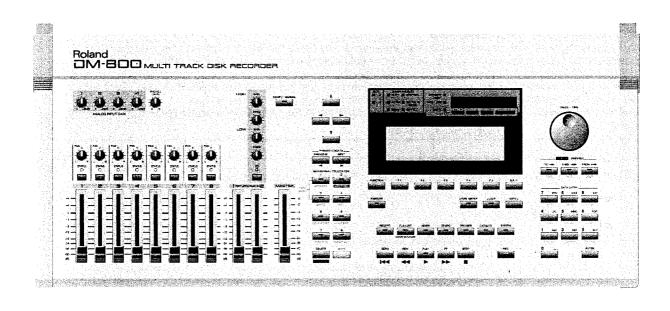


MULTI TRACK DISC RECORDER



OWNER'S MANUAL









ATTENTION: RISQUE DE CHOC ELECTRIQUE NE PAS QUVRIR

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS.

IMPORTANT SAFETY INSTRUCTIONS SAVE THESE INSTRUCTIONS

WARNING - When using electric products, basic precautions should always be followed, including the following:

- 1. Read all the instructions before using the product.
- Do not use this product near water for example, near a bathtub, washbowl, kitchen sink, in a wet basement, or near a swimming pool, or the like.
- 3. This product should be used only with a cart or stand that is recommended by the manufacturer.
- 4. This product, either alone or in combination with an amplifier and headphones or speakers, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate for a long period of time at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.
- The product should be located so that its location or position does not interfere with its proper ventilation.
- The product should be located away from heat sources such as radiators, heat registers, or other products that produce heat
- The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.

- 8. The power-supply cord of the product should be unplugged from the outlet when left unused for a long period of time.
- Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
- 10.The product should be serviced by qualified service personnel when:
 - A. The power-supply cord or the plug has been damaged; or
 - B. Objects have fallen, or liquid has been spilled onto the product; or
 - C. The product has been exposed to rain; or
 - D. The product does not appear to operate normally or exhibits a marked change in performance; or
 - E. The product has been dropped, or the enclosure damaged.
- 11.Do not attempt to service the product beyond that described in the user-maintenance instructions. All other servicing should be referred to qualified service personnel.

For the USA -

GROUNDING INSTRUCTIONS

This product must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock.

This product is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

DANGER: Improper connection of the equipment-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or serviceman if you are in doubt as to whether the product is properly grounded. Do not modify the plug provided with the product — if it will not fit the outlet, have a proper outlet installed by a qualified electrician.

For the U.K.-

IMPORTANT: THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE.

BLUE: NEUTRAL BROWN: LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK. The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED. Under no circumstances must either of the above wires be connected to the earth terminal of a three pin plug.

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INTRODUCTION

Thank you for purchasing the Roland DM-800 hard disk recorder.

The DM-800 is a 16-bit multitrack hard disk recorder. It can record and play back any combination of eight tracks simultaneously.

Recording time is limited to the amount of hard disk storage. One SCSI bus and disk(s) is required per 4 tracks of audio. The recording format is 16 bits linear; sample rates of 32, 44.1, and 48 kHz may be selected. A 100 megabyte hard disk will allow roughly 18 monophonic minutes of recording time at the CD rate of 44.1 kHz. A single recording or Project may be spread over multiple hard disks for even longer recording times, with an outer limit of over 12 hours of monophonic recording time.

On playback, the DM-800 uses a trick borrowed from MIDI sequencers and drum machines, where any one recorded section may be reused any number of times. A reused section may have different start, stop, fade in, and fade out times than the original use of the section. Also, when a track is silent, no disk memory is being used. Therefore, the total playback time may be much longer than the total recorded time. Since memory can be reused, it is better to think of the DM-800's recording time like the memory in a sampler than the length of a piece of tape.

PRECAUTIONS

REFER TO SECTIONS ON INSTALLATION AND INTERFACING FOR ADDITIONAL INFORMATION.

CARE

For everyday cleaning, wipe the unit with a soft dry cloth, or one that as been slightly dampened with water. To remove stubborn dirt use a mild neutral detergent. Afterwards be sure to wipe the unit thoroughly with a soft, dry cloth.

Never use benzene, thinner, alcohol or solvents of any kind to avoid the risk of discoloration or deformation

OTHER

Always turn off the power to all equipment before making connections with other devices.

Should a malfunction occur (or if you suspect there is a problem) attempt to save your project and then discontinue use immediately. Contact qualified personnel as soon as possible.

COPYRIGHT

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When recording from Compact Discs or other sources, please respect copyright laws. Refrain from copying and/or distributing copyrighted material in any way without the approval of the copyright holder.

HARD DISK HANDLING

A hard disk is a very delicate storage device. Do not subject it to shock or vibration of any kind. Be especially careful not to move or bump the unit while the power is on.

Shut down the DM-800 system, park all hard drive heads, and eject all removable media by selecting the Shut Down when quitting, before turning off the power. After shutting down the unit, wait until the drives have stopped rotating (about 30 seconds) before moving the unit.

Never turn off the power while the hard disk is being accessed (while any of the hard disk indicators are lit).

Roland cannot be responsible for any data lost while using the DM-800. It is strongly suggested that you frequently make backup copies of your DM-800 project data just as you would with any normal computer system.

"TRACK MINUTES" AND RECORDING TIME

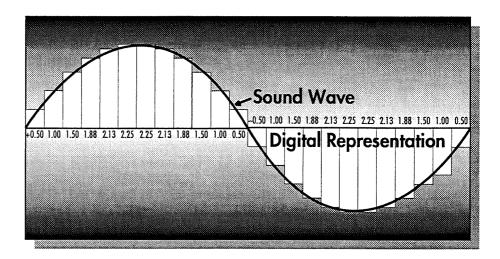
Any mention of recording time refers to track minutes. Track minutes is a commonly used term in hard disk recording which means the total number of minutes available for recording on a single track. 10 track minutes means 10 minutes of mono recording, 5 minutes of stereo recording or 2.5 minutes of four track recording. However, remember that recording time is utilized very differently in a disk system compared to a tape system.

HOW THE DM-800 SYSTEM WORKS

The DM-800 is possible because of a series of technological advancements. The most important of these are Digital Recording and Hard Disk Recording.

DIGITAL RECORDING

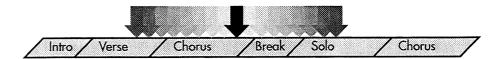
Digital recording popularized by the Compact Disc, records sound by storing a series of numbers, a series of digital snapshots. These snapshots are then played back in series, much like a motion picture. The number of snapshots per second is called the sampling rate. In a CD the sampling rate is 44.1 kHz, which means there are 44100 sonic snapshots every second. A DAT recorder has rates of 48 kHz, 44.1 kHz, and 32 kHz. The DM-800 can also record and play at any of these three sampling rates. The higher the rate, the higher the frequency response.



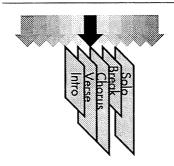
DISK RECORDING

Disk recording means storing digital recordings on a disk rather than a tape. Why is this important? Because it makes possible **random access**. Random access enables your recording to be played in any order you like. This means any note, measure, background vocal, or even the entire Project can be played back instantly, without having to rewind and fast forward a tape. This also means any recording can be played anywhere within the Project you like, just like a MIDI sequencer – except here we are working with complete digital recordings. The possibilities are quite profound and we encourage you to experiment and "push the envelope" of musical and production creativity.

LINEAR TAPE ACCESS:



RANDOM DISK ACCESS:



Another thing to be considered is the issue of the data itself. If over 44 thousand samples per second sounds like a lot of data, you're right. In fact, ten seconds of digital audio represents about the same amount of data as the manual you are holding in your hands right now. So we are talking about extremely large amounts of data moving in and out of the DM-800 at very high speeds.

What makes the DM-800 feasible is a big, fast disk drive. Floppy disk? Too slow. Even if it was fast enough, you'd fill it up after recording 10 seconds. Fortunately, the kind of big, fast disk drives needed for disk recording are now easily available. Your DM-800 may come with hard disks installed internally. If not, please contact your dealer or Roland for installing or replacing the internal hard disks. External disk drives can also be connected to the DM-800.

DATA ORGANIZATION

The data in the DM-800 is organized into three main groups: Projects, Takes, and Phrases.

TAKES

Every time you start recording, the DM-800 creates a new record file direct to the DM-800 hard disks, called a "Take". Up to eight channels (tracks) can be recorded simultaneously – four to each disk – ,yielding a Take that is eight channels "wide."

Since disk recording does not share the linear limitation of tape, it is not necessary to erase an old recording to make a new one – the DM-800 simply records another Take, creates a new Phrase, and places the new Phrase in the recording location. The old Take is not erased or modified. That is why this type of recording/editing is called "nondestructive."

PHRASES

The appearance of a Take inside a Project is called a "Phrase." The Phrase contains additional information such as start/end times, and Offset which is *where* in the Take the Phrase starts playing. Several Phrases can "point" to the same Take: for example one Phrase might only include the verse section of the Take, while another Phrase points to the chorus. A Phrase can point to all or only some of the tracks in a Take. Phrases on different tracks can be playing the same Take at the same time.

Overlapping phrases can both play on a single track for up to one second, and can crossfade within that interval. Cross-fading and other Phrase editing do not alter the original Take, so editing is nondestructive.

PROJECTS

A Project then, is an arrangement of Phrases which play back the recorded Takes in exactly the right order and combination.

A PROJECT IS CREATED FROM PHRASES:



PHRASES ARE CREATED FROM SECTIONS OF TAKES: TAKE Take Take 1 Verse Intro TAKE Take Solo Backina 2 Break Chorus (w/o Vocal Track TAKE Take Guitar Solo

TEMPO MAP/MIXER **SETTINGS**

There are additional elements in a Project as well. These are the Tempo Map, for sending MIDI clocks and for translating from absolute or SMPTE time to bars and beats; and the Mixer, which functions as an automated mixing console and enables changes of level, pan and EQ during the Project.

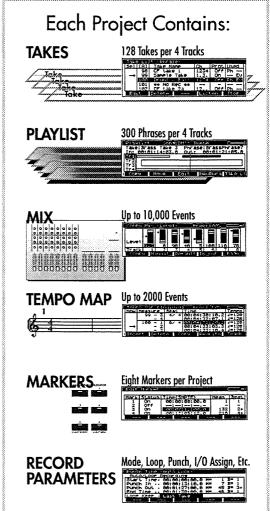
TAPE EDITING

In the Tape window, a Project's tracks are displayed as pieces of tape going across the Tape Window. Positions of Phrases can be moved earlier or later in a Project, and the length of the Phrase may be increased or decreased (as long as the Phrase does not become longer than the Take it points to).

DATA RESTRICTIONS

Phrase at a time, except for a one second maximum

Each track can play only one transition (crossfade) between two phrases.



PHRASE PRIORITY

Occasionally, more than one Phrase may be assigned to play on the same track at the same time. Since only one Phrase can be played, it is possible for one of the phrases to be partially or totally obscured by the other. When this situation occurs, the Phrase given top priority is the newest Phrase, that is, the Phrase that was most recently created.

You can adjust this priority using the Overlap commands, found in the Playlist menu. For more information, see the Playlist Mode section.

DISK ACCESS

Since the DM-800 operates using the principle of random disk access, it must be able to read and write data to the disk faster than the digital audio data rate. In other words the disk access time must be fast enough to allow digital playback at the sampling frequency.

Adequate disk access time is a function of several things:

- the sampling rate (a higher rate means more data),
- the number of tracks recording or playing at any one time (two tracks is twice as much data as one),
- the access time and data transfer rate of the disk drive itself (the ultimate speed limit),
- the location of the data on the disk (the farther away the data is, the farther the disk drive head must travel to reach it, and the longer it takes to get there)

IMPROVING DISK ACCESS TIMES

If you reach a problem situation caused by disk access, there are several things you can do to improve the situation.

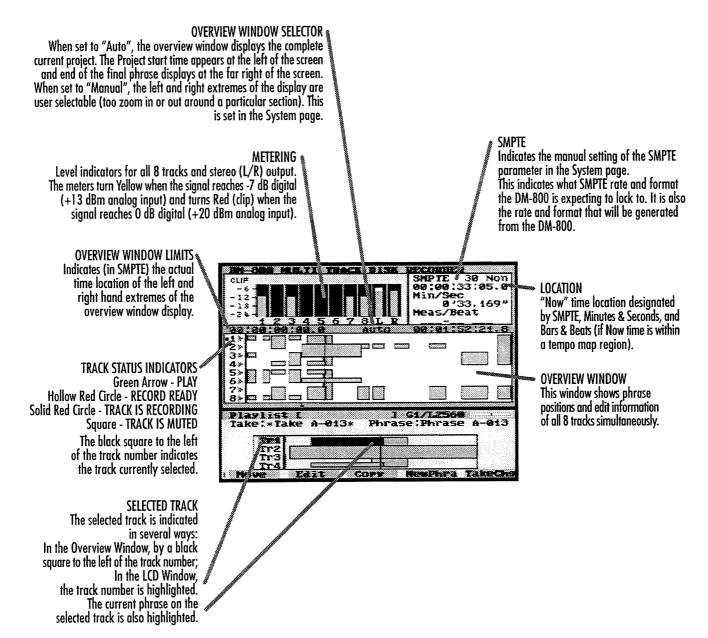
GET A FASTER DRIVE

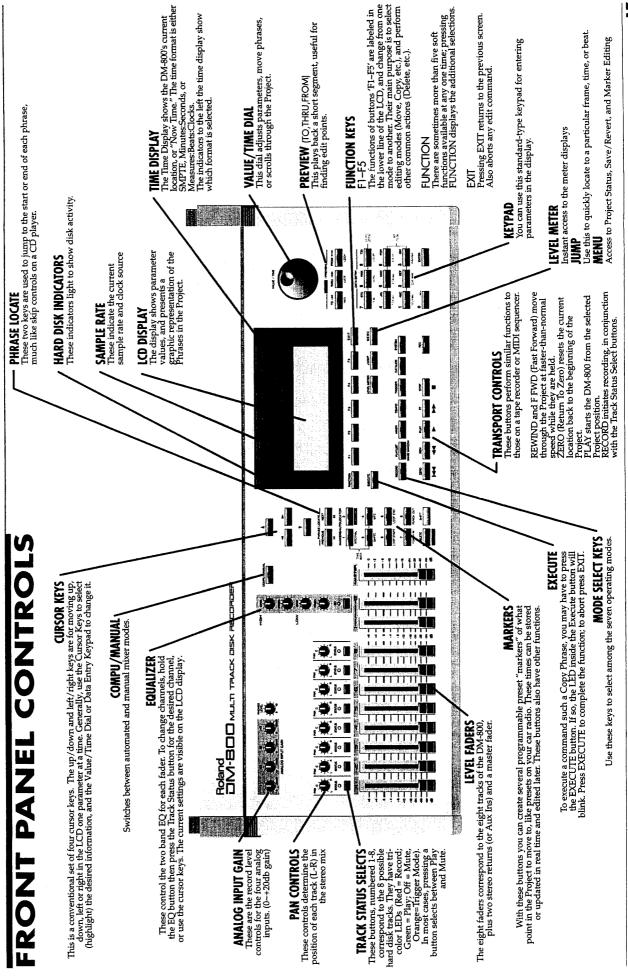
Naturally, a drive with faster access time will speed things up. Contact your dealer or your nearest Roland office for information regarding drives recommended for use with the DM-800.

USE A LOWER SAMPLING RATE

You should consider using a 44.1 kHz rather than 48 kHz sampling rate, especially if your release medium is a Compact Disc. The slightly lower data rate may make a difference in marginal disk access situations.

VIDEO OUTPUT DISPLAY





The analog inputs are balanced or unbalanced, +4 dBm. 18 bit, 128x oversampling delta-sigma A/D converters are used. HEADPHONE JACK This stereo headphone jack carries the mix output of channels 1 & 2. (1) The foot switch input can be used for punching in or out of Record mode or for entering the tempo in Tap Tempo mode. Use a Roland DP-216, Boss FS-5U or equivalent pedal. FOOT SWITCH The DM-800 incorporates a built-in 24-bit digital mixer for combining the internal hard disk tracks and four auxillary inputs to a stereo final mix. This stereo mix is sent to both analog and digital outputs, and is also available as a record input source for bouncing tracks. OUTPUTS RMDB CONNECTOR This 8 channel digital audio interface is used to connect the DM-800 to other digital audio devices. **ASCII KEYBOARD**An PC AT keyboard can be connected here to operate the DM-800. SMPTE LTC. I/O for longitudinal time code. The DM-800 can synchronize to SMPTE while sending MIDI Time Code (MTC) or MID! docks (with Song Position Pointer). REAR PANEL CONNECTIONS MIDI is used for several important functions: The DM-800 can synchronize to MIDI Time Code (MTC) while transmitting MIDI clocks (with Song Position Pointer), or synchronize to SMPTE while transmitting MTC. METRONOME MIDI notes can be used as the metronome. TRIGGER MODE In Trigger mode, Phrases can be triggered by MIDI keynotes. DIMINO MACHINE CONTROL The DM-800 can transmit and receive MIDI Machine Control. VIDEO DISPLAY OUTPUTS An external display can be used to enhance DM-800 operation. A computer monitor (digital RGB) or television monitor (NTSC or PAL) can be used. SCSI A & B The DM-800 uses SCSI interfaces to connect external disk drives for real-time recording. SCSI A is used for Tracks 1-4, SCSI B for Tracks 5-8. For additional information, please check the SCSI Configuration section at the end of this manual. CAUTION CAUTION Make on Lacrace amount So lacrace amount ATTENTION MAKE OF COCE ELECTROSE ME PAR CAPPER FRONT PANEL LCD CONTRAST Roland Roland POWER SWITCH Turns the unit on and off. **POWER INPUT**Connect a grounded power cable here.

The analog outputs use 8x oversampling chips and 18-bit D/A converters. The digital output signal goes to coaxial pin jacks.

INPUTS

	·		

INSTALLATION & INTERFACING

PLACEMENT

LOCATION

For best performance from the DM-800's hard disk be sure to install the DM-800 in a solid, level location, in an area free from excess vibration or movement

Operating the DM-800 near devices containing large power transformers (e.g. power amplifiers) may induce hum.

The DM-800 may also interfere with radio and television reception. Do not use this unit in the vicinity of such receivers.

Do not subject your DM-800 to temperature extremes (e.g. direct sunlight in an enclosed vehicle). Avoid storing or using the unit in dusty or humid areas, or areas that are subject to high vibration levels.

Note: If the room suddenly changes temperature, or if the DM-800 is brought from a cold location into a warm room, condensation may form on the hard disk or other components, which can cause damage. In this situation, wait for one hour or more for the DM-800 to adjust to the new temperature before operating.

POWER SUPPLY

Be sure to use only the correct AC voltage. The DM-800 power supply is designed for use in the country of purchase. If you plan to use the DM-800 in another country, a power converter or other accessories may be required. Please contact a Roland service center for additional information.

Do not connect the DM-800 to the same circuit as devices which produce electrical noise (motors, lighting dimmers, etc.) or devices which consume large amounts of power (heaters, air conditioners, etc.)

Avoid damaging the power cord – do not step on it or place heavy objects on it.

CONNECTIONS

ANALOG I/O

The analog inputs and outputs are 1/4" RTS (Ring=LOW / Tip=HIGH / Sleeve=GND) connectors. Both inputs and outputs are electronically balanced and calibrated for +4 dBm nominal input level. Up to 20 dB variable gain can be added to the inputs with the top panel Analog Input Gain controls. This will allow -16 dBm signals to be increased to nominal level.

REMEMBER: + 4 dBm analog input, produces a -16 dB Digital signal. Digital "0" (clip level) would occur at +20 dBm analog input.

DIGITAL I/O

The Digital I/O connectors are standard RCA coaxial type. The digital format is IEC-958 (S/PDIF) consumer.

NOTE: If AES/EBU, XLR type digital connection is required, use the Roland SRC-2 Sample Rate Converter to change the format and type.

PHONES

This is a standard 1/4" stereo headphone connection. The headphones are wired directly to Analog outputs 1 & 2. (i.e. Whatever you send to output 1 & 2 will appear on the headphones. This will normally be the stereo MIX output.)

NOTE: If the headphones you are using seem distorted, select a different pair of headphones with a higher input impedance (approx. 40 Ω or higher)

FOOT SWITCH

The foot switch jack is designed to accept only the Roland Model # DP-2/6 or the BOSS FS-5U foot switch. This foot switch can be used for record punch in/out and for entering MIDI tempo maps. Foot switches other than the ones specified should not be used.

SMPTE CONNECTION

The SMPTE input connector is RCA type. The input circuitry is designed to accept a wide range of levels, however, the nominal input level is 0.75Vp-p. The output connector is also RCA type with nominal output level of 0.75Vp-p.

RMDB BUSS

This 30 pin connector is used for interface to other digital audio and transport control devices. See the installation instructions supplied with each optional interface for information about connections to the RMDB Buss.

VIDEO OUTPUTS

Standard RCA composite video, S-video, and Digital RGB outputs are provided. Format is selected via the NTSC - PAL switch. Digital RGB video cables are available from Roland.

Model # RGB 25A - For Atari Monitor (round multipin)

Model # RGB 25N - For NEC Monitor (square multipin) (Sony)

Model # RGB 25II - For IBM Monitor (D-Sub connector)

(Digital RGB output level is 0 - 5V, standard NTSC scan rate of 15.7 kHz.)

NOTE: The video format cannot be changed between NTSC and PAL with the power on. You must turn off the unit and restart before the other format will become active.

The Digital RGB output will provide the sharpest image, however, only 8 colors are available. The S-video output will produce the next best display option and will provide all 16 colors.

ASCII KEYBOARD

This port provides connection for a standard IBM XT/AT style keyboard.

SCSI A & B

Refer to the next section, SCSI Configuration, for connection of external SCSI devices.

AUDIO DAT FOR BACKUP

CAUTION: Audio DAT recorders used for DM-800 backup MUST not do any processing from the digital input, through the tape, and back out the digital output. Some Audio DAT machines add additional information during playback that cannot be read by the DM-800. Check with Roland or your DAT supplier to be sure that "what goes into the Digital Input comes out the Digital output exactly the same".

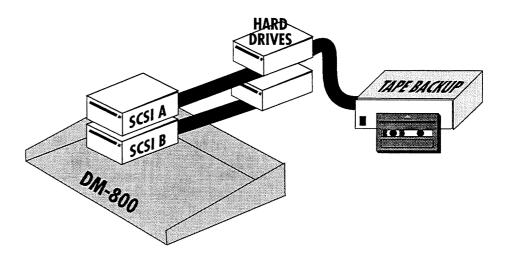
Connect the Digital Output # 1 from the DM-800 into the Digital Input of your Audio DAT recorder.

Connect the Digital Output from the DAT recorder to the Digital Input of the DM-800.

This is all that is required for connecting an Audio DAT to the DM-800 for Backup purposes.

SCSI CONFIGURATION

SCSI stands for Small Computer System Interface. SCSI is a computer industry-standard interface, defined by the American National Standards Institute (ANSI). The DM-800 can be connected to a wide number of devices for recording or high-speed data transfer.



RECORD AND PLAYBACK

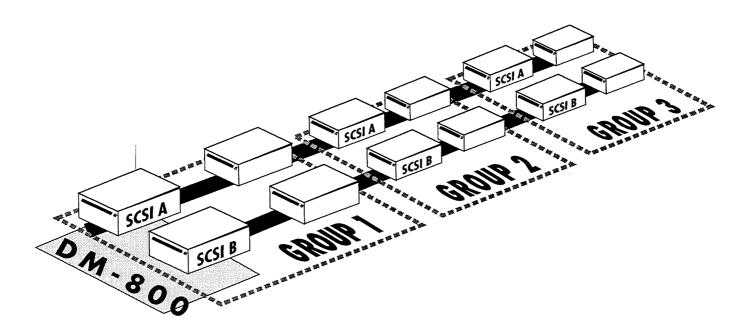
Use the SCSI connectors to connect additional devices for recording and playback. <u>DM-800 8-Track Version</u>: Connect additional drives in pairs; one to SCSI A and the second to SCSI B. <u>DM-800 4-Track Version</u>: Connect additional drives to SCSI A.

TAPE BACKUP

Use the DM-800's SCSI A or B connector for SCSI-based tape backup devices. (See section "Backing Up Your Data" for additional detailed information).

ABOUT DISK GROUPS

For Project recording purposes, there are three potential groups of disk drives available on the SCSI A&B busses: Group 1, Group 2, and Group 3.



Three separate disk Groups are provided by the DM-800 in order to provide flexibility for attaching external SCSI devices. Each disk Group allows 50 projects to be recorded thus providing a total potential of 150 projects available on-line.

Any attached SCSI device can be formatted by the DM-800 into any of the three disk Groups. For example, the disk drives mounted inside the DM-800 might be formatted as Disk Group 1. An external 240 Meg hard disk and 600 Meg Magneto Optical disk might be formatted as disk Group 2. An additional 1 Gig hard drive might be formatted as disk Group 3.

The SCSI A disk of each Group contains default settings for the system, such as timebase, clock source, SMPTE settings, etc.

You can move any complete disk Group from one DM-800 to another.

DISK GROUPINGS

Since the DM-800 considers all drives in a Group to be one large disk, all drives in the Group must be up and running before the DM-800 will recognize the Group. Specifically:

If a disk formatted as part of a group is not connected to the DM-800, or is connected to the opposite SCSI connector by mistake, the entire group containing that disk will not be available for recording. The DM-800 will only allow access to the Catalog UTILITY screen and all the disks in the Group will appear in the window as U.F. - Unformatted. You may choose to reformat the entire Group or you can shut down the DM-800, correct the connections, and then restart.

If a disk malfunctions, the entire disk group will not be available. In this case you must reformat all the other disks in the group, and all data will be lost.

DISK FORMATTING

Since the DM-800 treats all disks in a group as one large disk, there are several things to be concerned about when formatting a disk.

- You can add a new disk to an already existing group.
- Once a disk is formatted for a group, reformatting the disk for the same group causes all the other disks in the
 group to be reformatted as well.
- Once a disk is formatted for a group, reformatting a disk to a different group causes the other drives in the
 original group to become unformatted. You will need to reformat the remaining drives in the original group
 as well.
- When formatting disks, be sure to format the drive(s) on the SCSI A Bus first, then the SCSI B drives.

BEFORE MAKING SCSI CONNECTIONS

Make sure the power is off before making or changing any SCSI connections to the DM-800. Never connect and/or disconnect cables while the DM-800 is on. The DM-800 cannot recognize such changes and may cause a situation where you cannot save your Project data.

For the most reliable operation, use good SCSI cables and keep them as short as possible. The total length of connecting cable on each SCSI buss cannot exceed 6.5 meters, or 21 feet.

SCSI DEVICE NUMBERS

Each DM-800 SCSI port is completely independent. Up to eight SCSI devices can be connected to each SCSI port. Each device must have a unique device number, 0~7, so they can be individually identified on the SCSI bus. Devices with lower ID numbers have higher priority.

If your DM-800 contains internal hard drives, they are set to ID #0. ID #7 is reserved for the DM-800 CPU.

CHANGING DEVICE NUMBERS

Most external drives have a switch on the rear panel to set the device number. Follow the instructions included with your drive.

TERMINATION

Each DM-800 SCSI port is a completely independent SCSI chain. Each port must be properly terminated for the DM-800 to operate correctly. There must be no more than two terminators in each chain, one at the beginning and one at the end.

- Each DM-800 SCSI port is internally terminated.
- If you connect one device to the DM-800, that device needs a terminator.
- If you connect more than one device, only the device at the other end of the chain should have a terminator.
- See External SCSI Device section for more detailed SCSI information.

If more than two devices in a single chain have terminators, one or more of them will need to be removed. This can be done by an Authorized Roland Service Center. Please contact your dealer or Roland for the nearest service center.

DISK DRIVE SPECIFICATIONS

For Real-time recording any hard disks or Optical drives must meet minimum standards for access time and sustained data transfer. In other words, they must be very fast.

For backup or non real-time applications, drive speed is not a usage limitation.

For backup, many drives will work, although you probably want to use an optical disk or a tape backup.

The listing of recommended drives enclosed with your DM-800 gives specific information about drives that have been tested with the DM-800. Your dealer may have additional information regarding compatible drives. The following gives general information about the advantages and disadvantages of different types of devices.

HARD DISK DRIVES

Fixed disk drives, commonly known as Hard Disks, combine large capacity with high speed at a moderate price. The most common type of drive, hard disks are available in many sizes up to and beyond several Gigabytes.

OPTICAL DRIVES

Optical disk drives are well-suited for backup since they store 660MB (240 track-minutes @ 44.1 kHz) or more on each side of the disk.

Newer optical drives are fast enough to record on directly. Check with your Roland distributor for current drive information.

TAPE BACKUP

4mm DDS-1 SCSI DAT tape backup devices provide a cost effective method for making backup copies of hard disk data. Check with your Roland distributor for a listing of recommended tape drives.

POWER ON SEQUENCE

Interconnected computer devices need to be turned on and off in a particular order. Please observe the following suggestions.

POWER UP

Before turning on the DM-800, be sure to confirm all SCSI, Audio and MIDI connections. Reduce the audio monitor level.

- Power on the terminated SCSI devices.
- 2 Power on the other, non-terminated SCSI devices. Wait for all drives to come up to speed.
- Power on the DM-800.
- 4 Power on any MIDI and SMPTE devices.
- 5 Finally, turn on any other audio equipment.

POWER DOWN

Before powering down the DM-800, be sure to save the current Project, and reduce the audio monitor level.

- Execute the SHUT DOWN command from the System Mode. It will take about 30 seconds for all drives to stop spinning. Check that heads of all external drives have been parked (in other words, not spinning) and eject any removable disks or tapes.
- 2 Power off audio and all SCSI devices.
- 3 Power off the DM-800.

PANEL FUNCTIONS

OPERATIONAL OVERVIEW

The controls and indicators on the DM-800 are arranged in logical groups to enable quick and easy operation. Let's take a look at these groups:

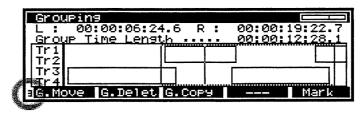
SOFTWARE VERSION



The current DM-800 software version is shown in the upper right corner of the System screen.

NOTE: This manual was written using software Version 1.20. If you have later versions of software, please refer to additional information supplied with the software revision.

SCREEN NUMBER



A number in lower left hand corner indicates more than one screen is available for this operating mode. Press the FUNCTION button to step through the additional screens. SCREEN #'s throughout this manual will refer to this number.

PAGE SELECTION



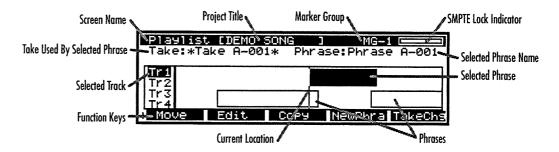
The word PAGE above the F5 button indicates that additional "pages" of function keys are available for this screen. Press the PAGE (F5) button to step through each set of function keys.

HOUR GLASS

The Hour Glass icon will appear in the LCD screen display anytime the DM-800 is processing and is unable to accept any new commands. Wait until the Hour Glass icon is gone before executing your next command.

LCD DISPLAY

Most DM-800 operations are performed by pressing buttons while looking at the LCD or video display.



The current screen is shown at the top left of the LCD, with the current Project title at top center. Recorded phrases are displayed as horizontal bars across the middle of the screen, with information about the phrase available when selected. The current location, also known as "Now Time," is shown as a vertical bar in the center of the LCD. Function Key names are visible on the bottom line.

LCD CONTRAST

You can adjust the LCD contrast with the Contrast control on the rear panel.

SMPTE LOCK INDICATOR

The SMPTE lock indicator displays information about the internal Resolver Sample Rate locking condition of the DM -800 with incoming SMPTE time code. If the DOT remains in the center of the display, this indicates that the incoming SMPTE is at the exact correct speed (as set in the System mode) and the DM-800 sample clock is locked to it. As the dot moves left or right of center, this indicates that the incoming SMPTE is faster or slower than the DM-800 expects, however, the DM-800 sample clock is still locked to it. If the DOT moves to the outer extremes of the window, or oscillates widely, the DM-800 will UNLOCK its sampling clock from SMPTE.

NOTE: This only applies when the Sampling Rate Clock source is set to SMPTE.

TIME DISPLAY



The Time Display above of the LCD shows the DM-800's current location, or "Now Time." The time format is either SMPTE, Minutes/Seconds, or Measures/Beats+Clocks.

The indicators to the left the time display show which time display format is selected, as well as the sampling clock source and the sampling rate.

Two indicators also show SCSI A & B disk access.

CURSOR KEYS



This is a conventional set of four cursor keys. The up/down and left/right keys are for moving up, down, left or right in the LCD one parameter at a time. Generally, use the Cursor Keys to select the desired information, and the Value/Time Dial or the Data Entry Keypad to change it.

When the cursor key is positioned on a track (track number is highlighted): Press the PREVIOUS or NEXT keys to jump to the start or end of each phrase on the track.

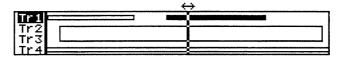
VALUE/TIME DIAL



THE VALUE/TIME DIAL IS USED IN SEVERAL WAYS:

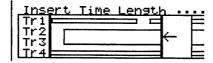
Time(SMPTE) 00:07:12:00.0

1 When you have selected a parameter with the Cursor Keys, turning the Value/Time Dial changes the value of that parameter.

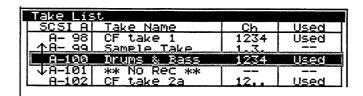


2 In the Record, Playlist, Menu, and Level Check screens, the Value/Time Dial scrolls forwards and backwards through the Project. If you turn the dial slowly, the time will move by 1 ms. If you turn the dial rapidly, the time will move in 100 ms increments.

3 In the Copy Phrase and Move screens, the dial scrolls through the project while specifying the destination edit point.



4 In the Insert Time and Cut Time screens, the Value/Time Dial scrolls through the Project while changing the Insert or Cut Time Length.



5 In Catalog screens and other screens that display a list of Projects or Takes, the Value/Time Dial scrolls through the list.

SOFT FUNCTION KEYS



F1-F5

The functions of buttons 'F1–F5' are labeled in the lower line of the LCD, and change from one mode to another. Their main purpose is to select editing modes (Move, Copy, etc.), and perform other common actions (Delete, etc.).

FUNCTION

There are sometimes more than five soft functions available at any one time; pressing FUNCTION displays an additional page of functions. The page number is displayed in the lower left corner of the display.

EXECUTE

To execute a command such a Copy Phrase, you may have to press the EXECUTE button. If so, the LED inside the Execute button will blink. Press EXECUTE to complete the function; to abort press EXIT.

EXIT

Pressing EXIT returns to the previous screen.

MENL

Pressing MENU shows the available menu items on the display. Use the F1–F5 keys to select the desired menu item.

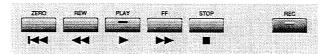
LEVER METER

Switches LCD directly to the level meters.

JUMP

Jumps directly to a new time location. Pressing jump brings up the jump screen. (see Jump, page 36)

TRANSPORT CONTROLS



These buttons perform similar functions to those on a tape recorder or MIDI sequencer.

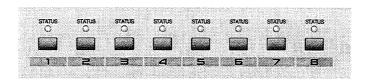
REWIND and F FWD (Fast Forward) move through the Project at faster-than-normal speed while they are held.

ZERO (Return To Zero) resets the current location back to the Project Start Time (see SYSTEM mode).

PLAY starts the DM-800 from the selected Project position.

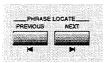
REC initiates recording, in conjunction with the Track Status Select buttons.

STATUS SELECTS



These status buttons, numbered 1-8, correspond to the 8 possible hard disk tracks in the DM-800. They have tricolor LEDs (Red = Record; Green = Play; Off = Mute; Orange = Trigger Mode). In most cases, pressing a Status button scrolls through the three possible states, Play, Record, and Mute.

PHRASE LOCATE SECTION



These two keys are used to jump to the start or end of each phrase, much like skip controls on a CD player.

When in Playlist or Record screens, while a track is selected with the cursor, pressing PREVIOUS moves the current Project location to the beginning of the current, or end of the previous phrase on that track. Pressing NEXT jumps to the end of the current phrase or start of the next phrase of that track.

MARKERS SECTION

With these buttons you can create several programmable preset markers of what point in the Project to move to, like presets on your car radio. These times can be stored or updated in real time and edited later.

1-8

These buttons are the eight marker memories. Pressing any marker key whose LED is lit, sets the current location to the memory setting.

PROGRAMMING MARKERS

To set a Marker, simply press any of the Marker keys whose LED is off. The key will be set to the current location and the LED will light indicating that the marker is programmed. Marker locations can be fine-tuned in the Edit Marker menu under the MENU key.

DELETE

You can delete a marker from memory with this function. Press and hold DELETE, then the desired marker key.

MARKER GROUPS

The DM-800 has 5 separate Marker Groups, each containing 8 marker positions (for a total of 40 Marker positions). To access a different group, hold down the SHIFT key and press #1, 2, 3, 4, or 5 on the Data Entry keypad (far right on front panel). This selects Marker Group 1-5 as indicated directly next to the SMPTE lock indicator in the LCD display. Each marker group works identically as described above.

EXAMPLE: If you select MG-3 (marker group 3) you can use the 1-8 marker buttons as outlined above. If you then select MG-4, you can program 8 New marker locations using marker buttons 1-8.

SHIFT+TIME ENTRY KEYS

Commonly used time settings such a loop and punch in points can be set using Shift functions of the Marker Section. It is not necessary to be on the Punch Time Screen.

LOOP START / LOOP END

These set the start and end times for playback in Loop recording mode.

PUNCH IN / PUNCH OUT

These set the actual recording start and end points in Loop and Auto punch recording modes.

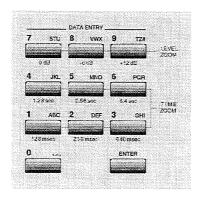
CAPTURE

When editing time parameters in edit windows, you can set the time to the current "Now Time" location by pressing SHIFT+CAPTURE.

INTERNAL / SMPTE / MTC

Sets time base.

DATA ENTRY KEYPAD



You can use this standard-type keypad for entering parameters in the display. To enter a numerical value parameter using the keypad:

Use the cursor keys to select the desired parameter,

Enter the value using the keypad

Press ENTER

ENTERING NAMES

The Data Entry Keypad can also be used for entering names and text. Pressing a keypad button scrolls through the lowercase characters printed above the button. To enter uppercase characters, hold SHIFT while pressing the desired keypad button.

In addition to the standard 26 letters, several other special characters (#, -, /, ., [space], +, *) are available by using the Value/Time Dial.

Note: Pressing ENTER moves the cursor to the right, one character at a time.

WAVE WINDOW SCALING

The Wave Window (waveform graphical display), selected by pressing the PLAYLIST mode button again, after Playlist mode has been selected can be scaled (zoomed) using the Data Entry Keypad.

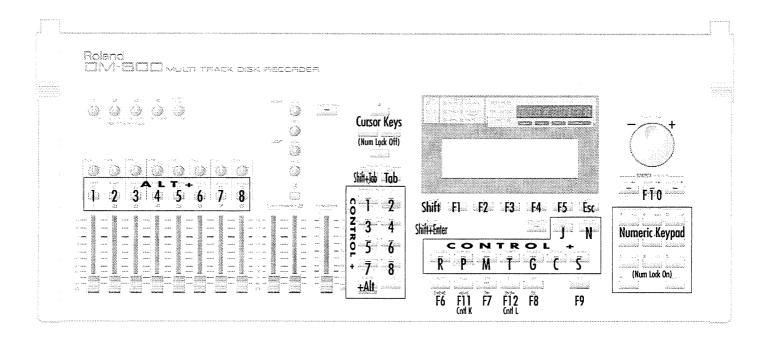
The 7, 8, and 9 buttons select 0 dB, +6 dB, and +12 dB vertical display gain. When the Wave Window is open, pressing these buttons will change the vertical resolution of the display.

The 1-6 buttons adjust the left-right (horizontal) scaling of the wave window display. The amount of "time" displayed in the window can be adjusted from 128 msec total to 6.4 sec total. This allows you to "zoom in" on a critical section to see more display detail.

NOTE: The settings of Wave Window scaling appear directly next to the SMPTE lock indicator in the LCD when the Wave Window is open. e.g. G2/L2560 indicates that the gain (vertical resolution) has been set to the second setting (+6 dB) and the length (horizontal resolution) has been set to 2.56 sec.

EXTERNAL KEYBOARD

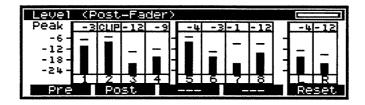
Any PC XT or AT compatible keyboard can be connected to the DM-800. The following shows keyboard equivalents to the DM-800 Front Panel functions:



COMMON FUNCTIONS

The following functions – "Level Meter", "Jump", "Menu", and "Preview" – are available in all operation modes. You will find them handy for quick access.

LEVEL METER

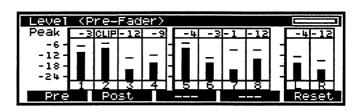


Pressing the Level Meter button opens a screen that displays peak reading, bar graph meters for inputs and outputs, the same as the bar graphs on the DM-800 video output display.

The highest peak value (peak hold) is displayed as a horizontal line on the graph and numerically above it. "CLIP" appears if the track has exceeded maximum digital level (0 dB). Pressing RESET (F5) resets the peak hold indicator as well as its value.

Note: Remember there is no digital counterpart to the traditional analog recording technique of pushing the record level to over-saturation in order to achieve tape compression and clean distortion. In digital recording, when you're out of bits, you're out of headroom — and instantly into nasty clipping. We suggest you use -18 dB as your analog-style zero reference. You can set the Headroom on the In/Out Assign screen—press RECORD, IN/OUT (F3) (see Mixer section).

PRE (F1) POST (F2)



You can check the levels pre or post fader by selecting PRE (F1) or POST (F2) respectively. If Post is selected, the fader sliders and the level faders in the Mixer Mode display. Level check points are shown on the Mixer block diagram, page 183.

When a track is monitoring an input source—such as during recording—the input level will be displayed.

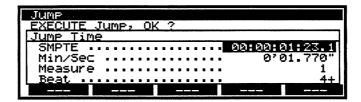
Note: Inputs are assigned to Tracks and Aux from the In/Out Assign Screen, accessible from Mixer , Record, or Trigger Play modes—press MIXER, IN/OUT (F3).

Note: The level of the Aux Inputs cannot be monitored. However you can temporarily assign the input to one of the recording channels, enter Recording Standby, and then view the level.

RESET (F5)

Press RESET to clear the peak hold values and the overload indicators.





You can jump to a specific measure, time or frame by entering the desired location point in this window.

- Press JUMP.
- Enter the desired time in one of the parameters. SMPTE frames, Minutes/seconds, and Measures/ beats are all available in the window.
- Press ENTER to store the time setting. Then, press EXECUTE to jump. The DM-800 jumps to the selected time and returns to the previous display.

You can also use the Value/Time dial to "dial in " the desired time, then press EXECUTE to jump.

Note: When a tempo map does not exist for the selected project, the time cannot be specified in measures/beats.

SHIFT+JUMP

Shift+Jump is a quick way to jump to a specific SMPTE frame by entering the time from the numeric keyboard.

- While holding down the SHIFT key, press JUMP.
- You can now enter a destination time directly in the LED display using the numeric keypad.
- Press ENTER to jump to the new destination time (press EXIT to cancel).

IBM AT KEYBOARD EQUIVALENTS:

- Hold CTRL and press U
- Enter the time on the numeric keypad (You may have to press the Num Lock button, depending on the keyboard you use)
- Jump by pressing ENTER (Press ESC to cancel)

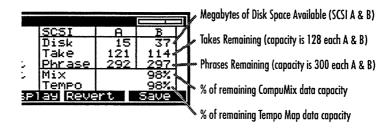
MENU



MENU contains functions needed in any mode of operation, such as input level, time display format, and marker editing. Press MENU to enter Menu mode, press EXIT to return to the previous function.

PROJECT INFO

The right side of the MENU display shows remaining system capacity for the current project.

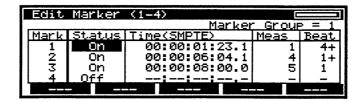


Five functions are always available, accessible by pressing the five function buttons below the display:

LEVEL (F1)

This opens the Level Meters window (same as pressing the Level Meter button).

EDIT MARKER (F2)



You can edit exact marker locations in this window. Markers can be deleted and new markers created.

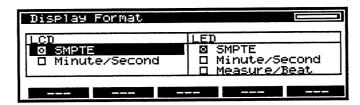
EDITING MARKERS

Use the Cursor keys to display markers 1 through 8 and parameters, then use the Value/Time Dial or Keypad to change the parameter's value. Both time and measure are visible for each marker. You can edit either of them and the other will change accordingly.

Turning OFF a marker deletes it. Turning ON a marker sets the marker to the current "Now Time" location.

Note: Holding the SHIFT key and pressing 1~5 on the data entry keypad selects corresponding Marker Group for editing.

DISPLAY FORMAT (F3)



The DM-800's time display formats can be set in this window. There are two display formats that can be set: LCD and LED.

To set the time display format, simply move the cursor using the cursor keys.

LCD

This parameter selects the DM-800's LCD timing format, which can be set to SMPTE frames or Minutes/seconds.

Note: The number of SMPTE frames per second is set in the System 1 window—press SYSTEM.

LED

The LED parameter selects the time format for the large LED display above the LCD. The display is constantly updated to show the current DM-800 location, also called Now Time. By looking at the displayed time, you can edit events in finer detail than the LCD resolution allows.

Time can be displayed in SMPTE hours: minutes: seconds: frames, Minutes/seconds, or Measures:beats.

Note: The number of SMPTE frames per second is set in the System 1 window—press SYSTEM.

NOTE ABOUT THE MEASURES/BEATS+CLOCKS DISPLAY:

Measures/Beats+Clocks timings are calculated by referencing the Tempo Map to the Time Base. Since the Tempo Map does not have to start at the beginning of the Project and does not have to extend for the full length of the Project, the Time Display (and times of events in the LCD) may display all dashes (—:—) when the current location is before the start or after the end of the Tempo Map.

REVERT (F4)

You can reload the last-saved version of the current Project from disk, if the current edit is not to your liking.

REVERT can be used like an undo function, if you diligently save to disk after each stage of progress.

Important: If you execute the Revert command, you will lose any changes made since last saving the Project.

Note: The current Project is automatically saved to disk during execution of the Take Delete and Delete Takes commands (see pages 51, 97). Therefore, the Revert command has no effect after execution of these commands.

Caution: Takes removed by the Take Delete and Delete Takes commands cannot be restored using

Caution: Executing REVERT immediately after making a recording eliminates only the Phrase--the Take remains, and can be removed only by using the Take Delete or Delete Takes commands.

SAVE (F5)

The current Project must be saved to disk before selecting another Project or shutting down the system. If not, the unsaved data will be lost.

Note: When you execute either SELECT PROJECT or SHUT DOWN (See pages 87,112), the DM-800 will ask if you want to save the current Project before continuing.

REVERT AND SAVE DATA

The Save and Revert commands operate on the following data:

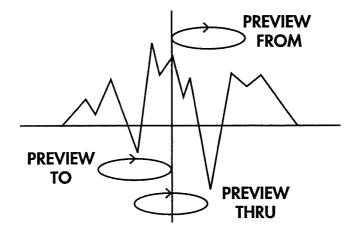
- Playlist (Phrases)
- Compu Mix
- Tempo Map
- Markers
- Recording Parameters

Takes are recorded and played directly from the disk. Because they are already on the disk, they are not affected by Save or Revert commands

PREVIEW

The DM-800 has a preview function which allows you to search for specific edit points of a Phrase. The preview function has three modes. Each has a different use depending on the situation.

When pressing the PREVIEW button, the DM-800 will play a loop of audio (length of loop is defined in SYSTEM) in real time. This loop can begin playing at the Now time, can play through the Now time, or it can play up to the Now time.



PREVIEW FROM

Press and hold PREVIEW FROM. All the tracks can be played back, from the Now Time (current time), for the amount of the time that is set by the Preview Length. A medium length is recommended – try 1~3 seconds.

PREVIEW THRU

Press PREVIEW THRU. All the tracks can be played back for the amount of the time that is set by the Preview Length, one-half before the Now Time and one-half after the Now Time. i.e. The Preview loop is centered on the Now Time. A longer length is recommended – try 2~4 seconds.

PREVIEW TO

Press PREVIEW TO. All the tracks can be played back, from before Now Time (current time) through to the Now Time, for the amount of the time that is set by the Preview Length. A short length is recommended – try $0.1 \sim 0.5$ seconds.

EXAMPLE: Find the beginning of the word "Cat". During playback, press STOP as close to the beginning of the word as possible. Press PREVIEW FROM and PREVIEW TO alternately. If you do not hear the beginning "cat" during PREVIEW FROM, you are too far ahead. If you do not hear the beginning of 'cat' during PREVIEW TO, you are too far behind. Adjust the Now Time by using the parameter dial until you just hear the beginning of the "C" from 'cat' using PREVIEW TO, then backup slightly. PREVIEW FROM should then begin playing exactly at the beginning of 'cat'. Your Now Time is set exactly on the beginning of the word 'cat'.

Alternately using PREVIEW TO and PREVIEW FROM with movement of the parameter dial gives you a very quick and precise method of finding edit points.

You can check how PHRASES are connected by using PREVIEW THRU across the edit point.

NOTE: PREVIEW may not loop if you press PREVIEW at a point just before the ending time of the Project (23:59:49:29.9/1439'49.999"). This is not a malfunction of the DM-800.

PREVIEW MODES

Three different Preview Modes are selectable on the DM-800. Hold down SHIFT key and Press PREVIEW TO to select the Trigger mode. SHIFT + PREVIEW THRU selects the Gate mode. SHIFT + PREVIEW FROM selects the Loop mode.

The chosen Preview Mode always remains selected until a different mode is entered from the front panel.

You can also select or change the Preview Mode under the System Mode (System Parameter 2 page).

TRIGGER MODE

This mode plays the Preview Loop through one time when any Preview button is pressed. You do not have to hold the button down to hear the entire loop. You must press the button each time you want to hear the loop.

GATE MODE

This mode plays the Preview Loop, only while the selected Preview button is held down. If the loop reaches the end and the button is still pressed, it will repeat over and over until the button is released.

LOOP MODE

This mode plays the Preview Loop, over and over, end to end, just like holding down the Button in Gate Mode. However, the Preview button is only pressed once to initiate Loop Preview.

NOTE: To stop the Preview Loop, press STOP or press the selected Preview button again.

SCRUB PREVIEW

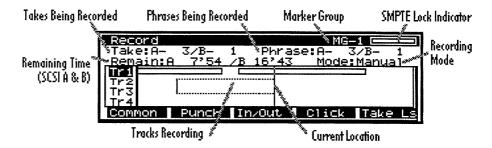
Holding down the DELETE (SCRUB) button before pressing any one of the three Preview Buttons will enter the Scrub Preview mode (To, Thru, or From)

The Scrub Preview mode will playback a very short loop (25 ms - 99 ms, set in System Mode) of audio with no breaks. This is similar to the skip or cue mode on a DAT or CD player. With this short loop of audio, you can "scrub" the audio using the Value/Param dial. Using Scrub Preview To, for example, you can "scrub" right up to the beginning of a sound, hearing just the very initial attack of the sound. Press STOP or the Preview Button again to exit Scrub Preview. The "now time" will be placed exactly at the beginning of the sound. Alternatively, using Scrub Preview From, you could scrub backwards to hear exactly when a sound decays.

OPERATION MODES

There are seven different software modes in the DM-800: 'Record,' 'Playlist,' 'Mixer,' 'Tempo,' 'Trigger,' 'Catalog,' and 'System'. The following section explains the functions of these modes in detail.

RECORD MODE



The Record screen is the main window for recording. Record Mode menus also access parameters related to the recording process, such as input assignment, metronome, punch-in/out, and special recording modes.

BASIC RECORDING PROCEDURE

INPUT ASSIGNMENT

- Press RECORD to access the Record Menu shown above.
- Press IN/OUT (F3) to access the Input/Output Assign screen.
- Use the Cursor to select tracks, and the Value/Time dial to select inputs. (See Page 48 for more information.)
- When complete, press EXIT to return to the Record screen.

TRACK ASSIGNMENT

- Set the current location to the desired record start point, using the Value/Time Dial, Jump mode, or one of the Markers.
- Set the desired recording tracks using the Track Status buttons. The record—enabled tracks will flash red.
- In the Transport Controls section, press the REC (red) button to activate record waiting mode. The REC LED will flash.

SETTING LEVELS

- Press LEVEL METER. The Level screen will appear.
- Adjust the levels on your output devices for the optimum input level on the level meters. In
 order to make the best possible recording, set the level to a point just below clipping. You can also
 use the analog input gain controls on the front panel.

Note: The level cannot be adjusted when recording from one of the digital inputs.

MAKING THE RECORDING

- Press RECORD to return to the Record screen.
- When you are ready to start, press PLAY.
- The DM-800 starts recording. The Record LED and the selected track LEDs will all light red.
- To stop recording, press STOP. A message screen will appear, asking if you would like to keep the
 recording you have just made.



- Press KEEP (F1) to keep the recording, press DELETE (F2) to discard it. Note: Pressing any button other than DELETE (F2) will not delete the take.
- After recording, the DM-800 will automatically name the new Take and Phrase, and place the corresponding Phrase in the current Project.

THE DM-800 RECORDING CONCEPT

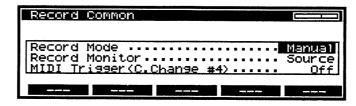
The DM-800 is designed to operate much like a tape recorder. However, the DM-800 is a disk recorder and therefore, it's approach to recording is a bit different. Let us spend a moment here discussing these differences:

With a tape recorder, you can cue up the part of the tape to be recorded, then start recording. The tape recorder erases a section of the recording and replaces it with the new recording. The erased recording is gone forever and there is nothing to differentiate between the previous and new recordings.

With the DM-800, you can also cue up the part of the Project to be recorded, then start recording. What's different is the DM-800 creates a new recording or *Take*, as well as a new *Phrase* that points to the take. The previously recorded phrase is replaced by the new phrase at the recording location. However, the old recording take still exists on the disk and can be accessed again at any time. It is not destroyed, that is why this recording and editing process is called nondestructive.

A Take can be accessed by any number of Phrases which point to parts of the Take, such as the first four bars, the guitar solo after the bridge, or the isolated snare drum in measure 45. Of course, a Phrase can also point to the entire Take. Multitrack Takes and Phrases can also be made.

COMMON (F1)



Basic record settings are made in this page.

RECORD MODE

This sets the type of recording mode: manual, auto punch-in, or looping.

MANUAL

Manual recording is the standard, non-automated method of recording. Recording is started by pressing the RECORD key, or using an external trigger such as a Foot Switch or MIDI Control Change #4 (see page 47).

- Push the Track Status Select buttons so they flash red.
- Push RECORD. The Record button will also flash red.
- Push PLAY. The Record indicator and Track Status Select buttons now glow red steadily and recording begins.

Punch In recording is also possible by first pressing PLAY, then triggering the RECORD button at the desired punch in point:

- Push the Track Status Select buttons so they flash red.
- Push PLAY. The Project will playback. The track buttons will continue to flash.
- Push RECORD. The Track Status Select buttons now glow red steadily and recording begins.

AUTO

This mode is for automated Punch In and Out. Pressing RECORD then PLAY starts playback. At the programmed Punch In time, the DM-800 will punch into record. At the Punch Out time, it will punch back out.

The Punch In and Out times are set in the punch time window — press EXIT to go back to the Record window, then press PUNCH (F2).

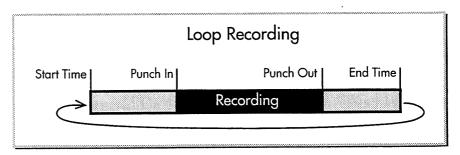
REHEARSAL

When Record Monitor is set to Disk, you can rehearse a punch in by pressing PLAY. At the programmed Punch In time, the DM-800 will not punch in, but will switch to monitor the input. At the Punch Out time, it will switch the monitor back to the disk.

LOOP

Loop Mode repeats a section of the Project over and over. When Record Monitor (see below) is set to Disk, you can rehearse, make a recording and listen back to it, all without stopping.

- Use the Track Status Select buttons to set which tracks will be recorded.
- Pressing PLAY starts playback.
- When the End Time is reached the DM-800 will jump back to the Start Time and resume playback, without stopping.



- You can enter Record on any repetition by pressing REC anytime before reaching the Punch In point. On the next loop, the DM-800 will punch into record. At the Punch Out time, it will punch back out.
- When the End Time is reached, the DM-800 will jump back to the Start Time and playback. A message screen will appear, asking if you would like to keep the recording you have just made. While the message is displayed, the DM-800 will continue to loop and playback the recording. Press KEEP (F1) to keep the recording, press DELETE (F2) to discard it.
- After pressing KEEP or DELETE, the DM-800 will return to rehearsal mode—it plays back and switches to input during the Punch In point.

Hint: You can save the Take and record another by pressing REC instead of KEEP. The DM-800 will keep the last Take/Phrase and punch in again.

The exciting part about loop recording is: each recording can be saved as a different take on the disk! This way you can record a part again and again, then listen back to all the recordings to find the best one. You can choose whether to keep each take as you record it. Of course you will hear the latest Take/Phrase you recorded.

MONITOR

This controls the input-output switching during Record Waiting modes.

SOURCE

When a track is placed in Record Ready—and the Track Status Select Red LED is flashing—the input source will be monitored. Use this mode if you want to play along until a punch in.

DISK

The track will playback from disk at all times except when actually recording and the Track Status Select red LED is lit. Use this mode if you want to hear other recordings on the track, for example, to manually punch in at a specific point.

MIDI TRIGGER

You can punch in and out using a MIDI pedal set to Continuous Controller #4. The Pedal operates like the REC key – pedal down = Record on, pedal down again = Record off.

The MIDI channel used is the MIDI Control Channel, set in the System Parameter 1 page — press SYSTEM, PAGE (F5).

PUNCH TIME (F2)



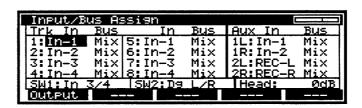
The automated punch timings for Auto and Loop recording are set in this window. Pressing RECORD and PLAY (in either order) starts playback. At the programmed Punch In time, the DM-800 will punch into record. At the Punch Out time, it will punch back out. When the End Time is reached the DM-800 will loop back to Start Time (in Loop mode).

Remember: These locations can also be entered from the front panel, on the fly, by using SHIFT + LOOP START, LOOP END, PUNCH IN, or PUNCH OUT.

IN/OUT ASSIGN (F3)

This page is the DM-800's *Patch Bay*. Inputs can be patched to the desired outputs for recording or remix. Each of the tracks and mixer's Aux channels can be patched. (See the Appendix for a mixer block diagram.)

INPUT ASSIGN



The input sources are:

- The four analog inputs (In-1 to In-4)
- The Digital input (Dg-L and Dg-R)
- The eight digital channels of the RMDB Buss (RMDB1 to RMDB8)
- The internal "bounce down" stereo buss (REC-L and REC-R)

As indicated in the LCD screen, first determine the track to which you want to assign an input. (Trk). Using the cursor keys, highlight the section under In next to the track of choice. Use the Value/Time dial to select the correct input of your choice.

Some inputs are not always available for selection. SW1 and SW2 are used as a Pre-Selector for some of the inputs.

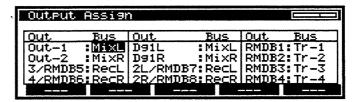
SW1 selects between Analog Input 3/4 and RMDB Buss 5/6. If SW1 is set to In 3/4, then Analog inputs 3/4 will be available as potential inputs to any of the tracks. Alternately, if you select RMDB 5/6 in SW1, the RMDB Buss 5 & 6 will be available.

NOTE: You cannot select Analog input 3 & 4 and RMDB 5&6 simultaneously.

SW2 selects between Digital Input L & R and RMDB 7 & 8. As above, this allows the Digital In or RMDB 7&8 to become choices for input select.

OUTPUT ASSIGN

Press OUTPUT (F1) to access the Output Assign screen.



The output assign screen determines which internal patch cord will feed each physical output connector.

Possible output sources are:

- Direct output from tracks 1 8.
- MIX (mixer) outputs L & R.
- REC buss outputs L & R. (internal bounce down recording buss)

The output section of the DM-800 has two parts: The internal Bus and the physical output connector on the rear panel. Think of the Bus as an Internal patch cord. You can select the input to this patch cord and you can also select the output of the patch cord.

Each track is assigned to a Bus in the first page of the In/Out screen. Just like selecting an input to a track, the output of the track can be directed to one of four different patch cords.

The patch cords are labeled:

This assigns a track to the MIX patch cord. The MIX patch cord goes to the 8 channel front panel mixer and is controlled by the channel fader, pan, and EQ. The audio is then routed to the MixL and MixR buss and the level is controlled by the Master fader.

NOTE: Each Track Output is also sent, PRE Fader, to the direct outputs and can be routed to any physical output connector using the OUTPUT screen. (No Fader, Pan or EQ control).

PRE This assigns a track only to a Pre Fader patch cord. This means that the signal is sent to the patch cord, before it goes through the front panel controls (no fader, no pan, no EQ control). This might be used to "send" a signal to an external processing device.

NOTE: In this mode, the signal will be **removed** from the on board mixer and will **only** be sent to the PRE patch cord. i.e. No output from MixL, MixR, RecL, or RecR.

PST This assigns the track only to a Post Fader patch cord. This means that the signal is sent to the patch cord after the mixer fader and EQ. i.e. The fader and EQ will affect the signal.

NOTE: In this mode, the signal will be **removed** from the on board mixer and will **only** be sent to the PST patch cord. i.e. No output from MixL, MixR, RecL, or RecR.

This assigns the track to a Post Fader patch cord. This means that the signal is sent to the patch cord after the mixer fader, pan, and EQ. i.e. The fader, pan, and EQ will affect the signal. In this REC mode, the signal will be removed from the on Mix Outputs (MixL & MixR) and will only be sent to the REC patch cord. The REC patch cord can then feed two new tracks for internally bouncing tracks. i.e. Assign tracks 1-6 to the REC patch cord. You can then assign the REC patch cord to the Input of tracks 7 & 8. Then using the faders for tracks 1-6, you can do an internal, digital mix directly to tracks 7 & 8. The output of tracks 7 & 8 can then be monitored through the output of the mixer.

NOTE: Each Track Output is also sent, PRE Fader, to the direct outputs and can be routed to any physical output connector using the OUTPUT screen. (No Fader, Pan or EQ control)

You will notice that Analog Out 3 & RMDB5 are selected at the same time. This means that whatever signal is selected to feed the Analog output # 3, also will feed the RMDB Buss # 5 simultaneously. In addition, Analog output # 4 and RMDB6 are tied together. Also, the Digital output # 2 left and right are tied together with the RMDB buss 7 & 8. This provides for maximum patching flexibility using the internal DM-800 hardware.

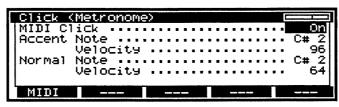
REMEMBER: The signal routed to the Analog output 1 & 2 will appear on the headphone jack. This will normally be the Mixer output MixL & MixR.

HEADROOM

You can reduce the level displayed by the meters to give headroom against mix output clipping. We recommend you set -18 dB headroom, or a level that is comfortable and consistent with your other equipment.

The headroom control is required because of the mixing capabilities of the DM-800. If you mix two tracks together, each with a signal of 0 dB, the resulting mixed signal will be over 0 dB, which is clipping in the digital world. The headroom control essentially allows you to "turn down" all the inputs simultaneously by the same amount so that you do not overload the digital output section.

CLICK (F4)



The settings for the Metronome are displayed in this window.

Note: Since the Metronome uses the Tempo Map to calculate Measures and Beats, the Metronome will not function unless a Tempo Map exists and will not click beyond the Tempo Map's boundaries.

MIDI ON/OFF (F1)

Turns the MIDI Metronome on and off.

Note: The Metronome MIDI channel is MIDI Control Channel, set in the System Parameter 1 page—Press SYSTEM, PAGE (F5)

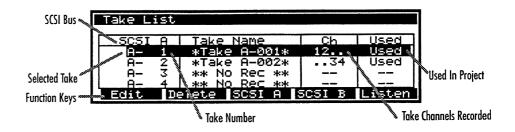
ACCENT

Sets the note number and velocity for the MIDI Metronome accent (downbeat).

NORMAL

Sets the note number and velocity for the non-accented MIDI Metronome (used other than on the downbeat).

TAKE LIST (F5)



In this page, you can audition, edit and delete individual takes. Move the cursor up and down through the list to select the desired take.

EDIT (F1)



You can name the selected Take, the individual channels, and add comments in this screen.

The HOME (F1) command skips to the beginning of the next data entry field. The END (F2) command blanks all the characters positioned to the right of the cursor. The INIT (F3) command clears the selected data field of existing data and moves the cursor to the first character position.

DELETE (F2)

You can delete the selected Take by pressing DELETE. The following message screen will appear:



Press EXECUTE or YES [F1] to continue, EXIT or NO [F2] to abort.

Warning: TAKE DELETE deletes not only the selected Take, but also all Phrases that use it, and also saves the Project data to disk. Since you cannot avoid saving in this situation, be sure you are ready to save before executing TAKE DELETE.

SCSI A (F3) SCSI B (F4)

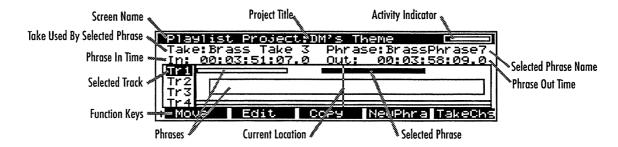
These change the Takes display between SCSI A and SCSI B.

LISTEN (F5)

You can audition the selected Take by pressing LISTEN (F5). A message screen will appear.

Press STOP [F5] to stop playing.

PLAYLIST MODE



The arrangement of Phrases within the Project is edited in Playlist Mode. This mode features the main graphic editing screen. Audio tracks are displayed as horizontal bars across the LCD. This current time is also displayed as a vertical bar in the center of the LCD. Recorded phrases are represented as horizontal lines of "tape". Phrases themselves can also be edited, and new Phrases can be created from existing Takes.

AUDIO PROFILE DISPLAY

In the Playlist mode, press PLAYLIST to open the audio profile display window. An audio profile will be displayed, centered on the "now" line, of the selected (highlighted) phrase. Use the cursor keys to move from track to track. Pressing PLAYLIST again will turn off the profile display. This display will allow you to edit using a waveform, set markers accurately, etc.



The amount of time shown in the display (horizontal resolution) can be changed by pressing the Data Entry keys # 1 through 6.

- #1 128 msec.
- #2 256 msec.
- #3 640 msec.
- #4 1.28 seconds
- #5 2.56 seconds
- #6 6.40 seconds

The audio profile level (vertical resolution), can be changed by pressing the Data Entry keys # 7 through 9.

- #7 Unity gain (G1)
- #8 Increase gain by 6dB (G2)
- #9 Increase gain by 12 dB (G3)

The upper right hand corner of the entire display indicates current vertical and horizontal resolution. e.g. G1/L2560 Unity Gain. Length of time in window is 2560 msec.

With audio profile open, the cursor keys (<) (>) allow you to move back and forth by half the display time. You can use the PARAMETER dial to move the NOW time with the audio display window open.

NOTE: The DM-800 only allows display of recorded audio down to -48 dB Digital or -28 dBm balanced Analog In. Therefore, low level signals will not show up in the audio profile.

The audio profile display is also functional & useful during Cut, Erase, Trim In, and Trim Out.

NOTE: Turn off the waveform display during TRIM-IN if you want to change the FADE-IN parameter. This is because the cursor keys are also used to move through the waveform.

PREVIEW LENGTH INDICATOR

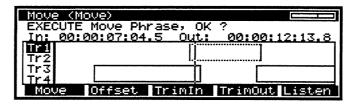
When the wave window (Audio Profile) is open and a Preview function is pressed, the Preview will appear as a horizontal line at the bottom of the wave window at the "Now Time" line. This way, you can see the waveform that is being previewed.

MOVE (F1)

Move and Trim enable graphic editing Phrases within the Project.

There are five functions: Move, Offset, Trim In, Trim Out, and Listen. The Move screen appears first, the others can be called using the function keys.

MOVE (F1)



This function *slips* a phrase against time and the other phrases.

PROCEDURE

- Select the desired phrase using the cursor.
- Set the Current Location to a timing reference point, such as a downbeat. You can use PREVIEW to determine the exact point.
- Press MOVE.
- Use REW or FF, or the Value/Time Dial to move to the new time for the reference point. You can use PREVIEW to determine the exact point.
- Move the cursor to select the destination track.
- Press EXECUTE. The phrase is moved to the new location.
- To abort, press EXIT instead.

RELATIVE MOVE

You can also move a subsequent phrase by the same amount as the previous Move or Copy. This is useful for moving several phrases by the same amount.

- Select the Phrase to Move
- Press MOVE (F1)
- Press the [<] or [>] Cursor Keys to move forwards or backwards by the same amount of time as the
 previously executed Move or Copy command.
- Press EXECUTE to complete the Relative Move.

OFFSET (F2)



The Offset is the length of time between the start of the Take and the In time of the Phrase playing it. If the Phrase starts playing the Take from the beginning, the Offset would be zero.

The Phrase Fade In Time can also be set in this window. The Fade In range is between 5 ms. and 1 second.

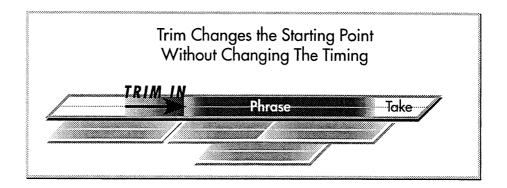
PROCEDURE

- Select the desired phrase using the cursor.
- Press MOVE (F1)
- Press OFFSET (F2).
- Use the Param/Time Dial to set a new Offset. You can also set the Fade In time.
- Press PREVIEW to listen to the change.
- To implement the change, press EXECUTE.
- To cancel, press EXIT instead.

TRIM IN (F3)



Trim In changes the In Point and Offset parameters simultaneously. The result is a change to the point at which the Phrase starts to play, without moving Phrase relative to the other Phrases in the Project. This is useful when the timing is right but you need to *uncover* more of the Take at the beginning.



PROCEDURE

- Select the desired phrase using the cursor.
- Press MOVE (F1)
- Press TRIM IN (F3).
- Use the Param/Time Dial to set a new Trim In point. You can also adjust the Fade In time.
- Press PREVIEW to listen to the effect.
- To implement the change, press EXECUTE.
- To cancel, press EXIT instead.

TRIM OUT (F4)



Trim Out changes the out point of the Phrase without moving it relative to the other Phrases in the Project. This is useful when the timing is right but you need to let the Phrase play longer or shorter at the end.

PROCEDURE

- Select the desired phrase using the cursor.
- Press MOVE (F1)
- Press TRIM OUT (F4).
- Use the Param/Time Dial to set a new Trim Out point . You can also adjust the Fade Out time.
- · Press PREVIEW to listen to the effect.
- To implement the change, press EXECUTE.
- To cancel, press EXIT instead.

USE SEARCH SOUND THRESHOLD FOR TRIM IN & TRIM OUT

You can TRIM IN or TRIM OUT a phrase, based on a preset audio threshold level. e.g. If you want to trim the silence at the beginning of a TAKE so the PHRASE begins exactly on the first audio attack or remove the silence at the end of a PHRASE.

- Press SYSTEM (System Parameter 1 screen)
- Set "Search Sound Threshold" level to the level of the first audio you want the DM-800 to recognize.
- Press PLAYLIST (pg. 1)

- Select PHRASE you want to TRIM
- Press [F1] MOVE
- Select [F3] TRIM IN or [F4] TRIM OUT
- Press △ (Up cursor) (Wait for DM-800 to find threshold it can take a number of seconds)
- Press EXECUTE

LISTEN (F5)

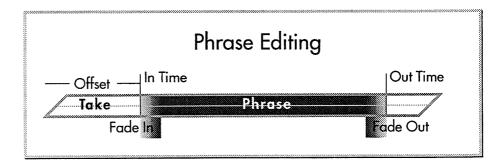
You can audition the selected Phrase by pressing LISTEN (F5). A message screen will appear.

Press STOP (F5) to stop playing.

PHRASE EDIT (F2)



The phrase parameters can be edited from this screen. The display shows the name of the selected Phrase, plus its starting and ending points as described below. You can see the tracks by pressing TRACK (F2), and listen to the phrase by pressing LISTEN (F5).



NAME

The Name of the phrase can be changed.

IN TIME

The In time is the time that the phrase starts playing in the Project. The display shows the In Time in Measures and Beats as well.

FADE IN

A Phrase typically fades in over a short time interval to eliminate pops or other abrupt changes. This duration is set by the Fade In time.

The Fade In duration is from a minimum of 5 ms. (displayed as 0.00) to a maximum of 1 second.

OUT TIME

The Out time is the ending time of the Phrase. The display shows the Out Time in Measures and Beats as well.

FADE OUT

A Phrase typically fades out over a short time interval to eliminate pops or other abrupt changes. This duration is set by the Fade Out time.

The Fade Out duration is from a minimum of 5 ms. (displayed as 0.00) to a maximum of 1 second.

OFFSET

The Offset is the length of time between the start of the Take and the In time of the Phrase playing it. If the phrase starts playing the take from the beginning, the Offset would be zero.

LEVEL

To simplify mixing, the output level can be set for each Phrase.

PARAM (F1) TRACK (F2)

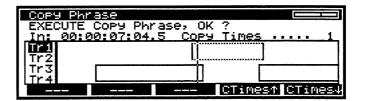
These switch between the two Phrase Edit screens, the Parameter screen as described above, and the Track screen described below.



When you record a Take and Phrase in Record mode, the Phrase is automatically assigned to the recording track(s) in the Playlist. You can change this assignment and mute (turn off) any of the channels.

Note: When you finish editing, press EXECUTE. To abort, press EXIT instead.

COPY (F3)



This function copies a phrase and pastes the copy into the Project at a new location. When selecting the phrase to copy, the current time location will be inserted precisely at the selected destination point.

PROCEDURE

- Select the desired phrase using the cursor.
- Set the Current Location to a timing reference point, such as a downbeat. You can use PREVIEW to determine the exact point.
- Press COPY (F3).
- Use REW, FF or the Value/Time Dial to move to the new time for the reference point. You can use PREVIEW to determine the exact point.
- Move the cursor to select the destination track.
- Press EXECUTE. To abort, press EXIT instead.
- The phrase is copied to the new location.

Note: The copy function creates a new phrase with a higher priority than those already existing in the Project. This means if the new phrase overlaps any previously existing phrase, the overlapped portion of the previous phrase will not play back. The phrase priority can be changed using the FRONT and BEHIND commands, found under Overlap Change in the Playlist Mode.

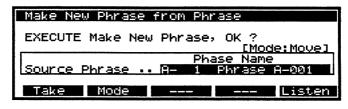
The Copy Times command (F4 and F5) allows you to select how many times the phrase will be copied end to end. e.g. If you select a phrase to be copied, move to the end of that phrase, then select 15 times to copy, the phrase will be copied end to end, 15 times in a row automatically. This is a very handy feature for drum loops, background ambiance tracks, etc.

NEW PHRASE (F4)

MAKE NEW PHRASE FROM PHRASE

You can make a new phrase from an existing Phrase (as opposed to Take). This allows you to quickly spot sound effects (Phrases) that have been previously edited from longer Takes.

- Press NEWPHRA [F4]
- [F1] Toggles between Phrase and Take.
- Select PHRASE (Top of display says "Make New Phrase from Phrase")

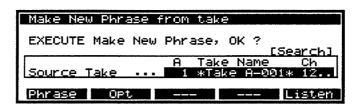


- Select MODE [F2] CAUTION!
 Move Source Phrase will be deleted from its existing location.
 Copy Source Phrase will be copied only.
- Use Value/Time dial to select Source Phrase
- Press EXECUTE a new Phrase is created at the "Now Time" line.

MAKE NEW PHRASE FROM TAKE

You can also make a new phrase from a take, using the Search Audio Threshold command. (See Search Sound Threshold under System Mode). This allows you to automatically trim the beginning of a take, up to the beginning of audio, during the make new phrase process.

- Press NEWPHRA [F4]
- [F1] Toggles between Phrase and Take.
- Select TAKE (Top of display says "Make New Phrase from Take")



Select OPT [F2] — CAUTION!

Search ON — the DM-800 searches the selected Take for the first audio level that exceeds the "Search Sound Threshold" (set in the System Parameter 1 screen) and uses that point as the beginning of the new phrase.

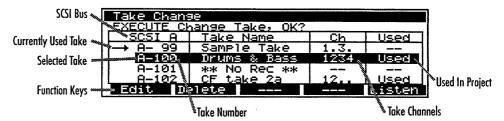
Search OFF — Very beginning of the Take is the beginning of the Phrase.

- Use Value/Time dial to select Source Take.
- Press EXECUTE a new Phrase is created at the "Now Time" line.

The new phrase will be named the same as the original Take. You can change the Name in the Phrase Edit screen.

NOTE: The new Phrase will be created on the same channel (Track) as the original Take. The Out Time of the new Phrase will become either the Out Time of the current Phrase or the end time of the original Take (whichever is earlier).

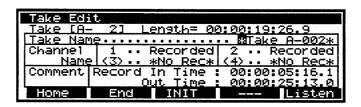
TAKE CHANGE (F5)



In this page, you can select a different Take to be used by the selected Phrase. You can also audition, edit and delete individual takes.

Move the cursor up and down through the list to select the desired take.

EDIT (F1)



You can name the selected Take, the individual tracks, and add comments in this screen.

The time at which a recording begins (In Time) and the time when it ends (Out Time) are automatically entered as text into the comment section of the Take.

The format of the time is the same as the format which is set in the LCD of the display format screen at the time of the recording. Once a Take is recorded, the format of the time in the comment never changes, even if the LCD settings of the display format screen are changed. By checking this comment text, it is possible to manually move the Take back to its originally recorded location.

DELETE (F2)

You can delete the selected Take by pressing DELETE. The following message screen will appear:



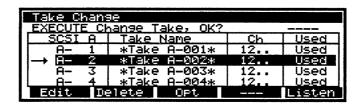
Press EXECUTE to continue, EXIT to abort.

Warning: TAKE DELETE deletes not only the selected Take, but also all Phrases that use it, and also saves the Project data to disk. Since you cannot avoid saving in this situation, be sure you are ready to save before executing TAKE DELETE.

OPTION (F3)

You can use the Search Sound Threshold function during a Take Change operation.

- Select the Phrase for the desired Take Change.
- Press TAKECNG [F5]



Select OPT [F3] — CAUTION !

Search ON — The DM-800 searches the selected TAKE for the first audio level that exceeds the "Search Sound Threshold" (set in the System Parameter 1 screen) and uses that point as the beginning of the new phrase.

Search OFF — The start of the Take becomes the beginning of the Phrase.

- Use the Value/Time dial to select the Source Take
- Press EXECUTE Replaces the existing Take with the new Take in the existing Phrase.

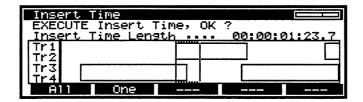
NOTE: The new Phrase will be created on the same channel (Track) as the original Take. The Out Time of the new Phrase will become either the Out Time of the current Phrase or the end time of the original Take (whichever is earlier).

LISTEN (F5)

You can audition the selected Phrase by pressing LISTEN (F5). A message screen will appear.

Press STOP to stop playing.

INSERT TIME (PAGE 2 + F1)



INSERT TIME adds blank space into the Project. It functions exactly like splicing in a piece of blank tape, creating silence that lasts the duration of the splice. If there are phrases that play across the splice point, they will resume after the splice (actually new phrases are created but the effect is the same).

PROCEDURE

Select the desired Phrase using the cursor, and set the Current Location to the desired starting point for the insert.

Hint: You can use the Preview function to help find the exact location.

- Press INSERT (Function+F1)
- Select ALL (F1) or ONE (F2) track for the edit.
- Use PLAY and STOP or the Value/Time Dial to set the duration. You can use the Preview function to help find the exact location.
- Press EXECUTE to create the insert.
- To abort, press EXIT instead.

ALL (F1)

This sets the Time to be inserted in all tracks, as well as into the Compu Mix data. The Tempo Map is not affected.

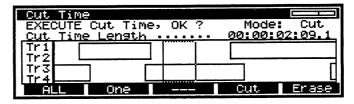
ONE (F2)

This sets the time to be inserted into only the selected track.

Note: If the selected track is one of a stereo pair—in other words, one track of a two-track Take—selecting One will affect both tracks.

Note: The Compu-Mix and Tempo Map data are not affected by this mode.

CUT/ ERASE (PAGE 2 + F2)



Cut/Erase offers two related functions, Cut and Erase. You can select the function using the function keys.

CUT (F4)

Cut Time removes space from the Project, exactly like splicing out a piece of tape, shortening the Project by the length of the cut. If there are phrases that play across the splice point, the midsection of the phrase will be spliced out (actually new phrases are created but the effect is the same).

ERASE (F5)

Erase blanks the selected region, like punching in blank space. All timings remain the same.

If there are phrases that play across the erased region, the midsection of the phrases will be removed (actually new phrases are created but the effect is the same).

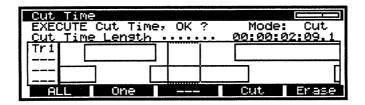
PROCEDURE

- Select the desired Phrase using the cursor, and set the Current Location to the desired starting point for the edit. You can use PREVIEW to help find the exact start point.
- Press CUT/ERS (Function+F2)
- Select CUT (F4) or ERASE (F5).
- Select ALL (F1) or ONE (F2) track for the edit.
- Use the PLAY and STOP or the Param/Time Dial to set the end point. You can use PREVIEW to find the exact spot.
- Press EXECUTE to cause the edit.
- To abort, press EXIT instead.

ALL (F1)

Selecting All causes the Erasure or Cut to occur on all tracks, as well as on the Compu Mix data. The Tempo Map is not affected.

ONE (F2)



Selecting One causes the Erasure or Cut to occur only on the selected track.

Note: If the selected track is one of a stereo pair—in other words, one track of a two-track Take—selecting One will affect both tracks.

Note: The Compu-Mix and Tempo Map data are not affected by this mode.

SPLIT PHRASE (PAGE 2 + F3)

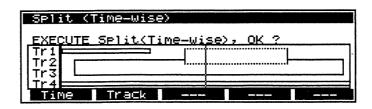
You can divide an existing Phrase into two new ones with this function. Phrases can be split either:

Time-wise: the original Phrase is cut into beginning and end segments, each with the same tracks,

OR:

Track-wise: some tracks are sent to one phrase, the remaining tracks to the other, while retaining the original length.

TIME-WISE (F1)



Splits phrase into two phrases. Current time and beyond becomes the second phrase.

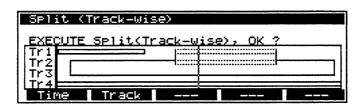
PROCEDURE:

Select the desired Phrase using the cursor, and set the Current Location to the desired split point.

Hint: You can use the Preview function to help find the exact location.

- Press SPLIT (Function+F3).
- Press TIME (F1)
- Press EXECUTE to create the split.
- To abort, press EXIT instead.

TRACK-WISE (F2)



Splits Phrase into two by tracks. The (cursor) selected track and below become the second Phrase.

PROCEDURE

- Select the desired Phrase using the cursor.
- Move the cursor up and down to select the track boundary for the split.
- Press SPLIT (Function+F3).
- Press TRACK (F2)
- Press EXECUTE to create the split.
- To abort, press EXIT instead.

OVERLAP (PAGE 2 + F4)



Sometimes your playlist arrangement will result in two or more phrases overlapping on the same track or tracks. You can arrange the relative priorities of these overlapping phrases with the FRONT (F1) and BEHIND (F2) keys. FRONT brings the selected phrase in front of the others, giving it first priority. BEHIND places the phrase behind the others, giving it last priority.

Note about Track Phase: To maintain phase coherency between tracks, avoid partially overlapping tracks in a Phrase—either overlap **all** tracks or don't overlap any. See Stereo Phrases — Phase Lock in the Troubleshooting section, page 131.

LIST (F3)



The LIST (F3) command will bring up a complete list of all phrases that are stacked on top of each other. Use the cursor keys to select the phrase of choice and bring to the FRONT (F1) or send to the BACK (F2).

You can audition the selected Phrase by pressing LISTEN (F5).

This is very handy when you have multiple Takes of the same material. e.g. 15 different guitar overdubs. You can easily select them one at a time and bring them to the front for auditioning and playback with all the other tracks.

PHRASE DELETE (PAGE 2 + F5)



You can delete the selected Phrase in this window by pressing EXECUTE. Press EXIT to abort.

Note: Deleting a Phrase does not delete the Take that it uses.

LISTEN (F5)

You can audition the selected Phrase by pressing LISTEN (F5). A message screen will appear.

Press STOP (F5) to stop playing.

GROUP (PAGE 3 + F1)

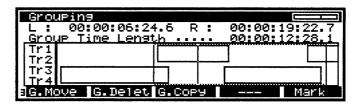
GROUP MOVE

You can move a group of phrases at the same time.

Use the FUNCTION button to find page 3 (Group) of Playlist screen



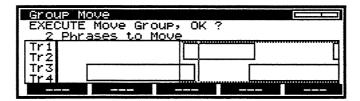
- Locate the Now Time to the sync point you want to move from.
- Press GROUP [F1] (this captures the Now Time as the sync point)
- Move to the beginning of the group of phrases to be moved, using jump, next, previous, param dial, markers, etc. Then press MARK [F5]. This marks the beginning of the group.



Move to the end of the group of phrases and press MARK [F5]. This marks the end of the group.

NOTE: You will see a dotted line box being drawn around the phrases you wish to move as you mark the beginning and end of the group. This box MUST fully enclose ALL phrases you wish to move. e.g. If you want to move phrases on tracks 1-4, start on track 1 for your first MARK command. Then use the cursor keys to move to track 4, before you place your last MARK. Then the box encloses phrases on all 4 tracks. The box can obviously enclose any number of tracks from 1~8 simultaneously.

Press G.MOVE [F1]



- Locate to the Now Time where you wish to move your phrases (using jump, next, previous, param dial, markers, etc.)
- Press EXECUTE to complete the Group Move.

GROUP DELETE

This allows you to Delete a group of phrases (similar to Group Move described above)

- Use the same commands as in Group Move to build your Group box around the Phrases you wish to
- Press G.DELETE [F2]



Press EXECUTE to complete the Group Delete function.

NOTE: If some tracks of a multitrack phrase are left outside of your Group Box, the phrase will be fractured (split trackwise) and only the tracks inside the box will be deleted.

GROUP COPY

This functions exactly like Group Move (see above), except that all the phrases within the Group Box will be copied (duplicated) to the new time location.



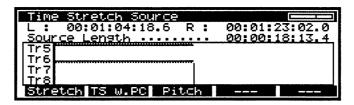
STRETCH (PAGE 3 + F2)

The Stretch command is used for three different Time and Pitch correction functions.

Place the Now Time line at the beginning of a phrase you wish to time or pitch correct.

NOTE: You can only start the STRETCH command at the beginning of a Phrase boundary. Use the Split command to create a new Phrase if you need to begin in the middle of an existing Phrase.

Press the STRETCH (F2) function key.

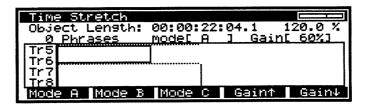


 Use the Value/Time dial, Markers, or Phrase Locate buttons to move the Now Time to the end of the Phrase (or Phrases) you wish to correct. You will see a dotted outline box drawn on the LCD screen. Use the up or down cursor to extend the box around additional phrase on additional tracks if required.

NOTE: The length of the selected Phrase or Phrases is indicated as Source Length. L: = Left boundary R: = Right boundary.

Then choose one of the following three options.

TIME STRETCH (F1)



This function is time compression or expansion without changing the pitch of the original material. The sound quality of Time Compression is affected by the interaction of many factors including the Time Compression algorithm used, the original source material, and the crossfade and gain settings. There are no "perfect" settings for any particular source material.

Experimentation with each individual sound source is the only way to insure the best results.

Use the Value/Time dial to change the length of the source material by the desired amount. (Time
and Percentage change are both indicated).

NOTE: As with all time compression algorithms, use the **minimum** amount of change required. As the correction amount increases, the audio quality decreases.

• Use Mode A, B, or C (F1-F3) to select between three different Time Compression algorithms.

Mode A (crossfade length - variable) 3 rd. choice.

Mode B (crossfade length - 158 msec) 1 st. choice.

Mode C (crossfade length - 68 msec) 2 cd. choice.

NOTE: Some users prefer Mode A for voice or narration, Mode B for classical music, and Mode C for pop or rock music. However, MODE B seems to be the preferred first choice for all material.

Use the Gain Up or Down buttons (F4-F5) to adjust the gain of the processed result. The Gain setting
is used to control the "digital overflows" that can occur from Time Compression calculations. The
Default setting is 60%. At 60%, overflows will never occur. However, as you increase the gain into
the 70% range, "overflow noise" can begin to occur.

NOTE: Remember to try different settings to learn how they affect your source material.

Press the EXECUTE button to complete the Time Compression function or EXIT to abort.

TIME STRETCH WITH PITCH CHANGE (F2)



This function provides time compression or expansion with the appropriate pitch shift associated with the change in playback time.

This is a particularly handy feature since it allows you to "varispeed" the actual playback time of the selected phrases. An external, sophisticated "Harmonizer" can then be used on the audio output to "pitch shift" the phrases back to their original pitch.

This is the preferred method for producing the highest quality time compression available.

Select High, Mid, or Low audio quality. Higher quality will take more time to process. Low quality will be faster.

- Use the Value/Time dial to change the length of the source material (Time, Percentage change, and Pitch change (in musical cents) are all indicated.
- Press the EXECUTE button to complete the Time Compression with Pitch Shift function or EXIT to abort.

PITCH CHANGE (F3)



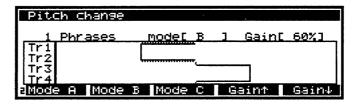
This function changes the pitch of the selected material without changing the playback time.

Select High, Mid, or Low audio quality. Higher quality will take more time to process. Low quality will be faster.

 Use the Value/Time dial to change the pitch of the source material. The amount of pitch change (in musical cents) is indicated in the LCD display.

REMEMBER: 100 cents = 1 musical half step.

Press the FUNCTION button to select Page 2 of the Pitch Change parameter settings.



 Use the F1-F3 buttons to select the Pitch change algorithm and the F4-F5 buttons to set the Gain of the Pitch changed phrase.

NOTE: See the information about Mode & Gain in the previous section - TIME STRETCH (F1).

 When both page 1 & 2 are set correctly, Press the EXECUTE button to complete the Pitch Change function or EXIT to abort.

X-FADE (PAGE 3 + F3)

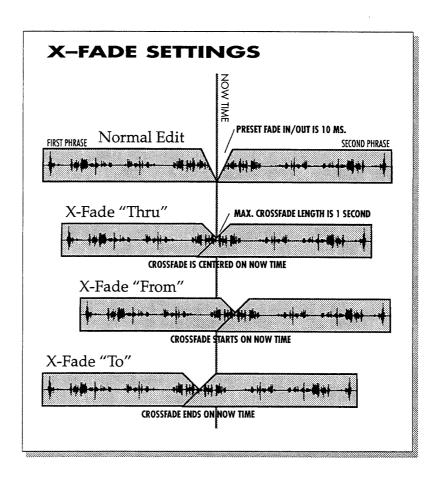


The X-Fade command is used to change the transition between one phrase and another phrase immediately following it.

When two Phrases are placed end to end (either using Split, Move, or Copy) the transition between the two phrases takes place as shown in the diagram below - Normal Edit Mode.

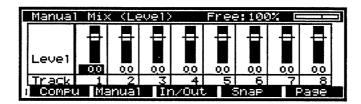
Use the Value/Time dial to select TO, FROM, or THRU mode and the length of the crossfade. (up to 1 Second Maximum.)

IMPORTANT NOTE: If the Length does NOT adjust, this indicates that you are at the extreme end or beginning of a TAKE. There is no more audio material available from the Take to perform the appropriate Fade Out or Fade In.



VERY IMPORTANT NOTE: The timing of the two Phrases does not change when executing the X-Fade command. i.e. Both Phrases remain exactly where they were originally placed on the timeline. Only the edit point is adjusted around the current Now Time.

MIXER MODE



The DM-800 has an internal eight input–two output mixer that can be used for creating a stereo, digital-domain mix to the stereo outputs. You can record this mix from the DM-800's Digital Output without having to convert your DM-800 recordings back to analog.

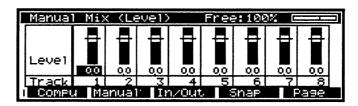
The mixer also includes automation much like that found on traditional consoles. The automated mix can be recorded and then updated with new values as many times as you wish. Individual mixer events can also be displayed and edited.

There are two mixer modes: Manual and Compu. You can switch between the modes by pressing the COMPU (F1) or MANUAL (F2) function keys.

MIXER CONTROL PAGES (F5)

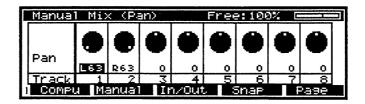
The structure of the Mixer pages represents a "window" on the mixer, showing a section of the mixer parameters for all eight channels. You can move through the different windows by pressing the PAGE (F5) key.

LEVEL



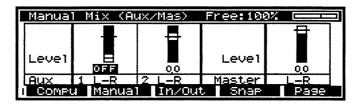
This window displays the Level settings for all eight track outputs. The level is displayed in dB.

PAN



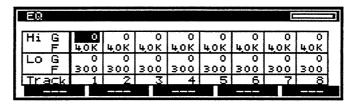
This window displays the Pan settings for all eight track outputs.

AUX/MAS



This window displays the mixer Master Output levels as well as levels for the two pairs of Auxiliary Inputs. The level is displayed in dB.

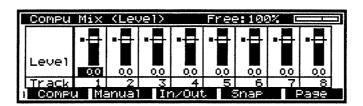
EQ



This window displays the EQ settings for all eight track outputs. You can set the EQ rolloff frequency and level here.

Frequencies (F) displayed with a decimal point indicate kHz, 2.5 kHz for example. Frequencies displayed without a decimal point indicate Hz, such as 350 Hz.

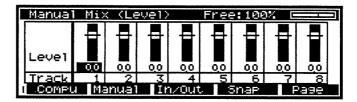
COMPU (F1)



In Compu Mixer mode, the mixer settings are automated. Mixes can be recorded, played back, and updated in this mode.

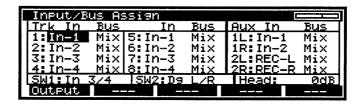
Note: The square mark indicates the physical position of the fader.

MANUAL (F2)



In manual mode, the mixer settings are static. You can change any parameter simply by moving the cursor to it and dialing in the desired setting, or by using the fader.

IN/OUT ASSIGN (F3)



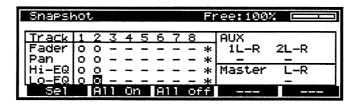
This is the DM-800's Patch Bay. Inputs can be patched to the desired outputs for recording or remix.

Refer to the Record Mode section under In/Out Assign, page 48.

MIXER FUNCTIONS (F4)

The Function button steps through 4 different possible commands for the (F4) button. SNAP, GROUP, MICRO, and INIT. Each command is described in detail below.

SNAP



You can make a SNAPSHOT of the mix at any existing time position. This function inserts all the selected manual mixer settings into the CompuMix data, at a specific time location. This feature can be used when you want to make a multitude of mixer changes at a specific time. e.g. Complete level and EQ changes between each music track of a CD master.

- Locate the DM-800 to the time you want a make a mixer snapshot.
- Press FUNCTION until SNAP is displayed under the F4 key.

- Set all appropriate mixer controls to the positions you wish to "snapshot"
- Press SNAP [F4]
- In the screen that appears, select which mixer controls are to be written into the snapshot.

Press ALL ON [F2] to turn all mixer controls on.

Press ALL OFF [F3] to turn all mixer controls off.

To select only **some** of the controls, press SEL [F1]. You can then use the cursor controls and the [F1] key to select the desired controls to be included.

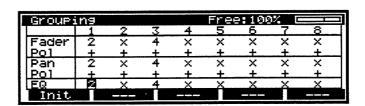
[o] — Included (On) [—] — Excluded (Off)

NOTE: This ON / OFF control does not have anything to do with the actual level setting of the control. It only indicates whether the physical setting of the control is included in the Snapshot or not.

Press EXECUTE to complete the mixer Snapshot at the current NOW time.

NOTE: The Mixer will maintain all Snapshot settings until it receives new Snapshot or CompuMix data.

GROUP



You can group several channels together to facilitate mixing: a stereo pair, the rhythm section of a music track, the music bed of a commercial are just some possibilities that come to mind.

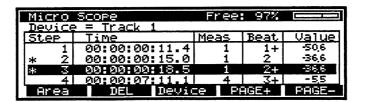
- Press FUNCTION until GROUP is displayed under the F4 key.
- Set the proper balance of the channels relative to each other before grouping.
- Press GROUP [F4]
- In the screen that appears, select the desired Mixer groups and polarity:

To disable all groups, press INIT [F1]

Use the Cursor controls and Value / Time Dial to select Fader Groups, Pan Groups, and Group Polarity.

- [x] Indicates NO group assignment.
- [1] Indicates fader or pan has been set to group #1 and fader or pan control #1 will be the master.
- [+] Indicates positive polarity Master goes up, this group member goes up.
- [—] Indicates negative polarity Master goes up, this group member goes down. This is useful for cross fading or cross panning.

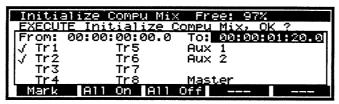
MICRO



This feature allows you to edit mixer steps in the CompuMix data.

- Press FUNCTION until MICRO is displayed under the F4 key.
- Press MICRO [F4]. CompuMix data for Track 1 is displayed on the screen in sequential time order. Use the UP and DOWN arrow keys to select a particular item for editing, then use the Value/Time dial to change the value.
- To select a different mixer parameter, e.g. Fader 1, Hi Eg 4, Master L, etc., press DEVICE [F3]. Use the Value/Time dial to select the parameter you wish to edit.
- DELETE [F2] allows you to DELETE the highlighted step of mixer data for the parameter you have selected.
- AREA [F1] allows you to select an AREA of mix data to DELETE. Hold down the [F1] button and use the Cursor controls or PAGE + or PAGE - to select the area for deletion (all steps to be deleted are indicated with an *).
- PAGE+ [F4] allows you to move forward through the steps, one page at a time.
- PAGE—[F5] allows you to move backward through the steps.

INIT



This function initializes (erases) CompuMix data. You can initialize individual tracks, or specify a specific time region to be initialized.

- Press FUNCTION until INIT is displayed under the F4 key.
- Press INIT [F4]

Choose which faders you wish to Initialize using the MARK (F1) command and Cursor controls. ALL ON (F2) will place a √ beside all tracks (all will be selected to Initialize). ALL OFF (F3) will remove all $\sqrt{}$ marks (no tracks will be Initialized).

The time boundaries for the Initialize are entered in the From and To sections. Move the cursor and enter a time setting using the keypad or the Value/Time dial.

Tracks which are initialized are set as follows:

- EQ is set to 0
- Track Fader is set to 0 dB.
- Aux Fader is set to OFF.
- Master Fader is set to 0 dB (full ON)

MIXER TRACK STATUS SELECT

When in a CompuMix screen, the Track Status Select buttons are used to select tracks for mix recording and playback. The LEDs display the track's mixer status:

Green LED: Compu Mix Play

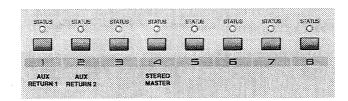
Red: LED: Compu Mix Record

No LED: Manual Mix

Caution: Be sure you are in a Compu Mix screen with mixer controls visible in the display. Otherwise, the Track Status Select keys will choose tracks for sound recording and playback.

AUX / MASTER MIX STATUS

When the Auxiliary Input / Master Output faders are displayed on the LCD screen, their mix status is displayed and can be set using the Track Status Select keys as indicated below:



COMPU MIX RECORDING

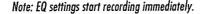
Compu Mix data for one Project can contain a maximum of 10,000 events. Each fader movement requires one event.

The available mix memory is shown on the top line of the Mixer screen as Free:**%.

Note: When the entire mix memory has been used up (Free: 00%) you cannot continue to record. The Initialize Compu Mix command will erase unnecessary data — Select INIT from the Mixer Mode to erase Compu Mix data. See previous page.

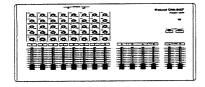
PROCEDURE

- Press MIXER to display the mixer screen.
- Press COMPU (F1). The Compu screen will be displayed.
- Select tracks for mix recording by pressing the appropriate Track Status Select keys. The Track Select Status LEDs will flash red.
- Press REC, then PLAY. The Project plays back.
- Move the faders until the square mark indicating the physical fader position matches the fader on the display. When matched, the mark will disappear and record updating will start for that control. The flashing Track Status Select LED will light steadily indicating recording.

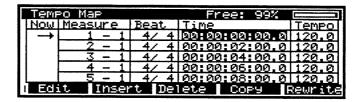


Press STOP.

To begin updating immediately on recording, match the fader levels during Record Waiting mode – after pressing REC but before pressing PLAY.



TEMPO MODE



Tempo Mode is for creation of a Tempo Map that references bars & beats to absolute time.

Some uses for the Tempo Map are:

- Synchronizing a MIDI sequencer to the DM-800 for MIDI overdubs against a live track.
- Placing bar lines on a track originally recorded without a metronome.

TEMPO MAP VS. PROJECT TIME

The DM-800 calculates the Measures/Beats display times by comparing the absolute time with the Tempo Map. However the Tempo Map does not have to start at the beginning of the Project and does not have to extend for the full length of the Project. When the TIME DISPLAY is set to MEAS/BEATS and the Tempo Map is shorter than the Project, the Time Display may occasionally show all dashes (—.—.). This is because the current location (Now Time) is before the start or after the end of the Tempo Map.

TEMPO MAP CAPACITY

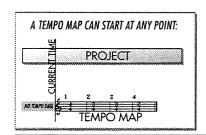
A Project's Tempo Map can contain a maximum of 2000 events. A minimum of one event is used for each measure. Each tempo change generates an event. Retards and accelerando are created by rapidly changing the tempo as often as every ½2 note—much like MIDI Continuous Controller messages.

Available Tempo Map memory is shown on the top line of the display as Free: **%.

CREATING A TEMPO MAP

A Tempo Map can be created from scratch either by inserting the desired number of measures, or by tapping in the beats on the ENTER key, footswitch, or connected MIDI device.

INSERTING MEASURES (OVERVIEW)



Creating a Tempo Map with INSERT MEASURE is useful when starting a new Project.

PROCEDURE

 Set the Project Current Time to the desired starting point for the Tempo Map—where the beat starts. This does not have to be the beginning of the project.

- Select the Insert Measures command—press TEMPO, then INSERT (F2)The Insert Point shows ****
 since a Tempo Map does not yet exist.
- Using the Cursor and the Value/Time Dial, set the Time Signature Beat (both top and bottom), and Tempo as desired. To the right of the Tempo parameter, the length of each measure is displayed.
- Set the number of measures of the same Beat and Tempo with the Insert Times parameter. The Total: parameter displays the total time of the measures to be inserted.
- When the settings are correct, press EXECUTE.

Note: The Type window allows selection of beat or measure. Selecting measure will insert full measures with equal beats per measure. Selecting beat will insert individual beats in each measure which can be edited individually.

USING TAP TEACH TO MANUALLY SET THE TEMPO

Creating a Tempo Map using TAP TEACH is best for matching bars to an already existing track. In this procedure, you play quarter notes (or whatever the Time Signature denominator) from a MIDI keyboard or other MIDI device. The ENTER key on the front panel can also be used. The Tempo Map adjusts each beat for the variations intempo as tapped in.

PROCEDURE

- As above, set the Project Current Time before the desired starting point for the Tempo Map—where
 the beat starts.
- Enter Tap Teach mode—press TEMPO, then TEACH (FUNCTION+F1).
- The Start Measure shows **** since a Tempo Map does not yet exist.
- Using the Cursor and the Value/Time Dial, set the Time Signature Beat (both top and bottom) as desired.
- Set the number of measures to be tapped with the Insert Times parameter. This is the number of
 measures that must be tapped for the recording to be completed.
- Set the Source to MIDI NOTES. The notes must be input on the MIDI Control Channel set on the SYSTEM page. If you wish to use the ENTER key on the Remote's keypad instead, set the Source to ENTER SW.
- Adjust the MIDI Note Range to the notes to be played.
- When the settings are correct and you are ready to start, press REC then PLAY. The REC LED will flash, and the Project will begin playback.
- When the desired starting point is reached, start tapping, beginning with the downbeat. The REC LEDs
 will now light steadily, and Tempo recording will begin.
- To complete the Tempo recording, you must tap the number of measures specified by the Insert
 Times parameter, plus the downbeat of the following measure. The following downbeat is
 necessary in order to calculate the length of the last beat.
- To abort the recording, stop tapping before completing the specified measures.

Note: If successive taps are not received within an approx. 12 second interval, the Tempo Map will time out and the recording will abort.

TO TAP TEACH WHEN A TEMPO MAP ALREADY EXISTS

The procedure is similar, except:

- You can set the Start Measure to begin tapping.
- The DM-800 starts playback at current location, which should be set before the Start Measure. The REC LEDs will flash until the Start Measure is reached, at which point it will glow steadily and recording will begin.
- Any taps before the Start Measure are ignored.
- Remember to tap the downbeat of the Start Measure.

USING MIDI CLOCKS TO SET THE TEMPO (OVERVIEW)

Use MIDI clocks from a remote source such as a MIDI sequencer to create a Tempo Map.

PROCEDURE

- As above, set the Project Current Time before the desired starting point for the Tempo Map—where the beat starts.
- Enter Tap Teach mode—press TEMPO, then TEACH (FUNCTION+F1).
- The Start Measure shows **** since a Tempo Map does not yet exist.
- Using the Cursor and the Param Dial, set the Time Signature Beat (both top and bottom) as desired.
- Set the number of measures for the Tempo Map with the Insert Times parameter. This is the number of measures that must be received for the recording to be completed.
- Set the Source to MIDI CLOCK.
- When the settings are correct and you are ready to start, press REC then PLAY. The REC LED will flash, and the Project will begin playback.
- When the desired starting point is reached, transmit MIDI clocks to the DM-800 by pressing PLAY or START on your MIDI sequencer or other device. The DM-800's REC LED will now light steadily, and Tempo recording will begin.
- To complete the Tempo recording, the DM-800 must receive the number of measures specified by the Insert Times parameter, plus the downbeat of the following measure.
- To abort the recording, stop the clocks before completing the specified measures.

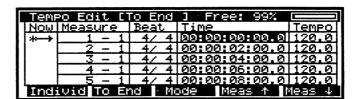
Note: If a Tempo Map previously exists, you can specify a Start Measure. Tempo Map recording will start at that point.

TEMPO MAP FUNCTIONS



Upon entering Tempo mode, the current time is referenced to the nearest Tempo Map event, shown in the center of the display. You can scroll through the tempo events with the Up/Down or Value dial. Marker keys can also be used to locate events.

EDIT (F1)



You can edit the selected Tempo Event using the Value/Time Dial. The INDIVID (F1) and TO END (F2) keys can be used to set the time editing mode, below.

INDIVIDUAL (F1) TO END (F2)

These keys set the time editing mode. In Individual mode, only the time of the cursor selected event will be changed—other events' timings will stay the same. In To End mode, changing the timing of any event affects all subsequent events as well.

In either mode, event timings will shift when performing any measure commands (Insert/Delete/Copy/Rewrite) and also when using Tap Teach.



MODE (F3)

Use the Mode (F3) button to enter the Value/Time Dial editing mode.



Normal edit mode shows the current Now Time as an arrow on the left of the LCD pointing to a particular Measure or Beat. This shows the current position of Now Time. If you move the Value/Time dial in this mode, it just moves the Now Time through the project. (the arrow will move from measure to measure)

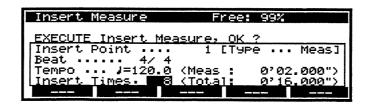
By using the Mode (F3) button, an * is placed next to the Now Time arrow. This indicates that the Value/Time dial can be used to change the Time / Tempo value of the highlighted bar or beat.

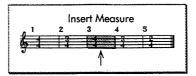
- No * = Value dial steps through the project.
- With * = Value dial changes Time / Tempo value of highlighted bar or beat.

MEASURE UP/DOWN (F4/F5)

The front panel cursor keys step through the Tempo Map one beat at a time. The Measure Up (F4) and Measure Down (F5) buttons allow you to step through the Tempo Map one whole Measure at a time. i.e. allows faster movement through the Tempo Map.

INSERT MEASURE (F2)





You can add individual measures to the Tempo Map from this screen. The Time Signature (Beat), and Tempo can be set, as well as the number of measures to be added (Insert Times). The DM-800 displays the duration of the measures to be inserted.

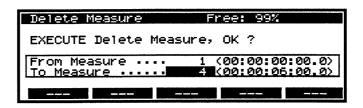
PROCEDURE

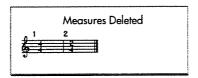
Select TEMPO mode, Screen # 1

Important: The arrow points to the measure nearest the current Now Time. Use the up/down arrow keys or Param dial to move through the list. Inserts will be made directly before the selected (highlighted) measure.

- Press [F2] Insert
- Using Cursor controls and Value/Time Dial you can:
 - Select Insert Point (measure #)
 - Select Type (whole Measures or individual Beats)
 - Select Beat (Time Signature)
 - Select Tempo (Beats per Minute)
 - Select number of times to insert
- Press EXECUTE to complete the INSERT.

DELETE MEASURE (F3)



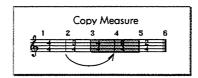


You can remove measure regions of the map with Delete Measure. Select a range From and To, then press Execute to delete the entire selected range.

Note: When free memory equals zero (Free: 00%) you cannot continue to record, or execute Insert/Copy Measure commands. DELETE MEASURE can be used to eliminate unnecessary data.

COPY MEASURE (F4)





You can copy one section of the tempo map and insert it to another with this command. The Copy Times parameter enables repeat copies.

REWRITE (F5)

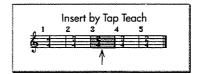


You can change the tempo of already existing measures from this screen.

TEACH (PAGE2+F1)



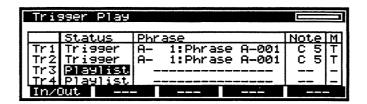
Using Tap Teach, you can program the tempo map automatically. There are several ways to accomplish this.



Play the DM-800 track and Tap the beats on the ENTER key, the footswitch, or a MIDI keyboard. This is the preferred way to sync a MIDI recording to a previously recorded DM-800 track.

Use an external MIDI clock source to define the beats. This will "stripe" the tempo on the DM-800. This method is best if you have already recorded data on your MIDI sequencer and are now going to record live tracks on the DM-800 in sync with your sequencer.

TRIGGER MODE



Trigger Play mode enables MIDI notes to be used to trigger individual recordings. The Keypad buttons 1-8 will also trigger the Phrase on the corresponding track.

To use a Phrase in Trigger Play mode, that phrase must be placed on the track by Recording, Copying, or Creating a New Phrase.

In Trigger Play mode, one Phrase can be assigned to play on each track. Each channel is essentially monophonic—re-triggering a Phrase cuts off any Phrase already playing.

Some tracks can be in Trigger mode, while others are in standard play mode at the same time. The Track Status Select LEDs show each track's mode:

• Red / Green / Off LED:

Playlist Mode

• Orange LED:

Trigger Mode

Note: Phrases can only be triggered while in Trigger Play mode.

CREATING TRIGGERED PHRASES

The procedure to create a Triggered Phrase is the same as to create any other Phrase. The difference is, instead of the Phrase playing at a certain time, the Phrase plays when a MIDI note is received.

PROCEDURE

- In RECORD mode, record a Take on the Track to be used for triggering. The exact placement of the Phrase on the Track is not important, only that it is on the proper Track.
- Give the Phrase an appropriate name, so you can easily recognize it in a listing.
- Press TRIGGER to enter TRIGGER PLAY mode.
- Using the Cursor, select the Status parameter for the Track to be used for Triggering. With the Value/ Time dial, set the Status to TRIGGER or ADVANCE TRIGGER.
- Move to the Phrase column. Using the Value/Time dial, select the desired Phrase. Any Phrases on the track can be selected.
- Move to the Note column. Select the MIDI note for Triggering.
- Move to the M (Mode) Column. Select T for "Triggered One-Shot" (plays all the way to the end), or G
 for "Gated" (plays only as long as triggered) playback.

TRIGGER PLAY FUNCTIONS

IN/OUT ASSIGN (F1)



This page is the DM-800's Patch Bay. Inputs can be patched to the desired outputs for recording or remix. Each of the tracks and mixer's Aux channels can be patched. Refer to the Record Mode section under In/Out Assign, page 48.

STATUS

Sets each track to Trigger, Advance Trigger, or Playlist mode.

ADVANCE TRIGGER MODE

You can select Advance Trigger status on any track. This allows you to advance sequentially to the next phrase on the timeline, after completing a trigger command, e.g. arrange 20 phrases on track 1 sequentially along the time line. Then select Track 1 to ADV.TRIG mode in the trigger window. Once you select which phrase to trigger first, the DM-800 will automatically advance to the next phrase on the timeline after each Track 1 trigger command.

In Adv. Trig mode, the triggered phrase MUST completely play to its end before the next phrase will advance.

0r:

- Use the Enter key to stop playback of the phrase the phrase will not advance.
- Use the Stop key to stop playback of the phrase the phrase will advance.

You can also move the cursor to another Track and select a new phrase to trigger without affecting tracks that are already playing - they will continue without interruption.

PHRASE

Defines which Phrase will be triggered on each track. Select the Phrase parameter for the desired track with the Cursor. Rotating the Value/ Time dial shows all phrases on that track.

NOTE

Sets the MIDI note for each track.

MODE(M)

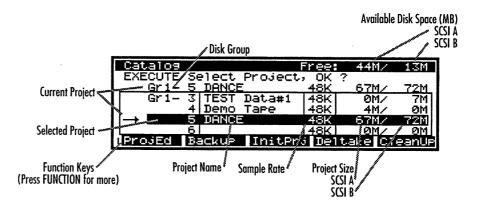
Triggered Events can be set to play all the way to the end, also known as "one-shot" (T); or to play only as long as the note (or data entry keypad button 1-8) is held down, "Gated" (G).

RECORDING A TRIGGERED PERFORMANCE

You can record the output of Triggered tracks onto new tracks by patching the Trigger mode tracks to the Record Bus (REC) and then patching the Record Bus to different tracks for Recording. This is useful for creating a rhythm track or sound environment.

See the Mixer Section Block Diagram (page 183) for a diagram of the signal path.

CATALOG MODE



The catalog mode contains a number of utility functions including:

- Project selection, initializing, naming, copying, and setting the sample rate.
- Take and Tempo Map management—copying and deleting
- Data Backup and Restore
- Disk formatting

SELECTING A PROJECT

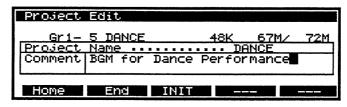
Open a Project file by scrolling through the list (using the Value/Time Dial or cursor keys), then press EXECUTE to make your choice.

IMPORTANT: The arrow at the left side of the display indicates the Current Project (loaded in memory).

After pressing EXECUTE, you can save the current Project to disk before continuing with loading the new project into memory.



PROJECT EDIT (F1)



You can rename a Project and add comments in this screen. Remember to Save the Project after making changes.

The following function keys assist in entering data.

HOME (F1)

Cursor advances to the home position of each parameter—the first character—with each press.

END (F2)

Characters positioned from the cursor to its right are blanked—changed to empty spaces. This is useful if you are replacing a long name with a short name.

INIT (F3)

The selected parameter is cleared and the cursor moves to the first position, ready to enter a new name or comments.

BACKUP (F2)

The BACKUP function is VERY important and some introductory information is helpful. The BACKUP command allows you to copy project information from your hard drives or other recording media, directly To or From SCSI DDS-1 DATA DAT tape or standard Audio DAT tape. This provides a permanent storage method for your Projects without taking up room on your hard drives.

DDS-1 SCSI DAT

CAUTION!

Use only DDS-1 SCSI DAT drive mechanisms with your DM-800. If they are capable of "hardware data compression", be sure that it is turned OFF.

REMEMBER: Do NOT use DATA compression on your SCSI DAT drive.

You should only use 60 or 90 meter DDS-1 DAT tapes.

DDS-1 SCSI DAT vs AUDIO DAT

All SCSI DDS-1 DAT Tape mechanisms perform a "verify" of the data as it is written to tape and the DDS-1 tape is 10 times less prone to dropouts compared to an Audio DAT machine. Because of this, Roland recommends that you always use a SCSI DDS-1 DAT drive for backup purposes. However, backup to Audio DAT is provided for those who do not wish to purchase a SCSI DDS-1 DAT drive.

REMEMBER: Roland is not responsible for lost data. Protect your projects carefully.

CAUTION: Audio DAT recorders used for DM-800 backup must not do any processing from the digital input, through the tape, and back out the digital output. Some Audio DAT machines add additional information in playback process that cannot be read by the DM-800. Check with Roland or your DAT supplier to be sure that what goes into the Digital Input comes out the Digital output exactly the same.

It is also necessary to understand what is saved to the tape during a Backup. Your projects have two "sets" of data: The actual audio recordings (Takes) and all the Editing Information, CompuMix, Tempo Map, etc. (Parameters). In most cases, the Audio Takes consume the majority of the required storage space. The Parameters take up only a very small amount of memory.

The DM-800 allows Backup (SAVE) and Restore (LOAD) of your complete projects or just the Parameters information.

This is particularly useful when backing up large projects. For example, let's assume you did all your recordings (3 hours of audio) on Monday and began your editing. If you do a complete project Backup on Monday, the Audio Takes and editing Parameters will all be saved to tape. For subsequent editing days, you need only to backup the Parameters (editing) information since all the Audio Takes were backed up on Monday.

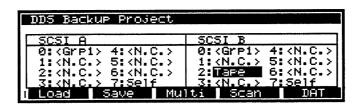
IMPORTANT NOTE: If you add or delete TAKES from a project during subsequent editing sessions, YOU MUST do a new, complete, BACKUP in order to save all the new Audio Takes.

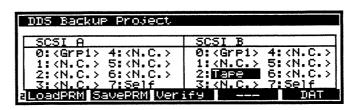
Of course these means that if you want to restore that project to the DM-800 you would first load the entire tape from Monday (Audio and Editing) and then load the latest editing Parameters backup tape to the same project. The latest editing information would write over the editing from Monday in the DM-800 project.

IMPORTANT NOTE: You must keep very careful track of your backup tapes. The DM-800 cannot determine if you loading the correct tape. You must be sure that you are Loading or Saving the correct information.

See the section, "BACKING UP YOUR DATA" for further important details.

There are FOUR basic screens available for BACKUP functions.







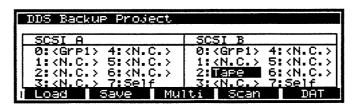


 Use the FUNCTION button to toggle between Page 1 & 2. Use (F5) to toggle between DDS backup screens and DAT backup screens.

4mm SCSI-based DDS-1 DAT tape backup devices can be used with the DM-800. Audio DAT machines can also be used. Check the recommended drive listing enclosed with the DM-800 or contact your dealer or Roland for more information on suitable devices.

Note: The Backup Command is only used for tape backup. Backup to disk-based media such as optical disk is performed with the Copy Project function described on the following page—from the Catalog Menu, press COPY PROJECT (Page 2+F1).

SCSI DDS-1 BACKUP



The DDS Backup page loads or saves projects to a SCSI DDS-1 tape backup device connected to the SCSI A or B port.

• First, select a backup device using the cursor; then select a function with one of the Function keys.

LOAD PROJECT (F1)



This copies a *single* Project file from DDS tape to the SCSI A&B disks. The Project is copied to the current Project location, and the Project Playlist and other parameters are loaded into memory for immediate use.

Note: LOAD PROJECT **erases the current Project** from the A&B disks, and replaces it with the Project loaded from tape. Make sure you have **first** saved your Project to tape using the Save Project command below, or to another disk using the Copy Project command (see page 100). Alternately, you can load a **blank** project into memory before executing the Load command.

Note: If the there is not enough free memory, the command will not execute.

PROCEDURE

From the Catalog Page (press CATALOG) and select (highlight) the destination Project for loading.
 This Project will be erased, and replaced with the new Project.

- Press EXECUTE to load the destination Project space into memory (make it the "current" Project).
- Press BACKUP (F2)
- Select the backup device using the cursor
- Press LOAD (F1). The DM-800 will search the tape for the Project name and automatically display it.
- If the tape does not contain the desired Project, you can insert a new tape, then press NAME (F1) to search the new tape for the Project name.
- Confirm the settings, then press EXECUTE to start, EXIT to abort.

ALTERNATE PROCEDURE

If the DDS tape was saved using the "Save Multi Projects to Backup" function, you will be presented with some additional on-screen options:



NAME [F1]

Displays DDS tape (project) name and used capacity on the tape (if the tape has been used before i.e. Not a new, blank tape)

ALL [F2]

CAUTION!

All your SCSI disks on the current disk group in the DM-800 will be FORMATTED and you will lose all projects on that SCSI group. Any other attached SCSI group will not be affected. i.e. If your current project is in GR 1, GR 2 & 3 will not be affected. The DDS tape data (all projects) will then be loaded to the newly formatted (current) disk group in the order of the projects on tape starting at number 1. Execute by pressing the EXECUTE button and selecting YES [F1].

SELECT [F3]

This allows you to select (highlight) the *destination* project within the DM-800 to load (restore) a single project into. You can choose any project in any group to load into.

IMPORTANT: If you are going to restore a single project, you must SELECT the project location you wish to restore to. Always open the SELECT screen and check to see that you have selected the correct project location in the DM-800.

SKIP [F1]



This allows you to "skip" the first project on the tape. The tape will advance to the next project on tape and ask again. You can "skip" your way through a multi project tape until you get to the single project you want to restore.

Press EXECUTE.

- You will be shown a warning page listing the Project to be loaded from tape and the destination location. Be sure you have selected both correctly OR press NO [F2] to exit.
- Press YES [F1] to begin the load (restore) process.

SAVE PROJECT (F2)



This copies the current Project data to a DDS tape on the SCSI bus. The Project is backed up as it currently exists, not as saved on the hard disk.

PROCEDURE

- From the Catalog Page (press CATALOG) select the Project to be saved.
- Press BACKUP (F2)
- Select the backup device using the cursor
- Press SAVE (F2)
- Confirm the settings, then press EXECUTE to start, EXIT to abort.

A different DDS tape cartridge must be used for each Project. All Project data (from both SCSI A & B) must fit on a single DDS tape.

NAME [F1]

Displays tape (project) name and used capacity on the tape (if the tape has been used before i.e. Not a new, blank tape)

BACKUP TIME

The DM-800 transfers data to DDS SCSI DAT tape at a rate of approximately 10 MB per minute, or approximately half the number of track-minutes. However digital audio uses enormous amounts of data, so the time required to load or save the a large Project to tape can be significant.

NOTE: See the Appendix section "Backing Up You Data" for more detailed information.

PROJECT DATA SIZE	APPROX. 4MM SCSI DAT BACKUP TIME
50 MB	5 Minutes
100 MB	10 Minutes
200 MB	20 Minutes
320 MB	32 Minutes
600 MB	1 Hour
1.2 GB	2 Hours
1.8 GB	3 Hours

NOTES:

- Project data size is the total of SCSI A & B.
- Tape length must be longer than backup time required.

MULTI (F3)



SAVE MULTI PROJECT TO BACKUP

This allows you to select a number of current projects in your DM-800 to be backed up to a single SCSI DDS-1 DAT tape.

PROCEDURE

- Load SCSI DAT tape into drive. (Wait for device to complete the loading cycle).
- Press BACKUP [F2]
- Press SCAN [F4]
- Select the appropriate backup device with the cursor keys.
- Press MULTI [F3]. The Multi screen appears as shown above.
- Select projects and options as described below.
- Press EXECUTE to save the selected projects to tape.

CAUTION! This feature will **write over** the existing tape. It does not append to the end. You will lose all existing data on the tape.

FOR FASTER BACKUP:

The time required to backup your project to SCSI DAT using the "Save" mode, depends on the number of takes in the project. However, the "Multi" mode backup uses a different format, not dependent on the number of takes in a project, which makes it faster. For fastest possible backup, always use Multi mode backup, even for a single project.

NAME [F1]

Displays tape (project) name and used capacity on the tape (if the tape has been used before i.e. Not a new, blank tape)

MARK [F2]

Allows you to selectively "mark" the projects you wish to backup.

NOTE: You can only select projects from the currently active drive group, i.e. If your current DM-800 project is in GR 1, the selection can only be made from projects in GR 1.

Select ALL projects on current SCSI chain for Backup.

ALL OFF [F4]

Selects NO projects on the current SCSI chain for Backup.

TAPE ID [F5]

Allows you to "name" the backup tape. Otherwise the tape will automatically be named the same as the first project selected.

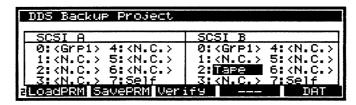
CAUTION! If you experience any SCSI ERRORS while performing a DAT backup of your projects, immediately correct the problem and make a new, error free, backup tape. DO NOT attempt to Restore a "corrupted" backup tape — it may cause problems with the <u>other</u> projects on your system.

SCAN (F4)

Scan checks all SCSI busses for connected devices. If a SCSI device was not powered up at first, or for some reason does not appear on the list of connected devices, you can execute SCAN to recognize it.

PARAMETERS ONLY (PAGE 2)

LOADPRM (F1) SAVEPRM (F2)



The DDS Backup Project 2 screen allows you to load or save editing parameters only (No Audio Takes will be saved or loaded).

IMPORTANT NOTE: Be sure that your Audio Takes for your project are already saved on another tape and they have not been changed.

The LOADPRM (F1) and SAVEPRM (F2) commands operate identically to the full LOAD and SAVE commands, however, only the Editing information (parameters) will be loaded or saved.

LOADPRM SCREEN



SAVEPRM SCREEN



VERIFY (F3)



The VERIFY command (F3) is used to reconfirm that a Project has been successfully SAVED to the SCSI DDS DAT. The DM-800 will compare the project data from the tape to the project data in the DM-800 to be sure that they are identical.

IMPORTANT NOTE: If an error message is reported, you MUST use a new tape and BACKUP your project (s) again. DO NOT keep any backup tape that does not verify as OK.

AUDIO DAT BACKUP

This section is used *ONLY* for backup to an Audio DAT machine.

>>>CAUTION! You must have at least 1 Mbyte of available disk space on each SCSI buss to successfully execute Backup to Audio DAT.



Four Commands are available:

Load (F1), Save (F2), Name (F3), Verify (F4)

These commands operate just like the SCSI DDS Data DAT tape commands, except that you must control the transport of the Audio DAT machine manually.

Please refer to the previous section about SCSI DDS DAT Backup for specific information about LOAD, SAVE, NAME, & VERIFY.

When you Save to tape, you will be instructed when to "Begin Recording" and when to stop. When you Load back into the DM-800, you be instructed when to "begin playback" of the Audio DAT tape.

You must rewind the tape manually and position the tape manually to the correct location since the DM-800 has no control over the Audio DAT machine.

NOTE: You can only save a **single** project to Audio DAT tape. No Multi-project functions are available.

IMPORTANT: The length of DAT tape required to complete the SAVE will be shown in the center of the DAT Backup Project screen. YOU MUST be sure that your DAT Tape is long enough to hold the entire project. If you run out of tape, before the backup is completed, DO NOT use that backup tape. Obtain a longer tape and do the Backup process again.

INITIALIZE PROJECT (F3)



Create a new Project here. INITIALIZE PROJECT clears the current Project, erasing all data and preparing it for new recording.

Enter a name and select a sampling rate: 48, 44.1, or 32 kHz; then press EXECUTE to initialize the Project.

Caution: Executing the Initialize Project command erases all data in the current Project.

Note: Once a Project is initialized, the sampling rate cannot be changed, unless it is initialized again.

CHOOSING A SAMPLING RATE

Each 100 MByte of hard disk storage yields approximately:

- 16 track-minutes at 48 kHz,
- 18 track-minutes at 44.1 kHz,
- 25 track-minutes at 32 kHz.

The higher the sampling rate, the higher the frequency response but the more disk space that is consumed per track minute of recording.

A Project's sample rate cannot be changed once it is set. Therefore it makes sense to choose the sample rate most appropriate to your project.

SOME SUGGESTIONS ABOUT SAMPLE RATES:

- If your Project will end up on a Compact Disc, and will remain in the digital domain from the DM-800 to the CD, you should choose 44.1 kHz so the digital data will not have to be sample-rate converted.
- If your Project is only one of several digital audio components of a soundtrack, such as the music or sound effects for a motion picture, you should set the DM-800 to the sampling rate that will be used during mixdown or assembly.
- If you are going to digitally transfer material from another source such as DAT, you may want to set the Project's sampling rate to be the same as the source, probably 48 or 44.1 kHz.
- If your Project will be used in a video environment that supports digital audio, such as the Direct Broadcast Satellite (DBS) format, you may want to set your sampling rate to the 32 kHz standard used in these environments.
- If your Project will be one of especially long duration and you can give up some high-end frequency response, you may want to consider using the 32 kHz sampling rate.

Note: You should not experience SCMS-related copying limitation problems using the DM-800's digital I/O ports.

Important: It is illegal to copy and/or distribute copyrighted material without the previous written consent of the copyright holder. When recording from Compact Disc or other material, please respect copyright laws.

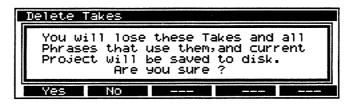
DELETE TAKE (F4)



Delete Take erases selected takes from the current Project.

CAUTION! These functions are DESTRUCTIVE. You cannot "UNDELETE" audio which has been lost by any DELETE TAKE commands.

There are several functions used to select (mark) which Takes to delete, explained below. When you have selected the proper takes to be deleted, press EXECUTE. The following dialog box will appear:



Press YES [F1] to continue, NO [F2] to abort.

Caution: This command cannot be undone. Once executed, all marked Takes will disappear.

Caution: The current Project is automatically saved to disk during execution of the Delete Takes command. Since you cannot avoid saving in this situation, be sure you are ready to save before executing Delete Take.

Remember: Only takes marked with a check mark () will be deleted. You cannot just highlight a phrase and press execute. You must check it > first.

SELECTING TAKES TO BE DELETED

UNUSED (F1)

This marks Takes not currently used in the current Project, creating additional disk space for recording.

SCSI A (F2) SCSI B (F3)

These commands mark all Takes from the selected bus. They are useful for clearing out disk space in preparation for new recording.

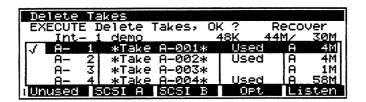
RECOVERING DISK SPACE FROM TAKES

OPTION (F4)

There are three additional options for deleting takes. Press OPTION to cycle through them:

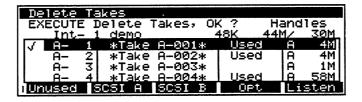
RECOVER

If you execute Delete Take with the Recover option selected, the DM-800 will examine the selected take for any current phrases. If a phrase in this project is using the take, the DM-800 will erase the portion of the audio before and after the phrase. This essentially will shorten the take to the length of the phrase. This will be very handy when you are using only 1 minute of audio from a 60 minute recording. If multiple phrases use this take, the take will be erased before the first phrase and after the last phrase only. The DM-800 cannot break the take into new individual takes.



HANDLES

If you execute Delete Take with the Handles option selected, the DM-800 will erase the beginning and end of a take not currently used in a phrase (just like Recover, above). *However*, this option will force the DM-800 to reserve a minimum of 1 second of audio at the beginning and the end of the phrase in order to be able to Trim In or Trim Out by a small amount at some future time.



NOTE: Difference between Recover and Handles. Using the Recover option, the DM-800 will attempt to erase the take as close to the beginning of the phrase as possible (depending on disk cluster placement). If the phrase information were located at the very beginning of a disk cluster, the take would be erased right to the beginning of the phrase. This would not allow you to adjust the Trim at some later time. The Handles option forces the DM-800 to keep 1 second of audio before and after the phrase in the take for future editing.

For your own safety, we recommend always using the Handles Option.

NONE

If Recover or Handles is not selected, all takes that have been marked with a $\sqrt{ }$ will be completely erased from the disk, whether they are being used or not.

LISTEN (F5)

You can audition the selected Take by pressing LISTEN (F5). A message screen will appear.

Press STOP to stop playing.

MARK (PAGE 2+F1)



This marks the selected Takes to be deleted, one at a time.

ALL ON (PAGE 2+F2)

This command marks all Takes in the Project. It is useful for clearing out disk space in preparation for new recording.

ALL OFF (PAGE 2+F3)

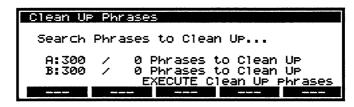
This command unmarks all Takes.

CLEAN UP (F5)

This feature allows you to delete all phrases in your current project that are completely covered by another phrase.

Let's say you did ten vocal overdubs using the Auto Punch In mode. Ten TAKES and ten matching PHRASES would be created on the same track, on top of each other. After moving the PHRASE you wish to keep to the top, the CLEANUP function will erase the other nine below it.

- Press CLEANUP [F5]
- THE DM-800 searches for all possible phrases to erase.



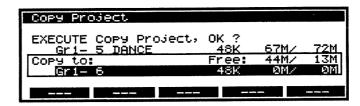
Press EXECUTE to complete the phrase cleanup function (or EXIT to cancel)

NOTE: This only deletes unused phrases. It does not effect the actual recordings (takes) on the disk. You can always make a new phrase from these takes.

CATALOG PAGE 2 FUNCTIONS



COPY PROJECT (PAGE 2 + F1)



This command is used to copy the current Project to another location to make a backup copy on the same disk, or to another disk such as an optical or other removable disk.

Note: The current Project is copied as it currently exists, not as saved.

Caution: This command overwrites the data in the destination.

Note: If there is not enough free memory, the command will not execute.

SELECTING DISK GROUPS

The DM-800 divides all disks attached to the SCSI-A and SCSI-B ports into three groups: GROUP 1, 2, & 3.

GROUP 1 (PROJECTS GRI 1 - GRI 50)

This group normally contains the DM-800's internal disks, plus any additional disks formatted as GR1 disks. If external drives are formatted as GR1 disks, they will need to be connected and on-line at all times while the DM-800 is in operation.

GROUP 2 (PROJECTS GR2 1 - GR2 50)

This group contains all drives formatted as GR2 disks. If you have disk drive(s) that you plan to move from one DM-800 system to another, make sure they are formatted as a different group than the internal disks since you cannot easily move the internals.

GROUP 3 (PROJECTS GR3 1 - GR3 50)

This group contains all drives formatted as GR3 disks. (similar to GR2) For more information about disk groups, see About Disk Groups, starting on page 106.

COPY TO (PAGE 2 + F2)



This features allows you to copy a take or phrase from the current Project to another Project.

Remember: Make sure the project you want to copy from is the current project.

SELECTING THE TAKES/PHRASES TO BE COPIED

You can select the takes or phrases to be copied as well as their SCSI destination.

COPYTO↑ (F1)

Select the destination project – scrolls up through the list of available projects.

COPYTO↓ (F2)

Select the destination project – scrolls down through the list of available projects.

A/B (F3)

This keeps the copied data on the same tracks as the original. Tracks 1-4 (SCSI Bus A) are copied to A and Tracks 5-8 (SCSI Bus B) are copied to B.

TO A (F4)

All data is copied to SCSI-A. The copy will appear on tracks 1-4.

TO B (F5)

All data is copied to SCSI-B. The copy will appear on tracks 5-8.

PAGE 2 FUNCTIONS



MARK (PAGE2+F1)

Allows you to mark one or more Phrases or Takes to Copy $(\sqrt{})$

ALL ON (PAGE2+F2)

Marks *all* Phrases or Takes to be copied.

ALL OFF (PAGE2+F3)

Removes ($\sqrt{}$) from all Phrases or Takes

PHRASE/TAKE (PAGE2+F4)

Switches between copying a Phrase or Take. The display will also change between Take List and Phrase List. Copying a Phrase will also copy the associated Take.



LISTEN (PAGE2+F5)

Plays the highlighted Take or Phrase. Press again to Stop.

MAKING THE COPY

Press EXECUTE to copy marked ($\sqrt{\ }$) PHRASES and/or TAKES from the current project into the selected project shown on the screen.

The Copy will be completed and you will be returned to your current project.

COPY FROM (PAGE 2 + F3)



This features allows you to copy a take or phrase from another project into the current Project.

SELECTING THE PROJECT TO COPY FROM

In the main Catalog screen, make sure the project you want to copy into is the current project.



Find and select (highlight) the project you want to copy from.

Press CPYFROM (PAGE2+F3) to enter the Copy From function. The screen shown at the beginning of this section will appear.

SELECTING THE TAKES/PHRASES TO BE COPIED

You can select the takes or phrases to be copied as well as their SCSI destination.

A/B (F3)

This keeps the copied data on the same tracks as the original. Tracks 1-4 (SCSI Bus A) are copied to A and Tracks 5-8 (SCSI Bus B) are copied to B. TO A (F4)

All data is copied to SCSI-A. The copy will appear on tracks 1-4.

TO B (F5)

All data is copied to SCSI-B. The copy will appear on tracks 5-8.

PAGE 2 FUNCTIONS



MARK (PAGE2+F1)

Allows you to mark one or more Phrases or Takes to Copy $(\sqrt{})$

ALL ON (PAGE2+F2)

Marks *all* Phrases or Takes to be copied.

ALL OFF (PAGE2+F3)

Removes ($\sqrt{}$) from all Phrases or Takes

PHRASE/TAKE (PAGE2+F4)

Switches between copying a Phrase or Take. The display will also change between Take List and Phrase List. Copying a Phrase will also copy the associated Take.



LISTEN (PAGE2+F5)

Plays the highlighted Take or Phrase. Press again to Stop.

MAKING THE COPY

Press EXECUTE to copy marked (√) PHRASES and/or TAKES to the current project.

The Copy will be completed and you will be returned to your current project.

COPY TEMPO MAP (PAGE 2 + F4)



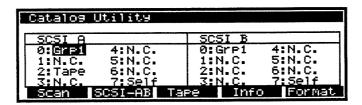
This command copies the Tempo Map from the current Project to the destination Project, overwriting the destination's previous Tempo Map.

PROCEDURE

- Select the destination Project for the copy, using the Cursor keys or the Value/Time Dial.
- Press EXECUTE to make the copy.

Note: The Tempo Map is copied as it currently exists, not in its last saved form (on disk).

UTILITY (PAGE 2 + F5)



This utility page displays a listing of the disk drives on the two SCSI buses used for recording and playback.

The display shows the formatted group of each drive:

Grp1 = Group 1
Grp2 = Group 2
Grp3 = Group 3
Self = DM-800 Main Unit
U.F. = Unformatted
N.C. = No Connection.

SCAN (F1)

Scan checks both SCSI busses for connected devices. If a SCSI device was not powered up at first, or for some reason does not appear on the list of connected devices, you can execute SCAN to recognize it.

SCSI-AB (F2)



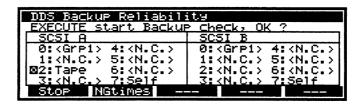
This is a SCSI Reliability test, which checks the communications between the DM-800 and all attached SCSI devices (hard disk drives, removable drives, DAT tape drives)

Press EXECUTE to begin the test.

This will perform a continuous test of the SCSI busses and report any problems in the upper right hand corner of the screen. If the Status shows "NG", some communications errors have occurred, and you should resolve the cause of the problem before using the DM-800. Pressing NGTIMES during the test will display exactly how many errors have occurred. We recommend you test for 5–10 minutes, then press STOP. If any errors occur, fix the problem then reformat all disks before beginning your work.

Caution: The SCSI tests only tell you that the DM-800 is able to communicate with the SCSI device. However, due to the high data transfer rates during recording and playback, the SCSI buss may still be too unstable for continuous use. If you experience any SCSI related problems, your cables, termination, or SCSI device itself may still have a problem.

TAPE (F3)



This is a DDS-1 SCSI DAT tape reliability test, which checks the reliability of a DDS-1 4mm DAT tape backup device.

PROCEDURE

- Press TAPE (F3)
- The message "You will lose all data of tapes on the SCSI buss" will appear.
- Select "Yes" to proceed or "No" to EXIT.
- The DM-800 will automatically search all tape backup devices connected to the SCSI buss and will begin the test process.

If the Status shows "NG", some errors have occurred and you should resolve the cause of the problem before using the tape backup. Pressing NGTIMES during the test will display exactly how many errors have occurred. We recommend you test for 15 minutes, then press STOP.

Note: You will have to hold the Stop button through the end of one test cycle before it will stop — be patient!)

REMINDER: Use only DDS certified DAT tapes for backup and clean your DAT drive regularly with a DAT cleaning tape after every 10-20 backups. Dirty DAT drives are a common cause of corrupted backups and lost projects.

INFO (F4)



Pressing INFO (F4) provides information about the selected SCSI device, such as device type, manufacturer, size, model #, etc.

FORMAT (F5)



This formats any of the DM-800's internal disks or any drive attached to the DM-800's SCSI ports. Which drive to format is specified by SCSI ID number.

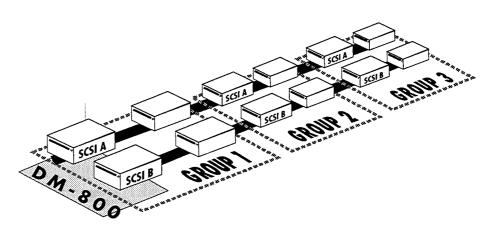
Warning: Formatting will erase all data on the target device. Once formatting starts all data will be erased. Devices in a different group than the individual target will not be affected by the formatting procedure.

PROCEDURE

- Select the disk to be formatted on the Catalog Utility page—press CATALOG, UTILITY (FUNCTION+F5).
- Press FORMAT (F5)
- Using the cursor keys, select the disk groupfor the drive to be formatted: GR1, GR2, or GR3.
- Confirm the settings, then press EXECUTE to start, EXIT to abort.

ABOUT DISK GROUPS

The DM-800 divides all disks attached to the SCSI-A and SCSI-B ports into three groups: Group 1, Group 2, and Group 3.



Three separate disk Groups are provided by the DM-800 in order to provide flexibility for attaching external SCSI devices. Each disk Group allows 50 projects to be recorded thus providing a total potential of 150 projects available on-line.

Any attached SCSI device can be formatted by the DM-800 into any of the three disk Groups. For example, the disk drives mounted inside the DM-800 might be formatted as Disk Group 1. An external 240 Meg hard disk and 600 Meg Magneto Optical disk might be formatted as disk Group 2. An additional 1 Gig hard drive might be formatted as disk Group 3.

The SCSI A disk of each Group contains default settings for the system, such as timebase, clock source, SMPTE settings, etc.

You can move any complete disk Group from one DM-800 to another.

DISK GROUPINGS

Since the DM-800 considers all drives in a Group to be one large disk, all drives in the Group must be up and running before the DM-800 will recognize the Group. Specifically:

If a disk formatted as part of a group is not connected to the DM-800, or is connected to the opposite SCSI connector by mistake, the entire group containing that disk will not be available for recording. The DM-800 will only allow access to the Catalog UTILITY screen and all the disks in the Group will appear in the window as U.F. - Unformatted. You may choose to reformat the entire Group or you can shut down the DM-800, correct the connections, and then restart.

If a disk malfunctions, the entire disk group will not be available. In this case you must reformat all the other disks in the group, and all data will be lost.

DISK FORMATTING

Since the DM-800 treats all disks in a group as one large disk, there are several things to be concerned about when formatting a disk.

- You can add a new disk to an already existing group.
- Once a disk is formatted for a group, reformatting the disk for the same group causes all the other disks in the group to be reformatted as well.
- Once a disk is formatted for a group, reformatting a disk to a different group causes the other drives in the original group to become unformatted. You will need to reformat the remaining drives in the original group as well.
- When formatting disks, be sure to format the drives on the SCSI(A) buss first, then those on SCSI(B).

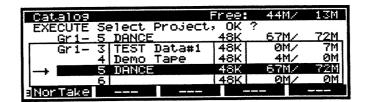
BEFORE MAKING SCSI CONNECTIONS

Make sure the power is off before making or changing any SCSI connections to the DM-800. Never connect and/or disconnect cables while the DM-800 is on. The DM-800 cannot recognize such changes and may cause a situation where you cannot save your Project data.

For the most reliable operation, use good SCSI cables and keep them as short as possible. The total length of connecting cable on each SCSI buss does not exceed 6.5 meters, or 21 feet.

See Appendix for more information about Disk Formatting Rules

PAGE 3 FUNCTIONS



NORMALIZE TAKE (PAGE 3+F1)

The Normalize Take function works exactly as the Normalize function in a RAM based digital sampler - the DM-800 looks for loudest point in the take, makes that the maximum level, and boosts the level of the rest of the take by the same amount.

Example: If you record a series of sound effects into the DM-800, they all may be at various recorded levels. You may choose to "digitally increase" the level of each TAKE to the maximum possible. This function operates by first playing through the TAKE (in processing only, you won't hear it) to determine the single highest (loudest) place in the entire TAKE. Digital gain is added to the complete TAKE to increase this highest point to Digital "0".

PROCEDURE:

Press NorTake (F1)

PAGE 1

 You must first "MARK" the TAKES you wish to Normalize. Using the cursor keys and the MARK (F1) button, you can add a $\sqrt{}$ to all the TAKES you wish to Normalize. The All On (F2) button will mark all Takes and the All Off (F3) button will remove the $\sqrt{}$ from all Takes

NOTE: A Take must be marked with a $\sqrt{}$ before it can be Normalized.

The Listen (F5) button allows you to hear any Take before deciding to Normalize.

PAGE 2

- The ROOM (F1) key allows you to select the headroom amount remaining in the normalized TAKE. e.g. If you set the headroom to 6 dB, the loudest point in the Take will be increased to 6 dB below "0".
- The OPT (F2) key toggles between two optional Normalize modes:
- "Lose Source Take" The original Takes are replaced by the Normalized ones.

NOTE: This is DESTRUCTIVE! You cannot recover the original version of the Take.

"Make New Take" - New "normalized" Take will be created in the Take list. You will not lose the original Takes

NOTE: This option is NONDESTRUCTIVE!

When all selected Takes have been "marked" and the headroom & Option has been selected, Press EXECUTE.

NOTE: Be patient. This might take quite a long time if you have many, very long Takes. The LCD screen will show the % complete of each Take. Remember: Each Take must be processed two times; once to find the highest level in the Take, the second time to actually perform the Normalize function.

NOTE: Once a Take has been normalized, the normal * character at the end of the Take Name will be changed to a ^. This indicates that the Take has been Normalized.

SYSTEM MODE

System Mode is for setting the working environment–timing, MIDI, sample rate parameters, etc. There are six pages of parameters, press PAGE (F5) to advance to the next page.

SYSTEM MODE PAGES

System Parameter 1

System Parameter 2

System Parameter 3

Project Parameter 1

Project Parameter 2

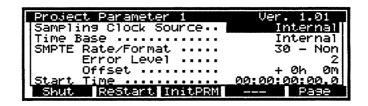
Color Select

All of the "settings" in the DM-800 are divided into two categories: "SYSTEM" and "PROJECT". The Project parameters are stored in the data of an individual Project and stay with that Project during Backup, Restore, etc. The System parameters are stored in the DM-800 and are reloaded upon Power-Up. They are not stored in a project. When you move from project to project throughout a daily session, the SYSTEM parameters do not changes unless you manually change them for each project. It is recommended that you keep adequate notes about the SYSTEM parameter settings for each project, in case you need to reset them.

- When you execute the "SAVE" command, the SYSTEM parameters and the PROJECT parameters are save to their respective locations.
- When you execute the "SHUT DOWN" command, the SYSTEM parameters are saved and the PROJECT parameters are saved only if you elected to "save the project".

See the Appendix for a complete list of all System and Project Parameters.

PROJECT PARAMETER 1



SAMPLING CLOCK SOURCE

This is the sync source for the digital sample words. The sample rate sync source controls the precise sampling rate of the DM-800.

Synchronizing, not only the timing clock rates, but the actual samples themselves is important in applications when many digital devices are talking to each other—when synced together, everyone will be on the same bit.

INTERNAL

This is the internal sync generator. Use Internal Sync if no other sync source is present.

DIGITAL INPUT

Set the DM-800 to sync to the Digital Input when recording a digital source from that input.

Note: If the Sampling Rate Source is set to Digital In and no digital signal is present at the input, the DM-800's output will be muted and the Clock Rate LEDs will blink. Recordings cannot be made in this condition.

Note: If the sampling rate of Digital Input is not the same as the sampling rate set for the current Project, the Clock Rate LED will blink at the current Project's sample rate, indicating the discrepancy. Recordings cannot be made in this condition.

SMPTE

Using the internal resolver, the sampling clock is developed using the frame edge of incoming SMPTE time code. This should be used in almost all cases when the time base is locked to SMPTE time code.

RMDB

This syncs the DM-800 to the incoming clock from a device connected to the RMDB connector. See the information supplied with the external interface for more detailed information.

TIME BASE

The Time Base is the source of timing and location information for the DM-800 system. Individual Time Base settings are described below.

INTERNAL

Timing and location information is controlled by the DM-800 internally. Use Internal Clock if no other clock source is present.

Note: Some functions, such as Markers during playback and transmission of SMPTE time code only function with the Internal Clock Source.

SMPTE

Timing and location information is received from SMPTE Time Code, whenever the DM-800 is in PLAY.

Note: SMPTE time code cannot be transmitted in this mode. However, incoming timecode will be reshaped and fed to the SMPTE out jack.

MIDI TIME CODE (MTC)

Timing and location information is received from MIDI Time Code, whenever the DM-800 is in PLAY.

Note: SMPTF time code cannot be transmitted in this mode.

WHEN THE TIMEBASE IS SET TO SMPTE OR MTC:

- To play the DM-800 while synchronizing to an external clock source, be sure to press the PLAY key on the (slaved) DM-800 before starting the external (master) device.
- When you press STOP on the DM-800—the DM-800 acts as if the timebase is set to Internal, and will not synchronize to the external master device. This is done to facilitate editing. To re-synchronize the DM-800 to the external timebase, press PLAY on the DM-800, then start the external device.

RMDB

Time Base information will be a device connected to the RMDB connector. See the information supplied with the external interface for more detailed information.

SMPTE RATE/FORMAT

This sets the SMPTE code format and frame rate.

30 - NON DROP

This is the standard 30 Non-Drop Frame format running at a frame rate of 30 fps, used for analog tape recorders and other audio devices. The DM-800 time display will match real clock time.

29.97 - NON DROP

This is the standard 30 Non-Drop Frame format running at a frame rate of 29.97 fps, used in NTSC color video production.

NOTE: The DM-800 time display will **not** match real clock time.

29.97 - DROP

This is the SMPTE Drop Frame format running at a frame rate of 29.97 fps, used for NTSC color video for broadcast purposes. The DM-800 time display will match real clock time. The Drop Frame format skips (drops) one frame each minute except for every 10th, in order to match SMPTE to real clock time. (See the SMPTE SYNCHRONIZATION section of this manual, page 143, for further details.)

25

This is the standard frame rate for European (PAL/SECAM) video, audio and film.

24

The standard rate for American film is 24 frames per second. Some film studios use this 24 fps rate for their film post-production work

ERROR LEVEL

When the DM-800 receives inconsistent SMPTE data, it will perform a data check. If the data check is okay the DM-800 will continue without interruption, if not the DM-800 will stop. The Error Level parameter sets the time interval of this data check.

If you are receiving many SMPTE timing errors causing the DM-800 to repeatedly start and stop, you may want to increase the Error Level, which will give the SMPTE data more time to settle down.

OFFSET

This parameter adds (or subtracts) a SMPTE frame offset to each received time code frame. An offset of +1h (1hour) will cause the DM-800 to locate to 02:00:00:00.0 when the received SMPTE timecode is 01:00:00:00.0.

Resolution is 10 minute intervals.

Note: You can use the Offset function to create several playlists within a single project. One version can be set to start at 1 hour, another at 2 hours, and a third version at 3 hours. Change the offset to lock the different versions to the picture.

START TIME

With SMPTE (and MTC) this parameter sets the starting frame number or "Zero location" of the Project. All timings (received and transmitted) are referenced to this starting frame. If the Start Time is set to 00:01:00:00.0, the DM-800 will locate to 00:01:00:00.0 when the Zero Return button is pressed.

Note: If the Time Format is set to Minutes/Seconds, the start time will always be zero minutes/zero seconds.

Note: The last possible frame in a Project is 23:59:59:29.9. Therefore, the maximum Project length is reduced by the Start Time offset.

SHUT DOWN (F1)

Be sure to use the SHUT DOWN command before turning off your system. SHUT DOWN sends commands to un-mount all drives and park the heads. Wait until all drives have stopped spinning (approximately 30 seconds) then eject any removable media and turn off the power.

Note: After pressing EXECUTE you will be given an opportunity to Save your current Project data before the DM-800 shuts down.



RESTART (F2)

Since the DM-800 will not operate after executing a Shut Down command, pressing RESTART will reboot the system.

Note: Some hard disk drives may require you to turn the power off and on again before executing the RESTART command, for the DM-800 to restart those drives.

INIT PRM (F3)

This Initialize parameters functions, resets all the DM-800 System and Project parameters to a known, factory preset value. (See Appendix Section for a complete list)

Pressing InitPRM (F3) will bring up a Save Project screen and you must decide Yes or No. Since all the parameters may be reset to other values, you must decide Yes, to save the project before the Parameters are Reset. The current project will SAVE to disk and then the Parameters will be Reset. If you select No, you will be returned to the Project Parameter 1 screen.

NOTE: You cannot Initialize Parameters without saving the project first.

This function is useful if you want to start a new project and Initialize all the parameters to factory presets, or during troubleshooting.

PROJECT PARAMETER 2



OVERVIEW SCREEN MODE

This screen provides controls for the overview portion of the Video Display. Screen Mode toggles between AUTO and MANUAL.

AUTO

Sets the Left and Right margins of the project overview in the Video Display (middle of the video screen) to the limits of the entire project. i.e. If the project begins at 01:00:00:00.0 and continues with phrases out at 05:00:00:00.0, the video overview will be set to those limits automatically.

MANUAL

Manual mode allows you to select the time for the left and right margin of the display. This allows you to "zoom in" to a particular section for greater detail.

START TIME

This sets the left margin of display in Manual mode

END TIME

This sets the right margin of display in Manual mode

SYSTEM PARAMETER 1



MIDI CONTROL CHANNEL

All channel-oriented MIDI data is sent and received on this MIDI Control Channel, which can be set to any of the 16 MIDI channels. Examples of messages that use the MIDI Control Channel are the MIDI Metronome, MIDI Record Trigger, and Tap Teach recording.

Note: MIDI Time Code, Clock, Start/Stop and other timing messages are not sent on a particular channel — and therefore are not affected by this parameter.

MTC OUTPUT

This turns on and off transmission of MIDI Time Code through the MIDI OUT jack. MIDI Time Code is essentially SMPTE reformatted for MIDI, and very useful with high-end MIDI sequencers.

MTC utilizes a significant portion of the MIDI bandwidth. While this is no problem for the DM-800, there may be situations where your other MIDI gear gets overloaded, especially if you are using a MIDI merger. So unless you are using MIDI Time Code, we suggest leaving MTC OUT turned OFF.

If turned ON, MTC will be transmitted in all clock sync modes.

MIDI CLOCK OUTPUT

This enables transmission of standard MIDI Beat Clocks and Song Position Pointer. The timing of these clocks will be determined by the Tempo Map. A more basic form of synchronization compared to SMPTE or MTC, however almost all sequencers and drum machines support MIDI Clock.

SEND NEW TIME

Should the DM-800 always transmit timing information (SMPTE or MTC) about where it is, or only when in Play or Record. You might want to set this to ONLY PLAY if you don't want your sequencer following you around each time you make an edit—remember, most editing functions are related to the current Project location. On the other hand, you may find it useful to select AT EVERY CHANGE to see your video synced to the DM-800 while looking for edit points, tempo mapping, etc.

Note: Song Position Pointer is always sent at every change, when MIDI clock Output is ON.

ALWAYS, KEEP RECORDED ITEMS

This allows you to turn ON or OFF the "KEEP or DELETE" prompt after each recording. All recordings will be kept automatically if turned ON.

- Press SYSTEM (System Parameter 1)
- Set "Always, Keep Recorded Items" to ON

AUTO NAME - TAKE & PHRASE

You can set the DM-800 to automatically and sequentially name new recorded TAKES and PHRASES

- From SYSTEM, set "Always, Keep Recorded Items" to OFF
- Make a recording in the normal fashion.
- When the KEEP or DELETE prompt appears, you may enter a name for the TAKE and the PHRASE. Then select KEEP.
- You can now go back to the SYSTEM page and set "Always, Keep Recorded Items" to ON
- Each subsequent recorded TAKE and PHRASE will automatically increment to the next number.
- To change the name for a new series of recordings, reset the SYSTEM page "Always, Keep Recorded Items" to OFF, make one recording, change the names, and proceed as outlined above.

NAMING RULES:

 Any numeric or alpha characters can be used in the NAME fields. However, the field must end with a number. The DM-800 will increment this number for each successive recording. Do not use a number longer than 6 characters.

e.g.	Guitar - 001	(OK)
	Music Bed - 1	(OK)
	1111	(OK)
	5555567	(NO - Number is too long)
	Male Vocal - 010	(OK)

REMEMBER: The TAKE & PHRASE names in the upper section of the RECORD screen indicate the next available physical TAKE & PHRASE location numbers in the DM-800 (A1-A128, B1-B-128) & (A1-A300, B1-B300). They do NOT have any reference to the actual "name" of the TAKE or PHRASE.

SEARCH SOUND THRESHOLD

You can use a preset audio level for TRIM IN, TRIM OUT, NEW PHRASE, and TAKE CHANGE.

- Press SYSTEM (System Parameter 1 screen)
- Set "Search Sound Threshold" level in dB

This sets the DM-800 to ignore audio below this minimum threshold when performing some editing functions (as described below). This threshold is adjustable from digital 0.00 dB to - 74.3 dB.

Setting	Digital Level	Balanced Analog IN Level	
0.0 dB	0	+20 dBm	
-16.0 dB	-16	+4 dBm	
-42.0 dB	-42	-22 dBm	
-62.0 dB	-62	-42 dBm	
-74.3 dB	-74.3	-54.3 dBm	

e.g. A setting of -16.00 dB indicates +4 dBm applied to a balanced analog input. A setting of -41.00 dB would indicate 25 dB below + 4 dBm (or -23 dBm input).

If, for example, you want to use Search Sound Threshold to edit the silence from the beginning of a TAKE, you would want to set the Threshold just slightly higher than your incoming noise floor. Experiment with various Threshold settings for your application.

USE SEARCH SOUND THRESHOLD FOR TRIM IN & TRIM OUT

You can TRIM IN or TRIM OUT a phrase, based on a preset audio threshold level. e.g. If you want to trim the silence at the beginning of a TAKE so the PHRASE begins exactly on the first audio attack or remove the silence at the end of a PHRASE.

- Press SYSTEM (System Parameter 1 screen)
- Set "Search Sound Threshold" level to the level of the first audio you want the DM-800 to recognize.
- Press PLAYLIST (pg. 1)
- Select PHRASE you want to TRIM
- Press [F1] MOVE
- Select [F3] TRIM IN or [F4] TRIM OUT
- Press △ (Up cursor) (Wait for DM-800 to find threshold it can take a number of seconds)
- Press EXECUTE

SYSTEM PARAMETER 2



SCRUB PREVIEW LENGTH

Sets the loop length of the Scrub Preview function.

Preview Length To, Thru, From

The length of each individual Preview function can be set here. Different values can be set for each Preview function.

PREVIEW MODE

This toggles between three different Preview Modes: Trigger, Gate, and Loop (see Preview section for more details). This Preview Mode can also be changed from the front panel by holding down the SHIFT key and pressing one of the three Preview Buttons.

EQ KNOB MODE

This selects among three operational modes for the EQ controls on the Front Panel.

RELATIVE

When the set of front panel EQ controls is assigned to a mixer channel (hold down the EQ button and press the STATUS button of the channel you want to change), any movement of any of the knobs will ADD or SUBTRACT to the existing setting of the digital equalizer.

Example: If the equalizer was already set to + 6 dB boost on the high frequency control, a 2 dB counterclockwise movement of the knob (cut) would reduce the boost amount to +4 dB. (+ 6 dB minus 2 dB)

NULL

No EQ change takes place until the physical knob is set to the same position as the internal digital equalizer.

Example: If the actual equalizer is set to + 6 dB boost and the knob is physically set to -10 dB (cut) when the EQ is selected, now change will occur in the EQ until the knob is moved to the + 6 dB position. Once the physical knob and the digital equalizer are set the same, the knob will automatically take control over the equalizer and continue to operate normally.

JUMP

Jump mode tells the equalizer to automatically JUMP to the physical position of the knob, as soon as the knob is moved slightly.

Example: If the equalizer is set to + 6 dB boost and the knob is set to - 10 dB (cut), the slightest movement of the EQ knob will cause the equalizer to "jump" to -10 dB (the physical position of the knob at the time of movement).

NOTE: EQ Knob mode is global - it is set for all four physical knobs simultaneously. However, each knob is considered individually. e.g. If you only change the Low Freq boost knob, no other EQ settings for that channel will be affected.

SYSTEM PARAMETER 3



MMC DEVICE MODE

This sets the DM-800 MIDI Machine Control functions.

OFF

No MMC commands are accepted or sent to external devices.

MASTER

The DM-800 becomes the "master" controller and sends MMC commands out through the MIDI OUT connector.

SLAVE

The DM-800 becomes the "slave" to MMC and will accept external MMC commands coming from the MIDI IN connector.

MMC DEVICE ID

This sets the Device ID # of the DM-800 to any value between 0 and 31.

REW / FF LENGTH

This sets the amount of time the Now Line will move through the project each time the REW or FF button is pressed once.

Example: If this value is set to 00:00:00:01.0 (1 SMPTE frame), the REW and FF buttons will move the Now Line 1 SMPTE frame each time they are pressed. (Hold down the REW or FF buttons for normal fast shuttle mode)

NOTE: This feature is extremely valuable when using the MOVE command to move sound effects against video. If you want to move forward by 2 frames, for example, simply enter MOVE mode, press the FF key 2 times, press Execute, and you have moved the sound effect forward by two frames.

COLOR SELECT



The color select screen provides user control over the video display screen colors. Use the Cursor and Value/Time dial to make color changes to different parts of the video display screen.

SET1 (F1), SET2 (F2), and SET3 (F3) provide 3 different factory color presets. You can start with a factory present and then change any individual color you choose.

The final screen colors that you choose will be saved as a SYSTEM parameter. i.e. The screen colors are not saved with each project and will continue to stay as you set them last, until you change them.

BACKING UP YOUR DATA

Man's creativity is infinite, yet the DM-800's disks are not. As a result of this paradox, sooner or later you will see the message on the display: "Out of Disk Space." At this point, you must remove some of your data from the disks to make room for further expression.

WHY IT'S IMPORTANT

Data backup is one of those things you don't want to put off for too long. As most computer users know from firsthand experience, hard disks are relatively volatile devices, prone to losing their data when you can least afford to lose it.

WHEN TO BACKUP YOUR DISKS

You should most definitely back up every Project in at least one place when you've finished it, and probably at the end of every session. Those with a more paranoid outlook on life will probably backup their DM-800 hourly.

HOW TO BACKUP YOUR DATA

There are two ways to save DM-800 data: Backup to Tape and Copying a Project to a removable disk. These methods are discussed below.

BACKUP TO TAPE

The DM-800 provides utilities to Backup to 4mm DDS-1 SCSI DATA DAT and to regular Audio DAT. The SCSI DAT is connected to the DM-800 SCSI port A or B. (see section on Interfacing.)

Using tape enables multiple backups to be made at a low cost.

DDS-1 SCSI DAT

CAUTION!

Use only DDS-1 SCSI DAT drive mechanisms with your DM-800. If they are capable of "hardware data compression", be sure that it is turned

REMEMBER: Do NOT use DATA compression on your SCSI DAT drive.

You should only use 60 or 90 meter DDS-1 DAT tapes.

DDS-1 SCSI DAT VS AUDIO DAT

All DDS-1 SCSI Data DAT mechanisms perform a "verify" of the data as it is written to tape and the DDS-1 Data DAT tape is 10 times less prone to dropouts compared to an Audio DAT machine. Because of this, Roland recommends that you always use a DDS SCSI Data DAT machine for backup purposes. However, backup to Audio DAT is provided for those who do not wish to purchase a SCSI Data Dat drive.

REMEMBER: Roland is not responsible for lost data. Protect your projects carefully.

CAUTION: Audio DAT recorders used for DM-800 backup must not do any processing from the digital input, through the tape, and back out the digital output. Some Audio DAT machines add additional information in playback process that cannot be read by the DM-800. Check with Roland or your DAT supplier to be sure that what goes into the Digital Input comes out the Digital output exactly the same.

It is also necessary to understand what is saved to the DAT tape during a Backup. Your projects have two "sets" of data: The actual audio recordings (Takes) and all the Editing Information, Compumix, Tempo Map, etc. (Parameters). In most cases, the Audio Takes consume the majority of the required storage space. The Parameters take up only a very small amount of memory.

The DM-800 allows Backup (SAVE) and Restore (LOAD) of your complete projects or just the Parameters information.

This is particularly useful when backing up large projects. For example, let's assume you did all your recordings (3 hours of audio) on Monday and began your editing. If you do a complete project Backup on Monday, the Audio Takes and editing Parameters will all be saved to tape. For subsequent editing days, you need only to backup the Parameters (editing) information since all the Audio Takes were backed up on Monday.

IMPORTANT NOTE: If you add or delete TAKES from a project during subsequent editing sessions, YOU MUST do a new, complete, BACKUP in order to save all the new Audio Takes.

Of course these means that if you want to restore that project to the DM-800 you would first load the entire tape from Monday (Audio and Editing) and then load the latest editing Parameters backup tape to the same project. The latest editing information would write over the editing from Monday in the DM-800 project.

IMPORTANT NOTE: You must keep very careful track of your Backup Tapes. The DM-800 cannot determine if you loading the correct Tape. You must be sure that you are Loading or Saving the correct information.

CAUTION!

Clean your DAT drive regularly with a certified DAT cleaning tape. (after approx. every 10 -20 backups). Dirty DAT drives are the most common cause of bad backup DATS and lost projects.

PROJECT DATA SIZE	APPROXIMATE BACKUP TIME	
(SCSI A + SCSI B)	4mm DAT	
50 MB	5 Minutes	
100 MB	10 Minutes	
200 MB	20 Minutes	
320 MB	32 Minutes	
600 MB	1 Hour	
1.2 GB	2 Hours	
1.8 GB	3 Hours	

These approximate times apply to the normal project with long recorded TAKES. Projects with many short TAKES and high edit densities, will take longer to backup.

APPROX. BACKUP TIME CAPACITY FOR 4MM SCSI DAT TAPES

TAPE LENGTH (Meters)	TAPE TIME (Minutes) I	DATA CAPACITY
90	180	1.8 GB
60	120	1.2 GB
45	90	900 MB

The longest 4 mm DDS-1 DAT tape currently available is 90 meters. Therefore, the largest Project that can be backed up presently, is one in which the total of SCSI A and SCSI B amounts to approximately 1.8 gigabytes.

When the Project is loaded (with the Load Project command) from the tape, the data is written to the location of the Project currently selected on the DM-800. This will overwrite any prior data in that Project. Therefore, you should select an unused Project before loading.

COPYING A PROJECT TO REMOVABLE MEDIA

Another way to save your work is by making a copy of your Project to a removable media device(s) on the SCSI A/B buses.

See Copy Project for more information.

OPTICAL DISK

Magneto-Optical and Phase-Optical disk drives such as those supplied by Sony, Canon, Kubota, Panasonic, Pioneer, and Seiko are well-suited for backup since they store 300-600 MB on each side of the disk.

REMOVABLE CARTRIDGES

Although the DM-800 does not specifically support Syquest or other cartridge drives, they can be formatted as GR1, 2, or 3, and used as "fixed" disk drives. Cartridge drives are a good choice if both your program material and your budget are modest. These drives work for archiving and are fast enough be used directly for recording and playback if your program material is relatively short.

TROUBLESHOOTING

If you are having difficulty making the DM-800 perform properly, one of the following situations might causing your problem.

BASIC FUNCTIONALITY

DM-800 DOES NOT FUNCTION

Check that the SCSI cables are connected properly.

Make all connections with the power off.

Make sure all disks in the same group are connected, and that all disks are connected to the proper SCSI connector.

Never disconnect any cable while the system is on. If this occurs you will be forced to turn off the power to the system, and all unsaved data will be lost.

OPTIONAL KEYBOARD DOES NOT FUNCTION

- Only works with IBM XT or AT compatible computer keyboards.
- Connect the keyboard before powering up DM-800 system.
- If the keyboard has a XT/AT switch, set it to AT.
- Don't use a MIDI cable to extend the keyboard cable—they are wired differently.

CANNOT RESTART DM-800 SYSTEM

With some hard disk drives, it is necessary to turn the power off and then on again, before executing the RESTART command.

CONNECTIONS

CAN'T LOCATE DISK DRIVE

Make sure all disks in the same group are connected, and that all disks are connected to the proper SCSI connector.

Scan the buss for SCSI devices—press CATALOG, UTILITY (FUNCTION+F5), then SCAN (F1). If you are using a drive with removable media, you will need to scan the buss when you change disks

Check SCSI Device IDs: each drive should be assigned a unique number. Is the drive formatted?

DRIVES DO NOT WORK PROPERLY

Check the termination for each bus, and remove or add terminators as necessary. See the SCSI section in the appendix for more information.

Never connect more than one terminator to a buss.

RECORDING

AUDIO INPUT CONNECTED BUT NO LEVEL DISPLAY

The audio input level can be monitored only in Record Waiting mode (Track Status Select and REC lights flashing).

CANNOT PLAY PROJECT

TIMING CLOCK

Check the setting of the Time Base parameters on the SYSTEM screen.

Make sure an appropriate timing signal is present at the selected input, or switch to Internal.

SAMPLING RATE CLOCK

Check the setting of the Sampling Clock Source parameter on the SYSTEM screen.

If this parameter is set to Digital, make sure a digital signal at the Project's sample frequency is present at the input, or switch to Internal.

CANNOT HEAR CERTAIN PARTS

Check that the Track Status is set to PLAY (Green LED).

Make sure the track is assigned to the proper output (MIX or DIRECT).

Check your audio connections.

Check the Compu Mix—the level may be down during these parts.

CANNOT RECORD ANY SOUND

Check the Remaining Time on the RECORD screen. Also, check that there are Takes available for recording—press RECORD, TAKE LS(F5), then scroll to the end of the list of takes.

Make sure an appropriate input in patched to the track—press RECORD, then IN/OUT (F3).

Record from the RECORD or TRIGGER PLAY screen.

CAN'T RECORD FROM ANALOG INPUT

IF THE SAMPLING RATE INDICATOR IS FLASHING

Make sure the Sampling Rate Source is set to Internal.

IF THE SAMPLING RATE INDICATOR IS NOT FLASHING:

Make sure the appropriate Analog input is assigned to the track you wish to record on.

Check your connections.

CANNOT RECORD FROM DIGITAL INPUT

IF THE SAMPLING RATE INDICATOR IS FLASHING:

Is the Sampling Rate Source is set to Digital In, with no digital signal present at the input? Make sure there is a digital signal from your output device.

Is your digital source at the same sampling rate as the current Project? Since you cannot record if the sample rates are different, you must resolve the situation one of several ways:

- Choose a Project at the correct sample rate to record on.
- Change the sample rate of the source.

If you are having difficulty making the DM-800 perform properly, one of the following situations might be causing your problem.

OTHER ITEMS THAT CAUSE DIFFICULTIES

GENERAL

The DM-800 analog inputs are balanced, +4 dBm. That's -16 dB digital. To take full advantage of your DM-800's dynamic range, keep your recording levels as hot as possible without clipping. (clipping is +20 dBm balanced analog IN)

Whenever possible, assemble large productions as smaller, individual projects. They back-up faster, fit on a single DAT tape, and if you happen to erase one, you have not lost the entire production.

EXTERNAL SCSI DISK DRIVES

READ the SCSI information in the Appendix Section of this manual.

If your DM-800 fails to recognize external SCSI devices or crashes unexpectedly, your external SCSI cables and/or termination are probably at fault. Refer to the SCSI (Interfacing) section of this manual.

Use highest quality terminator and SCSI cable.

You must format drives correctly and in the proper order. Refer to SCSI Disk Formatting. (Appendix section)

As often as convenient, format all disk drives to reduce disk fragmentation.

DAT BACKUP

Use Roland termination and SCSI cable.

Clean your DAT regularly with a certified cleaning tape, after every 10-20 backups.

Use ONLY certified DDS DATA DAT Tapes. Do not use audio DAT tapes in SCSI DAT drives.

SMPTE SYNC

READ the section on SMPTE in the Appendix Section of this manual. If you digitally layback to D2 or other digital destinations, a Roland SRC-2 Dual Sample Rate Converter may be required for some applications.

Remember: In a 44.1 K project,

Drop Frame code at 29.97 will produce a sample rate of 44,100 Hz on disk. Non Drop Frame code at 30 will produce a sample rate of 44,100 Hz on disk. Non Drop Frame code at 29.97 will produce a sample rate of 44,056 Hz on disk.

OPERATIONAL

If you try to RECORD and nothing happens, you're probably set to AUTO record. Put it back in MANUAL record mode.

If your DM-800 doesn't boot up, an external SCSI device may be disconnected or has not been powered up. (For the DM-800 to boot up, all connected SCSI devices must be powered on first.)

If you don't get any incoming audio on the meters, check your PATCHBAY assignments.

If you cannot record from the Digital input, you probably have not locked the DM-800 Sampling clock to Digital In.

If your DM-800 faders seem to be inoperative, check to be sure that the Compu/Manual button LED is off – if the LED is on, the mixer is in Compu mode and the faders may not respond the way you would expect.

OPERATIONAL USER TIPS

Many times, a DM-800 user will try to use his DM-800 in a new and unfamiliar application and inevitably runs into a few difficulties along the way. Here are a few reminders to help you figure out what to do next.

JOG VCR AND STAY IN SYNC

Have the video work dubs printed with VITC. This type of SMPTE makes your spotting life much easier. Connect the video out from the VTR into the in of a VITC to LTC converter (Horita # VLT-50 or equivalent) and the LTC out to the SMPTE input of the DM-800. This will allow the DM-800 to follow the VCR as it jogs along (even frame by frame) so that there will be no guessing or writing down of numbers to get exactly the right spot for your music or effects.

UNSPLITTING A PHRASE

Let's say that you have split a phrase into two separate phrases with the split command and now you want to "Undo" the split. Here's how. Tab to the end of the second phrase with NEXT. Place a marker here. Now DELETE the second phrase. Use PREVIOUS to go to the first phrase and then press MOVE, TRIM OUT and then the marker that you put on the end of the old second phrase. EXCUTE will now give you a single phrase with the exact length of the original before the split.

"ONLY ON PLAY" SETTING

The DM-800 has a feature that causes the DM-800 to output SMPTE (or MTC) locations even when it is in STOP mode. This is great when you use hardware synchronizers but it can cause problems with computer based sequencers. To stop sending code when the DM-800 isn't playing, go into the SYSTEM page in the DM-800 and set the "send New Time" setting to "Only on Play".

EDITING FLEXIBILITY

One nice feature of the DM-800 is the flexibility of its editing modes. You can Cut, Insert or Copy to specific markers or to Next or Previous or to locations that you type in (by hitting Jump) or by moving the Now line with the Value dial while in Preview. Many users don't realize that you can also go right into Play while you are in Cut mode, for example, and play ahead to find the end of a sentence or word, then use Preview and finalize your edit.

COPY FUNCTIONS

One great power of the DM-800 is its ability to copy relative to the position that you start from. For example, if you are looping ambience with a copy command, you can enter the copy command when the NOW line is in the middle of the first third of the sound and then copy to the middle of the last third of the sound. Giving the sound a fade in and out time of about .4 seconds or so before you start the copy can also be helpful. This will in effect give you a crossfade loop that can make an ambience loop smoother and less detectable.

For drum parts, if you are referencing a tempo map, you can add a snare drum to beats 2 and 4 of several measures by starting with the sound on beat 2. Select the beginning of the snare phrase and press COPY and choose the appropriate number of times, and then press JUMP and type in beat 4 of the same measure. This will then copy (assuming you are in 4/4 time), the snare part to beats 2 and 4 of as many measures as you would like. Pretty neat trick. It's also good for locating several choruses or guitar parts that occur regularly in the song.

FINDING THE LENGTH OF A SECTION OR PHRASE

To find the length of a section of work in the DM-800, first place a Marker at the end of the section. Now locate to the beginning of the section, press INSERT and then the Marker. You will now see in the Insert window the exact time between the section's start and the Marker.

Don't forget to press EXIT to get out of the INSERT mode!

OFFSETTING SMPTE TIMES

Let's say that you have done a great editing and assembly job only to find that the producers have changed the SMPTE reference numbers from 00:00:00:00 to 1 hour (or some other time). It is very easy in the DM-800 to match your work to any new SMPTE references or, as it is often referred, to OFFSET your current SMPTE times.

You can use the OFFSET command in the SYSTEM page.

OR:

TO OFFSET TO A NEW TIME THAT IS PAST YOUR CURRENT PROJECT LOCATION

To start your first phrase which is now at 00:01:00:00 at the new time of 01:01:23:00:

- Locate to the start of your first phrase using Previous or Next
- Select INSERT ON ALL TRACKS
- Press JUMP and type in the new start time (01:01:23:00 in this case).
- Press ENTER and then EXECUTE

This will move all of your work to the new start time.

TO OFFSET TO A NEW TIME THAT IS BEFORE YOUR CURRENT WORK

To start your first phrase which is now at 01:01:23:00 at the new time of 00:01:00:00:

- Locate the track selection cursor to the track that your first phrase is on.
- Hold SHIFT and press JUMP
- Type in the desired new starting time (00:01:00:00 in this case) and press ENTER
- Select CUT ALL TRACKS.
- Press NEXT and then EXECUTE.

This will move all of your work back to the new starting time.

LOOPING PASSAGES WITH UNDESIRED PICKUP NOTES LEADING TO THE NEXT SECTION

Let's say that you want to extend the second half of an instrumental chorus section that includes a pickup note to the section after the chorus. Let's also assume that the instrumental bed is consistent throughout the chorus section. Here's how you can use layering and trimming to accomplish this goal:

- First find the beginning and ending downbeats of the passage to be looped. Do this using "Preview To" or whatever method you prefer.
- Now place marker #1 at the end of the loop section.
- Copy the loop once starting on the beginning of the loop, pressing COPY, NEXT and EXECUTE.
- Using TRIM IN, extend the beginning part of the copy over the original until the offending pickup is covered and the transition sounds natural.
- Start at the new beginning of the copy, select INSERT and press marker #1 and write down the exact length of the overlapped section. Let's call that length "A". Then press EXIT (don't do the insert itself!)
- Here comes the tricky part: Locate to the end of the copy using NEXT, write down the time of this location and then subtract length "A" from that number.
- Place the NOW line at the number that you get above and place a SPLIT point at that spot in the copied phrase.
- DELETE the end of the copied phrase.

You now have a phrase that is correct both in its rhythmic location and in its length.

 Now locate to the beginning of the copied phrase, select COPY, put in the number of copies that you need for your loop, press NEXT and then EXECUTE. You will now have a seamless loop that you can Trim Out to get back the last pickup note leading into the next section and the rest of the composition if needed.

PS: It's easier to do than to describe!

SMPTE CONTROL OF PUNCH IN AND OUT

Automating record punch-in/outs while in SMPTE Sync is a useful technique when transferring audio from a video tape to the DM-800.

- In RECORD mode, press COMMON to get to the Record Mode function and set it to AUTO.
- You have two options for setting the Start , Punch in, Punch out, and Out times. One way is to do it on the fly while viewing the video tape or using the PUNCH page to type in the required numbers. To set numbers on the fly, use the lower markers with the light blue labels to grab TC numbers. Hold the SHIFT button down while pressing LOOP START to set the Start time. SHIFT + PUNCH IN sets the Punch in time etc. To type in the numbers, go to the PUNCH page and cursor to Start time and type in the SMPTE number you want and press ENTER.
- Now that the Punch in and out times are set and the DM-800 is in SMPTE SYNC, arm the tracks you want to record to, press RECORD, PLAY and the DM-800 will wait for Time Code to start it. The video tape needs at least 3.4 seconds of pre-roll before the Punch in time. NOTE: For this to work correctly be sure the DM-800's SMPTE display reads a number earlier than your Start time. If your display time is later than the Punch in time, you will get the message "Out of area for Auto REC" when you try to press the RECORD button. A quick way to move the DM-800 to an earlier time is to press the ZERO button in the Transport Control area and then press RECORD, PLAY and you are ready to begin your auto transfer.

KEEP IT SHORT

When using PREVIEW, keep the PREVIEW TIME as short as you can and still maintain comprehension of the context of your edit. For music looping you might try 3 or 4 tenths of a second, for voice over editing from 4 to 7 tenths.

It's always best to use PREVIEW FROM if possible because you don't need to hear the whole loop in order to tell exactly where your edit point is.

PREVIEW THRU is great for finding the exact point of a comp edit between 2 phrase layers on the same track, or when moving a phrase near another and you need to check on the feel of the timing.

For this you might need to use a longer loop.

PREVIEW TO is great for looping music or finding the exact start of a loud transient. Experiment with listening to the edit region, such as the transition from a word to a breath, by just hearing the very first edge of the sound and moving the edit point from that small bit of information, ie. don't listen to more of the loop than you really need. It can greatly speed up your work.

FINDING AND TRIGGERING A PHRASE FOR LIVE PLAYBACK

For a live show, you need virtually instant access to music beds and sounds but often don't know which of the chosen sounds will come when. The engineer will wait for the producer to say "Sad Music....now" and he must have the appropriate (predetermined) sad selection playing immediately.

In the DM-800 you can accomplish locating and playing material in several ways.

- One way is to have the appropriate material assigned on a track that is in Trigger mode and then just press the appropriate track number when needed. The only limitation here is that you are limited to only 8 selections. (usually you will need more)
- The second idea is to access the cuts in either take change or new phrase and play with the listen button. This works great except that you need to have recorded the takes trimmed with no silence at the head, and, also finding an exact number in a great hurry can be a bit risky.
- The winning method is as follows. First insert a tempo map into the DM-800 with the slowest possible tempo allowed. Then take each edited phrase and, using MOVE and JUMP, move it to the beginning of a bar of the map and make a note of each number. If a phrase would end up overlapping a previous phrase due to length, just take the next available number. Keep a record of which number is for each phrase.

Then, with the display in Bars and Beats format, press SHIFT and JUMP to prepare to locate to a specific phrase. When the director says: "Sad Music number one", enter the appropriate number and hit ENTER and PLAY. A very fast and easy way to dial in and play any phrase by entering a simple

TRIGGERING EXTERNAL CD PLAYERS OR AUTOMATING MIDI PROGRAM CHANGES

Sometimes during radio station spot or documentary production it might be convenient to trigger a CD of some music or maybe an ambience bed rather than record it onto the DM-800. Because we have full automation of the AUX returns, we can control when this playing track is heard via automation and save disk space. As most professional CD players have GPI trigger inputs for play enabling, there is an easy way to make this happen.

Use a SMPTE to GPI trigger device such as a Roland SBX-1000 or a JL Cooper PPS 100 SMPTE synchronizer. The SMPTE output of the DM-800 can be routed to the input of the box. When you locate the spot that you want to trigger the CD, stop and program the device to trigger one of its 4 GPIs to play the CD. Assign the output of the CD to a pair of the DM-800 AUX returns and you can then add a crowd sound or music bed to your project without using any storage.

UP AGAINST ZERO

The DM-800's work space is like having a 24 hour long piece of tape to work on. This is great because it allows you to work in several different areas to prepare multiple backing vocals or effects for a bounce down and use the bounced track(s) in the main area with your other tracks. You can easily come back and do a remix of the bounced elements if needed.

It is always a good idea to keep these tracks to the "left" or before the main editing area. This will keep the DM-800 working its fastest as it doesn't need to look down the line each time it does an edit.

One problem that occasionally occurs, especially when doing a back time edit of some music, is that the edit "runs up against zero". The DM-800 won't allow you to move a phrase before 00:00:00:00. If you are doing a spot that starts near zero and then try to move some music to fit the voice over, you may be asking the DM-800 to start the beginning of the phrase before zero. If this happens, the edit won't behave as expected, and you will be "up against zero". The easy fix for this, by the way, is to INSERT time on all tracks for a couple of minutes, giving yourself some elbow room.

MARKER PHRASES FOR STORING LENGTHS OF TIME

Sometimes it is useful to be able to store an exact length of time. This might occur if you are doing a crossfade loop and want to store the exact length of the crossfade so that you can easily set both ends of the loop. Another use would be if you were looping music and had to cover up a pick up to the next section. Also, you might need to copy or move a section of edits that had definite spacings between each section.

In order to accomplish these tasks, it is easy to take any phrase from your list of takes and place it near your edit area. Go to EDIT and turn the volume of the phrase "Off". Now, using TRIM IN or OUT, you can set the phrase to the needed length of the edit and then, using MOVE, place this "reference length" where ever it is needed. By moving the phrase from its end, you can set the length towards the left or by moving the front, you can set the length to the right.

DM-800 PERFORMANCE

TIMING LIMITATIONS - PUNCH IN/OUT

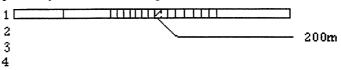
Depending on disk access and amount of edit information, you may occasionally find that the actual time of a punch in or punch out varies slightly from the selected times during auto or loop recording.

To improve this, set the punch-in time a little earlier and the punch-out time a little later than the intended points, then record. After recording, edit the In Time/Offset and the Out Time of the Phrase by using the Trim In or Trim Out command to adjust the final phrase.

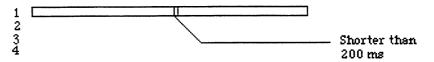
STANDARD SHORT PHRASE LENGTH

The practical limit to how short the DM-800 phrases can be split into depends on the access time of the disk drive, the sample rate of the Project, and the number of the tracks being used.

When using a hard disk drive with an average seek time of 19ms, and recording to only one track at a sampling rate of 48kHz, a Phrase can be split repeatedly into 200 ms lengths.



If a Phrase is not split repeatedly, but a short Phrase is sandwiched between two fairly long Phrases, the short Phrase can be less than 200 ms.



MINIMUM PHRASE LENGTH

Any Phrase will NOT play if it is less than 30 ms. i.e. You cannot make a new Phrase shorter than 30 ms. This does not affect your ability to edit out small areas. You can easily remove a section of audio down to 1 ms. such as a 'pop' or 'click'.

STEREO PHRASES - PHASE LOCK

Stereo phrases will remain phase locked L to R as long as they are edited equally on both channels. e.g. If you put a mono phrase on top of 1 track of a stereo phrase, it may cause the stereo phrase to loose phase lock after the mono phrase finishes. Put a SPLIT in the stereo track directly following the mono phrase, to begin the stereo phrase again, phase locked. i.e. Stereo Phrases will retain phase lock after an edit across both tracks.

Also if you fracture a stereo phrase (split into two mono tracks), the phase lock between the two channels will be broken.

Note: All four tracks on one SCSI buss will remain phase locked if they were recorded as a four track phrase.

MUTE CONDITIONS

During PLAY and/or PREVIEW, the DM-800 audio output of a Phrase will mute under the following conditions:

- The length of the Phrase is shorter than 30ms.
- If the length of the Phrase is longer than 30ms, but the time length from the current NOW time to the OUT TIME is less than 30ms. In this case, move the NOW time earlier in the phrase.
- If the current time has stopped in the Phrase Fade Out Period. To resume sound output, move the NOW time before the start of the FADE OUT.
- The playback of Phrases in the DM-800 is somewhat dependent on access speed of the hard disk. Very slow external disks could cause very short phrases to mute.

IMPROVING DISK ACCESS TIME

You can maximize the use of the hard disk and minimize delay times by:

- Obtaining a faster hard disk drive
- Consider using a 44.1 or 32 kHz sampling rate. The lower data rate may make the difference in marginal disk access situations.
- Limit the number of tracks being recorded or played back. NOTE: Muting a track (pressing the Track) Status Select button) does not keep the DM-800 from accessing those tracks, it just mutes the audio outputs. You must actually remove a phrase from the PLAYLIST to keep the DM-800 from accessing it from the hard disk.
- Try not to concentrate many short Phrases together on the Playlist. (Consider re-recording a track of many short phrases into a single new track with no edits).

PUNCH IN/OUT

The time interval between PUNCH IN and PUNCH OUT set during the Auto Recording and Loop Recording modes can not be set shorter than 1.0 second.

EXTERNAL SCSI DEVICES

STEP BY STEP INSTRUCTIONS

CONNECTION OF SCSI DEVICES

SPECIAL NOTE: If you do not have the time or desire to master the basics of SCSI devices, we recommend that you have your Roland dealer perform these steps or enlist the aid of a qualified technician.

SCSI is a very high-speed data transmission buss that is often taken for granted thanks to its common use on personal computers. However, insufficient attention to SCSI connections have turned out to be the major cause of "mysterious" or intermittent performance problems users have had with their DM-800s. Although SCSI has received a reputation for being voodoo or black magic, most problems may be cured 100% by following the suggestions in this document.

There are two main causes of SCSI problems: cables and termination. Roland recommends that you follow these specific procedures (Check off the steps as you complete them).

[] STEP 1. MACINTOSH COMPATIBLE DEVICES

All external disk drives and SCSI DAT devices for the DM-800 must be configured (jumper settings) as if they were going to be connected to an Apple Macintosh computer. If you are unsure, call your supplier.

[] STEP 2. INSTALL ROLAND EXTERNAL SCSI CABLES.

A: Install a Roland Part # C-5025-6 SCSI cable (6 foot, 25 pin - 50 pin) from the DM-800 SCSI A and SCSI B connections to the external disk drives. (Or be sure that you have a SCSI cable of the highest quality)

[] STEP 3. PROPERLY TERMINATE ALL EXTERNAL SCSI DEVICES.

External devices (Drives and DAT) MUST be properly terminated. Two methods may be acceptable, however, method # 1 is always preferred.

- 1. External ACTIVE termination applied at the end of the SCSI chain.
- 2. Internal termination applied directly to the device

(See sections later in this chapter for specific information about termination.)

Remember: External SCSI devices must provide their own terminator power. The DM-800 does not provide it.

[] STEP 4. SET SCSI ID NUMBERS CORRECTLY.

A: External Disk Drives attached to SCSI Buss A or B must be set to ID # 0 through 6 only. Drives attached to the same SCSI buss cannot be assigned to the same number. However, a single drive on Buss A and a single drive on Buss B can both to set to ID # 2, for example, since they are on different SCSI busses.

(The DM-800 CPU is already set to #7)

B: Set your external data SCSI DDS-1 DAT drive to any unused ID# and connect it to the SCSI A or SCSI B chain.

[] STEP 5 GR1, GR2, & GR3 DISK DRIVE GROUPS.

See later in this chapter for information about formatting disks as Group 1, Group 2, or Group 3. Decide which is best for your application.

[] STEP 6. POWER UP AND FORMAT.

Apply power to all external SCSI devices first, then power up the DM-800. From the Utility screen (F5 in the Catalog Mode), format the drives as shown under Hard Disk Drive Formatting Rules.

NOTE ABOUT DAT BACKUP

Clean your DAT drive regularly with a certified DAT cleaning tape. (after approx. every 10 -20 backups). Dirty DAT drives are the most common cause of bad backup DATS and lost projects. Use only DDS certified DAT tape. Do not use standard audio DAT tape in a DDS-1 SCSI Dat Drive.

TEST THE DRIVES & DAT [] STEP 7.

From the Utility Screen again, use F2 & F3 to test the SCSI communications between the DM-800 and all external SCSI devices. (See page 104 of this manual).

CONGRATULATIONS, YOU'RE DONE! [] STEP 8.

SCSI AND THE DM-800

Peripheral storage devices can be externally connected to the DM-800 in order to extend recording time and allow for project data backup. The DM-800 provides a SCSI A buss (tracks 1-4 & Backup devices), and a SCSI B buss (tracks 5-8 & Backup devices).

SCSI A AND SCSI B BUSSES

By connecting a SCSI device (i.e., a hard disk) to these SCSI busses, the recording time of the DM-800 can be expanded. Recording and playback of Projects are done in real time by using these SCSI busses. The SCSI A buss handles the data of tracks 1-4 as well as the connection of any external SCSI Dat or 8mm tape drives for backup. The SCSI B buss handles the data of tracks 5-8. Data (audio) and can be transferred between the SCSI A and the SCSI B via the Copy Take command under catalog, or, by digitally bouncing the tracks from one drive to the other inside the DM-800.

The DM-800 controls the recording and storage of Projects by dividing the internal hard disks (if any) and the external SCSI devices into three groups: GR1, GR2, GR3.

GROUP 1

Up to 50 Projects can be created (GR1-1 to 50).

Since the internal hard disks usually belong to Group 1, you may format the externally connected hard disks as part of Group 1 in order to maximize the recording time. Any SCSI devices can be used for the Group 1. Magneto-optical disk drives, phase change rewritable-optical drives and SyQuest type hard disk drives, which allow the disks to be removed, can be connected to the DM-800 and formatted as Group 1, 2, or 3.

If you format your added SCSI drive as GR1, it and the internal drives appear as one large drive to the DM-800. e.g. If you add an external 600 Meg drive and format it as Group 1, the DM-800 thinks it has one large drive (addition of internal and external). It will seamlessly record across from the internal drive to the external drive. Using this configuration, the DM-800 MUST always have that drive connected in order to operate. If you remove it for repair or any other reason, the DM-800 will not function without reformatting the drives mounted inside the DM-800.

GROUP 2

Up to 50 Projects can be created (GR2 -1 to 50).

When you wish to create more than 50 Projects or allow your hard disks to move from DM-800 to DM-800, format the attached drives as Group 2 or 3. If you format an attached 600 Meg drive as Group 2, the DM-800 sees the internal drive formatted as Group 1 and allows you to record up to 50 projects on it. It also sees the external drive, formatted as Group 2 as a separate drive and allows you to record up to 50 different projects on it. You can copy projects back and forth (assuming you have enough room on the internals). The advantage of this method is that the external (Group 2) drives can be disconnected without affecting the operation of the DM-800. However, all hard disks of each group must be connected to the correct SCSI busses. When even a single hard disk is missing or is connected to the wrong SCSI buss, the DM-800 cannot be used since it will not recognize the group.

NOTE: Group 3 follows the same rules as Group 1 & 2.

REVERSING EXTERNAL A & B DRIVES

IMPORTANT! If you reverse external A & B drives, the DM-800 will not operate correctly. Upon first turning the unit on with the drives reversed, the DM-800 will "lock up" on the "now loading" screen. If you power down and turn the unit on again, the DM-800 will "lock up" in the very early boot stages. Should this occur, simply turn off the power and put the drives back to their correct SCSI port. No damage will have been done and the unit should boot up normally.

4mm DAT is usually a more preferable device for BACKUP purposes.

- Faster removable drive technology will probably be on the market by the time you read this manual.
 Check with your Roland DM-800 dealer about any new removable drives that might be available.
- When using removable storage media such as a SyQuest disk or an optical disk drive, the disk cannot be removed during operation. To replace a disk, execute the SHUT DOWN command, then RESTART your system.
- After Loading a Project (when turning on the DM-800 initially, or when selecting Projects) which is
 stored on a write protected removable disk, a message will be displayed. This message will indicate
 that the disk is write protected. It is not possible with write protected disks to record, save, delete
 Project Takes, or to initialize a new Project. Only playback of a Project is possible. If you wish to
 create or edit a Project by recording, saving, deleting a Take or to initialize a Project, remove the
 disk using the SHUT DOWN command, change the position of the disk's write protect tab, then
 reinsert the disk and execute the RESTART command.

A single DM-800 can have a Group 1, Group2, and Group 3 attached simultaneously.

SCSI BACKUP DEVICE

Projects can be backed up to permanent storage by connecting a SCSIcompatible DDS-1 tape drive to the SCSI A or B buss. A Project must be short enough to back up to a single tape. (maximum of 1.8 GBytes)

NOTE: See the section "Backup Up Your Data" for more detailed information.

TROUBLESHOOTING SCSI

SCSI CABLES

Don't be fooled by drive suppliers that tell you, "our cables work just fine on a Macintosh computer". An unstable SCSI buss may require the host computer to try over and over to communicate with the drive. This is fine for Mac's since the user doesn't really notice that the MAC has to make a number of attempts at communication before actually writing the DATA to disk. However, the amount of data transfer for digital audio requires a very stable SCSI buss with rock solid drive communications at all times.

Since the SCSI buss is actually a form of transmission line, impedance matching is very important. If the impedance is not properly matched, "ghost reflections" will occur within the cable which will alter or corrupt the data on the line.

SCSI specifies a cable impedance of 100 Ω ±10%. Unfortunately, the vast majority of SCSI cables sold today have an impedance closer to 50 Ω . This results in up to 50% of the signal getting reflected back to the sending device. Another problem in cable construction is the amount of shielding used and the quality of the cables themselves. Some users have assumed that "molded connectors" are automatically equal to "high quality" - this is not the case.

The SCSI specification calls for the internal cable wiring to consist of 25 twisted pairs (each pair consists of one signal and one ground). However, many cables only contain a total of 26 wires - 25 signals plus one overall ground. "Double shielding" - where each twisted pair has its own shield in addition to the overall cable's shield - is required to eliminate crosstalk and RFI.

At low data speeds and for short cable runs (less than 1 foot), the above shortcomings may not be too much of a problem. With longer cable runs (3-6 feet) and higher data rates (such as those common in a DM-800), cable reflections do become a factor, resulting in random data errors that in turn cause problems ranging from noise in the audio all the way to the DM-800 ceasing to operate. Because these errors are indeed random, the resulting symptoms are also random and may not be completely repeatable (adding to confusion and frustration when trying to debug them).

Roland SCSI cables have been manufactured to meet all the SCSI specifications.

1.8 meter (6 feet) 25-pin to 50-pin cable (Part # C-5025-6)

.9 meter (3 feet) 50-pin to 50-pin cable (Part # C-5050-3)

These may be purchased from your Roland DM-800 dealer or directly from Roland as a replacement part.

SCSI TERMINATION

The two physical ends of a SCSI chain must be terminated correctly. This also helps reduce reflection on the bus. Incorrect termination will result in extra "ghost reflections" appearing on the SCSI bus, which can also corrupt SCSI communications.

Since the DM-800's A and B SCSI busses are internally terminated, the other physical end of the external SCSI chain must be terminated as well. i.e. If you have a 300 Meg external drive and a 600 Meg external drive connected to the "SCSI A" port on the DM-800, the last drive in the chain must be terminated.

Most drives are available with internal or external terminators. Internal terminators are usually small in line resistor packs called "SIPs". They plug directly into sockets on the main controller circuit board of the drive itself.

CAUTION: DO NOT INSTALL SIPs terminators backwards. Pin # 1 is designated with a dot. Socket # 1 of the circuit board will be designated with a 1, a dot, a square, or some other designation for Pin # 1. Match Pin # 1 to Socket # 1.

External terminators are usually rectangular boxes which can be attached to a separate 50 Pin Centronix connector on the rear of the drive. Other external terminators have a 50 pin connector on both sides so the terminator can be plugged onto the drive and the cable from the DM-800 can be plugged into the terminator.

CAUTION !! Do not change terminators on any SCSI device with the power turned on.

"ACTIVE" TERMINATORS

"Active" terminators are your best and first choice. These have a voltage regulator inside to make sure the precise reference voltage is available to minimize cable reflections. Unless external terminators are marked as "active", they will be "passive" devices. We have actually seen "active" terminators fix systems with substandard cables that would not work with internal or passive external terminators.

Internal SIPs termination is probably your second choice with external "passive" termination a very close third choice. However, every SCSI device is slightly different.

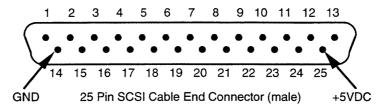
The termination that works perfectly with one device, will cause an unstable SCSI buss on another SCSI device. That is why we recommend that you purchase drives from suppliers WHO have exhaustively tested their drives specifically with the DM-800 or other Digital Audio or Video applications.

For example, some SCSI DAT drives are unstable using their internal SIPs terminators, however, they become completely stable if terminated with an external "active" terminator.

APS TECHNOLOGIES TERMINATION

As of this writing, many companies are beginning to provide SCSI mechanisms with 'Active Termination' built into the housing assembly which can be turned on or off with a rear panel switch. This is highly effective and should be a very good choice. One high quality source in the USA is APS Technologies, 6131 Deramus, Kansas City, MO 64120-0087 USA. Telephone: 816-920-4109 Fax: 816-483-3077. Their exclusive DaTerm[™] technology and their very small cases are of superior quality. In addition, their Drives, Supplies, and Accessories Catalog provides a wealth of good information about SCSI devices. (The catalog is free).

TEST FOR INTERNAL TERMINATION



If you are not sure if your external drive is internally terminated, you can measure this. With the drive turned on and not connected to any other SCSI device, measure the voltage between one of the data lines (such as pin 26 on a 50-pin connector, or pin 6 on a 25-pin connector) and the ground (GND) pin listed above. If the drive is internally terminated, you should measure approximately 3 VDC. If the drive is **not** internally terminated, this pin will be "floating" and you may measure something close to 0 or 5 VDC (your meter may even fluctuate between these two extremes).

DOUBLE TERMINATION

Be sure that the last drive in the SCSI chain is not double terminated. That means that it has internal terminator resistors installed as well as an external 50 Pin terminator. You must remove either the internal SIPs or the external terminator package.

KNOWN CURES

There are a number of DM-800 problems that we have traced specifically to improper SCSI cables or SCSI termination. Below are examples of some of these situations. If you are experiencing similar problems, you should try changing your cables and/or termination accordingly. This is certainly not a complete list and other symptoms may occur as well.

Examples of problems that correct SCSI cables & terminators have cured are:

- Locking up during booting while connected to external hard and optical drives (including seeing a message that the internal drives were unformatted, when in fact they were okay)
- Not recognizing external drive (including DAT backup drive)
- Recognizing formatted external drives as unformatted
- Locking up during formatting external hard drives
- Randomly locking up while just playing a project.
- Locking up while copying projects to and from external drives

- Clicks induced in audio while playing from internal drives while external drives were connected (remember that when a SCSI communication takes place, the entire bus is active - not just the section of cable between the DM-800 and the active drive)
- Random system crashes with no direct cause.

NOTE: If the DM-800 operates normally most of the time, but crashes during long recording or playback, it is usually caused by a problem with the attached SCSI hard drives 'thermal recalibration'. (See enclosed drive specs for proper thermal recalibration specs.)

MINIMUM HARD DISK DRIVE SPECIFICATIONS

- 1. Less than 20 ms disk access time. NOTE: The faster the drive, the more small edits you can do. There is a direct connection between disk access time and edit density.
- 2. 1:1 Interleave
- 3. Slip Sectoring
- 4. Configured for connection to a Macintosh
- 5. 100% SCSI-I Compatible
- 6. Thermal Recalibration **IMPORTANT!** Drives should have "intelligent" Thermal Recalibration. i.e. Drive should wait to recalibrate until the SCSI buss is clear and should abort recalibration if a new SCSI request is received.
- 7. Proper SCSI cable (Roland part # C-5025-6 recommended)
- 8. Active terminator.

MINIMUM SCSI DAT DRIVE SPECIFICATIONS

- 1. DO NOT Use SCSI DAT drives with DATA Compression.
- 2. Drive must be a fully compatible DDS-1 drive, configured for connection to a Macintosh.

The DM-800 DOES NOT support DDS-2 SCSI DAT drives.

- 3. Use only DDS-1 compatible DATA DATS DO NOT use general purpose Audio DATs.
- 4. 100% SCSI-I Compatible.
- 5. Proper SCSI cable (Roland part # C-5025-6 recommended)
- 6. Active terminator.

NOTE ABOUT DAT BACKUP: Clean your DAT drive regularly with a certified DAT cleaning tape. (after approx. every 10 -20 backups). Dirty DAT drives are the most common cause of bad backup DATS and lost projects. Use only DDS certified DAT tape.

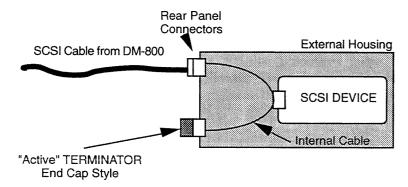
IMPORTANT NOTICE

While most individual drive mechanisms have worked successfully with the DM-800, ROLAND does not recommend that you purchase raw mechanisms. Many of these mechanisms require special dip switch settings, jumper configurations, and even some EPROM reprogramming to work properly with the DM-800 and other Digital Recording applications. You should always purchase drive assemblies from your ROLAND DM-800 authorized dealer or from "system integrators" who have programmed the drives specifically for the DM-800 or other Digital Audio recording systems.

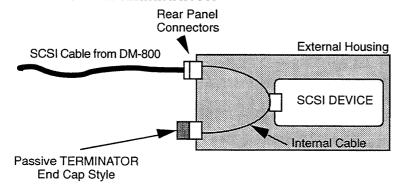
We would also recommend that you only purchase SCSI devices with a full return guarantee in case of incompatibility with the DM-800.

IF YOUR SCSI DEVICE IS WIRED LIKE THIS:

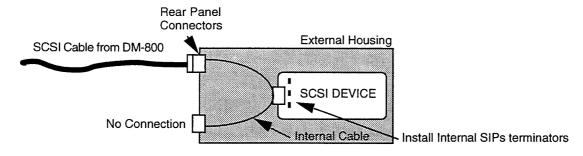
BEST CHOICE FOR TERMINATION



2ND CHOICE FOR TERMINATION



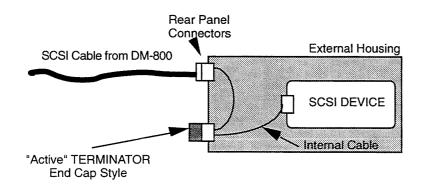
3RD CHOICE FOR TERMINATION



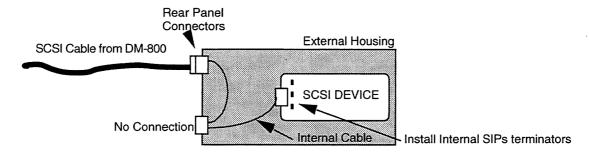
REMEMBER: Start with the BEST choice. If that does not give you a stable SCSI buss, try choice # 2, then choice # 3.

IF YOUR SCSI DEVICE IS WIRED LIKE THIS:

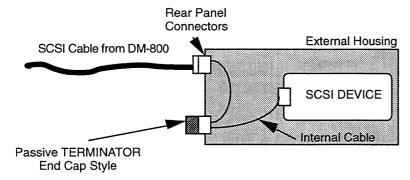
BEST CHOICE FOR TERMINATION



2ND CHOICE FOR TERMINATION



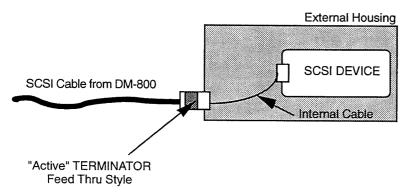
3RD CHOICE FOR TERMINATION



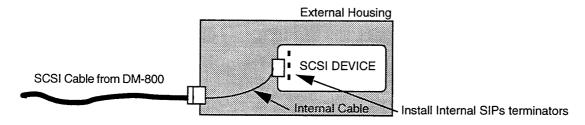
REMEMBER: Start with the BEST choice. If that does not give you a stable SCSI buss, try choice # 2, then choice # 3.

IF YOUR SCSI DEVICE IS WIRED LIKE THIS:

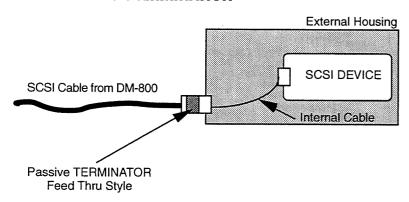
BEST CHOICE FOR TERMINATION



2ND CHOICE FOR TERMINATION



3RD CHOICE FOR TERMINATION



REMEMBER: Start with the BEST choice. If that does not give you a stable SCSI buss, try choice # 2, then choice # 3.

SMPTE SYNCHRONIZATION

HOW THE DM-800 WORKS

RANDOM ACCESS

We must first visualize how the DM-800 records & plays audio. When you press RECORD, the DM-800 begins sampling the instantaneous level of the incoming audio at periodic intervals, turns this data into digital words, and stores these words in memory. When there is enough data in the memory (and the disk is not busy elsewhere), a section of the data is deposited on the hard disk, with the digital words arranged endto-end in the order they were received. This single recording on the hard disk in the DM-800 is labeled as a TAKE. We then create a "PLAYLIST" for the DM-800 where we instruct it when to play a particular piece of audio, what output (track) to play it from, and how long to play it. "Random access" is this ability to play any piece of audio in any order at any time, regardless of the order it was recorded in.

SAMPLE CLOCK

The sampling speed, (i.e. how many audio samples the DM-800 takes every second), is controlled by a clock; the "SAMPLE RATE CLOCK". This Sample Rate Clock can be controlled internally or externally. The DM-800 has internal fixed sampling rates of 48 kHz, 44.1 kHz, and 32 kHz. If the DM-800 plays back the digital samples at the same rate they were recorded, the audio will play for precisely the same length of time as when it was recorded. e.g. If you record precisely 1 minute of audio at a sample rate of 44,100 samples per second, then play back at exactly 44,100 samples per second, the resulting playback will be precisely 1 minute long.

TIME BASE

Now visualize the "Time Base" or PLAYLIST in the DM-800 as a variable speed 24 hour digital clock. The DM-800 can display this clock as SMPTE time code numbers, Bars & Beats, or just Hours, Minutes and Seconds. The speed of this clock can be controlled in a number of ways. e.g. If the DM-800's Time Base is set to read incoming SMPTE time code, the speed of that time code directly controls the DM-800 Time Base clock. The DM-800 follows each SMPTE number, at precisely the same speed, as they increment upward.

However, if the DM-800's Time Base is set to INTERNAL, the speed of the Time Base clock is determined by the relationship between the SMPTE Rate/Format setting in the DM-800 and the DM-800's current SAMPLE RATE clock (either internal or external.)

DM-800 PLAYLIST

You can think of the playlist in the DM-800 as a master scheduler. When you create PHRASES on the DM-800 Playlist, you "schedule" them for a specific output (track) at some specific Time Base location. You can think of these PHRASES as instructions to the DM-800 for audio playback. e.g. A PHRASE (instruction) placed on Track 3, at SMPTE location 01:02:00:00 might tell the DM-800 to begin playing the Bass Guitar recording on output # 3 when you reach time code location number 01:02:00:00. As the time code numbers advance, (controlled by the Time Base clock), the DM-800 triggers playback of the correct audio from a particular output at the correct time. Once a PHRASE has been triggered for playback by the Playlist, the PHRASE continues to play for its defined length at a constant speed which is determined by the "Sampling Clock".

Remember: The Playlist (Time Base) only triggers a phrase for playback; the speed at which the audio is played is then controlled by the Sampling Clock. e.g. Let's assume the Sample Rate is 44.1 kHz and the sampling clock is controlled by the DM-800 internally. Once our Bass Guitar track has been triggered to play at Time Base location 01:02:00:00, it will continue to play at 44,100 samples per second, regardless of what is happening with the Time Base clock.

Since the Sampling Clock and the Time Base Clock can be completely independent (as it can be when you are syncing to external SMPTE), you must pay special attention to the relationship of these two clocks. If you ever expect the DM-800 (or any other digital device) to operate correctly with SMPTE, you MUST synchronously "link" these two clocks together. e.g. If the Playlist is expecting a PHRASE to play for precisely 60 seconds, then the Sample Rate clock must "clock out" exactly the correct number of samples to fill that time. If the Sample Rate is too slow, the audio will be too short. If it is too fast, the playback audio will be too long. In either case, synchronization between the DM-800 and SMPTE has been lost.

You must always keep in mind the relationship between TIME BASE and SAMPLE RATE. "What is the clock source for my TIME BASE?" What is the clock source for my SAMPLE RATE?"

NOTE: You also want to keep the same clock sources during playback that you used during recording. e.g. Let's say you recorded some stereo music with an external Sampling clock that was just a little slower than normal; 44,090 instead of 44,100 samples per second. As long as you use that same clock during playback, the DM-800 will play back the audio exactly as recorded. However, if you used a different Sampling clock source during playback, running at 44,105, the digital samples would be played back slightly faster than they were recorded. This playback would be a little shorter in length than it was originally recorded and at a slightly higher "pitch". Obviously this change is very small and would not even be noticed in a typical musical piece, however, when locked to a long video, even the slightest error in timing will accumulate, causing the end of your audio to be out of sync with your video.

This is why understanding your TIME BASE clock and your SAMPLING clock is so important.

SOME EXAMPLES

- Let's first look at one example when the TIME BASE CLOCK and the SAMPLE RATE CLOCK are exactly the same (e.g. when both are set to INTERNAL in the DM-800). In this situation, a single clock in the DM-800 controls the Time Base and the Sampling Clock. When this clock tells the Time Base "scheduler" to move forward 10 seconds, it is also telling the Sample Rate to play 44,100 digital samples of audio every second for ten seconds. Since this 10 seconds is precisely the same length, the TIME BASE and SAMPLE RATE are perfectly in sync.
- Now let's assume that the SAMPLE RATE clock is still locked to INTERNAL, but the TIME BASE clock is now locked to external SMPTE time code from a video machine. What happens if the SMPTE clock (Time Base from the video machine) is slightly slower than the DM-800 internal Sampling clock? The DM-800 plays 44,100 digital samples every second for 10 seconds according to its internal clock, and the incoming SMPTE time code tells the DM-800 time base to increment ahead by 10 seconds; but remember that the 10 seconds of SMPTE from the video tape is slightly slower than the 10 seconds in the DM-800. You can see that at the end of 10 seconds, the SMPTE location numbers will be just a little behind the digital samples (audio) coming from the DM-800. As you continue to play a single PHRASE for minutes or hours, the SMPTE locations (video) and the actual digital audio samples from the DM-800 will move further and further out of sync.
- One might say, "If we just record and then play back using the exact same set of clocks; shouldn't they stay in sync?" i.e. "If we record using the slower SMPTE for Time Base location information and then play back using the same slower SMPTE, shouldn't we stay in sync with the video?" Yes, it will be in sync, but ONLY if you start at the very beginning of a DM-800 PHRASE. e.g. Let's say the time code numbers recorded on the video tape read 00:05:00:00 to 00:10:00:00. But remember, the video is playing back slower. So let's exaggerate it for the sake of understanding and say it takes 6 minutes for the video to play. However, the time code numbers say it is only 5 minutes in length. If we record audio into the DM-800 beginning at 00:05:00:00, we will record for 6 minutes (to match the length of the video tape). When you play back the DM-800 and the video from the beginning, they start together, each continue playing for 6 minutes, and they end together in sync. **HOWEVER**, if you start in the middle somewhere, the DM-800 must "calculate" how far into the PHRASE it must begin to play. Let's begin playing the video at SMPTE number 00:07:30:00 (which is exactly half way through the video). The DM-800 reads the SMPTE number and calculates that it should start playing 2 min. and 30 sec. from the beginning of the PHRASE (which started at 00:05:00:00). In order to do this, the DM-800 must count how many samples from the beginning of the Phrase to start playing. It multiples 2 min. and 30 seconds times the Sampling rate (44.1k) and begins playback at what it believes to be the correct time. But remember that the video and audio are playing for 6 minutes in length, one half of which is 3 minutes, NOT 2 min. and 30 sec. Thus the DM-800 will have missed the correct place to begin playing by 30 seconds. This is why absolute synchronization between the TIME BASE and the SAMPLE RATE must be maintained at all times in order to maintain proper sync of audio and video.

MAINTAINING SYNC

There are a number of ways to assure that you will always maintain sync.

- INTERNAL / INTERNAL Obviously if you use the DM-800's internal clock to control TIME BASE and SAMPLE RATE, they will maintain internal sync since they are controlled by the same clock.
- SMPTE/DIGITAL IN In a video environment you can use a House Sync generator to lock your video machine, your time code generator, and your DM-800 together. If the SMPTE was recorded onto the video machine with the generator locked to House Sync, the video machine itself is locked to House Sync so its playback speed is controlled. If you video deck has a digital audio output, you could use this audio signal to the DM-800 Digital Input and lock the DM-800 sampling clock to Digital In. Since SMPTE time code and the Digital audio clocks are externally "locked" together with the House Sync generator, they will cause the DM-800 Time Base and Sampling Clock to lock together.

IMPORTANT NOTE: Remember that the DM-800 expects a particular sampling clock rate which is dependent on the SMPTE rate. You must be sure that you do not externally "force" the DM-800 to sample at a rate other than what it is expecting. If you do, the DM-800 will not sync correctly. (see later information for more detail).

PREFERRED METHOD FOR SMPTE SYNC

Set the DM-800 Sample Clock source to SMPTE and the internal Resolver will generate a synchronous Sample Clock directly from the SMPTE.

In an application where you MUST lock the DM-800 to a source of SMPTE time code whose clock is different from the DM-800 Sampling clock (consumer VCR, Time Code DAT, etc.) or to a "varying" source of time code such as an analog tape deck; you should always use the internal DM-800 sample rate resolver to maintain accurate synchronization.

This internal circuitry provides the capability to generate a Sample Clock directly from the incoming SMPTE time code. The DM-800 can then use this "generated" Sample Clock and the incoming SMPTE time code to maintain perfect sync. Since the DM -800 generates its Sample Clock directly from the incoming SMPTE time code, the TIME BASE (SMPTE) and the resulting SAMPLING clock will always be synchronous. e.g. If the incoming SMPTE were to speed up a small amount, the generated Sampling clock will speed up the same amount. In this way, the DM-800's Sampling Clock follows the incoming SMPTE time code, no matter how it changes (within the limits of the DM-800).

Using the internal sample rate resolver, you can always lock the DM-800 to any time code source and have accurate synchronization over any amount of time.

REMEMBER: The resulting sample rate on disk will vary slightly, in synchronization with SMPTE time code. This variable Sampling rate will generally make it impossible to directly transfer digitally, from the DM-800 to another digital device. Use the Roland's SRC-2 Dual Sample Rate converter to convert the "variable" sample clock into a "fixed and stable" clock in order to digitally transfer to DAT, D-2, etc. when using the internal Resolver.

IMPORTANT NOTE: In order to use the internal Resolver effectively, you must make the original recordings with the <u>DM-800 locked to the master SMPTE time code source</u>. They will then playback synchronously. The Resolver is particularly valuable when you must lock the DM-800 to SMPTE time code striped on a track of an analog tape machine. Since an analog machine normally has it's own reference for playback speed (its own TIME BASE clock), and its speed may vary slightly from one end of a reel to the other, the DM-800 must generate a varying Sample Clock in sync with the varying time code (TIME BASE).

THE DM-800 AND SMPTE SYNCHRONIZATION

The playback timing within the DM-800 is divided into two sections. The controls for them are found in the <u>SYSTEM MODE</u> (Project Parameter 1 screen) of the DM-800.

- Remember: The <u>"TIME BASE"</u> section controls <u>when</u> a particular phrase begins to play. This can be controlled by:
 - The DM-800's Internal Clock
 - SMPTE (from an external source)
 - MIDI Time Code (from an external source)

NOTE: MIDI Time Code is exactly the same format as LTC SMPTE, except that it is imbedded in the standard MIDI data stream.

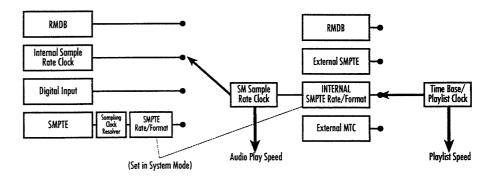
- The RMDB Buss.
- **Remember:** The "SAMPLING CLOCK" controls the *rate* or speed of playback of a phrase once it begins to play.

NOTE: This also controls the rate at which the DM-800 generates SMPTE when Time Base is set to INTERNAL.

This can be controlled by:

- The DM-800's Internal Sampling Rate Clock.
- Digital Input.
- SMPTE (using the internal Sample Rate Resolver recommended for use in all SMPTE applications).
- RMDB Buss (sample clock from an externally connected device.)

DM-800 SAMPLE CLOCK & TIME BASE RELATIONSHIP



SMPTE TIME CODE

BACKGROUND INFORMATION

SMPTE time code is a widely used, but often misunderstood protocol. SMPTE should always be identified in two parts.

- The <u>FORMAT</u> describes the actual counting method for the location frame numbers that are being generated.
- The <u>RATE</u> describes how fast those numbers are being generated.

FORMAT and RATE are completely different aspects of SMPTE. Any of the formats can occur at any of the rates, although in practice there are some standard combinations.

FORMATS

30 Non Drop (ND)

30 Drop Frame (DF)

25

24

RATES (FPS - FRAMES PER SECOND)

30 fps (SMPTE generated for analog recorders, <u>B&W Video</u> prior to NTSC Color)

29.97 fps (SMPTE generated for use with Color NTSC Video)

25 fps (EBU generated for use with European PAL Video)

24 fps (SMPTE generated for use with Film)

NOTE: When you label your tapes or inquire about a tape you receive, SMPTE should always be specified as a FORMAT & RATE.

THE DIFFERENCE BETWEEN 30 ND AND 30 DF

SMPTE time code basically counts the passage of time in hours, minutes, seconds, and frames (30 frames per second). 30 Non-Drop Format time <u>code</u> running at a rate of <u>30 fps</u> will match real clock time exactly. Since there are exactly 30 frames of time code generated every second, generating 1 hour of 30 Non-Drop, 30 fps time code will be completed in exactly one hour.

However, if you slow the generator down to <u>29.97 fps</u> in order to match NTSC video frames (generate all 30 numbers (format) but slightly slower than 30 fps (rate)), the time code numbers will soon begin to fall behind the actual clock on the wall. This accumulated error is 3.6 seconds in a one hour program. In order to compensate for this, Drop Frame format was introduced. This format drops two frame numbers at the beginning of each minute except for every 10th minute. This method allows the time code numbers on a one hour video tape, for example, to match one hour on the clock. As you guessed, the code never "exactly" matches the clock. As it starts to fall behind in the first minute, it "jumps" two frame numbers and gets back in sync. It then slowly falls behind the next minute, then "jumps" two frame numbers to get back in sync. This continuous "adjustment" of the numbers at least allows 1 hour of code to be generated in one clock hour.

Most often, Drop Frame - 29.97 time code is used only for broadcast applications where the time code numbers must match real clock time. For almost all post production applications, Non-Drop - 29.97 SMPTE is used. This makes it easier for the post production engineer. They can just calculate continuous 30 frame numbers without the need to compensate for the two frames that are dropped every minute in Drop-Frame code.

SMPTE FORMAT AND RATE COMBINATIONS

	FORMAT	RATE
•	30 ND (non-drop)	30 fps matches actual clock time.
•	30 DF (drop-frame)	29.97 fps matches actual clock time.
•	30 ND (non-drop)	29.97 fps DOES NOT match actual clock time.
•	30 DF (drop-frame)	30 fps <u>DOES NOT</u> match actual clock time.
		(NOTE: This combination is usually generated only by mistake)
•	25	25 fps <u>matches</u> actual clock time.
•	24	24 fps matches actual clock time.

NOTE: For a more detailed SMPTE Time Code explanation, refer to "The Time Code Handbook" by Walter A. Hickman, available from the MIX Magazine Bookshelf, # 2183D — USA.

NOTE: For an additional look at time code applications in film and video, refer to "Using Time Code in the Reel World II," by Jim Tanenbaum. (Sound Recording Services, 8827 Lookout Mountain Ave., Los Angeles, CA 90046 USA. 213-654-2076)

VITC (VERTICAL INTERVAL TIME CODE)

- LTC (Longitudinal Time Code) is recorded on tape in a linear fashion just like regular audio. This is fine as long as the tape is playing at normal play speed. However, it doesn't work very well at slow or jog speeds.
- VITC (Vertical Interval Time Code) was developed as a means to encode SMPTE time code numbers directly into the video signal so it could be read at all speeds, including still frame. Working with VITC is extremely handy since you can jog video, one frame at a time, to find the exact video frame to place a sound effect, and have external equipment "know" the time code number you have stopped on. The DM-800 does not read VITC directly, but any VITC to LTC converter should work for locking the DM-800 to VITC. (Horita # VLT-50 or equivalent). The VITC/LTC converter works by reading the incoming VITC from video and outputting a LTC data stream at the correct rate. If the video is stopped, the converter just repeats the same frame number over and over in the LTC data stream. The DM-800 just keeps "resyncing" to the same number over and over so it locks to the VITC time code even in "still frame" mode. This allows the DM-800 to move along frame by frame, even with slow motion video.

DM-800 CONNECTIONS

SMPTE LTC IN - . This RCA connector is UNBALANCED. Incoming SMPTE level should be between 0.5Vp-p and 5Vp-p.

SMPTE LTC OUT - This RCA connector is also UNBALANCED. Nominal output level from this connector is 0.75Vp-p.

NOTE: When the DM-800 Time Base is set to SMPTE, the incoming SMPTE time code will be "reshaped" and fed directly to the SMPTE output jack.

TIME BASE & SAMPLING CLOCK COMBINATIONS

The DM-800's internal calculations for SMPTE synchronization are based on a simple set of rules.

- If the Rate/Format is set to 30 Non (ND), the DM-800 expects ND Time Code at a rate of 30 FPS and it will sample at 44.1K (48K or 32K).
- If the Rate/Format is set to 29.97 Drop (DF), the DM-800 expects Drop Frame Time Code at a rate of 29.97 FPS, and it will sample at 44.1K (48K or 32K).
- THE ONE EXCEPTION: If the Rate/Format is set to 29.97 Non (ND), and you feed it 29.97 Time Code, the DM-800 will still operate synchronously, but it will sample at 44,056 (47.952 or 31.968). The reason for this: Incoming Time Code is .1% slower than the DM-800 expects (30 fps to 29.97 fps), but the Sample rate has also been reduced by .1% (44,100 to 44,056) due to internal Resolver, allowing the DM-800 to remain in Sync with the video tape.

BE SURE THE SAMPLING CLOCK SOURCE IS SET TO SMPTE...

Any deviations from these three rules, will cause the DM-800 to playback non-synchronously to video.

NON-SYNCHRONOUS PLAYBACK EXAMPLE: Using the Rate/ Format set to 30 - Non (ND), sending 29.97 Time Code, but locking the Sampling clock to Digital In with a 44,100 sample rate coming in from a DAT machine will cause non-synchronous playback. Why? Remember that under the conditions of ND code at a rate of 29.97, the DM-800 expects to sample at 44.056. By locking it to Digital In with a sample rate of 44,100 instead of 44,056; you "force" the DM-800 to make calculations incorrectly which causes it to playback non-synchronously.

REMEMBER: It is very easy to insure that the DM-800 will always operate synchronously. Just follow the three rules above.

HOW SMPTE AFFECTS SAMPLE RATE

The following table shows how the Time Base and Sampling Clock settings interact with the Project's sample rate, and the actual sample rate recorded on disk.

SAMPLE RATE SETTINGS VS RECORDED SAMPLE RATE

TIME BASE SETTING	PROJECT SAMPLE RATE SETTING (KHZ)	SAMPLE RATE CLOCK SETTING	ACTUAL SAMPLE RATE ON DISK (KHZ)
INTERNAL	48, 44.1, 32	INTERNAL	48, 44.1, 32
MTC	48, 44.1, 32	INTERNAL	48, 44.1, 32
SMPTE - 30 - NON	48, 44.1, 32	INTERNAL	48, 44.1, 32
SMPTE - 29.97 - NON	48, 44.1, 32	INTERNAL	47.952, 44.056, 31.968
SMPTE - 29.97 - DROP	48, 44.1, 32	INTERNAL	48, 44.1, 32
SMPTE - 25	48, 44.1, 32	INTERNAL	48, 44.1, 32
SMPTE - 24	48, 44.1, 32	INTERNAL	48, 44.1, 32
SMPTE - 30 - NON	48, 44.1, 32	SMPTE	48, 44.1, 32
SMPTE - 29.97 - NON	48, 44.1, 32	SMPTE	47.952, 44.056, 31.968
SMPTE - 29.97 - DROP	48, 44.1, 32	SMPTE	48, 44.1, 32
SMPTE - 25	48, 44.1, 32	SMPTE	48, 44.1, 32
SMPTE - 24	48, 44.1, 32	SMPTE	48, 44.1, 32
ANY SETTING	48, 44.1, 32	RMDB	FOLLOWS RMDB INPUT
ANY SETTING	48, 44.1, 32	DIGITAL IN	FOLLOWS DIGITAL INPUT

IMPORTANT NOTES TO REMEMBER

- If you use 29.97 Non Drop Time Code, the DM-800's display will accurately match the video time code numbers, HOWEVER, the display will NOT equal real clock time. i.e. If you have a project starting at exactly 01:00:00:00 on the display that runs till 02:00:00:00, it will not actually be one hour in real time. (The project will be 3.6 seconds longer than one hour).
- If you use 29.97 Non Drop Time code when locking to video and the Sample Clock set to SMPTE, the DM-800 will lock appropriately (in sync). However, remember that the DM-800 will sample at 44.056 or 47.952 instead of 44.1 or 48K. That's not a problem if you intend to layback from the DM-800 through the analog outputs. If, however, you intend to digitally transfer out of the DM-800 to DAT, D-2, etc.; you will need to use the Roland SRC-2 Dual Sample Rate Converter to convert 44.056 to 44.1K or 47.952 to 48K. This can be easily avoided by using 29.97 Drop Frame code instead of 29.97 Non Drop code when locking to picture. Then the DM-800 will sample at 44.1K or 48K.
- Always record into the DM-800 under the same circumstances you will be playing back.

IMPORTANT: The reason for this is to be sure that the number of digital samples recorded to disk per second during the recording process matches the number of samples per second that are played back. The most important point is that if you locate into the middle of a Take, for example, the DM-800 cannot calculate the proper # of samples to start from if the number per second is different on playback from those during recording. This will cause the SMPTE sync to be off by the amount of the calculation error.

EXAMPLE: Let's say you record into the DM-800 using 30 Non Drop Time Code with the DM-800 set on "internal" sampling clock. As per the chart above, the digital samples would be recorded at 44,100 per second. If you then locked the DM-800 to 29.97 Non Drop Time Code for playback, the DM-800 will play back the samples at 44,056 per second. As you can see, the DM-800 would play the samples back slightly slower than they were recorded. This means that the project would playback slightly longer in time than it was recorded. This is, of course, true with any digital recorder.

- When making a digital recording from the DM-800 to DAT at 47.952kHz, for example, and then playing it back at 48kHz on another DAT deck, the total play time becomes shorter. In order to avoid this problem, use the Roland SRC-2 Dual Sample Rate Converter to convert 47.952kHz to 48kHz, or simply record analog from the DM-800 to DAT.
- Always use the same time code format and rate throughout an entire project in order to synchronize accurately. i.e. DO NOT switch format or rate in the middle of a project.
- When striping SMPTE onto a video tape, be sure that the SMPTE generator is locked to an appropriate "house sync" clock source. DO NOT record "wild" SMPTE from a free-wheeling generator onto your video tape. The SMPTE frame numbers must be striped in "sync" with the video frames.
- If a SMPTE generator locked to "house sync" is not available, use the SMPTE generator built into the DM-800 as your master generator with the DM-800 Sampling Clock locked to Digital A. Feed a digital audio signal into Digital A from a source that is locked to "house sync" and set it to the correct Sample Rate.
- You must always select the correct format of SMPTE on the DM-800 (drop frame or non-drop). If you are not sure about the incoming time code, the DM-800 Playlist screen will indicate DF or ND. If the incoming SMPTE format does not match your DM-800 Rate/Format setting, the DM-800 will NOT operate synchronously.
- If you receive 1/2" or 3/4" video "work tapes" which you have to use for audio production, be sure to insist that the time code striped on the tape (either LTC or VITC) has been recorded synchronously with the video (generator and video all locked to same "house sync" source).
- We strongly recommend that you carefully outline, in advance, each project you intend to do, keeping in mind your sampling clock, time base reference, SMPTE format and rate, etc. You can then be assured of accurate timing and synchronization at all times. It would also be helpful to document this information along with each project.

KEEP TRACK OF:

- Time Code Format (drop or non-drop)
- Time Code Rate (30 or 29.97)
- Sampling Clock Source (SMPTE, Internal, Digital In, or RMDB)
- Resulting Sample Rate on disk (44,100 or 44,056, etc.)

This way you can always come back to the project at some later date and recreate the exact set of conditions required for proper sync.

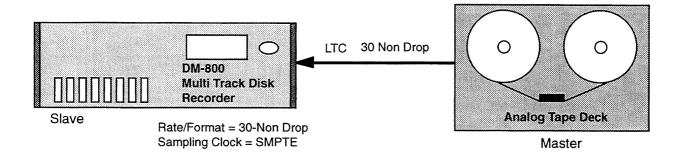
APPLICATION EXAMPLE

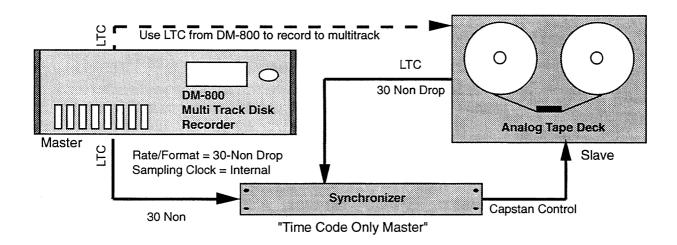
Let's say you are going to use the DM-800 to do vocal comps from multiple vocal tracks on a digital multitrack tape. Your first action might be to stripe SMPTE from the DM-800 onto one track of the multitrack in order to slave the DM-800 to the multitrack. If the DM-800 has its "sampling clock" set to internal, the internal clock will generate the SMPTE numbers. That's all fine **until** you want to lock the DM-800 sampling clock to "Digital In" so you can transfer tracks digitally from the multitrack to the DM-800. The DM-800 has already generated time code at its internal clock rate, but now the sampling clock is coming from the multitrack. If those two clocks are even slightly different, the SMPTE sync will drift as you move further and further into the tape.

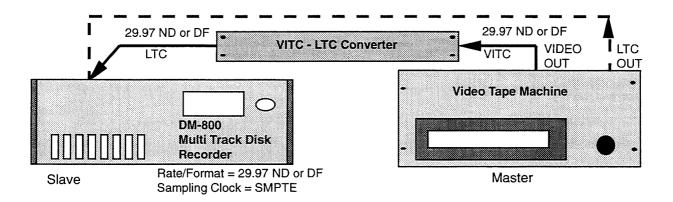
THE BETTER WAY would be to lock the DM-800 to the multitrack through the Digital Input while you stripe SMPTE to the multitrack. Now the same clock source that was used to stripe SMPTE is now being used to read SMPTE. Thus sync is always maintained.

SMPTE 153

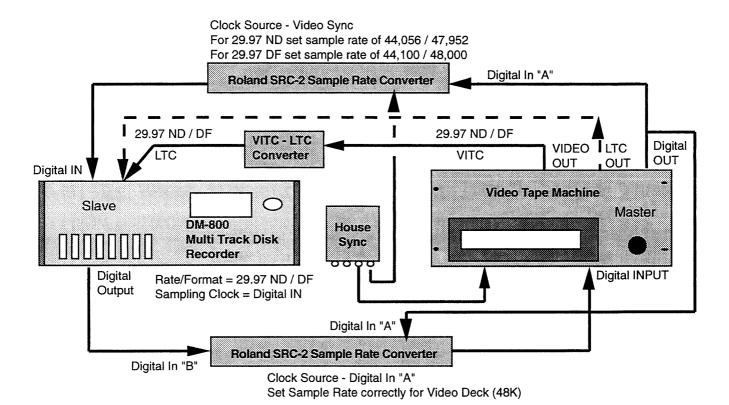
EXAMPLES: ANALOG TAPE MACHINE & VCR







EXAMPLE: DIGITAL AUDIO TRANSFER - D-2 VIDEO TO DM-800



DM-800 TUTORIAL

TERMS

A TAKE is a recording and refers to the whole recording. The only time that you use disk space is when you record a Take in the Record Mode.

A PHRASE is all or part of a Take. The only things that you see in the Playlist are Phrases. You can have many phrases that play part or all of a particular Take.

The NOW LINE is the line in the center of the screen that shows where you are playing as the phrases move by underneath.

A PROJECT is a collection of Takes and Phrases as well as Automation, Trigger assignments and all of the information that makes one complete "project" for saving and cataloguing purposes.

BUTTONS

CURSORS: These are navigational tools. Use them to move around within different edit windows. They are also used to select which track you are working on.

NEXT/PREVIOUS: Think of these like the Track Skip buttons on a CD Player. They will locate to the beginning or end of each phrase on the selected track.

MARKERS: The markers are your grease-pen. Place a marker at any position in your project by pressing one of the marker buttons. Once a marker is used, it turns red. To instantly locate back to a marker, simply press it. Erase a marker by holding down the Delete button and pressing the marker you want to erase.

EXECUTE: This must be pushed to complete most edits, like an ENTER key on a computer.

FUNCTION: This button toggles between different sets of the Functions that are displayed above the "F" Keys, if there is more than one set for a particular Mode.

F1-F5 FUNCTION KEYS

These are known as "soft keys". Each button corresponds to a specific edit command displayed in the LCD directly above the button.

MENU: Selects 5 global functions, including LEVEL and SAVE.

EXIT: This is your "oops" button. It lets you stop in the middle of any function. (Think of this as the ESCAPE button).

TRACK STATUS: These buttons mute, record-enable, or play-enable the tracks.

TRANSPORT CONTROL: These control play, stop, rewind, etc. (similar to analog tape recorder)

VALUE/TIME DIAL: This moves the play position or changes values in editing windows. We will refer to this as the JOG WHEEL.

PREVIEW: The Preview buttons are used to precisely audition edit points.

MODE SELECT KEYS

These choose the MODES that control the DM-800 such as Record, Playlist (where you do your editing), etc. These include:

RECORD: For recording audio into the DM-800 and for setting up recording parameters such as auto punch, the internal patch bay, etc.

PLAYLIST: This is where you do all your editing. You cannot record any audio with this mode selected.

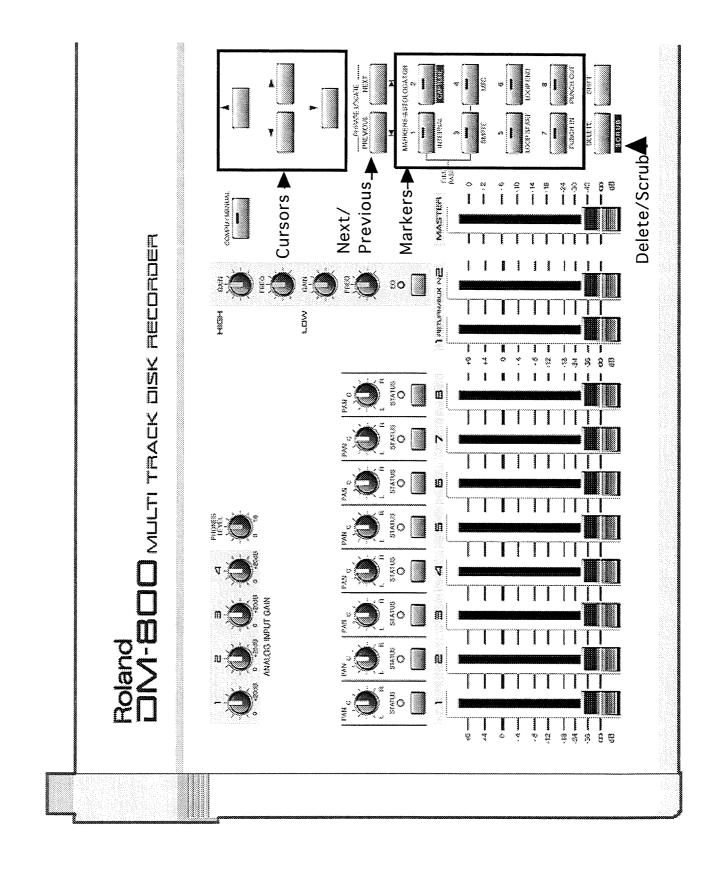
MIXER: For controlling the DM-800's automation of all mixing parameters including level, pan, EQ and Aux Faders.

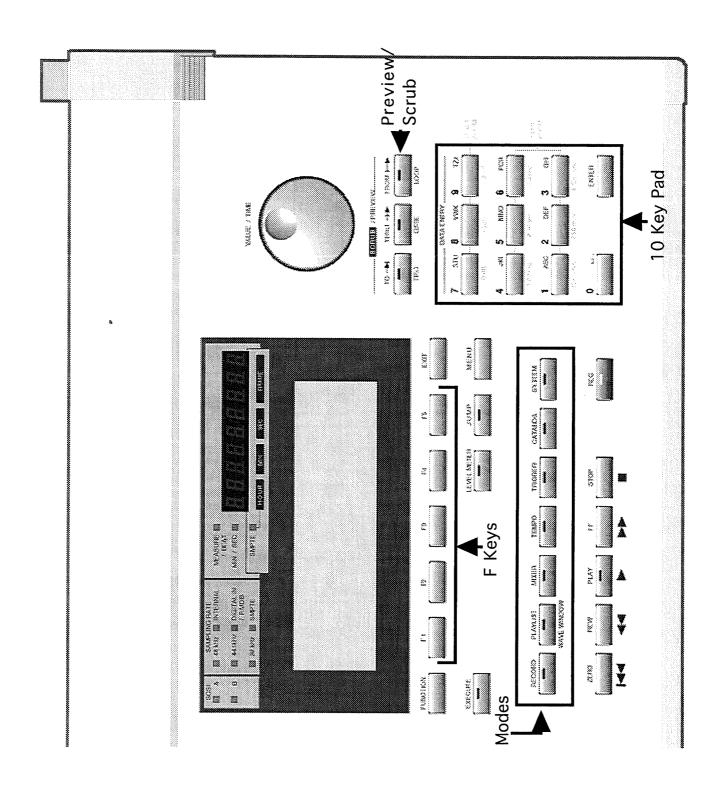
TEMPO: For creating and editing MIDI tempo maps.

TRIGGER: For setting up phrases to be triggered.

CATALOG: This is where you do all your housekeeping. Here you manage disk functions such as backing up, changing projects, and copying takes between drives or between projects.

SYSTEM: This is a "set and forget" mode. Set it up one time. All User-Definable preferences. For setting sync modes, internal/external clock mode, recording from Digital A, Preview Length, SMPTE offset, etc.





INITIALIZING THE DM-800 SETTINGS

To make sure that the settings on your DM-800 match those of the tutorial, please Initialize the settings of your system before you begin. This will assure the DM-800 has all the factory default settings for various parameters.

- Press SYSTEM Mode
- Press the F3 key that is under the command InitPRM. If you don't see the InitPRM command, press F5 (PAGE) until you see the InitPRM command.
- Press the EXECUTE button twice to Initialize the DM-800.

RECORDING AUDIO

RECORDING A MONO **VOICE OVER**

- Press the RECORD Mode button.
- Plug a line level source into Input 1 on the back the DM-800.
- Press TRACK STATUS button for track 1 until it is flashing red.
- The three possible positions for each TRACK STATUS button are:

FLASHING RED = Record Ready GREEN = Playback OFF = Mute

As soon as the track is in Record Ready (i.e. flashing red) you should check the input levels using the video display of the DM-800. If you do not have the DM-800 connected to a video monitor, you can look at input levels by pressing the LEVELS button. If necessary, you can adjust the input gain for analog input #1 using the knobs at the top left corner of the DM-800.

NOTE: THE TUTORIAL WILL USE VOICE OVER MATERIAL CONSISTING OF COUNTING FROM 1 TO 10 AS ITS MODEL WHEN WE ARE DISCUSSING EDITING. TO FOLLOW ALONG MORE EASILY, RECORD A VOICE COUNTING FROM 1 TO 10 ON TRACK 1.

- Press the red REC button. It will begin flashing red. This is RECORD READY. To begin actual recording, press the PLAY button. (Note the flashing red changes to solid red.)
- Press STOP to stop recording. Wait for the DM-800 to finish "thinking". A screen will come up on the display asking you to "KEEP or DELETE?" Pressing F1 (for KEEP) will save the recording.

RECORDING A STEREO MUSIC BED

- Press RECORD Mode
- Plug 2 line level inputs from your stereo source into inputs 3 and 4 on the back the DM-800.
- Press TRACK STATUS buttons for tracks 3 and 4 until they begin flashing red to record-enable tracks 3 and 4.
- Press track 1 button until it turns green.

You can check the input levels on the video display or by pressing the LEVEL Button.

You can also adjust the input level using the Analog Input Gain Knobs for inputs 3 and 4.

- Press the red REC button and then PLAY to record.
- Press STOP to stop recording and F1 (KEEP) to keep the Take.

NEXT AND PREVIOUS

Two of the many ways to instantly go to a location in the DM-800 are the NEXT and PREVIOUS Buttons. These buttons locate to the beginning or end of any phrase.

Use these buttons now to get familiar with them.

Notice that they work on the track that is selected using the cursor keys.

EDITING AUDIO

Note: All editing on the DM-800 is NON DESTRUCTIVE, even the DELETE Phrase command. Please feel free to try any and all of the Editing Commands: You cannot damage the DM-800's software in any way. You cannot "accidentally" loose any of your recordings (unless you specifically erase them).

PLAYLIST MODE.

All editing is done in the PLAYLIST Mode. Make sure the PLAYLIST button is selected. (It will turn red.)

FUNCTION BUTTON

In Playlist Mode you use the FUNCTION Button to find all of the editing commands. By pressing the FUNCTION Button, you will see the various choices for editing cycle by over the F Keys. You choose the Editing Command that you want by pressing the F Key that is below the Command that you want to choose.

USING THE SPLIT AND DELETE COMMANDS

The **SPLIT** command is just like cutting a piece of tape with a razor blade. A SPLIT simply takes one phrase and splits it into two phrases which can then be edited, moved or deleted separately.

DELETE removes the phrase from the Playlist. However, it is NON DESTRUCTIVE: It does not remove the original recording (Take) from the Hard Drives, so you can get that audio back any time that you want to.

Let's first SPLIT the voice-over phrase into two parts, the first including the word "1".

- Locate the beginning of your counting phrase using the PREVIOUS Button.
- PLAY your recording and STOP after you hear the word "1".
- Press the FUNCTION Button until you see the command SPLIT over F3.

- Make sure that the track and phrase are selected using the CURSOR Buttons.
- Press SPLIT and then EXECUTE. This splits the original phrase into two parts.

Now let's DELETE the first phrase including the word "1".

- Select the first of the two phrases that you have just created by pressing the PREVIOUS Button. If you have a video monitor connected, notice the selected phrase turns yellow.
- Press the DELETE Function using the F5 button.
- Press EXECUTE to finish the command.

MOVING PHRASES

Phrases can be Moved by the JOG Wheel or to a MARKER or by the NEXT or PREVIOUS buttons or to an exact SMPTE time using MOVE combined with the JUMP Command.

Let's move the word "4" away from the word "3".

- PLAY the phrase until you hear the word 3 and then press STOP.
- Press the SPLIT command and then EXECUTE to divide the counting into two phrases.
- Locate to the beginning of the second phrase (starting with the word 4) using the PREVIOUS or NEXT
- Find the MOVE Command by pressing the FUNCTION Button until you see MOVE over F1.
- Select MOVE by pressing F1.
- Use the JOG Wheel to Move the second phrase away from the first phrase and the press EXECUTE.
- Locate to the beginning of the whole selection using the PREVIOUS Button and then press PLAY to hear the changes you just made.

USING MOVE WITH NEXT AND PREVIOUS

Let's use the Move command to put the phrases back next to each other.

- Using PREVIOUS or NEXT, locate to the beginning of the second phrase.
- Press the MOVE command to enter the Move Function.
- Press PREVIOUS to locate to the end of the prior phrase.
- Press EXECUTE to finish the Move Command.

USING MARKERS

The DM-800 has Markers to help in locating sections and to use with various Editing Commands.

ENTERING MARKERS

Markers can be entered during Play or Stop. Look at the Marker/Auto Locator number pad.

- Choose a Marker that is not RED
- Press the Marker button. Notice that it is now red.
- Press Play and then press a different, unlit marker.
- While the DM-800 is still playing press the same marker again. This will locate the DM-800 to that marker and it will continue to play.

DELETING MARKERS

- Press and continue to hold down the DELETE Button at the bottom of the Marker area.
- Press each marker that is now red and it will turn blank or off.

ENTERING MARKERS ON THE FLY

Let's put in markers before the numbers "5" thru "8".

- Play the voice over from the beginning.
- After the number "3" press Marker #4.
- After the number "4" press Marker #5 and so on thru Marker #8.

While the DM-800 is stopped, locate to a marker and then listen to your location by pressing Play.

WAVEFORM EDITING

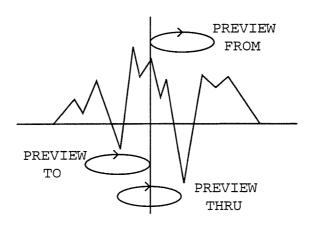
The DM-800 has a waveform display that is great for finding edit points. Let's explore that feature now.

- Select the track that has the voice over using the Cursor Keys.
- Press Marker #5 to locate in front of the number "5".
- Press the PLAYLIST Mode Button. This will open the Waveform Window.
- Use the numbers 1-6 on the 10 Key Pad to Zoom to different levels of Waveform Viewing.

PREVIEW FROM AND TO

The PREVIEW Function is a great way to audition your location while finding edit points and is used during MOVE and CUT and other functions of the DM-800.

PREVIEW FROM plays the audio from the PLAY line just as if you had pressed Play, but without losing your play point. You can adjust the length of this, and all PREVIEW types in the System Mode.



 Leaving the Waveform Window open, press the PREVIEW FROM button and listen to your exact location.

- Using the JOG Wheel, move the Play Line about 1 full rotation clockwise and then press PREVIEW FROM again to hear the audio at your new location.
- Now try using PREVIEW TO to listen to the part of the word that is before the Play Line. This is currently set to play only a short time. You can change this length if you want in the System Mode.

Explore these functions with the words you have recorded until the PREVIEW Function feels comfortable to use.

SCRUB PREVIEW TO

Let's try another method for finding our edits:

- Locate near the beginning of the number 6.
- Press and hold down the SCRUB button at the bottom of the Markers section.
- Press the SCRUB/PREVIEW TO button to listen to the Scrub Feature.
- Slowly move the JOG Wheel clockwise to listen to various parts of the word "6".
- Press Stop to end the Scrub Function.

CUTTING AND ERASING AUDIO

The DM-800 has two functions that you will use often while you are editing: CUT and ERASE.

CUT removes the material that you have selected and moves all of the later material to meet the start of your Cut. This is very much like spooling tape onto the floor and then splicing the end of the section back to where you started.

You can do this on ONE track only or on ALL 8 tracks.

ERASE removes the material that you have selected during the ERASE Function and leaves the space that this material formerly occupied. The material after your edit has not moved in time. This is like using a Spot Eraser on a tape recorder: the material you have erased is gone, but nothing else is changed.

You can also do this on ONE track only or on ALL 8 tracks.

Let's explore these functions now.

CUTTING OUT A WORD

Let's cut out the number "6".

You can choose the area that you are cutting by using the JOG Wheel, the Jump command, NEXT/PREVIOUS. PLAY or REW/FF, or with MARKERS.

Let's use Play and the Markers in this example.

- Press Marker #6 to get to the beginning of the word "6". If you need to, you can use the Waveform Window and/or the Preview Functions to fine tune your location.
- Press the FUNCTION Button until you see the command CUT/ERS over the F2 Button.
- Press the F2 button to enter this Function.
- Press F4 Button to enter the CUT Function. The DM-800 will remember your last Cut or Erase selection.
- Press PLAY and listen to the word "6" and then press STOP.
- You can also just press Marker #7 to get to the end of the word as well.

- If you want to, Press the PLAYLIST Button to bring up the Waveform Window or use the PREVIEW Functions to fine tune your ending point for the edit.
- Press EXECUTE to finish the Cut.
- Press and hold the REW Button to back up a few seconds and then press Play. Notice that the number "6" has been cut out and that "7" is right after "5".

ERASING A WORD

Now let's ERASE the word "8".

- Press Play and listen until you hear the word "7" and then press STOP.
- Press the CUT/ERASE Function by pressing F2.
- Press F5 to select the ERASE option.
- Press Play until you hear the word "8" and then Stop.
- Press EXECUTE to finish the Erase.

Notice that the space that used to be the word "8" is still there and that the word itself has been erased.

MOVING A PHRASE BACK TO THE PREVIOUS PHRASE

To close the gap that we created with the Erase Function we could use the CUT Function. To do this, we would start at the beginning of the space, choose CUT and the press NEXT and EXECUTE.

We can also MOVE the second phrase backwards in time to meet the previous phrase.

- Locate to the beginning of the phrase that includes the word "9" after the space left by the last Erase
- Press FUNCTION until you see the command MOVE command over F1.
- Press F1 to access MOVE.
- Press PREVIOUS to move the Play Line to the previous phrase.
- Press EXECUTE.

MAKING A NEW PHRASE FROM **RECORDED AUDIO USING THE NEW** PHRASE COMMAND.

As you know, all of the editing that you have done is NONDESTRUCTIVE. This means that the original recording or TAKE is still intact, on the hard drive.

Let's bring back the original recording to do some more editing.

- Locate to the end of the last counting phrase that you have been working with using the NEXT Button.
- Press the FUNCTION Button until you see the function NewPhra over the F4 button.
- Press NEW PHRASE (F4). Notice that you can see a list of all of your recordings here in this window. This may be only recording: the counting. If you have more, you can use the LISTEN Button to check which recording you are selecting.
- Select the counting Take using the JOG Wheel.

Press EXECUTE.

Notice that you have created a new phrase available for editing.

MAKING A PHRASE OF THE TWO WORDS 2 AND 3

Let's take our new phrase and reduce it to the words "2" and "3".

- Locate to the beginning of the phrase you just created with the New Phrase command.
- Choose the CUT Function.
- Press Play and Stop when you hear the first part of the word "2".
- Press PLAYLIST to bring up the Waveform Window and find the very beginning of the word "2". Use the PREVIEW Functions to verify your position.
- Press EXECUTE to cut out all of the beginning of the phrase including the word "1".
- Play until you hear the end of the word "3" and then press Stop.
- Press the CUT Function again.
- Press NEXT to get to the end of the phrase.
- Press EXECUTE.

We could have accomplished the same thing by using the SPLIT command after the word "3" and then using the DELETE command on the phrase we created when we split the original phrase after the word "3".

COPYING A PHRASE

Let's say that we want to use a phrase again, in another location. One of the ways that we can do this is by using the COPY Command.

- Locate the beginning of the phrase "2,3" using the PREVIOUS Button.
- Use the FUNCTION Button to find the COPY Function over the F3 Button.
- Press F3 for COPY.
- Press F4 two times to make 3 copies.
- Press NEXT to set the location of the first Copy.
- Press EXECUTE.

You now have 3 copies, back to back of the same material. This can be used for stutter effects, looping music, the reuse of a breath or word, and other editing techniques.

MOVING PHRASES TO ANOTHER TRACK

- Select the last "2,3" phrase that you just Copied.
- Press the MOVE Function.
- Using the Down Cursor, MOVE the phrase to track 2.
- Press EXECUTE.

MOVING PHRASES BY SOME EVENT IN THE MIDDLE OF THE PHRASE: (BACK TIME EDITING).

Often you need to Move some audio element not based on the beginning of the phrase, but on some event in the middle of the phrase such as a musical chorus or ending flourish or some other event. Let's simulate that now with our Numbers.

- Select the end of the "2,3" phrase on track 2.
- Press the NEW PHRASE Command and press EXECUTE.

(The Take that is used for the current phrase is automatically the one selected, so that you are automatically on the right phrase for this exercise.

Notice that the phrase is created on Track 1, as this is where it was originally recorded.

- Delete all of your Markers by holding the DELETE Button and pressing any Markers with the LED lighted RED.
- Play the phrase and stop right after the number "3".
- Place Marker #1 here.
- Cursor to Track 2 and press PREVIOUS twice to get to the beginning of the phrase "2,3" that we
 moved to Track 2.
- Press Play and stop after you hear the beginning of the word "3".
- Use the WaveForm Window or Preview to find the very beginning of the word "3".

We now want to move this word "3" to the Marker #1 that we have placed after the word "3" in the longer phrase.

- Press MOVE to enter the Move Function. Please notice that we have chosen the "EVENT" that we want
 to move to a particular location by first locating this Event and then pressing the MOVE Command.
- Press Marker #1. We are now "showing" the Move Function where we want the Event to go.
- Press EXECUTE.

Play the selection and see that we moved the event (the word "3") to our marker and the DM-800 has figured out where the rest of the phrase should be.

MOVE AND PREVIEW THRU

The DM-800 allows you to listen to your edits while you are doing them. In some instances, this allows you to save a great deal of time.

- Locate to Marker #1 in the previous example, the end of the word "3" of the phrase on Track 1 as well as the beginning of the word "3" on Track 2.
- Select the shorter phrase on Track 2.
- Press the MOVE Function.
- Use the TIME/VALUE Dial to move the phrase to a new location.
- Press the PREVIEW THRU Button to listen to this new location.
- Continue trying new locations while using the PREVIEW THRU Function to listen to each new location without having to leave the MOVE Function.

SOME BASIC HOUSEKEEPING FUNCTIONS

SAVING YOUR WORK

The DM-800 records all of your raw recordings or TAKES directly to disk. These will be there until you permanently Delete them or Initialize the whole Project.

The editing you do, however, is done in RAM memory and you do need to save this before you turn the DM-800 off.

To Save your work:

- Press the MENU Button
- Press F5 for SAVE
- Press EXECUTE.

That's it. Your current Project and its edits are now saved to disk.

REMEMBER TO "SAVE" YOUR WORK TO DISK OFTEN.

CHANGING PROJECTS

All of the editing that you have been doing, along with the raw recordings or TAKES, is contained in one PROJECT. This Project is what you have been saving when you Execute the SAVE Command.

There will be times when you want to keep the material in one Project and begin work in another. Here's how you do that.

- Press CATALOG MODE. This is the Mode where most of the Disk Housekeeping is done.
- Notice the ARROW that is pointing to the Project that you are working on currently.

The Prompt at the top of the screen asks you if you want to Select a different Project.

Use the CURSORS or the JOG Wheel to select a different Project.

Notice that the Arrow is still pointing to the Project that you were working on, indicating that this is still the Current Project.

- Press EXECUTE.
- The DM-800 asks if you want to SAVE your current work or all of the editing that you have done since the last time you saved. Press EXECUTE again to Save your old project.
- Notice that the DM-800 has now moved the Arrow to the new project that you have selected.

INITIALIZING A PROJECT

After the Tutorial is finished, unless you want to save it for sentimental reasons, you may want to INITIALIZE the Project to remove it from your drives and get the disk space back.

CAUTION! USE THIS FUNCTION CAREFULLY BECAUSE IT DOES REMOVE EVERYTHING, INCLUDING YOUR RECORDINGS IN THIS PROJECT, FOREVER.

- Press the CATALOG Mode to enter the Disk housekeeping area.
- MAKE SURE THAT THE ARROW IS POINTING TO THE PROJECT THAT YOU WANT TO INITIALIZE. If it isn't, select the proper project using the techniques that we just discussed above.
- Press F3: InitPrj to engage the INITIALIZE PROJECT Function.
- Press EXECUTE twice to remove the project and all of its recordings from your hard drives.

THE IN/OUT PAGE: A DIGITAL PATCHBAY

In the RECORD Mode, the IN/OUT (F3) Function opens the DM-800 Digital PatchBay. This is the area where you can set the routing assignments for all of the Analog and Digital inputs. This is used not only for getting Audio into and out of the DM-800 and assigning this audio to or from specific tracks, but also for such functions as Stereo FX Sends, Internal Track Bouncing and more.

Please check the manual for the details on these functions.

We do want to cover one example of the use of the IN/OUT Page, in case you want to do more Analog Audio Recording at this time.

ASSIGNING THE **ANALOG INPUTS TO** TRACKS

The DM-800 has 4 Analog Balanced Inputs. These Inputs are the Tip/ Ring/Sleeve type, but they will accept the common unbalanced, Tip/ Sleeve connectors as well.

The INPUT GAIN TRIM Pots allow you to control the levels at these Analog Inputs.

Press the F3 IN/OUT Function.

This Function allows you to assign any of the Analog (or Digital) Inputs to any or all of the tracks.

Notice that Analog Input #1 has been assigned to Track 1, Input #2 to Track 2, Input #3 to Track 3 and so on. These are the defaults that were set when you Initialized the DM-800 earlier in the Tutorial.

- Cursor to the selection area right next to Track #1 in the upper Left corner of the screen.
- Turn the JOG Wheel to go through the Input choices for Track #1.
- These choices are also available for all of the other Tracks.

Let's say, for example, you are recording a voice-over and your Mic Preamp is plugged into Analog Input #1. You want to record this voice over on several different tracks for editing reasons. To make this very easy to do, you can assign the Mic Preamp, Analog Input #1, to all of the tracks of the DM-800.

You do this by simply selecting Input #1 as the Input assignment for all of the tracks in the IN/OUT Window. This makes routing very easy and eliminates much of the cable patching that you would need to do without this Digital PatchBay. Now, whichever Track is set to Record-Enable will be receiving the Mic input from Analog Input #1.

OTHER GREAT FUNCTIONS AND FEATURES OF THE ROLAND DM-800

Be sure to check the manual for these functions. Remember, you can feel free to try any editing features, mixing features or any of the features of the DM-800 that you want to: You cannot damage the software of the DM-800 in any way, so go ahead and experiment. There are many ways to do most edits, and you will want to find the way that works best for you.

OTHER FEATURES TO TRY:

RECORD MODE

- Auto Punch and Loop Recording
- Pre Naming of Takes
- DISK or SOURCE listening while recording.
- Using Auto Loop to listen to material while you try EQ's or practice punches, etc.

EDIT MODE

- MOVE: Trimming Audio Edits In or Out
 Automatically trimming the silence from the start or end of a phrase.
- EDIT: Naming Phrases, Changing levels of phrases, Fading Phrases in or out.
- Relocking stereo or more tracks together after they have been split apart.
- NEWPHRASE: "From Phrase": Making New Phrases from previously edited phrases.
- Automatically trimming the silence from the beginning of phrases as you create them.
- TAKE CHANGE: Changing one sound effect for another by substituting the original Take with another Take.
- INSERT: Inserting Time into all or one track to move material around or to change the SMPTE
 locations of all of the phrases that you are working with.
- Using INSERT to find out how long any phrase or section of phrases lasts.
- SPLIT: Splitting 2, 3 or 4 "phase-locked" recordings into separate pieces to edit separately.
- OVERLAP: There are 100 layers per track. Use this command and the LIST and LISTEN commands with it to navigate these layers.
- GROUP: Use this to MOVE, DELETE or COPY many phrases at once.
- Move a phrase or phrases from tracks 1-4 to tracks 5-8.
- Use this command to create a whole new copy of all of your work at a new time on the Time Line to try a different version.
- STRETCH: Time Compression, Pitch Correction, Varispeed playback.
- XFADE: The fastest way to meld together two music tracks, some voice edits, etc.

MIXER MODE

- AUTOMATE all of your levels, pans, EQ.
- SNAPSHOT Automation.
- GROUP Faders.

TEMPO MODE

- Create a TEMPO MAP for fast musical edits using Bars, Beats and 960 Ticks.
- Use the TEMPO MAP as Song Position Pointer sync for your sequencers.
- Create a TEMPO MAP to control a sequencer to quantize keyboard or drum parts to existing "wild" tracks.

TRIGGER MODE

- Use TRIGGER MODE like 8 cart machines to fire voice overs, music and effects.
- Use ADVANCED TRIGGER to fire a sequence of voice overs or effects in conjunction with other playlist tracks.

CATALOG MODE

- Use Catalog Mode to transfer takes or phrases from one project to another.
- Use HEADER ONLY BACKUP to Save different versions of your project very quickly.
- Use BACKUP to store your whole project including the Automation, Trigger settings, etc. to a back up DAT either AUDIO or DATA DAT.
- NORMALIZE a Take here.

SYSTEM MODE

Use System Mode for:

- SYNCHRONIZATION settings
- DIGITAL TRANSFER settings
- OVERVIEW WINDOW settings for the VIDEO OUT.
- PREVIEW LENGTH settings
- FF and REW LENGTH settings to nudge phrases by Frames or Beats.

RECORDING FROM A DIGITAL SOURCE

If you want to bring a digital signal into the DM-800 please do the following:

- Plug the Digital out of your digital device into the DIGITAL Input of the DM-800.
- The PROJECT SAMPLING RATE must match the sampling rate of the digital source you are recording from. If it doesn't, you must initialize the DM-800 project to the sampling rate of the incoming digital source. This is done in the Catalog Mode. Be careful because this does erase all of the information in the project. Use the InitPri Command F3 to do this. Please check the manual for more details.
- Go to the SYSTEM Mode. Set the Sampling Clock Source to DIGITAL IN. If the DM-800 doesn't accept this setting, it means that either the Sampling Rate of your project doesn't match that of your digital source, or the source is not outputting a clock signal due to its settings or a bad cable. Try playing the digital source and then setting the DM-800 Sampling Clock Source.

Some DAT's don't output their clock when a tape is first put into the deck.

- Press RECORD MODE.
- Press F3 IN/OUT.
- Cursor to the input selections for Tracks 3 and 4 and select Digital L and R using the JOG Wheel.

Now continue as you did for the other recordings above.

ENTOY YOUR DM-800!

HARD DISK DRIVE -FORMATTING RULES

- Rule # 1 If you want to format a NEW DISK GROUP, you must format SCSI A drive first, then format SCSI B drive.
- Rule # 2 If you want to "add" a drive to an existing DISK GROUP, you can just format the NEW drive. The extra recording time will be added to the GROUP without affecting the existing data.
- Rule #3 If you format a drive, which is already formatted as part of an existing DISK GROUP, the entire DISK GROUP will be re-formatted. CAUTION: You will lose everything on the entire DISK GROUP.
- Rule # 4 If you REMOVE a drive from an existing DISK GROUP, all other drives in the group will become Un-Formatted (U.F.) You must re-format the entire group from the beginning.
- Rule # 5 All SCSI devices formatted for the same Group # must be "on-line" at all times or the entire Group will be unavailable to the DM-800.
- Rule # 6 Any SCSI device can be formatted within the same group. Example: Hard Disk drives, Removable Hard Drives, MO Drives, etc. can all be formatted in the same disk Group.
- Rule #7 You cannot format a device on SCSI-B into a Group unless a device on SCSI-A is already formatted for that Group. Example: If you have a drive on SCSI-A formatted for GR1, and another drive on SCSI-A formatted for GR3, you cannot format a drive on SCSI-B for GR2. You must add the SCSI-B drive to GR1 or GR3.

REMEMBER:

N.C	DM-800 does not recognize a drive at that SCSI ID.
U.F	DM-800 recognizes drive - but it is Un-formatted.
GR1	DM-800 recognizes drive - formatted for GROUP 1.
GR2	DM-800 recognizes drive - formatted for GROUP 2.
GR3	DM-800 recognizes drive - formatted for GROUP 3.

EXAMPLE 1

SCSI-A		SCSI-B	
0:U.F.	4:N.C.	0:U.F.	4:N.C.
1:N.C.	5:N.C.	1:N.C.	5:N.C.
2:N.C.	6:N.C.	2:N.C.	6:N.C.
3:N.C.	7:Self	3:N.C.	7:Self

EXECUTE: First format SCSI-A, ID-0 (Group 1)

SCSI-A		SCSI-B	
0:GR1	4:N.C.	0:U.F.	4:N.C.
1:N.C.	5:N.C.	1:N.C.	5:N.C.
2:N.C.	6:N.C.	2:N.C.	6:N.C.
3·N C	7:Self	3:N.C.	7:Self

EXECUTE: Then format SCSI-B, ID-0 (Group 1)

SCSI-A		SCSI-B	
0:GR1	4:N.C.	0:GR1	4:N.C.
1:N.C.	5:N.C.	1:N.C.	5:N.C.
2:N.C.	6:N.C.	2:N.C.	6:N.C.
3·N C	7·Self	3·N (7-Self

EXAMPLE 2 SCSI-A 0:GR1 SCSI-B 4:N.C. 0:GR1 4:N.C. 5:N.C. 5:N.C. 1:N.C. 1:U.F. 2:N.C. 6:N.C. 2:N.C. 6:N.C. 7:Self 3:N.C. 7:Self 3:N.C.

EXECUTE: Format SCSI-B, ID-1 as Group 1.

RESULT: SCSI-A, ID-O is not affected.

SCSI-B, ID-O is not affected.

SCSI-B, ID-1 is formatted.

SCSI-B recording time is increased.

SCSI-A	SCSI-B	}	
0:GR1 1:N.C. 2:N.C. 3:N.C.	4:N.C. 5:N.C. 6:N.C. 7:Self	0:GR1 1:GR1 2:N.C. 3:N.C.	4:N.C 5:N.C 6:N.C 7:Self
EXAMPLE 3			
SCSI-A	SCSI-B	}	
0:GR1 1:GR1 2:N.C. 3:N.C.	4:N.C. 5:N.C. 6:N.C. 7:Self	0:GR1 1:GR1 2:N.C. 3:N.C.	4:N.C 5:N.C 6:N.C 7:Self

EXECUTE: Format SCSI-A, ID-0 (Group 1)

RESULT: SCSI-A, ID-O re-formatted

SCSI-A, ID-1 re-formatted

SCSI-B, ID-O re-formatted

SCSI-B, ID-1 re-formatted

(All data will be lost)

SCSI-A	SCS1-B		
0:GR1	4:N.C.	0:GR1	4:N.C.
1:GR1	5:N.C.	1:GR1	5:N.C.
2:N.C.	6:N.C.	2:N.C.	6:N.C.
3:N.C.	7:Self	3:N.C.	7:Self

EXAMPLE 4

SCSI-A		SCSI-B	
0:GR1	4:N.C.	0:GR1	4:N.C.
1:GR1	5:N.C.	1:GR1	5:N.C.
2:N.C.	6:N.C.	2:N.C.	6:N.C.
3:N.C.	7:Self	3:N.C.	7:Self

EXECUTE: Format SCSI-A, ID-1 (Group 2)

RESULT: SCSI-A, ID-O becomes Un-formatted

SCSI-A, ID-1 is formatted as Group 2

SCSI-B, ID-O becomes Un-formatted

SCSI-B, ID-1 becomes Un-formatted

SCSI-A		SCSI-B	
0:U.F.	4:N.C.	0:U.F.	4:N.C.
1:GR2	5:N.C.	1:U.F.	5:N.C.
2:N.C.	6:N.C.	2:N.C.	6:N.C.
3-N C	7-Self	3:N.C.	7:Self

Then Format SCSI-B, ID-1 (Group 2)

Then Format SCSI-A, ID-0 (Group 1)

Then Format SCSI-B, ID-0 (Group 1)

SCSI-A		SCSI-B	
0:GR1	4:N.C.	0:GR1	4:N.C.
1:GR2	5:N.C.	1:GR2	5:N.C.
2:N.C.	6:N.C.	2:N.C.	6:N.C.
3:N.C.	7:Self	3:N.C.	7:Self

UPGRADES AND SERVICE

SYSTEM SOFTWARE

Roland will periodically release new versions of system software to modify or add new features. When software upgrade ROMs are available, you will need to bring your unit to a Roland Authorized Service Center for installation.

Be sure to return your Product Registration card promptly to insure that you are notified of all software updates and service bulletins.

RETURNING FOR SERVICE

The DM-800 has no user-serviceable parts. Attempts by unauthorized personnel to repair or modify the DM-800 will void the warranty. If you have trouble with the unit, you must bring or sent it to an authorized Roland Service center. Consult your dealer or Roland for the nearest service center.

When preparing to ship the unit, first be sure to park all internal drives in the DM-800, as well as any drives connected to it. From the SYSTEM page, press SHUT (F1). Wait until all drives have stopped spinning, approximately 30 seconds, before turning off the power or moving the

Use the original packing material that came with the DM-800 to ship the unit. If the original packaging is not available, use a reinforced, sealable, foam-lined case. Remember, hard disks are fragile devices.

SPECIFICATIONS

OPERATIONAL

SAMPLE RATES

48 kHz, 44.1 kHz, 32 kHz

DISK

MAXIMUM RECORDING TIME (PER 100MBYTES OF DISK STORAGE/FOUR TRACKS)

16 minutes @ 48 kHz 18 minutes @ 44.1 kHz 25 minutes @ 32 kHz

THEORETICAL DISK LIMIT

4 GByte (per four tracks) - (12 track hours of recording @ 48 kHz.)

PROJECT

TAKES

Maximum 128 per 4 tracks

PHRASES

Maximum 300 per 4 tracks

COMPUMIX

Maximum 10,000 events per project

TEMPO MAP

Maximum 2,000 events

(one per measure default, plus as many as one each 32nd. note)

INCLUDED ITEMS

Owner's Manual

OPTIONAL ITEMS (SUBJECT TO CHANGE)

Hard Carrying/Shipping Case

Padded Wrist Rest Roll Around Stand

Internal Disk Drive Mounting Kit

Interfaces For External Devices (RMDB Buss Connection)

DA-400 (4 Channel D/A Converter)

STANDARD SCSI DEVICE -**ERROR CODES**

Error # Error Code CANNOT COMMUNICATE (SCSI communication error) **ID ERROR ILLEGAL ACCESS** TIME OUT **BUSS FREE WAIT ARBITRATION FAILED** PHASE ERROR INTERRUPT ERROR 10 NO STATUS 11 CHECK CONDITION 12 BUSY 13 STATUS ERROR 14 NO MESSAGE 15 MESSAGE ERROR RECOVERED ERROR 17 NOT READY 18 MEDIUM ERROR (disk or DAT tape error) 19 HARDWARE ERROR 20 ILLEGAL REQUEST 21 UNIT ATTENTION ERROR 22 DATA PROTECT (medium is Write protected) 23 BLANK CHECK 24 COPY ABORTED 25 ABORTED COMMAND 26 VOLUME OVERFLOW 27 28 EOM (end of memory or medium - e.g. DAT tape) 29 UNDEFINED SENSE 30 MEMORY FULL (memory OR disk is full) 32 NOT FORMATTED (disk is not formatted) 33 ILLEGAL LINKAGE 34 SPC HARD ERROR - A 35 SPC HARD ERROR - B 37 NOT FOUND HD - A 38 NOT FOUND HD - B 39 NOT FOUND MASTER - A 40 NOT FOUND MASTER - B 41 CANNOT EXECUTE 42 ABORT

43 RACK FIFO FULL (Over Work) 128 UNDEFINED COMMAND

INITIALIZING SYSTEM/PROJECT **PARAMETERS**

You can restore System and Project parameters to the default value by using the Initialize Parameter function in the System Mode.

PROCEDURE

In the System Mode, press INITPRM [F3]

The DM-800 asks if you want to save the current project.

Press YES [F1] to save the current project and initialize the parameters. Press NO [F2] to abort.

Note: After executing Initializing Parameters, the initialized project is in the DM-800 memory not on disk. It is necessary to execute the Save Project command in order to save the initialized project to disk. To restore the previous parameters, execute a Load Project or Revert Project.

DEFAULT SETTINGS

SYSTEM PARAMETERS

MIDI Control Chann	ıel	1
MTC Output		Off
MIDI Clock Out		Off
Send New time		Only Upon Play
Always, Keep Reco	rded Items	Off
Search Sound Thres		-39.7
Scrub Preview Leng	ıth	99msec
Preview Length	To	0.3 sec
.	Thru	3.0 sec
	From	2.0 sec
Preview Mode		Trigger
EQ Knob Mode		Relative
MMC	Device Mode	Off
MMC	ID	0
REW / FF Length		00:00:01:00.0

PROJECT PARAMETERS

Sampling Clock So	Internal Internal	
Timebase		
SMPTE	Rate Format	30 Non Drop
	Error Format	5
	Offset	+0h 0m
Start Time		0.00:00:00:00
Overview Screen	Mode	Auto
	Start Time	0.00:00:00:00

End Time

00:05:00:00.0

RECORD PARAMETERS

Common	Record Mode	Manual
	Record Monitor MIDI Trigger	Source Off
Click	MIDI Click	On
Accent	Note	C#2
	Velocity	96
Normal	Note	C#2
	Velocity	64

PLAYLIST PARAMETERS

Wave Window Time Zoom 2.56 sec Level Zoom OdB

MIXER PARAMETERS

Mode		Manual
In/Out (Input Bu	s assign)	
TrÌ	In-1	Mix
Tr2	In-2	Mix
Tr3	In-3	Mix
Tr4	In-4	Mix
Tr5	In-5	Mix
Tr6	In-6	Mix
Tr7	In-7	Mix
Tr8	ln-8	Mix
Aux1L	In-1	Mix
Aux1R	In-2	Mix
Aux2L	RecL	Mix
Aux2R	RecR	Mix
Headroo	m	0dB
(Output Assig	an)	
Out-1	MixL	
Out-2	MixR	
Out-3	RecL	
Out-4	RecR	
Snapshot		All Off
Grouping		All Off

TEMPO PARAMETERS

Enter Switch TapTeach Source MIDI Note Lower [-]

High G9

Note: Phrases, Takes, Tap tempo Data, Compu Mix Data, and Marker Data are not changed by the Initialize Parameters function.

SYSTEM PARAMETERS (THESE DO **NOT SAVE WITH PROJECT DATA)**

SYSTEM

LCD & LED Display Setting

MIDI Control Channel

Send New Time

Record Monitor

Always, Keep Recorded Items

Search Sound Threshold

• TAP TEACH

Tap Teach Source

Tap Note Range Low

Tap Note Range High

• METRONOME

MIDI Click On / Off

Click Accent Note

Click Accent Velocity

Click Normal Note

Click Normal Velocity

• MIDI SYNC

MIDI Clock Out

MIDI MTC Out

MMC Device Mode

MMC Device ID

• PREVIEW

Scrub Preview Length

Preview Length: To, Thru, From

Preview Mode

• EQ KNOB MODE

- REW / FF LENGTH
- COLOR SELECT (VIDEO OUT)

PROJECT PARAMETERS (SAVED WITH EACH INDIVIDUAL PROJECT)

• PROJECT

Current Project Name

Current Project Comments

Master Sampling Rate

Timebase

Sampling Clock Source

• SMPTE

Project Start Time

SMPTE Offset Time

Error Level

SMPTE Rate/Format

• RECORDING

Record Mode

MIDI Record Trigger

Loop Start Time

Loop End Time

Punch In Time

Punch Out time

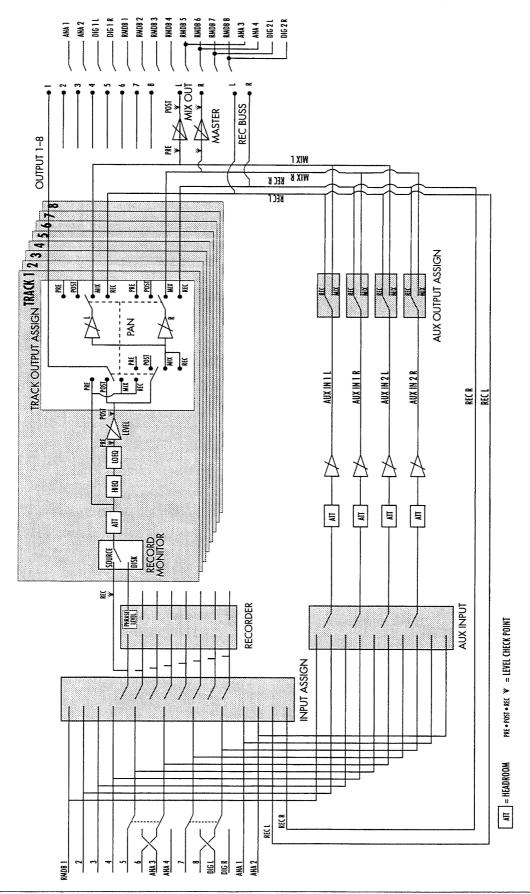
• OVERVIEW SCREEN MODE (VIDEO)

Start Time

End Time

- ENTIRE "TAKE" LIST INFORMATION
- 40 MARKER LOCATIONS
- I/O ASSIGNMENTS
- MIXER GROUP SETTINGS
- TRIGGER PLAY SETTINGS
- MIXER MODE
- HEAD ROOM SETTING
- COMPU-MIX SETTINGS
- PLAYLIST (EDIT INFORMATION)
- TEMPO MAP

MIXER BLOCK DIAGRAM



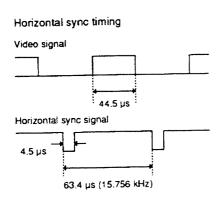
DM-800 DIGITAL RGB OUTPUT

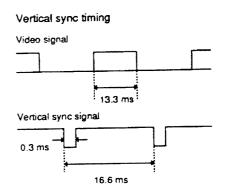
The DIGITAL RGB connector is for TTL RGB 200 lines. The output impedance is 100 ohms, and the specifications are as follows. If you connect an unsuitable display, the screen image may not be correct.



Pin No.		Signal	Specification
1	+5V	+5V power supply output	
2	GND	ground	
3	open		
4	HSYNC	horizontal sync signal output	TTL level
5	VSYNC	vertical sync signal	negative polarity
6	R	video output (red)	TTL level
7	G	video output (green)	positive polarity
8	В	video output (blue)	

RGB output time chart





ROLAND MULTIPURPOSE **DIGITAL BUSS**

	pin RMDB <u>nector (female)</u>			30 pin HDI Connector (female)
DM- Pin		AL DIR	ECTION	EXTERNAL DEVICE PIN #
1	Asynchronous transmitter data	->	Asynchronous receiver data	1
2	GND	-	GND	2
3	Asynchronous receiver data	<-	Asynchronous transmitter data	3
4	GND	-	GND	4
5	Fs(Out) GND	->	Fs (In)	5
6 7		-	GND	6
8	64xFs (Out) GND	->	64xFs (In) GND	7 8
9	Word sync (In)	- <-	Word sync (Out)	9
10	GND	-	GND	10
11	Digital audio output (ch1 & ch2)	- ->	Digital audio input (ch1 & ch2)	11
12	GND		GND	12
13	Digital audio output (ch3 & ch4)	->	Digital audio input (ch3 & ch4)	13
14	GND		GND	14
15	Digital audio output (ch5 & ch6)	->	Digital audio input (ch5 & ch6)	15
16	GND	-	GND	16
17	Digital audio output (ch7 & ch8)	->	Digital audio input (ch7 & ch8)	17
18	Reserved (Out) (High level)	->	Reserved (In)	18
19	GND	-	GND	19
20	Digital audio input (ch1 & ch2)	<-	Digital audio output (ch1 & ch2)	20
21	GND	-	GND	21
22	Digital audio input (ch3 & ch4)	<-	Digital audio output (ch3 & ch4)	22
23	GND	-	GND	23
24	Digital audio input (ch5 & ch6)	<-	Digital audio output (ch5 & ch6)	
25	GND	-	GND	25
26	Digital audio input (ch7 & ch8)	<-	Digital audio output (ch7 & ch8)	
27	GND	-	GND	27
28	Reserved (In)	<-	Reserved (Out)	28
29	GND	-	GND	29
30	Reserved (In)	<-	Reserved (Out)	30

(*) THE DRIVER OR RECEIVER IS HC541

NOTE: INTERFACE CABLE BETWEEN DM-800 & EXTERNAL DEVICE IS WIRED

PIN 1-1, 2-2, ...30-30. (MALE - MALE)

SOCKET DIAGRAM (PANEL MOUNT - FEMALE)

25	26	27	28	29	30
19	20	21	22	23	24
13	14	15	16	17	18
7	8	9	10	11	12
1	2	3	4	5	6

MIDI IMPLEMENTATION

Ver. 1.00	FUNCTION	TRANSMITTED	RECOGNIZED	REMARKS	
Basic	Default	1-16	1-16		
Channel	Changed	1-16	1-16		
	Default	Mode 3	Mode 3		
Mode	Messages	х	X		
	Altered	*****			
Note		0-127 *1	0-127 *1		
Number	True Voice	*****	*2		
Velocity	Note ON	0	Х		
reidelly	Note OFF	x 9n, v=0	x		
After Touch	Key's	X	0		
Aller Tooch	Ch's	x	x		
Pitch Bend	Cira	X	X		
Control	4 Foot Tymo		*3	Recording Trigger	
	4 Foot Type			Recording mager	
Change					
D		X	l _x		
Prog.	True #	*****	^		
Change	1100 #	*3	*3		
System		"3	3		
Exclusive	c D	*3	X		
System	Song Pos		X		
Common	Song Sel	X			
	Tune	X	X *4		
System	Clock	*3	· ·		
Real Time	Commands	*3	*4		
Aux	Local On/Off	X	X		
Messages	All Notes OFF	X	X		
	Active Sense	X	X		
Ni-t	Reset *1 Can be set o	X mamarizad	X		
Notes	*2 Same pitch of	at which it was recorded			
	*3 Can be set tp O or X and saved on the disk				
	*4 Can be received only in Tap Teach mode MTC can be set to O or X: Quarter frame message can be sent and received				
	MMC can be se	et O or X: MMC can be sen	t and received		
MMC	Transmitted	01H Stop (MCS)	١		
Only One Way Mode		03H Deferred Play (MCS 06H Record Strobe	1		
,,,,,,		07H Record Exit			
	Passanizad	44H Locate 01H Stop (MCS)			
	Recognized	02H Play (MCS)			
		03H Deferred Play (MCS			
		04H Fast Forward (MCS) 05H Rewind (MCS)			
		06H Record Strobe			
		07H Record Exit			
		ODH MMC Reset 40H Write (Information F	ield = GPO/Locat	te Point ~ GP7	
	1	44H Locate			
		4CH Move (Information f		te Point ~ GP7	
Made 1: OM		4FH Track Record Ready		O · Yes	

Mode 1: OMNI ON, POLY Mode 3: OMNI OFF, POLY

Mode 2: OMNI ON, MONO Mode 4: OMNI OFF, MONO

O : Yes X : No

MIDI Implimentation Multi Track Disk Recorder Model DM-800

1. MIDI Channel

Transmitting channel and receiving channel are set using the parameter MIDI Control Channel.

2. Recognized Receive Data

1.2 Messages Recognized

Channel Voice Message

Note Off

Status Second Third 8nH kkH vvH 9nH kkH 00H

n = MIDI channel Number : 0H - FH kk = Note Number : 00H - 7FH vv = Velocity : 01H - 7FH

Note On

<u>Status</u> <u>Second</u> <u>Third</u> 9nH kkH vvH

n = MIDI channel Number : 0H - FH kk = Note Number : 00H - 7FH vv = Velocity : 01H - 7FH

The DM-800 recognizes a Note On and generates the specified sound in the trigger play mode.

Received Velocity does not affect the level of the generated sound. Note numbers to be recognized can be set and stored on the disk.

When in Tap Teach mode and the parameter Tap Teach Source is a MIDI note, a note on message having a Note Number within the specified range can be recognized and used as a tap timing.

Control Change

Foot Type

Status Second Third BnH 04H vvH

n = MIDI channel Number : 0H - FH

vv = Control Value : 01H - 7FH 00H - 3FH = OFF

40H - 7FH = ON

When the parameter Record Trigger is MIDI, this message can be used as a trigger for recording..

System Real Time Message

When in the Tap Teach mode and the parameter Tap Source is set to MIDI Clock, the DM-800 uses the timing clock as the Tap Timing.

Timing Clock

Status

F8H

Start

<u>Status</u>

FAH

Continue

Status FBH

2.2 Message Recognized as Sync

MIDI Time Code

System Common Messages

MTC Quarter Frame Message

F1 < message >

F1 = System Common status byte < message > = 0nnndddd

nnn = Message Type

0 = Frame Count LS nibble

1 = Frame Count MS nibble

2 = Seconds Count LS nibble

3 = Seconds Count MS nibble

4 = Minutes Count LS nibble

5 = Minutes Count MS nibble

6 = Hours Count LS nibble

Frame Count

Hours Count

7 = Hours Count MS nibble and SMPTE Type

dddd = 4 bits of binary data for this message type

xxxy yyyy xxx: Reserved (=0)

yyyyy: Frame # (0-29)

Seconds Count xxyy yyyy xx: Reserved (=0)

yyyyyy: Seconds (0-59)

Minutes Count xxyy yyyy xx: Reserved (=0)

xyyz zzzz

yyyyyy: Minutes (0-59) x: Reserved (=0)

yy: Type Code Type 0 = 24 Frames/Sec

1 = 25 Frames/Sec 2 = 30 Frames/Sec (Drop Frame)

3 = 30 Frames/Sec (Non Drop) zzzzz: Hours (0-23)

When in play or recording mode with the parameter Time Base set to MTC, the recorder will run in sync with the MTC quarter frame message.

3. Transmitted Data

3.1 Generated and Transmitted Message

Channel Voice Message

Note On

<u>Status</u> <u>Second</u> <u>Third</u> 9nH kkH vvH

n = MIDI channel Number kk = Note Number

: 0H - FH

vv = Velocity

: 00H - 7FH : 01H - 7FH

When the parameter Metronome is on and MIDI Click is on, the recorder will transmit the Note On in time to the metronome.

The Note Number and the velocity to be transmitted can be set and saved on the disk.

3.2 Message generated for sync

System Common Message

Song Position Pointer

Status Second Third F2H llH hhH

ll = Least Significant

: 00H - 7FH

hh = Most significant

: 00H - 7FH

When the system parameter MIDI Clock output is on, the recorder sends this message in accordance with the tempo map

System Real Time Message

When the system parameter MIDI Clock output is on, sends this message in accordance with the tempo map.

Timing Clock

Status

F8H

Start

Status

FAH

Continue

Status

FBH

Stop

Status

FCH

MIDI Time Code

System Common Message

MTC Quarter Frame Message

F1 < message >

F1 = System Common status byte < message > = 0nnndddd

nnn = Message Type

0 = Frame Count LS nibble

1 = Frame Count MS nibble

2 = Seconds Count LS nibble

3 = Seconds Count MS nibble

4 = Minutes Count LS nibble

5 = Minutes Count MS nibble 6 = Hours Count LS nibble

7 = Hours Count MS nibble and SMPTE Type

dddd = 4 bits of binary data for this message type

xxx: Reserved (=0) Frame Count xxxy yyyy yyyyy: Frame # (0-29) xx: Reserved (=0) Seconds Count xxyy yyyy yyyyyy: Seconds (0-59) Minutes Count ххуу уууу xx: Reserved (=0) yyyyyy: Minutes (0-59) Hours Count xyyz zzzz x: Reserved (=0) yy: Type Code Type 0 = 24 Frames/Sec 1 = 25 Frames/Sec2 = 30 Frames/Sec (Drop Frame) 3 = 30 Frames/Sec (Non Drop) zzzzz: Hours (0-23)

When the parameter MTC Output is on, the recorder sends the MTC quarter frame message while running.

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As of April 14, 1994



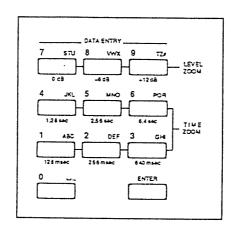
Concerning the Trigger Mode

When using the DM-800's Trigger mode, please be aware of the following points. You may wish to consult pp. 83–85 in the Owner's Manual as you read this information.

Going Beyond Trigger Mode Limitations

There is another way of playing Phrases assigned to the various tracks in Trigger mode—if you connect a MIDI keyboard (or other instrument) to the DM-800, you can send it MIDI Note On messages to trigger Phrases.

You can, of course, also use Keypad buttons 1–8 (DATA ENTRY section) to trigger Phrases on corresponding tracks. However, when using these buttons, no more than two Phrases can be played simultaneously.



For example, it is not possible to play the Phrases assigned to tracks 4, 5 and 7 by simultaneously pressing Keypad buttons [4], [5] and [7]. If you attempt to use the Keypad buttons to play three or more Phrases simultaneously, problems will occur; e.g., a Phrase on a track that hasn't been selected may be played.

We recommend that you favor the use of notes for triggering rather than using the keypad. That way, you can readily play three or more Phrases simultaneously (after you have assigned all the Phrases you want to the same note number). Simply press the relevant note on a MIDI keyboard to simultaneously play the Phrases.

For details on how to specify note numbers, and more info on the Trigger mode, please refer to the DM-800 Owner's Manual.



CORRECTIONS

Some of the descriptions in the Owner's Manual for the DM-800 were incorrect. We apologize for any inconveniences this may cause. Please correct the relevant passages as follows:

■ <u>Page 95</u> Delete the following sentence, which begins in the 2nd line from the top, and replace it as follows:

(Delete)

The DM-800 will compare the project data from the tape to the project data in the DM-800 to be sure that they are identical.

(Add)

The DM-800 will examine the project data on the tape, and determine if it can be reliably loaded back into the DM-800.

Also, delete the following sentence (which starts in the 5th line from the top), and add the following:

(Delete)

IMPORTANT NOTE: If an error message is reported, you MUST use a new tape and BACKUP your project(s) again.

(Add)

IMPORTANT NOTE: If an error message is reported, it means that you will not be able to load the project on the tape into the DM-800. You MUST use a new tape and BACKUP your project(s) again.

■ <u>Page 128</u> Delete the following sentence that begins in the 21st line from the top.

(Delete)

If your display time is later than the Punch in time, you will get the message "Out of area for Auto REC" when you try to press the RECORD button.

■ <u>Page 180</u> In the 11th,12th,13th, and 14th line from the top.

(Wrong)	(Correct)		
Tr5 In-5 Mix	Tr5 In-1 Mix		
Tr6 In-6 Mix	Tr6 In-2 Mix		
Tr7 In-3 Mix	Tr7 In-3 Mix		
Tr8 In-8 Mix	Tr8 In-4 Mix		

'95-7-A3-11KY

For Germany -

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß der/die/das

MULTITRACK DISK RECORDER DM-800

(Gerät, Typ, Bezeichnung)

in Übereinstimmung mit den Bestimmungen der BMPT-AmtsblVfg 243/1991 funk-entstört ist. Der vorschriftsmäßige Betrieb mancher Geräte (z. B. Meßsender) kann allerdings gewissen Einschränkungen unterliegen. Beachten Sie deshalb die Hinweise in der Bedienungsanleitung.

Dem Zentralamt für Zulassungen im Fernmeldewesen wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf die Einhaltung der Bestimmungen eingeräumt.

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For the USA

FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Unauthorized changes or modification to this system can void the users authority to operate this equipment. This equipment requires shielded interface cables in order to meet FCC class B Limit.

For Canada

CLASS B

NOTICE

This digital apparatus does not exceed the Class B limits for radio noise emissions set out in the Radio Interference Regulations of the Canadian Department of Communications.

CLASSE B

AVIS

Cet appareil numérique ne dépasse pas les limites de la classe B au niveau des émissions de bruits radioélectriques fixés dans le Règlement des signaux parasites par le ministère canadien des Communications.

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