

5 ACARS Messages

The following lists show the various message types, by message label, which are supported while the Dlink+ w/CPDLC is operating in the ACARS mode.

5.1 ARINC 618 Formatted Messages

Label	Description
00	Emergency Situation Report
10-39	User Defined Messages
52	Ground UTC Request
54	Voice Contact Request
57	Alternate Aircrew Initiated Position Report
5R	Aircrew Initiated Position Report
5U	Weather Request
5Y	Aircrew Revision to Previous ETA/Diversion Report
7A	Aircrew Initiated Engine Data/Takeoff Thrust Report
7B	Aircrew Entered Miscellaneous Message
Q0	Link Test
Q1	Departure/Arrival Report
Q2	Estimated Time of Arrival Report
QA	OUT/Fuel Report (IATA Airport Code)
QB	OFF Report (IATA Airport Code)
QC	ON Report (IATA Airport Code)
QD	IN/Fuel Report (IATA Airport Code)
QE	OUT/Fuel/Destination Report (IATA Airport Code)
QF	OFF/Destination Report (IATA Airport Code)
QG	OUT/Return IN Report (IATA Airport Code)
QH	OUT Report (IATA Airport Code)
QK	Landing Report (IATA Airport Code)
QL	Arrival Report (IATA Airport Code)
QM	Arrival Information Report (IATA Airport Code)
QN	Diversion Report (IATA Airport Code)
QP	OUT Report (ICAO Airport Code)
QQ	OFF Report (ICAO Airport Code)
QR	ON Report (ICAO Airport Code)
QS	IN Report (ICAO Airport Code)
QT	OUT/Return IN Report (ICAO Airport Code)

5.2 ARINC 622 Formatted Messages

Label	Description
B1	Request Oceanic Clearance
B2	Oceanic Clearance Readback
B3	Request Departure Clearance
B4	Departure Clearance Readback Downlink
B7	Free Text to ATC
B9	Request ATIS Report
BB	Terminal Weather Information for Pilots
BC	Pushback Clearance Request
BD	Expected Taxi Clearance Request

6 ACARS Operation

The Aircraft Communication Addressing and Reporting System is a digital Datalink system for transmission of short, relatively simple messages between aircraft and ground stations via radio or satellite.

ACARS operation is an option on the Dlink+ w/CPDLC. If the option has not been enabled the menus and functions, detailed in this document, will not be available to the user.

6.1 Start up

To begin using the ACARS system, assuming the system has been configured with the proper service providers, frequency lists, and aircraft identification, it is necessary to enter in some basic information about the flight.

Refer to the **Main – Flight Information Menu** section for a visual representation of the menus and an explanation of the data contained within.

6.1.1 Entering the Flight Number

The flight number is a required data item used as an aid in identifying your aircraft to the various operation and maintenance centers.

The flight number will consist of 1-4 numeric characters.

The flight number may be entered manually or may be collected from available aircraft information broadcasted over the ARINC 429 busses and populated automatically.

6.1.2 Entering Origin and Destination Stations

The origin and destination stations consist of 4 alpha characters. The origin and destinations may be entered manually or may be collected from available aircraft information broadcasted over the ARINC 429 busses and populated automatically.

6.2 Sending a Message

Pressing the ACARS function key will bring you directly to the ACARS Index Menu. (see: Figure 3.12.13-1 ACARS Index Menu). From the menu index follow the prompts to the desired message type. Refer to ACARS Menus for specific details.

6.2.1 Requirements for Sending a Message

In order to facilitate sending an ACARS messages there must exist a link to the ground through a service provider. When there is no established link the Dlink+ w/CPDLC will report “NO COMM” in the advisory area of the display. The COMM Status may be viewed by pressing the READ Function key. This will display the Monitor Menu, showing the COMM Status and the states of various services (VHF, Satcom, and ATN).

6.3 Reading Received Messages

When an ACARS message is received the ACARS annunciator will be lit. At this point pressing the MSG function key will display the Message Log Menu (see ACARS Index – Message Log Menu). Navigate to the particular message to be viewed and press the LSK indicated. Refer to (ACARS Index – Message Log Viewing Menu).

7 CPDLC Operation

7.1 CPDLC Menus

7.1.1 CPDLC – Index Menu

The CPDLC INDEX Menu is the primary interface for CPDLC Operation. From this menu, access is provided to the CM Logon Menu (see Section 7.1.3), the Request Menu (see Section 7.1.5), the Message Log Menu (see Section 7.1.4), the Report Menu (see Section 7.1.13), and the Free Text Menu (see Section 7.1.2). When configuring any of the possible messages on these menus all required fields must be filled in to get a VERIFY Prompt, This VERIFY Prompt will only be displayed when all required fields have been configured. The fields required will vary depending on the message being configured. This is talked about more specifically in the sections that follow for each type of message that can be configured through sub-menus of the CPDLC INDEX Menu.

In addition to providing basic access to other CPDLC Menus, the operator is provided with the option to change the ATN Operational Mode. The 'ATN Mode' can be configured to RTCA DO280B or Link 2000. When configured for RTCA DO280B operation, most of the RTCA DO280B defined message set is available for use. When configured for Link2000 Operational mode, the available message set (both uplink and downlink) is limited to those messages supported in the European Link 2000 environment (see Sections 7.3.1 and 7.3.2).

The ATN Mode may be toggled between Link 2000 and RTCA DO280B by selecting the L1 Line Select Key on the B-Page of the CPDLC INDEX Menu.

PAGE NAVIGATION:

1. ▶ **CPDLC** Function Key
2. ▶ **L1** Line Select Key from the User Menu (See section 3.2)

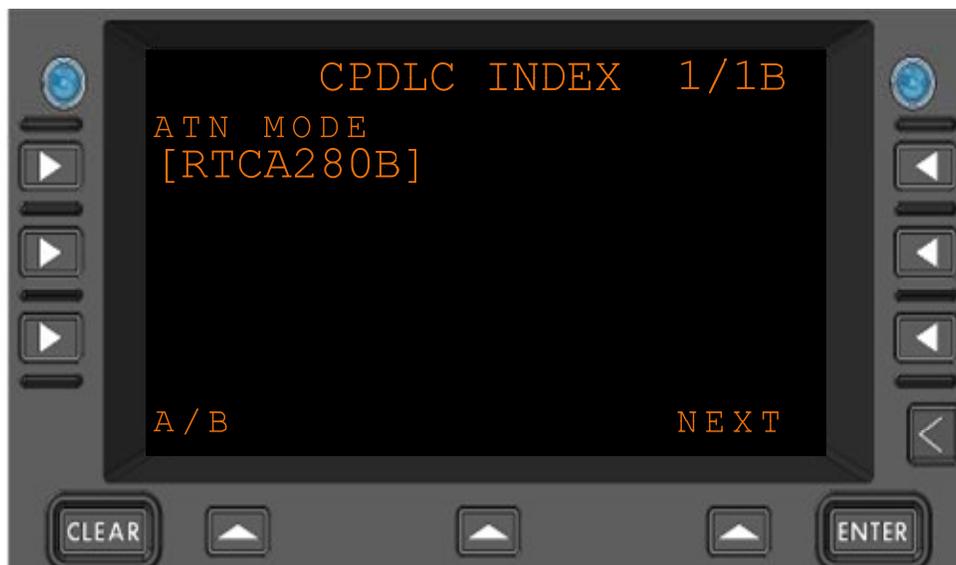


Figure 7.1.1-1 CPDLC Index Menu (Menus A and B)

7.1.2 CPDLC – Free Text Menu

The FREE TEXT Menu allows entry of a free text message that may be down-linked to ATC. Up to 256 characters are permitted in the free text message. Entries are displayed on lines 1-5. When all 5 lines have been used on the first page a second FREE TEXT page becomes available. If all of the space on the second FREE TEXT page has been used, then a third FREE TEXT page becomes available. The third FREE TEXT page will accept just one line of text, limited to 16 characters. These last 16 characters result in a maximum of a 256 character Free Text message being available if each preceding line is completely filled.

PAGE NAVIGATION:

- A. ▶ **R2** Line Select Key from the A-Page of the CPDLC INDEX Menu (See 7.1.1)



Figure 7.1.2-1 CPDLC Free Text Menu (Menus A and B)

FREE TEXT

Format: Each line permits up to 24 characters of free text. Text is entered in the scratch pad and up-selected to the line with dashes in it. Any text line may be overwritten by up selecting the contents of the scratch pad to it.

7.1.3 CPDLC – CM Logon Menu

The CM (Context Management) LOGON Menu provides an interface that may be used to initiate a CM Logon to the End System of an Air Traffic Control (ATC) authority. This action results in the transfer of information regarding various data link capabilities between the ground and the airborne systems and in general makes the ATN Network aware of the aircrafts presence and its ability to support ATN.

A CM Logon is usually a prerequisite to establishing a CPDLC connection with ATC. Usually this would be performed prior to departure. Under some circumstances, the CM connection can be initiated by the ground using a Contact Request when ATC is already aware of an Aircrafts presence and capabilities, but this is not the normal way in which CM is established. For instance, if a manual CM logon has been performed at some point, the ATN Network will have been made aware of the aircraft network address and its data link capabilities. At some future point in time, a second facility may issue a Contact Request to the aircraft from the current facility directing Dlink+ w/CPDLC to contact it. When this happens, the CM function will automatically send a CM-Logon Request to the new station. If a valid CM-Logon response is received from that new station, a CM Logon will exist with the new facility. The only indication of this happening will be the Facility ID changing on the CM Logon page to the Facility ID contained in the Contact Request (see 7.1.3).

This menu may also be used to log off of CM. It also provides access to view the current status when viewing page B of the CM Logon Menu. The status is set to INACTIVE when CM is not logged on and as ACTIVE when CM is logged on.

The Logon Prompt appears in **R2** of the B Menu when all prerequisites to perform a CM Logon have been met. In order for the CM Logon Prompt to appear, the following conditions must be satisfied:

1. There must be an active connection to the ATN Network. This can be checked from the Monitor Menu by pressing the **USER** Function Key then the **R2** Line Select Key and then the **L1** Line Select Key (See section 3.4.1).
2. A valid 'FACILITY ID', 'ORIGIN', 'CALL SIGN, and 'DESTINATION must be entered into the CM Logon Menu.

NOTE: Entry of data into Departure Time and Departure Date fields is optional in a sense. If the above conditions are met, a CM Logon prompt will appear in **R2** of the B Menu even if this information is not present. However, if entry is made into one of these fields, then both the DEPART TIME and DEPART DATE fields must be provided. A CM Logon prompt will not appear if entry is made into one field and not the other.

Besides providing the CM Logon prompt in **R2** and a means to return to the CPDLC Index Menu in **L3**, the B Menu provides status information and the ability to Inhibit CPDLC.

The Current Data Authority is displayed in **L1**. This status defines the active ATC Center that has current responsibility for CPDLC communication with the aircraft. All commands to the aircraft or requests from the aircraft are processed by this data authority. No pilot action is required to obtain the Current Data Authority as this is controlled by the ground.

The Next Data Authority is displayed in **L2**. This is the next ATC Center that will assume responsibility for CPDLC communication with the aircraft after communication has ended with the Current Data Authority. There may not always be a Next Data Authority, but when there is, its existence is controlled by the ground. No pilot action is required in regard to the Next Data Authority with the possible exception of action required when switching between data authorities which is directed by specific CPDLC messages (see Section ?).

The STATUS displayed in **R1**. This is the CM connection status, not the CPDLC connection status. An active CM connection is required for CPDLC use. Without a CM connection access is limited. If there is an active CM connection the status will be set to ACTIVE. Otherwise the status will be INACTIVE.

CPDLC Communication may be inhibited by the Pilot. This option is made available and displayed in **R3**. CPDLC is automatically inhibited until a CM connection has been established. After the CM status changes to ACTIVE in **R1**, CPDLC can be inhibited by selecting **R3**.

When CPDLC is inhibited by selecting **R3**, the CM connection is aborted. If the operator later performs a manual CM Logon, the assumption is made that this is done for the sole intention of establishing CPDLC (since that is the only ATN application available to him at this time). As a result, the action to log onto CM will automatically un-inhibits CPDLC.

If the ground issues a contact request while CPDLC is inhibited, the CM application will honor the contact request and log onto the respective ground station (if it is not a blind contact request, see below). However, in this case, CPDLC will stay inhibited because the operator has not yet provided permission or any indication that he is willing to allow a CPDLC session. If the ground later attempts to send a CPDLC start request, Dlink+ w/CPDLC will reject the start request and provide a message to ATC that the crew has inhibited CPDLC. No pilot action is required for this.

In some cases, the ATN Network may have knowledge that an aircraft is in the network from a previous CM Logon. If the ground sends a contact request following power up, and no CM Station was previously logged onto, this is termed a blind contact, and it will not result in a automatic CM Logon. In this case, the information for the end system which contacted the aircraft will be displayed on the CM Logon page and it is up to the operator to press the Logon prompt in order to perform the CM Logon.

PAGE NAVIGATION:

- A. ▶ **L3** menu key from the CPDLC INDEX Menu (See section 7.1.1)

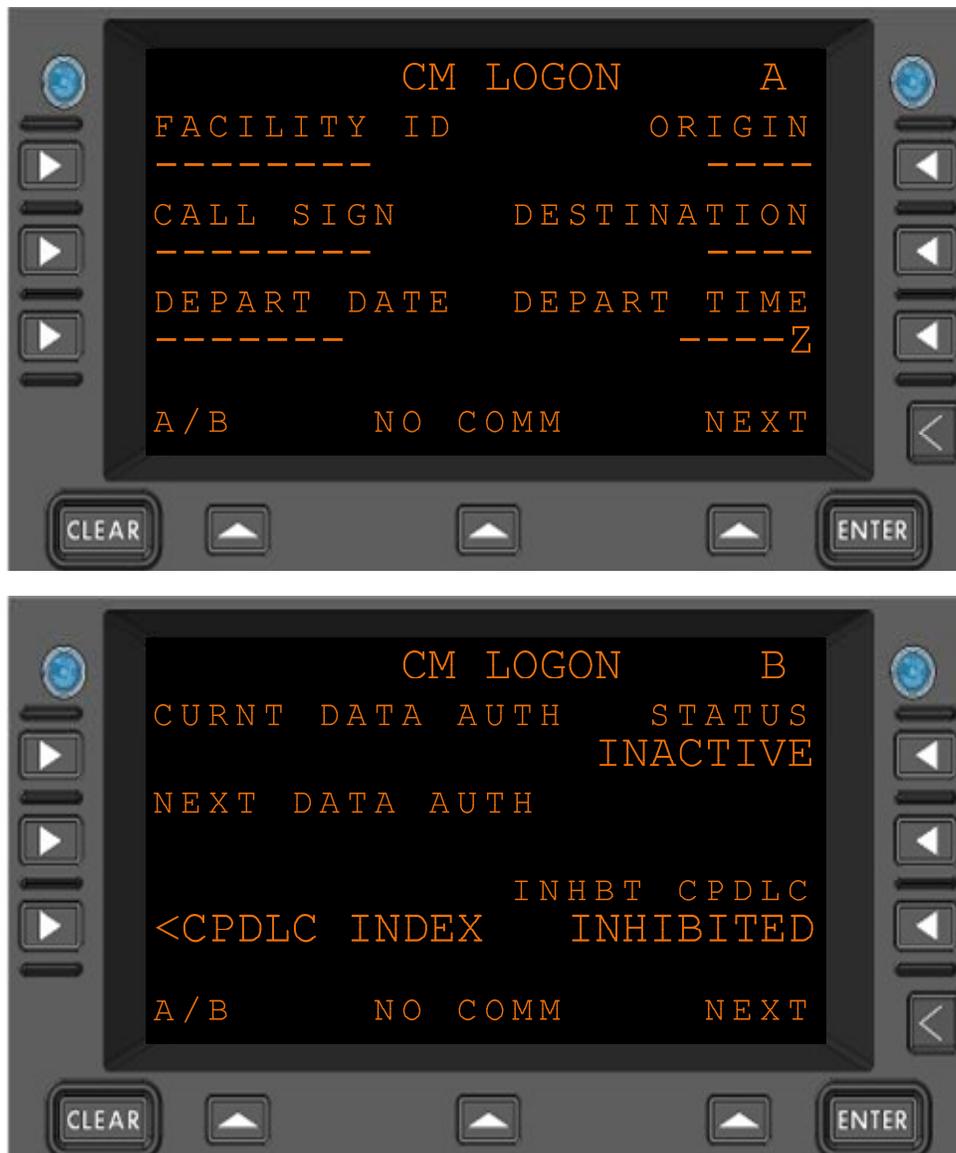


Figure 7.1.3-1 CM LOGON Menu (Menus A and B)

FACILITY ID	Format: 4-8 characters Range: A-Z, 0-9
CALL SIGN	Format: 2-8 characters Range: A-Z, 0-9
DEPART DATE	Format: DDMMYY DD = day of the month MMM = first 3 characters of the month YY = last 2 digits of the year
ORIGIN AND DESTINATION	Format: 4 characters Range: A-Z, 0-9
DEPART TIME	Format: HHMM HH = hours MM = minutes Hours range: 00-23 Minutes range: 00-59

7.1.4 CPDLC – Message Log Menu

The MESSAGE LOG Menu provides access to all the CPDLC message elements sent and received over the ATN network. The MESSAGE LOG will also provide the ability to review the content of all past messages. To open a message in the message log, press the corresponding Line Select Key to the right of the message. In the example below the **R1** Line Select Key would be pressed to open the uplink that is displayed in the message log.

PAGE NAVIGATION:

- A. ► **R1** Line Select Key from the CPDLC INDEX Menu (See section 7.1.1)

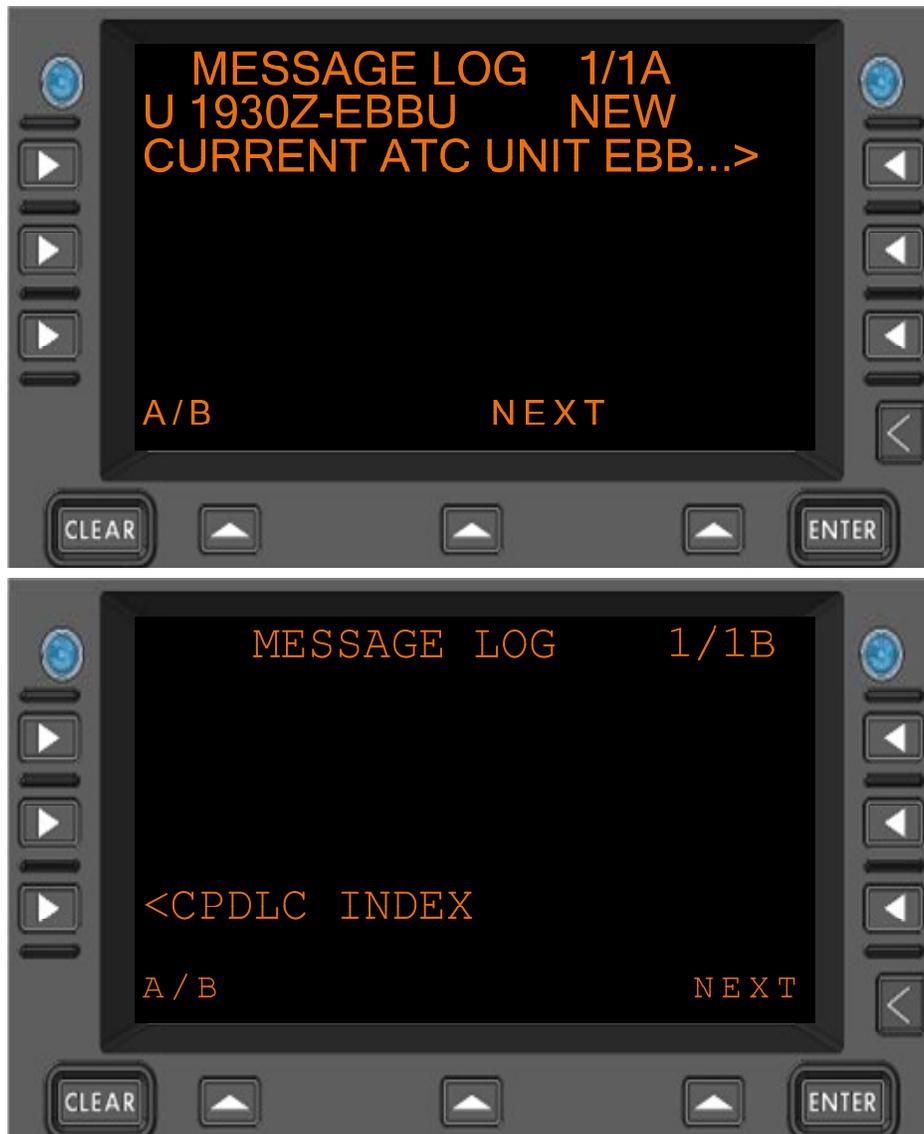


Figure 7.1.4-1 MESSAGE LOG Menu (Menus A and B)

To view the content of the complete message, the right-hand line select keys are used. Selection of a right-hand line select key on which a truncated message is displayed provides access to the MESSAGE REVIEW page, where the entire content of the message is displayed.

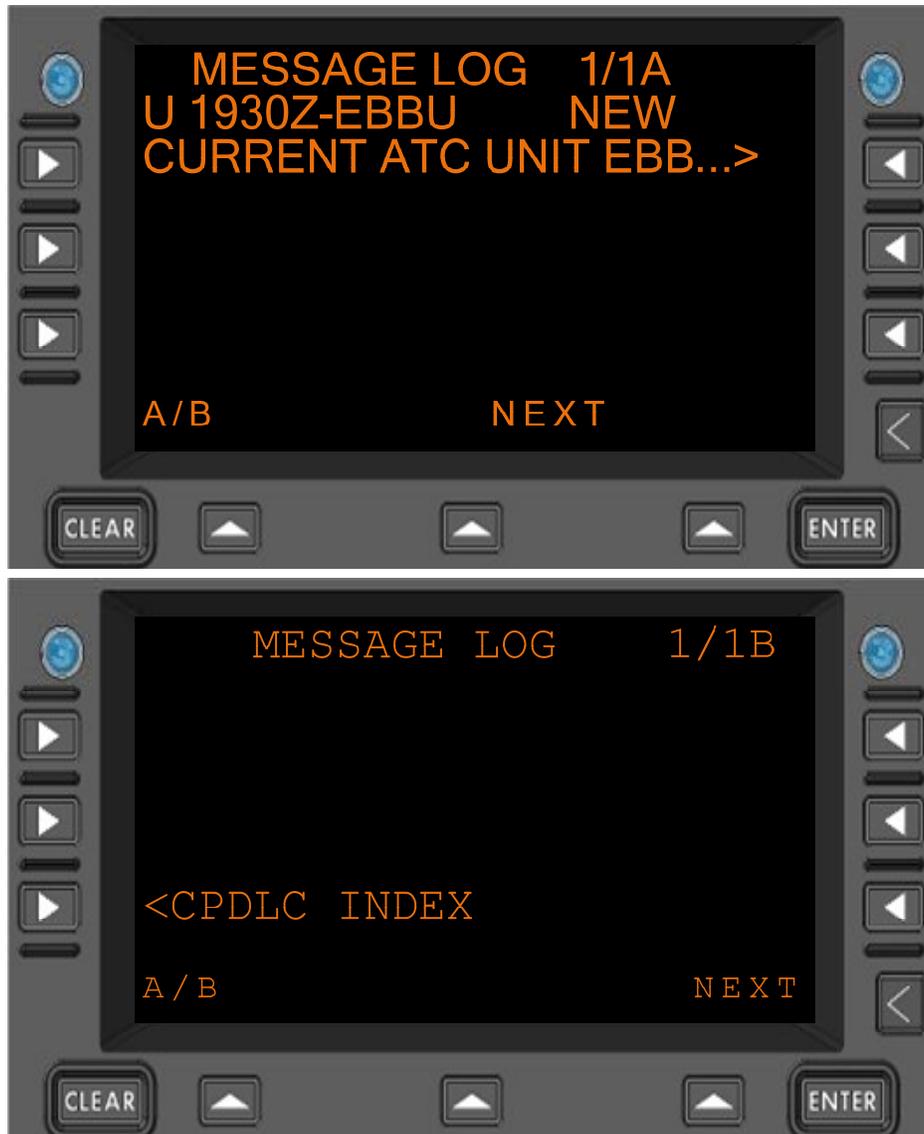


Figure 7.1.4-2 MESSAGE LOG Menu (Menus A and B)

There are two ways that messages in the message log can be cleared. The first happens automatically 10 minutes after the flight is complete and the plane has landed. This clears all messages in the message log. The second is done manually. To delete messages manually the left-hand line select keys are used after pressing the clear function key to enter clear into the scratch pad. Selecting the left-hand line select key that corresponds to a particular message when clear is in the scratch pad will clear the message when the message status is not NEW, OPEN or SENDING. The message status must be ACCEPTED, REJECTED, CLOSED or ABORTED in order to clear a message. This ensures that a message has been reviewed and responded to (if needed) prior to its removal from the log.

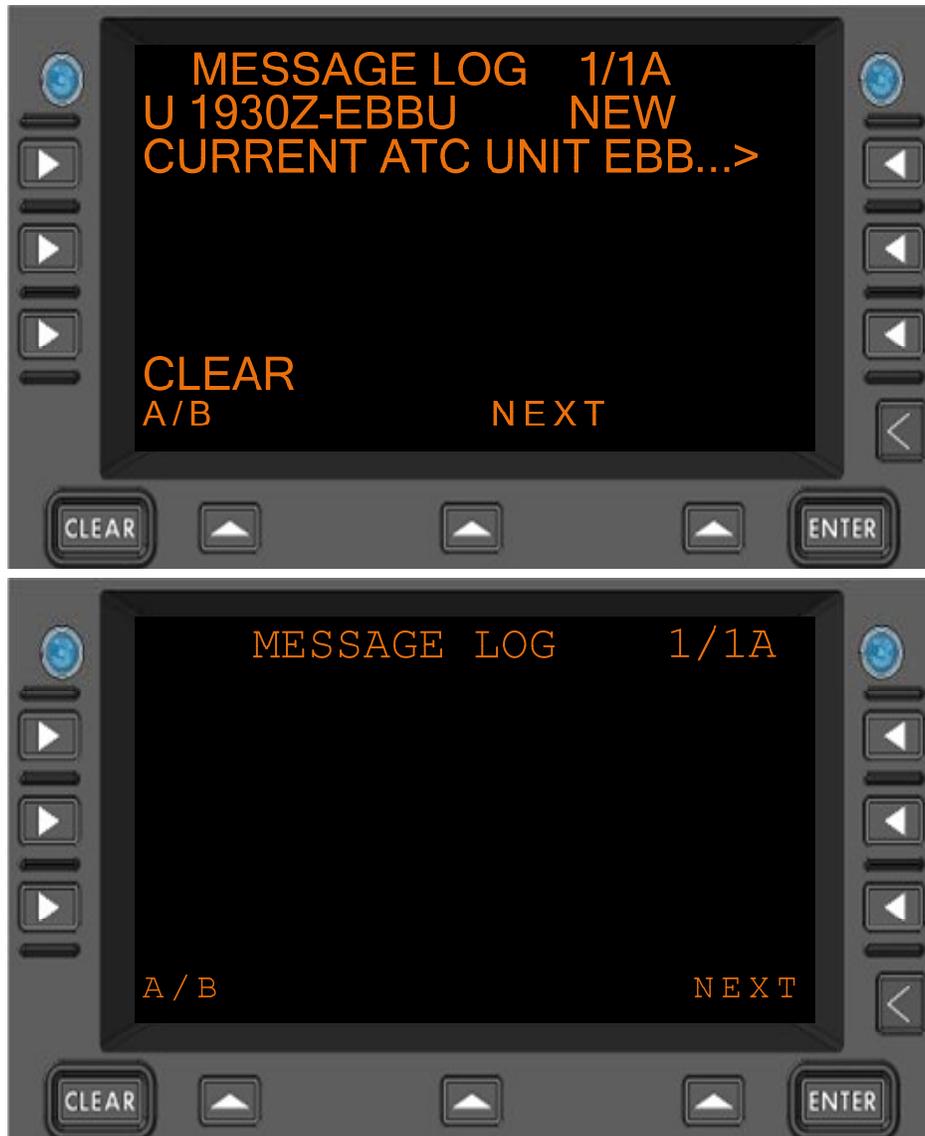


Figure 7.1.4-3 Clearing a Message from the CPDLC Message Log

7.1.5 CPDLC – Request Index Menu

The REQUEST INDEX Menu is the primary interface that is used to make requests of ATC. The content and operational features of this menu change depending on the ATN Operational Mode, as discussed in this Section. For information on ATN Operational Modes, see Sections 7.1.1 and 7.3.

PAGE NAVIGATION:

- A. ► **[L1]** menu key from the CPDLC INDEX menu (See section 7.1.1)

7.1.5.1 REQUEST INDEX Menu, Link 2000 Operational Mode

When configured for Link2000, the REQUEST INDEX Menu supports the following requests:

- Vertical Request
- Speed Request
- Route Mod Request (Route Modification Request)
- WX DEV Request (Weather Deviation Request)



Figure 7.1.5-1 REQUEST INDEX Menu (Menus A and B), LINK 2000

7.1.5.2 REQUEST INDEX Menu, RTCA DO 280 B Operational Mode

The REQUEST INDEX Menu provides the ability to access the Vertical Request Menu (see section 7.1.6), the Lateral Request Menu (see section 7.1.10), The Route Request Menu (see section 7.1.8), the Request Weather Deviation Menu (see section 7.1.9), the When Can We Menu (see section 7.1.11), and Speed Request Menu (see section 7.1.7). Each of these requests can be selected using the corresponding Line Select Keys.

Figure 7.1.5-2 depicts the Request Index Menu as it appears when operating in RTCA DO280B mode.



Figure 7.1.5-2 Request Index (Menu A and B), DO 280B

7.1.6 CPDLC – Vertical Request Menu

The VERTICAL REQUEST Menu provides a means by which the operator may request changes to the current vertical location of the aircraft. The content and operational features of this menu change depending on the ATN Operational Mode, as discussed in this Section. For information on ATN Operational Modes, see Sections 7.1.1 and 7.3.

PAGE NAVIGATION:

- A. ► **L1** Line Select Key from the CPDLC INDEX Menu (See section 7.1.1) then ► **L1** Line Select Key from the REQUEST INDEX Menu (See section 7.1.5)

7.1.6.1 VERTICAL REQUEST Menu, Link 2000 Operational Mode

When configured for LINK 2000 Mode the following Vertical Requests are valid:

- Request Level (REQ LVL must contain a valid level)
- Request Climb To Level (REQ CLB TO must contain a valid level)
- Request Descent To Level (REQ DES TO must contain a valid level)



Figure 7.1.6-1 VERTICAL REQUEST Menu Page 1 (Menus A and B), LINK 2000



Figure 7.1.6-2 VERTICAL REQUEST Menu Page 2 (Menus A and B), LINK 2000

7.1.6.2 RTCA DO 280 B Operational Mode

When configured for RTCA DO 280B Mode the following Vertical Requests are valid:

- Request Level (REQ LVL must contain a valid level)
- Request Block Level (REQ LVL and OR BLOCK TO must contain valid levels)
- Request Cruise Climb To Level (REQ CRUISE CLIMB TO must contain a valid level)
- Request VMC Descent (REQ VMC DESCENT field must be selected by pressing the **L1** line select key)
- Request Climb To Level (REQ CLB TO must contain a valid level)
- Request Descent To Level (REQ DES TO must contain a valid level)
- At Position Request Climb To Level (POS TYPE, AT POSITION, and REQ CLB TO fields must contain valid values)
- At Position Request Descent To Level (POS TYPE, AT POSITION, and REQ DES TO fields must contain valid values)

- At Time Request Climb To Level (OR TIME and REQ CLB TO fields must contain valid values)
- At Time Request Descent to Level (OR TIME and REQ DES TO fields must contain valid values)

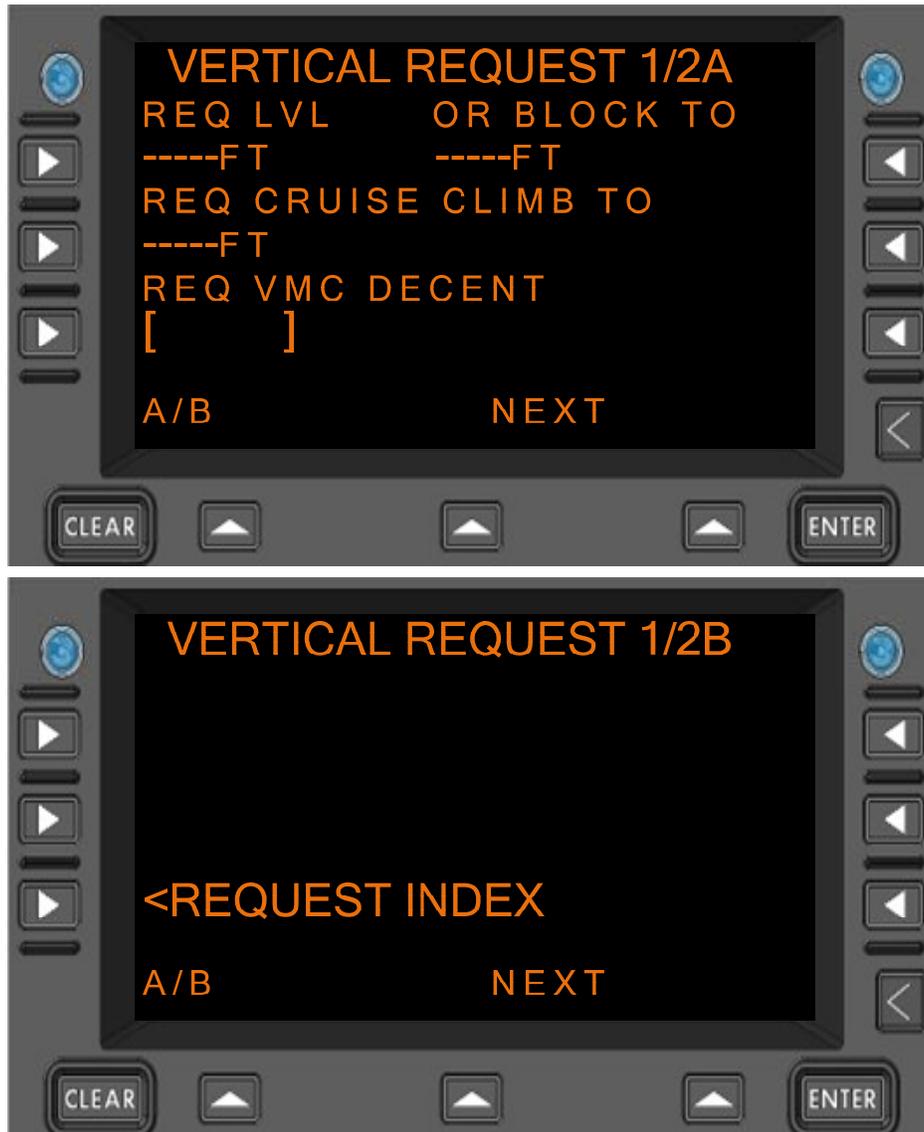


Figure 7.1.6-3 VERTICAL REQUEST Menu Page 1 (Menus A and B), DO 280B

AT POSITION

Format:

1. When associated *Position Type* field is set to NAVAID (Navaid), the following entry is valid:
 - a) Format: AAAA
 - b) Where: "A" is an alpha-numeric entry representing a waypoint,
navaids or airport identifier
 - c) Range: 0-9, A-Z (1- 4 Characters)

2. When associated *Position Type* field is set to FIX (*FixName*), the following entries are valid:
 - a) Format: AAAAA
 - b) Where: "A" is an alpha-numeric entry representing a waypoint,
navaids or airport identifier.
 - c) Range: 0-9, A-Z (1-5 Characters)

3. When associated *Position Type* field is set to AIRPORT (airport), the following entry is valid:
 - a) Format: AAAA
 - b) Where: "A" is an alpha-numeric entry representing a waypoint,
navaids or airport identifier
 - c) Range: 0-9, A-Z (4 characters)

4. When associated *Position Type* field is set to LAT/LON (*latitudeLongitude*), the following entries are valid:
 - a) Format: ADDMMSS/BDDMMSS
 - b) Where: "A" is either N or S
"B" is either E or W
"DD" is a numerical entry representing geographical latitude
"DDD" is a numerical entry representing geographical longitude
"MM" is a numerical entry representing geographical minutes.
"SS" is a numerical entry representing geographical seconds.
 - c) Range: "DD" is 00-89
"DDD" is 000-179
"MM" is 0-59
"SS" is 0-59

For an example of the vertical request page with the 'REQ LVL' Line Field filled in and the 'VERIFY' prompt shown on Vertical Request menu 1B-Page see Figure 7.1.6-5.



Figure 7.1.6-5 VERTICAL REQUEST Menu, Verify Prompt Displayed

7.1.7 CPDLC – Speed Request Menu

The SPEED REQUEST Menu provides a means by which the operator may request a change of speed. The content of this menu changes depending on the ATN Operational Mode Selected. This Section discusses this menu for both RTCA DO 280 and LINK 2000 Operational Modes. For information on ATN Operational Modes, see Sections 7.1.1 and 7.3.

PAGE NAVIGATION:

- A. ► **[L1]** Line Select Key from the CPDLC INDEX menu (See section 7.1.1) then ► **[R1]** Line Select Key from the REQUEST INDEX menu (See section 7.1.5)

7.1.7.1 SPEED REQUEST Menu, Link 2000 Operational Mode

When configured for LINK 2000 Mode the following Speed Request is valid:

- Request Speed (SPEED TYPE and REQUEST SPD fields must contain valid values)

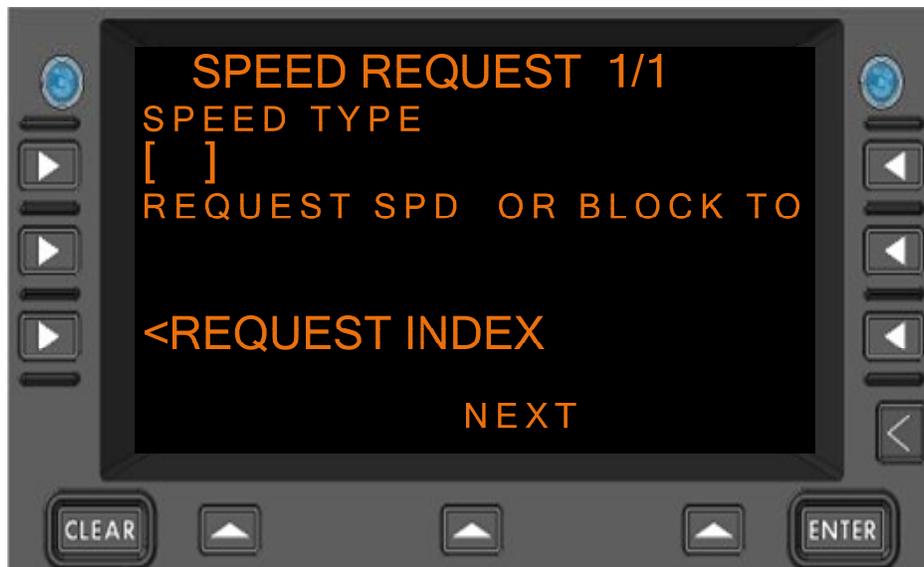


Figure 7.1.7-1 SPEED REQUEST Menu, LINK 2000

7.1.7.2 SPEED REQUEST Menu, RTCA DO 280 B Operational Mode

When configured for RTCA DO 280B Mode the following Speed Requests are valid:

- Request Speed (SPEED TYPE and REQUEST SPD fields must contain valid values)
- Request Speed Range (SPEED TYPE, REQUEST SPD, and OR BLOCK TO fields must contain valid values)

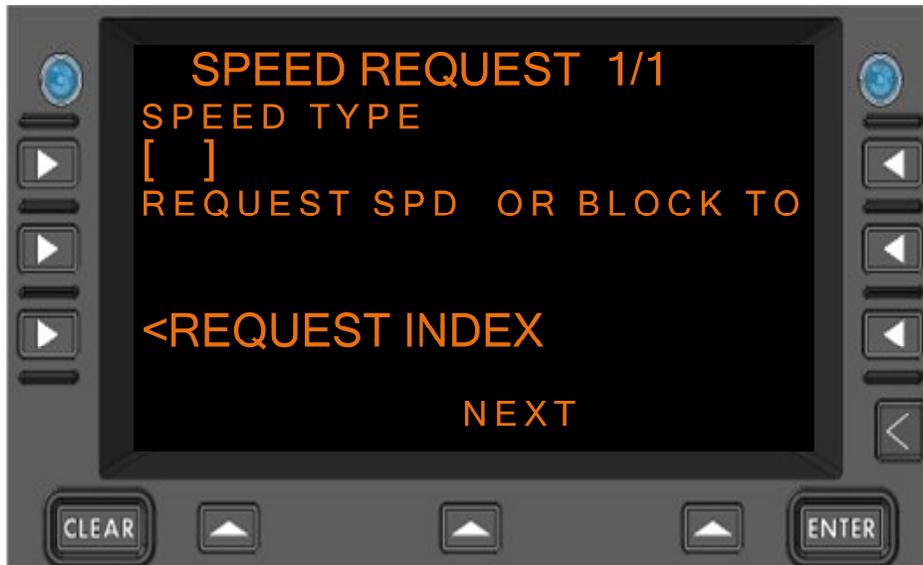


Figure 7.1.7-2 SPEED REQUEST Menu, DO 280B

REQUEST SPD

English Format: NNN where “N” is a numerical entry in the range of 0-400.

Metric Format: NNN where “N” is a numerical entry in the range of 0-800.

BLOCK TO

Format: NNNNN where “N” is a numerical entry in the range of -600-70000.

An example of the speed request page with the ‘REQUEST SPD’ Line Field filled in and the ‘VERIFY’ prompt displayed is in **Figure 7.1.7-3**

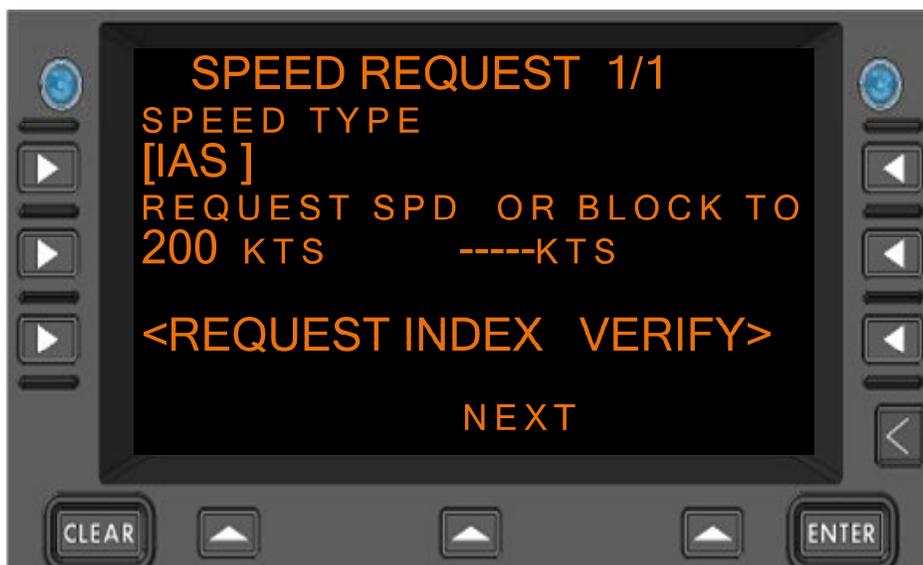


Figure 7.1.7-3 SPEED REQUEST Menu, Verify Prompt Display

7.1.8 CPDLC – Route Mod Request Menu

The ROUTE MOD REQUEST Menu provides a means by which the operator may request a route modification. The content and operational features of this menu change depending on the ATN Operational Mode, as discussed in this Section. For information on ATN Operational Modes, see Sections 7.1.1 and 7.3.

PAGE NAVIGATION:

- A. ▶ **L1** Line Select Key from the CPDLC INDEX menu (See section 7.1.1) then ▶ **R2** Line Select Key from the REQUEST INDEX (See section 7.1.5)

7.1.8.1 ROUTE MOD REQUEST Menu, Link 2000 Operational Mode

When configured for LINK 2000 Mode the following Route Modification Request is valid:

- Request Direct To Position (POS TYPE and REQ DIRECT TO POSITION fields must contain valid values)



Figure 7.1.8-1 ROUTE MOD REQUEST Menu Page 1 (Menus A and B), LINK 2000



Figure 7.1.8-2 ROUTE MOD REQUEST Menu Page 2 (Menus A and B), LINK 2000

7.1.8.2 ROUTE MOD REQUEST Menu, RTCA DO 280 B Operational Mode

When configured for RTCA DO 280B Mode the following Route Modification Requests are valid:

- Request Direct To Position (POS TYPE and REQ DIRECT TO POSITION fields must contain valid values)
- Request Procedure (PROC TYPE, TRANSITION, and PROC IDENT fields must contain valid values)
- Request Clearance (REQ CLEARANCE TYPE field must be selected by pressing the L3 line select key on page 1/2A)
- Request Heading (REQ HDG field must contain a valid heading)
- Request Track (OR GND TRK must contain a valid track)
- Request To Maintain Own Separation and VMC (OWN SEP AND VMC field must be selected by pressing the L2 line select key on page 1/2B)



Figure 7.1.8-3 ROUTE MOD REQUEST Menu Page 1 (Menus A and B), DO 280B



Figure 7.1.8-4 ROUTE MOD REQUEST Menu Page 1 (Menus A and B), DO 280B

DIRECT TO POSITION Format:

1. When associated *Position Type* field is set to NAVAID, the following entry is valid:
 - a. Format: AAAA
 - b. Range: 0-9, A-Z (1- 4 Characters)
2. When associated *Position Type* field is set to FIX (*FixName*), the following entries are valid:
 - Format: AAAAA
 - Range: 0-9, A-Z (1-5 Characters)
3. When associated *Position Type* field is set to AIRPORT (airport), the following entry is valid:
 - a. Format: AAAA
 - b. Range: 0-9, A-Z (4 characters)
4. When associated *Position Type* field is set to LAT/LON (*latitudeLongitude*),

the following entries are valid:

- a. Format: ADDMMSS/BDDMMSS
 - b. Where: "A" is either N or S
"B" is either E or W
"DD" is a numerical entry representing geographical latitude
"DDD" is a numerical entry representing geographical longitude
"MM" is a numerical entry representing geographical minutes.
"SS" is a numerical entry representing geographical seconds.
 - c. Range: "DD" is 00-89
"DDD" is 000-179
"MM" is 0-59
"SS" is 0-59
5. When associated *Position Type* field is set to PBD-NAV (*PlaceBearingDistance* using NAVAID), the following entries are valid:
- a) Format: AAAA/XXXT/YYYY (Where "AAAA" is validated using the "NAVAID" entry requirements in this section).
 - b) Where: "A" is an alpha-numeric entry representing a navaid.
"X" is a numerical entry representing degrees
"T" is an optional entry to indicate the bearing is references to True North
"Y" is a numerical entry representing distance
 - c) Range: "A" is 0-9, A-Z
"X" is 000 - 360
"Y" is 1-250 (This restriction could be user defined)
6. When associated *Position Type* field is set to PBD-FIX (*PlaceBearingDistance* using FIX), the following entries are valid:
- a) Format: AAAA/XXXT/YYYY (Where "AAAA" is validated using the "FIX" entry requirements in this section).
 - b) Where: "A" is an alpha-numeric entry representing a fix.
"X" is a numerical entry representing degrees
"T" is an optional entry to indicate the bearing is references to True North
"Y" is a numerical entry representing distance
 - c) Range: "A" is 0-9, A-Z
"X" is 000 - 360
"Y" is 1-250 (This restriction could be user defined)

**REQ HDG
OR
GND TRK**

Format: NNNT Where “N” is a numerical entry

“T” indicates the entry is referenced to True North and is optional.

Range: 1-360 (3 numerical characters, with an optional 4th for the letter “T”)

An example of the Route Mod Request page (LINK 2000) with the ‘POS TYPE’ and ‘REQ DIRECT TO POSITION’ fields entered and the ‘VERIFY’ prompt shown on Route Mod menu 1B-Page is shown in **Figure 7.1.8-5**.



Figure 7.1.8-5 ROUTE MOD REQUEST Menu, Verify Prompt Displayed

7.1.9 CPDLC – Request Weather Deviation Menu

The REQUEST WX DEV (Request Weather Deviation) Menu provides a means by which the operator may request a Route Modification due to weather. The content and operational features of this menu are identical, regardless of the ATN Operational Mode.

When configured for LINK 2000 or RTCA DO 280B Mode the following Weather Deviation Request is valid:

- Request Weather Deviation from Route (OFFSET DIST and DIRECTION fields must contain valid values)

An example of a blank REQUEST WX DEV Menu (no entries made) is shown in Figure 7.1.9-1

PAGE NAVIGATION:

- A. ► **L1** Line Select Key from the CPDLC INDEX Menu (See section 7.1.1) then ► **R3** Line Select Key from the REQUEST INDEX Menu (See section 7.1.5)



Figure 7.1.9-1 WEATHER DEVIATION REQUEST Menu

OFFSET DIST

Format:

- When configured for English standard units, the following entry is valid (distanceSpecifiedNm):
 - Format: NNN
 - Where: "N" is a numerical entry
 - Range: 1-250
 - Units: NM
- When configured for Metric units, the following entry is valid (distanceSpecifiedKm):
 - Format: NNN
 - Where: "N" is a numerical entry
 - Range: 1-500
 - Units: KM

An example of the WEATHER DEVIATION REQUEST Menu with the 'OFFSET DIST' and 'DIRECTION' fields filled in and the 'VERIFY' prompt is shown in Figure 7.1.9-2



Figure 7.1.9-2 WEATHER DEVIATION REQUEST, Verify Prompt Displayed

7.1.10 CPDLC – Lateral Offset Menu

The LATERAL OFFSET Menu is only available when in DO 280B ATN Operational mode. This menu provides a means by which the operator may request a lateral offset.

When configured for RTCA DO 280B Mode the following Lateral Offset Requests are valid:

- Request Lateral Offset from Route (OFFSET DIST and DIRECTION fields must contain valid values)
- At Position Request Lateral Offset from Route (POS TYPE, AT POSITION, OFFSET DIST, and DIRECTION fields must contain valid values)
- At Time Request Lateral Offset from Route (OR AT TIME, OFFSET DIST, and DIRECTION fields must contain valid values)

An example of the blank LATERAL OFFSET Menu (no entries made) is shown in Figure 7.1.10-1

PAGE NAVIGATION:

- A. ▶ **L1** Line Select Key from the CPDLC INDEX Menu (See section 7.1.1) then ▶ **L2** Line Select Key from the REQUEST INDEX menu (See section 7.1.5)

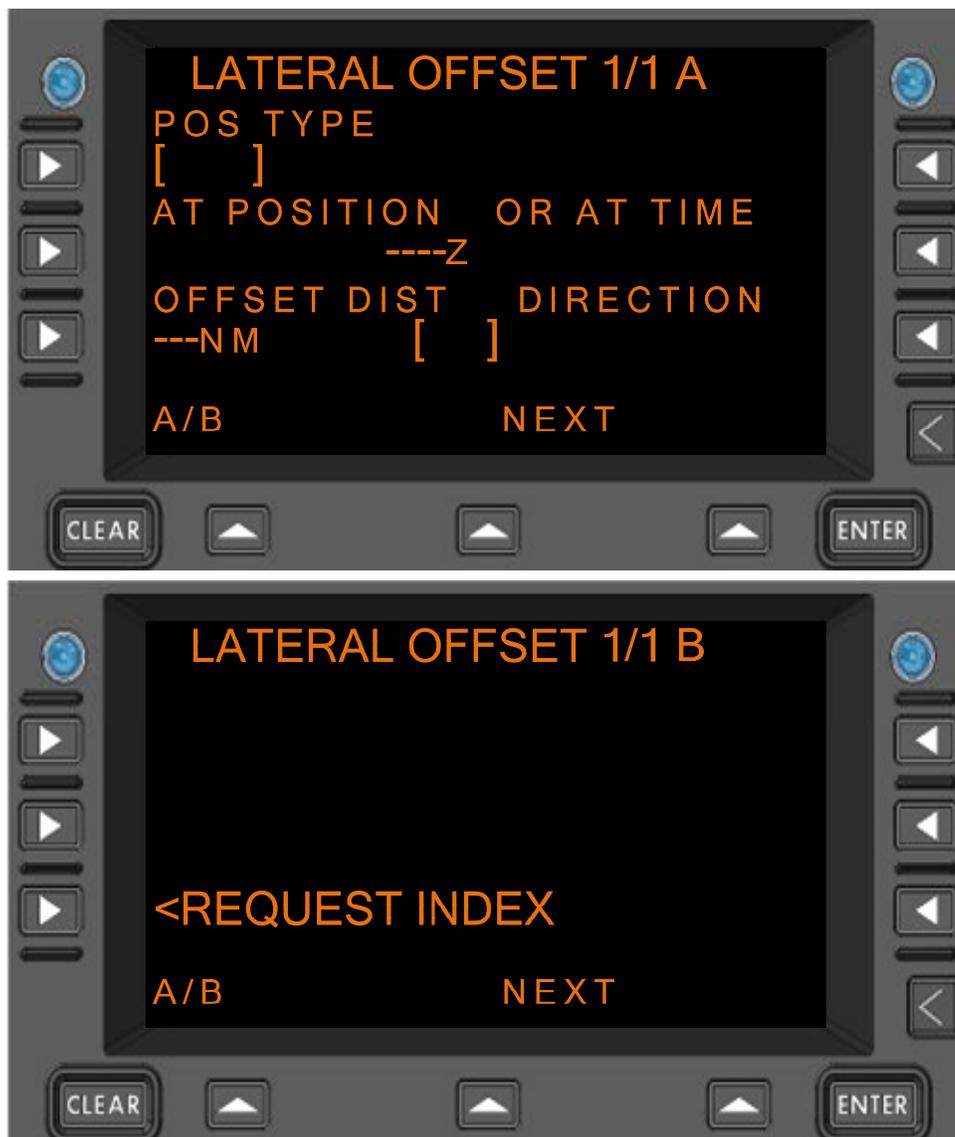


Figure 7.1.10-1 LATERAL OFFSET REQUEST Menu

OFFSET DIST**Format:**

1. When configured for English standard units, the following entry is valid (distanceSpecifiedNm):
 - a) Format: NNN
 - b) Where: "N" is a numerical entry
 - c) Range: 1-250
 - d) Units: NM

2. When configured for Metric units, the following entry is valid (distanceSpecifiedKm):
 - e) Format: NNN
 - f) Where: "N" is a numerical entry
 - g) Range: 1-500
 - h) Units: KM

AT POSITION**Format:**

1. When associated *Position Type* field is set to NAVAID (Navaid), the following entry is valid:
 - c. Format: AAAA
 - d. Range: 0-9, A-Z (1- 4 Characters)

2. When associated *Position Type* field is set to FIX (*FixName*), the following entries are valid:
 - Format: AAAAA
 - Range: 0-9, A-Z (1-5 Characters)

3. When associated *Position Type* field is set to AIRPORT (airport), the following entry is valid:
 - c. Format: AAAA
 - d. Range: 0-9, A-Z (4 characters)

4. When associated *Position Type* field is set to LAT/LON (*latitudeLongitude*), the following entries are valid:
 - d. Format: ADDMMSS/BDDMMSS
 - e. Where: "A" is either N or S
"B" is either E or W
"DD" is a numerical entry representing geographical latitude
"DDD" is a numerical entry representing geographical longitude
"MM" is a numerical entry representing geographical minutes.
"SS" is a numerical entry representing geographical seconds.
 - f. Range: "DD" is 00-89
"DDD" is 000-179

“MM” is 0-59

“SS” is 0-59

5. When associated *Position Type* field is set to PBD-NAV (*PlaceBearingDistance* using NAVAID), the following entries are valid:
- d) Format: AAAA/XXXT/YYYY (Where “AAAA” is validated using the “NAVAID” entry requirements in this section).
 - e) Where:
 - “A” is an alpha-numeric entry representing a navaid.
 - “X” is a numerical entry representing degrees
 - “T” is an optional entry to indicate the bearing is references to True North
 - “Y” is a numerical entry representing distance
 - f) Range:
 - “A” is 0-9, A-Z
 - “X” is 000 - 360
 - “Y” is 1-250 (This restriction could be user defined)
6. When associated *Position Type* field is set to PBD-FIX (*PlaceBearingDistance* using FIX), the following entries are valid:
- d) Format: AAAAA/XXXT/YYYY (Where “AAAAA” is validated using the “FIX” entry requirements in this section).
 - e) Where:
 - “A” is an alpha-numeric entry representing a fix.
 - “X” is a numerical entry representing degrees
 - “T” is an optional entry to indicate the bearing is references to True North
 - “Y” is a numerical entry representing distance
 - f) Range:
 - “A” is 0-9, A-Z
 - “X” is 000 - 360
 - “Y” is 1-250 (This restriction could be user defined)

AT TIME

Format: HHMM

HH = hours

MM = minutes

Hours range: 00-23

Minutes range: 00-59

An example of the Lateral Offset Menu with the ‘POS TYPE’, ‘AT POSITION’, ‘OFFSET DIST’, and ‘DIRECTION’ fields filled in and the ‘VERIFY’ prompt is shown in Figure 7.1.10-2.



Figure 7.1.10-2 LATERAL OFFSET REQUEST Menu, Verify Prompt Displayed

7.1.11 CPDLC – When Can We Menu

The WHEN CAN WE Menu is only available when in DO 280B ATN Operational mode (see Section 7.1.1). This menu provides a means by which the operator may request when it is possible to adjust the current speed, vertical location, or lateral location of the aircraft.

When configured for RTCA DO 280B Mode the following When Can We Requests are valid:

- When Can We Expect Speed (SPEED TYPE and SPEED fields must contain valid values)
- When Can We Expect Speed Range (SPEED TYPE, SPEED, and OR BLOCK TO fields must contain valid values)
- When Can We Expect Back On Route (BACK ON RTE field must be selected by pressing the **L1** line select key on page 1/2B)
- When Can We Expect Lower Level (LOWER LEVEL field must be selected by pressing the **L3** line select key on page 1/2A)
- When Can We Expect Higher Level (HIGHER LEVEL field must be selected by pressing the **R3** line select key on page 1/2A)
- When Can We Expect Cruise Climb to Level (CRUISE CLIMB TO field must contain a valid level)
- When Can We Expect Climb to Level (CLIMB TO field must contain a valid level)
- When Can We Expect Descent to Level (DESCENT TO field must contain a valid level)

An example of the blank When Can We Menu (no entries made) is shown in Figure 7.1.11-2

PAGE NAVIGATION:

- A. ► **L1** Line Select Key from the CPDLC INDEX Menu (See section 7.1.1) then ► **L3** Line Select Key from the REQUEST INDEX Menu (See section 7.1.5)



Figure 7.1.11-1 WHEN CAN WE REQUEST Menu Page 1 (Menus A and B)

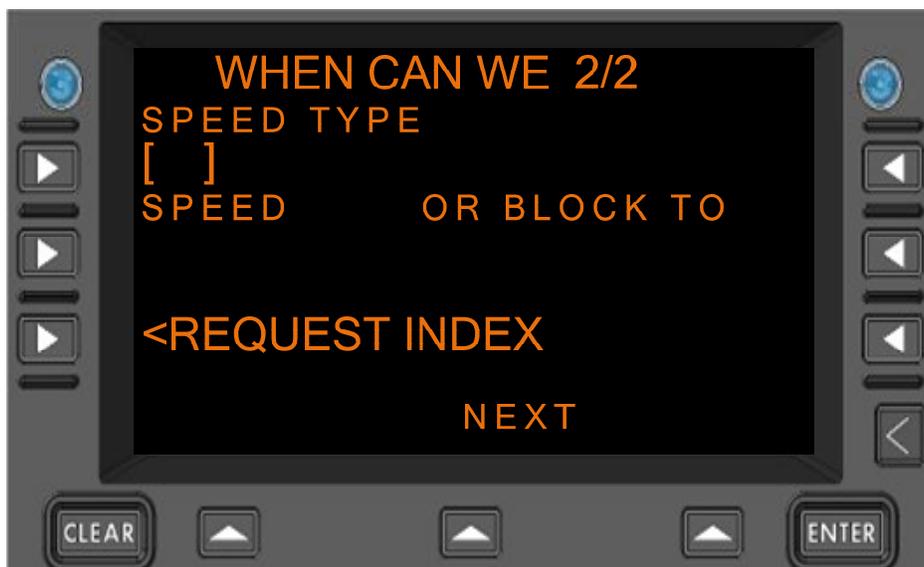


Figure 7.1.11-2 WHEN CAN WE REQUEST Menu Page 2

DECENT TO**CRUISE CLIMB TO****CLIMB TO****Format:**

1. When configured for English-standard units, the following entry is valid (*LevelFeet*):
 - a) Format: NNNNN
 - b) Where: "N" is a numerical entry
 - c) Range: -600 – 70000 (1 – 5 characters)
 - d) Units: FT

2. When configured for English-standard units, the following entry is valid (*LevelFlightLevel*):
 - a) Format: FLNNN
 - b) Where: "N" is a numerical entry
 - c) Range: 030 – 700 (5 characters including "FL")
 - d) Units: N/A

3. When configured for Metric units, the following entry is valid (*LevelMeters*):
 - a) Format: NNNNN
 - b) Where: "N" is a numerical entry
 - c) Range: -30 – 25000 (1 – 5 characters)
 - d) Units: M

4. When configured for Metric units, the following entry is valid (*LevelFlightLevelMeters*):
 - a) Format: FLNNN
 - b) Where: "N" is a numerical entry
 - c) Range: 10 – 250 (5 characters, including "FL")
 - d) Units: M

An example of the When Can We request page with the 'BACK ON RTE' field filled in and the 'VERIFY' prompt is shown in **Figure 7.1.11-3**.

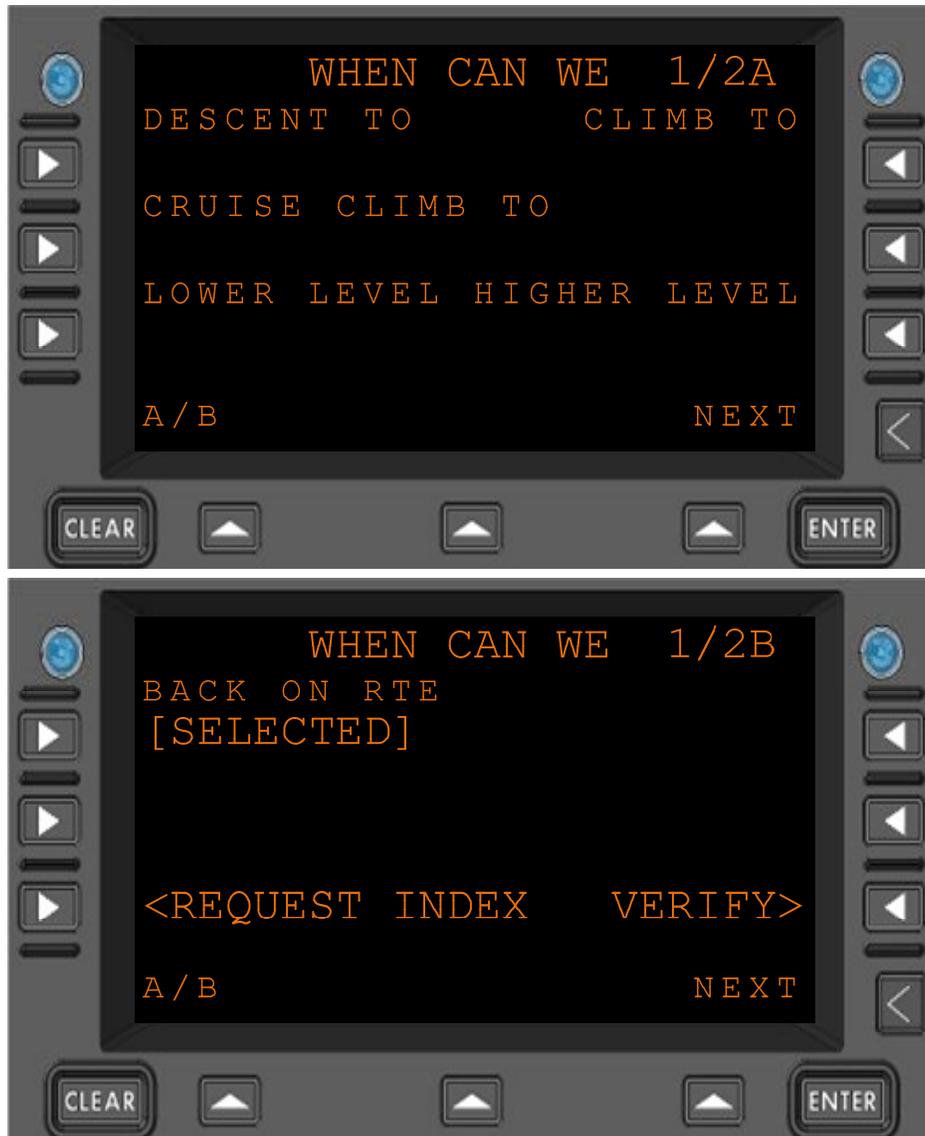


Figure 7.1.11-3 WHEN CAN WE REQUEST Menu, Verify Prompt Displayed

7.1.12 CPDLC – Voice Request Menu

The VOICE REQUEST Menu is only available when in DO 280B ATN Operational mode (see Section 7.1.1). This menu provides a means by which the operator may request voice contact.

When configured for RTCA DO 280B Mode the following Voice Requests are valid:

- Request Voice Contact (VOICE CONTACT field must be selected by pressing the **L1** line select key)
- Request Voice Contact on Frequency (FREQ_TYPE and FREQUENCY must contain valid values)

An example of the blank Voice Request Menu (no entries made) is in Figure 7.1.12-1

PAGE NAVIGATION:

- A. ► **L1** Line Select Key from the CPDLC INDEX Menu (See section 7.1.1) ► **L1** Function Key from the REQUEST INDEX Menu (See section 7.1.5) ► **R1** Line Select Key from the REQUEST INDEX page B Menu (See section 7.1.5)



Figure 7.1.12-1 VOICE REQUEST Menu

FREQUENCY

Format:

1. If the *Frequency Type* is set to 0 (HF):
 - a) Format: NNNNN
 - b) Where: "N" is a numerical entry.
 - c) Range: 2850 – 28000
 - d) Units: kHz
2. If the *Frequency Type* is set to 1 (VHF):
 - a) Format: NNN.NNN
 - b) Where: "N" is a numerical entry.
 - c) Range: 118.00-136.990
 - d) Units: MHz
3. If the *Frequency Type* is set to 2 (UHF):

- a) Format: NNN.NNN
 - b) Where: "N" is a numerical entry.
 - c) Range: 225.000 - 399.975
 - d) Units: MHz
4. If the *Frequency Type* is set to 3 (SAT):
 - a) Format: NNNNNNNNNNNN
 - b) Where: "N" is a numerical entry.
 - c) Range: Numerical string representing a 12-digit telephone number

An example of the Voice request page with the 'FREQ TYPE' and 'FREQUENCY' fields filled in and the 'VERIFY' prompt is shown in **Figure 7.1.12-2**



Figure 7.1.12-2 VOICE REQUEST Menu, Verify Prompt Displayed

7.1.13 CPDLC – Report Index Menu

The REPORT INDEX Menu provides access to the CPDLC Report Menus. The content and operational features of this menu change depending on the ATN Operational Mode, as discussed in this Section. For information on ATN Operational Modes, see Sections 7.1.1 and 7.3.

PAGE NAVIGATION:

- A. ► **L2** menu key from the CPDLC INDEX menu (See section 7.1.1)

7.1.13.1 Report Index Menu, Link 2000 Operational Menu

When in LINK 2000 Mode the REPORT INDEX Menu is limited to the following reports:

- HDG/ALT (Heading/Altitude)
- MONITOR

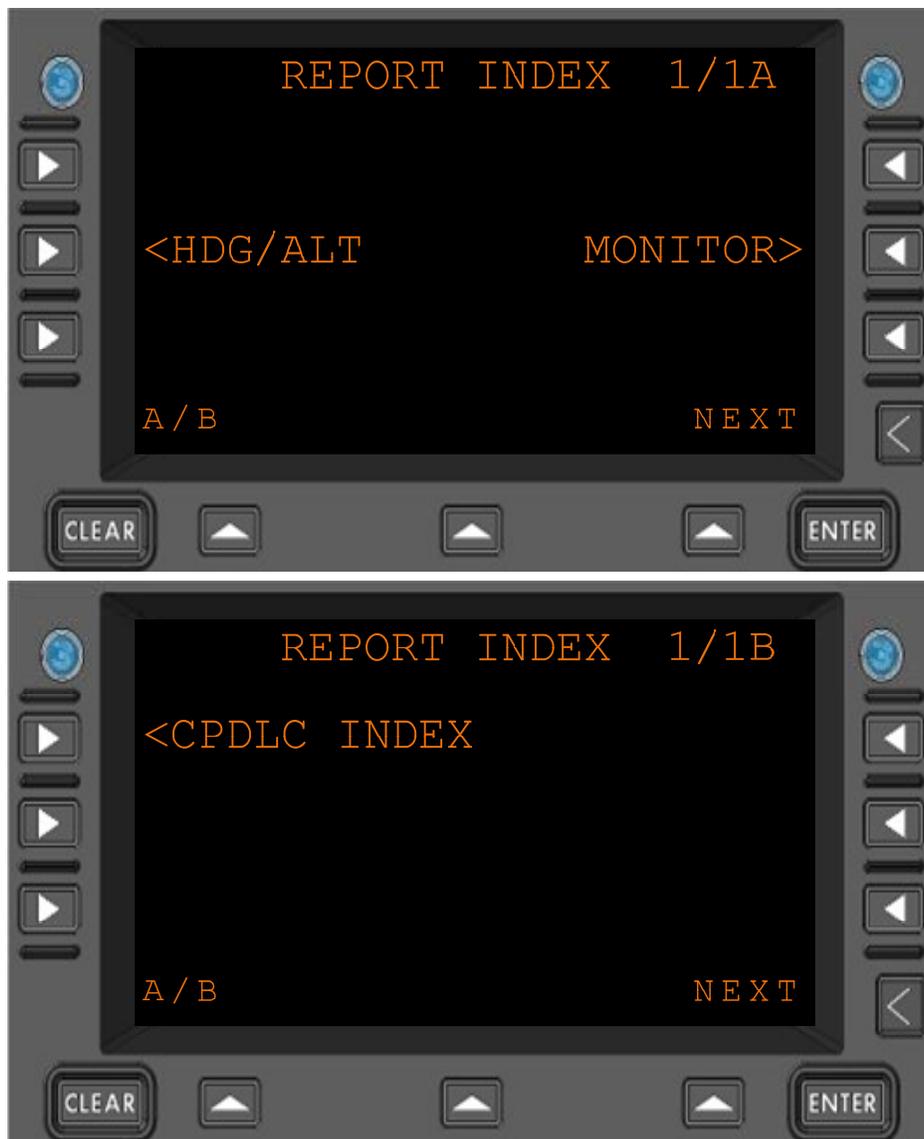


Figure 7.1.13-1 REPORT INDEX Menu (Menus A and B), LINK 2000

7.1.13.2 Report Index Menu, RTCA DO 280 Operational Mode

The REPORT Menu provides the ability to access the Position Report Menu (see section 7.1.16), Speed Report Menu (see section 7.1.17), Heading/Altitude Report Menu (see section 7.1.14), Monitoring Report Menu (see section 7.1.15), and Notification Report Menu (see section 7.1.18). Each of these menus can be selected using the corresponding Line Select Keys.

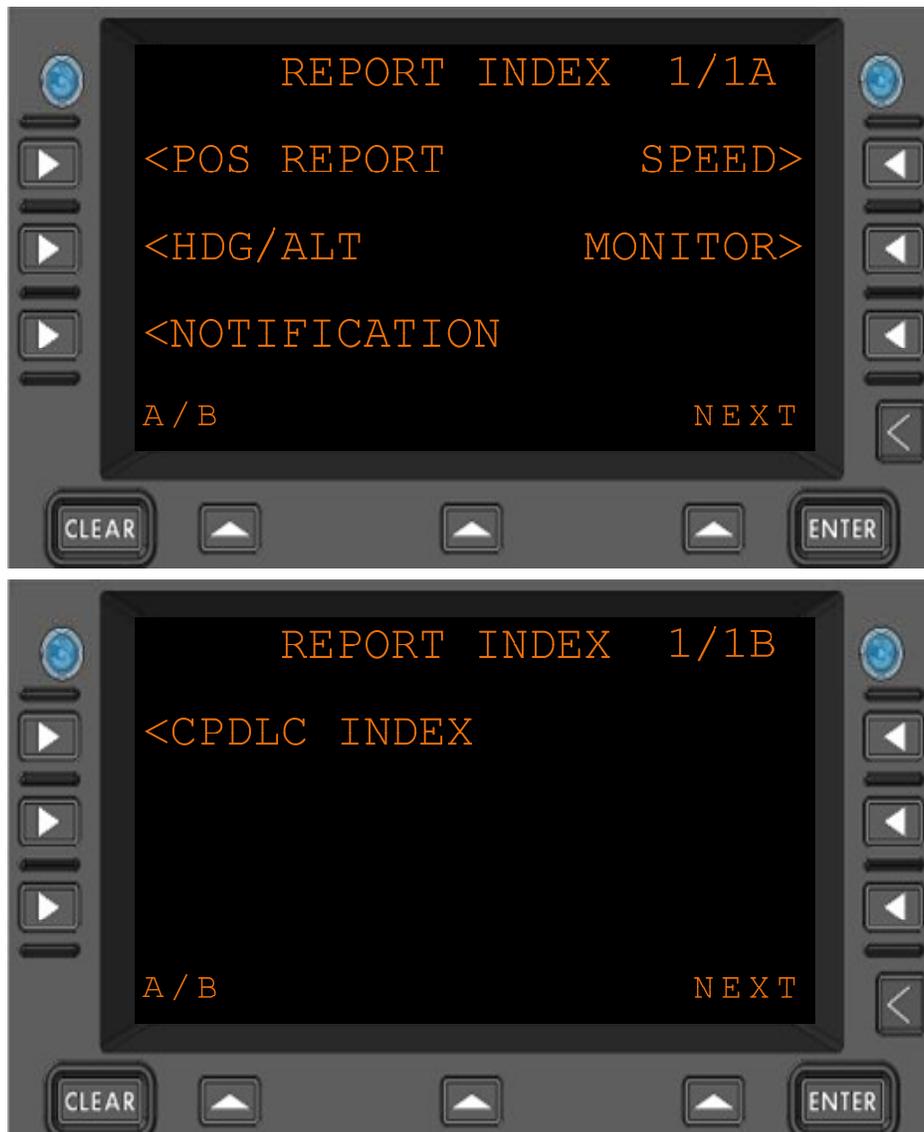


Figure 7.1.13-2 REPORT INDEX Menu (Menus A and B), DO 280B

7.1.14 CPDLC – Heading/Altitude Report Menu

The Heading/Altitude Report Menu provides a means by which the operator may report changes to the current vertical location of the aircraft as well as changes to the aircraft heading or track. The content and operational features of this menu change depending on the ATN Operational Mode, as discussed in this Section. For information on ATN Operational Modes, see Sections 7.1.1 and 7.3.

PAGE NAVIGATION:

- A. ► **L2** from the REPORT INDEX Menu (see Section 7.1.1)

7.1.14.1 HEADING/ALTITUDE Report Menu, Link 2000 Operational Mode

When configured for LINK 2000 Mode the following Heading/Altitude Reports are valid:

- Present Level (PRESENT LEVEL field must contain a valid level)
- Preferred Level (PRFRD LEVEL field must contain a valid level)

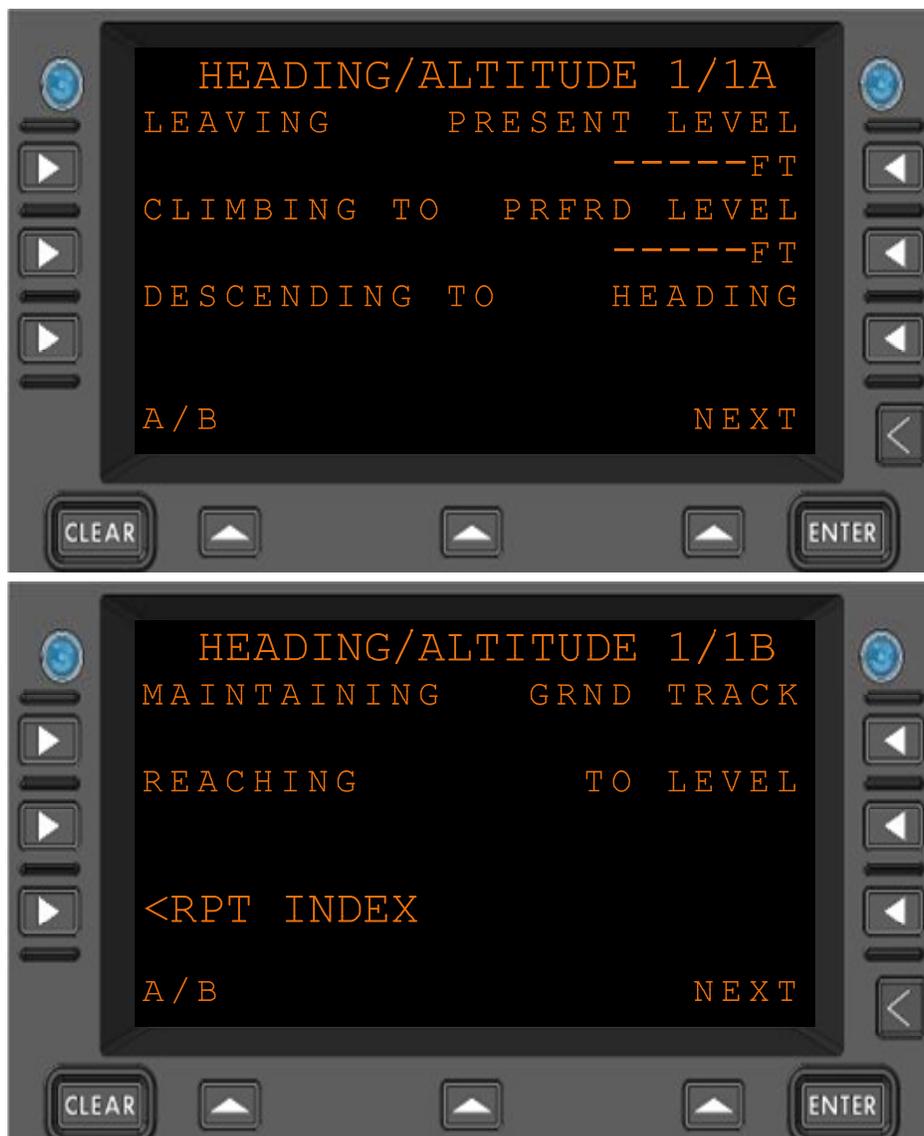


Figure 7.1.14-1 HEADING/ALTITUDE Menu (Menus A and B), LINK 2000

7.1.14.2 Heading/Altitude Report Menu, RTCA DO 280 B Operational Mode

When configured for RTCA DO 280B Mode the following Heading/Altitude Reports are valid:

- Leaving Level (LEAVING field must contain a valid level)
- Climbing to Level (CLIMBING TO field must contain a valid level)
- Descending to Level (DESCENDING TO field must contain a valid level)
- Present Level (PRESENT LEVEL field must contain a valid level)
- Present Heading (HEADING field must contain a valid heading)
- Present Ground Track (GRND TRACK field must contain a valid track)
- Maintaining Level (MAINTAINING field must contain a valid level)
- Reaching Level (REACHING field must contain a valid level)
- Reaching Block Level (REACHING and TO LEVEL fields must contain valid levels)
- Preferred Level (PRFRD LEVEL field must contain a valid level)

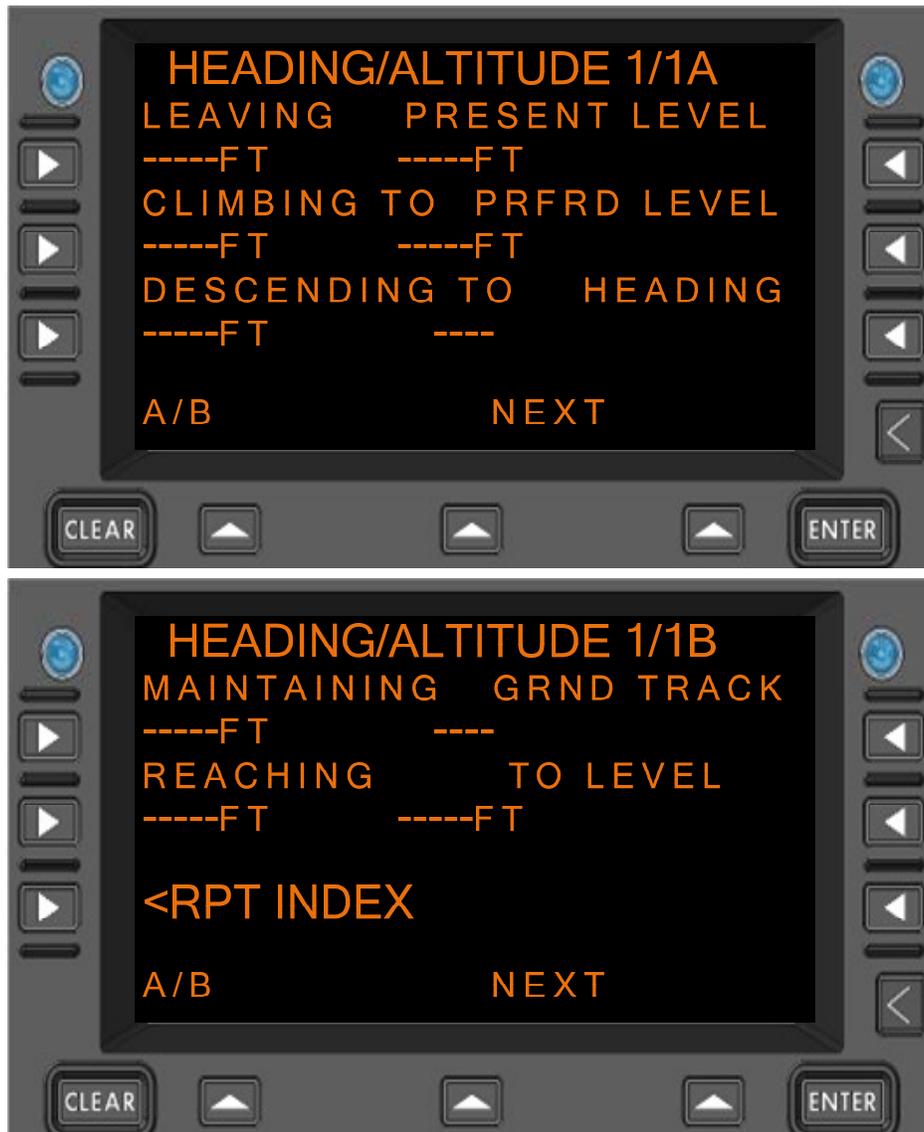


Figure 7.1.14-2 HEADING/ALTITUDE Menu (Menus A and B), DO 280B

LEAVING

CLIMBING TO

DESCENDING TO

PRESENT LEVEL

PRFRD LEVEL

MAINTAINING

REACHING

TO LEVEL

Format:

5. When configured for English-standard units, the following entry is valid (*LevelFeet*):

- a) Format: NNNNN
- b) Where: "N" is a numerical entry
- c) Range: -600 – 70000 (1 – 5 characters)
- d) Units: FT

6. When configured for English-standard units, the following entry is valid (*LevelFlightLevel*):

- a) Format: FLNNN
- b) Where: "N" is a numerical entry
- c) Range: 030 – 700 (5 characters including "FL")
- d) Units: N/A

7. When configured for Metric units, the following entry is valid (*LevelMeters*):

- a) Format: NNNNN
- b) Where: "N" is a numerical entry
- c) Range: -30 – 25000 (1 – 5 characters)
- d) Units: M

8. When configured for Metric units, the following entry is valid (*LevelFlightLevelMeters*):

- a) Format: FLNNN
- b) Where: "N" is a numerical entry
- c) Range: 10 – 250 (5 characters, including "FL")
- d) Units: M

GRND TRACK

Format: NNNT Where "N" is a numerical entry

"T" indicates the entry is referenced to True North and is optional.

Range: 1-360 (3 numerical characters, with an optional 4th for the letter "T")

HEADING

Format: NNNT Where "N" is a numerical entry

"T" indicates the entry is referenced to True North and is optional.

Range: 1-360 (3 numerical characters, with an optional 4th for the letter "T")

An example of the Heading/Altitude report page with the 'PRESENT LEVEL' field filled in and the 'VERIFY' prompt is shown in **Figure 7.1.14-3**

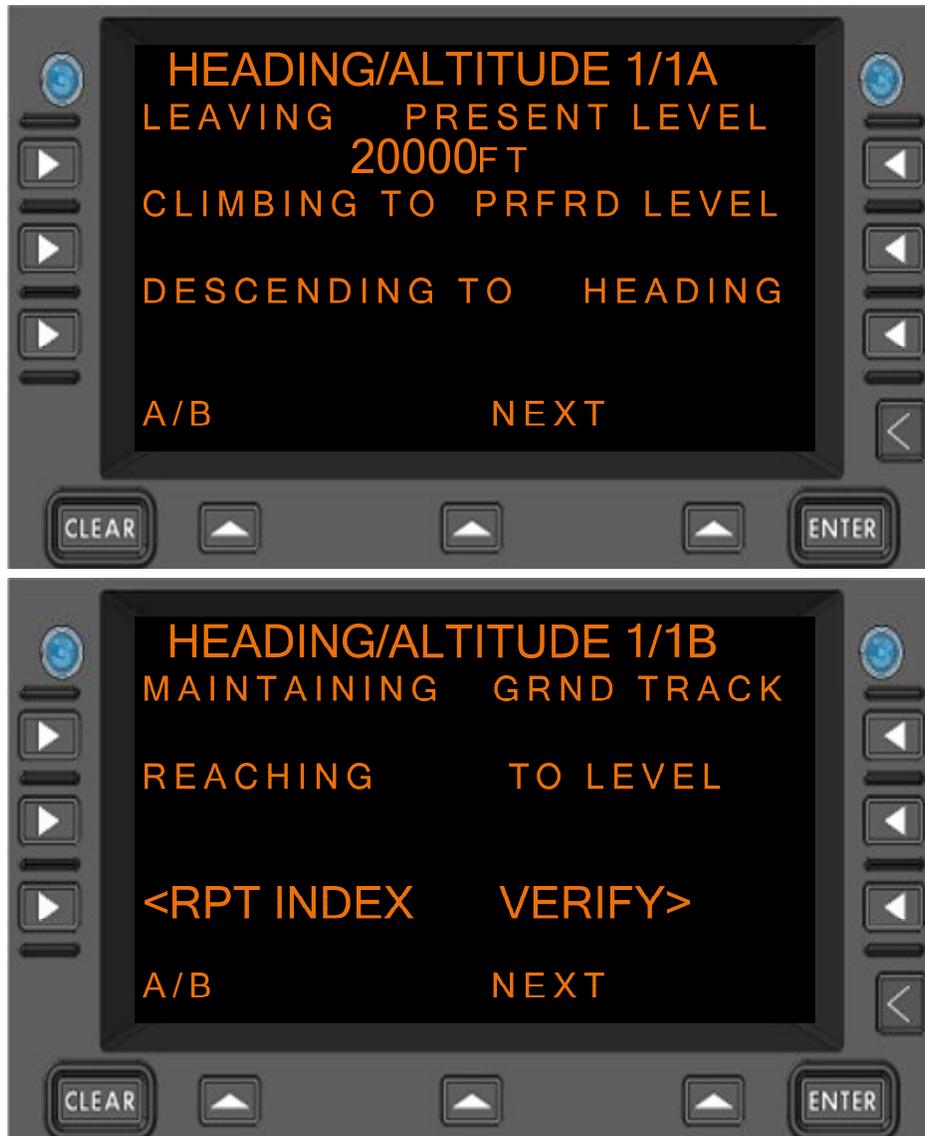


Figure 7.1.14-3 HEADING/ALTITUDE Menu, Verify Prompt Displayed

7.1.15 CPDLC – Monitoring Report Menu

The MONITORING Menu provides a means to notify ATC that the radios have been tuned to the assigned unit and frequency. An example of the use of this page may be: when receiving an uplink that requests a unit/frequency change, the operator responds with a “WILCO” and sets the radios as assigned. Then the operator may send a separate message from the MONITORING page indicating that they have complied with the request. The content and operational features of this menu are identical, regardless of the ATN Operational Mode.

When configured for LINK 2000 or RTCA DO 280B Mode the following Monitoring Report is valid:

- Monitoring UnitName Frequency (FAC NAME, FAC DESIG, FUNCTION, FREQ TYPE, and FREQUENCY must contain valid values)

An example of a blank MONITORING Menu (no entries made) is shown in **Figure 7.1.15-1**

PAGE NAVIGATION:

- A. **R2** Line Select Key from the REPORT INDEX Menu (see Section 7.1.1).

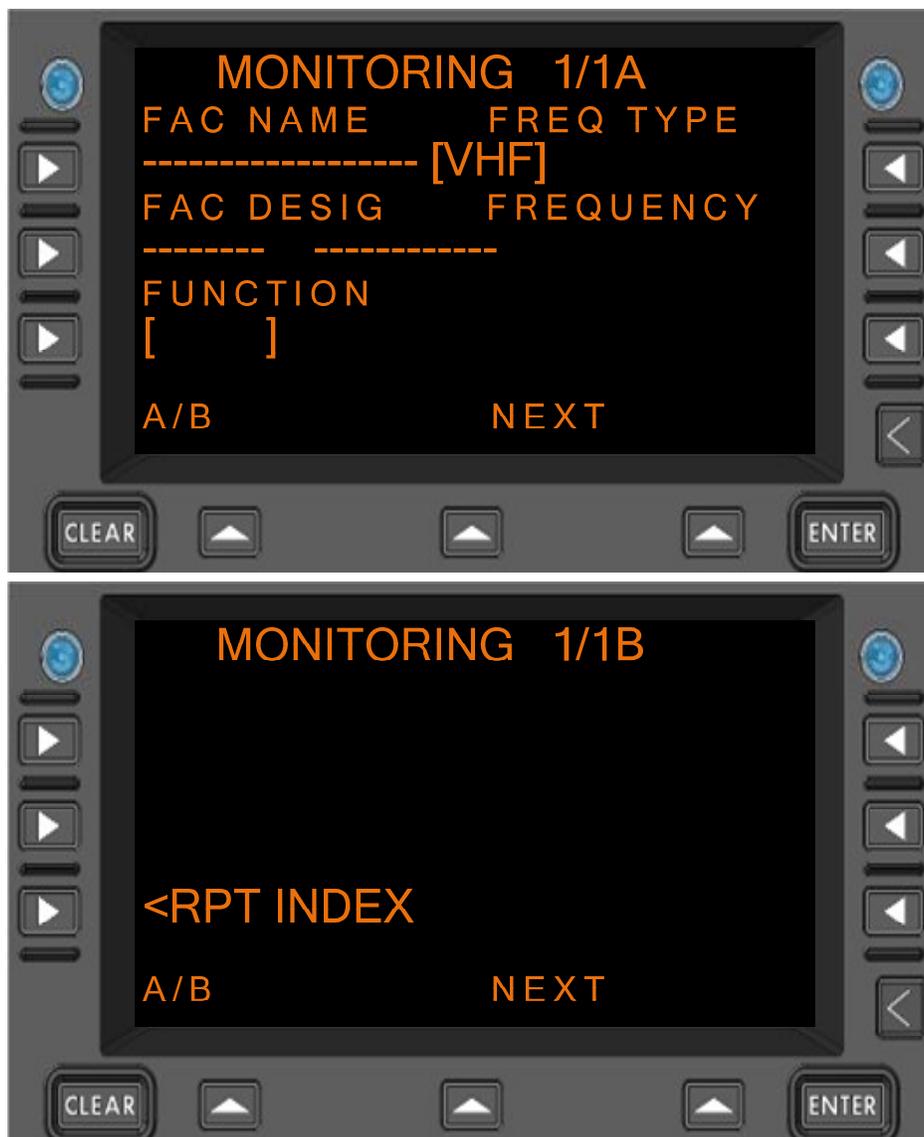


Figure 7.1.15-1 MONITORING Menu (Menus A and B)

- FAC NAME** **Format:** AAAAAAAAAAAAAAAAAA Where “A” is an alpha-entry
Range: A-Z (3 – 18 characters)
- FAC DESIG** **Format:** AAAAAAA Where: “A” is an alpha-numeric entry
Range: A-Z, 0-9 (4 – 8 characters)
- FREQUENCY** **Format:**
1. If the *Frequency Type* is set to 0 (HF):
 - a. Format: NNNNN
 - b. Where: “N” is a numerical entry.
 - c. Range: 2850 – 28000
 - d. Units: kHz
 2. If the *Frequency Type* is set to 1 (VHF):
 - a. Format: NNN.NNN
 - b. Where: “N” is a numerical entry.
 - c. Range: 118.00-136.990
 - d. Units: MHz
 3. If the *Frequency Type* is set to 2 (UHF):
 - a. Format: NNN.NNN
 - b. Where: “N” is a numerical entry.
 - c. Range: 225.000 - 399.975
 - d. Units: MHz
 4. If the *Frequency Type* is set to 3 (SAT):
 - a. Format: NNNNNNNNNNNN
 - b. Where: “N” is a numerical entry.
 - c. Range: Numerical string representing a 12-digit telephone number
 - d. Units: N/A

An example of the Monitoring Report Menu with the ‘FAC NAME’, ‘FAC DESIG’, ‘FUNCTION’, ‘FREQ TYPE’, and ‘FREQUENCY’ fields filled in and the ‘VERIFY’ prompt is shown in **Figure 7.1.15-2**



Figure 7.1.15-2 MONITORING Menu (Menus A and B), Verify Prompt Displayed

7.1.16 CPDLC – Position Report Menu

The POSITION REPORT Menu is only available when in DO 280B ATN Operational mode (see Section 7.1.16). The Position Report Menu provides a means by which the operator may report current aircraft position.

When configured for RTCA DO 280B Mode the following Position Reports are valid:

- Passing Position (POS TYPE and PASSING fields must contain valid values)
- Back On Route (BACK ON RTE field must be selected by pressing the **R1** line select key)
- Position Report (POS RPT field must be selected by pressing the **L1** line select key)

An example of the blank Position Report Menu (no entries made) is shown in **Figure 7.1.16-1**

PAGE NAVIGATION:

1. ► **L2 Line Select key from the CPDLC INDEX Menu (See section 7.1.1)** then ► **L1 Line Select Key from the REPORT INDEX Menu (See section 7.1.13)**

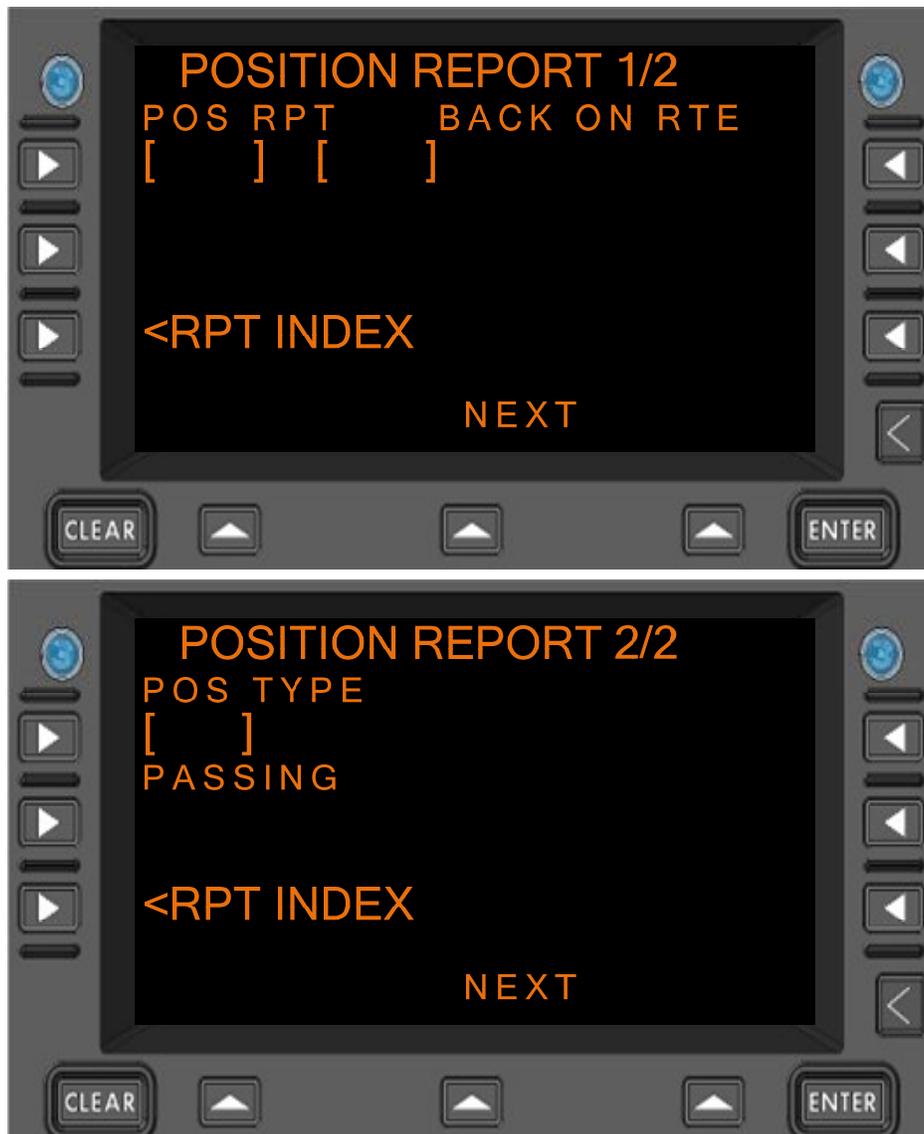


Figure 7.1.16-1 POSITION REPORT Menu (Menus A and B), DO 280B

PASSING**Format:**

1. When associated *Position Type* field is set to NAVAID (Navaid), the following entry is valid:
 - a. Format: AAAA
 - b. Range: 0-9, A-Z (1- 4 Characters)
2. When associated *Position Type* field is set to FIX (*FixName*), the following entries are valid:
 - a. Format: AAAAA
 - b. Range: 0-9, A-Z (1-5 Characters)
3. When associated *Position Type* field is set to AIRPORT (airport), the following entry is valid:
 - a. Format: AAAA
 - b. Range: 0-9, A-Z (4 characters)
4. When associated *Position Type* field is set to LAT/LON (*latitudeLongitude*), the following entries are valid:
 - a. Format: ADDMMSS/BDDMMSS
 - b. Where: "A" is either N or S
"B" is either E or W
"DD" is a numerical entry representing geographical latitude
"DDD" is a numerical entry representing geographical longitude
"MM" is a numerical entry representing geographical minutes.
"SS" is a numerical entry representing geographical seconds.
 - c. Range: "DD" is 00-89
"DDD" is 000-179
"MM" is 0-59
"SS" is 0-59
5. When associated *Position Type* field is set to PBD-NAV (*PlaceBearingDistance* using NAVAID), the following entries are valid:
 - a) Format: AAAA/XXXT/YYYY (Where "AAAA" is validated using the "NAVAID" entry requirements in this section).
 - b) Where: "A" is an alpha-numeric entry representing a navaid.
"X" is a numerical entry representing degrees
"T" is an optional entry to indicate the bearing is references to True North
"Y" is a numerical entry representing distance
 - c) Range: "A" is 0-9, A-Z
"X" is 000 - 360
"Y" is 1-250 (This restriction could be user defined)
6. When associated *Position Type* field is set to PBD-FIX (*PlaceBearingDistance*

using FIX), the following entries are valid:

- a) Format: AAAAA/XXXT/YYYY (Where "AAAAA" is validated using the "FIX" entry requirements in this section).
- b) Where:
 - "A" is an alpha-numeric entry representing a fix.
 - "X" is a numerical entry representing degrees
 - "T" is an optional entry to indicate the bearing is references to True North
 - "Y" is a numerical entry representing distance
- c) Range:
 - "A" is 0-9, A-Z
 - "X" is 000 - 360
 - "Y" is 1-250 (This restriction could be user defined)

An example of the Position Report Menu with the 'POS TYPE' and 'PASSING' fields filled in and the 'VERIFY' prompt is shown in **Figure 7.1.16-2**

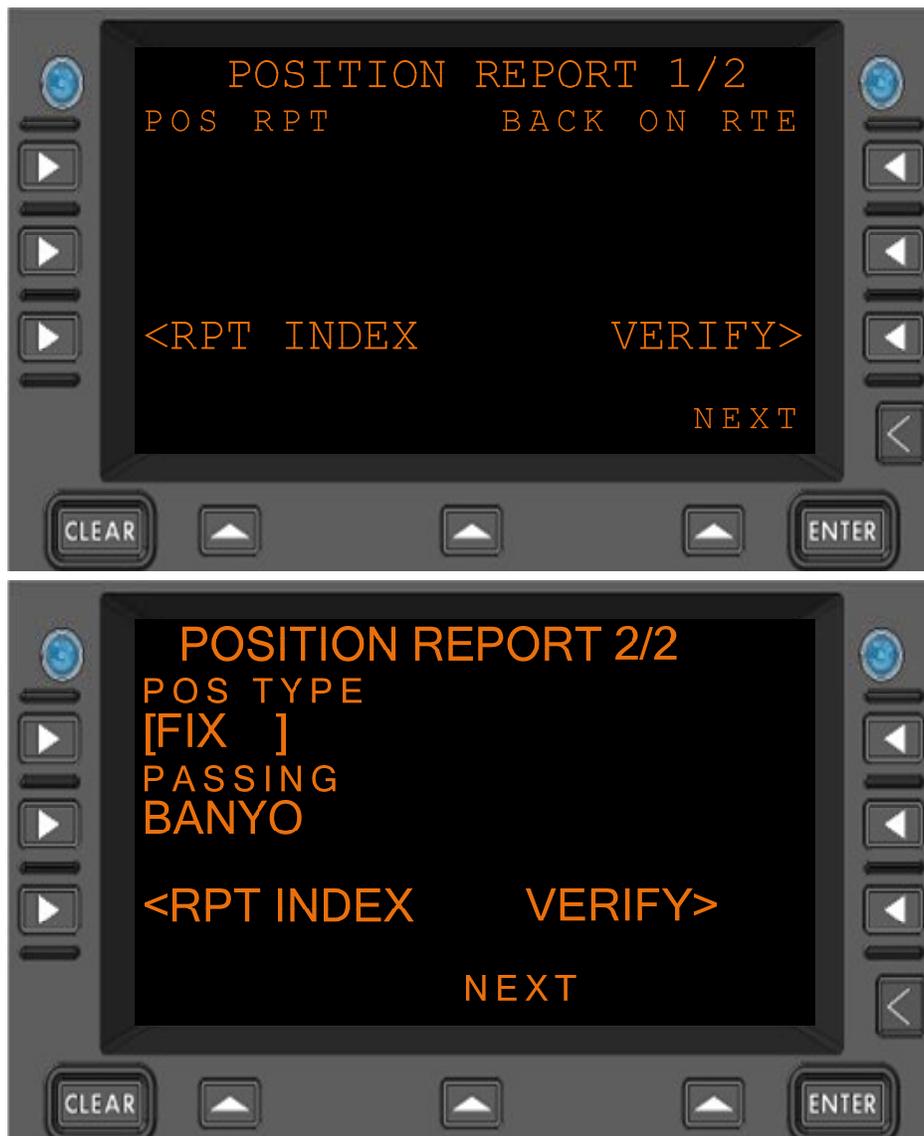


Figure 7.1.16-2 POSITION REPORT Menu (Menus A and B), Verify Prompt Displayed

7.1.17 CPDLC – Speed Report Menu

The Speed Report Menu is only available when in DO 280B ATN Operational mode (see Section 7.1.1). The Speed Report Menu provides a means by which the operator may report current aircraft speed.

When configured for RTCA DO 280B Mode the following Speed Report is valid:

- Present Speed (SPEED TYPE and PRESENT SPEED fields must contain valid values)

An example of the blank Speed Report Menu (no entries made) is shown in **Figure 7.1.17-1**

PAGE NAVIGATION:

- A. ► **L2** Line Select Key from the CPDLC INDEX Menu (See section 7.1.1 Error! Reference source not found.) then ► **R1** Line Select Key from the REPORT INDEX Menu (See section 7.1.13)



Figure 7.1.17-1 SPEED REPORT Menu, DO 280B

PRESENT SPEED

English Format: NNN where “N” is a numerical entry in the range of 0-400.

Metric Format: NNN where “N” is a numerical entry in the range of 0-800.

An example of the Speed Report Menu with the ‘SPEED TYPE’ and ‘PRESENT SPEED’ fields filled in and the ‘VERIFY’ prompt is shown in **Figure 7.1.17-2**

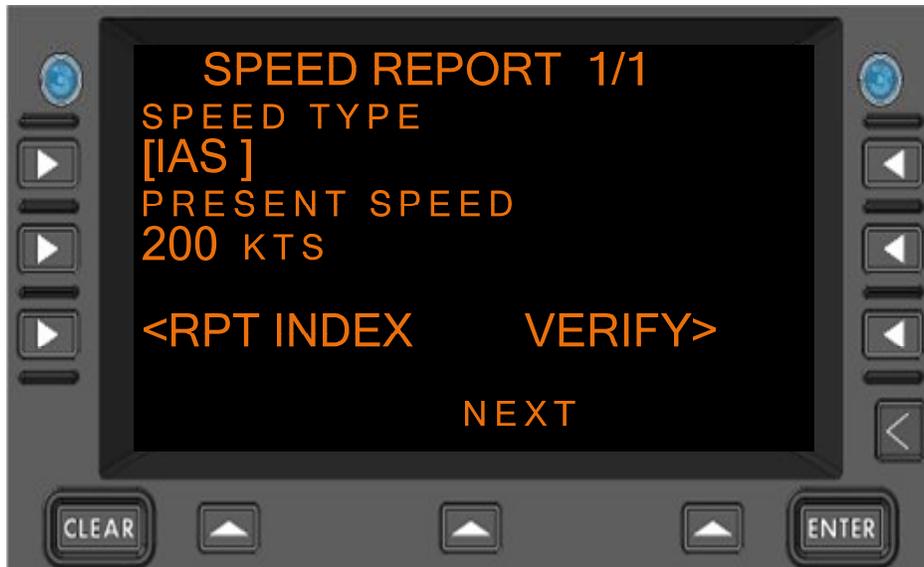


Figure 7.1.17-2 SPEED REPORT Menu, Verify Prompt Displayed

7.1.18 CPDLC – Notification Menu

The Notification Menu is only available when in DO 280B ATN Operational mode (see Section 7.1.1). The Notification Menu provides a means by which the operator may notify ATC that the IFR (Instrument Flight Rules) Flight Plan has been cancelled. In addition, it also permits a second notification to indicate de-icing is complete.

When configured for RTCA DO 280B Mode the following Notification Reports are valid:

- Cancelling IFR (CANCEL IFR field must be selected by pressing the **L1** line select key)
- De-Icing Complete (DEICE COMPL field must be selected by pressing the **R1** line select key)

An example of the blank Notification Menu (no entries made) is shown in **Figure 7.1.18-1**

PAGE NAVIGATION:

- A. ► **L2** Line Select Key from the CPDLC INDEX Menu (See section 7.1.1) then ► **L3** Line Select Key from the CPDLC INDEX Menu (See section 7.1.13)



Figure 7.1.18-1 NOTIFICATION Menu, DO 280B

An example of the Notification Menu with the 'CANCEL IFR' field filled in and the 'VERIFY' prompt is shown in **Figure 7.1.18-2**



Figure 7.1.18-2 NOTIFICATION Menu, Verify Prompt Displayed

7.2 CPDLC Operational Scenario

7.2.1 CM Logon

Say the operator is on the ground and wishes to perform a CM logon. First, the operator will have to navigate to the 'CM LOGON' menu press the 'CPDLC' menu key and then select 'CM LOGON' by pressing the **L3** menu key. See **Figure 7.2.1-1**



Figure 7.2.1-1 CM LOGON Menu

The operator then enters a Facility ID, Call Sign, Origin, and Destination on the A-Page in order to have access to the 'LOGON' prompt found on the B-Page. A Depart Date and Time is not required to get the 'LOGON' prompt. However, if a Date is entered a Time must be entered (and vice versa) in order for the LOGON prompt to appear. The menu with all required fields filled in is in **Figure 7.2.1-2**



Figure 7.2.1-2 CM LOGON Menu

Here is what the B-Page of the CM LOGON Menu will look like after entering required information for a CM Logon:

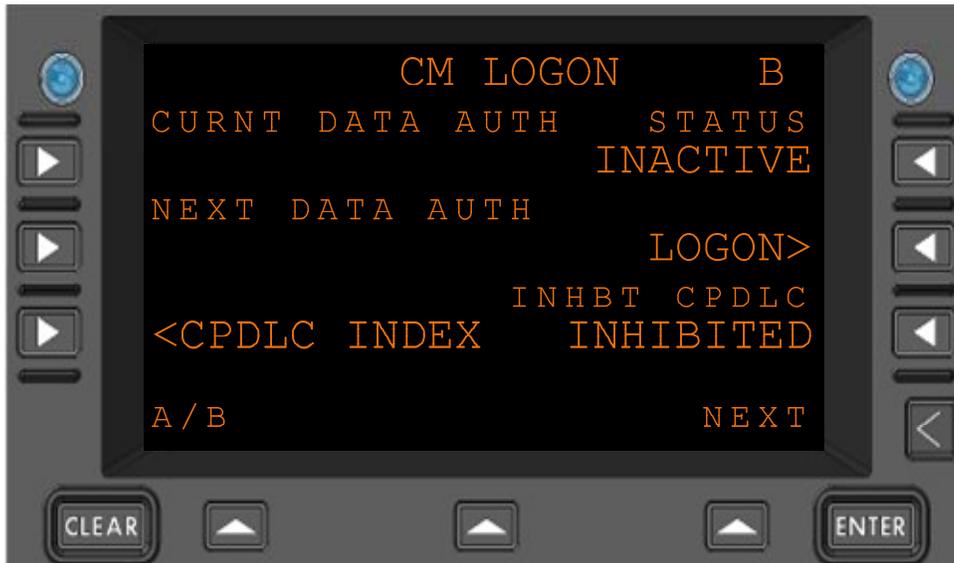


Figure 7.2.1-3 CM LOGON Menu

The R2 Line Select Key would then be pressed from the B-Page to select the 'LOGON' prompt and perform a CM Logon. When successfully logged on the 'LOGON' Prompt located to the left of the R2 Line Select Key on the B-Page will change to the 'LOGOFF' Prompt, the status will be set to 'ACTIVE', and 'INHIBITED' will change to 'INHIBIT' as seen in **Figure 7.2.1-4**

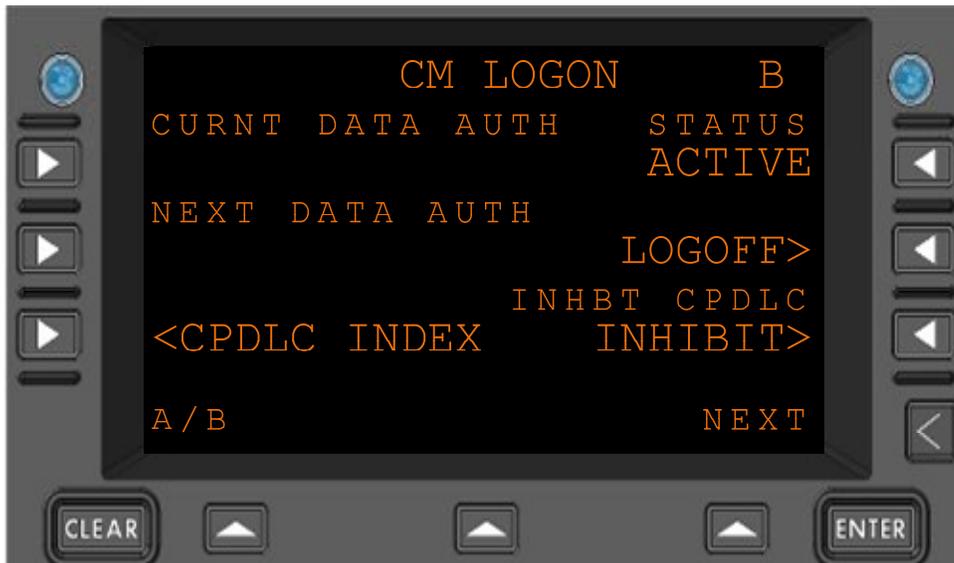


Figure 7.2.1-4 CM LOGON Menu

If the CM logon was not successful the 'CM LOGON FAILED' scratchpad message would be displayed and the prompt that corresponds with the R2 Line Select Key would change to 'RESEND' as seen in **Figure 7.2.1-5**

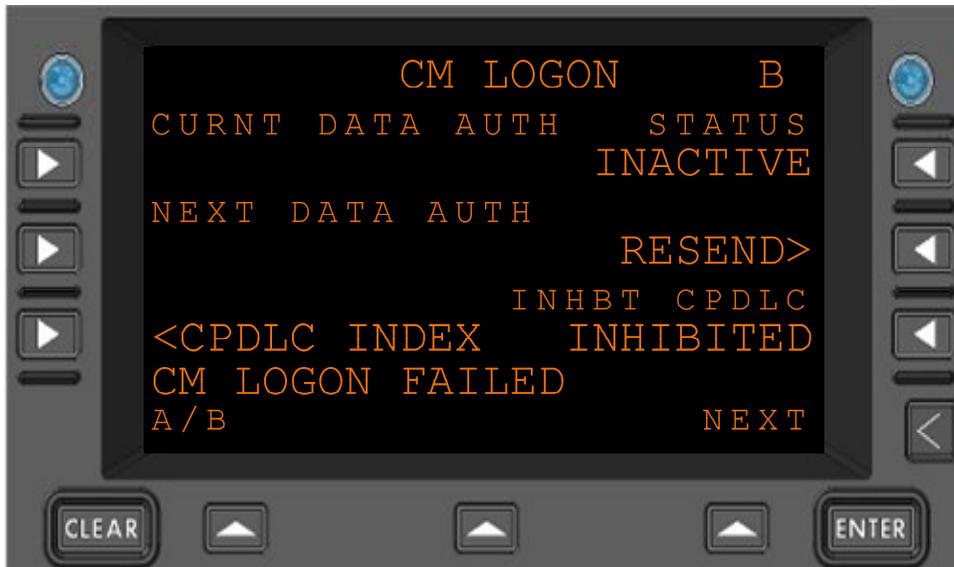


Figure 7.2.1-5 CM LOGON Menu

7.2.1.1 Manual Entry of TSAP Address

If the FACILITY ID that is entered on the CM Logon Menu does not exist within the TSAP database, the prompt that corresponds with the **R2** Line Select Key on the B-Page or the CM Logon Menu will change to 'SET TSAP' in order for the operator to manually enter a TSAP address.

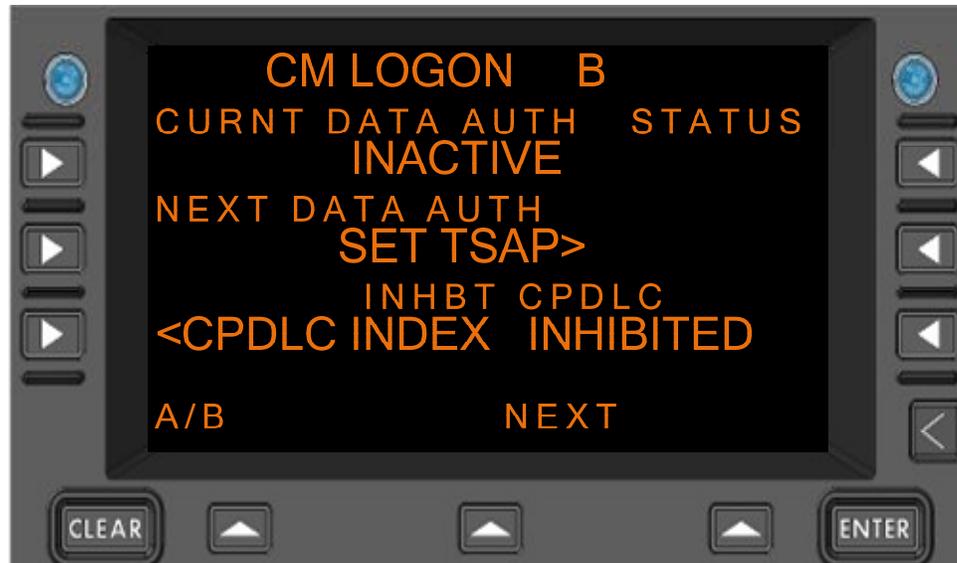


Figure 7.2.1-6 CM LOGON Menu

Selection of the 'SET TSAP' Prompt will cause the 'ENTER TSAP' Menu to be displayed. Once a valid TSAP is entered the operator can save the TSAP entry and return to the CM Logon Menu by pressing the Line Select Key that corresponds with the 'SAVE TSAP' Prompt.

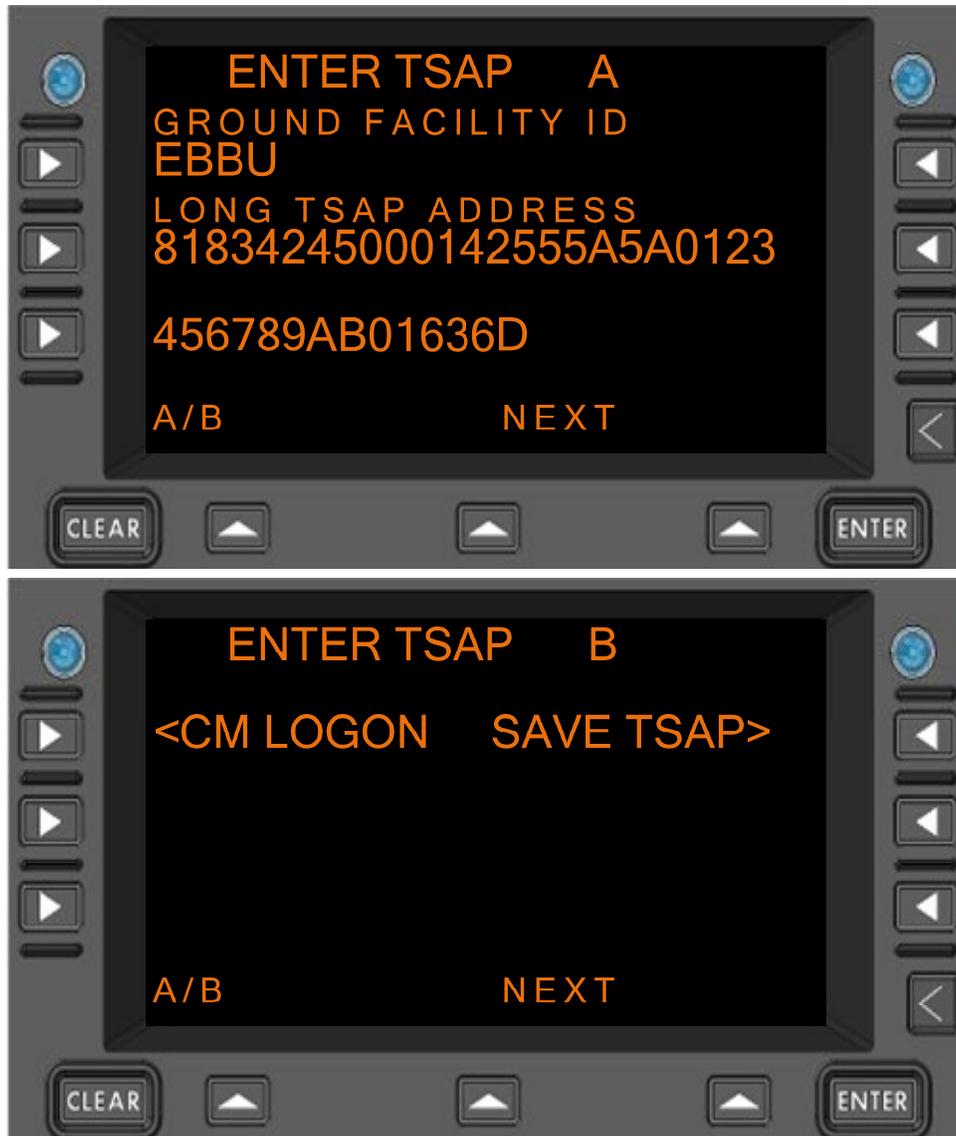


Figure 7.2.1-7 ENTER TSAP Menu

7.2.2 CPDLC Start from the Ground

Now assume the operator is at 20000 feet and a CPDLC start request is received from the ground. When the start request is received from the ground 'CPDLC ESTABLISHED' will be displayed in the scratch pad and the ground station that has sent the start request will be displayed as the current data authority as shown in **Figure 7.2.2-1**

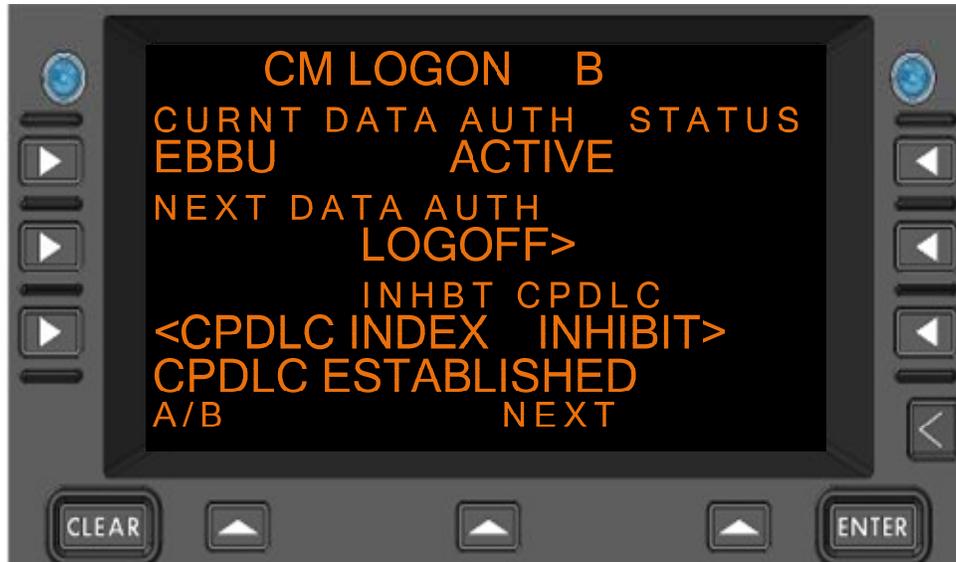


Figure 7.2.2-1 CM LOGON Menu

7.2.3 Vertical/Route Mod Message Exchange with ATC

Now assume that the operator wishes to request a vertical change to 25000 feet. The 'CPDLC' Function Key would be pressed then the operator would select the 'REQUEST' field by pressing the **L1** Line Select Key. This section is based on LINK 2000 Mode, if RTCA DO280B Mode is selected the page display may differ slightly. That menu, in LINK 2000 Mode, can be found in **Figure 7.2.3-1**:



Figure 7.2.3-1 REQUEST INDEX Menu

Now the operator would select 'VERTICAL' by pressing the **L1** Line Select Key. The Vertical Request menu is shown in **Figure 7.2.3-2**:

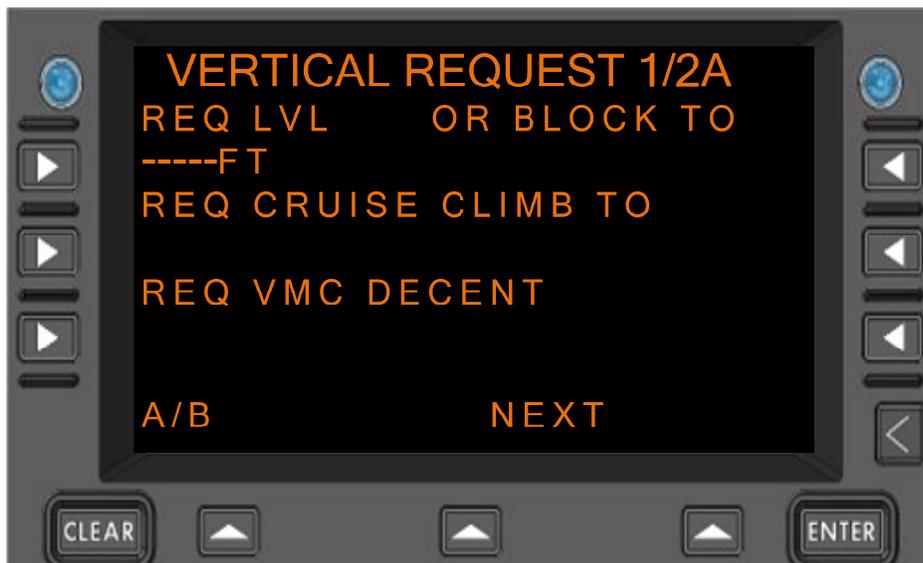


Figure 7.2.3-2 VERTICAL REQUEST Menu

25000 would then be entered into the scratch pad and up-selected to the 'REQ LVL' Line Field by pressing the **L1** Line Select Key. The VERTICAL REQUEST Menu is shown in **Figure 7.2.3-3**:



Figure 7.2.3-3 VERTICAL REQUEST Menu

On the 1B-Page of the Vertical Request Menu the operator selects the 'VERIFY' Prompt by pressing the **R3** Line Select Key. This will bring the operator to the Verify Request Menu shown in **Figure 7.2.3-4**:



Figure 7.2.3-4 VERIFY REQUEST Menu

On the B-Page of the Verify Request Menu the 'SEND' prompt would be selected by pressing the R3 Line Select Key. Then a downlink in the CPDLC message log titled 'REQUEST 25000FT' will be viewable in the Message Log as shown in **Figure 7.2.3-5**:

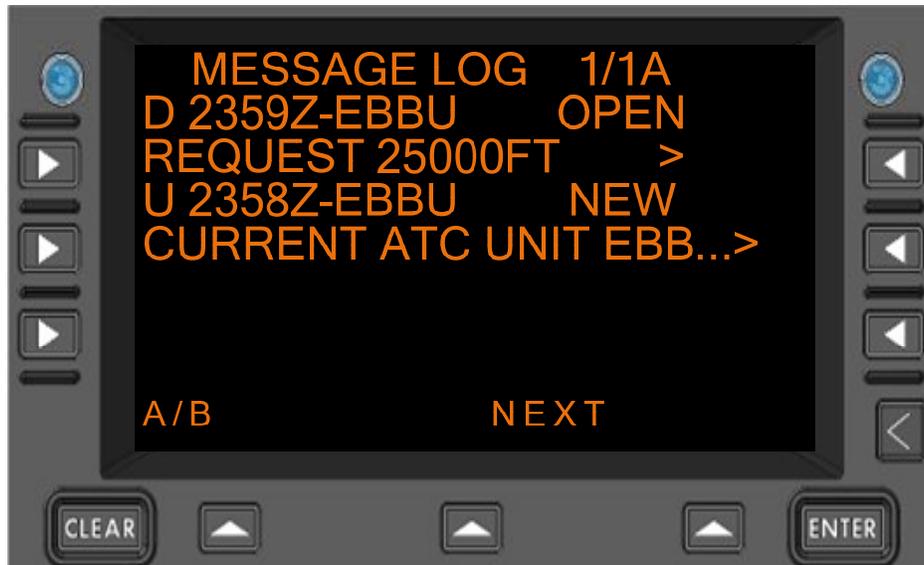


Figure 7.2.3-5 MESSAGE LOG Menu

The ground could then send a standby to request that the operator wait for further instruction. The standby is a viewable message in the CPDLC Message Log. An example of the standby in the Message Log is found in **Figure 7.2.3-6**:



Figure 7.2.3-6 MESSAGE LOG Menu

If the ground then sent the operator a request to go to 25000 feet the message would be displayed in the CPDLC message log as shown in **Figure 7.2.3-7**. The operator can open and respond to this message.



Figure 7.2.3-7 MESSAGE LOG Menu

To respond to and accept the Climb To Request the operator would select the message in the Message Log by pressing the corresponding Line Select Key, **R1** in the above example, then select respond from the B-Page of the message review by pressing the **R3** Line Select Key while on the B-Page. See **Figure 7.2.3-8**:

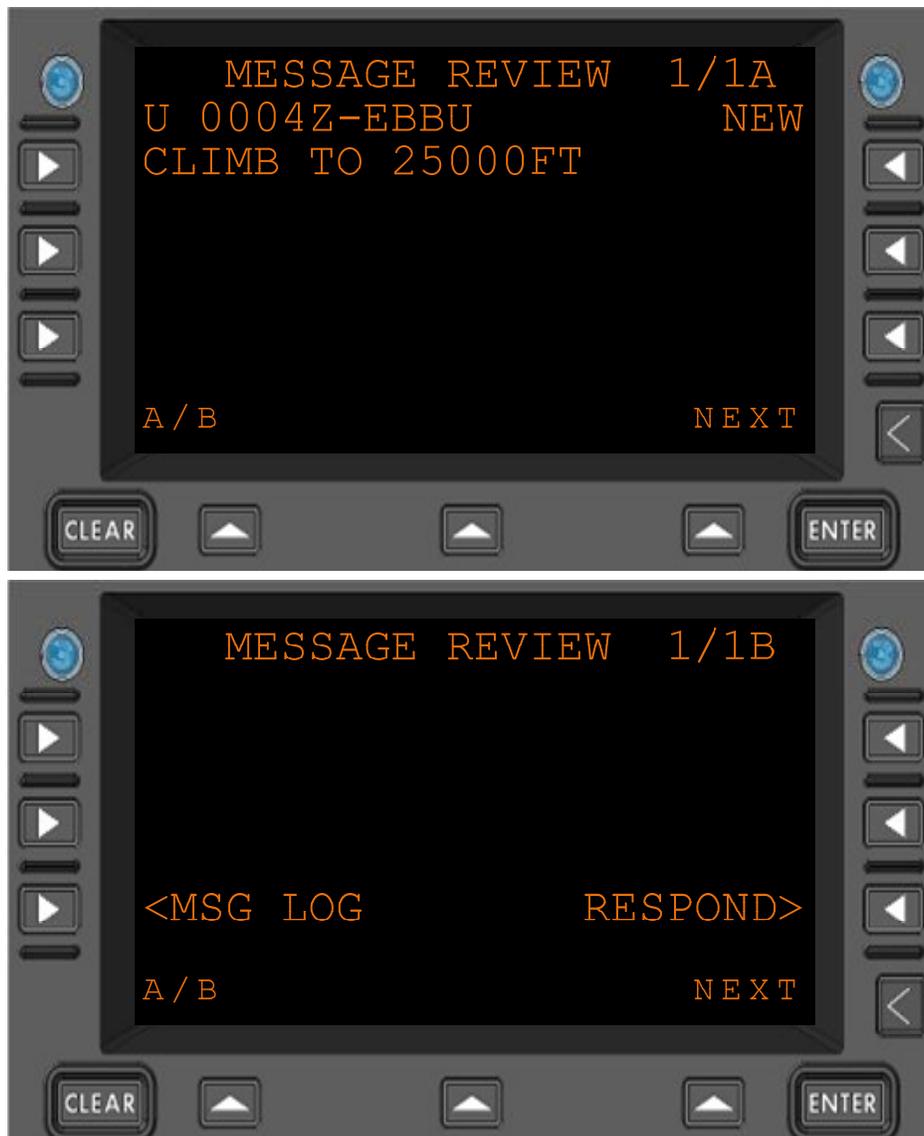


Figure 7.2.3-8 MESSAGE REVIEW Menu

This brings the operator to the Message Response Menu. If the operator selects WILCO in the 'RESPOND' field by pressing the **L2** Line Select Key and sends the response the Climb To Request would be accepted. **Figure 7.2.3-9** shows the MESSAGE RESPONSE Menu after selecting WILCO for a response type.

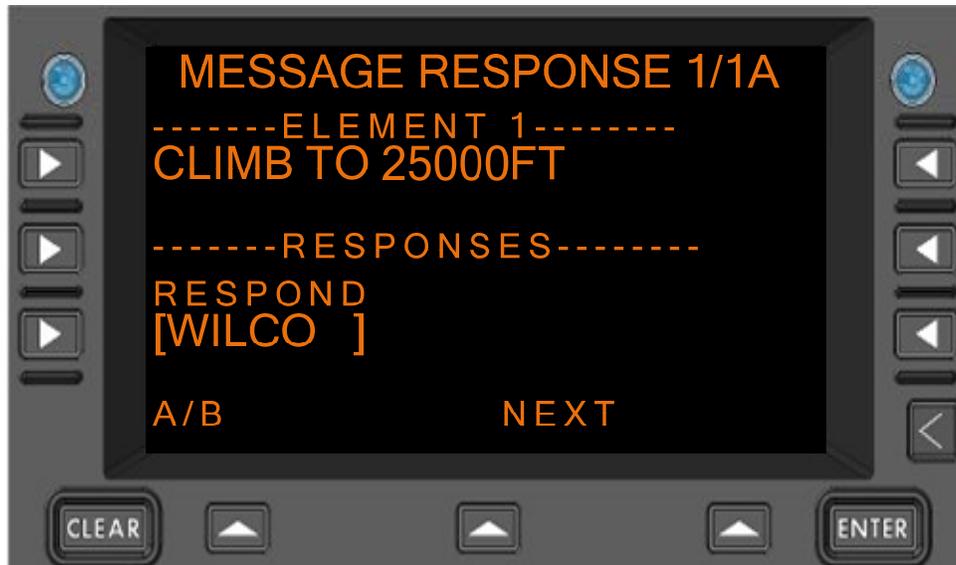


Figure 7.2.3-9 MESSAGE RESPONSE Menu

After setting the response type to WILCO the operator would navigate to the B-Page of the Message Response and select the 'SEND' Prompt by pressing the **R3** Line Select Key as seen in **Figure 7.2.3-10**

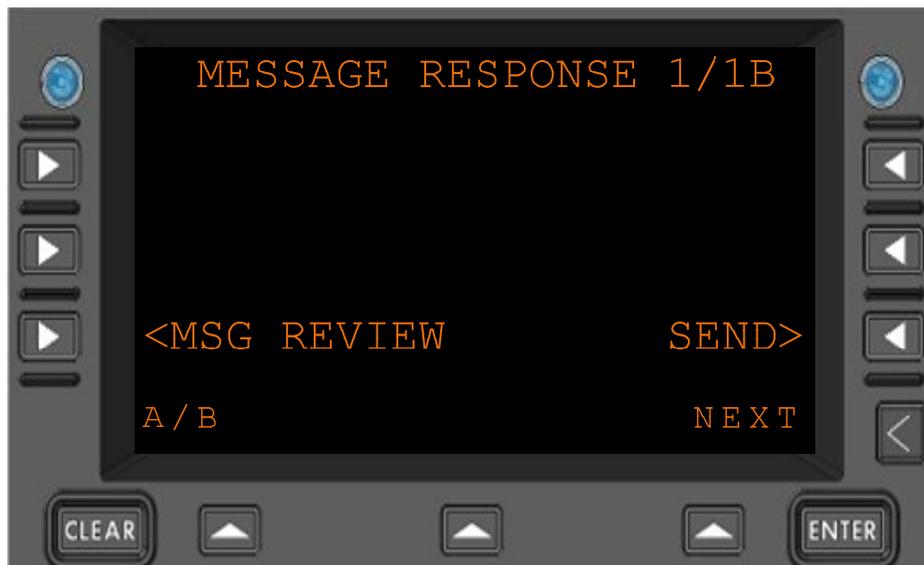


Figure 7.2.3-10 MESSAGE RESPONSE Menu

In the case that the operator wanted to request a route modification, the operator would navigate to the Route Mod Request Menu by first pressing the 'CPDLC' Line Select Key, then selecting the 'REQUEST' field by pressing the L1 Line Select Key from the CPDLC Menu, and then selecting 'ROUTE' by pressing the R2 Line Select Key. Then the operator must select a Position Type and a Request Direct to Position. To select a Position Type the L1 Line Select Key is pressed, in the below example 'AIRPORT' is set for the Position Type. Next a Request Direct to Position would be filled in by making an entry in the scratch pad and then pressing the L2 Line Select Key to up-select the entry to that field. **Figure 7.2.3-11** is an example of this screen with the 'POS TYPE' and 'REQ DIRECT TO POSITION' fields filled in. This information is needed in order to get a 'VERIFY' Prompt on the B-Page of the Route Mod Request page.



Figure 7.2.3-11 ROUTE MOD REQUEST Menu

After entering this information the operator would navigate to the B-Page of the Route Mod Request page and select the 'VERIFY' prompt by pressing the **R3** Line Select Key. This will take you to the Verify Request Menu. The Verify Request Menu is shown in **Figure 7.2.3-12**:



Figure 7.2.3-12 VERIFY REQUEST Menu

If the operator navigates to the B-Page of the Verify Request Menu a 'SEND' prompt will be present. To send the verified Route Mod Request the **R3** Line Select Key would be pressed. **Figure 7.2.3-13** shows an example of the B-Page of the Verify Request with the 'SEND' Prompt:



Figure 7.2.3-13 VERIFY REQUEST Menu

Now if the ground accepts the Route Mod Request, they will send up a Route Mod containing the same information as the Request the operator sent in the downlink to the ground station. In the Message Log this this would look like the example in **Figure 7.2.3-14**:



Figure 7.2.3-14 MESSAGE LOG Menu

To accept the Route Mod sent up from the ground station the operator must select the uplink message from the CPDLC Message Log which will bring the operator to the Message Review Menu:

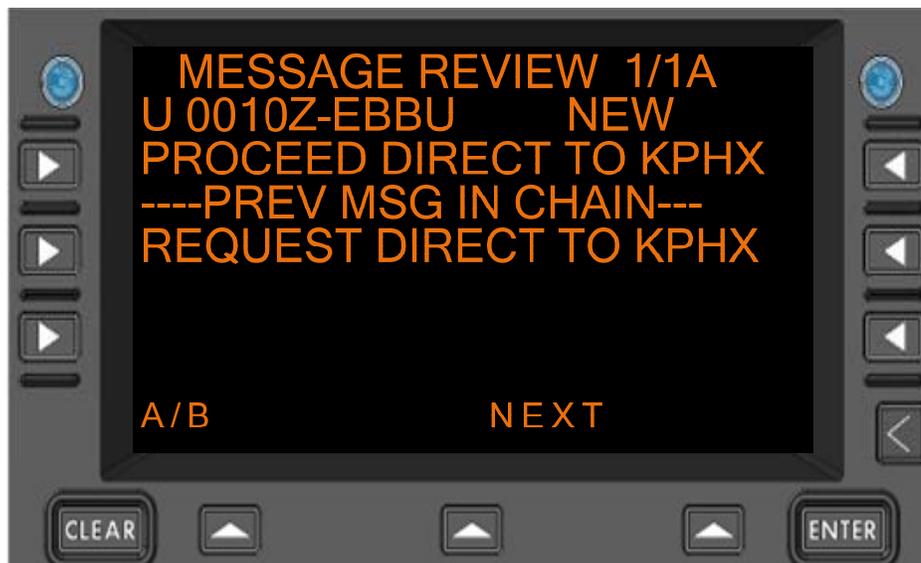


Figure 7.2.3-15 MESSAGE REVIEW Menu

Navigating to the B-Page of the Lateral Offset will give the operator access to the 'RESPOND' Prompt. The B-Page would look like the example in **Figure 7.2.3-16**:



Figure 7.2.3-16 MESSAGE REVIEW Menu

Pressing the **R3** Line Select Key from the B-Page of the Message Review Menu to select the 'RESPOND' prompt will bring the operator to the 'Message Response Menu. On the 'Message Response Menu, in the 'RESPOND' field the operator would select WILCO by pressing the **L3** Line Select Key once. **Figure 7.2.3-17** shows an example of this page:

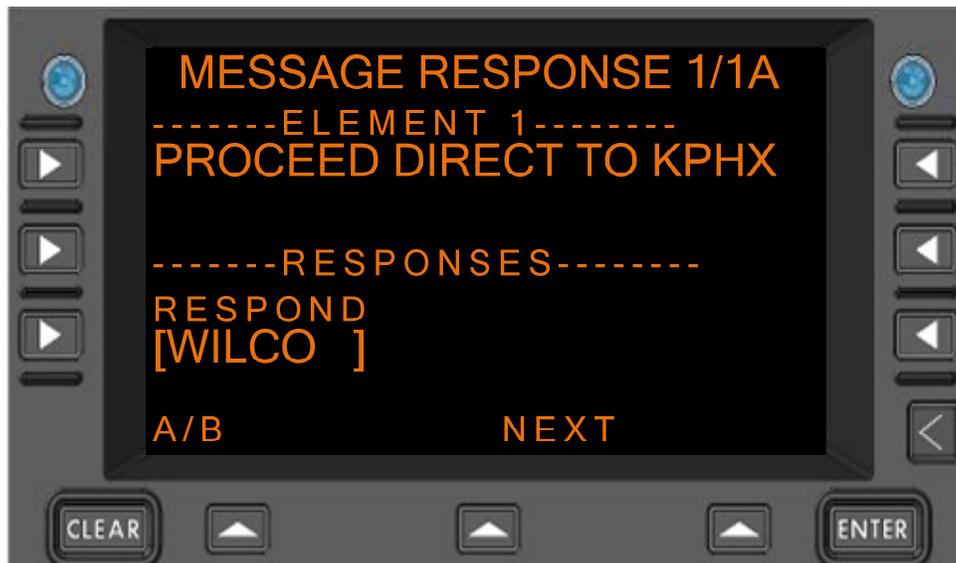


Figure 7.2.3-17 MESSAGE RESPONSE Menu

Then the operator would navigate to the B-Page of the Message Response Menu and select the 'SEND' Prompt by pressing the **R3** Line Select Key shown in **Figure 7.2.3-18**:

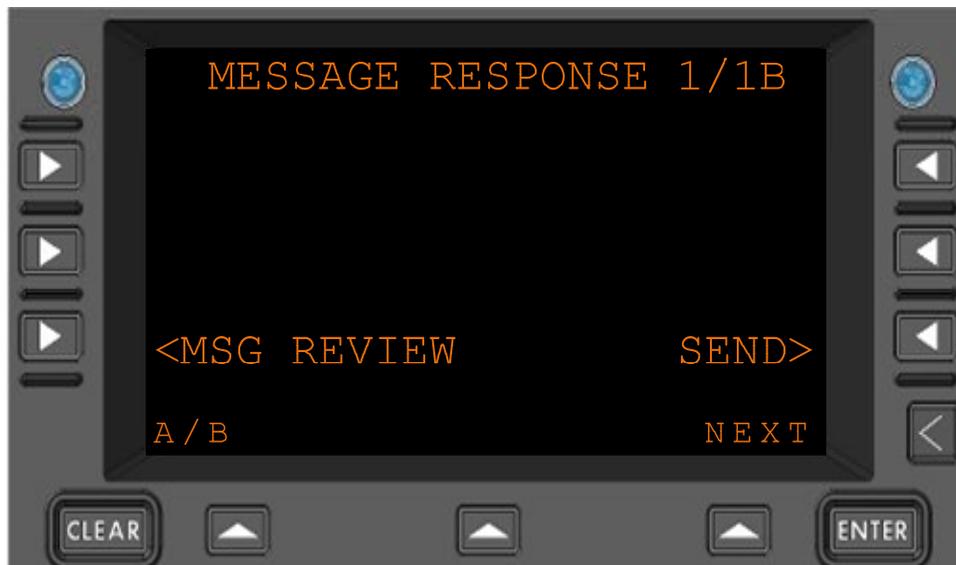


Figure 7.2.3-18 MESSAGE RESPONSE Menu

Sending the WILCO in response to the Route Mod accepts the ground stations Route Mod. This is viewable in the message log shown in **Figure 7.2.3-19** (notice the Route Mod now has an accepted status):

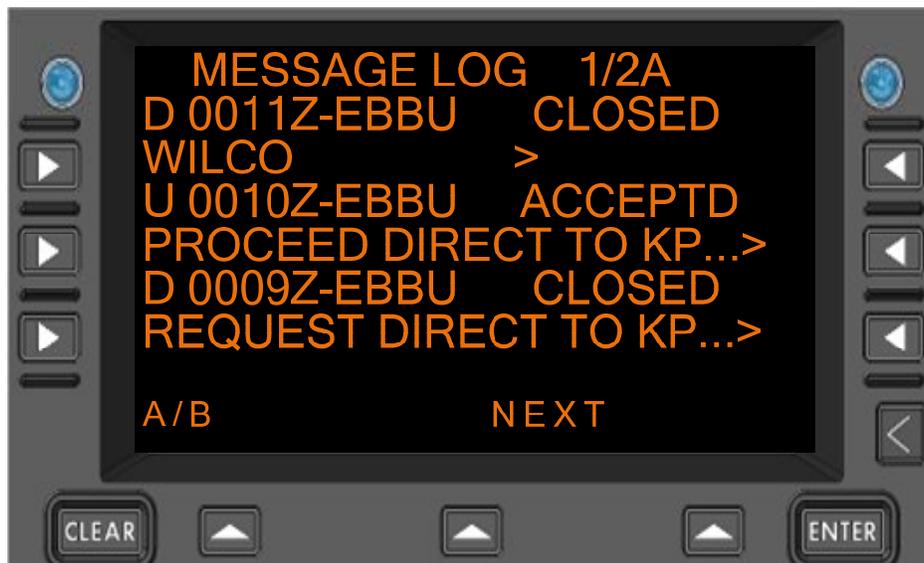


Figure 7.2.3-19 MESSAGE LOG Menu

7.2.4 Next Data Center Established

To establish a Next Data Authority the ground will first send an uplink that contains the facility ID for the Next Data Authority. When the ground has sent this uplink the facility ID will be viewable on the 'CM LOGON' menu in the 'NEXT DATA AUTH' field. This is in **Figure 7.2.4-1** with a 'NEXT DATA AUTH' of LFRR:

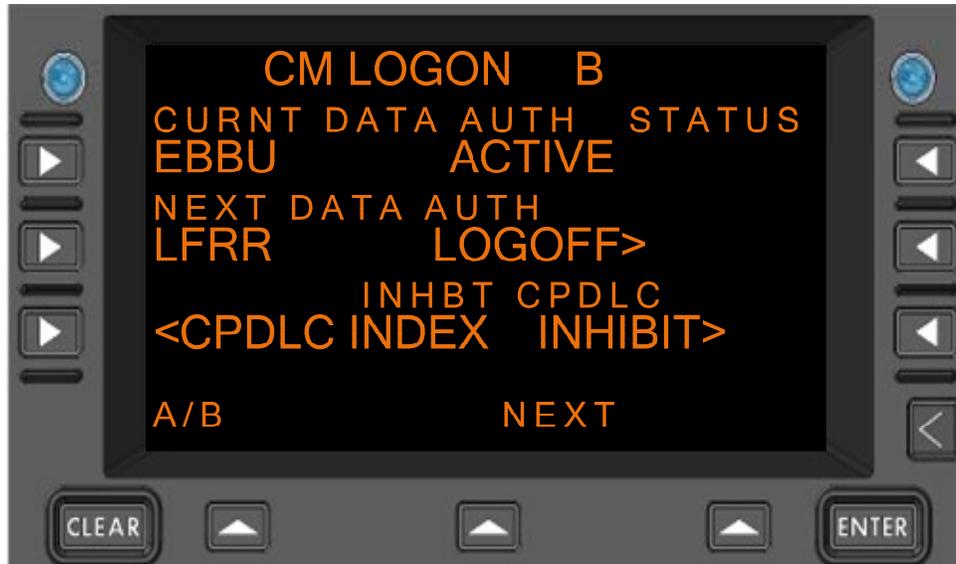


Figure 7.2.4-1 CM LOGON Menu

7.2.5 Change of Current Data Center

In order for the Next Data Authority (LFRR in the example) to become the Current Data Authority it must first send a Start Request, the Current Data Authority (EBBU in the example) must then send an End Request containing the facility designation of the Next Data Authority. Then the operator would be able to view and respond to a contact request in the CPDLC message log from the Next Data Authority. If the operator choose to respond to this request with a WILCO the Next Data Authority would become the Current Data Authority. **Figure 7.2.5-1** shows the contact request after the operator has responded with a WILCO to accept the Contact Request from the new station:

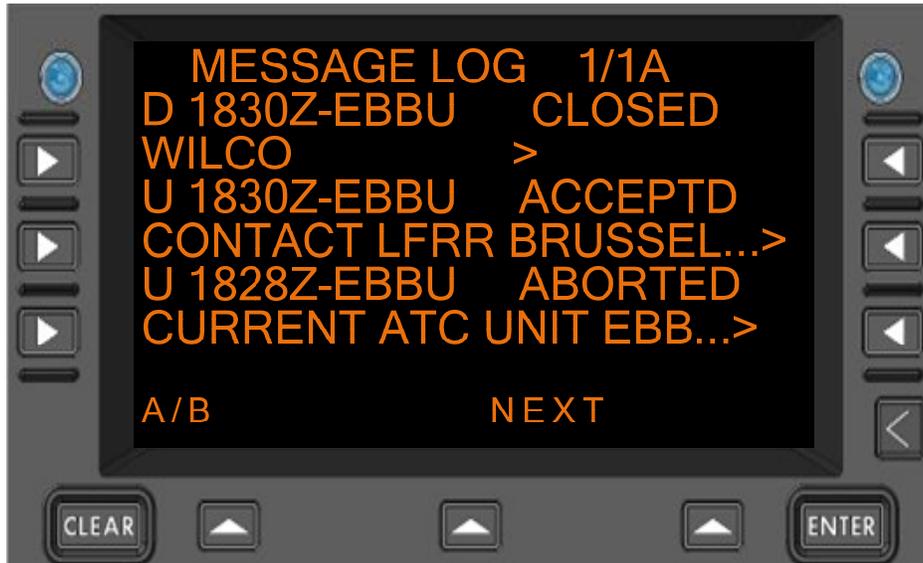


Figure 7.2.5-1 MESSAGE LOG Menu

The steps that should be taken to do this will be to navigate to the CPDLC message log, select the contact request from the Next Data Authority by pressing the Line Select Key that corresponds to the message, navigate to the B-Page of the Message Review Menu, select respond by pressing the **[R3]** Line Select Key on the B-Page of the message review, then pressing the **[L2]** Line Select Key on the Response Menu to select WILCO for a response type if the operator wishes to accept the Contact Request. Then the operator would send the response by navigating to the B-Page of the Message Response Menu and pressing the **[R3]** Line Select Key to select the 'SEND' Prompt. Figure 7.2.5-2 shows what the B-Page of the CM Logon Menu will look like after these steps are done and the Current Data Authority has changed to LFRR.

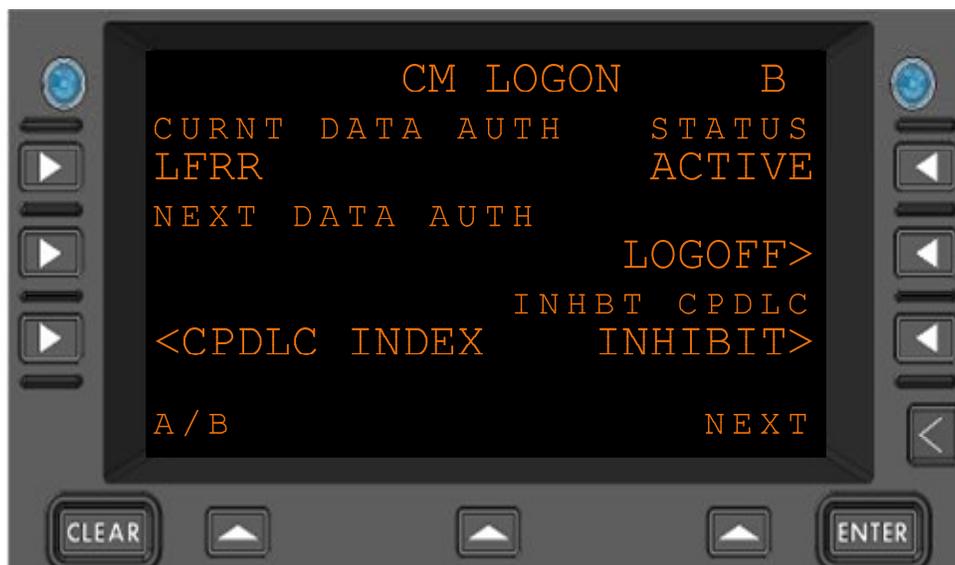


Figure 7.2.5-2 CM LOGON Menu

7.2.6 Contact Request

If the active facility (EBBU) sent a contact request to a second available facility (LFRR) and that facility responded with a CM Logon Response the second facility would become the active facility and this would be viewable from the CM Logon Menu. This is shown in **Figure 7.2.6-1**



Figure 7.2.6-1 CM LOGON Menu

7.3 Supported ATN CPDLC Messages

7.3.1 Uplink Messages Supported by Dlink+ w/CPDLC

The list below defines those uplink messages supported by Dlink+ w/CPDLC when in RTCA DO280B ATN Operational Mode. When in LINK 2000 ATN Operational Mode, supported uplink messages are limited to those messages that are shaded in yellow. (See Section 7.1.1 for information on how the ATN Operational Mode can be changed.)

Uplink Message Element	Message Element Format	Message Intent
0	UNABLE	UNABLE - Indicates that ATC cannot comply with the request.
1	STANDBY	STANDBY - Indicates that ATC has received the message and will respond.
2	REQUEST DEFERRED	REQUEST DEFERRED - Indicates that ATC has received the request but it has been deferred until later.
3	ROGER	ROGER - Indicates that ATC has received and understood the message.
4	AFFIRM	AFFIRM - Yes.
5	NEGATIVE	NEGATIVE - No.
6	EXPECT 25000FT	EXPECT [level] - Notification that a level change instruction should be expected.
7	EXPECT CLIMB AT 1232	EXPECT CLIMB AT [time] - Notification that an instruction should be expected for the aircraft to commence climb at the specified time.
8	EXPECT CLIMB AT KXX	EXPECT CLIMB AT [position] - Notification that an instruction should be expected for the aircraft to commence climb at the specified position.
9	EXPECT DESCENT AT 1232	EXPECT DESCENT AT [time] - Notification that an instruction should be expected for the aircraft to commence descent at the specified time.
10	EXPECT DESCENT AT XXZ	EXPECT DESCENT AT [position] - Notification that an instruction should be expected for the aircraft to commence descent at the specified position.
11	EXPECT CRUISE CLIMB AT 1232	EXPECT CRUISE CLIMB AT [time] - Notification that an instruction should be expected for the aircraft to commence cruise climb at the specified time.
12	EXPECT CRUISE CLIMB AT XYZ	EXPECT CRUISE CLIMB AT [position] - Notification that an instruction should be expected for the aircraft to commence cruise climb at the specified position.
13	AT 1232 EXPECT CLIMB TO 25000FT	AT [time] EXPECT CLIMB TO [level] - Notification that an instruction should be expected for the aircraft to commence climb at the specified time to the specified level.
14	AT XYZ EXPECT CLIMB TO 25000FT	AT [position] EXPECT CLIMB TO [level] - Notification that an instruction should be expected for the aircraft to commence climb at the specified position to the specified level.
15	AT 1232 EXPECT DESCENT TO 25000FT	AT [time] EXPECT DESCENT TO [level] - Notification that an instruction should be expected for the aircraft to commence descent at the specified time to the specified level.

Uplink Message Element	Message Element Format	Message Intent
16	AT XYZ EXPECT DESCENT TO 25000FT	AT [position] EXPECT DESCENT TO [level] -Notification that an instruction should be expected for the aircraft to commence descent at the specified position to the specified level.
17	AT 1232 EXPECT CRUISE CLIMB TO 25000FT	AT [time] EXPECT CRUISE CLIMB TO [level] - Notification that an instruction should be expected for the aircraft to commence cruise climb at the specified time to the specified level.
18	AT XYZ EXPECT CRUISE CLIMBE TO 25000FT	AT [position] EXPECT CRUISE CLIMBE TO [level] - Notification that an instruction should be expected for the aircraft to commence cruise climb at the specified position to the specified level.
19	MAINTAIN 25000FT	MAINTAIN [level] - Instruction to maintain the specified level.
20	CLIMB TO 25000FT	CLIMB TO [level] - Instruction that a climb to a specified level is to commence and once reached the specified level is to be maintained.
21	AT 1232 CLIMB TO 25000FT	AT [time] CLIMB TO [level] - Instruction that at the specified time a climb to the specified level is to commence and once reached the specified level is to be maintained.
22	AT XYZ CLIMB TO 25000FT	AT [position] CLIMB TO [level] - Instruction that at the specified position a climb to the specified level is to commence and once reached the specified level is to be maintained.
23	DESCEND TO 25000FT	DESCEND TO [level] - Instruction that a descent to a specified level is to commence and once reached the specified level is to be maintained.
24	AT 1232 DESCEND TO 25000FT	AT [time] DESCEND TO [level] - Instruction that at a specified time a descent to a specified level is to commence and once reached the specified level is to be maintained.
25	AT XYZ DESCEND TO 25000FT	AT [position] DESCEND TO [level] - Instruction that at the specified position a descent to the specified level is to commence and once reached the specified level is to be maintained.
26	CLIMB TO REACH [level] BY 1232	CLIMB TO REACH [level] BY [time] - Instruction that a climb is to commence at a rate such that the specified level is reached at or before the specified time.
27	CLIMB TO REACH 25000FT BY XYZ	CLIMB TO REACH [level] BY [postion] -Instruction that a climb is to commence at a rate such that the specified level is reached at or before the specified position.
28	DESCEND TO REACH 25000FT BY 1232	DESCEND TO REACH [level] BY [time] -Instruction that a descent is to commence at a rate such that the specified level is reached at or before the specified time.
29	DESCEND TO REACH 25000FT BY XYZ	DESCEND TO REACH [level] BY [position] -Instruction that a descent is to commence at a rate such that the specified level is reached at or before the specified position.
30	MAINTAIN BLOCK 25000FT TO 25000FT	MAINTAIN BLOCK [level] TO [level] - Instruction that a level within the defined vertical range specified is to be maintained.
31	CLIMB TO AND MAINTAIN BLOCK 25000FT TO 30000FT	CLIMB TO AND MAINTAIN BLOCK [level] TO [level] - Instruction that a climb to a level within the vertical range

Uplink Message Element	Message Element Format	Message Intent
		defined is to commence.
32	DESCEND TO AND MAINTAIN BLOCK 25000FT TO 20000FT	DESCEND TO AND MAINTAIN BLOCK [level] TO [level] - Instruction that a descent to a level within the vertical range defined is to commence.
34	CRUISE CLIMB TO 25000FT	CRUISE CLIMB TO [level] - Instruction that a cruise climb is to commence and continue until the specified level is reached.
35	CRUISE CLIMB TO 25000FT	CRUISE CLIMB ABOVE [level] - Instruction that a cruise climb can commence once above the specified level.
36	EXPEDITE CLIMB TO 25000FT	EXPEDITE CLIMB TO [level] - Instruction that the climb to the specified level should be made at the aircraft's best rate.
37	EXPEDITE DESCENT TO 25000FT	EXPEDITE DESCENT TO [level] - Instruction that the descent to the specified level should be made at the aircraft's best rate.
38	IMMEDIATELY CLIMB TO 25000FT	IMMEDIATELY CLIMB TO [level] – Urgent instruction to immediately climb to the specified level.
39	IMMEDIATELY DESCEND TO 25000FT	IMMEDIATELY DESCEND TO [level] – Urgent instruction to immediately descend to the specified level.
42	EXPECT TO CROSS XYZ AT 25000FT	EXPECT TO CROSS [position] AT [level] -Notification that a level change instruction should be expected which will require the specified position to be crossed at the specified level.
43	EXPECT TO CROSS XYZ AT OR ABOVE 25000FT	EXPECT TO CROSS [position] AT OR ABOVE [level] - Notification that a level change instruction should be expected which will require the specified position to be crossed at or above the specified level.
44	EXPECT TO CROSS XYZ AT OR BELOW 25000FT	EXPECT TO CROSS [position] AT OR BELOW [level] - Notification that a level change instruction should be expected which will require the specified position to be crossed at or below the specified level.
45	EXPECT TO CROSS XYZ AT AND MAINTAIN 25000FT	EXPECT TO CROSS [position] AT AND MAINTAIN [level] - Notification that a level change instruction should be expected which will require the specified position to be crossed at the specified level which is to be maintained subsequently.
46	CROSS XYZ AT 25000FT	CROSS [position] AT [level] - Instruction that the specified position is to be crossed at the specified level. This may require the aircraft to modify its climb or descent profile.
47	CROSS XYZ AT OR ABOVE 25000FT	CROSS [position] AT OR ABOVE [level] -Instruction that the specified position is to be crossed at or above the specified level.
48	CROSS XYZ AT OR ABOVE 25000FT	CROSS [position] AT OR BELOW [level] - Instruction that the specified position is to be crossed at or below the specified level.
49	CROSS XYZ AT AND MAINTAIN 25000FT	CROSS [position] AT AND MAINTAIN [level] -Instruction that the specified position is to be crossed at the specified level and that level is to be maintained when reached.
50	CROSS XYZ BETWEEN 20000FT AND 25000FT	CROSS [position] BETWEEN [level] AND [level] - Instruction that the specified position is to be crossed at a level between the specified levels.

Uplink Message Element	Message Element Format	Message Intent
51	CROSS XYZ AT 1232	CROSS [position] AT [time] - Instruction that the specified position is to be crossed at the specified time.
52	CROSS XYZ AT OR BEFORE 1232	CROSS [position] AT OR BEFORE [time] -Instruction that the specified position is to be crossed at or before the specified time.
53	CROSS XYZ AT OR AFTER 1232	CROSS [position] AT OR AFTER [time] -Instruction that the specified position is to be crossed at or after the specified time.
54	CROSS XYZ BETWEEN 1230 AND 1250	CROSS [position] BETWEEN [time] AND [time] - Instruction that the specified position is to be crossed at or after the specified time.
55	CROSS XYZ AT 200KTS	CROSS [position] AT [speed] - Instruction that the specified position is to be crossed at the specified speed and the specified speed is to be maintained until further advised.
56	CROSS XYZ AT OR LESS THAN 200KTS	CROSS [position] AT OR LESS THAN [speed] - Instruction that the specified position is to be crossed at a speed equal to or less than the specified speed and the specified speed or less is to be maintained until further advised.
57	CROSS XYZ AT OR GREATER THAN 200KTS	CROSS [position] AT OR GREATER THAN [speed] - Instruction that the specified position is to be crossed at a speed equal to or greater than the specified speed and the specified speed or greater is to be maintained until further advised.
58	CROSS XYZ AT 1232 AT 25000FT	CROSS [position] AT [time] AT [level] - Instruction that the specified position is to be crossed at the specified time and the specified level.
59	CROSS XYZ AT OR BEFORE 1232 AT 25000FT	CROSS [position] AT OR BEFORE [time] AT [level] - Instruction that the specified position is to be crossed at or before the specified time and at the specified level.
60	CROSS XYZ AT OR AFTER 1232 AT 25000FT	CROSS [position] AT OR AFTER [time] AT [level] - Instruction that the specified position is to be crossed at or after the specified time and at the specified level.
61	CROSS XYZ AT AND MAINTAIN 25000FT AT 200KTS	CROSS [position] AT AND MAINTAIN [level] AT [speed] - Instruction that the specified position is to be crossed at the specified level and speed, and the level and speed are to be maintained.
62	AT 1232 CROSS XYZ AT AND MAINTAIN 25000FT	AT [time] CROSS [position] AT AND MAINTAIN [level] - Instruction that at the specified time the specified position is to be crossed at the specified level and the level is to be maintained.
63	AT 1232 CROSS XYZ AT AND MAINTAIN 25000FT AT 200KTS	AT [time] CROSS [position] AT AND MAINTAIN [level] AT [speed] - Instruction that at the specified time the specified position is to be crossed at the specified level and speed, and the level and speed are to be maintained.
64	OFFSET 200KM LEFT OF ROUTE	OFFSET [specifiedDistance] [direction] OF ROUTE - Instruction to fly a parallel track to the cleared route at a displacement of the specified distance in the specified direction.
65	AT XYZ OFFSET 200KM LEFT OF ROUTE	AT [position] OFFSET [specifiedDistance] [direction] OF ROUTE - Instruction to fly a parallel track to the cleared route at a displacement of the specified distance in the specified direction and commencing at the specified position.

Uplink Message Element	Message Element Format	Message Intent
66	AT 1232 OFFSET 200KM LEFT OF ROUTE	AT [time] OFFSET [specifiedDistance] [direction] OF ROUTE - Instruction to fly a parallel track to the cleared route at a displacement of the specified distance in the specified direction and commencing at the specified time.
67	PROCEED BACK ON ROUTE	PROCEED BACK ON ROUTE - Instruction that the cleared flight route is to be rejoined.
68	REJOIN ROUTE BY XYZ	REJOIN ROUTE BY [position] - Instruction that the cleared flight route is to be rejoined at or before the specified position.
69	REJOIN ROUTE BY 1232	REJOIN ROUTE BY [time] - Instruction that the cleared flight route is to be rejoined at or before the specified time.
70	EXPECT BACK ON ROUTE BY XYZ	EXPECT BACK ON ROUTE BY [position] -Notification that a clearance may be issued to enable the aircraft to rejoin the cleared route at or before the specified position.
71	EXPECT BACK ON ROUTE BY 1232	EXPECT BACK ON ROUTE BY [time] -Notification that a clearance may be issued to enable the aircraft to rejoin the cleared route at or before the specified time.
72	RESUME OWN NAVIGATION	RESUME OWN NAVIGATION - Instruction to resume own navigation following a period of tracking or heading clearances. May be used in conjunction with an instruction on how or where to rejoin the cleared route.
73	EBBU CLEARED TO: AAAAA	[DepartureClearance] - Notification to the aircraft of the instructions to be followed from departure until the specified clearance limit.
74	PROCEED DIRECT TO XYZ	PROCEED DIRECT TO [position] - Instruction to proceed directly from its present position to the specified position.
75	WHEN ABLE PROCEED DIRECT TO XYZ	WHEN ABLE PROCEED DIRECT TO [position] - Instruction to proceed, when able, directly to the specified position.
76	AT 1232 PROCEED DIRECT TO XYZ	AT [time] PROCEED DIRECT TO [position] - Instruction to proceed, at the specified time, directly to the specified position.
77	AT ABA PROCEED DIRECT TO XYZ	AT [position] PROCEED DIRECT TO [position] - Instruction to proceed, at the specified position, directly to the next specified position.
78	AT 2500FT PROCEED DIRECT TO XYZ	AT [level] PROCEED DIRECT TO [position] -Instruction to proceed, upon reaching the specified level, directly to the specified position.
79	CLEARED TO XYZ VIA -options selected in the route clearance will be viewable when the message is opened from the CPDLC message log	CLEARED TO [position] VIA [routeClearance] -Instruction to proceed to the specified position via the specified route.
80	CLEARED -options selected in the route clearance will be viewable when the message is opened from the CPDLC message log	CLEARED [routeClearance] - Instruction to proceed via the specified route.
81	CLEARED ARRIVAL, XYZ.ABC	CLEARED [procedureName] - Instruction to proceed in accordance with the specified procedure.
82	CLEARED TO DEVIATE UP TO 200KM LEFT OF ROUTE	CLEARED TO DEVIATE UP TO [specifiedDistance] [direction] OF ROUTE - Approval to deviate up to the specified distance from the cleared route in the specified

Uplink Message Element	Message Element Format	Message Intent
		direction.
83	AT XYZ CLEARED -options selected in the route clearance will be viewable when the message is opened from the CPDLC message log	AT [position] CLEARED [routeClearance] -Instruction to proceed from the specified position via the specified route.
84	AT XYZ CLEARED ARRIVAL, XYZ.ABC	AT [position] CLEARED [procedureName] -Instruction to proceed from the specified position via the specified procedure.
85	EXPECT -options selected in the route clearance will be viewable when the message is opened from the CPDLC message log	EXPECT [routeClearance] - Notification that a clearance to fly on the specified route may be issued.
86	AT XYZ EXPECT -options selected in the route clearance will be viewable when the message is opened from the CPDLC message log	AT [position] EXPECT [routeClearance] - Notification that a clearance to fly on the specified route from the specified position may be issued.
87	EXPECT DIRECT TO XYZ	EXPECT DIRECT TO [position] – Notification that a clearance to fly directly to the specified position may be issued.
88	AT ABA EXPECT DIRECT TO XYZ	AT [position] EXPECT DIRECT TO [position] -Notification that a clearance to fly directly from the first specified position to the next specified position may be issue
89	AT 1232 EXPECT DIRECT TO XYZ	AT [time] EXPECT DIRECT TO [position] -Notification that a clearance to fly directly to the specified position commencing at the specified time may be issued.
90	AT 25000FT EXPECT DIRECT TO XYZ	AT [level] EXPECT DIRECT TO [position] -Notification that a clearance to fly directly to the specified position commencing when the specified level is reached may be issued.
91	HOLD AT XYZ MAINTAIN 25000FT INBOUND TRACK 010T LEFT TURNS 100KM	HOLD AT [position] MAINTAIN [level] INBOUND TRACK [degrees][direction] TURNS [legtype] -Instruction to enter a holding pattern with the specified characteristics at the specified position and level.
92	HOLD AT XYZ AS PUBLISHED MAINTAIN 25000FT	HOLD AT [position] AS PUBLISHED MAINTAIN [level] - Instruction to enter a holding pattern with the published characteristics at the specified position and level.
93	EXPECT FURTHER CLEARANCE AT 1232	EXPECT FURTHER CLEARANCE AT [time] -Notification that an onwards clearance may be issued at the specified time.
94	TURN LEFT HEADING 010T	TURN [direction] HEADING [degrees] - Instruction to turn left or right as specified on to the specified heading.
95	TURN LEFT GROUND TRACK 010T	TURN [direction] GROUND TRACK [degrees] -Instruction to turn left or right as specified on to the specified track.
96	CONTINUE PRESENT HEADING	CONTINUE PRESENT HEADING - Instruction to turn left or right as specified on to the specified track.
97	AT XYZ FLY HEADING 010T	AT [position] FLY HEADING [degrees] -Instruction to continue to fly on the current heading.
98	IMMEDIATELY TURN LEFT HEADING 010T	IMMEDIATELY TURN [direction] HEADING [degrees] - Instruction to turn immediately left or right as specified on to the specified heading.
99	EXPECT ARRIVAL, XYZ.ABC	EXPECT [procedureName] - Notification that a clearance may be issued for the aircraft to fly the specified

Uplink Message Element	Message Element Format	Message Intent
		procedure.
100	AT 1232 EXPECT 200KTS	AT [time] EXPECT [speed] - Notification that a speed instruction may be issued to be effective at the specified time.
101	AT XYZ EXPECT 200KTS	AT [position] EXPECT [speed] - Notification that a speed instruction may be issued to be effective at the specified position.
102	AT 25000FT EXPECT 200KTS	AT [level] EXPECT [speed] - Notification that a speed instruction may be issued to be effective at the specified level.
103	AT 1232 EXPECT 200KTS TO 100KTS	AT [time] EXPECT [speed] TO [speed] -Notification that a speed range instruction may be issued to be effective at the specified time.
104	AT XYZ EXPECT 200KTS TO 100KTS	AT [position] EXPECT [speed] TO [speed] -Notification that a speed range instruction may be issued to be effective at the specified position.
105	AT 25000FT EXPECT 200KTS TO 100KTS	AT [level] EXPECT [speed] TO [speed] -Notification that a speed range instruction may be issued to be effective at the specified level.
106	MAINTAIN 200KTS	MAINTAIN [speed] - Instruction that the specified speed is to be maintained.
107	MAINTAIN PRESENT SPEED	MAINTAIN PRESENT SPEED - Instruction that the present speed is to be maintained.
108	MAINTAIN 200KTS OR GREATER	MAINTAIN [speed] OR GREATER - Instruction that the specified speed or a greater speed is to be maintained.
109	MAINTAIN 200KTS OR LESS	MAINTAIN [speed] OR LESS - Instruction that the specified speed or a lesser speed is to be maintained.
110	MAINTAIN 200KTS TO 100KTS	MAINTAIN [speed] TO [speed] - Instruction that a speed within the specified range is to be maintained.
111	INCREASE SPEED TO 200KTS	INCREASE SPEED TO [speed] - Instruction that the present speed is to be increased to the specified speed and maintained until further advised.
112	INCREASE SPEED TO 200KTS OR GREATER	INCREASE SPEED TO [speed] OR GREATER - Instruction that the present speed is to be increased to the specified speed or greater, and maintained at or above the specified speed until further advised.
113	REDUCE SPEED TO 200KTS	REDUCE SPEED TO [speed] - Instruction that the present speed is to be reduced to the specified speed and maintained until further advised.
114	REDUCE SPEED TO 200KTS OR LESS	REDUCE SPEED TO [speed] OR LESS -Instruction that the present speed is to be reduced to the specified speed or less and maintained at or below the specified speed until further advised.
115	DO NOT EXCEED 200KTS	DO NOT EXCEED [speed] - Instruction that the specified speed is not to be exceeded.
116	RESUME NORMAL SPEED	RESUME NORMAL SPEED - Notification that the aircraft need no longer comply with the previously issued speed restriction.
117	CONTACT LFRR CENTER 136.975MHZ	CONTACT [unitname] [frequency] - Instruction that the ATS unit with the specified ATS unit name is to be contacted on the specified frequency.

Uplink Message Element	Message Element Format	Message Intent
118	AT XYZ CONTACT EBBU CENTER 136.975MHZ	AT [position] CONTACT [unitname] [frequency] - Instruction that at the specified position the ATS unit with the specified ATS unit name is to be contacted on the specified frequency.
119	AT 1232 CONTACT EBBU CENTER 136.975MHZ	AT [time] CONTACT [unitname] [frequency] -Instruction that at the specified time the ATS unit with the specified ATS unit name is to be contacted on the specified frequency.
120	MONITOR EBBU CENTER 136.975MHZ	MONITOR [unitname] [frequency] – Instruction that the ATS unit with the specified ATS unit name is to be monitored on the specified frequency.
121	AT XYZ MONITOR EBBU CENTER 136.975MHZ	AT [position] MONITOR [unitname] [frequency] - Instruction that at the specified position the ATS unit with the specified ATS unit name is to be monitored on the specified frequency.
122	AT 1232 MONITOR EBBU CENTER 136.975MHZ	AT [time] MONITOR [unitname] [frequency] -Instruction that at the specified time the ATS unit with the specified ATS unit name is to be monitored on the specified frequency.
123	SQUAWK 0123	SQUAWK [code] - Instruction that the specified code (SSR code) is to be selected.
124	STOP SQUAWK	STOP SQUAWK - Instruction that the SSR transponder responses are to be disabled.
125	SQUAWK MODE CHARLIE	SQUAWK MODE CHARLIE - Instruction that the SSR transponder responses should include level information.
126	SQUAWK MODE CHARLIE	STOP SQUAWK MODE CHARLIE - Instruction that the SSR transponder responses should no longer include level information.
127	Report Back On Route	Report Back On Route - Instruction to report when the aircraft is back on the cleared route.
128	Report Leaving 25000FT	Report Leaving [LEVEL] - Instruction to report when the aircraft has left the specified level.
129	Report Leaving 25000FT	Report Maintaining [LEVEL] - Instruction to report when the aircraft is in level flight at the specified level.
130	Report Passing XYZ	Report Passing [POSITION] - Instruction to report when the aircraft has passed the specified position.
132	Report Position	Report Position - Instruction to report the present position.
133	Report Present Level	Report Present Level - Instruction to report the present level.
135	Confirm Assigned Level	Confirm Assigned Level - Instruction to confirm and acknowledge the currently assigned level.
136	Confirm Assigned Level	Confirm Assigned Speed - Instruction to confirm and acknowledge the currently assigned speed.
138	Confirm Time Over reported Waypoint	Confirm Time Over reported Waypoint -Instruction to confirm the previously reported time over the last reported waypoint.
139	Confirm Reported Waypoint	Confirm Reported Waypoint - Instruction to confirm the identity of the previously reported waypoint.
140	Confirm Next Waypoint	Confirm Next Waypoint - Instruction to confirm the identity of the next waypoint.

Uplink Message Element	Message Element Format	Message Intent
141	Confirm Next Waypoint ETA	Confirm Next Waypoint ETA - Instruction to confirm the previously reported estimated time at the next waypoint.
142	Confirm Next Waypoint ETA	Confirm Ensuing Waypoint - Instruction to confirm the identity of the next but one waypoint.
144	Confirm Squawk	Confirm Squawk - Instruction to report the selected (SSR) code.
145	Report Heading	Report Heading - Instruction to report the present heading.
146	Report Ground Track	Report Ground Track - Instruction to report the present ground track.
147	Request Position Report	Request Position Report - Instruction to make a position report.
148	When Can You Accept 25000FT	When Can You Accept [LEVEL] - Request for the earliest time at which the specified level can be accepted.
151	When Can You Accept 200KTS	When Can You Accept [SPEED] - Instruction to report the earliest time when the specified speed can be accepted.
152	When Can You Accept 200KM LEFT Offset	When Can You Accept [SPECIFIED DISTANCE] [DIRECTION] Offset - Instruction to report the earliest time when the specified offset track can be accepted.
153	ALTIMETER 23.00HG	ALTIMETER [altimeter] - ATS advisory that the altimeter setting should be the specified setting.
154	RADAR SERVICE TERMINATED	RADAR SERVICE TERMINATED – ATS advisory that the radar service is terminated.
155	RADAR CONTACT XYZ	RADAR CONTACT [position] - ATS advisory that radar contact has been established at the specified position.
156	RADAR CONTACT LOST	RADAR CONTACT LOST - ATS advisory that radar contact has been lost.
157	CHECK STUCK MICROPHONE 136.975MHZ	CHECK STUCK MICROPHONE [frequency] -Instruction that a continuous transmission is detected on the specified frequency. Check the microphone button.
158	CHECK STUCK MICROPHONE 136.975MHZ	ATIS [atiscodes] - ATS advisory that the ATIS information identified by the specified code is the current ATIS information.
159	ERROR INSUFFICIENT RESOURCES	ERROR [errorInformation] - A system generated message notifying that the ground system has detected an error.
160	A UM160 WILL NOT SHOW UP IN THE CPDLC MESSAGE LOG. WHEN ONE IS RECEIVED THE 'NEXT DATA AUTH' FIELD ON SCREEN B OF THE 'CM LOGON' PAGE WILL CONTAIN A FACILITY ID OF THE NEXT DATA AUTHORITY.	NEXT DATA AUTHORITY [facility] – Notification to the avionics that the specified data authority is the next data authority. If no data authority is specified, this indicates that any previously specified next data authority is no longer valid.
161	END SERVICE	END SERVICE - Notification to the avionics that the data link connection with the current data authority is being terminated.
162	MESSAGE NOT SUPPORTED BY THIS ATS UNIT	MESSAGE NOT SUPPORTED BY THIS ATS UNIT - Notification that the ground system does not support this message.
163	LFRR	[facilitydesignator] - Notification to the pilot of an ATSU identifier.
164	WHEN READY	WHEN READY - The associated instruction may be complied with at any future time.

Uplink Message Element	Message Element Format	Message Intent
165	THEN	THEN - Used to link two messages, indicating the proper order of execution of clearances/ instructions.
166	DUE TO CROSSING TRAFFIC	DUE TO [traffictype]TRAFFIC - The associated instruction is issued due to traffic considerations.
167	DUE TO AIRSPACE RESTRICTION	DUE TO AIRSPACE RESTRICTION – The associated instruction is issued due to airspace restrictions.
168	DISREGARD	DISREGARD - The indicated communication should be ignored.
169	Up to 256 alpha-numeric characters and symbols	[freetext]
170	Up to 256 alpha-numeric characters and symbols	[freetext]
171	CLIMB AT 20000FPM MINIMUM	CLIMB AT [verticalRate] MINIMUM – Instruction to climb at not less than the specified rate.
172	CLIMB AT 25000FPM MAXIMUM	CLIMB AT [verticalRate] MAXIMUM - Instruction to climb at not above the specified rate.
173	DESCEND AT 7000FPM MINIMUM	DESCEND AT [verticalRate] MINIMUM -Instruction to descend at not less than the specified rate.
174	DESCEND AT 15000FPM MAXIMUM	DESCEND AT [verticalRate] MAXIMUM -Instruction to descend at not above the specified rate.
175	Report Reaching 25000FT	Report Reaching [LEVEL] - Instruction to report when the aircraft has reached the specified level.
176	MAINTAIN OWN SEPARATION AND VMC	MAINTAIN OWN SEPARATION AND VMC -Notification that the pilot is responsible for maintaining separation from other traffic and is also responsible for maintaining visual meteorological conditions.
177	AT PILOTS DISCRETION	AT PILOTS DISCRETION - Used in conjunction with a clearance/instruction to indicate that the pilot may execute when prepared to do so.
179	SQUAWK IDENT	SQUAWK IDENT - Instruction that the 'ident' function on the SSR transponder is to be actuated.
180	Report Reaching Block 20000FT to 25000FT	Report Reaching Block [LEVEL] to [LEVEL] -Instruction to report when the aircraft is within the specified vertical range.
181	Report Distance TO XYZ	Report Distance [TO/FROM] [POSITION] -Instruction to report the present distance to or from the specified position.
182	Confirm ATIS Code	Confirm ATIS Code - Instruction to report the identification code of the last ATIS received.
183	Up to 256 alpha-numeric characters and symbols	[freetext]
184	At Time 1232 Report Distance FROM XYZ	At Time [TIME] Report Distance [TO/FROM] [POSITION] - Instruction to report at the specified time the distance to or from the specified position.
185	AFTER PASSING XYZ CLIMB TO 25000FT	AFTER PASSING [position] CLIMB TO [level] -Instruction that after passing the specified position a climb to the specified level is to commence and once reached the specified level is to be maintained.
186	AFTER PASSING XYZ DESCEND TO 20000FT	AFTER PASSING [position] DESCEND TO [level] - Instruction that after passing the specified position a descent to the specified level is to commence and once reached the specified level is to be maintained.
187	Up to 256 alpha-numeric characters and symbols	[freetext]

Uplink Message Element	Message Element Format	Message Intent
188	AFTER PASSING XYZ MAINTAIN 200KTS	AFTER PASSING [position] MAINTAIN [speed] - Instruction that after passing the specified position the specified speed is to be maintained.
189	ADJUST SPEED TO 200KTS	ADJUST SPEED TO [speed] - Instruction that the present speed is to be changed to the specified speed.
190	FLY HEADING 150T	FLY HEADING [degrees] - Instruction to fly on the specified heading.
191	ALL ATS TERMINATED	ALL ATS TERMINATED - ATS advisory that the aircraft is entering airspace in which no air traffic services are provided and all existing air traffic services are terminated.
192	REACH 25000FT BY 1232	REACH [level] BY [time] - Instruction that a change of level is to continue, but at a rate such that the specified level is reached at or before the specified time.
193	IDENTIFICATION LOST	IDENTIFICATION LOST - Notification that radar identification has been lost.
195	Up to 256 alpha-numeric characters and symbols	[freetext]
196	Up to 256 alpha-numeric characters and symbols	[freetext]
197	Up to 256 alpha-numeric characters and symbols	[freetext]
198	Up to 256 alpha-numeric characters and symbols	[freetext]
199	Up to 256 alpha-numeric characters and symbols	[freetext]
200	Report Reaching	Report Reaching - Instruction used in conjunction with a level clearance to report reaching the level assigned.
203	Up to 256 alpha-numeric characters and symbols	[freetext]
205	Up to 256 alpha-numeric characters and symbols	[freetext]
208	Up to 256 alpha-numeric characters and symbols	[freetext]
209	REACH 25000FT BY XYZ	REACH [level] BY [position] - Instruction that a change of level is to continue, but at a rate such that the specified level is reached at or before the specified position.
210	IDENTIFIED XYZ	IDENTIFIED [position] - ATS advisory that the aircraft has been identified on radar at the specified position.
211	REQUEST FORWARDED	REQUEST FORWARDED - Indicates that the ATC has received the request and has passed it to the next control authority.
212	EBBU ATIS A CURRENT	[facilitydesignation] ATIS [atiscode] CURRENT -ATS advisory that the specified ATIS information at the specified airport is current.
213	EBBU ALTIMETER 800.0HPA	[facilitydesignation] ALTIMETER [altimeter] – ATS advisory that the specified altimeter setting relates to the specified facility.
214	RVR RUNWAY 20L 200FT	RVR RUNWAY [runway] [rvr] - ATS advisory that indicates the RVR value for the specified runway.
215	TURN LEFT 200	TURN [direction][degrees] - Instruction to turn a specified number of degrees left or right.
216	Request Flight Plan	Request Flight Plan - Instruction to file a flight plan.
217	Report Arrival	Report Arrival - Instruction to report that the aircraft has landed.

Uplink Message Element	Message Element Format	Message Intent
218	REQUEST ALREADY RECEIVED	REQUEST ALREADY RECEIVED - Indicates to the pilot that the request has already been received on the ground.
219	STOP CLIMB AT 25000FT	STOP CLIMB AT [level] - Instruction to stop the climb below the previously assigned level.
220	STOP DESCENT AT 25000FT	STOP DESCENT AT [level] - Instruction to stop the descent above the previously assigned level.
221	STOP TURN HEADING 150T	STOP TURN HEADING [degrees] - Instruction to stop turn at the specified heading prior to reaching the previously assigned heading.
222	NO SPEED RESTRICTION	NO SPEED RESTRICTION - Notification that the aircraft may keep its preferred speed without restriction.
223	REDUCE TO MINIMUM APPROACH SPEED	REDUCE TO MINIMUM APPROACH SPEED -Instruction to reduce present speed to the minimum safe approach speed.
224	NO DELAY EXPECTED	NO DELAY EXPECTED - ATS advisory that no delay is expected.
225	DELAY NOT DETERMINED	DELAY NOT DETERMINED - ATS advisory that the expected delay has not been determined.
226	EXPECTED APPROACH TIME 1245	EXPECTED APPROACH TIME [time] – ATS advisory that the aircraft may expect to be cleared to commence its approach procedure at the specified time.
227	LOGICAL ACKNOWLEDGMENT	LOGICAL ACKNOWLEDGMENT - Confirmation to the aircraft system that the ground system has received the message to which the logical acknowledgment refers and found it acceptable for display to the responsible person.
228	Report ETA XYZ	Report ETA [POSITION] - Instruction to report the estimated time of arrival at the specified position.
229	Report Alternate Aerodrome	Report Alternate Aerodrome - Instruction to report the preferred alternate aerodrome for landing.
230	IMMEDIATELY	IMMEDIATELY - The associated instruction is to be complied with immediately.
231	State Preferred Level	State Preferred Level - Instruction to indicate the pilot's preferred level.
232	State Top Of Descent	State Top Of Descent - Instruction to indicate the pilot's preferred time and/or position to commence descent to the aerodrome of intended arrival.
233	USE OF LOGICAL ACKNOWLEDGMENT PROHIBITED	USE OF LOGICAL ACKNOWLEDGMENT PROHIBITED - Notification to the pilot that messages sent requiring a logical acknowledgment will not be accepted by this ground system.
234	FLIGHT PLAN NOT HELD	FLIGHT PLAN NOT HELD - Notification that the ground system does not have a flight plan for that aircraft.
236	LEAVE CONTROLLED AIRSPACE	LEAVE CONTROLLED AIRSPACE – Instruction to leave controlled airspace.
237	REQUEST AGAIN WITH NEXT UNIT	REQUEST AGAIN WITH NEXT UNIT – Indicates that the request cannot be responded to by the current unit, and that it should be requested from the next unit

7.3.2 Downlink Messages Supported by Dlink+ w/CPDLC

The table below defines those downlink messages supported by Dlink+ w/CPDLC when in RTCA DO280B ATN Operational Mode. When in LINK 2000 ATN Operational Mode, supported downlink messages are limited to those messages that are shaded in yellow. (See Section 7.1.1) for information on how the ATN Operational Mode can be changed.)

Downlink Message Element	Message Element Format	Message Intent
0	WILCO	WILCO - The instruction is understood and will be complied with.
1	UNABLE	UNABLE - The instruction cannot be complied with.
2	STANDBY	STANDBY - Wait for a reply.
3	ROGER	ROGER - Message received and understood.
4	AFFIRM	AFFIRM - Yes.
5	NEGATIVE	NEGATIVE - No.
6	REQUEST 25000FT	REQUEST [level] - Request to fly at the specified level.
7	REQUEST BLOCK 20000FT TO 25000FT	REQUEST BLOCK [level] TO [level] - Request to fly at a level within the specified vertical range.
8	REQUEST CRUISE CLIMB TO 25000FT	REQUEST CRUISE CLIMB TO [level] – Request to cruise climb to the specified level.
9	REQUEST CLIMB TO 25000FT	REQUEST CLIMB TO [level] - Request to climb to the specified level.
10	REQUEST DESCENT TO 20000FT	REQUEST DESCENT TO [level] - Request to descend to the specified level.
11	AT XYZ REQUEST CLIMB TO 25000FT	AT [position] REQUEST CLIMB TO [level] -Request that at the specified position a climb to the specified level be approved.
12	AT ABC REQUEST DESCENT TO 15000FT	AT [position] REQUEST DESCENT TO [level] -Request that at the specified position a descent to the specified level be approved.
13	AT 1254 REQUEST CLIMB TO 25000FT	AT [time] REQUEST CLIMB TO [level] – Request that at the specified time a climb to the specified level be approved.
14	AT 1032 REQUEST DESCENT TO 22000FT	AT [time] REQUEST DESCENT TO [level] -Request that at the specified time a descent to the specified level be approved.
15	REQUEST OFFSET 200KM LEFT OF ROUTE	REQUEST OFFSET [specifiedDistance] [direction] OF ROUTE - Request that a parallel track, offset from the cleared track by the specified distance in the specified direction, be approved.
16	AT ABC REQUEST OFFSET 200KM LEFT OF ROUTE	AT [position] REQUEST OFFSET [specifiedDistance] [direction] OF ROUTE -Request that a parallel track, offset from the cleared track by the specified distance in the specified direction, be approved from the specified position.
17	AT 1221 REQUEST OFFSET 150KM RIGHT OF ROUTE	AT [time] REQUEST OFFSET [specifiedDistance] [direction] OF ROUTE - Request that a parallel track, offset from the cleared track by the specified distance in the specified direction, be approved from the specified time.

Downlink Message Element	Message Element Format	Message Intent
18	REQUEST 200KTS	REQUEST [speed] - Request to fly at the specified speed.
19	REQUEST 150KTS TO 200KTS	REQUEST [speed] TO [speed] - Request to fly within the specified speed range.
20	REQUEST VOICE CONTACT	REQUEST VOICE CONTACT - Request for voice contact.
21	REQUEST VOICE CONTACT 136.975	REQUEST VOICE CONTACT [frequency] -Request for voice contact on the specified frequency.
22	REQUEST DIRECT TO XYZ	REQUEST DIRECT TO [position] - Request to track from the present position direct to the specified position.
23	REQUEST ARRIVAL, XYZ.ABC	REQUEST [procedureName] - Request for the specified procedure clearance.
25	REQUEST ARRIVAL, XYZ.ABC CLEARANCE	REQUEST [clearanceType] CLEARANCE -Request for a clearance.
27	REQUEST WEATHER DEVIATION UP TO 150KM RIGHT OF ROUTE	REQUEST WEATHER DEVIATION UP TO [specifiedDistance] [direction] OF ROUTE - Request for a weather deviation up to the specified distance off track in the specified direction.
28	LEAVING 20000FT	LEAVING [level] - Notification of leaving the specified level.
29	CLIMBING TO 25000FT	CLIMBING TO [level] - Notification of climbing to the specified level.
30	DESCENDING TO 23000FT	DESCENDING TO [level] - Notification of descending to the specified level.
31	PASSING XYZ	PASSING [position] - Notification of passing the specified position.
32	PRESENT LEVEL 23000FT	PRESENT LEVEL [level] - Notification of the present level.
33	PRESENT POSITION XYZ	PRESENT POSITION [position] - Notification of the present position.
34	PRESENT SPEED 200KTS	PRESENT SPEED [speed] - Notification of the present speed.
35	PRESENT HEADING 150T	PRESENT HEADING [degrees] - Notification of the present heading in degrees.
36	PRESENT GROUND TRACK 165	PRESENT GROUND TRACK [degrees] -Notification of the present ground track in degrees.
37	MAINTAINING 23000FT	MAINTAINING [level] - Notification that the aircraft is maintaining the specified level.
38	ASSIGNED LEVEL 23000FT	ASSIGNED LEVEL [level] - Read-back of the assigned level.
39	ASSIGNED SPEED 200KTS	ASSIGNED SPEED [speed] - Read-back of the assigned speed.
41	BACK ON ROUTE	BACK ON ROUTE - The aircraft has regained the cleared route.
42	NEXT WAYPOINT DAR	NEXT WAYPOINT [position] - The next waypoint is the specified position.
43	NEXT WAYPOINT ETA 1124	NEXT WAYPOINT ETA [time] - The ETA at the next waypoint is as specified.
44	ENSUING WAYPOINT DAR	ENSUING WAYPOINT [position] - The next but one

Downlink Message Element	Message Element Format	Message Intent
		waypoint is the specified position.
45	REPORTED WAYPOINT DAR	REPORTED WAYPOINT [position] - Clarification of previously reported waypoint passage.
46	REPORTED WAYPOINT 1124	REPORTED WAYPOINT [time] - Clarification of time over previously reported waypoint.
47	SQUAWKING 2130	SQUAWKING [code] - The specified (SSR) code has been selected.
48	POSITION REPORT XYZ	POSITION REPORT [positionreport] - Position report.
49	WHEN CAN WE EXPECT 200KTS	WHEN CAN WE EXPECT [speed] - Request for the earliest time at which a clearance to the specified speed can be expected.
50	WHEN CAN WE EXPECT 150KTS TO 200KTS	WHEN CAN WE EXPECT [speed] TO [speed] -Request for the earliest time at which a clearance to a speed within the specified range can be expected.
51	WHEN CAN WE EXPECT BACK ON ROUTE	WHEN CAN WE EXPECT BACK ON ROUTE -Request for the earliest time at which a clearance to regain the planned route can be expected.
52	WHEN CAN WE EXPECT LOWER LEVEL	WHEN CAN WE EXPECT LOWER LEVEL -Request for the earliest time at which a clearance to descend can be expected.
53	WHEN CAN WE EXPECT HIGHER LEVEL	WHEN CAN WE EXPECT HIGHER LEVEL -Request for the earliest time at which a clearance to climb can be expected.
54	WHEN CAN WE EXPECT CRUISE CLIMB TO 25000FT	WHEN CAN WE EXPECT CRUISE CLIMB TO [level] - Request for the earliest time at which a clearance to cruise climb to the specified level can be expected.
62	ERROR INSUFFICIENT RESOURCES	ERROR [errorInformation] - A system-generated message that the avionics has detected an error.
63	NOT CURRENT DATA AUTHORITY	NOT CURRENT DATA AUTHORITY - A system-generated denial to any CPDLC message sent from a ground facility that is not the current data authority.
65	DUE TO WEATHER	DUE TO WEATHER - Used to explain reasons for pilot's message.
66	DUE TO AIRCRAFT PERFORMANCE	DUE TO AIRCRAFT PERFORMANCE - Used to explain reasons for pilot's message.
67	Up to 256 alpha-numeric characters and symbols	[freetext]
69	REQUEST VMC DESCENT	REQUEST VMC DESCENT - Request that a descent be approved on a see-and-avoid basis.
70	REQUEST HEADING 150T	REQUEST HEADING [degrees] - Request a clearance to adopt the specified heading
71	REQUEST GROUND TRACK 150	REQUEST GROUND TRACK [degrees] – Request a clearance to adopt the specified ground track.
72	REACHING 25000FT	REACHING [level] - Notification that the aircraft has reached the specified level.
74	REQUEST TO MAINTAIN OWN SEPARATION AND VMC	REQUEST TO MAINTAIN OWN SEPARATION AND VMC - States a desire by the pilot to provide his/her own separation and remain in VMC.
75	AT PILOTS DISCRETION	AT PILOTS DISCRETION - Used in conjunction with another message to indicate that the pilot wishes to execute request when the pilot is prepared to do so.

Downlink Message Element	Message Element Format	Message Intent
76	REACHING BLOCK 23000FT TO 25000FT	REACHING BLOCK [level] TO [level] -Notification that the aircraft has reached a level within the specified vertical range.
77	ASSIGNED BLOCK 23000FT TO 25000FT	ASSIGNED BLOCK [level] TO [level] - Read-back of the assigned vertical range.
78	AT 1241 200KM TO XYZ	AT [time] [distance] [tofrom] [position] -Notification that at the specified time, the aircraft's position was as specified.
79	ATIS X	ATIS [atiscode] - The code of the latest ATIS received is as specified.
81	WE CAN ACCEPT 25000FT AT 1024	WE CAN ACCEPT [level] AT [time] - We can accept the specified level at the specified time.
82	WE CANNOT ACCEPT 100000FT	WE CANNOT ACCEPT [level] -We cannot accept the specified level.
83	WE CAN ACCEPT 200KTS AT 1130	WE CAN ACCEPT [speed] AT [time] - We can accept the specified speed at the specified time.
84	WE CANNOT ACCEPT 700KTS	WE CANNOT ACCEPT [speed] - We cannot accept the specified speed.
85	WE CAN ACCEPT 200KM RIGHT AT 1135	WE CAN ACCEPT [specifiedDistance] [direction] AT [time] - We can accept a parallel track offset the specified distance in the specified direction at the specified time.
86	WE CANNOT ACCEPT 500KM RIGHT	WE CANNOT ACCEPT [specifiedDistance] [direction] - We cannot accept a parallel track offset the specified distance in the specified direction.
87	WHEN CAN WE EXPECT CLIMB TO 20000FT	WHEN CAN WE EXPECT CLIMB TO [level] -Request for the earliest time at which a clearance to climb to the specified level can be expected.
88	WHEN CAN WE EXPECT DESCENT TO 1000FT	WHEN CAN WE EXPECT DESCENT TO [level] - Request for the earliest time at which a clearance to descend to the specified level can be expected.
89	MONITORING EBBU CENTER 136.975	MONITORING [unitname] [frequency] – The specified ATS unit is being monitored on the specified frequency.
98	Up to 256 alpha-numeric characters and symbols	[freetext]
99	THIS DOWNLINK WILL NOT SHOW UP IN THE CPDLC MESSAGE LOG. WHEN ONE IS RECEIVED THE NEXT DATA AUTHORITY BECOMES THE CURRENT DATA AUTHORITY. THIS IS VIEWABLE THROUGH THE 'CURNT DATA AUTH' FIELD ON SCREEN B OF THE 'CM LOGON' PAGE.	CURRENT DATA AUTHORITY - A system-generated message to inform a ground facility that it is now the current data authority
100	LOGICAL ACKNOWLEDGMENT	LOGICAL ACKNOWLEDGMENT – Confirmation to the ground system that the aircraft system has received the message to which the logical acknowledgment refers and found it acceptable for display to the responsible person.
102	LANDING REPORT	LANDING REPORT - Used to report that an aircraft has landed.
103	CANCELLING IFR	CANCELLING IFR - Allows the pilot to indicate that he/she has cancelled IFR flight plan.
104	ETA XYZ 1234	ETA[position][time] - Notification of estimated time of arrival at the specified position.
105	ALTERNATE AERODROME EBBU	ALTERNATE AERODROME[airport] - Notification of the alternative aerodrome for landing.

Downlink Message Element	Message Element Format	Message Intent
106	PREFERRED LEVEL 25000FT	PREFERRED LEVEL[level] - Notification of the preferred level.
107	NOT AUTHORIZED NEXT DATA AUTHORITY	NOT AUTHORIZED NEXT DATA AUTHORITY – A system-generated message sent to a ground system that tries to connect to an aircraft when a current data authority has not designated the ground system as the NDA.
108	DE-ICING COMPLETE	DE-ICING COMPLETE - Notification that de-icing action has been completed.
109	TOP OF DESCENT 1237	TOP OF DESCENT [time] - Notification of the preferred time to commence descent for approach.
110	TOP OF DESCENT XYZ	TOP OF DESCENT [position] - Notification of the preferred position to commence descent for approach.
111	TOP OF DESCENT 1200 XYZ	TOP OF DESCENT [time] [position] - Notification of the preferred time and position to commence descent for approach.

8 Events

8.1 OOOI Events

The OOOI, (Out / Off / On / In) events provide a basic indication of the phase of a flight. Each event may be set up, by the user, to provide information to an operational center as one or several down links.

8.1.1 Out Event

An Out Event is triggered when all of the following are true:

1. Breaks are OFF
2. All doors are CLOSED
3. OOOI STATE is INIT or RETURN.
4. The above conditions have existed for 5 consecutive seconds.

8.1.2 Off Event

An Off event is triggered when all of the following are true:

1. No weight on wheels
2. OOOI STATE is OUT.
3. The above conditions have existed for 5 consecutive seconds.

8.1.3 On Event

Event is triggered when all of the following are true:

1. There is weight on wheels
2. OOOI STATE is OFF.
3. The above conditions have existed for 5 consecutive seconds.

8.1.4 In Event

Event is triggered when all of the following are true:

1. Breaks are ON
2. One or more doors is open
3. OOOI STATE is ON.
4. The above conditions have existed for 5 consecutive seconds.

8.1.5 Out Return In Event

Event is triggered when all of the following are true:

1. Breaks are ON
2. One or more doors are open
3. OOOI STATE is OUT.

8.1.6 Reset Event

A Reset event is triggered when all of the following are true:

1. The flight complete timer expires.
2. OOOI_STATE is IN.

8.2 OOOI Initialize State

The Initialize state is entered when all of the following are true:

1. The Dlink+ w/CPDLC has recently powered up.
2. The OOOI STATE is IN
3. An OUT Event is triggered.

EVENT	OOOI_STATE					
	INIT	RETURN	OUT	OFF	ON	IN
OUT	Do the following: 1. Set Out of Gate Time to current time. 2. Set OOOI_OUT to TRUE. 3. Trigger all downlinks associated with the OUT event.	Do the following: 1. Set Out of Gate Time to current time. 2. Set OOOI_OUT to TRUE. 3. Trigger all downlinks associated with the OUT event.	No Action	No Action	No Action	No Action
	OUT	RETURN	OUT	OFF	ON	IN
OFF	No Action	No Action	Do the following: 1. Set Off Ground Time to current time. 2. Set OOOI_OFF to TRUE. 3. Trigger all downlinks associated with the OFF event.	No Action	No Action	No Action
	INIT	RETURN	OFF	OFF	ON	IN
OUT RETURN IN	No Action	No Action	Do the following: 1. Set Return TO Gate Time to current time. 2. Set OOOI_OUT to FALSE. 3. Trigger all downlinks associated with the RETURN event.	No Action	No Action	No Action
	INIT	RETURN	RETURN	OFF	ON	IN
ON	No Action	No Action	No Action	Do the following: 1. Set On Ground Time to current time. 2. Set OOOI_ON to TRUE. 3. Trigger all downlinks associated with the ON event.	No Action	No Action
	INIT	RETURN	OUT	ON	ON	IN
IN	No Action	No Action	No Action	No Action	Do the following: 1. Set Into Gate Time to current time. 2. Set OOOI_IN to TRUE. 3. Trigger all downlinks associated with the IN event. 4. Start the flight complete timer with an expiration value of 10 minutes.	No Action
	INIT	RETURN	OUT	OFF	IN	IN

RESET	No Action	Do the following: 1. Reset following data to its default: Out of Gate Time, Return To Gate Time, Off Ground Time, On Ground Time, Into Gate Time, Origin Airport, Flight Number, Destination Airport, 2. Reset this OOOI data to FALSE: OOOI_OUT OOOI_OFF OOOI_ON OOOI_IN				
	INIT	RETURN	OUT	OFF	ON	

Table 3 OOOI State Table

9 Startup

9.1 Visual Indicators

During power on start up the Dlink+ w/ CPDLC will perform several power-on Built In Tests (BIT). You will observe all annunciators becoming illuminated and remain so for approximately 10 seconds. This is followed by the annunciators extinguishing and the blank display showing the splash screen. The splash screen (see Splash Screen for a visual representation) will remain for approximately 5 seconds before transitioning to the Main Menu. At this point the Dlink+ w/CPDLC will be ready for normal operation.

9.2 ACARS

Refer to section on ACARS Start up.

9.3 CPDLC

Refer to the section on CPDLC start up and logon (CM Logon)

10 Shutdown

When the Dlink+ w/CPDLC shuts down or loses power for any reason messages in the message log will be retained.

10.1 User-Initiated Reset

It is possible to reset the Dlink+ w/CPDLC from the keyboard, without removing power or repositioning a breaker. By pressing and holding the “7”, “Z”, and “/” keys for 2 seconds will initiate a reset. The screen will indicate as such.