks only.

You can use the MAPALT command only against the device address that defines the entire device in fixed block mode.

MAPALT does not support:

- Emulated devices on FBA devices
- The IBM 0671, 9313, 9332, and 9336



When you are using the CMS version of ICKDSF, the MAPALT command is valid only with dedicated devices. There is no minidisk support. For more information, see Chapter 5, “Getting started with the CMS version,” on page 37.

Syntax

MAPALT
Required Parameters SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*)
Optional Parameters DETAIL|NODETAIL LIMITS(*start,end*)|ALL

Required parameters

SYSNAME|UNITADDRESS parameter: identify the volume

Parameter/ Abbreviations	Description
SYSNAME(*sysxxx*)	Required to identify a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.

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Parameter/ Abbreviations	Description
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for a Stand-Alone version volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. For *ccuu*, specify the address (3 or 4 hexadecimal digits) of the channel and unit of the volume. The unit address is the device number.
Default:	None.
Restrictions:	None.

Optional parameters

DETAIL|NODETAIL parameter: controlling the program output

Parameter/ Abbreviations	Description
DETAIL **DTL**	Prints a detailed report that lists each defective block assigned to an alternate, its location on the disk, and the location of the assigned alternate block.
NODETAIL **NODTL**	Suppresses printing of the detailed report.
Default:	NODETAIL
Restrictions:	This parameter controls printing of the detailed report only and does not affect other output from the program. The summary message will always print when the program ends.

LIMITS|ALL parameter: specify the area to be mapped

Parameter/ Abbreviations	Description
LIMITS(*start,end*) **LIMIT** **LIMS** **LIM**	Specifies the area of the disk where you want alternate block mapping performed. For *start,end*, specify the relative block number for the start and end of mapping. *start* must be less than or equal to *end*. The values can be expressed in decimal or hexadecimal and must be within the device limits. For device limits, see Table 52 on page 387.
ALL	Maps the entire volume.
Default:	ALL
Restrictions:	None.

Reading the MAPALT report output

A two-part report is produced.

1. The first part, which is optional, is shown in Table 55 on page 413:

Table 55: MAPALT report (first part)

Primary Block Number	Block Address	Alternate Address
nnnnnnnn	C=nnn H=nn	C=nnn H=nn
nnnnnnnn	C=nnn H=nn	C=nnn H=nn
nnnnnnnn	C=nnn H=nn	C=nnn H=nn
nnnnnnnn	C=nnn H=nn	C=nnn H=nn
nnnnnnnn	C=nnn H=nn	C=nnn H=nn

This detailed report shows:

- The relative block number of the defective primary block
- The defective primary block location on the volume (cylinder and head number)
- The location of the alternate block that has been assigned to the primary (also in cylinder and head number)

Depending on the device type, the primary and alternate block addresses can be the same on this report.

2. The second part of the report, which is always printed, is a summary message. It shows the number of blocks (within the specified range) found assigned to alternates.

MAPALT diagnostic output

The program reports any I/O errors that interrupt it. The following information appears on the program output when such errors occur:

```
CSW = xxxxxx xxxxxx CCW = xxxxxxxx xxxxxxxx
SENSE = xxxxxxxx xxxxxxxx xxxxxxxx xxxxxxxx
        xxxxxxxx xxxxxxxx
```

This information should be used, in accordance with installation procedures, as an aid in isolating and correcting the cause of the problem.

If a data check is encountered, an error message is printed giving the relative block number of the block causing the error. Processing then continues with the next sequential block.

Examples of the MAPALT command

The following examples show ways you might code the MAPALT command in various situations.

Mapping volumes with the Stand-Alone version



The following examples show you how to map volumes with the Stand-Alone version of ICKDSF.

Mapping a full volume

In this example, a full volume scan of a 3370 direct access storage volume is performed and a summary report is made of the total number of blocks found that have alternates assigned.

```
MAPALT  UNITADDRESS(0141) ALL NODETAIL
```

Using abbreviations and defaults, you could also have specified:

```
MAPALT  UNIT(0141)
```

Mapping a range of blocks in a volume

In this example, the range of blocks from 200,000 to 300,000 on a 3370 direct access storage volume is scanned. A detailed report is made of each block within that range that has an alternate assigned, and a summary report is made giving the total number of assigned alternates found.

```
MAPALT  UNITADDRESS(0142) LIMITS(200000,300000) DETAIL
```

Using abbreviations, you could have specified:

```
MAPALT  UNITADDR(0142) LIM(200000,300000) DTL
```

Mapping a full VSE version volume



In this example, a full volume scan is performed on the fixed block architecture device assigned to SYS001. A detailed report is made of each block on the volume that has an alternate assigned, and a summary report is made giving the total number of alternates found.

```
// JOB   jobname
// ASSGN SYS001,140
// EXEC  ICKDSF,SIZE=AUTO
  MAPALT  SYSNAME(SYS001) ALL DETAIL
/*
/&
```

Chapter 33. REFORMAT command—FBA



The REFORMAT command updates portions of a previously initialized volume. After issuing INIT to initialize a volume, use REFORMAT to change the:

- Volume serial number
- Owner identification

Only volumes that have been previously initialized can be reformatted.



Do not use REFORMAT to update volumes that have been formatted with the CPVOLUME command for use in a VM environment. Use the CPVOLUME command instead.

Syntax

The abbreviation for the REFORMAT command is RFMT.

REFORMAT
Required Parameters SYSNAME(*sysxxx*)|UNITADDRESS(*ccuu*) VERIFY(*serial*|**NONE*[,owner]*)|NOVERIFY
Optional Parameters OWNERID(*owner*) VOLID(*serial*)

Required parameters

SYSNAME|UNITADDRESS parameter: identify the volume

Parameter/ Abbreviations	**Description**
SYSNAME(*sysxxx*)	Required to identify a VSE volume when executing ICKDSF in batch mode; the volume must be online. For *sysxxx*, specify the SYSNAME in the ASSGN system control statement.
UNITADDRESS(*ccuu*) **UNITADDR** **UNIT**	Required for a minidisk, Stand-Alone, or CMS version volume. For VSE, it is required when executing ICKDSF in command mode; the volume must be online. For *ccuu*, specify the address (3 or 4 hexadecimal digits) of the channel and unit of the volume. For the CMS version, specify the virtual address of the minidisk or dedicated device. The unit address is the device number.
Default:	None.
Restrictions:	None.

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VERIFY|NOVERIFY parameter: verify volser and ownerid

Parameter/ Abbreviations	Description
VERIFY(*serial[,owner]*) **VFY**	Required when you want to verify the volume serial number and owner identification before reformatting the volume or minidisk. If the volume serial number or owner identification does not match that found on the volume or minidisk, REFORMAT ends. For *serial*, substitute 1 to 6 alphanumeric characters for the volume serial number. For *owner*, substitute 1 to 14 alphanumeric characters for the owner identification.
NOVERIFY **NOVFY** **NVFY**	Required when you want to bypass verification of the volume serial number and owner identification.
Default:	None. You must specify either VERIFY or NOVERIFY.
Restrictions:	You cannot verify the owner identification separately from the volume serial number. Both the volume serial number and the owner identification must be verified when you want to verify the owner identification. When you specify the VERIFY parameter and verification fails, the command stops running.

Optional parameters

OWNERID parameter: specify a new volume-Ooner identification

Parameter/ Abbreviations	Description
OWNERID(*owner*) **OWNER**	Writes a new volume-owner identification in the volume or minidisk label. For *owner*, substitute 1 to 14 alphanumeric characters for the owner identification to be written in the volume or minidisk label.
Default:	If you do not specify a new owner identification when reformatting a volume or minidisk, the old owner identification remains unchanged.
Restrictions:	None.

VOLID parameter: specify a new volume serial number

Parameter/ Abbreviations	Description
VOLID(*serial*)	Writes a new volume serial number in the volume or minidisk label. For *serial*, substitute 1 to 6 alphanumeric characters for the volume serial number. If fewer than six characters are specified, the serial is left-justified, and the remainder of the field is padded with blanks (X'40').
Default:	When you reformat a volume or minidisk and do not specify the VOLID parameter, the old volume serial number remains unchanged.
Restrictions:	Any catalog that identifies the volume by its volume serial number must be changed to reflect the new volume serial number for any cataloged data sets that reside on the reformatted volume.

Examples of the REFORMAT command

The following examples show different ways to code the REFORMAT command.

Any values specified here are examples only and should not necessarily be interpreted as the values for your system.

Reformatting volumes with the VSE version



The following examples show you how to reformat volumes with the VSE version of ICKDSF.

Changing the volume serial number

In this example, the volume serial number and owner ID are verified, and a new volume serial number and owner ID are assigned.

```
// JOB      jobname
// ASSGN    SYS010,380
// EXEC     ICKDSF,SIZE=AUTO
   REFORMAT SYSNAME(SYS010) VERIFY(OLDVOL,SMITH) -
            VOLID(NEWVOL) OWNERID(JONES)
/*
/&
```

Changing the volume serial and blanking out the owner-ID

In this example, the volume serial number and owner ID are verified, a new volume serial number is assigned, and the owner ID is blanked.

```
// JOB      jobname
// ASSGN    SYS011,381
// EXEC     ICKDSF,SIZE=AUTO
   REFORMAT SYSNAME(SYS011) VERIFY(OLDVOL,JONES) -
            VOLID(NEWVOL) OWNERID('b')
/*
/&
```

In the example above, 'b' is a space.

Reformatting a minidisk in the CMS version



In this example, the volume serial number of an MVS minidisk at virtual address 291 is being changed from OLDVOL to NEWVOL and the owner identification from PAYROLL to NEWPAY. The VERIFY parameter is specified to ensure that the correct volume and owner is being accessed before the volume serial/ owner ID is changed.

```
REFORMAT UNITADDRESS(0291) VERIFY(OLDVOL,PAYROLL) -
          VOLID(NEWVOL) OWNERID(NEWPAY)
```

Appendix A. Device Support Facilities messages (ICK)

This appendix contains all ICKDSF messages with the ICK prefix.

Messages are explained as fully as possible so that you can understand a condition and take necessary action. Information for each message includes, when appropriate:

Explanation
What the message means, why it appears, what caused it, what its variable fields are.

System Action
What is happening as a result of the condition causing the message. For example, the system waiting for responses.

Operator and Programmer Response
If a response is necessary, who performs it, what the pertinent responses are, and their effect on the system or program.

Note: Wherever the CE cylinder is referred to in the message, this can be either the CE, device support, or diagnostic cylinder, depending on the device.

Message routing and descriptor codes

Routing codes provide the ability to route system operator messages to selected functional areas.

ICKDSF messages will be routed to default functional areas as defined by a specific installation or, in the absence of such definition, they will be routed to the master console.

Component Name
ICK

Program Producing Message
Device Support Facilities

Audience/Where Produced
For the operator/the operator's console. For the system programmer/printed output.

Message Format
ICK s nnn t text or ICK nnn t text

s
Condition code indicating severity of message received at the output printer. Messages received at the console do not have a condition code indicating severity.

0
Information: no effect upon processing

1
Warning: function might fail

2
Error: function probably failed

3
Serious error: function failed

4
Terminal error: ICKDSF processor ends

It is possible to determine which of several messages issued during command processing results in a specific condition code value. The highest condition code multiplied by four yields the command's setting of the LASTCC.

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nnnn or nnn
Message serial number: 4 digits for printed messages, and 3 digits for messages that appear at the operator's console.

t
Type code:

I
Informational

E
Eventual action required

D
Decision required, processing waiting

A
Operator action required

text
Message text

** Indicates a 'second-level' message that further explains a preceding message. The track addresses (X'cccc:hhhh') in message text appear in hexadecimal format.

Associated Publications
None

ICK001D CONFIRM PURGING OF UNEXPIRED DATA SETS ON *ccuu*, REPLY U TO PURGE, ELSE T

Explanation

When one or more data sets are on the volume at *ccuu*, the INIT command could possibly destroy the contents of one or more tracks of this data set.

When one or more unexpired data sets are on the volume at *ccuu*, the INSPECT command or TRKFMT command could possibly destroy the contents of one or more tracks of this data set.

There is no verification that the tracks being inspected or processed with the TRKFMT command, are actually within the data set. The data set is affected by the INSPECT command or TRKFMT command only if the specified tracks are within the unexpired data set.

The data set is not purged from the VTOC. Only the specified tracks or blocks are purged, unless recovery is in effect.

System action

ICKDSF waits for the operator's response.

Operator response

For the INIT command, reply U to permit unconditional purging of the data set.

Reply T to stop purging and to stop processing the function.

For the INSPECT command, reply U to permit INSPECT to proceed on the tracks specified in the command.

Reply T to stop possible destruction of the specified tracks and to end the function.

For the TRKFMT command, reply U to permit TRKFMT to proceed on the tracks specified in the command.

Reply T to stop possible destruction of the specified tracks and to end the function.

System programmer response

None.

ICK002D ERROR IN REPLY, REPLY "U" OR "T"

Explanation

There is a response that is not valid to a message whose only valid response is U or T. Such a character causes a request for reentry to be made.

System action

ICKDSF waits for the operator's response.

Operator response

Respond with U for unconditional purging, or T to end.

System programmer response

None.

ICK003D REPLY U TO ALTER VOLUME ccuu CONTENTS, ELSE T

Explanation

Processing of the volume ccuu offline must be confirmed because the operating system does not check the offline volume. This could cause loss or modification of data on the volume.

Depending on the command and parameter used, the amount of altered data might be as small as the volume serial (such as the REFORMAT command with VOLID parameter), or as large as a track (such as INSPECT with NOPRESERVE), or a whole volume.

System action

ICKDSF waits for the operator's response.

Operator response

Respond U to proceed with command processing. Respond T to end the command.

System programmer response

None.

ICK004D READY DEVICE ccuu AND REPLY U, ELSE T

Explanation

The device *ccuu* is not in the READY state.

System action

ICKDSF waits for the operator's response.

Operator response

Ensure that the device is in the READY state. Respond U to continue processing the command or respond T to end the command.

System programmer response

None.

ICK005E DEFINE INPUT DEVICE, REPLY "dddd,ccuu" or "CONSOLE"

Explanation

dddd is the device type.

ccuu is the channel and unit address.

This message appears only in the Stand-Alone version. The device type and location of the command input stream must be specified. To specify the console, enter a null line.

System action

ICKDSF waits for the operator's response.

Operator response

Specify the input device type, and its channel and unit address. Specify ccuu as 3 or 4 digits.

System programmer response

None.

ICK006E DEFINE OUTPUT DEVICE, REPLY "dddd,ccuu" or "CONSOLE"

Explanation

dddd is the device type.

ccuu is the channel and unit address.

This message appears only in the Stand-Alone version. The device type and the location of the printed output must be specified. To specify the console, enter a null line.

System action

ICKDSF waits for the operator's response.

Operator response

Specify the output device type and its channel and unit address. *ccuu* can be specified as 3 or 4 digits.

System programmer response

None.

ICK007E INVALID INPUT DEVICE SPECIFIED

Explanation

This message appears only in the CMS or Stand-Alone version. The specified device type is not valid to message ICK005E.

System action

ICKDSF repeats message ICK005E.

Operator response

Specify a correct input device type. For CMS version see "Using parameters to select the input and output

devices" on page 42. For Stand-Alone version see "Defining the input and output device" on page 60.

System programmer response

None. Save the job output and contact your IBM service representative.

ICK008E INVALID OUTPUT DEVICE SPECIFIED

Explanation

This message appears only in the CMS or Stand-Alone version. The specified device type is not valid to message ICK006E.

System action

ICKDSF repeats message ICK006E.

Operator response

Specify a correct output device type. For CMS version see "Using parameters to select the input and output devices" on page 42. For Stand-Alone version see "Defining the input and output device" on page 60.

System programmer response

None. Save the job output and contact your IBM service representative.

ICK009I SVC INTERRUPT OCCURRED

Explanation

This message appears only in the CMS or Stand-Alone version. It indicates a probable program error. The SVC instruction cannot be used in the CMS or Stand-Alone version.

System action

ICKDSF ends.

Operator response

Notify the system programmer.

System programmer response

Save the job output and contact your IBM service representative.

ICK010I PROGRAM INTERRUPT OCCURRED

Explanation

This message appears only in the CMS or Stand-Alone version. It indicates a probable program error where an instruction processed incorrectly.

System action

ICKDSF ends.

Operator response

Notify the system programmer.

System programmer response

Save the job output and contact your IBM service representative.

ICK011E I/O ERROR -- error-type, ccuu, command, csw, sense

Explanation

This message appears only in the CMS or Stand-Alone version. An I/O error of the type indicated has occurred on the device at address *ccuu*. The message prints the failing command, the contents of the channel status word (CSW), and the results of a sense operation against the device.

System action

ICKDSF ends.

Operator response

None.

System programmer response

Correct the cause of the error, and restart ICKDSF. Save the job output and contact your IBM service representative.

ICK012E INTERVENTION REQUIRED, ccuu

Explanation

This message appears only in the CMS or Stand-Alone version. The device shown is not in the READY state.

System action

ICKDSF waits for correction of the problem.

Operator response

Ensure that the device is in a READY state.

System programmer response

None.

ICK013E CONSOLE READ FAILED, REENTER LAST LINE

Explanation

This message appears only in the CMSor Stand-Alone version. An I/O error occurred while reading a line entered at the console.

System action

ICKDSF waits for the line to be reentered.

Operator response

Reenter the line.

System programmer response

None. Save the job output and contact your IBM service representative.

ICK014D SET DEVICE ccuu IN WRITE-MODE AND REPLY U, ELSE T

Explanation

The device at address *ccuu* is set in read-only mode.

System action

ICKDSFwaits a response.

Operator response

Set the device to allow write operations and reply *U*. If write operations cannot be allowed, reply *T*, and the command ends.

System programmer response

None.

ICK015E SUPPLY TODAY'S DATE, REPLY "mm/dd/yy"

Explanation

This message appears only in the Stand-Alone version.

- To include the date as part of the output title line, respond with the month, day, and year, as shown.
- To omit the date, press the ENTER key.

To bypass this message, set the CPU time and date before IPLing Stand-Alone ICKDSF.

System action

Either the date appears in the title line of the output listing, or blanks are substituted if a date was not supplied.

Operator response

To include the date in the title line of the output listing, respond with the month, day, and year. Otherwise, respond by pressing the ENTER key.

System programmer response

None.

ICK016E SUPPLY TIME OF DAY, REPLY "hh:mm:ss"

Explanation

This message appears only in the Stand-Alone version.

- To include the time of day in the title line of the output listing, respond with the hour, minute, and second as indicated.
- To omit the time of day, press the ENTER key.

To bypass this message, set the CPU time and date before IPLing Stand-Alone ICKDSF.

System action

Either the time of day appears in the title line of the output listing, or blanks are substituted if a time of day was not specified.

Operator response

To include the time of day in the title line of the output listing, specify the hour, minute, and second. Otherwise, respond by pressing the ENTER key.

System programmer response

None.

ICK017D filename IS A SECURED FILE

Explanation

The specified *filename* is a data-secured file and ICKDSF requests permission to purge this file in an associated message, ICK018D.

System action

This message is informational. Command processing continues.

Operator response

None.

ICK018D CONFIRM PURGING OF SPECIFIED FILE NAME, REPLY U TO PURGE, ELSE T

Explanation

The filename is displayed in message ICK017D. INIT command processing requests permission to purge the data set.

INSPECT command and TRKFMT command processing requests permission to possibly destroy the contents of one or more tracks of this data set. There is no verification that the tracks being inspected or processed with the TRKFMT command are actually contained in this data set. The data set is not purged from the VTOC.

System action

Command processing continues after the correct reply is issued. If the reply is T, the command ends, and ICKDSF continues processing the next command.

If the reply is U, ICKDSF continues to process the current command.

Operator response

Reply to this message with either U or T.

System programmer response

None.

ICK019D CONFIRM PURGING OF ALL VSAM FILES ON *ccuu*, REPLY U TO PURGE, ELSE T

Explanation

The volume at *ccuu*, is known to contain one or more VSAM data sets.

When the INIT command is specified, permission is being requested to purge all the VSAM data sets on the volume at *ccuu*.

When the INSPECT command or TRKFMT is specified, if one or more VSAM data sets have been found on the volume at *ccuu*, permission is being requested to possibly destroy the contents of one or more tracks of VSAM data sets. There is no verification that the tracks being inspected or processed with the TRKFMT command, are actually within the VSAM data sets.

The VSAM data set is affected by the INSPECT command or TRKFMT command only if the tracks specified are within the VSAM data set. The data set is not purged from the VTOC. Only the contents of the specified tracks are affected. If PRESERVE, HOLDIT, or KEEPIT have been specified, the INSPECT command will attempt to save and restore the contents of the track.

System action

Command processing continues after a correct reply is received. Reply T ends the command, and ICKDSF continues processing the next command.

Reply U to continue processing the current command.

Operator response

Reply either U or T to this message.

System programmer response

None.

ICK020D DEVICE *ccuu* IS SHARED. REPLY U OR T

Explanation

The volume addressed by the *ccuu* is being shared, and ICKDSF requests permission to operate on the subject volume.

System action

Command processing continues after the correct reply is given. Reply T ends the command and ICKDSF continues processing the next command. Reply U to continue processing the current command.

Operator response

Reply to this message with either *U* or *T*.

System programmer response

None.

ICK024I UNABLE TO OPEN VOLUME

Explanation

The specified volume cannot be opened for these possible reasons:

- The DD statement is missing or not valid.
- The channel/unit address is not valid.
- While processing in a shared environment, the device is not in an offline status on the system processing ICKDSF
- There are I/O errors associated with the volume.

System action

The command ends. ICKDSF processing continues with the next command.

Operator response

None.

System programmer response

Check the status of the volume. Examine previous messages to determine the volume status. Save the job output and contact your IBM Support Center.

ICK030E DEFINE INPUT DEVICE: fn ft fm, OR "CONSOLE," OR "READER"

Explanation

Specify the input device.

System action

ICKDSF waits for the operator's response.

Operator response

- If the ICKDSF input command stream comes from the console, either enter CONSOLE or press the ENTER key.
- If the ICKDSF input command stream is contained in a CMS file, enter fn ft fm.
- If the ICKDSF input command stream is contained in a virtual reader file, enter READER (the file must be the first file in the reader).

Type ? to invoke the online help panels.

System programmer response

None.

ICK031E DEFINE OUTPUT DEVICE: fn ft fm, OR "CONSOLE," OR "PRINTER"

Explanation

Specify the output device.

System action

ICKDSF waits for the operator's response.

Operator response

- If the console is to be used as the ICKDSF output device, either enter CONSOLE or press the ENTER key.
- If the output device is to be a CMS file, enter fn ft fm.
- If ICKDSF output device is a printer, enter PRINTER.

Type ? to invoke the online help panels.

System programmer response

None.

ICK033E ENTER CYL OR BLOCK SIZE FOR THE SPECIFIED MINIDISK

Explanation

Specify the size of the minidisk either in cylinders for CKD devices, or in blocks for FBA devices. No verification is made of the accuracy of the size of the minidisk. This message follows ICK12316I.

System action

ICKDSF waits for operator's response.

Operator response

Specify the minidisk size (1-8 decimal digits) either in cylinders for CKD devices or in blocks for FBA devices.

System programmer response

None.

ICK035I CMS PARAMETER LIST LENGTH IS INVALID.

Explanation

ICKDSF was invoked by the CMS invocation parameter list and the number of the items in the list is not valid. The valid numbers are: 2, 4, or 6:

- Valid parameters with a length of two are:
  - CONSOLE CONSOLE
  - CONSOLE PRINTER
  - READER CONSOLE
  - READER PRINTER
- Valid parameters with a length of four are:
  - CONSOLE fn ft fm
  - READER fn ft fm
  - fn ft fm CONSOLE
  - fn ft fm PRINTER
- Valid parameters with a length of six are:
  - fn ft fm fn ft fm

System action

Command processing ends.

Operator response

Specify valid INPUT and OUTPUT device parameters.

System programmer response

None.

ICK036I CMS PARAMETER LIST IS INVALID.

Explanation

ICKDSF was invoked by the invocation parameter list and the list is not valid. Valid parameters for INPUT DEVICE are: CONSOLE, READER or fn ft fm.. Valid parameters for OUTPUT DEVICE are: CONSOLE,PRINTER or (fn ft fm).

System action

Command processing ends.

Operator response

Specify valid INPUT and OUTPUT DEVICE parameters.

System programmer response

None.

ICK037I FILE MODE PARAMETER LENGTH INVALID

Explanation

ICKDSF was invoked using the CMS invocation parameter list, and the length of the file mode parameter is not valid. The maximum length for file mode is two characters.

System action

Command processing ends.

Operator response

Specify a valid file mode parameter.

System programmer response

None.

ICK057I INVALID DEVICE TYPE: VTOC INDEX NOT SUPPORTED ON THIS DEVICE

Explanation

The device type is not valid for initialization with a VTOC index.

System action

The VTOC index is not created. INIT command processing continues.

Operator response

None.

System programmer response

None.

ICK058I ccuu I/O ERROR DETECTED DURING INDEX CREATION: ERROR CODE= *

Explanation

An I/O error occurred during VTOC index creation processing. These are possible error codes:

1 Error occurred reading volume label
2 Error occurred reading VTOC
3 Error occurred writing VTOC
4 Error occurred writing index records
5 Index extent violated; increase index size

System action

VTOC index creation processing ends. The VSE volume indicator is turned on in the VTOC. INIT command processing continues.

Operator response

Refer the error response to the system coordinator for problem determination.

System programmer response

None.

ICK059I INDEX STARTING LOCATION INVALID AS SPECIFIED

Explanation

The INDEX parameter on the INIT command statement is not valid. The starting location, as specified, is not valid for one of the following reasons:

- It caused an overlap with the VTOC.
- It defined cylinder 0, track 0 as the starting location of the index data set.
- It was outside the physical limits of the device.
- The relative track specified is not valid for the device.

System action

Command processing ends.

Operator response

None.

System programmer response

Check the values specified for the INDEX parameter and correct the value in error. Resubmit the job.

ICK061I **ccuu VTOC INDEX CREATION SUCCESSFUL: VOLUME IS IN INDEX FORMAT**

Explanation

The VTOC index was successfully created on the volume.

System action

None.

Operator response

None.

System programmer response

None.

ICK062I **ccuu VTOC INDEX CREATION FAILED: RETURN CODE= 12**

Explanation

Index creation was unsuccessful.

System action

None.

Operator response

None.

System programmer response

Check the job output for additional information about the reason for job failure.

ICK091I **ccuu NED=tttttt.mmm.mfg.lc.ssssssssssss**

Explanation

The device NED is shown for the device. Either the device is connected on a single path, or if multiple paths to his host exist, the NED information was found to match for all paths. The NED information shown is in the following format:

tttttt = device type
mmm = model
mfg = manufacturer
lc = manufacturing location
ssssssssssss = sequence number

Note: The information in the above fields are printed as they are returned from the device. If blanks are returned, then blanks will be printed. Unprintable characters may be printed as '.'. Some examples of this are:

- The device type field, tttttt, is a 6-digit field. The information is printed in the message as it is returned from the device. For example, when the first 2-digits are returned as blanks by the device, they will be printed as blanks in the message. So the device type field will appear to have leading blanks.
- Some devices (for example 2105) returns blanks in the model field, so the model field will be blank in the message.

System action

Processing continues.

Operator response

None.

System programmer response

If the information is not correct for this device, take the necessary action to determine if a configuration error exists and correct the problem.

ICK126D **DATA ALREADY EXISTS FOR TRACK X'cccc hhhh' REPLY "R" TO RECOVER, "E" TO ERASE THE RECOVERY DATA, OR "T" TO TERMINATE**

Explanation

This message is issued if recovery data exists for a track (see ICK2115I), but there already exists data on that track.

This situation might occur if:

- The original data on the track has not yet been erased at the point of failure.
- An INSPECT did not run to completion, but the volume was available for user use before this invocation of the INSPECT command.

System action

Screen prompt asks the operator for one of these replies:

- If R is specified, the data will be recovered from the recovery information. (The new data on the track is erased).
- If E is specified, the recovery data is destroyed. The current data on the track remains.
- If T is specified, command processing ends. The recovery data remains intact. The next invocation of the INSPECT command will again attempt to process the recovery data.

Operator response

Reply R, E or T.

System programmer response

None.

ICK130D **DATA CANNOT BE RECOVERED FOR TRACK X'cccc hhhh' REPLY C TO ERASE AND CONTINUE, T TO TERMINATE, I TO IGNORE**

Explanation

The previous INSPECT command did not complete running during PRESERVE backup processing.

Note: The data cannot be recovered from the backup location.

System action

A prompt asks for a reply to this message. The ignore option is available if the current invocation of the INSPECT command specified HOLDIT.

- If C is specified, the data is erased at the backup location, and processing begins from the start of the specified range. This should be specified if the user has no need to recover data from the backup location.
- If I is specified, the recovery data is ignored, and command processing continues for the current invocation.

  Note: This response is allowed only if HOLDIT was specified.

  The recovery data remains intact. The next invocation of the INSPECT command will again attempt to process the recovery data.
- If T is specified, command processing ends. The recovery data remains intact. This should be specified if the user wishes to either retry the recovery process, or examine the situation before allowing the data to be erased. The next invocation of the INSPECT command will again attempt to process the recovery data.

Operator response

Respond C, I or T.

System programmer response

None.

ICK158D **DATA CANNOT BE RECOVERED FOR BLOCK xxxxxxxx REPLY C TO ERASE AND CONTINUE, T TO TERMINATE, I TO IGNORE**

Explanation

The previous invocation of the INSPECT command did not run to completion during PRESERVE backup processing.

Note: The data cannot be recovered from the backup location.

System action

A prompt asks for a reply to this message. The ignore option is available if the current invocation of the INSPECT command specified HOLDIT.

- If C is specified, the data is erased from the backup location, and processing begins from the start of the specified range. This should be specified if the user has no need to recover data from the backup location.
- If I is specified, the recovery data is ignored, and command processing continues for the current invocation. Note that this response is allowed only if HOLDIT was specified. The recovery data remains intact. The next invocation of the INSPECT command will again attempt to process the recovery data.
- If T is specified, command processing ends. The recovery data remains intact. This should be specified if the user wishes to retry the recovery process, or examine the situation before allowing the data to be erased. The next invocation of the INSPECT command will again attempt to process the recovery data.

Operator response

Respond with C, I or T.

ICK159D **DATA ALREADY EXISTS FOR BLOCK xxxxx REPLY “R” TO RECOVER, “E” TO ERASE THE RECOVERY DATA, OR “T” TO TERMINATE**

Explanation

This message is issued if recovery data exists for a block (see ICK12157), but that block already contains data that is neither ICKDSF nor original user data.

This situation can occur if an INSPECT did not run to completion, but the volume was available for user use before this invocation of the INSPECT command.

System action

A prompt asks the operator to reply to this message.

- If R is specified, the data will be recovered from the recovery information. (The new data on the block is erased).
- If E is specified, the recovery data is destroyed. The current data on the block remains.
- If T is specified, command processing ends. The recovery data remains intact. The next invocation of the INSPECT command will again attempt to process the recovery data.

Operator response

Respond R, E, or T.

ICK177D REPLY U TO ERASE CONTENTS OF SYSTEM RESERVED AREA ON ccuu, ELSE T

Explanation

When a CONTROL command with the RECLAIM(SYSAREA) parameter is issued, the operator must confirm the processing before ICKDSF starts the reclaim process to destroy the contents of the System Reserved Area. ccuu is the address of the device that will be modified if the command continues.

System action

ICKDSF waits for operator's response.

Operator response

- Respond U to permit the command to start system reserved area reclaim processing.
- Respond T to end processing and prevent destruction of system reserved area contents.

System programmer response

None.

ICK203I PPRCOPY ESTPAIR FUNCTION COMPLETED SUCCESSFULLY

Explanation

The PPRCOPY ESTPAIR command used to establish remote copy pairs has completed successfully.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK210I *** COPY IN PROGRESS *****

Explanation

MSGREQ(YES) parameter has been specified with the PPRCOPY ESTPAIR command. Copy is still in progress. The command has not yet been completed.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK231I DEVICE IS NOW A PEER TO PEER REMOTE COPY VOLUME

Explanation

PPRCOPY ESTPAIR completed successfully. The device is now a Peer-to-peer Remote Copy volume.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK316I INSTALL FUNCTION COMPLETED SUCCESSFULLY

Explanation

The INSTALL command processing completed successfully.

System action

ICKDSF ended normally. Processing continues with the next command.

Operator response

None.

System programmer response

None.

ICK318I REVAL FUNCTION COMPLETED SUCCESSFULLY

Explanation

The REVAL command processing completed successfully.

System action

ICKDSF ended normally. Processing continues with the next command.

Operator response

None.

System programmer response

None.

ICK401I ccuu SUSPECTED DRIVE PROBLEM

Explanation

Drive tests have detected an error.

System action

Command processing ends.

Operator response

Depending on your installation's procedures, you might do the following:

- Restore the entire volume to another drive from a backup volume.
- Discontinue using the drive.

Save the output, which contains further information about the hardware problems.

Take the action appropriate to your installation's procedures for handling suspected equipment problems.

System programmer response

If you are running under VM (either CMS or Stand-Alone, VSE, or MVS running under VM), this message can indicate that a diagnostic function was attempted against a device that was a minidisk and was LINKed to the userid. Diagnostic functions must be done on dedicated devices.

If this is determined to be the case, and if a scan was the primary purpose of this ANALYZE command invocation, specify NODRIVE. Otherwise, the device must be dedicated.

For more information on VM support, see Chapter 5, “Getting started with the CMS version,” on page 37.

System programmer response

If the problem recurs, save the job output and contact your IBM service representative.

ICK404I ccuu VOLUME HAS UNFORMATTED DATA BLOCKS. TESTING TERMINATED

Explanation

An attempt was made to read a data block which is not initialized (the data field is not written).

System action

After 504 data checks, the ANALYZE command ends.

Operator response

Perform appropriate procedures to recover all desired data from the volume and then run the VSE utilities INTDK or INTDSK with the IQ option to initialize all data blocks.

System programmer response

None.

ICK407I ccuu NO DRIVE PROBLEMS FOUND

Explanation

Drive test completed successfully and detected no problems.

System action

Command processing continues.

Operator response

None.

Note:

1. If a data problem prompted you to run this command, and if the problem persists, run the data verification test.
2. If a drive problem prompted you to run this command, and if the problem persists, further analysis is needed according to your installation's procedures.

System programmer response

None.

ICK411I FUNCTIONAL VERIFICATION DATA WRITE/READ TEST STARTED

Explanation

HA/R0 validation and functional data verification test for the REVAL command process has started.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK412I FUNCTIONAL VERIFICATION DATA WRITE/READ TEST ENDED

Explanation

HA/R0 validation and functional data verification test for the REVAL command process has ended.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK416D CHPID = XX, RESERVED, REPLY R TO RETRY, B TO BYPASS

Explanation

The system operator receives this message if the processing encounters a path that remains reserved for all of its retries. XX specifies the path (CHPID).

System action

See explanation.

Operator response

- Reply R to reissue the I/O operation to the device.
- Reply B to bypass further processing on this path.

System programmer response

None.

ICK417D X, Y, RESERVED, REPLY R TO RETRY, B TO BYPASS

Explanation

The system operator receives this message if the processing encounters a path that remains reserved for all of its retries. X specifies the channel number. Y specifies the channel set (CPU affinity).

System action

See explanation.

Operator response

- Reply R to reissue the I/O operation to the device
- Reply B to bypass further processing on this path

System programmer response

None.

ICK418I REVALIDATE FIXSIM(4E4E) PROCESS STARTED

Explanation

Rewrite user data for the specified range has started.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK419I REVALIDATE FIXSIM(4E4E) PROCESS ENDED

Explanation

Rewrite user data for the specified range has ended.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK420I REVALIDATE FUNCTION STARTED WITHOUT FFVDP WRITE/READ TEST

Explanation

HA/R0 validation test has started for the specified range for the REVAL command. No factory functional verification data pattern will be written on the volume.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK430I REVALIDATE REFRESH PROCESS STARTED

Explanation

Rewrite the user data for the specified range has started.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK431I REVALIDATE REFRESH PROCESS ENDED

Explanation

Rewrite the user data for the specified range has ended.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK440I VOLSER, VTOC AND DATA IN THE SPECIFIED RANGE WILL BE ERASED

Explanation

The message was printed for REVAL DATA or REVAL NODATA processing. The VOL1 record, the VTOC pointer, and the data in the specified range will be erased. Data on the volume will be inaccessible when the REVAL process has completed.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK501I INVALID DEVICE TYPE SPECIFIED FOR BUILDIX COMMAND

Explanation

There is a request to change the format of a VTOC on a volume whose device type is not supported by the BUILDIX command (for example, a 2314 DASD).

System action

Command processing ends.

Operator response

None.

ICK502I BUILDIX FUNCTION STARTED

Explanation

The BUILDIX command has started running. Processing of the BUILDIX command has begun.

System action

None.

Operator response

None.

ICK503I ccuu REQUEST RECEIVED TO CONVERT VTOC TO **FORMAT

Explanation

This message verifies the requested format change for a VTOC. ** specifies the format requested: either OS or IX.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK504I ccuu VTOC FORMAT IS CURRENTLY **FORMAT, REQUEST ACCEPTED

Explanation

This message verifies that the specified BUILDIX function is valid for the current format of the VTOC on the volume. ** identifies the format of the VTOC: either OS or IX.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK505I ccuu VTOC FORMAT IS CURRENTLY **FORMAT, REQUEST REJECTED

Explanation

The format requested by the BUILDIX command is the same as the current VTOC format.

** identifies the format of the VTOC: either OS or IX.

System action

Command processing ends.

Operator response

None.

System programmer response

None.

ICK508A ccuu SHOULD CONVERSION PROCEED? REPLY U TO CONTINUE, ELSE T

Explanation

This message permits the operator to verify that the user is authorized to request the BUILDIX function before command processing begins.

System action

The system waits for the operator's response.

Operator response

Verify that the user is authorized to issue the command, and reply:

- U to continue
- T to end processing

Any reply other than U or T causes this message to be issued again.

System programmer response

None.

ICK509I ccuu DIRF FLAG SET IN VTOC, BUILDIX CANNOT PROCEED

Explanation

An error occurred during VTOC processing on a previous job which set the DADSM interrupt flag in the VTOC. The VTOC is not accurate.

System action

Command processing ends

When the job is completed, resubmit the BUILDIX command.

Operator response

Prepare a job that will reconstruct the VTOC and run it against the volume. (For example, run an IEFBR14 job to allocate a temporary data set to the volume.)

System programmer response

None.

ICK510I **ccuu BUILDIX REQUEST CANCELLED DUE TO OPERATOR ACTION**

Explanation

The operator replied CANCEL to a message requiring a response.

System action

Command processing ends.

Operator response

None.

System programmer response

None.

ICK511I **ccuu CVAF ERROR: RETURN CODE=** ERROR CONDITION= ***

Explanation

The common VTOC access facility returned to ICKDSF with a return code that indicates either a logical error or a physical error. Return codes have the following meanings:

4, 12
Indicate logical errors

8
Indicates an index structure that is not valid

16
Indicates an I/O error

The error condition will be printed only for a return code of 4 or 8. For more information on these error conditions, see *z/OS DFSMSdfp Diagnosis* .

System action

Command processing ends with the following conditions, depending on the return code:

4, 8, 12
The volume remains in OSVTOC format

16
The volume remains as it was before the command was issued

Operator response

None.

System programmer response

None.

ICK512I **ccuu ERROR: SYS1.VTOCIX IS A VIO DATASET. BUILDIX TERMINATED.**

Explanation

The BUILDIX command does not support the index data set allocated as a VIO data set.

System action

Command processing ends with a return code of 12. The VTOC remains unchanged.

Operator response

None.

ICK513I **ccuu BUILDIX PROCESSING COMPLETED: VTOC IS NOW IN **FORMAT.**

Explanation

The BUILDIX command completed successfully. ** shows the new VTOC format: either OS or IX.

System action

ICKDSF ends normally.

Operator response

None.

System programmer response

None.

ICK514I **INDEXED VTOC FACILITY NOT ON SYSTEM. BUILDIX TERMINATED.**

Explanation

There is a request to change a VTOC to IXVTOC format, but the system does not contain indexed VTOC programming support.

System action

Command processing ends.

Operator response

None.

System programmer response

None.

ICK515I ccuu BUILDIX COMMAND FAILED.

Explanation

An error caused command processing to end.

System action

Command processing ends.

Operator response

None.

System programmer response

None.

ICK516I ccuu I/O ERROR DETECTED DURING VTOC CONVERSION: ERROR CODE= *

Explanation

There was an I/O error during BUILDIX processing. Error codes:

1
Error occurred in reading the volume label

2
Error occurred in reading the VTOC

3
Error occurred in writing the VTOC

4
Error occurred in writing index records

5
Index extent was violated; increase index size

System action

BUILDIX command processing ends.

Operator response

Refer the error indication to the system coordinator for problem determination.

ICK517I ccuu ERROR: VOLUME IS A DOS STACKED PACK

Explanation

The volume being processed has a VTOC on the first track of the volume. VTOC conversion is not possible on this type of volume.

System action

Command processing ends.

Operator response

None.

System programmer response

None.

ICK518I ccuu ERROR: VOLUME CONTAINS SPLIT CYLINDER EXTENTS

Explanation

The volume contains one or more shared extent data sets which are not supported by the BUILDIX command.

System action

BUILDIX command processing ends.

Operator response

None.

System programmer response

None.

ICK519I ccuu ERROR: SYS1.VTOCIX. DATASET NOT FOUND ON VOLUME

Explanation

The index data set could not be found on the volume.

System action

BUILDIX command processing ends.

Operator response

None.

System programmer response

None.

ICK520I ccuu ERROR: DUPLICATE INDEX DATASET NAME FOUND ON VOLUME

Explanation

Two data sets were found on the volume that had names beginning with SYS1.VTOCIX. Only one set per volume is allowed.

System action

BUILDIX command processing ends.

Operator response

None.

System programmer response

None.

ICK521I ccuu ERROR: INDEX DATASET EXTENT NOT CONTIGUOUS

Explanation

The index data set occupies more than one extent. This data set must occupy one, and only one, extent.

System action

BUILDIX command processing ends.

Operator response

None.

System programmer response

None.

ICK522I INVALID UNITADDRESS OR DDNAME SPECIFIED

Explanation

The UNITADDRESS or DDNAME is incorrect in the command statement.

System action

BUILDIX command processing ends.

Operator response

Correct the job control statement, then resubmit the job.

System programmer response

None.

ICK523I VTOC ENQUEUE FAILURE

Explanation

ENQ RET=HAVE; returned higher than a return code 8 (task does not have resources).

System action

Command ends. Processing continues with the next command.

Operator response

None.

System programmer response

Resubmit the job when ENQ can be obtained.

ICK526I CONVERSION TO OSFORMAT COULD NOT COMPLETE SUCCESSFULLY

Explanation

The VTOC indicates an error condition after the completion of BUILDIX processing to convert to OSFORMAT.

System action

BUILDIX ends abnormally.

Operator response

None.

System programmer response

This message usually means that the OS VTOC on the volume contains an error. Examine the VTOC to determine the nature of the error.

ICK528I INDEX DATA SET CANNOT START AT CYLINDER 0, TRACK 0

Explanation

You specified cylinder 0, track 0 for the index data set location. This is not a valid location.

System action

BUILDIX command processing ends. None.

Operator response

None.

System programmer response

Respecify the command using a valid location.

ICK529I ALLOCATE ERROR: RETURN CODE = **

Explanation

DADSM allocate returned to ICKDSF with an unexpected return code.

System action

BUILDIX command processing ends.

Operator response

None.

System programmer response

See the *z/OS DFSMSdfp Diagnosis* for a full explanation of DADSM allocate return codes.

ICK600I MAPALT STARTED

Explanation

MAPALT command processing has started.

System action

None.

Operator response

None.

ICK602I INCORRECT DEVICETYPE, MAPALT TERMINATED

Explanation

The MAPALT command does not support the specified device type.

System action

MAPALT command processing ends.

Operator response

MAPALT can only run on fixed block devices in fixed block mode.

System programmer response

None.

ICK603I UNABLE TO OPEN VOLUME

Explanation

The specified volume cannot be opened. The ASSGN statement is possibly missing or not valid, or the channel and unit address is not valid.

System action

MAPALT command processing ends.

Operator response

Correct the error, then resubmit the job.

System programmer response

None.

ICK604I ccuu LIMITS PARAMETER INVALID AS SPECIFIED, MAPALT TERMINATED

Explanation

The LIMITS parameter specified relative block numbers that are not valid.

System action

MAPALT command processing ends.

Operator response

Correct the values in the LIMITS parameter, then resubmit the job.

System programmer response

None.

ICK605I ccuu UNRECOVERABLE I/O ERROR DETECTED, MAPALT TERMINATED

Explanation

There is an unrecoverable I/O error (other than a data check).

System action

MAPALT command processing ends.

Operator response

Check the job output which contains diagnostic information to aid error analysis.

Run the ICKDSF ANALYZE command as a problem determination aid.

Follow installation procedures for recovery from this type of error.

System programmer response

None.

ICK606I nnnnn BLOCKS ASSIGNED TO ALTERNATES IN LIMITS SPECIFIED

Explanation

This summary message shows the number of blocks that were assigned to alternates within the limits specified on the command statement.

System action

None.

Operator response

None.

System programmer response

None.

ICK607I ccuu MAPALT ABNORMALLY ENDED, REPORT MAY BE INCOMPLETE

Explanation

There is an error that caused command processing to end. The report may be incomplete.

System action

None.

Operator response

Check the job output for previous messages, then follow installation procedures.

System programmer response

None.

ICK608I ccuu MAPALT ENDED NORMALLY, RETURN CODE= n

Explanation

Command processing ended without any errors that stopped processing.

A return code of 0 or 4 is indicated in the message:

0
means no errors were encountered

4
means one or more recoverable errors were encountered

System action

None.

Operator response

None.

System programmer response

None.

ICK609I PERMANENT DATA CHECK FOUND READING ID FOR BLOCK nnnnnn

Explanation

A permanent data check was found while reading the ID field of the primary block shown in the message.

System action

The output device prints diagnostic information, and command processing continues.

Operator response

None.

System programmer response

Save the job output for the system coordinator, and follow installation procedures for data recovery and assignment of an alternate block.

ICK611I MAIN STORAGE NOT AVAILABLE, MAPALT TERMINATED

Explanation

Dynamic acquisition of storage for control blocks and work areas failed.

System action

MAPALT command processing ends.

Operator response

Increase main storage size, then resubmit the job.

System programmer response

None.

ICK705I VOLUME SERIAL NUMBER FOR DEVICE ccuu IS xxxxxx

Explanation

This is an informational message containing the volume serial and VTOC of the volume at *ccuu*.

If the volume serial was changed, you also receive one or both of these messages:

CHANGED FROM *xxxxxx* - The volume serial number of the *ccuu* was changed.

VOLUME SERIAL DUPLICATE FOR DEVICE *ccuu*. VOLUME MADE UNAVAILABLE - The new volume serial on the *ccuu* is a duplicate of a volume already known to the operating system. The device has been unloaded.

If the VTOC location was changed, you also receive the following:

VTOC LOCATION MOVED - The VTOC location of the volume at *ccuu* has moved.

VOLUME AT *ccuu* HAS MOVED.

If the volume serial is a duplicate, you also receive the following diagnostic message that may be used by your service representative if additional assistance is needed:

ocuu ADDRESS *xxxxxxxx,xxxxxxxx dcuu* ADDRESS *xxxxxxxx,xxxxxxxx* - In this message, *ocuu* is the address that was made unavailable; *dcuu* is the address of the duplicate volume.

System action

Command processing continues.

Operator response

If the device is being shared by other systems, this volume may need to be remounted at the sharing systems.

System programmer response

None.

Messages received at the output printer

ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS nn hh:mm:ss mm/dd/yy

Explanation

A command has been processed.

- The value *nn* is the last condition code (LASTCC) generated during processing.
- *hh:mm:ss* and *mm/dd/yy* are the hours, minutes, seconds and month, day, year respectively of the date and time of the message.

Note: The LASTCC value is the highest condition code found in the messages printed during command processing.

System action

LASTCC is set to *nn*;

MAXCC is set to *nn* if *nn* is greater than the current value of MAXCC.

Operator response

None.

System programmer response

None.

ICK00002I ICKDSF PROCESSING COMPLETE. MAXIMUM CONDITION CODE WAS nn

Explanation

This message is issued upon completion of a ICKDSF job step. The highest condition code (MAXCC) set during the job step is printed (see message ICK00001I) and returned to the ICKDSF invoker in register 15.

System action

None.

Operator response

None.

System programmer response

None.

ICK00091I ccuu NED=tttttt.mmm.mfg.lc.sssssssssss

Explanation

The device NED is shown for the device. Either the device is connected on a single path, or if multiple paths to his host exist, the NED information was found to match for all paths. The NED information shown is in the following format:

tttttt = device type
mmm = model
mfg = manufacturer
lc = manufacturing location
sssssssssss = sequence number

Note: The information in the above fields are printed as they are returned from the device. If blanks are returned, then blanks will be printed. Unprintable characters may be printed as '.'. Some examples of this are:

- The device type field, tttttt, is a 6-digit field. The information is printed in the message as it is returned from the device. For example, when the first 2-digits are returned as blanks by the device, they will be printed as blanks in the message. So the device type field will appear to have leading blanks.
- Some devices (for example 2105) returns blanks in the model field, so the model field will be blank in the message.

System action

Processing continues.

Operator response

None.

System programmer response

If the information is not correct for this device, take the necessary action to determine if a configuration error exists and correct the problem.

ICK00100I I/O DELAY IS SET TO nnnn AFTER EVERY m I/O INVOCATION

Explanation

The time delay is reset to *none*.

System action

No time delay will be provided for succeeding ICKDSF commands.

Operator response

None.

System programmer response

None.

ICK00101I I/O DELAY IS SET TO NONE

Explanation

The time delay is reset to none.

System action

No time delay will be provided for succeeding ICKDSF commands.

Operator response

None.

System programmer response

None.

ICK00204I PRECEDING COMMAND BYPASSED DUE TO CONDITION CODES

Explanation

The specified IF-THEN-ELSE command sequence caused the command to be bypassed. When specifying an IF-THEN-ELSE command sequence, either the THEN or the ELSE clause is processed. The clause that is not processed is bypassed.

System action

The bypassed portion of the command sequence is checked for syntax errors but is not processed. ICKDSF processing continues.

Operator response

None.

System programmer response

None.

ICK00206I IMPROPERLY PLACED COMMA HAS BEEN FOUND AND IGNORED

Explanation

The command contained a redundant comma. It is ignored.

Note: Positional parameters cannot be omitted by the use of commas.

Leading positional parameters cannot be omitted.

System action

Command processing continues.

Operator response

None.

System programmer response

Correct the syntax error to prevent the message from reoccurring. Save the job output and contact your IBM service representative.

ICK00215I **MINIDISK INFORMATION FOR DEVICE *ccuu***
RELOCATION FACTOR = *nnnnn*
SIZE = *mmmmm*
OWNER = owner-id
FPO LINK ADDRESS = *xxxx*

Explanation

This message indicates the location of the user minidisk on the real volume. (For example, for CKD devices, cylinder 0 of the minidisk is located at cylinder *nnnnnnnnn* of the real volume.) Relocation factor and minidisk size are in decimal. The minidisk is full-pack-overlay linked to the invoker as virtual address *xxxx* by ICKDSF.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK00222I **WARNING: COMMAND-END DELIMITER APPEARS WITHIN APOSTROPHES**

Explanation

There is a semicolon (the optional command delimiter) inside a quoted string. A closing single quotation mark may have been omitted.

System action

The usage is accepted, and the semicolon is treated as a valid character instead of as a delimiter.

Operator response

None.

System programmer response

Check the usage of the semicolon, and correct if necessary.

ICK00233I **TOO MANY RIGHT PARENTHESES FOUND. EXCESS IGNORED**

Explanation

There are too many closing parentheses at the end of the command or following a first-level parameter.

System action

The excess is ignored, and command processing continues.

Operator response

None.

System programmer response

Remove the excess parentheses.

ICK00546I **DATA SET NAME = data.set.name**

Explanation

The name of the data set that occupies the VTOC extent you specified in VTOC expansion processing.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK00700I **DEVICE INFORMATION FOR ccuu ON SUBCHANNEL SET n IS CURRENTLY AS FOLLOWS:**
PHYSICAL DEVICE=yyyy
LOGICAL DEVICE=yyyy
STORAGE CONTROLLER=aaaa

```
STORAGE CONTROL
DESCRIPTOR=bb
DEVICE DESCRIPTOR=cc
ADDITIONAL DEVICE
INFORMATION =
TRKS/CYL = dd, # PRIMARY
CYLS = eeeee
```

Explanation

ON SUBCHANNEL SET n identifies the subchannel set ID for the volume. It is included if the SUBCHSET parameter was specified on the INIT command.

PHYSICAL DEVICE=yyyy identifies the physical device type for the unit being processed. This message is always issued.

LOGICAL DEVICE=yyyy identifies the logical device. This line is displayed only if the logical device is different from the physical device.

STORAGE CONTROLLER=aaaa identifies the storage control type for the unit being processed. This is displayed if the sense-id CCW is supported.

STORAGE CONTROL DESCRIPTOR=bb describes the features associated with the storage controller. It contains the information in sense-id byte 3. (See the device storage control document for more information concerning the specific meaning of this byte.) This message is issued if the sense-id CCW is supported.

DEVICE DESCRIPTOR=cc describes the features associated with the device. It contains the information in sense-id byte 6. (See the device storage control document for more information concerning the specific meaning of this byte.) This message is issued if the sense-id CCW is supported.

ADDITIONAL DEVICE INFORMATION = XXXXXXXX is used by your IBM service representative in helping with problem diagnosis.

TRKS/CYL = dd identifies the number of tracks per cylinder.

PRIMARY CYLS = eeeee identifies the number of primary cylinders for the volume.

System action

ICKDSF command processing continues.

Operator response

None.

System programmer response

None.

ICK00701I EQUIPMENT CHECK RETRY SUCCESSFUL

Explanation

The system has successfully recovered from an equipment check.

System action

Command processing continues.

Operator response

None.

System programmer response

None. The channel command word (CCW), channel status word (CSW), and sense information are provided to help determine the cause of the error if the assistance of a service representative is required.

ICK00702I SECONDARY VOLUME DEVICE DESCRIPTOR = cc

Explanation

This message follows ANALYZE or INSPECT command processing on the secondary volume of a dual copy pair when the primary and secondary volumes are different model devices. For more information, see the explanation of the *DEVICE DESCRIPTOR* for message ICK00700I.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK00703I DEVICE IS OPERATED AS A MINIDISK

Explanation

ICKDSF has determined that the device being used is a minidisk.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK00704I DEVICE DOES NOT SUPPORT MEDIA MAINTENANCE FUNCTIONS

Explanation

ICKDSF has determined that the device being used is a minidisk or that the device does not support media maintenance functions.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK00705I SUBSYSTEM INFORMATION FOR ccuu IS CURRENTLY AS FOLLOWS:
SUBSYSTEM SERIAL NUMBER = xxxxx
SUBSYSTEM ID = xxxx
CHANNEL CONNECTION ADDRESS = xx
LSS NUMBER = xx

Explanation

Subsystem information for the device is printed. The information printed is variable depending on the device being processed.

SUBSYSTEM SERIAL NUMBER = xxxxx identifies the last five digits of the Subsystem or Storage Control sequence number. (Or last 7 digits for RVA devices.)

SUBSYSTEM ID = xxxx identifies the user assigned number that identifies a DASD subsystem.

CHANNEL CONNECTION ADDRESS = xx identifies the I/O address that uniquely identifies an I/O device to the channel during an I/O operation. This is not printed for RVA devices.

LSS NUMBER = xx identifies the Logical Subsystem (LSS) number. This is printed when running on a 2105, 2107, and 1750.

System action

None.

Operator response

None.

System programmer response

None.

ICK00706I SUBSYSTEM INFORMATION FOR ccuu IS CURRENTLY AS FOLLOWS:
SUBSYSTEM SERIAL NUMBER = xxxxx
SUBSYSTEM ID = xxxx
CHANNEL CONNECTION ADDRESS = xx
PATHS/CLUSTER ID = xx
SYSTEM ADAPTER ID = xx
HOST LINK ADDRESS = xxxx
LSS NUMBER = xx

Explanation

Subsystem information for the device is printed. The information printed is variable depending on the device being processed.

SUBSYSTEM SERIAL NUMBER = xxxxx identifies the last 5 digits of the Storage Control sequence number.

SUBSYSTEM ID = xxxx identifies the user-assigned number that identifies a DASD subsystem. This number is set by the service representative at installation and is included in the vital product data.

CHANNEL CONNECTION ADDRESS = xx identifies the I/O address that uniquely identifies an I/O device to the channel during an I/O operation.

PATHS/CLUSTER ID = xx identifies which storage path for the cluster is configured in the Storage Director (Bit 0 - Storage path zero, Bit 1 - Storage path one). This will print N/A if it is not applicable to the control unit or the device being processed.

SYSTEM ADAPTER ID = xx identifies the channel interfaces.

HOST LINK ADDRESS = xxxx identifies the ESCON/host Link Address (all 0s for parallel channels). The length of the link address printed will vary depending on the type.

LSS NUMBER = xx identifies the Logical Subsystem number. This is printed when running on a 2105, 2107, and 1750.

System action

None.

Operator response

None.

System programmer response

None.

ICK00707I MIRRORING OPERATIONAL

Explanation

The mirroring status of the device is operational. This message is issued for information purposes only. The mirroring status does not affect ICKDSF processing.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK00708I MIRRORING PENDING

Explanation

The mirroring status of the device is pending. This message is issued for information purposes only. The mirroring status does not affect ICKDSF processing, and therefore will have no affect on the ICKDSF condition code of the command being executed.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK00709I MIRRORING FAILED

Explanation

Mirroring has failed for this device. This is due to a hardware failure. A Service Call will automatically be made to resolve the problem is resolved and the re-synchronization process is begun. Mirroring will become Operational after the re-synchronization is completed. This message is issued for information purposes only. The mirroring status does not affect ICKDSF processing, and therefore will have no affect on the ICKDSF condition code of the command being executed.

System action

Command processing continues.

Operator response

Notify your System programmer.

System programmer response

None required since this is a temporary condition that will resolve itself. However, since the data on this device is not currently being protected by mirroring, you may decide to move this data and/or new allocations to a device which is currently mirrored.

ICK01016I ALTERNATE TRACK CCHH=X'cccc hhhh' ASSIGNED TO PRIMARY TRACK CCHH=X'cccc hhhh'

Explanation

An alternate track was assigned to a primary track because:

The primary track was marked defective or was found to be defective by surface checking; or

There was a request for an unconditional alternate track assignment for the primary track.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01018I ALTERNATE CCHH=X'cccc hhhh' RE-ASSIGNED FOR PRIMARY CCHH=X'cccc hhhh'

Explanation

The alternate track originally assigned to the indicated primary track was either:

marked defective, or

was found defective through surface checking. Another alternate track was assigned in place of the original alternate track.

(If the PRESERVE option was specified, the data on the original alternate track was copied to the new alternate track.)

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01020I ALTERNATE TRACK CCHH=X'cccc hhhh' WAS RECLAIMED

Explanation

An alternate track previously marked defective was not defective when surface checking was performed.

The track is added to the set of available alternate tracks.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01021I PRIMARY TRACK CCHH=X'cccc hhhh' WAS RECLAIMED

Explanation

A primary track previously marked defective was not defective when surface checking was performed.

The primary track is marked available, and the assigned alternate track is added to the set of available alternate tracks.

(If the PRESERVE parameter was specified, any data written on the alternate track is copied back to the reclaimed primary track.)

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01022I DEFECTIVE PRIMARY TRACK STATUS WILL BE RESET FOR TRACK X'cccc hhhh'

Explanation

During the INSTALL/REVAL command process, the defective primary track status for the specified track will be disassociated from the alternates.

Surface checking function will be performed to the specified primary track later to determine if the track is defective.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01135I PRESERVE INFORMATION EXISTS ON CE CYLINDER FOR TRACK X'cccc hhhh'

Explanation

During ANALYZE DRIVETEST processing, it was determined that the PRESERVE function of the INSPECT command did not run to completion for the specified track.

Surface checking function will be performed to the specified primary track later to determine if the track is defective.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01136I CONTINUE INFORMATION EXISTS ON CE CYLINDER FOR TRACK X'cccc hhhh'

Explanation

During ANALYZE DRIVETEST processing, it was found that a previous invocation of the INIT command did not run to completion. X'cccc hhhh' represents the last track for which a checkpoint was taken.

It is likely a track beyond this checkpoint is not usable.

System action

This information is not erased. ANALYZE command processing continues with the remainder of the drive test.

Operator response

None.

System programmer response

Run the INIT command for this device to make sure the tracks following the previous checkpoint are usable.

ICK01305I ccuu ALL DATA “MACHINE READABLE”

Explanation

This is an informational message indicating that all data on the volume can be read successfully.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01306I SKIP DISPLACEMENTS ASSIGNED

Explanation

This is an informational message indicating that there was a skip displacement process and skip displacements have been successfully assigned.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01307I DEFECTIVE TRACK LIST IN HEXADECIMAL FOR VOLUME volid

Explanation

This message is the first line of the volume map. A list in hexadecimal follows, showing any tracks that were found defective during the command processing.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01308I THE FOLLOWING PRIMARY TRACKS WERE FOUND DEFECTIVE:

Explanation

This message is a line in the volume map that identifies (in hexadecimal) any primary tracks that were found defective during command processing.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01309I THE FOLLOWING ALTERNATE TRACKS WERE FOUND DEFECTIVE:

Explanation

This message is a line in the volume map that identifies (in hexadecimal) any alternate tracks that were found defective during the command processing.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01310I NO DEFECTIVE TRACKS WERE FOUND

Explanation

This message is a line in the volume map indicating that no defective tracks were found during the command processing.

When the command does not specify that all the tracks were to be checked, unchecked tracks could be defective.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01311I NO DEFECTIVE PRIMARY TRACKS WERE FOUND

Explanation

This message is a line in the volume map indicating that no defective primary tracks were found during command processing.

When the command does not specify that all the primary tracks are to be checked, unchecked primary tracks could be defective.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01312I NO DEFECTIVE ALTERNATE TRACKS WERE FOUND

Explanation

This message is a line in the volume map indicating that no defective alternate tracks were found during command processing.

When the command does not specify that all of the alternate tracks are to be checked, unchecked alternate tracks could be defective.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01313I VOLUME CONTAINS nnnn ALTERNATE TRACKS -- mmmm AVAILABLE

Explanation

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01314I VTOC IS LOCATED AT CCHH=X'cccc hhhh' AND IS xxxx TRACKS.

Explanation

This message is a line in the volume map showing the cylinder and track where the volume table of contents begins and the number of tracks it occupies.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01315I VOLUME IS IN UN-INITIALIZED STATE

Explanation

Volume label and volume table of contents (VTOC) information were erased during the REVAL/INSTALL command process. The volume has no volume label or VTOC.

System action

None.

Operator response

None.

System programmer response

If the REVAL/INSTALL command process was successful, use the INIT command to initialize the volume. For VM, use the CPVOLUME command to initialize the volume.

ICK01316I INSTALL FUNCTION COMPLETED SUCCESSFULLY

Explanation

The INSTALL command processing completed successfully.

System action

ICKDSF ended normally. Processing continues with your next command.

Operator response

None.

System programmer response

None.

ICK01317I VTOC-INDEX IS LOCATED AT CCHH=X'cccc hhhh' AND IS xxxx TRACKS.

Explanation

This message shows the cylinder and track where the volume table of contents index begins and the number of tracks it occupies.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01318I REVAL FUNCTION COMPLETED SUCCESSFULLY

Explanation

The REVAL command processing completed successfully.

System action

ICKDSF ended normally. Processing continues with your next command.

Operator response

None.

System programmer response

None.

ICK01319I VOLUME IS TEMPORARILY NOT AVAILABLE FOR IPL

Explanation

Surface checking is performed on cylinder 0 head 0 during the concurrent media maintenance process. The track is marked defective and the data is preserved on an alternate track. The volume cannot be used to IPL during this process.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01320I LOGICAL DEVICE TYPE IS NOW SET TO : xxxx

Explanation

The mode change function of the INSTALL command is complete, and the logical device type is now type *xxxx*.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01321I FMT5/FMT7 FREE SPACE CHAIN UPDATED

Explanation

This is an informational message indicating the free space chain has been updated when the VTOC was refreshed.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01322I THE VTOC HAS BEEN EXPANDED TO *number* TRACKS

Explanation

This is an informational message indicating that the VTOC was expanded when the VTOC was refreshed or converted to an OSVTOC. *number* is the number of tracks, in decimal, that the VTOC now occupies.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01323I VOLUME CONTAINS nn ALTERNATE LOCATIONS, mm ASSIGNED, jj UNAVAILABLE, kk AVAILABLE

Explanation

This message maps a volume:

nn is the total number of alternate locations reserved for the device;
mm is the number of alternate locations that have been assigned (to primary tracks);
jj is the number of locations not available for use by the subsystem;
kk is the number of locations still available for alternate assignment.

System action

None.

Operator response

None.

System programmer response

None.

ICK01328I SURFACE ANALYSIS PROCESSING ON TRACK X'XXXX XXXX'

Explanation

Skip displacement processing has been performed for the specified track.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01331I TRACK X'cccc hhhh' MAY REQUIRE INSPECTION

Explanation

During CHECK NOSKIP processing , a data check was detected on track X'cccc hhhh'. Further processing, however, did not detect a defect.

This message indicates that if an INSPECT TRACKS (X'cccc', X'hhhh') CHECK(n) is done subsequently for this track, a defect might be detected (and skipped).

System action

INIT or INSPECT command processing continues with the next track.

Operator response

None.

System programmer response

After completion of the INIT or INSPECT command, the programmer may want to run an INSPECT CHECK(n) TRACKS(...) for any track indicated in the message.

ICK01332I SURFACE ANALYSIS CYLINDER COULD NOT BE UPDATED

Explanation

After assigning a skip displacement to a track, ICKDSF could not update the delta map on the surface analysis cylinder with the current skip displacement data for this track.

The CCW, CSW, and sense information associated with the message is printed.

System action

Processing the track that contains the defect is completed successfully. If the home address becomes unreadable, subsequent processing of this track may require analysis of the entire track to locate the defect.

This message is for information only, since there is no consequence to the user resulting from this condition.

Operator response

None.

System programmer response

None. Since the usability of the track is not affected, there is no need to examine further information. However, it is possible to examine the failing CCW, CSW, and sense information in detail if necessary.

ICK01334I CURRENTLY PROCESSING TRACK CCHH=X'cccc hhhh'

Explanation

Information message given when ICKDSFis performing full volume processing. The message is issued to show ICKDSF progress.

System action

Command processing continues with the next track.

Operator response

None.

System programmer response

None.

ICK01336I TRACK X'cccc hhhh' EXPERIENCED NON-RECURRING DATA CHECKS

Explanation

Skip displacement analysis processing for this track detected multiple discrete data checks that were not repeatable.

System action

Command processing continues with the next track.

Operator response

None.

System programmer response

This condition might arise from too much random noise on a track. If this message is issued for multiple tracks, or many tracks under the same head, this could indicate a potential hardware problem.

Save the job output and contact your IBM hardware service representative.

ICK01380I THE FOLLOWING TRACKS ARE UNRECOVERABLE:

Explanation

This message is a line in the volume map that identifies tracks that were found unrecoverable during the command processing. An unrecoverable track is a track where the home address and record 0 cannot be read successfully after making all recovery attempts. This message is followed by one of the following volumes:

- For volumes with cylinder addresses 0 to 65,535, the format of the track information is CCHH =X'cccc hhhh'.

- For volumes with cylinder addresses greater than 65,535, the format of the track information is C-H = X'cccCCCC:H'.

System action

- If the track is unrecoverable because of a data error, the command runs to completion with an error return code.
- If the track is unrecoverable because of an error not related to data, command processing ends after error detection.

Operator response

None.

System programmer response

Prior messages should be examined (including the CCW, CSW, and sense that caused the I/O) to determine the cause of the failure.

This message can occur if the read/write mode switch is set to READ mode, or if some other condition prevents ICKDSF from writing on the volume.

Assistance may be required from the IBM hardware service representative. Save the job output and contact your IBM hardware service representative.

ICK01381I RECURRING CORRECTABLE ERRORS ON TRACKS

Explanation

This message is a line in the volume map that identifies tracks where ICKDSF detected recurring correctable data checks. The message is issued only for those count-key-data devices that do not have skip displacement areas. The message is followed by the following volumes:

- For volumes where the data is between cylinder addresses 0 to 65,535, the format of the track information is C-H = X'cccc hhhh'.
- For volumes where the data is above cylinder addresses greater than 65,535, the format of the track information is C-H = X'cccCCCC:H'.

System action

The command completed successfully.

Operator response

None.

System programmer response

If a correctable data check on the indicated track is determined to be detrimental to installation, an alternate track can be unconditionally assigned to the indicated track using the INSPECT command.

Save the job output and contact your IBM service representative.

ICK01400I ccuu ANALYZE STARTED

Explanation

ANALYZE has begun running its tests on the logical volume identified in the message (that is, on the volume whose unit address is ccuu).

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01405I ccuu ALL DATA “MACHINE READABLE” WITHOUT ERRORS

Explanation

The data verification test (SCAN option) successfully read the volume.

System action

Command processing ends normally.

Operator response

None.

System programmer response

(If you ran ANALYZE because of a data problem, and the problem persists, further analysis is needed according to your installation's procedures.)

ICK01406I ccuu ANALYZE ENDED

Explanation

ANALYZE command has completed processing.

System action

Command processing ends.

Operator response

None.

System programmer response

None.

ICK01407I ccuu NO DRIVE PROBLEMS FOUND

Explanation

Drive tests successfully completed running and did not detect any problems.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01408I ccuu DATA VERIFICATION TEST STARTED

Explanation

ANALYZE has begun running its data verification tests.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01409I DRIVE TEST STARTED

Explanation

Drive test processing is beginning.

System action

Drive test command processing continues.

Operator response

None.

System programmer response

None.

ICK01410I DRIVE TEST: TESTING SUCCESSFUL ON:
CHPID = XX
CHANNEL NUMBER = X
CHANNEL SET = X
STORAGE DIRECTOR ID = XX
SUBSYSTEM ID = XXXX
CLUSTER = X
STORAGE PATH = X

Explanation

- The drive test successfully completed processing on the indicated path, where:
- CHPID = XX identifies the CHPID for the path being processed. This line is displayed only if it applies to the operating system environment.
- CHANNEL NUMBER = X identifies the channel number for the path being processed. This line is displayed only if it applies to the operating system environment.
- CHANNEL SET = X identifies the channel set (CPU affinity) for the path being processed. This line is displayed only if it applies to the operating system environment.
- STORAGE DIRECTOR ID = XX identifies the Storage Director Id for the path being processed. It contains the information present in sense byte 21. This line is displayed only if it applies to the storage control being processed.
- SUBSYSTEM ID = XXXX identifies the Subsystem Id for the path being processed. It contains the information present in sense bytes 20 and 21. This line is displayed only if it applies to the storage control being processed.
- CLUSTER = X identifies the Cluster for the path being processed. This line is displayed only if it applies to the storage control being processed.
- STORAGE PATH = X identifies the Storage Path of the Cluster being processed. This line is displayed only if it applies to the storage control being processed.

System action

ICKDSF processing of the command continues.

Operator response

None.

System programmer response

None.

ICK01411I FUNCTIONAL VERIFICATION DATA WRITE/READ TEST STARTED

Explanation

HA/R0 validation and functional data verification test of the specified range for the REVAL command has started.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01412I FUNCTIONAL VERIFICATION DATA WRITE/READ TEST ENDED

Explanation

HA/R0 validation and functional data verification test of the specified range for the REVAL command has ended.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01413I IN THIS ENVIRONMENT PATH CONTROL WILL ONLY PROCESS ON CHANNEL: X

Explanation

When using path control in this Stand-Alone environment, only the channel shown is processed on the first channel set located. Refer to the path control parameters for restrictions when operating in this environment.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01414I THE FOLLOWING ERRORS WERE ALSO DETECTED

Explanation

When a drivetest failure occurs, this message provides sense data for the service representative. (Please refer to preceding messages ICK21407 and ICK21409.)

System action

Command processing continues.

Operator response

None.

System programmer response

Contact your IBM hardware service representative.

ICK01415I CORRECTABLE DATA CHECK OCCURRED ON CE CYLINDER, HEAD = X'hhhh', RECORD = X'rr'

Explanation

An I/O error occurred on the customer engineer (CE) cylinder on the head and record indicated. The message is followed by CCW, CSW, and sense bytes describing the record error.

System action

ICKDSF command processing continues. Processing may eventually halt.

Operator response

None.

System programmer response

If processing halts, the CCW, CSW, and sense information are provided for the service representative.

ICK01416D CHPID = XX, RESERVED, REPLY R TO RETRY, B TO BYPASS

Explanation

This message is issued to the system operator if processing encounters a path that remains reserved for all of its retries.

XX specifies the path (CHPID).

- Reply R to reissue the I/O operation to the device.
- Reply B to bypass further processing on this path.

System action

See explanation.

Operator response

Respond R or B.

System programmer response

None.

ICK01417D X, Y RESERVED, REPLY R TO RETRY, B TO BYPASS

Explanation

This message is issued to the system operator if processing encounters a path that remains reserved for all of its retries.

X specifies the channel number and Y specifies the channel set (CPU affinity).

- Reply R to reissue the I/O operation to the device.
- Reply B to bypass further processing on this path.

System action

See explanation.

Operator response

Respond R or B.

System programmer response

None.

ICK01418I REVALIDATE FIXSIM(4E4E) PROCESS STARTED

Explanation

Rewrite user data for the specified range has started.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01419I REVALIDATE FIXSIM(4E4E) PROCESS ENDED

Explanation

Rewrite user data for the specified range has ended.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01420I REVALIDATE FUNCTION STARTED WITHOUT FFVDP WRITE/READ TEST

Explanation

HA/R0 validation test of the specified range for the REVAL command has started. No factory functional verification data pattern will be written on the volume.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01421I RECOVER PREVIOUS REVALIDATE FIXSIM(4E4E) CHECKPOINT

Explanation

A previous REVAL FIXSIM(4E4E) did not complete, ICKDSF restarts REVAL FIXSIM(4E4E) with the old range first. When the recovery process is completed, ICKDSF will then continue with the new range.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01422I RECOVER PREVIOUS REVALIDATE DATA/NODATA CHECKPOINT

Explanation

Previous REVAL DATA or NODATA process did not complete. REVAL will process the previous range with the current specification, then process the new range.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01425I PRIMARY TRACK CCHH = X'cccc hhhh' HAD BEEN SURFACE CHECKED

Explanation

An I/O error occurred while ICKDSF was rewriting the user data back to the primary track. ICKDSF has performed surface checking attempting to fix the primary track.

System action

Command processing continues if the primary track was fixed by surface checking, otherwise the command terminates.

Operator response

None.

System programmer response

If the command terminates, refer to the previous messages issued by the surface checking routine.

ICK01430I REVALIDATE REFRESH PROCESS STARTED

Explanation

Rewrite the user data for the specified range has started.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01431I REVALIDATE REFRESH PROCESS ENDED

Explanation

Rewrite the user data for the specified range has ended.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01432I RECOVER PREVIOUS REVALIDATE REFRESH CHECKPOINT

Explanation

Since previous REVAL REFRESH process did not complete, ICKDSF will run REVAL REFRESH with the old range first. When recovery process is completed, ICKDSF will then continue with the new range.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01440I VOLSER, VTOC AND DATA IN THE SPECIFIED RANGE WILL BE ERASED

Explanation

The message was printed for REVAL DATA or REVAL NODATA processing. The VOL1 record, the VTOC

pointer, and the data in the specified range will be erased. Data on the volume will be inaccessible when the REVAL process has completed.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01501I INVALID DEVICE TYPE SPECIFIED FOR BUILDIX COMMAND

Explanation

There is a format change request for a VTOC on a volume whose device type is not supported by the BUILDIX command (for example, a 2314 DASD).

System action

Command processing ends.

Operator response

None.

System programmer response

Verify that the volume is on a device type supported by the BUILDIX command, then change the JCL or command statement.

ICK01502I BUILDIX FUNCTION STARTED

Explanation

BUILDIX command processing has begun.

System action

None.

Operator response

None.

System programmer response

None.

ICK01503I ccuu REQUEST RECEIVED TO CONVERT VTOC TO **FORMAT

Explanation

This message verifies the request for a change of VTOC format. "**" specifies the format requested—either OS or IX.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01504I ccuu VTOC FORMAT IS CURRENTLY **FORMAT, REQUEST ACCEPTED

Explanation

This message verifies that the BUILDIX function specified on the command statement is valid for the current format of the VTOC on the volume. "**" identifies the format of the VTOC, either OS or IX.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01508A ccuu SHOULD CONVERSION PROCEED? REPLY U TO CONTINUE, ELSE T

Explanation

This message permits the operator to verify that the user is authorized to request the BUILDIX function before command processing begins.

System action

The system waits for the operator's reply.

Operator response

Verify that the user is authorized to issue the command, and reply:

U to continue;
T to end processing.

Any reply other than U or T causes this message to be issued again.

System programmer response

None.

ICK01513I ccuu BUILDIX PROCESSING COMPLETED: VTOC IS NOW IN **FORMAT

Explanation

The BUILDIX command completed successfully. ** shows the new VTOC format: either OS or IX.

System action

ICKDSF ends normally.

Operator response

None.

System programmer response

None.

ICK01520I THE VTOC-INDEX WAS DELETED

Explanation

ICKDSF deleted the index data set from the volume as it was no longer valid after the VTOC was rebuilt. If the device is online to the MVS environment, ICKDSF will then allocate a new index data set and rebuild the index.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01600I MAPALT STARTED

Explanation

Processing has started for the MAPALT command.

System action

None.

Operator response

None.

ICK01606I nnnnn BLOCKS ASSIGNED TO ALTERNATES IN LIMITS SPECIFIED

Explanation

This summary message shows the number of blocks assigned alternates, on this or previous runs, within the limits specified in the command statement.

System action

None.

Operator response

None.

System programmer response

None.

ICK01608I ccuu MAPALT ENDED NORMALLY, RETURN CODE= n

Explanation

Command completed without any errors detected that would have caused processing to end.

A return code of 0 or 4 will be indicated in the message.

- 0 means no errors were encountered;
- 4 means one or more recoverable errors were encountered.

System action

None.

Operator response

None.

System programmer response

None.

ICK01609I PERMANENT DATA CHECK FOUND READING ID FOR BLOCK nnnnnn

Explanation

A permanent data check was encountered while attempting to read the ID field of the primary block shown in the message.

System action

Diagnostic information is printed on the output device, and command processing continues.

Operator response

None.

System programmer response

Save the job output for the system coordinator, and follow your installation's procedures for data recovery.

If this message is received for up to 3 blocks, the ICKDSF INSPECT command can be used to assign an alternate block for the blocks experiencing the data checks.

If this message is received for more than 3 blocks, contact your IBM hardware or software service representative. Save the job output and contact your IBM hardware service representative.

ICK01701I ONLY 5 USER VOL LABELS ALLOWED

Explanation

Only five user volume labels are allowed for fixed block architecture devices. The LABEL parameter has specified more than five labels.

System action

Space is reserved for six labels, and command processing continues.

Operator response

None.

System programmer response

None.

ICK01704I ALTERNATE ASSIGNED FOR BLOCK xxxxxxxx

Explanation

Block xxxxxxxx was found defective during surface analysis. The block has been assigned an alternate.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01708I RECLAIM SUCCESSFUL FOR BLOCK xxxxxxxx

Explanation

BLOCK xxxxxxxx has been successfully reclaimed.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01714I RECLAIM UNSUCCESSFUL FOR BLOCK xxxxxxxx

Explanation

The defective block xxxxxxxx failed surface analysis and could not be reclaimed.

System action

An alternate is assigned to the block. Command processing continues.

Operator response

None.

System programmer response

None.

ICK01715I TOTAL NUMBER OF ALTERNATES ASSIGNED = n

Explanation

N is the total number of alternate blocks assigned in this run.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01725I EXCESSIVE NUMBER OF ALTERNATES ASSIGNED FOR A CYLINDER

Explanation

During initialization of a 3370 volume, more than 24 alternates were assigned on one cylinder. This exceeds the number of alternates on a cylinder.

System action

Command processing continues.

Operator response

None.

System programmer response

This could cause performance degradation on the volume. You may need to contact your IBM hardware service representative. Save the job output and contact your IBM service representative.

ICK01726I nnnnnn FACTORY FLAGGED BLOCKS.

Explanation

Final message of INIT reclaim processing. nnnnnn is the number of factory-flagged blocks assigned an alternate.

System action

INIT processing surface analysis phase is started.

Operator response

None.

System programmer response

None.

ICK01727I RECLAIM SPECIFIED WITH NOCHECK. NO RECLAIM DONE

Explanation

RECLAIM function was not performed, because NOCHECK was specified or defaulted. CHECK is required for RECLAIM.

System action

Command processing continues without RECLAIM.

Operator response

None.

System programmer response

For RECLAIM, specify CHECK and run the job again.

ICK01729I SPECIFIED CISIZE ADJUSTED TO NEXT HIGHER MULTIPLE OF DEVICE BLOCKSIZE

Explanation

When you specify a CISIZE which is not a multiple of 512, ICKDSF rounds the value up to the next higher multiple.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01730I RECLAIM AND/OR CHECK NOT SUPPORTED FOR MINI-DISKS

Explanation

The requested CHECK and RECLAIM functions are not supported for fixed block architecture (FBA) minidisks.

System action

Command processing continues without CHECK or RECLAIM.

Operator response

None.

System programmer response

None. If CHECK or RECLAIM is needed, the full volume must be initialized.

ICK01731I MAP FUNCTION NOT SUPPORTED FOR MINI-DISKS

Explanation

The MAP parameter was specified or defaulted on the command, but MAP is not supported for FBA minidisks.

System action

Command processing continues without MAP function.

Operator response

None.

System programmer response

None

ICK01732I MAP FUNCTION NOT SUPPORTED FOR THIS DEVICE TYPE

Explanation

The MAP parameter was specified or defaulted on a device where MAP is not supported.

System action

Processing bypasses the MAP function and continues.

Operator response

None.

System programmer response

None Save the job output and contact your IBM service representative.

ICK01754I xx OF THE INSPECTED BLOCKS HAVE ALTERNATES ASSIGNED

Explanation

This summary message prints when MAP is specified. xx is the number of blocks inspected that have alternates assigned.

System action

None.

Operator response

None.

System programmer response

None.

ICK01759I USER DATA ON BLOCK xxxxxxxx RESTORED

Explanation

Command processing failed because of a permanent error, and ICKDSF was able to restore the data on block xxxxxxxx before ending command processing.

System action

Current command processing is ended because of a previously reported error. Command processing continues with the next command.

Operator response

None.

System programmer response

None.

ICK01760I SURFACE OF BLOCK xxxxxxxx DEFECTIVE

Explanation

The check function found the surface of BLOCK xxxxxxxx defective.

System action

If ASSIGN is specified, an alternate is assigned.

Operator response

None.

System programmer response

None.

ICK01761I SURFACE OF BLOCK xxxxxxxx NOT DEFECTIVE

Explanation

The check function found the surface of block xxxxxxxx not defective.

System action

Command processing continues with the next block.

Operator response

None.

System programmer response

None.

ICK01765I NEW ALTERNATE ASSIGNED TO BLOCK xxxxxxxx

Explanation

BLOCK xxxxxxxx has been assigned a new alternate.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01781I dataset IS A PASSWORD PROTECTED DATA SET BUT USER EXIT DIRECTS BYPASS CHECK

Explanation

The user security exit module has directed ICKDSF to bypass password verification of the named password-protected data set on the volume.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01795I TRACK X'cccc hhhh'| X'cccCCCC:H' IS CONTAINED IN DATA SET dataset

Explanation

The track specified in the command is contained in the named data set. (This message may be followed by others such as ICK31780I.)

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK01832I PATH xxxx,y HAS BEEN WRITE ALLOWED

Explanation

This in an informational message indicating to the operator and the programmer which path ids have been write-allowed by the CONTROL command.

xxxx is the unit address, *y* is the path ID (CHPID).

System action

Command processing continues.

Operator response

All devices on that path have been cleared. However, the operator must vary the required paths back online to make them accessible.

System programmer response

None.

ICK01833I DEVICE ccuu FENCE STATUS CLEARED

Explanation

This is an informational message indicating that the fence status for the device ccuu has been cleared by the CONTROL command.

System action

Command processing continues.

Operator response

None

System programmer response

None

ICK01841I RESET INDEFINITE CONDITION OF DEVICE ccuu COMPLETE

Explanation

The device *reset indefinite condition* completed successfully.

System action

Command processing ends.

Operator response

None.

System programmer response

None.

ICK02100I LAST INVOCATION CHECKPOINTED AT X'cccc hhhh', RECOVERY IN PROCESS

Explanation

A previous use of the INIT command did not complete. The track specified in this message is the last checkpointed location.

System action

The track being processed at the time of failure is returned to its proper condition. (Specific action depends on the device type and the reason for failure of the previously used INIT command.)

After the recovery process is complete, processing begins for this use of the INIT command.

Operator response

None

System programmer response

None

ICK02101I INITIALIZE IS CONTINUING FROM TRACK X'cccc hhhh'.

Explanation

CONTINUE data existed when INIT was invoked.

System action

Processing begins at track X'cccc hhhh' for the remainder of the CURRENT specified range.

Operator response

None.

System programmer response

None.

ICK02103I INITIALIZE IS CONTINUING FROM BLOCK xxxxxxxx.

Explanation

CONTINUE data existed when INIT was invoked. xxxxxxxx indicates the last checkpointed block.

System action

Processing begins with BLOCK xxxxxxxxxx for the remainder of the CURRENT specified range.

ICK02104I NO ADDITIONAL TRACKS REMAIN IN THE SPECIFIED RANGE

Explanation

CONTINUE processing was previously activated. (See ICK02101I.) After verification of the tracks necessary to ensure the validity of the volume, there were no additional tracks to process in the specified range.

System action

Command processing continues with the minimal initialization functions.

Operator response

None.

System programmer response

None.

ICK02105I PROCESSING IS CONTINUING FROM LAST CHECKPOINT

Explanation

The current command has detected that the previous command did not complete processing. Processing will continue from the last checkpoint.

System action

Command processing continues from the last checkpoint.

Operator response

None.

System programmer response

None.

ICK02128I RECOVERY PROCESS COMPLETE

Explanation

Recovery of data from the previous checkpoint is complete.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02129I RECOVERY COMPLETE FOR TRACK X'cccc hhhh'

Explanation

The backup recovery function is complete for the specified track.

System action

Command processing continues with the current invocation parameters.

Operator response

None.

System programmer response

None.

ICK02150I INITIALIZE IS CONTINUING WITH RECLAIM PROCESSING

Explanation

A previous use of the INIT command did not complete during reclaim processing. The reclaim process is being restarted.

System action

The reclaim process is restarted.

Operator response

None.

System programmer response

None.

ICK02156I INITIALIZE PREVIOUSLY INTERRUPTED AT BLOCK xxxxxxxx

Explanation

A previous use of the INIT command did not complete. The block specified in the message is the last checkpointed location.

System action

The CONTINUE data and specified parameters are examined to determine what processing should be done.

Operator response

None.

System programmer response

None.

ICK02163I CONTINUE INFORMATION EXISTS ON CE CYLINDER FOR BLOCK xxxxxxxx

Explanation

During ANALYZE DRIVETEST processing, it was determined that a previous invocation of the INIT command did not run to completion. xxxxxxxx is the last block for which a checkpoint was taken.

System action

Continue information is not erased. ANALYZE command processing continues with the remainder of the drive test.

System programmer response

This is an informational message.

If required by the circumstances of the previous INIT interruption, restart the INIT command specifying CONTINUE or NONCONTINUE.

ICK02164I PRESERVE INFORMATION EXISTS ON CE CYLINDER FOR BLOCK xxxxxxxx

Explanation

During ANALYZE DRIVETEST processing, it was determined that the PRESERVE function of the INSPECT command did not run to completion for the specified block. Data has been saved for this block.

System action

This information is not erased. ANALYZE command processing continues with the remainder of the drive test.

Operator response

None.

System programmer response

Run the INSPECT command for this device to make sure the specified block is usable, and to recover the data.

ICK02166I RECOVERY COMPLETE FOR BLOCK xxxxxxxx

Explanation

The backup recovery function is complete for the specified block.

System action

Command processing continues with the current invocation parameters.

Operator response

None.

System programmer response

None.

ICK02174I VOLUME CONTAINS xxxxx ALTERNATE TRACKS -- AVAILABLE ALTERNATES UNDETERMINED

Explanation

Since the VTOC for this volume cannot be read, or does not exist, the current number of available alternate tracks cannot be determined. Previous messages indicate why the VTOC is inaccessible. xxxxx is the total number of alternate tracks on the volume.

System action

Command processing continues.

Operator response

None.

System programmer response

See previous messages to determine why the VTOC is inaccessible.

ICK02200I PPRCOPY DEFINESESSIONS FUNCTION COMPLETED SUCCESSFULLY

Explanation

The request to OPEN or CLOSE the specified session completed successfully.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02201I PPRCOPY ESTPATH FUNCTION COMPLETED SUCCESSFULLY

Explanation

The PPRCOPY ESTPATH command used to establish Peer-to-Peer Remote Copy (PPRC) paths between two subsystems has completed successfully.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02202I PPRCOPY DELPATH FUNCTION COMPLETED SUCCESSFULLY

Explanation

The PPRCOPY DELPATH command used to delete Peer-to-Peer Remote Copy (PPRC) paths between two subsystems has completed successfully.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02203I PPRCOPY ESTPAIR FUNCTION COMPLETED SUCCESSFULLY

Explanation

The PPRCOPY ESTPAIR command used to establish remote copy pairs has completed successfully.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02204I PPRCOPY DELPAIR FUNCTION COMPLETED SUCCESSFULLY

Explanation

The PPRCOPY DELPAIR command used to delete remote copy pairs has completed successfully.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02205I PPRCOPY SUSPEND FUNCTION COMPLETED SUCCESSFULLY

Explanation

The PPRCOPY SUSPEND command used to suspend remote copy pairs has completed successfully.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02206I PPRCOPY QUERY FUNCTION COMPLETED SUCCESSFULLY

Explanation

The PPRCOPY QUERY command used to query device status has completed successfully.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02207I PPRCOPY RECOVER FUNCTION COMPLETED SUCCESSFULLY

Explanation

The PPRCOPY RECOVER command used to reestablish access to the secondary volume has completed successfully.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02208I PPRCOPY FREEZE FUNCTION COMPLETED SUCCESSFULLY

Explanation

The PPRCOPY FREEZE command used to suspend all operations for all PPRC volumes on a single storage control has completed successfully.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02209I PPRCOPY RUN FUNCTION COMPLETED SUCCESSFULLY

Explanation

The PPRCOPY RUN command used to resume all operations for all previously FREEZEed PPRC volumes on a single storage control has completed successfully.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02210I *** COPY IN PROGRESS *****

Explanation

The MSGREQ(YES) parameter has been specified with the PPRCOPY ESTPAIR command. Copy is still in progress. ESTPAIR command has not yet been completed.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02211I DEVICE IS IN CRITICAL WRITE STATE

Explanation

The primary device has been placed into a critical write state as specified by the PPRCOPY ESTPAIR command. In this state, the failure to write an update to the secondary results in a unit check and the primary device does not enter the suspended state.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02212I COPY SUSPENDED BY HOST COMMAND DIRECTED TO THE PRIMARY

Explanation

The ESUSP parameter may have been specified to suspend after establishment.

System action

Command processing continues.

Operator response

None.

System programmer response

The detail status can be obtained by using the PPRCOPY QUERY command.

ICK02213I VOLUME IS ELIGIBLE FOR PPRC CASCADING

Explanation

This message is issued during PPRCOPY QUERY processing when the queried device supports the cascading functionality and has been set up as the primary of a Peer-to-Peer Copy pair. This device is eligible to become the secondary of a Peer-to-Peer Copy pair that will complete the cascading relationship.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02214I INFORMATION FOR THIS VOLUME AS A PRIMARY FOLLOWS

Explanation

This message is issued during PPRCOPY QUERY processing when the queried device is in a cascading state and information following this message relate to the device as the primary of the Peer-to-Peer Copy pair.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02215I INFORMATION FOR THIS VOLUME AS A SECONDARY FOLLOWS

Explanation

This message is issued during PPRCOPY QUERY processing when the queried device is in a cascading state and information following this message relate to the device as the secondary of the Peer-to-Peer Copy pair.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02216I PPRCOPY POPULATESESSION FUNCTION COMPLETED SUCCESSFULLY

Explanation

The request to JOIN or REMOVE volumes from the specified session completed successfully. Note that the specified volumes will enter either a 'join pending' or 'remove pending' state and may remain there for some time depending on whether an Asynchronous PPRC configuration that includes the volumes has been started, or if a consistency group is underway.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02217I PPRCOPY STARTASYNCCOPY FUNCTION COMPLETED SUCCESSFULLY

Explanation

The STARTASYNCCOPY completed successfully.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02218I PPRCOPY TERMASYNCCOPY FUNCTION COMPLETED SUCCESSFULLY

Explanation

The command completed without errors.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02219I VOLUME IN CASCADED FAILOVER MODE. HOST WRITES ALLOWED

Explanation

The addressed volume is the intermediate volume in a Cascaded triad, and a Failover request was successfully issued to it as a secondary volume, putting the volume in Failover mode. Host writes to the volume are allowed.

System action

None.

Operator response

None.

System programmer response

None.

ICK02220I UNABLE TO QUERY FLASHCOPY

Explanation

The command failed. There should be other messages issued that indicate the source of the problem.

System action

Command ends.

Operator response

None.

System programmer response

Correct the indicated problem(s) and resubmit the request.

ICK02221I UNABLE TO WITHDRAW FLASHCOPY

Explanation

The command failed. There should be other messages issued that indicate the source of the problem.

System action

Command processing ends.

Operator response

None.

System programmer response

Correct the indicated problem(s) and resubmit the request.

ICK02222I UNABLE TO ESTABLISH FLASHCOPY

Explanation

The command failed. There should be other messages issued that indicate the source of the problem.

System action

Command processing ends.

Operator response

None.

System programmer response

Correct the indicated problem(s) and resubmit the request.

ICK02223I FLASHCOPY TARGET IN PATH GROUP - ONLINE TARGET NOT ALLOWED

Explanation

The ESTABLISH request specifies a target device that was found to be grouped. The device is assumed to be on-line.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Vary the target device offline, or select a device for the target that is offline, and run the job again. If the device is a 2105, 2107, or 1750 you may use the ONLINTGT(YES) parameter if you wish to establish the Flashcopy relationship to an online target device.

ICK02224I SOURCEVOL AND TARGETVOL KEYWORDS NOT ALLOWED WITH RESETTGTWRTINHIBIT

Explanation

When RESETTGTWRTINHIBIT is specified the command must be issued to the device from which the 'target write inhibit' is to be removed, thus the SOURCEVOL and TARGETVOL keywords are not allowed.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Issue the command directly to the device from which the 'target write inhibit' is to be removed.

ICK02225I ATTEMPT TO ESTABLISH A FLASHCOPY TARGET VOLUME THAT IS ALREADY AN ASYNCHRONOUS PPRC PRIMARY VOLUME

Explanation

A FLASHCPY ESTABLISH command specified a FlashCopy target volume that was already a Global Mirror (Asynchronous PPRC) primary volume or was the primary of a synchronous PPRC pair whose secondary is a cascaded Global Mirror primary.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Ensure the volume to be the Flashcopy target volume is the intended volume. If so, then the volume must be removed from its relationship as an Asynchronous PPRC primary volume or primary to a cascaded secondary volume before the command can be resubmitted.

ICK02226I INVALID CONSISTENCY GROUP STATE FOR RECEIPT OF REVERTIBLE FLASHCOPY ESTABLISH COMMAND

Explanation

An Extended Distance Consistency session was not in 'Consistency Group In Progress' state when the Asynchronous PPRC subordinate issued the Revertible Establish Flashcopy command to the remote ESS as part of the formation of a Consistency Group.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Contact your customer engineer.

ICK02227I VOLUME IS IN CASCADED FAILBACK MODE. PRIMED FOR RESYNCHRONIZATION

Explanation

A PPRC Establish Failback has been issued to the intermediate volume of a Cascaded triad. This intermediate volume is the PPRC primary volume to the original local volume, but is not the PPRC primary to the original remote volume. However, it records in its structures that it is in a state that allows Peer-to-Peer Remote Copy resynchronization between itself and the remote volume.

System action

None.

Operator response

None.

System programmer response

None.

ICK02230I DEVICE IS NOW IN SIMPLEX STATE

Explanation

PPRCOPY DELPAIR or RECOVER command completed successfully. The device is now in simplex state.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02231I DEVICE IS NOW A PEER TO PEER REMOTE COPY VOLUME

Explanation

PPRCOPY ESTPAIR completed successfully. The device is now a Peer-to-Peer Remote Copy (PPRC) volume.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02232I DEVICE IS NOW A SUSPENDED PPRC VOLUME

Explanation

PPRCOPY SUSPEND command completed successfully. The device is now a suspended PPRC volume.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK02233I PPRCOPY SETCHARACTERISTICS FUNCTION COMPLETED SUCCESSFULLY

Explanation

The PPRCOPY SETCHARACTERISTICS command completed without errors.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK03000I CPVOL REPORT FOR *ccuu*
FOLLOWS:
VOLUME SERIAL = volid
{CYL|PAGE} RANGE TO BE FORMATTED
IS *xxxxxxxxx-yyyyyyyyy*
FORMATTING OF CYLINDER *xxxxxxxxx* STARTED
AT *hh*:*mm*:*ss*
TDSK CYLINDER(S) *xxxxxxxxx-yyyyyyyyy* NOT EXAMINED
FORMATTING OF CYLINDER *yyyyyyyyy* STARTED
AT *hh*:*mm*:*ss*
FORMATTING OF CYLINDER *zzzzzzzzz* ENDED
AT *hh*:*mm*:*ss*
VOLUME SERIAL NUMBER IS NOW = volid
{CYL|PAGE} ALLOCATION IS AS FOLLOWS:
TYPE START END TOTAL
---- --------- --------- ---------
type *xxxxxxxxx yyyyyyyyy zzzzzzzzz*

Explanation

VOLUME SERIAL=volid identifies the volume serial of the unit being processed.

{CYL|PAGE} RANGE TO BE FORMATTED IS *xxxxxxxxx-yyyyyyyyy* identifies the starting and ending values for the range of cylinders or FBA pages to be formatted. If the EXAMINE function was specified, this message will state "{CYL|PAGE} RANGE TO BE EXAMINED IS *xxxxxxxxx-yyyyyyyyy*".

FORMATTING OF CYLINDER *xxxxxxxxx* STARTED AT *hh*:*mm*:*ss* displays the time when the formatting or the examination was started.

FORMATTING OF CYLINDER *yyyyyyyyy* STARTED AT *hh*:*mm*:*ss* displays the time when the formatting or the examination was started.

TDSK CYLINDER(S) *xxxxxxxxx-yyyyyyyyy* NOT EXAMINED displays the starting and ending cylinders that were “skipped” by the EXAMINE process. TDSK cylinders are not always in a format that can be read by EXAMINE and consequently are bypassed.

FORMATTING OF {CYL|PAGE} *zzzzzzzzz* ENDED AT *hh*:*mm*:*ss* displays the time when the formatting or the examination ended.

VOLUME SERIAL NUMBER IS NOW = volid identifies the new volume serial of the unit being processed if VOLID(serial) was specified in the CPVOLUME command.

{CYL|PAGE} ALLOCATION IS AS FOLLOWS: it displays the contents of the allocation map.

System action

ICKDSF processing of the command continues.

Operator response

None.

System programmer response

None.

ICK03005I AIXVOL REPORT FOR *ccuu*
FOLLOWS:
VOLUME SERIAL = volid
CYLINDER RANGE TO BE FORMATTED IS
xxxxxxxxx-yyyyyyyyy
FORMATTING OF CYLINDER *xxxxxxxxx* STARTED
AT *hh*:*mm*:*ss*
FORMATTING OF CYLINDER *yyyyyyyyy* STARTED
AT *hh*:*mm*:*ss*
FORMATTING OF CYLINDER *zzzzzzzzz* ENDED
AT *hh*:*mm*:*ss*
VOLUME SERIAL NUMBER IS NOW = volid

Explanation

VOLUME SERIAL=volid identifies the volume serial of the unit being processed.

CYLINDER RANGE TO BE FORMATTED IS *xxxxxxxxx-yyyyyyyyy* identifies the starting and ending values for the range of cylinders or FBA pages to be formatted. If the EXAMINE function was specified, this message will state "CYLINDER RANGE TO BE EXAMINED IS *xxxxxxxxx-yyyyyyyyy*".

FORMATTING OF CYLINDER *xxxxxxxxx* STARTED AT *hh*:*mm*:*ss* displays the time when the formatting or the examination was started.

FORMATTING|EXAMINATION OF CYLINDER *xxxxxxxxx* STARTED AT *hh*:*mm*:*ss* displays the time when the formatting or the examination was started.

FORMATTING|EXAMINATION OF CYLINDER *yyyyyyyyy* STARTED AT *hh*:*mm*:*ss* displays the time when the formatting or the examination started for cylinder *yyyyyyyyy*. This is a progress message that is repeated periodically (approximately every 100 cylinders).

FORMATTING|EXAMINATION OF CYLINDER *zzzzzzzzz* ENDED AT *hh*:*mm*:*ss* displays the time when the formatting or the examination ended.

VOLUME SERIAL NUMBER IS NOW = volid identifies the new volume serial of the unit being processed if VOLID(serial) was specified in the AIXVOL command.

{CYL|PAGE} ALLOCATION IS AS FOLLOWS: it displays the contents of the allocation map.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK03010I **SPECIFIED RANGE (*xxxxxxxxx,yyyyyyyyy*); VOLUME END LIMITED TO *nnnnnnnn***

Explanation

A formatting range or allocation type statement specified an ending range value *yyyyyyyyy* that exceeds the capacity *nnnnnnnn* of the volume.

System action

CPVOLUME and AIXVOL replaces *yyyyyyyyy* with *nnnnnnnn* and the command processing continues.

Operator response

None, if the resulting range is acceptable. Otherwise, run the CPVOLUME or the AIXVOL command again using the correct range value.

System programmer response

None.

ICK03011I **CYLINDER|PAGE RANGE TO BE FORMATTED IS *xxxxxxxxx-yyyyyyyyy* CYLINDER|PAGE RANGE TO BE EXAMINED IS *xxxxxxxxx-yyyyyyyyy***

Explanation

xxxxxxxxx is the starting cylinder or page to be formatted or examined by the CPVOLUME or the AIXVOL command. *yyyyyyyyy* is the ending cylinder to be formatted or examined by the CPVOLUME or the AIXVOL command.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK03020I **CPVOL WILL PROCESS ccuu FOR [VM/370|XA|ESA] MODE**

Explanation

CPVOLUME has determined that its operating mode is either VM/370, VM/XA or VM/ESA. Volumes formatted in the VM/ESA mode can be used on either VM/ESA or z/VM systems. CPVOLUME will format the device for the specified operating system.

System action

Command processing continues.

Operator response

None, if the MODE is acceptable.

System programmer response

None.

ICK03021I **ccuu IS FORMATTED FOR [VM/370|VM/XA|VM/ESA|ESA] MODE**

Explanation

CPVOLUME has determined that the device has been formatted for use in a VM/370, VM/XA or VM/ESA, or VM/ESA-only environment.

System action

Command processing continues.

Operator response

None.

System programmer response

None if the mode is acceptable.

ICK03022I FORMATTING THE DEVICE with/without FILLER RECORDS

Explanation

The volume will be formatted with or without filler records, depending on the device status and parameter specification.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK03024I DEVICE IS CURRENTLY FORMATTED with/without FILLER RECORDS

Explanation

The volume you specified is currently formatted with or without filler records.

System action

Command processing continues.

Operator response

None.

System programmer response

Not applicable.

ICK03025I AIXVOL WILL PROCESS ccuu FOR AIX/ESA MODE

Explanation

AIXVOL will process the device specified for use in an AIX/ESA environment.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK03026I TRACK CENTER TEST DATA EXISTS, SELECTED HEADS WILL BE FORMATTED

Explanation

INSTALL command will only format the heads that are indicated by the track center data. If track center data does not exist, INSTALL formats the whole volume.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK03030I ALLOCATION MAP WILL BE EXPANDED FROM *xxxxxxxxx* TO *yyyyyyyyy* [CYLS| PAGES] ALLOCATION MAP WILL BE REDUCED FROM *xxxxxxxxx* TO *yyyyyyyyy* [CYLS|PAGES]

Explanation

The volume specified by the UNIT parameter was previously formatted with an allocation map that no longer matches the actual number of cylinders contained on the device. The value *xxxxxxxxx* is the highest cylinder defined in the allocation map. If the unit is a dedicated device, *yyyyyyyyy* is the number of cylinders for the native device. If the unit is a minidisk, *yyyyyyyyy* is the number of cylinders for the minidisk.

This condition occurs:

- When a CP formatted volume is copied or restored to a volume that contains more cylinders. For example, if a 3380D is copied to a 3380E, the message

indicates that the allocation map must be expanded from 885 to 1770 cylinders.

- When a previously formatted minidisk is redefined with a different number of cylinders.
- When the MIMIC(MINI(*xxxxxxxxx*)) parameter specifies a value *xxxxxxxxx* that does not agree with the allocation map.

If the operation is FORMAT or ALLOCATE, the allocation map will be changed if the reply to message ICK003D is U. The map is EXPANDED by adding PERM space to the end of the allocation map. The map is REDUCED by deleting space from the end of the allocation map.

System action

ICKDSF continues processing.

Operator response

None, if the change is acceptable. Otherwise reply T to message ICK003D.

System programmer response

None.

ICK03040I PERMANENT READ ERROR ON [((cchh)|(cccCCCC:H))|block]

Explanation

When the EXAMINE function is performed, an uncorrectable data check occurred.

System action

The EXAMINE function continues processing.

Operator response

When the EXAMINE function completes, reformat the indicated cylinder.

System programmer response

None.

ICK03050I FORMAT ERROR ON CYL(S) *xxxxxxxxxx-yyyyyyyyy*

Explanation

When the EXAMINE function is performed, a cylinder (or range of cylinders) was found not properly formatted.

This might be caused by a mixture of cylinders with filler records and cylinders without filler records on a 3380 DASD. Or the range of cylinders might be formatted as a CMS minidisk instead of a CP system area that is formatted by CPVOLUME.

System action

The EXAMINE function continues processing.

Operator response

When the EXAMINE function completes, reformat the indicated cylinders.

System programmer response

None.

ICK03060I INVALID TRACK FORMAT ON [((cchh)|(cccCCCC:H))|block]

Explanation

While performing the FORMAT function, an INVALID TRACK FORMAT or NO RECORD FOUND error was encountered while searching for R0 on the track.

System action

The INSPECT function is initiated to surface check the track and rewrite the R0. If the INSPECT is successful, formatting continues, otherwise the operation ends. Message ICK03070I will report the results of the track surface check operation.

Operator response

None, if the operation continues. If the operation ends, refer to message ICK03070I or ICK33110I.

System programmer response

None.

ICK03070I SURFACE CHECK IN PROGRESS ON cchh|block SURFACE CHECK COMPLETED SUCCESSFULLY ON cchh|block

Explanation

While formatting, a device error was encountered that requires that the CKD track or FBA block be inspected. CPVOLUME or AIXVOL invokes the INSPECT function to attempt to correct the error. Message ICK03070I is issued when INSPECT is started and is issued again to report the results of the INSPECT.

System action

Formatting is suspended until the INSPECT operation completes. If the INSPECT operation is successful, formatting continues. If the INSPECT operation fails, formatting ends.

Operator response

None.

System programmer response

None, if the INSPECT operation is successful. If the INSPECT fails, refer to additional messages issued by INSPECT.

ICK03080I CYL0/TRK0 REFORMATTED WITH NEW ALLOCATION MAP

Explanation

Message ICK03030I was previously issued, indicating a required change in the allocation map. This message now indicates that the records on cylinder 0 track 0 have been rewritten to accommodate the changed size of the allocation map record.

System action

ICKDSF continues processing.

Operator response

None.

System programmer response

None.

ICK03090I VOLUME SERIAL = vvvvvv

Explanation

vvvvvv is the volume serial obtained from the volume label record. If there is no volume label record then vvvvvv will be displayed as .....

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK03091I EXISTING VOLUME SERIAL READ = vvvvvv

Explanation

vvvvvv is the existing volume serial read from the volume label record before command processing. If there is no volume label record, or the volume record can not be read then vvvvvv will be displayed as *NONE*.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK03092I VOLUME VM SSI OWNER = ssiname

Explanation

A VM single-system image (SSI) name, *ssiname*, has been assigned to the volume.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK03093I VOLUME SYSTEM OWNER = sysname

Explanation

A system name, *sysname*, has been assigned to the volume.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK03094I MISSING KEYWORDS SSIN, NOSSI, SYSN, NOSYS

Explanation

The OWNER parameter has been specified without one or more required parameters. With OWNER, either SYSNAME or NOSYS, and either SSINAME or NOSSI, is required.

System action

Command processing terminates.

Operator response

None.

System programmer response

None.

ICK03095I NO OWNER SSINAME OR SYSNAME TO DELETE

Explanation

The command that was entered removes the single-system image (SSI) name and/or the system name assigned to the volume, but there is no SSI name or system name to remove.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK03096I EXISTING VTOC IS LOCATED AT CCHH=X'cccc hhhh' AND IS xxxxx TRACKS.

Explanation

This is an informational message showing the existing volume table of contents location before command processing. It contains the cylinder and track where the volume table of contents begins and the number of tracks it occupies.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK04000I DEVICE IS IN SIMPLEX STATE

Explanation

The device is in simplex state and not part of a dual copy pair.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK04001I DEVICE IS IN DUPLEX STATE

Explanation

The device is part of a dual copy pair and is in duplex state.

System action

Command processing continues. Process may later end if the ICKDSF command does not support volumes in duplex state.

Operator response

None.

System programmer response

None.

ICK04002I DEVICE IS IN SUSPENDED DUPLEX STATE

Explanation

The device is part of a dual copy pair and is in suspended duplex state.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK04003I PROCESSING ON PRIMARY VOLUME OF DUAL COPY PAIR

Explanation

Command processing is being directed to the primary volume of a dual copy pair.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK04004I PROCESSING ON SECONDARY VOLUME OF DUAL COPY PAIR

Explanation

Command processing is being directed to the secondary volume of a dual copy pair.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK04005I THE FOLLOWING MEDIA SIM IS BEING CLOSED, SIM ID=X'nn'

Explanation

An open media SIM is being closed after successful track surface checking. See ICK10711I for more information.

System action

Command processing continues.

Operator response

None.

System programmer response

None

ICK04006I RECOVERY IN PROGRESS FOR TRACK X'cccc hhhh'

Explanation

The current process has determined that checkpoint data exists for a previous ICKDSF function and recovery action is in process for the specified track.

System action

ICKDSF continues with the recovery action.

Operator response

None.

System programmer response

None.

ICK04007I SPEED OR NOSPEED IS IGNORED FOR THE DEVICE TYPE

Explanation

The SPEED or NOSPEED option cannot be performed for the specified device type because Device Support Facilities issues a "perform subsystem function" (PSF) command and the subsystem performs the data SCAN for this device.

System action

Command processing continues with the parameter ignored.

Operator response

None.

System programmer response

None.

ICK04008I PSF ORDER = xxxxx PSF SUBORDER = yyyyy

Explanation

An error has been detected for a "perform subsystem function" (PSF) of Order *xxxx* and Suborder *yyyyy*.

System action

Processing may continue or end depending on the error type. See the accompanying messages to determine the action that was taken.

Operator response

None.

System programmer response

See the accompanying messages.

ICK04009I TRACK X'cccc hhhh' IS NOT DEFECTIVE, NOT RECLAIMED

Explanation

After surface checking, the specified primary track has been found not defective. The track remains assigned to an alternate location because NORECLAIM is specified.

System action

Command processing continues.

Operator response

None.

System programmer response

None

ICK04010I DIAGNOSTIC INFORMATION FROM READ SUBSYSTEM DATA:

Explanation

This message gives information for a previously issued PSF command. The information is returned by the subsystem when an abnormal condition occurs.

System action

Depending on the severity of the problem, the function processing may end.

Operator response

None.

System programmer response

Examine the error information and refer to *z/OS DFSMSdfp Diagnosis* for more information. Contact your IBM service representative if necessary.

ICK04013I PRIMARY TRACK X'cccc hhhh' IS PERMANENTLY (RE)ASSIGNED TO AN ALTERNATE LOCATION

Explanation

An alternate location has been assigned to the specified primary track because the primary track is defective, or an unconditional alternate assignment was requested for the primary track. If the primary track already has an alternate location assigned, a new alternate is reassigned to the primary track.

System action

Command processing continues.

Operator response

None.

System programmer response

None

ICK04020I INVALID TRACK DETECTED ON X'cccc hhhh'|X'cccCCCC:H', ASSUMED NO DATA ON THE TRACK

Explanation

A 0F0B condition was detected. ICKDSF rewrites the HA and R0 with the assumption that no data existed on the track.

System action

Command processing continues.

Operator response

None.

System programmer response

None

ICK04029I DEVICE IS IN SUSPENDED PPRC STATE

Explanation

The device is part of a PPRC pair and is in a suspended state.

System action

Command processing continues.

Operator response

None.

System programmer response

The detail status can be obtained by using PPRCOPY QUERY command.

ICK04030I DEVICE IS A PEER TO PEER REMOTE COPY VOLUME

Explanation

The device is part of a PPRC pair and Peer to Peer Remote Copy is active for the device.

System action

Command processing continues.

Operator response

None.

System programmer response

The detail status can be obtained by using PPRCOPY QUERY command.

ICK04031I DEVICE IS IN PPRC PENDING STATE

Explanation

The device is part of a PPRC pair and is in a PPRC pending state.

System action

Command processing continues.

Operator response

None.

System programmer response

The detail status can be obtained by using PPRCOPY QUERY command.

ICK04032I DEVICE SPECIFIED IS A PPRC SECONDARY

Explanation

The specified volume is a PPRC secondary.

System action

Command processing continues.

Operator response

None.

System programmer response

The detail status can be obtained by using the PPRCOPY QUERY command.

ICK04033I 3-SITE INCREMENTAL RESYNC IS ACTIVE ON THIS VOLUME

Explanation

Incremental Resync is active on the addressed volume.

System action

None.

Operator response

None.

System programmer response

None.

ICK04034I THIS PAIR WAS THE TARGET OF A WITHDRAWN PRESERVE MIRROR RELATION

Explanation

A FLASHCPY WITHDRAW command was issued with the FORCE parameter where this volume was the target of the withdrawn relationship.

System action

None.

Operator response

None.

System programmer response

None.

ICK04035I DEVICE IS IN A SOFT FENCED STATE

Explanation

The device specified is in a soft-fenced state. The control unit will prevent all reads and writes to the volume from any host system. The soft-fenced state will remain until explicitly reset and will be remembered across an IML.

System action

Command processing continues.

Operator response

None.

System programmer response

If you wish to clear the soft-fenced state, you can use the CONTROL CLEARFENCE command or the PPRCOPY ESTPAIR FAILBACK command, which automatically clears the soft-fenced state when the volume is to become the PPRC secondary.

ICK04036I DEVICE IS IN A SPID FENCED STATE

Explanation

The device specified is in a SPID-fenced state. The control unit will not allow any commands that would establish path groups to the device. Set path group ID commands to disband a path group or resign a path from an already established group will be allowed for the device.

Note: This state will be lost if the control unit is IMLed, however, the state will persist through a warm start, cluster failover or cluster failback.

System action

Command processing continues.

Operator response

None.

System programmer response

This is an informational message. The application that set the SPID fence is responsible for resetting the fence. Use the ANALYZE HOSTACCESS command to display the SPID fence host token, which may indicate the application that set the SPID fence. To clear the SPID fence state, use the CONTROL CLEARFENCE SPID SCOPE(DEV|LSS) SERIAL(*serial-number*) command.

ICK10705I VOLUME SERIAL NUMBER FOR DEVICE ccuu IS xxxxxx

Explanation

Informational message concerning the volume serial and VTOC of the volume at ccuu. If the volume serial was changed, you also receive one or both of the following:

- CHANGED FROM xxxxxx - The volume serial number of the ccuu was changed.
- VOLUME SERIAL DUPLICATE FOR DEVICE ccuu. VOLUME MADE UNAVAILABLE - The new volume serial on the ccuu is a duplicate of one already known to the operating system. The device has been unloaded.

If the VTOC location was changed, you also receive the following:

- VTOC LOCATION MOVED - The VTOC location of the volume at *ccuu* has moved.
- VOLUME AT *ccuu* HAS MOVED.

If the volume serial is a duplicate, you also receive the following diagnostic message that may be used by your service representative if additional assistance is needed:

- *ocuu* ADDRESS *xxxxxxxx,xxxxxxxx dcuu* ADDRESS *xxxxxxxx,xxxxxxxx* - In this message, *ocuu* is the address that was made unavailable; *dcuu* is the address of the duplicate volume.

System action

Command processing continues.

Operator response

If the device is being shared by other systems, this volume may need to be remounted at the sharing systems.

System programmer response

None.

ICK10710I I/O ERROR OCCURRED ON DEVICE ccuu

Explanation

An I/O error occurred on the device address *ccuu*. The two following message lines show the failing channel command word (CCW), the channel status word (CSW), the filemask, and the sense bytes, which describe the nature of the I/O error. If you are running ICKDSF in a virtual machine under VM, see "Problem solving under VM" on page 66.

System action

Command processing continues. Command processing may eventually end, but it is generally documented by an ending message.

Operator response

None.

System programmer response

Make sure that the problem is caused by the device. Correct the device problem, and retry the command.

ICK10711I SIM INFORMATION: CCUU=ccuu, errortype,severity,

MT=xxxx-xx,SER=xxxx-xxxxx,
REFCODE=xxx-xxxx-xxxx,
VOLSER=xxxxxx,ID=xx,
CCHH=X'cccc hhhh',
BLOCK=xxxxxxxx,REPEATED
SIM=xxxxxxxxxxxxxxxxxxxxx

Explanation

Information from a service information message (SIM). The CCHH or BLOCK fields are printed only when they are applicable to the error type. When other fields are not applicable to the error type, N/A is printed in the variable portion of the message. The DASD model number appears in bits 3-5 of the MT field.

System action

Command processing continues.

Operator response

None.

System programmer response

Depending on the device see *z/OS DFSMSdfp Diagnosis*, or *z/OS DFSMSdfp Storage Administration* for further information.

ICK10720I **UNABLE TO DETERMINE IF DUPLICATE VOLSER EXISTS RETURN CODE = xxxxxxxx REASON CODE = xxxxxxxx**

Explanation

ICKDSF conclusion processing attempted to determine if another UCB exists with a duplicate *volser* of this volume. Because the UCBLOOK service returned with an unexpected error condition, ICKDSF has been unable to determine if a duplicate exists. The UCB for the device has been marked offline.

The hexadecimal UCBLOOK return and reason codes are printed if applicable.

System action

Conclusion processing continues.

Operator response

None.

System programmer response

- Examine the previous messages to determine if the requested ICKDSF function completed successfully.
- Examine the UCBLOOK return and reason code to determine the cause the error.

See *z/OS DFSMSdfp Diagnosis* for more information.

If no other online device exists with the same volser, then the volume can be varied back online.

ICK10721I **ccuu VOLUME MADE UNAVAILABLE**

Explanation

The device has been unloaded during ICKDSF termination processing, because either an error occurred or a duplicate volser was found.

System action

Termination processing continues.

Operator response

None.

System programmer response

Examine the previous messages to determine the reason the volume is unavailable.

ICK10722I **UCBLOOK FAILED RETURN CODE = xxxxxxxx REASON CODE = xxxxxxxx**

Explanation

The UCB service, UCBLOOK was unsuccessful.

System action

Command processing ends. The hexadecimal UCBLOOK return and reason codes are printed if applicable.

Operator response

None.

System programmer response

Examine the UCBLOOK return and reason codes to determine the cause of the error.

See *z/OS DFSMSdfp Diagnosis* for more information.

ICK10723I **UCBPIN FAILED RETURN CODE = xxxxxxxx REASON CODE = xxxxxxxx**

Explanation

The UCB service, UCBPIN was unsuccessful. The hexadecimal UCBPIN return and reason codes are printed if applicable.

System action

Command processing ends.

Operator response

None.

System programmer response

Examine the UCBPIN return and reason codes to determine the cause of the error.

See *z/OS DFSMSdfp Diagnosis* for more information.

ICK10724I UCBPIN FAILED, UNABLE TO UNPIN UCB RETURN CODE = xxxxxxxx REASON CODE = xxxxxxxx

Explanation

The UCB for this device could not be unpinned. The hexadecimal UCBPIN return and reason codes are printed if applicable. ICKDSF termination processing was unable to complete successfully. End of Task processing will also attempt to unpin the UCB.

System action

Command processing ends.

Operator response

None.

System programmer response

Examine the UCBPIN return and reason codes to determine the cause of the error.

See *z/OS DFSMSdfp Diagnosis* for more information.

ICK10725I UCB SERVICE FAILED RETURN CODE = xxxxxxxx REASON CODE = xxxxxxxx

Explanation

The UCB service failed while ICKDSF was attempting to determine the path status. The hexadecimal UCB Service return and reason codes are printed if applicable.

System action

ICKDSF will either end processing, or bypass some functions and continue.

Operator response

None.

System programmer response

Examine the UCB service return and reason codes to determine the cause of the error.

See *z/OS DFSMSdfp Diagnosis* for more information. Examine the subsequent messages to determine if ICKDSF will bypass some functions and continue processing, or whether processing will end.

ICK10726I UNABLE TO DETERMINE PATH STATUS

Explanation

The path status could not be determined.

System action

Command processing continues, bypassing the functions that require path control.

Operator response

None.

System programmer response

Examine the previous messages to determine the reason the path status could not be determined.

ICK10727I UNABLE TO UNALLOCATE UCB, RC=xxxx, RSN=xxxx

Explanation

An error occurred while trying to unallocate the UCB. The RC and RSN are the return and reason code from the MVS service that was invoked to unallocate the UCB.

System action

ICKDSF terminates.

Operator response

Contact the system programmer.

System programmer response

Determine the reason for the inability to unallocate the UCB.

ICK10728I ENFREQ FAILED: RETURN CODE = XXXXXXXX

Explanation

During the closing of the volume, an error occurred using the event notification facility macro ENFREQ.

This macro is used to tell components that are listening that the following may have occurred:

- The VTOC has been converted from an OSVTOC to an Indexed VTOC.
- The VTOC was extended or moved.
- The device size in the format 4 DSCB has changed.

The ENFREQ macro passed return code; see *z/OS MVS Programming: Authorized Assembler Services Reference EDT-IXG* for further information

System action

Command processing continues.

Operator response

None.

System programmer response

Analyze the return code from the ENFREQ macro. The function may have completed successfully, however, ICKDSF was unable to notify other components that the VTOC has changed.

ICK11005I VTOC DOES NOT EXIST

Explanation

A volume table of contents was not found on the volume during command processing.

System action

Command processing continues.

Operator response

None.

System programmer response

The volume must be initialized before being used in an MVS or VSE environment.

Note: A VTOC is not required for CP volumes.

ICK11009I IPL PROGRAM SUPPLIED FOR MSS -- IGNORED

Explanation

A volume being formatted as an MSS staging pack cannot contain IPL records.

System action

Command processing ignores the IPL program specified, and the continues.

Operator response

None.

System programmer response

Remove the IPLDD parameter from the command.

ICK11010I UNABLE TO CLOSE VOLUME

Explanation

A system error has occurred that prevents the volume from being closed properly.

System action

The command probably did not complete successfully because the volume did not close. ICKDSF processing continues with the next command.

Operator response

None.

System programmer response

None. Save the job output and contact your IBM service representative.

ICK11019I NEXT-AVAILABLE-ALTERNATE POINTER OR COUNTER IN VTOC IS INVALID

Explanation

There is an error in either the value of the pointer to the next available alternate track or in the count of the available alternate tracks.

System action

Command processing continues. If it is possible, the value in the VTOC is updated when processing completes.

Operator response

None.

System programmer response

None. Save the job output and contact your IBM service representative.

ICK11038I NO VALID TRACKS WERE SPECIFIED

Explanation

If the TRACKS parameter specifies no valid track addresses, this message indicates that the command was not processed.

System action

Command processing ends. However, PRESERVE data is processed before termination. ICKDSF processing continues with the next command.

Operator response

None.

System programmer response

Reissue the command, and specify one or more valid track addresses. Save the job output and contact your IBM service representative.

ICK11048I INDEX SIZE SPECIFIED IS NOT LARGER THAN THE ORIGINAL, THE ORIGINAL SIZE IS USED

Explanation

You have specified a new index size smaller than the current size. The current size will be used when rebuilding the index.

System action

Command processing continues.

Operator response

None.

System programmer response

If you wish to build an index smaller than the current size you must use the BUILDIX command to first delete the current index, and then use the BUILDIX command to build an index the size you wish.

ICK11049I EXTINDEX PARAMETER IGNORED, VOLUME IS NOT IN INDEX FORMAT

Explanation

You have specified the EXTINDEX parameter for a volume which is not in index format.

System action

Command processing continues.

Operator response

None.

System programmer response

If you wish to build an index use the BUILDIX command.

ICK11050I VTOC LOCATION SPECIFIED FOR MSS STAGING PACK -- IGNORED

Explanation

You cannot specify a VTOC location for a Mass Storage System staging pack.

System action

The VTOC parameter is ignored, and command processing continues.

Operator response

None.

System programmer response

Remove the VTOC parameter from the command.

ICK11051I LABELS PARAMETER SPECIFIED FOR MSS STAGING PACK -- IGNORED

Explanation

You cannot place user volume labels on a Mass Storage System staging pack.

System action

The LABELS parameter is ignored, and command processing continues.

Operator response

None.

System programmer response

Remove the LABELS parameter from the command.

ICK11065I DATA PRESERVED FOR TRACK CCHH=X'cccc hhhh' ON ALTERNATE TRACK CCHH=X'cccc hhhh'

Explanation

This message follows message ICK21047I if the preserved data is successfully written to an alternate track.

System action

Command processing continues with the next track. The return code is set to 4.

System programmer response

Further inspection of the failing track might be required to determine the reason for the failure.

ICK11066I DATA RESTORED FROM ALTERNATE TRACK CCHH=X'cccc hhhh' TO PRIMARY TRACK CCHH=X'cccc hhhh'

Explanation

This is an informational message that user data has been restored from the alternate track to the primary track. However, the process ended because of an I/O error preceding or following this message.

System action

Command processing ends.

Operator response

None.

System programmer response

Examine the failing CCW, CSW and SENSE information to determine the cause of the error.

ICK11095I UNABLE TO READ VOLUME LABEL - PROCESS CONTINUING

Explanation

An inspect has been requested on a volume that does not contain an OS volume label.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK11130I CAN NOT DETACH LINKED DEVICE ccuu RC = nnnn

Explanation

The DIAGNOSE 08 allows the user program to issue a CP command. The DETACH command detaches the specified address that was full-pack overlay linked by ICKDSF during the media maintenance processing. The operation failed with CP return code *nnnn*.

System action

Command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

For more information about DETACH, see *CP Command Reference for General Users*.

ICK11306I NO STORAGE AVAILABLE FOR PACK MAP

Explanation

During initialization or inspection of a volume, storage is dynamically acquired for data elements that are collected later to format the pack map. This message shows that storage was not available for a data element that was being allocated.

System action

The command is completed, but without a pack map.

Operator response

None.

System programmer response

Specify a larger region size, and reissue the command. Save the job output and contact your IBM service representative.

ICK11315I UNABLE TO READ VOLUME LABEL

Explanation

An I/O error occurred when attempting to read the volume label. When the number of user volume labels cannot be determined, the IPL program record might be written over existing records.

System action

Command processing continues, but ICKDSF does not write the IPL program records.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK11328I SKIP DISPLACEMENT(S) CHANGED FOR TRACK X'cccc hhhh'

Explanation

Skip displacement surface checking has detected at least one area on the track that is potentially defective. The defective areas have been skipped. The surface of the track is defect free if no subsequent messages are issued.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK11329I SURFACE ANALYSIS CYLINDER COULD NOT BE READ FOR TRACK X'cccc hhhh'

Explanation

The surface analysis cylinder is accessed for skip displacement devices when there is a need to restore the skip displacement information on a track to the factory level.

This message can occur when there is no factory map information on the surface analysis cylinder, or there is an I/O error that cannot be corrected.

The channel command word (CCW), CSW, and sense information that caused the error is printed.

System action

Depending upon the input track condition and the device type being processed, the home address may be rewritten without any factory skip displacement information before surface checking of the track occurs. Subsequent messages will appear if the factory skip displacement information might be overridden.

System programmer response

Because the usability of this track is not affected, there is no need to examine further information. However, the failing CCW, CSW, and sense information can be examined in detail if necessary.

ICK11390I INVALID DATA ON SA CYLINDER

Explanation

The data on the surface analysis cylinder for this volume (which contains skip displacement information for this volume) is not in the expected format.

System action

This is an informational message only. ICKDSF will issue other messages for any other actions taken as a result of this situation. Command processing continues.

Operator response

None.

System programmer response

None.

ICK11392I SKIP DISPLACEMENT DATA DEFAULTED FOR TRACK X'cccc hhhh'

Explanation

The skip displacement data for the specified track could not be read.

System action

The track is processed as though there were no skip displacements assigned to it, and the track receives a complete surface check.

Assignment of new skip displacements takes place as required.

Note that if there had been factory assigned skip displacements for this track, they have been reset.

Operator response

None.

System programmer response

None. When ICKDSF processing completes for this track, the specified condition of the track (that is, either not defective or defective) is valid.

ICK11400I SUSPECTED PATH PROBLEM

Explanation

A path that was initially operational became not operational during drivetest processing.

System action

Command processing continues.

Operator response

None.

System programmer response

Correct the cause of the not-operational path status and run the job again.

ICK11411I ccuu INCORRECT DEVICE TYPE FOR DRIVE TEST, DRIVE TEST BYPASSED

Explanation

Drive test was either specified or defaulted, but the device type for the volume indicated by device ccuu is not for a fixed media device. Some count key data (CKD) devices, such as the 2105, 2107, or 1750, do not support the drive test.

System action

ANALYZE command processing continues with the data verification test. The ANALYZE return code is set to 4.

Operator response

None.

System programmer response

Valid device types for ANALYZE drive test include devices listed in Table 13 on page 8, Table 11 on page 7, and any CKD device emulated on a CKD device.

ICK11412I DRIVE TEST NOT SUPPORTED FOR MINIDISK, DRIVE TEST BYPASSED

Explanation

You specified the ANALYZE DRIVETEST function, which is not supported for minidisks.

System action

The drive test is bypassed.

Operator response

None.

System programmer response

None.

ICK11414I WRITE INHIBIT SWITCH ON, WRITE TESTS BYPASSED

Explanation

An error was detected when the ANALYZE drive test attempted to write on the CE cylinder, but the device was in a write inhibited condition.

System action

All tests that attempt to write on the CE cylinder are bypassed, but command processing continues.

Operator response

If the device has an R/W or READ switch, make sure the switch is in the READ/WRITE position, and is functioning properly.

This condition can also exist if the storage control has been write inhibited by the operating system. See the explanation of the CONTROL command to determine further action.

ICK11417I HOME ADDRESS READ FROM C.E. CYLINDER IS INCORRECT: SHOULD BE X'cccc hhhh', IS X'cccc hhhh'.

Explanation

The cylinder and head information in the home address for the specific track on the CE cylinder is incorrect.

System action

ANALYZE attempts to rewrite the home address with the correct cylinder and head information:

- If the rewrite is successful, command processing continues with the write tests.
- If the rewrite is unsuccessful, this message is followed by a line showing the failing CCW, CSW, and sense, and indicating that the write tests will be bypassed. Command processing continues, bypassing the write tests.

Operator response

None.

System programmer response

If ANALYZE was being run because of a suspected write problem, and the rewrite of the home address on the CE cylinder is unsuccessful, investigate the situation further.

ICK11418I HOME ADDRESS MARKED DEFECTIVE ON CE CYLINDER CCHH = X'cccc hhhh'

Explanation

The home address on track X'cccc hhhh' on the CE cylinder was found with the defect bit set on in the home address. ICKDSF will attempt to rewrite the home address with the defect bit off, unless this is one of the backup tracks containing backup data. If the correction attempt fails, then the message will be followed by another ICK10710I or ICK20100I with the ccw, csw, and sense information.

(The existence of backup data will have been indicated in a prior message.)

System action

Command processing may eventually end.

Operator response

None.

System programmer response

If message ICK10710I or ICK20100I is issued, examine the ccw, csw, and sense to determine the cause of the error. Assistance from your IBM hardware service representative may be required to correct the cause of the problem.

(If a prior message indicated that backup data exists for a previous uncompleted command, first issue the command again that did not complete.)

ICK11425I OPERATOR SPECIFIED B TO BYPASS RESERVED PATH

Explanation

The operator replied B in response to message ICK416D or ICK417D.

System action

Further processing is bypassed on this path.

Operator response

None.

System programmer response

None.

ICK11426I DRIVE TEST: PATH UNAVAILABLE ON: CHPID = XX CHANNEL NUMBER = X CHANNEL SET =X STORAGE DIRECTOR ID = XX SUBSYSTEM ID = XXXX CLUSTER = X STORAGE PATH = X

Explanation

The drive test attempted to start an I/O operation to a path that was not operational or was inaccessible.

CHPID = XX identifies the CHPID for the path being processed. This line is displayed only if it applies to the operating system environment.

CHANNEL NUMBER = X identifies the channel number for the path being processed.

CHANNEL SET = X identifies the channel set (CPU affinity) for the path being processed. This line is displayed only if it applies to the operating system environment.

STORAGE DIRECTOR ID = XX identifies the Storage Director Id for the path being processed. It contains the information in sense byte 21. This line is displayed only if it applies to the storage control being processed, or if the error did not occur before the Storage Director Id was determined.

SUBSYSTEM ID = XXXX identifies the Subsystem Id for the path being processed. It contains the information in sense bytes 20 and 21. This line is displayed only if it applies to the storage control being processed, or if the error did not occur before the Subsystem ID was determined.

CLUSTER = X identifies the Cluster for the path to be processed. This line is displayed only if it applies to the storage control being processed, or if the error did not occur before the Cluster was determined.

STORAGE PATH = X identifies the Storage Path of the Cluster to be processed. This line is displayed only if it applies to the storage control being processed, or if the error did not occur before the Storage Path was determined.

System action

Drive test processing ends on this path.

Operator response

None.

System programmer response

Correct the cause of the not-operational path status.

ICK11427I PATH PARAMETER(S) IGNORED

Explanation

The path control parameters are only valid for drive test functions on 3380 and 3390 devices, and are not supported in the VSE version.

This message may also be issued following message ICK10710I when processing on a 3990 storage control if the 3990 storage control does not support the Guarantee Storage Path operation. The path control parameters may not be valid on all devices that emulate 3380 and 3390. See the ANALYZE command section for further information.

System action

Command processing continues without path control.

Operator response

None.

System programmer response

If the device is not a 3380 or 3390 or the device is being processed in the VSE version, no further action is necessary.

If this message is issued following ICK10710I when processing on a 3990 storage control, contact your IBM hardware service representative. The path parameters may not be valid on all devices that emulate 3380 and 3390. See the ANALYZE command section for further information.

ICK11428I STORAGE PATH STATUS CANNOT BE DETERMINED

Explanation

An I/O error occurred while attempting to determine the storage path status.

System action

If the ANALYZE command is running, path control functions will be bypassed.

If the CONTROL CLEARFENCE command has been issued, the fence status cannot be determined.

Operator response

None

System programmer response

Take action appropriate to your installation's procedures for handling suspected equipment problems.

ICK11429I FENCED/DISABLED PATH(S) WILL BE BYPASSED

Explanation

A fenced or disabled condition was detected on one or more paths.

System action

Processing will be bypassed on the paths with the existing fenced or disabled condition. The Path Status Table will show the paths where the fenced or disabled condition exists.

Operator response

None

System programmer response

Examine the Path Status Table that was previously printed to determine the paths that have a fenced or disabled condition.

If the path is disabled, determine the cause of the disablement. If the fence condition exists, contact your IBM software service representative to resolve the fenced condition.

ICK11430I PATH INFORMATION CANNOT BE DETERMINED

Explanation

Path information cannot be determined because of an error. ICKDSF functions which require path control cannot be processed.

System action

Subsequent messages indicate whether command processing must end or whether it can continue without using path control.

Operator response

None.

System programmer response

Examine the previous messages to find the reason path information cannot be determined.

ICK11431I PATH MAP ROUTINE FAILED RC = xxxxxxxx

Explanation

The system path map routine returned with an error. *RC=xxxxxxxx* is the return code (in hexadecimal) in the message as follows:

Code	Meaning
4	The target subchannel is in permanent error and cannot be accessed.
8	The UCB is not connected to a subchannel.

System action

Subsequent messages show whether the command ends or whether it continues without path control.

Operator response

None

System programmer response

Return code 8 indicates *not connected subchannels*. This means there is a UCB, but no subchannel.

This condition has 3 possible causes and solutions:

1. You over genned to software. Correct by dynamically adding a new subchannel or re-iml with an IOCDS that matches the software.
2. You used CONFIG CHPID to move the last to another partition. When the last channel path is taken away, all the subchannels are also taken away, and the UCBs become *not connected* Correct by reconfiguring the CHPID into the partition.
3. Under VM, you detached the device from MVS and the subchannels became *not connected*. Correct by attaching the device to the guest.

ICK11432I LOGICAL PATH STATUS CANNOT BE DETERMINED

Explanation

An I/O error occurred while attempting to determine the logical path status.

System action

Command processing continues.

Operator response

None.

System programmer response

Examine the CCW, CSW, and sense information to determine the cause of the error. Take action appropriate to your installation's procedures for handling suspected equipment problems.

ICK11433I INTERFACE INFORMATION CANNOT BE DETERMINED

Explanation

An error occurred attempting to obtain the interface information.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Examine the previous messages to determine the cause of the error.

ICK11434I FIBRE CHANNEL CONNECTION INFORMATION CANNOT BE DETERMINED

Explanation

An ANALYZE NOSCAN NODRIVE specifying the WWNN keyword was issued requesting FCP path connectivity information between the control units identified by the two specified World Wide Node Names. The I/O request failed.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Other messages should have been issued indicating the cause of the failure. Determine the cause of the failure and, if appropriate, resolve the cause of the failure and resubmit the request.

ICK11435I CHANNEL CONNECTION ADDRESS SPECIFIED BUT IGNORED

Explanation

Channel Connection Address (CCA) is not required for this command. Specified value will be ignored.

System action

Command processing continues.

Operator response

None.

System programmer response

Remove specified Channel Connection Address (CCA).

ICK11436I CGROUP PARAMETER IGNORED FOR THIS STORAGE CONTROL

Explanation

The CGROUP parameter was specified with the PPRCOPY ESTPATH command, but the device does not support consistency groups. The parameter is ignored.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK11437I CCA SPECIFICATION IS MISSING, IT IS REQUIRED FOR THIS REQUEST

Explanation

Specification of the channel connection address (CCA) is required for the command.

System action

Command processing ends.

Operator response

None.

System programmer response

Specify the CCA and resubmit the request.

ICK11438I NO PRIMARY ADAPTERS AVAILABLE FOR FIBRE CHANNEL CONNECTION

Explanation

An ANALYZE NOSCAN NODRIVE specifying the WWNN keyword was issued requesting FCP path connectivity information between the control units identified by the two specified World Wide Node Names. There are no adapters configured with FCP paths on the control unit identified by the first World Wide Node Name to the control unit identified by the second specified World Wide Node Name.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Contact those personnel responsible for the configuration of the devices and determine whether the desired FCP connectivity should exist. If so, that configuration must be physically established.

ICK11439I NO SECONDARY ADAPTERS AVAILABLE FOR FIBRE CHANNEL CONNECTION

Explanation

An ANALYZE NOSCAN NODRIVE specifying the WWNN keyword was issued requesting FCP path connectivity information between the control units identified by the two specified World Wide Node Names. There are no adapters configured with FCP paths on the control unit identified by the second World Wide Node Name to the control unit identified by the first specified World Wide Node Name.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Contact those personnel responsible for the configuration of the devices and determine whether

the desired FCP connectivity should exist. If so, that configuration must be physically established.

ICK11440I HOST ACCESS INFORMATION CAN NOT BE DETERMINED

Explanation

An ANALYZE NOSCAN NODRIVE command that included the HOSTACCESS parameter to request host access information was issued. The associated I/O request failed.

System action

Command processing continues without the host access information.

Operator response

None.

System programmer response

Check for other messages that indicate the cause of the failure. If appropriate, resolve the cause of the failure and resubmit the request.

ICK11441I HOST ACCESS INFORMATION IS NOT SUPPORTED FOR THIS DEVICE, PARAMETER IGNORED

Explanation

An ANALYZE NOSCAN NODRIVE command that included the HOSTACCESS parameter to request host access information was issued. The device specified does not support this function.

System action

Command processing continues without the host access information.

Operator response

None.

System programmer response

None.

ICK11450I DIRECT I/O IS NOT SUPPORTED FOR THIS DEVICE, PARAMETER IGNORED

Explanation

The DIRECTIO parameter was specified, but either the subsystem does not support dual copy or the device is in simplex state.

System action

Command processing continues without DIRECTIO.

Operator response

None.

System programmer response

None.

ICK11451E ***WARNING* ALTERNATE TRACK ASSIGNMENT EXISTS ON SECONDARY VOLUME**

Explanation

One or more alternate track assignments exist on the secondary volume of a dual copy pair. The use of a volume as a secondary volume when there is an alternate track assigned is not recommended.

System action

Command processing continues.

Operator response

None.

System programmer response

Reestablish duplexing with another volume with no alternate track assigned. This volume may be used as a simplex volume or as a primary volume of a dual copy pair.

ICK11452I UNABLE TO READ DATA ON SECONDARY VOLUME FOR TRACK CCHH = X'cccc hhhh'

Explanation

When processing on the primary volume of a dual copy pair, INSPECT determines if the corresponding track on the secondary volume is readable. The specified track on the secondary volume was not readable.

The previous ICK10710I message contains the CCW, CSW, and sense information for the error.

System action

Command processing continues.

Operator response

None.

System programmer response

Examine the CCW, CSW, and sense information to determine the cause of the error on the secondary volume. Take appropriate action for your installation procedures for handling problems on the secondary volume.

ICK11453I UNABLE TO READ DATA ON PRIMARY VOLUME FOR TRACK CCHH = X'cccc hhhh'

Explanation

During processing of the primary volume, data on the primary volume of the dual copy pair could not be read.

The previous ICK10710I message contains the CCW, CSW, and sense information for the error on the primary volume.

If the device is in duplex state, processing will continue to read data from the secondary volume.

System action

Message ICK21044I will be issued if data cannot be recovered from the secondary volume; command processing continues with the next track.

Operator response

None.

System programmer response

Examine the CCW, CSW, and sense information to determine the cause of the error on the primary volume. If the error is a data check, the following action is recommended:

1. Suspend the primary volume. This will cause the primary volume to become the disabled secondary.
2. Inspect the track on the disabled secondary with the DIRECTIO parameter.
3. If the INSPECT runs, reestablish the dual copy pair.

   If the device is in duplex state and data is recovered from the secondary volume, the above action is not required.

For all other errors, take the action appropriate to your installation procedures for handling errors on the primary volume of a dual copy pair.

ICK11454I UNABLE TO READ DATA ON PRIMARY VOLUME FOR TRACK CCHH = X'cccc hhhh', PROCESS CONTINUING

Explanation

When you are processing the secondary volume of a dual copy pair, INSPECT determines if the corresponding track on the primary volume is readable. The specified track on the primary volume was unreadable.

The previous ICK10710I message contains the CCW, CSW, and sense information for the error.

System action

Because TOLERATE(PRIFAIL) was specified, command processing continues for this track on the secondary volume

Operator response

None.

System programmer response

Examine the CCW, CSW, and sense information to determine the cause of the error on the primary volume and take action appropriate to your installation's procedures for handling errors on the primary volume of a dual copy pair.

ICK11455I [PREVIOUS INSTALL|REVAL|INIT|INSPECT] COMMAND DID NOT COMPLETE ON [PRIMARY|SECONDARY VOLUME]

Explanation

The current process found that checkpoint data exists because a previous command prematurely ended on the primary or secondary volume of a dual copy pair.

System action

The action taken by ICKDSF may differ depending on the current function and the dual copy volume state.

Operator response

None.

System programmer response

See the message following. Determine the reason the previous ICKDSF command did not complete.

ICK11456I CHECKPOINT DATA BEING ERASED

Explanation

See the explanation for previous messages you received. Based on the current ICKDSF function you

specified and status of the dual copy volume, ICKDSF determined that either:

- You did not request the checkpoint recovery process, or
- The checkpoint data must be erased in order to perform the current function.

System action

ICKDSF erases the checkpoint data.

Operator response

None.

System programmer response

It is strongly recommended that you do not establish or fail a dual copy pair (change the volume state) or invoke a different function if a previous ICKDSF function did not complete.

ICK11457I PROCESSING CONTINUES WITHOUT RECOVERY ACTION

Explanation

See the explanation of previous messages. It is unclear if or how ICKDSF should perform the recovery process based on the current volume state, the intent of the current ICKDSF function and the content of the checkpoint data.

Since the volume is a dual copy volume, the current function takes precedence.

System action

Command processing continues without checkpoint recovery.

Operator response

None.

System programmer response

It is strongly recommended that you complete the previous function to ensure the volume is in a usable condition. Place the dual copy pair in simplex state if necessary. The checkpoint data may or may not be erased (see ICK11456).

ICK11458I UNABLE TO USE ALTERNATE TRACK CCHH=X'cccc hhhh' TO ESTABLISH TRACK ASSOCIATION

Explanation

The alternate track indicated cannot be used to establish a primary/alternate track association on the secondary volume.

System action

INSPECT command processing continues.

Operator response

None.

System programmer response

Run INSPECT SKIP to surface check the alternate track.

ICK11459I NOPRESERVE PARAMETER IGNORED ON PRIMARY VOLUME OF DUAL COPY PAIR

Explanation

The NOPRESERVE parameter is not valid on the primary volume of a dual copy pair.

System action

The NOPRESERVE parameter is ignored and command processing continues with PRESERVE in effect.

Operator response

None.

System programmer response

None.

ICK11460I PRESERVE PARAMETER IGNORED ON SECONDARY VOLUME OF DUAL COPY PAIR

Explanation

The PRESERVE parameter is not valid on the secondary volume of a dual copy pair.

System action

The PRESERVE parameter is ignored and command processing continues.

Operator response

None.

System programmer response

None.

ICK11461I NON-STANDARD RECORD ZERO EXISTS ON PRIMARY VOLUME FOR TRACK CCHH = X'cccc hhhh', PROCESS CONTINUING

Explanation

A non-standard record 0 condition exists on the primary volume of the dual copy pair.

System action

Since TOLERATE(PRIFAIL) was specified, command processing continues on the secondary volume.

Operator response

None.

System programmer response

The primary volume should be put in simplex state and INSPECT NOPRESERVE run on the track of the primary volume.

ICK11462I NON-STANDARD RECORD ZERO EXISTS ON SECONDARY VOLUME FOR TRACK CCHH = X'cccc hhhh', CORRECTION IN PROGRESS

Explanation

A non-standard record 0 condition exists on the secondary volume of the dual copy pair.

System action

INSPECT attempts to write a standard home address and record 0 on the track of the secondary volume.

Operator response

None.

System programmer response

None.

ICK11467I ADDITIONAL PEER-TO-PEER REMOTE COPY RELATIONSHIPS EXIST

Explanation

Additional peer-to-peer remote copy relationships exist, but cannot be displayed, as the PPRC QUERY command was issued on a system that does not support the display of all peer-to-peer remote copy relationships for the device.

System action

Command processing continues.

Operator response

None.

System programmer response

To see the additional relationships you must issue the PPRC QUERY command on a system that supports the display of all peer-to-peer remote copy relationships for the device. The additional peer-to-peer remote copy relationships were introduced with multi-target support.

ICK11468I RELEASE ALLOCATED TARGET SPACE FAILED

Explanation

The PPRCOPY WITHDRAW command completed successfully but the release allocated target space failed due to a condition detected in the Space Efficient Repository or Space Efficient Extent Pool.

System action

Command processing continues.

Operator response

None.

System programmer response

To release the allocated target space you can reinitialize the target volume using the INIT command.

ICK11741I DATA CHECK ON ID OR DATA FIELD ORIENTATION ADDR = nnnnn.

Explanation

This message is printed for each block that fails the data verification test phase of ANALYZE. The data check indicates that data synchronization on the block's ID or data field was unsuccessful.

nnnnn is the relative block number in error.

This message is followed by a line showing the failing CCW, CSW and sense information.

System action

ANALYZE command processing continues.

Operator response

None.

System programmer response

Normally, this error is an indication of a media surface problem that can be resolved by:

- Assigning an alternate to the failing block with the INSPECT command, or
- Using the INIT command with the CHECK parameter to reinitialize the fixed block architecture (FBA) device.

Note: A large number of these messages occurring for a newly installed device may be an indication of an incorrectly formatted device. In this case, assistance from your IBM hardware service representative will probably be necessary.

ICK11743I DATAVER UNCORRECTABLE ERROR ADDR BLOCK nnnnn

Explanation

This message is printed for each block that fails the data verification test phase of ANALYZE with an ECC uncorrectable data check. This message is followed by a line showing the failing CCW, CSW, and sense information. nnnnn is the relative block number of the failing block.

System action

ANALYZE command processing continues. The return code is set to a 4.

Operator response

None.

System programmer response

Normally, this error is an indication of a media surface problem that can be resolved by:

- Assigning an alternate to the failing block with the INSPECT command, or
- Using the INIT command with the CHECK parameter to reinitialize the FBA device.

If repeated attempts to resolve the problem using the INSPECT or INIT command fail, seek assistance from your IBM hardware service representative to aid in resolving the problem.

ICK11745I DATAVER CORRECTABLE ERROR ADDR BLOCK = nnnnn

Explanation

This message is printed for each block that fails the data verification test phase of ANALYZE with an ECC correctable data check. This message is followed by a line showing the failing CCW, CSW, and sense information.

nnnnn is the relative block number of the failing block.

System action

ANALYZE command processing continues. The return code is set to a 4.

Operator response

None.

System programmer response

Normally, this error is an indication of a minor media surface defect and should not be considered a problem if the device is being used with systems such as VSE and VM, which have error recovery procedures that do ECC correction.

The performance impact of fixing the data in storage is less than the impact of the device reading the data from an alternate block. If it is necessary to eliminate this type of error, the INSPECT command can be used to unconditionally assign an alternate to the failing block.

Note: If an excessive number of these errors occur, assistance from your IBM hardware service representative should be sought to aid in determining if a hardware problem exists.

ICK11752I BLOCK xxxxxxxx OUTSIDE DEVICE LIMITS

Explanation

Block number xxxxxxxx specified by the BLOCKS parameter is not valid.

System action

The command continues, ignoring the block number that is not valid.

Operator response

None.

System programmer response

Resubmit the job, specifying the correct block number in the BLOCKS parameter. See “BLOCKRANGE|BLOCKS parameter: specify which blocks to inspect” on page

402. Save the job output and contact your IBM service representative.

ICK11782I DATAVER UNCORRECTABLE ERROR ADDR CCHH = X'cccc hhhh'| X'cccCCCC:H'

Explanation

This message is printed for each track that fails the data verification test with an apparent ECC uncorrectable data check.

If the error could have been corrected by storage control retry, or if the record that experienced the error contained two non adjacent ECC correctable data checks, this error would appear as ECC uncorrectable (including correctable errors in the key or data fields subsequent to record 1).

In either of the above cases, subsequent I/O against the same data might perceive the error as correctable. This message is followed by a line showing the failing CCW, CSW, and sense information. *cccc hhhh* is the hexadecimal cylinder and head address of the failing track.

System action

Command processing continues. The return code is set to a 4.

Operator response

None.

System programmer response

Normally, this error is an indication of a media surface problem that can be resolved by either performing a skip displacement to skip the defect, or if necessary, by assigning an alternate track. You can use the INSPECT command to perform skip displacement or assign an alternate track.

Note: If repeated attempts to resolve the problem using the INSPECT or INIT command fail, contact your IBM hardware service representative.

ICK11784I DATAVER CORRECTABLE ERROR ADDR CCHH = X'cccc hhhh'| X'cccCCCC:H'

Explanation

This message is printed for each track that fails the data verification test phase with an ECC correctable data check. This message is followed by a printout of the failing CCW, CSW, and sense information. *cccc hhhh* is the hexadecimal cylinder and head address of the failing track.

System action

Command processing continues. The return code is set to 4.

Operator response

None.

System programmer response

Normally, this error indicates a media surface problem that can be resolved by using the INSPECT command to skip displace over the error, or by using the INIT command with the CHECK parameter to reinitialize the CKD device.

This error is an indication of a minor media surface defect and need not be skip displaced if the device is being used with any IBM operating system, all of which have error recovery procedures that do ECC correction.

After skip displacement of the error is performed, there is no performance impact. The track contains no ECC correctable errors.

Note: If repeated attempts to resolve the problem using the INSPECT or INIT command fail, contact your IBM hardware service representative.

ICK11826I DATAVER INVALID TRACK FORMAT ON CCHH=X'cccc hhhh'|X'cccCCCC:H'

Explanation

A track format condition that was not valid was detected while scanning data on the specified track. This is usually an indication that data was written to the track beyond the track capacity. It is generally a user error.

System action

Command processing continues. At the completion of the command, the return code is set to 4.

Operator response

None.

System programmer response

Determine the data set containing the specified track. To determine how the not valid track format condition occurred, determine how, where, and when the data on the track was written.

ICK11827I POTENTIAL DRIVE PROBLEM EXPERIENCED ON TRACK CCHH = X'xxxx xxxx'

Explanation

The INSPECT {PRESERVE|HOLDIT} process detected the possibility of a potential drive problem.

System action

The process continues and provides a possible fix for the situation.

Operator response

None.

System programmer response

If this message is issued on multiple tracks, during multiple invocations of ICKDSF, or recurs on the same track, contact your IBM hardware service representative.

ICK11841I DEVICE IS NOT IN "STATUS CANNOT BE DETERMINED" STATE

Explanation

A Reset Indefinite Condition for Device (RESETICD parameter of the CONTROL command) has been issued for a device which is not currently in the Status Cannot Be Determined State.

System action

Command processing ends.

Operator response

None.

System programmer response

None.

ICK12105I NO BLOCKS REMAIN IN THE SPECIFIED RANGE

Explanation

CONTINUE processing was previously activated. (See ICK02103I.) There are no blocks to process in the specified range subsequent to the last checkpointed location.

System action

Command processing continues with the minimal initialization functions.

Operator response

None.

System programmer response

None.

ICK12107I CONTINUE FUNCTION CANCELLED

Explanation

The continue function of the INIT command has been cancelled. (Previous messages have indicated the reason for the cancellation.)

System action

Command processing continues for the specified range. Checkpointing is no longer taking place.

Operator response

None.

System programmer response

If processing completes normally, this message can be disregarded.

If processing does not run to completion for FBA devices, and RECLAIM was not specified, this message can be disregarded. For FBA devices where RECLAIM is specified, the RECLAIM job should be restarted.

For CKD devices that do not run to completion, a track on the device may contain a format that is not valid.

After the reason for the abnormal ending has been resolved, at least a medial INIT should be run for the entire volume.

Note: Subsequent invocations of the INIT command may or may not experience the same error, and may or may not attempt to CONTINUE from a previously recorded location. This depends on the reason the function was cancelled and the nature of the failure.

If multiple initializes are necessary, NOCONTINUE can be specified to ensure that processing never resumes from an unwanted location.

As long as processing successfully completes for each invocation, the persistence of this message can be ignored.

ICK12108I CONTINUE TRACK CANNOT BE USED

Explanation

The track normally used to contain checkpoint information is in use by this device. This message is followed by ICK12107I.

System action

See ICK12107I.

Operator response

None.

System programmer response

See ICK12107I.

ICK12109I CONTINUE DATA COULD NOT BE RESET

Explanation

An error occurred while checkpoint data was being written. This message is followed by ICK12107I.

System action

See ICK12107I.

Operator response

None.

System programmer response

See ICK12107I

ICK12110I LAST INSPECT PROCESS FROM ANOTHER CPU CHECKPOINTED AT X'xxxx xxxx'

Explanation

The current INSPECT process detected that there is checkpoint data for the specified track from another processor. This indicates that a prior INSPECT process from another processor ended prematurely, or there is an INSPECT process currently working on the same device and same track from another processor.

System action

See message ICK12111I or ICK33105.

Operator response

None.

System programmer response

See message ICK12111I or ICK33105.

ICK12111I SURFACE CHECKING BYPASSED FOR X'xxxx xxxx'

Explanation

This message is preceded by ICK12110. This message is only given when the FORCE parameter is specified. The INSPECT process is bypassed for the specified track.

System action

Command processing continues on next track.

Operator response

None.

System programmer response

You should avoid more than one concurrent INSPECT process working on the same device. If it is determined that a prior INSPECT process ended prematurely, resubmit the INSPECT job for the specified track.

ICK12112I UNABLE TO SET/RESET/READ CHECKPOINT DATA, PROCESSING CONTINUES

Explanation

The current INSPECT process is unable to set/reset/read the checkpoint data because of an I/O error. The recovery process for the error is exhausted.

System action

Because the FORCE parameter is specified, the current INSPECT process bypasses any future checkpoint data function and continues.

Operator response

None.

System programmer response

None

ICK12115I DATA BEING RECOVERED FOR TRACK X'cccc hhhh'

Explanation

The previous INSPECT command did not run completely during PRESERVE backup processing.

System action

Primary surface checking functions are done for the specified track, and data is recovered if data exists.

Operator response

None.

System programmer response

None.

ICK12116I PRESERVE DATA CANNOT BE BACKED UP FOR THIS DEVICE TYPE

Explanation

The PRESERVE recovery function is not supported for this device type.

System action

Command processing continues as for HOLDIT.

Operator response

None.

System programmer response

None.

ICK12117I PRESERVE BACKUP TRACK CANNOT BE USED. USE "HOLDIT"

Explanation

The track normally used to contain recovery information is in use by this device and PRESERVE was specified.

System action

Command processing ends.

Operator response

None.

System programmer response

Resubmit the job, specifying HOLDIT instead of PRESERVE or KEEPIT.

ICK12118I ERROR READING BACKUP TRACK

Explanation

An I/O error occurred while the specified command was determining the existence of recovery data for this volume.

System action

The CCW, CSW and sense information are printed. This message is followed by another message describing the system action.

Operator response

None.

System programmer response

None.

ICK12119I PRESERVE BACKUP DATA IGNORED

Explanation

This message follows ICK12118I if HOLDIT is specified. Any recovery data that might exist is left intact, and command processing continues.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK12120I THE PRESERVE DATA EXISTS FOR TRACK X'cccc hhhh'

Explanation

User is trying to preserve data when preserve data already exists for a different minidisk.

System action

Command processing continues.

Operator response

None.

System programmer response

See ICK32123I.

ICK12121I BACKUP/RECOVERY DATA IGNORED

Explanation

This message may be issued following ICK12118I. Any recovery data that might exist is left intact, and command processing continues.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK12123I PRESERVE BACKUP DATA CANNOT BE ESTABLISHED OR RESET

Explanation

An I/O error was encountered while performing the PRESERVE backup function.

System action

If the data was being reset, this message is issued as a warning. Command processing continues.

ICK12124I ERROR TRYING TO ACCESS RECOVER TRACK X'cccc hhhh' --RECOVERY IN PROGRESS

Explanation

An I/O error was encountered while trying to determine the current disposition of the track to recover.

System action

Standard ICKDSF track recovery operations take place for this track. If recovery is successful, the backup recovery process continues.

Operator response

None.

System programmer response

If track recovery is unsuccessful, subsequent messages are issued.

ICK12125I NO PRESERVE BACKUP DATA EXISTS FOR TRACK X'cccc hhhh'

Explanation

The track backup recovery is attempting to recover is unrecoverable. Standard ICKDSF track recovery operations failed for this track. However, no data exists for that track.

System action

Command processing continues as if backup recovery is complete.

Operator response

None.

System programmer response

Standard installation procedures should be followed for unrecoverable tracks.

ICK12126D DATA ALREADY EXISTS FOR TRACK X'cccc hhhh' REPLY R TO RECOVER, E TO ERASE THE RECOVERY DATA, OR T TO TERMINATE

Explanation

This message is issued if recovery data exists for a track (message ICK1215I), but there is already data on that track.

This situation can occur if:

- The original data on the track had not yet been erased at the point of failure, or
- An INSPECT did not run to completion, but the volume was available for user use before this invocation of the INSPECT command.

System action

The operator is prompted for a reply to this message.

Specify:

- R to recover data from the recovery information. (The new data on the track is erased).
- E to destroy recovery data. The current data on the track remains.
- T to end processing. The recovery data remains intact.

The next invocation of the INSPECT command will again attempt to process the recovery data.

Operator response

Respond R, E, or T.

System programmer response

None.

ICK12128I RECOVERY DATA HAS BEEN ERASED

Explanation

This message is issued if you reply:

- C to ICK22158D or ICK22130D, or
- E to ICK12126D or ICK12159D.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK12130I UNABLE TO RESET RECOVERY DATA

Explanation

An I/O error occurred while the command checkpoint data was being updated to indicate that command processing had completed.

System action

Command processing continues. All required functions have been completed.

Operator response

None.

System programmer response

The volume is still usable. Because the I/O error occurred on a track that is not a user track, this message can be ignored.

Subsequent invocations of the INIT command will issue a warning message. If desired, take action appropriate to your installation's procedures for handling the I/O error problems. If the problem cannot be resolved, call your IBM software service representative.

ICK12151I RECLAIM PROCESSING PREVIOUSLY INTERRUPTED, RECLAIM FORCED

Explanation

A previous use of the INIT command failed during reclaim processing and the RECLAIM parameter has not been specified with the CONTINUE parameter.

Reclaim processing is being forced to ensure that factory defects are properly flagged and that all primary and alternate pairs are properly connected.

System action

The reclaim processing is restarted.

Operator response

None.

System programmer response

None.

ICK12153I BLOCKRANGE IGNORED

Explanation

The BLOCKRANGE specification is being ignored because a previous use of the INIT command with the RECLAIM parameter has failed. Full volume processing is forced to insure the data integrity of the device.

System action

Surface analysis will continue from the last checkpointed block to the end of the volume.

Operator response

None.

System programmer response

None.

ICK12154I PARAMETER NOSKIP IS IGNORED FOR DEVICE TYPE

Explanation

Skip displacement surface checking is always performed for the device type even if NOSKIP parameter was specified by the user.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK12155I PARAMETERS IGNORED FOR DEVICE TYPE - parameter list

Explanation

The listed parameters were ignored for the device type.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK12157I DATA BEING RECOVERED FOR BLOCK xxxxxxxx

Explanation

The previous invocation of the INSPECT command did not run to completion during PRESERVE processing.

System action

Surface checking functions are completed for the specified block, and data is recovered.

Operator response

None.

System programmer response

None.

ICK12159D DATA ALREADY EXISTS FOR BLOCK xxxxx REPLY “R” TO RECOVER, “E” TO ERASE THE RECOVERY DATA, OR “T” TO TERMINATE

Explanation

This message is issued if recovery data exists for a block (ICK12157), but there is already data on that block that is not ICKDSF data and is not the original user data.

This situation can occur if an INSPECT did not run to completion, but the volume was available for user use before this invocation of the INSPECT command.

System action

The operator is prompted for a reply to this message.

Reply:

- R to recover data from the recovery information. (The new data on the block is erased).
- E to destroy recovery data. The current data on the block remains.
- T to end processing. The recovery data remains intact.

The next invocation of the INSPECT command will again attempt to process the recovery data.

Operator response

Respond R, E or T.

System programmer response

None.

ICK12161I ERROR READING RECOVERY BLOCK - DATA IGNORED

Explanation

Backup recovery is currently attempting to recover a block which cannot be read successfully.

System action

Whatever data currently exists on the block is ignored, and normal surface checking procedures are done for this block.

Operator response

None.

System programmer response

None.

ICK12162I ERROR READING BACKUP BLOCK

Explanation

An I/O error occurred while INSPECT was determining the existence of recovery data for this volume.

System action

The CCW, CSW and sense information are printed. This message is followed by another message describing the system action.

Operator response

None.

System programmer response

None.

ICK12168I SPEED IGNORED BECAUSE HEADRANGE SPECIFIED

Explanation

Because SPEED operates on a cylinder at a time, it is not valid with HEADRANGE, and is ignored if both HEADRANGE and SPEED are specified.

System action

Command processing continues with NOSPEED.

Operator response

None.

System programmer response

None.

ICK12171I PRESERVE DATA BEING ERASED FOR TRACK X'cccc hhhh'

Explanation

During processing of the INIT command, it has been determined that a previous use of the INSPECT command did not run to completion. Because this is an initialize, it is assumed that the data saved from that track (*cccc hhhh*) is no longer needed.

System action

The preserved data is erased, and command processing continues.

Operator response

None.

System programmer response

None.

ICK12172I PRESERVE DATA BEING ERASED FOR BLOCK xxxxxxxx

Explanation

During processing of the INIT command, it has been determined that a previous use of the INSPECT command did not run to completion. Because this is an initialize, it is assumed that the data saved by block xxxxxxxx is no longer needed.

System action

The preserved data is erased, and command processing continues.

Operator response

None.

System programmer response

None.

ICK12173I *WARNING* PREVIOUS PROCESS DID NOT COMPLETE

Explanation

Checkpoint data has been detected that indicates an INSTALL or REVAL command did not complete processing. This could be an indication that the volume is in an unusable state.

System action

This message is followed by ICK12107. The CONTINUE function is cancelled. Command processing continues.

Operator response

None.

System programmer response

The message can be ignored if:

- It is issued during a medial initialization (the condition will be corrected), or
- It can be determined that message ICK12130 was issued during the processing of a previous command.

Otherwise, run a command to ensure the device is returned to a usable condition (for example, medial initialization or REVAL).

ICK12179I UNABLE TO DETERMINE CHECKPOINT INFORMATION, RECOVERY PROCESS BYPASS

Explanation

I/O error occurred during read of checkpoint data. Checkpoint data is ignored.

System action

Command processing continues.

Operator response

None.

System programmer response

Refer to previous I/O error information.

ICK12180I CHECKPOINT DATA EXISTS FROM A PREVIOUS xxxxxxx COMMAND

Explanation

The current process has determined that checkpoint data exists. This indicates a previous ICKDSF command did not complete successfully.

System action

Depending on the current process and the previous checkpoint data, the function may either continue or end processing. See the messages which follow.

Operator response

None.

System programmer response

None.

ICK12181I CHECKPOINT DATA IS BEING ERASED

Explanation

See the checkpoint data described in ICK12180. Since the current process can recover or override the error of the previous ICKDSF function, the checkpoint data is being erased.

System action

Command processing continues.

Operator response

None.

System programmer response

None

ICK12182I A SUBSYSTEM FUNCTION MAY STILL BE EXECUTING FROM ANOTHER CPU

Explanation

See the checkpoint data described in ICK12180. From the checkpoint information, the current process has determined that a subsystem function may still be running from another host since the maximum allowable run time has not been reached for a PSF command.

System action

Because it is not acceptable to run multiple ICKDSF functions to the same device simultaneously, function processing is ended.

Operator response

None.

System programmer response

Either wait for the current function to complete or rerun the job from the same host.

ICK12183I PREVIOUS SUBSYSTEM FUNCTION IS BEING CANCELLED

Explanation

See the checkpoint data described in ICK12180. The current process has determined that the previous PSF command either should have ended or can be cancelled.

A "CANCEL" of the previous PSF command is being issued to the device.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK12184I FUNCTION CONTINUES WITHOUT CHECKPOINT PROCESS

Explanation

See the checkpoint data described in ICK12180. The current process can continue without a recovery of the previous ICKDSF function. However, the current process will neither erase the previous checkpoint data nor set its own checkpoint data.

System action

Command processing continues.

Operator response

None.

System programmer response

After the current process completes, rerun the command as described in ICK12180.

ICK12185I ****WARNING** UNABLE TO RESET CHECKPOINT INFORMATION**

Explanation

The current ICKDSF process completed but was unable to reset the checkpoint data because of either an I/O error, a subsystem function failure, or overlaid checkpoint data.

System action

Command processing ends.

Operator response

None.

System programmer response

Investigate the error information associated with this problem, then call your IBM service representative if necessary. Rerun the command after the problem is corrected.

ICK12200I **ENQUEUE FAILED ON TRACK X'cccc hhhh'. PROCESS CONTINUING**

Explanation

The enqueue for the data set which contains track X'cccc hhhh' was unsuccessful. Because TOLERATE(ENQFAIL) was specified, command processing continues.

System action

Command processing continues on this track.

Operator response

None.

System programmer response

None.

ICK12202I **INSUFFICIENT STORAGE AVAILABLE FOR DATA SET ENQUEUE -- TOLERATE(ENQFAIL) IS IN EFFECT FOR ALL TRACKS**

Explanation

GETMAIN failed while obtaining the storage necessary to process the data set enqueue procedures. Because TOLERATE(ENQFAIL) was specified, command processing continues as if the enqueue failed.

System action

Command processing continues for all tracks without the enqueue function.

Operator response

None.

System programmer response

None.

ICK12204I **UNABLE TO ENQUEUE VSAM DATA SET FOR TRACK X'cccc hhhh', PROCESS CONTINUING**

Explanation

The specified track is part of a VSAM data set. ICKDSF does not support data set enqueue for VSAM data sets. Because TOLERATE(ENQFAIL) is specified or assumed, command processing continues for this track.

System action

Command processing continues for this track.

Operator response

None.

System programmer response

None.

ICK12316I **UNABLE TO DETERMINE MINIDISK SIZE**

Explanation

Either the system support code for the requested command does not exist in VM, or the minidisk is a T-disk. This message is followed by message ICK033E.

System action

The system requests a specification of the size of the minidisk.

Operator response

None.

System programmer response

None.

ICK13010I ALLOCATION MAP NOT UPDATED

Explanation

A function was requested that should have updated the allocation map, but an error condition caused CPVOLUME to bypass the update of the allocation map.

System action

Command processing continues.

Operator response

Review all messages for the operation and correct the reported error.

System programmer response

None.

ICK13015I FILLER|NOFILLER PARAMETER IS IGNORED FOR DEVICE TYPE

Explanation

The device type specified does not support the FILLER|NOFILLER parameter.

System action

Command processing continues and FILLER or NOFILLER is ignored.

Operator response

None.

System programmer response

None.

ICK13016I MODE PARAMETER IS IGNORED FOR THE LIST|LABEL FUNCTION

Explanation

The MODE parameter is not required for the LIST and LABEL functions and need not be specified.

System action

The MODE parameter is ignored and command processing continues.

Operator response

None.

System programmer response

None.

ICK13018I PARM ALLOCATION TYPE IS IGNORED IN A VM/XA ENVIRONMENT

Explanation

CPVOLUME has determined that you are operating in a VM/XA environment and that PARM allocation types exist in the allocation map.

System action

Command processing continues and PARM allocation types are ignored.

Operator response

None.

System programmer response

PARM allocation types are valid in a VM/ESA environment only and will be ignored in a VM/XA environment. If you wish to use that space on the volume, you must reallocate it to an allocation type supported by VM/XA.

ICK13019I UNDEFINED ALLOCATION TYPES EXIST

Explanation

CPVOLUME has determined that space on the volume has not been allocated. An entire PARM allocation type range was not reallocated. To reallocate a PARM type, you must reallocate the entire PARM range.

System action

Command processing continues.

Operator response

None.

System programmer response

Reallocate the ranges in the allocation map flagged as ????.

ICK13020I CYLINDER(S) *xxxxxxxxxx-yyyyyyyyyy* WAS FORMATTED with or without FILLER RECORDS

Explanation

When the EXAMINE function of the CPVOLUME command is performed, a cylinder (or range of cylinders) was found that was previously CPVOLUME formatted with a different method (filler or nofiller).

System action

Command processing continues.

Operator response

None.

System programmer response

None

ICK14000I OUTSTANDING DEVICE SIM STILL EXISTS, SIM ID=X'nn'

Explanation

The specified device has an open SIM (open, pending, or suppress presentation) status. The system prints SIM information. See message ICK10711I.

System action

Command processing continues.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK14001I OUTSTANDING MEDIA SIM STILL EXIST, SIM ID=X'xx'

Explanation

The specified device has a not closed Media SIM. The SIM information is printed. See ICK10711I.

System action

Command processing continues.

Operator response

None.

System programmer response

See ICK10711I.

ICK14002I UNABLE TO OBTAIN ADDITIONAL SIM

Explanation

The previously issued PSF command has either failed or encountered an exception status, and a SIM is being generated by the subsystem. However, the associated SIM cannot be found.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK14003I MEDIA MAINTENANCE IS RECOMMENDED FOR TRACK X'cccc hhhh'

Explanation

The subsystem recommends media maintenance action for the specified track.

System action

Command processing continues.

Operator response

None.

System programmer response

After the current process completes, perform media maintenance procedures for the specified track.

ICK14004I INVALID ALTERNATE LOCATION ASSIGNMENT FOR TRACK X'cccc hhhh', INSPECT REQUIRED

Explanation

The subsystem indicates media maintenance action is required on the specified track.

System action

Command processing continues.

Operator response

None.

System programmer response

After the current process completes, perform media maintenance procedure for the specified track.

ICK14006I SIM CAN NOT BE FOUND FOR THE SPECIFIED SIM ID=X'nn'

Explanation

The current ICKDSF process cannot obtain detailed SIM information for the specified SIM id contained in the summary SIM information for the device.

System action

Command processing continues without any SIM management for the specified SIM id.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK14007I INVALID STATE CHANGE FOR SIM ID=X'nn'

Explanation

An exception has been encountered for the specified SIM id because the SIM id is not valid.

System action

Command processing continues without any SIM management for the specified SIM id.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK14008I UNABLE TO UPDATE SIM STATUS FOR SIM ID=X'nn'

Explanation

The current ICKDSF process cannot update the SIM status because of either an I/O error or some other subsystem exception status.

System action

The cause of the error is printed and command processing continues without any SIM management for the specified SIM id.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK14009I UNRECOVERABLE ERROR IS DETECTED FOR TRACK X'cccc hhhh'|X'cccCCCC:H'

Explanation

An unrecoverable error has been detected during the perform subsystem function (PSF) on the specified track.

System action

Command processing continues.

Operator response

None.

System programmer response

Media maintenance is recommended for the specified track.

ICK14010I RECOVERABLE ERROR IS DETECTED FOR TRACK X'cccc hhhh'

Explanation

A recoverable error has been detected during the perform subsystem function (PSF) on the specified track.

System action

Command processing continues.

Operator response

None.

System programmer response

Media maintenance is recommended for the specified track.

ICK14020I VOLUME LABEL IN INPUT DOES NOT MATCH THAT ON VOLUME

Explanation

A RECOVER operation attempted to verify a volume label and found a mismatch between the label given in the command input and the label on the volume.

System action

The RECOVER operation is completed, and a return code of 4 is posted.

Operator response

None.

System programmer response

Verify the volume label.

ICK14021I CHANNEL PROGRAM: READ VOLUME LABEL FAILED

Explanation

A RECOVER operation attempt to write a volume label failed.

System action

The RECOVER operation on the volume is completed, only the volume label step is not completed; a return code of 4 is posted.

Operator response

None.

System programmer response

ICK14022I CHANNEL PROGRAM: WRITE VOLUME LABEL FAILED

Explanation

A RECOVER operation attempt to write a volume label failed.

System action

The RECOVER operation on the volume is completed, only the volume label step is not completed; a return code of 4 is posted.

Operator response

None.

System programmer response

Refer to the DASD ERP messages issued to the system console. Take the appropriate action and relabel the volume using ICKDSF or similar program.

ICK20011I FUNCTION CANNOT BE EXECUTED. INSUFFICIENT MAIN STORAGE

Explanation

There is not enough virtual storage available to run a command.

System action

The command ends. ICKDSF processing continues with the next command.

Operator response

None.

System programmer response

Increase the amount of virtual storage available to ICKDSF, and reissue the command. Save the job output and contact your IBM service representative.

ICK20100I I/O ERROR OCCURRED DURING DRIVE TEST

Explanation

An I/O error occurred during the basic drive tests. The message is followed by the ccw, csw, and sense information for the error.

System action

Drive test processing ends if path control is not being used.

If path control is being used, drive test processing ends on the current path and command processing continues with the next available path specified.

Operator response

None.

System programmer response

Take action appropriate to your installation's procedures for handling suspected equipment problems.

ICK20101I I/O ERROR OCCURRED DURING DRIVE TEST ON CCHH = X'cccc hhhh'

Explanation

An I/o error occurred on the indicated track while running the drive test. The message is followed by the ccw, csw and sense information for the error.

System action

Drive test processing ends if path control is not being used.

If path control is being used, drive test processing ends on the current path and command processing continues with the next available path specified.

Operator response

None.

System programmer response

Examine the failing ccw, csw and sense to determine the cause of the error.

ICK20200I 0F0B TRACK X'cccc hhhh'| X'cccCCCC:H' IS ALLOCATED TO DATA SET data.set.name

Explanation

The track listed in the message contains an 0F0B error. If the track was allocated to a data set, then the data set name is indicated in the message.

System action

Command processing continues.

Operator response

None.

System programmer response

See *Maintaining IBM Storage Subsystem Media*, procedure 4, for the response.

ICK20201I TRACK X'cccc hhhh'| X'cccCCCC:H' IS ALLOCATED TO DATA SET data.set.name

Explanation

The track listed in the message contains an uncorrectable error. The track was allocated to a data set, and the data set name is indicated in the message.

System action

Command processing continues.

Operator response

None.

System programmer response

See message ICK11782I for more information on the uncorrectable error.

ICK20800I UNABLE TO SCRATCH dsname

Explanation

An error occurred while attempting to scratch the identified data set. A subsequent second-level message identifies the error.

System action

The data set is not scratched. ICKDSF processing continues with the next command.

Operator response

None.

System programmer response

See the associated message. Save the job output and contact your IBM service representative.

ICK20801I ** NO VOLUME MOUNTED

Explanation

Volume not mounted.

System action

The data set is not scratched. ICKDSF processing continues with the next command.

Operator response

None.

System programmer response

Reissue the command, making sure the correct volume is mounted. Save the job output and contact your IBM service representative.

ICK20802I ** PASSWORD VERIFICATION FAILED

Explanation

The data set to be scratched is password protected, and the operator did not supply the correct password.

System action

The data set is not scratched. ICKDSF processing continues with the next command.

Operator response

None.

System programmer response

Reissue the command, and specify the correct password when prompted. Save the job output and contact your IBM service representative.

ICK20803I ** DATA SET HAS NOT EXPIRED ON VOLUME volser

Explanation

The PURGE parameter was not specified, and the data set retention period has not expired.

System action

The data set is not scratched. ICKDSF processing continues with the next command.

Operator response

None.

System programmer response

Specify the PURGE parameter if you want to destroy the data set, and reissue the command. Save the job output and contact your IBM service representative.

ICK20804I ** PERMANENT I/O ERROR ON VOLUME

Explanation

The volume table of contents cannot be read because of an I/O error condition.

System action

The data set is not scratched. ICKDSF processing continues with the next command.

Operator response

None.

System programmer response

Either restore the volume or initialize the volume offline. Save the job output and contact your IBM service representative.

ICK20805I ** UNABLE TO MOUNT VOLUME volser

Explanation

An appropriate device was not available for mounting the volume.

System action

The data set was not scratched. ICKDSF processing continues with the next command.

Operator response

Make sure a device is available for mounting, and reissue the command.

System programmer response

None. Save the job output and contact your IBM service representative.

ICK20806I ** DATA SET WAS IN USE

Explanation

The data set to be scratched was being used by another program.

System action

The data set is not scratched, and command processing continues.

Operator response

Make sure that no other job is using the data set (do not specify DISP=SHR), and reissue the command.

System programmer response

None. Save the job output and contact your IBM service representative.

ICK20807I THE INDEX DATA SET CAN NOT BE PURGED ON AN SMS MANAGED VOLUME

Explanation

When using the BUILDIX OSVTOC command to convert the indexed VTOC to an OS VTOC you also specified the PURGE parameter to purge the index data set. The index data set may not be purged on an SMS managed volume.

System action

The data set is not purged, and command processing continues.

Operator response

None.

System programmer response

If you wish to delete the index data set the volume must be non SMS managed. To make the volume non SMS managed you must first convert the VTOC back to an indexed VTOC by using the BUILDIX IXVTOC command. When the VTOC is indexed you can then use the DFSMSdss CONVERTV command to make it non SMS managed. When the volume is non SMS managed you can then run the BUILDIX OSVTOC command with the PURGE parameter and the VTOC will be converted to an OS VTOC and the index data set will be deleted.

ICK20810I ** INVALID RACF AUTHORIZATION

Explanation

A RACF-protected data set resides on the volume. The volume cannot be purged, because the user does not have the correct authorization to scratch the data set.

System action

The data set is not scratched, and the command ends. ICKDSF processing continues with the next command.

Operator response

None.

System programmer response

None. Save the job output and contact your IBM service representative.

ICK20950I INVALID FORMAT STRUCTURE

Explanation

An element of one of the static text structures is incorrect. There is probably a program error.

System action

The request to print a line is ignored. Command processing continues, but no output is printed.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK20951I OUTPUT COLUMN SPECIFIED OUT OF RANGE

Explanation

An output column specification is outside the allowed print line width (for example, the specification is beyond column 120). There is probably a program error.

System action

This field and subsequent fields for the same line are ignored. Command processing continues, but no output is printed.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK20952I EXCESSIVE FIELD LENGTH FOR BD OR PU CONV

Explanation

A binary-to-decimal or packed-to-unpacked conversion length was specified greater than 15. There is probably a program error.

System action

A default value of 15 is used, and command processing continues.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK20953I A REDO SUB-STRUCTURE IS NESTED

Explanation

A redo structure cannot be defined within a set of structures to be redone. There is probably a program error.

System action

The current redo operation ends. All structures are treated only once.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK20954I STATIC TEXT ENTRY REQUESTED NOT IN MODULE

Explanation

A request for a specific static text entry in a specified static text module could not be resolved. Either the static text index is incorrect, or the programmer has neglected to enter a message into the static text module.

There is probably a program error.

System action

The request is ignored, and command processing continues.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK20955I INVALID PACKED DECIMAL FIELD

Explanation

A conversion request for packed-to-unpacked decimal encountered a digit that is not in the range of 0 to 9. There is probably a program error.

System action

Conversion stops for the current request. Command processing continues without the packed-to-unpacked conversion.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK21000I ALTERNATE TRACK CCHH=X'cccc hhhh' FOUND UNRECOVERABLE

Explanation

Track surface checking encountered error conditions that prevented the alternate track's home address or record 0 from being rewritten to indicate that it is a defective track.

Since the track cannot be marked defective, it cannot be used by the operating system.

System action

If the inability to recover the track is caused by a data error, the command runs to completion with an error return code. If the cause is anything other than a data error, command processing stops after detection of the error.

Operator response

None.

System programmer response

Prior messages should be examined (including the CCW, CSW, and sense that caused the I/O) to determine the cause of the failure. This message may be issued if either the read/write mode switch is set to READ mode, or some other condition prevents ICKDSF from writing on the volume.

If running under VM either from either Stand-Alone or an operating system version, this message can indicate that a diagnostic or media maintenance function was attempted against a device that was a minidisk and LINKED to the userid. Diagnostic and media maintenance functions must be done on dedicated devices.

For more information on VM support, see Chapter 8, “ICKDSF versions supported as guests under VM,” on page 65.

Assistance may be required from the IBM service representative. Save the job output and contact your IBM hardware service representative.

ICK21001I PRIMARY TRACK CCHH=X'cccc hhhh' FOUND UNRECOVERABLE

Explanation

Track surface checking found error conditions which prevented the primary track's home address or record 0 from being rewritten to indicate that it is a defective track.

Since the track cannot be marked defective, it cannot be used by the operating system.

This message may appear if, during command processing, the read/write mode switch is inadvertently set to READ mode.

System action

ICKDSF continues, unless the unrecoverable track threshold is met (see message ICK31013I).

Operator response

None.

System programmer response

Prior messages should be examined (including the CCW, CSW, and sense that caused the I/O) to determine the cause of the failure. This message may be issued either if the read/write mode switch is set to READ mode, or some other condition prevents ICKDSF from writing on the volume.

If running under VM, from either Stand-Alone or an operating system version, this message can indicate that a diagnostic or media maintenance function was attempted against a device that was a minidisk and LINKED to the userid. Diagnostic and media maintenance functions must be done on dedicated devices.

For more information on VM support, see Chapter 8, "ICKDSF versions supported as guests under VM," on page 65.

Assistance may be required from the IBM service representative. Save the job output and contact your IBM hardware service representative.

ICK21002I INVALID VTOC ORIGIN SPECIFICATION FOR TRACK: X'cccc hhhh'|X'cccCCCC:H'

Explanation

The VTOC parameter specifies a track location that is not valid for the volume table of contents. The VTOC cannot begin on cylinder 0, track 0 or encroach on the alternate track area. For devices that contain more than 64K tracks, there are special considerations for VTOC placement. The existing IBM software uses relative track addressing or the Track-Track-Record (TTR) format to process the VTOC. This restricts the highest address that can be referenced as a VTOC track to be 64K-1. The entire VTOC must reside within the first 64K tracks because of this restriction. The VTOC must end before cylinder 4369 head 1.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Either accept the default location, or reissue the command specifying a correct location. Save the job output and contact your IBM service representative.

ICK21003I INVALID VTOC EXTENT SPECIFICATION: *xxxxx*

Explanation

The VTOC parameter specifies an extent that is not valid (number of tracks) for the VTOC area. The VTOC cannot have an extent of 0 or encroach on the alternate track area. For devices that contain more than 64K tracks, there are special considerations for VTOC placement. The existing IBM software uses relative track addressing or the Track-Track-Record (TTR) format to process the VTOC. This restricts the highest address that can be referenced as a VTOC track to be 64K-1. The entire VTOC must reside within the first 64K tracks because of this restriction. The VTOC must end before cylinder 4369 head 1.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Either accept the default extent, or reissue the command specifying a correct extent. Save the job output and contact your IBM service representative.

ICK21004I INVALID VTOC HEAD SPECIFICATION: *xx*

Explanation

The head value that you specified is not valid for this device.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Reissue the command that specifies a correct head value. If the problem still exists, save the job output and contact your IBM service representative.

ICK21007I R-ZERO INCORRECT -- a CCHH=X'cccc hhhh' (X'cccc hhhh') b CCHH=X'cccc hhhh'

Explanation

This message indicates a primary/alternate track association that is not valid on a volume. See Figure 37 on page 654 for an example of a proper association.

- a CCHH=cccc hhhh indicates the cylinder/head of the primary track in error. If that track is flagged defective, a is set to D; otherwise, a is set to N. The cccc hhhh in parentheses is the cylinder/head of the track pointed to in record 0 of the primary track in error.
- b CCHH=cccc hhhh indicates the cylinder/head for the alternate track in error. If that track is flagged defective, the b is set to D; otherwise, b is set to N. See Figure 37 on page 654 for an example of a proper association.

If a primary track is detected that contains an unknown alternate track pointer (the cylinder/head in record 0 does not indicate a valid track address), the b CCHH=cccc hhhh portion of the message is printed N CCHH=FFFF FFFF.

System action

If performing an INITialize command, processing stops.

If performing an INSPECT command, ICKDSF continues with the next track.

Operator response

None.

System programmer response

For INITialize processing, this message is only issued for a minimal INIT. Either INITialize the volume at the medial level or INSPECT the primary or alternate track to correct the problem.

For INSPECT processing, this message is issued when an inconsistency exists for a track, and ICKDSF is not permitted to fix the problem. Specify ASSIGN and retry. Sometimes, specifying RECLAIM can also solve the problem. Save the job output and contact your IBM service representative.

ICK21008I UNABLE TO WRITE IPL RECORDS

Explanation

The IPL program records could not be written. Messages issued just prior to this message indicate the type of error that occurred.

System action

The IPL program records are not written, but command processing continues.

Operator response

None.

System programmer response

Correct the error, and reissue the command. Save the job output and contact your IBM service representative.

ICK21011I CRITICAL TRACK DESCRIPTOR INCORRECT CCHH=X'cccc hhhh'|X'cccCCCC:H'

Explanation

The critical tracks are reserved for the volume table of contents and cylinder 0, track 0. The contents of the record 0 on the identified track are in error.

System action

None.

Operator response

None.

System programmer response

Either reinitialize the volume at the medial level or INSPECT the track at X'cccc hhhh'. Save the job output and contact your IBM service representative.

ICK21014I SURFACE CHECK FUNCTION FAILS ON TRACK CCHH=X'cccc hhhh'

Explanation

While writing or reading the indicated track, a channel program failure other than DATA CHECK occurred.

System action

The command ends.

ICKDSF continues with the next command.

Operator response

None.

System programmer response

Examine the CCW, CSW, and sense information associated with the message to determine the kind of I/O error.

If operating under VM from either Stand-Alone or an operating system version, this message can indicate that a diagnostic or media maintenance function was attempted against a device that was a minidisk and LINK to the userid. Diagnostic and media maintenance functions must be done on dedicated devices.

For more information on VM support, see Chapter 8, "ICKDSF versions supported as guests under VM," on page 65. Save the job output and contact your hardware service representative

ICK21015I ALTERNATE TRACK CCHH = X'cccc hhhh' FOUND DEFECTIVE

Explanation

The concurrent media maintenance process found the specified alternate track defective while preserving the user data.

System action

The alternate track is flagged as defective and ICKDSF continues, using the next alternate track to preserve user data.

Operator response

None.

System programmer response

None.

ICK21016I UNABLE TO USE ALTERNATE TRACK CCHH = X'cccc hhhh' TO PRESERVE DATA

Explanation

The specified alternate track cannot be used to preserve user data. It either was found defective or had an I/O error.

System action

If an I/O error occurred, command processing ends. If the alternate track was found defective, ICKDSF continues, using the next alternate track.

Operator response

None.

System programmer response

For an I/O error, examine the failing CCW, CSW and SENSE information to determine the cause of the error.

ICK21017I NO MORE ALTERNATE TRACKS LEFT ON PACK

Explanation

All nondefective alternate tracks have been assigned to primary tracks.

System action

Assignment of alternate tracks ends. Command processing continues.

Operator response

None.

System programmer response

Use the RECLAIM function of the INSPECT command to attempt reclamation of primary and alternate tracks. (For the IBM 3375, 3380, and 3390, use only the INSPECT command.)

The assistance of an IBM service representative might be necessary to determine the cause of the alternate track assignments. Save the job output and contact your IBM service representative.

ICK21028I NOT ALLOWED TO CHANGE VOLUME LABEL

Explanation

Only an authorized user can change the volume label in a system that has Resource Access Control Facility (RACF) installed.

System action

The contents of the volume label are not changed, but command processing continues.

Operator response

None.

System programmer response

None. Save the job output and contact your IBM service representative.

ICK21030I NOT ALLOWED TO WRITE IPL RECORDS

Explanation

Only an authorized user can change the IPL records on a volume in a system where Resource Access Control Facility (RACF) is installed.

System action

The IPL records are not written, but command processing continues.

Operator response

None.

System programmer response

None. Save the job output and contact your IBM service representative.

ICK21031I UNABLE TO RECLAIM ALTERNATE TRACK CCHH=X'cccc hhhh'

Explanation

An I/O error occurred while attempting to rewrite the home address and record 0 on the indicated alternate track.

System action

The alternate track is not reclaimed. Command processing continues.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK21032I UNABLE TO RECLAIM PRIMARY TRACK CCHH=X'cccc hhhh'

Explanation

An I/O error occurred while attempting to rewrite the home address and record 0 on the indicated primary track.

System action

The primary track is not reclaimed. Command processing continues.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK21033I TRACK DISSOCIATION FAILED: CCHH=X'cccc hhhh'

Explanation

An error prevented correct rewriting of the record 0 while reclaiming either a primary or alternate track. Track addresses associating the primary and alternating tracks could not be removed.

System action

The alternate track is marked defective, and command processing continues.

Operator response

None.

System programmer response

None. Save the job output and contact your IBM service representative.

ICK21037I INVALID TRACK ADDRESS SPECIFIED: CCHH=X'cccc hhhh'|X'cccCCCC:H'

Explanation

Only tracks within either the defined primary or alternate track areas of a volume can be inspected. Either a track beyond these areas was specified, or a there was a syntax error in the track address specification.

System action

The requested action is ignored on the track that is not valid, but command processing continues for any tracks that were correctly specified.

Operator response

None.

System programmer response

Correct the incorrect specification, and reissue the command. Save the job output and contact your IBM service representative.

ICK21039I PRIMARY TRACK CCHH=X'cccc hhhh' DEFECTIVE, NO ALTERNATE -- DATA SAVED

Explanation

Surface checking found the indicated primary track defective, but no alternate track is available for assignment to it.

System action

The contents of the primary track are saved and rewritten on the primary track, if possible. Command processing continues.

Operator response

None.

System programmer response

Reinitialize the volume. Save the job output and contact your IBM service representative.

ICK21040I PRIMARY TRACK CCHH=X'cccc hhhh' DEFECTIVE, NO ALTERNATE -- DATA LOST

Explanation

Surface checking found the indicated track defective, but no alternate track is available for assignment to it.

System action

The contents of the primary track are not rewritten on the primary track and are therefore lost. Command processing continues.

Operator response

None.

System programmer response

Reinitialize the volume. Save the job output and contact your IBM service representative.

ICK21041I ALTERNATE TRACK CCHH=X'cccc hhhh' DEFECTIVE -- DATA SAVED

Explanation

Surface checking found the indicated alternate track defective, but no alternate track is available for assignment to it.

System action

If possible, the contents of the alternate track are saved and rewritten to the alternate track. Command processing continues.

Operator response

None.

System programmer response

Reinitialize the volume. Save the job output and contact your IBM service representative.

ICK21042I ALTERNATE TRACK C-H=X'cccc hhhh'|X'cccCCCC:H' DEFECTIVE -- DATA LOST

Explanation

Surface checking found the indicated alternate track defective, but no alternate track is available for assignment to it.

System action

The contents of the alternate tracks are not rewritten to the alternate track and are therefore lost. Command processing continues.

Operator response

None.

System programmer response

Reinitialize the volume. Save the job output and contact your IBM service representative.

ICK21044I UNABLE TO PRESERVE -- UNABLE TO READ TRACK CCHH=X'cccc hhhh'

Explanation

A record on the indicated cylinder and track could not be read because of I/O errors.

Two conditions:

- Sense information in the subsequent message that is all zeros, and
- CSW indicating only Channel End, Device End, and Incorrect Length (0C40 in the first two bytes of the second word)

are usually an indication that previous ICKDSF processing has caused a nonstandard record zero to remain on the volume.

Run an INSPECT of the track specifying a NOPRESERVE CHECK(1) to correct the situation. (Be aware that there is no user data on the track.)

System action

The record on the indicated track is not lost, and the track is not marked defective. The specified track is not surface-checked. Command processing continues with the next track.

Operator response

None.

System programmer response

Start error recovery procedures for the data set containing the track in error. Rerun the command for the track in error with NOPRESERVE specified.

If the volume is part of a dual copy pair, put the volume in simplex state to perform an INSPECT with NOPRESERVE. Save the job output and contact your IBM service representative.

ICK21045I UNABLE TO RESTORE -- UNABLE TO READ TRACK CCHH=X'cccc hhhh'

Explanation

During the concurrent media maintenance process, an I/O error prevented both rereading of the user data on the specified alternate track and data restoration back to the original primary track.

System action

Command processing ends. The user data remains on the alternate track.

Operator response

None.

System programmer response

Examine the failing CCW, CSW and SENSE information to determine the cause of the error.

ICK21047I PRESERVED DATA CANNOT BE REWRITTEN TO TRACK CCHH=X'cccc hhhh'

Explanation

An I/O error prevented a successful write operation of preserved records back to either the original track or its assigned alternate track.

System action

Regardless of the current value of the ASSIGN command, three attempts are made to assign a (new) alternate track and to correctly rewrite the data.

Operator response

None.

System programmer response

Subsequent messages will indicate the final status of the data.

ICK21048I CYL-0 TRK-0 DEFECTIVE, PACK UNUSABLE FOR IPL

Explanation

Cylinder 0, track 0 has been found defective. The track has been assigned an alternate track, but the volume cannot be used as an IPL volume.

System action

Command processing continues.

Operator response

None.

System programmer response

Call the IBM hardware service representative if you must use this volume as an initial-program-load volume. Save the job output and contact your IBM service representative.

ICK21050I ERROR OCCURRED WHILE PROCESSING TRACK CCHH = X'cccc hhhh'|X'cccCCCC:H'

Explanation

An error occurred while processing the specified track. The function specified by the parameters might not have completed.

System action

Command processing continues with the next track.

Operator response

None.

System programmer response

Examine the previous messages to determine the cause of the error.

ICK21055I VTOC IS LOCATED ON CYLINDER 0 HEAD 0

Explanation

The volume table of contents resides on the first track of the volume. This prevents the writing of IPL program records on the first track of the volume. VTOC expansion or VTOC refresh processing is also not allowed.

System action

If IPLDD specified, command processing continues, but the IPL program record is not written. If VTOC expansion or VTOC refresh processing is specified, command processing ends.

Operator response

None.

System programmer response

If it is necessary to have IPL records, expand the VTOC, or refresh the VTOC, reinitialize the volume with the VTOC on any track except the first track of the volume.

ICK21060I FREE SPACE IS NOT AVAILABLE FOR THE NEW INDEX

Explanation

The free space extents in the volume are too small to fit the new INDEX.

System action

The index is not rebuilt. Command processing continues.

Operator response

None.

System programmer response

Move or delete data sets so there is a free space extent big enough for the new index size. Then allocate the new index data set and issue the BUILDIX command to rebuild the index.

ICK21065I ERROR OCCURRED WHILE ISSUING MACRO MODVCE, RETURN CODE =

Explanation

In the VSE environment during the closing of the volume, an error occurred notifying the supervisor of volser changes. The value of return code is in decimal.

System action

Command processing ends.

Operator response

None.

System programmer response

See the *IBM VSE/Enterprise Systems Architecture VSE Central Functions Supervisor Diagnosis Reference Version 6 Release 4*, and the *VSE/ESA Messages and Codes* for the reason for failure.

ICK21070I ERROR OCCURRED WHILE ISSUING MACRO CVTOC, RETURN CODE =

Explanation

In the VSE environment during the closing of the volume, an error occurred trying to unlock the Exclusive Open obtained by the OVTOC macro. The value of return code is in decimal.

System action

Command processing ends.

Operator response

None

System programmer response

See the *IBM VSE/Enterprise Systems Architecture VSE Central Functions Diagnosis Reference LIOCS Version 6 Release 4*, and the *VSE/ESA Messages and Codes* for the reason for failure.

ICK21080I ALTERNATE TRACKS INSPECTION NOT VALID FOR DEVICE TYPE

Explanation

There is a request to directly inspect an alternate track on a device where this is not supported. The alternate track cannot be inspected directly for these devices. Inspection of the primary track automatically also inspects the alternate track.

System action

ICKDSF continues with the next track.

Operator response

None.

System programmer response

To inspect the alternate track, first examine the map to determine the address of the primary track associated with the alternate track. Then rerun the job using the primary track address.

ICK21316I UNABLE TO OPEN IPL INPUT DATA SET

Explanation

The data set specified by the IPLDD parameter cannot be opened. An associated message identifies the reason for the failure.

System action

Command processing continues, but the IPL program record is not written.

Operator response

None.

System programmer response

Correct the error identified in the associated message, and reissue the command. Save the job output and contact your IBM service representative.

ICK21317I IPL INPUT RECORD-1 FORMAT IMPROPER

Explanation

The four characters IPL1 were not the first four characters of the first user-specified IPL bootstrap record.

System action

System-defined IPL bootstrap records are written on the volume and command processing continues. The remainder of the user-specified IPL bootstrap records and IPL program records are ignored.

Operator response

None.

System programmer response

Either correct the IPL bootstrap record format and reissue the command, or accept the system-defined IPL bootstrap records. Save the job output and contact your IBM service representative.

ICK21318I IPL INPUT RECORD-2 FORMAT IMPROPER

Explanation

The second user-specified IPL bootstrap record did not contain IPL2 as the first four characters of the record.

System action

The system-defined IPL bootstrap records are written on the volume and command processing continues. The user-specified IPL bootstrap records and IPL program records are ignored.

Operator response

None.

System programmer response

Correct the IPL bootstrap record format and reissue the command, or accept the system-defined IPL bootstrap records. Save the job output and contact your IBM service representative.

ICK21319I UNABLE TO WRITE BOOTSTRAP RECORD-1 ON VOLUME

Explanation

An I/O error occurred while attempting to write the first IPL bootstrap record on cylinder 0, track 0. The volume is unusable for IPL.

System action

Command processing continues, but the IPL bootstrap records are not written on the volume.

Operator response

None.

System programmer response

Either issue the INSPECT command to attempt to reclaim the track, or reinitialize the volume. Save the job output and contact your IBM service representative.

ICK21320I UNABLE TO WRITE BOOTSTRAP RECORD-2 ON VOLUME

Explanation

An I/O error occurred while attempting to write the second IPL bootstrap record on cylinder 0, track 0. The volume is unusable for IPL.

System action

Command processing continues, but the IPL bootstrap records are not written on the volume.

Operator response

None.

System programmer response

Either issue the INSPECT command to attempt to reclaim the track, or reinitialize the volume. Save the job output and contact your IBM service representative.

ICK21321I UNABLE TO WRITE IPL PROGRAM ON VOLUME

Explanation

An I/O error occurred while attempting to write the IPL program record on the volume. The volume is unusable for IPL.

System action

Command processing continues, but the IPL program record is not written on the volume.

Operator response

None.

System programmer response

Either issue the INSPECT command to attempt to reclaim the track, or reinitialize the volume. Save the job output and contact your IBM service representative.

ICK21322I SPECIFIED IPL PROGRAM LENGTH IS EXCESSIVE

Explanation

The total number of bytes required by the user-specified IPL program exceeds the maximum permitted for the volume being initialized.

System action

Command processing continues, but the IPL program is not written on the volume.

Operator response

None.

System programmer response

Determine the cause of the excessive size, and either recompile or reassemble the IPL program. Then reissue the command.

Save the job output and contact your IBM service representative.

ICK21323I IPL PROGRAM INPUT CONTAINS NO TXT CARDS

Explanation

The input records specified for the IPL program source were read, but contained no records that were identified as standard text (TXT) records.

System action

The IPLDD parameter is ignored, and command processing continues.

Operator response

None.

System programmer response

Be sure the correct input is supplied in the input stream or in the specified data set. Save the job output and contact your IBM service representative.

ICK21350I EXCESSIVE COMBINED ERROR RATE ON HEAD X'cccc hhhh'

Explanation

The specified head exceeded the acceptable error rate threshold for the device.

System action

Command processing continues.

Operator response

None.

System programmer response

See message ICK21401I.

ICK21351I EXCESSIVE COMBINED ERROR RATE FOR ALL HEADS

Explanation

The combined error rate of all the heads in the diagnostic (CE) cylinder exceeded the acceptable error rate threshold for the device.

System action

Command processing continues.

Operator response

None.

System programmer response

See message ICK21401I.

ICK21394I EXCESSIVE DATA CHECKS OCCURRING FOR TRACK X'cccc hhhh'|X'cccCCCC:H'

Explanation

During skip displacement processing for the specified track, the number of data checks exceeded the device threshold for this device type.

System action

Processing is completed for this track. ICKDSF continues with the next track.

Operator response

None.

System programmer response

This message is an indication that an abnormal amount of data checks have occurred for this track. Although this message is intended as a warning, it is advisable to seek the aid of the IBM hardware service representative (particularly if the message is issued for multiple tracks).

If alternate track assignment is required, run INSPECT NOCHECK ASSIGN.

ICK21398I RECORD ZERO MAY BE INVALID ON TRACK X'cccc hhhh'| X'cccCCCC:H'

Explanation

Rewriting of a standard record 0 could not be verified after the completion of surface checking. Surface checking was either successful or unsuccessful.

System action

If this message is issued during either an INIT or an INSPECT NOPRESERVE, ICKDSF continues with the next track.

Operator response

None.

System programmer response

This message is often accompanied by an indication that surface checking failed on the specified track. The accompanying messages, including the I/O error messages, should be examined to aid in determining the cause of the failure.

Support from your IBM representative might be required.

After the source of the error is corrected, run an INSPECT of the track to correct the bad record zero. Data recovery actions may be required if the accompanying messages indicate a data loss during INSPECT PRESERVE processing.

ICK21401I ccuu SUSPECTED DRIVE PROBLEM

Explanation

An error was detected during the drive test.

System action

Command processing ends.

Operator response

None.

System programmer response

Previous messages should aid identification of the problem.

Save printer output. Take the action appropriate to your installation's procedures for handling suspected equipment problems. If the problem cannot be explained, contact your IBM hardware or software service representative.

You can also take these steps in the interim, depending on your installation's procedures:

- Restore the entire volume to another drive from a backup volume.
- Discontinue using the drive.

ICK21402I ccuu ERROR READING DATA

Explanation

This message is issued if any data checks are detected during the data scan portion of the command.

System action

ICKDSF continues.

Operator response

None.

System programmer response

Examine previous messages to determine the nature and location of the data checks and then take appropriate action.

ICK21403I TEMPORARY EQUIPMENT CHECK LIMIT EXCEEDED, ERROR INFORMATION FOLLOWS

Explanation

During the write and read test portion of the drive test, excessive temporary equipment checks were detected for this device type.

This message will be followed by the failing channel status word (CSW), channel command word (CCW), and sense bytes for each temporary equipment check that occurred.

System action

Drive test processing ends if path control is not being used. If path control is being used, drive test processing ends on the current path and ICKDSF continues with the next available path specified.

Operator response

None.

System programmer response

None.

ICK21404I WRT TST: FORMAT WRITE OF CE CYLINDER FAILED ON HEAD = X'hhhh'

Explanation

An error was detected during the format write to the customer engineer (CE) cylinder.

System action

Drive test processing ends if path control is not being used. If path control is being used, drive test processing ends on the current path and ICKDSF continues with the next available path specified.

Operator response

None.

System programmer response

Examine previous messages to determine the cause of the error.

ICK21405I WRT TST: UPDATE WRITE OF CE CYLINDER FAILED ON HEAD = X'hhhh'

Explanation

An error was detected during the update write to the customer engineer (CE) cylinder.

System action

Drive test processing ends if path control is not being used. If path control is being used, drive test processing ends on the current path and ICKDSF continues with the next available path specified.

Operator response

None.

System programmer response

Examine previous messages to determine the cause of the error.

ICK21406I CLEANUP TEST: CLEANUP OF CE CYLINDER FAILED ON HEAD = X'hhhh'

Explanation

An error was detected while attempting to cleanup the tracks on the customer engineer (CE) cylinder after the drive test completed.

System action

Drive test processing ends if path control is not being used. If path control is being used, drive test processing ends on the current path and ICKDSF continues with the next available path specified.

Operator response

None.

System programmer response

Examine previous messages to determine the cause of the error.

ICK21407I UNCORRECTABLE DATA CHECK OCCURRED ON CE CYLINDER, HEAD = X'cccc hhhh', RECORD = X'rr'

Explanation

An uncorrectable data check was detected during the read test portion of the drive test. The message is followed by the failing CSW, CCW, and sense byte information.

System action

ICKDSF continues. Processing may eventually end.

Operator response

None.

System programmer response

Contact your IBM hardware service representative to aid in resolving the problem.

ICK21408I CE CYLINDER DATA CHECK THRESHOLD EXCEEDED

Explanation

During read testing from the customer engineer (CE) cylinder, excessive data checks were detected for this device type.

System action

Drive test processing ends if path control is not being used. If path control is being used, drive test processing ends on the current path and ICKDSF continues with the next available path specified.

Operator response

None.

System programmer response

Examine the error information contained in message ICK01415 and/or ICK21407 to determine the failing heads and records. Contact your IBM hardware service representative to aid in resolving the problem.

ICK21409I CORRECTABLE DATA CHECK LIMIT EXCEEDED ON CE CYLINDER, HEAD = X'hhhh'

Explanation

During the read test portion of the drive test, this head exceeded the error criterion. The message will be preceded by message ICK01415 for each record with a correctable data check.

System action

Drive test processing ends if path control is not being used. If path control is being used, drive test processing ends on the current path and ICKDSF continues with the next available path specified.

Operator response

None.

System programmer response

Examine the error information contained in message ICK01415 to determine the failing records. Contact your IBM hardware service representative for aid in resolving the problem.

ICK21410I READ TEST: READ TEST ON CE CYLINDER FAILED ON HEAD = X'hhhh'

Explanation

An error other than a data check occurred during the read test portion of the drive test.

System action

Drive test processing ends if path control is not being used. If path control is being used, drive test processing ends on the current path and ICKDSF continues with the next available path specified.

Operator response

None.

System programmer response

Examine previous messages to determine the cause of the problem.

ICK21420I DRIVE TEST: TESTING UNSUCCESSFUL ON:
CHPID = XX
CHANNEL NUMBER = X
CHANNEL SET = X
STORAGE DIRECTOR ID = XX
SUBSYSTEM ID = XXXX
CLUSTER = X
STORAGE PATH = X

Explanation

The drive test was unable to complete successfully on the indicated path where:

CHPID = XX identifies the CHPID for the path being processed. This line is displayed only if it applies to the operating system environment.

CHANNEL NUMBER = X identifies the channel number for the path being processed. This line is displayed only if it applies to the operating system environment.

CHANNEL SET = X identifies the channel set (CPU affinity) for the path being processed. This line is displayed only if it applies to the operating system environment.

STORAGE DIRECTOR ID = XX identifies the Storage Director Id for the path being processed. It contains the information present in sense byte 21. This line is displayed only if it applies to the storage control being processed.

SUBSYSTEM ID = XXXX identifies the Subsystem Id for the path being processed. It contains the information present in sense bytes 20 and 21. This line is displayed only if it applies to the storage control being processed.

CLUSTER = X identifies the Cluster for the path being processed. This line is displayed only if it applies to the storage control being processed.

STORAGE PATH = X identifies the Storage Path of the Cluster being processed. This line is displayed only if it applies to the storage control being processed.

System action

Drive test processing ends on this path.

Operator response

None.

System programmer response

Examine previous messages to determine the cause of the error on the specified path.

ICK21421I DRIVE TEST: I/O ERROR ON:
CHPID = XX
CHANNEL NUMBER = X
CHANNEL SET = X
STORAGE DIRECTOR ID = XX
SUBSYSTEM ID = XXXX
CLUSTER = X
STORAGE PATH = X

Explanation

An I/O error occurred on the indicated path. The csw, ccw, and sense byte information for the error are printed with the message.

CHPID = XX identifies the CHPID for the path being processed. This line is displayed only if it applies to the operating system environment.

CHANNEL NUMBER = X identifies the channel number for the path being processed.

CHANNEL SET = X identifies the channel set (CPU affinity) for the path being processed. This line is displayed only if it applies to the operating system environment.

STORAGE DIRECTOR ID = XX identifies the Storage Director Id for the path being processed. It contains the information present in sense byte 21. This line is displayed only if it applies to the storage control being processed, or if the error occurs after the Storage Director Id has been determined.

SUBSYSTEM ID = XXXX identifies the Subsystem Id for the path being processed. It contains the information present in sense bytes 20 and 21. This line is displayed only if it applies to the storage control being processed, or if the error occurs after the Subsystem ID has been determined.

CLUSTER = X identifies the Cluster for the path to be processed. This line is displayed only if it applies to the storage control being processed, or if the error occurs after the Cluster has been determined.

STORAGE PATH = X identifies the Storage Path of the Cluster to be processed. This line displayed only if it applies to the storage control being processed, or if the error occurs after the Storage Path has been determined.

System action

No further processing occurs on this path.

Operator response

None.

System programmer response

Examine the CCW, CSW, and sense information to determine the cause of the error.

ICK21422I CHPID/ALLCHPID INVALID FOR THIS ENVIRONMENT

Explanation

The CHPID and ALLCHPID parameters are only valid in the MVS, CMS, and Stand-Alone environments.

System action

Drive test processing is bypassed.

Operator response

None.

System programmer response

Correct the parameters and rerun the job.

ICK21423I CHANNUM/ALLCHAN/CHANSET INVALID FOR THIS ENVIRONMENT

Explanation

The CHANNUM, ALLCHAN, and CHANSET parameters are not valid in this environment.

System action

Drive test processing is bypassed.

Operator response

None.

System programmer response

Correct the parameters, then rerun the job.

ICK21424I UNKNOWN PATH SPECIFIED CHPID = XX CHANNEL NUMBER = X

Explanation

The CHPID or CHANNEL specified in the parameters does not match any of the valid paths determined by ICKDSF. Either CHPID = XX or CHANNEL NUMBER = X will be displayed, depending on the parameters specified.

System action

ICKDSF continues with the next valid path specified.

Operator response

None.

System programmer response

Correct the parameters, then rerun the job.

ICK21425I INVALID SPECIFICATION FOR PATH PARAMETERS: xx

Explanation

The CHPID or channel specified in the parameters is not a valid value. XX is the value that is not valid.

The valid values for CHPID are 00 thru FF.

The valid values for CHANNUM are 0 thru F.

System action

Drive test processing is bypassed.

Operator response

None.

System programmer response

Correct the parameters, then rerun the job.

ICK21454I UNABLE TO READ DATA ON PRIMARY VOLUME FOR TRACK CCHH = X'cccc hhhh', PROCESS TERMINATING

Explanation

While INSPECT was processing the secondary volume of a dual copy pair, it attempted to determine if the corresponding track on the primary volume was readable. In this case, the track on the primary volume is not readable.

The previous ICK10710I message contains the CCW, CSW, and sense information for the error.

System action

Because TOLERATE(PRIFAIL) is not specified, the track on the secondary volume is not inspected Command processing ends on this track and continues with the next track.

Operator response

None.

System programmer response

Examine the CCW, CSW, and sense information to determine the cause of the error on the primary volume. Then take action appropriate to your installation's procedures for handling errors on the primary volume of a dual copy pair.

ICK21461I NON-STANDARD RECORD ZERO EXISTS ON PRIMARY VOLUME FOR TRACK CCHH = X'cccc hhhh' PROCESS TERMINATING

Explanation

A non-standard record 0 condition exists on the primary volume of a dual copy pair.

System action

Since TOLERATE(PRIFAIL) is not specified, command processing ends for the track on the secondary volume.

Operator response

None.

System programmer response

Put the primary volume in simplex state and run INSPECT NOPRESERVE on the track on the primary volume.

ICK21601I I/O ERROR ON PATH XX

Explanation

An I/O error occurred on the indicated path while attempting to determine the potential paths to the device. The CSW, CCW, and sense bytes for the error are printed with the message.

System action

No further processing occurs on this path.

Operator response

None.

System programmer response

Examine the CCW, CSW, and sense information to determine the cause of the error.

ICK21721I FIXED BLOCK WRITE C.E. AREA TEST: BWRCE

Explanation

An error was detected during the write to the customer engineer (CE) cylinder.

System action

Command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21723I FIXED BLOCK CALIBRATION SEEK TEST: BCALSK

Explanation

An error was detected while moving the access arm from block 244 to a specified location, and returning again to read.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21725I MULTIPLE BLOCK WRITE TEST: BHDSK

Explanation

An error was detected while attempting to write multiple blocks and to seek the next sequential track.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21727I FIXED BLOCK INCREMENTAL SEEK TEST: BINCSK

Explanation

An error was detected while attempting to incrementally move the access arm to read.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21729I FIXED BLOCK SERVO SEEK TEST: BSRVOSK

Explanation

An error was detected during an attempt to write and read back block 244 of the CE area.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Contact your IBM hardware service representative.

ICK21731I FIXED BLOCK RANDOM SEEK TEST: BRANSK

Explanation

An error was detected during an attempt to switch heads randomly to read.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21733I FIXED BLOCK READ PREFORMATTED BLOCK TEST: BWRNFPS

Explanation

An error was detected while attempting to read block 296 of the CE area.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21735I FIXED BLOCK WRITE PRESELECTED BLOCKS TEST: BWRNFP

Explanation

An error was detected while attempting to write multiple blocks in the CE area.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21736I FIXED BLOCK WRITE/READ PRESELECTED BLOCKS TEST: BWRRDRV

Explanation

An error was detected during the write/read tests on preselected blocks on a track in the CE cylinder.

System action

ANALYZE drive test continues processing by testing blocks on the next track of the CE cylinder.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21737I FIXED BLOCK ERROR READING ID FIELD, TESTING TERMINATED

Explanation

An error was detected while reading the ID field on the CE cylinder.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21738I FIXED BLOCK DATA COMPARE FAILED: BWRRDRV

Explanation

An error was detected when the data in the data record read did not compare equally with the data previously written to the same record.

System action

ANALYZE drive test continues processing by testing blocks on the next track of the CE cylinder.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21739I FIXED BLOCK DATA COMPARE FAILED: BWRCE

Explanation

An error is detected when the record read did not compare equally with the same record previously written.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21750I SNS TEST: ERROR IN SENSE CCW

Explanation

An error was detected when ANALYZE failed to obtain sense information. This message is followed by a printout of the failing CCW, CSW, and sense information.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21752I RECAL TEST: RECALIBRATE TO CYL 0 HEAD 0

Explanation

An error was detected while ANALYZE attempted to recalibrate the access arm to cylinder 0, head 0. This message is followed by a printout of the failing CCW, CSW, and sense information.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21754I RHAMH TEST: READ HOME ADDRESS UNDER MOVABLE HEADS FAILED.

Explanation

An error was detected when ANALYZE failed to read home addresses under all the movable heads. This message is followed by a printout of the failing CCW, CSW, and sense information.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21755I READ FOR PRESERVE OF BLOCK xxxxxxxx FAILED: NON-

CORRECTABLE DATA CHECKS PROCESSING OF BLOCK TERMINATED

Explanation

The user data on block xxxxxxxx could not be read because of permanent data checks.

System action

Diagnostic information is printed on the output device. Processing of the block ends to prevent the loss of the user data on the block. ICKDSF continues with the next valid block specified in the BLOCKS parameter.

Operator response

None.

System programmer response

Begin error recovery procedures for the data set containing the block in error, and rerun the command for the block in error with NOPRESERVE specified.

Save the job output and contact your IBM service representative.

ICK21756I RHAFH TEST: READ HOME ADDRESS UNDER FIXED HEADS FAILED.

Explanation

An error was detected when ANALYZE failed to read home addresses under all the fixed heads. This message is followed by a printout of the failing CCW, CSW, and sense information.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21758I SKINCR TEST: INCREMENTAL MOVEMENT OF ACCESS ARM FAILED.

Explanation

An error was detected when ANALYZE failed to incrementally move the access arm. This message is followed by a printout of the failing CCW, CSW, and sense information.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21760I SKRAN TEST: RANDOM CYLINDER ACCESS FAILED.

Explanation

An error was detected when ANALYZE failed to move the access arm randomly from one cylinder address to another. This message is followed by a printout of the failing CCW, CSW, and sense information.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21762I SKMAX TEST: SEEK FROM CYLINDER 0 TO MAXIMUM CYLINDER FAILED.

Explanation

An error was detected when ANALYZE failed to move the access arm from cylinder 0 to the maximum cylinder address. This message is followed by a printout of the failing CCW, CSW, and sense information.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21764I RHA TEST: READ HOME ADDRESS ON C.E. CYLINDER FAILED. WRITE TEST BYPASSED.

Explanation

An error was detected when ANALYZE failed to read the CE cylinder's home address. This message is followed by a printout of the failing CCW, CSW, and sense information.

System action

ANALYZE command processing continues, but does not process the write tests on the CE cylinder. The return code is set to 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21765I UNABLE TO WRITE HOME ADDRESSES ON CCHH = X'cccc hhhh'|X'cccCCCC:H'

Explanation

An error occurred while attempting to write the home address on the CE cylinder. This message is followed by the failing CCW, CSW, and sense.

System action

If path control is in effect, ICKDSF continues with the next path to be processed. If path control is not in effect, command processing ends.

Operator response

None.

System programmer response

Contact your IBM hardware service representative to aid in resolving the problem.

ICK21766I WRT TEST: WRITE RECORDS R0 AND R1 ON C.E. CYLINDER FAILED.

Explanation

An error was detected when ANALYZE failed to write records 0 and 1 on the CE cylinder. This message is followed by a printout of the failing CCW, CSW, and sense information.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21768I RDMT TEST: MULTI-TRACK READ ON C.E. CYLINDER FAILED

Explanation

An error was detected when ANALYZE failed to read records on the CE cylinder. This message is followed by a printout of the failing CCW, CSW, and sense information.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21770I RMDT DATA COMPARE TEST: WRONG RECORD READ

Explanation

An error was detected when a drive error caused the wrong record to be read. This message is followed by a printout of the failing CCW, CSW, and sense information, although the sense information will be zero if no unit check is indicated in the CSW.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21772I WRTPAD READ WRONG RECORD-- EXP=xxxxxxx, REC=yyyyyyy

Explanation

An error was detected while ANALYZE attempted to write a record using the write count, key, data CCW, and to read it back. The record read back was not as expected.

xxxxxxx is the description of the record that was expected. It is the data that was written.

yyyyyyy is the description of the record that was received.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21774I WRTPAD TEST: WRITE COUNT, KEY, DATA FAILED

Explanation

An error was detected when ANALYZE failed to write a record using the write count, key, data CCW. This message is followed by a printout of the failing CCW, CSW, and sense information.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21775I DATAVER: DATA CHECKS EXCEEDED THRESHOLD - PROCESS CONTINUING

Explanation

The number of data checks exceeded the limit set for the specified device. For CKD devices, this limit is equivalent to 50.

System action

INSTALL command processing completes the mode change before ending.

Operator response

None.

System programmer response

Run the ANALYZE command with the scan parameter on the volume. Save the console and printer output for the INSTALL and ANALYZE commands and take action appropriate to your installation procedures for determining if an equipment problem is suspected.

If the problem is determined to be equipment-related, contact your IBM hardware or software service representative.

ICK21776I DATAVER TEST: ERROR DURING DATA VERIFICATION

Explanation

A drive error was detected during the data verification test.

This message is followed by a printout of the failing CCW, CSW, and sense information.

System action

Command processing ends with a return code of 8.

Operator response

None.

System programmer response

Contact your IBM hardware service representative for the drive error.

ICK21778I CLEANUP TEST: CLEANUP OF C.E. CYLINDER TRACK 0 FAILED

Explanation

An error was detected when ANALYZE completed its test and an error occurred during the cleanup of track 1 on the CE cylinder.

This message is followed by a printout of the failing CCW, CSW, and sense information.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Check subsequent messages for status of drive.

ICK21786I RPS ERROR: READ SECTOR OR SET SECTOR FAILED

Explanation

An error was detected when ANALYZE failed to read sector or to set sector.

This message is followed by a printout of the failing CCW, CSW and sense information.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

Contact your IBM hardware service representative.

ICK21798I INVALID TRACK FORMAT ON CYLINDER = *xxxxxxxxxx* HEAD *x*

Explanation

A track was encountered during reclaim processing with a format which is not consistent with the information in the factory defect map for the track.

System action

Reclaim processing of the indicated track ends. Reclaim processing continues with the next sequential track.

Operator response

None.

System programmer response

Contact your IBM hardware service representative. Save the job output and contact your IBM service representative.

ICK21826I INVALID TRACK FORMAT ON TRACK CCHH = X'cccc hhhh'| X'cccCCCC:H'

Explanation

A track format condition that is not valid was detected while attempting to preserve data on the specified track. This usually indicates that data has been written to the track beyond the track capacity. It is generally a user error.

System action

The record on the specified track is not lost, and the track is not marked defective.

The specified track is not surface-checked. ICKDSF continues with the next track. The return code is set to 8.

Operator response

None.

System programmer response

Determine the data set containing the specified track. Determine how, when, and where the data on the specified track was written, in order to find how the track format condition that was not valid occurred.

Begin recovery of the data on the track using your installation's procedures. Then inspect the failing track specifying NOPRESERVE.

ICK21831I NO PATHS HAVE BEEN WRITE ALLOWED

Explanation

During processing of the CONTROL command to allow write access to the paths to a device, the write-allow was unsuccessful for all paths.

System action

The return code is set to 8.

Operator response

None.

System programmer response

Rerun the job for a device that is known to go through the storage control that has been write-prevented.

This condition can also arise if the required path has been reserved for too long a duration, and the operator requested that retry end. If this condition exists, action must be taken to ensure that the path is released so that the job can be rerun.

ICK21832I FENCE STATUS INDETERMINATE

Explanation

A CONTROL command (with CLEARFENCE parameter) to reset a fence status is unsuccessful. The device fence status cannot be determined at this time.

System action

The return code is set to 8 and ICKDSF continues.

Operator response

None.

System programmer response

This condition can arise if the required path has been reserved for too long a duration, and the operator requests that retry ends. If this condition exists, action must be taken to ensure that the path is released so the job can be rerun.

If a fence condition exists for this device, other methods may have to be used to unfence the device. Contact your IBM service representative.

ICK21833I DEVICE ccuu FENCE STATUS STILL EXISTS ON -- CLUSTER x STORAGE PATH y

Explanation

The CONTROL command (with CLEARFENCE parameter) has successfully issued the CCW to reset the fence status. However, the allowable time period expired, but the device fence status still exists on the storage path indicated.

System action

Processing continues.

Operator response

None

System programmer response

Contact your IBM hardware service representative.

ICK21834D PATH xxxx,y RESERVED-REPLY U TO RETRY WRITE ALLOW, T TO IGNORE

Explanation

This message is issued to the system operator if the CONTROL command encounters a path that remains reserved for all of its retries.

xxxx is the unit address

y is the path ID (CHPID).

Reply:

- U to reissue the write-allow to the device.
- T to ignore this path and continue with the next path.

System action

The system waits for your response.

Operator response

Respond U or T.

System programmer response

None.

ICK21835D DEVICE ccuu RESERVED-REPLY U TO RETRY CLEAR FENCE, ELSE T

Explanation

This message is issued if a device or path remains reserved for the duration of CONTROL command (with the CLEARFENCE parameter) processing.

Reply:

- U to reissue the CONTROL command.
- T to ignore this path and continue CONTROL command processing with the next path.

System action

The system waits for your response.

Operator response

Respond U or T.

System programmer response

None.

ICK21836D IPL TEXT EXISTS ON volid. REPLY U TO OVERLAY, ELSE T.

Explanation

An attempt is made to replace the IPL text on a volume that already contains IPL text.

Reply:

- U to place the new IPL text on the volume.
- T to end command processing.

System action

The system waits for your response.

Operator response

Respond U or T.

System programmer response

None.

ICK21837I SP FENCE STATUS STILL EXISTS ON CLUSTER x STORAGE PATH y THROUGH CHANNEL-SWITCH z

Explanation

The CONTROL command (with CLEARFENCE parameter) has successfully issued the CCW to reset the fence status. However, the allowable time period has expired, but the SP fence status still exists on the storage path through the specified channel-switch.

System action

Processing continues.

Operator response

None.

System programmer response

Contact your IBM hardware service representative.

ICK21850I EXTENDED CKD FUNCTIONS CANNOT BE ACTIVATED - MINIMAL INIT FORCED

Explanation

The device has never been online to the operating system and the operating system cache logic has not been activated. ICKDSF surface checking functions cannot be performed.

System action

Command processing continues as if a minimal initialization has been requested. This enables the volume label and the VTOC to be written to the volume.

Operator response

The device must be either varied online and varied offline, or varied online and the job run online. (This enables activation of the operating system cache logic.)

System programmer response

The device cannot be varied online if the volume label is the same as a volume label that is already online. In this case, run either the INIT or the REFORMAT command to change the volume label.

After the device has been varied online (and offline again if necessary), the job can be re-run.

ICK22130D DATA CANNOT BE RECOVERED FOR TRACK X'cccc hhhh' REPLY C TO ERASE AND CONTINUE, T TO TERMINATE, I TO IGNORE

Explanation

The previous INSPECT command did not complete processing during PRESERVE backup processing.

Note: The data cannot be recovered from the backup location.

Reply:

- C to erase data at the backup location, and begin processing from the start of the specified range. (Specify C if there is no need to recover data from the backup location.)
- I to ignore recovery data, and continue processing for the current invocation. (Note that this response is allowed only if HOLDIT was specified.) The recovery data remains intact. The next invocation of the INSPECT command will again attempt to process the recovery data.
- T to end processing. The recovery data remains intact. (Specify T to retry the recovery process, or to examine the situation before allowing the data to be erased.) The next invocation of the INSPECT command will again attempt to process the recovery data.

System action

The system waits for a response. (The ignore response option is provided if HOLDIT is specified on the current invocation of the INSPECT command.)

Operator response

Respond C, I, or T.

System programmer response

None.

ICK22131I ALTERNATE TRACK CANNOT BE ASSIGNED FOR THE RECOVERY TRACK

Explanation

The track for which backup recovery is processing is defective, but there are no available alternate tracks.

System action

An attempt is made to write the backup recovery data to the recovery track without an alternate track assigned.

If the procedure fails, subsequent messages will indicate system action.

Operator response

None.

System programmer response

In an attempt to make alternate tracks available for future use, it is recommended that INSPECT RECLAIM be run for tracks that have alternates assigned.

ICK22158D DATA CANNOT BE RECOVERED FOR BLOCK xxxxxxxx REPLY "C" TO ERASE AND CONTINUE, "I" TO IGNORE, T TO TERMINATE.

Explanation

The previous invocation of the INSPECT command did not run to completion during PRESERVE backup processing.

Note: The data cannot be recovered from the backup location.

Reply:

- C to erase data from the backup location, and begin processing from the start of the specified range. (Specify C if there is no need to recover data from the backup location.)
- I to ignore the recovery data and continue processing for the current invocation. (Note that this response is allowed only if HOLDIT was specified.) The recovery data remains intact.

  The next invocation of the INSPECT command will again attempt to process the recovery data.
- T to end processing. The recovery data remains intact. (Specify T to retry the recovery process, or to examine the situation before allowing the data to be erased.)

  The next invocation of the INSPECT command will again attempt to process the recovery data.

System action

The operator is prompted for a reply to this message. (The ignore option is provided if HOLDIT is specified on the current invocation of the INSPECT command.)

Operator response

Respond C, T, or I.

System programmer response

None.

ICK22176I DATA CHECK THRESHOLD EXCEEDED ON ONE OR MORE HEADS

Explanation

The ANALYZE SCAN function found that the data error rate on one or more heads exceeded the data check error rate threshold criterion for the device.

System action

A movable head error table is printed on the ICKDSF output device with a T in the DATA CHK column indicating which head or heads exceeded the data check error rate threshold.

Operator response

None.

System programmer response

The movable head error table and previous messages will aid in identifying the problem. Save the printer output from the ANALYZE run and take action appropriate to your installation's procedures for handling suspected equipment problems. If your problem cannot be determined, contact your IBM service representative.

ICK22201I TRACK X'cccc hhhh' WAS NOT INSPECTED DUE TO ENQUEUE FAILURE ON -- xxxxxx

Explanation

The data set enqueue for track X'cccc hhhh' failed.

xxxxxx is the data set name.

TOLERATE(ENQFAIL) was not specified. The track was not INSPECTed.

System action

INSPECT continues on the next track.

Operator response

None.

System programmer response

The job should be rerun for this track when the data set is available.

If it is certain that the data set will never be available for exclusive control, but the track must be inspected, rerun the job for this track specifying TOLERATE(ENQFAIL).

ICK22205I TRACK X'cccc hhhh' WAS NOT INSPECTED -- VSAM DATA SET CAN NOT BE ENQUEUED

Explanation

The specified track is part of a VSAM data set. ICKDSF does not support data set enqueue for VSAM data sets. The track was not inspected because TOLERATE(ENQFAIL) was not specified or assumed.

System action

ICKDSF continues on the next track.

Operator response

None.

System programmer response

An INSPECT for this track should be done either with the device mounted offline, or by specifying TOLERATE(ENQFAIL).

ICK22206I TRACK X'cccc hhhh' WAS NOT PROCESSED DUE TO ENQUEUE FAILURE ON - xxxxxx

Explanation

The data set enqueue for track X'cccc hhhh' failed.

xxxxxx is the data set name.

TOLERATE(ENQFAIL) was not specified. The track was not processed.

System action

Command processing continues on the next track.

Operator response

None.

System programmer response

The job should be rerun for this track when the data set is available.

ICK22207I TRACK X'cccc hhhh' WAS NOT PROCESSED - VSAM DATA SET CAN BE ENQUEUED

Explanation

The specified track is part of a VSAM data set. ICKDSF does not support data set engueue for VSAM data sets. The track was not processed because TOLERATE(ENQFAIL) was not specified or assumed.

System action

Command processing continues on the next track.

Operator response

None.

System programmer response

The job should be rerun for this track either with the device mounted offline or by specifying TOLERATE(ENQUFAIL).

ICK24000I UNABLE TO PRESERVE DATA FOR TRACK X'cccc hhhh'

Explanation

The current ICKDSF process cannot assign a temporary alternate location before media maintenance action can be taken on the specified track.

System action

The cause of the error is printed and command processing continues on the next track.

Operator response

None.

System programmer response

See the Programmer Response for the other error messages which are issued.

ICK24001I SUBSYSTEM FUNCTION HAS BEEN CANCELLED

Explanation

The current ICKDSF process has determined that a previously issued PSF command has been cancelled. The cancellation can be caused either by ICKDSF if the maximum run time is exceeded, or by a process other than ICKDSF.

System action

Command processing ends.

Operator response

None.

System programmer response

See accompanying error messages to determine the cause of the subsystem function being cancelled. Re-run the command if necessary.

ICK24002I UNABLE TO OBTAIN THE TRACK STATUS FOR TRACK X'cccc hhhh'

Explanation

The current ICKDSF process is unable to determine the current track status for the specified track because of either an I/O error or a subsystem function failure.

System action

Command processing continues.

Operator response

None.

System programmer response

None.

ICK24003I UNABLE TO READ PRIMARY TRACK X'cccc hhhh' AFTER DATA IS RESTORED

Explanation

After the media maintenance function, an attempt was made to restore the data on the primary track from a previously assigned temporary alternate location. The restore function failed because of a primary track read failure.

System action

The specified primary track is permanently assigned to an alternate location. Command processing continues on the next track.

Operator response

None.

System programmer response

None

ICK24004I PRIMARY TRACK READ FAILURE IS DETECTED

Explanation

During the media maintenance PRESERVE function, the data on the primary track could not be read because of either an I/O error or a subsystem function failure.

System action

The associated error information is printed and the function continues on the next track.

Operator response

None.

System programmer response

Run the job again with NOPRESERVE option. Call your IBM service representative if necessary.

ICK24005I ALTERNATE LOCATION READ FAILURE IS DETECTED

Explanation

During the media maintenance PRESERVE function, the data on the alternate location could not be read because of a subsystem function failure.

System action

The associated error information is printed and the function continues on the next track.

Operator response

None.

System programmer response

Run the job again with NOPRESERVE option. Call your IBM service representative if necessary.

ICK24050I DEVICE SPECIFIED IS NOT THE PRIMARY OF A PPRC PAIR

Explanation

The device is not the primary of a PPRC pair. PPRC QUERY PATHS directs PPRC to display all of the paths

associated with application site storage control (primary).

System action

Command Processing ends.

Operator response

None.

System programmer response

Re-issue the command without PATHS parameter or reissue the command to a primary volume.

ICK24051I DEVICE SPECIFIED IS A DUAL COPY VOLUME

Explanation

The device is a dual copy volume. It is not a PPRC or simplex volume. PPRC QUERY command will not display Volume or Paths information for a dual copy volume.

System action

Command Processing ends.

Operator response

None.

System programmer response

If a user needs to establish a PPRC pair, the dual copy pair will have to be ended before issuing PPRCOPY ESTPAIR command.

ICK24052I ESTPAIR COMPLETED WITH ERRORS

Explanation

A PPRCOPY ESTPAIR command with the MSGREQ parameter completed successfully but encountered correctable errors. The copy is complete and the volume pair is in duplex state.

System action

Command Processing continues.

Operator response

None.

System programmer response

Look for any console messages issued and refer to the IBM 3990 Storage Control Reference for Model 6 for information related to returned sense data. Notify your service representative of any hardware error conditions.

ICK30003I FUNCTION TERMINATED. CONDITION CODE IS nn hh:mm:ss mm/dd/yy

Explanation

A command has encountered an abnormal ending error condition during processing. The value is the last condition code (LASTCC) generated during command processing. Messages printed just prior to this message indicate the nature of the error.

Note that the LASTCC value is the highest condition code found in the messages printed during command processing.

hh:mm:ss and *mm/dd/yy* are the hours, minutes and seconds, and month, day, and year, respectively, of the date and time of the message.

System action

ICKDSF continues with the next command. LASTCC is set to *nn*; MAXCC is set to *nn* if *nn* is greater than the current value of MAXCC.

Operator response

None.

System programmer response

Correct the cause of the error, and reissue the command. Save the job output and contact your IBM service representative.

ICK30004I FUNCTION TERMINATED. INSUFFICIENT MAIN STORAGE

Explanation

The size of allocated virtual storage is too small.

System action

ICKDSF continues with the next command.

Operator response

None.

System programmer response

Increase the allocated size of virtual storage, and reissue the command. Save the output and contact your IBM service representative.

ICK30008I ***function*** **NOT SUPPORTED IN THIS ENVIRONMENT**

Explanation

The version of ICKDSF that is being used does not support the function specified.

System action

Command processing ends.

Operator response

None.

System programmer response

Refer to the command description in the user's guide to see which functions are supported for the version of ICKDSF you are running. Either run the job again with the appropriate parameters, or make sure that you are running with the version of ICKDSF that supports the function requested.

ICK30009I **CPU CLOCK IS NOT SET OR NOT OPERATIONAL**

Explanation

The processor clock has not been set or is not operational.

System action

Command processing ends with an ICKDSF return code of 12.

Operator response

Set the clock.

System programmer response

Set the clock.

ICK30091I **ccuu NED INFORMATION DOES NOT MATCH FOR ONE OR MORE PATHS: NED=tttttt.mmm.mfg.lc.sssssssssss, CHPID=xx**

Explanation

A configuration error was detected. Multiple paths to this host exist, but the device NED information does not match on each path. The NED information is printed for each CHPID. The NED information shown is in the following format:

tttttt = device type
mmm = model
mfg = manufacturer
lc = manufacturing location
sssssssssss = sequence number

Note: The information in the above fields are printed as they are returned from the device. If blanks are returned, then blanks will be printed. Unprintable characters may be printed as '.'. Some examples of this are:

- The device type field, tttttt, is a 6-digit field. The information is printed in the message as it is returned from the device. For example, when the first 2-digits are returned as blanks by the device, they will be printed as blanks in the message. So the device type field will appear to have leading blanks.
- Some devices (for example 2105) returns blanks in the model field, so the model field will be blank in the message.

System action

ICKDSF terminates.

Operator response

Contact the system programmer.

System programmer response

A path or paths may be cabled incorrectly. Examine the information for each path to determine which path or paths do not match, and take the necessary action to correct the problem.

ICK30101I **NO PATHS AVAILABLE TO EXECUTE DRIVE TEST**

Explanation

ICKDSF was unable to locate any available paths that match the specified path parameters because one or more of the following conditions were detected:

- The user specified path did not match any of the paths found by ICKDSF. Message ICK21424I was previously issued for the path that does not match. The PATH STATUS table indicates the paths found by ICKDSF. Correct the parameters to specify a valid path and run the job again.
- The user specified path is not operational. The PATH STATUS table indicates the path is unavailable. Determine the reason the path is not operational.

- The user specified path encountered an error that prevents further testing on the path. Examine previous error messages to determine the cause of the error. Take action appropriate to your installation's procedures for handling suspected equipment problems.

The message relates only to paths specified in the parameters. Paths that may be available but were not specified are not considered.

System action

Command processing ends.

Operator response

None.

System programmer response

See explanation.

ICK30111I DEVICE SPECIFIED IS THE SECONDARY OF A DUPLEX OR PPRC PAIR

Explanation

The specified device is the secondary device address of a duplex or pprc pair. You must specify the primary device address.

System action

Command processing ends.

Operator response

None.

System programmer response

Specify the primary device address and submit the job again.

ICK30112I DEVICE SPECIFIED IS IN DUPLEX PENDING STATE

Explanation

The specified device of a duplex pair is in a temporary state. The subsystem is in the process of synchronizing the two devices.

System action

Command processing ends.

Operator response

None.

System programmer response

Submit the job again when the duplexing operation completes.

ICK30113I DEVICE SPECIFIED IS NOT IN SIMPLEX STATE

Explanation

The device specified is a duplex pair and ICKDSF function cannot be performed.

System action

Command processing ends.

Operator response

None.

System programmer response

To perform the specified function, place the device in simplex state and submit the job again. (Note that limited ICKDSF functions support the device in dual copy mode.)

ICK30114I PINNED DATA EXISTS, MODE SWITCHING IS NOT ALLOWED

Explanation

The mode switch of an IBM 3390 from 3390 mode to 3380 track compatibility mode or vice-versa cannot be performed because of pinned data in the control unit. (See pinned data in *IBM 3990 Storage Control Reference*.)

System action

Command processing ends.

Operator response

None.

System programmer response

To perform mode switching, discard the pinned data and submit the job again.

ICK30115I DEVICE SPECIFIED IS IN PPRC PENDING STATE

Explanation

The device is in a PPRC pending state. Copy to establish a PPRC pair is in progress.

System action

Command processing ends.

Operator response

None.

System programmer response

Re-issue the command when the copy has been completed.

ICK30116I DEVICE SPECIFIED IS THE PRIMARY OF A PPRC PAIR

Explanation

The PPRCOPY RECOVER command is only valid on the secondary device of a PPRC pair.

System action

Command processing ends.

Operator response

None.

System programmer response

Verify the device number is the secondary volume and re-issue the PPRCOPY RECOVER command.

ICK30130I ccuu DEVICE NOT OPERATIONAL

Explanation

The device address you specified is not operational.

System action

Command processing ends.

Operator response

None.

System programmer response

Verify that a path is available to the device. Save the output and contact your IBM service representative if necessary.

ICK30135I THE SUBSYSTEM IMAGE SERIAL NUMBER SPECIFIED DOES NOT MATCH THIS DEVICE

Explanation

The subsystem image serial number specified with the SERIAL parameter does not match the subsystem image serial number for this device.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Verify that you are issuing the command to the right device. To obtain the subsystem image serial number, use the CONTROL CONFIGURE(DISPLAY) command.

ICK30200I TOO MANY POSITIONAL PARAMETERS AFTER xxxx

Explanation

A parameter list has too many specified positional parameters following the characters *xxxx*.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Remove the excess parameters and issue the command again. Save the output and contact your IBM service representative.

ICK30201I CONSTANT xxxx EXCEEDS LENGTH LIMIT

Explanation

The constant *xxxx* contains more characters than the maximum permitted by the command syntax.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the constant, and issue the command again. Save the output and contact your IBM service representative.

ICK30202I ABOVE TEXT BYPASSED UNTIL NEXT COMMAND. CONDITION CODE IS 12

Explanation

There is a syntax error in the command. The remainder of the command is ignored.

Messages printed just prior to this message indicate the nature of the error.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the syntax error, and issue the command again. Save the output and contact your IBM service representative.

ICK30203I ITEM xxxx DOES NOT ADHERE TO RESTRICTIONS

Explanation

An indicated parameter does not conform to required naming conventions. For example, *dname* may be misspelled.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the parameter error, and issue the command again. Save the output and contact your IBM service representative.

ICK30205I DELIMITER xxxx IS NOT PROPERLY PRECEDED BY A CONSTANT OR KEYWORD

Explanation

A delimiter was found where either a subparameter list or data was expected.

The delimiter is improperly used because either parentheses were improperly positioned, or a positional parameter was missing.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the syntax error, and issue the command again. Save the output and contact your IBM service representative.

ICK30207I REMAINDER OF COMMAND INPUT STREAM IGNORED

Explanation

An error has occurred that prohibits further scanning of the command stream. Messages issued just prior to this message indicate the nature of the error.

Note: Condition code (MAXCC) is always set to 16 when this situation is encountered.

System action

ICKDSF processing ends.

Operator response

None.

System programmer response

Correct the error, and issue the command again. Save the output and contact your IBM service representative.

ICK30208I LEFT PARENTHESIS MISSING FOLLOWING KEYWORD xxxx

Explanation

The keyword *xxxx* is not followed by the opening parenthesis. This character must begin the required subparameter list or value associated with the command keyword.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Check the requirements of the keyword, correct the syntax, and issue the command again. Save the output and contact your IBM service representative.

ICK30209I RIGHT PARENTHESIS MISSING AFTER xxxx

Explanation

A closing parenthesis was not found where expected. A subparameter list was possibly not properly delimited.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the command syntax, and issue the command again. Save the output and contact your IBM service representative.

ICK30210I INVALID PARENTHESES FOR SPECIFYING REPEATED SUBPARAMETER LIST

Explanation

Parentheses that delimit repeated subparameter lists are either missing or not matched.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the command syntax, and reissue the command. Save the output and contact your IBM service representative.

ICK30211I KEYWORD xxxx IS IMPROPER

Explanation

The command contains a misspelled, improperly specified, or inapplicable keyword.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the command syntax, and issue the command again. Save the output and contact your IBM service representative.

ICK30212I INVALID LEFT PARENTHESIS AFTER xxxx

Explanation

There is an opening parenthesis which appears to delimit the positional parameter *xxxx*, but the positional parameter specified is not a constant or a list of constants.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the command syntax, and issue the command again. Save the output and contact your IBM service representative.

ICK30213I KEYWORD xxxx APPEARS TOO OFTEN

Explanation

The keyword *xxxx* appears too often in the command. A parameter list may be incorrectly specified.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the command syntax by removing the keyword, and issue the command again. Save the output and contact your IBM service representative.

ICK30214I HEX OR BINARY CONSTANT SPECIFIED IMPROPERLY

Explanation

A hexadecimal or binary constant is not specified in the correct format: *n* or B"*n*", respectively.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the command syntax, and issue the command again. Save the output and contact your IBM service representative.

ICK30216I ABOVE TEXT BYPASSED UNTIL NEXT COMMAND

Explanation

Syntax checking of this command found an error. Syntax checking ended. Messages issued just prior to this message indicate the nature of the error.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the command syntax, and issue the command again. Save the output and contact your IBM service representative.

ICK30217I PASSWORD IMPROPER AFTER xxxx

Explanation

A password, denoted by a slash (/), was encountered where a password is not allowed.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Remove the password from the parameter, and issue the command again. Save the output and contact your IBM service representative.

ICK30218I TOO MANY REPEATED SUBPARAMETER LISTS APPEAR

Explanation

More repeated subparameter lists are specified than are allowed for this command.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Check the command syntax, correct the error, then issue the command again. Save the output and contact your IBM service representative.

ICK30219I VERB NAME xxxx UNKNOWN

Explanation

The verb *xxxx* is not recognized as a command.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Reissue the command with the correct command name. Save the output and contact your IBM service representative.

ICK30220I IMPROPER NUMERIC DIGIT FOUND IN xxxx

Explanation

The constant *xxxx* contains a character that is not valid:

- A decimal number can only be specified with the symbols 0 through 9;
- hexadecimal number can only be specified with the symbols 0 through 9 and A through F;
- A binary number can only be specified with the symbols 0 and 1.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the command syntax error, and issue the command again. Save the output and contact your IBM service representative.

ICK30221I CONSTANT xxxx NOT WITHIN VALUE RANGE

Explanation

The value of the constant *xxxx* is outside the range of values allowed for the associated parameter.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Check the command syntax for allowed values, correct the error, then issue the command again. Save the output and contact your IBM service representative.

ICK30223I TOO MANY CONSTANTS IN LIST BEGINNING AT xxxx

Explanation

The command contains too many specified constants beginning at the characters *xxxx*.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the command syntax, and issue the command again. Save the output and contact your IBM service representative.

ICK30225I REQUIRED (SUB)PARAMETER OF xxxx IS MISSING

Explanation

A required parameter or subparameter, identified by *xxxx*, is missing.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Add the missing parameter, and issue the command again. Save the output and contact your IBM service representative.

ICK30226I INCONSISTENT PARAMETERS INVOLVING xxxx

Explanation

Some commands contain parameters that are defined as mutually exclusive. (If one parameter is specified, the other parameter is not allowed.)

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the command syntax, and issue the command again. Save the output and contact your IBM service representative.

ICK30227I VOLCOUNT MISMATCH WITH NUMBER OF INDIVIDUAL OR RANGES OF VOLUMES SPECIFIED WITH IVOLLIST OR RVOLLIST KEYWORD

Explanation

The value specified with the VOLCOUNT keyword does not match the number of entries specified with the IVOLLIST or RVOLLIST keywords. If IVOLLIST is specified then the number of individual entries should be what is indicated with VOLCOUNT. If RVOLLIST is used then VOLCOUNT should contain the number of ranges specified.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure the that VOLCOUNT value matches the number of entries in the appropriate list and resubmit the job.

ICK30228I VOLCOUNT MISMATCH WITH NUMBER OF VOLUMES SPECIFIED WITH MTIVOLLIST OR MTRVOLLIST KEYWORD

Explanation

The value specified with the VOLCOUNT keyword does not match the number of entries specified with the MTIVOLLIST or MTRVOLLIST keywords. If MTIVOLLIST is specified then the number of individual entries should be what is indicated with VOLCOUNT. If MTRVOLLIST is used then VOLCOUNT should contain the number of ranges specified.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure that the VOLCOUNT value matches the number of entries in the appropriate list and resubmit the job.

ICK30234I TOO FEW RIGHT PARENTHESES FOUND AT END OF COMMAND

Explanation

The command contains too few specified closing parentheses at the end to properly close the subparameter lists.

System action

Command processing ends.

Operator response

None.

System programmer response

Correct the command syntax. Save the output and contact your IBM service representative.

ICK30300I ERROR OPENING {dsname|ddname}

Explanation

An error occurred when attempting to open the indicated data set or volume. See the associated message for the cause of the error.

System action

See the associated message.

Operator response

None.

System programmer response

See the associated message. Save the job output and contact your IBM service representative.

ICK30301I ERROR CLOSING dsname

Explanation

An error was encountered while attempting to close the data set. See the associated message for the cause of the error.

System action

See the associated message.

Operator response

None.

System programmer response

See the associated message. Save the job output and contact your IBM service representative.

ICK30302I ACTION ERROR ON dsname

Explanation

This informational message identifies the name of the data set that was processing when the error occurred. See the associated message for an explanation of the error.

System action

None.

Operator response

None.

System programmer response

None. Save the job output and contact your IBM service representative.

ICK30304I **JCL STATEMENT MISSING

Explanation

The DD statement that was identified in the DDNAME parameter is missing.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Ensure that the DD statement is in the job stream as specified in the command. Check the DDNAME for correct spelling. Save the job output and contact your IBM service representative.

ICK30309I **RECORD xxxxx NOT WRITTEN. LENGTH INVALID

Explanation

The record *xxxxx* was not written for one of the following reasons:

- The record length was greater than LRECL of the output data set.
- The record length was less than the LRECL of the output data set and RECFM was F (fixed).

Note: *xxxxx* is the first five bytes of the record in hexadecimal format.

System action

ICKDSF continues processing until four such errors occur. After four errors, the command continues to run, but no further records are written to the output data set.

Operator response

None.

System programmer response

Redefine the data set with the correct LRECL value. Save the job output and contact your IBM service representative.

ICK30312I **SYSTEM UNABLE TO OPEN

Explanation

The DCBOFLG was not set ON following an OPEN SVC (MVS), or the OPEN system macro failed (VSE). See the associated messages for the cause of the error.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK30313I **synad.text

Explanation

An I/O error occurred. The contents of the MVS Data Management Services SYNADAF error message are written.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Check the explanation of the SYNADAF message. Correct the error, and issue the command again. Save the job output and contact your IBM service representative.

ICK30315I **RECORD SIZE GREATER THAN 32767 NOT SUPPORTED

Explanation

The system cannot process a logical record whose size is greater than 32,767 bytes.

System action

The command ends.

ICKDSF continues with the next command.

Operator response

None.

System programmer response

Change the DD statement to specify a LRECL length that is less than 32,767 bytes. Save the job output and contact your IBM service representative.

ICK30317I **PERMANENT I/O ERROR

Explanation

An error was detected while performing an I/O operation. The data set name is given in the associated message.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Check the MVS JCL statements to be sure the data set was correctly defined.

If the data set was correctly defined, there is a hardware error. The data set must be created again on another I/O device. Save the job output and contact your IBM service representative.

ICK30318I **INVALID DATA SET SPECIFICATION

Explanation

In the VSE version, the I/O adapter open/close routine was unable to open a data set because the DLBL statement contained a data set specification that was not valid.

System action

Processing for the specific data set ends. Command processing will continue if opening the specific data set is not critical to the main function performed by the command.

Operator response

None.

System programmer response

Check the DLBL statement for a probable user error. If there are no errors, save the job output and contact your IBM Service Representative.

ICK30320I **INVALID DEVICE TYPE

Explanation

In the VSE version, the I/O adapter open/close routine was unable to open a data set, because it exists on a device that is not supported for sequential processing.

System action

Processing for the specific data set ends. Command processing will continue if opening the specific data set is not critical to the main function performed by the command.

Operator response

None.

System programmer response

Probable user error. The data set does not exist on a valid device that is supported for sequential processing (SAM access method). Correct the error and submit the job again.

If the error persists, save the job output and contact your IBM Service Representative.

ICK30321I **OPEN/CLOSE ABEND EXIT TAKEN

Explanation

The OPEN/CLOSE system services SVC detected an error while either opening or closing a data set. The abend message was written to the JOBJCL data set.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Check the abend message, correct the error, then issue the command again. Save the job output and contact your IBM service representative.

ICK30330I DATA SET xxxxxxxx IS TOO SHORT FOR THE SPECIFIED FUNCTION

Explanation

The specified data set is not large enough to accommodate the data fields specified in the CCW chain.

System action

Command processing ends.

Operator response

None.

System programmer response

Reallocate the data set and submit the job again.

ICK30332I UNABLE TO PROCESS DATA SET RC=xx

Explanation

The CP macro FSSTATE was issued with RC=xx.

Code
Meaning

20
Character in fileid not valid

24
File mode not valid

28
File not found

36
Disk not accessed

80
I/O error accessing OS data set

81
OS read password protected data set

82
OS data set organization is not BSAM, QSAM, or BPAM

83
OS data set has more than 16 extents

System action

The command ends with condition code 12

Operator response

None.

System programmer response

Correct the error and run the job again.

ICK30334I {record length|format} OF DATA SET fn ft fm IS INCORRECT

Explanation

The record length must be = 80, the record format must be fixed block.

System action

Process ends.

Operator response

None.

System programmer response

Correct the data set and run the job again.

ICK30335I DATA SET ON READ ONLY DISK

Explanation

The specified file is on a read only disk.

System action

Command processing ends.

Operator response

None.

System programmer response

Correct the data set and run the job again.

ICK30336I TIC ADDRESS OUTSIDE CCW AREA OF FILE

Explanation

A TIC ccw with an address outside the ccw area of the file been found.

System action

Command processing ends.

Operator response

None.

System programmer response

Correct the data set and run the job again.

ICK30337I CCW ENDING INDICATOR NOT FOUND

Explanation

A double word of X'FFFFFFFFFFFFFFFF' was not found in the file.

System action

Command processing ends.

Operator response

None.

System programmer response

Correct the data set and run the job again.

ICK30500I MAIN STORAGE NOT AVAILABLE, COMMAND TERMINATED

Explanation

Dynamic acquisition of storage for control blocks and work areas failed.

System action

The command ends.

Operator response

Increase main storage size, and submit the job again. Save the job output and contact your IBM service representative.

ICK30699I I/O RETRY LIMIT EXCEEDED

Explanation

I/O was attempted but could not be successfully completed within the retry limit.

System action

The command might succeed if alternate recovery is possible, otherwise the command fails.

Operator response

None.

System programmer response

Determine the cause of the error and, if the cause can be overcome, rerun the job.

ICK30700I EQUIPMENT CHECK

System action

Drive test processing ends if path control is not being used. If path control is being used, drive test processing ends on the current path and ICKDSF continues with the next available path specified.

ICK30701I EQUIPMENT CHECK ON ccuu

Explanation

An EQUIPMENT CHECK I/O error occurred.

System action

If you do not receive message ICK00701I EQUIPMENT CHECK RETRY SUCCESSFUL, command processing ends.

Operator response

None.

System programmer response

Examine the failing CCW, CSW, and sense information to determine the cause of the equipment check.

Assistance of the IBM hardware service representative is required to interpret the sense information and to aid in correcting the cause of the error. Save the job output and contact your IBM hardware service representative.

ICK30702I OPERATOR DID NOT READY DEVICE

Explanation

When prompted by message ICK004D to make a device ready, operator requested that command processing end.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

None. Save the job output and contact your IBM service representative.

ICK30703I DEVICE ALREADY IN USE

Explanation

The device referred to in the ICKDSF command by the UNITADDRESS or DDNAME parameter is already being used by another job.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Determine what job is using the device, and when the job completes resubmit your job.

ICK30704I INVALID DEVICE-TYPE FOR FUNCTION

Explanation

The type of device specified is not valid for the command issued.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Issue the command again specifying an appropriate device. Save the job output and contact your IBM service representative.

ICK30705I OPERATOR DID NOT SET DEVICE TO WRITE-MODE

Explanation

I/O operations found the device set for read-only mode.

Operator elected to end command processing in response to message ICK014D instead of setting the device to write mode.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure that the device is in write mode, and submit the command again. Save the job output and contact your IBM service representative.

ICK30706I DEVICETYPE PARAMETER MISSING OR ERRONEOUS

Explanation

This message appears only in the Stand-Alone version.

The DEVICETYPE parameter must specify one of the valid device types. See Table 13 on page 8 for valid device types.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the error, and issue the command again. Save the job output and contact your IBM service representative.

ICK30707I MIMIC MINI/EMU SPECIFICATION ERRONEOUS

Explanation

The number of cylinders specified, either for an MVS minidisk for the VM environment or for an emulated count-key-data device on a fixed block architecture device, is greater than the total number of primary cylinders that exist on the volume.

System action

The command ends and ICKDSF continues processing with the next command.

Operator response

None.

System programmer response

Correct the number of cylinders that is not valid in the MINI or EMU specification, and resubmit the job.

ICK30708I DEVICETYPE PARAMETER REQUIRED WITH MIMIC MINI/EMU SPECIFICATION.

Explanation

When you specify the MIMIC MINI parameter, you must also specify the DEVICETYPE parameter.

System action

The command ends and ICKDSF continues processing with the next command.

Operator response

None.

System programmer response

Correct the command syntax, and resubmit the job.

ICK30709I ACCESS DENIED TO SHARED DEVICE ccuu BY OPERATOR

Explanation

If the operator replies T to message ICK020D, this message appears before the command ends.

System action

The command ends, and ICKDSF continues processing with the next command.

Operator response

None.

System programmer response

When the volume is accessible, submit the job again.

ICK30710I SUBSID SUPPORT NOT AVAILABLE ON SYSTEM

Explanation

The level of the VSE system where ICKDSF is running does not have the support required to run ICKDSF.

System action

Command processing ends.

Operator response

None.

System programmer response

See explanation.

ICK30711I CHANNEL ERROR: CSW=xxxxxx xxxxxxxx

Explanation

An unrecoverable channel error occurred. xx . . . xx is a hexadecimal display of the last seven bytes of the CSW at the time of the error.

System action

The command ends. ICKDSF continues processing with the next command.

Operator response

None.

System programmer response

Save the job output and contact your IBM hardware service representative

ICK30712I ccuu DEVICE TYPE VERIFICATION FAILED

Explanation

During OPEN, either ICKDSF was unable to determine the device type at address xxx, or the device type is not supported.

If the sense ID CCW X'E4' is supported by the device at address xxx, then the following message is issued:

PHYSICAL DEVICE=UNKNOWN
SENSE ID=xxxxxxxxxxxxxx

See the appropriate device manual for the sense ID information. Basically, the format is as follows:

byte 0 = X'FF'
bytes 1-3 = storage control id
bytes 4-6 = device id

If the sense ID CCW is not supported by the device, the following message is issued:

PHYSICAL DEVICE=UNKNOWN
LOGICAL DEVICE=UNKNOWN

System action

Command processing ends.

Operator response

None.

System programmer response

The Introduction lists the direct access devices supported by ICKDSF.

Ensure that the device specified by the UNITADDRESS, DDNAME, or SYSNAME parameter is supported by ICKDSF. If the device is supported by ICKDSF, save the output and contact your IBM service representative.

ICK30713I UNABLE TO ALLOCATE UCB, RC=xxxx, RSN=xxxx FROM xxxxxxxx

Explanation

An error occurred while trying to allocate the UCB. The RC and RSN are the return and reason code from the MVS service that was invoked to allocate the UCB. The service that was used is listed after FROM.

System action

ICKDSF terminates.

Operator response

Contact the system programmer.

System programmer response

Determine the reason for the inability to allocate the UCB.

ICK30714I DDNAME NOT FOUND IN JCL

Explanation

The ddname specified on the DDNAME parameter of input command could not be found for this job step.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

To include the ddname specified in the command, add a DD card to the JCL for the job step. Save the output and contact your IBM service representative.

ICK30715I DEVICE IS IN TRANSITION MODE

Explanation

The device is in transition state between 3390 mode and 3380 track compatibility mode. This can occur because a previous INSTALL command did not complete.

System action

Command processing ends.

Operator response

None.

System programmer response

Run the INSTALL command to complete the mode change before running any other commands.

ICK30716I DEVICE IS IN MEDIA MAINTENANCE RESERVE STATE

Explanation

The device is in media maintenance reserve state because a previous INSPECT PRESERVE did not complete.

System action

Command processing ends.

Operator response

None.

System programmer response

Run the INSPECT PRESERVE command to a track other than the failing track, so that the media maintenance reserve may be released.

ICK30717I UNRECOGNIZED I/O ERROR TYPE

Explanation

An I/O error has occurred, however the error cannot be recognized for the specified device type.

System action

ICKDSF has performed a retry, but the error still persists. A system or hardware error is suspected.

System programmer response

Examine the failing CCW,CSW and sense information. Assistance of the IBM service representative may be required to interpret the sense information and to aid in correcting the cause of the error.

ICK30718I FUNCTION NOT SUPPORTED FOR NONSYNCHRONOUS DASD

Explanation

The specified function cannot be performed because the device is attached to a nonsynchronous storage subsystem, which does not support 3380 track compatibility mode.

System action

The command ends.

Operator response

None.

System programmer response

The specified function can only be performed on a either a parallel channel interface or a nonsynchronous storage subsystem that supports 3380 track compatibility mode.

ICK30719I DEVICE IS IN THE "STATUS CAN NOT BE DETERMINED" STATE

Explanation

The device is in a *status cannot be determined state*. The CONTROL command with the RESETICD parameter must be run to reset this condition before any other commands are issued.

System action

The current command ends.

Operator response

None.

System programmer response

Contact your IBM service representative and run CONTROL RESETICD.

ICK30720I COMMAND FAILED - AN I/O CONFIGURATION CHANGE OCCURRED

Explanation

The command failed due to a hardware configuration change.

System action

The command processing ends.

Operator response

None.

System programmer response

Verify that you have entered the correct source and target parameters and submit the job again. The CONTROL CONFIG(DISPLAY) command can be used to verify the LSS, CCA, SSID and serial number parameters.

ICK30721I UNABLE TO DETERMINE PATH STATUS

Explanation

The path status could not be determined.

System action

Command processing ends.

Operator response

None.

System programmer response

Examine the previous messages to identify the reason the path status could not be determined.

ICK30722I FUNCTION NOT ALLOWED ON XRC VOLUME

Explanation

The device indicates that XRC is active on this volume. The specified function is not allowed when XRC is active.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

The volume must be removed from the XRC session before running this function. Refer to *z/OS DFSMS Advanced Copy Services*, *Controlling ICKDSF activity to XRC volumes* section for more information.

ICK30726I STIMERM FUNCTION CANNOT BE PERFORMED RETURN CODE = xxxxxxxx

Explanation

The system STIMERM function could not be performed.

System action

Command processing ends. The return code from the STIMERM function is printed in hexadecimal.

Operator response

None.

System programmer response

Contact your IBM service representative to assist in determining the reason the function could not be performed.

ICK30730I UNSUPPORTED DEVICE TYPE

Explanation

The device type as described in message ICK00700I is not a supported device for this release of ICKDSF.

System action

The function ends.

Operator response

None.

System programmer response

None.

ICK30731I X'xxxxxxx' CYLINDER SIZE EXCEEDS SUPPORTED SIZE X'yyyyyyy'

Explanation

The device exceeds the maximum cylinder size that ICKDSF supports. X'xxxxxxx' contains the cylinder size to which the device is configured. X'yyyyyyy' contains the supported cylinder size.

System action

Command processing ends.

Operator response

None.

System programmer response

Redefine the device to a supported size, and issue the command again. Assistance from your IBM hardware service representative may be required to redefine the device to a supported size.

ICK30732I X'xxxxxxxx' BLOCKS EXCEEDS THE SUPPORTED SIZE X'yyyyyyyy'

Explanation

The device exceeds the maximum number of blocks that ICKDSF supports. X'xxxxxxxx' contains the number of blocks to which the device is configured. X'yyyyyyyy' contains the maximum number of blocks supported.

System action

Command processing ends.

Operator response

None.

System programmer response

Redefine the device to a supported size, and issue the command again. Assistance from your IBM hardware service representative may be required to redefine the device to a supported size.

ICK30800I DEVICE IS EITHER SPARE VOLUME OR BROKEN SPARE VOLUME

Explanation

The device is either in spare volume status or in broken spare volume status. The data on the device is not accessible.

System action

Command processing ends.

Operator response

None.

System programmer response

If you want to keep the volume in spare status, then correct the device address and reissue the command. If you do not want to keep this volume as spare volume, contact your IBM service representative to change the volume status.

ICK31004I VTOC CREATION FAILED

Explanation

An I/O error occurred when attempting to write a volume table of contents on the volume.

System action

The volume table of contents is not written on the volume, and the command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK31005I INDEX IS REQUIRED WHEN STORAGEGROUP IS SPECIFIED FOR THIS DEVICE TYPE

Explanation

User is probably running ICKDSF on a device which does not support the default index (see Table 13 on page 8). In this case, the INDEX parameter must be explicitly specified when the STORAGEGROUP parameter is specified.

System action

The command ends with return code 12. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Ensure INDEX parameter is specified when STORAGEGROUP parameter is specified.

ICK31006I VOLUME LABEL CREATION FAILED

Explanation

An I/O error occurred while attempting to write a volume label.

System action

A volume label was not written, and the command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Examine the CCW, CSW, and sense information to aid in determining the cause of the failure. Also:

- During minimal initialization, writing the volume label is the first write operation that occurs on the volume. This message can be an indication that the volume is in read only mode.
- The error may be caused by a data check. Run INSPECT of cylinder 0, track 0 to correct the error.

Other failure conditions may require the aid of the IBM service representative. If so, save the job output and contact your IBM service representative.

ICK31007I ALLTRACKS NOT SUPPORTED FOR THIS FUNCTION

Explanation

The ALLTRACKS parameter is only valid for NOCHECK NOASSIGN processing.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Limit the amount of track specified by using the range parameters.

ICK31011I NON-STANDARD VOL1 RECORD DETECTED

Explanation

The VOL1 record which contains the volume label you are attempting to change is not a standard 80-character VOL1 record.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Use the AIXVOL command to change the volume label.

ICK31012I VOLID NOT SPECIFIED AND NO VOLUME LABEL EXISTS

Explanation

The volume being initialized does not contain a volume label, and no volume label was provided.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Ensure the correct volume is mounted. Specify the VOLID parameter and reissue the command. Save the job output and contact your IBM service representative.

ICK31013I UNRECOVERABLE TRACK THRESHOLD MET

Explanation

Multiple failures have occurred while writing the home address/record 0 on multiple tracks. This message follows many ICK21000 and/or ICK21001 messages.

System action

The command ends.

Operator response

None.

System programmer response

Examine prior messages (including the CCW, CSW, and sense that caused the I/O) to determine the cause of the failure.

This message may be issued if either the read/write mode switch is set to READ mode, or some other condition prevents ICKDSF from writing on the volume.

ICK21000 messages issued for the first 10 successive alternate tracks on the volume characterizes the inability to write on the volume.

If running under VM (either Stand-Alone or an operating system version running under VM), this message can indicate that a diagnostic or media maintenance function was attempted against a device that was a minidisk or LINK to the userid.

Diagnostic and media maintenance functions must be done on dedicated devices. For more information on VM support, see Chapter 8, “ICKDSF versions supported as guests under VM,” on page 65.

Assistance may be required from the IBM service representative.

ICK31015I UNABLE TO READ VOLUME LABEL

Explanation

An I/O error occurred while attempting to read the volume label to verify the volume serial number.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Either issue the command again specifying the NOVERIFY parameter, or reinitialize the volume. Save the job output and contact your IBM service representative.

ICK31016I LABEL NOT SUPPORTED FOR CMS FORMATTED VOLUMES

Explanation

The LABEL parameter was specified, but the volume is CMS formatted, not CP formatted.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Use the appropriate CMS command to change the volume label.

ICK31017I VOLID PARAMETER INVALID FOR UNITIALIZED VOLUME

Explanation

The VOLID parameter is only valid for initialized volumes.

System action

Command processing ends.

Operator response

None.

System programmer response

Initialize the volume.

ICK31019I NEXT-AVAILABLE-ALTERNATE POINTER OR COUNTER IN VTOC IS INVALID

Explanation

There is an error in either the value of the pointer to the next available alternate track or the count of the number of alternate tracks that are available.

System action

Command processing continues. If possible, the value in the VTOC is updated when processing completes.

Operator response

None.

System programmer response

Reinitialize the volume at either the minimal or the maximal level. Save the job output and contact your IBM service representative.

ICK31022I UNABLE TO CHANGE VOLUME LABEL

Explanation

An I/O error occurred while attempting to change the volume serial number, the owner identification, or the address of the volume table of contents in the volume label.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Reinitialize the volume. Save the job output and contact your IBM service representative.

ICK31023I INVALID UNITADDRESS, SYSNAME OR DDNAME SPECIFIED

Explanation

Either the channel and unit addresses specified do not exist in the system I/O configuration, or the DDNAME is incorrect, or the SYSNAME is incorrect. This message may be issued if an alias of a parallel access volume is specified when running offline in an MVS environment.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the value substituted for *ccuu*, or for *dname*, or for *sysxxx*, then issue the command again. For Parallel Access Volumes, specify the base volume of the Parallel Access Volume. Save the job output and contact your IBM service representative.

ICK31024I UNABLE TO OPEN VOLUME

Explanation

The volume that was specified cannot be opened for several possible reasons:

- The DD statement is missing or not valid.
- The channel/unit address is not valid.
- When processing in a shared environment, the device is not in an offline status on the system processing ICKDSF.
- There are I/O errors associated with the volume.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Determine the status of the volume by examining previous messages. Save the job output and contact your IBM service representative.

ICK31025I VOLUME NOT MOUNTED PRIVATE

Explanation

When online initializing, inspecting, or reformatting is requested, the specified volume must be mounted PRIVATE to prevent interference by other jobs.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Either ensure the volume is mounted PRIVATE, or perform the job offline. Save the job output and contact your IBM service representative.

ICK31026I COMMAND INVALID FOR UNINITIALIZED VOLUME

Explanation

The REFORMAT command can only be specified for a previously initialized volume.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Initialize the volume. Save the job output and contact your IBM service representative.

ICK31027I UNABLE TO WRITE VOLUME LABEL DURING VTOC CREATION

Explanation

An I/O error occurred while attempting to rewrite the volume label field that locates the volume table of contents.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK31028I INVALID VSE DATA SET NAME

Explanation

The DSname is limited to seven characters.

System action

Command processing ends.

Operator response

None.

System programmer response

Correct the data set and run the job again.

ICK31029I VTOCPTR SPECIFIED AND VOLUME LABEL EXISTS

Explanation

VTOCPTR restores destroyed *volser* information of a previously initialized volume. VTOCPTR cannot be used if the volume label exists.

System action

Command processing ends.

Operator response

None.

System programmer response

None.

ICK31030I VALID VTOC DOES NOT EXIST AT THE SPECIFIED LOCATION

Explanation

The format-4 DSCB cannot be found at the specified VTOC location.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue the REFORMAT command again specifying the correct VTOC location.

ICK31034I "ASSIGN NOCHECK" PROHIBITED WITH RANGE PARAMETERS

Explanation

The combination of ASSIGN and NOCHECK indicates the user has determined that an alternate track or block is necessary. The determination is independent of the surface analysis processes performed by ICKDSF.

If used with range parameters, this combination of parameters can easily exhaust the alternate tracks or blocks on a volume, because unconditional alternate assignment takes place.

System action

Command processing ends.

System programmer response

To unconditionally assign alternate tracks or blocks, use ASSIGN and NOCHECK with the TRACKS or BLOCKS parameter.

ICK31035I UNABLE TO READ FORMAT-4 DSCB

Explanation

An I/O error occurred while attempting to read the data set control block (DSCB) for the volume table of contents. This record is read, then rewritten, to indicate the location.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Reinitialize the volume. Save the job output and contact your IBM service representative.

ICK31036I UNABLE TO INITIALIZE 2314 MINI DISC

Explanation

Initialization of less than 2 cylinders was requested for the 2314 minidisk specification. This is not acceptable because one cylinder is always used as a cylinder of alternate tracks.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the MIMIC(MINI(n)) parameter, then reissue the command.

ICK31037I UNABLE TO REMOVE IPL TEXT

Explanation

An I/O error occurred while attempting to remove the IPL text.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK31043I NO STORAGE AVAILABLE TO HOLD RECORD BEING PRESERVED, TRACK CCHH=X'cccc hhhh'

Explanation

During surface checking, the contents of a track are preserved by reading the complete track into a dynamically allocated buffer according to the track capacity of the volume. There is insufficient space for allocating this buffer.

System action

The track under inspection is not surface checked to avoid loss of data, and the command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Either increase the system storage space, or specify the NOPRESERVE parameter if the data may be destroyed. Then issue the command again. Save the job output and contact your IBM service representative.

ICK31046I UNABLE TO WRITE FORMAT-4 DSCB AT CCHH=X'cccc hhhh'

Explanation

An I/O error occurred while attempting to update the volume table of contents. The address of the first available alternate track and the number of alternate tracks could not be written in the VTOC.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Either reinitialize the volume specifying a different cylinder and track location for the volume table of contents, or issue the INSPECT command to assign an alternate track. Save the job output and contact your IBM service representative.

ICK31048I VOLSER CHANGE NOT ALLOWED FOR ONLINE VOLUMES

Explanation

Changing the volser is not allowed for *online* volumes. The volser can be changed only on *offline* volumes.

System action

Command processing ends.

Operator response

None.

System programmer response

Vary the volume *offline* and run the command again with the VOLID parameter.

ICK31049I UNITADDRESS SPECIFIED FOR ONLINE VOLUME

Explanation

The UNITADDRESS parameter is valid for offline processing only, but this device is online.

System action

Command processing ends.

Operator response

None.

System programmer response

Either vary the volume offline, or specify the DDNAME parameter.

ICK31050I UNABLE TO ENSURE DATA AVAILABILITY -- FUNCTION TERMINATED

Explanation

You specified the AVAILABLE parameter for the INSPECT command. However, the device does not support the *concurrent media maintenance* function and ICKDSF cannot ensure the availability of the user data during the INSPECT process.

System action

Command processing ends.

Operator response

None.

System programmer response

Remove the AVAILABLE parameter and issue the command again.

ICK31052I MINIMAL INITIALIZATION NOT PERMITTED FOR MSS STAGING PACK

Explanation

Mass Storage System staging packs are not supported.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

None.

ICK31053I DIRECTIO(SECONDARY) IS SPECIFIED TO THE VOLUME IN DUPLEX STATE

Explanation

You specified the INSPECT DIRECTIO(SECONDARY) function to a volume that is in duplex state.

System action

INSPECT function is not supported on the secondary device if the volume is in duplex state.

Operator response

None.

System programmer response

Place the volume in suspended failed duplex state prior to invoking INSPECT.

ICK31054I DEVICE NOT SUPPORTED FOR THE SPECIFIED FUNCTION

Explanation

The volume specified for the command is not supported for the function defined by the combination of parameters used.

For example, ANALYZE is not valid for a 9332 device. See Table 13 on page 8 for other incompatible functions.

System action

Command processing ends.

Operator response

None.

System programmer response

Correct the control statement, and issue the command again.

ICK31055I CONCURRENT MEDIA MAINTENANCE FUNCTION REQUIRED FOR DUAL COPY VOLUMES

Explanation

In order to process a volume that is part of a dual copy pair, the INSPECT command requires the *concurrent media maintenance* function on this storage control.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact your IBM hardware service representative. In the interim, reset the dual copy pair to simplex state and run the INSPECT command on the volume in simplex state.

ICK31056I VTOC LOCATION IN VOLUME LABEL INCORRECT

Explanation

The VTOC location specified in the standard volume label is incorrect. Therefore, addressability to the volume table of contents is lost.

System action

The command ends. Command processing continues with the next command.

Operator response

None.

System programmer response

Reinitialize the volume, and reestablish addressability to the volume table of contents.

ICK31057I INVALID DEVICE TYPE: VTOC INDEX NOT SUPPORTED ON THIS DEVICE

Explanation

The device type is not valid for initialization with a VTOC index.

System action

The creation of the VTOC index is not attempted. INIT command ICKDSF continues.

Operator response

None.

System programmer response

None.

ICK31058I ccuu I/O ERROR DETECTED DURING INDEX CREATION: ERROR CODE= *

Explanation

An I/O error occurred during VTOC index creation processing. Error codes:

1
Error occurred in reading the volume label

2
Error occurred in reading the VTOC

3
Error occurred in writing the VTOC

4
Error occurred in writing index records

5
Index extent was violated; increase index size

System action

VTOC index creation processing ends. The VSE volume indicator is turned on in the VTOC. INIT command processing continues.

Operator response

Ask the system coordinator to analyze the cause of the error.

System programmer response

None. Save the output and contact your IBM service representative.

ICK31059I INDEX STARTING LOCATION INVALID AS SPECIFIED

Explanation

The INDEX parameter, or starting location, on the INIT command statement is not valid for one of the following reasons:

- It caused an overlap with the VTOC.
- It defined cylinder 0, track 0 as the starting location of the index data set.
- It was outside the physical limits of the device.
- The relative track specified is not valid for the device.
- The ending location of the index exceeds cylinder 65,520, head 14.

System action

Command processing ends.

Operator response

None.

System programmer response

Check the values specified for the INDEX parameter, and correct the value in error. Submit the job again.

ICK31060I VTOC INDEX RECORDS EXCEEDED THE MAXIMUM VALUE ALLOWED

Explanation

The specified index extent cannot be built as it requires a number of index records greater than the maximum value allowed. For the maximum VTOC and VTOC index sizes, refer to appendix C. VTOC index.

System action

Command processing ends.

Operator response

None.

System programmer response

Modify the size of the VTOC and or index extent and reissue the command.

ICK31061I ccuu VTOC INDEX CREATION SUCCESSFUL: VOLUME IS IN INDEX FORMAT

Explanation

The VTOC index was successfully created on the volume.

System action

None.

Operator response

None.

System programmer response

None.

ICK31062I ccuu VTOC INDEX CREATION FAILED: RETURN CODE= 12

Explanation

Index creation was unsuccessful.

System action

None.

Operator response

None.

System programmer response

Check the job output for additional information on the reason for job failure.

ICK31063I UNABLE TO READ HOME ADDRESS BEFORE DATA SAVED FROM CCHH=X'cccc hhhh'

Explanation

Before the data on a track is read, the home address must be read from the specified track. This read operation failed.

System action

ICKDSF continues with the next track. The return code is set to 8.

Operator response

None.

System programmer response

Attempt to recover the data on the track if necessary. (This may not be possible because the home address cannot be read.) Then inspect the failing track specifying NOPRESERVE in order to take all possible recovery actions.

If the volume is part of a dual copy pair, put the volume in simplex state to perform an INSPECT with NOPRESERVE.

Note: No further inspection of this track takes place; no information regarding the condition of this track is retained or included in the map when processing completes.

ICK31064I UNABLE TO READ RECORD ZERO BEFORE DATA SAVED FROM CCHH=X'cccc hhhh'

Explanation

Before the data on a track is read, record 0 must be read from the specified track. This read operation failed.

If the sense information is all zeros, and the CSW indicates only channel end/device end/incorrect length, it could be an indication that ICKDSF processing was previously aborted while running on this track.

System action

ICKDSF continues with the next track. The return code is set to 8.

Operator response

None.

System programmer response

Attempt to recover the data on the track if necessary. (This may not be possible because record 0 cannot be read.) Then inspect the failing track specifying NO PRESERVE in order to take all possible recovery actions.

If the volume is part of a dual copy pair, put the volume in simplex state to perform an INSPECT with NOPRESERVE.

Note: No further inspection of this track takes place; no information regarding the condition of this track is retained or included in the map when processing completes.

ICK31065I INVALID DEVICE SIZE: INIT COMMAND NOT SUPPORTED ON THIS DEVICE

Explanation

The volume is greater than 65,520 cylinders and the system requires it to use cylinder-managed space above 65,520 cylinders. Because cylinder-managed space is managed by the system in units of 21 cylinders (referred to as the *minimum allocation unit*), the device must have a total volume size in cylinders that is evenly divisible by 21. This volume does not meet the requirement, so a VTOC and INDEX cannot be created for it.

System action

Command processing ends.

Operator response

None.

System programmer response

Define the volume to a size that is divisible by the minimum allocation unit. If the additional assistance is required, save the job output and contact your IBM service representative.

ICK31066I PRESERVE RECOVERY FAILED DATA MAY BE LOST FOR TRACK CCHH=X'cccc hhhh'

Explanation

This message follows message ICK21047I if the preserved data cannot be successfully written to an alternate track.

System action

Command processing ends.

Operator response

None.

System programmer response

Analyze the accompanying CCW, CSW, and sense bytes information to determine the cause of the failure.

After the failing situation has been determined and corrected, issue an INSPECT of the failing track to ensure that the track is in a proper format. Data recovery procedures may be required for the previous data on the track.

ICK31067I UNABLE TO ESTABLISH PRIMARY AND ALTERNATE ASSOCIATION FOR TRACK CCHH =X'cccc hhhh'

Explanation

During the concurrent media maintenance process, the HA/R0 of the specified primary track cannot be written to associate it to an alternate track because of an I/O error.

System action

Command processing ends.

Operator response

None.

System programmer response

Examine the failing CCW, CSW and SENSE information to determine the cause of the error.

ICK31070I DUPLEX PAIR STATE HAS BEEN CHANGED

Explanation

The state of the duplex pair has been changed (not by ICKDSF) during the direct I/O operation.

System action

Command processing ends.

Operator response

None.

System programmer response

Save the ICKDSF output and document which primary or secondary physical volume was processing.

Investigate the cause of the state change, then take action appropriate to your installation's procedure. If you suspect equipment problems, contact your IBM service representative.

Resume the ICKDSF job.

Note: If the volume becomes suspended duplex state, the original primary and secondary volume may be swapped.

ICK31082I DEVICE TYPE OF SPECIFIED UNIT ADDRESS IS INVALID FOR THIS COMMAND

Explanation

The specified device type is not acceptable for this command.

System action

The command ends.

Operator response

None.

System programmer response

A previous message should indicate the device type of the specified unit. Examine the description of the input command to determine the valid device types for the specified command.

ICK31096I UNABLE TO READ VOLUME LABEL - CANNOT VERIFY VOLUME

Explanation

An INSPECT specifying verify has been requested either on a volume that does not contain a volume label, or on a volume that is online to an MVS operating system.

System action

Because verification cannot take place without a volume label (and/or the operating system cannot function with an online volume that contains an unreadable volume label), the command ends.

Operator response

None.

System programmer response

Either use the INIT command to write a volume label, then run the INSPECT command with the NOVERIFY parameter again, and/or vary the device offline.

ICK31300I VERIFICATION FAILED: VOLUME-SERIAL WRONG

Explanation

The VERIFY parameter was specified, but the specified volume serial number does not match the volume serial number found in the volume label.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Ensure that the correct volume is mounted. Either correct the volume serial number specified in the command, or specify the NOVERIFY parameter. Save the job output and contact your IBM service representative.

ICK31301I VERIFICATION FAILED: OWNER-ID WRONG

Explanation

The VERIFY parameter was specified, and the specified owner identification does not match the owner identification found in the volume label.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Ensure that the correct volume is mounted. Either correct the owner identification specified in the command, or specify the NOVERIFY parameter. Save the job output and contact your IBM service representative.

ICK31302I VERIFICATION FAILED: VOLUME-SERIAL EXISTS

Explanation

The VERIFY(*NONE*) parameter was specified, but a volume serial number was found in the volume label.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Ensure that the correct volume is mounted. Either specify the VERIFY parameter with the volume serial number, or specify the NOVERIFY parameter.

ICK31303I UNABLE TO VERIFY AUTHORIZATION FOR PROTECTED DATA SET

Explanation

An attempt was made to scratch a data set, but the user was not authorized to do so.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Either obtain the proper authorization, or reissue the command in the offline mode. Save the job output and contact your IBM service representative.

ICK31304I SYSTEM OPERATOR DID NOT CONFIRM DATA SET PURGING

Explanation

The operator replied T to the console message received.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Determine if the data may be purged and, if so, issue the command again and reply U to the console message. Save the job output and contact your IBM service representative.

ICK31305I UNEXPIRED OR PASSWORD PROTECTED DATA SET FOUND ON VOLUME

Explanation

The attempt to process an online volume using either INIT with NOPURGE or INSPECT with NOPRESERVE, found unexpired or password-protected data sets. These prevent initialization or inspection of the volume.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

If the unexpired or password protected data sets can be purged, either issue the INIT command again with the PURGE parameter (or the INSPECT command with the PRESERVE parameter), or process the volume offline. Save the job output and contact your IBM service representative.

ICK31306I VERIFICATION FAILED: DEVICE FOUND TO BE GROUPED

Explanation

The VERIFYOFFLINE parameter was specified and the device was found to be grouped. The device is assumed to be online.

System action

Processing of the command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Ensure that the correct device has been specified and that it is offline to all host systems. If the device supports ANALYZE NODRIVE NOSCAN with the HOSTACCESS parameter, the host access information for grouped paths for the device will be displayed after this message. This information may be used to determine which systems the device is online to.

ICK31307I CORRECTABLE DATA CHECK LIMIT EXCEEDED THE THRESHOLD

Explanation

During the REVAL FIXSIM(4E4E) or REFRESH process, excessive data checks were detected.

System action

Command processing terminates.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK31308I DATA CHECK OCCURS WHILE RESTORING TRACK X'cccc hhhh'

Explanation

While restoring user data, a data check was detected.

System action

Command processing terminates.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK31309I READ BACK CHECK FAILED ON TRACK X'cccc hhhh', DATA LOST

Explanation

While restoring user data, reread user data failed with data checks. User data was lost.

System action

Command processing terminates.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK31310I REVALIDATE FIXSIM(4E4E) PROCESS CAN NOT CONTINUE

Explanation

During the REVAL FIXSIM(4E4E) process, a severe error was detected.

System action

Command processing terminates.

Operator response

None.

System programmer response

Refer to the previous messages for problem determination.

ICK31311I REVALIDATE REFRESH PROCESS CAN NOT CONTINUE

Explanation

During the REVAL REFRESH process, a severe error was detected.

System action

Command processing ends.

Operator response

None.

System programmer response

Refer to the previous messages for problem determination.

ICK31322I RACHECK FAILED FOR resname

Explanation

You attempted to execute an ICKDSF command for which you are not authorized. The request failed as the resource was protected by RACF. Resname will contain the resource name.

System action

Command processing ends.

Operator response

None.

System programmer response

Obtain the proper level of authorization.

ICK31323I RACROUTE FAILED SAF RETURN CODE = nn RACF RETURN CODE = nn RACF REASON CODE = nn

Explanation

RACF was unable to complete the request to check user authority to access a resource. For descriptions of the error codes, see the return code information under RACROUTE REQUEST=AUTH in the External Security Interface (RACROUTE) Macro Reference.

System action

Command processing ends.

Operator response

None.

System programmer response

Correct the error indicated in the error codes.

ICK31324I VOLUME CONTAINS VSAM DATA SET(S)

Explanation

The volume being processed online contains one or more VSAM data sets.

System action

The data sets are not destroyed, and the command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Either use Access Method Services to delete the VSAM data sets, or initialize the volume offline. Save the job output and contact your IBM service representative.

ICK31325I OPERATOR REFUSED TO CONTINUE PROCESSING

Explanation

The operator responded T to message ICK003D when a reply to continue processing was requested.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Determine the reason the request to process was refused, and reissue the command.

ICK31326I IMPROPER RACF ACCESS AUTHORITY

Explanation

A volume that is RACF protected cannot be processed unless the user has the proper level of authorization.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Either obtain the proper level of authorization, or process the volume in offline mode. Save the job output and contact your IBM service representative.

ICK31327I NO STORAGE AVAILABLE FOR MAXIMUM TRACK CAPACITY RECORD

Explanation

No main storage buffer space was available to store the bit pattern that would eventually be written on the volume during surface check.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Specify a larger region size for the job step, and submit the job again.

ICK31328I UNABLE TO OBTAIN STORAGE

Explanation

Dynamic acquisition of storage for control blocks and work areas failed.

System action

Command processing ends.

Operator response

None.

System programmer response

Increase storage size and submit the job again.

ICK31329I ERROR DURING FREEMAIN

Explanation

An error occurred during processing of the FREEMAIN macro.

System action

Command processing ends.

Operator response

None

System programmer response

Contact your IBM service representative.

ICK31330I UNIT PARAMETER INVALID

Explanation

The specified UNIT parameter is not valid in this operating system environment.

System action

Command processing ends.

Operator response

None.

System programmer response

Check the accepted parameters for the specified command to determine what parameters are valid for this operating system.

ICK31331I REALADDR PARAMETER INVALID

Explanation

The specified REALADDR parameter is not valid in this operating system environment.

System action

Command processing ends.

Operator response

None.

System programmer response

Check the accepted parameters for the specified command to determine the valid parameters for this operating system.

ICK31332I SUBCHSET PARAMETER INVALID

Explanation

The specified SUBCHSET parameter is not valid in this operating system environment.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure that you are running the z/OS version of ICKDSF and that the operating system is at z/OS V1R10 or higher.

ICK31333I SUBCHSET VALUE IS INVALID

Explanation

The value for subchannel set identifier specified with the SUBCHSET(*subchset-identifier*) parameter is not valid in this operating system environment.

System action

Command processing ends.

Operator response

None.

System programmer response

Check the values for the subchannel set identifier that are supported by the level of z/OS on which the command was issued.

ICK31335I SPECIFIED RANGE IS INVALID WHEN USED WITH REALADDR PARAMETER

Explanation

Specified addresses for the INSPECT REALADDR command cannot exceed either one cylinder for CKD devices, or one block for FBA devices

System action

Command processing ends.

Operator response

None.

System programmer response

Check the accepted parameters for the specified command to determine the valid parameters.

ICK31336I VERIFYOFFLINE PARAMETER INVALID

Explanation

Either the VERIFYOFFLINE parameter specified is not valid in this operating system environment or

additional hardware or software is needed for this support.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure that you are running the z/OS version of ICKDSF and that you have the hardware and software that are required for the requested function.

ICK31396I TOO MANY DATA CHECKS ON VOLUME

Explanation

During processing for the specified volume, more data checks occurred than are considered reasonable for this device type.

System action

The command ends.

Operator response

None.

System programmer response

This message indicates that an abnormal amount of data checks have occurred for this volume.

If a large number of data checks are expected for the volume, issue the command again.

Otherwise, seek the aid of the IBM hardware service representative. Obtain helpful information by running ANALYZE SCAN of the volume for its output, in addition to the current ICKDSF output.

ICK31401I UNABLE TO PROCESS FURTHER

Explanation

An error prevents further processing on this device.

This message is issued when path control is used and an error prevents processing on any remaining paths.

It is also issued when a volume in duplex or suspended duplex state changes its state during processing.

System action

Command processing ends.

Operator response

None.

System programmer response

Examine previous messages to determine the cause of the error.

ICK31403I ccuu DATA SCAN VALUES INVALID, TESTING TERMINATED

Explanation

The relative block numbers, tracks, or cylinders specified by the LIMITS parameter are not valid.

System action

Data verification is not done.

Operator response

Specify valid relative block numbers, tracks, or cylinders in the LIMITS parameter, and submit the request again.

ICK31404I ccuu VOLUME HAS UNFORMATTED DATA BLOCKS, TESTING TERMINATED

Explanation

An attempt was made to read a data block which was not initialized (data field not written).

System action

After 504 data checks, the ANALYZE command ends.

Operator response

Perform appropriate procedures to recover all desired data from the volume. Then reinitialize the volume, using the ICKDSF INIT command specifying the CHECK parameter.

ICK31405I NO STORAGE AVAILABLE

Explanation

Dynamic acquisition of storage for work areas and control blocks failed.

System action

Command processing ends.

Operator response

Increase main storage size.

ICK31406I INVALID DATA RECEIVED FROM DEVICE, *varname=varvalue*

Explanation

A CCW was issued to the device, and data was returned which is invalid. The *varname* value contains the variable that ICKDSF is referencing, and the *varvalue* value contains the data passed back from device.

System action

The command ends.

Operator response

None.

System programmer response

None. Save the job output and contact your IBM service representative.

ICK31410I MAIN STORAGE NOT AVAILABLE, TESTING TERMINATED

Explanation

Dynamic acquisition of storage for work areas and control blocks failed.

System action

Command processing ends.

Operator response

Increase main storage size.

ICK31412I *ccuu* DEVICE NOT READY, TESTING TERMINATED

Explanation

A condition has caused "Intervention Required" to be posted in the failing CSW sense byte.

System action

The ANALYZE command ends.

Operator response

Ready the drive, and issue the command again.

ICK31413I DATAVER DATA FORMAT UNACCEPTABLE ON CYLINDER X'cccc'|X'cccCCCC'

Explanation

One of the following conditions might have occurred at hexadecimal cylinder X'cccc'|X'cccCCCC' on the device:

- The data on the identified cylinder is written in a format unreadable by the standard IBM CCWs.

  Examine and correct this condition using the INIT or INSPECT commands.
- A drive error (such as dropping ready) occurred during the test. The condition that caused the drive error is usually intermittent or marginal, and was not detected during the drive tests.

  Seek support from your IBM hardware service representative.
- The volume under test is also accessed by another program, and the other program erased a record that ANALYZE might be trying to reread. This condition is not probable, but if it occurs, run the ANALYZE job again.

System action

ANALYZE command processing ends with a return code of 8.

Operator response

None.

System programmer response

See "Explanation." Check subsequent messages for status of drive.

ICK31414I MAIN STORAGE NOT AVAILABLE FOR DRIVE TEST

Explanation

Storage is not available for CCW and work areas.

System action

Command processing ends.

Operator response

Increase storage size and submit the job again.

System programmer response

None.

ICK31415I UNABLE TO READ HOME ADDRESS FROM CE TRACK X'cccc hhhh'

Explanation

Unable to read the home address from the CE track during the Write System Stress Test.

System action

Command processing terminates.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK31416I UNABLE TO WRITE RECORDS TO CE TRACK X'cccc hhhh'

Explanation

Unable to write records onto the CE track during the Write System Stress Test.

System action

Command processing terminates.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK31417I MULTIPLE DATA CHECKS OCCUR ON TRACK X'cccc hhhh'

Explanation

At least two data checks occurred on the same CE track during the Write System Stress Test.

System action

Command processing terminates.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK31418I DATA CHECKS EXCEED HEAD THRESHOLD

Explanation

More than two data checks occurred on the same CE track during the Write System Stress Test.

System action

Command processing terminates.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK31420I DATA COMPARE ERROR STARTING AT BYTE = X'xxxx'
EXPECTED DATA =
+ 00 ....
+ 10 ....
RECEIVED DATA =
+ 00 ....
+ 10 ....

Explanation

The data transferred during the drive test did not match what was expected. The starting byte printed by the message is the first byte that did not compare (relative to the beginning of the transferred data).

The expected and received data is dumped starting at offset 0 from the point of mismatch. The length of the data dumped is variable.

System action

Command processing ends on this path. Some tests are bypassed.

Operator response

None.

System programmer response

Contact your IBM hardware service representative for assistance in resolving the problem.

ICK31430I EXCESSIVE 0F0B ERRORS OCCURRED ON THE VOLUME

Explanation

The 0F0B errors encountered on the volume excessed the threshold.

System action

Command processing ends.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK31501I **INVALID DEVICE TYPE SPECIFIED FOR BUILDIX COMMAND**

Explanation

A request was made to change the format of a VTOC on a volume whose device type is not supported by the BUILDIX command (for example, a 9332 DASD).

System action

Command processing ends.

Operator response

None.

System programmer response

Verify that the volume is on a device type supported by the BUILDIX command, and change the JCL or command statement.

ICK31505I **ccuu VTOC FORMAT IS CURRENTLY **FORMAT, REQUEST REJECTED**

Explanation

The format of the VTOC is currently the same as the format requested in the BUILDIX command statement.

** identifies the format of the VTOC, either OS or IX.

System action

Command processing ends.

Operator response

None.

System programmer response

Check the command statement. (The format requested must be opposite the current VTOC format identified in this message.)

Be certain that the JCL DD statement correctly identifies the volume. Change the statements where required, and submit the job again.

ICK31509I **ccuu DIRF FLAG SET IN VTOC, COMMAND CANNOT PROCEED**

Explanation

An error during VTOC processing on a previous job caused the DADSM interrupt flag to be set in the VTOC. The VTOC is not accurate.

System action

Command processing ends.

Operator response

Prepare a job that will cause reconstruction of the VTOC, and run it against the volume. (For example, run an IEFBR14 job to allocate a temporary data set to the volume.)

On conclusion of this job, reissue the command again.

Note: The VTOC DIRF bit and the indexed bit (DS4VTOC=5) should never be set on together. If they are, the IEFBR14 job, mentioned in the previous paragraph, cannot correct the VTOC. To correct this condition, you can use the SUPERZAP program, available with your system, to turn the DIRF bit off.

System programmer response

None.

ICK31510I **ccuu BUILDIX REQUEST CANCELLED DUE TO OPERATOR ACTION**

Explanation

The operator replied CANCEL to a message requiring a response.

System action

Command processing ends.

Operator response

None.

System programmer response

Confirm the reason for cancellation of the job with the operator.

ICK31511I **ccuu CVAF ERROR: RETURN CODE=** ERROR CONDITION= ***

Explanation

The common VTOC access facility returned to ICKDSF with a return code indicating either a logical error or a physical error. Return codes have the following meanings:

4, 12
Logical errors

8
Index structure not valid

16
I/O error

For more information on these error conditions, refer to *z/OS DFSMSdfp Diagnosis*.

System action

Command processing ends

Operator response

None.

System programmer response

Refer to the DADSM program logic manual for a full explanation of CVAF return codes and error condition codes.

ICK31512I ccuu ERROR: SYS1.VTOCIX. IS A VIO DATASET. BUILDIX TERMINATED.

Explanation

The index data set was allocated as a VIO data set and is not supported by the BUILDIX command.

System action

Command processing ends with a return code of 12. The VTOC is left unchanged.

Operator response

None.

System programmer response

Ensure that allocation of the index data set specifies a permanent data set.

Check the JCL statement that defines the index data set and change the parameter. Resubmit the job.

ICK31514I INDEXED VTOC FACILITY NOT ON SYSTEM

Explanation

There is a request to change a VTOC to IXVTOC format, but the system does not contain indexed VTOC programming support.

System action

If the command was BUILDIX, then command processing ends. If the command was REFORMAT, then ICKDSF will not rebuild the index after VTOC expansion process is completed.

Operator response

None.

System programmer response

None.

ICK31515I ccuu BUILDIX COMMAND FAILED.

Explanation

An error caused command processing to end.

System action

Command processing ends.

Operator response

None.

System programmer response

Check the job output for messages describing the type of failure.

ICK31516I ccuu I/O ERROR DETECTED DURING VTOC CONVERSION: ERROR CODE= *

Explanation

An I/O error occurred during BUILDIX processing. Error codes:

1
Error occurred in reading the volume label

2
Error occurred in reading the VTOC

3
Error occurred in writing the VTOC

4
Error occurred in writing index records

5
Index extent was violated; increase index size

System action

BUILDIX command processing ends.

Operator response

Consult the system coordinator to identify the problem.

System programmer response

None.

ICK31517I ccuu ERROR: VOLUME IS A DOS STACKED PACK

Explanation

The volume being processed has a VTOC on the first track of the volume. VTOC conversion is not possible on such a volume.

System action

Command processing ends.

Operator response

None

System programmer response

Correct the problem on the volume, possibly by initializing the volume with an INIT command.

Note: This will purge all existing data on the volume.

ICK31518I ccuu ERROR: VOLUME CONTAINS SPLIT CYLINDER EXTENTS

Explanation

The volume contains one or more shared extent data sets. These are not supported by the command.

System action

Command processing ends.

Operator response

None.

System programmer response

None.

ICK31519I ccuu ERROR: SYS1.VTOCIX. DATASET NOT FOUND ON VOLUME

Explanation

The index data set could not be found on the volume.

System action

BUILDIX command processing ends.

Operator response

None.

System programmer response

Check the job control statements to see if a DD statement exists that will allocate the index data set.

If the statement exists, make sure the name is specified correctly. Correct the error and submit the job again.

ICK31520I ccuu ERROR: DUPLICATE INDEX DATASET NAME FOUND ON VOLUME

Explanation

Two data sets were found on the volume that had names beginning with SYS1.VTOCIX. Only one is allowed per volume.

System action

BUILDIX command processing ends.

Operator response

None.

System programmer response

Either submit a job to scratch one of the data sets, or scratch both data sets if new index allocation is desired.

ICK31521I ccuu ERROR: INDEX DATASET EXTENT NOT CONTIGUOUS

Explanation

This data set occupies more than one extent. The index data set must occupy one, and only one, extent.

System action

BUILDIX command processing ends.

Operator response

None.

System programmer response

Scratch the index data set that is not valid. Submit the job again with a job control statement that will ensure only one extent is allocated to the index.

ICK31522I INVALID UNITADDRESS OR DDNAME SPECIFIED

Explanation

The UNITADDRESS or DDNAME is incorrect in the command statement.

System action

BUILDIX command processing ends.

Operator response

Correct the job control statement, and resubmit the job.

System programmer response

None.

ICK31523I VTOC ENQUEUE FAILURE

Explanation

ENQ RET=HAVE returned higher than a return code 8 (task does not have resources).

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Submit the job again when ENQ can be obtained.

ICK31526I CONVERSION TO OSFORMAT COULD NOT COMPLETE SUCCESSFULLY

Explanation

The VTOC indicated an error condition at the conclusion of BUILDIX processing to convert to OSFORMAT.

System action

BUILDIX ends abnormally.

Operator response

None.

System programmer response

This message is usually an indication that the OS VTOC on the volume contains an error. Examine the VTOC to determine the nature of the error.

ICK31528I INDEX DATA SET CANNOT START AT CYLINDER 0, TRACK 0

Explanation

You specified cylinder 0 track 0 for the index data set location. This is not a valid location.

System action

BUILDIX command processing ends.

Operator response

None.

System programmer response

Issue the command again using a valid location.

ICK31529I ALLOCATE ERROR: RETURN CODE = **

Explanation

DADSM allocate returned to ICKDSF with an unexpected return code.

System action

BUILDIX command processing ends.

Operator response

Ensure that DEVMAN is running on the system on which you issued the BUILDIX command.

System programmer response

Refer to *z/OS DFSMSdfp Diagnosis* for a full explanation of DADSM allocate return codes. For more information on DEVMAN refer to *z/OS MVS System Commands*.

ICK31530I NO ROOM IN VTOC OR VTOC INDEX ON VOLUME

Explanation

An index could not be built as DADSM allocate indicated to ICKDSF that the VTOC or VTOC index on the volume is full.

System action

Command processing ends.

Operator response

None.

System programmer response

You may free up space by either moving data sets to another volume or deleting unwanted data sets from the volume. Or you may expand the VTOC and VTOC index using the REFORMAT command.

ICK31531I DUMPCONDITIONING VOLSER CAN NOT BE SET TO EXISTING VOLSER

Explanation

The volume serial number specified in the VOLID parameter is the same as the existing one on the volume. To identify a volume as a conditioned volume change the current volser.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Specify a new volume serial and issue the command again.

ICK31538I REMOVEIPLTXT PARAMETER INVALID FOR CP-FORMATTED VOLUMES

Explanation

The REMOVIPLTXT parameter was specified on a volume that has been formatted with the CPVOLUME command for use in a VM environment.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

The REMOVEIPLTXT parameter is only valid with volumes that have been initialized with the INIT command.

ICK31539I EXTINDEX PARAMETER INVALID FOR OFFLINE VOLUMES

Explanation

In the MVS environment the volume must be online when EXTINDEX is specified.

System action

Command processing ends.

Operator response

None.

System programmer response

Vary the device online and reissue the command using the DDNAME parameter.

ICK31540I NEWVTOC PARAMETER INVALID FOR ONLINE VOLUMES

Explanation

In the MVS environment the volume must be offline when NEWVTOC is specified.

System action

Command processing ends.

Operator response

None

System programmer response

Vary the device offline and reissue the command with the UNIT parameter.

ICK31541I NEW VTOC EXTENT IS NOT LARGER THAN THE ORIGINAL VTOC EXTENT

Explanation

The size of the new VTOC must be greater than the size of the old VTOC.

System action

Command processing ends.

Operator response

None

System programmer response

Modify the size of the new VTOC and reissue the job.

ICK31542I OVERLAY BETWEEN THE OLD AND NEW VTOC IS NOT ALLOWED

Explanation

The beginning and ending locations of the new VTOC must not be the same as the old VTOC. Overlay between the new and old VTOC is not allowed.

System action

Processing ends.

Operator response

None

System programmer response

Modify the location of the new VTOC and reissue the job. Or specify NEWVTOC(ANY,n) to let ICKDSF find the first free extent for the new VTOC.

ICK31543I I/O ERROR DETECTED WHILE ACCESSING VTOC : ERROR CODE = x

Explanation

An I/O error occurred while ICKDSF was accessing the VTOC. These are possible error codes:

1
Error occurred in reading the VTOC.

2
Error occurred in writing the VTOC.

System action

ICKDSF processing ends.

Operator response

None

System programmer response

Save the job output and contact your IBM service representative.

ICK31544I SPECIFIED VTOC EXTENT WAS OCCUPIED BY THE FOLLOWING DATA SETS :

Explanation

The specified VTOC extent is allocated to other data sets. Refer to message ICK00546 for the data set names.

System action

Command processing ends.

Operator response

None

System programmer response

Either modify the new VTOC location, or delete those data sets that are no longer needed, or move those data sets to another location, then run the job again.

ICK31545I FREE SPACE IS NOT AVAILABLE FOR THE NEW VTOC

Explanation

Either the specified VTOC extent is allocated to other data sets, or the free extents on the volume are too small to fit the new VTOC.

System action

Command processing ends.

Operator response

None

System programmer response

Either modify the new VTOC location, or delete those data sets that are no longer needed, or move those data sets to another location. Or, if NEWVTOC was specified, you may specify NEWVTOC(ANY,n) to let ICKDSF find the first free extent, if one is available for the new VTOC.

Note: For devices containing more than 64K tracks, there are special considerations for VTOC placement. The existing IBM software uses relative track addressing or the Track-Track-Record (TTR) format to process the VTOC. This restricts the highest address that can be referenced as a VTOC track to be 64K-1. Because of this, the entire VTOC must reside within the first 64K tracks; that is, the VTOC must end before cylinder 4369 (X'1111') head 1.

ICK31548I NEW VTOC EXTENT MUST BE SPECIFIED

Explanation

The VTOC extent is a required subparameter for NEWVTOC or EXTVTOC.

System action

Command processing ends.

Operator response

None

System programmer response

Modify the command and reissue the job.

ICK31549I ERROR WAS FOUND IN VTOC: ERROR CODE = x

Explanation

An error was found in the VTOC in regards to data set information. The possible error codes are:

1
F1 or F3 pointer does not point to a F3 DSCB, or F8 pointer does not point to a F9 DSCB.

2
Invalid data set extent information. If F1 or F8 DSCB then refer to message ICK00546 for the data set name.

3
Invalid record number

System action

Command processing ends.

Operator response

None

System programmer response

Follow the procedures at your installation for reconstructing VTOCs. After the VTOC is repaired, reissue the command.

ICK31550I INVALID VTOC LOCATION SPECIFIED:

Explanation

The specified VTOC location contained invalid characters.

System action

Command processing ends.

Operator response

None

System programmer response

Correct the VTOC location and reissue the job.

ICK31551I TOO MANY SUBPARAMETERS SPECIFIED IN PARAMETER : parameter

Explanation

The number of subparameters specified in the listed parameter exceeds the limit.

System action

Command processing ends.

Operator response

None

System programmer response

Correct the command syntax, and issue the command again.

ICK31560I ERROR OCCURRED WHILE ISSUING MACRO OVTOC, RETURN CODE =

Explanation

In the VSE environment, during the opening of the volume, an error occurred trying to obtain an exclusive open using the OVTOC macro. The value of return code is in decimal.

System action

Command processing ends.

Operator response

None

System programmer response

See the *IBM VSE/Enterprise Systems Architecture VSE Central Functions Diagnosis Reference LIOCS Version 6 Release 4*, and the *VSE/ESA Messages and Codes* for the reason for failure.

ICK31565I ERROR OCCURRED WHILE ISSUING MACRO ASSIGN,RETURN CODE =

Explanation

In the VSE environment, during the opening of the volume, an error occurred trying to dynamically assign a system logical unit. The value of return code is in decimal.

System action

Command processing ends.

Operator response

None

System programmer response

See the *IBM VSE/Enterprise Systems Architecture VSE Central Functions Initial Program Load and Job Control Diagnosis Reference Version 6 Release 6*, and the *VSE/ESA Messages and Codes* for the reason for failure.

ICK31602I INCORRECT DEVICETYPE, MAPALT TERMINATED

Explanation

The device type specified is not supported by the MAPALT command.

System action

MAPALT command processing ends.

Operator response

Specify the correct device type in the DEVICETYPE keyword of the command statement, and submit the job again. (MAPALT can only be processed on fixed block devices in fixed block mode.)

System programmer response

None.

ICK31603I UNABLE TO OPEN VOLUME

Explanation

The volume that was specified cannot be opened. The ASSGN statement could be either missing or not valid, or the channel and unit address could be not valid.

System action

MAPALT command processing ends.

Operator response

Correct the error, and submit the job again.

System programmer response

None.

ICK31604I ccuu LIMITS PARAMETER INVALID AS SPECIFIED, MAPALT TERMINATED

Explanation

The relative block numbers specified by the LIMITS parameter are not valid.

System action

MAPALT command processing ends.

Operator response

Correct the values in the LIMITS parameter, and submit the job again.

ICK31605I ccuu UNRECOVERABLE I/O ERROR DETECTED, MAPALT TERMINATED

Explanation

An unrecoverable I/O error (other than a data check) was encountered.

System action

MAPALT command processing ends.

Operator response

Check the job output for diagnostic information to aid in analyzing the error.

Run the ICKDSF ANALYZE command as a problem determination aid, then follow installation procedures for recovery from this type of error.

System programmer response

None

ICK31607I ccuu MAPALT ABNORMALLY ENDED, REPORT MAY BE INCOMPLETE

Explanation

An error caused command processing to end. The report may be incomplete.

System action

None.

Operator response

Check previous job output messages, and follow installation procedures.

System programmer response

None.

ICK31611I MAIN STORAGE NOT AVAILABLE, MAPALT TERMINATED

Explanation

Dynamic acquisition of storage for control blocks and work areas failed.

System action

MAPALT command ended.

Operator response

Increase main storage size, and submit the job again.

System programmer response

None.

ICK31700I VTOC EXTENT INVALID

Explanation

Either the starting or ending block number as calculated from the FBAVTOC parameter is not valid.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the FBAVTOC parameter so the ending parameter is within the device limits. Run the job again.

ICK31701I VTOC EXTENT EXCEEDED THE MAXIMUM VALUE ALLOWED

Explanation

The specified VTOC extent has exceeded the maximum allowed. See Appendix C, “VTOC index,” on page 655 for the maximum VTOC size for different device types.

System action

Command processing ends.

Operator response

None

System programmer response

Modify the size of the VTOC extent and reissue the job.

ICK31702I AN UNRECOVERABLE I/O ERROR OCCURRED DURING RECLAIM PROCESSING

Explanation

An unrecoverable I/O error occurred during INIT reclaim processing.

System action

Command processing ends.

Operator response

None.

System programmer response

Prior messages should be examined (including the CCW, CSW, and sense that caused the I/O) to determine the cause of the failure.

Run the INIT command again after the problem has been resolved.

Assistance may be required from the IBM service representative. Save the job output and contact your IBM hardware service representative.

ICK31705I ALTERNATE BLOCKS EXHAUSTED

Explanation

A prime block needed an alternate, but all available alternate blocks have already been assigned.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Reinitialize the volume with RECLAIM specified to free alternate blocks. If this is not successful, save the job

output and contact your IBM hardware service representative.

ICK31706I AN UNRECOVERABLE I/O ERROR OCCURRED DURING SURFACE ANALYSIS

Explanation

An unrecoverable I/O error occurred during INIT surface analysis.

System action

Command processing ends.

Operator response

None.

System programmer response

Prior messages should be examined (including the CCW, CSW, and sense that caused the I/O) to determine the cause of the failure. Resolve the problem and run the INIT command again.

Assistance may be required from the IBM service representative. Save the job output and contact your IBM hardware service representative.

ICK31709I I/O ERROR FORMATTING BLOCK IDENTIFIER

Explanation

An uncorrectable error occurred while formatting the block identifier field of a block on a 3370.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Contact your IBM hardware service representative. Save the job output and contact your IBM hardware service representative.

ICK31710I I/O ERROR FORMATTING BAD BLOCK xxxxxxxxxx

Explanation

An uncorrectable error occurred while formatting the defective block xxxxxxxx.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Contact your IBM hardware service representative. Save the job output and contact your IBM hardware service representative.

ICK31711I CANNOT READ SA INFORMATION

Explanation

The surface analysis information (factory-flagged list) cannot be read because of an I/O error.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Contact your IBM hardware service representative. Save the job output and contact your IBM hardware service representative.

ICK31712I INVALID SA INFORMATION FORMAT

Explanation

The data format of SA information (factory-flagged list) is in error. (Typically, the end of data is not found.)

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Contact your IBM hardware service representative. Save the job output and contact your IBM hardware service representative.

ICK31713I CANNOT READ PRIME CYLINDER IDS

Explanation

An uncorrectable I/O error occurred while reading the ID fields of prime blocks.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Contact your IBM hardware service representative. Save the job output and contact your IBM hardware service representative.

ICK31715I SETMODE PARAMETER INVALID FOR THIS DEVICE TYPE

Explanation

The SETMODE parameter of the INSTALL command is only valid for 3390 devices.

System action

Command processing ends.

Operator response

None

System programmer response

Correct the parameters and run the job again.

ICK31716I INVALID PARAMETER(S) FOR DEVICE TYPE: list of parameters

Explanation

Parameters in the parameter list are not valid for device type being processed. For example, the VTOC parameter is specified for an INIT of an FBA device, or the CHECK parameter is specified for the IBM 3375, 3380, or 3390.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct parameters, and run the job again.

ICK31717I VERIFICATION FAILED: VOL1 LABEL DOES NOT EXIST

Explanation

Verification failed because the volume being initialized does not have a VOL1 label to use for the verify. This may indicate the wrong volume.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Resolve the problem and run the job again.

ICK31718I INIT FAILED: VOLID NOT SPECIFIED AND I/O ERROR READING VOLUME LABEL

Explanation

The VOLID parameter is not specified. Because of an I/O error reading the volume label, a volume serial is not available.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Try specifying VOLID.

If this is not successful, identify the cause of the I/O error reading the volume label. Save the job output and contact your IBM hardware service representative.

ICK31719I INVALID PARAMETER(S) FOR OPEN-SYSTEM - list of parameters

Explanation

Parameters shown in the list are not valid with parameters for open-system DASD.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the parameters and run the job again.

ICK31720I VOLUME SIZE IS TOO SMALL FOR THIS FUNCTION

Explanation

The size of the volume (number of cylinders) is too small for this function.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Use a larger volume to run this function.

ICK31721I LSS PARAMETER REQUIRED FOR DEVICE TYPE

Explanation

The LSS parameter is required to be specified for this device.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the parameters and run the job again.

ICK31722I VERIFICATION FAILED: I/O ERROR READING VOL1 LABEL

Explanation

An uncorrectable I/O error occurred while reading the VOL1 label. Verification cannot continue.

System action

Diagnostic information is printed on the output device. The command is ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Reinitialize the volume, specifying NOVERIFY and a VOLID. Start recovery procedures for data on the volume. Save the job output and contact your IBM hardware service representative.

ICK31723I TOO MANY LINK ADDRESSES SPECIFIED FOR DEVICE TYPE

Explanation

The number of link addresses specified is more than what is allowed for this device type.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the parameters and run the job again.

ICK31724I SEC LSS SPECIFIED DOES NOT MATCH LSS IN LINKADDR: X'xxxx xxxx'

Explanation

The logical subsystem number specified as the secondary LSS in the LSS parameter does not match the destination LSS specified in the last byte of the linkaddress. X'xxxx xxxx' is the linkaddress specified that does not match.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the parameters and run the job again.

ICK31728I FBA MINIDISK NOT SUPPORTED IN THIS ENVIRONMENT

Explanation

Fixed block architecture minidisks are not supported in VSE or MVS environments.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Run the command in the Stand-Alone version of ICKDSF.

ICK31748I COMMAND CANNOT BE EXECUTED - DEVICE ACCESS LIMITED

Explanation

The current command cannot be processed because certain types of access are prohibited for the specified device.

For example, a diagnostic control CCW cannot be issued for a minidisk.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Make sure the issued command is compatible with the specified device.

ICK31749I DEVICE TYPE NOT SUPPORTED IN THIS ENVIRONMENT

Explanation

The device type is not supported in your version of ICKDSF.

System action

Command processing ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Refer to the command description in the user's guide to see which versions of ICKDSF support this device type. Make sure that the appropriate version is installed before running the job again.

ICK31750I TRACKS OR ALLTRACKS PARAMETER REQUIRED FOR CKD DEVICES

Explanation

BLOCKS was specified for a count-key-data device. You must specify either TRACKS or ALLTRACKS for these devices.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Resubmit the job, specifying either TRACKS or ALLTRACKS. Save the output and contact your IBM service representative.

ICK31751I BLOCKS PARAMETER REQUIRED FOR FBA DEVICE

Explanation

TRACKS OR ALLTRACKS was specified for a fixed block architecture device. You must specify BLOCKS for these devices.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Submit the job again, specifying BLOCKS. Save the output and contact your IBM service representative.

ICK31753I NO VALID BLOCK NUMBERS SPECIFIED

Explanation

All the block numbers specified by the BLOCKS parameters were not valid. This message is preceded by one or more ICK11752I messages.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Resubmit the job, specifying the correct block numbers in the BLOCKS parameter. Save the output and contact your IBM service representative.

ICK31756I READ FOR PRESERVE OF BLOCK xxxxxxxx FAILED: UNRECOVERABLE I/O ERROR

Explanation

The user data on block xxxxxxxx could not be read because of unrecoverable I/O errors.

System action

Diagnostic information is printed on the output device and block processing ends to prevent loss of the user data on the block. Command processing continues with the next valid block specified in the BLOCKS parameter.

Operator response

None.

System programmer response

None. Save the job output and contact your IBM hardware service representative.

ICK31757I READ FOR PRESERVE OF BLOCK xxxxxxxx FAILED: INSPECT ECC CORRECTION LOGIC FAILED

Explanation

The read for the user data on block xxxxxxxx failed with an error correction code (ECC) correctable error, and the ECC correction information in the sense did not correspond to the expected information for the processed CCW chain.

System action

Diagnostic information is printed on the output device, and command processing ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

None. Save the output and contact your IBM service representative.

ICK31758I USER DATA ON BLOCK xxxxxxxx LOST

Explanation

Command processing failed with a permanent error. ICKDSF was unable to restore the user data on block xxxxxxxx.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Start recovery procedures for the data set containing block xxxxxxxx. Save the output and contact your IBM service representative.

ICK31762I CHECK FUNCTION FOR BLOCK xxxxxxxx FAILED: UNRECOVERABLE I/O ERROR

Explanation

An unrecoverable I/O error occurred during surface analysis of block xxxxxxxx.

System action

Diagnostic information is printed on the output device. The command ends, and ICKDSF continues with the next command.

If you specified PRESERVE, you receive either message ICK31758I or message ICK01759I on the output device to indicate the status of the user data on the block.

Operator response

None.

System programmer response

Save the job output and contact your IBM hardware service representative.

ICK31763I ASSIGN FUNCTION FOR BLOCK xxxxxxxx FAILED: NO ALTERNATE BLOCKS AVAILABLE

Explanation

An attempt was made to assign an alternate to block xxxxxxxx, and there are no more alternates available.

System action

The command ends. ICKDSF continues with the next command.

If you specified PRESERVE, you receive either message ICK31758I or message ICK01759I on the output device to indicate the status of the user data on the block.

Operator response

None.

System programmer response

Reinitialize the device. Save the output and contact your IBM service representative.

ICK31764I ASSIGN FUNCTION FOR BLOCK xxxxxxxx FAILED: FORMAT DEFECTIVE BLOCK ERROR

Explanation

An unrecoverable error occurred while using the format defective block CCW chain to assign a new alternate to block xxxxxxxx.

System action

Diagnostic information is printed on the output device. The command ends, and ICKDSF continues with the next command.

If you specified PRESERVE, you receive either message ICK31758I or message ICK01759I on the output device to indicate the status of the user data on the block.

Operator response

None.

System programmer response

Save the job output and contact your IBM hardware service representative.

ICK31766I ASSIGN FUNCTION FOR BLOCK xxxxxxxx FAILED: NO NON-DEFECTIVE ALTERNATES FOUND

Explanation

The format defective block CCW chain was retried 10 times for block xxxxxxxx and all ten assigned alternates failed surface analysis.

System action

The command is ends, and ICKDSF continues with the next command.

If you specified PRESERVE, you receive either message ICK31758I or message ICK01759I on the output device to indicate the status of the user data on the block.

Operator response

None.

System programmer response

Save the job output and contact your IBM hardware service representative.

ICK31767I ASSIGN FUNCTION FOR BLOCK xxxxxxxx FAILED: UNRECOVERABLE I/O ERROR OCCURRED DURING SURFACE ANALYSIS

Explanation

An unrecoverable I/O error occurred during surface analysis of the alternate assigned to block xxxxxxxx.

System action

Diagnostic information is printed on the output device. The command ends and ICKDSF continues with the next command.

If you specified PRESERVE, you receive either message ICK31758I or message ICK01759I on the

output device to indicate the status of the user data on the block.

Operator response

None.

System programmer response

Save the job output and contact your IBM hardware service representative.

ICK31768I INVALID LOGICAL AND PHYSICAL DEVICE COMBINATION FOR REQUESTED FUNCTION

Explanation

The logical and physical device types were not equal. This was determined from the information returned from the sense ID (Sense I/O Type) CCW. Emulation of fixed block architecture devices is not supported by ICKDSF.

System action

The command ends, and ICKDSF continues with the next command.

Operator response

None.

System programmer response

Verify the device configuration is supported by ICKDSF. Save the output and contact your IBM service representative.

ICK31769I DEVICE BLOCK SIZE OF nnnn NOT SUPPORTED

Explanation

The block size (nnnn) information returned from the characteristics CCW of a read device does not equal 512.

System action

The command ends, and ICKDSF continues with the next command.

Operator response

None.

System programmer response

Save the job output and contact your IBM hardware service representative

ICK31772I INSUFFICIENT STORAGE AVAILABLE TO READ VTOC

Explanation

Dynamic acquisition of storage for an input buffer failed.

System action

The command ends and ICKDSF continues with the next command.

Operator response

None.

System programmer response

Increase the amount of storage available for GETMAIN/GETVIS. Save the output and contact your IBM service representative.

ICK31773I VOL1 LABEL NOT FOUND

Explanation

An online volume does not have a VOL1 label.

System action

The command ends, and ICKDSF continues with the next command.

Operator response

None.

System programmer response

Either initialize the volume, or run the command again in the Stand-Alone version of ICKDSF.

ICK31774I I/O ERROR READING VOL1 LABEL

Explanation

A permanent I/O error occurred while reading the VOL1 label.

System action

Diagnostic information is printed on the output device. The command ends, and ICKDSF continues with the next command.

Operator response

None.

System programmer response

Reinitialize the volume, and start recovery procedures for the data on the volume.

The INIT command for reinitialization must specify the NOVERIFY and VOLID parameters. Save the job output and contact your IBM hardware service representative.

ICK31775I DATAVER: DATA CHECK EXCEEDED THRESHOLD

Explanation

The number of data checks exceeded the limit set for the specified device.

- For FBA devices, this limit is 504.
- For CKD devices, this limit is equivalent to the number of alternate tracks for this device, or 50, whichever is larger.

System action

Command processing ends with a return code of 12.

Operator response

None.

System programmer response

Save the console output and the printer output. Take action appropriate to your installation procedures for determining if an equipment problem exists.

If the problem is equipment-related, contact your IBM hardware service representative.

ICK31776I dataset IS A RACF-PROTECTED DATA SET, BUT RACF IS INACTIVE

Explanation

The named data set is marked as RACF protected, but RACF is not active on the system. This prevents ICKDSF from determining the user's authority to alter the data set.

System action

Command processing ends after the security function completes.

Operator response

None.

System programmer response

Activate RACF on the system or run in offline mode.

ICK31777I UNRECOVERABLE I/O ERROR READING THE VTOC

Explanation

An unrecoverable I/O error occurred while the ICKDSF security function tried to read the VTOC.

System action

Command processing ends and the next command, if any, is processed.

Operator response

None.

System programmer response

Investigate the cause of the I/O error. If required, run the command in an offline mode or Stand-Alone version.

Save the job output and contact your IBM hardware service representative.

ICK31779I dataset IS A RACF-PROTECTED DATA SET, BUT NO RACF PROFILE EXISTS

Explanation

The named data set is marked as RACF protected, but the RACF data set does not contain a profile for the named data set.

System action

Command processing ends after the security function completes.

Operator response

None.

System programmer response

Contact the system RACF administrator. If required, run the command in an offline mode or the Stand-Alone version of ICKDSF.

ICK31780I dataset IS A RACF-PROTECTED DATA SET, BUT THE USER IS NOT AUTHORIZED

Explanation

The named data set is RACF protected and the user does not have authority to alter the data set.

System action

Command processing ends after the security function completes.

Operator response

None.

System programmer response

Contact the system RACF administrator.

ICK31782I dataset IS A PASSWORD PROTECTED DATA SET, NO PASSWORD GIVEN

Explanation

The named data set is password protected, and the user gave no password for it.

System action

Command processing ends after the security function completes.

Operator response

None.

System programmer response

Supply a password for the named data set using the PASSWORDS parameter, and run the job again.

ICK31783I dataset IS A PASSWORD PROTECTED DATA SET, USER HAS NO ALTER AUTHORITY

Explanation

The named data set is password protected, and the password supplied by the user does not give authority to alter the data set.

System action

Command processing ends after the security function completes.

Operator response

None.

System programmer response

Supply the correct password and run the job again.

ICK31784I dataset IS A PASSWORD PROTECTED DATA SET, WRONG PASSWORD GIVEN

Explanation

The named data set is password protected, and the password supplied by the user for this data set is incorrect.

System action

Command processing ends after the security function completes.

Operator response

None.

System programmer response

Supply the correct password and run the job again.

ICK31785I USER SECURITY EXIT ROUTINE RETURNED AN INVALID CODE = X'code'

Explanation

The user security exit returned a code other than the codes documented in Appendix F, “User security exit module,” on page 667, of this manual.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact the owner of your installation's user security exit routine for ICKDSF.

ICK31786I dataset IS A PASSWORD PROTECTED DATASET, USER EXIT REJECTS DATASET

Explanation

The named data set is password protected, and the user security exit module indicates the user is not authorized to alter this data set.

System action

Command processing ends after the security function completes.

Operator response

None.

System programmer response

Consult the owner of your installation's user security exit module.

ICK31787I TRACK X'00000000' CANNOT BE INSPECTED WITH "NOPRESERVE"

Explanation

ICKDSF does not allow INSPECTing cylinder 0, track 0 in an online mode with the NOPRESERVE option.

System action

Command processing ends after the security function completes.

Operator response

None.

System programmer response

If required, run in either an offline mode or in a Stand-Alone version of ICKDSF.

ICK31788I TRACK X'cccc hhhh' IS CONTAINED IN THE VTOC

Explanation

The track identified in the message is contained in the volume table of contents and cannot be INSPECTed with NOPRESERVE.

System action

Command processing ends after the security function completes.

Operator response

None.

System programmer response

If required, run the job in either an offline mode or in the Stand-Alone version of ICKDSF.

ICK31789I VOLUME volser IS RACF PROTECTED AND THE USER HAS INSUFFICIENT ACCESS AUTHORITY

Explanation

The named volume is RACF-protected, and the user does not have authority to alter its contents.

System action

Command processing ends, and the next command, if any, is processed.

Operator response

None.

System programmer response

Consult the RACF administrator for your installation.

ICK31790I dataset IS A PASSWORD PROTECTED DATA SET, UNRECOVERABLE I/O ERROR IN PASSWORD DATA SET

Explanation

An unrecoverable I/O error occurred in the system password data set while verifying the user's authority to modify the named data set.

System action

Command processing ends and the next command, if any, is processed.

Operator response

None.

System programmer response

Consult the system programmer at your installation.

ICK31791I dataset IS AN UNEXPIRED DATASET, USER NOT AUTHORIZED

Explanation

The expiration date for the named data set has not yet passed, and either the PURGE parameter was not specified on the INIT command, or the command is INSPECT with NOPRESERVE.

System action

Command processing halts after the security function is complete.

Operator response

None.

System programmer response

If INIT is used, specify the PURGE parameter and run the job again. If INSPECT is used, run specifying PRESERVE.

ICK31792I dataset IS A VSAM DATASET, USER NOT AUTHORIZED

Explanation

The named data set is a VSAM data set and either the PURGE parameter was not specified on the INIT command, or NOPRESERVE was specified on the INSPECT command.

System action

Command processing ends after the security function completes.

Operator response

None.

System programmer response

If INIT is used, specify PURGE and run the job again. If INSPECT is used, run specifying PRESERVE, or take the volume off line and rerun with NOPRESERVE.

ICK31793I dataset IS A PASSWORD/VSAM/ UNEXPIRED DATASET, USER EXIT TERMINATES COMMAND

Explanation

The named data set is either a password protected, VSAM or unexpired data set. The user security exit module has indicated that ICKDSF should end command processing.

System action

Command processing ends and the next command, if any, is processed.

Operator response

None.

System programmer response

Consult the owner of the user security exit module at your installation.

ICK31794I dataset: UNRECOVERABLE I/O ERROR READING FORMAT 2/ FORMAT 3 DSCB

Explanation

An unrecoverable I/O error occurred while reading a Format 2/ Format 3 data set label for the named data set.

System action

Command processing ends and the next command, if any, is processed.

Operator response

None.

System programmer response

Consult the system programmer at your installation. If required, run in either an offline mode or in the Stand-Alone version.

ICK31796I TRACK INSIDE VTOC INDEX DATASET CANNOT BE INSPECTED WITH"NOPRESERVE"

Explanation

One or more tracks to be inspected are contained in the INDEX VTOC data set and cannot be inspected with NOPRESERVE.

If the TRACKS parameter is specified, the preceding ICK01795I messages identify the specified tracks that are inside the INDEX VTOC data set.

System action

Command processing ends after the security function is complete.

Operator response

None.

System programmer response

If required, run in either an offline mode or the Stand-Alone version.

ICK31797I TRACKS INSIDE VTOC CANNOT BE INSPECTED WITH "NOPRESERVE"

Explanation

One or more tracks to be inspected are contained in the VTOC and cannot be inspected with NOPRESERVE.

System action

Command processing ends after the security function completes.

Operator response

None.

System programmer response

If required, run in either an offline mode or the Stand-Alone version.

ICK31799I OPERATOR REFUSED PERMISSION TO RECLAIM SYSTEM RESERVE AREA ON *ccuu*

Explanation

The operator replied T to message ICK177D

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Determine why the requested processing was refused and issue the command again.

ICK31816I PREVIOUS COMMAND DID NOT COMPLETE: commandname

Explanation

A previous command did not complete. The command that did not complete is indicated by *commandname*. Current command processing will be inhibited until the condition is corrected.

System action

Command processing ends.

Operator response

None.

System programmer response

Run the command that did not complete first.

ICK31817I TRACK x'00000000' CANNOT BE PROCESSED ONLINE

Explanation

The ICKDSF command does not allow processing of cylinder 0, head 0 in an MVS online mode.

System action

Command processing ends after the security function completes.

Operator response

None.

System programmer response

If required, run in either an offline mode or a Stand-Alone version of ICKDSF.

ICK31818I TRACK INSIDE VTOC INDEX DATASET CANNOT BE PROCESSED ONLINE

Explanation

One or more tracks to be processed are contained in the INDEX VTOC dataset, and the command does not allow processing of these tracks in an MVS online mode.

System action

Command processing ends after the security function completes.

Operator response

None.

System programmer response

If required, run in either an offline mode or a Stand-Alone version of ICKDSF.

ICK31819I TRACKS INSIDE VTOC CANNOT BE PROCESSED ONLINE

Explanation

One or more tracks to be processed are contained in the VTOC, and the command does not allow processing of these tracks in an MVS online mode.

System action

Command processing ends after the security function completes.

Operator response

None.

System programmer response

If required, run in either an offline mode or a Stand-Alone version of ICKDSF.

ICK31820I INVALID TRACK FORMAT DETECTED ON X'cccc hhhh'

Explanation

The primary track was flagged defective but the associated alternate track did not point back to the primary track. The data on the primary track was lost.

System action

Command processing terminates.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK31821I FREQUENCY OF SURFACE CHECKING PROCESS EXCEEDS THE LIMIT

Explanation

During the REVAL FIXSIM(4E4E) or REFRESH process, the number of surface checks performed on the primary track exceeded the limit.

System action

Command processing terminates.

Operator response

None.

System programmer response

Save the job output and contact your IBM service representative.

ICK31827I UNABLE TO DO CONCURRENT PRESERVE ON TRACK CCHH = X'xxxx xxxx'

Explanation

The *concurrent media maintenance* process was unable to guarantee that it has read the unmodified data from the track. Either the number of records or the format of data records is consistently changing. This problem has two possible causes:

- Consistent reformatting of the track by the user program while the INSPECT process is preserving the data.
- A hardware error.

System action

The process ends.

Operator response

None.

System programmer response

This message is preceded with ICK11827. Run the job again and ensure that there is no other application accessing the same volume during the INSPECT process. If either this message or message ICK11827 persists, contact your IBM service representative.

ICK31837I IPL TEXT EXISTS ON VOLUME. OPERATOR REFUSED PERMISSION TO OVERLAY

Explanation

A volume already contains IPL text, and it cannot be replaced.

The operator refused permission to replace the IPL text.

System action

The command ends.

Operator response

None.

System programmer response

Either specify a volume that does not contain IPL text, or instruct the system operator to allow permission.

ICK31841I FORMAT FC STATUS CANNOT BE DETERMINED FOR DEVICE ccuu

Explanation

An I/O error prevented completion of the RESETICD function. This problem has two possible causes:

- A hardware error.
- The device is not in the FC status and therefore does not need to be reset.

System action

ICKDSF ends.

Operator response

None.

System programmer response

See *Storage Subsystem Library 3990 Manuals*. Examine the CCW, CSW, and sense information to determine the cause of the error. Take action appropriate to your installation's procedures.

ICK31851I EXTENDED CKD FUNCTIONS CANNOT BE ACTIVATED - COMMAND TERMINATED

Explanation

The device has never been online to the operating system, and the extended CKD functions (for example, cache logic) have not been activated. ICKDSF surface checking functions cannot be performed.

System action

Command processing ends.

Operator response

To activate the extended CKD functions, the device must be either:

- Varied online and varied offline or
- Varied online and the job run online

Also make certain that at least one I/O path to the device is online.

System programmer response

When the device cannot be varied online (that is, there is either no volume label or duplicate volume label), this procedure will process completely enough to activate the extended CKD logic. The job can be successfully run offline again.

ICK32106I RANGE SPECIFICATIONS INVALID

Explanation

The combination and/or values of the parameters specifying the current range are not valid.

System action

Command processing ends.

Operator response

None.

System programmer response

Correct the parameters, and run the job again.

ICK32110I TOO MANY TRACKS IN SPECIFIED RANGE FOR SKIP DISPLACEMENT FUNCTION

Explanation

The total number of tracks to be processed is greater than the maximum allowed for SKIP processing.

System action

Command processing ends.

System programmer response

Run the job again with either a smaller range, or the NOSKIP parameter.

ICK32111I TOO MANY TRACKS IN SPECIFIED RANGE

Explanation

The total number of tracks in the specified range is greater than the maximum allowed for INSPECT processing.

System action

Command processing ends.

Operator response

None.

System programmer response

Either run the job again with a smaller range, or if necessary, save the data and use the INITialize command.

ICK32112I UNABLE TO SET/RESET/READ CHECKPOINT DATA, PROCESSING TERMINATES

Explanation

The current INSPECT process is unable to set/reset/read the checkpoint data because of an I/O error. The recovery process for the error is depleted.

System action

The current INSPECT process ends.

Operator response

None.

System programmer response

If it is determined there is no other ICKDSF job processing the same device from a different processor, the INSPECT job can be submitted again using the FORCE parameter.

ICK32113I ONLINE REVALIDATE FIXSIM(4E4E) IS INVALID WHEN FIXSIM(4E4E) CHECKPOINT EXIST

Explanation

The REVALIDATE FIXSIM(4E4E) command has been issued to an online volume, which contains checkpoint data from a previous REVALIDATE FIXSIM(4E4E) command which did not complete.

System action

Command processing terminates.

Operator response

None.

System programmer response

Vary the device offline and reissue the FIXSIM(4E4E) job with the UNIT parameter.

ICK32114I INVALID SUBPARAMETER SPECIFIED IN PARAMETER : xxxxxx

Explanation

The subparameter the user specified in the listed parameter is not valid.

System action

Command processing terminates.

Operator response

None.

System programmer response

Correct the subparameter and reissue the job.

ICK32115I ONLINE REVAL REFRESH IS INVALID WHEN REFRESH CHECKPOINT EXIST

Explanation

When previous REVAL REFRESH did not complete, the user cannot specify another REVAL REFRESH while the device was online.

System action

Command processing ends.

Operator response

None.

System programmer response

Vary the device offline and reissue the REVAL REFRESH job with the UNIT parameter.

ICK32120I PRESERVE BACKUP FUNCTION CANNOT BE ACTIVATED

Explanation

The PRESERVE backup function of the INSPECT command cannot be activated. This message follows message ICK12118I.

System action

Command processing ends.

Operator response

None.

System programmer response

The job can be run again using HOLDIT.

If the error is temporary, the job can be run again.

ICK32121I CANNOT WRITE DATA ON THE PRESERVE TRACK

Explanation

An I/O error occurred while backing up user data on the preserve track.

System action

Command processing ends.

Operator response

None.

System programmer response

The job can be run again using HOLDIT.

Note: This system programmer response is valid only for the INSPECT command.

If the error is temporary, the job can be run again.

ICK32122I PRESERVE BACKUP FUNCTION CANCELLED USE "HOLDIT"

Explanation

An I/O error occurred while performing the PRESERVE backup function. This message is preceded by a message indicating the reason for cancellation.

System action

Command processing ends.

Operator response

None.

System programmer response

The job can be run again using HOLDIT.

If the error is temporary, the job can be run again.

ICK32123I PRESERVE DATA EXISTS THAT DOES NOT BELONG TO THIS MINIDISK

Explanation

User is trying to preserve data for the specified minidisk. However, there is preserve data that already exists for a different minidisk.

System action

Command processing ends.

Operator response

None.

System programmer response

See track address in ICK12120I to determine which minidisk is affected. Either recover or erase the previous preserve data before issuing the command again.

ICK32127I DATA CANNOT BE RECOVERED, INSPECT TERMINATED

Explanation

This message is issued after a reply of T to messages ICK22158I, ICK22130I, ICK12126I or ICK12159I.

ICK32160I CANNOT WRITE DATA ON THE PRESERVE BLOCK

Explanation

An I/O error was encountered while backing up user data on the preserve block.

System action

Command processing ends.

Operator response

None.

System programmer response

The job can be run again using HOLDIT.

If the error is temporary, the job can be run again.

ICK32165I TOO MANY BLOCKS IN SPECIFIED RANGE

Explanation

The total number of blocks in the specified range is greater than the maximum allowed for INSPECT processing.

System action

Command processing ends.

Operator response

None.

System programmer response

Either run the job again with a smaller range, or if necessary, save the data and use the INITialize command.

ICK32166I ERROR NOT A DATA CHECK-PROCESSING TERMINATED

Explanation

An I/O error occurred that was not a data check. See the previous messages, CCW, CSW, and sense information to determine the cause of the error.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Examine the previous messages, CCW, CSW, and sense information to determine the cause of the I/O error.

ICK32167I ALTERNATE TRACK CANNOT BE ASSIGNED FOR TRACK CCHH=X'cccc hhhh'

Explanation

The INSPECT command to unconditionally assign alternate tracks found no alternate track available for X'cccc hhhh'

No assignment for this track has taken place.

System action

Command processing ends.

Operator response

None.

System programmer response

Available alternate tracks are depleted.

To unconditionally assign tracks:

1. Issue INSPECT with RECLAIM for tracks that already have alternates assigned to them.
2. If any tracks can be reclaimed, run the job again to assign an unconditional alternate to this track.

Note: When MAP is specified, a map is produced at the end of INSPECT processing. The map contains the tracks that currently have alternate tracks assigned.

If MAP is not specified, run INSPECT NOCHECK NOASSIGN MAP TRACKS(xxxx,xxxx) for any track to produce a map.

ICK32170I - CONTINUE DATA EXISTS FOR THIS VOLUME - RUN INITIALIZE

Explanation

A previous INIT job did not complete for this INSPECT job.

For CKD devices, there is probably a track on the volume that cannot be used by the operating system. The volume label and the VTOC have not been written on the volume.

System action

Command processing ends.

Operator response

None.

System programmer response

Run an INIT at the minimal level or higher before running this INSPECT job again.

ICK32171I PREVIOUS INSTALL OR REVAL COMMAND DID NOT COMPLETE

Explanation

An INSTALL/REVAL command did not complete and the volume has been left in an unusable state. Current command processing will be inhibited until the condition is corrected.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue a command that ensures the device is returned to a usable condition (for example, INSTALL, medial initialization, or REVAL).

ICK32175I UNABLE TO SET/RESET MODE

Explanation

During INSTALL command processing, an I/O error occurred while switching the device to 3390 mode or 3380 track compatibility mode.

System action

Command processing ends.

Operator response

None.

System programmer response

Examine the CSW, CCW, and sense information in the previous message to determine the cause of the error.

ICK32176I DATA CHECK THRESHOLD EXCEEDED ON FOLLOWING HEAD(S):

Explanation

The data error rate on one or more heads exceeded the data check error rate threshold criterion for the device.

The message prints heads in error.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Take action appropriate to your installation's procedures for handling the suspected equipment problems. If the problem cannot be determined, contact your IBM service representative.

ICK32177I DATA SETS EXIST ON DFSMS MANAGED VOLUME

Explanation

An online INIT has been issued to a Data Facility Storage Management Subsystem (DFSMS) managed volume which contains data sets other than the index data set and/or VVDS.

System action

Command processing ends.

Operator response

None.

System programmer response

Either delete the data sets from the volume or perform the INIT offline, or specify the SMSDSEXIST parameter to allow the online INIT to a DFSMS managed volume which contains data sets.

ICK32178I UNRECOVERABLE TRACK ON CE/SA CYLINDER, CCHH = X'xxxx xxxx'

Explanation

All attempts to write the home address and/or record zero on the indicated track failed.

System action

Command processing ends.

Operator response

None.

System programmer response

Examine the failing, CCW, CSW, and sense information to determine the cause of the error.

Contact the IBM hardware service representative to aid in resolving the problem.

ICK32179I DATA SETS EXIST ON VOLUME

Explanation

The NODSEXIST parameter was specified with the INIT command and data sets other than the VTOC index data set or VVDS exist on the volume.

System action

Command processing ends.

Operator response

None.

System programmer response

Verify that this is the correct volume you wish to initialize. If it is then either delete the data sets from the volume or remove the NODSEXIST parameter.

ICK32180I DIAGNOSTIC INFORMATION FOR CHECKPOINT DATA:

Explanation

The checkpoint process failed. Diagnostic information is printed.

System action

See the other associated messages.

Operator response

None.

System programmer response

None.

ICK32181I UNABLE TO DETERMINE CHECKPOINT INFORMATION, FUNCTION TERMINATED

Explanation

Either an I/O error or a subsystem failure prevents identification of checkpoint data.

System action

The associated diagnostic information is printed and the function ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK32182I UNABLE TO UPDATE CHECKPOINT INFORMATION, FUNCTION TERMINATED

Explanation

Checkpoint data cannot be updated because of either an I/O error or subsystem failure.

System action

The associated diagnostic information is printed and the function ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK32190I CURRENT PROCESS TERMINATED DUE TO CHECKPOINT DATA

Explanation

See the checkpoint data described in ICK12180. The current process cannot continue without completion of the previous ICKDSF function.

System action

Command processing ends.

Operator response

None.

System programmer response

Run the command again as described in ICK12180I.

ICK32203I INSUFFICIENT STORAGE AVAILABLE FOR DATA SET ENQUEUE -- FUNCTION TERMINATED

Explanation

GETMAIN failed while obtaining the storage necessary to process data set enqueue procedures. Because TOLERATE(ENQFAIL) was not specified, command processing ends.

System action

Command processing ends.

Operator response

None.

System programmer response

Run the job again either providing more storage, specifying TOLERATE(ENQFAIL), or specifying fewer total tracks, or taking the volume offline.

Note: The request for storage cannot exceed available free private area storage below 16MB that is available to a batch job in the private area. The request for storage is calculated in the following way: *number of tracks* * 49.

ICK32310I FUNCTION NOT SUPPORTED FOR READ ONLY MINIDISK

Explanation

The ICKDSF command function you requested cannot be performed on a read only minidisk.

System action

The command ends. ICKDSF continues with the next command.

Operator response

none.

System programmer response

none.

ICK32315I DEVICE ADDRESS COULD NOT BE FOUND TO ESTABLISH A LINK

Explanation

ICKDSF must obtain an unused virtual address to establish a full-pack overlay link for the minidisk media maintenance function.

Address range 05FF to 0000 in descending order was checked and no address was found available.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

use CP DETACH to detach an unused virtual address, then issue the command again.

ICK32316I SYSTEM SUPPORT IS UNAVAILABLE FOR SPECIFIED FUNCTION

Explanation

The required system support code from VM for the CMS version of ICKDSF does not exist.

System action

The command ends.

Operator response

None.

System programmer response

Check with your installation to determine if support is provided for your environment. If support is available, ensure it is installed before running the job.

ICK32317I ccuu DEVICE DOES NOT EXIST

Explanation

The device address you specified does not exist.

System action

The command ends.

Operator response

None.

System programmer response

Provide the correct address and run the job again.

ICK32318I CCUU UNABLE TO DETERMINE SUB-CHANNEL ID FOR THE SPECIFIED DEVICE

Explanation

An attempt has been made to get the sub-channel ID for the device specified by *ccuu* by issuing the CMS macro, GETSID. However, no matching sub-channel ID was found.

System action

Command processing ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

None.

ICK32345I CYLINDER OR BLOCK INFORMATION IS REQUIRED FOR THE SPECIFIED FUNCTION

Explanation

When you specify REALADDR, you must also specify the cylinder or block address.

System action

The command ends.

Operator response

None.

System programmer response

Provide a range, or specific cylinder/track/block for the command you specified.

ICK32347I REPLY "T" TO MESSAGE ICKnnnnnn HAS BEEN ISSUED, FUNCTION TERMINATED

Explanation

ICKDSF was invoked using the invocation parameter list and CONSOLE is not the INPUT device. An assumed reply T was given to the previous ICKnnnnnn message.

System action

Command processing ends.

Operator response

Run the job again either without invocation parameter list or specifying CONSOLE as INPUT device.

System programmer response

None.

ICK32364I CAN NOT OBTAIN ACCESS TO DEVICE ccuu RC= nnnn failing reason

Explanation

The DIAGNOSE E4 FCN 00, 01, 02 or 03 enables ICKDSF to:

- Obtain minidisk information, or
- To establish a full-pack overlay link to the specified user's minidisk or real device defined in the system.

The operation failed with the CP return code RC=nnnn. The *failing reason* line of the message gives some common reasons for the failure.

RC=0005
USER DOES NOT HAVE DIRECTORY OR RACF AUTHORIZATION

To perform this function, you must have appropriate options (such as DEVMAINT, LNKExclu) specified on your OPTION directory control statement and if RACF/VM is installed, the appropriate RACF PERMITS executed on your behalf.

Note: LNKExclu is required.

RC=0101
- VIRTUAL DEVICE ADDRESS INVALID -

The device number does not identify a device in the current I/O configuration of the virtual machine specified by the input userid.

RC=0102
VIRTUAL DEVICE ADDRESS IS NOT ACCEPTED. IT DOES NOT REPRESENT A MINIDISK

RC=0103
REAL VOLUME WHICH CONTAINS THE MINI DISK IS NOT MOUNTED

RC=0200
USERID NOT DEFINED TO THE SYSTEM

RC=0201
DEVICE DOES NOT IDENTIFY A VIRTUAL DEVICE IN THE DIRECTORY FOR THE INPUT USERID

RC=0202
VIRTUAL DEVICE ADDRESS IS NOT ACCEPTED IT DOES NOT REPRESENT A MINIDISK

RC=0203
REAL VOLUME WHICH CONTAINS THE MINI DISK IS NOT MOUNTED

RC=0204
THE DIRECTORY BLOCKS COULD NOT BE ACCESSED BECAUSE OF SYSTEM ERROR

RC=0300
USERID NOT DEFINED TO THE SYSTEM

RC=0301
DEVICE DOES NOT IDENTIFY A VIRTUAL DEVICE IN THE DIRECTORY FOR THE INPUT USERID

RC=0302
VIRTUAL DEVICE ADDRESS IS NOT ACCEPTED IT DOES NOT REPRESENT A MINIDISK

RC=0303
REAL VOLUME WHICH CONTAINS THE MINI DISK IS NOT MOUNTED

RC=0304
THE DIRECTORY BLOCKS COULD NOT BE ACCESSED BECAUSE OF SYSTEM ERROR

RC=0305
A FULL PACK OVERLAY ALREADY EXISTS

Only one full pack overlay is allowed on a volume at any time.

RC=0306
THE FULL PACK OVERLAY REQUEST INCLUDES CP PAGING, SPOOLING, DIRECTORY, T-DISK OR DUMP AREAS

RC=0307
THE FULL PACK OVERLAY REQUEST FAILED BECAUSE THE MINIDISK HAS EXISTING LINKS TO IT USERID = NNNNNN

The target minidisk has a write link to it. Remove the LINK and run the job again.

USERID = NNNNNN specifies the user who has the existing link to the volume.

RC=0402
INPUT REAL DEVICE IS NOT ACCEPTED BECAUSE IT IDENTIFIES A NON DASD DEVICE

RC=0403
DEVICE OFFLINE OR NOT MOUNTED

This return code can also be received if the device is a FREE device (not assigned to the system). In this case, ATTACH the device to the system.

RC=0405
A FULL PACK OVERLAY ALREADY EXISTS

Only one full pack overlay is allowed on a volume at any time.

RC=0406
THE FULL PACK OVERLAY REQUEST INCLUDES CP PAGING, SPOOLING, DIRECTORY, T-DISK OR DUMP AREAS

RC=0407
THE FULL PACK OVERLAY REQUEST FAILED BECAUSE THE MINIDISK HAS EXISTING LINKS TO IT USERID = NNNNNN

The target minidisk has a write link to it. Remove the LINK and run the job again. USERID = NNNNNN specifies the user who has the existing link to the volume.

RC=0410
CYLINDER OR BLOCK NUMBER INVALID

CP has determined the cylinder or block number is not valid. If the cylinder or block is valid for the device type, check the CP directory to make sure this device type is correctly defined.

System action

The command ends. ICKDSF continues with the next command.

Operator response

Correct the problem and run the job again.

System programmer response

Refer to *CP Programming Services* , for more information concerning the Diagnose E4 command and the corresponding return code.

ICK33000I ***volser*** **{CYL|PAGE} ZERO NOT IN CP{370|XA|ESA} FORMAT**

Explanation

The requested function requires a properly formatted volume. The volume is in a format that is not supported for this operating system.

System action

Command processing ends.

Operator response

Use CPVOLUME command to reformat the volume.

System programmer response

None.

ICK33001I **volser {CYL|PAGE} ZERO NOT IN CP FORMAT**

Explanation

The requested function requires a formatted unit. The unit is not formatted.

System action

Command processing ends.

Operator response

Format the unit.

System programmer response

None.

ICK33005I **volser {CYL|PAGE} ZERO NOT IN AIX/ESA FORMAT**

Explanation

The requested function requires a unit that is the unit to be formatted for an AIX/ESA environment. The unit is not formatted for an AIX/ESA environment.

System action

Command processing ends.

Operator response

Format the unit.

System programmer response

None.

ICK33010I **SPECIFIED RANGE(*xxxxxxxxx*,*yyyyyyyyy*); START CYLINDER HIGHER THAN END CYLINDER**

Explanation

Either a range or allocation statement contained a start value higher than the end value.

System action

- If the statement in error is RANGE, command processing ends.
- If the statement in error is an allocation statement, the allocation map will not be updated.

Operator response

Correct the statement in error.

System programmer response

None.

ICK33011I **SPECIFIED type RANGE(xxxx,yyyy); MAY NOT EXCEED PAGE 16777215**

Explanation

The range specified for the allocation type exceeds the maximum page value allowed for that allocation type.

System action

The command ends. ICKDSF continues with the next command.

Operator response

Correct the problem and run the job again.

System programmer response

None.

ICK33020I SPECIFIED RANGE(*xxxxxxxxx,yyyyyyyyy*); START CYLINDER HIGHER THAN VOLUME END (*nnnnnnnnn*)

Explanation

A range or allocation statement contained an ending value (*yyyyyyyyy*) higher than the highest cylinder/page (*nnnnnnnnn*) on the unit.

System action

- If the statement in error is RANGE, command processing ends.
- If the statement in error is an allocation statement, the allocation map will not be updated.

Operator response

Correct the statement in error.

System programmer response

None.

ICK33030I ALLOCATION MAP IS INVALID

Explanation

The allocation map contains data that is logically inconsistent.

System action

The allocation map will not be updated and command processing ends.

Operator response

The allocation map must be recreated by running the CPVOLUME FORMAT function with a starting range of 0.

System programmer response

None.

ICK33040I ALLOCATION MAP IS FULL

Explanation

The allocation map has reached the upper limit of allocation ranges.

System action

The allocation map is not updated and command processing ends.

Operator response

Review the allocation map for the unit. Reduce fragmentation by combining or eliminating allocation ranges.

System programmer response

None.

ICK33050I ALLOCATION TYPE "type" IS NOT SUPPORTED IN {VM370|VMXA|VMESA:} MODE

Explanation

This operating system does not support the specified allocation type. Refer to the CPVOLUME command for valid allocation types.

System action

The allocation map will not be updated, and command processing ends.

Operator response

Change the allocation type.

System programmer response

None.

ICK33060I ALLOCATION TYPE "type" IS NOT SUPPORTED ON 3880-xx

Explanation

The specified allocation type is not supported for either 3880-11 or 3880-21 paging subsystems. The only supported allocation types are PAGE and PERM.

System action

The allocation map is not updated.

Operator response

Either change the allocation type, or use a different device type.

System programmer response

None.

ICK33070I ALLOCATION MAP FORMAT DOES NOT ALLOW LIST/EXAMINATION

Explanation

The existing ALLOCATION MAP format of this device is not in the required format for the specified device type.

System action

Command processing ends.

Operator response

None.

System programmer response

Run either CPVOLUME ALLOCATE without specifying TYPE to convert the existing allocation map to the required format, or run CPVOLUME FORMAT specifying the necessary parameters.

ICK33080I PREVIOUS cmdtype COMMAND DID NOT COMPLETE

Explanation

Either an INITIALIZE, INSTALL, INSPECT or REVAL command was interrupted and did not complete.

System action

Processing is prohibited.

Operator response

Complete the interrupted command.

System programmer response

None.

ICK33090I DEVICE MUST BE PROCESSED IN VM/370 OR VM/ESA MODE.

Explanation

CPVOLUME command formerly formatted FBA volumes for use on VM/370 and VM/ESA systems. Formatting for VM/370 is no longer supported. A volume formerly formatted in VM/370 mode must be reformatted for use on a VM/ESA or z/VM system. A volume formerly formatted in VM/ESA mode can be used on a VM/ESA or z/VM system.

System action

The command ends.

Operator response

None.

System programmer response

Run the job again.

ICK33091I DEVICE MUST BE PROCESSED IN VM/370 MODE

Explanation

The CPVOLUME command does not support the specified device type in this operating system.

System action

Command processing ends.

Operator response

None.

System programmer response

None.

ICK33095I DEVICE MUST BE PROCESSED IN VM/ESA MODE

Explanation

The CPVOLUME command supports the specified device type only in ESA mode.

System action

Command processing ends.

Operator response

None.

System programmer response

None.

ICK33100I nnnn CYLINDER MINIDISK IS INVALID

Explanation

nnnn exceeds the maximum number of cylinders that the allocation map allows. The capacity of the allocation map is 4096.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the value of the cylinders for the device in the MIMIC(MINI) parameter, and run the job again.

ICK33101I CONCURRENT MEDIA MAINTENANCE FUNCTION CANCELLED

Explanation

An error caused cancellation of concurrent media maintenance processing. Examine the previous message to determine the error.

System action

Command processing ends.

Operator response

None.

System programmer response

See previous message issued.

ICK33102I CONCURRENT MEDIA MAINTENANCE FUNCTION CAN NOT BE ACTIVATED

Explanation

The concurrent media maintenance function cannot be activated because either the required storage control microcode support does not exist or because a failure occurred.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact your IBM hardware service representative.

ICK33103I UNABLE TO RESET MEDIA MAINTENANCE RESERVE STATE

Explanation

The device cannot be reset to a normal state when:

- ICKDSF is re-invoked
- The concurrent media maintenance function cannot be continued because an I/O error occurred while the device was being reset from a media maintenance reserve state
- The media maintenance reserve state cannot be reset after an INSTALL command

System action

Command processing ends. The device is left in the media reserve state. All future I/O to the device will result an I/O error until the problem is solved.

Operator response

None.

System programmer response

Contact your IBM hardware service representative. Then run the job again after the problem is resolved.

ICK33104I DEVICE ccuu INACCESSIBLE

Explanation

The device is placed in the media maintenance reserve state due to an I/O error while: 1) restoring the user data, or 2) resetting the device from a media maintenance function to a normal state. The concurrent media maintenance function cannot continue and the device cannot be accessed by the user program.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact your IBM hardware service representative.

ICK33105I UNABLE TO RECOVER CHECKPOINT FAILURE FOR ANOTHER CPU

Explanation

The current INSPECT process has identified checkpoint data from another processor. Since the FORCE parameter is not specified, the current INSPECT process cannot recover the failure.

System action

The current INSPECT process ends.

Operator response

None.

System programmer response

If there is no other processor working on the device, specify the FORCE parameter and run the job again.

ICK33106I VOLSER ALREADY EXISTS, VERIFY/NOVERIFY MUST BE SPECIFIED

Explanation

An INSTALL command was performed to a volume which has a volume serial. Either use the VERIFY parameter specifying the *volser*, or specify NOVERIFY to perform an INSTALL.

Remember that after an INSTALL the volume is left in an uninitialized state and is unusable in either an MVS, VM, or VSE environment.

System action

Command processing ends.

Operator response

None.

System programmer response

Specify either the VERIFY or NOVERIFY parameter.

ICK33110I FORMAT TERMINATED-DEVICE MODE DOES NOT ALLOW INSPECTION

Explanation

A device error while formatting requires either the CKD track or FBA block to be inspected. CPVOLUME or AIXVOL cannot invoke INSPECT for minidisk errors.

System action

Formatting ends.

Operator response

Refer to "CMS version minidisk support" on page 208 (CKD) or "CMS version minidisk support" on page 407 (FBA) for a description of how to INSPECT a minidisk track or block using the USERID and REALADDR parameters. After the CKD track or FBA block has been successfully inspected, restart the format operation.

System programmer response

None.

ICK33113I NOFILLER IS NOT ALLOWED IN 370 MODE

Explanation

NOFILLER can only be specified if CPVOLUME is operating in XA or ESA mode.

System action

Command processing ends.

Operator response

None.

System programmer response

Reissue the CPVOLUME FORMAT command without the NOFILLER command, or specify XA or ESA mode.

ICK33114I FORMATTING ON PARTIAL VOLUME IS NOT ALLOWED

Explanation

Formatting a partial volume is not allowed if:

- the current specification is NOFILLER and the volume was previously CPVOLUME formatted with filler records, or
- the current specification is FILLER, and the volume was previously CPVOLUME formatted without filler records.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Reissue the CPVOLUME FORMAT command without the RANGE parameter.

ICK33120I "type" IS AN INVALID ALLOCATION TYPE

Explanation

The specified allocation type is unknown for the CPVOLUME command.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the allocation type, and run the job again.

ICK34000I PERFORM SUBSYSTEM FUNCTION FAILED

Explanation

There is a failed completion status from the subsystem for a previously issued PSF command.

System action

The PSF command order and the SIM information for this error are printed. The function ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK34001I UNDEFINED COMPLETION STATUS CODE IS DETECTED

Explanation

The returned completion status from the subsystem for a previously issued PSF command is undefined.

System action

The previously issued PSF command and its associated Read Subsystem Data are printed. The function ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK34002I INVALID EXCEPTION STATUS CODE OR INFORMATION IS DETECTED

Explanation

The returned exception status or information from the subsystem for a previously issued PSF command is not valid.

System action

The system prints previously issued PSF command and its associated Read Subsystem Data. The function is ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK34003I UNABLE TO DETERMINE DEVICE/ TRACK STATUS FOR MEDIA MAINTENANCE

Explanation

ICKDSF is unable to determine the device, track status, or the media maintenance characteristics for the device because of a failure of a PSF command.

Inspect either the previous I/O error message, or the subsequent Read Subsystem Data to identify the error.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK34005I NO MORE ALTERNATE LOCATION AVAILABLE

Explanation

The subsystem could not either assign an alternate location prior to a surface checking function or permanently flag a primary track defective.

The system prints the Read Subsystem Data.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK34007I UNABLE TO RESTORE PRIMARY TRACK X'cccc hhhh' FROM ALTERNATE LOCATION

Explanation

The subsystem cannot restore the data from an alternate location to the specified primary track. See the error description from the previous messages.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK34010I UNABLE TO ASSIGN ALTERNATE LOCATION FOR TRACK X'cccc hhhh'

Explanation

The subsystem is unable to assign an alternate location for the specified primary track. Inspect either the previous error message, or the subsequent Read Subsystem Data to identify the error.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK34011I COMMAND FAILED - THE VOLUME IS NOT INITIALIZED AS A RESERVED VOLUME

Explanation

The volume specified is not a reserved volume that has been initialized with the RESERVED parameter.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure the command is issued to the correct volume. If the volume is correct then remove the UNRESERVED parameter and resubmit the command.

ICK34012I COMMAND FAILED - THE VOLUME IS INITIALIZED AS A RESERVED VOLUME

Explanation

The volume specified is a reserved volume that has been initialized with the RESERVED parameter. To initialize a reserved volume, you must either specify the UNRESERVED parameter, or if you wish to reinitialize it as a reserved volume, you must specify the RESERVED parameter.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure the command is issued to the correct volume. If the volume is correct then you must specify the RESERVED or UNRESERVED parameter and resubmit the command.

ICK34014I DRIVE TEST FAILED EXCEPTION STATUS DETECTED

Explanation

A *failed exception status* from the drive test occurred during the device test.

System action

The system prints the diagnostic information from the Read Subsystem Data and the device SIM for this error.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK34015I ERROR COUNT EXCEEDED THRESHOLD

Explanation

The maximum allowable error count has been reached for the specified ICKDSF function. Identify the error from previous error messages.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK34016I TRACK X'cccc hhhh' NOT FLAGGED DEFECTIVE

Explanation

An alternate track was assigned when ICKDSF performed a previous surface checking PSF command. Therefore, ICKDSF expected the specified track to be defective.

The track is not defective.

System action

The ICKDSF process customarily must ensure that the primary track is assigned to an alternate before issuing the surface checking PSF command.

However, if this error occurs, there may be either an ICKDSF logic error or subsystem error.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK34017I UNRECOVERABLE TRACK HEADER FAILURE DETECTED FOR TRACK X'cccc hhhh'

Explanation

The header for each track includes a home address and record 0. These are managed by the subsystem and are not accessible to the host. The subsystem also performs recovery from a failure.

A track header failure condition is a severe error that requires service to repair/replace the device.

(It is not necessary to either save the user data for this particular PSF command or use the temporary alternate pointer facility.)

System action

Command processing ends and the system issues a SIM.

Operator response

None.

System programmer response

Contact your IBM service representative.

Process the ICKDSF function again after service.

ICK34018I PRIMARY TRACK HEADER FAILURE DETECTED FOR TRACK X'cccc hhhh'

Explanation

The header for each track includes a home address and record 0. These are managed by the subsystem and are not accessible to the host. The subsystem also performs recovery from a failure.

A track header failure condition is a severe error that requires service to repair/replace the device.

If the track header failure occurs either while or after an alternate location is assigned, the user data is not necessarily lost. The device can be used, and the host can access data with a temporary alternate pointer facility. (This temporary alternate pointer facility is reset after the service action is taken.)

System action

Command processing ends and the system issues a SIM.

Operator response

None.

System programmer response

Contact your IBM service representative. Process the ICKDSF function again after the service action.

ICK34019I EXISTING TRACK HEADER FAILURE (ANOTHER TRACK) DETECTED

Explanation

A track header failure condition is detected during a PSF command on another track because service is required. The subsystem cannot accept further commands that require different temporary alternate facilities.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK34020I EXISTING TRACK HEADER FAILURE (THIS TRACK) DETECTED ON X'cccc hhhh'.

Explanation

A track header failure condition has been detected during a PSF command because service for a previous head failure is required.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK34021I INVALID ALTERNATE LOCATION ASSIGNMENT DETECTED FOR TRACK X'cccc hhhh'

Explanation

An alternate assignment exception status is not valid for the specified track.

System action

- If the current command is ANALYZE, INIT or INSTALL, the error is reported. ICKDSF performs the necessary recovery actions and the function ends.
- If INSPECT PRESERVE is the current command, issue the command again specifying the NOPRESERVE option.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK34022I I/O ERROR OCCURRED FOR PERFORM SUBSYSTEM FUNCTION

Explanation

There was an I/O error while the subsystem function (PSF) command was processing. The system prints CCW, CSW and sense information.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK34023I INVALID READ SUBSYSTEM DATA MESSAGE IS DETECTED

Explanation

A PSF command has detected a response from a Read Subsystem Data that is not valid. See message ICK04010I for more diagnostic information.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK34024I OUTSTANDING DEVICE SIM STILL EXISTS, SIM ID=X'nn'

Explanation

The specified device has an open SIM (open, pending, or suppress presentation) status. The system prints SIM information. See message ICK10711I.

System action

Command processing ends.

Operator response

None.

System programmer response

Contact your IBM service representative.

ICK34026I ESTPAIR FAILED - SECONDARY HAS A SPACE EFFICIENT TARGET VOLUME

Explanation

The command specified a secondary volume that is in a Flash Copy relation with a target that is space efficient.

System action

Command processing ends.

Operator response

None.

System programmer response

Use the FLASHCPY QUERY RELATIONS command to verify the status of the secondary volume. Withdraw the relationship and reissue the command.

ICK34028I THE FEATURE THAT THE COMMAND REFERENCES IS NOT INSTALLED OR ENABLED FOR THE SUBSYSTEM

Explanation

The volume specified for the command is not supported for the function defined by the combination of parameters used, due to the feature either not being installed or enabled for the subsystem and/or the operating system.

System action

Command processing ends.

Operator response

None.

System programmer response

Refer to the command description in the user's guide to see which functions are supported for the device you are running against. Either run the job again with the appropriate parameters, or make sure that the feature you are attempting is installed and enabled for that device and for the operating system.

ICK34029I COMMAND FAILED - TARGET/ SECONDARY IS A SPACE EFFICIENT VOLUME

Explanation

One of the following conditions occurred:

- A FLASHCPY ESTABLISH command specified a target volume that is space efficient, but did not specify SETGTOK(YES)
- A FLASHCPY ESTABLISH command was issued requesting background copy and the specified target device is a space efficient volume.
- A FLASHCPY ESTABLISH command was issued requesting preserve mirror preferred or preserve mirror required and the specified target device is a space efficient volume.
- A FLASHCPY WITHDRAW command was issued requesting a background copy and the target device is a space efficient volume.
- A PPRCOPY ESTPAIR command specified a secondary volume that is space efficient, but did not specify SESECOK(YES)
- A INIT command was issued to a volume that is the source of a FlashCopy relationship and the target of the relationship is a space efficient volume.

System action

Command processing ends.

Operator response

None.

System programmer response

If the intent is to establish a FlashCopy relationship to a space efficient target volume, reissue the command with SETGTOK(YES) specified.

If an establish with MODE(COPY) was specified or implied, reissue the command with MODE(NOCOPY).

If the intent is to establish a FlashCopy relationship with preferred mirror or preserve mirror required the space efficient relationship needs to be withdrawn first.

If a withdraw with background copy was specified, verify that a withdraw without background copy of the source relationship is acceptable and reissue the withdraw without background copy.

If the intent is to establish a PPRCOPY relationship to a space efficient target volume, reissue the command with SESECOK(YES) specified.

If the INIT command was issued, the relationship needs to be withdrawn prior to the initialization being processed.

ICK34030I PPRCOPY OPERATION FAILED: FORMAT/MESSAGE=X'xx', REASON CODE=X'xx'

Explanation

The storage control detected an error in the subsystem involving a duplex volume operation, but not specifically a PPRC function. The message format and number from byte 7 of the sense information is given, xx is the reason code from byte 8 of the sense information. If the sense information in message ICK10710I contains all zeros the FORMAT/MESSAGE and REASON CODE may be ignored.

System action

Command processing ends.

Operator response

None.

System programmer response: ddd

System programmer response

If message ICK10710I is issued, examine the CCW, CSW, and sense to determine the cause of the error. Assistance from your hardware service representative may be required to correct the cause of the problem.

ICK34031I NO RESOURCES TO CREATE FLASHCOPY RELATION OR NUMBER EXCEEDS MAXIMUM ALLOWED

Explanation

There are not resources available to create the requested relationship or the maximum number of relationships is already met.

System action

The command ends.

Operator response

None.

System programmer response

Query the FlashCopy relations on the volumes with FLASHCPY QUERY RELATIONS to determine existing relationships. Remove relationships if appropriate using the FLASHCPY WITHDRAW command.

ICK34032I ESTPAIR FAILED - NVS SPACE NOT AVAILABLE FOR BIT MAP

Explanation

Insufficient non-volatile storage space was available for the application site storage control to create the changed track bit map for the volume pair.

System action

Command processing ends.

Operator response

None.

System programmer response

Refer to the IBM 3990 Operations and Recovery Guide for pinned data procedures. Correct the condition and retry the command.

ICK34033I ESTPAIR FAILED - DEVICES NOT IN SUSPEND MODE

Explanation

The devices were not in the suspend mode as expected by the command. The ESTPAIR RESYNC option is only valid if the devices are in SUSPEND mode.

System action

Command processing ends.

Operator response

None.

System programmer response

Use the PPRCOPY QUERY command to verify the status of the pair, then use the ESTPAIR command with the COPY or NOCOPY option.

ICK34034I ESTPAIR FAILED - DEVICES NOT IN SIMPLEX MODE

Explanation

The devices were not in simplex mode as expected by the command.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue the PPRCOPY QUERY command to verify the status of the devices (pending, duplex, or suspended). If status is suspended, then use ESTPAIR command with the RESYNC option.

ICK34035I COMMAND FAILED - SECONDARY NOT IN CORRECT STATE

Explanation

The secondary volume is actively being used by this or another attached host.

System action

Command processing ends.

Operator response

None.

System programmer response

Quiesce activity on the target secondary device (vary it offline to all attached hosts). The target secondary device can not be actively used.

ICK34036I ESTPAIR FAILED - PINNED DATA ON SUSPENDED VOLUME

Explanation

The storage control detected pinned data for a volume and halted the command. An PPRCOPY ESTPAIR command was issued to a suspended volume that contains pinned data.

System action

Command processing ends.

Operator response

None.

System programmer response

Refer to the IBM 3990 Operations and Recovery Guide for pinned data procedures. Correct the condition and retry the command.

ICK34037I ESS BATTERY UNAVAILABLE, REQUIRED FOR FLASHCOPY OPERATION

Explanation

The ESS battery feature is unavailable or not installed. Flashcopy requires the battery for proper operation.

System action

The command ends.

Operator response

None.

System programmer response

Contact your customer engineer.

ICK34038I SUSPEND OPERATION REJECTED - SUSPEND STATE EXISTED

Explanation

An attempt to suspend a PPRC copy was made to a pair that is already suspended.

System action

Command processing ends.

Operator response

None.

System programmer response

Execute the PPRCOPY QUERY command to verify the PPRC volume or path status.

ICK34039I ATTEMPTED A DUPLEX OPERATION ON A SIMPLEX VOLUME

Explanation

A PPRC operation (DELPAIR, SUSPEND or RECOVER) was directed to a volume that is not a member of a PPRC pair.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue the PPRCOPY QUERY command to determine the volume status.

ICK34040I SUSPEND PRIMARY FAILED - DUPLEX OR PPRC PENDING

Explanation

A suspend operation was attempted to a volume which had a duplex or PPRC operation pending.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue the PPRCOPY QUERY command to verify that the volume is in pending status. Reissue the command when the device is no longer in pending status.

ICK34041I COMMAND FAILED - DEVICE IN CE MODE, UNCONFIGURED OR STATUS CANNOT BE DETERMINED

Explanation

The device is in CE Mode, is unconfigured or in a 'Status cannot be determined' state.

System action

Command processing ends.

Operator response

None.

System programmer response

Take the device out of CE mode or correct the condition, then reissue the Command.

ICK34042I DELPAIR FAILED - DASD FAST WRITE PENDING

Explanation

The storage control was unable to terminate a pair while DASD Fast Write was pending.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue the DEVSERV command (MVS) or Q DASDFW (VM) or CACHE UNIT=ccuu,STATUS (VSE) to determine the DASD Fast Write condition. Reissue the command when the DFW pending condition clears. The DFW pending condition will not be cleared if pinned data exists. (To determine if pinned data exists for VM, issue the Q PINNED command.)

ICK34043I xxx FAILED, SUBSYSTEM INSTALLING MICROCODE

Explanation

The indicated command failed because it was received while the subsystem was attempting to install a new microcode load.

xxx can be PPRCOPY or FLASHCPY

System action

Command processing ends.

Operator response

None.

System programmer response

Allow the microcode install operation to complete, then reissue the command.

ICK34044I ESTPATH FAILED - WOULD EXCEED UNITS/PATHS LIMITS

Explanation

The command would exceed the maximum number of secondaries, or the number of paths to a specific storage control.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue the PPRCOPY QUERY command with the PATHS option to determine the established recovery site storage controls and paths for each. Under certain conditions, attempts to establish paths might have failed but still have left residual data on the control unit, effectively consuming a path 'slot'. It is necessary to delete any such paths using the DELPATH command before attempting to establish any more paths.

ICK34045I VOLUME IN CASCADED FAILOVER MODE. HOST WRITES ALLOWED

Explanation

The volume was the intermediate volume in a PPRC Cascading triad and a Failover was issued to the device. Host writes are allowed to this volume.

System action

Command processing ends.

Operator response

None.

System programmer response

None

ICK34046I NO MATCH IN CU FOR SSID OR SER# OF PRIMARY OR SECONDARY

Explanation

The storage control could not resolve the parameters in the command input to match a subsystem ID or serial number.

System action

Command processing ends.

Operator response

None.

System programmer response

Verify that the command input correctly identifies the primary and secondary information by checking with configuration maps and logs. The PPRCOPY QUERY command may also assist in this verification. Under certain conditions, attempts to establish paths might have failed but still have left residual data on the control unit, effectively consuming a path 'slot'. It is necessary to delete any such paths using the DELPATH command.

ICK34047I CONDITIONS AT SECONDARY CU PROHIBIT PROPER OPERATION

Explanation

A condition at the recovery site storage control was detected which prohibits initiation of the operation. One of the following conditions exists on the recovery site 3990.

- Cache is not active for the subsystem
- Cache is not active for the device
- NVS is not active for subsystem
- DFW is not active for the device
- Incompatible primary and secondary device geometry.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue the DEVSERV command (MVS) or Q DASD DETAILS (VM) or CACHE SUBSYS=ccuu,STATUS and CACHE UNIT=ccuu,STATUS (VSE) to determine the status of the above conditions and correct those conditions. When conditions have been corrected, reissue the command.

ICK34048I FAILED TO ESTABLISH ONE OR MORE PATHS TO SECONDARY

Explanation

The storage control did not complete establishment of all the paths specified in the PPRCOPY ESTPATH command. One or more paths failed to be established.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue a PPRCOPY QUERY command, with the PATHS option, to the primary device to determine the pathing status. Refer to the data returned with the PPRCOPY QUERY command to determine the action required for status other than "established."

ICK34049I ESTPAIR FAILED - A VOLUME HAS PINNED DATA

Explanation

Either the primary or secondary volume has pinned data, preventing the establishment of the pair.

System action

Command processing ends.

Operator response

None.

System programmer response

See the *IBM 3990 Operations and Recovery Guide* for pinned data recovery procedures. Correct the condition and retry the command.

ICK34050I VOLUME IN SUSPENDED PPRC STATE

Explanation

The addressed device is in a suspended peer-to-peer remote copy state. All write commands with normal authorization indicated are rejected.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue the PPRCOPY QUERY command to verify the status of the devices (pending, duplex, or suspended). There are several reasons the device could be in a suspended state as a result of having issued the PPRCOPY SUSPEND or PPRC FREEZE commands. If it is deemed appropriate to move the device out of the suspended state then:

- If the suspension is the result of a FREEZE then the PPRCOPY RUN command can be issued to the device. Paths and pairs must then be reestablished.

  Or

- Use the ESTPAIR command with the RESYNC option.

ICK34051I ESTPAIR FAILED - SECONDARY VOLUME IS A FLASHCOPY TARGET VOLUME

Explanation

An establish peer-to-peer remote copy pair command was received and the secondary volume is a Remote FlashCopy® target volume.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure that the secondary target volume of the ESTPAIR command is correctly specified in the command. If so, then that target device must be taken out of the FlashCopy state, or the ESTPAIR command cannot be processed.

ICK34052I DELPATH FAILED - PPRC VOLUMES ARE STILL ACTIVE

Explanation

The DELPATH was issued while the PPRC volumes were still active.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue the PPRCOPY DELPAIR command first to end the PPRC pair, then retry the command. This action assumes that you have verified status (with the PPRCOPY QUERY command), and that you are specifying the correct PPRC device.

ICK34053I UNIT DOES NOT SUPPORT PPRC OPERATIONS

Explanation

A PPRC operation was sent to a storage control which does not support the PPRC feature.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue the command to a device attached to a storage control that has the PPRC licensed microcode installed.

ICK34054I PPRCOPY PRIMARY TIMED OUT ATTEMPTING TO COMMUNICATE WITH SECONDARY

Explanation

The PPRCOPY primary timed out attempting to communicate with the secondary.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Determine the cause of the error and run the job again. Assistance of a hardware service representative may be needed to determine the cause of the problem.

ICK34055I PPRCOPY FAILED - SECONDARY ADDRESS OUTSIDE OF ADDRESS RANGE

Explanation

The device or CCA specified for the PPRC secondary is outside the range of valid addresses.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Specify a valid device for the secondary and run the job again.

ICK34056I ESTPATH FAILED - SAME PATH SPECIFIED AS COMMAND RECEIVED ON

Explanation

The ESTABLISH PATH specified a path for a linkaddress that is the same path the command was received on from the primary host. The path cannot be used for both.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Specify a different path in the linkaddress and run the job again.

ICK34057I PPRC SECONDARY OR FLASHCOPY TARGET DEVICE FOUND TO BE GROUPED

Explanation

The PPRC ESTABLISH PAIR or FLASHCPY ESTABLISH was received for a PPRC secondary or Flashcopy target device that was found to be grouped. The device is assumed to be on-line.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Vary the PPRC secondary or Flashcopy target device offline, or select a device for the secondary or target device that is offline, and run the job again. If the device is a 2105, 2107, or 1750 you may use the ONLINSEC(YES) parameter for PPRC ESTABLISH or ONLINTGT(YES) parameter for FLASHCPY ESTABLISH if you wish to establish a pair to an online secondary device.

ICK34058I OPERATION CAN NOT BE EXECUTED ON AN ALIAS ADDRESS

Explanation

A PPRC operation specified an alias volume. The operation must specify the base volume of the PARALLEL ACCESS VOLUME.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the parameters and run the job again.

ICK34059I SPECIFIED VOLUMES NOT OF THE SAME SIZE AND FORMAT

Explanation

The specified volumes are not the same size and format.

System action

The command ends.

Operator response

None.

System programmer response

Select volumes that have the same size and format and resubmit the job.

ICK34060I TARGET VOLUME IS A PPRC PRIMARY OR SECONDARY VOLUME OR AN XRC PRIMARY VOLUME

Explanation

The specified target volume is a PPRC primary volume or an XRC primary volume.

This message may also be received if PRESERVEMIRROR(REQUIRED) and TGTOKASPPRCPRIM(YES) are specified but the read features codes do not indicate that the preserve mirror operations are available.

System action

The command ends.

Operator response

None.

System programmer response

If the target volume is a PPRC primary volume and this is your intention then you can specify TGTOKASPPRCPRIM(YES) and resubmit the request. An XRC primary volume cannot also be a Flashcopy target volume. If you are using the PRESERVEMIRROR(REQUIRED) parameter you may receive this message if the feature is not installed on the control unit. Verify that the preserve mirror operations are available.

ICK34061I ESTPAIR FAILED - DEVICES NOT IN SAME TRACK FORMAT

Explanation

A PPRC ESTPAIR operation attempt to establish duplex pair for devices that are not in same track format. The number of cylinders on the secondary must be equal to or greater than the number on the primary.

System action

Command processing ends.

Operator response

None.

System programmer response

Make sure the selected devices are in same track format. Reissue the command.

ICK34062I PPRCOPY COMMAND FAILED - NO ACTIVE PATH AVAILABLE

Explanation

There must be at least one active path established to the secondary control unit to complete the command. If there is no path, the command is terminated.

System action

Command processing ends.

Operator response

None.

System programmer response

Make sure at least one path is available before reissuing the command.

ICK34063I ADDRESS SPECIFIED AS THE SECONDARY IS INCORRECT

Explanation

The storage control could not resolve the secondary (target) volume's address from the parameter given in the command. The secondary address provided in the command is not valid for this PPRC pair.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue PPRCOPY QUERY command to obtain the information and reissue the command.

ICK34064I CLEANUP FAILED

Explanation

The PPRCOPY ESTPATH failed. ICKDSF attempted to do cleanup by issuing a DELPATH which also failed.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue PPRCOPY QUERY command to obtain the information and reissue the command.

ICK34065I PPRCOPY FAILED - SUBSYSTEM IS IN A STATE CHANGE PENDING CONDITION

Explanation

The command failed due to the Subsystem or device being in a 'state change pending' condition.

System action

Command processing ends.

Operator response

None.

System programmer response

Retry the PPRCOPY command on a periodic basis. The command should be successful as soon as the state change pending condition is cleared.

ICK34066I PPRCOPY FAILED - CACHE STORAGE IS NOT AVAILABLE

Explanation

The command requires Cache Storage and Cache Storage is not available.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure Cache storage is available and reissue the command.

ICK34067I PPRCOPY FAILED - DEVICE IS NOT SUSPENDED DUPLEX

Explanation

Attempt to establish a Duplex Pair and the addressed device is not Suspended Duplex.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue PPRCOPY QUERY command to obtain the path information needed for the PPRCOPY ESTPATH command, and reissue the command.

ICK34068I PPRCOPY FAILED - DEVICE IS NOT SIMPLEX OR SECONDARY OF A DUPLEX PAIR

Explanation

Attempt to establish a Duplex Pair and the device specified is not Simplex or the secondary of the Duplex Pair.

System action

None.

Operator response

None.

System programmer response

Issue PPRCOPY QUERY command to verify the status of the device and reissue the command.

ICK34069I PPRCOPY FAILED - PRIMARY DEVICE WRITE FAILURE

Explanation

Peer to Peer Remote Copy Suspended. Primary device write failed.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue PPRCOPY QUERY command to verify the status of the device and reissue the command.

ICK34070I PPRCOPY FAILED - SECONDARY SUBSYSTEM FAILURE

Explanation

Peer to Peer Remote Copy Suspended due to a Secondary Subsystem failure.

System action

Command processing ends.

Operator response

None.

System programmer response

Verify/correct the status of the secondary subsystem and reissue the command.

ICK34071I PPRCOPY FAILED - COMMUNICATIONS WITH THE SECONDARY DEVICE FAILURE

Explanation

Peer to Peer Remote Copy Suspended. Communications with the secondary device failed.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue PPRCOPY QUERY command to verify the status of the secondary device and reissue the command.

ICK34072I PPRCOPY FAILED - CRITICAL VOLUME STATE, ALL WRITES WILL FAIL

Explanation

Peer to Peer Remote Copy Suspended. Critical volume state, all writes will be failed until problem is fixed and the copy is reestablished.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue PPRCOPY QUERY command to verify the status of the device and reissue the command.

ICK34073I PPRCOPY FAILED - NOT READY DEVICE, INTERVENTION REQUIRED

Explanation

Peer to Peer Remote Copy Suspended. Device is not ready. Intervention is required for Peer to Peer Remote Copy Secondary.

System action

Command processing ends.

Operator response

None.

System programmer response

Get the device ready and reissue the command.

ICK34074I UNABLE TO DETERMINE COPY COMPLETION STATUS

Explanation

An I/O error occurred while checking the copy completion status. The PPRCOPY ESTPAIR function may not have completed successfully.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue a PPRCOPY QUERY command to determine the status of the device. The device may still be in PENDING mode or in SUSPEND(x) state.

ICK34075I ESTPAIR FAILED TO COMPLETE COPY FROM PRIMARY VOLUME

Explanation

A PPRCOPY ESTPAIR command with the MSGREQ parameter has failed to complete. The storage subsystem detected errors. The copy is not complete and the volume pair is not in duplex state.

System action

Command processing ends.

Operator response

None.

System programmer response

Look for any console messages issued and refer to the IBM 3990 Storage Control Reference for Model 6 for information related to returned sense data. Notify your service representative of any hardware error conditions.

ICK34076I PPRCOPY FAILED - NON-VOLATILE STORAGE IS NOT AVAILABLE

Explanation

The command requires Non-volatile Storage and Non-volatile Storage is not available.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure Non-volatile storage is available and reissue the command.

ICK34077I PRIMARY VOLUME INFORMATION NOT CORRECT FOR THIS SECONDARY

Explanation

For PPRC Failover mode, the parameters that identify the primary are not correct for the device associated with this secondary.

System action

Command processing ends.

Operator response

None.

System programmer response

Correct the parameters and run the job again.

ICK34078I VOLUME IS NOT A PPRC SECONDARY IN THE PROPER STATE

Explanation

For PPRC Failover mode, the volume must be a secondary in full duplex or suspended state.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure the command is issued to the correct volume in the proper state.

ICK34079I VOLUME INFORMATION NOT CORRECT FOR ORIGINAL PRIMARY

Explanation

For PPRC Failback mode, the parameters that identify the original primary are not correct for the device associated with this volume.

System action

Command processing ends.

Operator response

None.

System programmer response

Correct the parameters and run the job again.

ICK34080I VOLUME IS NOT A PPRC PRIMARY IN SUSPENDED STATE

Explanation

For PPRC Failback mode, the volume must be a primary in suspended state.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure the command is issued to the correct volume in the proper state.

ICK34081I AN ESTABLISH PPRC CMD ATTEMPTED AN INVALID TRANSITION BETWEEN MODES

Explanation

An attempt is being made to go to PPRC Extended Distance mode, but the pair is in the wrong state to transition to PPRC Extended Distance mode. The only valid transition to PPRC Extended Distance mode is from a state of suspension.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure that you are issuing the command for the correct volume, and that the volume is in the correct state.

ICK34082I A COMMAND WAS RECEIVED THAT IS NOT VALID FOR THIS PPRC STATE

Explanation

A command was received that conflicts with an established Peer-to-Peer Remote Copy state for the device.

System action

Command processing continues.

Operator response

None.

System programmer response

Ensure that you are issuing the command for the correct volume, and that the volume is in the correct state.

ICK34083I ESTPAIR FAILED - SOURCE AND DESTINATION PORTS FOR PPRC PATH OVER FCP NOT UNIQUE

Explanation

The source and destination ports for a PPRC path over FCP must be unique. Any single port cannot be used as both source and destination.

System action

Processing stops.

Operator response

None.

System programmer response

Correct the SAID specification in the FCPPATHS keyword and resubmit the request.

ICK34084I ESTPATH FAILED - MIXED ESCON AND FCP INFORMATION SPECIFIED

Explanation

An ESTPATH command must specify all ESCON or all FCP paths. ESCON and FCP paths may not be mixed within the same command.

System action

Processing stops.

Operator response

None.

System programmer response

Correct the ESTPATH specification and resubmit the request.

ICK34085I INVALID WORLD WIDE NODE NAME SPECIFIED

Explanation

The primary and secondary WWNN must be a valid WWNN for an ESS box.

System action

Processing stops.

Operator response

None.

System programmer response

Correct the specification of the WWNN referenced in the ESTPATH, DELPATH or ANALYZE request. The WWNN can be determined by issuing the PPRCOPY QUERY (without PATHS) command to the device.

ICK34086I ATTEMPT TO ESTABLISH OR REMOVE FCP OR ESCON PATHS WHEN THE OTHER TYPE EXISTS

Explanation

A request establish or delete FCP paths was made but ESCON paths already exist between the related control units or a request establish or delete ESCON paths was made but FCP paths already exist between the related control units.

System action

Command processing ends.

Operator response

None.

System programmer response

Modify the request to refer to the appropriate type of path. A PPRC QUERY PATHS request can be issued to confirm the type of paths that already exist.

ICK34087I ESTPATH FAILED - ATTEMPT TO ESTABLISH FCP PPRC PATHS ON PORT WITH EXISTING FICON PATHS

Explanation

An attempt was made to establish or remove FCP PPRC paths on a port with existing FICON logical paths.

System action

Processing stops.

Operator response

None.

System programmer response

Ensure the correct devices are being targeted. If so and the request is ESTPATH, the command cannot be successfully executed until the FICON paths have been removed. If the correct devices are being targeted and the request is a DELPATH request, then there are no FCP PPRC paths to be deleted.

ICK34088I PPRC SECONDARY VOLUME FOUND IN UNCONFIGURED OR UNDEFINED STATE

Explanation

A peer-to-peer remote copy secondary volume was found to be in an unconfigured or undefined state.

System action

Processing stops.

Operator response

None.

System programmer response

Save the output and contact your IBM service representative.

ICK34089I ESTPATH FAILED - DEVICE 0 NOT CONFIGURED IN SECONDARY LSS

Explanation

An establish peer-to-peer remote copy paths command failed because device 0 is not configured in the secondary logical subsystem.

System action

Processing stops.

Operator response

None.

System programmer response

Save the output and contact your IBM service representative.

ICK34090I ESTPAIR FAILED - FAILOVER OR FAILBACK SPECIFIED BUT PPRC PAIR ALREADY IN REQUESTED STATE

Explanation

An establish peer-to-peer remote copy pair command specifying PPRC FAILOVER mode or PPRC FAILBACK mode was received, but the peer-to-peer remote copy pair is already in the requested state.

System action

Processing stops.

Operator response

None.

System programmer response

None.

ICK34091I CASCADING PPRC SECONDARY IN INVALID STATE FOR REQUEST. PRIMARY SYNCHRONOUS AND SUSPENDED, PENDING DUPLEX, OR FULL DUPLEX

Explanation

For cascading PPRC modes, when this command specifies a secondary volume that is determined to be in a PPRC relationship, that relationship must have been established in a cascading PPRC state.

System action

Processing stops.

Operator response

None.

System programmer response

Ensure that the secondary volume targeted by the current command is the correct one. If so, then you can reissue the ESTPAIR command with the CASCADE keyword added, to the pair, the primary volume of which, is the secondary volume of the current command.

ICK34092I SPECIFIED PRIMARY VOLUME MAY NOT BE IN PPRC EXTENDED DISTANCE MODE

Explanation

For cascading PPRC Modes, if the command specifies cascading PPRC with synchronous mode, the volume receiving this command as specified in the primary volume parameters can not be a PPRC secondary volume in PPRC Extended Distance Mode.

System action

Processing stops.

Operator response

None.

System programmer response

Ensure that the secondary volume targeted by the current command is the correct one. If so, then a cascaded triad where the local pair is in extended distance mode and the remote pair is in synchronous mode is not supported.

If the cascaded triad is still desired then the valid configurations are:

Synchronous to extended distance
Extended distance to extended distance, and
Synchronous to synchronous

If the cascaded triad is still desired with the local pair in extended distance mode then the remote pair will have to be established in extended distance mode.

ICK34093I INVALID VALUE SPECIFIED FOR xxxxxx

Explanation

The value indicated by xxxxxx was specified by the user and is invalid. The values that can be substituted for xxxxxx follow.

PRIMARY CCA
SECONDARY CCA
PRIMARY LSS
PRIMARY SEQUENCE NUMBER
PRIMARY WWNN
PRIMARY SSID
SECONDARY LSS
SECONDARY SEQUENCE NUMBER
SECONDARY WWNN

SECONDARY SSID
FIRST LINK OR FCP PATH
SECOND LINK OR FCP PATH
THIRD LINK OR FCP PATH
FOURTH LINK OR FCP PATH
FIFTH LINK OR FCP PATH
SIXTH LINK OR FCP PATH
SEVENTH LINK OR FCP PATH
EIGHTH LINK OR FCP PATH
PACE

System action

Command processing ends.

Operator response

None.

System programmer response

Respecify the incorrect value and resubmit the request.

ICK34094I INVALID BITS SET IN BYTE X''XXXX''. THOSE BITS SET INVALIDLY ARE: y (, z ...)

Explanation

Bits have been set in byte xxxx that are not valid for the CCW. The invalid bits are indicated using conventional hex format. So, for example, if the first bit from the left is invalid it would be indicated as "X'80'", the second bit from the left would be indicated as "X'40'", and so on.

System action

Command processing ends.

Operator response

None.

System programmer response

Save the output and notify your IBM Service representative.

ICK34095I TRACK FORMAT MISMATCH BETWEEN PRIMARY AND SECONDARY DEVICE DETECTED DURING UPDATE

Explanation

The format of a track on the secondary volume does not match the format of the corresponding primary track when performing an update operation.

System action

Command processing ends.

Operator response

None.

System programmer response

Verify and correct the track format discrepancy and issue the command again.

ICK34096I CASCADED SYNC TO SYNC CONFIGURATION WITH WRITES FROM LOCAL PAIR PROCEEDING

Explanation

The PPRC pair in a cascading PPRC relationship is connected via Fiber Channel Links. Both PPRC pairs in the cascading PPRC relationship are synchronous and write I/Os are still being transferred from the primary to the secondary of the first PPRC pair. This combination is not allowed.

System action

Command processing ends.

Operator response

None.

System programmer response

Restore the remote PPRC pair which is now in synchronous mode to Extended Distance mode.

ICK34097I RESTORE SPECIFIED AND VOLUMES WERE NOT IN A PERSISTENT RELATIONSHIP WHOSE BACKGROUND COPY HAD COMPLETED

Explanation

A Restore Flashcopy relationship command was received and the volumes were not in a persistent relationship whose background copy had completed.

System action

The command ends.

Operator response

None.

System programmer response

Use the FLASHCPY QUERY RELATIONS command to determine whether the background copy has completed and once completed, resubmit the request.

ICK34098I INBAND REQUEST SENT TO NON-PPRC VOLUME

Explanation

The request indicated that the command should be sent to a PPRC remote control unit for execution and the volume receiving the command is not a PPRC primary, or a PPRC primary does not exist for the specified remote secondary.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure that inbanding is intended. If not intended then remove the keyword that requests it, for example, remove the SOURCEVOL keyword from the Flashcopy request. If inbanding is intended the confirm that the targeted volumes are in a PPRC relationship, which can be done using the PPRC QUERY command.

ICK34099I COMMAND NOT SUPPORTED ON THE HARDWARE OR SOFTWARE LEVEL OF ESS

Explanation

The requested function is not supported by the hardware or the software level of the addressed ESS.

System action

The command ends.

Operator response

None.

System programmer response

Ensure the addressed ESS is the intended one. If so, the hardware and/or the software level on the ESS must be brought to a level that supports the requested function.

ICK34100I ORDER CANNOT COMPLETE DUE TO INTERNAL HARDWARE CONDITIONS OR LACK OF RESOURCES TO MANAGE THE RELATIONSHIP

Explanation

The requested command cannot complete due to internal hardware conditions or lack of resources to manage the relationship.

System action

The command ends.

Operator response

None.

System programmer response

Wait 2 minutes and retry command. If condition persists, notify your customer engineer.

ICK34101I REMOTE SOURCE VOLUME SPECIFIED FOR INBAND REQUEST NOT SECONDARY PPRC VOLUME OF THE ADDRESSED VOLUME

Explanation

The request must specify the remote source volume to be the secondary PPRC volume for the PPRC primary volume this command is addressed to.

System action

The command ends.

Operator response

None.

System programmer response

Ensure the SOURCEVOL keyword specifies the volume that is the PPRC secondary volume to the volume that the I/O is issue to.

ICK34102I MAXIMUM NUMBER OF FLASHCOPY RELATIONSHIPS HAS BEEN EXCEEDED

Explanation

The command cannot complete because the maximum number of Flashcopy relationships has been exceeded for one or more of the source or target tracks specified in the Flashcopy extents.

System action

The command ends.

Operator response

None.

System programmer response

The number of relationships can be reduced by withdrawing existing relationships or waiting for existing relationships to complete (via background copy completing). Background copy completion can be monitored via the FLASHCPY QUERY RELATIONS command.

ICK34103I FCP PATHS SPECIFIED BUT SPECIFIED ADAPTER(S) ARE FIBRE CHANNEL ARBITRATED LOOP

Explanation

The SAIDs specified with the command are for FCAL adapters and FCP paths cannot be established to such adapters.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure the FCP paths are intended and if so determine which SAIDs can be used in establishing the paths.

ICK34104I REQUEST SPECIFIES THAT EXISTING TARGET TRACK BECOME A SOURCE TRACK

Explanation

The command cannot complete because it has specified that an existing target track become a source track. A target track may have only one source.

System action

The command ends.

Operator response

None.

System programmer response

Ensure the device for which the command is intended is the one specified and, if so, then Flashcopy relationships may have to be withdrawn in order to successfully complete this request.

ICK34105I MAXIMUM NUMBER OF RELATIONSHIPS FOR THE VOLUME EXCEEDED

Explanation

The command cannot complete because the maximum number of relationships for the volume has been exceeded. If a Flashcopy Withdraw command causes relationships to be split, this can cause the number of relationships to increase.

System action

The command ends.

Operator response

None.

System programmer response

The number of target relationships can be reduced by withdrawing existing relationships or waiting for existing relationships to complete (via background copy completing). Background copy completion can be monitored via the FLASHCPY QUERY RELATIONS command.

ICK34106I VOLUME INHIBITED FOR FLASHCOPY QUERY

Explanation

The command cannot complete because the volume is inhibited for Flashcopy relationship establish.

System action

The command ends.

Operator response

None.

System programmer response

Determine why the volume is inhibited for Flashcopy relationship establishment and correct the situation, if appropriate, and resubmit the request. Depending on the reason for the inhibition, the FLASHCPY QUERY command may be useful in determining the cause.

ICK34107I COMMAND CANNOT COMPLETE BECAUSE SPECIFIED VOLUME(S) ARE OFFLINE OR IN INACCESSIBLE STATE

Explanation

The command failed because the specified volume(s) is offline or is in an inaccessible state.

System action

The command ends.

Operator response

None.

System programmer response

If the failure is due to the volume(s) being offline, then either vary the device online and resubmit the request. If the failure is due to the volume(s) being in an inaccessible state then determine the cause of the inaccessibility, correct it and resubmit the job.

ICK34108I REQUEST SPECIFIES THAT EXISTING TARGET TRACK BECOME A TARGET TRACK

Explanation

The command cannot complete because it specifies that an existing target track become a target track. A target track may have only one source.

System action

The command ends.

Operator response

None.

System programmer response

Ensure the device for which the command is intended is the one specified and, if so, then Flashcopy relationships may have to be withdrawn in order to successfully complete this request.

ICK34109I REQUEST SPECIFIES THAT EXISTING SOURCE TRACK BECOME A TARGET TRACK

Explanation

The command cannot complete because it specifies that an existing source track become a target track. A target track may have only one source.

System action

The command ends.

Operator response

None.

System programmer response

Ensure the device for which the command is intended is the one specified and, if so, then Flashcopy relationships may have to be withdrawn in order to successfully complete this request.

ICK34110I REQUEST TO REVERSE FLASHCOPY RELATIONSHIP FAILED BECAUSE TARGET BITMAP NOT ALL ZEROS

Explanation

The command attempted to reverse the order of the Flashcopy relation and the target bitmap was not all zeros.

System action

The command ends.

Operator response

None.

System programmer response

Wait until the Flashcopy completes via background copy. Completion of the background copy can be monitored via the FLASHCPY QUERY RELATIONS command.

ICK34111I STATE OF EXISTING FLASHCOPY RELATION DOES NOT ALLOW SPECIFIED REQUEST, RSN=*xx*

Explanation

The state of the existing Flashcopy relation does not allow the specified request to be processed.

Reason code *xx* indicates the reason for the error:

00
indicates that the reason code qualifier was not returned. Some possible reasons the request could not be completed are:

- The request was to reverse an existing Flashcopy relationship. However, change recording is not active for the specified relationship.

- The request was to do an establish with change recording, but the full volume relationship was not initially established with change recording.
- The request is attempting to create more than one relationship with version 1 change recording.
- The request is attempting to restore a relationship that was created with version 2 change recording but version 2 change recording has been disabled by MULTINCRFLC=NO in the DEVSUP*xx* member of PARMLIB.

01

Establish FlashCopy specified starting a new change recording relation and a change recording relation already exists between the two specified volumes.

02

Establish FlashCopy specified Start/Continue Change Recording Type 1, Restore and Change Recording Type 1 was NOT active for the specified source and target.

03

Establish FlashCopy specified Start/Continue Change Recording Type 2, Restore and Change Recording Type 2 was NOT active for the specified source and target.

04

For Establish FlashCopy, no relationship was found for the restore, FlashCopy increment, or the fast reverse restore request.

05

Establish FlashCopy change recording type mismatch. Establish FlashCopy specified Start/Continue Change Recording Type 1 and a Change Recording Type 2 relationship exists for the specified source and target volume OR Establish FlashCopy specified Start/Continue Change Recording Type 2 and a Change Recording Type 1 relationship exists for the specified source and target volume.

06

Establish FlashCopy specified Revertible and the relationship was already in a revertible state and its sequence number is NOT equal to the sequence number specified.

07

Establish FlashCopy specified Revertible and the specified source and target volumes will reverse the original relationship.

08

Establish FlashCopy specified Fast Reverse Restore and the relationship is NOT reversed by the specified parameters.

09

Establish FlashCopy specified Restore and not Fast Reverse Restore or specified Revertible AND a previous Establish FlashCopy specified Fast Reverse Restore for the relationship.

0A

Establish FlashCopy specified Restore or Revertible AND the relationship is in a failed state due to out of space condition on a space efficient target volume or the volume is fenced.

0B

Withdraw FlashCopy specified Revert or Commit AND the relationship is in a failed state.

0C

Withdraw FlashCopy specified Revert or Commit AND the relationship does not exist for the specified volumes.

0E

An error has occurred on the Remote Peer-to-Peer Remote Copy Control Unit or Global Mirror Subordinated Control Unit.

0F

The Establish FlashCopy specified target volume is a Peer-to-Peer Remote Copy Primary Volume and the volume is waiting to release space.

11

Establish FlashCopy specified a source or target volume that is in an existing relationship and that relationship is in a revertible state.

12

Establish FlashCopy specified a source volume that is the target of an existing incremental relationship and the incremental copy has not completed for the other relationship.

14

Establish FlashCopy specified a source volume that is the target volume of an existing relationship and the existing relationship for the volume is in the failed state.

System action

The command ends.

Operator response

None.

System programmer response

Determine the state of the existing Flashcopy relation(s) by issuing either the FLASHCPY QUERY or FLASHCPY QUERY RELATIONS commands.

ICK34112I REQUEST ISSUED TO VM MINI-DISK WHICH IS NOT SUPPORTED

Explanation

The request was issued to a device that is a VM mini-disk and mini-disks are not supported.

System action

The command ends.

Operator response

None.

System programmer response

None.

ICK34113I REVERT OR COMMIT SPECIFIED, BUT THE EXISTING RELATION IS NOT REVERTIBLE

Explanation

The existing relation is not revertible.

System action

The command ends.

Operator response

None.

System programmer response

None.

ICK34114I FLASHCOPY WITHDRAW PARTIAL EXTENTS FROM SPECIFIED RELATIONSHIP IS INVALID

Explanation

The command failed due to one of the following reasons:

- An attempt was made to split an existing full volume incremental relationship
- An attempt was made to split an existing full volume relationship with a space-efficient target
- The target volume of the Flashcopy relationship was a Peer-to-Peer Remote Copy primary volume that was established with PPRC/XRC incremental resync enablement and the Flashcopy background copy had not completed when the withdraw Flashcopy command was issued.

System action

The command ends.

Operator response

None.

System programmer response

None.

ICK34115I CHANGE RECORDING SPECIFIED BUT IS ALREADY ACTIVE AND NOT PREVIOUSLY ACTIVATED WITH SAME OPERATION TYPE

Explanation

Change recording is specified but change recording is already active and was not previously activated by the same operation type.

System action

The command ends.

Operator response

None.

System programmer response

Issue FLASHCPY QUERY or PPRC QUERY to the volume and determine if Change Recording is already active. If it is, then it is most likely that someone else is using these volumes for another purpose.

ICK34116I ERROR ENCOUNTERED DURING OUTPUT OF TABLE> OUTPUT OF THE DATA PORTION OF THE TABLE CANNOT BE COMPLETED

Explanation

The FLASHCPY QUERY RELATIONS request failed on an attempt to acquire additional data that could not be retrieved on previous attempts.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Another message will have been issued that explains the cause of the error. Review that message and take appropriate action.

ICK34117I XDC CONSISTENCY CANNOT BE MAINTAINED DUE TO CONDITION THAT CAUSES VOLUME TO BE IN INCORRECT STATE

Explanation

XDC (Asynchronous PPRC) consistency cannot be maintained due to a timeout of a paused increment or for other conditions that have caused the volume to be in an incorrect state.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue PPRCOPY QUERY SESSIONSDEVICES to determine the state of the volumes in the session - take corrective action as needed. Corrective action might involve issuing commands to bring volumes to the correct state, remove volumes from the session or repair hardware.

ICK34118I CLOSE SESSION CANNOT BE DONE BECAUSE THERE ARE STILL VOLUMES IN THE SESSION

Explanation

The PPRC DEFINESESSIONS CLOSE command failed because there are still volumes populating the session.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue the PPRC QUERY SESSIONSDEVICES to determine which volumes are still defined to the session, then use the PPRC POPULATE REMOVE command to remove those volumes from the session.

ICK34119I PPRC SECONDARY VOLUME NOT ESTABLISHED IN CASCADING PPRC STATE

Explanation

An attempt was made to establish a volume as the secondary in a PPRC relationship when it is already the primary of an existing PPRC relationship which will result in a Cascaded triad, however this secondary volume was not established in its existing relationship to be in a Cascade state.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure that the volume indicated to be the secondary of the new PPRC relationship is the one intended. If so, you must break the existing PPRC relationship and reestablish it specifying the CASCADE keyword, then resubmit this request.

ICK34120I SESSION ALREADY OPEN ON LSS OR MAXIMUM SESSIONS ALLOWED ALREADY MET

Explanation

A request to open a session failed because that session number already exists on the targeted LSS or the maximum number of sessions has already been met.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue the PPRC QUERY SESSIONSDEVICES command to determine what sessions exist on the device, then delete any unwanted sessions before resubmitting this request.

ICK34121I ONE OF THE VOLUME(S) IS ALREADY ASSOCIATED WITH A SESSION

Explanation

A request to populate a session with a particular volume failed because that volume is already defined to another session.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue the PPRC QUERY SESSIONSDEVICES command to determine what volumes are currently populating which sessions, then, if appropriate, remove the volume(s) from their existing sessions before resubmitting this request.

ICK34122I SPECIFIED SESSION ID DOES NOT EXIST ON ADDRESSED LSS

Explanation

The request to JOIN or REMOVE volumes from the specified session failed because that session does not exist on the targeted LSS.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue the PPRC QUERY SESSIONSDEVICES command to determine what sessions currently exist on which LSSs, then, if appropriate, define the desired session before resubmitting this request.

ICK34123I PATHS NOT ESTABLISHED BETWEEN MASTER AND ONE OR MORE SUBORDINATES

Explanation

The command failed because FCP paths have not been established between the Master ESS and one of its Subordinates.

System action

Command processing ends.

Operator response

None.

System programmer response

Use the PPRC ESTPATH command to establish FCP paths between the Master and its Subordinate(s) then resubmit this request.

ICK34124I START REQUESTED AND ANOTHER MASTER IS ALREADY RUNNING OR MODIFY REQUESTED AND PARAMETERS DO NOT MATCH EXISTING SESSION OR COMMAND ISSUED TO OTHER THAN ALLOWABLE LSS

Explanation

If STARTASYNCCOPY START was specified then there is already a Master running on the targeted ESS box. If STARTASYNCCOPY MODIFY was specified then there is a mismatch between the specified parameters and the existing values or the wrong LSS was targeted.

System action

Command processing ends.

Operator response

None.

System programmer response

If STARTASYNCCOPY START was specified then ensure that the targeted ESS is the intended one and, if so, terminate the existing asynchronous PPRC configuration and resubmit this request. If STARTASYNCCOPY MODIFY was specified ensure that the specified parameters are correct and the correct LSS is targeted.

ICK34125I COMMAND ISSUED TO DEVICE ON WHICH CONFIGURATION DOES NOT EXIST OR TO OTHER THAN ALLOWABLE LSS

Explanation

The command failed because the configuration for the specified session doesn't exist or the I/O was issued to a device that is not a member of the LSS to which the STARTASYNCCOPY command was originally issued.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure the request is issued to the correct device and the correct session number is specified.

ICK34126I COMMAND ISSUED TO DEVICE WOULD RESULT IN EXCEEDING THE MAXIMUM NUMBER OF ALLOWED MASTERS

Explanation

The command failed because completion of the command would cause the maximum number of allowed Masters to be exceeded.

System action

Command processing ends.

Operator response

None.

System programmer response

Ensure the request for the correct Subordinate ESS SSIDs.

ICK34127I MISMATCH BETWEEN MASTER CUSN AND THAT FOR SPECIFIED SESSION OR BETWEEN SPECIFIED AND EXISTING SESSIONS

Explanation

The command failed because the control unit serial number for the specified Master does not match the existing control unit serial number for the specified session number, or the specified session number does not match the existing session number for the specified Master.

System action

Command processing ends.

Operator response

None.

System programmer response

Correct the parameters and resubmit the request.

ICK34128I ONE OR MORE NON-VOLATILE STRUCTURES COULD NOT BE UPDATED OR ACCESSED DUE TO FAILURE OR TO ESS BEING IN SINGLE CLUSTER MODE

Explanation

The command failed because one or more of the non-volatile structures could not be updated or accessed due to failure or due to the ESS being in a single cluster mode.

System action

Command processing ends.

Operator response

None.

System programmer response

Notify customer engineer.

ICK34129I PAUSE/TERMINATE FAILED BECAUSE COMPLETION WOULD JEAPORDIZE THE CONSISTENT COPY OF THE DATA

Explanation

A Pause/Terminate of the Asynchronous PPRC configuration failed because the termination could not complete without compromising the consistent copy of the data.

System action

Command processing ends.

Operator response

None.

System programmer response

Notify customer engineer.

ICK34130I XDC START INCREMENT ORDER RECEIVED ON SUBSYSTEM, BUT SESSION OR MEMBERS OF SESSION NOT IN CORRECT STATE

Explanation

The command failed because the session or members of the session are not in a state to process the command.

System action

Command processing ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Issue the PPRC QUERY ASYNCCOPY and/or the PPRC QUERY SESSIONSDEVICES commands to determine the state of the session.

ICK34131I XTH CUSN FIELD OF TOPOLOGY KEYWORD INVALID

Explanation

Specification of the CUSN field contains an invalid number of characters. Specification of the CUSN field contains an invalid number of characters. The CUSN field may consist of a sequence number (five or fewer characters), a two character Plant of Manufacture, and a four character Machine Type (eleven characters in total). If either the Plant of Manufacture or the Machine Type is specified they must both be specified.

System action

Process of this command terminates and return code is set to 12.

Operator response

None.

System programmer response

Review the CUSN specification and ensure that if any field, in particular the sequence number, contains fewer characters than the maximum that leading zeros are present. The Plant of Manufacture and Machine Type can be determined by issuing the CONTROL CONFIG(DISPLAY) command to the device.

ICK34132I SPECIFICATION OF MACHINE TYPE AND PLANT OF MANUFACTURE MUST BE MADE FOR ALL SUBORDINATES OR NONE OF THEM

Explanation

If the Plant of Manufacture and Machine Type are specified for any Subordinate then the information must be specified for all Subordinates.

System action

Process of this command terminates and return code is set to 12.

Operator response

None.

System programmer response

Either specify the Plant of Manufacture and Machine Type for all Subordinates or for none of them and resubmit the job.

ICK34133I XTH CUSN FIELD OF TOPOLOGY KEYWORD CONTAINS INVALID MACHINE TYPE

Explanation

The Machine type specified with the xth CUSN is invalid.

System action

Process of this command terminates and return code is set to 12.

Operator response

None.

System programmer response

Review the xth CUSN specification and ensure that the Machine Type is correct. The Machine Type can be determined by issuing the CONTROL CONFIG(DISPLAY) command to the device.

ICK34134I XTH CUSN FIELD OF THE TOPOLOGY KEYWORD CONTAINS AN INVALID SEQUENCE NUMBER

Explanation

The control unit sequence number specified in the xth CUSN is invalid. It may be too long.

System action

Process of this command terminates and return code is set to 12.

Operator response

None.

System programmer response

Review the xth CUSN specification and ensure that the specified sequence number is correct and that neither Plant of Manufacture nor Machine Type are specified.

ICK34135I MODE(COPY|ALL) PARAMETER IS INVALID WHEN COMMAND IS ISSUED TO THE TARGET VOLUME

Explanation

The MODE(COPY) or MODE(ALL) parameter is invalid when the volume specified in the UNITADDRESS, DDNAME, or SYSNAME parameter is the target volume.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the parameters and run the job again.

ICK34136I INCREMENTAL RESYNC TIME SEQUENCE CONFLICT BETWEEN PRIMARY AND SECONDARY VOLUMES

Explanation

An INCRESYNC(INCRES) command was issued specifying 3-Site Incremental Resync Establish and the secondary 3-Site Incremental Resync time sequence is newer than the primary 3-Site Incremental Resync time sequence.

System action

The command fails.

Operator response

None.

System programmer response

It is likely that the volumes identified as the local primary and remote secondary are not members of the same Cascaded triad. Ensure that the volumes have been correctly identified. If synchronization of the two volumes is still desired, then a full copy of the primary to the secondary volume is required.

ICK34137I MISMATCH IN SPECIFICATION OF INCREMENTAL RESYNC PRIMARY AND SECONDARY VOLUMES

Explanation

An INCRESYNC(INCRES) command was issued specifying 3-Site Incremental Resync Establish, and the specified primary and secondary are not both targets of the same Peer-to-Peer Remote Copy primary *or* the specified primary's secondary is not the same volume as the specified secondary's primary volume.

System action

The command fails.

Operator response

None.

System programmer response

It is likely that the volumes identified as the local primary and remote secondary are or were not members of the same Cascaded triad. Ensure that the volumes have been correctly identified.

ICK34139I PPRC ESTPAIR INCRESYNC(INCRES) ISSUED BUT 3-SITE INCREMENTAL RESYNC MECHANISM NOT RUNNING

Explanation

A request to undertake Incremental Resync recovery processing was made but the Incremental Resync mechanism is not running on the addressed volume.

System action

The command fails.

Operator response

None.

System programmer response

Ensure that the correct volume is addressed. If the correct volume is being addressed, then attempt to determine whether an INCRESYNC(STOP) has been issued to the device. If synchronization of the two

volumes is still desired then a full copy of the primary to the secondary volume is required.

ICK34140I COMMAND FAILED - VOLUME RESIZE IS IN PROGRESS

Explanation

The PPRCOPY ESTPAIR, or FLASHCPY ESTABLISH command cannot complete because the volume is restricted from participating in a Copy Services relationship due to the volume being resized.

System action

The command ends.

Operator response

None.

System programmer response

Wait until the volume resize has completed, and run the job again.

ICK34141I ESTABLISH FAILED - PRESERVE MIRROR OPERATION COULD NOT BE COMPLETED, RSN=xx

Explanation

The ESTABLISH request specified a Preserve Mirror operation and the source or the target Peer-to-Peer Remote Copy pairs are not in the correct state.

Reason code xx indicates the reason for the error:

01
The specified source volume is NOT a Peer-to-Peer Remote Copy primary device.

02
The secondary volume of the specified source volume and the secondary volume of the target volume are not in the same Storage Facility Image (SFI).

03
The Peer-to-Peer Remote Copy relationship between the specified source volume and its secondary volume is NOT full duplex.

04
The Peer-to-Peer Remote Copy relationship between the specified target volume and its secondary volume is NOT full duplex.

05
The secondary control unit does not have the microcode installed that supports Preserve Mirror operations.

06
The inband FlashCopy Establish command was not successful at the secondary because a Remote Pair FlashCopy relationship already existed.

07
An error was detected when sending a Define Subsystem Operation command to the secondary volume.

08
An incremental was requested and the existing incremental relationship is not a preserve mirror relation.

09
Establish Flashcopy specified a Preserve Mirror (Remote Pair Flashcopy) operation, the target device is a Peer-to-Peer Remote Copy multi-target primary device and the setting for Use Remote Pair FlashCopy is ambiguous (it is not set for any PPRC relationship or is set for more than one PPRC relationship). Use the PPRCOPY SETCHARACTERISTICS command to set the Use Remote Flashcopy (Preserve Mirror) indicator for the designated PPRC Remote Flashcopy pair.

0A
Change Recording Type 2 was specified and the secondary control unit does not have the microcode installed that supports Change Recording Type 2.

0B
You specified the PRESERVEMIRROR(PREFERRED) parameter and the volume is in a Peer-to-Peer Remote Copy multi-target relationship. If you wish to use Preserve Mirror you must specify the PRESERVEMIRROR(REQUIRED) parameter.

14
You specified the PRESERVEMIRROR(PREFERRED) parameter and the control unit no longer supports Preserve Mirror Preferred. If you wish to use Preserve Mirror you must specify the PRESERVEMIRROR(REQUIRED) parameter.

System action

Command processing ends.

Operator response

None.

System programmer response

Examine the previous messages, CCW, CSW, and sense information to determine the cause of the I/O error. Ensure that you have specified the right devices and that they have the proper features installed. To

determine the state of the Peer-to-Peer Remote Copy pairs issue the PPRCOPY QUERY command.

ICK34142I WITHDRAW COMMAND ISSUED TO SECONDARY FAILED

Explanation

A FLASHCPY WITHDRAW command was issued to a Peer-to-Peer Remote Copy Secondary Volume and the relationship was established as a Preserve Mirror operation.

System action

Command processing ends.

Operator response

None.

System programmer response

Issue the FLASHCPY WITHDRAW to the primary and the background copy will automatically be started on the secondary to withdraw it (or, if you specify FORCE, the relation on the secondary will be immediately terminated).

ICK34143I FLASHCOPY COMMAND FAILED - FAILOVER/FAILBACK RECOVERY IN PROGRESS OR INCREMENTAL RESYNC STARTED ON TARGET

Explanation

For an ESTABLISH request the command specified a target that:

- is in the process of a PPRC Cascading Failover/ Failback recovery operation or
- has incremental resync change recording started for the target PPRC pair.

For a WITHDRAW request the command specified a relationship with its target volume:

- in the in the process of a PPRC Cascading Failover/ Failback recovery operation and the background copy has not completed or
- that is a PPRC primary with incremental resync change recording active and the background copy has not completed.

System action

Command processing ends.

Operator response

None.

System programmer response

Reissue the request when the recovery operations are complete or when incremental resync has been stopped.

ICK34144I FLASHCOPY WITHDRAW CANNOT BE SENT TO REMOTE FOR PRESERVE MIROR RELATION

Explanation

The WITHDRAW command involved an existing Preserve Mirror relationship. The command was completed for the local relationship but could not be sent to the remote.

System action

Command processing ends.

Operator response

None.

System programmer response

The remote relationship may have to be explicitly withdrawn

ICK34146I COMMAND FAILED - VM COMMAND REJECT, RSN= *xx*

Explanation

The command was rejected by z/VM due to either an incorrect source or target parameter was entered, or a hardware configuration change occurred. The return code from z/VM is contained in RSN= *xx* where *xx* is one of the following:

01
Source LSS/UA mismatch

02
Target LSS/UA mismatch

03
CUISSID mismatch

04
Subchannel ID mismatch

System action

Command processing ends.

Operator response

None.

System programmer response

Verify that you have entered the correct source and target parameters and submit the job again. The CONTROL CONFIG(DISPLAY) command can be used to verify the LSS, CCA, SSID and serial number parameters.

ICK34147I COMMAND FAILED - PAUSE GLOBAL MIRROR WITH CONSISTENCY FAILED, RSN=*xx*

Explanation

A Pause/Terminate Global Mirror request that specified Pause Global Mirror with consistency failed with the reason *xx*. Reason *xx* is one of the following:

01
Pause/Terminate Global Mirror specified Pause Global Mirror with consistency. The microcode level of one or more of the subordinate control units does not support the Pause Global Mirror with consistency function.

02
One or more of the Global Copy members failed to suspend during the processing for a Pause/Terminate Global Mirror command that specified Pause Global Mirror with Consistency.

03
One or more of the Global Copy members failed to unsuspend following a Pause/Terminate Global Mirror command that specified Pause Global Mirror with Consistency.

System action

Command processing ends.

Operator response

None.

System programmer response

Examine the previous messages, the CCW, the CSW and sense information to determine the cause of the I/O error. Ensure that you have specified the right devices and that they have the proper features installed. To determine the state of the Peer-to-Peer Remote Copy pairs issue the PPRCOPY QUERY command. For more information refer to "PPRCOPY QUERY–querying status" on page 265.

ICK34148I THE COMMAND IS NOT ALLOWED DUE TO DEVICE BEING IN A SOFT FENCE STATE, RSN= *xx*

Explanation

The command entered is not allowed, as the device is in a soft-fenced state. Reason code *xx* indicates the reason for the error:

00
No additional information is available.

01
The device that is in the soft-fenced state is either the channel connection device, a Peer-to-Peer Remote Copy primary device, or a FlashCopy source device.

02
The device that is in the soft-fenced state is either a Peer-to-Peer Remote Copy secondary or a FlashCopy target device.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

If you wish to clear the soft-fenced state, you can use the CONTROL CLEARFENCE command or the PPRCOPY ESTPAIR FAILBACK command, which automatically clears the soft-fenced state when the volume is to become the PPRC secondary.

ICK34149I REMOTE SOURCE VOLUME SPECIFIED FOR INBAND REQUEST DOES NOT SUPPORT THE PARAMETERS SPECIFIED

Explanation

The function that was specified requires features that have not been installed for the specified remote source volume.

System action

Command processing ends.

Operator response

None.

System programmer response

Examine the previous messages, CCW, CSW, and sense information to determine the cause of the I/O error. Ensure that you have specified the right devices and that they have the required features installed.

ICK34150I COMMAND FAILED, JOIN/REMOVE OPERATION COULD NOT BE COMPLETED, RSN= *xx*

Explanation

The request to join or remove volumes from the specified session with the PPRCOPY POPULATESESSION command failed. Reason code *xx* indicates the reason for the error:

00

There is no open session equal to the session specified in the SESSIONNO parameter.

System programmer response: Verify that you are running to the right device and that the session you specified is open. Use the PPRCOPY QUERY SESSIONSDEVICES command to determine the existing sessions.

01

A request to join volumes to a session was made using the IVOLLIST or RVOLLIST parameter, and a session exists that was populated with the multi-target MTIVOLLIST or MTRVOLLIST parameter.

System programmer response: If you wish to establish a non multi-target session you must first remove the multi-target sessions.

02

A request to join volumes to a session was made using the multi-target MTIVOLLIST or MTRVOLLIST parameter, and a session exists that was populated with the IVOLLIST or RVOLLIST parameter.

System programmer response: If you wish to establish a multi-target session you must first remove the non multi-target sessions.

03

A request to remove volumes from a session was made using the multi-target MTIVOLLIST or MTRVOLLIST parameter, and the session is not multi-target.

System programmer response: Verify that you are running to the right device and that the session you specified is mult-target. Use the PPRCOPY QUERY SESSIONSDEVICES command to determine the existing sessions.

04

A request to remove volumes from a session was made using the multi-target MTIVOLLIST or MTRVOLLIST parameter, and the secondary control volume information specified does not match the secondary control volume information for the session number specified.

System programmer response: Use the PPRCOPY QUERY SESSIONSDEVICES command to obtain the secondary control volume information.

05

A request to join volumes to a session was made using the IVOLLIST or RVOLLIST parameter, and one or more of the volumes you have specified is in a peer-to-peer remote copy multi-target relationship.

System programmer response: If you wish to establish a non multi-target session you must first ensure that the volumes you are specifying are not in a peer-to-peer remote copy multi-target relationship. Use the PPRCOPY QUERY command to determine the relationship of the volumes you are attempting to join to a session. For multi-target PPRC configurations, the MTIVOLLIST or MTRVOLLIST parameter must be used, specifying the secondary device to be used in the Global Mirror session.

System action

Command processing ends.

Operator response

None.

System programmer response

Refer to the preceding reason code description for the suggested response.

ICK34151I ESTPAIR FAILED - A MULTI-TARGET OPERATION COULD NOT BE COMPLETED, RSN= *xx*

Explanation

The PPRCOPY ESTPAIR command failed as a multi-target operation could not be completed. Reason code *xx* indicates the reason for the error:

01

Establish Peer-to-Peer Remote Copy Pair is establishing a peer-to-peer remote copy multi-target relationship and the peer-to-peer remote copy multi-target microcode EC is not active on all CECs of the primary control unit.

System programmer response: Ensure that the peer-to-peer remote copy multi-target microcode is installed and active on all CECs of the primary control unit.

02

Establish Peer-to-Peer Remote Copy Pair is establishing a peer-to-peer remote copy multi-target relationship and one or more of the

secondary control units does not have the microcode EC active that supports peer-to-peer remote copy multi-target.

System programmer response: Ensure that the microcode EC that supports peer-to-peer remote copy multi-target is properly installed/active on all of the secondary control units.

03

An Establish Peer-to-Peer Remote Copy Pair command would have resulted in a peer-to-peer remote copy primary with more than two active secondary relationships.

System programmer response: Issue a Peer-to-Peer Remote Copy Query command and remove any extra relationships. If it does not appear that there are more relationships than should be supported, verify that the microcode level installed supports the number of relationships desired.

04

An Establish Peer-to-Peer Remote Copy Pair command would have resulted in a peer-to-peer remote copy primary with more than three secondary relationships.

System programmer response: Issue a Peer-to-Peer Remote Copy Query command and remove any extra relationships. If it does not appear that there are more relationships than should be supported, verify that the microcode level installed supports the number of relationships desired.

05

The addressed device was a secondary of a peer-to-peer remote copy multi-target relationship and the Establish Peer-to-Peer Remote Copy Pair command attempted to make it a primary of another peer-to-peer remote copy multi-target relationship.

System programmer response: Cascaded peer-to-peer remote copy multi-target relationships are not supported by the microcode. Issue a Peer-to-Peer Remote Copy Query command and remove any extra relationships. If it does not appear that there are more relationships than should be supported, verify that the microcode level installed supports the number of relationships desired.

0A

The addressed device is the primary of a peer-to-peer remote copy multi-target relationship and a cascaded peer-to-peer remote copy device. The Establish command specified ACTION(FAILOVER), which is not supported in a multi-target configuration.

System programmer response: Re-issue the Establish Peer-to-Peer Remote Copy Pair command with FAILOVERMT.

0D

The peer-to-peer remote copy multi-target internal relationship between the partner secondaries cannot be created because more than 16 LSS associations have been established for the partner secondary volume executing the command.

System programmer response: Issue a Peer-to-Peer Remote Copy Query command and remove any extra secondary LSS associations. If it does not appear that there are more secondary associations than should be supported, verify that the microcode level installed supports the number of relationships desired.

0E

The peer-to-peer remote copy multi-target internal relationship between the partner secondaries cannot be created because more than 4 volume relationships are associated with the volume executing the command.

System programmer response: Issue a Peer-to-Peer Remote Copy Query command to all of the secondaries associated with this primary. Remove any extraneous MTIR relationships. If it does not appear that there are more relationships than should be supported, verify that the microcode level installed supports the number of relationships desired.

0F

The peer-to-peer remote copy multi-target internal relationship cannot be created because out-of-sync track bitmap (OOS) bitmaps are not available.

System programmer response: Contact your hardware representative for diagnostic assistance.

System action

The command ends. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Refer to the preceding reason code description for the suggested response.

ICK34152I COMMAND FAILED - RESTRICTED VOLUME TYPE COMBINATION, RSN= *xx*

Explanation

The PPRCOPY ESTPAIR command cannot complete because the combination of the volume types specified are restricted from participating in a Copy Services relationship with the installed level of microcode. Reason code *xx* indicates the reason for the error:

01
Establish Peer-to-Peer Remote Copy Pair specified a restricted volume type combination. The specified secondary volume is an Extent Space Efficient volume.

03
Establish Peer-to-Peer Remote Copy Pair specified a restricted volume type combination. The specified primary volume is an Extent Space Efficient volume.

System action

Command processing ends.

Operator response

None.

System programmer response

Refer to the preceding reason code description for the suggested response.

ICK34153I COMMAND FAILED - A STORE CLOUD OR RETRIEVE CLOUD DATA OPERATION IS IN PROGRESS, RSN= *xx*

Explanation

The PPRCOPY ESTPAIR or FLASHCPY ESTABLISH command cannot complete due to a Store Cloud Data or Retrieve Cloud Data operation in progress. Reason code *xx* indicates the reason for the error:

FE
A Store Cloud Data operation or a Retrieve Cloud Data operation is in progress for the target volume specified in the FLASHCPY ESTABLISH command.

FF
A Store Cloud Data operation or a Retrieve Cloud Data operation is in progress for the primary or secondary volume specified in the PPRCOPY ESTPAIR command.

System action

Command processing ends.

Operator response

None.

System programmer response

Re-issue the command when the Store Cloud Data or Retrieve Cloud Data operation has been completed.

ICK40227I AN "ELSE" COMMAND APPEARS IMPROPERLY

Explanation

The command contains an ELSE clause without a corresponding IF statement.

System action

The remainder of the command is ignored. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the command syntax, and issue the command again. Save the output and contact your IBM service representative.

ICK40228I AN "END" COMMAND IS INVALID

Explanation

An END statement does not have a matching DO statement.

System action

The remainder of the command is ignored. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the DO-END sequence, and issue the command again. Save the output and contact your IBM service representative.

ICK40229I 'IF' COMMAND HAS INVALID RELATIONAL EXPRESSION

Explanation

The IF-THEN-ELSE statement sequence is incorrect.

Only the system variables LASTCC and MAXCC can be specified. All values must be decimal numbers from 0 through 99999.

System action

The remainder of the command stream is ignored. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Check the requirements of the IF-THEN-ELSE statement sequence and correct the error. Issue the command again. Save the output and contact your IBM service representative.

ICK40230I "SET" COMMAND HAS INVALID ASSIGNMENT EXPRESSION

Explanation

The syntax of a SET statement is not valid. Only the system variables LASTCC and MAXCC can be assigned values. All values must be decimal numbers from 0 through 99999.

System action

The remainder of the command stream is ignored. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Check the syntax requirements of the SET statement and correct the error. Issue the command again. Save the output and contact your IBM service representative.

ICK40232I IMPROPER OR MISSING "THEN" KEYWORD

Explanation

The THEN clause of the IF-THEN-ELSE command sequence is either missing or is misspelled.

System action

The remainder of the command stream is ignored. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Correct the error, and issue the command again. Save the output and contact your IBM service representative.

ICK40236I INPUT STREAM END-OF-FILE FOUND BEFORE END OF COMMAND

Explanation

An end-of-file condition was encountered while scanning the command. This could be caused by either incorrect command-continuation syntax or missing records in the input stream.

System action

The command ends.

Operator response

None.

System programmer response

Either correct the command syntax, or add the missing records. Issue the command again. Save the output and contact your IBM service representative.

ICK40237I TOO MANY LEVELS OF "IF" COMMAND NESTING

Explanation

More than ten IF statements have been nested.

System action

The remainder of the command stream is ignored. ICKDSF continues with the next command.

Operator response

None.

System programmer response

Restructure the command stream to avoid the excessive nesting, and issue the command again. Save the output and contact your IBM service representative.

ICK40300I ERROR READING INPUT DATA FROM "fn ft fm" RC= nnnn

Explanation

While CMS macro FSREAD read a record from the specified CMS file, an error condition occurred with RC=nnnn.

System action

The command ends.

Operator response

None.

System programmer response

For an explanation of the return code, see the FSREAD macro in *CMS Macros and Function Reference*

ICK40305I ERROR READING INPUT DATA FROM VIRTUAL READER RC= nnnn

Explanation

While the CMS macro RDCARD read a record from a virtual reader file, an error condition occurred with RC=nnnn.

System action

The command ends.

Operator response

None.

System programmer response

For an explanation of the return code, see the RDCARD macro in *CMS Macros and Function Reference*

ICK40310I ERROR WRITING OUTPUT DATA TO "fn ft fm" RC= nnnn

Explanation

While CMS macro FSWRITE was writing a record to a specified CMS file, an error condition occurred with RC=nnnn.

System action

The command ends.

Operator response

none.

System programmer response

For an explanation of the return code, see the FSWRITE macro in *CMS Macros and Function Reference*

ICK40315I ERROR WRITING OUTPUT DATA TO VIRTUAL PRINTER RC= nnnn

Explanation

While CMS macro PRINTL was printing a line to a virtual printer, an error condition was detected with RC=nnnn.

System action

The command ends.

Operator response

None.

System programmer response

For an explanation of the return code, see the PRINTL macro in *CMS Macros and Function Reference*

ICK40317I UNABLE TO DETERMINE MINI DISK SIZE

Explanation

ICKDSF was invoked using the CMS invocation parameter list. The process requires an operator response, but the input device does not allow operator input.

System action

Command processing ends.

Operator response

Run the job again, specifying an input device which allows a response.

System programmer response

None.

ICK40320I I/O OPERATION INCOMPLETE OR FAILED RC= nnnn

Explanation

While CMS macro HNDINT was handling the I/O interrupt for the DASD I/O operation, an error condition occurred with RN=nnnn.

System action

The command ends.

Operator response

None.

System programmer response

For an explanation of the return code, see HNDINT macro in *CMS Macros and Function Reference*

ICK40999I UABORT CODE nn

Explanation

An abnormal end error caused the ICKDSF processor to abort. This situation is usually caused by hardware, program, or system errors. The message appears in the output listing from the write-to-programmer SVC.

Code *nn* indicates the nature of the error.

Code
Meaning

15
When ICKDSF was invoked from CMS using the CMS parameter list, the file containing the input data set could not be found.

19
Input device is not valid.

24
Text processor's print control table is not addressed by the GDT.

28
No virtual storage is available for:

- Page header line
- Argument lists
- Main title line
- Footing lines
- Print control table (PCT)
- Initialization of the I/O adapter historical data and message area
- Automatic (dynamic) storage for a module which uses preallocated automatic storage
- A GETMAIN/GETVIS request
- Space for STAE control block
- Open control-block allocation
- Device Information Table (DIT)

Note: The system could not issue the message that sufficient storage was not available because the SYSPRINT data set was not open.

29
Output device not valid.

32
Request made to process unopened data set

33
Unable to cancel STAE control

34
Too many USTAE calls

36
Processor unable to open SYSPRINT (or whichever DD name is used to denote the processor's standard listing output data set).

The SYSIN DD card may be misspelled.

40
List of U-macro arguments that are not valid:

UOPEN, UCLOSE, UPUT, UALLOC, UCVAF,
UGSPACE, UGPOOL, UFPOOL, USCRATCH,
UTIME
UVOLCHK, UWTO, UDEQ,
USTAE, URESERVE

41
Invalid storage request for UGSPACE macro

44
Processor is unable to produce a dump. The SNAP system service was not successful: either the DSFDUMP data set could not be opened, or not enough storage was available.

50
ICKDSF order not valid

52
Module not found for ULOAD

59
HNDINT macro error in the SIO routine. Abnormal end error message for message ICK40320I. See the explanation and response for ICK40320I.

68
GETVIS failure.

69
HNDINT macro error in the GET SCHIB routine (at open time). Abnormal end error message for message ICK40320I. See the explanation and response for ICK40320I.

72
Unsupported device type.

75
Operating system could not be determined.

76
370 mode not supported.

77
VSE EXTRACT failed, unable to determine CPUID.

80
CCW action flag not valid.

81
Bad OSVTOC. Cannot call DADSM to correct the problem.

82
Internal ENQ process problem.

84
A unrecognized I/O error has occurred for the device type

88
Operator replied T to message ICK014D

89
DIRECTed I/O incorrect. Contact your IBM service representative.

93
ICKDSF abnormal end for message ICK011E.

96
Equipment check occurred on device that is being processed.

98
Invalid PSF order or undefined action.

99
PSF order not defined in action table.

System action

ICKDSF ends.

Operator response

Notify the system programmer.

System programmer response

Correct the cause of the error, and start ICKDSF again. Save the job output and contact your IBM hardware service representative.

Appendix B. Volume layout and record formats on CKD Devices

This appendix gives information on volume layout and record formats for CKD devices. It includes:

- An example of a 3380 volume map
- Track contents after initialization
- IPL bootstrap record contents
- How track associations are recorded

The track is the smallest directly addressable space on a device. Tracks typically occupy a full 360-degree rotation of the disk medium; however, a track can correspond to either fractional or multiple device rotations.

Each track has a starting point, called an **index** (see Figure 34 on page 651). After its index point, each track on a CKD device begins with a **home address** that identifies the track's address and defines its operational status.



Figure 34: CKD track and record formats

The **track descriptor record** is always the first record on the track following the home address. It is **record zero (R0)**. If a flag in the home address area indicates the track is defective, then the count area of record zero contains the track address of the track that is to be used as an alternate. The count area of record 0 on the alternate track contains the track address of the defective, primary track.

Following the track descriptor record (record 0), one or more user records can be written on the track. These records are typically numbered in sequence. Each of these physical records contains a count area, an optional key area, and a data area, each of which is separated by a gap. Checking information is added to each area when it is written and is used later for detecting and correcting data errors.

Count Area contains the ID of the data area that follows. The record ID is specified by a value expressed as five bytes (CCHHR). In addition to the record ID, the count area specifies the length in bytes of the key and data areas of the record.

Key Area is an optional portion of the record. It can be used by the programmer to identify the information in the data area of the record. Note that there is no key area in the standard record zero.

Data Area contains data that has been organized and arranged by the programmer.

Example of a 3380 volume map

Figure 35 on page 652 is an example of the volume map after processing a 3380 volume with either the INIT or the INSPECT command.

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```
ICKDSF - xxx DEVICE SUPPORT FACILITIES yyy TIME: 00:23:00  mm/dd/yy  PAGE 1
 INIT UNIT(0127) NVFY VOLID(tstvol) VTOC(1,1,1)

⋮
ICK31061I 0A93 VTOC INDEX CREATION SUCCESSFUL: VOLUME IS IN INDEX FORMAT
ICK061I   0A93 VTOC INDEX CREATION SUCCESSFUL: VOLUME IS IN INDEX FORMAT
ICK01307I DEFECTIVE-TRACK LIST IN HEXADECIMAL FOR VOLUME TSTVOL
ICK01308I THE FOLLOWING PRIMARY TRACKS WERE FOUND DEFECTIVE:
  CCHH OF TRACK --- CCHH OF ALTERNATE --- FLAGGED DEFECTIVE
    0003 0003          0375 0001               YES
    0004 0004          0375 0002               YES
    0004 0005          0375 0003               YES
    0005 0005          0375 0004               YES
    0006 0006          0375 0005               YES
    0006 0007          0375 0006               YES
    000C 000A          0375 0000               YES

ICK01312I NO DEFECTIVE ALTERNATE TRACKS WERE FOUND.
ICK01313I VOLUME CONTAINS 15    ALTERNATE TRACKS --  8    AVAILABLE.
ICK01314I VTOC IS LOCATED AT CCHH=X'0001 0001' AND IS     1 TRACKS.
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
          00:26:00    mm/dd/yy
```

Figure 35: Volume map output (CKD devices)

Symbol	Indicates
mm/dd/yy	The Month/Day/Year the ICKDSF command was run.
xxx	Operating System
yyy	Release (for example, Release 17). See “Devices supported by ICKDSF” on page 6 for an explanation of how to determine System and Release.
ICK01307I	The volume serial number for which the map is produced.
ICK01308I	Printed as the second line of the volume map when one or more defective primary tracks were found. **Note:** Only medial initialization will generate a volume map that lists all defective tracks. Minimal initialization generates a map that lists only the alternate tracks. The INSPECT command generates a map that lists only the individual tracks that were inspected. Some of the listed tracks may not be defective. Lists may include tracks that are marked defective because of unconditional assignment of alternate tracks.
CCHH OF TRACK	The hexadecimal track address of the defective primary track.
CCHH OF ALTERNATE	The hexadecimal track address of the alternate track assigned to the primary track. If a primary track is marked defective but does not have an associated alternate track, this column contains the primary track address.
FLAGGED DEFECTIVE	A YES indicates that the home address flag byte has its defective-track flag on. A NO indicates that the defective-track flag is off.
TRACK CONDITION	This column is printed only if the CHECK parameter was specified with the command or if an unrecoverable track was found. (This column does not appear in the example shown.)
DEFECTIVE	The track could not be read without a DATA CHECK occurring.
NOT-DEFECTIVE	The track could be read and written without difficulty. The defective-track flag was on and, although the track did not appear to have defects, it was not reclaimed. The NOT-DEFECTIVE condition appears only when you do not issue the RECLAIM parameter.

Symbol	Indicates
UNRECOVERABLE	Surface checking could not be performed because I/O errors occurred that prevented either the home address or the record 0 from being written on the track.
ICK01309I	One or more alternate tracks were found defective. The same information is provided for alternate tracks and primary tracks, but the second column identifies the primary track associated with the alternate track. **Note:** In some cases, the track address for the primary track is the same track address as that of the alternate track. This indicates that the alternate track is not associated with a primary track. When an alternate track is found unrecoverable, the FLAGGED DEFECTIVE column is blank, and the primary track address is set to NONE.
ICK01313I	The number of alternate tracks defined for the volume and the number of alternate tracks that are neither defective nor assigned.
ICK01314I	The track address where the volume table of contents begins and the number of tracks reserved for it.

Track contents after initialization

MVS VSE

Figure 36 on page 653 shows the contents of cylinder 0, track 0 after the volume has been initialized. The first track of the first cylinder is reserved for system-defined records:

- Home address and record 0
- IPL bootstrap records
- Volume label
- Optional user-volume labels
- Optional IPL program

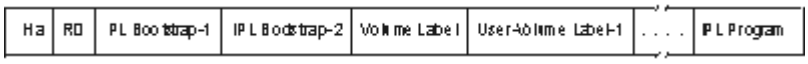


Figure 36: Cylinder 0, track 0 layout (CKD devices)

IPL bootstrap record contents

MVS

Table 56 on page 654 shows the contents of the IPL bootstrap records as the system supplies them. Each bootstrap record has a count area and a four-byte key area.

The key of the first record is IPL1, and the count area indicates that its data area is 24 bytes long. The key of the second record is IPL2, and the count area indicates that its data area is 144 bytes long.

Bootstrap record 1 causes bootstrap record 2 to be read, and bootstrap record 2 causes the IPL program to be read. The IPL program contains user-defined values.

Table 56: IPL bootstrap records	
IPL Bootstrap Record 1:	
00000000 00000000	PSW
06003A98 60000060	CCW: Read
08003A98 00000000	CCW: TIC
IPL Bootstrap Record 2:	
07003AB8 40000006	CCW: Seek
31003ABE 40000005	CCW: Search Id Equal
08003AA0 00000000	CCW: TIC
06000000 20000000	CCW: Read
000000000000	Seek Address—0:0
0000000004	Search Address—R 4
0000000000000000	Padding
0000000000000000	(101 Bytes)

How track associations are recorded

Figure 37 on page 654 shows how the primary and alternate track associations are recorded on the volume. The track addresses, in this example, are for an IBM 3390 Model 2.

For the IBM 9345, the primary/alternate track reassignment is managed by the subsystem.

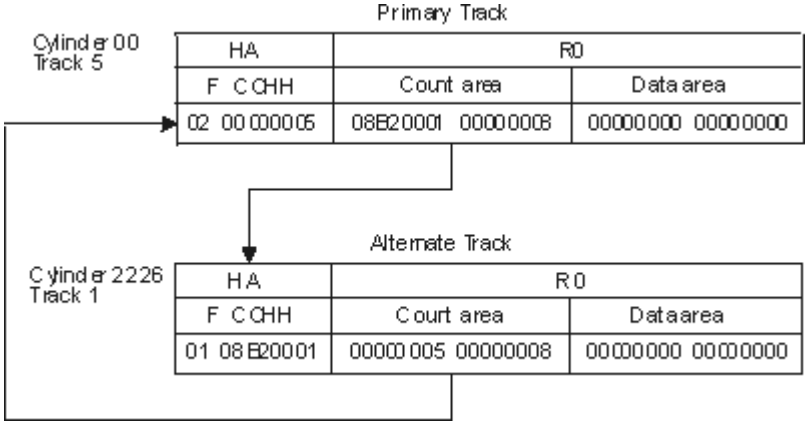


Figure 37: Primary/alternate track association (3390 model 2)

Appendix C. VTOC index



This appendix gives you information on the VTOC and the VTOC index. It includes information about:

- Calculating the size of the VTOC
- Calculating the size of the VTOC index
- Calculating the number of tracks for the index
- Determining how many VIERS you need

The VTOC index is a separate, sequential data set containing four record types that give information on volume and VTOC status. Systems that contain and use indexed VTOC programming support can achieve performance improvements in the areas of volume space management and I/O operations to the VTOC.

The INIT and BUILDIX commands will build the VTOC index on eligible CKD devices. The INIT command creates space for the index during volume initialization in both operating system and stand-alone versions. The BUILDIX command, which requires that the host operating system contain indexed VTOC programming support, builds VTOC indexes on volumes currently in use on the system. Both commands prepare the VTOC on the target volume to indexed VTOC (IXVTOC) format.

Calculating the size of the VTOC

To calculate VTOC size, you generally determine the maximum number of data sets that will reside on the volume. The number of VTOC tracks to reserve can be easily calculated by dividing this number by the number of data set control blocks (DSCBs) per track, rounding to the next higher track.

The number of DSCBs in the VTOC determines the number of data sets or VSAM data spaces that can reside on a volume and is therefore essential information for the DADSM routines that allocate and release space.

The number of DSCBs that will fit on a single track of each type can be found in Table 57 on page 656.

Calculating the size of the VTOC index

The size of the index data set depends upon:

- The size of the volume (total number of cylinders and tracks)
- The track length (in bytes)
- The number of tracks occupied by the VTOC

For the INIT command, the user may calculate the number of tracks to reserve for the index and place that value as the third, optional subparameter of the INDEX parameter. Or you can omit the third subparameter and let the program calculate the size of the index. For the BUILDIX command, the user must calculate the size of the index.

If your data set name lengths are greater than 12, you should compute the size of your VTOC index using the calculations shown following Table 57 on page 656.

It is recommended that you calculate the number of tracks to reserve for both the VTOC and the index data set. Table 57 on page 656 shows the recommended maximum values for VTOC and VTOC index size for the devices that can support the VTOC index. The chart places the recommended upper limits for calculating maximum usable space.

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The assumptions used to generate the chart may or may not be valid in an actual situation, and are dependent on how much space you have already used.

Table 57: Table of maximum VTOC and VTOC index sizes.

DEVICE	CYLS		TRKS PER CYL	DSCBs/ TRK	INDEX RECS/ TRK[1]	MAX. VTOC[2] (TRKS)	MAX. INDEX[3] (TRKS)	# OF RECORD TYPES[4]		
	PRI	ALT						VPSM[5]	VMDS[6]	VIER[7]
3375	959	1	12	51	14	222	20	1	1	272
3380 A04, B04 AA4, AD4, BD4 AJ4, BJ4, CJ2	885	1	15	53	18	246	16	1	1	285
3380 AE4, BE4	1 770	1	15	53	18	492	31	2	2	553
3380 AK4, BK4	2 655	1	15	53	18	738	46	3	3	821
3390-1	1 113	1	15	50	21	328	17	2	2	352
3390-2	2 226	1	15	50	21	655	33	3	3	686
3390-3	3 339	1	15	50	21	983	50	4	4	1 041
3390-9[9]	10 017	3	15	50	21	2 944	150	11	10	3 129
3390-9[9]	32 760	0	15	50	21	9 828	491	34	31	10 238
3390-9[9]	65 520	0	15	50	21	19 656	980	66	62	20 475
3390-1 (3380 mode)	1 113	1	15	53	18	310	20	2	2	355
3390-2 (3380 mode)	2 226	1	15	53	18	619	39	3	3	695
3390-3 (3380 mode)	3 339	1	15	53	18	928	58	4	4	1 035
9345-1	1 440	N/A[8]	15	45	17	470	26	2	2	437
9345-2	2 156	N/A[8]	15	50	17	655	40	3	2	674

Notes:

1
Index record length of 2048 bytes.

2
This maximum value assumes that all data sets on the volume are single track data sets.

3
This maximum value assumes that the VTOC is the maximum size.

4
The first VIXM map will manage up to 7840 index records. (One VIXM is more than sufficient for current devices.) The second VIXM will manage an additional 16032 records.

5
The number of VPSMs required for a device is dependent upon its size. 16032 bits are available for cylinder and track mapping in each VPSM.

6
The first VMDS will manage up to 16032 DSCBs. The second and third VMDS will manage up to an additional 16032 DSCBs.

7
Each VIER is assumed to contain 48 entries.

8
Alternates are managed by the subsystem. They are not available to the host channel program or the user.

9
Model 9 will be used for all devices equal to or greater than 10017 cylinders. The hardware device characteristics for these devices indicate it is a Model 9.

Calculating the number of tracks for the index

To calculate the number of tracks to reserve for the index:

1. Determine the average data set name length of the identifier data set control blocks. This value will be referred to as D.

   If the length chosen is too small, the data set names may not fit in the index. If the length chosen is too large, some space is unused in the index.

2. Determine the maximum number of data sets that will reside on the volume. This value will be referred to as N.
3. Calculate the number of VTOC index entry records (VIERs) needed to contain N data set names, each of which has an average length of D. Use the calculations from "Determining how many VIERs you need" on page 657.

   For the number of VIXM, VPSM, and VMDS records, refer to the chart for actual numbers.
4. Add together the totals of all four record types and divide by the number of index records per track.
5. To get the number of tracks to reserve for the index, round the average from the above step to the next higher track.

Place the value calculated for the index size either:

- As the third subparameter of the INDEX parameter on the INIT command statement, or
- As the number of tracks to be allocated in the SPACE or ABSTR parameter in the DD statement required to run BUILDIX.

Determining how many VIERs you need

The following shows the calculations to determine the number of VIERs needed to contain N data set names, each of which has an average data set name length of D. The calculations assume that:

- All VIERs except one at each level are half-filled.
- A new level of the index is created. when four lower-level VIERs are created.
- n+1 unused VIERs are required for an n-level index.

Calculate the number of VIERs as follows where:

$\lfloor \ \rfloor$ = round quotient down to integer value

$\lceil \ \rceil$ = round quotient up to integer value

N = number of data set names in the index
D = average data set name length
E^1 = number of data set names that fit in a half-filled level 1 VIER
E^2 = number of data set names that fit in a half-filled level 2 or greater VIER

L(n) = number of VIERs at level n

$\lfloor 244/(D+8) \rfloor * 4 = E^1$ number of data set names that fit in a half-filled level 1 VIER

$\lfloor 244/(D+7) \rfloor * 4 = E^2$ number of data set names that fit in a half-filled level 2 or greater VIER

Calculate L(n) (where n is 1,2,3,...). and L(n) is the number of VIERs at level n

$\lceil N/E^1 \rceil - 1 = L(1)$ number of level 1 VIERs.
Use L(n)=1 if calculation yield zero.

For n=2,3,... L(n) is calculated from L(n-1)

If $L(n-1) \geq 4$ then

$\lceil L(n-1)/E^2 \rceil - 1 = L(n)$ Use L(n)=1 if calculation yields zero.

If $L(n-1) < 4$, then there are no VIERs at level n or higher

The total number of VIERs is

$L(1) + L(2) + \ldots + L(n)$

The assumptions used for the above calculations represent the state of the index immediately after building it using the BUILDIX command. The state of the index is such that the largest number of VIERs possible are used to contain the data set names. Since the data set names on a volume will not all have the same length, use the calculations only as an approximation. Choose N (maximum number of data set names) and D conservatively to account for the varying number of data set names that will fit in a VIER.

Note: Fragmentation (because of scratch and reallocation activity) will cause the index to expand up to 50%.

How ICKDSF determines the default index size

With APAR PK56092 for release 17 the following logic is used to determine the default index size. This is done when the INIT command is specified without specifying the INDEX parameter.

Index terminology and calculations:

The following terminology is used to describe the different record types in the Index.

- Extended Address Volume (EAV) - A volume with more than 65,520 cylinders.
- Cylinder-managed space - The space on the volume that is managed only in multicylinder units.
- VPSM - Index record that maps space on the volume in track and cylinder units, and multicylinder units for volumes with cylinder-managed space.
- VMDS - Index record that maps DSCBs in VTOC
- VIXM - Index record that map VIERS (records that contain VTOC index entry records - data sets)
- VIRs (VTOC Index Records) - equals VPSMs + VMDSs + VIXMs, limited to 255

Volumes with cylinder-managed space will have an index record size of 8K.

A 2K record size can map 999 cylinders in one VPSM. An 8K record can map 4,071 cylinders in one VPSM. A VPSM that maps only cylinders can map up to 1,368,864 cylinders.

The VIER in a 2K record can have a maximum of 48 entries. The VIER in an 8K record can have a maximum of 184 entires.

The maximum number of DSCB's is determined by taking the value in the FMT4DSCB (DS4DEVDT, number of DSCBs per track) and multiplying it by the number of tracks in the VTOC.

The number of 2K records that can be written on a track is 21. The number of 8K records that can be written on a track is 6.

To compute the index size:

NUMVPSM = number of VPSMs needed.

- If the volume < 64K Tracks, then default to 6 for a volume.
- If the volume > 64K Tracks and not EAV, the number of cylinders found in FMT4DSCB (DS4DSCYL / 999). If there is a remainder, then add one.
- If EAV, then the number of cylinders found in FMT4DSCB (DS4DCYL - 65,520 / 1,368,864). If there is a remainder, then add one. Then add this to the number of VPSM's that mapped the first 65,520 cylinders. This is determined by dividing 65,520 by 4071 and then adding one for the remainder. It is 17 VPSM's.

MAXDSCB = FMT4DSCB (DS4DEVDT, number of DSCBs per track multiplied by number of tracks in VTOC).

MAXENTYS = Maximum Entries in VIER, 48 for 2K, 184 for 8K.

RECTRK = Records per track max is 21 for 2K records, 6 for 8K records.

TOTAL INDEX RECORDS = NUMVPSM + (MAXDSCB/MAXENTYS) + RECTRK.

TOTAL INDEX TRACKS = (TOTAL INDEX RECORDS / RECTRK) + 1 - the one is added so we know that it is large enough to hold the VIXM and VMDS that are needed.

Appendix D. Fixed block architecture VTOC (FBAVTOC)

VSE

This appendix describes the fixed block architecture VTOC (FBAVTOC), shows examples of label record format, and lists the FBAVTOC space requirements.

VTOCs on FBA devices are formatted in a similar manner to VSAM relative record data sets. The 140-byte label records are stored in control intervals. For example, three label records fit into a 512-byte control interval. The control interval size is always an integral multiple of the device's physical block size. The upper limit is 8192 bytes.

The FBAVTOC extent is expressed in number of slots, which is equivalent to the number of file label records. It can range from a minimum of three slots to a maximum of 999 slots, fitting into as many control intervals as required. The program rounds up the extent values to that of the next full control interval.

The FBAVTOC's starting location can be any physical block on the volume, except for blocks 0 and 1, which are reserved for the IPL and volume label blocks (VLB).

A default (non-SYSRES) FBAVTOC has the following default characteristics:

Starting location
Block 2, immediately after the VLB

Extent
56 file label records

Control interval size
1024 bytes (or FBA block size, if larger)

If you specify FBAVTOC(END), ICKDSF creates a VTOC that is 99 entries long with a control interval size of 1024. ICKDSF places the VTOC on the last blocks of the volume.

Label record format

Each record of the FBAVTOC contains 140 bytes, written as binary zeros. The first two records of the FBAVTOC are reserved for specific records:

- The data set control block of the FBAVTOC
- The space management label

Each control interval of the FBAVTOC contains a fixed number of slots. Figure 38 on page 661 shows the FBAVTOC format.

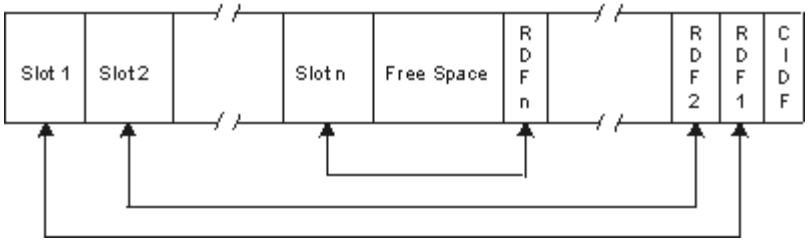


Figure 38: Format of a FBAVTOC control interval

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There is one record definition field (RDF) associated with each slot in a control interval. The length field in the RDF (bytes 1 and 2) contains the slot length, which is equal to the label record length. Bit 5 of byte 0 of the RDF indicates whether the associated slot contains a record/label (bit 5=0) or not (bit 5=1). The RDF has one of the following contents:

X'00008C' if the slot contains a label.
X'04008C' if the slot does not contain a label, that is, it is empty.

Labels per control interval (LBPCI) is recorded in the standard volume label (VOL1) in bytes 29 through 32.

The control interval definition field (CIDF) has the following format:

```
Bytes 0,1   free-space offset = RECSIZE * LBPCI
Bytes 2,3   free-space length = CISIZE-4-LBPCI * (RECSIZE+3)
```

FBAVTOC space requirements

To calculate the space required for a FBA VTOC:

1. Calculate the number of labels per control interval (LBPCI). Use the formula:

   ```
   LBPCI = FLOOR of (CISIZE-4)/(RECSIZE+3)
   ```

   where:

   FLOOR
   Takes the integral part of the argument.

   CISIZE
   Equals the control interval size.

   RECSIZE
   Equals the label record size, which is equal to 140.

2. Calculate the number of control intervals required for the FBAVTOC.

   ```
   CEILING of (number of labels specified/LBPCI)
   ```

   where:

   CEILING
   Takes the next highest integer if there is a remainder.

3. Calculate the number of physical blocks reserved for the FBAVTOC.

   ```
   CI * (CISIZE/physical block size)
   ```

   where:

   CI
   Equals the number of control intervals required for the VTOC.

Appendix E. Surface checking

This appendix describes surface checking for a track. It includes:

- Surface checking for defects
- Primary checking
- Skip displacement checking
- Check values

Surface checking for a track is performed when you specify:

- INIT with the CHECK(*n*) parameter for 3370 and 9335 devices.
- INSPECT with the CHECK(*n*) parameter for 3370, 3375, 3380, 3390, and 9335 devices.
- INSPECT with either CHECK or SKIP for the IBM 9345. There is only one level of surface checking for the IBM 9345. It replaces the primary and skip displacement checking, and it is performed by the subsystem. For more information, see *IBM 9340 Direct Access Storage Subsystems Reference*.

Surface checking for possible defects

The purpose of surface checking is to detect defects that might exist on the surface of a track. These defects might be correctable or uncorrectable.

Surface defects exist with different degrees of visibility. Some defects can be detected by any I/O operation to the defective area of the track. Others might be detected only once out of every 100 I/O operations and only with a certain bit pattern. The number of I/O operations that ICKDSF does to any one track is limited by performance considerations, the practicality of finding a defect, and what can be done if a defect is detected for the device type being processed.

The surface checking functions performed by ICKDSF are not equivalent to the surface checking performed on a volume at the factory. Marginal defects that exist on the surface of a track cannot be detected consistently by ICKDSF because of their intermittent nature. Therefore, different results can be obtained for the same track or volume from multiple runs of ICKDSF. Also, ICKDSF output can differ from other surface checking products because of different checking algorithms.

The IBM 3375, 3380, 3390, and 9345 device types contain extra space that can be used if a defective area is detected on a track. By assigning a **skip displacement** to a given track, the hardware knows to skip over the defective area and to use the extra area for this track.

No alternative track assignment is needed. There is no performance degradation, and the track functions as if no defect exists.

ICKDSF performs two types of surface checking:

1. **Primary checking** is supported for the IBM 3370, 3375, 3380, 3390, 9345, and 9335.
2. **Skip displacement checking** can occur on 3375, 3380, and 3390 devices only.

Primary checking

Primary checking is performed when CHECK(*n*) is specified as follows:

- For the IBM 3370, 3375, 3380, 3390, and 9335, when you use the INSPECT command.
- For the IBM 9335 and 3370, when you use the INIT command.
- Primary checking is the only level supported for the IBM 3370 and 9335 devices. It consists of writing and reading back *n* bit patterns for the specific device. For the values for *n* by device, see “CHECK(n) values” on page 665.

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Primary checking for CKD devices

Primary checking for CKD devices consists of the following:

1. A bit pattern for the specified device is written and read back once.
2. If a data check is detected (correctable or uncorrectable), the following is performed:
   - For devices with skip displacement support, the I/O operation is repeated to determine if the data check persists. If it does, skip displacement checking is performed on the track. For more information, see "Skip displacement checking" on page 664.
   - For devices without skip displacement support, the bit pattern is reread up to ten times to determine if the error is repeatable. If the error is not repeatable, processing continues.

     If the error is repeatable:

     – For correctable errors, an entry is made in the map output if MAP was specified. Processing continues to the next track. If you want to assign an alternate to that track, use INSPECT NOCHECK ASSIGN TRACKS.

     – For uncorrectable data checks, the track is declared defective.
3. This is repeated *n* times (from CHECK(*n*)) unless a data check is encountered. Each pass through uses a different device-dependent bit pattern. If all the patterns for the device are used, the sequence of patterns is repeated starting with the first pattern used. For the values of *n* that write each bit pattern at least once, see "CHECK(n) values" on page 665.

Primary checking for FBA devices

Primary checking for FBA devices consists of the following:

1. A bit pattern for the specified device is written and read back once.
2. If a correctable data check is detected, the block is reread ten times to determine if the error is repeatable.
3. If an uncorrectable data check or repeatable correctable data check is encountered and ASSIGN is specified, an alternate is assigned and the process is restarted to analyze the surface of the alternate.
4. This is repeated *n* times (from CHECK(*n*)) until it is performed without encountering any uncorrectable data checks or any repeatable correctable data checks. Each pass through uses a different device-dependent bit pattern. If all the patterns for the device are used, the sequence of patterns is repeated starting with the first pattern used. For the values of *n* that write each bit pattern at least once, see "CHECK(n) values" on page 665.

Skip displacement checking

Skip displacement checking of a track can be performed on 3375, 3380, and 3390 devices. Rigorous surface checking is done to locate and skip over defective areas on a track.

The maximum number of defects that can be skipped on any one track is dependent upon the device type. A track is declared defective only if the number of defects exceeds this maximum.

Skip displacement checking is performed using the INIT or INSPECT command as follows:

INSPECT command–For the IBM 3375, 3380, and 3390 when:

- SKIP is specified with CHECK(*n*).
- Primary surface checking detects a data check.
- RECLAIM is specified and the track is currently flagged defective.

Detection and assignment of a skip displacement for a track are complicated and can be time consuming. When skip displacement processing is issued, the emphasis is on defect detection.

For the NOSKIP process, the total running time can vary considerably, depending upon the number of tracks that might invoke skip displacement analysis.

Additionally, for low visibility defects, an error might not be detected during one NOSKIP run (and therefore no skip displacement checking takes place), but might be detected during a subsequent NOSKIP run.

Note that, after a defect is skipped, that defect becomes invisible to all subsequent processing and will not be encountered again.

CHECK(n) values

The CHECK(*n*) values shown below give one pass through each bit pattern. Specifying a value of *n* greater than these values causes the same bit pattern to be rewritten. As this is a time-consuming option, you should think about performance considerations.

- For the 3370 and 9335, *n*=3 gives one pass through each bit pattern.
- For the 3375, 3380, and 3390, *n*=2 gives one pass through each bit pattern

If you specify SKIP for supported devices, skip displacement checking is automatically performed and *n* is ignored.

Appendix F. User security exit module

This appendix contains Programming Interface information.



The data security function in ICKDSF provides for a user exit module that can tailor security processing to installation needs. A default module is shipped with ICKDSF. This appendix describes this module.

The user exit module is invoked by the ICKDSF security/authorization module for online processing under MVS. The only intended purpose of the user exit module is to control the security checking function by setting return codes. Attempts to alter anything other than return codes with the module may have unpredictable results.

For an example of link-editing an exit module, see Figure 40 on page 669. The ICKDSF program directory, which is supplied with the ICKDSF program, contains information about link-editing.

Loading registers

ICKDSF loads the following registers as input to ICKUSER1:

Register	Content
1	Pointer to a 3-word parameter list.
13	Pointer to a standard 18-word save area.
14	Return address.
15	Address of ICKUSER1 entry point.

The 3-word parameter list contains:

Word	Description
Word 1	Pointer to a data set name.
Word 2	Pointer to a 6-character volume serial number.
Word 3	Pointer to a 2-character field containing: A 1-byte data set type code A 1-byte ICKDSF command code

The data set type codes are:

1
VSAM data set

2
Password-protected data set

3
Unexpired data set

The command codes are:

1
Reserved

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2
INIT command

3
INSPECT command

4
TRKFMT command

Note: The user exit module must set a return code in register 15 indicating the action required.

Return codes for password-protected data sets

For password-protected data sets, the return codes are:

Hex	Dec	Meaning
00	0	Bypass checking for this volume and do not return to ICKUSER1 for this volume
04	4	Bypass checking for this data set, but return to ICKUSER1 for the next data set
08	8	Check this data set normally and return to ICKUSER1 for the next data set
0C	12	Check this volume normally and do not return to ICKUSER1 for this volume
10	16	Reject access to this data set without checking and return to ICKUSER1 for the next data set
14	20	Terminate this command immediately

Normal checking for a password-protected data set consists of taking the user-supplied password for this data set from the PASSWORDS parameter and verifying that this password provides authority to alter the data set.

Return codes for VSAM and unexpired data sets

For VSAM and unexpired data sets, the return codes are:

Hex	Dec	Meaning
00	0	Bypass checking for this volume and do not return to ICKUSER1
0C	12	Check this volume normally and do not return to ICKUSER1
14	20	Terminate this command immediately

Normal checking for VSAM and unexpired data sets consists of checking whether the PURGE option has been specified. (For INSPECT with NOPRESERVE, the PURGE option is always absent.) If a code other than the ones shown is returned, ICKDSF terminates the function.

Return codes for the IBM module

The IBM-supplied module always returns a code of 12. Codes returned by the IBM module are arranged as shown in Table 58 on page 668.

Table 58: Offsets of return codes for the IBM-supplied user exit module.

Hex Offset	Code	Command	Data Set Type
+4*	12		
+8*	12		
+C*	12		
+10	12	INIT	VSAM

Table 58: Offsets of return codes for the IBM-supplied user exit module. (continued)

Hex Offset	Code	Command	Data Set Type
+14	12	INIT	Password-Protected
+18	12	INIT	Unexpired
+1C	12	INSPECT	VSAM
+20	12	INSPECT	Password-Protected
+24	12	INSPECT	Unexpired
+28	12	TRKFMT	VSAM
+2C	12	TRKFMT	Password Protected
+30	12	TRKFMT	Unexpired

***** Reserved.

However, the IBM-supplied return codes can easily be changed with superzap. Figure 39 on page 669 is an example of overriding ICKUSER1, in which the IBM-supplied return code is changed in this manner. This example shows how ICKUSER1 can be overridden to permit use of the INSPECT command with the NOPRESERVE option on volumes containing VSAM data sets. This JCL changes the IBM-supplied return code of 12 at offset X'1C' as shown in Table 58 on page 668.

```
//DSFP62D      JOB     CLASS=A,MSGLEVEL=(1,1)
//ZAPOFF       EXEC    PGM=AMASPZAP
//SYSPRINT     DD      SYSOUT=A
//SYSLIB       DD      DSN=SYS1.LINKLIB,DISP=SHR,UNIT=3390,
//             VOL=SER=VS2D57
//SYSIN        DD      *
 NAME          ICKDSF  ICKUSER1
 VER           001C    0000000C
 REP           001C    00000000
/*
```

Figure 39: Overriding ICKUSER1 to change return codes

Replacing the IBM-supplied user exit routine

When an installation wants to replace the IBM-supplied user exit routine:

1. The replacement routine must be named ICKUSER1 with an entry point of ICKUSER1.
2. ICKDSF must be re-link-edited into an APF-authorized library.

Figure 40 on page 669 shows an example of how to re-link-edit ICKDSF to include a new ICKUSER1. In the figure, ICKUSER1 is a member of MYLIB.

```
//LINKLIB      EXEC    PGM=IEWL,PARM='XREF,LIST,LET,RENT,REFR'
//SYSPRINT     DD      SYSOUT=A
//SYSUT1       DD      UNIT=SYSDA,SPACE=(CYL,(2,2))
//MYLIB1       DD      DISP=SHR,DSN=MYLIB,VOL=SER=xxxxx,UNIT=3390
//SYSLMOD      DD      DISP=SHR,DSN=SYS1.LINKLIB
//SYSLIN       DD      *
     INCLUDE   MYLIB1(ICKUSER1)
     INCLUDE   SYSLMOD(ICKDSF)
     ENTRY     ICKSA01
     SETCODE   AC(1)
     NAME      ICKDSF(R)
/*
```

Figure 40: Link-edit for ICKUSER1

Appendix G. ICKMCLVL macro

MVS

The macro identified in this appendix is provided as a programming interface for customers by Device Support Facilities.

Attention: Do not use as programming interfaces any ICKDSF macros other than the one identified in this appendix.

The ICKMCLVL macro is a general use programming interface.

This appendix contains Programming Interface information.

MVS

This appendix describes the ICKMCLVL macro. ICKMCLVL (in SYS1.SAMPLIB) is an in-line executable assembler-language macro that can be invoked by a caller. This macro lets subsystems that invoke ICKDSF dynamically know if ICKDSF is installed on the system, and if it is, its version, release, and modification level.

This ICKDSF-provided macro attempts to load the ICKDSF module. If the load is successful, it determines the ICKDSF version, release, and modification level and passes the requested information in a register. The macro also causes the load module to be deleted from main storage. The caller can be in problem program state and have a user key. The caller must save registers 0, 1, 14, and 15 before invoking the macro. No other registers are disturbed.

On return, register 1 contains information as follows:

- If the release level of ICKDSF cannot be determined, register 1 contains X'04000000'.
- Otherwise, register 1, byte 0 contains X'00', and the three low-order bytes contain:
  - Byte 1: Version number (in binary)

    00 = Version 0
    01 = Version 1
    02 = Version 2
  - Byte 2: Release number (in binary)

    01 = Release 1
    02 = Release 2
    03 = Release 3
    ⋮
    10 = Release 16
    11 = Release 17
  - Byte 3: Modification level (in binary)

    00 = Modification level 0
    01 = Modification level 1
    02 = Modification level 2

Figure 41 on page 672 shows the expansion of the macro ICKMCLVL.

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```
     MACRO
     ICKMCLVL
      LOAD EP=ICKRELVL, ERRET=ICK1SYSNDX
      LR   1,0
      L    1,0(1)
      B    ICK2&SYSNDX
ICK1&SYSNDX LA 1,4(0,0)
      SLL  1,24(0)
      B    ICK3&SYSNDX
ICK2&SYSNDX DELETE EP=ICKRELVL
ICK3&SYSNDX DS  OH
      MEND
*     register 1 contents:
*          byte 0: 00 if no errors, 04 otherwise
*          byte 1: version number
*          byte 2: release number
*          byte 3: modification number
```

Figure 41: Expansion of macro ICKMCLVL

Appendix H. Calling ICKDSF from an application program

ICKDSF can be invoked as a utility program from an application program by using the LINK (or ATTACH) macro. The general use programming interface for invoking utility programs is described in the appendix of *z/OS DFSMSdfp Diagnosis*. Any parameter that can be specified on the EXEC PARM JCL statement for ICKDSF can be passed by way of this interface as described below.

Callers of ICKDSF BUILDIX command with the IXVTOC parameter may indicate that the caller already holds a RESERVE on the VTOC. ICKDSF BUILDIX with OSVTOC parameter and all other ICKDSF commands do not support this option (an indication that the caller holds a RESERVE is ignored).

To request this function from ICKDSF, build a parameter list as described in Figure 42 on page 673.

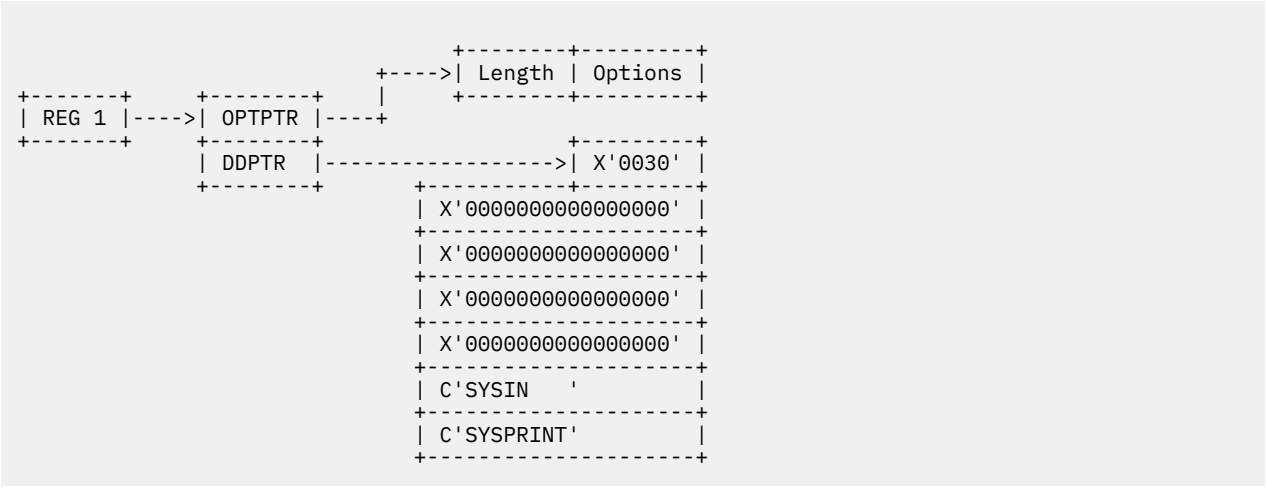


Figure 42: ICKDSF invocation parameter list

OPTPTR is the name of the pointer to the option list and is similar to the OPTIONADDR description used in *z/OS DFSMSdfp Utilities*. This provides a way to specify processing options. This parameter must be specified even if the list is a null list. This means that if you do not want to specify any parameters to ICKDSF, this pointer must be specified and must point to a halfword of binary zeros. The same values that can be specified in the EXEC PARM field in the JCL for ICKDSF can be specified in the option list. An additional option is available to program callers of ICKDSF BUILDIX with IXVTOC parameter that its caller holds a RESERVE on the VTOC of the volume to be processed. This 6-byte long parameter takes the following form.

```
X'FFtttttttFF
```

where:

`ttttttt` is the address of the TCB that owns the RESERVE on the VTOC. If the specified TCB does, in fact own the RESERVE, ICKDSF BUILDIX IXVTOC will not obtain a RESERVE of its own. If not, the BUILDIX command will be terminated. It is the caller's responsibility to ensure that the free space information on the volume is correct prior to calling ICKDSF BUILDIX IXVTOC when the TCB address is passed.

This parameter can be specified anywhere within the list of options.

Caution: Users of this interface are expected to maintain the RESERVE on the VTOC of the volume being processed until ICKDSF has completed its task.

Failure to do so may result in the loss of data.

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Appendix I. Accessibility

Accessible publications for this product are offered through IBM Knowledge Center (www.ibm.com/support/knowledgecenter/SSLTBW/welcome).

If you experience difficulty with the accessibility of any z/OS information, send a detailed email message to mhvrcfs@us.ibm.com.

Accessibility features

Accessibility features help users who have physical disabilities such as restricted mobility or limited vision use software products successfully. The accessibility features in z/OS can help users do the following tasks:

- Run assistive technology such as screen readers and screen magnifier software.
- Operate specific or equivalent features by using the keyboard.
- Customize display attributes such as color, contrast, and font size.

Consult assistive technologies

Assistive technology products such as screen readers function with the user interfaces found in z/OS. Consult the product information for the specific assistive technology product that is used to access z/OS interfaces.

Keyboard navigation of the user interface

You can access z/OS user interfaces with TSO/E or ISPF. The following information describes how to use TSO/E and ISPF, including the use of keyboard shortcuts and function keys (PF keys). Each guide includes the default settings for the PF keys.

- *z/OS TSO/E Primer*
- *z/OS TSO/E User's Guide*
- *z/OS ISPF User's Guide Vol I*

Dotted decimal syntax diagrams

Syntax diagrams are provided in dotted decimal format for users who access IBM Knowledge Center with a screen reader. In dotted decimal format, each syntax element is written on a separate line. If two or more syntax elements are always present together (or always absent together), they can appear on the same line because they are considered a single compound syntax element.

Each line starts with a dotted decimal number; for example, 3 or `3.1` or `3.1.1`. To hear these numbers correctly, make sure that the screen reader is set to read out punctuation. All the syntax elements that have the same dotted decimal number (for example, all the syntax elements that have the number `3.1`) are mutually exclusive alternatives. If you hear the lines `3.1 USERID` and `3.1 SYSTEMID`, your syntax can include either `USERID` or `SYSTEMID`, but not both.

The dotted decimal numbering level denotes the level of nesting. For example, if a syntax element with dotted decimal number 3 is followed by a series of syntax elements with dotted decimal number 3.1, all the syntax elements numbered 3.1 are subordinate to the syntax element numbered 3.

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Certain words and symbols are used next to the dotted decimal numbers to add information about the syntax elements. Occasionally, these words and symbols might occur at the beginning of the element itself. For ease of identification, if the word or symbol is a part of the syntax element, it is preceded by the backslash (\) character. The * symbol is placed next to a dotted decimal number to indicate that the syntax element repeats. For example, syntax element *FILE with dotted decimal number 3 is given the format 3 * FILE. Format 3* FILE indicates that syntax element FILE repeats. Format 3* * FILE indicates that syntax element * FILE repeats.

Characters such as commas, which are used to separate a string of syntax elements, are shown in the syntax just before the items they separate. These characters can appear on the same line as each item, or on a separate line with the same dotted decimal number as the relevant items. The line can also show another symbol to provide information about the syntax elements. For example, the lines 5.1*, 5.1 LASTRUN, and 5.1 DELETE mean that if you use more than one of the LASTRUN and DELETE syntax elements, the elements must be separated by a comma. If no separator is given, assume that you use a blank to separate each syntax element.

If a syntax element is preceded by the % symbol, it indicates a reference that is defined elsewhere. The string that follows the % symbol is the name of a syntax fragment rather than a literal. For example, the line 2.1 %OP1 means that you must refer to separate syntax fragment OP1.

The following symbols are used next to the dotted decimal numbers.

? indicates an optional syntax element
The question mark (?) symbol indicates an optional syntax element. A dotted decimal number followed by the question mark symbol (?) indicates that all the syntax elements with a corresponding dotted decimal number, and any subordinate syntax elements, are optional. If there is only one syntax element with a dotted decimal number, the ? symbol is displayed on the same line as the syntax element, (for example 5? NOTIFY). If there is more than one syntax element with a dotted decimal number, the ? symbol is displayed on a line by itself, followed by the syntax elements that are optional. For example, if you hear the lines 5 ?, 5 NOTIFY, and 5 UPDATE, you know that the syntax elements NOTIFY and UPDATE are optional. That is, you can choose one or none of them. The ? symbol is equivalent to a bypass line in a railroad diagram.

! indicates a default syntax element
The exclamation mark (!) symbol indicates a default syntax element. A dotted decimal number followed by the ! symbol and a syntax element indicate that the syntax element is the default option for all syntax elements that share the same dotted decimal number. Only one of the syntax elements that share the dotted decimal number can specify the ! symbol. For example, if you hear the lines 2? FILE, 2.1! (KEEP), and 2.1 (DELETE), you know that (KEEP) is the default option for the FILE keyword. In the example, if you include the FILE keyword, but do not specify an option, the default option KEEP is applied. A default option also applies to the next higher dotted decimal number. In this example, if the FILE keyword is omitted, the default FILE(KEEP) is used. However, if you hear the lines 2? FILE, 2.1, 2.1.1! (KEEP), and 2.1.1 (DELETE), the default option KEEP applies only to the next higher dotted decimal number, 2.1 (which does not have an associated keyword), and does not apply to 2? FILE. Nothing is used if the keyword FILE is omitted.

*** indicates an optional syntax element that is repeatable**
The asterisk or glyph (*) symbol indicates a syntax element that can be repeated zero or more times. A dotted decimal number followed by the * symbol indicates that this syntax element can be used zero or more times; that is, it is optional and can be repeated. For example, if you hear the line 5.1* data area, you know that you can include one data area, more than one data area, or no data area. If you hear the lines 3* , 3 HOST, 3 STATE, you know that you can include HOST, STATE, both together, or nothing.

Notes:

1. If a dotted decimal number has an asterisk (*) next to it and there is only one item with that dotted decimal number, you can repeat that same item more than once.
2. If a dotted decimal number has an asterisk next to it and several items have that dotted decimal number, you can use more than one item from the list, but you cannot use the items more than once each. In the previous example, you can write HOST STATE, but you cannot write HOST HOST.

3. The * symbol is equivalent to a loopback line in a railroad syntax diagram.

+ indicates a syntax element that must be included

The plus (+) symbol indicates a syntax element that must be included at least once. A dotted decimal number followed by the + symbol indicates that the syntax element must be included one or more times. That is, it must be included at least once and can be repeated. For example, if you hear the line `6.1+ data area`, you must include at least one data area. If you hear the lines `2+, 2 HOST,` and `2 STATE`, you know that you must include `HOST, STATE,` or both. Similar to the * symbol, the + symbol can repeat a particular item if it is the only item with that dotted decimal number. The + symbol, like the * symbol, is equivalent to a loopback line in a railroad syntax diagram.

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This document also documents information that is NOT intended to be used as Programming Interfaces of ICKDSF. This information is identified where it occurs, by an introductory statement.

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This glossary defines technical terms and abbreviations used in this document. If you do not find the term you are looking for, see the index of the appropriate document, or view the IBM Glossary of Computing Terms (www.ibm.com/software/globalization/terminology).

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- The *IBM Dictionary of Computing*, New York: McGraw-Hill, 1994.

The following cross-reference may be used in this glossary:

See:
This refers the reader to (a) a related term, (b) a term that is the expanded form of an abbreviation or acronym, or (c) a synonym or more preferred term.

See also
Refers to a related term.

Contrast with
Refers to a contrasting term.

A

A-unit
The direct access storage unit that contains the controller functions to attach to the storage control. An A-unit controls the B-units that are attached to it and is often referred to as a head of string.

AIX
Advanced Interactive Executive.

ALLOC
A space allocation parameter which indicates type, such as cylinders and tracks.

Allocation map
A record of how a volume (space) on a cylinder is to be used (allocated).

alternate track
On a direct access storage device, a track designated to contain data in place of a defective primary track. See also *primary track*.

ANALYZE DRIVETEST
ICKDSF command used to determine if a problem exists in the drive itself rather than in the media located on a volume.

ANALYZE SCAN
ICKDSF command used to determine if problems exists in the media which is located on a volume.

ANSI
American National Standards Institute.

APF
Authorized Program Facility.

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attached device
See *dedicated device*

B

B-unit
A direct access storage unit that attaches to the subsystem through an A-unit. A B-unit has no controller functions.

BDAM
Basic direct access method.

BPAM
Basic partitioned access method.

BSAM
Basic sequential access method.

C

cache
A random access electronic storage in selected storage controls used to retain frequently used data for faster access by the channel. For example, the 3990 Model 3 contains cache.

cache fast write
A form of fast write where the data is written directly to cache without using nonvolatile storage and is available for later destaging. This 3990 Model 3 Storage Control function should be used for data of a temporary nature, or data which is readily recreated, such as the sort work files created by the appropriate release of DFSORT.

CCA
Channel connection address

CCHH
Cylinder, cylinder, head, head.

CCHHR
Cylinder, cylinder, head, head, record.

CCW
Channel command word.

CE
Customer engineer.

channel interface (CHL-I)
The circuitry of a storage control that attaches storage paths to a host channel.

channel path
A connection between a processor and storage control along which signals and data can be sent to perform I/O requests.

channel set
A collection of channels that can be addressed by one of the processors of a processor complex.

CHPID
Channel path identifier.

CI
Control interval.

CKD
Count-key-data.

Class F
See *dedicated device*

CLIST
Command list.

cluster
See *storage cluster*.

CMS
Conversational Monitor System.

command retry
A combined channel and storage director procedure that allows a command in a channel program to be re-executed without causing an I/O interrupt.

CP
Control program.

CP page
See *page*.

concurrent media maintenance
The capability that enables a customer to perform maintenance on a track while allowing user access to that track's data.

control unit
A hardware unit that controls the reading, writing, or displaying of data at one or more input/output devices. See also *storage control*.

control unit address
The high order bits of the unit address, used to identify the control unit to the host system.

Note: The control unit address bits are set to zeros for ESCON attachments.

controller
See *DASD controller* or *storage controller*.

count-key-data (CKD)
A DASD data recording format employing self-defining record formats in which each record is represented by a count area that identifies the record and specifies its format, an optional key area that may be used to identify the data area contents, and a data area that contains the user data for the record. CKD is also used to refer to a set of channel commands that are accepted by a device that employs the CKD recording format. See also *extended count-key-data*.

correctable errors
See **errors, correctable** and *errors, uncorrectable*.

CSECT
Control section.

CSW
Channel status word.

CVAF
Common VTOC Access Facility.

CYL
Cylinder.

D

DADSM
Direct access device space management.

DADSM Interrupt Recording Facility
DADSM Interrupt Recording Facility. If a system fails, or a permanent I/O error occurs while allocating space or running a routine that updates the VTOC, the VTOC might be in error. To ensure that an error is recorded, the DADSM routines turn on a bit in the VTOC upon entry to a DADSM function, and, if no errors occur during processing, turn off that bit upon exiting from that function. This DIRF bit is bit 5 of the DS4VTOCI field of the format-4 DSCB.

DASD
Direct access storage device.

DASD controller
The hardware component that provides DASD path control and data transfer functions.

DASD fast write
A form of fast write to cache where the data is written concurrently to cache and nonvolatile storage and automatically scheduled for destaging to the DASD. Both copies are retained in the storage control until the data is completely written to the DASD, providing data integrity equivalent to writing directly to the DASD. DASD fast write is available with a 3990 Model 3 Storage Control.

DASD subsystem
A DASD storage control and its attached direct access storage devices.

data check
An error detected in the bit pattern read from the disk. Some data checks are caused by hardware, some are caused by media, and others are the result of random events, such as transient electrical interference.

DCB
Data control block.

DD
Data definition.

dedicated device
An I/O device or line not being shared among users. The facility can be permanently assigned to a particular virtual machine by a VM/ESA directory entry, or temporarily attached by the resource operator to the user's virtual machine.

DFSMS
Data Facility Storage Management Subsystem.

DFSMS environment
An environment that helps automate and centralize the management of storage. This is achieved through a combination of hardware, software, and policies. See also *system-managed storage*.

destage
The asynchronous write of new or updated data from cache or nonvolatile storage to DASD. This is used only for the fast write and dual copy functions of 3990 Model 3. See also *fast write* and *write hit*.

device
A uniquely addressable part of a DASD unit that consists of a set of access arms, the associated disk surfaces, and the electronic circuitry required to locate, read, and write data. See also *volume*.

device address
Three or four hexadecimal digits that uniquely define a physical I/O device.

device ID
An 8-bit identifier that uniquely identifies a physical I/O device.

Device Level Selection (DLS)
A DASD function available with 3380 Models AD4, BD4, AE4, BE4, AJ4, BJ4, AK4, BK4, and CJ2. With DLS, each of the two controllers in the DASD string has a path to all devices in the string, and any two devices in the 2-path DASD string can read or write data simultaneously. See *DLS mode*.

Device Level Selection Enhanced (DLSE)
A DASD function providing four data transfer paths to each device in a 4-path DASD string. With DLSE, any four devices in a 4-path DASD string can read or write data simultaneously. See *DLSE mode*.

device number
Three or four hexadecimal digits that uniquely define a physical I/O device.

device path
The hardware within a 9340 Direct Access Storage Subsystem that transfers data between the DASD and a storage cluster.

DEVMAINT authority
DEVMAINT is a parameter on the OPTION directory control statement that allows an ICKDSF user to perform media maintenance against dedicated devices and minidisks.

MAINTCCW is a similar parameter, but it allows an ICKDSF user to perform media maintenance against dedicated devices only. For more information on how to obtain DEVMAINT and MAINTCCW authority, see the *CP Planning and Administration* book applicable to your VM operating system.

director
See *storage director*.

DIRF
DADSM Interrupt Recording Facility.

DLS
Device Level Selection.

DLSE
Device level selection enhanced.

DLS mode
A mode of operation in a 3990 Storage Control that supports 3380 2-path strings. DLS mode must be specified by the IBM service representative at installation for the 3990. See *single-path storage director*.

DLSE mode
A mode of operation in a 3990 Model 2 or 3 Storage Control that supports 3380 AJ4 and AK4 4-path strings and 3390 strings. DLSE mode must be specified by the IBM service representative at installation time for the 3990. See *multipath storage director*.

DSCB
Data set control block.

DSF
Device Support Facilities

dual copy
A high availability function made possible by nonvolatile storage in a 3990 Model 3. Dual copy maintains two functionally identical copies of designated DASD volumes in the logical 3990 Model 3 subsystem, and automatically updates both copies every time a write operation is issued to the dual copy logical volume.

dual copy logical volume
A logical volume comprised of two physical devices with all data recorded twice, once on each device. A 3990 Model 3 Storage Control automatically ensures that both devices are updated with each write operation to the dual copy volume. Also called a duplex pair.

duplex pair
See *dual copy logical volume*.

duplex state
Two devices in a 3990 Model 3 subsystem are in duplex state when they have been made into a dual copy logical volume.

Dynamic Path Selection (DPS)
DASD subsystem functions available with all 3380 heads of string except Model A04. These functions include:

- Two controllers providing data paths from the 3380 strings to the storage directors
- Simultaneous transfer of data over two paths to two devices, providing the two devices are on separate internal paths within the string
- Sharing DASD volumes by using System-Related Reserve and Release
- Providing dynamic path reconnect to the first available path.

E

EBCDIC
Extended binary coded decimal interchange code.

ECC
Error checking and correcting.

emulated device
A device that is logically formatted on to a different device type such that the data and programming can be used without modification.

ENQ
A system macro used to serialize the access to a data set.

environmental data
Data the 3990 must report to the host; the data can be service information message (SIM) sense data, logging mode sense data, an error condition that prevents completion of an asynchronous operation, or a statistical counter overflow. The 3990 reports the appropriate condition as unit check status to the host during a channel initiated selection. Sense byte 2, bit 3 (environmental data present) is set to 1.

EOF
End-of-file.

erase
To remove data from a data medium, leaving the medium available for recording new data.

ERDS
Error recording data set.

EREP
Environmental Record Editing and Printing.

ERP
Error Recovery Procedures.

error correcting code (ECC)
A code designed to detect and correct error bursts by the use of check bytes.

errors, correctable
When a data check is referred to as "correctable", the following are present:

- The format 5 sense record has the correctable bit set (byte 2, bit 1).
- The error is correctable by use of ECC correction bytes.

The storage director or the system ERPs can correct this error with the aid of the ECC correction code without rereading the record. All the information needed is contained in the format 5 sense record. Restart displacement, error displacement, and error correction pattern.

When ECC correctable, the data is reconstructed to be the same as the data original written on disk storage. The data correction may be done by the subsystem as data is transferred to processor storage, or it may be done by the system ERP after the data is in processor storage. Although the data in processor storage is correct for use in processing, the data on the disk is not changed. The next attempt to read the data may again result in a data error. See also *errors, uncorrectable*.

errors, permanent
From the system perspective, an error is permanent if error recovery procedures performed by the operating system or storage subsystem cannot recover from the error condition.

errors, temporary
An error is temporary if the subsystem or system error recovery procedures are successful. A temporary error is only seen by the subsystem or system, and is never returned to the application.

errors, uncorrectable
A data check that the storage director cannot correct using the ECC correction code bytes. Rereading or rereading with head offset is the only method available. See also *error correcting code*.

ESA
Enterprise Systems Architecture.

EXCP
Execute channel program.

extended count-key-data
A set of channel commands that use the CKD track format. Extended count-key-data uses the Define Extent and Locate Record commands to describe the nature and scope of a data transfer operation to the storage control to optimize the data transfer operation. See also *count-key-data* and *nonsynchronous operation*.

extent
A set of consecutively addressed tracks that a channel program can access. The limits of an extent are defined by specifying the addresses of the first and last tracks in the extent.

F

Factory functional verification data patterns (FFVDP)
A predefined data pattern used to certify a volume at the factory.

fast dual copy
A dual copy capability where DASD fast write and dual copy are active concurrently.

fast write
In a 3990 Model 3 Storage Control, a write operation at cache speed that does not require immediate transfer of data to a DASD. The data is written directly to cache and/or nonvolatile storage and is available for later destaging. Fast write reduces the time an application must wait for the I/O operation to complete. See also *DASD fast write*, *cache fast write*, and *destage*

FBA
Fixed-block architecture.

FBAVTOC
Fixed-block architecture volume table of contents.

fence
To separate one or more paths or elements from the remainder of the logical DASD subsystem. The separation is by logical boundaries rather than power boundaries. This separation allows isolation of failing components so that they do not affect normal operations.

FFVDP
Factory functional verification data patterns.

fixed-block-architecture (FBA).
A DASD data recording format that stores data in blocks of fixed size; these blocks are addressed by block number relative to the beginning of the particular file. Contrast with count=key-data (CKD).

formatting a volume
Refers to making a volume usable in a specific operating environment.

full-pack minidisk
A virtual disk that contains all of the addressable cylinders of a real DASD volume.

H

HA
Home address.

HDA
Head-disk assembly.

head-disk assembly (HDA)
A field replaceable unit in a direct access storage device containing the disks and actuators.

head of string
The unit in a DASD string that contains controller functions. Also called the A-unit.

home address (HA)
The first field on a CKD track that identifies the track and defines its operational status. The home address is written after the index point on each track.

I

ICKDSF
See *Device Support Facilities program*.

ID
Identifier.

identifier
A sequence of bits or characters that identifies a program, device, controller, or system.

IML
Initial microcode load.

index point
The reference point on a disk surface that determines the start of a track.

indexed VTOC
The data set on which the location of the format-1 DSCBs of the VTOC are kept in an index for quick access by DADSM.

initial microcode load (IML)
The act of loading microcode.

I/O
Input/output.

IOCDS
Input/output control data set.

I/O device
An addressable input/output unit, such as a direct access storage device, magnetic tape device, or printer.

IPL
Initial program load.

IPL bootstrap
A loader used in a computer to load part of an operating system needed to load the remainder of the operating system.

IPL text
IPL program records

ISMF
Interactive Storage Management Facility.

ISPF/PDF
Interactive System Productivity Facility/Program Development Facility.

J

JCL
Job control language.

JCS
Job control statement.

L

LAN
Local area network.

like devices
Devices that have the same track capacity, and the same number of tracks per cylinder; that is, like devices can differ only in the number of cylinders per volume.

LSS
logical subsystem.

M

MAINTCCW authority
See *DEVMAINT authority*.

maximal initialization
Refers to writing the volume label, VTOC, home address, and record 0 on 3350 volumes. It also includes the checking of track surfaces for each track within a specified range.

media
The disk surface on which data is stored.

media SIM
A message generated when a storage subsystem detects a problem with device media. You must perform media maintenance using ICKDSF to resolve the problem. See also *service information message (SIM)*.

medial initialization
Refers to writing the volume label, VTOC, home address, and record 0 on a volume.

megabyte (MB)
10^6 bytes.

minidisk
A logical subdivision (or all) of a physical disk pack that has its own virtual device address, consecutive virtual cylinders (starting with virtual cylinder 0), and a VTOC or disk label identifier. Each user virtual disk is preallocated and defined by a VM/ESA directory entry as belonging to a user.

minimal initialization or minimal INIT
Refers to writing the volume label and VTOC on a volume for MVS and VSE.

multipath storage director
A storage director in a 3990 Storage Control operating in DLSE mode. Each multipath storage director in a storage control is associated with two storage paths. All storage paths in a multipath storage director respond to the same range of control unit addresses on a channel.

MVS
Multiple Virtual Storage.

N

nonsynchronous operation
A type of operation in which the channel and storage control activities required to end one command and initiate the next do not necessarily occur within the inter-record gap between two adjacent fields. Contrast with *synchronous operation*.

Note: With nonsynchronous operations, the channel can be slower than the device while reading information, and faster than the device while writing information. Therefore, the time difference in processing a channel program depends on the current operating environment rather than on a property of the device or storage control.

NVS
Non-Volatile Storage.

O

orientation
A control state within a storage path that indicates the type of area (home address, count, key, or data field) that has just passed under the read/write head of the device.

OS
Operating system.

P

page
A fixed-length block that has a virtual address and can be transferred between real storage and auxiliary storage.

permanent errors
See *errors, permanent*.

pinned data
Data that is held in a 3990 Model 3 Storage Control, because of a permanent error condition, until it can be destaged to DASD or until it is explicitly discarded by a host command. Pinned data exists only when using fast write or dual copy functions.

PPRC
Peer-to-Peer Remote Copy.

primary device
One device of a dual copy volume. All channel commands to the dual copy logical volume are directed to the primary device. The data on the primary device is duplicated on the secondary device. See also *secondary device*.

primary surface checking
Consists of writing and reading back bit patterns for the specified device. Skip displacement checking is performed (for those devices that support skip displacement) only if a data check occurs. Performed by ICKDSF when NOSKIP is specified.

primary track
On a direct access storage device, the original track on which data is stored. See also *alternate track*.

privilege class
One or more classes assigned to a virtual machine user in a VM/ESA directory entry; each privilege class specified lets a user access a logical subset of the CP commands. Class F privilege class corresponds to the service representative's administration functions. For more information, see the *CP Planning and Administration* book appropriate for your VM operating system.

PROP
Programmable Operator facility.

PSW
Program status word.

Q

quiesce
A function that makes one component of a storage subsystem temporarily unavailable to the processor while assuring that the remaining components are available for data transfer. This function is initiated by a service representative. Contrast with *resume*.

R

R0
Record zero.

RACF
Resource Access Control Facility.

release
A facility that allows other host systems to communicate with the reserved device. Contrast with *reserve*.

reserve
A facility for devices attached to multiple channel paths. It allows only one host system to communicate with the specified device. Contrast with *release*.

RESETICD
Reset Indefinite Condition for Device

resume
A function that enables a component that has been quiesced. This function is initiated by a service representative. Contrast with *quiesce*.

REXX
Restructured Extended Executor.

RPS
Rotational position sensing.

S

SAM
Sequential access method.

SAPL
Stand-Alone Program Loader.

SCLP
Service Call Logical Processor facility.

secondary device
One of the devices in a dual copy logical volume that contains a duplicate of the data on the primary device. Unlike the primary device, a limited subset of channel commands may be directed to the secondary device. See also *primary device*.

service information message (SIM)
A message, generated by a storage subsystem, that is the result of error event collection and analysis. A SIM indicates that some service action is required. See also *media SIM*.

Service Call Logical Processor Facility (SCLP)
Provides a means of communicating between the control program and the service console (or compatible console). The SCLP allows the stand-Alone version of ICKDSF to use the service console (or compatible console) as a input/output device.

SIM
Service information message.

SIM Alert message
An operator console message that notifies the operator that a SIM has been generated and some service action is required. More information about the SIM can be obtained from EREP reports.

simplex state
A volume is in the simplex state if it is not part of a dual copy logical volume. Terminating a dual copy logical volume returns the two devices to the simplex state. In this case, there is no longer any capability for either automatic updates of the secondary device or for logging changes, as would be the case in suspended duplex state.

single-path storage director
A storage director in a 3990 or 3380 Model CJ2 operating in DLS mode. Each single-path storage director in the storage cluster is associated with one storage path. A storage path on a single-path storage director responds to a unique control unit address on the channel. A single-path storage director in a 3990 is like a storage director in a 3880.

SIO
Start I/O.

Skip displacement
A method of shifting data so that any surface defect causing an error can be positioned in a gap rather than in a data area, eliminating the error.

SML
MVS Storage Management Library.

SMS
Storage Management Subsystem.

Specified range
Used in this book to describe the tracks that are the result of

The combination of FROMRANGE and TORANGE, or
The combination of CYLRANGE and HEADRANNGE, or
The entire volume, if all the range parameters are omitted

SPID
Set path group ID.

SSL
Storage Subsystem Library.

storage cluster
A power and service region that runs channel commands and controls the storage devices. Each storage cluster contains both channel and device interfaces. Storage clusters in 9340 subsystems also perform the DASD controller functions.

storage control
The component in a storage subsystem that handles interaction between processor channel and storage devices, runs channel commands, and controls storage devices.

storage controller
A component in a storage subsystem that performs both the storage control and DASD controller functions. See also *storage control* and *DASD controller*.

storage director
In a 3990 storage control, a logical entity consisting of one or more physical storage paths in the same storage cluster. In a 3880, a storage director is equivalent to a storage path. See also *storage path*, *single-path storage director*, and *multipath storage director*.

storage director ID
For 3880 Storage Control configurations, an 8-bit designation that uniquely identifies the storage director regardless of its selection address. It identifies to the service representative, by means of EREP, a failing subsystem component (storage director) without having to translate a selection address (which may have little relation to a physical address) to a physical component. The storage director ID is the number shown on the operator panels of 3880s and the attached DASD units. For 3990s, see *subsystem identifier (SSID)*.

storage path
The hardware within the 3990 Storage Control that transfers data between the DASD and a channel. See also *storage director*.

storage subsystem
A storage control and its attached storage devices.

string
A series of connected DASD units sharing the same A-unit (or head of string).

subsystem identifier (SSID)
A user-assigned number that identifies a DASD subsystem. This number is set by the service representative at the time of installation and is included in the vital product data.

subsystem
See *DASD subsystem* or *storage subsystem*.

surface analysis cylinder
The surface analysis (SA) cylinder is reserved by the system to contain a record of all the home addresses (HA) that have a skip displacement assigned at the time of manufacture or assigned subsequently by ICKDSF (depends on the device).

suspended duplex state
When only one of the devices in a dual copy logical volume is being updated because of either a permanent error condition or an authorized user command. All writes to the remaining functional device are logged. This allows for automatic resynchronization of both volumes when the dual copy logical volume is reset to the active duplex state.

SVC
Supervisor call instruction.

system-managed storage
Storage managed by the Storage Management Subsystem. SMS attempts to deliver required services for availability, performance, space, and security to applications. See also *DFSMS environment*.

synchronous operation
A type of operation in which all channel and storage control activities required to end one command and initiate the next must occur within the inter-record gap between two adjacent fields. Contrast with *nonsynchronous operation*.

T

temporary errors
See **errors, temporary**.

TIC
Transfer in channel.

TOD
Time-of-day.

track compatibility mode
See *3380 track compatibility mode*

TRK
A subparameter of the SPACE parameter in a DD statement that specifies the allocation of space by tracks.

TSO
Time sharing option.

TTR
Track-Track-Record.

U

UCB
Unit control block.

uncorrectable errors
See *errors, uncorrectable*.

unit address
The last two hexadecimal digits of a device address or a device number.

Note: Often used interchangeably with *control unit address* and *device address*.

unlike device
Devices that have different track capacities, or that have a different number of tracks per cylinder.

V

VBA
Variable blocked (with ANSI carriage control characters)

Verification data pattern
A predefined data pattern used to certify a volume at the factory.

VIER
VTOC index entry record containing pointers to each format-1 DSCB in the VTOC.

VIO
Virtual input/output.

VIXM
VTOC index map.

VM
Virtual machine.

VMDS
VTOC map of DSCBs containing a bit map that indicates free and allocated DSCBs in the VTOC.

volume
The DASD space identified by a common label and accessed by any of a set of related addresses. See also *device*.

volume label
The volume label uniquely identifies the volume to the operating system. Additional optional user labels are available. containing information such as user name, serial number, etc.

VPSM
VTOC pack space map.

VSAM
Virtual storage access method.

VSE
Virtual Storage Extended.

VTOC
Volume table of contents.

VTOCIX
The data set on which the location of the format-1 DSCBs of the VTOC are kept in an index for quick access by DADSM.

W

write hit
When data requested by the write operation are in the cache.

Numeric

2-path string
A series of physically connected DASD units in which the head of string unit provides two data transfer paths that can operate simultaneously.

3380 track compatibility mode
A mode of operation in which a 3390 device manages its tracks as if they were 3380 tracks. Contrast with *3390 mode*.

3390 mode
The mode of the actuator when the entire capacity of the 3390 device is initialized. Contrast with *3380 track compatibility mode*.

4-path string
A series of physically connected DASD units in which the head of string provides four data transfer paths that can operate simultaneously. A 3390 4-path string requires one A-unit, while two 3380 Model AJ4/AK4 units are required for a 3380 4-path string.

Index

Special Characters

< or LT
    comparison operators 20
= or EQ
    comparison operators 20
> or GT
    comparison operators 20
>= or GE
    comparison operators 20
¬= or NE
    comparison operators 20

Numerics

0
    condition code 20
0F0B exception conditions
    detected by ANALYZE SCAN 77
    issue INSPECT NOPRESERVE to fix 77
12
    condition code 20
16
    condition code 20
1750 7, 112, 232
1750, CGROUP parameter 258
1750, ONLINSEC parameter 249
2105
    cascading 233
2105, CGROUP parameter 258
2105, ONLINSEC parameter 249
2107 7, 112, 232
2107, CGROUP parameter 258
2107, ONLINSEC parameter 249
3270
    console 59
3350 DASD 8
3370 device
    emulated CKD 83
3375 device, installing 70
3375 or older HDA from the factory 70
3380 device, installing 69
3380 device, relocating 214
3380 track compatibility mode
    setting, example 217
3380 track compatibility mode, setting example 70
3380 track format 8
3380, 3390, or 9345, example 69
3390 device
    converting to 3380 track compatibility mode 217
    repairing a 4E4E SIM 348
3390 device, installing 69
3390 device, relocating 214
3390-9, 3380 track compatibility mode restriction 70
3390, setting to 3380 track compatibility mode, example 70
3422
    tape drive 56
3880 Model 21 Storage Control 8
3990 Storage Control 234
3995 Models 151 and 153
    valid commands for 83
3995-151 or -153 device
    emulating a CKD device on 83
4
    condition code 20
8
    condition code 20
9313 device
    emulating a CKD device on 83
    warning, emulating a CKD device on 83
9332 device
    emulating a CKD device on 83
    warning, emulating a CKD device on 83
9335 device
    emulated CKD device on a 9313, 9332, or 9335 device 83
    warning, emulating a CKD device on 83
9345 device, installing 69
9345 device, relocating 214

A

abbreviating commands and parameters 18
about the Stand-Alone version 53
ABSFORMAT subparameter, REFORMAT (CKD) command 335
accessibility
    contact IBM 675
    features 675
adding IPL text
    INIT (CKD) command 170
additional volume labels, reserving space for
    INIT (CKD) command 171
    INIT (FBA) command 394
addressed volume 153
AIXVOL (CKD) command
    changing volume label 91
    errors reported by EXAMINE 90
    formatting a cylinder 89
    formatting a minidisk, example 91
    formatting entire volume, example 91
    formatting part of a volume, example 91
    parameter description 87
AIXVOL command 4–7, 9
ALL parameter
    ANALYZE (CKD) command 94
    ANALYZE (FBA) command 372
    MAPALT (FBA) command 412
ALL parameter, CONTROL (CKD) command 122
ALL parameter, CONTROL (FBA) command 381
ALLCHPID parameter, ANALYZE (CKD) command 94
ALLOC, definition 683
ALLOCATE parameter
    CPVOLUME (CKD) command 128

ALLOCATE parameter *(continued)*
CPVOLUME (FBA) command 383
allocation
changing for VM volumes 133, 135, 388
allocation map
creating for minidisk 134
allocation map, creating for minidisk
CPVOLUME (FBA) command, description 389
allocation, changing for VM volumes 389
allocation, specifying type of
CPVOLUME (CKD) command 131
CPVOLUME (FBA) command 386
ALLOWONLINE 139, 148, 150, 153, 155
ALLOWONLINE parameter
ANALYZE (CKD) command 94
ALLOWWRITE parameter, CONTROL (CKD) command 120
ALLTRACKS parameter, INSPECT (CKD) command 193
alternate blocks
conditionally assigning, example 366
printing a map of 413
printing a map of (INIT (FBA) command) 394
printing a map of (INSPECT (FBA) command 403
printing a map of, MAPALT (FBA) command, example 368, 414
table of parameters used to assign 404
unconditionally assigning, example 366, 407, 408
alternate tracks
associations recorded on the volume 654
conditionally assigning, example 80, 209
printing a map of 85
printing a map of, INSPECT (CKD) command, example 210
reassigning 348
table of parameters used to assign 204
unconditionally assigning, example 80, 84, 209
alternate tracks, printing a map of
INIT (CKD) command 171
ANALYZE (CKD) command
CMS version 104
DEVADDR parameter 95
diagnosing disk errors 77
diagnostic messages 107
drive test
path control restriction 101
drive test example 104
dual copy volumes 104
EXAMPLES 104
finding where INSPECT failed, example 81
fixed-head error table 108
HOSTACCESS parameter 97
logical path status table 111
minidisk support 104
movable head error table 107
path controls when running analyze drive test 106
path controls when running analyze drive test, table 106
path status table 109
RANGE parameters 103
scan function 101, 102
scan function example 104
syntax 93
verifying data records 101
with RACF protection 93
ANALYZE (FBA) command
analyzing part of a volume 368
ANALYZE (FBA) command *(continued)*
conditions assumed when running 374
data verification test 374
diagnostic messages 376
drive test 373
drive test example 364, 375
finding where INSPECT failed, example 365
minidisk support 374
movable-head error table 376
ANALYZE command 4–8, 30
ANALYZE drivetest, definition 683
ANALYZE scan, definition 683
analyzing volumes with the
CMS Version 376
Stand-Alone version 104, 375
VSE version volume 376
APAR PQ73189 10
APF (Authorized Program Facility) 33
application program, calling ICKDSF 673
ASSGN statement (VSE) 49
ASSIGN parameter
INSPECT (CKD) command 193
INSPECT (FBA) command 401
assigning a volume to a reserve storage pool 173
assigning alternate blocks
conditionally, example 366
table of parameters used to assign 404
unconditionally, example 366, 407, 408
assigning alternate tracks
conditionally 80
conditionally, example 80, 209
reassigning alternate tracks 348
table of parameters used to assign 204
unconditionally, example 80, 84, 209
assistive technologies 675
assumed conditions when running ANALYZE 374
Asynchronous Peer-to-Peer Remote Copy Recovery from an unplanned outage 323
Asynchronous PPRC 321
Asynchronous PPRC Processing, Disaster Recovery for 322
Asynchronous PPRCOPY Configurations 324
Asynchronous PPRCOPY session, Typical Scenario for establishing an 322
Asynchronous PPRCOPY Solution 321
asynchronous PPRCOPY, using synchronous and 226
authority, MAINTCCW 66
Authorized Program Facility (APF) 33
authorizing access with RACF 31
automated recovery bit 258
AVAILABLE parameter, INSPECT (CKD) command 193

B

B-unit, definition 684
batch mode for VSE 48
BLOCKRANGE parameter
ANALYZE (FBA) command 372
INIT (FBA) command 392
INSPECT (FBA) command 402
blocks
formatting with CPVOLUME (FBA) command 387
preventing destruction of data on 403
reclaiming, example 366
blocks, alternate

blocks, alternate *(continued)*
conditionally assigning, example 366
printing a map of 394, 403
printing a map of, example 368, 413, 414
table of parameters used to assign 404
unconditionally assigning, example 366, 407, 408
BOOTSTRAP parameter
INIT (CKD) command 163
REFORMAT (CKD) command 333
bootstrap records, IPL
contents 653
bootstrap records, IPL (writing)
REFORMAT (CKD) command 333
bootstrap records, IPL writing
INIT (CKD) command 163
bridge, FICON 113
BUILDIX (CKD) command
building a VTOC index, example 118
converting indexed VTOC to OS format 76, 117
converting OS VTOC to indexed format 76, 116
description 115
dual copy volumes 115
examples 117
processing in a shared environment 116
restriction 115
with RACF protection 115
BUILDX command 4–7, 9

C

cached storage control 8
calculating size of VTOC and VTOC index 655
calling ICKDSF, from an application program 673
CARD input device specification 59
CASCADE parameter 246
CASCADE support, PQ72465 250
cascaded pairs 227
cascading 225
cascading, 2105 233
cascading, using 226
CCW (channel command word) 65
CD-ROM version 56
CD-ROM, loading the Stand-Alone 60
CE cylinder
drive test error summary 107
preserving data during INSPECT (CKD) command 199
CGROUP parameter 258
CHAN entry in path status table 109
CHANGERECORDING 140
changing the volume serial number and owner identification 363
changing volume allocation
CPVOLUME (CKD) command, example 135
CPVOLUME (FBA) command, example 389
VM volumes
CPVOLUME (FBA) command, description 388
changing volume serial number and owner identification
AIXVOL (CKD) command, example 91
REFORMAT (CKD) command, example 341, 344
REFORMAT (FBA) command, example 417
channel command words (CCW) 65
CHANNEL entry in path status table 109
channel path, definition 684
channel set, definition 684
channel status word (CSW) 66
channel-attached
3422 tape drive 56
CHANSET entry in path status table 109
CHECK parameter
INIT (FBA) command 393
INSPECT (CKD) command 194
INSPECT (FBA) command 402
specifying CHECK(n) values 665
checking
primary, for FBA devices 664
surface 663
checking and correcting (ECC) 14
checking disk surfaces
example (FBA) 365
with INSPECT 78
checking primary, for CKD devices 664
checking skip displacement 664
checking, primary 663
checkpoint data (CKD)
handling of checkpoint data 355
previous command 355
checkpoint, resuming from after failure
REVAL (CKD) command 349
CHPID entry in path status table 109
CHPID parameter, ANALYZE (CKD) command 94
CHPID path xv, 431
CKD (count-key-data) xiv, 425
CKD devices, examples 69
class F user authority 66
CLEARFENCE parameter 85
CLEARFENCE parameter, CONTROL (CKD) command 120
CLEARFENCE parameter, CONTROL (FBA) command 380
clearing a storage control
CONTROL (CKD) command, description 122
CONTROL (CKD) command, example 124
clearing fence status
CONTROL (CKD) command 123
CONTROL (CKD) command example 124, 125
CONTROL (CKD) command, example 85
CLEAROWNERID parameter
INIT (CKD) command 164
REFORMAT (CKD) command 333
CLUSTER entry in path status table 109
CMS tasks, flowchart 37
CMS version
initializing a volume, example 187
minidisk support 104, 183, 208
CMS version minidisk support 397
CMS version, flowchart 37
codes, return, for password-protected data sets 668
codes, return, for the IBM module 668
command
AIXVOL 4–7, 9
AIXVOL (CKD) 87
ANALYZE 4–8, 30
ANALYZE (CKD) 93
ANALYZE (FBA) 371
BUILDIX (CKD) 115
BUILDX 4–7, 9
CONTROL 4–7, 85
CONTROL (CKD) 119, 122
CONTROL (FBA) 379
CPVOLUME 4–7, 9

command *(continued)*
CPVOLUME (CKD) 127
DUPLEX 4
FLASHCOPY 4–6
FREEZE 231, 259
INIT xv, 4–7, 426, 428
INIT (FBA) 391
INIT NOVALIDATE 9
INSPECT xv, 4–8, 31, 427, 428
INSPECT (CKD) 189
INSPECT (FBA) 399
INSTALL (CKD) 213
IODELAY 4–6
IODELAY (CKD) 219
IODELAY (FBA) 409
MAPALT 4–6
MAPALT (FBA) 411
mode for VSE 49
mode restrictions 50
MOUNT 35
PPRCOPY 4–7, 9, 223
PPRCOPY DELPATH 240
PPRCOPY ESTPAIR 227
PPRCOPY ESTPATH 251
REFORMAT 4–7, 9, 75
REFORMAT (CKD) 331
REFORMAT (FBA), CMS version 415
REVAL 4–8
RUN 231
TRKFMT 4–7
TRKFMT (CKD) 351
command retry, definition 685
command statement syntax 17
commands and parameters, abbreviating 18
commands that operate on a minidisk from a guest operating system 65
commands, FLASHCPY 137
comments, ICKDSF commands 19
comparison operators
< or LT 20
= or EQ 20
> or GT 20
>= or GE 20
¬= or NE 20
completing the installation procedure 69
concurrent media maintenance 35
condition code
0 20
12 20
16 20
4 20
8 20
LASTCC 20
MAXCC 20
condition code 0F0B
issue INSPECT NOPRESERVE to fix 77
conditionally assigning alternate blocks 366
conditionally assigning alternate tracks 80
conditionally assigning alternate tracks, example 209
configuration checking 10
Configurations, Asynchronous PPRCOPY 324
CONFIGURE(DISPLAY) parameter, CONTROL (CKD) command 121
CONFIGURE(DISPLAY) parameter, CONTROL (FBA) command 380
conflicting keyword parameters 18
consistency group coordination, XD 296
consistency group drain time 296
consistency group interval time 296
consistency, secondary PPRCOPY volume 291
console, Service Call Logical Processor Facility (SCLP) 57
contact
z/OS 675
continuation lines 18, 21
CONTINUE parameter
INIT (CKD) command 164
INIT (FBA) command 393
restriction (0671, 9313, 9332, or 9336) 393
restriction (CMS) 393
CONTROL (CKD) command
clearing a storage control 122
clearing a storage control example 124
clearing fence status 85, 123
clearing fence status example 124, 125
discarding data pinned in cache 123
discarding data pinned in cache example 124
examples 124
with RACF protection 119
write-allowing WRITE INHIBITed device 122
write-allowing WRITE INHIBITed device, example 124
CONTROL (FBA) command
examples 381
CONTROL command 4–7, 85
control command execution, condition codes 20
control processing 19
controlling the level of surface checking 202
converting 3390 to 3380 track compatibility mode, example 217
converting from one PPRCOPY volume state to another 228
converting OS VTOC to indexed format 76, 116, 117
copying data to different device size
CPVOLUME (CKD) command 133
CPVOLUME (FBA) command 388
correctable errors, definition 685
correctable versus uncorrectable 14
count key data (CKD) 4, 11
CP pages
definition 127
CP pages formatting 386
CP TRACE CCW command 66
CP-owned volumes 127
CPLIST EXEC, example 40
CPVOLUME (CKD) command
changing volume allocation 133, 135
creating minidisk volume allocation map, example 134
formatting a cylinder 131
formatting entire volume, example 74, 134
formatting part of a volume, example 74, 135
parameter description 128
CPVOLUME (FBA) command
changing volume allocation
description 388
changing volume allocation example 389
creating minidisk volume allocation map, description 389
description 383
formatting blocks 0-15 387

CPVOLUME (FBA) command *(continued)*
formatting entire volume, example 363, 389
formatting part of a volume, example 389
parameter description 383
CPVOLUME command 4–7, 9
creating an ICKDSF Stand-Alone IPL tape
using CMS 56
using MVS 55
creating minidisk allocation map
CPVOLUME (CKD) command, example 134
CPVOLUME (FBA) command, description 389
CSW (channel status word) 66
CVAF (common VTOC access facility) xv, 434
CYCLES parameter 354
CYCLES(n) parameter 352
cylinder 0, track 0 layout (CKD devices) 653
cylinder, formatting
for AIX use 89
for VM use 131
cylinders 91
CYLRANGE parameter
ANALYZE (CKD) command 103
INIT (CKD) command 165
INSPECT (CKD) command 194, 203
REVAL (CKD) command 347

D

DADSM (direct access device space management) xv, 433
DASD physical characteristics 13
DASD storage media 13
data area, CKD devices 651
data check
on AIX volume 90
on CP-formatted cylinder 133
data checks 14
DATA parameter
INIT (CKD) command 165
REVAL (CKD) command 347
data record 651
data set
password-protected, return codes 668
printed output 27
data set security and protection
in VSE 50
providing passwords for 172, 197, 354
securing data 667
data set, security 31
data-secured files 51
data, preventing destruction during inspection
INSPECT (CKD) command 198
data, scanning, on part of a volume 78
database consistency automation 291
date, specifying in Stand-Alone version 61
DDNAME parameter
ANALYZE (CKD) command 94
BUILDIX (CKD) command 115
INSPECT (CKD) command 191
REFORMAT (CKD) command 332
REVAL (CKD) command 346
TRKFMT (CKD) command 352
DEDICATE directory control statement 37
dedicated device 37
defective blocks
defective blocks *(continued)*
inspecting in Stand-Alone version 407
reclaiming, INIT (FBA) command 395
defective tracks
reclaiming (INSPECT) 200
define input and output devices 60
defining sessions, PPRCOPY 236
degree of repeatability 14
degree of visibility 14
delay per I/O, setting
IODELAY (CKD) command, example 220
IODELAY (FBA) command, example 410
deleting pairs 238
deleting Peer-to-Peer Remote Copy paths 240
delimiters 18
DEQ macro 34
DETAIL parameter, MAPALT (FBA) command 412
detecting hardware problems with DRIVETEST 373
detection of 0F0B conditions 98
determining the VTOC size and location 75
DEVADDR parameter, ANALYZE (CKD) command 95
device
identifying the type 195
device address to query
specifying, ANALYZE (CKD) command 95
device formatting 74
Device Level Selection Enhanced (DLSE) 3
Device NED (node element descriptor) 10
device, identifying the type 165
device, installing 69
DEVICETYPE parameter
INSPECT (CKD) command 195
DEVMAINT authority authority
ICKDSF commands available, table 44
DEVMAINT authority authority, VM 43
DFSMS-managed volume 181
diagnostic messages
ANALYZE (CKD) command 107
ANALYZE (FBA) command 376
diagnostic output, MAPALT (FBA) command 413
different device size, copying data 133
DIRECTIO parameter
ANALYZE (CKD) command 95
INSPECT (CKD) command 195
Disaster Recovery for Asynchronous PPRC Processing 322
discarding data pinned in cache 123, 124
disk surfaces
checking, example 365
problem determination 364
displacement, skip 664
display panels, ISMF 27
displaying volume information
CPVOLUME (CKD) command 133
CPVOLUME (FBA) command 388
DO-END statement, example of 22
DOSVTOC parameter, INIT (CKD) command 166
drain time, consistency group 296
DRCT subparameter
CPVOLUME (CKD) command 131
CPVOLUME (FBA) command 386
drive problems, investigating suspected 77
drive test
path status table 109
DRIVETEST parameter

DRIVETEST parameter *(continued)*
ANALYZE (CKD) command 95
ANALYZE (FBA) command 372
DSEXIST parameter
INIT (CKD) command 166
dual copy volumes
ANALYZE (CKD) command 104
BUILDIX (CKD) command 115
CONTROL (CKD) command 119
CONTROL (FBA) command 379
initialization restriction 183
INSPECT (CKD) command 208
INSTALL (CKD) command, restriction 213
medial INIT restriction 179
minimal INIT restriction 179
restriction, INSPECT (CKD) command 208
specifying primary or secondary volumes 195
specifying primary or secondary volumes, ANALYZE (CKD) command 95
DUMPCOND parameter
REFORMAT (CKD) command 334
DUPLEX command 4
duplex state
ANALYZE (CKD) command 104
BUILDIX (CKD) command 115
CONTROL (CKD) command 119
CONTROL (FBA) command 379

E

ECC (error checking and correcting) 14
ELSE clause
IF statement 21
null 23
EMU(n) parameter
INIT (CKD) command 171
INSPECT (CKD) command 197
EMUALL parameter
INIT (CKD) command 171
INSPECT (CKD) command 197
emulated device, definition 687
emulating a CKD device
initialization restriction 179
minimal initialization 188
on a 3370 83
on a 3995-151 or -153 83
on a 9313, 9332, or 9335 device 83
on FBA device 171, 197
emulating a CKD device on an FBA device 369
emulating devices 82
END clause, IF statement 22
ending a command 19
ending ICKDSF in the Stand-Alone version 61
environment, setting up for Peer-to-Peer Remote Copy 233
ERASEDATA parameter 351, 352
erasing a volume
INIT (CKD) command, example 85
INIT (FBA) command, example 368
ERDS (error recording data set) 15, 77
ERP (error recovery procedures) 14, 15
error
condition code 0F0B 98
conditions in Stand-Alone version 61
diagnosis, disk 364
error *(continued)*
format, on CP-formatted cylinder 133
I/O, unexpected 102
reported by EXAMINE 90
error handling 258
error notification 15
error recording data set (ERDS) 15, 77
error recovery procedures (ERP) 14, 15
error table
fixed-head, ANALYZE (CKD) command 108
movable head, ANALYZE (CKD) command 107
movable-head (ANALYZE - FBA) 376
errors, correctable, definition 688
errors, permanent, definition 688
errors, temporary, definition 688
ESCON 113
ESCON channels 234
ESCON/FCP 224
ESS prerequisite level 321
establishing an Asynchronous PPRCOPY session, Typical Scenario for 322
establishing Peer-to-Peer Remote Copy pairs 243
establishing Peer-to-Peer Remote Copy paths 251
EXAMINE parameter
AIXVOL (CKD) command 87, 90
CPVOLUME (CKD) command 128
CPVOLUME (FBA) command 383
examining
pages for errors 388
volumes for errors 133
example of
3380 volume map 651
ANALYZE command 375
CPVOLUME command 134, 389
formatting a minidisk (CKD) 91
INIT command 183, 397
INSPECT command 209, 407
INSTALL command 216
installing a new device 361
IODELAY command 220, 410
MAPALT command 413
mapping a full volume with the Stand-Alone version 413
REFORMAT command 416
REFORMAT Command 341
reformatting a volume for MVS 341
REVAL Command 349
exception condition 0F0B 77, 98
EXEC statement, executing ICKDSF
in VSE batch mode 48
in VSE command mode 49
under CMS 39, 40
EXEC, CMS, to copy Stand-Alone ICKDSF to tape, example 56
EXEC, CPLIST, example 40
executing
VSE version of ICKDSF in batch mode, example 49
existing data, writing over on previously initialized volume
INIT (CKD) command 173
existing logical paths 258
expanding the VTOC and the index 342
extended distance mode 225
EXTINDEX parameter
REFORMAT (CKD) command 334
EXTVTOC parameter

EXTVTOC parameter *(continued)*
REFORMAT (CKD) command 334

F

FACILITY class profile, RACF 34
factory functional verification data patterns (FFVDP) 70
factory, installing a device from 69
FAILBACK 230, 247
FAILOVER 230, 247
FAILOVER and FAILBACK 318
FAILOVERMT 230, 247
failure, resuming after
REVAL (CKD) command 349
FASTREVERSERESTORE 140
FBA (fixed block architecture) xiv, 425
FBA blocks
conditionally assigning, example 366
inspecting in Stand-Alone version 407
unconditionally assigning, example 366, 407, 408
FBAVTOC parameter
INIT (FBA) command 393
space requirements 662
FBAVTOC, writing 363
FCP (Fibre Channel Protocol), establishing paths 253
FCP, type of F 112
FCPPATHS parameter 253
feedback xlv
fence status, clearing 124, 125
fenced state, clearing 121, 122, 380, 381
FFVDP, validating and writing 71
Fibre Channel Protocol (FCP), establishing paths 253
FICON bridge 113
FILLER parameter, CPVOLUME (CKD) command 129
filler records 129
finding where INSPECT failed
ANALYZE (CKD) command, example 81
ANALYZE (FBA) command, example 365
fixed block architecture (FBA) 4, 11
fixed block architecture VTOC (FBAVTOC) 661
fixed-head error table (CKD) 108
FIXSIM(4E4E) parameter, REVAL (CKD) command 347
FLASHCOPY command 4–6
flashcopy examples 144
Flashcopy States, Recovering from Inconsistent 322
FLASHCPY (CKD) command
with RACF protection 137
FLASHCPY commands 137
FLASHCPY ESTABLISH command 137
FLASHCPY QUERY command 146
FLASHCPY QUERY INCREMENTSTATUS command 149
FLASHCPY QUERY RELATIONS command 151
FLASHCPY WITHDRAW command 153
flowchart showing ICKDSF tasks 47, 54
FMTMDVOL INPUT A, example 41
FORCE 156
FORCE parameter
INSPECT (CKD) command 195
warning on use of 208
force removal of existing paths 242
format error
on AIX volume 90
on CP-formatted cylinder 133
FORMAT parameter
FORMAT parameter *(continued)*
AIXVOL (CKD) command 87
CPVOLUME (CKD) command 128
CPVOLUME (FBA) command 383
INIT (FBA) command 394
format tracks 651
formatting
CP volumes for a specific VM operating system 383
minidisk (CKD), example 91
minidisk (FBA), example 363
part of a volume (FBA), example 389
tracks and reassigning alternate tracks 348
formatting a cylinder
for AIX use 89
for VM use 131
formatting a minidisk (CKD) example 74
formatting devices 74, 363
formatting entire volume (CKD)
CP-owned volumes 127
for AIX use, example 91
for VM use, example 74, 134
formatting entire volume (FBA)
blocks 0-15, description 387
for VM use, example 363, 389
formatting pages 386
formatting part of a volume (CKD)
for AIX use, example 91
for VM use, example 74, 135
free space information 673
FREEZE command 231, 259
Freeze/Run, using 231
FROMRANGE parameter
ANALYZE (CKD) command 103
INIT (CKD) command 167
INSPECT (CKD) command 196, 203
full duplex, volumes 228
full-pack minidisk 37
functional data verification test xv, 431

G

general users, without special authority, support 43
global mirror 321
guest operating systems, running ICKDSF on 65

H

HA/RO validation xv, 431
handling of checkpoint data 355
hardware documents xl
hardware requirements, Peer-to-Peer Remote Copy 232
head of string, definition 689
head-disk assembly (HDA) 70
HEADRANGE parameter
ANALYZE (CKD) command 103
INIT (CKD) command 167
INSPECT (CKD) command 196, 203
REVAL (CKD) command 348
HOLDIT parameter
INSPECT (CKD) command 198
INSPECT (FBA) command 403, 405
restriction (0671, 9313, 9332, or 9336) 403
home address

home address *(continued)*
validating (INIT - CKD) 175
home address (HA) xv, 431
host access information
obtaining, ANALYZE (CKD) command 97
host impact time 296
HOSTACCESS parameter, ANALYZE (CKD) command 97
how track associations are recorded 654

I

I/O delay, setting
IODELAY (CKD) command, example 220
IODELAY (FBA) command, example 410
I/O errors, unexpected 102
IBM module, return codes 668
IBM TotalStorage Enterprise Storage Server (ESS) 9, 234
IBM-supplied user exit routine, replacing 669
ICK002D 420
ICK31054I 253
ICKDSF commands, table 63, 64
ICKDSF default index size 658
ICKMCLVL macro 3, 671
ICKSADSF COREIMAG file (CMS) 56
ICKSADSF file (MVS) 55
identifying a volume
AIXVOL (CKD) command 88
ANALYZE (CKD) command 94
ANALYZE (FBA) command 371
BUILDIX (CKD) command 115
CONTROL (CKD) command 120
CONTROL (FBA) command 379
CPVOLUME (CKD) command 128
CPVOLUME (FBA) command 384
INIT (CKD) command 162
INIT (FBA) command 392
INSPECT (CKD) command 191
INSPECT (FBA) command 401
INSTALL (CKD) command 215
MAPALT (FBA) command 411
of a dual copy pair, INSPECT (CKD) command 195
REFORMAT (CKD) command 332
REFORMAT (FBA) command 415
REVAL (CKD) command 346
TRKFMT (CKD) command 352
identifying the console in the Stand-Alone version 59
identifying the input device in the Stand-Alone version 59
identifying the output device in the Stand-Alone version 60
identifying type of device
INIT (CKD) command 165
INSPECT (CKD) command 195
identifying volume pairs 233
IDisk 9
IF statement 21
IF-THEN-ELSE DO-END statement, example of 22
IF-THEN-ELSE statement 21
important:
issue a MOUNT command 35
Inconsistent Flashcopy States, Recovering from 322
INCRESYNC parameter 248
indefinite status condition, resetting 123, 124
INDEX parameter, INIT (CKD) command 167
index point on track 651
index terminology and calculations 658
index, VTOC 655
index, VTOC building example 118
indexed VTOC, converting to OS format 76, 117
indexed VTOC, definition 690
INHIBITTARGETWRITES 141
INIT (CKD) command
adding IPL text 170
CKD devices, example 71
converting a reserve storage pool volume, example 186
description 161
dual copy volumes 183
erasing a volume, example 85
examples 183
initializing a volume for a reserve storage pool, example 186
initializing a volume for CMS use, example 187
initializing a volume for MVS, example 184, 186
initializing a volume for VSE use, example 187
initializing a volume in the Stand-Alone version, example 186
installing a new device 70
medial initialization 179
minidisk support, CMS version 183
minimal initialization 178
processing in a shared DFSMS environment 180
relevant parameters for rewriting data 81
required parameters 162
restoring FFVDP 183
restoring volume to factory specs, example 85
resuming after job or system failure 181
shared-system processing 180
specifying range 182
validating and writing FFVDP 71
verifying device is offline 175
with RACF protection 162
writing VTOC 363
writing VTOC, example 75
INIT (FBA) command
erasing a volume, example 368
installing a new device, example 361
reclaiming blocks, example 366
resuming after job or system failure 396
resuming from a checkpoint, example 362
under CMS version 397
INIT command xv, 4–7, 426
INIT NOVALIDATE command 9
INITEM utility 83
initialization for open-system DASD
definition 161
description 179
initialize a reserved volume as non-reserved 175
initializing
minidisk 187, 398
replaced HDA with a minimal INIT 361
volumes with the Stand-Alone version 397
initializing (FBA)
maximal level 396
maximal restriction (0671, 9313, 9332, and 9336) 396
minidisk in a Stand-Alone version 398
minimal level 396
minimal restriction (0671, 9313, 9332, and 9336) 396
volume in a Stand-Alone version 397
initializing a volume 181
initializing a volume (CKD)

initializing a volume (CKD) *(continued)*
resuming after job or system failure 181
initializing a volume (FBA)
resuming after job or system failure 396
VSE version, example 398
input device, Stand-Alone version 59
input file, executing ICKDSF, CMS version 41
INSPECT (CKD) command
assigning alternate tracks, table 204
CMS version 208
concurrent media maintenance 207
conditionally assigning alternate tracks 80
conditionally assigning alternate tracks, example 209
controlling level of surface checking 202
data preservation 207
defective track, rewriting the data of 204
dual copy volume restriction 208
examples of 209
finding where INSPECT failed, example 81
inspecting volumes with the MVS Version 209
minidisk support 208
parameter description 189
parameters to assign alternate tracks, table 204
preserving data 198, 206
printing a map of alternate tracks, example 85
reclaiming tracks, example 80
recovering data after job or system failure, example 81, 205
recovering data, warning 205
resource serialization 205
specifying range 203
surface checking, example 78
syntax 191
unconditionally assigning alternate tracks 80, 84
under CMS 208
with RACF protection 189
writing data from backup location 198, 206
INSPECT (FBA) command
CMS version 407
conditionally assigning alternate blocks example 366
finding where INSPECT failed, example 365
parameter description 399
preserving data 405
preserving data, example 367
recovering data after job or system failure, example 406
surface checking part of a volume, example 367
table of parameters to assign alternate blocks 404
unconditionally assigning alternate blocks 408
unconditionally assigning alternate blocks example 366
unconditionally assigning alternate blocks, Stand-Alone example 407
warning 405
writing data from backup location 405
INSPECT (FBA) command, example 406
INSPECT command xv, 4–8, 31, 427, 428
INSPECT, preserving data 35
inspecting
CKD minidisks, CMS version, example 211
minidisk (CKD), example 211
range of cylinders for errors 91
volumes with the CMS version 408
volumes with the Stand-Alone version 407
volumes with the VSE version 408
inspecting a volume (CKD)
inspecting a volume (CKD) *(continued)*
controlling level of surface checking 202
inspecting CKD volumes
containing VSAM data sets with NOPRESERVE, example 669
duplex pair, example, MVS offline 210
inspecting FBA minidisks
CMS version, example 408
inspecting FBA volumes
checking blocks, VSE example 408
Stand-Alone version 407
INSTALL (CKD) command
converting 3390 to 3380 track compatibility mode, example 217
initializing a volume, example 217
installing a new 3380, 3390, or 9345 69
installing relocated devices 214
mode change warning 216
parameter description 214
resuming after job or system failure 216
shared-system processing 216
with RACF protection 214
installing a new 3380, 3390, or 9345, example 69
Interactive Storage Management Facility (ISMF) 25, 27
Interface Information table 112
interfaces, programming 667
intermediate site 227
Internal Disk Feature 9
interpreting error conditions 61
interval time, consistency group 296
investigating suspected drive problems 77, 364
invoking ICKDSF
with an input file 41
invoking ICKDSF with a CMS EXEC 40
invoking interactively from the console, example 39
IODELAY (CKD) command
examples of 220
parameter description 219
syntax 219
with RACF protection 219
IODELAY (FBA) command
parameter description 409
IODELAY command 4–6
IPL bootstrap records
contents (CKD) 333, 653
IPL bootstrap records, writing
INIT (CKD) command 163
IPL error PSW codes, table 61
IPL program
IPL text, adding 170
maximum size by device type 168
writing on a volume 76
IPL program, maximum size by device type
REFORMAT (CKD) command 336
IPL program, writing
with user-supplied records, example 335
IPL program, writing on a volume
CMS version, example 343
from another volume, example 342
online mode, example 341
IPL tape, creating, example 55
IPL text
removing from a volume 338
IPL, definition 690

IPL, no load parm specified 59
IPL, stand alone program loader 58
IPL, with a load parm specified 58
IPLDD parameter
  INIT (CKD) command 168
  REFORMAT (CKD) command 335
IPLing the Stand-Alone ICKDSF 57
IPLTXTEXIST parameter
  REFORMAT (CKD) command 336
ISMF panels to run ICKDSF, using 27
ISMF PRIMARY OPTION MENU - z/OS DFSMS V1 R3 panel, example 28
ISPF PRIMARY OPTION MENU panel, example 28
IXVTOC parameter 116
IXVTOC parameter, BUILDIX (CKD) command 116

J

JCL, running ICKDSF with, example 26
Job Control Commands (JCC) 49
job failure
  recovering data 406
job failure, resuming 181
JOB statement, executing ICKDSF in MVS 26
JOBCAT DD statement, executing ICKDSF in MVS 26

K

KEEPIT parameter
  INSPECT (CKD) command 198
  INSPECT (FBA) command 403, 405
  restriction (0671, 9313, 9332, or 9336) 403
key area 651
keyboard
  navigation 675
  PF keys 675
  shortcut keys 675
keyword parameters, conflicting 18

L

LABEL parameter
  AIXVOL (CKD) command 87
  CPVOLUME (CKD) command 128
  CPVOLUME (FBA) command 383
label record format, FBA devices 661
LABELS parameter
  INIT (CKD) command 171
  INIT (FBA) command 394
LASTCC condition code 20, 21
licensed internal code 234
like devices, definition 690
limiting the use of resources with the Authorized Program Facility 33
LIMITS parameter
  ANALYZE (FBA) command 372
  MAPALT (FBA) command 412
line continuations 18, 21
LIST parameter
  CPVOLUME (CKD) command 128
  CPVOLUME (FBA) command 383
load from CD-ROM or SERVER task 56
load parm on the IPL panel 57
loading registers 667
local site 227
logical path status table
  ANALYZE (CKD) command 111
logical subsystem number 258
logical subsystem number (LSS)
  determining 316
long distance data migration 228
LSS 248
LSS parameter 240, 258, 260, 292

M

macro
  DEQ 34
  ICKMCLVL 3
  RESERVE 34
macro, ICKMCLVL 671
MAINTCCW authority 66
managed volume, SMSDSEXIST parameter 173
managed volume, STORAGEGROUP parameter 174
managing the Peer-to-Peer Remote Copy system 307
map of DSCBs (VMDS) 655
MAP parameter
  INIT (CKD) command 171
  INIT (FBA) command 394
  INSPECT (CKD) command 196
  INSPECT (FBA) command 403
  restriction (0671, 9313, 9332, or 9336) 394, 403
MAPALT (FBA) command
  diagnostic output 413
  example 368
  report output 412
MAPALT command 4–6
mapping
  VSE version volume 414
mapping alternate blocks
  MAPALT (FBA) command, example 414
mapping alternate tracks 171
maps, index space
  VIXM, VMDS, VPSM 655
marking a volume 340
MAXCC condition code 20, 22
maximal initialization
  definition 161
  FBA devices 396
maximal initialization, definition 690
maximum size
  INIT (CKD) command, IPL program by device type 168
  permitted for the IPL program 170
  VTOC and VTOC index, table 655
media maintenance
  CKD devices, example 79
  emulated CKD devices 84
  FBA devices, example 366
medial INIT 69
medial initialization
  definition 161
  description 179
  dual copy volume restrictions 183
  restriction on dual copy volumes 179
  restriction on emulated devices 179
  Stand-Alone version, example 186, 187
medial initialization, definition 691

menu-driven panels, ISMF 27
message
ICK003D 31
message text
REPLY U TO ALTER VOLUME ccuu CONTENTS, ELSE T 31
messages
ICK 419
received at the console 420
routing and descriptor codes 419
migrating data
CPVOLUME (FBA) command 388
MIMIC parameter
INIT (CKD) command 171
INSPECT (CKD) command 197
MIMIC(MINI) parameter
AIXVOL (CKD) command 88
CPVOLUME (CKD) command 129
MINI(n) parameter, INIT (CKD) command 171
minidisk
creating volume allocation map 134
minidisk (CKD)
changing the volume serial number, example 343
drive test and volume scan support 104
formatting, example 91
initializing under CMS version 183
initializing, example 187
INSPECT (CKD) command support 208
inspecting in the CMS version, example 211
inspecting, example 211
reformatting, example 343
removing owner identification 164, 333
specifying a volume as 171, 197
specifying another user's 100, 202
specifying owner identification 172
specifying real address 94
specifying volume as 88, 129
users without special authority 43
minidisk (FBA)
ANALYZE (FBA) command 373
data verification test, example 376
formatting, example 363
initializing for VSE environment, example 398
inspecting in the CMS version, example 408
reformatting, example 417
specifying a real address 371
specifying another user's 373, 404
users without special authority 43
minidisk, creating volume allocation map
CPVOLUME (FBA) command, description 389
minidisk, definition 691
minidisks under the CMS version 42
minimal INIT 69
minimal initialization
definition 161
description 178
dual copy volume restriction 183
FBA devices 396
first time in offline mode (MVS), example 184
for VSE use, example 187
INSTALL (CKD) command, example 217
offline mode, example 185
restriction on dual copy volumes 179
minimal initialization, definition 691
miscable checking 10
MODE 141, 156
MODE parameter 249
mode, extended distance 225
MODE(COPY) parameter 236
module, IBM, return codes 668
monitoring PPRCOPY volume pairs 230
MOUNT command 35
movable-head error table
CKD 107
FBA 376
MSECONDS parameter
IODELAY (CKD) command 220
IODELAY (FBA) command 410
MSGREQ parameter 249
MSS parameter
INIT (CKD) command 171
INSPECT (CKD) command 197
Multiprise 3000 9
MVS
online tracks, example 357
online, example 357
MVS offline tracks, example 358
MVS RACF authorization table 31
MVS version
converting a reserve storage pool volume 186
initializing a volume 184, 186
initializing a volume for a reserve storage pool 186
MVS version, flowchart
tasks using 25
MVS, JCL to copy Stand-Alone ICKDSF to tape, example 55

N

navigation
keyboard 675
nested IF statement 22
new device, installing, example 361
NEWVTOC parameter
REFORMAT (CKD) command 334
NOASSIGN parameter
INSPECT (CKD) command 193
INSPECT (FBA) command 401
NOBOOTSTRAP parameter
INIT (CKD) command 163
REFORMAT (CKD) command 333
NOCHECK parameter
INIT (CKD) command 169
INIT (FBA) command 393
INSPECT (CKD) command 194
INSPECT (FBA) command 402
NOCONTINUE parameter
INIT (CKD) command 164
INIT (FBA) command 393
NODATA parameter
INIT (CKD) command 165
REVAL (CKD) command 347
node element descriptor (NED) 10
NODETAIL parameter, MAPALT (FBA) command 412
NODRIVE NOSCAN parameters 112
NODRIVETEST parameter
ANALYZE (CKD) command 95
ANALYZE (FBA) command 372
NODSEXIST parameter
INIT (CKD) command 169

NOFILLER parameter, CPVOLUME (CKD) command 129
NOINDEX parameter, INIT (CKD) command 167
NOLPS parameter
  ANALYZE (CKD) command 98
NOMAP parameter
  INIT (CKD) command 171
  INIT (FBA) command 394
  INSPECT (CKD) command 196
  INSPECT (FBA) command 403
non-cascading 224
non-VSAM password-protected data sets 32
NONE subparameter
  AIXVOL (CKD) command 88
  CPVOLUME (FBA) command 384
  INIT (CKD) command 163
  INIT (FBA) command 392
  INSPECT (CKD) command 192
  INSTALL (CKD) command 215
  REFORMAT (FBA) command 401
  REVAL (CKD) command 346
NOPRESERVE parameter, INSPECT (CKD) command 198
NOPURGE parameter
  BUILDIX (CKD) command 116
  INIT (CKD) command 173
  INIT (FBA) command 395
  REFORMAT (CKD) command 337
NOREADCHECK parameter
  AIXVOL (CKD) command 89
  CPVOLUME (CKD) command 130
  CPVOLUME (FBA) command 385
NORECLAIM parameter
  INIT (FBA) command 395
  INSPECT (CKD) command 200
NOSCAN parameter
  ANALYZE (CKD) command 98
  ANALYZE (FBA) command 372
NOSKIP parameter
  INSPECT (CKD) command 200
NOSPEED parameter
  ANALYZE (CKD) command 99
  ANALYZE (FBA) command 373
NOSSI parameter
  CPVOLUME (CKD) command 130
  CPVOLUME (FBA) command 384
NOSYS parameter
  CPVOLUME (CKD) command 130
  CPVOLUME (FBA) command 385
NOVALIDATE parameter, INIT (CKD) command 175
NOVERIFY parameter
  AIXVOL (CKD) command 88
  CPVOLUME (CKD) command 129
  CPVOLUME (FBA) command 384
  INIT (CKD) command 163
  INIT (FBA) command 392
  INSPECT (CKD) command 192
  INSPECT (FBA) command 401
  REFORMAT (CKD) command 333
  REFORMAT (FBA) command 416
  REVAL (CKD) command 346
NOVERIFYOFFLINE parameter, INIT (CKD) command 175
NOVERIFYOFFLINE parameter, REFORMAT (CKD) command 338
null THEN and ELSE clause 23
number of CKD records formatted per track by AIXVOL command 89
number of records formatted by CPVOLUME command 132

O

OBJFORMAT subparameter, REFORMAT (CKD) command 335
offline
  verifying device is 175, 338
offline mode
  changing volume serial number and owner identification, example 341
  data set security and protection 31
  initializing a volume 184
  initializing a volume at the minimal level, example 185
  MVS offline tracks 358
  reclaiming tracks 210
  unconditionally assigning alternate tracks, example 209
offline mode, initializing a volume 185
offline mode, initializing two volumes
  example (INIT - CKD) 184
online mode
  conditionally assigning alternate tracks, example 209
  data set security and protection 31
  inspecting a duplex pair 210
  MVS online tracks, example 357
online mode, adding IPL text, example 341
online panels, ISMF 27
ONLINSEC parameter 249
ONLINTGT 141
operating system, guest 65
operator's intervention consideration 35
Optical Media Attach (OMA) 56
OPTION parameter 250
OS VTOC, converting to indexed format 76, 116
OSVTOC parameter, BUILDIX (CKD) command 116
outage, Asynchronous Peer-to-Peer Remote Copy Recovery from an unplanned 323
output device, specifying in the Stand-Alone version 60
output, diagnostic, MAPALT (FBA) command 413
overview of the ICKDSF
  tasks using the Stand-Alone version 54
  tasks using the VSE version 47
Overview, PPRCOPY 224
owner identification
  removing 164, 333
  specifying 172
  verifying
    INIT (CKD) command 346
owner identification, cerifying
  REFORMAT (CKD) command 333
owner identification, changing
  REFORMAT (CKD) command, example 341, 344
  REFORMAT (FBA) command, example 363, 417
owner identification, verifying
  INIT (CKD) command 163
  INIT (FBA) command 392
  INSPECT (CKD) command 192
  INSPECT (FBA) command 401
  REFORMAT (FBA) command 416
  TRKFMT (CKD) command 354
OWNER parameter
  CPVOLUME (CKD) command 128

OWNER parameter *(continued)*
CPVOLUME (FBA) command 383
OWNERID parameter
INIT (CKD) command 172
INIT (FBA) command 395
REFORMAT (CKD) command 337
REFORMAT (FBA) command 416

P

PACE parameter 250
pack space map (VPSM) 655
PAGE subparameter
CPVOLUME (CKD) command 131
CPVOLUME (FBA) command 386
page, definition 691
Parallel Access Volume (PAV) 9
parameter
ALL 94
ALLOWONLINE 94
ALLOWWRITE 120
CHECK 81
CLEARFENCE 85, 120, 380
CONFIGURE(DISPLAY) 121, 380
CONTINUE 164
CYCLES 354
CYCLES(n) 352
CYLRANGE 97, 165, 352, 356
DATA 165
DIRECTIO 4, 95, 208
DSEXIST 166
ERASEDATA 351, 352
EXTINDEX 75
EXTVTOC 75
FBAVTOC 661
FROMRANGE 96, 167, 353, 356
HEADRANGE 96, 167, 353, 356
INDEX 167
LIMITS 97
LSS 260, 292
MAP 171
MODE(COPY) 236
NOCHECK 169
NODATA 165
NODSEXIST 169
NOINDEX 167
NOLPS 98
NOMAP 171
NOPURGE 116
NOVERIFY 215, 354
PASSWORDS 30, 31, 354
PRESERVE 81
PRINTDS 98
PURGE 31, 116
RESETICD 121
SETMODE 70
SYSNAME 120, 379
TOLERATE 355
TORANGE 175, 353, 356
TRACKS 355
UNITADDRESS 120, 379
USERID 100
VERIFY 30, 215, 354
VOLID 177
parameter *(continued)*
VTOC 177
parameter conditions when specifying part of the volume, table 203
parameters to select the input and output devices 42
PARM subparameter
CPVOLUME (CKD) command 131
CPVOLUME (FBA) command 386
PARM=NOXRC parameter 10
password-protected data sets
return codes 668
PASSWORDS parameter
INIT (CKD) command 172
INSPECT (CKD) command 197
path control
specifying, ANALYZE (CKD) command 94, 106
under ANALYZE (CKD) command, restriction 101
when running analyze drive test 106
when running analyze drive test, table 106
path status table, ANALYZE (CKD) command 109
paths, existing logical 258
Peer-to-Peer Remote Copy (PPRCOPY)
3990 NVS and cache requirements for PPRCOPY, table 235
command functions 231
configuring storage subsystem resources 234
defining sessions 236
deleting pairs 238
deleting paths 240
establishing pairs 243
establishing paths 251
establishing the configuration 234
identifying volume pairs 233
managing the PPRCOPY system 307
overview 224
PPRCOPY QUERY with multi-target support 280
PPRCOPY QUERY with the PATHS parameter 273
PPRCOPY QUERY without the PATHS Parameter 266
querying status 265
recovering data on the recovery system 288
setting up the environment 233
suspending pairs 300
with RACF protection 224
Peer-to-Peer Remote Copy (PPRCOPY) hardware requirements 232
Peer-to-Peer Remote Copy (PPRCOPY) restrictions 232
Peer-to-Peer Remote Copy Recovery from an unplanned outage, Asynchronous 323
Peer-to-peer Remote Copy volume xv, 429
performing ICKDSF tasks on minidisks with the Stand-Alone version 63
performing miscellaneous tasks with ICKDSF 368
performing tasks with INSPECT parameters 189
PERIO parameter
IODELAY (CKD) command 220
IODELAY (FBA) command 409
PERM subparameter
CPVOLUME (CKD) command 131
CPVOLUME (FBA) command 386
permanent data checks 14
permanent errors, definition 691
placing a VTOC at the end of a volume 75
placing an FBAVTOC at the end of a volume 363
PPRC Processing, Disaster Recovery for Asynchronous 322

PPRC, Asynchronous 321
PPRCOPY command 4–7, 9, 223
PPRCOPY DEFINESESSION 236
PPRCOPY DELPAIR 238
PPRCOPY DELPATH command 240
PPRCOPY device error, 1750 258
PPRCOPY device error, 2105 258
PPRCOPY device error, 2107 258
PPRCOPY ESTPAIR command 227, 243
PPRCOPY ESTPATH command 234, 251
PPRCOPY ESTPATH syntax 252
PPRCOPY extended distance
    setting up your environment 225
    using 226
PPRCOPY FREEZE command 259
PPRCOPY licensed internal code (LIC) 232
PPRCOPY Overview 224
PPRCOPY POPULATESESSION command 261
PPRCOPY QUERY ASYNCCOPY command 281
PPRCOPY QUERY command 265
PPRCOPY QUERY OUTOFSYNCSTATE command 285
PPRCOPY QUERY SESSIONSDEVICES command 287
PPRCOPY RECOVER command 288
PPRCOPY RUN command 291
PPRCOPY session, Typical Scenario for establishing an Asynchronous 322
PPRCOPY Solution, Asynchronous 321
PPRCOPY STARTASYNCCOPY command 293, 295
PPRCOPY SUSPEND command 300
PPRCOPY TERMASYNCCOPY command 303
PPRCOPY volume pairs
    establishing 226
PPRCOPY volume state
    converting from one to another 228
PPRCOPY, establish FCP paths 253
PPRCOPY, using synchronous and asynchronous 226
PQ72465, CASCADE support 250
prerequisites – LIC 321
PRESERVE backup processing. xv, 428
PRESERVE parameter
    INSPECT (CKD) command 198
    INSPECT (FBA) command 403, 405
    restriction (0671, 9313, 9332, or 9336) 403
PRESERVEMIRROR 142
preserving data
    INSPECT (FBA) command 405
preserving data during INSPECT (CKD) command 206
preserving data during INSPECT (FBA) command 404, 405
preventing destruction of data
    on the blocks inspected (INSPECT - FBA) 403
primary checking 663
primary checking for CKD devices 664
primary checking for FBA devices 664
Primary surface checking, definition 692
primary/alternate track, CKD devices 654
PRINTDS parameter
    ANALYZE (CKD) command 98
printed output (VSE) 49
printed output data set 27
printing a map of alternate blocks
    INIT (FBA) command 394
    INSPECT (FBA) command 403
    MAPALT (FBA) command, example 368, 413, 414
printing a map of alternate tracks
printing a map of alternate tracks *(continued)*
    INIT (CKD) command 171
    INSPECT (CKD) command, example 85, 210
PRNT output device specification 60
problem determination
    FBA disk 364
problem solving under VM 66
processing in a shared DFSMS environment 180, 181
processing in a shared environment 34, 51, 116, 180, 216
processing tracks
    MVS version 357
    offline mode, MVS version 358
    online mode, MVS version 357
    Stand-Alone version 358
processing, control 19
processing, XRC volumes 10
programming interfaces 667
protected data sets, security
    data sets in an online mode 31
protecting
    MVS volumes and data sets 30
protecting data sets in an offline mode 31
protection, RACF authorization 31
providing passwords for data set security 172
PSW error condition codes, table 61
PURGE parameter
    BUILDIX (CKD) command 116
    INIT (CKD) command 173
    INIT (FBA) command 395
    REFORMAT (CKD) command 337

Q

querying status, PPRCOPY QUERY 265

R

RACF FACILITY class profile 34
RACF protected data sets 32
RACF protection
    ANALYZE (CKD) command 93
    BUILDIX (CKD) command 115
    CONTROL (CKD) command 119
    FLASHCPY (CKD) command 137
    INIT (CKD) command 162
    INSPECT (CKD) command 189
    INSTALL (CKD) command 214
    IODELAY (CKD) command 219
    Peer-to-Peer Remote Copy (PPRCOPY) 224
    REFORMAT (CKD) command 331
    REVAL (CKD) command 345
    TRKFMT (CKD) command 351
RAMAC Array DASD (9391) 8
RAMAC Array Subsystem (9394) 8
RAMAC Electronic Array (9397) 8
RAMAC Scalable Array (9396) 8
RAMAC Virtual Array (9393) 8
RAMAC Virtual Array Subsystem 234
RANGE parameter
    AIXVOL (CKD) command 89
    CPVOLUME (CKD) command 130
    CPVOLUME (FBA) command 385
RANGE parameters 203

range, specifying
ANALYZE (CKD) command 103
INIT (CKD) command 182
INSPECT (CKD) command 203
TRKFMT (CKD) command 356
read-back check, specifying
CKD devices 89, 130
FBA devices 385
read-write heads 13
READCHECK parameter
AIXVOL (CKD) command 89
CPVOLUME (CKD) command 130
CPVOLUME (FBA) command 385
reading the MAPALT report output 412
READY state xiv, 421
REALADDR parameter
ANALYZE (CKD) command 94
ANALYZE (FBA) command 371
INSPECT (CKD) command 191
reassigning alternate tracks 348
rebuilding an existing VTOC index, example 118
RECLAIM parameter
INIT (FBA) command 395
INSPECT (CKD) command 200
reclaiming blocks
example 366
reclaiming tracks
INSPECT (CKD) command, example 210
reclaiming tracks example 80
Recommendation
VERIFY parameter 30
record 0, validating (CKD) 175
record format 651
record zero (R0) xv, 431
record, CKD device format 651
recovering data (FBA) 405
recovering data with Peer-to-Peer Remote Copy 288
Recovering from Inconsistent Flashcopy States 322
Recovery for Asynchronous PPRC Processing, Disaster 322
Recovery from an unplanned outage, Asynchronous Peer-to-Peer Remote Copy 323
REFORMAT (CKD) command
adding IPL text 76, 335
adding IPL text, online mode, example 341
changing volume serial number and ownerid, example 76, 341, 344
parameter description 332
reformatting a volume for MVS use, example 341
verifying device is offline 338
with RACF protection 331
REFORMAT (CKD) command, adding IPL text
CMS version, example 343
from another volume, example 342
REFORMAT (FBA) command
changing volume serial number and ownerid, example 363, 417
parameter description 415
reformatting a minidisk, example 417
reformatting a volume for VSE use, example 417
REFORMAT (FBA) command, example 363
REFORMAT command 4–7, 9, 75
reformatting a minidisk in the CMS version 417
reformatting a volume
for MVS use, example 341
reformatting a volume *(continued)*
for VSE use, example 417
refreshing the VTOC and index 343
REFVTOC parameter
CPVOLUME (CKD) command 128
REFORMAT (CKD) command 334
regardless of previous processing 72
registers, loading 667
reinitializing a volume
REVAL (CKD) command, example 350
reinitializing a volume, example 185
RELATSPACE 156
relocated devices, installing 214
remote copy-capable LIC 232
remote devices 57
remote site 227
REMOVEIPLTXT parameter
REFORMAT (CKD) command 338
repairing 4E4E SIMs on the 3390 348
replacing the IBM-supplied user exit routine 669
report output, MAPALT (FBA) command 412
RESERVE macro 34
RESERVE macro, use of 34
reserve storage pool, assigning a volume to 173
RESERVED parameter, INIT (CKD) command 173
RESERVEPOOLNAME parameter, INIT (CKD) command 173
reserving space for additional volume labels
INIT (CKD) command 171
INIT (FBA) command 394
RESET parameter
IODELAY (CKD) command 219
IODELAY (FBA) command 409
RESETICD parameter, CONTROL (CKD) command 121
RESETTGTWRTINHIBIT 157
resetting fence status 123–125
resetting indefinite status condition
CONTROL (CKD) command 123
CONTROL (CKD) command, example 124
Resource Access Control Facility (RACF) 30
resource serialization, INSPECT (CKD) command 205
resource serialization, TRKFMT (CKD) command 356
RESTORE 142
restoring a volume
factory specs, example 85, 368
INIT (CKD) command 165
restoring FFVDP 183
restoring volume serial number 340
restriction
BUILDIX (CKD) command 115
resuming
after a job or system failure 181
from a checkpoint, FBA devices, example 362
from a checkpoint, initializing a volume 164
jobs, FBA devices 393
resuming after job or system failure
INIT (CKD) command 181
INIT (FBA) command 396
INSTALL (CKD) command 216
REVAL (CKD) command 349
resuming from checkpoint
during initialization 71
resuming initialization from a checkpoint location 71
retrieving data from the backup location 405
return codes

return codes *(continued)*
password-protected data sets 668
the IBM module 668
VSAM and unexpired data sets 668
REVAL (CKD) command
data destruction warning 345
description 345
parameter description 346
reassigning alternate tracks 348
reinitializing a volume, example 350
repairing 4E4E SIMs on the 3390 348
VSE version 349
with RACF protection 345
REVAL command 4–8
reverse direction of PPRCOPY 247
REVERT/COMMIT 157
rewriting
volume label 91
volume serial 388
rewriting volume label 133
rewriting volume serial number and owner identification 363
RIPLTXT parameter
REFORMAT (CKD) command 338
RUN command 231
running
REVAL with FIXSIM 349
VSE version of ICKDSF in batch mode 48
running ICKDSF with JCL, example 26
running VSE version of ICKDSF in command mode 49
RVA (9393) 232

S

S/390 Multiprise 2000 9
SA cylinder
preserving data during INSPECT (CKD) command 206
SAPL (stand alone program loader) 58
saving data during surface checking 367
SCAN parameter
ANALYZE (CKD) command 98
ANALYZE (FBA) command 372
scanning data on part of a volume 78
SCOPE parameter, CONTROL (CKD) command 121
SCOPE parameter, CONTROL (FBA) command 380
secondary PPRCOPY volume consistency 291
secondary volume, online 249
SECONDS parameter
IODELAY (CKD) command 220
IODELAY (FBA) command 410
securing data 30, 33
security, RACF authorization 31
SECWWNN parameter
ANALYZE (CKD) command 99
selecting input and output devices using parameters 42
self description 10
sending to IBM
reader comments xlv
Sense Subsystem Status Data 10
separating commands and parameters 18
SERIAL parameter, CONTROL (CKD) command 121
SERIAL parameter, CONTROL (FBA) command 380
Service Call Logical Processor Facility (SCLP) 57, 59, 60
service information messages (SIM) 15
SESECOK parameter 250
session, Typical Scenario for establishing an Asynchronous PPRCOPY 322
SET parameter
IODELAY (CKD) command 219
IODELAY (FBA) command 409
SET statement, example of 20, 21
SETGTOK 142
SETMODE parameter 70
SETMODE parameter, INSTALL (CKD) command 215
setting 3390 to 3380 track compatibility mode 70
shared environment
VSE version 51
shared environment, MVS version 34
shared-system processing
INIT (CKD) command 180
INSTALL (CKD) command 216
sharing across multiple
processors 51
users and partitions in a single processor 51
shortcut keys 675
SIMs (service information messages)
repairing 4E4E on the 3390 348
single storage control 231, 259
size, VTOC index 655
skip displacement checking 664
skip displacement devices 78
Skip displacement, definition 693
SKIP parameter
INSPECT (CKD) command 200
slowing down I/O operations
IODELAY (CKD) command, example 220
IODELAY (FBA) command, example 410
SMSDSEXIST parameter, INIT (CKD) command 173
SOFT parameter, CONTROL (CKD) command 122
SOFT parameter, CONTROL (FBA) command 381
software documents xlii
Solution, Asynchronous PPRCOPY 321
solving problems with ANALYZE output 374
SOURCEVOL 143, 148, 158
space maps 655
space requirements, FBAVTOC 662
special authority, supporting general users without 43
specify the reserve storage pool name 173
specifying primary or secondary volumes (CKD) 95
SPEED parameter
ANALYZE (CKD) command 99
ANALYZE (FBA) command 373
SPID parameter, CONTROL (CKD) command 122
SPID parameter, CONTROL (FBA) command 381
SSI name, specifying
CKD devices 130, 384
SSINAME parameter
CPVOLUME (CKD) command 130
CPVOLUME (FBA) command 384
staging devices, considerations 171
stand alone program loader, IPLing 58
Stand-Alone Program Loader (SAPL) 53
Stand-Alone tasks 54
Stand-Alone version
ending ICKDSF 61
error conditions 61
initializing a volume, example 186
output devices supported 60
specifying date and time of day 61

Stand-Alone version, flowchart 54
standard track layout (CKD devices) 651
starting ICKDSF 26
States, Recovering from Inconsistent Flashcopy 322
status for MSS staging 171
STEPCAT DD statement, executing ICKDSF in MVS 26
storage control, clearing
    CONTROL (CKD) command, description 122
    CONTROL (CKD) command, example 124
storage control, single 259
STORAGE DIRECTOR entry in path status table 109
STORAGE PATH entry in path status table 109
STORAGEGROUP parameter, INIT (CKD) command 174
subchannel set identifier, specifying 99, 122, 174, 381
SUBCHSET parameter, ANALYZE (CKD) command 99
SUBCHSET parameter, CONTROL (CKD) command 122
SUBCHSET parameter, CONTROL (FBA) command 381
SUBCHSET parameter, INIT (CKD) command 174
subparameter
    NONE 354
SUBSYSTEM ID entry in path status table 109
subsystem image serial number, specifying 121, 380
supplying variable-length records as IPL data 170
support under the CMS version
    dedicated devices under the CMS version 44
supported by ICKDSF commands (minidisks under CMS), table 42
surface analysis cylinder, definition 694
surface checking
    disks, example 365
    minidisk (CKD), example 211
    part of a volume 78
    part of a volume, example (FBA) 367
    track 663
surface checking a volume (CKD)
    controlling the level 202
suspended duplex state
    ANALYZE (CKD) command 104
    BUILDIX (CKD) command 115
    CONTROL (CKD) command 119
    CONTROL (FBA) command 379
suspending Peer-to-Peer Remote Copy pairs 300
synchronous and asynchronous PPRCOPY, using 226
syntax, ICKDSF command 17
SYS1.LOGREC file (MVS) 77
SYS1.SAMPLIB library 55, 342, 671
SYSIN DD statement, executing ICKDSF in MVS 26
SYSNAME parameter
    ANALYZE (CKD) command 94
    ANALYZE (FBA) command 371
    CONTROL (CKD) command 120
    CONTROL (FBA) command 379
    CPVOLUME (CKD) command 130
    CPVOLUME (FBA) command 385
    INIT (CKD) command 162
    INIT (FBA) command 392
    INSPECT (CKD) command 191
    INSPECT (FBA) command 401
    INSTALL (CKD) command 215
    MAPALT (FBA) command 411
    REFORMAT (CKD) command 332
    REFORMAT (FBA) command 415
    REVAL (CKD) command 346
    TRKFMT (CKD) command 352
SYSPRINT DD statement, printed output data set 26
SYSREC file (VSE) 77
System Adapter ID (SAID) 317
system failure
    recovering data 406
    resuming a job after 396
system failure, recovering data 406
system failure, resuming 181
system name, specifying
    CKD devices 130, 385
system view of a permanent data check 15
system-managed storage (SMS) 30
system-managed volume 173, 174

T

tape or card reader 56
TARGETVOL 139, 155
tasks
    assign alternate tracks 10
    drive problems 10
    initializing and formatting the volume 10
    installing a device 10
    media maintenance 10
    problem determination 10
    reading data stored on the volume 10
    reclaim a track 10
    rewrite data 10
    skip displacement checking 10
    surface checking functions 10
tasks using the CMS version 37
tasks using the MVS version, overview of ICKDSF 25
TDSK subparameter
    CPVOLUME (CKD) command 131
    CPVOLUME (FBA) command 386
temporary data checks 14
temporary errors, definition 694
temporary versus permanent 14
terminator, ICKDSF commands 19
testing the drive and logical volume with ANALYZE 100, 373
TGTCANCOMEONLINE 143
TGTOKASPRIMPPRC 144
THEN clause
    IF statement 21
    null 23
THEN DO clause, IF statement 22
thermal stability
    ANALYZE (CKD) command restriction 102
    medial INIT restriction 179
thermal stability restriction 102
time of day, specifying when loading ICKDSF program 61
TOD (time-of-day) clock 61
TOLERATE parameter 355
TOLERATE parameter, INSPECT (CKD) command 201
TORANGE parameter
    ANALYZE (CKD) command 100, 103
    INIT (CKD) command 175
    INSPECT (CKD) command 201, 203
track contents after initialization (CDK devices) 653
tracks
    alternate
        reassigning 348
    associations, primary/alternate (CKD) 654
    MVS

tracks *(continued)*
MVS *(continued)*
online, example 357
TRACKS parameter
INSPECT (CKD) command 202
tracks, address 651
tracks, alternate
conditionally assigning, example 80, 209
printing a map of 171
printing a map of, example 85, 210
table of parameters used to assign 204
unconditionally assigning, example 80, 84, 209
tracks, CMS example 358
tracks, disk surface 651
tracks, reclaiming
those previously flagged defective 200
tracks, reclaiming example 80
tracks, Stand-Alone example 358
tracks, standard layout (CKD devices) 651
trademarks 682
TRKFMT (CKD) command
previous command 355
specifying range 356
with RACF protection 351
TRKFMT command 4–7
troubleshooting, VM 66
type of F, FCP 112
TYPE parameter
CPVOLUME (CKD) command 131
CPVOLUME (FBA) command 386

U

unconditionally assigning
alternate block, INSPECT command 407
alternate blocks 366
alternate tracks 80, 209
uncorrectable errors, definition 695
understanding which INSPECT parameters to use 189, 399
unexpected I/O errors 102
unexpired data sets
VSAM, return codes 668
unexpired data sets, security 32
unexpired files (VSE) 51
UNITADDRESS xv, 436
UNITADDRESS parameter
AIXVOL (CKD) command 88
ANALYZE (CKD) command 94
ANALYZE (FBA) command 371
CONTROL (CKD) command 120
CONTROL (FBA) command 379
CPVOLUME (CKD) command 128
CPVOLUME (FBA) command 384
INIT (CKD) command 162
INIT (FBA) command 392
INSPECT (CKD) command 191
INSPECT (FBA) command 401
INSTALL (CKD) command 215
MAPALT (FBA) command 411
REFORMAT (CKD) command 332
REFORMAT (FBA) command 415
REVAL (CKD) command 346
TRKFMT (CKD) command 352
unlike device, definition 695
unmarking a volume 340
unplanned outage, Asynchronous Peer-to-Peer Remote Copy
Recovery from an 323
UNRESERVED parameter, INIT (CKD) command 175
updating portions of a previously initialized volume
REFORMAT (FBA) command 415
updating the allocation map 133, 388
use of VSE ICKDSF command mode during VSE install
process 50
use the Stand-Alone, preparing 56
USECONDS parameter
IODELAY (CKD) command 220
IODELAY (FBA) command 410
user authority, class F 66
user exit routine,IBM supplied, replacing 669
user interface
ISPF 675
TSO/E 675
user security exit module 31, 667
user-supplied IPL program, writing
REFORMAT (CKD) command 335
user-volume labels
reserving space for (CKD) 171
USERID parameter
ANALYZE (CKD) command 100
ANALYZE (FBA) command 373
INSPECT (CKD) command 202
INSPECT (FBA) command 404
using DEVMAINT authority 43
using REFORMAT command with the CMS version 343
using synchronous and asynchronous PPRCOPY 226
utility, INITEM 83

V

VALIDATE parameter, INIT (CKD) command 175
validating
part of a volume 71
validating and writing
FFVDP for one head 73
validating and writing, FFVDP 71
validating entire volume (CKD), example 71
validating from a specific point 72
validating last heads of a device 73
validating part of volume (CKD), example 71
validating the home address and record 0 (INIT - CKD) 175
validating to a specific point 73
VARY OFFLINE, TEST command 171
VERIFY parameter
AIXVOL (CKD) command 88
CPVOLUME (CKD) command 129
CPVOLUME (FBA) command 384
INIT (CKD) command 163
INIT (FBA) command 392
INSPECT (CKD) command 192
INSPECT (FBA) command 401
REFORMAT (CKD) command 333
REFORMAT (FBA) command 416
REVAL (CKD) command 346
verifying
data records with ANALYZE 374
device is offline 175, 338
identification and preventing data loss 50
verifying the volume serial number

verifying the volume serial number *(continued)*
AIXVOL (CKD) command 88
CPVOLUME (CKD) command 129
CPVOLUME (FBA) command 384
INSTALL (CKD) command 215
verifying the volume serial number and owner identification
INIT (CKD) command 163
INIT (FBA) command 392
INSPECT (CKD) command 192
INSPECT (FBA) command 401
REFORMAT (CKD) command 333
REFORMAT (FBA) command 416
REVAL (CKD) command 346
TRKFMT (CKD) command 354
VERIFYOFFLINE parameter, INIT (CKD) command 175
VERIFYOFFLINE parameter, REFORMAT (CKD) command 338
version minidisk support 374
VIO (virtual input output) xv, 434
vital product data (VPD) 258
VIXM (VTOC index map) 655
VM operating system, formatting CP volumes 383
VM troubleshooting 66
VM version, DEVMAINT authority 43
VMDS (VTOC map of DSCBs) 655
VOLID parameter
AIXVOL (CKD) command 89
CPVOLUME (CKD) command 131
CPVOLUME (FBA) command 386
INIT (CKD) command 177
INIT (FBA) command 396
REFORMAT (CKD) command 339
REFORMAT (FBA) command 416
volume allocation map
creating for minidisk 134
volume allocation map, creating for minidisk
CPVOLUME (FBA) command, description 389
volume allocation, changing
VM volumes
CPVOLUME (FBA) command, description 388
volume allocation, changing (VM volumes) 389
volume and data set security 31
volume information 133
volume information, displaying
CPVOLUME (FBA) command 388
volume initialization (FBA)
maximal level 396
minimal level 396
volume label
reserving space for (CKD) 171
reserving space for (FBA) 394
writing over 337
volume label, definition 695
volume layout and record formats on CKD devices 651
VOLUME LIST SELECTION MENU, example 29
volume map
output, example (CKD) 651
volume map, printing
CKD devices 85, 171
CKD devices, INSPECT (CKD) command, example 210
FBA devices 403, 413
FBA devices, INIT (FBA) command 394
FBA devices, MAPALT (FBA) command 414
VOLUME SELECTION ENTRY PANEL, example 29
volume serial number
specifying 89
volume serial number, changing
AIXVOL (CKD) command, example 91
REFORMAT (CKD) command, example 341, 344
REFORMAT (FBA) command, example 363, 417
volume serial number, restoring
REFORMAT (CKD) command 340
volume serial number, specifying
CPVOLUME (CKD) command 131
CPVOLUME (FBA) command 386
INIT (FBA) command 396
REFORMAT (CKD) command 339
REFORMAT (FBA) command 416
volume serial number, verifying
AIXVOL (CKD) command 88
CPVOLUME (CKD) command 129
CPVOLUME (FBA) command 384
INIT (CKD) command 163
INIT (FBA) command 392
INSPECT (FBA) command 401
INSTALL (CKD) command 215
REFORMAT (CKD) command 333
REFORMAT (FBA) command 416
REVAL (CKD) command 346
TRKFMT (CKD) command 354
volume usage format
specifying 171, 197
volume, marking
REFORMAT (CKD) command 340
volume, unmarking
REFORMAT (CKD) command 340
volume, writing on
IPL program 170
VPSM (VTOC pack space map) 655
VSAM (virtual storage access method) xiv, 424
VSAM and unexpired data sets 32
VSAM and unexpired data sets, return codes 668
VSAM data sets, security 32
VSAM files, VSE version 51
VSE
initializing a minidisk for, example 398
VSE tasks 47
VSE version
initializing a volume (FBA) 398
initializing a volume, example 187
inspecting a volume (CKD) 211
mapping entire volume, example 414
processing a volume (CKD) 358
reformatting a volume, example 417
REVAL (CKD) command 349
running a drive test 376
surface checking a volume (FBA), example 408
VSE version of ICKDSF in command mode, example 49
VSE version, flowchart 47
VSEVTOC parameter, INIT (CKD) command 166
VTOC (volume table of contents)
determining the size and location 75
placing at the end of a volume 75
VTOC index 655
VTOC index building, example 118
VTOC parameter, INIT (CKD) command 177
VTOC, VTOCIX data sets 33
VTOCIX data set, security 31, 198

VTOCPTR parameter, REFORMAT (CKD) command 340

W

warning
  CE panel on the control unit and DASD 123
  changing storage control, volume, or path connectivity for PPRCOPY-managed volumes 308
  changing volume mode, INSTALL (CKD) command 216
  correct microcode level for CKD emulation 83
  data destruction, REVAL (CKD) command 345
  format the volume for use 217
  initialize the volume 213
  path contention, ANALYZE (CKD) command 101
  potential data integrity exposures 236
  potential data integrity exposures to offline volumes 236
  protect your data by ensuring your secondary device is correct 243
  recovering data, INSPECT (CKD) command 205
  running ICKDSF under VM 37
  running INSPECT (FBA) 399
  use of FORCE parameter, INSPECT (CKD) command 208
  using volumes before recovering the data 206
  volume is not formatted for the MVS environment 350
with user-supplied records, example
  INIT (CKD) command 170
World Wide Node Name (WWNN) 257
WRITE INHIBITed device 124
write-allowing WRITE INHIBITed device
  CONTROL (CKD) command, description 122
  CONTROL (CKD) command, example 124
writing
  a null THEN and ELSE 23
writing a DO-END statement 22
writing a SET statement 20
writing a user-supplied IPL program on the volume 168
writing an IF-THEN-ELSE statement 21
writing command statements 19
writing data from backup location
  INSPECT (CKD) command 198, 206
  INSPECT (FBA) command 405
writing FBAVTOC, example 364
writing FFVDP, INIT (CKD) command, example 71
writing IPL bootstrap records on a volume
  INIT (CKD) command 163
  REFORMAT (CKD) command 333
writing IPL program
  INIT (CKD) command 170
writing IPL program, adding IPL text
  REFORMAT (CKD) command, CMS version, example 343
  REFORMAT (CKD) command, from another volume, example 342
  REFORMAT (CKD) command, online mode, example 341
  with user-supplied records, example 335
writing on a volume
  with user-supplied records, example 168
writing on CKD devices, example 75
writing over existing data on a previously initialized volume
  INIT (CKD) command 173
writing the FFVDP
  on part of a volume 71
writing VTOC
  CKD devices, example 75
writing VTOC *(continued)*
  FBA devices, example 363
WWNN parameter 257

X

XD consistency group coordination 296
XRC volumes, processing 10
XRCLOGGER parameter, REFORMAT (CKD) command 340



GC35-0033-42

