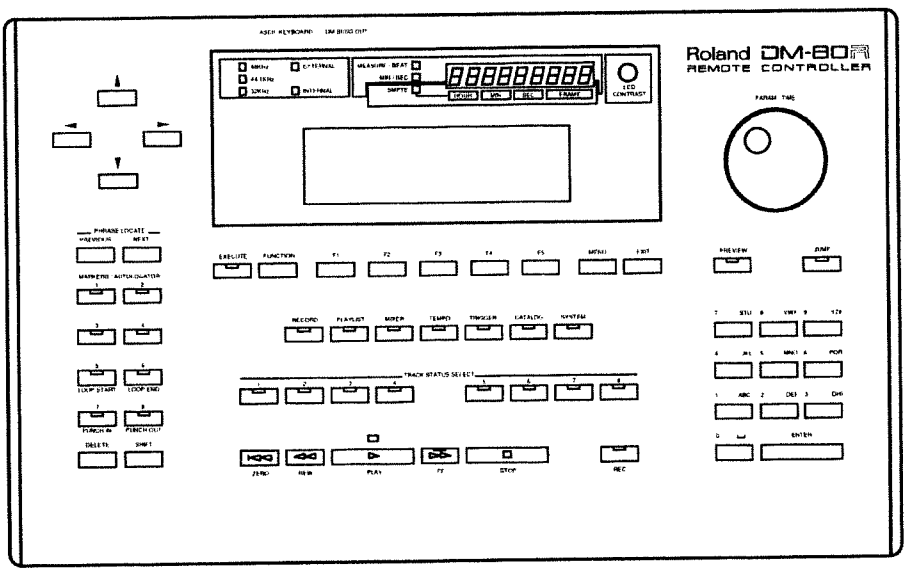
Roland

REMOTE CONTROLLER

DM-80R

OWNER'S MANUAL



For Germany

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß der/die/das

Roland REMOTE CONTROLLER DM-80R

(Gerät. Typ. Bezeichnung)

in Übereinstimmung mit den Bestimmungen der

Amtsbl. Vfg 1046/1984

(Amtsblattverfügung)

funk-entstört ist.

Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Roland Corporation Osaka/Japan

Name des Herstellers/Importeurs

For the USA

RADIO AND TELEVISION INTERFERENCE

WARNING — This equipment has been verified to comply with the limits for a Class B computing device, pursuant to Subpart J, of Part 15, of FCC rules. Operation with non-certified or non-verified equipment is likely to result in interference to radio and TV reception.

The equipment described in this manual generates and uses radio frequency energy. If it is not installed and used properly, that is, in strict accordance with our instructions, it may cause interference with radio and television reception. This equipment has been tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J, of Part 15, of FCC Rules. These rules are designed to provide reasonable protection against such a interference in a rasidential installation. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by the following measure:

- Disconnect other devices and their input/output cables one at a time. If the interference stops, it is caused by either the other device or its I/O cable. These devices usually require Roland designated shielded I/O cables. For Roland devices, you can obtain the proper shielded cable from your dealer. For non Roland devices, contact the manufacturer or dealer for assistance.

  If your equipment does cause interference to radio or television reception, you can try to correct the interference by using one or more of the following measures.
- Turn the TV or radio antenna until the interference stops.
- Move the equipment to one side or the other of the TV or radio.
- Move the equipment farther away from the TV or radio.
- Plug the equipment into an outlet that is on a different circuit than the TV or radio. (That is, make certain the equipment and the radio or television set are on circuits controlled by different circuit breakers or fuses.)
- Consider installing a rooftop television antenna with coaxial cable lead-in between the antenna and TV. If necessary, you should consult your dealer or an experienced radio/television technician for additional suggestions. You may find helpful the following booklet prepared by the Federal Communications Commission:

  "How to Identify and Resolve Radio — TV Interference Problems"

  This booklet is available from the U.S. Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

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 Réglement des signaux parasites par le ministère canadien des Communications.

CONTENTS

INTRODUCTION

Thank you for purchasing the Roland DM-80 hard disk recorder.

The DM-80 is a 16-bit multi-track hard disk recorder. The basic model (DM-80-4) can record and play back any combination of four tracks simultaneously. The expanded DM-80-8 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-80 uses a trick borrowed from MIDI sequencers and drum machines, where any one recorded section may be re-used any number of times. A re-used 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-80's recording time like the memory in a sampler than the length of a piece of tape.

FEATURES

16-bit multi-track hard disk recording.

Record and play back any combination of four tracks simultaneously (DM-80-4).

Eight tracks capability (DM-80-8).

Recording time limited only by the amount of hard disk storage. One SCSI bus and disk per 4 tracks of audio.

16 bits linear recording format; sample rates of 32, 44.1, and 48 kHz available.

Each 100 megabyte hard disk allows approximately 18 track minutes of recording time at 44.1 kHz.

Recordings can be spread over multiple disks for longer recording times.

PRECAUTIONS

POWER SUPPLY

Do not connect the DM-80-R to anything other than the DM-80 rack mount unit, or the DM-80-F fader unit.

LOCATION

Do not subject the unit 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.

This unit may interfere with radio and television reception. Do not use this unit in the vicinity of such receivers.

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

Do not subject the DM-80-R to strong shocks.

Do not press hard on the display or allow it to be hit.

The DM-80-R may produce some heat when operating normally.

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

Do not allow objects or liquids of any kind to penetrate the unit. In the event of such an occurrence, discontinue use immediately. Contact qualified service personnel as soon as possible.

Should a malfunction occur (or if you suspect there is a problem) discontinue use immediately. Contact qualified personnel as soon as possible.

The display may produce a small amount of noise when operating normally.

COPYRIGHT

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-80 system, park all hard drive heads, and eject all removable media by using the Shut Down command before turning off the power. (Press SYSTEM, then SHUT (F1). After shutting down the unit, wait until the drive has stopped rotating, about 30 seconds, before moving the unit.

It will take several minutes for the hard disk to "boot up" after the power is turned on.

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-80-R. It is strongly suggested that you frequently make backup copies of your hard disk data.

CONVENTIONS

SWITCHES

Panel and display switches are indicated in all caps. Soft function keys are shown with the function button in parentheses:

Press COPY (F1)

Press EXECUTE

SYSTEM CONFIGURATION

The DM-80 is available in two versions: the DM-80-4 which contains four tracks and a single 100 MB hard disk drive; and the DM-80-8 which contains eight tracks and two 100 MB hard disk drives. The term DM-80 is used to mean either of these models.

A DM-80-4 can be upgraded to eight tracks with the installation of the DM-80-E Expansion Upgrade. The DM-80-E must be installed by an Authorized Service Center. For more information, contact Roland or your nearest Service Center.

THE DISK

The disk as used in this manual refers to any and all disk drives attached to the DM-80, internal or external.

TRACK MINUTES

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 one 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 TO USE THIS MANUAL

This manual is organized in the following manner:

HOW THE DM-80 WORKS
An explanation of disk-based digital audio

GETTING STARTED
Installation, connections, and getting around on the DM system.

DATA ORGANIZATION
Explanation of the DM-80's Project / Phrase / Take structure.

PANEL FUNCTIONS
Front panel controls are explained in detail. Refer to this chapter when you need specific information about the panel switches.

SOFTWARE FUNCTIONS
Operations of DM-80 are explained. Refer to this chapter when you want to find a specific procedure.

INTERFACING THE DM-80
Some comments about how the DM-80 relates to the outside world.

BACKING UP YOUR DATA
Backing up the huge amounts of data created by digital recordings merits a chapter of its own, devoted to the various issues involved in saving your work.

TROUBLESHOOTING
If you have problems getting the DM-80 to operate properly, check this section for possible solutions.

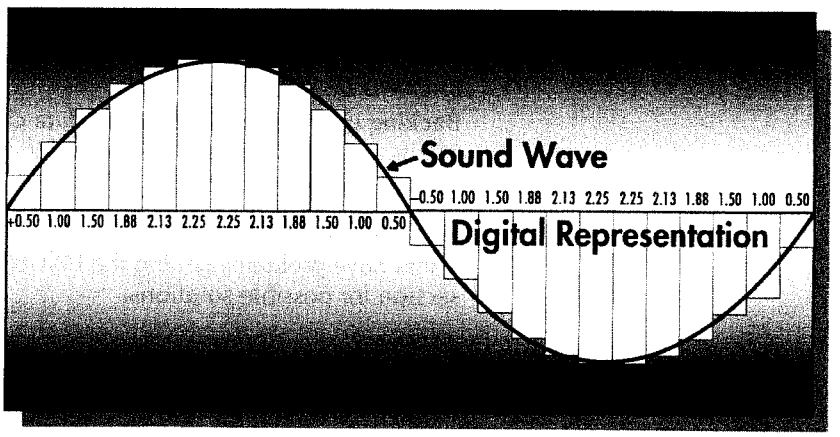
APPENDIX
This chapter contains upgrade and service information, Mixer block diagram, and specifications.

HOW THE DM-80 WORKS

The DM-80 is possible because of a series of technological advancements. The most important of these are Digital Recording and Disk Recording.

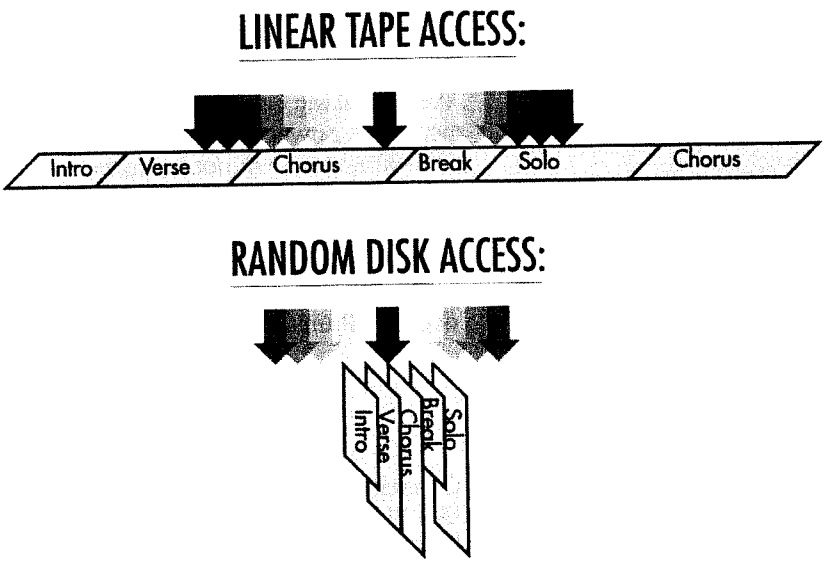
DIGITAL RECORDING

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 a 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-80 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 then 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 creativity.



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-80 at very high speeds.

What makes the DM-80 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. The DM-80-4 has a 100 MB drive built-in, and the DM-80-8 has two 100 MB drives. External disk drives can also be used.

GETTING STARTED

INSTALLATION

BEFORE MAKING CONNECTIONS

Use the cables packed with the DM-80-4/8 and the DM-80-F. Use of other cables may result in damage to the units.

Never connect anything but the specified optional keyboards. Damage to the unit may occur if any other equipment is connected.

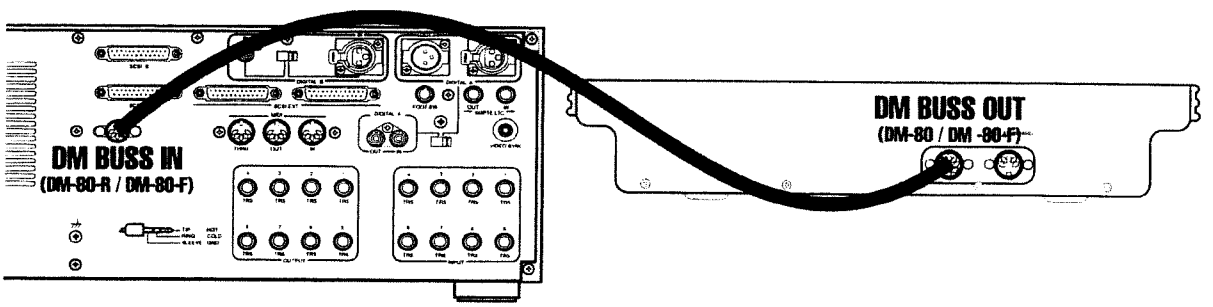
When making connections, be sure the DM-80-4/8 is powered off. Do not apply power until after all connections have been made. If not, the DM-80 system will not function.

Never disconnect any DM BUSS cable or external keyboard cable while operating the DM-80 system. If a DM BUSS cable is disconnected and then re-connected, the system will cease functioning. You will need to power off the unit before it can be restarted. If this occurs, all unsaved data will be lost.

DM BUSS CONNECTIONS

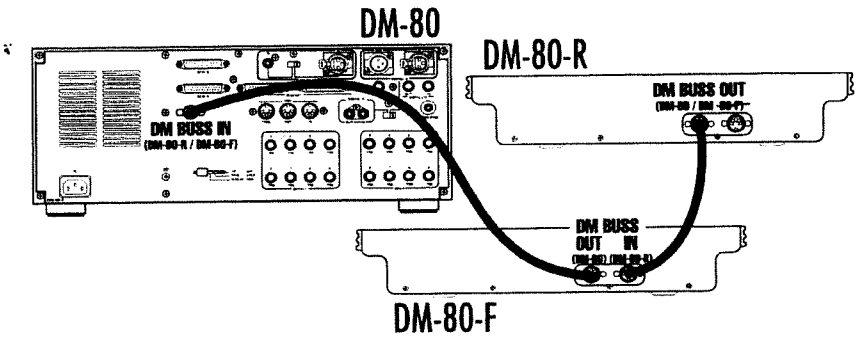
CONNECTING THE REMOTE TO THE RACK UNIT

Connect the cable packed with the DM-80-4/8 into the jack labeled DM BUSS OUT. Connect the other end of this cable to the jack labeled DM BUSS IN on the DM-80 Rack Unit rear panel.



CONNECTING DM-80-F FADER REMOTE

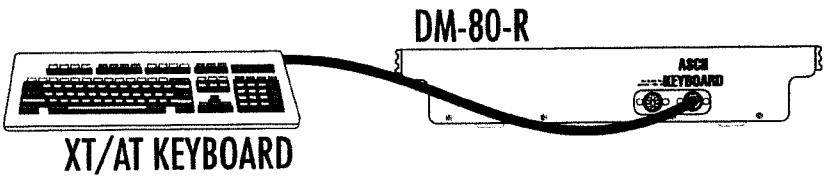
Connect the DM BUSS OUT connector on the DM-80-F to the DM BUSS IN connector on the DM-80 rear panel using the cable supplied with the DM-80-4/8. Connect the DM BUSS OUT connector on the DM-80-R to the DM BUSS IN connector on the DM-80-F, using the cable supplied with the DM-80-F as shown below.



CONNECTING THE OPTIONAL KEYBOARD

The DM-80-R also features a connector that supports an IBM XT/AT compatible keyboard. Using the keyboard makes entering text easier and duplicates many functions of the Remote unit.

To connect the optional keyboard, plug a cable from the keyboard into the jack on the DM-80-R labelled ASCII KEYBOARD. If your keyboard has an XT/AT select switch, set it to the AT side.



Note: The DM-80 takes a US English standard keyboard. Other language keyboards may not work properly.

For more information, please see page 28.

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-80, be sure to confirm all DM BUSS, SCSI, optional keyboard, audio and MIDI connections. Reduce the audio monitor level.

1 Power on the terminated SCSI devices.

2 Power on the other, non-terminated SCSI devices. Wait for all drives to come up to speed.

3 Power on the DM-80.

4 Power on any MIDI and SMPTE devices.

5 Finally, turn on any other audio equipment.

POWER DOWN

Before powering down the DM-80, be sure to save the current Project, and reduce the audio monitor level.

1 Execute the SHUT DOWN command—press SYSTEM, SHUT (F1).

You will have a chance to Save the current Project to disk before continuing. Press YES or NO.

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, stopped spinning) and eject any removable disks or tapes.

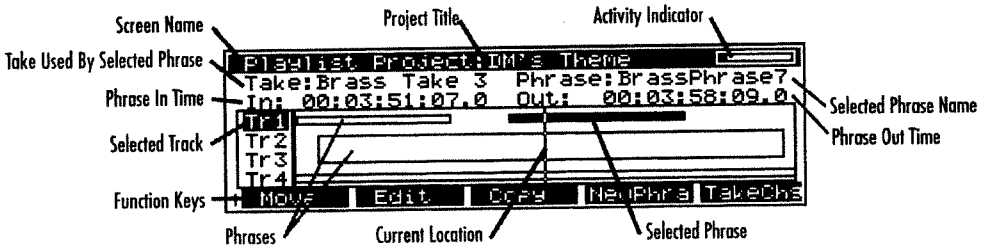
2 Power off audio devices.

3 Power off the DM-80

PROJECT LOADING

The DM-80 takes several minutes to get started. As part of its start-up sequence, the DM-80 loads the last selected Project.

When the DM-80 has finished loading, the time display will appear and the LCD will show the Playlist screen. On this screen you can see the Project title as well as other information as shown here:



- Use the LCD Contrast control to adjust the display for best visibility.

FRONT PANEL CONTROLS

LCD DISPLAY

The display shows parameter values, and presents a graphic representation of the Phrases in the Project.

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 Param/Time Dial or the Data Entry Keypad to change it.

PHRASE LOCATE

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

MARKERS

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.

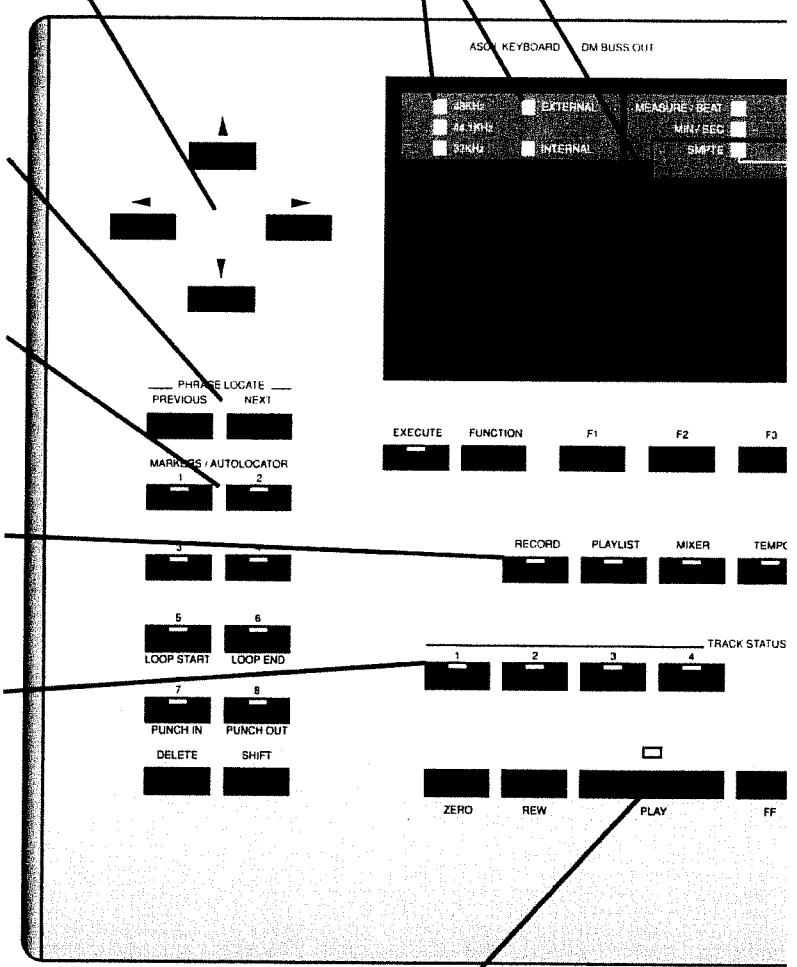
MODE SELECT KEYS

Use these keys to select operating modes.

TRACK STATUS SELECTS

These buttons, numbered 1-8, correspond to the 8 possible hard disk tracks. They have bi-color LEDs (Red = Record; Green = Play; Off = Mute, Orange=Trigger Mode).
In most cases, pressing a button selects between Play and Mute.

Note: in the 4 track DM-80-4 configuration, buttons 5-8 have no function in most situations.



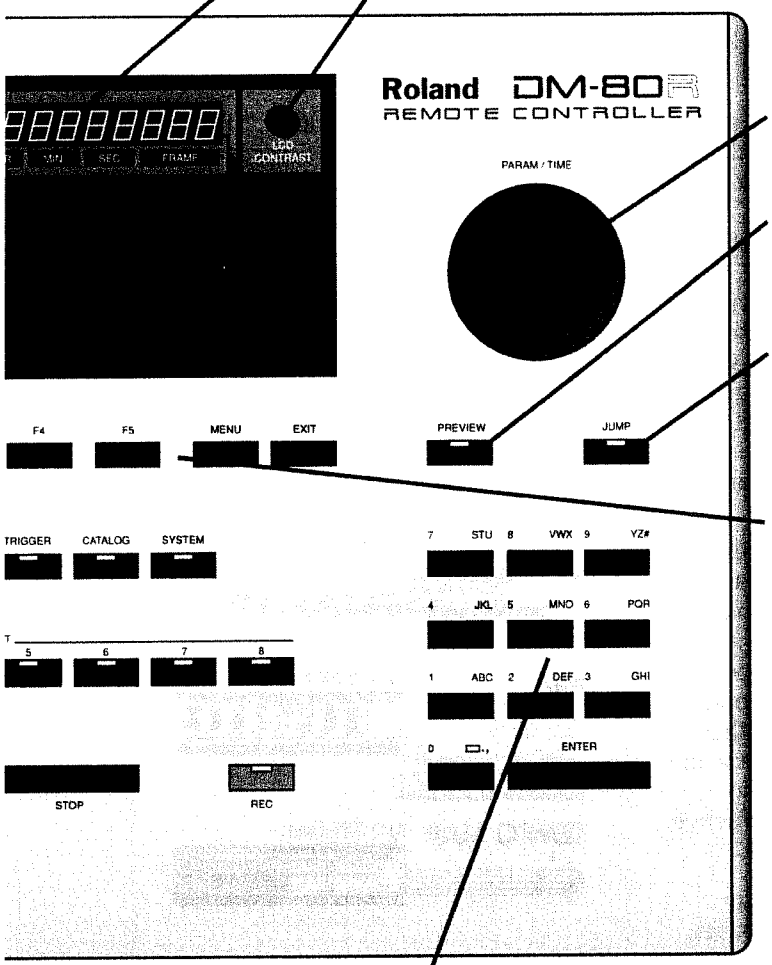
TRANSPORT CONTROLS

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 beginning of the Project.
PLAY starts the DM-80 from the selected Project position.
RECORD initiates recording, in conjunction with the Track Status Select buttons.

TIME DISPLAY

The Time Display shows the DM-80'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 format is selected.

LCD CONTRAST CONTROL



PARAM/TIME DIAL

This dial adjusts parameters, or scrolls through the Project.

PREVIEW

This plays back a short segment, useful for finding edit points.

JUMP

Use this to quickly locate a particular frame or beat.

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 the additional selections.

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.

MENU

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

KEYPAD

You can use this standard-type keypad for entering parameters in the display.

DATA ORGANIZATION

The data in the DM-80 is organized in three main groups: Projects, Phrases and Takes.

TAKES

Every time you start recording, the DM-80 creates a new record file, called a "Take". Up to four channels can be recorded simultaneously, yielding a Take that is four 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-80 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 editing is called "non-destructive."

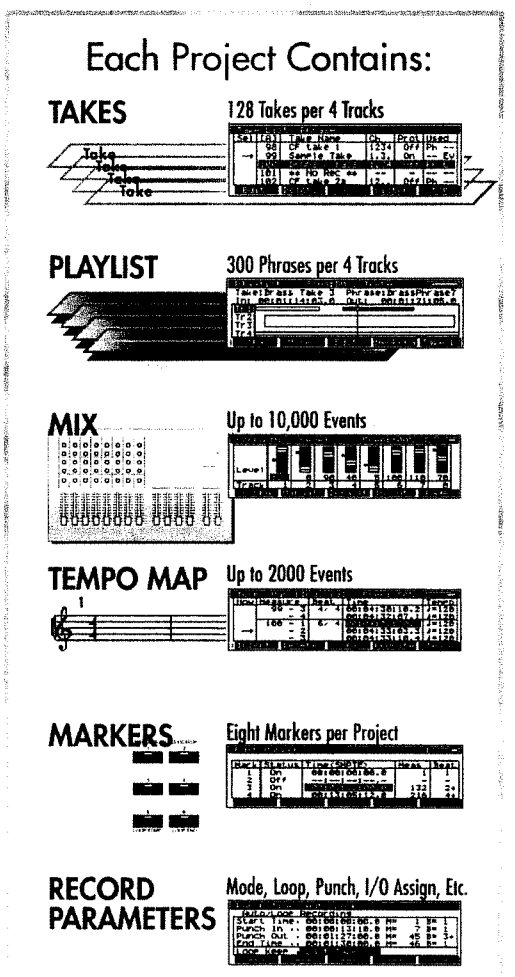
PHRASES

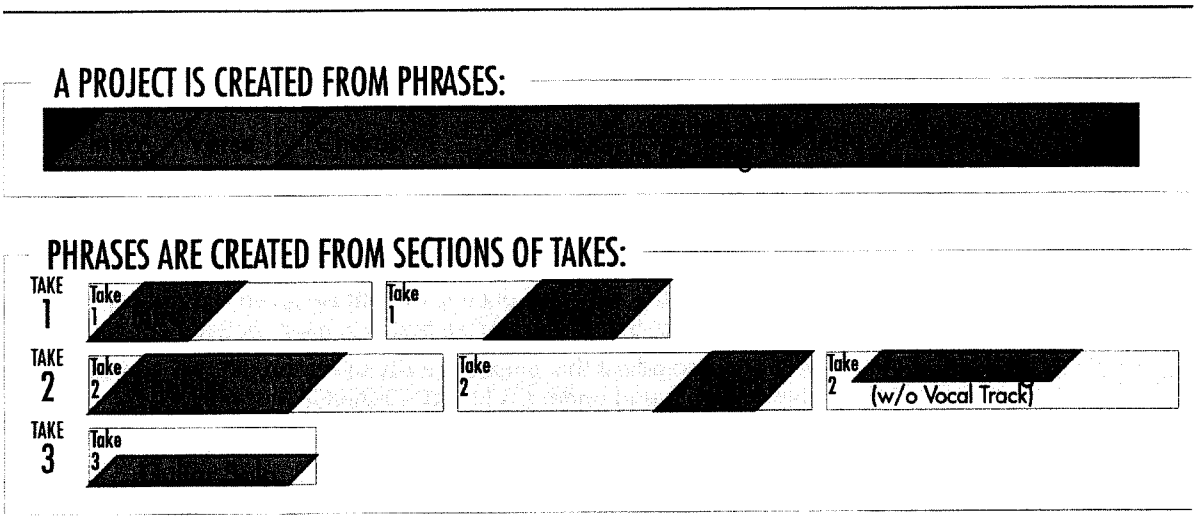
The appearance of a Take inside a Project is called a "Phrase." The Phrase contains additional information such as start/end times, and Offset which is *where* in the Take the Phrase starts playing. Several Phrases can "point" to the same Take: for example one Phrase might only include the verse section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

Overlapping phrases can also cross-fade on a single Track. The only limit is that the length of the cross-fade cannot be more than one second. Cross-fading and other Phrase editing do not alter the original Take, so editing is non-destructive.

PROJECTS

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





TRIGGER PLAY

Besides their use in a Project, recordings can also be played directly. These audio events can be triggered by MIDI notes or the Data Entry Keypad. Triggered Phrases can also be used while a Project is playing.

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.

PLAYLIST EDITING

In Playlist mode, a Project's tracks are displayed as four (or eight) pieces of tape going across the LCD complete with splices. The positions of Phrases in a Project may be moved earlier or later, 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

Each track can play only one Phrase at a time, except during a cross-fade.

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 also adjust this phrase priority using the FRONT and BEHIND commands, found under OVERLAP CHANGE in the PLAYLIST mode.

DISK ACCESS

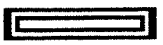
Since the DM-80 operates using the principle of random disk access, it must be able to read and write data to the disk faster than the digital audio data rate. In other words the disk access time must be fast enough to allow digital playback at the sampling frequency.

Adequate disk access time is a function of several things:

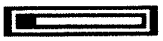
- the sampling rate (a higher rate means more data),
- the number of tracks recording or playing at any one time (two tracks is twice as much data as one),
- the access time and data transfer rate of the disk drive itself (the ultimate speed limit),
- the location of the data on the disk (the farther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

ACTIVITY INDICATOR

The Activity Indicator, in the upper-right corner of the LCD in record and play modes, shows how close this disk activity is to the operational limit.



No activity, such as when the DM-80 is stopped.



Moderate activity. This is the optimum condition for recording and playback.

Increased activity. Access time approaching the operational limit.

Too much activity. Data access cannot keep up with output demand. If this condition is reached, the DM-80 will stop.

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-80.

USE A LOWER SAMPLING RATE

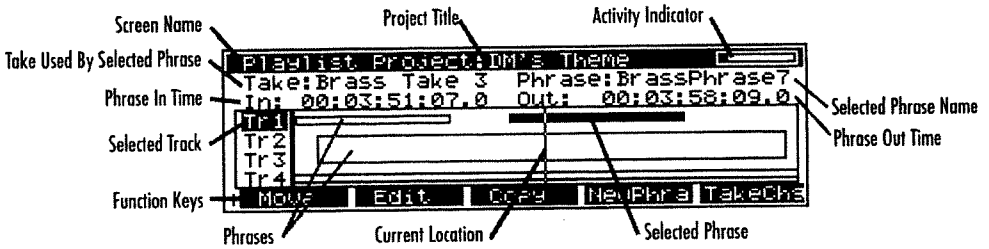
You should consider using a 44.1 kHz rather than 48 kHz sampling rate, especially if your release medium is a Compact Disc. The slightly lower data rate may make a difference in marginal disk access situations.

PANEL FUNCTIONS

The controls and indicators on the DM-80-R are arranged in logical groups to enable quick and easy operation. Let's take a look at these groups:

LCD DISPLAY

Most DM-80 operations are performed by pressing buttons while looking at the LCD 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.

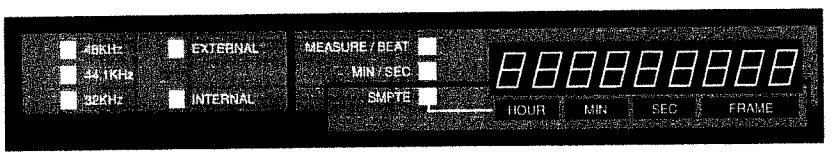
ACTIVITY INDICATOR

The Activity Indicator, at the top-right corner of the display, gives a general indication of disk access time. If the indicator is completely solid it means that access time has become too slow for proper playback. For more information, see page 21.

LCD CONTRAST

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

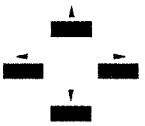
TIME DISPLAY



The Time Display above of the LCD shows the DM-80'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.

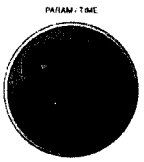
CURSOR KEYS



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 Param/Time Dial or the Data Entry Keypad to change it.

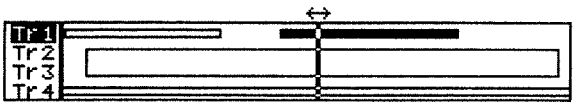
When the cursor key is positioned on a track (track number is highlighted): Press the PREVIOUS or NEXT keys to jump to the start or end of each phrase on the track.

PARAM/TIME DIAL



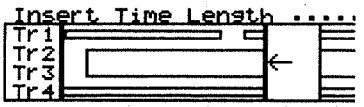
THE PARAM/TIME DIAL IS USED IN SEVERAL WAYS:

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

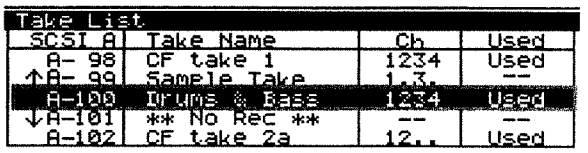


2 In the Record, Playlist, Menu, and Level Check screens, the Param/Time Dial scrolls forwards and backwards through the Project. If you turn the dial slowly, the time will move by 1 ms. If you turn the dial rapidly, the time will move in 100 ms increments.

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

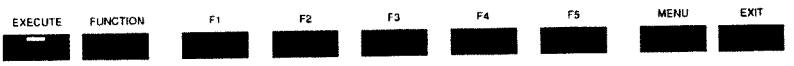


4 In the Insert Time and Cut Time screens, the Param/Time Dial scrolls through the Project while changing the Insert or Cut Time Length.



5 In Catalog screens and other screens that display a list of Projects or Takes, the Param/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 the additional selections.

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.

MENU

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

TRANSPORT CONTROLS

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

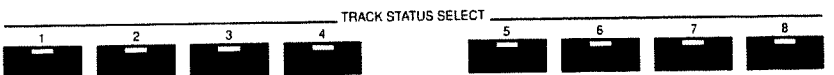
REWIND and F FWD (Fast Forward) move through the Project at faster-than-normal speed while they are held.

ZERO (Return To Zero) resets the current location back to the beginning of the Project.

PLAY starts the DM-80 from the selected Project position.

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

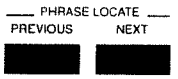
TRACK STATUS SELECTS



These buttons, numbered 1-8, correspond to the 8 possible hard disk tracks in the DM-80. They have bi-color LEDs (Red = Record; Green = Play; Off = Mute; Orange = Trigger Mode). In most cases, pressing a Track Status button scrolls through the two possible states, Play and Mute.

Note: In the 4 track DM-80-4 configuration, buttons 5-8 have no function in most situations.

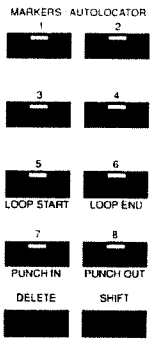
PHRASE LOCATE SECTION



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.

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 and Auto punch recording modes.

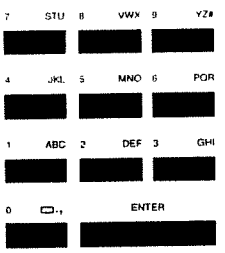
PUNCH IN / PUNCH OUT

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

CAPTURE

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

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 lower-case characters printed above the button. To enter upper-case characters, hold SHIFT while pressing the desired keypad button.

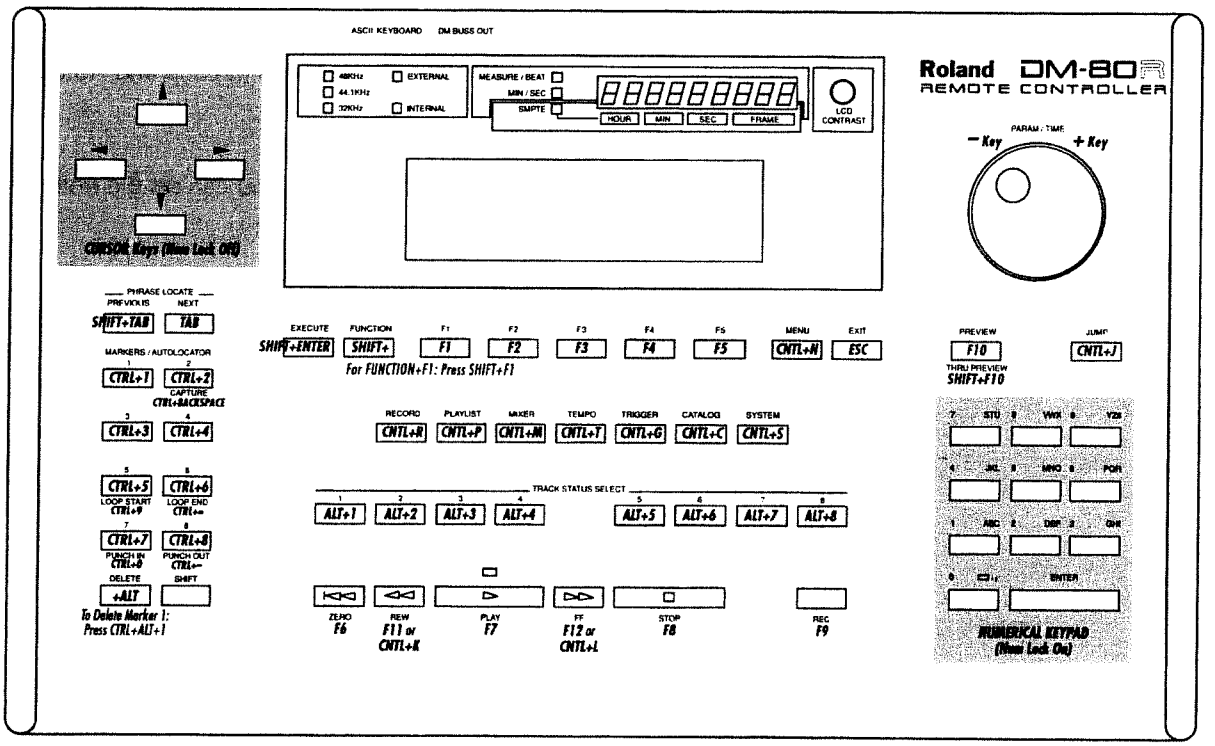
In addition to the standard 26 letters, several other special characters (#, -, /, ., [space], +, *) are available by using the Param/Time Dial.

Note: Pressing ENTER moves the cursor to the right-most position.

EXTERNAL KEYBOARD

Any PC XT/AT compatible keyboard can be connected to the DM-80-R.

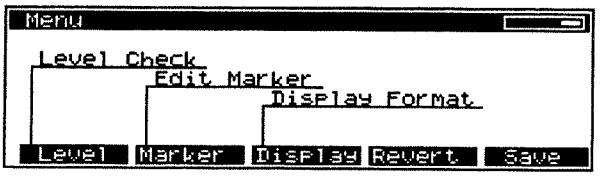
The following shows keyboard equivalents to the DM-80-R Front Panel functions:



SOFTWARE FUNCTIONS

There are seven different software modes in the DM-80: 'Record,' 'Playlist,' 'Mixer,' 'Tempo,' 'Trigger,' 'Catalog,' and 'System'. Three other modes are always available: 'Menu,' 'Preview,' and 'Jump'. The following section explains the functions of these modes in detail.

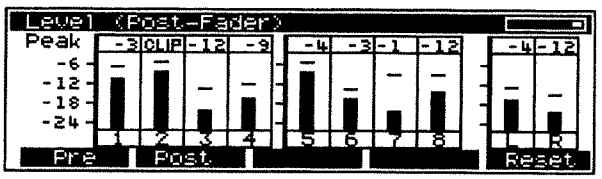
MENU MODE



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

Five functions are always available:

LEVEL CHECK (F1)

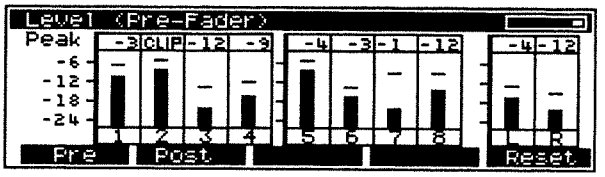


Level Check opens a screen that displays peak reading, bar graph meters for inputs and outputs, approximating the bar graphs on the DM-80 rack front panel.

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).

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, level faders in the Mixer Mode or on the Fader unit will affect the display. Level check points are shown on the Mixer block diagram, page 98.

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

Note: The Rack Unit's level meters are also switched between pre and post-fader along with the Level Check screen. The pre or post setting will remain in effect until Pre or Post is again selected on the Level Check screen.

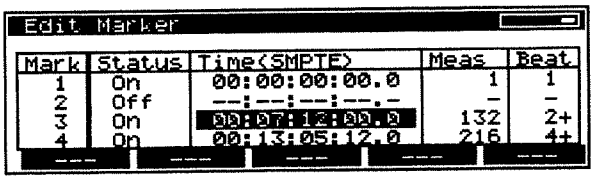
Note: Inputs are assigned to Tracks and Aux from the In/Out Assign Screen, accessible from Mixer, Record, or Trigger Play modes—press MIXER, IN/OUT (F4).

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.

EDIT MARKER (F2)



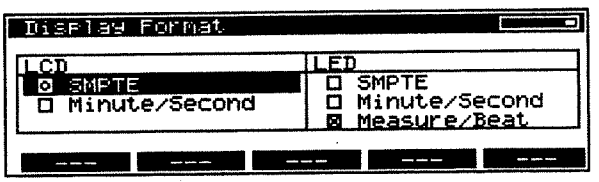
You can edit exact marker locations in this window. Markers can be deleted and new markers created.

EDITING MARKERS

Use the Cursor keys to display markers 1 through 8 and parameters, then use the Param/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 location.

DISPLAY FORMAT (F 3)



The DM-80'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-80'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-80 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 Project.

Note: The current Project is automatically saved to disk during execution of the Take Delete and Delete Takes commands (see pages 48 & 73). 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 REVERT.

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 69 & 83), the DM-80 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 MODE

The Preview function stores a piece of data in RAM to help make it easy to find a desired edit point. The starting point is the current time, which is shown on the display and can be edited.

Press and release PREVIEW to play the segment. To play the data again, press PREVIEW again.

Note: PREVIEW can only be accessed when the DM-80 is stopped.

PREVIEW LENGTH

The length of the Preview segment is set in the System 3 screen—press SYSTEM, PAGE (F5), PAGE (F5). The maximum length is 5 seconds.

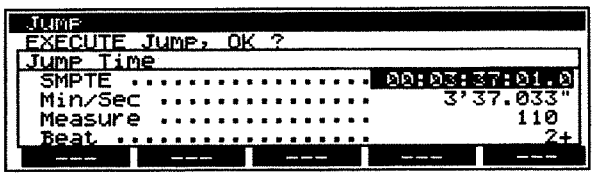
PREVIEWING TRANSITIONS

By pressing SHIFT+PREVIEW, you can Preview starting ***before*** the current time and play through it.

PREVIEWING END POINTS

In the Trim Out screen (press PLAYLIST, MOVE (F1), TRIM OUT (F4)), Preview plays ***until*** the current time, rather than starting at the current time. This shift is made in order to better hear the out point.

JUMP MODE



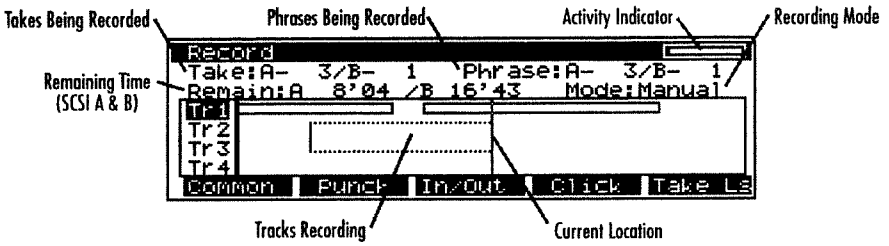
You can jump to a specific measure, time or frame by entering the desired location point in this window.

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 EXECUTE. The DM-80 jumps to the selected time and returns to the previous display.

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 (just below the LCD) 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 Param/Time dial to select inputs. (See Page 40 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 Param/Time Dial, Jump mode, or one of the Markers.

Set the desired recording tracks using the Track Status Select buttons. The record–enabled tracks will flash red.

In the Transport Controls section, press the Record button to activate record waiting mode. The Record LED will flash.

SETTING LEVELS

Press MENU, then LEVEL (F1). The Level screen will appear.

Press PRE (F1) or POST (F2) to select pre or post fader.

Adjust the levels on your output devices for the optimum input level on the DM-80's meters. In order to make the best possible recording, set the level to a point just below clipping.

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

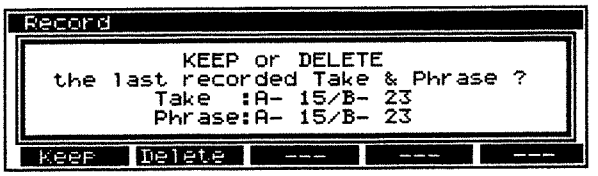
MAKING THE RECORDING

Press RECORD to return to the Record screen.

When you are ready to start, press PLAY.

The DM-80 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.

After recording, the DM-80 will automatically name the new Take and Phrase, and place the corresponding Phrase in the current Project.

THE DM-80 RECORDING CONCEPT

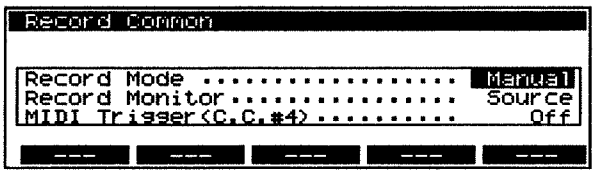
The DM-80 is designed to operate much like a tape recorder. However, the DM-80 is a disk recorder and therefore, it's approach to recording is a bit different. Let us spend a moment here discussing these differences:

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-80, you can also cue up the part of the Project to be recorded, then start recording. What's different is the DM-80 creates a new Take of the recording 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 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 *non-destructive.*

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. Multi-track Takes and Phrases can also be made.

RECORD COMMON
(F 1)



Basic record settings are made in this page.

RECORD MODE

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

Note: Recording should be done when in a Record screen with an Activity Indicator.

MANUAL

Manual recording is a 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 39).

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 Start Time. At the programmed Punch In time, the DM-80 will punch into record. At the Punch Out time, it will punch back out. When the End Time is reached the DM-80 will stop.

The Start, In, Out, and End 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 (see below) is set to Disk, you can rehearse a punch in by pressing PLAY. Playback will start at the programmed Start Time. At the programmed Punch In time, the DM-80 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. When the End Time is reached the DM-80 will stop.

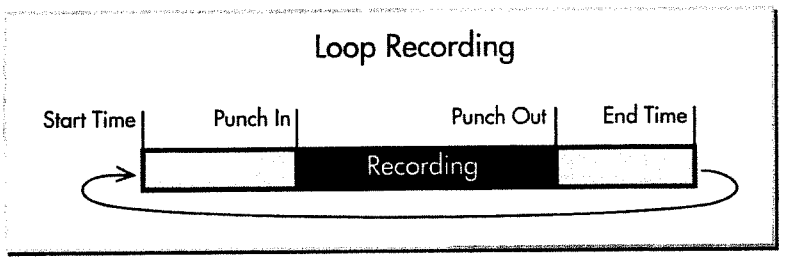
LOOP

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-80 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. At the Punch In point the DM-80 will punch into record. At the Punch Out time, it will punch back out.

When the End Time is reached, the DM-80 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-80 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-80 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-80 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, the latest take will be inserted into the Project.

RECORD MONITOR

This controls the input–output switching during Record and 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

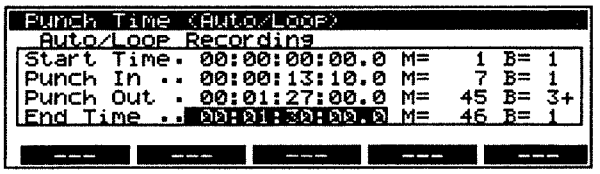
The track will playback from disk at all times except when actually recording and the Track Status Select red LED is lit. Use this mode if you *want* to hear other recordings on the track, for example, to manually punch in at a specific point.

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 2 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 Start Time. At the programmed Punch In time, the DM-80 will punch into record. At the Punch Out time, it will punch back out. When the End Time is reached the DM-80 will stop (in Auto mode) or loop back to Start Time (in Loop mode).

IN/OUT ASSIGN (F3)

This page is the DM-80'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.

The input sources are:

The eight analog inputs (In-1—In-8)

The digital inputs (DgA-L, DgA-R, DgB-L, DgB-R)

The output of the mixer itself (RecL, RecR)

The output destinations are:

The Mixer (Mix), for mix to the stereo Mix Outputs.

The corresponding Direct Output 1–8, Pre-fader (Pre).

The corresponding Direct Output 1–8, Post-fader (Pst). The input will go through the Mixer's level and EQ but will not be summed with the other mixer channels.

The Record bus (Rec), for bounce down and other applications.

The mixer's Aux channels are also patched in In/Out screen. Any input can be can be assigned to these channels, but the output can only be routed to Mix or Rec.

INPUT 7/8 SELECT (DM-80-8 ONLY)

If you are using a DM-80-8 eight track unit, Inputs 7 & 8 Can be set to either analog inputs 7 & 8 (In-7&8), or the Digital B input (DgB-L&R). This enables both pairs of Digital Inputs to be used together to record a multi-track Take.

Note: The Digital B input cannot be used if the Project sample rate is 32 kHz. When the current Project Sample Rate is 32 kHz, the input will be fixed at Analog.

RATE CONVERSION

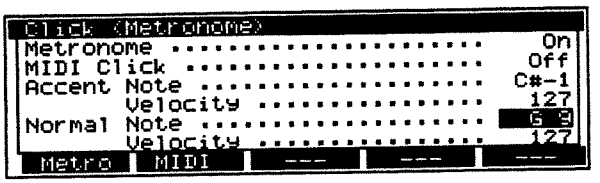
On the DM-80-8, the second digital input (DIGITAL B) is automatically sample rate converted in order to be exactly synchronized to the Project's sample rate.

The display will show **Dg B ???** if there is no signal present at the Digital B input, or if it cannot lock to it. When the DM-80 locks to the Digital B input, the display will read **Dg B L/R**.

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.

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.

METRONOME ON/OFF (F1)

Turns the internal Metronome on and off.

MIDI ON/OFF (F2)

Turns the MIDI Metronome on and off.

Note: The MIDI Metronome will not transmit unless the Metronome On/Off function is also ON.

Note: The Metronome MIDI channel is MIDI Control Channel, set in the System 2 page—Press SYSTEM, PAGE (F5)

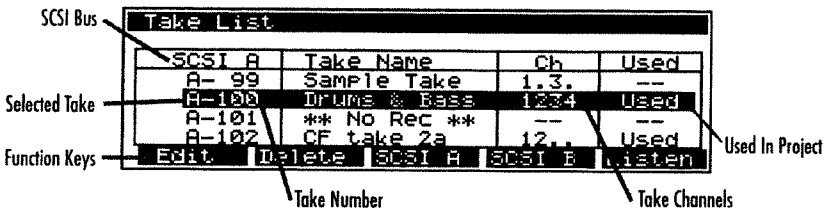
ACCENT

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

NORMAL

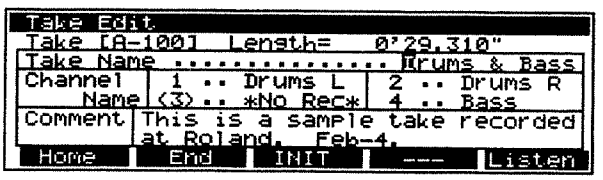
Sets the note number and velocity for the non-accented MIDI Metronome (used other than on the downbeat).

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.

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.

SCSI A (F3)
SCSI B (F4)

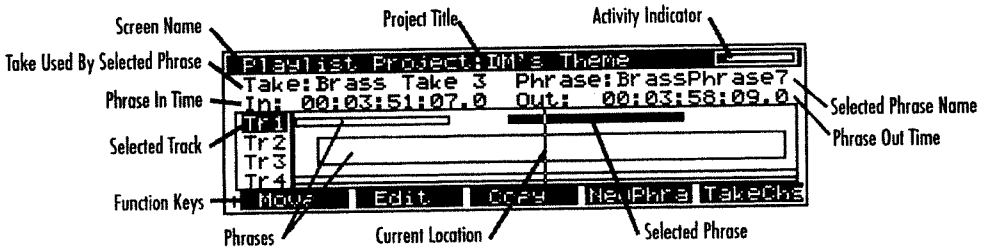
These change the Takes display between SCSI A and SCSI B.

LISTEN (F5)

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

Press STOP to stop playing.

PLAYLIST MODE



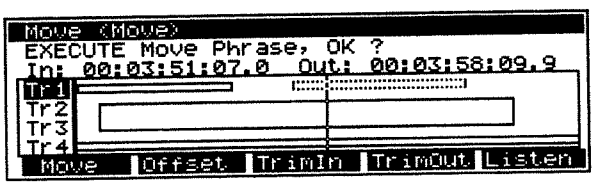
The arrangement of Phrases within the Project is edited in Playlist Mode. This mode features the main graphic editing screen. Audio tracks are displayed as horizontal bars across the LCD. This current time is also displayed as a vertical bar in the center of the LCD. Recorded phrases are represented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

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.

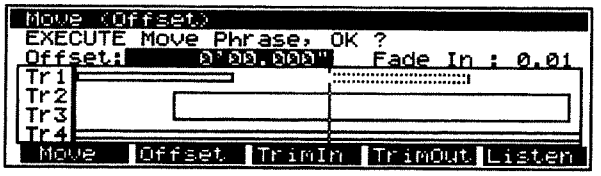
Use PLAY and STOP or the Param/Time Dial to move to the new time for the reference point. You can use PREVIEW to determine the exact point.

Move the cursor to select the destination track.

Press EXECUTE. The phrase is moved to the new location.

To abort, press EXIT instead.

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 OFFSET (F2).

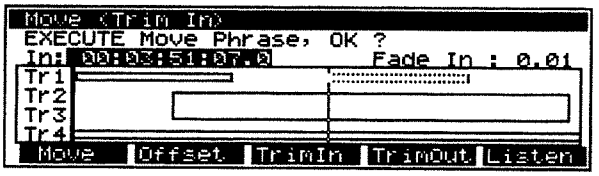
Use the Param/Time Dial to set a new Offset. You can also set the Fade In time.

Press PREVIEW to listen to the change.

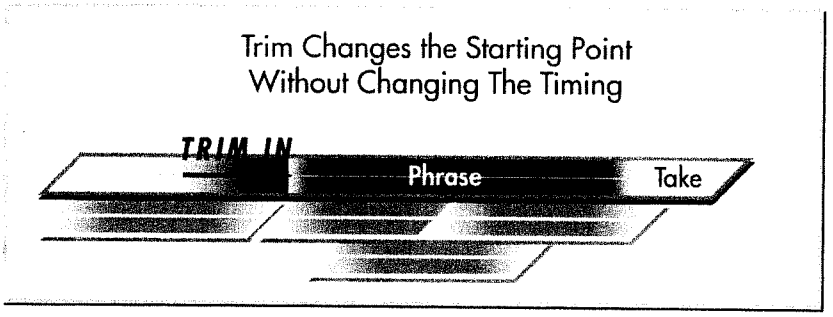
To implement the change, press EXECUTE.

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 TRIM IN (F3).

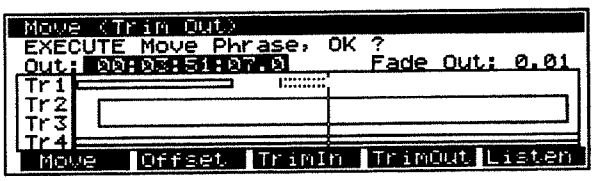
Use the Param/Time Dial to set a new Trim In point . You can also adjust the Fade In time.

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 starts to play 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 TRIM OU (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.

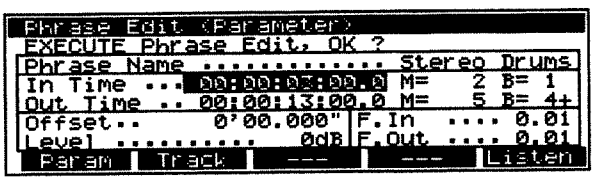
Note: In the Trim Out screen the PREVIEW function plays *until* the current time, rather than from the current time as in other modes.

LISTEN (F5)

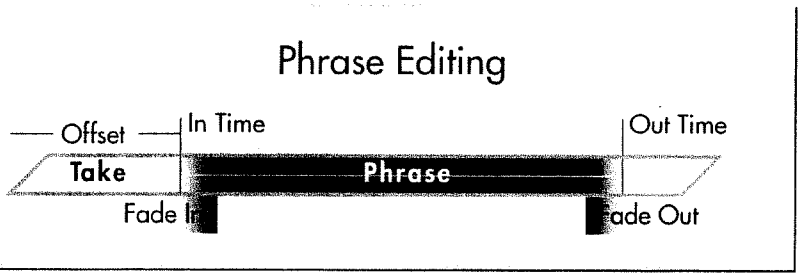
You can audition the selected Phrase by pressing LISTEN (F5). A message screen will appear.

Press STOP 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).



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.

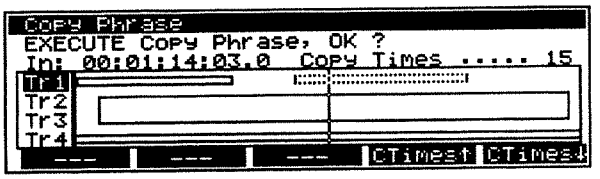
PARAM (F1)
TRACK (F2)

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 PLAY and STOP or the Param/Time Dial to move to the new time for the reference point. You can use PREVIEW to determine the exact point.

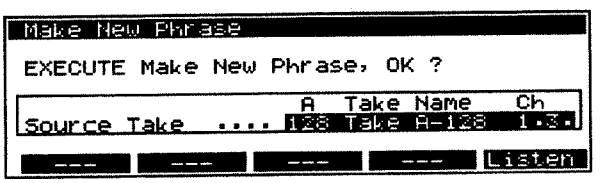
Move the cursor to select the destination track.

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.

NEW PHRASE (F4)



Create a new Phrase in this window.

First select a take to use. Use the Param/Time Dial to highlight the desired take. You can audition any of the takes by pressing LISTEN (F5). A message screen will appear.

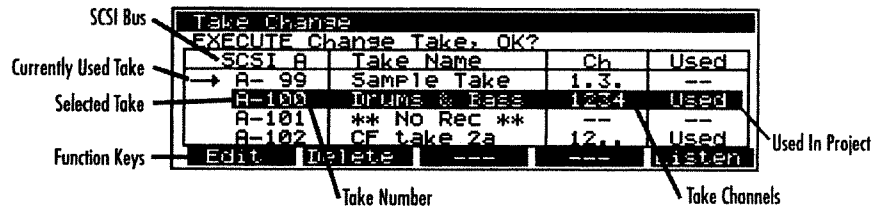
Press STOP (F5) to stop listening.

Press EXECUTE to set the Take and display the Phrase Edit window, where the other phrase parameters can be set.

To abort, press EXIT instead.

The In Time of the new Phrase is set to the current location.

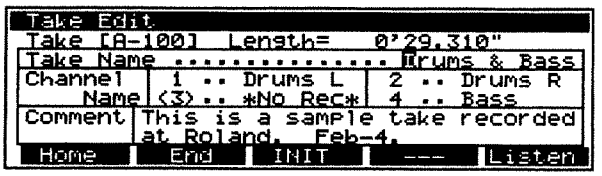
TAKE CHANGE (F5)



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.

DELETE (F2)

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

Press EXECUTE to continue, EXIT to abort.

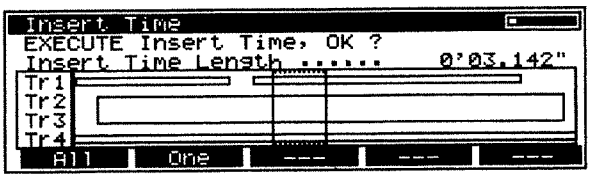
Warning: TAKE DELETE deletes not only the selected Take, but also all Phrases that use it, and also saves the Project data to disk. Since you cannot avoid saving in this situation, be sure you are ready to save before executing TAKE DELETE.

LISTEN (F5)

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

Press STOP to stop playing.

INSERT TIME (FUNCTION+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 Param/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)

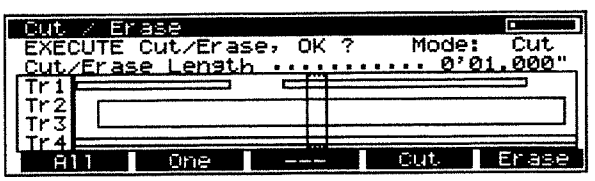
This sets the Time to be inserted in all tracks, as well as into the Compu Mix data. The Tempo Map is not affected.

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.

CUT/ ERASE (FUNCTION+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 mid-section 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 mid-section 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.

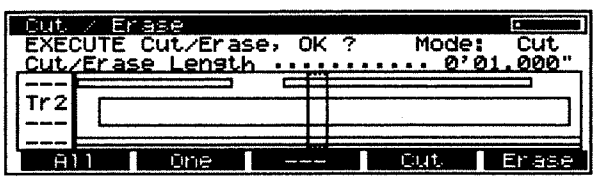
Press EXECUTE to cause the edit.

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.

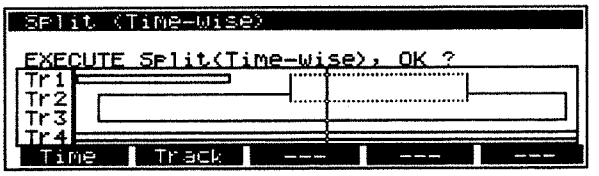
ONE (F2)



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.

SPLIT PHRASE (FUNCTION+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.

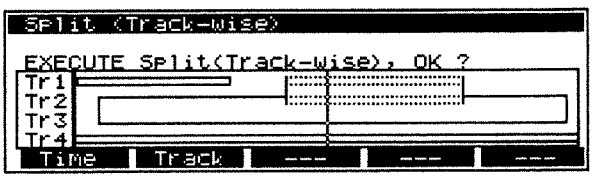
Press SPLIT (Function+F3).

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.

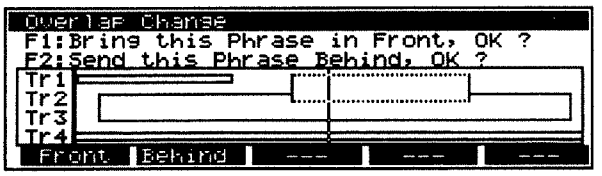
Press SPLIT (Function+F3).

Press TRACK (F2)

Press EXECUTE to create the split.

To abort, press EXIT instead.

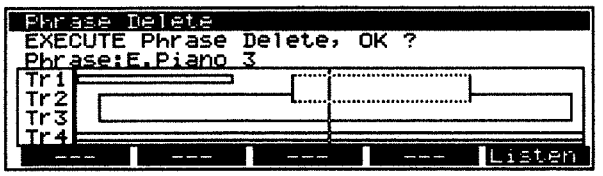
OVERLAP CHANGE (FUNCTION+F4)



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 *Tracks Are Out of Phase* in the Troubleshooting section, page 94.

PHRASE DELETE (FUNCTION+F5)



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

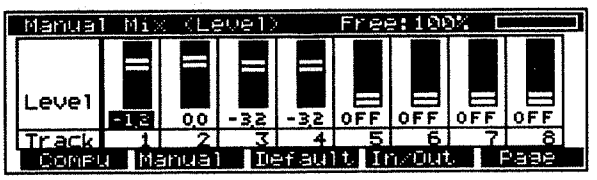
Note: Deleting a Phrase does not delete the Take that it uses.

LISTEN (F5)

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

Press STOP to stop playing.

MIXER MODE

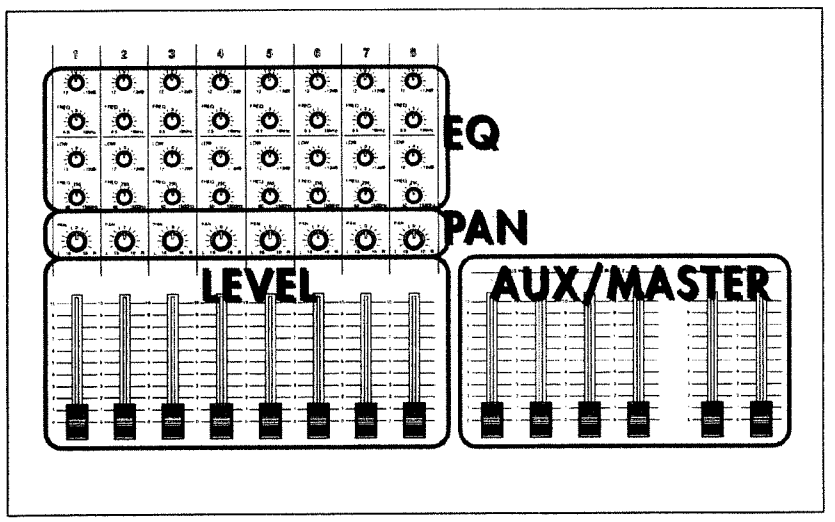


The DM-80 has an internal eight input–two output mixer that can be used for creating a stereo, digital-domain mix to the stereo outputs. You can record this mix from the DM-80's Digital Output without having to convert your DM-80 recordings back to analog.

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.

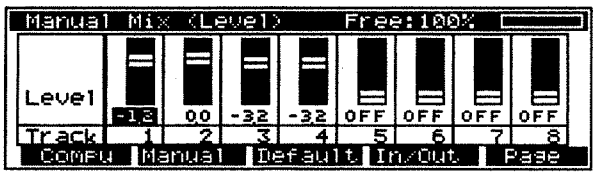
The Roland DM-80-F Fader Unit also can be used to operate the internal mixer. All actions on the fader unit will be recorded by the compu mixer.

MIXER CONTROLS



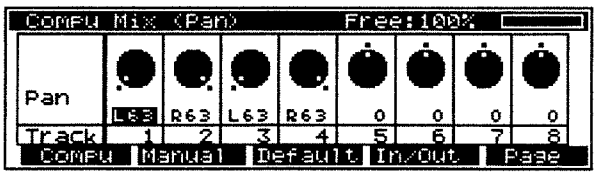
The structure of the Mixer pages represents a "window" on the mixer, showing a section of the mixer parameters for all eight channels. You can move through the different windows by pressing the PAGE (F5) key.

LEVEL



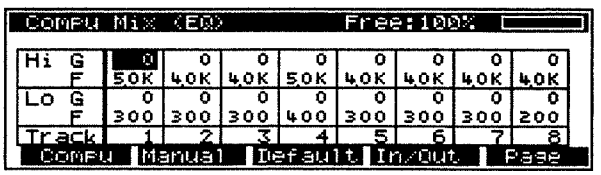
This window displays the Level settings for all eight track outputs. The level is displayed in dB.

PAN



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

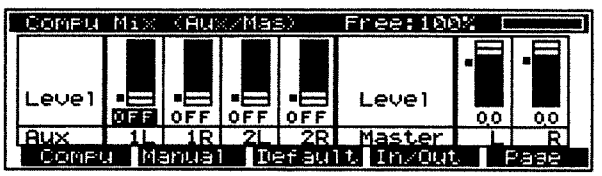
EQ



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.

AUX/MAS

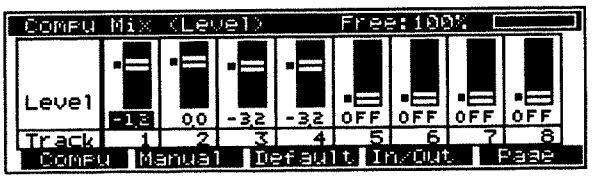


This window displays the mixer Master Output levels as well as levels for the two pairs of Auxiliary Inputs. The level is displayed in dB.

MIXER AUTOMATION FUNCTIONS

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

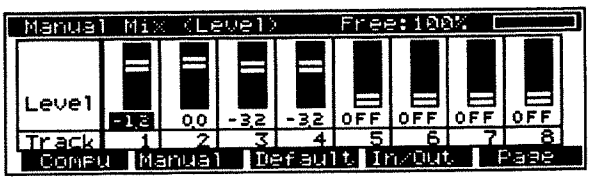
COMPU (F1)



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

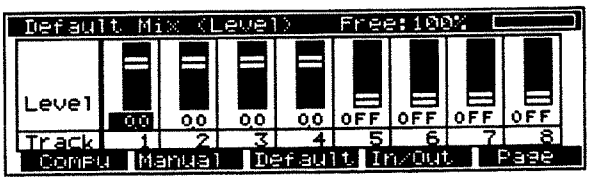
Note: The square mark indicates the physical position of the fader on the DM-80-F fader unit.

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 controls on the DM-80-F Fader Unit.

DEFAULT (F3)



You can create a default mix, which takes effect in Compu Mode when there is no mix data, and also in Manual Mode when there is no fader unit connected.

IN/OUT ASSIGN (F4)

This page is the DM-80's *Patch Bay*. Inputs can be patched to the desired outputs for recording or remix.

The input sources are:

The eight analog inputs (In-1—In-8)

The digital inputs (DgA-L, DgA-R, DgB-L, DgB-R)

The output of the mixer itself (RecL, RecR)

The output destinations are:

The Mixer (Mix), for mix to the stereo Mix Outputs.

The corresponding Direct Output 1–8, Pre-fader (Pre).

The corresponding Direct Output 1–8, Post-fader (Pst). The input will go through the Mixer's level and EQ but will not be summed with the other mixer channels.

The Record bus (Rec), for bounce down and other applications.

The mixer's Aux channels are also patched in In/Out screen. Any input can be can be assigned to these channels, but the output can only be routed to Mix or Rec.

INPUT 7/8 SELECT (DM-80-8 ONLY)

If you are using a DM-80-8 eight track unit, Inputs 7 & 8 Can be set to either analog inputs 7 & 8 (In-7&8), or the Digital B input (DgB-L&R). This enables both pairs of Digital Inputs to be used together to record a multi-track Take.

Note: The Digital B input cannot be used if the Project sample rate is 32 kHz. When the current Project Sample Rate is set to 32 kHz, the input will be fixed at Analog.

RATE CONVERSION

On the DM-80-8, the second digital input (DIGITAL B) is automatically sample rate converted in order to be exactly synchronized to the Project's sample rate.

The display will show **Dg B ???** if there is no signal present at the Digital B input, or if it cannot lock to it. When the DM-80 locks to the Digital B input, the display will read **Dg B L/R**.

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.

PAGE (F5)

Page advances through the Level, Pan, EQ, and Aux/Master control windows.

MIXER TRACK STATUS SELECT

When in a Compu Mix 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:**%.**

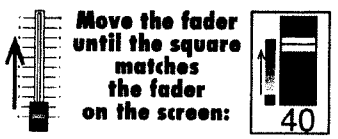
Note: When the entire mix memory has been used up (Free: 00%) you cannot continue to record. The Initialize Compu Mix command will erase unnecessary data—press CATALOG, then INIT MIX (F5). See page 74 for more information.

PROCEDURE

- **Press MIXER to display the mixer screen.**
- **Press COMPU (F1) or COMPU on the DM-80-F Fader Unit. 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.**

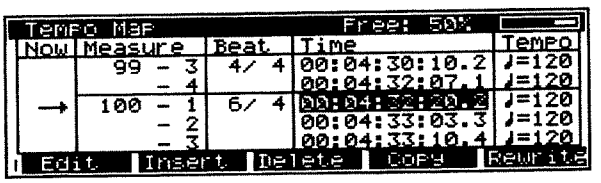
  Note: EQ settings start recording immediately.

- **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-80 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-80 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 $1/32$ 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

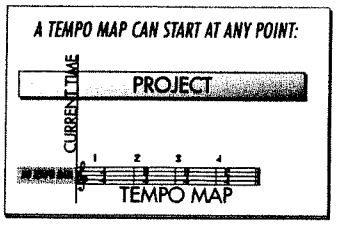
A Tempo Map can be created from scratch either by inserting the desired number of measures, or by *tapping* in the beats on the ENTER key, footswitch, or connected MIDI device.

INSERTING MEASURES

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 Param 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.

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 in tempo 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 Param 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-80 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

Use MIDI clocks from a remote source such as a MIDI sequencer to create 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 device. The Tempo Map adjusts each beat for the variations in tempo 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 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-80 by pressing PLAY or START on your MIDI sequencer or other device. The DM-80's REC LED will now light steadily, and Tempo recording will begin.

To complete the Tempo recording, the DM-80 must receive the number of measures specified by the Insert Times parameter, plus the downbeat of the following measure.

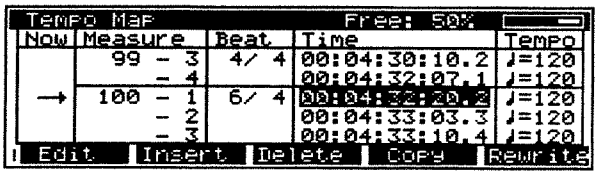
To abort the recording, stop the clocks before completing the specified measures.

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 CURSOR or MEAS↑ (FUNCTION+F4) or MEAS↓ (FUNCTION+F5) keys. Marker keys can also be used to locate events.

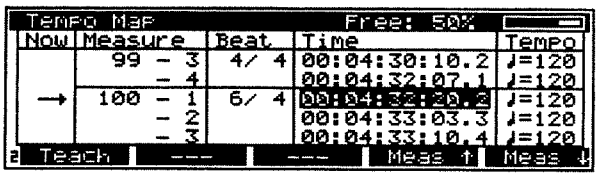
EDIT (F1)



You can edit the selected Tempo Event with the Param/Time Dial.

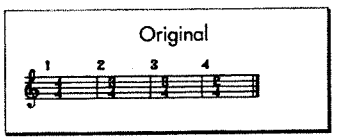
The INDIVID (F1) and TO END (F2) keys can be used to set the time editing mode, below.

INDIVIDUAL (F1)
TO END (F2)

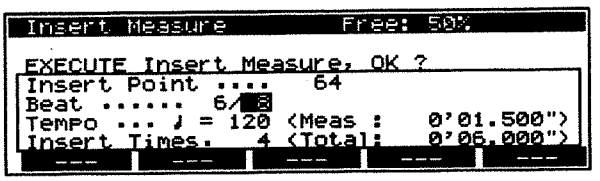


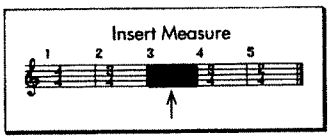
These keys set the time editing mode. In Individual mode, only the time of the cursor selected event will be changed—other events' timings will stay the same. In To End mode, changing the timing of any event affects all subsequent events as well.

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



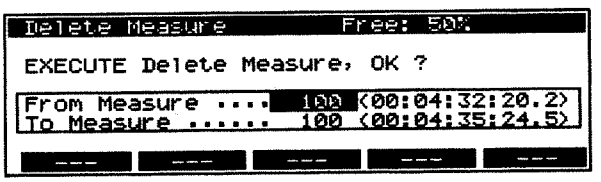
INSERT MEASURE (F2)

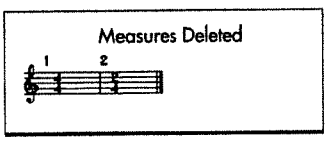




You can add individual measures to the Tempo Map from this screen. The Time Signature (Beat), and Tempo can be set, as well as the number of measures to be added (Insert Times). The DM-80 displays the duration of the measures to be inserted.

DELETE MEASURE (F3)

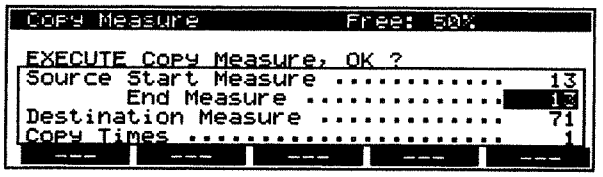


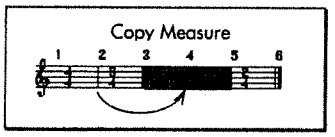


You can remove measure regions of the map with DELETE MEASURE.

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.

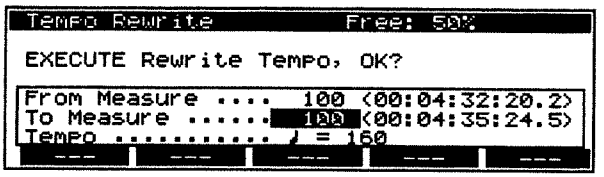
COPY MEASURE (F4)





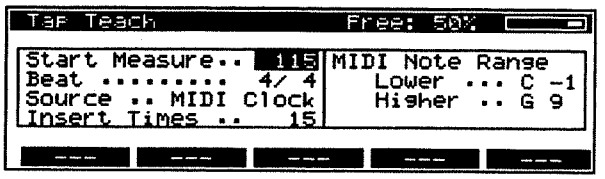
You can copy one section of the tempo map and insert it to another with this command. The Copy Times parameter enables repeat copies.

REWRITE (F5)

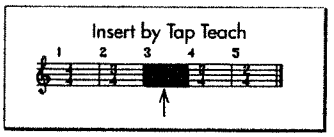


You can change the tempo of already existing measures from this screen.

TEACH (FUNCTION+F1)



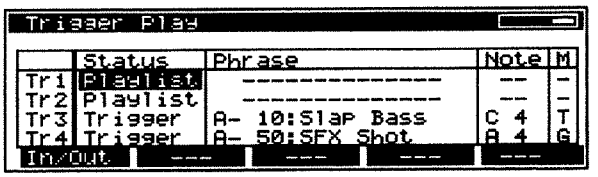
Using Tap Teach, you can program the tempo map automatically. There are several ways to accomplish this.



Play the DM-80 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-80 track.

Use an external MIDI clock source to define the beats. This will "stripe" the tempo on the DM-80. 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-80 in sync with your sequencer.

TRIGGER PLAY 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—retriggering 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 PARAM/TIME dial, set the Status to Trigger.

Move to the Phrase column. Using the PARAM 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

STATUS

Sets each track to Trigger or Playlist mode.

PHRASE

Defines which Phrase will be triggered on each track. Select the Phrase parameter for the desired track with the Cursor. Rotating the PARAM/ 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 is held down, "Gated" (G).

IN/OUT ASSIGN (F1)

This page is the DM-80's *Patch Bay*. Inputs can be patched to the desired outputs for recording or remix.

The input sources are:

The eight analog inputs (In-1—In-8)

The digital inputs (DgA-L, DgA-R, DgB-L, DgB-R)

The output of the mixer itself (RecL, RecR)

The output destinations are:

The Mixer (Mix), for mix to the stereo Mix Outputs.

The corresponding Direct Output 1–8, Pre-fader (Pre).

The corresponding Direct Output 1–8, Post-fader (Pst). The input will go through the Mixer's level and EQ but will not be summed with the other mixer channels.

The Record bus (Rec), for bounce down and other applications.

The mixer's Aux channels are also patched in In/Out screen. Any input can be can be assigned to these channels, but the output can only be routed to Mix or Rec.

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 98) for a diagram of the signal path.

INPUT 7/8 SELECT (DM-80-8 ONLY)

If you are using a DM-80-8 eight track unit, Inputs 7 & 8 Can be set to either analog inputs 7 & 8 (In-7&8), or the Digital B input (DgB-L&R). This enables both pairs of Digital Inputs to be used together to record a multi-track Take.

Note: The Digital B input cannot be used if the Project sample rate is 32 kHz. When a Project's Sample Rate is set to 32 kHz, the input will be fixed at Analog.

RATE CONVERSION

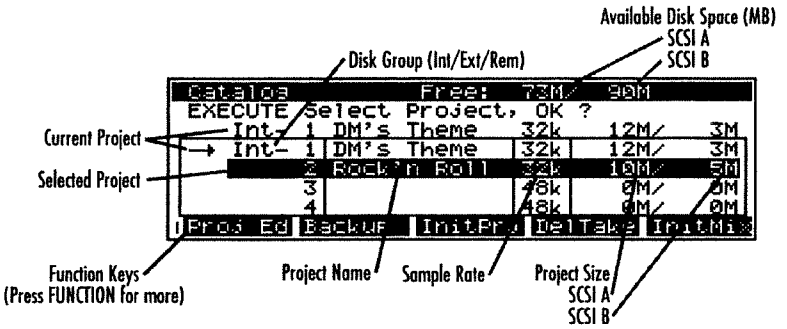
On the DM-80-8, the second digital input (DIGITAL B) is automatically sample rate converted in order to be exactly synchronized to the Project's sample rate.

The display will show **Dg B ???** if there is no signal present at the Digital B input, or if it cannot lock to it. When the DM-80 locks to the Digital B input, the display will read **Dg B L/R**.

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.

CATALOG MODE



The catalog mode contains a number of utility functions including:

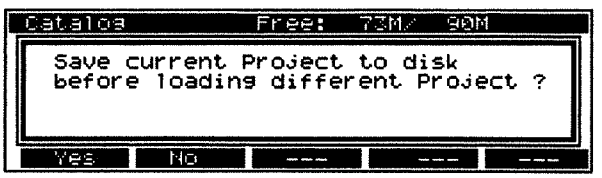
- **Project selection, initializing, naming, copying, and setting the sample rate.**
- **Take and Tempo Map management—copying and deleting**
- **Compu Mix data management—initializing**
- **Data Backup and Restore**
- **Disk formatting**

SELECTING A PROJECT

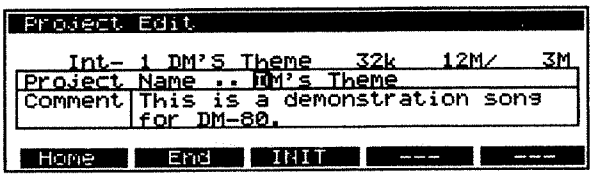
Open a Project file by scrolling through the list (using the Param/Time Dial or cursor keys) , then press EXECUTE to make your choice.

The arrow at the left side of the display indicates the Current Project.

After pressing EXECUTE, you can save the current Project to disk before continuing.



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.

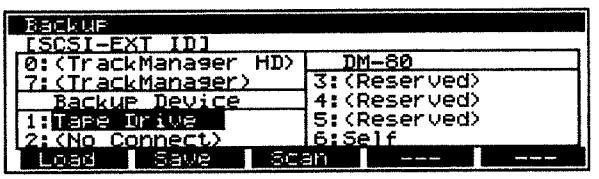
END (F2)

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.

BACKUP (F2)



The Backup page loads or saves an individual Project to a tape backup device connected to the SCSI EXT port.

8mm (Video8) or 4mm (DAT) SCSI-based tape backup devices can be used with the DM-80. Check the recommended drive listing enclosed with the DM-80 rack unit 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 (Function+F1).

First, select a Backup Device using the cursor; then select a function with one of the Function keys.

Note: The device number of your SCSI backup unit must be set to either 1 or 2—all other numbers are reserved, as shown on the Backup screen above.

LOAD PROJECT (F1)

This copies a Project file from SCSI EXT 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 RAM for 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 75).

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

Note: An eight-track Project will not load into a four-track DM-80.

PROCEDURE

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

Press BACKUP (F2)

Select the backup device using the cursor

Press LOAD (F1). The DM-80 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.

SAVE PROJECT (F2)

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

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 tape cassette must be used for each Project. All Project data (from both SCSI A & B) must fit on a single cassette, maximum 5 GByte.

BACKUP TIME

The DM-80 transfers data to 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.

PROJECT DATA SIZE		*APPROXIMATE BACKUP TIME*
50 MB		5 Minutes
100 MB	Internal DM-80-4	10 Minutes
200 MB	Internal DM-80-8	20 Minutes
320 MB	One M/O Disk	32 Minutes
500 MB		50 Minutes
1 GB	Large Hard Disk	1.7 Hours
2 GB		3.4 Hours
5 GB	Maximum	8.5 Hours

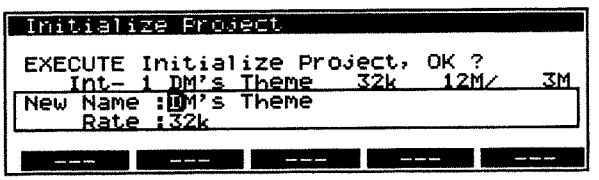
NOTES:

- **Project data size is the total of SCSI A & B.**
- **Tape length must be longer than Backup Time.**
- **The above table applies to both 8mm (Video8) and 4mm (DAT) tape.**

SCAN (F3)

Scan checks all SCSI three 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.

INITIALIZE PROJECT (F 3)



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.

CHOOSING A SAMPLING RATE

Each internal 100 MByte hard disk 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. Also, converting digital data from one sample rate to another should be avoided whenever possible, since the sound is degraded by the conversion process. Therefore it makes sense to choose the sample rate most appropriate to your project.

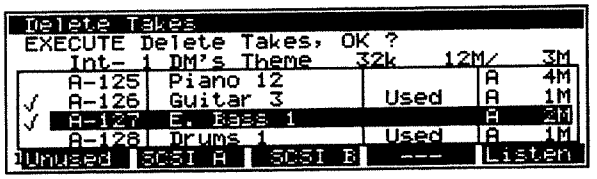
SOME SUGGESTIONS ABOUT SAMPLE RATES:

- If your Project will end up on a Compact Disc, and will remain in the digital domain from the DM-80 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-80 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 currently used in Japan and Europe (US DBS broadcasts start in 1994), 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-80's digital I/O ports.

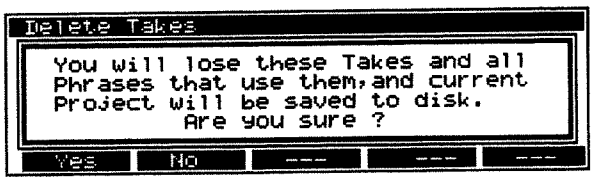
Important: It is illegal to copy and/or distribute copyrighted material without the previous written consent of the copyright holder. When recording from Compact Disc or other material, please respect copyright laws.

DELETE TAKES (F4)



DELETE TAKES erases selected Takes from the current Project. There are several functions used to select (mark) which Takes to delete.

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 TAKES.

UNUSED (F1)

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

SCSI A (F2)
SCSI B (F3)

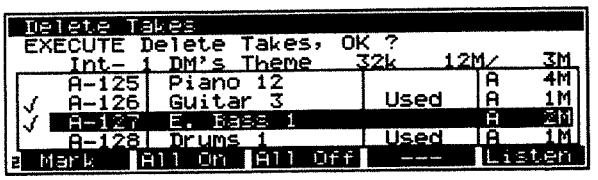
These commands marks all Takes from the selected bus. They are useful for clearing out disk space in preparation for new recording.

LISTEN (F5)

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

Press STOP to stop playing.

MARK (FUNCTION+F1)



This marks the selected Take to be deleted.

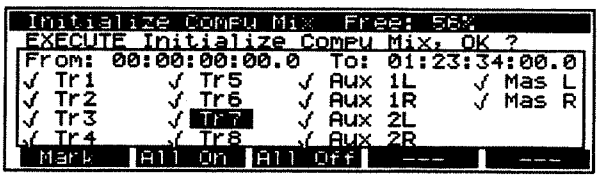
ALL ON (FUNCTION+F2)

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

ALL OFF (FUNCTION+F3)

This command unmarks all Takes.

INITIALIZE COMPU MIX (F5)



This command clears mix data on selected tracks within a specific time range.

TIME RANGE

The From and To parameters specify the time range to be erased.

SELECTING TRACKS

Tracks to be initialized have a check mark in the display.

Use the cursor to select a track.

MARK (F1)

This marks the selected Channel to be initialized.

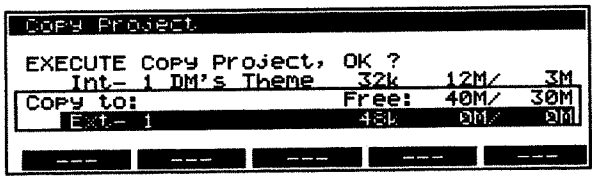
ALL ON (F2)

This command marks all Channels in the Project. It is useful for erasing a section or the entire mix.

ALL OFF (F3)

This command unmarks all Channels.

COPY PROJECT (FUNCTION+F1)



This command is used to copy the current Projects to another location—to make a backup copy on the same disk, or to another disk such as an optical disk. COPY PROJECT can also be used to make a backup copy to a 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 the there is not enough free memory, the command will not execute.

ABOUT DISK GROUPS

The DM-80 divides all disks attached to the SCSI-A and SCSI-B ports into three groups: Internal, External, and Removable.

INTERNAL (PROJECTS I1–I50)

This group contains the DM-80's internal disks, plus any additional disks formatted as *Internal disks*. If external drives are formatted as Internal disks, they will need to be connected and on-line at all times while the DM-80 is in operation.

EXTERNAL (PROJECTS E1–E50)

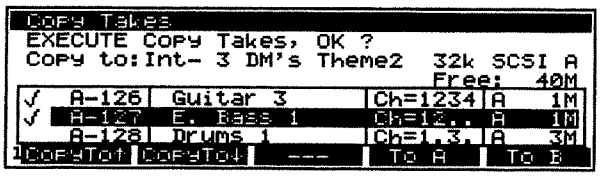
This group contains all drives formatted as *External* disks. If you have a fixed disk drive(s) that you plan to move from one DM-80 system to another, make sure it is formatted as *External*.

REMOVABLE (PROJECTS R1–R50)

This group contains all drives with removable media such as optical drives, formatted as *Removable* disks.

For more information about disk groups, see *About Disk Groups* in the DM-80-4/8 manual starting on page 20.

COPY TAKES (FUNCTION+F2)



Individual Takes can be copied from the current Project to another using this command. Takes are first selected (marked) and then copied to the destination Project.

Note: A Take can only be copied if its sample rate is the same as the destination Project, or the destination Project is empty.

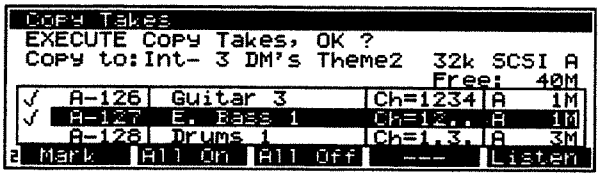
Note: All Takes will be copied to either SCSI A or SCSI B.

PROCEDURE

Press COPY TO↑ (F1) or COPY TO↓ (F2) to select the destination Project.

Press TO A (F4) or TO B (F5) to select whether to copy to SCSI A (tracks 1–4) or SCSI B (tracks 5–8).

Press FUNCTION to select the other function keys:



Use the CURSOR keys or PARAM/TIME dial to scroll through the list of takes. You can audition any of the Takes with the LISTEN (F5) keys.

Press MARK (F1) to select each take to be copied.

ALL ON (F2) marks all Takes in the current Project, ALL OFF (F3) unmarks all of them.

Once the destination Project and Buss have been selected and all the desired Takes have been marked, press EXECUTE to make the copy.

Note: If there is not enough space on the destination disk, COPY TAKE will stop after the disk's capacity has been reached.

COPY TO↑ (F1)
COPY TO↓ (F2)

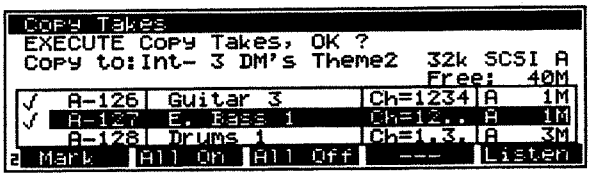
These select the destination Project for the copy.

TO A (F4)
TO B (F5)

These select whether the Takes will be copied to SCSI A (tracks 1–4) or SCSI B (tracks 5–8).

Note: All Takes must be copied to *either* SCSI A or SCSI B.

MARK (FUNCTION+F1)



This marks the selected Take to be copied.

ALL ON (FUNCTION+F2)

This command marks all Takes in the Project.

ALL OFF (FUNCTION+F3)

This unmarks all Takes.

LISTEN (FUNCTION+F5)

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

Press STOP to stop playing.

COPY TEMPO MAP (FUNCTION+F3)

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

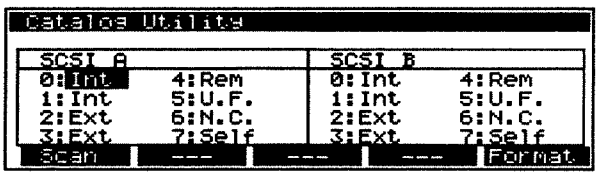
PROCEDURE

Select the destination Project for the copy, using the Cursor keys or the Param/Time Dial.

Press EXECUTE to make the copy.

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

UTILITY (FUNCTION+F5)



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

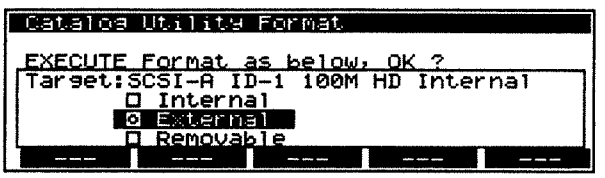
The display shows the formatted group of each drive:

Int	= Internal
Ext	= External
Rem	= Removable
U.F.	= Unformatted
N.C.	= No Connection.

SCAN (F1)

Scan checks all SCSI three 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.

FORMAT (F5)



This formats any of the DM-80's internal disks or any drive attached to the DM-80's SCSI-A or SCSI-B 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 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).

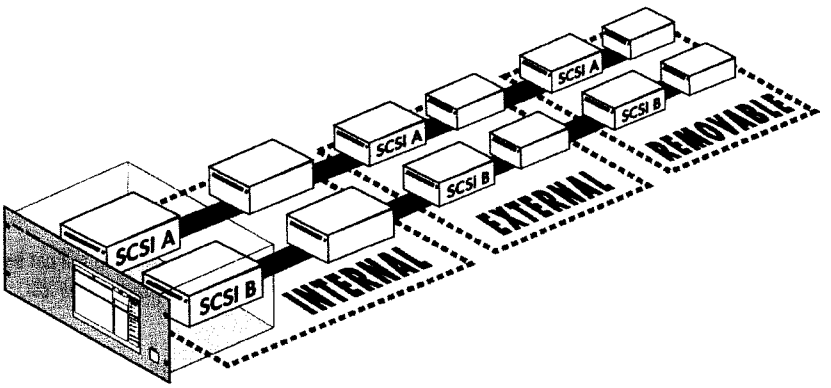
Press FORMAT (F5)

Using the cursor keys, select the ***disk group*** for the drive to be formatted: Internal, External or Removable.

Confirm the settings, then press EXECUTE to start, EXIT to abort.

ABOUT DISK GROUPS

The DM-80 divides all disks attached to the SCSI-A and SCSI-B ports into three groups: Internal, External, and Removable.



INTERNAL

This group contains the DM-80's internal disks, plus any additional disks formatted as *Internal* disks. If external drives are formatted as Internal disks, they will need to be connected and on-line at all times while the DM-80 is in operation.

EXTERNAL

This group contains all drives formatted as *External* disks. If you have a fixed disk drive(s) that you plan to move from one DM-80 system to another, make sure it is formatted as *External*.

REMOVABLE

This group contains drives with removable media such as optical drives, formatted as *Removable* disks.

DISK GROUPINGS

Since the DM-80 considers all drives in a group to be one large disk, all drives in the group must be up and running before the DM-80 will recognize the "disk." Specifically:

If a disk formatted as part of a group is not connected to the DM-80, or is connected to the opposite SCSI connector by mistake, the entire group containing that disk will not be available. In this case, shut down the DM-80, correct the connections, and restart.

All disks formatted as *INTERNAL DISKS*, whether inside or outside of the DM-80 rack, must be connected and on-line at all times while the DM-80 is in operation.

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-80 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.**

DM-80-8 USERS: When formatting disks, be sure to format the drive(s) on the SCSI A Bus first, then the SCSI B drives.

The Internal disk(s) inside the DM-80 rack unit come from the factory formatted as Internal disks. The Demo Project is contained on these disks. Reformatting the Internal group will erase the Demo Project.

BEFORE MAKING SCSI CONNECTIONS

Make sure the power is off before making or changing any SCSI connections to the DM-80. Never connect and/or disconnect cables while the DM-80 is on. The DM-80 cannot recognize such changes and may cause a situation where you cannot save your Project data.

For the most reliable operation, make sure the total length of connecting cable on each SCSI buss does not exceed 6.5 meters, or 21 feet.

SYSTEM MODE

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

SYSTEM PAGE 1

TIME BASE

The Time Base is the source of timing and location information for the DM-80 system. Individual Time Base settings are described below. Specific applications are discussed in the INTERFACING section, starting on Page 87.

INTERNAL

Timing and location information is controlled by the DM-80 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-80 is in PLAY.

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

MIDI TIME CODE (MTC)

Timing and location information is received from MIDI Time Code, whenever the DM-80 is in PLAY.

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

WHEN THE TIMEBASE IS SET TO SMPTE OR MTC:

- **To play the DM-80 while synchronizing to an external clock source, be sure to press the PLAY key on the (slaved) DM-80-R before starting the external (master) device.**
- **When you press STOP on the DM-80-R—the DM-80 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-80 to the external timebase, press PLAY on the DM-80-R, then start the external device.**

SMPTE RATE/FORMAT

This sets the SMPTE code frame rate.

30 – NON DROP

This is the standard frame rate for American and Japanese (NTSC) video and audio. However, it takes slightly more than one second to play the 30 frames (for archaic reasons having to do with color video broadcast bandwidth), so there is a discrepancy between tape time and real time.

30 – DROP

To eliminate the discrepancy between SMPTE code and real time, 30 Drop Frame format (actually 29.97) skips (drops) one frame each minute. 30 – Drop should be used if you are working in broadcast television.

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

START TIME

With SMPTE (and MTC) this parameter sets the starting frame number of the Project. All SMPTE timings (received and transmitted) are referenced to this starting frame.

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.

RECEIVE OFFSET

This parameter adds (or subtracts) a frame offset to each received time code frame. Receive Offset is useful for compensating for small changes in synchronization.

The offset range is about a minute in each direction: –00:00:59:29.9 ~ +00:00:59:29.9.

ERROR LEVEL

When the DM-80 receives inconsistent SMPTE data, it will perform a data check. If the data check is okay the DM-80 will continue without interruption, if not the DM-80 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-80 to repeatedly start and stop, you may want to increase the Error Level, which will give the SMPTE data more time to settle down.

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-80 shuts down.

RESTART (F2)

Since the DM-80 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-80 to restart those drives.

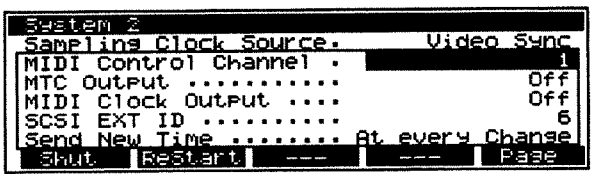
– (F3)
+ (F4)

The – and + keys are used to change the polarity of the SMPTE receive offset—*before* or *after* 00:00:00:00.0.

PAGE (F5)

This advances to the next System page. From the System 3 page, pressing PAGE returns to the System 1 page.

SYSTEM PAGE 2



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-80.

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 A INPUT

Set the DM-80 to sync to the DIGITAL A input when recording a digital source from that input.

Note: If the Sampling Rate Source is set to Digital A and no digital signal is present at the input, the DM-80'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 A 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.

Note About Sample Rate Conversion:

> **The Digital B input on a DM-80-8 rack unit will always slave to whatever sampling rate source is selected, and unlike the Digital A input, will be sample rate converted to maintain perfect sync at any sample rate. Other than this, the DM-80 will not perform any sample rate conversion. This means a 48 kHz-rate digital source cannot be recorded in a 44.1 kHz Project, unless the source is connected to the Digital B input—only on a DM-80-8.**

VIDEO SYNC

The VIDEO SYNC BNC connector on the DM-80 rear panel is for video "house" sync. This allows the DM-80 to sync to digital video recorders.

Video and post-production audio studios often supply a video sync signal, called "house sync," used to exactly synchronize the video scanning lines. In the same way, house sync can also be used to synchronize digital audio devices. The DM-80 reads the video sync signal, then interprets it to achieve proper digital sampling synchronization.

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-80, 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.

SCSI EXT ID

This sets the DM-80's ID number for the SCSI EXT bus, used for backup. It does not effect SCSI A or SCSI B.

WHAT IS SCSI?

SCSI stands for Small Computer System Interface. SCSI is a high-speed, computer industry-standard interface, defined by the American National Standards Institute (ANSI). SCSI enables the DM-80 to connect to a wide number of devices for recording and high-speed data transfer.

The DM-80 has three independent SCSI ports, used for different purposes.The DM-80's SCSI EXT port is used for data transfer other than real-time recording and playback, such as backup to SCSI tape drives.

SCSI DEVICE NUMBERS

Each DM-80 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.

For the SCSI EXT bus, the DM-80's Device Number can be set from 3 to6.

For Macintosh computers, the computer's device number is fixed at 7, while the internal hard disk is set to 0.

For more information about SCSI, Device Numbering and Termination, please consult the DM-80-4/8 Rack Unit manual.

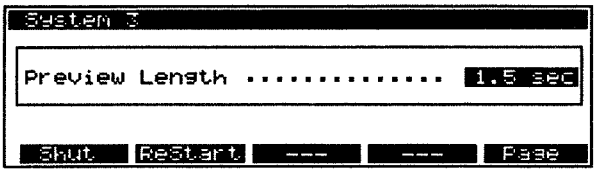
Note: For interfacing via MIDI (without SCSI), you do not need to concerned with device numbers.

SEND NEW TIME

Should the DM-80 *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-80 while looking for edit points, tempo mapping, etc.

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

SYSTEM PAGE 3



PREVIEW LENGTH

The Preview key plays a segment of the current Project, starting at the current time. The length of the Preview segment is set here. The maximum length is 5 seconds.

INTERFACING THE DM-80

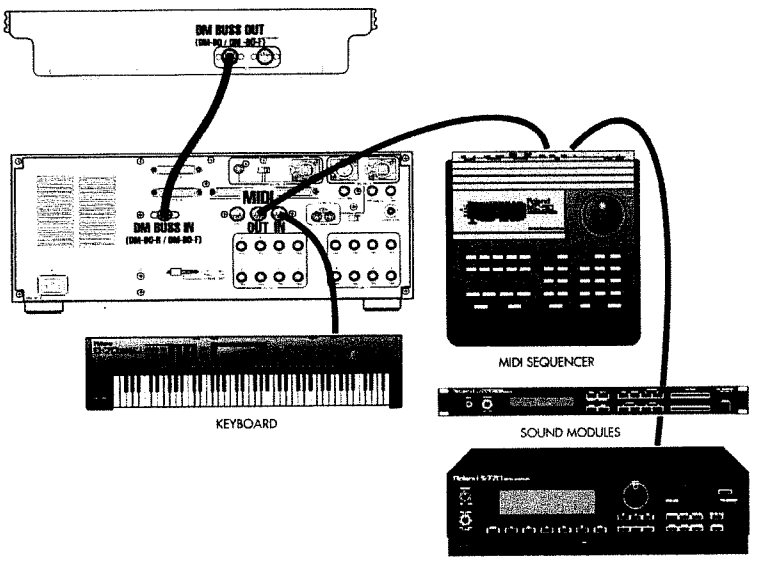
This section offers a couple of suggestions for real world applications.

MIDI STUDIO APPLICATION

Combining a MIDI sequencer with the DM-80 forms a powerful multi-track recording environment.

HOOKUP

The DM-80 should be set as the master clock in most cases. However the DM-80 *can* slave to a sequencer via MTC.



SYNCHRONIZATION

There are two options for synchronizing a sequencer to the DM-80: MIDI Time Code and MIDI Clocks.

MTC

If your sequencer supports it, MIDI Time Code offers tempo–independent synchronization between DM-80 and Sequencer. MTC doesn't require a Tempo Map, and provides a consistent time metaphor (hours:minutes:seconds:frames) between units.

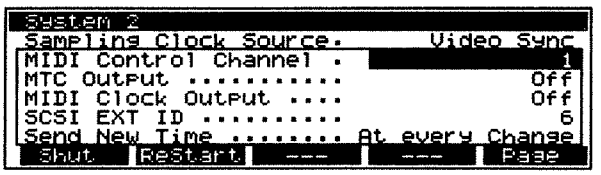
MIDI BEAT CLOCKS / SONG POINTER

Synchronization using MIDI Clocks has the advantage of timing oriented in musical terms: Measures and Beats rather than frame numbers. The timing of MIDI clocks is determined by the DM-80's Tempo Map. Almost all sequencers, drum machines and other timing-oriented MIDI devices support MIDI Clocks.

SYNC SETTINGS

On the System 1 page, make sure the Time Base is set to Internal as shown below:

On the System 2 page, turn ON either MTC OUTPUT or MIDI CLOCK OUTPUT, depending on which clock format you are using.



SETTING UP THE TEMPO MAP

When using a time-oriented device like the DM-80 in combination with a musically-oriented device such as sequencer or drum machine, the Tempo Map becomes the critical link between them. Below, a few common applications are described with suggestions for handling them.

"STRIPING" MIDI BEAT CLOCKS

One method for setting up the Tempo Map is to *Stripe* the Tempo Map with clocks from your MIDI sequencer before recording, just as you might stripe SMPTE onto a tape before a session. This method is especially useful if your sequencer already contains recorded parts.

On the Tap Teach page, set the Source parameter to MIDI Clock as shown below:

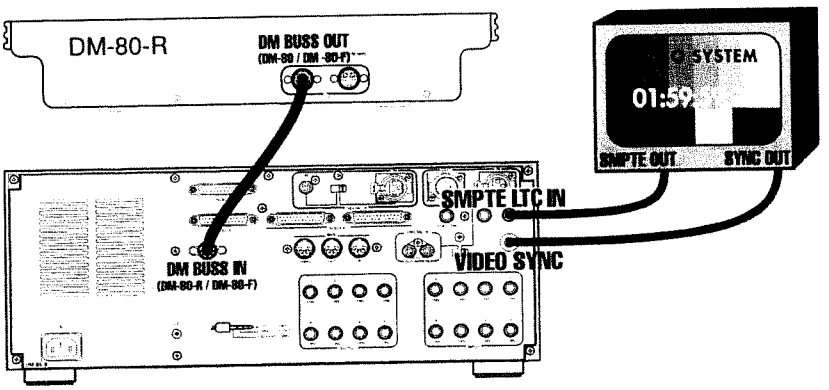
SYNCING A MIDI SEQUENCER TO A LIVE TRACK

If you need to synchronize a quantized sequencer track with a live DM-80 recording, calibrating the Tempo Map to the live track and then slaving your sequencer using MIDI Clocks might be easiest. Use the DM-80's Tap Teach function to precisely interpret the tempo of the live recording.

POST PRODUCTION APPLICATION

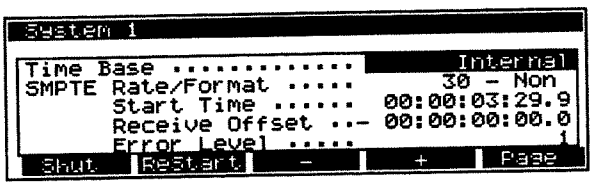
HOOKUP

In this application, the DM-80 receives timing from SMPTE and sampling rate sync from house video.

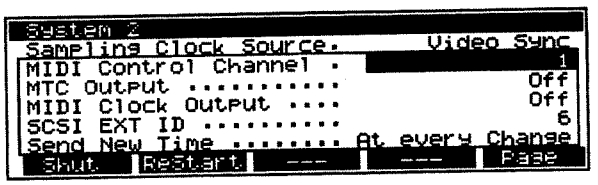


SETUP

In the System 1 screen, set the TIME BASE to SMPTE and the SMPTE RATE/FORMAT to match the format being used.



On the System 2 page, set the SAMPLING CLOCK SOURCE to Video Sync as shown below:



SYNC

The DM-80 will lock to SMPTE whenever the PLAY key is pressed. For ease of editing and other off-line functions, the DM-80 uses its Internal clock when not in PLAY, for example when stopped (by pressing the STOP key on the DM-80-R). However, the Timebase parameter does not change, and remains set to SMPTE.

Remember that valid SMPTE and Video Sync signals must be present at the inputs for proper play and record operations.

BACKING UP YOUR DATA

Man's creativity is infinite, yet the DM-80'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 creativity off the disks to make room for further expression.

WHY ITS IMPORTANT

Data backup is one of those things you don't want to put off for too long. As most computer users know from first-hand 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-80 hourly.

HOW TO BACKUP YOUR DATA

There are two ways to save DM-80 data:

BACKUP TO TAPE

The DM-80's Backup function is designed to operate efficiently with SCSI tape backup systems using 4mm (DAT) and 8mm (Video8) tape. The tape backup peripheral is connected to the SCSI EXT port.

Using tape enables multiple backups to be made at low cost. Using a SCSI-based data tape device gives higher reliability than with a DAT system designed to record sound.

See Backup (page 69) for more information.

COPY PROJECT TO DISK

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 (page 75) for more information.

OPTICAL DISK

Magneto-Optical and Phase-Change Rewritable Optical disk drives such as those supplied by Sony and Panasonic are well-suited for backup since they store 290 MB or more on each side of the disk.

TROUBLESHOOTING

If you are having difficulty making the DM-80 perform properly, one of the following situations might causing your problem.

BASIC FUNCTIONALITY

DM-80 DOES NOT FUNCTION

Check that the DM BUSS and 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.

Did you power up the system in the proper order? See Rack Manual, page 17.

OPTIONAL KEYBOARD DOES NOT FUNCTION

- Only works with IBM XT or AT compatible computer keyboards.
- Connect the keyboard before powering up DM-80 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-80 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 or cartridges.

Check SCSI Device IDs: each drive should be assigned a unique number.

Is the drive formatted? See the DM-80 rack manual, starting on page 18.

DRIVES DO NOT WORK PROPERLY

Check the termination for each bus, and remove or add terminators as necessary. See the DM-80 rack manual, page 21.

Never connect more than two terminators to a bus.

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 1 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 2 screen.

If this parameter is set to Digital A, make sure a digital signal at the Project's sample frequency is present at the input, or switch to Internal.

If this parameter is set to Video Sync, make sure a valid video signal is present at the Video Sync 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 THROUGH ANALOG INPUTS 7 & 8

Make sure the Input 7/8 Parameter in the Input/Output Assign screen is set to Analog—press RECORD, In/Out (F3).

CANNOT RECORD FROM DIGITAL A

IF THE SAMPLING RATE INDICATOR IS FLASHING:

Is the Sampling Rate Source is set to Digital A 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:

- **Use the Digital B input (DM-80-8 only)**
- **Choose a Project at the correct sample rate to record on.**
- **Change the sample rate of the source.**
- **Record from an analog input instead.**

IF THE SAMPLING RATE INDICATOR IS NOT FLASHING:

Is Sample Rate Source set to DIGITAL A? (SYSTEM 2 Page)

Make sure the Digital A input is assigned to the tracks you wish to record on.

Check your connections.

CANNOT RECORD FROM DIGITAL B

Make sure the Input 7/8 Parameter in the Input/Output screen is set to Dg B L/R—press RECORD, In/Out (F3). The Input 7/8 parameter will show "???" until a digital signal is connected to the Digital B input, when the display will change to "Dg B L/R".

Make sure the Digital B input is assigned to the tracks you wish to record on.

Make sure the Project sample rate is 44.1 or 48 kHz—the Digital B input cannot be used at 32 kHz.

Check your connections.

E D I T

CANNOT COPY TAKES

Make sure the Sample Rates between the source and destination Projects match.

PHRASES SOUND DISTORTED

Use a proper recording level. Avoid clipping.

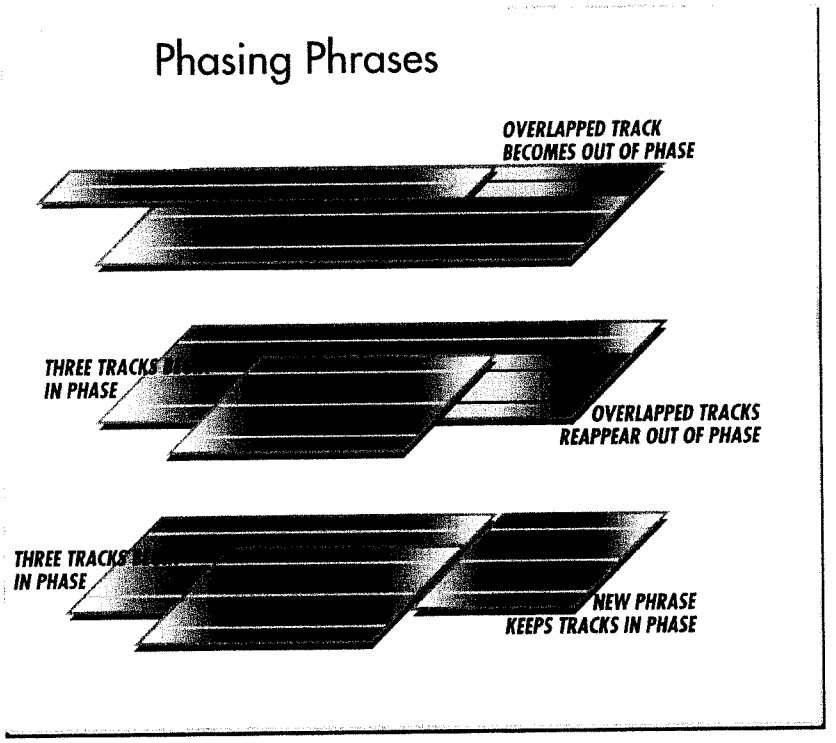
Are you using a large amount of EQ boost? It *is* possible to overdrive the DM-80's internal digital mixer and cause distortion. Increase headroom, decrease the level or amount of EQ boost.

TRACKS ARE OUT OF PHASE

When the DM-80 records a multi-track Phrase, as long as all tracks of that Phrase start at the same time, they will play back in perfect phase. However, if one or more tracks of the Phrase start at a different time or are interrupted in the middle (by another track overlapping some of the tracks, for example), then exact phase synchronization will be lost. This should only be noticeable when one sound is panned across several tracks—the timing will still be close enough for most musical applications.

To maintain perfect phase relationships, avoid overlapping only some tracks of a multi-track Phrase—overlap all the tracks, or re-edit the Phrases so none of the tracks overlap:

Phasing Phrases



M I X

NO SOUND FROM DIRECT OUTPUTS

Make sure the Track Output Assign is set to DIRECT/PRE or POST—press MIXER, then In/Out (F4).

CANNOT HEAR SOME TRACKS THROUGH MIX OUTPUT

Make sure the Track Output Assign is set to MIX—press MIXER, then In/Out (F4).

COMPU MIX DOES NOT FUNCTION

Make sure the Track Output Assign is set to MIX or DIRECT/POST—press MIXER, then In/Out (F4).

CANNOT RECORD COMPU MIX

Make sure the Track is set for Mix Recording—press MIXER, COMPU (F1), then check the Track Status Select LEDs.

Remember that level and pan recording will not start until you match the fader position with the square mark, and the mark disappears.

Confirm there is available mix memory—the Free % on the top of the mixer screens should be above 00%.

TEMPO MAP

CANNOT USE METRONOME

A Tempo Map must exist before the Metronome can be used.

If a Tempo Map exists, make sure it covers the current location. The Tempo Map does not have to cover the entire Project.

Check the Metronome settings—press RECORD, CLICK (F4).

CANNOT CREATE TEMPO MAP

Confirm there is available Tempo Map memory—the Free % on the top of the Tempo screen should be above 00%.

INTERFACING

DOES NOT SYNC TO SMPTE OR MTC

Make sure TIME BASE on the SYSTEM 1 page is set to SMPTE or MTC as desired.

Match SMPTE frame rates.

Check SMPTE output level and verify that the DM-80 can read it.

Be sure to press PLAY on the DM-80-R before starting the external controlling device. When you press STOP on the DM-80-R, the DM-80 acts as if the Time Base is set to internal. This is done in order to enable editing and other off-line functions. To re-synchronize to the external time base, press PLAY, then start the external device.

CANNOT TRANSMIT OR RECEIVE MIDI EVENTS

Check the setting of the MIDI Control Channel, on the SYSTEM 2 screen. All channelized MIDI events are transmitted and received on this MIDI control channel.

For the Metronome, check parameters on the CLICK (Metronome) screen.

For the Record Trigger, check parameters on the Record Common screen.

UPGRADES AND SERVICE

SYSTEM SOFTWARE

Roland will periodically release new versions of system software to fix problems 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.

EIGHT TRACK UPGRADE (DM-80-E)

A DM-80-4 can be upgraded to eight tracks with the installation of the DM-80-E Expansion Upgrade. The DM-80-E must be installed by a Roland Authorized Service Center. For more information, contact Roland or your nearest Service Center.

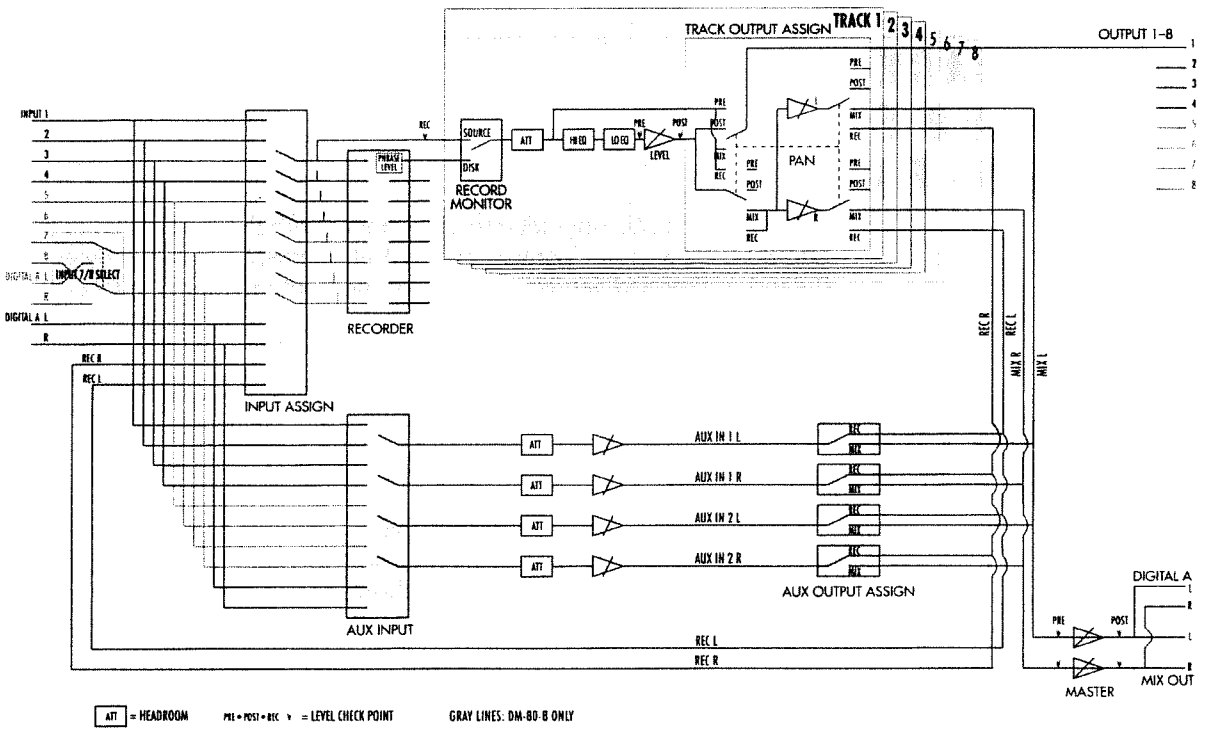
RETURNING FOR SERVICE

The DM-80 has no user-serviceable parts. Attempts by unauthorized personnel to repair or modify the DM-80 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-80, 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 unit.

Use the original packing material that came with the DM-80-R to ship the unit. If the original packaging is not available, use a reinforced, sealable, foam-lined case. Remember, hard disks are fragile devices.

MIXER SECTION BLOCK DIAGRAM



SPECIFICATIONS

DISPLAY

LCD: 64 x 240 dot, 40 characters x 8 lines
LED: 7 segment numeric x 9

FRONT PANEL

SWITCHES

Cursor (Up/Down/Left/Right)
Phrase Locate (Previous, Next)
Markers (1-8, Capture Start, End, In, Out, Delete, Shift)
Track Status Select (1-8)
Transport Switches (Zero, Rewind, Play, Forward, Stop, Record)
Execute
Menu
Function Keys (F1-F5, Function)
Exit
Mode Switches (Record, Playlist, Mixer, Tempo, Trigger, Catalog, System)
Preview
Jump
Data Entry Keypad

OTHERS

Param/Time Dial (detented)
LCD Contrast

REAR PANEL

DM Buss Output jack
ASCII keyboard jack

OPERATIONAL

SAMPLE RATES

48 kHz, 44.1 kHz, 32 kHz

DIGITAL B INPUT CONVERSION RATES (DM-80-8 ONLY)

48 kHz, 44.1 kHz, 44.056 kHz, 32 kHz

DISK

MAXIMUM RECORDING TIME (INTERNAL DISK – TOTAL PER FOUR TRACKS)

16 minutes @ 48 kHz
18 minutes @ 44.1 kHz
25 minutes @ 32 kHz

THEORETICAL DISK LIMIT

4 GByte (12 Hours @ 48 kHz)

PROJECT

TAKES

Maximum 128 per 4 tracks

PHRASES

Maximum 300 per 4 tracks

TEMPO MAP

Maximum 2000 events - one per measure default plus as many as one each 32nd note.

COMPU MIX

Maximum 10,000 events

PHYSICAL

DIMENSIONS

430 (W) x 268 (D) x 65 (H)mm

16 15/16" x 10 9/16" x 2 9/16"

WEIGHT

3.24 Kg, 7.15 Lbs.

INCLUDED ITEMS

Owner's Manual

OPTIONS

Fader Unit (DM-80-F)

Rack Mounting Angle (RAD-80)

In the interest of product improvement, the specifications of this unit are subject to change without notice.

INDEX

Information

●When you need repair service, call your local Roland Service Station or the authorized Roland distributor in your country as shown below.

U. S. A.
Roland Corp US
7200 Dominion Circle
Los Angeles, CA. 90040 - 3647
U. S. A.
☎ (213)685 - 5141

CANADA
Roland Canada Music Ltd.
(Head Office)
5480 Parkwood
Richmond B. C., V6V 2M4
CANADA
☎ (604)270 - 6626

Roland Canada Music Ltd.
9425 Transcanadienne
Service Rd. N.,
St Laurent, Quebec H4S 1V3
CANADA
☎ (514)335 - 2009

Roland Canada Music Ltd.
346 Watline Avenue,
Mississauga, Ontario L4Z 1X2
CANADA
☎ (416)890 - 6488

AUSTRALIA
Roland Corporation
(Australia)Pty. Ltd.
(Head Office)
38 Campbell Avenue
Dee Why West. NSW 2099
AUSTRALIA
☎ (02)982 - 8266

Roland Corporation
(Australia)Pty. Ltd.
(Melbourne Office)
50 Garden Street
South Yarra, Victoria 3141
AUSTRALIA
☎ (03)241 - 1254

NEW ZEALAND
Roland Corporation (NZ)Ltd.
97 Mt. Eden Road, Mt, Eden,
Auckland 3
NEW ZEALAND
☎ (09)3098 - 715

UNITED KINGDOM
Roland(UK)Ltd.
Rye Close
Ancells Business Park
Fleet
Hampshire GU13 8UY
UNITED KINGDOM
☎ 0252 - 816181

GERMANY
Roland Elektronische
Musikinstrumente
Handelsgesellschaft mbH.
Oststrasse 96,
2000 Norderstedt
GERMANY
☎ 040/52 60 090

BELGIUM/HOLLAND/ LUXEMBOURG
Roland Benelux N. V.
Houtstraat 1
B - 2260 Oevel - Westerlo
BELGIUM
☎ (0032)14 - 575811

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Langebrogade 6
Box 1937
DK - 1023 Copenhagen K.
DENMARK
☎ 31 - 95 31 11

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Roland Scandinavia as
DanvikCenter 28 A, 2 tr.
S - 131 30 Nacka,
SWEDEN
☎ 08 - 702 00 20

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Roland Scandinavia
Avd. Norge
Lilleakerveien 2
Postboks 95 Lilleaker
N - 0216 Oslo 2
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☎ 02 - 73 00 74

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Fazer Musik Inc.
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POB 169
SF - 02101 Espoo
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20020 ARESE MILANO
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☎ 02 - 93581311

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Calle Bolivia 239
08020 Barcelona
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☎ 93 - 308 - 1000

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Gerberstrasse 5, CH - 4410
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☎ 061/921 16 15

Roland CK (Switzerland) AG
Hauptstrasse 21/Postfach
CH - 4456 Tenniken
SWITZERLAND
☎ 061/98 60 55
Repair Service by Musitronic AG

FRANCE
Musikengro
102 Avenue Jean - Jaures
69007 Lyon Cedex 07
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☎ (7)858 - 54 60

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41 rue Charles - Fourier,
94400 Vitry s/Seine
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☎ (1)4680 86 62

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A - 6021 Innsbruck Box 591
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☎ (0512)63 451

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2 Phidiou Str., GR 106 78
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Rua de Santa Catarina 131
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2045 Torokbalint
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☎ (1)1868905

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25 Pinsker St.,
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☎ 03 - 283015

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Bras Basah Complex #03 - 23
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330 Verng Nakorn Kasem, Soi 2
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No.142, Jalan Bukit Bintang
55100 Kuala Lumpur
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☎ 2421288

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Kompleks Perkantoran
Duta Merlin Blok C/59
Jl. Gajah mada No.3 - 5
Jakarta 10130
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Siraselviler Cad. 86/6 Taksim
Istanbul
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☎ 149 93 24

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Radex Sound Equipment Ltd.
17 Panteli Katelari Str.
P.O.Box 2046, Nicosia
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