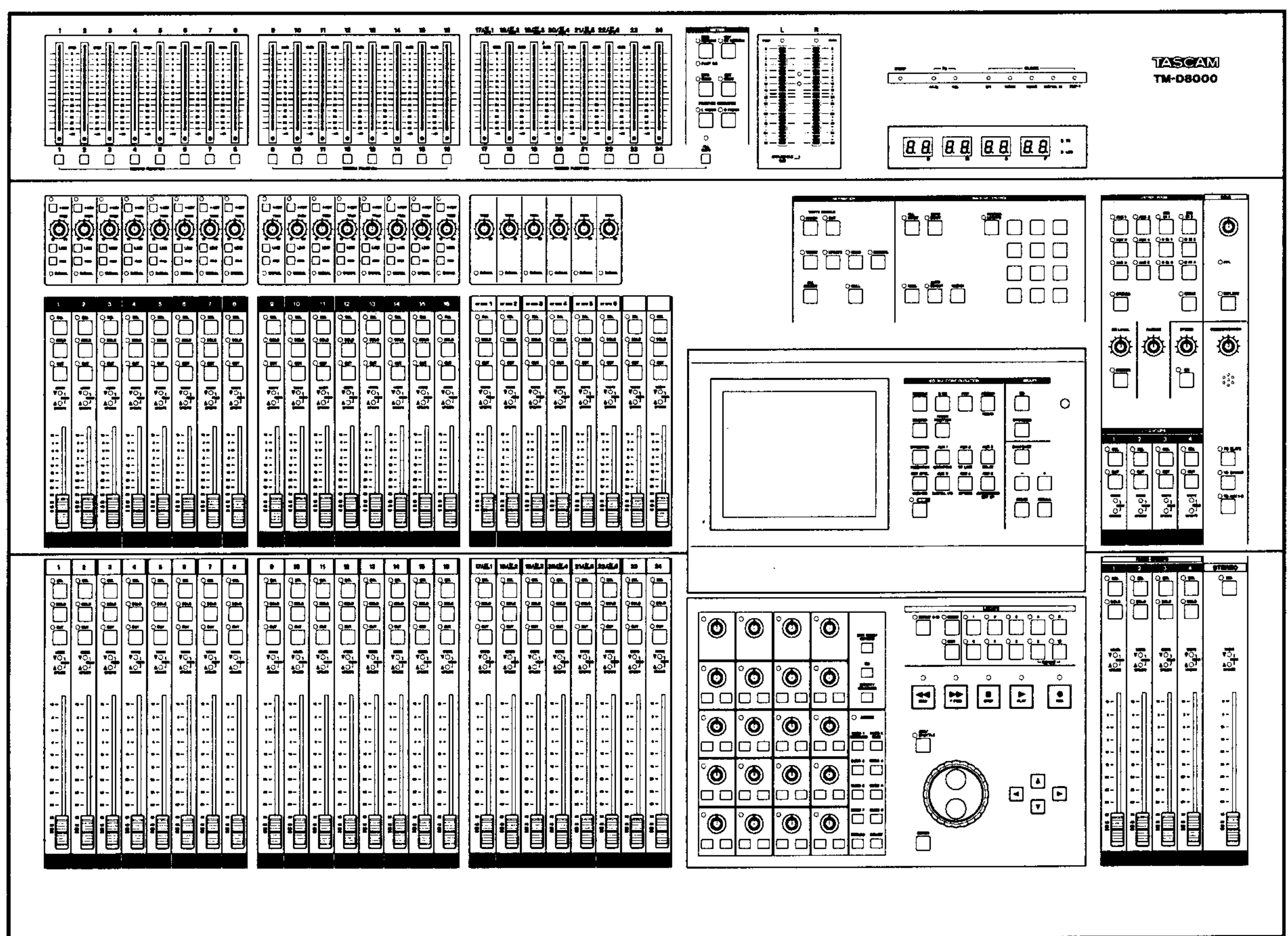


TASCAM

TEAC Professional Division

TM-D8000

Digital Mixing Console



Reference Manual

D00365300A



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN



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



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



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

This appliance has a serial number located on the rear panel. Please record the model number and serial number and retain them for your records.

Model number _____

Serial number _____

**WARNING: TO PREVENT FIRE OR SHOCK
HAZARD, DO NOT EXPOSE THIS
APPLIANCE TO RAIN OR MOISTURE.**

IMPORTANT (for U.K. Customers)

DO NOT cut off the mains plug from this equipment.

If the plug fitted is not suitable for the power points in your home or the cable is too short to reach a power point, then obtain an appropriate safety approved extension lead or consult your dealer.

If nonetheless the mains plug is cut off, remove the fuse and dispose of the plug immediately, to avoid a possible shock hazard by inadvertent connection to the mains supply.

If this product is not provided with a mains plug, or one has to be fitted, then follow the instructions given below:

IMPORTANT: The wires in this mains lead are coloured in accordance with the following code:

GREEN-AND-YELLOW	: EARTH
BLUE	: NEUTRAL
BROWN	: LIVE

WARNING: This apparatus must be earthed.

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

The wire which is coloured GREEN-and-YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol \perp or coloured GREEN or GREEN-and-YELLOW.

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

When replacing the fuse only a correctly rated approved type should be used and be sure to re-fit the fuse cover.

IF IN DOUBT — CONSULT A COMPETENT ELECTRICIAN.

For U.S.A

TO THE USER

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAUTION

Changes or modifications to this equipment not expressly approved by TEAC CORPORATION for compliance could void the user's authority to operate this equipment.

For the consumers in Europe

WARNING

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

Pour les utilisateurs en Europe

AVERTISSEMENT

Il s'agit d'un produit de Classe A. Dans un environnement domestique, cet appareil peut provoquer des interférences radio, dans ce cas l'utilisateur peut être amené à prendre des mesures appropriées.

Für Kunden in Europa

Warnung

Dies ist eine Einrichtung, welche die Funk-Entstörung nach Klasse A besitzt. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen und dafür aufzukommen.

CAUTION:

- **Read all of these Instructions.**
- **Save these Instructions for later use.**
- **Follow all Warnings and Instructions marked on the audio equipment.**

- 1) Read instructions** — All the safety and operating instructions should be read before the product is operated.
- 2) Retain instructions** — The safety and operating instructions should be retained for future reference.
- 3) Heed Warnings** — All warnings on the product and in the operating instructions should be adhered to.
- 4) Follow instructions** — All operating and use instructions should be followed.
- 5) Cleaning** — Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
- 6) Attachments** — Do not use attachments not recommended by the product manufacturer as they may cause hazards.
- 7) Water and Moisture** — Do not use this product near water — for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool; and the like.
- 8) Accessories** — Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.
- 9) A product and cart combination should be moved with care.** Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.



10) Ventilation — Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

11) Power Sources — This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.

12) Grounding or Polarization — This product may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

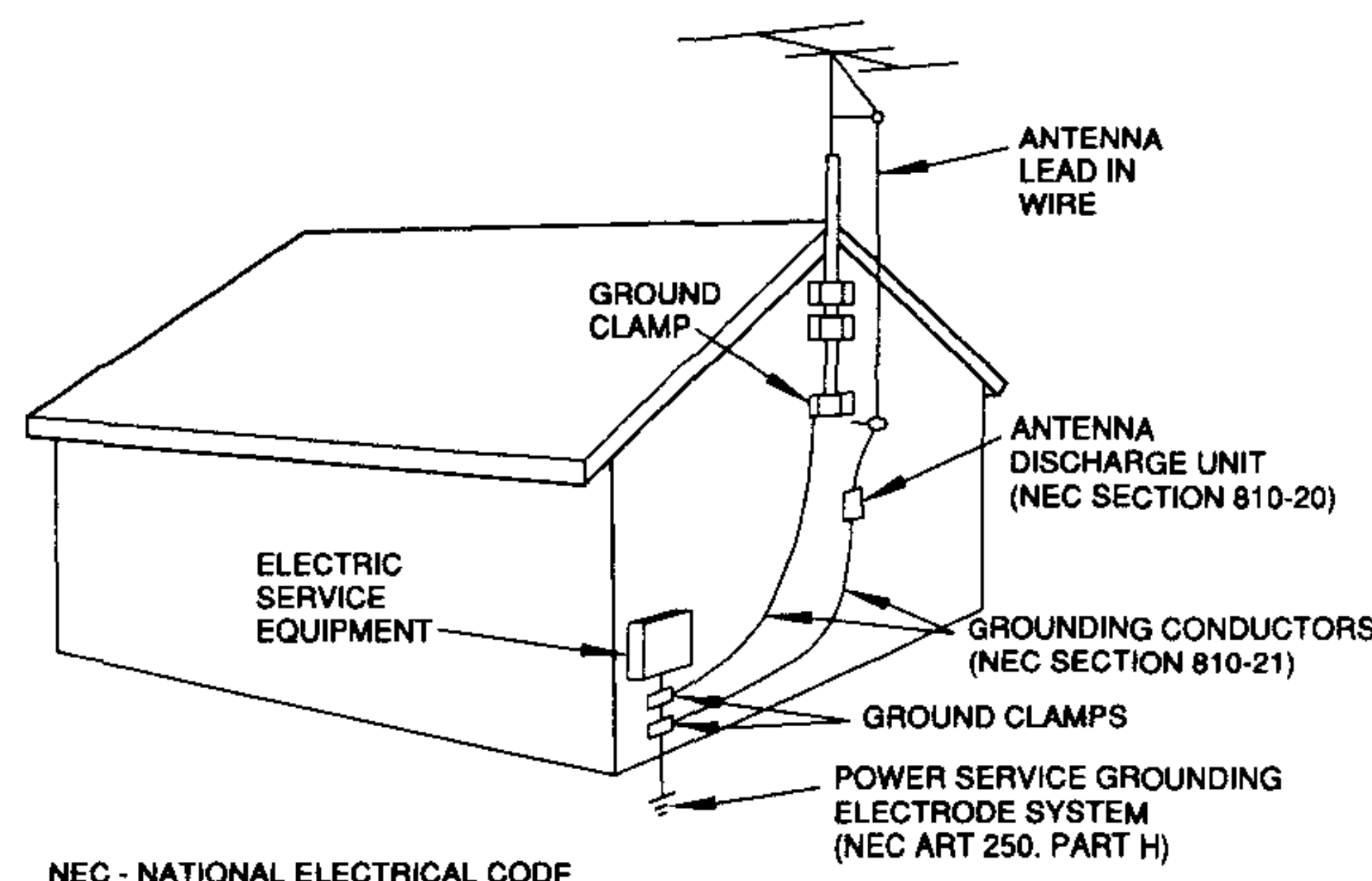
13) Power-Cord Protection — Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.

14) Outdoor Antenna Grounding — If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

"Note to CATV system installer:

This reminder is provided to call the CATV system installer's attention to Section 820-40 of the NEC which provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

Example of Antenna Grounding as per National Electrical Code, ANSI/NFPA 70



15) Lightning — For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power-line surges.

16) Power Lines — An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.

17) Overloading — Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in risk of fire or electric shock.

18) Object and Liquid Entry — Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

19) Servicing — Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

20) Damage Requiring Service — Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- a) when the power-supply cord or plug is damaged.
- b) if liquid has been spilled, or objects have fallen into the product.
- c) if the product has been exposed to rain or water.
- d) if the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
- e) if the product has been dropped or damaged in any way.
- f) when the product exhibits a distinct change in performance — this indicates a need for service.

21) Replacement Parts — When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.

22) Safety Check — Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

23) Wall or Ceiling Mounting — The product should be mounted to a wall or ceiling only as recommended by the manufacturer.

24) Heat — The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

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1 – Introduction

The TM-D8000 is a fully-functional digital mixing console, designed to work with a wide variety of other equipment, including DTRS digital multi-track equipment.

- The TM-D8000 can accept up to 40 digital signals in TDIF-1 format, and mix them in the digital domain to a stereo buss and eight digital output busses. AES/EBU and SPDIF inputs and outputs are also provided.
- Analog inputs are also provided, along with “standard” console features such as phantom powering, etc. for full compatibility with analog equipment.
- Channels are divided into “large” (100mm) and “small” (60mm) fader sections. Fader sections may be assigned to either input or tape return, depending on user preference.
- Faders may be grouped into any of four fader groups, or any of four cut groups, allowing one control to affect the level or output of a group of faders.
- Each channel, whether input or tape return, is provided with 4-band fully parametric EQ. EQ settings can be freely copied between modules and stored and recalled from an internal library.
- Six aux sends and dedicated stereo returns for the aux loops are provided, and an insert matrix is available, allowing external patching, or the routing of signals through any one of eight internal dynamic processors. This allows digital MTR tracks to be patched through external analog effects, if required. Compressor/limiter and gate settings can be stored and recalled from an internal library.
- As well as stereo mixing, the TM-D8000 is also capable of producing surround mixes for AV projects in a variety of formats.
- Console parameters can be controlled using the on-board display and POD section, with “soft” controls and switches, or using a Macintosh® computer running the Automation Software for TM-D8000 for full parameter control.
- Full mixing parameter snapshots can be stored and recalled, with or without the external control software.
- The external software can be used to provide full console automation, synchronized to timecode, generated either from the TM-D8000’s

own internal timecode generator, or from an external source.

- The TM-D8000 is provided with transport controls, and the capability of acting as the “control center” for other equipment, whether using the TASCAM DTRS remote protocol, RS-422 devices, MMC devices, or MIDI control of other units. Location memories, jog and shuttle control, auto-punch, etc. operations are all possible from the TM-D8000 (the exact features available depend on the controlled device).
- Full control-room and studio monitoring facilities are provided, including an integral talkback microphone.

1.1 About this manual

As well as this manual, there is also a tutorial to get you started using the TM-D8000.

Please take the short time necessary to work your way through this tutorial, if you have not already done so. You will find that the familiarity you gain with the TM-D8000 will help you understand this reference manual more fully.

When we refer to a control or a connector of the TM-D8000, it will be referred to in bold type. Very often, the number of the part, as shown on the illustrations, will also be given:

Press the **MASTER** key [35].

When we refer to a display screen or to a field or on-screen button, we will use a special typeface to show this:

Move the cursor to the on-screen **STORE** button.

The different sections of this reference manual are as follows:

1.1.1 (1) - Introduction

The section you are currently reading.

1.1.2 (2) - Front panel features

This section provides a “road map” to the front panel of the TM-D8000, together with a brief explanation of each control.

1.1.3 (3) - Rear panel connectors

The connectors of the rear panel are listed and briefly explained here.

1.1.4 (4) - The center control section and display

The center control section houses the “soft” controls that form the operational heart of the TM-D8000. You should read this section to understand the basic operational principles of the console.

1.1.5 (5) - Making connections to the TM-D8000

As well as how to connect other equipment to the TM-D8000, this section also explains how to make the appropriate settings for the different types of equipment you can use with the console.

1.1.6 (6) - Console operations

This section explains the operations that correspond to the typical operations on an analog console (level adjustment, EQ, aux, routing, etc.). Read this for a reference of the console features.

1.1.7 (7) - Monitoring and talkback

Monitoring is an important subject in multitrack recording projects, and it is accordingly given its own section here.

1.1.8 (8) - Surround operations

Section 6, “Console operations”, deals with stereo operations. Since the use of the TM-D8000 when dealing with surround sound is a little different, it is described separately. If you only work in stereo, you will not need to refer to this section.

1.1.9 (9) - External devices and the TM-D8000

When the TM-D8000 is connected to external devices, it can be used to control them (using MMC, RS-422, etc.). This section explains the various options available.

1.1.10 (10) - Specifications

Tables of messages, specifications, etc. of the TM-D8000.

1.1.11 (11) - TM-D8000 automation

This section describes the automation techniques and software used with the TM-D8000.

1.2 Precautions and recommendations

As with every precision piece of electronic equipment, common-sense precautions apply to the TM-D8000.

However, there are a few additional precautions that apply to the TM-D8000, and we suggest that you make a note of these.

1.2.1 Digital audio operations

When setting up and operating a digital audio studio, it is important that all digital audio units are synchronized to a common word clock or word sync (this is **not** timecode).

If different word clock sources are used throughout the setup, it is actually possible to damage speakers, etc. because of mismatches.

The TM-D8000 can either act as a word clock master for the system, or, if working with video sources, it is suggested that a video sync signal is used as a house sync to synchronize all units in the studio, including the TM-D8000.

1.2.2 Environmental conditions

The TM-D8000 can be operated in most environments, but we suggest that you keep the environmental conditions within the following limits:

- Ambient temperature between 5° and 35°C (41° and 95°F).
- Relative humidity should be between 30% and 80% non-condensing.

Avoid spraying polish, insecticides, etc. near the TM-D8000.

WARNING

If you need to clean the surface of the TM-D8000, use a soft cloth, moistened (not wet) if necessary with a little detergent and water. Do not use abrasive cleaners or solvents such as alcohol or thinner.

Avoid spilling liquids into the interior of the TM-D8000. If you do spill liquid into the TM-D8000, turn the unit off **immediately**, and contact your TASCAM service center.

Avoid subjecting the TM-D8000 to sudden jolts, shocks, etc.

WARNING

If you have to return the unit for service or repair, use the original packing materials if possible. If the unit is to be transported to a recording location, etc., use a suitable transport case with sufficient shock protection.

TASCAM does not accept responsibility for damage resulting from neglect or accident.

1.2.3 Installing the TM-D8000

The TM-D8000 may be installed in any location which conforms to the environmental parameters given above.

However, since the TM-D8000 is quite heavy (44kg - 80lb), you should make sure that the flat, level surface on which you install it is stable and strong enough to take its weight.

You should also make sure that there is sufficient space for ventilation and all cabling at the rear of the unit.

1.2.4 Electrical considerations

Make sure that your local power supply matches the voltage requirements marked on the rear panel of the TM-D8000.

If you are in any doubt concerning the local power supply, consult a competent electrician.

Avoid connecting the TM-D8000 to a power supply with extreme voltage fluctuations. If necessary, use an input voltage regulator to smooth the power supplied to the TM-D8000.

Do not open the unit to clean inside or to perform any adjustments. You should not attempt any cleaning or other maintenance procedures which are not described in this manual.

1.2.5 Connections, etc.

When making connections, especially those relating to digital audio, always use TASCAM cables.

WARNINGS

Only use TASCAM-supplied and TASCAM-approved cables when making connections to the TM-D8000. Though the cables and connectors used for digital audio connections may resemble computer cables, they serve different purposes, and meet a different set of specifications. The use of cables other than those designed for use with TDIF-1 digital audio signals will almost certainly result in reduced performance, and may even result in damage to equipment.

If the use of cables other than TASCAM cables causes or results in damage, the warranty is voided.

1.2.6 Power-up

When turning on the studio equipment, follow the usual rule for turning on equipment; from source to output.

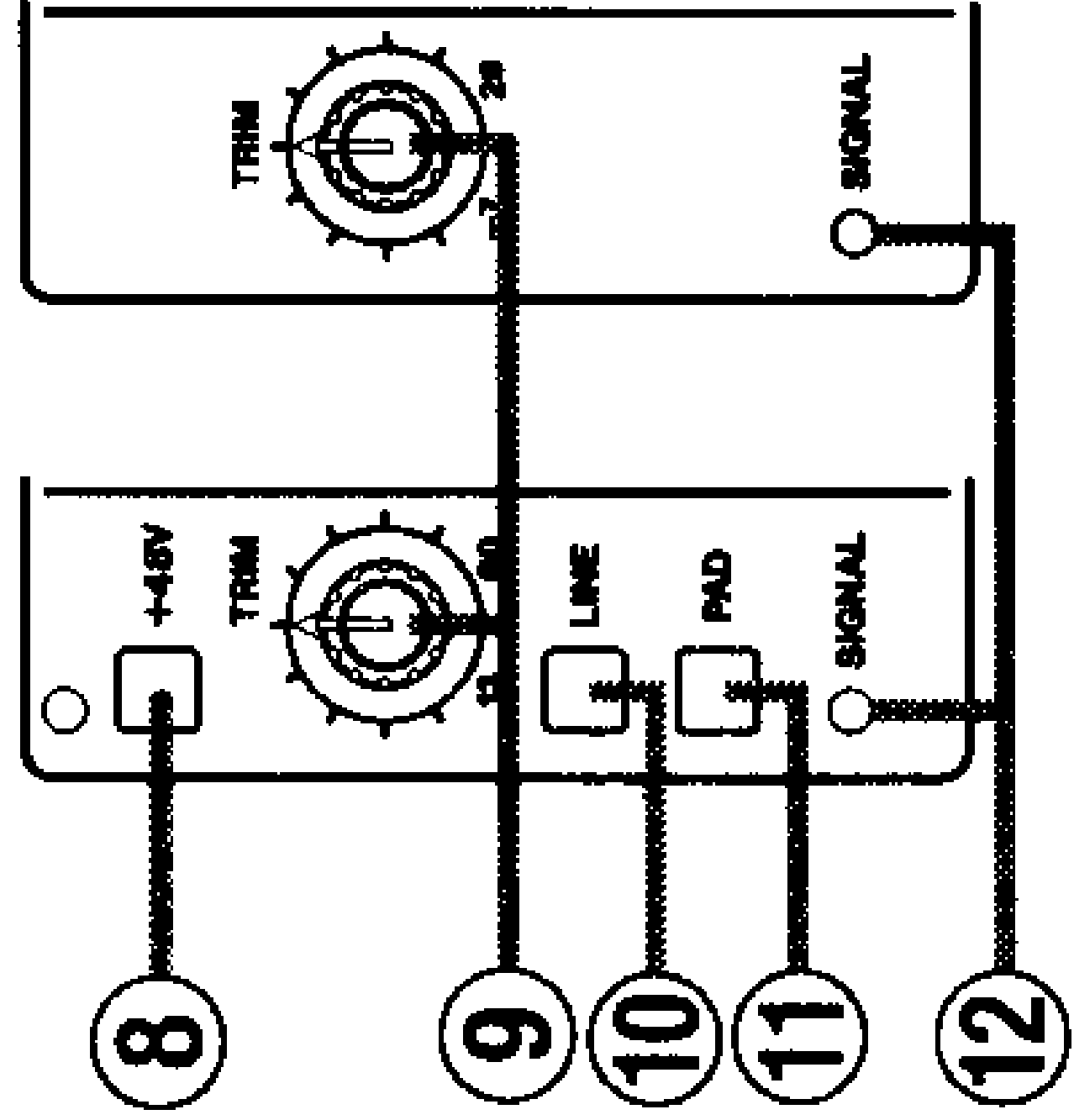
Sound sources (including tape decks) should be turned on first, followed by the TM-D8000. Lastly, turn on any monitoring amplifiers.

WARNING

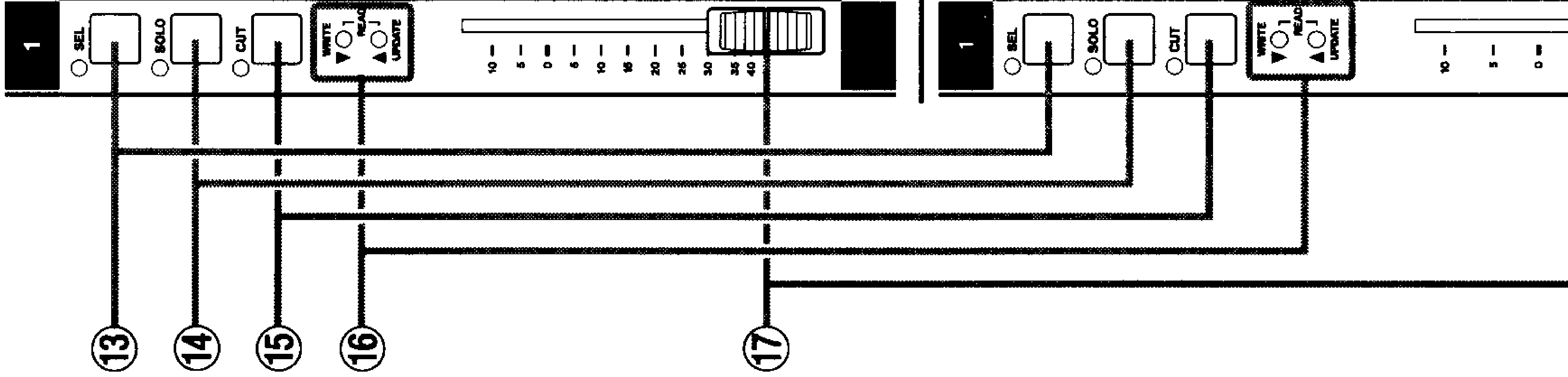
At power-up, the sound from the TM-D8000 is muted for five seconds. However, when the sound is un-muted, there may be a pop or level jump. Remove headphones and turn down any connected monitoring equipment when powering up the TM-D8000.

The TM-D8000 produces an audible "thump" when powered down (output is muted for five seconds when powering up). If you have the monitoring amplifier switched on while powering down the console, you risk damaging the monitoring speakers (and your ears!).

Always turn off the monitoring amplifier when turning the TM-D8000 off.

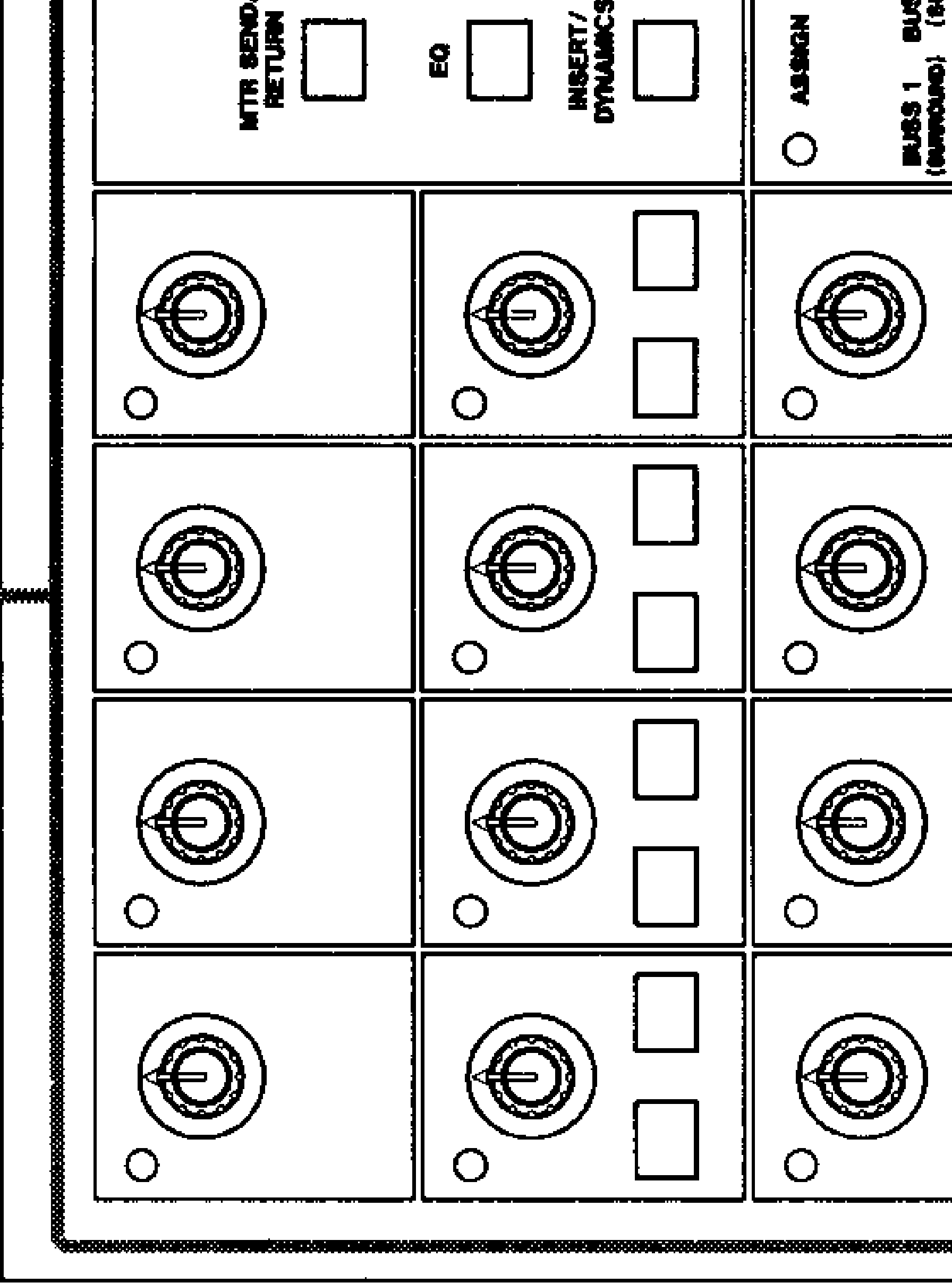


Analog input section

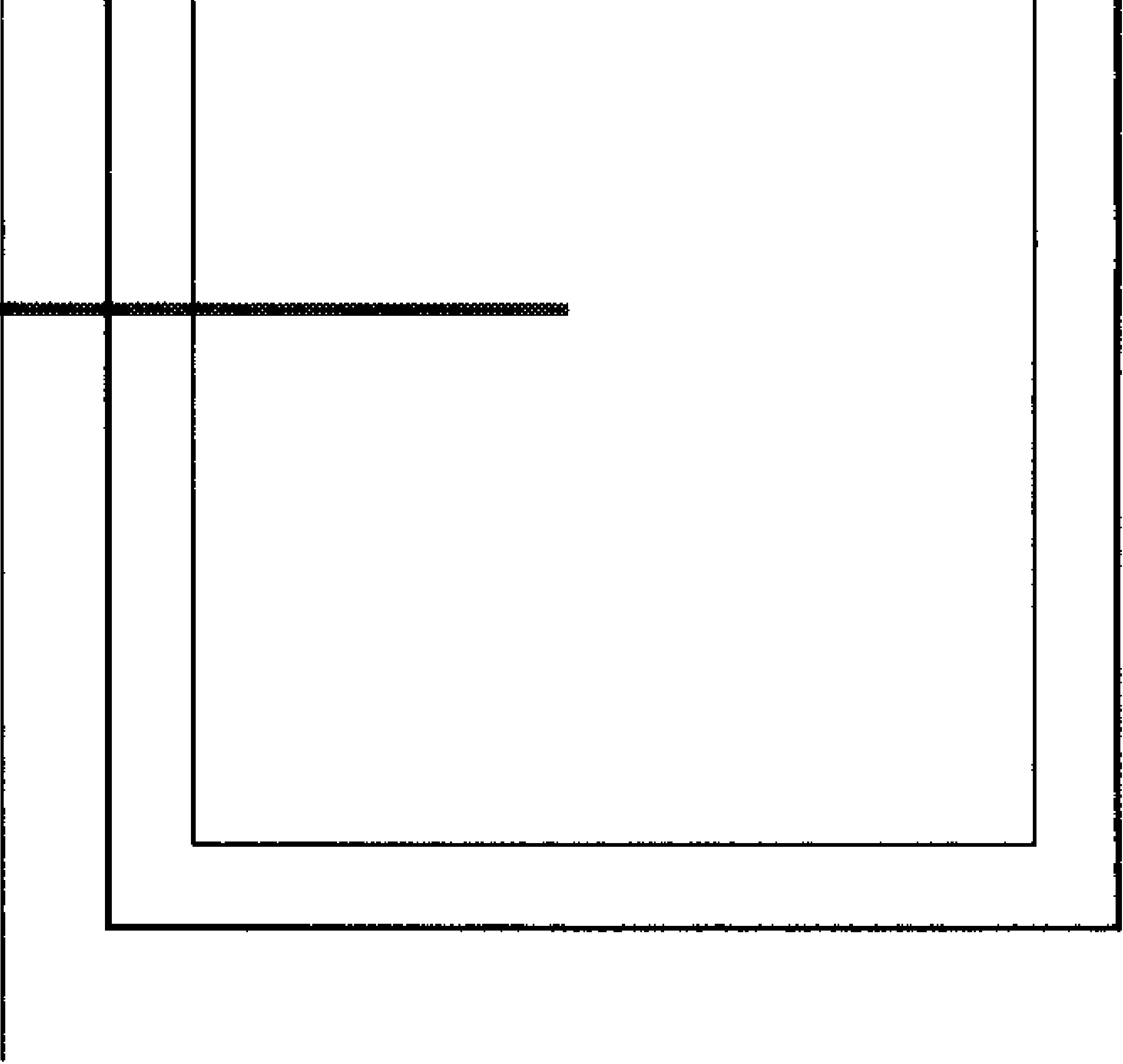


Master control section

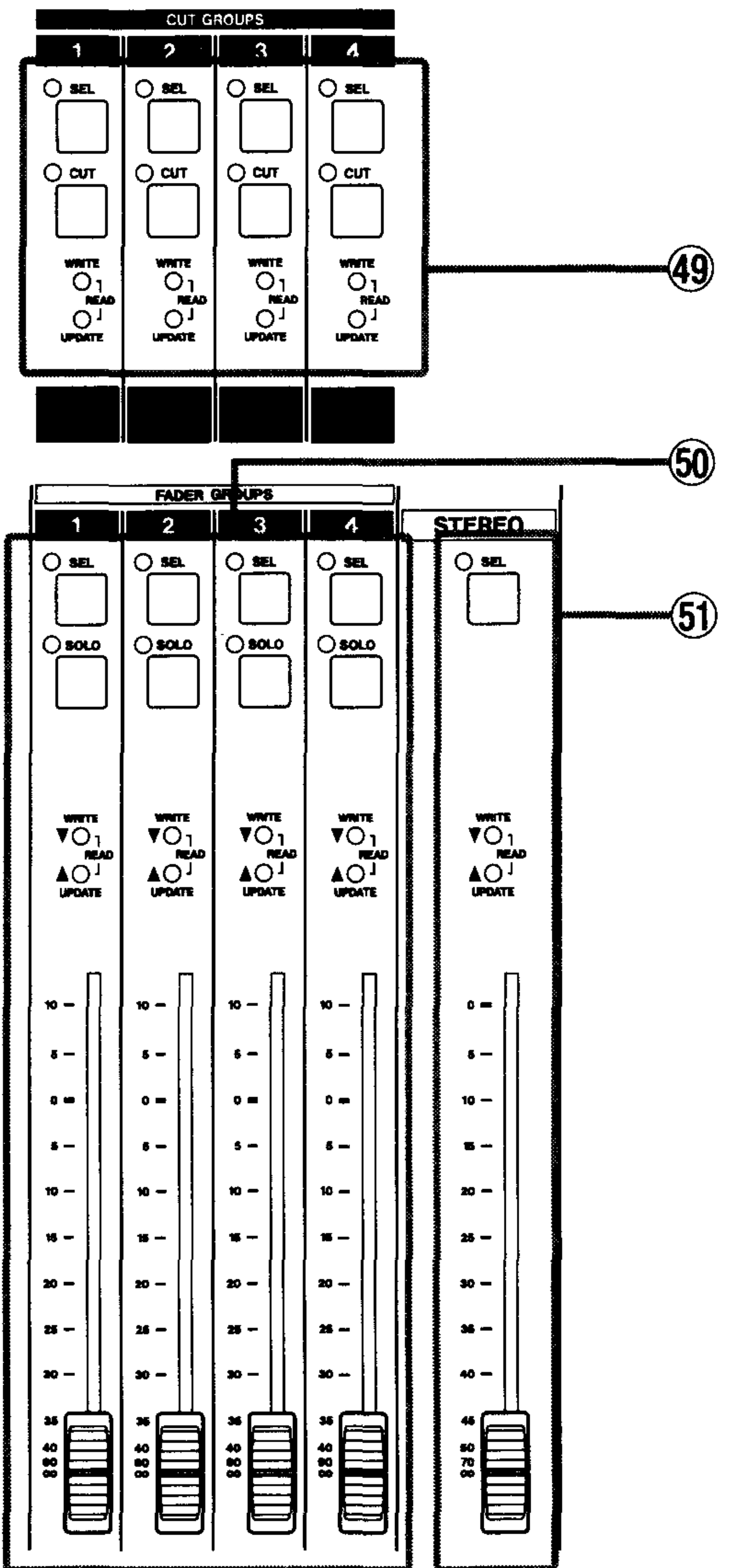
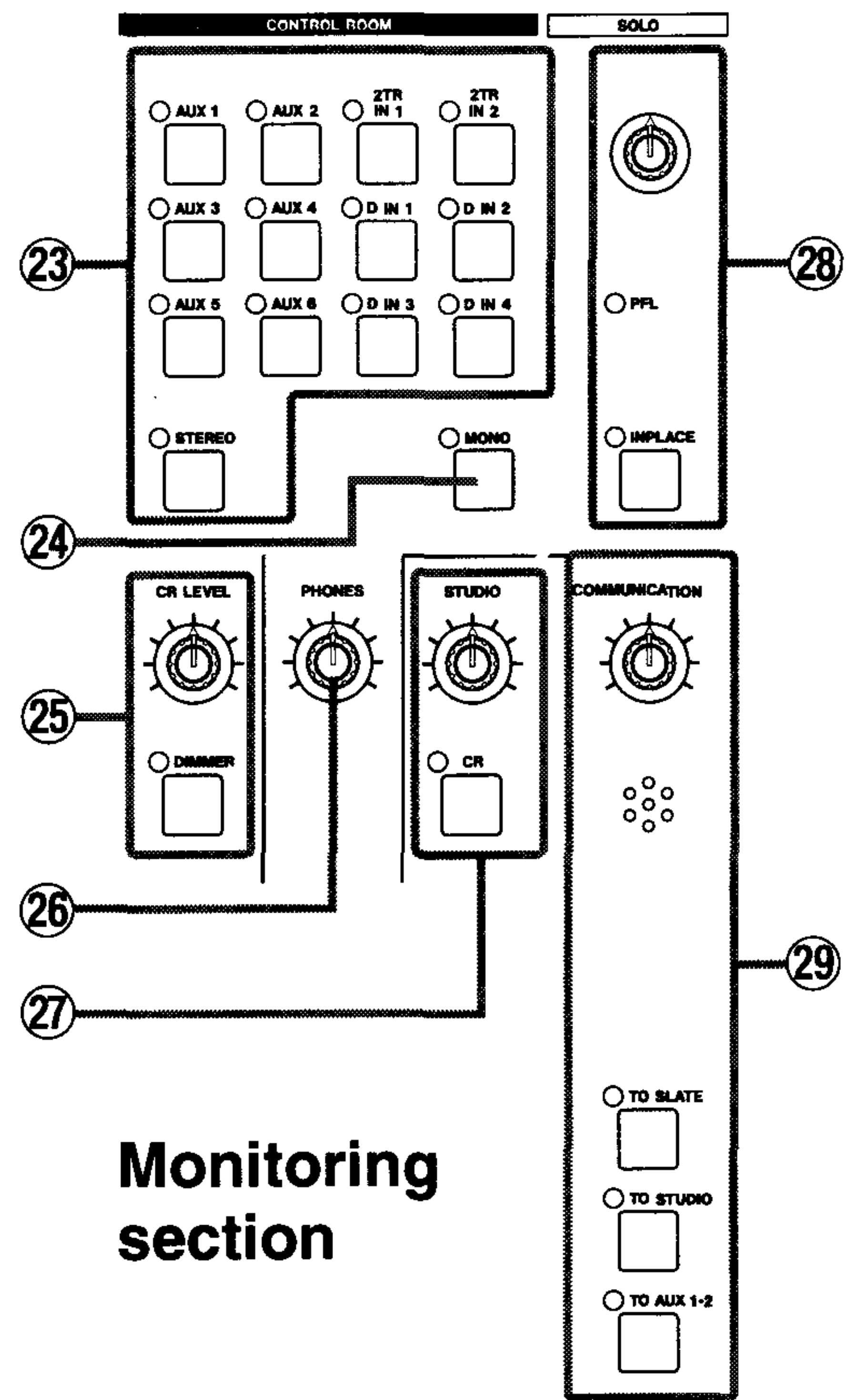
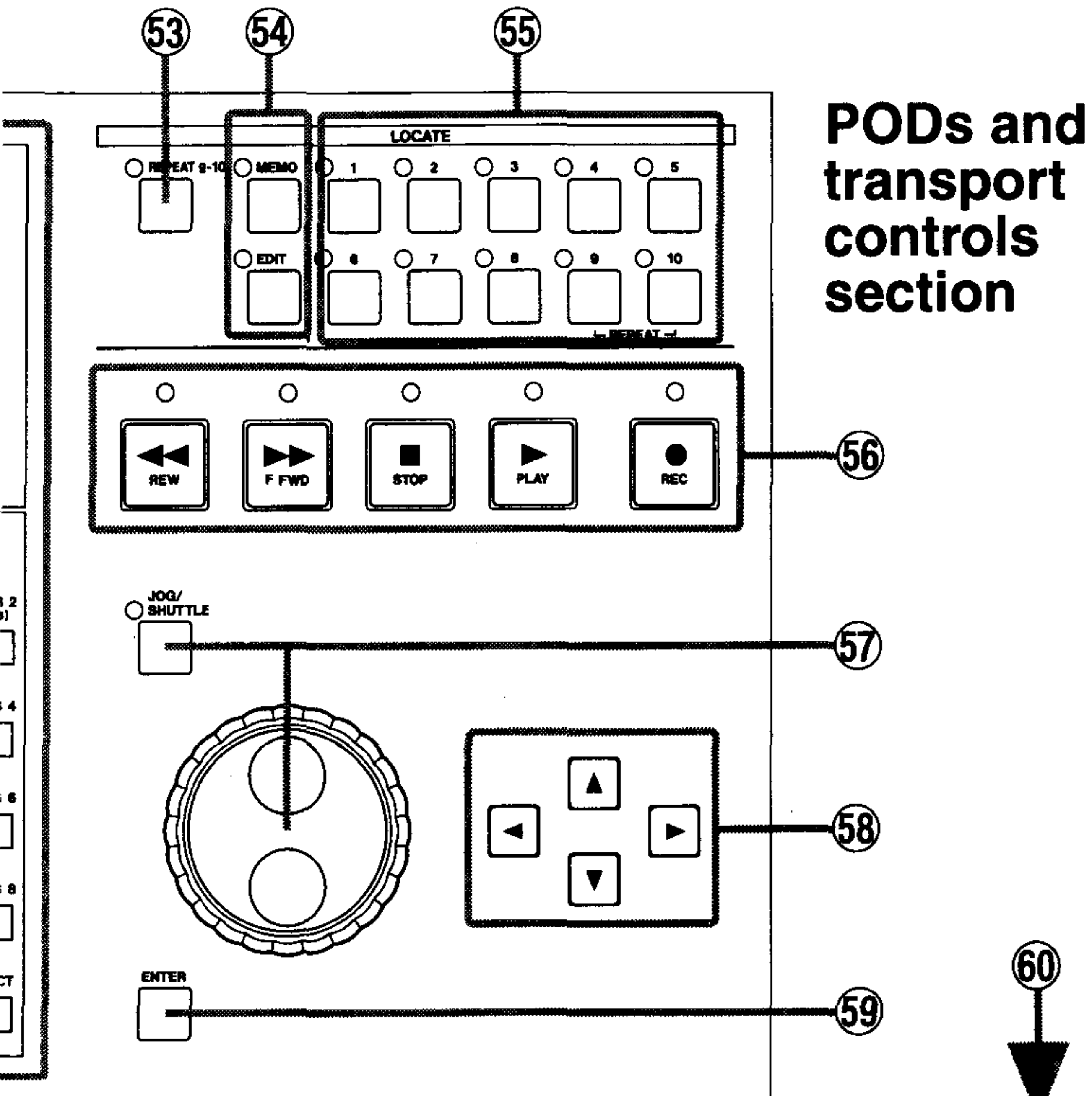
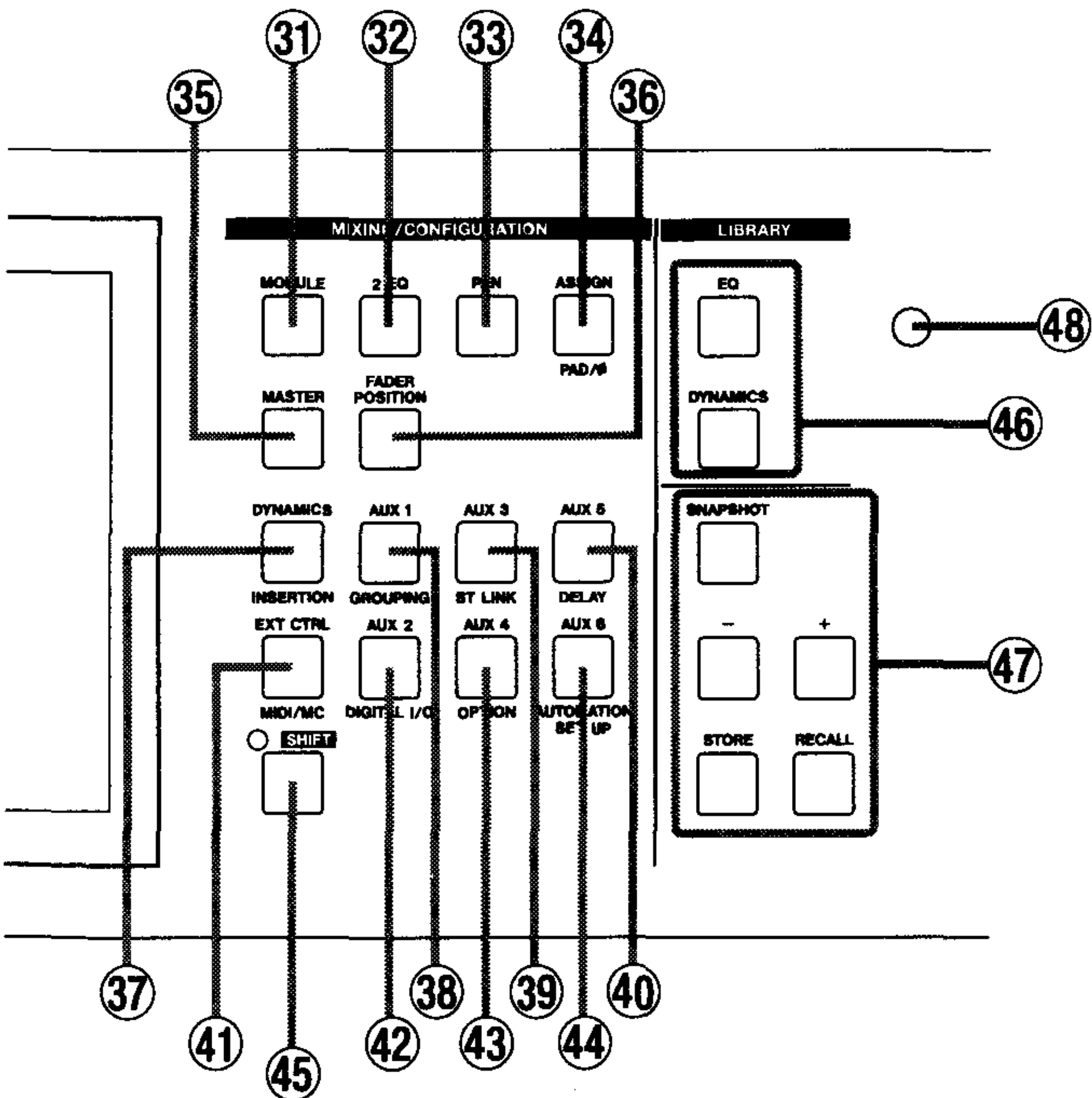
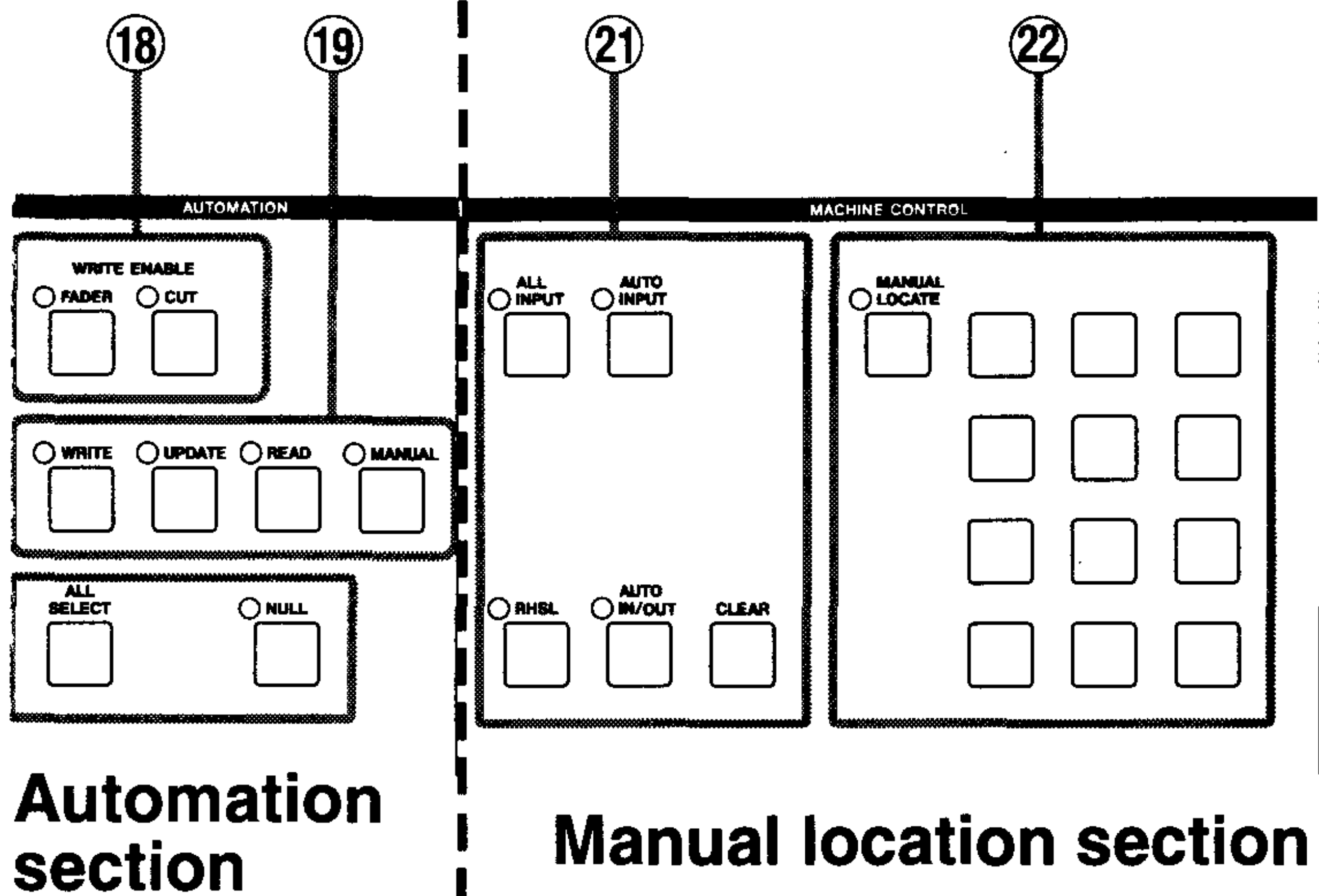
52



30

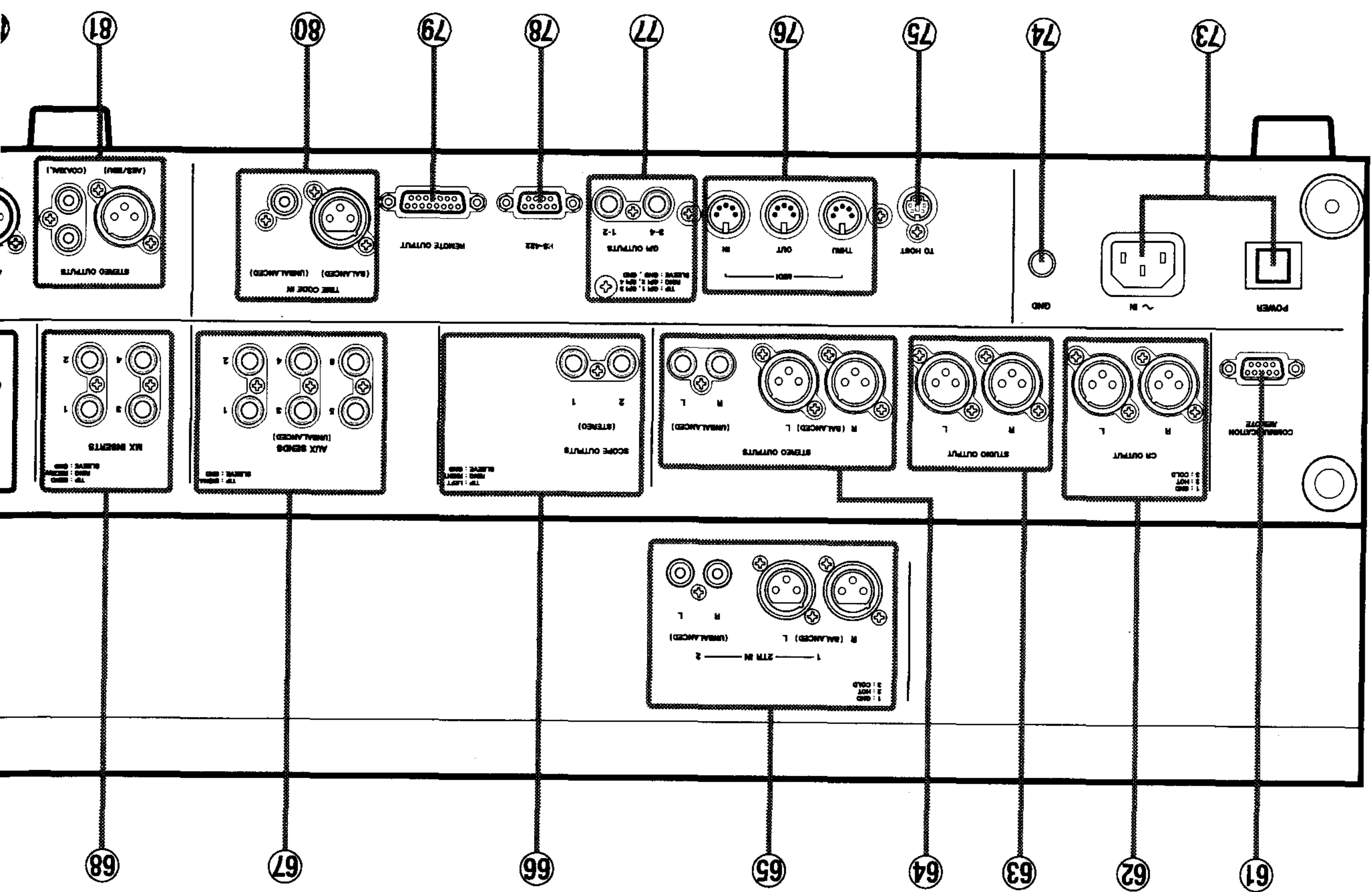


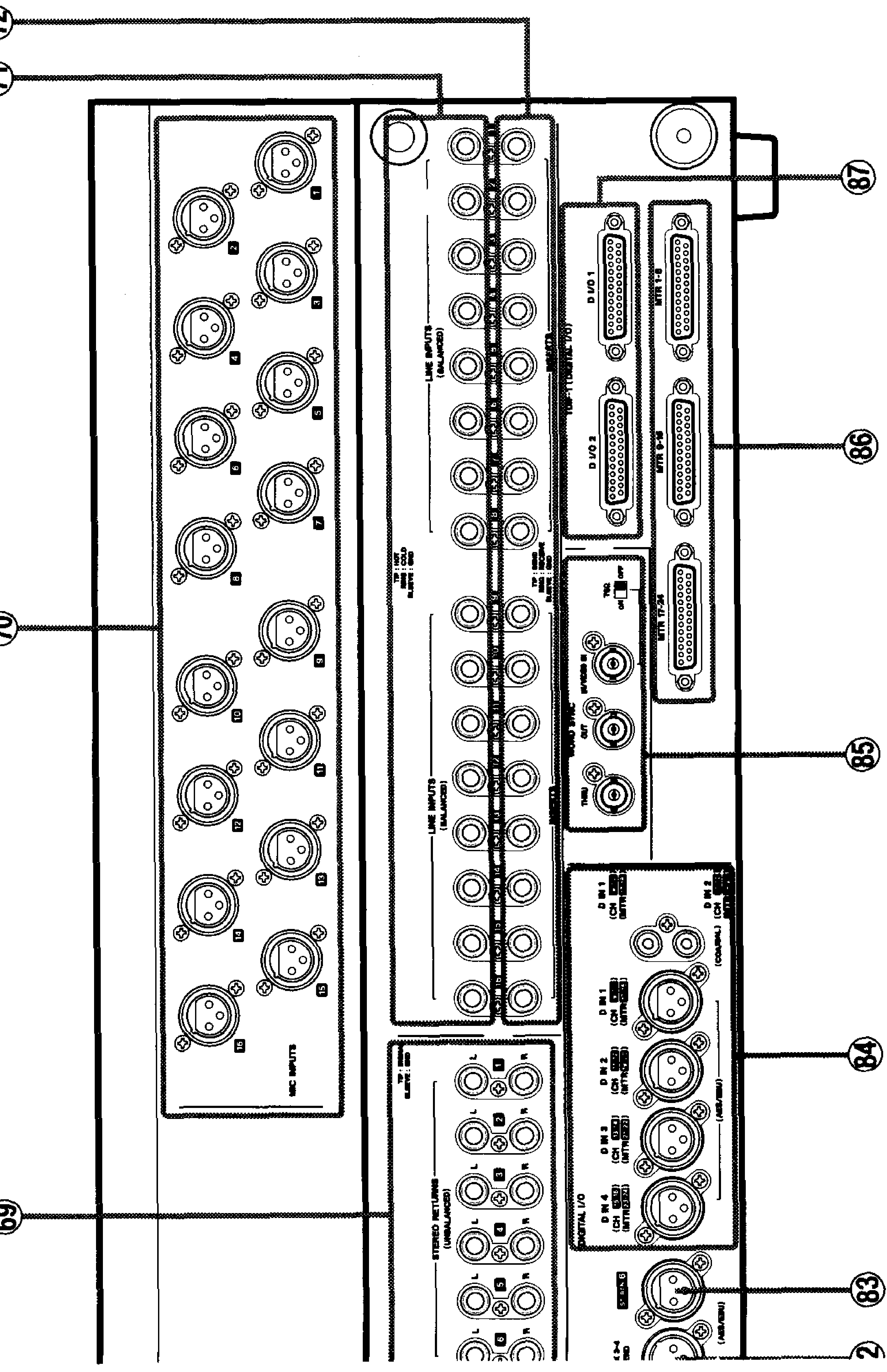
MTR SEND RETURN ☐ EQ ☐ INSERT/DYNAMICS ☐ ASSIGN ☐ BUS 1 BUS (AROUND) (18)



Groups and STEREO section







2 – Front panel features

The following is a “roadmap” to the front panel features of the TM-D8000, rather than a guide to operations.

[1] Multi-function meters

These 15-segment bargraph peak meters can be used for a variety of purposes, as determined by the **METER** control block [3].

The peak hold time and ballistics are user-determined, as described in 6.5, “Metering signals”.

[2] RECORD FUNCTION keys and indicators

These keys and indicators are used to arm and show the status of tracks on remote recorders, such as DTRS recorders, connected to the TM-D8000.

[3] METER control block

The six keys here switch between different metering modes: **MTR RETURN**, **CH** input and **STEREO RETURNS**, **MTR SEND** (buss levels), and **AUX SEND**.

The MTR returns and channel inputs can be metered pre-or post-EQ. To change between these modes, continue to press the appropriate meter key until the correct status is shown by the **POST EQ** indicator.

In addition, the meters can also be used to show the fader positions, when the TM-D8000 is under automation control, or faders are assigned to fader groups. The **L**(arge) and **S**(mall) **FADER** keys achieve this.

[4] ALL SAFE key and indicator

This key is used to safe all tracks of recorders connected to the TM-D8000. The indicator lights when all tracks have been “safed”.

[5] Stereo meters

These 30-segment bargraph dual-function meters, with **OVER** indicators, give accurate measurements of the signals output from the stereo buss. The operation of these meters is explained in 6.5.4, “Stereo meters”.

Two nominal 0dB indicators are provided, one at the TASCAM -16dB FS level, and the other at the SMPTE -20dB FS. The appropriate level for the project is set via software and the appropriate indicator will light to show the 0dB level.

[6] Status indicators

These LEDs show the current status of the TM-D8000 for the following items:

- Fader SWAP status (whether the large faders are used for MTR returns or for channel inputs).
- The sampling frequency at which the system is running (44.1kHz or 48kHz).
- The clock to which the TM-D8000 is synchronized (**INT**ernal, **WORD**, **VIDEO**, or from the **DIGITAL IN** [87] or **TDIF-1** [86] connectors). The clock source is set using software.

[7] Time counter

This 8-digit counter usually displays the timecode received from the system timecode master. At these times, the **TC** indicator will be lit.

When timecode is received, but is unstable, a dot will appear at the right of the right-most digit in the display. This will clear when timecode is locked.

However, when locating a device, or editing locate points, the display can be configured to show the locate time, rather than the current timecode. The **LOC** indicator will light in these cases.

2.1 Analog input section

This section of the console controls the analog signals received at the **MIC/LINE IN** jacks at [70] and the **LINE** jacks at [71] as well as the stereo returns at [69].

[8] +48V switches and indicators

Individual +48V phantom powering is available for input channels 1 through 16 through the XLR **MIC/LINE** inputs [70]. The indicator lights when phantom power is applied.

WARNING

Do not provide phantom power for any equipment other than condenser microphones that need this power. Serious damage may be caused to other equipment if you send phantom power to dynamic microphones, for example.

[9] TRIM controls

These controls allow adjustment of the **MIC/LINE** amp gain from +16dB to +60dB.

[10] LINE switches

When these switches are engaged, the source for the channel is through the 1/4” **LINE** jack for that channel [71], rather than the XLR **MIC/LINE** input [70].

[11] **PAD switches**

These switches allow the input signal to be attenuated by 20dB.

[12] **SIGNAL indicators**

These green LEDs light when the signal received at the input jack (post-pad and trim) reaches a level of -10dBu or above.

2.2 **Small and large fader modules**

The large and small fader modules are identical, except, as the name suggests, in the size of the faders.

The large faders have a 100mm throw, and the small faders have a 60mm throw.

[13] **SEL keys and indicators**

These keys are used to select the module when performing editing functions (routing, EQ, linking, etc.).

The green indicators are usually used to indicate the selected channel, but may be used for other purposes, such as displaying the channels belonging to a particular fader or cut group.

[14] **SOLO keys and indicators**

These keys are used to solo (either PFL or in-place, depending on the **INPLACE**[28] key) individual channels, and the red indicators display the current solo status.

[15] **CUT keys and indicators**

These keys are used to cut (mute) channels on an individual basis.

The yellow indicators show the cut status of channels, either from the **CUT** keys, or from the cut groupings (6.17.1, "Assigning channels to the cut groups (i)") or in-place soloing of other tracks.

[16] **Automation indicators (WRITE and UPDATE)**

These indicators show the current status of the channel with regard to automation. The indicators are used in the following way to show status:

Automation Status	WRITE	UPDATE
Manual	Off	Off
Write	On	Off
Update	Off	On
Read	On	On

Additionally, they are used to allow matching of the physical fader position to the "virtual fader position" (see 11.9.2, "Manually nulling a fader").

[17] **Faders**

The faders allow adjustment of levels from +10dB to -∞dB (full cut).

2.3 **Automation section**

These keys and indicators are all concerned with the automation of mix procedures.

Full details of automation are given in 11, "TM-D8000 automation", but briefly:

[18] **WRITE ENABLE (FADER and CUT)**

As their name implies, these keys when on (as shown by the indicators) allow the writing of fader information, and enable the writing of cut information for automation.

[19] **WRITE, UPDATE, READ and MANUAL**

These keys and indicators allow the selection of the different automation modes. When one of these keys is selected, and a module is selected, the appropriate module automation indicator [16] will light.

[20] **ALL SELECT and NULL**

The **ALL SELECT** key, as implied by its name, selects all modules for whatever automation operation is to take place.

The **NULL** key is used to view and set the null point for all modules (see 11.9.1, "What is a null point?").

2.4 **Manual location section**

This section can be regarded as an advanced controller section.

[21] **ALL INPUT, AUTO INPUT, RHSL, AUTO IN/OUT and CLEAR**

These keys mirror the same keys on a remote unit such as a DTRS recorder.

[22] **MANUAL LOCATE and number keypad**

The **MANUAL LOCATE** key is used together with the number keypad for the manual entry and editing of location points.

2.5 **Monitoring section**

The TM-D8000 provides sophisticated monitoring for the control room and the studio.

[23] **CONTROL ROOM selection keys and indicators**

The control room can monitor the individual AUX sends 1 through 6 (as output through [67]), either of the 2-track analog inputs (as input through [65]), the individual DIGITAL INs 1 through 4 ([84]) or the STEREO buss (in surround modes, only the left and right front channels are routed from here).

The selected buss is also sent to the PHONES outputs [60]. In the case of a surround mix, only the front L and R signals are sent to the headphones.

[24] **MONO key**

This key allows mono monitoring of the selected input source.

[25] **CR LEVEL and DIMMER**

This **LEVEL** control adjusts the level of the signal fed through the CR outputs [62].

The latching **DIMMER** switch attenuates the level of the signal sent to these outputs by 30dB. The red indicator lights when dimming is active.

[26] **PHONES**

This adjusts the level of the signals sent to the **PHONES** outputs [60].

[27] **STUDIO control and CR key**

The control adjusts the level of the signal sent to the **STUDIO** outputs [63].

This signal is usually the stereo buss mix, but can be overridden to be the signal sent to the control room (when this is not the stereo buss) by using the **CR** key (indicator lights when active).

[28] **SOLO, PFL indicator and INPLACE key**

When a module is soloed using the **SOLO** key [14], and the **INPLACE** indicator is not lit, the **PFL** indicator will flash to show that a module is being soloed.

If the **INPLACE** is active, the **INPLACE** indicator will be lit. All other modules will be cut on all 8 busses and the stereo buss (their **CUT** indicators [15] will be lit).

It is possible to disable a module's in-place soloing under software control (see 6.13.3, "Protecting channels from inplace solo").

[29] **COMMUNICATION and talkback keys**

The TM-D8000 features an integral talkback microphone with level control.

The three talkback keys route the talkback signal in the following way:

TO SLATE	Talkback routed to MTR 1 through 24, DIGITAL I/O 1 and 2, and the stereo master buss
TO STUDIO	Talkback routed to the STUDIO outputs [63].
TO AUX 1-2	Talkback routed to AUX busses 1 and 2

These keys can be latching or non-latching. If pressed and held down, they are non-latching (in other words, they will stay on as long as they are held down). If they are pressed momentarily, they will stay on until pressed once again.

In each case, the control room signal is attenuated by 30dB when a talkback key is pressed.

2.6 Master control section

In this part of the TM-D8000, the control of functions which are carried out by dedicated controls on analog consoles (e.g. EQ) as well as system parameters (such as selecting word clock) are carried out.

The **SYSTEM CONFIGURATION** keys allow the display screen to show different parts of the TM-D8000 system for editing.

[30] **Display screen**

This backlit LCD screen (320 x 240) provides information on the current status of the parameters being set in the TM-D8000.

[31] **MODULE key**

This key allows the setting of parameters on an individual module (or stereo linked pair), using the PODs and the display screen in a similar way to a channel strip on an analog mixer.

[32] **2 EQ key**

This key allows the editing and copying of EQ settings between channels.

[33] **PAN/BAL**

This key allows the viewing of the pan and balance settings of many different console modules simultaneously, and their adjustment.

[34] ASSIGN / PAD/Φ

This key allows the viewing of channel-to-buss assignments of many different console modules simultaneously and their adjustment.

In shifted mode, the digital pad and phase settings of multiple console modules can be viewed simultaneously and adjusted.

[35] MASTER

This key allows the viewing and setting of the levels of the AUX sends and the eight master busses.

[36] FADER POSITION key

This key allows the viewing of actual and virtual fader positions of multiple console modules simultaneously.

[37] DYNAMICS / INS ASSIGN

This key allows the setting of the parameters relating to the TM-D8000's eight internal dynamic processors.

In shifted mode, it allows the assignment of modules to the dynamic processors, as well as to the external matrix [68].

[38] AUX 1 / GROUPING

This key allows the viewing of the AUX 1 send levels of many different console modules simultaneously and their adjustment.

In shifted mode, the assignment of modules to the fader and cut groups can be viewed and edited.

[39] AUX 3 / ST LINK

This key allows the viewing of the AUX3 send levels of many different console modules simultaneously and their adjustment.

In shifted mode, the stereo linking settings of modules can be viewed and edited.

[40] AUX 5 / DELAY

This key allows the viewing of the AUX 5 send levels of many different console modules simultaneously and their adjustment.

In shifted mode, the delay settings of modules can be viewed and adjusted.

[41] EXTERNAL CTRL/ MIDI/MC

This key allows the viewing and adjustment of parameters relating to control by the TM-D8000 of external MIDI devices.

In shifted mode, system parameters related to MIDI and external machine control can be viewed and edited.

[42] AUX 2 / DIGITAL I/O

This key allows the viewing of the AUX 2 send levels of many different console modules simultaneously and their adjustment.

In shifted mode, parameters relating specifically to digital audio (e.g. clock source) can be viewed and edited.

[43] AUX 4 / OPTION

This key allows the viewing of the AUX 4 send levels of many different console modules simultaneously and their adjustment.

In shifted mode, various system options can be examined and edited.

[44] AUX 6 / AUTOMATION SET UP

This key allows the viewing of the AUX 6 send levels of many different console modules simultaneously and their adjustment.

In shifted mode, parameters relating to console automation may be examined and edited.

[45] SHIFT key and indicator

Press once to turn the shift mode on (the indicator will light) and the display selector keys will be in shifted mode (they take on the functions as indicated by the legends in blue under the keys).

Press again to exit shifted mode.

[46] EQ and DYNAMICS LIBRARY keys

These keys allow the manipulation of stored equalization and dynamic processor settings (store, recall and assignment) respectively.

As well as providing a library of useful preset settings, the TM-D8000 also allows the editing, storage and recall of user settings.

[47] SNAPSHOT keys

The **SNAPSHOT** key allows the manipulation (storage, copying, renaming) of snapshot settings.

The + and - keys increment and decrement the snapshot number from any screen, and the **STORE** and **RECALL** keys allow the storage and recall of snapshot settings from any screen (no special mode is needed for snapshot storage and recall).

[48] Display contrast control

Use this control to adjust the contrast of the display [30] so that it is most legible from your working position.

2.7 Groups and STEREO

The TM-D8000 has 2 sets of groups, one set for cutting module outputs and one for assigning to faders. There are four groups in each set.

[49] Cut groups

The four cut groups each consist of a **SEL** key and indicator (used for assigning the modules to the groups and for automation), a **CUT** key and indicator for cutting those modules assigned to the group, and automation indicators as provided on individual modules, but without the fader indicators provided on modules.

Naturally, there are no faders or solo facilities provided on the cut groups.

[50] Fader groups

The four fader groups each consist of a **SEL** key and indicator (used for assigning the modules to the groups and for automation), a **SOLO** key and indicator, automation indicators as provided on individual modules, and a 100mm fader.

[51] STEREO module

The **STEREO** module consists of a **SEL** key and indicator (used for automation purposes), automation indicators as provided on individual modules, and a 100mm fader.

2.8 PODs and transport controls

The PODs are used for general parameter editing.

The transport controls are used for external devices; exactly what device is controlled is determined through software settings.

[52] Assignable control section

The assignable control section forms the operational "heart" of the TM-D8000.

Its PODs and keys are described more fully in section 4.2, "The assignable control section".

[53] REPEAT key

This key repeats playback of the controlled device between the two location points set by 9 and 10.

[54] MEMO and EDIT keys

These keys allow the storage, checking and editing of 10 stored location points, used on the controlled device.

[55] LOCATE 1 through 10

These keys are used for location of the controlled device to location points set and edited using [54].

[56] Transport keys

These transport keys duplicate the basic transport operations of the controlled device.

[57] JOG dial, SHUTTLE wheel and JOG/SHUTTLE key and indicator

When the **JOG/SHUTTLE** mode is inactive (the indicator is off), the jog dial (inner) is used to edit parameter values. The shuttle wheel (outer) is sometimes used to select areas for editing on the display screen.

When the **JOG/SHUTTLE** mode is active (the indicator is on), the jog dial and shuttle wheel control the external device. The exact way in which this is done depends on the characteristics of the device.

[58] Cursor keys

These keys are used to move the cursor around display screens.

[59] ENTER key

The key is used to confirm the editing of entries.

If the jog dial/shuttle wheel is used with the right hand, the **ENTER** key will be found to fall conveniently under the right thumb.

[60] PHONES outputs

These two stereo 1/4" jacks (tip = left, ring = right, sleeve = ground) are used to drive standard headphones with an impedance of 30Ω. The level is controlled by the **PHONES** control [26].

3 – Rear panel connectors

This section is not a guide to connecting the TM-D8000 to other equipment, but should be treated as a “roadmap” to the different connectors available on the rear panel. For full details of how to connect the TM-D8000 to other equipment, see 5, “Making connections to the TM-D8000”.

WARNINGS

- When making connections between the TM-D8000 and other equipment, whether audio or control, both the TM-D8000 and the other equipment must be turned **off**, otherwise damage may be caused to the TM-D8000 and/or the other equipment.
- Only use TASCAM-supplied and TASCAM-approved cables when making digital audio and control connections to the TM-D8000. Though the cables and connectors may resemble computer cables, they serve different purposes, and meet a different set of specifications. The use of cables other than TASCAM cables will at best cause the equipment to work erratically, and at worst cause damage to the equipment.
- If the use of cables other than TASCAM cables causes or results in damage, the warranty is voided.

3.1 Wiring conventions

For all balanced XLR-type connectors, the wiring is as follows:

1	Gnd
2	Hot (+)
3	Cold (–)

For all balanced TRS 1/4” jacks, the wiring is as follows:

Tip	Hot
Ring	Cold
Sleeve	Ground

3.2 Rear panel connectors

[61] COMMUNICATION REMOTE INPUT

This 9-pin D-sub connector is used to carry various studio communication and tally lines. The pinout is as follows:

Pin	Signal	Level, etc.
1	Analog ground	
2	Digital ground	
3	EXT_SLATE input	TTL level, diode
4	EXT_STUDIO input	TTL level, diode
5	EXT_AUX input	TTL level, diode
6	EXT_MIC input	

Pin	Signal	Level, etc.
7	SLATE_TLY	LED anode, 5V 1k Ω output impedance
8	STUDIO_TLY	LED anode, 5V 1k Ω output impedance
7	AUX_TLY	LED anode, 5V 1k Ω output impedance

[62] CR OUTPUT

This pair of balanced XLR-type connectors is used to drive the control room monitoring system.

The nominal output level is +4dBu and the maximum output level is +20dBu. The impedance is 75 Ω .

[63] STUDIO OUTPUT

This pair of balanced XLR-type connectors is used to drive the studio monitoring system.

The nominal output level is +4dBu and the maximum output level is +20dBu. The impedance is 75 Ω .

[64] STEREO OUTPUTS

There are two sets of analog outputs from the stereo buss. The first is a balanced pair of XLR-type connectors. The nominal output level of these connectors is +4dBu and the maximum output level is +20dBu. The impedance is 75 Ω .

There is also a pair of unbalanced RCA jacks, with a nominal output level of –10dBV (maximum of +6dBV. The impedance is 100 Ω .

[65] 2TR IN (1 & 2)

These two pairs of analog inputs are used to connect the analog outputs of mastering 2-track machines.

The balanced XLR-type connectors (**2TR 1**) accept signals at a nominal level of +4dBu with an impedance of 20k Ω .

The unbalanced RCA connectors (**2TR 2**) accept signals at a nominal level of –10dBV with an impedance of 20k Ω .

[66] SCOPE OUTPUTS (STEREO)

These two unbalanced stereo 1/4” jacks are used to deliver duplicates of the **CR OUTPUT** [62] signals to signal scopes, etc. The nominal level is –2dBu (maximum +14dBu) with an impedance of 100 Ω , and the pinouts are:

Tip	Left
Ring	Right
Sleeve	Ground

[67] AUX SENDS (1 through 6)

These unbalanced 1/4" jacks output the signals from the AUX SEND busses at a nominal level of +4dBu (maximum of +20dBu). The impedance is 100Ω

[68] MX INSERTS (1 through 4)

These TRS 1/4" analog jacks are used to connect outboard processors, etc. in the matrix. The pinouts are:

Tip	Send	Nominal level +4dBu (maximum +16dBu), impedance 100Ω
Ring	Return	Nominal level +4dBu (maximum +16dBu), impedance 10kΩ
Sleeve	Ground	

[69] STEREO RETURNS (1 through 6)

These six pairs of left and right unbalanced 1/4" jacks are used to return the signals from outboard signal processors, etc. The nominal input level is +4dBu, with a maximum gain of +26dB. The input impedance is 10kΩ

[70] MIC/LINE inputs

These balanced XLR-type jacks can be used to accept signals from a wide variety of analog sources (in conjunction with the analog pad and trim controls provided on the front panel). They are also provided with individually switchable +48V phantom powering for condenser microphones.

The input impedance is 2.4kΩ, and the signals can be from -57dBu to -9dBu (nominal of -50dBu). +60 dB of gain is provided (with the pad [11] off, the **TRIM** controls [9] allow adjustment from +61dB to +13dB).

[71] LINE INPUTS

These 1/4" balanced (TRS) jacks are used as balanced inputs from line-level sources with levels of -37dBu to +11dBu (nominal +4dBu) to input channels 1 through 16. With the pad [11] on, the **TRIM** controls [9] on the front panel can be used to adjust the gain from +41dB to -7dB. The nominal impedance of these inputs is 2.4kΩ

[72] INSERT connectors

These 1/4" jacks provide the connections for unbalanced insert loops from and to input channels 1 through 16. The nominal level for both send and return is +4dBu (maximum +20dBu on send and +16dBu on return). The nominal impedance

for the output is 100Ω and for the input is 10kΩ. The wiring for these jacks is as follows:

Tip	Send
Ring	Return
Sleeve	Ground

[73] POWER switch and ~ IN (AC power)

Press the power switch once to switch on the TM-D8000, and again to turn it off. Output from the TM-D8000 is muted for five seconds after power-on.

Use the provided AC power cord to connect the TM-D8000 to the AC power supply through this connector.

[74] GND (frame ground)

This connector provides a useful frame ground reference if you need to reduce hum caused by ground loops, etc.

A full discussion of grounding techniques is outside the scope of this manual, and we suggest consulting one of the many reference books available on this subject.

[75] TO HOST

This 8-pin mini-DIN connector is used to connect the TM-D8000 to a personal computer using RS-422 data transmission.

[76] MIDI IN, OUT and THRU

These 5-pin DIN connectors are used to carry standard MIDI signals. The nomenclature of these connectors corresponds to MIDI standards.

[77] GPI OUTPUTS

These 2-channel 1/4" jacks may be used to connect up to 2 GPI-compatible devices each using TRS connectors. The cables should be wired as follows:

Tip	GP 1 – EV1, GP 2 – EV 3
Ring	GP 1 – EV2, GP 2 – EV 4
Sleeve	Ground

[78] RS-422

This 9-pin D-sub connector is used for connection to devices implementing the Sony P2 protocol.

[79] REMOTE OUTPUT

This 15-pin D-sub connector is used for connection to the **REMOTE/SYNC IN** connectors of DTRS¹ recorders such as the TASCAM DA-98.

¹ DTRS is a registered trademark of TEAC Corporation.

This allows integration of and control by the TM-D8000 to the DTRS recorders.

[80] TIME CODE IN

There are two connectors available for the input of timecode. Both have an impedance of 20K Ω and accept signals at a level of -20dBm.

The XLR-type input, however, is balanced, and the RCA jack is unbalanced.

[81] STEREO OUTPUTS

These three connectors provide the stereo outputs from the TM-D8000. The XLR-type connector provides the output at AES/EBU level, and the two RCA connectors provide the same signals at IEC958 (SPDIF) level.

The format of these signals is determined by software (see 5.2.10, "Selecting an output format").

[82] AUX 3-4 SEND

This XLR-type jack carries the outputs from the AUX 3-4 buss at AES/EBU levels for use by a suitably-equipped outboard processing unit. The format is selected by software.

[83] ST RTN 6

This XLR-type jack is used to input an AES/EBU signal from a suitably-equipped outboard processing unit (or other suitably-equipped source) to the stereo return 6 buss.

[84] D IN 1 THRU 4

These four XLR-3-31 type connectors (D IN 1 through 4) and 2 RCA jacks (D IN 1 and 2 only) carry individual direct digital stereo inputs at AES/EBU levels (XLR-type connectors) or SPDIF (RCA connectors).

[85] WORD SYNC (IN, OUT and THRU) with 75 Ω switch

These three BNC connectors are used for word and video clocking signals.

Signals are received at the **IN** connector, and retransmitted from the **THRU** connector. Any clocking signals generated by the TM-D8000 itself are transmitted from the **OUT** connector.

The 75 Ω switch is used to provide a 75 Ω input impedance as required. The **SYNC OUT** always has a 75 Ω impedance.

Word and frame signals are received and transmitted at TTL level. The video signal should be in the range of 0.5V p-p to 2.0V p-p.

[86] MTR 1-8, MTR 9-16, MTR 17-24

These 25-pin D-sub connectors are used to carry digital audio inputs and outputs in TDIF-1 format between the TM-D8000 and DTRS multitrack digital tape recorders. Each 25-pin D-sub connector carries 8 inputs and outputs. Use only TASCAM cables to connect equipment using these connectors.

[87] D I/O 1 and 2

These 25-pin D-sub connectors are used to carry digital audio inputs and outputs in TDIF-1 format (usually between the TM-D8000 and DTRS recorders, though other situations are also possible). Each 25-pin D-sub connector carries 8 inputs and outputs. Use only TASCAM cables to connect equipment using these connectors.

This means that up to 5 DTRS recorders can be connected simultaneously to one console for mixing purposes.

4 – The center control section and display

The center control section includes the display and assignable controls, which together may be considered as the main control center of the TM-D8000.

4.1 The display

The display is used to show a number of on-screen controls, some of which may be familiar from general computer user interfaces.

There are “push-buttons”, number fields, “radio buttons” (exclusive either/or choices), “check boxes” and selection lists.

In addition to these, there are also rotary controls.

The on-screen controls are typically controlled in one of two ways:

- Using the cursor keys [58] to move a cursor between parameters, and the jog dial [57] to set the values before confirming the entry with the **ENTER** key [59]. This method is usually used for making system parameter settings, naming snapshots, etc., but may also be used for console module parameter control.
- Using the assignable controls (PODs), which are mapped to the on-screen controls. This method is typically used for console module parameter control, where the PODs take the place of dedicated controls on an analog console.

4.2 The assignable control section

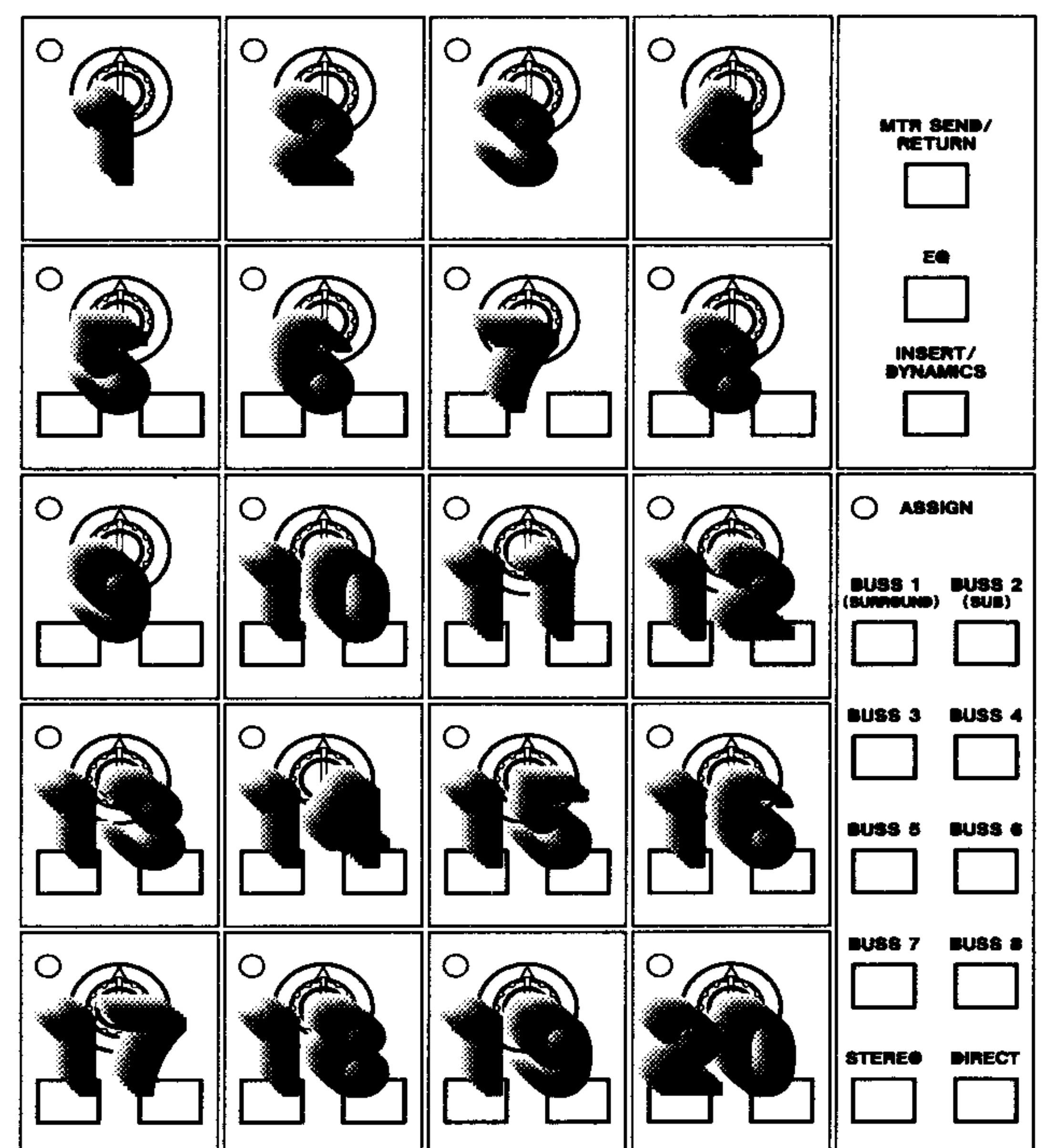
This section consists of five rows of four columns of PODs. A POD consists of a continuous rotary encoders (i.e. with no end-stop in either the clockwise or counter-clockwise directions), an LED indicator, and (apart from the top row of PODs) two switches.

The PODs have no fixed function, but are “soft”, i.e. they change function according to the job currently being performed.

To the right of the PODs are three dedicated controls, and below these, dedicated buss assignment switches. However, though the functions of these switches are fixed, these switches are not always active.

The indicator above the buss assignment switches is lit when these are active.

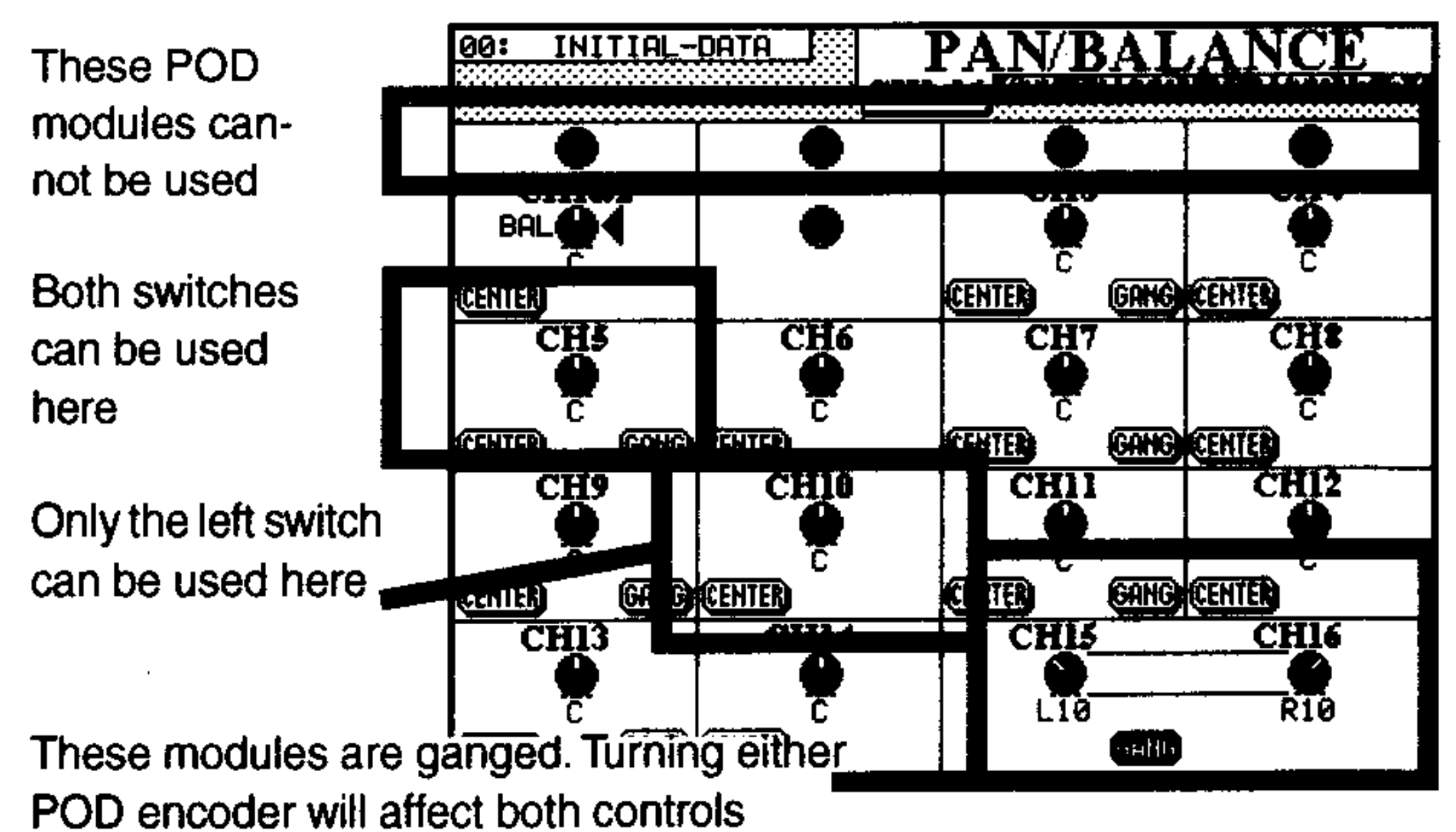
A diagram of the PODs and the assignable control section is given below:



The numbers shown in this illustration are not printed on the TM-D8000 itself, and are only for reference within this manual.

4.2.1 Mapping the controls (i)

A typical screen display with on-screen controls mapped to the assignable controls is shown below:



The solid circles in the top row of PODs (1 through 4) indicate that these PODs cannot be used in this screen. This can also be confirmed by checking the LED indicators of these PODs, which will be unlit.

The odd-numbered input channels (mapped to PODs 5, 7, 9, 11, 13, 15 and 17) have both their switches enabled. The left switch is assigned as a pan centering switch, and the right switch will

gang the pan of this channel with that of the even-numbered channel immediately to its right.

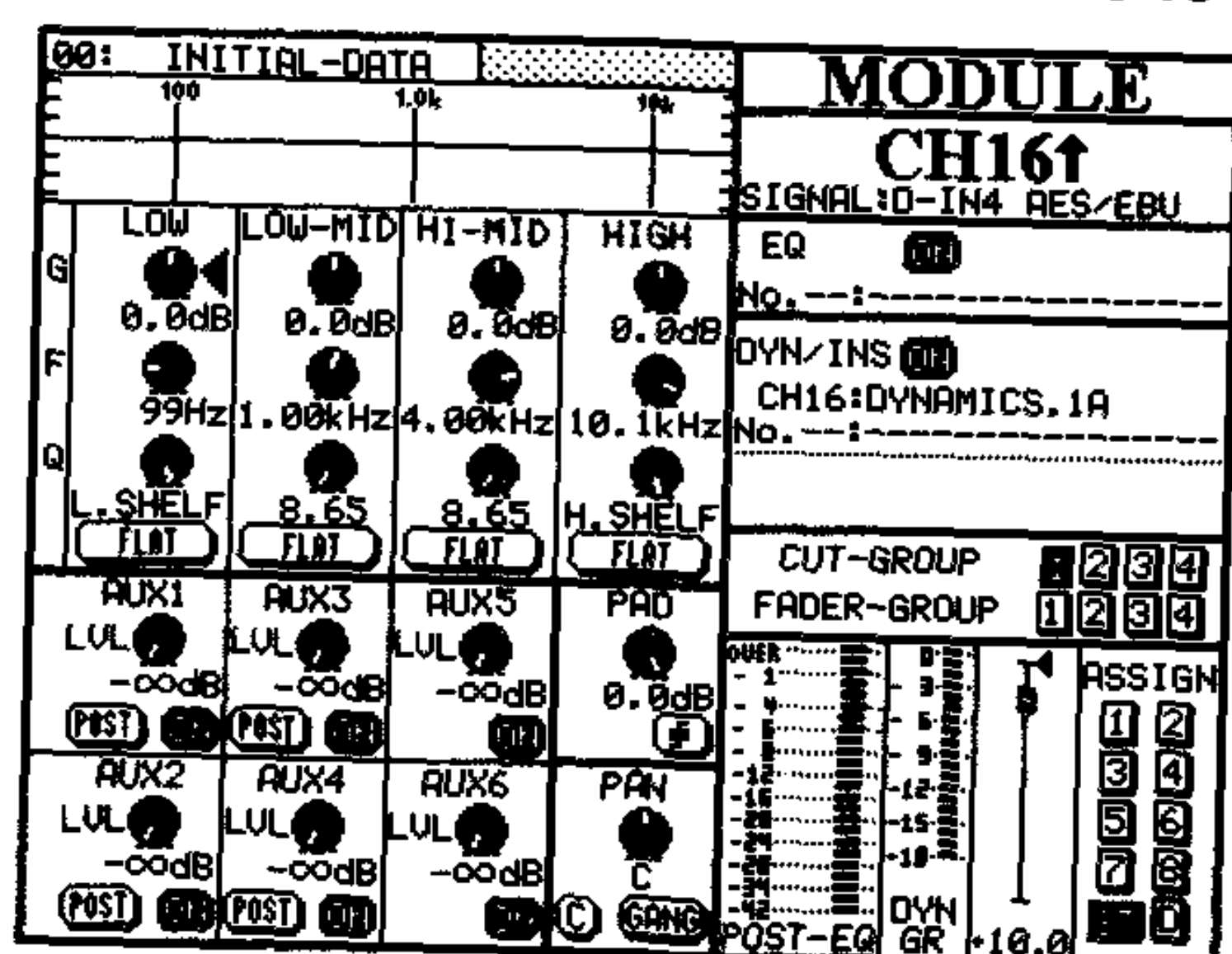
Note the triangular cursor by the representation of POD 10. This means that this is the active POD (for instance, if the jog dial is turned, the value of this control will change). The cursor is moved either with the cursor keys, or by using the appropriate POD control. As the rotary control or switch is moved, the cursor will “jump” to the appropriate controls to show the active POD. This feature can help you to navigate round the POD controls without having to look at the controls themselves.

The even-numbered input channels (mapped to PODs 4, 6, 8, 10, 12, 14, 16 and 18) have only their left switches enabled as a pan centering switch. Pressing the right switch of these PODs will have no effect.

PODs 19 and 20 control the ganged channels 15 and 16. Turning either of the POD rotary encoders will affect the pan position of both channels. The channels can be “un-ganged” by pressing the right switch of the left channel of the ganged pair.

4.2.2 Mapping the controls (ii)

A more complex use of the assignable controls comes when a channel module is to be edited:



In this case, the PODs are used to control different parameters of the channel module.

The top three rows of POD encoders (1 through 12) are used to set the gain, frequency and Q of the four EQ bands. The switches of the third row (9 through 12) are used as EQ “flatteners”, i.e. the gain can be reset to 0dB for each band individually.

The next row is used to set the AUX send levels for three AUX busses (13 through 15) and to add a pad (16). The switches are used as pre/post and AUX send ON switches for the AUX send pods, and the last POD’s right-hand switch is used as a phase reversal switch.

The last row of PODs (17 through 19) is used for another three AUX sends, and the last POD encoder (20) is used as a pan control. The left-hand switch is used as a centering control, and the right-hand switch is used as a gang control.

In this mode, the **EQ** and **INSERT/DYNAMICS** keys are used to switch the equalization circuits and insert matrix or dynamic processing circuits in and out of the module. If the module is not an input module, the **MTR SEND/RETURN** key is used to determine whether the module controls the monitoring of the multitrack send buss or the multitrack return.

4.3 The SEL keys

The channel **SEL** keys [13] are used to select the channel on which operations are to be performed, as in the **MODULE** screen shown above (4.2.2, “Mapping the controls (ii)”).

In the above example, input channel 1 is being edited. The upward arrow by the channel name at the top right of the screen shows that the input channels have been assigned to the small (upper) faders.

When this screen is displayed, the green **SEL** indicator of the small fader channel 1 will be lit.

If the faders have been swapped (see 6.1, “Fader swap”), the on-screen arrow would point down for input channels and up for MTR channels.

The **SEL** keys can also be used as cursor keys, allowing the selection of channels in multi-channel screens, such as the one illustrated in 4.2.1, “Mapping the controls (i)”.

Pressing a channel **SEL** key will move the on-screen cursor to the appropriate channel.

If the screen is showing the settings for one group of channels (for instance, the **PAN/Balance** screen shown above is showing the settings for input channels 1 through 16), pressing the **SEL** key of a channel of any other group will show the screen for the group to which that channel belongs.

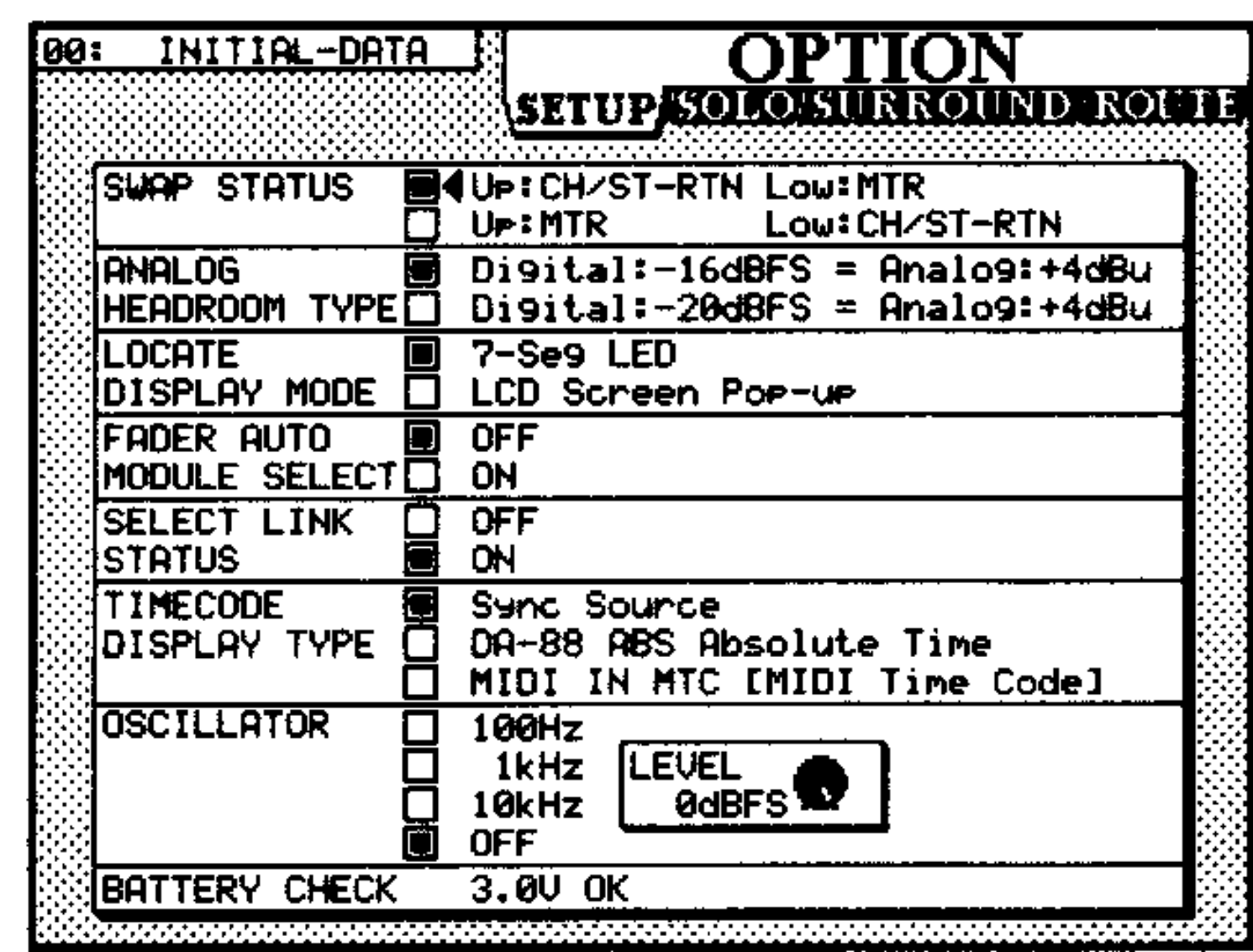
The **SEL** key may also be used to assign channels in other circumstances (e.g. fader groups, assignment to matrix inserts, etc.). These functions will be described fully in the appropriate areas of this manual.

4.3.1 AUTO CHANNEL SELECTION

When viewing the MODULE screen (as described in 6, “Console operations”, it may be easier under some circumstances to move a fader than to press a **SEL** key.

Accordingly, there is an option which allows you to use the faders to select channels.

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.
- 2) Press the **OPTION** key [43] until the following screen appears:



- 3) Use the cursor keys to move the cursor to the **AUTO CHANNEL SELECTION** option and turn it on or off as required.

NOTE

Auto channel selection only applies to the selection of channels for the **MODULE** parameter screens.

5 – Making connections to the TM-D8000

As with all audio equipment, always make connections to and from the TM-D8000 with the power turned **OFF**.

This section provides not only a guide to connecting external equipment to the TM-D8000, but also to many of the functions of the TM-D8000 which are concerned with these connections.

The TM-D8000 provides facilities for mixing down into a variety of surround formats. The techniques involved (including connections) are treated in a separate section; 8, “Surround operations”. Accordingly, in this section we assume a stereo mixdown situation.

5.1 Audio connections (analog)

The following describes the connection details for analog audio to and from the TM-D8000.

5.1.1 LINE IN connections

The 16 **LINE IN** 1/4” jacks [71] accept balanced signals at a nominal level of +4dBu.

The **LINE** switches on the front panel [10] are used to switch between the signals at these inputs (**LINE** switch engaged) or the **MIC/LINE** inputs [70] (**LINE** switch disengaged).

The level of these inputs can be adjusted using the **PAD** and **TRIM** controls ([11] and [9]) on the front panel. When a signal level of more than –10dBu (post-trim and pad is received, the **SIGNAL** indicator [12] for the channel will light.

+48V phantom power is **not** available through the 1/4” jacks.

5.1.2 MIC/LINE connections

The 16 **MIC/LINE** XLR connectors accept balanced signals at a nominal level of –50dBu.

The level of these inputs can be adjusted using the **PAD** and **TRIM** controls ([11] and [9]) on the front panel. When a signal level of more than –10dBu (post-trim and pad is received, the **SIGNAL** indicator [12] for the channel will light.

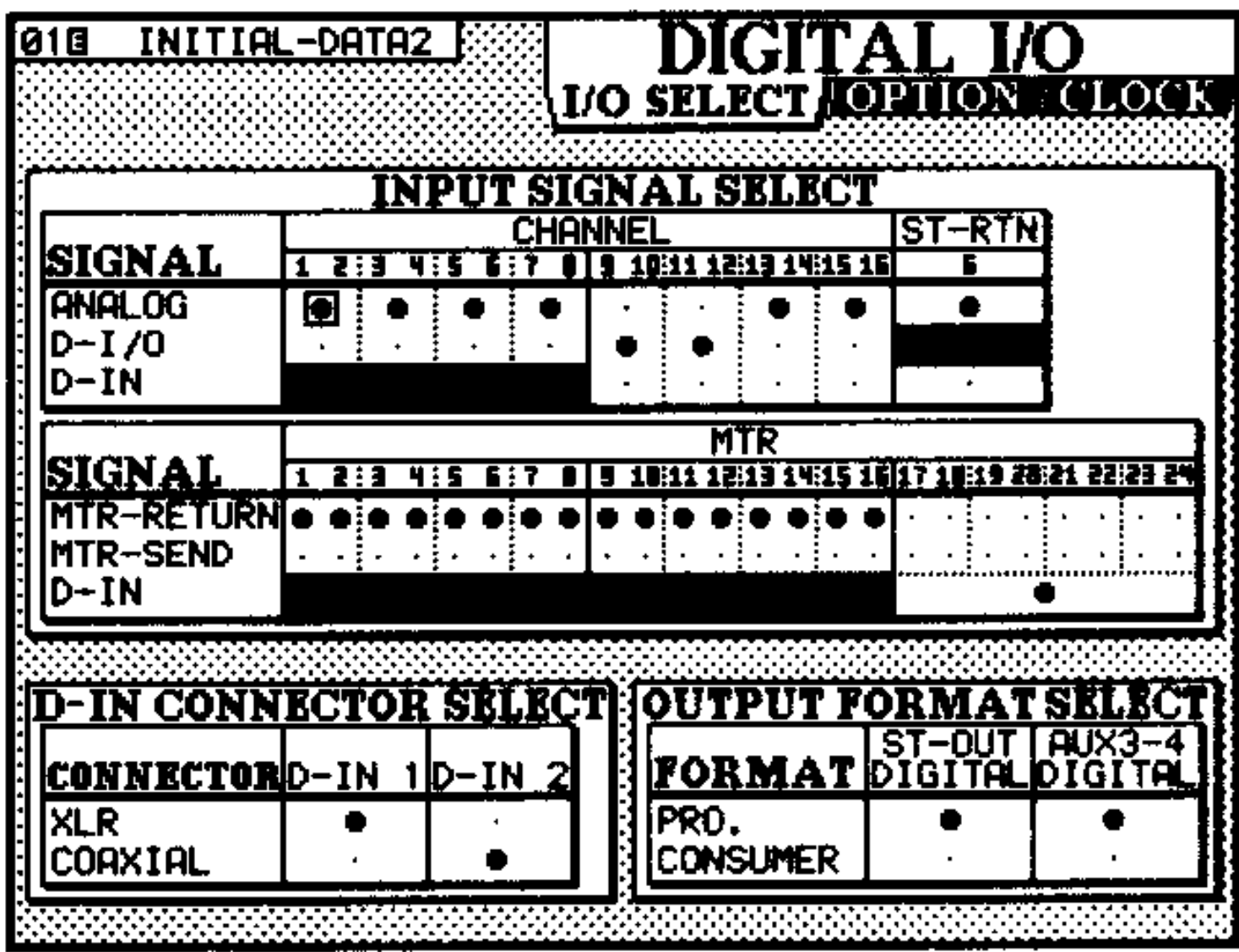
+48V phantom power can be provided on an individual basis using the **+48V** switches on the front panel [8].

5.1.3 Selecting analog inputs

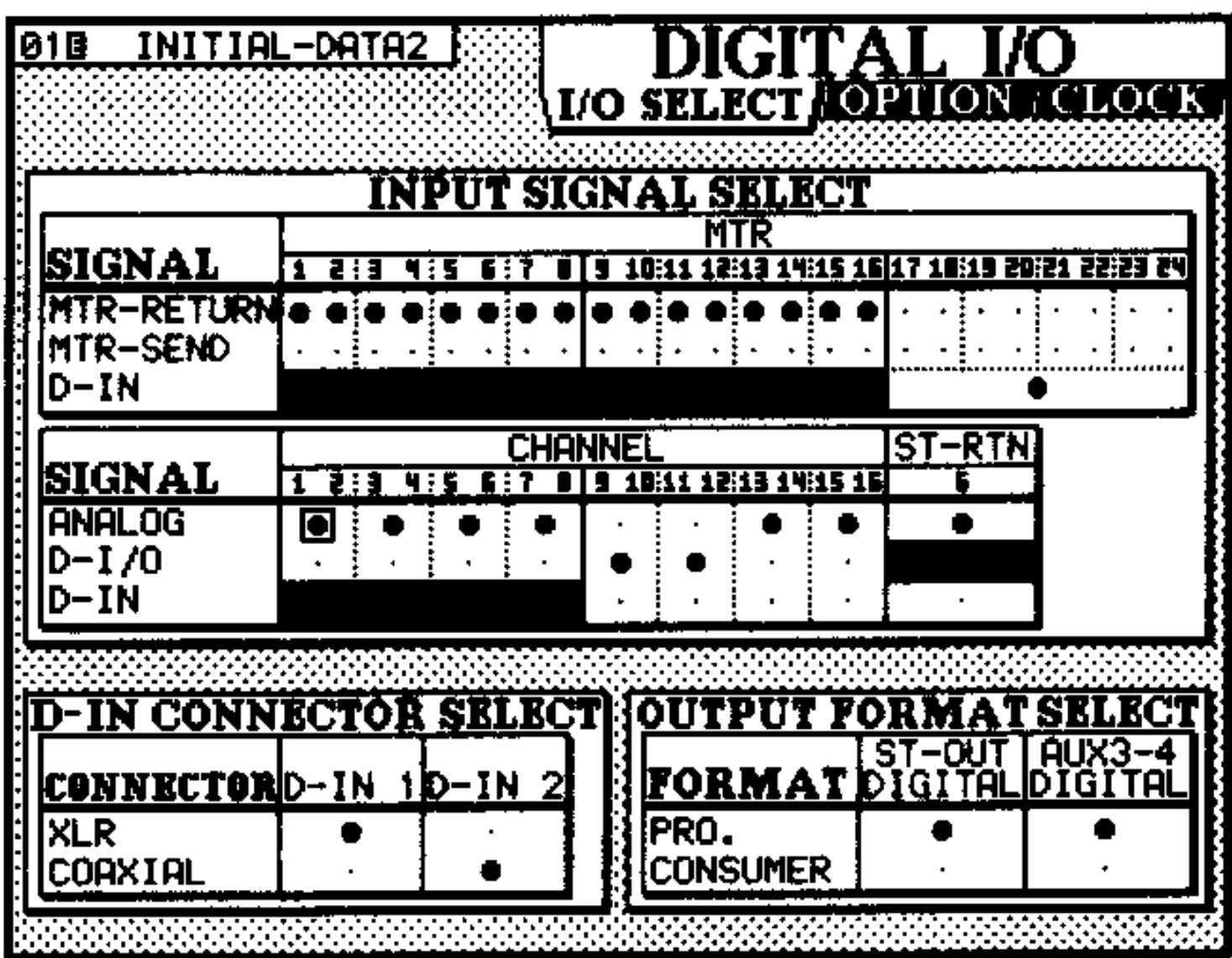
When analog inputs are used, these must be selected from the TM-D8000’s **DIGITAL I/O** screen after the system has been powered up.

- 1) Press the **SHIFT** key [45], followed by the **DIGITAL I/O** key [42].

If the screen below does not appear, keep pressing the **DIGITAL I/O** key until it does:



Note that if the **SWAP** indicator [6] is lit, this screen will appear slightly different:



- 2) Use the **CURSOR** keys [58] to move the on-screen cursor (the square box) to highlight **ANALOG** for a pair of **CHANNEL**s which take their inputs from the **LINE IN** or **MIC/LINE** connectors.

NOTE

Channels are selected in pairs; it is not possible to change the input source of channels individually.

- 3) Press **ENTER** to change the input source.
- 4) Repeat the process for all channels.

5.1.4 Channel insert connections

The 1/4" **INSERT** jacks [72] below the **LINE IN** jacks are used for inserting outboard processors (compressors, gates, etc.) into the analog inputs.

NOTE

Insert-type processing on channels fed by digital inputs is done using the matrix insert loops (5.1.6, "Matrix inserts").

The analog TRS **INSERTs** are wired with the tip providing the send (+4dBu nominal, 100Ω output impedance), the ring providing the return (+4dBu nominal, 10kΩ input impedance), and the sleeve providing a common ground.

5.1.5 Effect loops (AUX send and return)

Outboard effect processors are connected using unbalanced 1/4" jacks at nominal +4dBu levels. Sends are made through the **AUX SENDs** 1 through 6 [67] and the returns are made through the **STEREO RETURN** pairs [69].

The nominal output impedance for the AUX sends is 100Ω and the nominal input impedance for the stereo returns is 10kΩ.

The level of the signal received at the **STEREO RETURNS** can be adjusted with the **TRIM** controls [9] for these analog sections (17 through 22).

The **AUX SENDs** are available as independent sends, or may be linked together as stereo sends. The way in which this is done is described in 6.10.3, "Linking AUX sends and setting levels".

NOTES

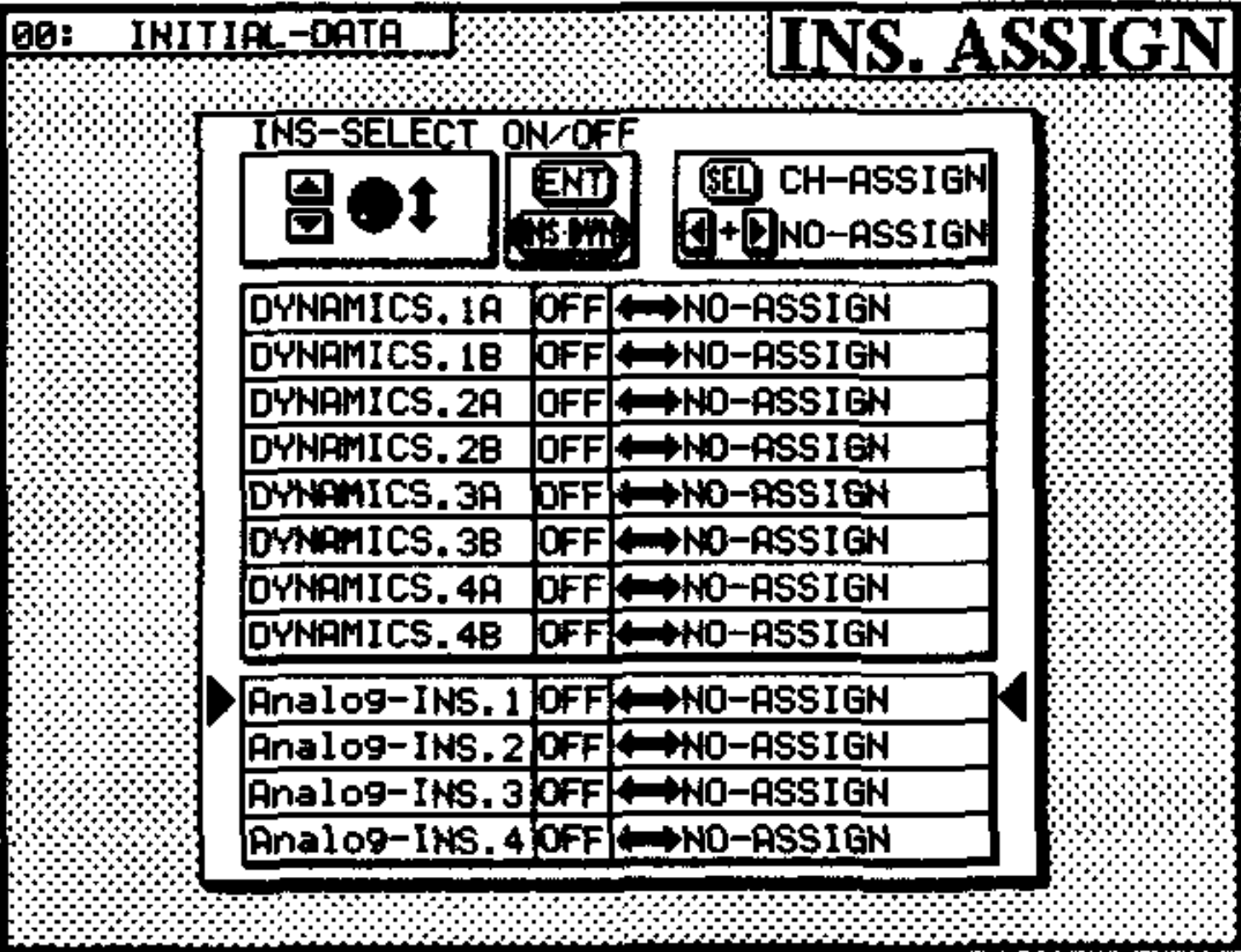
- The analog signals output from the AUX 3 and 4 busses are duplicated as digital signals in AES/EBU format from the **AUX 3-4 SEND XLR** connector [82].
- The signal returned to the **STEREO RETURN 6** signals can be replaced by an AES/EBU digital signal received at the **DIGITAL I/O ST RTN 6** XLR connector [83]. See 5.2.8, "Digital AUX return (6)" for details.
- The **STEREO RETURN** connectors can be used as additional unbalanced, unequalized stereo line inputs if they are not being used for processor returns.

5.1.6 Matrix inserts

The matrix inserts provide four unbalanced analog insert points for any input or tape return signals. These matrix points are at +4dBu nominal levels. The 1/4" jacks are wired with the tip providing the send (+4dBu nominal, 100Ω output impedance),

the ring providing the return (+4dBu nominal, 10kΩ input impedance), and the sleeve providing a common ground.

- 1) To assign a signal to a matrix insert after powering up the system, press the **SHIFT** key [45] so that the indicator lights.
- 2) Press the **INS ASSIGN** key [37].



- 3) Use the jog dial [57] to move the triangular cursors to one of the **Analog-INS** selection boxes.

In the illustration above, the first analog matrix has been selected.
- 4) Press the **SEL** key [13] of the channel or MTR return where you want to make the matrix insert.
- 5) A pop-up display will ask you to confirm this change and inform you if this will overwrite an existing assignment.

If the channel is currently in Read mode (automation), this assignment cannot be made, and a message will appear to inform you of this.
- 6) The right column of the highlighted row will change from showing **NO-ASSIGN** to the name of the channel or MTR return.
- 7) To turn the highlighted insert loop on or off, use the **ENTER** key.
- 8) To "un-assign" a matrix insert, press the cursor **LEFT** key while holding down the **RIGHT** key.

5.1.7 Connecting the STEREO outputs (analog)

The two sets of **STEREO** outputs [64] provide identical signals from the stereo buss. Use these connectors for hooking up analog stereo mastering machines.

If a digital mastering machine is to be used, the **DIGITAL I/O** stereo outputs [81] should be used, as described in 5.2.9, "Digital stereo outputs".

The balanced XLR outputs are at professional levels, +4dBu with 75Ω impedance.

The unbalanced RCA outputs are at domestic levels, -10dBV level with 100Ω impedance.

5.1.8 Connecting the 2-track inputs (2TR IN)

The two sets of 2-track mastering recorder inputs [65] complement the two STEREO output pairs, as described above.

If digital monitoring of a digital mastering machine is required, the mastering machine should be connected to one of the **D IN** connectors [84].

The balanced XLR set of inputs is at professional levels, +4dBu with 20kΩ impedance.

The unbalanced set of RCA inputs is at domestic levels, -10dBV, with 20kΩ impedance.

Either of the two sets of 2-track inputs can be selected using the appropriate **CONTROL ROOM** keys [23].

5.1.9 Connecting the control room monitoring system

The control room monitoring system is connected through the balanced +4dBu XLR **CR OUTPUT** connectors [62].

The nominal impedance for these connectors is 75Ω.

The signal sent to the control room outputs is chosen using the **CONTROL ROOM** selection keys [23]. The level of the signal sent to these connectors is adjusted using the **CR LEVEL** control and the **DIMMER** key [25].

5.1.10 Connecting the studio monitoring system

The studio monitoring system is connected through the balanced +4dBu XLR **STUDIO OUTPUT** connectors [63].

The nominal impedance for these connectors is 75Ω.

Typically, the stereo buss is sent through these outputs, but with the **CR** key [27], the studio outputs can echo the signal from the control room

monitoring outputs. The level is adjusted using the **STUDIO** control [27].

In post-production and other facilities where studio monitoring is not used, these outputs may be used to drive a set of near-field or small monitors.

5.1.11 Talkback and communications

The TM-D8000 incorporates a talkback mic [29] and volume control which is used for talkback and slating.

The 9-pin D-sub **COMMUNICATION REMOTE INPUT** connector can be used to connect a variety of tally and talkback devices. Consult your TASCAM dealer for details of suitable devices which may be connected to this port.

5.2 Connection of digital equipment

WARNING

As with all digital systems, it is very important that a central house sync is used on all digital audio equipment in a studio. If different word clocks are used throughout a system, there is a risk of damage being caused to the monitoring equipment.

See 5.3, "Synchronization and control connections" below for details of clock settings on the TM-D8000 and connected equipment.

5.2.1 Connecting multitrack recorders

Up to three DTRS recorders (or other TDIF-1 digital connections of 8 channels each) may be connected as primary recording and playback units. These recorders should be connected to the **MTR 1-8, 9-16** and **17-24** 25-pin D-sub connectors [86].

- If non-TDIF-1 format digital devices are to be used as MTR devices for playback and recording, the TASCAM IF-88AE or IF-88SD units may be used to convert between TDIF-1 and AES/EBU and SDIF-2 formats, respectively.

5.2.2 Additional multitrack recorders

A further two DTRS recorders (or TDIF-1 devices) may be connected as secondary MTR units.

These should be connected to the **D I/O** 25-pin D-sub connectors [87].

If these are to be used, after powering up the system, they must be assigned to pairs of channels as follows:

1) Press the **SHIFT** key [45] so that the indicator lights.

2) Press the **DIGITAL I/O** key [42] until the following screen appears.

3) Use the cursor keys to move the cursor (square box) to the channel pair(s) that you want to use with the signals received at the D I/O connectors, and position the cursor in the center row (D - I / O).

You can also use the **SEL** keys of the channels to select the channel, but the cursor must be moved up and down using the cursor keys.

4) Use **ENTER** to confirm your selection.

Note that you can only assign these channels to the inputs in pairs, rather than individually.

2) Press the **DIGITAL I/O** key [42] until the following screen appears.

3) Use the cursor keys to move the cursor to the bottom row of the MTR 17-24 block (as shown in the illustration above).

4) Press **ENTER** to select the D - I N inputs.

NOTE

AES/EBU signals carry a clock signal, but any devices which accept AES/EBU are capable of accepting external word clock signals, either through a separate connection, or through the AES/EBU cable. We strongly suggest that you synchronize these devices to external sync (either from the TM-D8000, or from the house sync master).

5.2.3 Using DTRS units with other multitrack equipment

It is also possible to keep the sixteen input channels as analog channels, while using MTR channels 1 through 16 with TDIF-1 equipment, and 17 through 24 with AES/EBU equipment.

Note, however, that in this case, channels 17 through 24 can only be used for playback.

The AES/EBU outputs of the multitrack equipment should be connected to the four **D IN** XLR connectors [84]. After powering up the system, assign these inputs to channels in the following way.

1) Press the **SHIFT** key [45] so that the indicator lights.

5.2.4 Connecting AES/EBU or SPDIF devices as input sources

As well as being routed to MTR channels, the signals from the **D IN 1** through **4** connectors can also be used as channel sources.

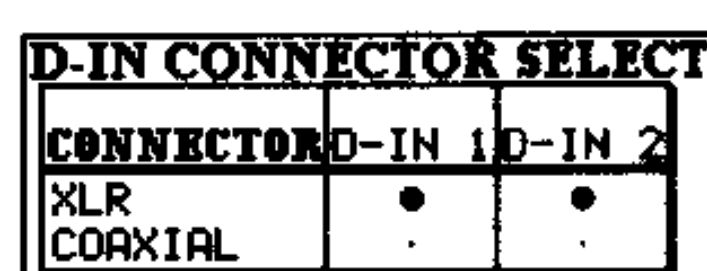
The inputs can be assigned to channels on a paired basis, in the same way as the **DIGITAL I/O** screen as described above (see 5.2.2, "Additional multitrack recorders"). In this case, however, the **D IN** rather than the **D - I / O** setting should be made.

The inputs are assigned to tracks as follows:

D IN	Channels
1	9 and 10
2	11 and 12
3	13 and 14
4	15 and 16

D IN 1 and **D IN 2** can be individually assigned to use the RCA connectors (SPDIF) rather than the XLR connectors (AES/EBU). This allows the connection of domestic CD players and DAT recorders with coaxial digital outputs.

- 1) Press the **SHIFT** key [45] so that the indicator lights.
- 2) Press the **DIGITAL I/O** key [42] until the **I/O Select** screen appears.
- 3) Use the cursor keys to move the cursor to the **D-IN CONNECTOR SELECT** section at the bottom left section of the screen.



- 4) Select either the **XLR** or **COAXIAL** setting for **D-IN 1** and **D-IN 2**.

If you have not previously selected **D-IN** for channels 9 and 10 (**D-IN 1**) or 11 and 12 (**D-IN 2**), these settings will have no effect.

- 5) Press **ENTER** to confirm your setting.

5.2.5 Word length

The TM-D8000 can accept audio data in word lengths of 16, 20 or 24 bits.

When using the TM-D8000 with the DA-88 DTRS recorder, you should use 16-bit words. The DA-38 and DA-98 recorders are capable of dithering and you may select 20 or 24-bit words.

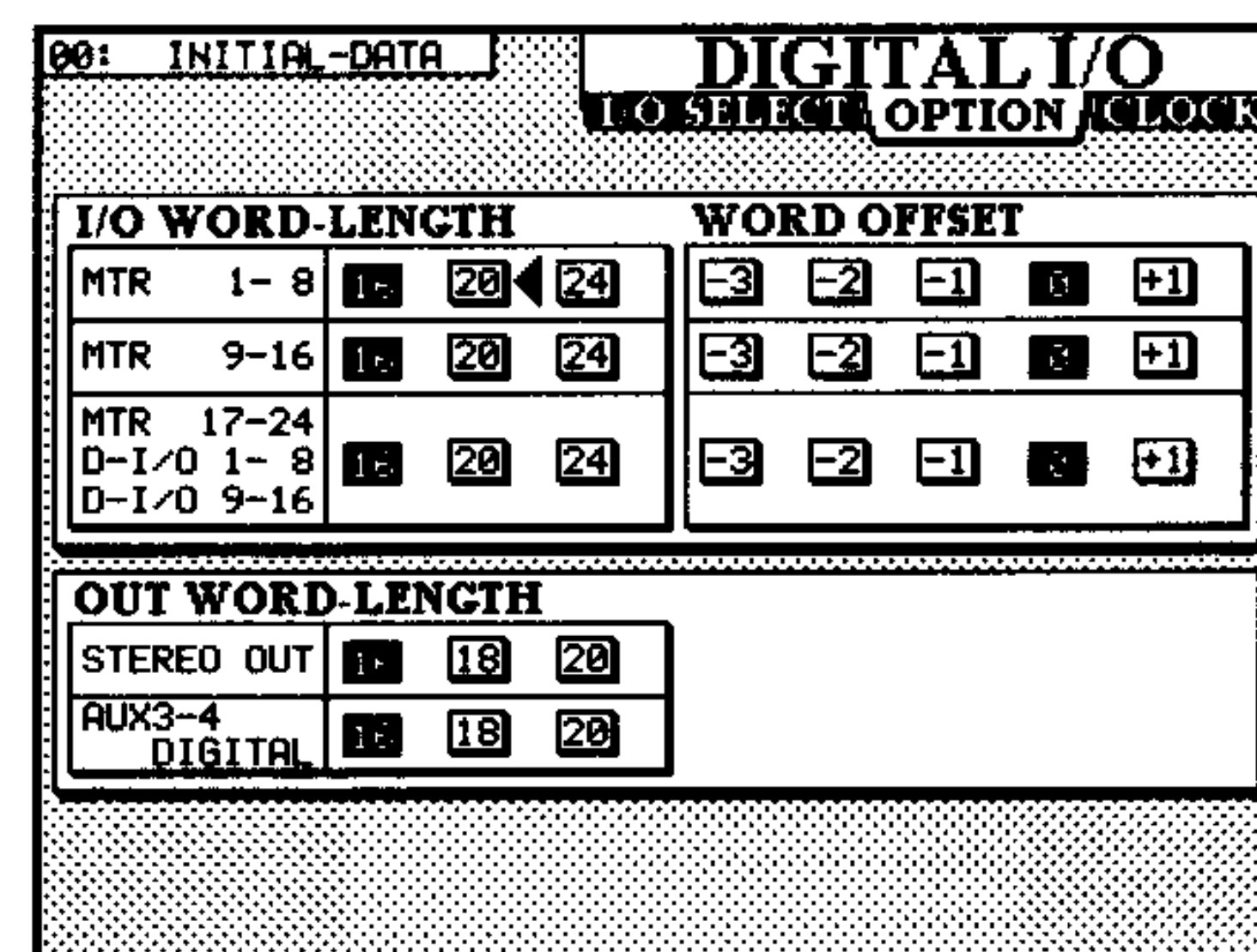
Some AES/EBU devices may also output their data with 20 or 24-bit words. Select the appropriate word length for these devices.

This applies also if you are using an IF-88AE interface to convert between TDIF-1 and AES/EBU signals, remember that if the TM-D8000 is set to 16-bit word length, bits above the 16th bit will be truncated. We therefore suggest that you use a 20-bit or 24-bit setting.

Word length on the **STEREO OUT** and **AUX 3/4** digital outputs may be rounded to 16, 18 or 20 bits. This may help to reduce low-level noise.

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.

- 2) Press the **DIGITAL I/O** key [42] until the following screen appears:



- 3) Use the cursor and **ENTER** keys to select the appropriate word length for the appropriate **MTR**, **D I/O** and **AUX** connectors, etc.

Since you can make different settings for the different MTR inputs, you can use a 16-bit input for a DA-88 being used as a master DTRS unit, and 20-bit for 2 DA-38 slaves, for example.

5.2.6 Word offset

Under certain circumstances, you may need to change the word offset for the **MTR** and **D I/O** TDIF-1 connections. Generally speaking, though, these should be left at the **0** setting unless you are experiencing problems.

Symptoms which may be cured by setting the word offset to a level other than **0** are:

- When feeding a steady signal (such as the built-in lineup oscillator) to all **MTR** outputs, and the armed tracks of the multitrack units do not all show the same level.
- When directly monitoring the MTR returns as signals are fed to the DTRS units and noise can be heard.
- These symptoms above are most likely to occur if DA-88s are connected to the TM-D8000 with a cable which is more than 5m (about 15 ft.) long, or if DA-38s or DA-98s are connected to the TM-D8000 with a cable more than 10m (about 30 ft.) long.

- 1) Use the **DIGITAL I/O OPTION** screen (as described above) to change the word offset.

Use the **1** setting first to try to eliminate the cause of the problem.

If you need to run the TDIF-1 cables over long distances (up to 50m -150ft), you should consider the use of the TDIF-1EX extension unit. Contact your TASCAM supplier for details.

5.2.7 Using digital AUX outputs

The analog outputs from AUX sends 3 and 4 are echoed from the XLR connector **AUX 3-4 SEND** [82] at AES/EBU level.

Connect a suitably-equipped off-board device to this XLR connector.

Select either professional or consumer format, as described below (5.2.10, "Selecting an output format").

5.2.8 Digital AUX return (6)

The AUX return 6 buss can be fed through the XLR connector **ST RTN 6** [83] at AES/EBU level.

- 1) Use the **SHIFT** key [45] to turn the **SHIFT** indicator on.
- 2) Press the **DIGITAL I/O** key [42] until the **I/O Select** screen appears.
- 3) Move the cursor to the **ST-RTN** section at the top right of the display screen and select **D-IN**.
- 4) Press **ENTER** to confirm your setting.

5.2.9 Digital stereo outputs

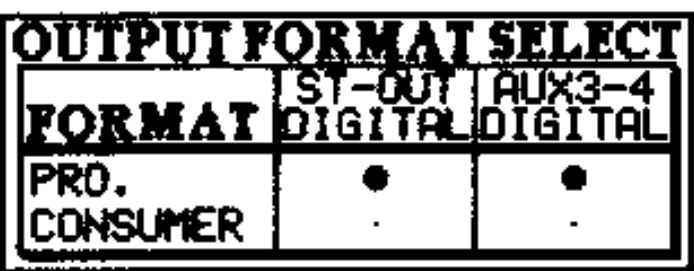
There are three digital stereo connectors available. The signal output from these connectors is identical to the signal output from the analog **STEREO OUTs** [64].

The XLR connector outputs at AES/EBU levels, and the two RCA jacks output the signal in SPDIF levels.

5.2.10 Selecting an output format

The digital audio output from the TM-D8000 digital **AUX 3-4** and **STEREO** connectors can be switched between professional and consumer. This is done from the **DIGITAL I/O** screen.

- 1) Use the **SHIFT** [45] and **DIGITAL I/O** [42] keys (as described above) to enter the **DIGITAL I/O** screen.
- 2) Move the cursor to the **OUTPUT FORMAT SELECT** section at the bottom right of the screen:



- 3) Select the appropriate format for both the **STEREO** and **AUX 3-4** outputs, pressing **ENTER** to confirm your selections.

5.3 Synchronization and control connections

The TM-D8000 can be connected to a variety of other equipment for synchronization and control purposes.

As explained previously, it is vital that every piece of equipment in a digital audio studio is clocked to the same reference. This may be either a word clock (or, if video is involved in the production) a video clock or frame clock.

5.3.1 Notes on sync clock operation

The **MASTER CLOCK** and **FS** indicators above the time display [6] show the source and frequency of the clock received by the TM-D8000.

The 3 **WORD SYNC** BNC connectors [85]; **IN**, **OUT** and **THRU** are used to carry this clock.

The **IN** automatically detects whether the clock received is a word or frame (both carried at TTL levels) or video (carried at a level of 0.5Vp-p to 2.0Vp-p) clock. No switching is necessary.

Valid signals are:

Frequency	44.1kHz or 48kHz $\pm 6\%$
Video signals:	25Hz (PAL/SECAM), 29.97Hz (NTSC color), 30Hz (NTSC mono)
Frame signals:	24Hz (film), 25Hz, 29.97Hz, 30Hz, 50Hz (mains-locked PAL/SECAM), 59.94 (mains-locked NTSC color), 60Hz (mains-locked NTSC mono)

A 75 Ω impedance switch is provided to match impedance with the clock source. Switch this in or out as necessary (consult the other equipment's manuals for details).

Any interruption in the clock source (this may be caused by pitch shift, for example) will cause the source indicator to flash, and a prolonged interruption will cause the TM-D8000 to revert to its internal clock. A pop-up message will alert you of this fact.

Valid sampling frequencies are 44.1kHz and 48kHz. If a signal is received which is neither of these, an error will be displayed, and the operation of the TM-D8000 will not be stable.

The tolerance for varispeed is $\pm 6\%$. If a clock source is operated outside this range, the clock signal will be lost.

The word clock screen, as shown below, allows you to choose the clock source, and also provides

information on the different clock sources which may be connected to the TM-D8000:

The thirteen sources on the screen each contain a check (tick) mark, a cross, or a question mark. A check indicates that valid clock data is being received at this port. If a cross is shown, the clock data received at this port (if any) is unusable. A question mark indicates that the clock is not of the correct frequency.

DTRS units connected to the TDIF ports will also have their type and ID shown here.

Pressing the on-screen **ADVICE** button will bring up a list of all digital inputs and clock sources, and their relationship to the current master clock source.

The **FS Status** box provides information on the current locked status, whether a word or video clock has been selected as the clock source.

Since the digital stereo return is not available for use as a master clock source, this is in a box of its own, and the cursor cannot move to it. However, it displays the same icons as the other sources.

Moving the cursor to one of these boxes and pressing **ENTER** will bring up a pop-up display showing more details of the clock being received at this port. Information includes the type of clock, frequency, etc. For **D IN 1** through **4**, the pitch relative to the current master (as a percentage relative to the current master), the data format and audio content status are shown. For any **TDIF-1** signal, the code, pitch both in absolute terms and relative to the master clock are shown. **Tracking** is shown if the selected clock is the same as the master clock.

If the clock is valid, pressing **ENTER** again will select it for use as the master clock (otherwise, use the cursor keys to cancel). An invalid clock's pop-up message can be cancelled by pressing **ENTER** again.

NOTE

If a clock source becomes unstable within a few seconds of selecting it for use as a master, a word clock loop may have been formed (e.g. a DTRS unit is set as a word clock slave, but has been selected on the TM-D8000 as a word clock master, or a mastering recorder connected to one of the D IN connectors is selected – a mastering recorder should always be a clock slave of the TM-D8000).

A clock will be regarded as invalid even if it is in the right frequency range, if the audio content flag is off (e.g. AC3 surround data).

5.3.2 Clock polarity, etc.

The on-screen buttons at the bottom of the clock screen allow you to change the polarity of the word clock received or transmitted by the TM-D8000. A reversed clock may result in the left-right signals being reversed relative to the clock source.

Move the cursor to the on-screen buttons, and use the **ENTER** key to toggle between normal and reversed clocks. Usually, these buttons do not need to be activated and may be left in the **NORMAL** state.

The on-screen **VIDEO** button is toggled with the **ENTER** key. This allows you to lower the generated master frequency by 0.1% ("pulldown") for use in telecine work.

5.3.3 Word and video clock synchronization using BNC connectors

When the TM-D8000 is to be synchronized to an external source received at the **WORD IN** connector, the clock source must be displayed on screen as being available.

- 1) Use the **SHIFT** key [45] to turn the **SHIFT** indicator on.

- 2) Press the **DIGITAL I/O** key [42] until the following screen appears:

The screenshot shows a menu titled "DIGITAL I/O" with a subtitle "HOUSEHOLD OPTION CLOCK". It contains several sections: "MASTER CLOCK SELECT" with options VIDEO, FRAME, INT, and USERBLE (checked); "DIGITAL ST-RTNS" with options D-IN1, D-IN2, D-IN3, D-IN4, and D-I/O (checked); "REMOTE INFO" with options ID=1, ID=2, ID=5, ID=7, and ID=8; "Fs SELECT" with options 44.1k, 48k, and a checked box for "F? STATUS LOCKED"; and "OPTION" with options WORD-IN POLARITY, WORD-OUT POLARITY, VIDEO, and BNC SYNC FRAME RATE (29.97Hz).

In this example, the signal being received at the BNC **IN** connector is a word clock (this box is checked).

A check mark in a box indicates that a valid clock signal is being received. A cross shows that no clock source is available at this connector. A question mark indicates an out-of-range or otherwise unusable source (e.g. a source is running vari-speed more than 6% outside the standard range).

NOTE

If the selected clock goes out of range, or DIN audio with illegal flags is received, or the clock source otherwise becomes unusable (the source is disconnected or develops some kind of problem), the output from the TM-D8000 will be muted, and an appropriate message will appear on the display. This will prevent your monitor speakers and ears from potential noise caused by clock problems.

- 3) Move the cursor so that the appropriate clock source is highlighted and press **ENTER**.

A pop-up panel will appear giving details of the signal available.

- 4) Press **ENTER** to select the chosen clock source, or any of the cursor keys to close the panel.

The clock source selected will be shown in inverse video (like **WORD** in the screen above), and the appropriate indicator will light on the status indicator strip above the time counter [6]. The appropriate sampling frequency indicator will also light.

The signal received at the **IN** is echoed by the **THRU**.

The **OUT** is used to carry the word clock generated internally by the TM-D8000. The clock signal is at TTL levels.

5.3.4 Synchronization with DTRS units

Strictly speaking, you do not need to make any dedicated digital audio synchronization connections between the TM-D8000 and DTRS record-

ers, whether the TM-D8000 is to be the clock master or slave relative to the DTRS units, as the TDIF-1 cables connected to the MTR inputs will carry clock signals. However, you should note the following.

Although it is possible to use the TDIF-1 signal from a DTRS recorder as a clock to drive the TM-D8000, we suggest that you use a dedicated word clock from the DTRS recorder, with the DTRS unit set as the clock master, taking a cable from the DTRS unit's **WORD OUT** to the TM-D8000's **WORD IN** [85].

Though you can select TDIF-1 as the clock master, a warning message will appear when you make this selection, prompting you to use a different clock master source.

Note that it is possible for the TM-D8000 to be a clock slave relative to an external piece of equipments (such as a house sync generator), and also be the word clock master for the DTRS units, re-transmitting the clock through the TDIF-1 ports and through the **WORD OUT**.

The master DTRS recorders in the chain which is to be a word clock slave to the TM-D8000 should have its clock source set to **WORD**. The other DTRS units in the chain cannot have their clock source changed.

We suggest that you **use the TM-D8000 as the word clock master** relative to DTRS units when there is a master house sync source or a video sync source. You should also use the TM-D8000 as a word clock master and the DTRS units as word clock slaves if there is a non-syncable (usually AES/EBU or SPDIF) digital audio source in the system. This digital audio source should be selected as the clock master for the TM-D8000.

We suggest that you **use the TM-D8000 as a word clock slave** relative to DTRS units if the digital audio system consists only of the TM-D8000 and the DTRS recorders.

If you want to use the DTRS machine as the clock master, use the **Clock** screen as described above (5.3.3, "Word and video clock synchronization using BNC connectors") to select any of the **MTR** or **D-I/O** boxes which are checked.

When a unit connected to the **MTR** or **D-I/O** inputs has been selected as a clock source, the **TDIF-1** status indicator [6] will light, together with the sampling frequency to which the TDIF-1 clock source is set. However, once again, we strongly suggest

that you use the word clock output from the DTRS unit as the clock source if the DTRS unit is to be the sync master.

5.3.5 Control of DTRS units

The transport controls [56] and [57], location controls [22], [53] through [55] and **REC FUNCTION** keys [2] on the TM-D8000 may be used to control the DTRS units. For further details of how to control external units using the TM-D8000, see 9, "External devices and the TM-D8000".

Connect the **REMOTE OUTPUT** of the TM-D8000 to the **REMOTE IN/SYNC IN** of the first DTRS unit in the chain using a PW-88S cable.

NOTES

This DTRS unit will be numbered as 0 if it is a DA-88, and it will be numbered as 1 if it is a DA-38 or DA-98.

Use only a TASCAM cable for this purpose. The use of any other cable may cause damage to the DTRS unit and/or the TM-D8000.

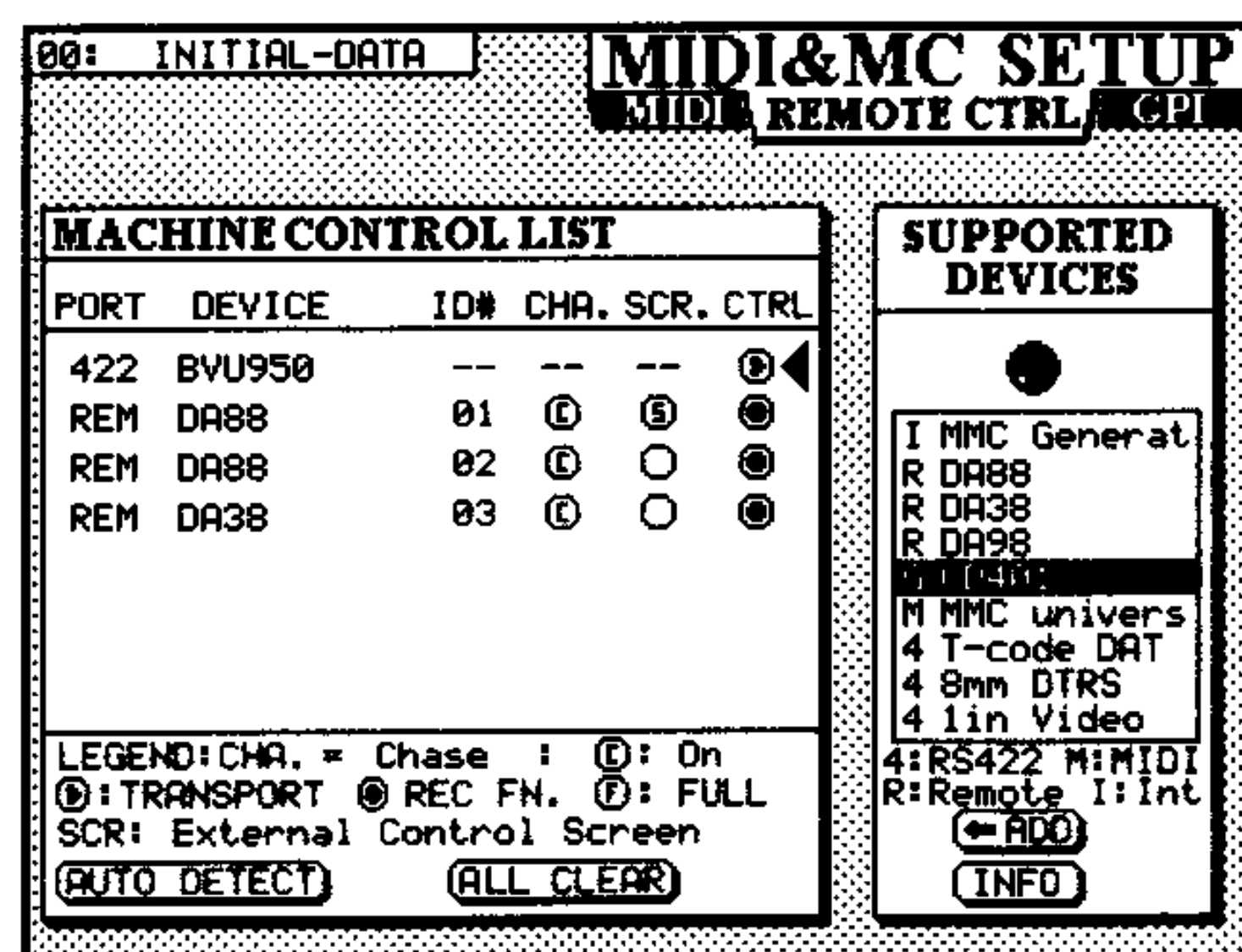
Make a control "daisy-chain" of the DTRS units from **REMOTE OUT** to **REMOTE IN**.

Terminate the **REMOTE OUT** of the last DTRS unit in the chain.

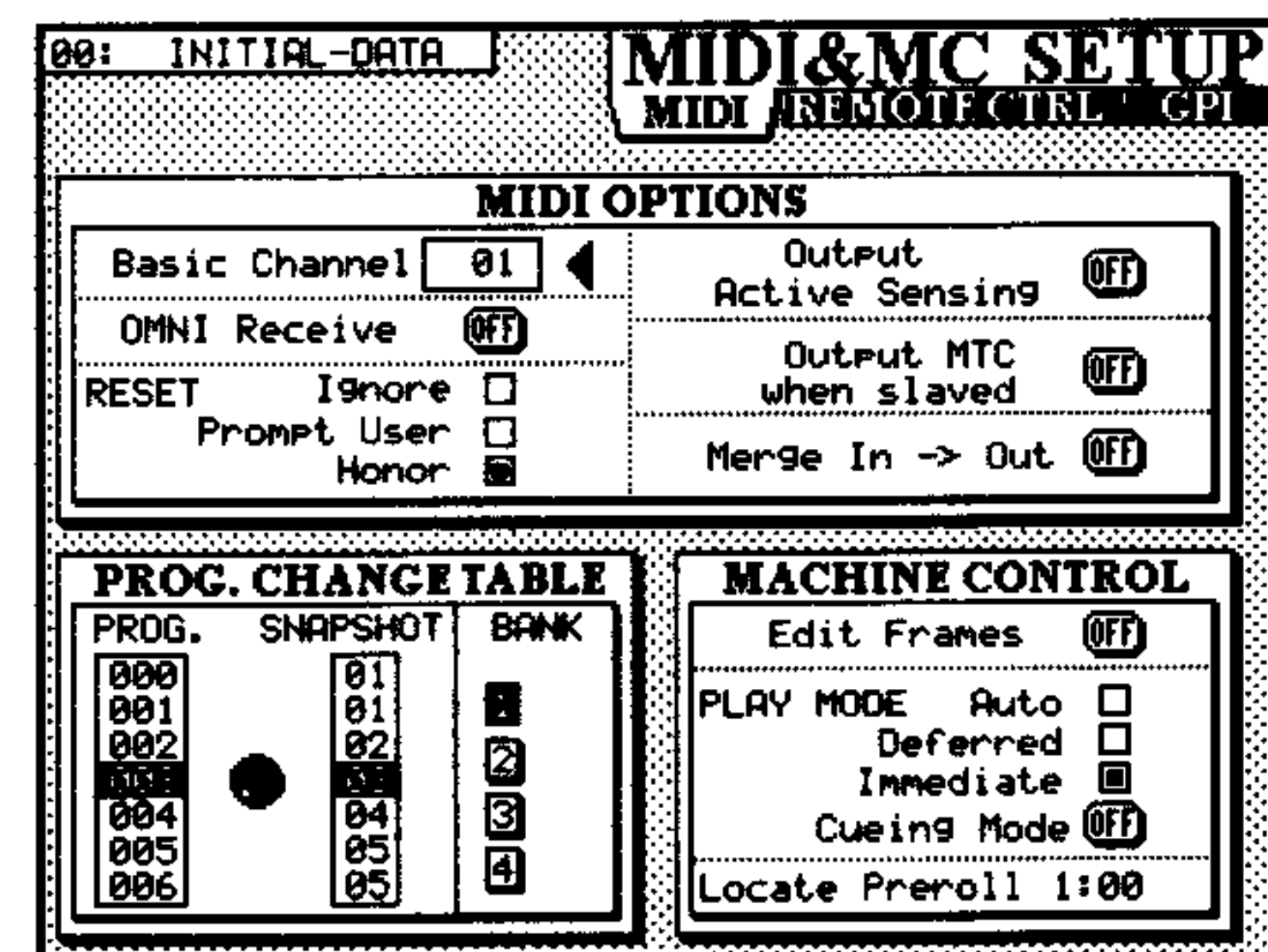
When the system has been powered up, assign the transport controls to the DTRS units in the following way.

This assumes that you are using the ABS code recorded on the DTRS tapes and that the DTRS units are free-running (i.e. they are not slaved to any timecode device).

- 1) Press the **CHASE** key for all DTRS units connected to the TM-D8000, except the first one. The **CHASE** indicators will flash.
- 2) Press the **SHIFT** key [45] so that the indicator lights, and then press the **MIDI/MC** key [41] key until a screen similar to the following appears:

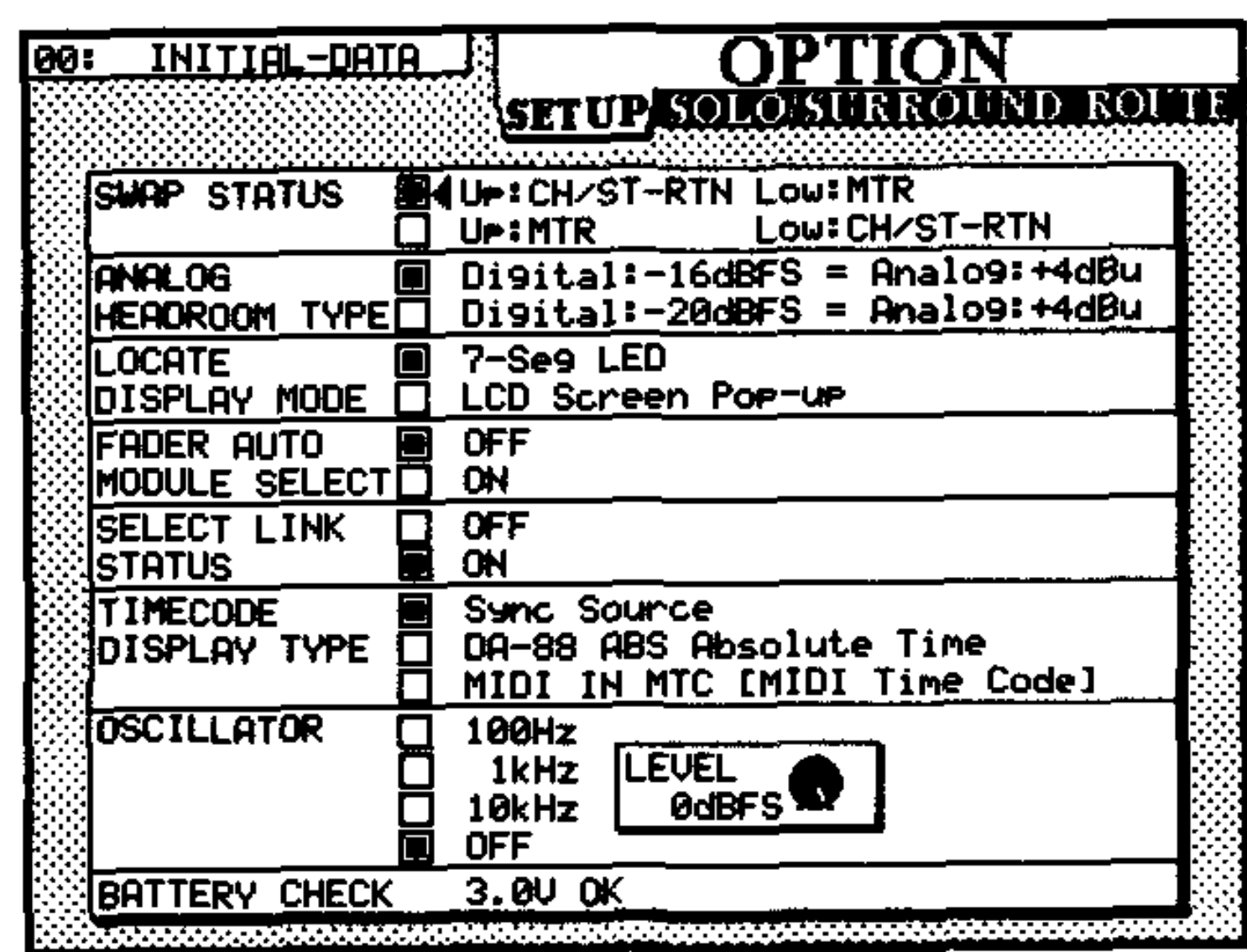


- 3) Use the cursor keys to highlight the on-screen **ALL CLEAR** button and press **ENTER**.
- 4) Use the cursor keys to highlight the on-screen **AUTO DETECT** button, and press **ENTER**.
 A list of devices connected to the TM-D8000 will be shown.
- 5) As in the screen above, move the cursor to the **CTRL** column of the first DTRS unit and press **ENTER** until a circled "F" appears, indicating that you have full control of the unit.
 The number of the first DTRS unit will always be shown as 1, even if the unit is a DA-88 whose ID has been set to 0.
- 6) Move the cursor to the **CTRL** column of the other units, and press **ENTER** until the circled dot appears (indicating that the TM-D8000 can be used to arm the tracks of the DTRS unit).
- 7) The **SCR** column allows control of some DTRS functions (e.g. Track Delay, see 9.1.9, "Control of DTRS units"). Press **ENTER** until a circled "S" is displayed for the DTRS unit(s) for which you want to edit these functions.
 The functions are available from the **EXTERNAL CTRL** screens.
- 8) Press the **MIDI/MC** key until the **MIDI** screen appears:



- 9) Move the cursor to the **PLAY MODE** section (bottom right) and select **IMMEDIATE** with the **ENTER** key.
- 10) If you want to set location points to frame accuracy (as opposed to second accuracy), turn the on-screen **EDIT FRAMES** button to **ON**.

11) With the **SHIFT** indicator still lit, press the **OPTION** key until the following screen appears:



12) To enable the display of the ABS timecode on the TM-D8000 time counter, move the cursor to the **DTRS ABS Absolute Time** field and press **ENTER**, so that it is selected, as in the display above.

5.3.6 Transport keys and DTRS units

When using the transport keys on the TM-D8000 to control the DTRS, the controls work much the same way as the DTRS' own controls. Note the following differences, however:

- The **PLAY** key's operation is determined in the MIDI screen, as shown above (see 9.1.5, "PLAY key function").
- The fast transport (fast forward and rewind) keys may be non-latching ("cueing mode"). For example, if the DTRS unit is in play or record mode, and the rewind key is pressed, the DTRS will go into rewind mode for only as long as the rewind key is held down. See 9.1.6, "Cueing mode" for details.

NOTE

Only one device at a time may be controlled using the transport keys. If another device (for instance, an RS-422 device, as described in 5.3.8, "RS-422 connection") is selected, the DTRS unit will no longer be controlled by the transport keys.

However, different mappings may be set up so that you can quickly change between control of different units without re-selecting and re-setting all parameters. See 9.1.3, "Machine Control Mapping memories" for details.

The **JOG/SHUTTLE** controls [57] can also be used to control the transport of the DTRS units. For these to be operational, the **JOG/SHUTTLE** key must be pressed to that the indicator lights.

The shuttle wheel works in the same way as the DTRS shuttle control, and the jog dial allows pre-

cise positioning of the tape through "rock and roll" positioning.

The techniques associated with location memories, punch operations, etc. are described in 9.3, "Location points, etc."

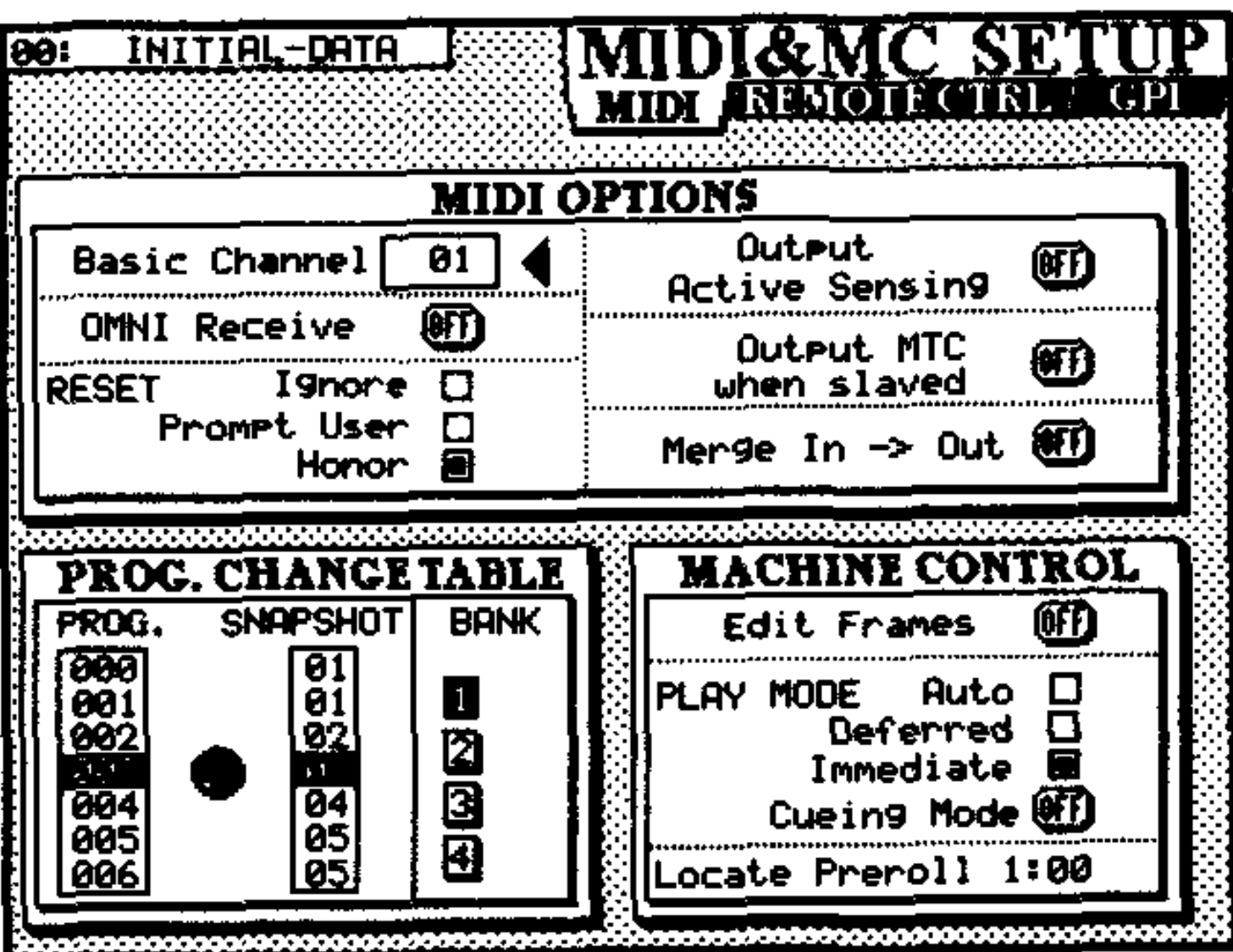
5.3.7 Timecode synchronization

To synchronize the TM-D8000 to external timecode, and to enable the timecode to be displayed on the time counter, connect the external timecode to one of the two **TIMCODE IN** connectors [80] on the rear panel.

The balanced XLR connector allows the input of a balanced timecode signal at a nominal input level of -20dBm. The input impedance is 20kΩ.

The unbalanced RCA connector allows the input of an unbalanced timecode signal with at a nominal input level of -20dBV. The input impedance is 20kΩ.

There is no timecode "out" or "through" connector provided, but MIDI timecode will be output from the **MIDI OUT** terminal if internal timecode is selected as the source, or through an option in the **MIDI** screen (with the **SHIFT** indicator on, press **MIDI/MC** until the screen appears).



- 1) Move the cursor to **Output MTC When slaved**, and change the on-screen button to **ON** to allow the retransmission of timecode as **MTC**.
- 2) Press **ENTER** to confirm the setting.

To use the timecode, enter the **OPTION SETUP** screen (with the **SHIFT** indicator lit, press the **OPTION** key until the following screen appears):

- 1) Use the cursor keys to move the cursor to the **EXTERNAL** setting.
- 2) Press **ENTER** to confirm this.

5.3.8 RS-422 connection

Devices which can be controlled using the Sony P2 protocol can be connected to the **RS-422** port [78] on the rear panel.

At the time of writing, all currently available Sony devices supporting P2 control (including DAT and VTR devices) are automatically detected.

These devices can be manually selected from the list in the **REMOTE CTRL** screen, (with the **SHIFT** indicator on, press **MIDI/MC** until the screen appears):

- 1) Move the cursor to the on-screen **ADD** or **INFO** button on the right, and use the jog dial [57] to scroll through the list of devices which may be controlled through the **RS-422** buss.

These devices have a 4 beside their names. More devices may be added to the list by upgrading the TM-D8000's flash ROM via MIDI using the supplied automation software (see 11, "TM-D8000 automation").

Alternatively, use the **AUTO DETECT** function (as described in 5.3.5, "Control of DTRS units") to search the **RS-422** buss for connected units. At the time of writing, all currently available Sony

devices supporting P2 control (including DAT and VTR devices) are automatically detected.

NOTE

Some devices (for example the DTRS recorders) can be controlled either through the **RS-422** buss or through the **REMOTE OUT** connector and hence appear more than once in the scrolling list.

- 2) To find out more about the device, move the cursor to the on-screen **INFO** button, and press **ENTER**.
- 3) When you have found the device you want to add, move the cursor to the on-screen **ADD** button, and press **ENTER**.

Up to 16 devices can be selected for control by the TM-D8000. Seven can be shown at any one time, and the list can be scrolled.

RS-422 devices have no ID, and their "ID" is represented by hyphens.

The **CHA** (chase) field is inactive for **RS-422** devices.

Control of functions other than transport functions may be possible. If this is the case, the **SCR** column will have a circle in it (which may be changed to a circled 'S' to enable editing through the **EXTERNAL CTRL** functions (see 9.1.9, "Control of DTRS units" for an example of such external control).

The values to which the **CTRL** field may be changed depend on the device attached (for instance, if a playback-only device is attached via **RS-422**, recording is not possible. Remember that only one device at a time may be controlled using the TM-D8000 transport keys.

If recording is possible and is enabled for the **RS-422** device, **REC FUNCTION** keys 17 through 24 of the TM-D8000 are used to arm the tracks of the **RS-422** device. The exact assignment of tracks (from the 4 analog and 8 digital control channels) to these **REC FUNCTION** keys depends on the device. Units controlled through **MMC** (MIDI Machine Control) will use **REC FUNCTION** keys 9 through 16.

5.3.9 GPI-controlled devices

The wiring of cables associated with the two GPI ports [77] is as follows:

Tip	GP 1 – EV1, GP 2 – EV 3
Ring	GP 1 – EV2, GP 2 – EV 4
Sleeve	Ground

To trigger events using the GPI ports, which are synchronized to timecode, use the GPI screen (with the **SHIFT** indicator on, press the **MIDI/MC** key until a screen similar to the following appears):

	TIME	Output	EDGE	Offset	Enable
00: INITIAL-DATA	00:00:00:00	All	L 0ms	0:00.00	OFF
1	00:05:32:00	1	JL 100	0:00.00	OFF
2	00:06:10:15	2	J 0ms	0:00.00	OFF
3	New	-	- 0ms	0:00.00	OFF

Buttons at bottom: ALL OFF, ALL ON, SORT, DELETE, TRIGGER, CAPTURE TC, CAPTURE P-IN

Up to 16 events may be created, and the on-screen list can be scrolled so that all events can be viewed. An event is selected from the list using the jog dial or cursor keys to move the cursor to the event's number, and then pressing **ENTER**. The event is then selected.

An event may be turned **ON** or **OFF** using the on-screen button. All events in the list may be turned on or off using the appropriate on-screen buttons at the bottom of the screen.

The time at which an event takes place may be input using the number keys [22]. Alternatively, the cursor can be moved to the on-screen **CAPTURE TC** button, and when pressed, the timecode currently shown on the time counter [7] will be stored as the trigger time for that event.

In addition, if an automatic punch-in point has been set using the remote punch control keys [21], the on-screen **CAPTURE P-IN** button can be used to transfer this time to the event trigger time.

If the selected event has **New** displayed as its timecode value, a capture will create a new event at the captured time.

All event times, once entered, can be subsequently edited using the jog dial and/or number keys.

The offset of the event to the selected time is set in seconds and frames, to the nearest quarter frame in the **Offset** column, using the jog dial. As the

name implies, the value set here will be used as an offset from the time set earlier (in other words, an offset of 1 second will start the event 1 second before the displayed timecode value). This allows you to allow for device "wind-up" time, etc.

NOTE

If the received timecode is unstable, GPI events will not be triggered. Unstable timecode is indicated by the dot at the right of the time counter.

The signals which can be **Output** to the GPI ports are:

- Rising edge
- Falling edge
- Positive pulses (50ms, 100ms and 200ms)
- Negative pulses (50ms, 100ms and 200ms)

Select the output type using the jog dial. The timings of the pulse widths are ± 3 ms, as they are referenced to the quarter-frame timecode clock. The start time will always be locked to the quarter-frame timecode clock.

When events have been entered, the on-screen **SORT** button can be used to sort them in chronological order. Whenever the display is changed from this screen and back again, events are automatically sorted.

The on-screen **TRIGGER** button will trigger the selected event, regardless of the current time, and regardless of whether the event has been enabled or disabled.

The on-screen **DELETE** button deletes the selected event from the list.

5.3.10 MIDI connections

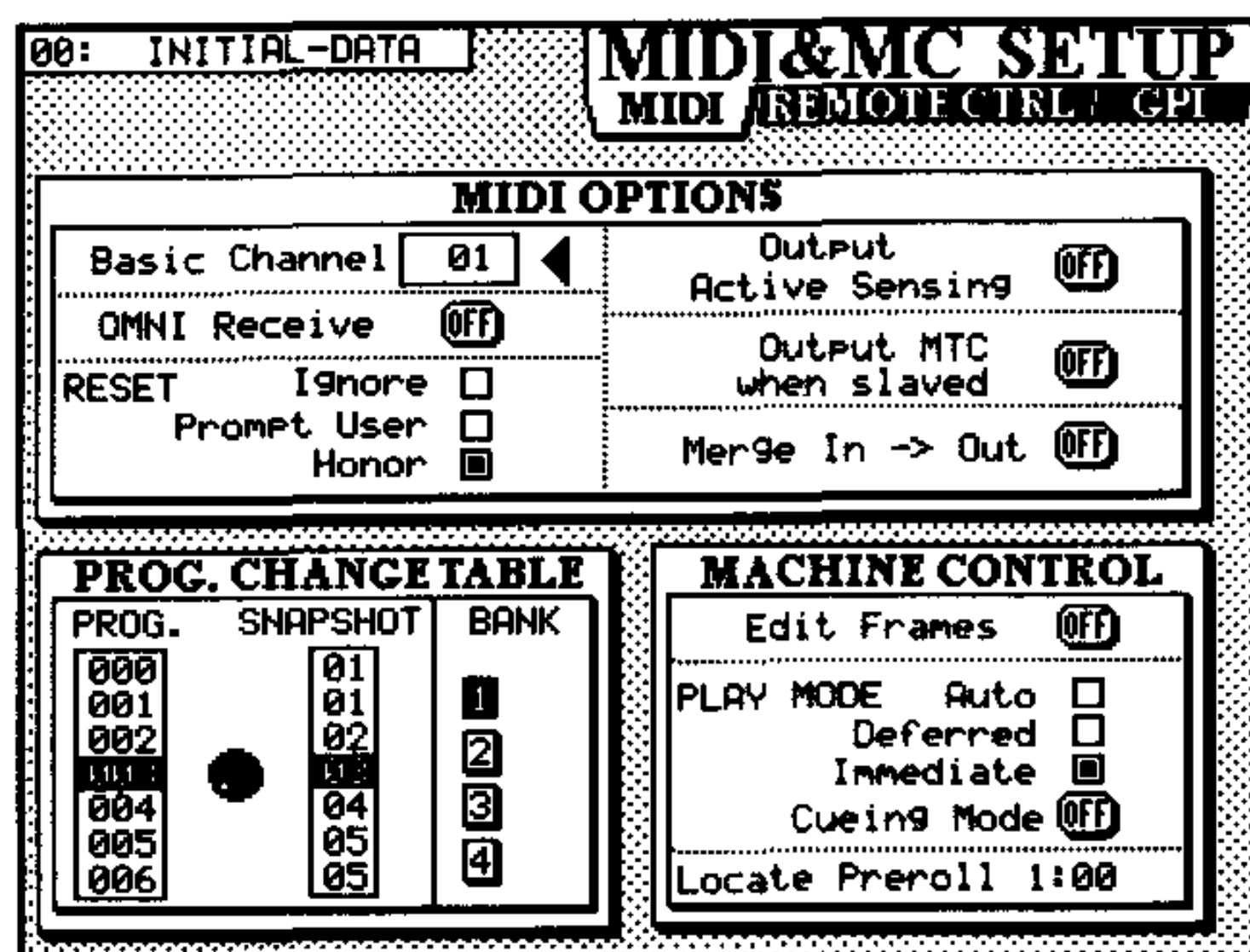
The TM-D8000 can be used as part of a MIDI setup, sending and receiving MIDI messages such as Control Change and Program Change messages, etc. from a sequencer. The MIDI ports can also be used with a personal computer running the supplied automation software.

MIDI connections should be made in the same way as with any other piece of MIDI equipment¹.

The **MIDI OUT** can be used as a merged **OUT** and **THRU** if the on-screen **Merge IN -> OUT**

¹ A discussion of MIDI basics is outside the scope of this manual. If you are unfamiliar with MIDI systems, there is an excellent selection of books on the market, for example, *MIDI Systems and Control*, Francis Rumsey, pub. Focal Press.

button in the following screen (use the **SHIFT** and **MIDI/MC** keys to access this screen) is set:



MIDI messages are received on the channel selected in the above screen. Use the jog dial [57] or number keypad [22] to set the channel number.

OMNI Receive can also be turned on or off using the on-screen button.

The MIDI System Realtime message FF (hex) is a RESET message. The TM-D8000 can Honor this message (it will reset when an FF is received), can put a message on-screen asking for confirmation (Prompt User) or it can Ignore the message, depending in the setting made in this screen.

You can also map MIDI program change commands to snapshot memories (see 9.4.6, "Program Change Tables").

5.3.11 Connection to a computer

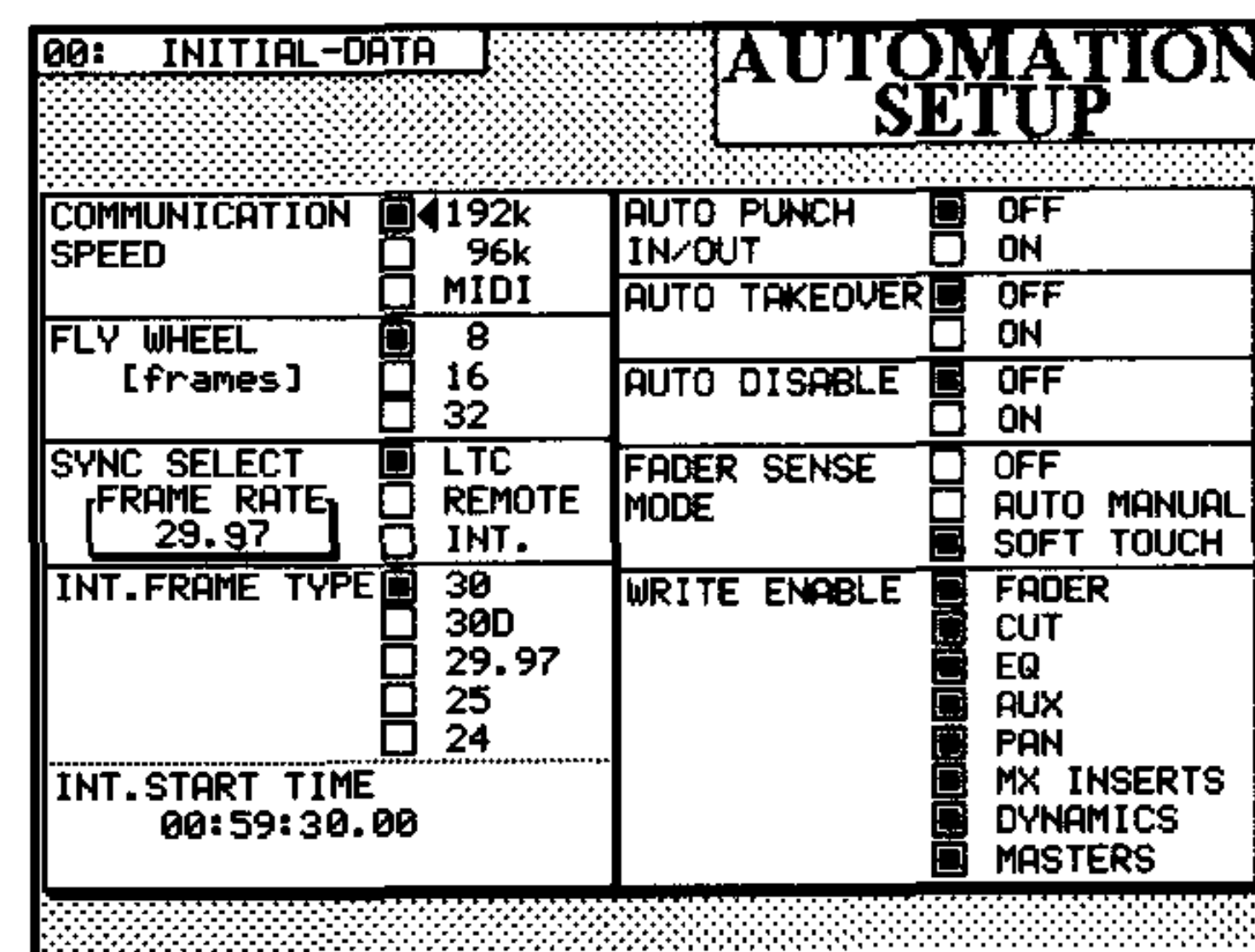
The TM-D8000 can be connected to an Apple Macintosh™ personal computer using the **TO HOST** 8-pin mini-DIN RS-422 connector [75].

Use only a Macintosh modem (not printer) cable the connection between the TM-D8000 and the computer. See 11.2.1, "TM-D8000 and computer connection" for details.

The computer can run the supplied TM-D8000 automation software which can be used to control the TM-D8000 through this port.

However, to enable communication between the computer and the TM-D8000, a speed must be set. With the **SHIFT** indicator lit, press the **AUTOMA-**

TION SET UP key until the following screen appears:



Select a communication speed for the serial port, 48k bps or 96k bps. If MIDI is selected, automation information will be passed using the MIDI interface of the computer (if fitted) to the MIDI ports of the TM-D8000.

For full details of how to use the automation software, see 11, "TM-D8000 automation".

5.3.12 Connecting oscilloscopes

The **SCOPE OUTPUTS** [66] are, strictly speaking, audio outputs, echoing the output from the control room monitoring buss.

The 1/4" stereo jacks (tip = left, ring = right, sleeve = ground) have a nominal output impedance of 100Ω, and output the signal at a nominal level of -2dBu.

Use these outputs to connect phase metering scopes.

These outputs can also be used to connect external analog stereo meters (average or peak), if these are required.

6 – Console operations

This section describes how to use the TM-D8000 as a recording mixing console. It is assumed that you have some familiarity with the principles and techniques of conventional analog console operations (but not necessarily at an expert level).

In this section, channels which accept inputs are called “input channels” and those accepting tape returns are known as “MTR channels”. Since the two are identical, except for position, for the most part, they can be treated identically.

In this section, we are assuming the use of stereo outputs. If you are using the TM-D8000 to create surround mixes, the operation is similar to that described in this section, but you should also read 8, “Surround operations”, which is a section dedicated to the practice of surround mixing as implemented on the TM-D8000.

This section follows (as far as practical) the signal path through the console.

6.1 Fader swap

As shipped from the factory, the TM-D8000 is configured so that the large (lower) faders are used for MTR channels, and the small (upper) faders are used for input channels, corresponding to the usual American convention.

This can be reversed so that the large faders become channel faders and the small faders become MTR faders, thus corresponding to the usual British convention.

- 1) Use the **SHIFT** key [45] to turn the **SHIFT** indicator on.
- 2) Press the **OPTION** key [43] so that the following screen appears:

00: INITIAL-DATA	
OPTION	
SETUP/SOLO/SURROUND/ROUTE	
SWAP STATUS	Up:CH/ST-RTN Low:MTR
ANALOG HEADROOM TYPE	Digital:-16dBFS = Analog:+4dBu
LOCATE	7-Seg LED
DISPLAY MODE	LCD Screen Pop-up
FADER AUTO	OFF
MODULE SELECT	ON
SELECT LINK STATUS	OFF
TIMECODE	Sync Source
DISPLAY TYPE	DA-88 ABS Absolute Time
OSCILLATOR	100Hz
BATTERY CHECK	3.0V OK

- 3) Use the cursor keys to move the on-screen cursor to the desired option of the uppermost parameter, **SWAP STATUS**.

- 4) Press **ENTER** to confirm your setting.

The **SWAP** indicator on the status indicator strip [6] above the time counter will light.

When the channels are swapped, the status of the green **SEL** indicator (along with all channel settings, EQ, solos, etc.) of the channels will be “carried over” with the fader control. However, when the channels are swapped, the output level of the channels will not be carried over, but will reflect the levels as set by the “new” fader.

6.2 Analog inputs

Input channels 1 through 16 can accept analog inputs. These analog sections can accept signals from either the **MIC/LINE** XLR connectors [70] or the **LINE** 1/4” jacks [71]. All these inputs are balanced at +4dB with an input impedance of 2.4kΩ.

Details of how to select analog inputs are given in 5.1.3, “Selecting analog inputs”.

6.2.1 Analog controls

The controls for each analog input from 1 through 16 are similar to those found on an analog console.

The **LINE** switch [10], when on (depressed), feeds the analog signal present at the **LINE** jack [71] through the input channel. When off, the signal present at the **MIC/LINE** connector [70] is fed through the input channel.

The **+48V** switch [8] provides phantom powering to the **MIC/LINE** XLR connector [70]. The indicator lights when +48V power is being supplied to that input channel.

The **PAD** switch [11] provides -20dB of attenuation to the signal, immediately prior to the **TRIM** control [9].

The **TRIM** control [9] allows adjustment of the input gain from +16dB to +60dB.

The **SIGNAL** indicator [12] lights when an analog signal is received at a level of -10dBu or over (post **TRIM** control).

After the analog signal has passed through the **SIGNAL** indicator circuit, it is fed into the channel’s internal A/D convertor, where it enters the digital domain.

6.3 Digital channel processing

All digital signals entering input channels, all signals entering MTR channels (which have no ana-

log inputs), and all post-**SIGNAL** analog signals are now treated identically in the digital domain.

The controls for digital channels (except for the fader, **SOLO** and **CUT** keys) are all assignable. The assignable controls and SEL keys of the channels should be used to alter channel parameters. See 4, “The center control section and display” for details of how to use these controls.

For many parameters, there will be more than one way to achieve the same end; using a global channel screen, where the one or two parameters of many channels can be viewed and edited together, and the module screen, where all parameters of a single channel (or pair of channels) may be viewed and edited together.

6.4 Pad and phase

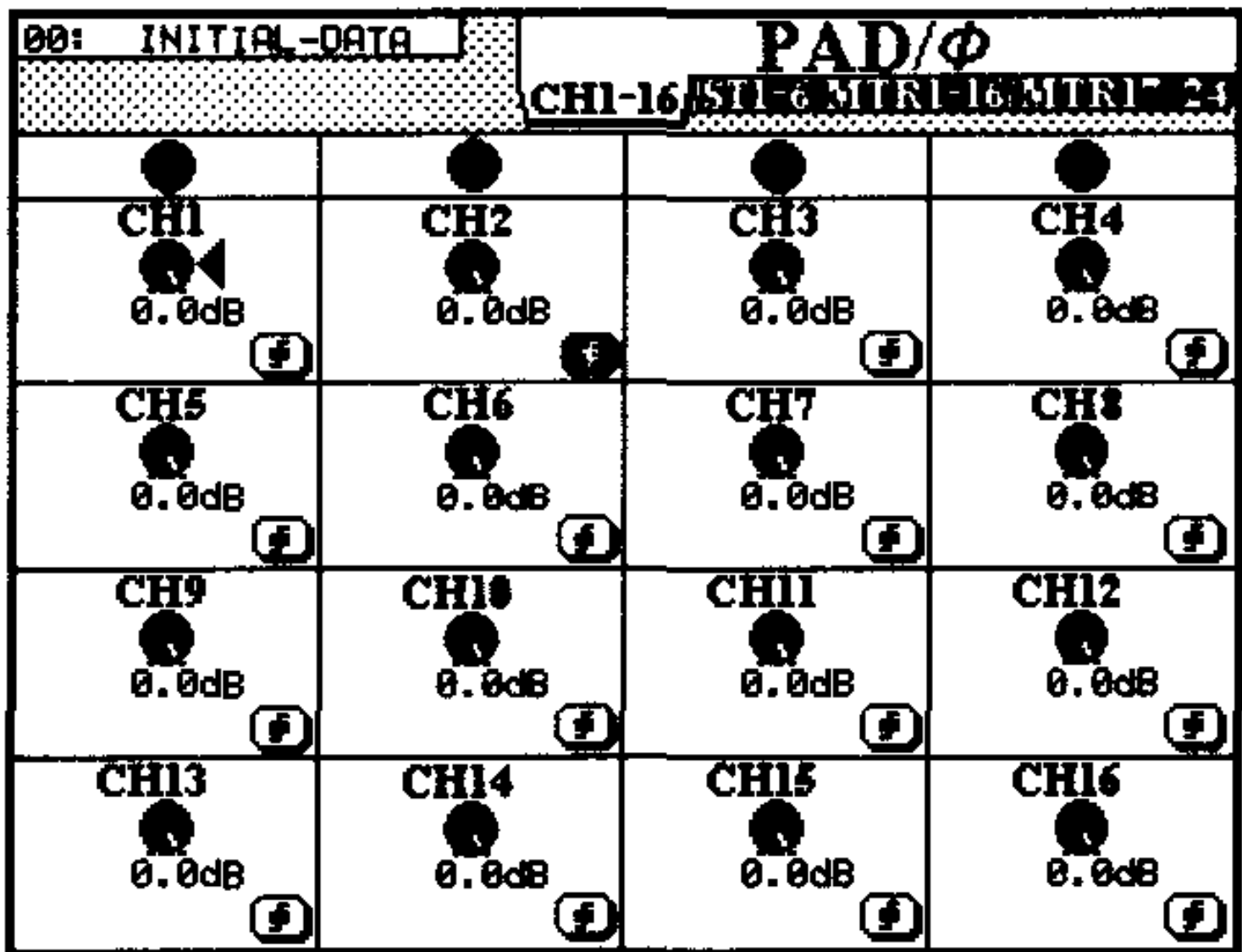
A digital pad allows attenuation of the signal up to 36dB (in 0.5dB steps).

A phase reversal switch for each channel is provided immediately after the pad.

6.4.1 Pad and phase (i)

To view and set many pad and phase settings together:

- 1) Use the **SHIFT** key [45] to turn the **SHIFT** indicator on.
- 2) Press the **PAD/Φ** [33] key so that a screen similar to the following appears:



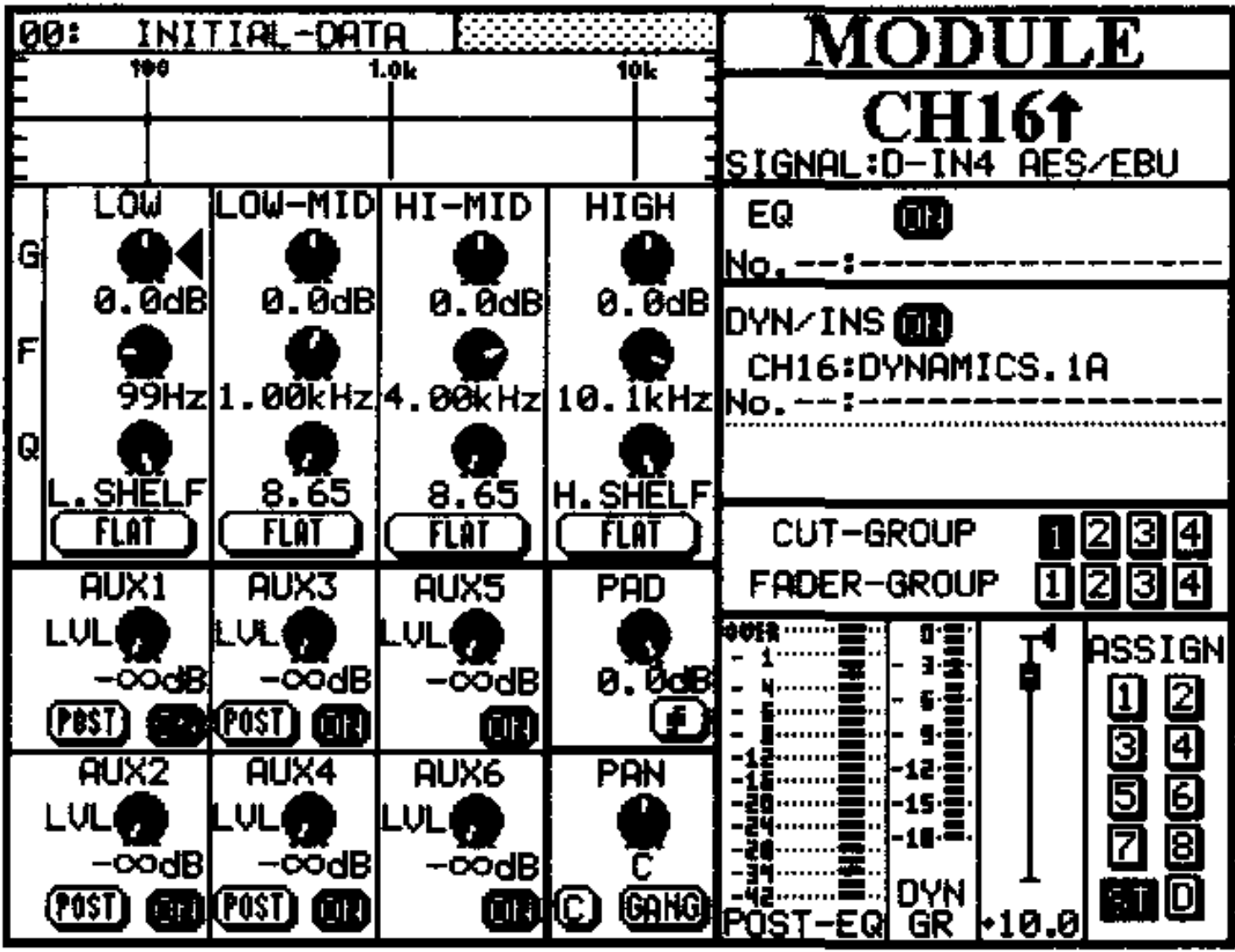
- 3) The rotary controls of PODs 5 through 20 are used here to control the digital pad of the appropriate channel.
- 4) The right switches of PODs 5 through 20 are used to control the phase of the input signal.
In this example, the phase of channel 2 has been reversed.
- 5) To view the other groups of channels (stereo returns, MTR 1-16, and MTR 17-24), either press the **SEL** key of a channel belonging to

that group, or press the **PAD/Φ** [33] key until the appropriate screen appears.

6.4.2 Pad and phase (ii)

The **MODULE** screen can also be used to view and change pad and phase settings on a channel-by-channel basis:

- 1) Press the **MODULE** key [31].



- 2) Press the **SEL** key of the channel whose parameters are to be edited.
- 3) Use the rotary control of **POD 16** to set the pad level for this channel.
- 4) Use the right switch of **POD 16** to set the phase for this channel.

6.5 Metering signals

After the digital pad is a meter take-off point.

The 24 channel meters can be used to meter the following signals, and the mode is selected using the **METER** selection keys [3]:

- MTR RETURN** MTR channels 1 through 24 – all meters are available for use
- CH/ST RETURN** Input channels 1 through 16 are assigned to meters 1 through 16, the stereo returns are assigned to meters 17 through 22, meters 23 and 24 are unused
- MTR SEND** The eight output busses are mirrored across the meters. Buss 1 is metered on meters 1, 9 and 17, buss 2 on 2, 10 and 18, etc. If a channel has been routed to **DIRECT OUT**, the meter will show that channel's **DIRECT OUT** level.
- AUX SEND** Meters 17 through 22 are used to meter the levels sent to the six AUX busses

The meters may also be used to monitor the fader levels of the large or small faders. See 6.9, “Channel faders”.

For the **MTR RETURN** and **CH/ST RETURN** modes, metering may either be done pre-EQ (the **POST EQ** indicator is not lit) or post-EQ (the **POST EQ**

indicator is lit). **MTR SEND** and **AUX SEND** busses have no EQ facilities, and hence cannot be metered pre- or post-EQ.

The post-EQ take-off point is, as the name suggests, immediately following the EQ section.

To switch between pre-EQ and post-EQ metering, press the appropriate **METER** key until the **POST EQ** indicator shows the desired status. This status applies only to the currently-selected meter mode, and will be retained for this meter mode, even when another meter mode is selected.

When the **MODULE** screen for a channel is shown, the “soft” meter at the lower part of the screen will also show the pre- or post-EQ status of the meter.

6.5.1 Setting meter hold time

The hold time of the peak segment of the channel meters can be cycled round between none (instant drop-back), 1, 2, 4 and 8 seconds, and continuous (the peak segment will stay lit until reset).

- 1) **Press and hold down the SHIFT key (the status of the SHIFT indicator does not matter).**
- 2) **Press the L FADER meter select key.**

A pop-up display will appear, showing the new hold time (the next value in the cycle) and the current release time.
- 3) **While holding down the SHIFT key, continue to press the L FADER key until the hold time you want is shown in the pop-up display.**
- 4) **Release both the SHIFT key and the L FADER key.**

When this setting is changed, all “continuous” peak settings will be cleared.

“Continuous” peak holds will also be cleared whenever the meter mode is changed.

6.5.2 Release time

In addition to the hold time, the fall rate of the meters’ ballistics can also be cycled between Fast, Medium and Slow.

- 1) **Press and hold down the SHIFT key (the status of the SHIFT indicator does not matter).**
- 2) **Press the S FADER meter select key.**

A pop-up display will appear, showing the current hold time and new release time (the next value in the cycle).

- 3) **While holding down the SHIFT key, continue to press the S FADER key until the release time you want is displayed in the pop-up display.**
- 4) **Release both the SHIFT key and the S FADER key.**

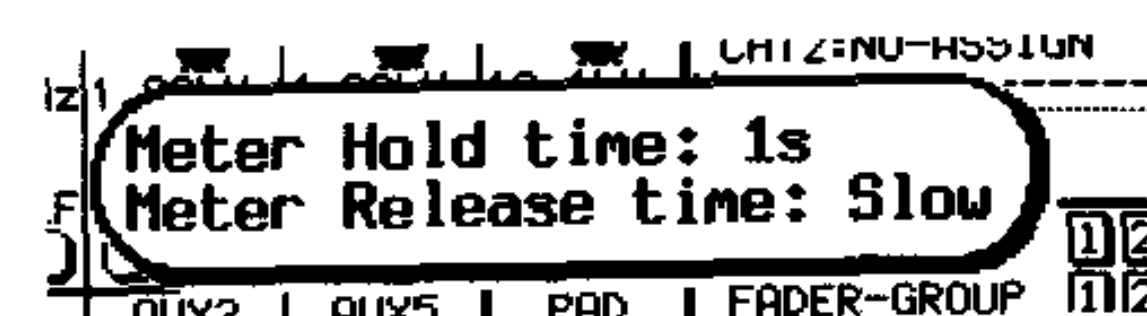
When the release time setting is changed, all “continuous” peak settings will be cleared.

6.5.3 Checking settings

Checking the current meter settings

- 1) **Press and hold down the SHIFT key.**
- 2) **While holding down the SHIFT key, press any of the METER selection keys.**

A pop-up display will appear on screen for three seconds.



Although any of the **METER** selection keys can be used to show the current meter settings, only the **L FADER** and **S FADER** keys can be used to change them.

6.5.4 Stereo meters

The characteristics of the stereo meters [5] are **not** affected by any changes made to the hold times or release times of the channel meters.

These meters are dual-mode, providing a quasi-rms display of the average program power as a solid bar, together with a program peak, displayed as a single LED, following the absolute peaks of the output data.

The “peak factor” of the program can be judged by eye, from the distance between the top of the average bar, and the peak dot.

If additional metering is required, one of the pairs of **SCOPE** outputs [66] can be used for this purpose, to connect an analog RMS or PPM meter.

6.6 Equalization features

Each input and MTR channel, as well as the **STEREO** output buss of the TM-D8000 is equipped with fully-parametric 4-band equalization.

All EQ channels settings made from the TM-D8000 are made using the **POD** in the **MODULE** screen. There is no “global” EQ screen.

The frequency range of each band is from 32Hz to 19kHz, in 112 steps.

The two bands marked as **LOW** and **HIGH** can cut and boost their respective frequency bands by up to 15dB in either direction, settable in 0.5dB increments. In addition, they can act as high-pass and low-pass filters, respectively.

The two mid bands, **LOW-MID** and **HIGH-MID** can also cut and boost their respective frequency bands by up to 15dB in either direction, settable in 0.5dB increments. They can also act as notch filters.

The **Q** of each band can be set from 8.65 to 0.27 in 24 steps. In addition, the **LOW** and **HIGH** bands have an additional **SHELF** setting, allowing them to act as shelving filters.

The EQ circuitry can be enabled and disabled with one key-press, allowing instant “A-B” comparison.

The gain of each band can be individually set to 0dB (flattened) with one key-press.

At all times, the response curve of the equalization settings is displayed on the **MODULE** screen.

When a setting has been made on one channel, it can be copied easily to another channel or channels using a dedicated screen function.

Frequently-used EQ settings can be stored in an recalled from a library. A number of professionally-produced EQ settings are also provided in read-only memory, which can be used “as is” or as starting points for your own EQ settings.

counterclockwise on the two **MID** bands will enable the **NOTCH** setting.

- 3) **The rotary controls of PODs 5 through 8 control the frequency affected by each band.**
- 4) **The rotary controls of PODs 9 through 12 control the **Q** of the bands.**
Turning POD controls 9 and 12 fully clockwise will enable the shelving function for these bands.
- 5) **The switches of PODs 9 through 12 are used to flatten the gain of bands on an individual basis.**
The two switches of each POD perform the same function as each other; it is if there were only one switch.

As adjustments are made to the EQ settings, the EQ response curve is shown graphically at the top left of the screen.

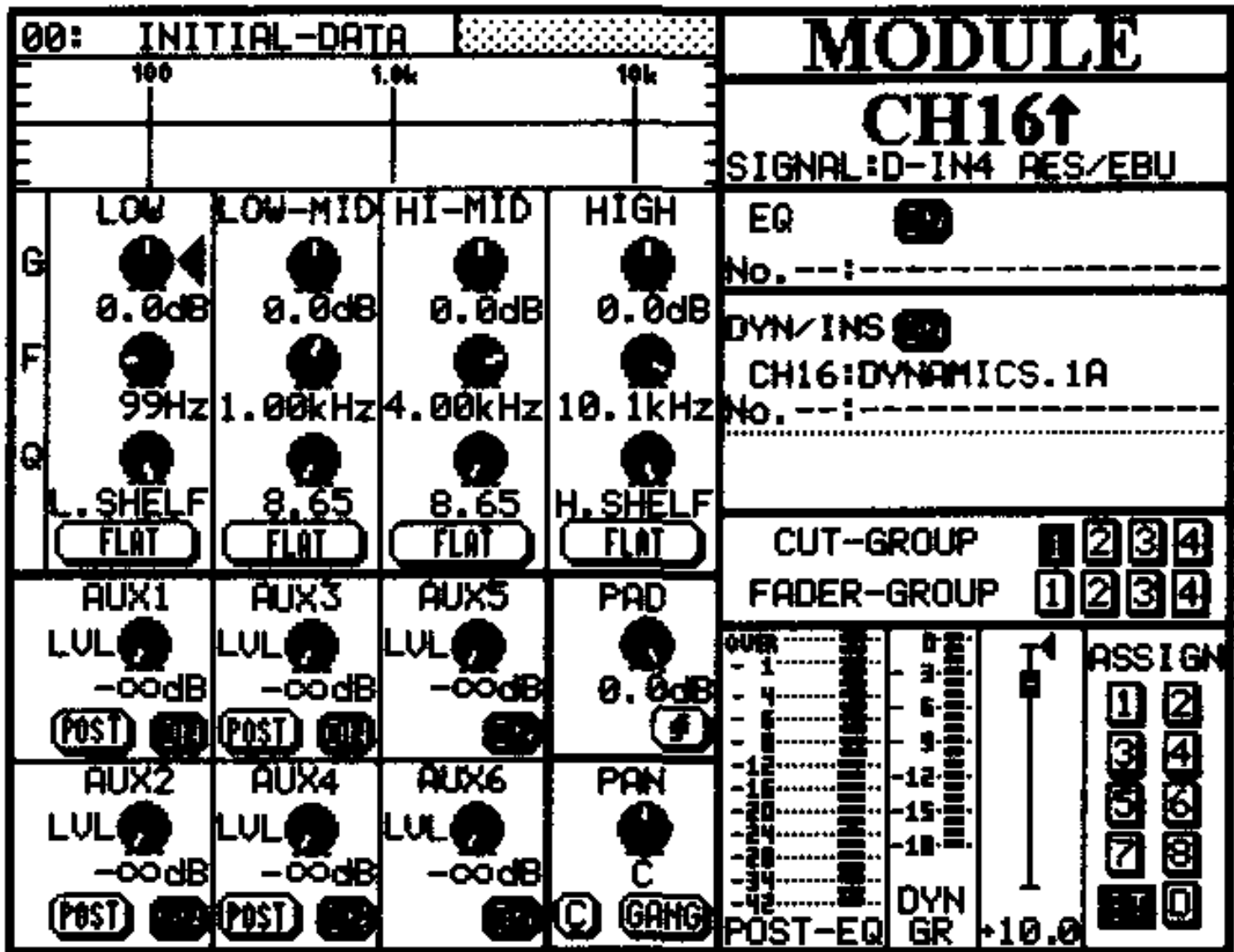
- 6) **The EQ switch of the assignable control section [52] is used to switch the equalization circuit in and out of the mix.**
In the screen shown above, the EQ is switched **ON**. An additional indication of whether the equalization circuits for a channel are switched in or not is given by the graphical response curve, which changes from solid to halftone gray when the EQ circuit is not switched in.

NOTE

When the EQ is **OFF**, any adjustments made to the settings are, of course, inaudible. If you are experimenting with the EQ settings, and you cannot hear any changes, check the status of the EQ.

6.6.1 Setting channel EQ

- 1) Press the **MODULE** key [31], followed by the **SEL** key of the channel whose EQ settings you want to edit:



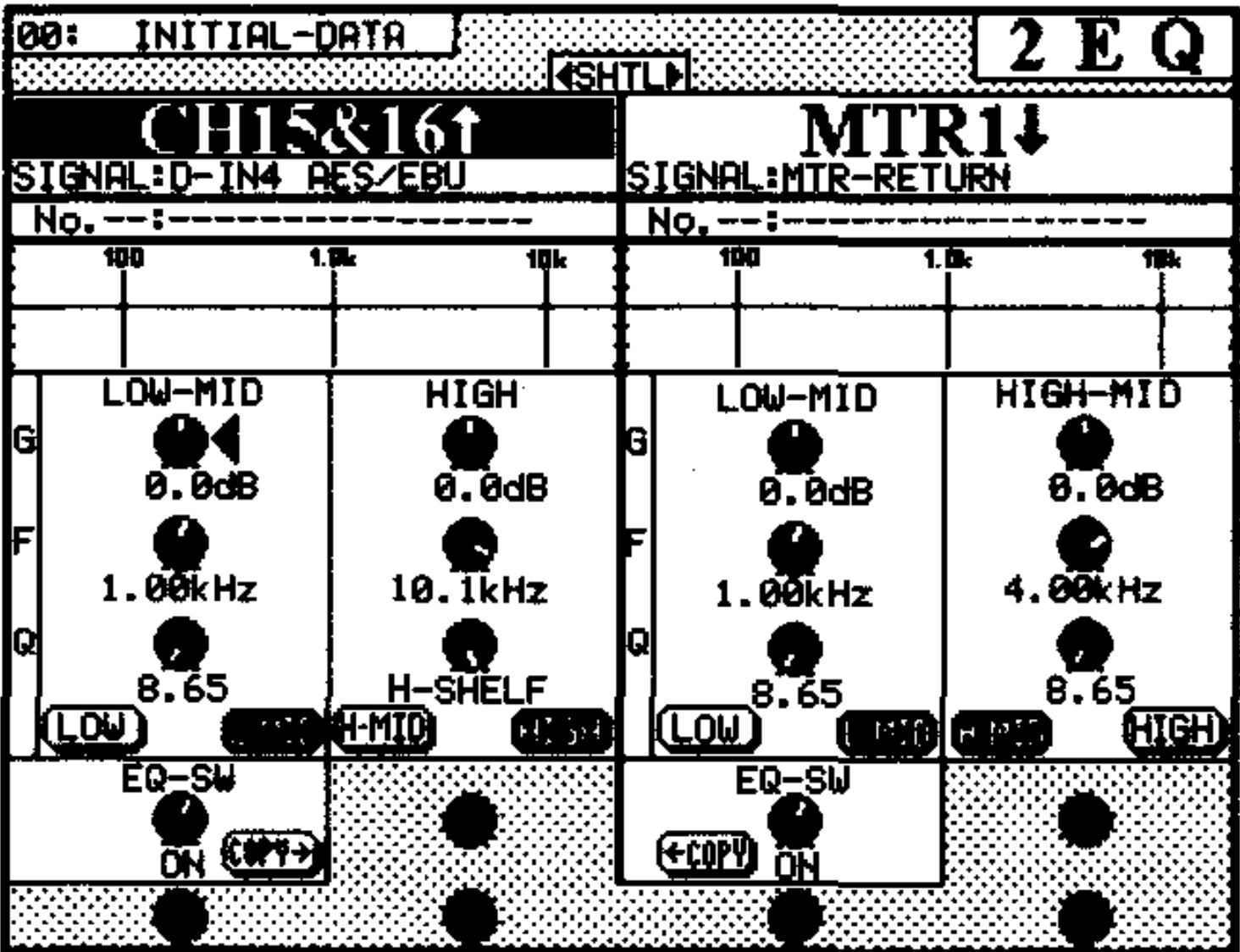
- 2) **The rotary controls of PODs 1 through 4 control the gain of the four frequency bands**

Turning the controls fully counter-clockwise on the **LOW** and **HIGH** bands will enable the **HPF** and **LPF**, respectively. Turning the controls fully

6.6.2 Copying EQ settings between channels

As mentioned earlier, once EQ settings have been made on one channel, they can be copied to another channel.

- 1) Press the **2 EQ** key [32].



Note that this particular screen shows a linked pair of channels as the “left” channel. When channels

are linked in the “stereo link” mode (see 6.14, “Stereo linking of channels”), there is no need to use this screen to copy EQ settings. One setting affects both channels. However, as can be seen here, it is possible to treat a stereo pair as a single channel in this case.

- 2) **Use the shuttle wheel (outer) to choose the channel which is displayed on either the left or right side of the screen.**

There is no “source” or “target” position – the source for the EQ copy operation can be on either side of the screen. This allows you to copy EQ settings from left to right, for example, and then use the “right” channel, slightly modified, as a source for further copy operations.

- 3) **Use the appropriate channel SEL key to pick the channels for one side of the screen.**
- 4) **Use the shuttle wheel to select the other side of the screen. Use the SEL key of the appropriate channel to select the channel for this side.**
- 5) **While this screen is active, the EQ settings of either channel can be edited.**

Note that there are not enough PODs to be assigned to every EQ parameter of each channel simultaneously.

Accordingly, the switches of PODs 9 and 11 are used to switch the bands of the “left” and “right” channels between L \square W and L – M I D (low-mid). Pressing the left switch will turn off the right switch, and vice versa.

The switches of pods 10 and 12 are used in the same way to change between the H – M I D (high-mid) and H I G H bands.

As the EQ settings are adjusted, the appropriate EQ response curve at the top of the screen will change.

- 6) **The rotary switches of PODs 13 and 15 are used in a slightly unusual way; they are used as rotary on (clockwise) or off (counterclockwise) switches for the EQ circuits of their respective channels.**
- 7) **Once the desired EQ settings have been made on the “source” channel, press the appropriate POD C O P Y key to copy these to the “target” channel.**

To copy from the “left” channel to the “right” channel, press the right switch of POD 13.

To copy from the “right” channel to the “left” channel, press the left switch of POD 15.

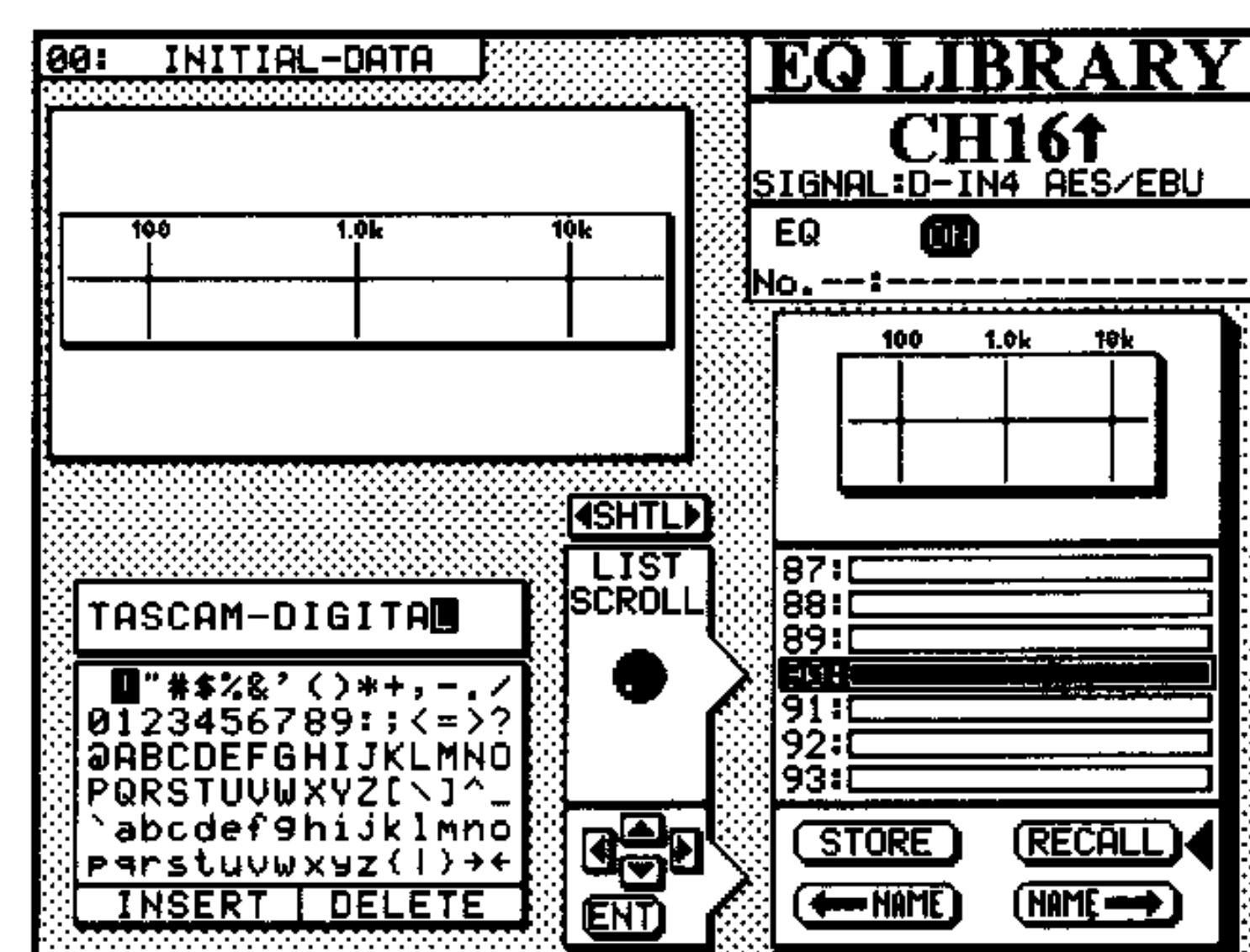
- 8) **The process can be repeated until EQ settings have been copied to all desired channels.**

A practical example of this would be if a 60Hz line hum was to be removed with a notch filter on all analog channels. A flat EQ setting could be made on channel 1, except for a 60Hz notch filter. This EQ setting could then be copied to each analog channel in turn, prior to the equalization of individual channels.

6.6.3 Recalling settings from the EQ library

The following procedure recalls settings from the EQ library (either factory presets or user library settings)

- 1) **Press the LIBRARY EQ key [46]:**



- 2) **If the center portion is not “pointing” to the right as shown above, turn the shuttle wheel (outer) clockwise.**
 - 3) **Select the channel to which the library entry is to be recalled using the channel’s SEL key.**
- The channel’s EQ response curve will be shown in the space at the top left of the screen.
- 4) **Use the jog dial (inner) to scroll through the list of available library memories.**

As you scroll through the list of library entries, a miniature representation of the EQ response curve will be shown above the scrolling list.

- 5) **When you have highlighted the desired library entry, move the cursor (use the cursor keys) to the on-screen RECALL button (as shown above), and press ENTER.**

The EQ settings of the library entry will be transferred to the selected channel. The name of the library entry will be shown in the MODULE screen. If the EQ settings are changed away from the library entry, an inverse ‘E’ will be shown by

the name to show that the settings have been edited.

If you try to recall an empty library entry, a warning message will appear on screen. The EQ settings of the channel will remain unchanged. Note that it is possible to have valid a library entry that is a flat EQ setting, though.

- 6) Use the assignable control section EQ key to turn the EQ on or off for the channel. This allows you to hear the effect of the recalled library entry.
- 7) Repeat the selection of library entries and channels until all channels have been set to the desired library entries.

6.6.4 Storing settings in the EQ library

You can store and edit the current EQ settings of different channels in the EQ library and name them for future reference.

- 1) Press the LIBRARY EQ key [46] – the screen will appear as above (6.6.3, “Recalling settings from the EQ library”).
- 2) If the center portion is not “pointing” to the right as shown above, turn the shuttle wheel (outer) clockwise.
- 3) Select the channel whose current EQ setting you wish to store to the library, using the channel’s SEL key.

The channel’s EQ response curve will be shown in the space at the top left of the screen.

- 4) Use the jog dial (inner) to select a library area in which you want to store the setting.

Factory (read-only) areas in the library are shown with an inverse “R” (R). If you attempt to store a setting to an area marked in this way, the screen will briefly show an message informing you that this is a read-only library area.

- 5) Use the cursor keys to move the cursor to the on-screen STORE button, and press ENTER.

The EQ settings of the currently-selected channel will be stored in the selected library area. If the library area already has data stored in it, a message will appear asking if you want to overwrite the previously-stored data. Press ENTER to overwrite the data, or any of the cursor keys in order to exit without overwriting.

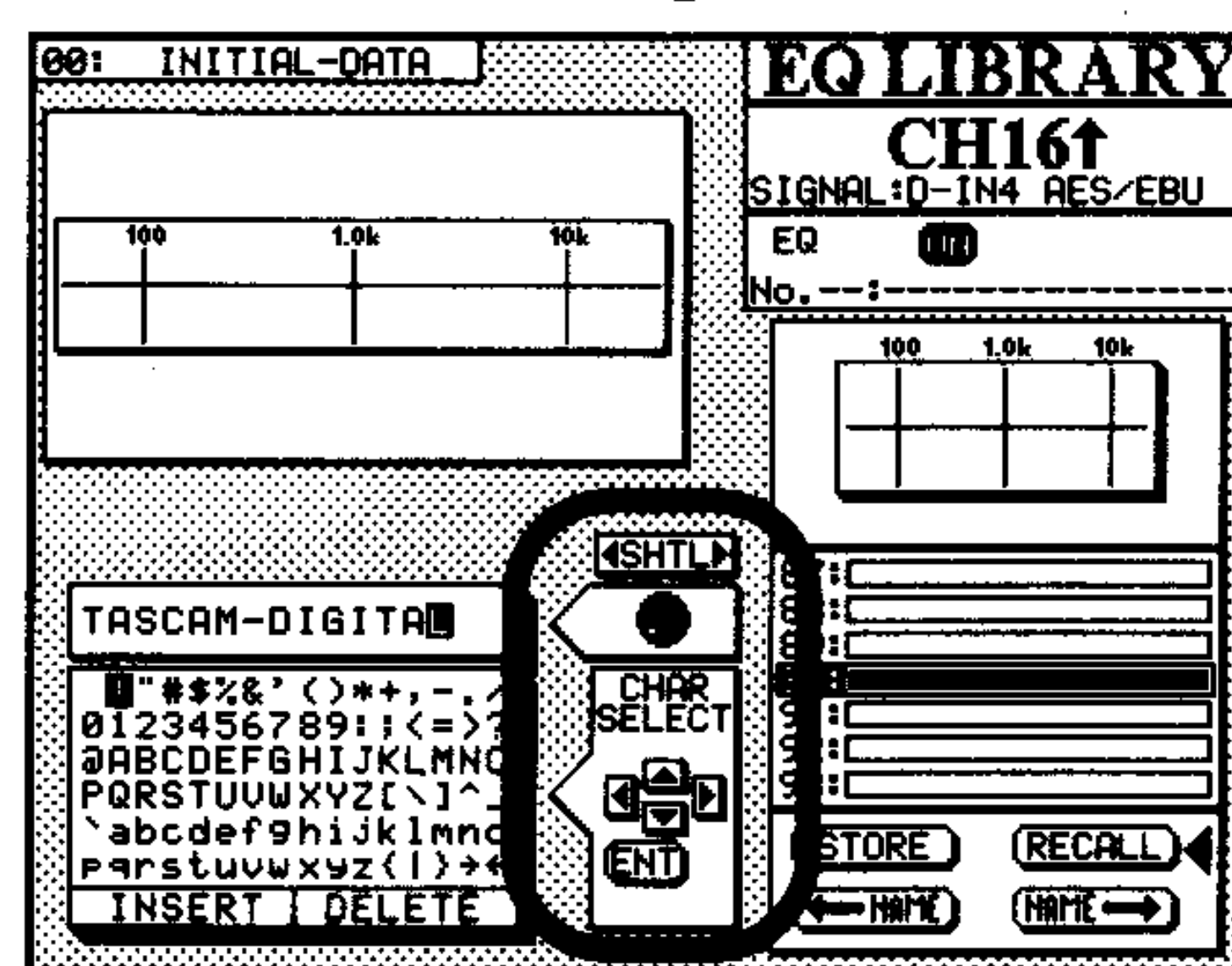
6.6.5 Naming and renaming EQ library entries

When the data has been stored to a library area, it can be named (and existing library areas which have already been named can also be renamed using the procedure described below).

NOTE

The naming and renaming procedures described here apply not only to the EQ library entries, but also to the snapshot, dynamic processor and routing table libraries.

- 1) With the center portion “pointing” to the right, select the library area that you wish to name or rename.
- 2) Use the shuttle wheel to “point” the center portion to the left part of the screen:



- 3) The jog dial can now be used as a cursor to move backwards and forwards through the library area name as it is edited.
- 4) The cursor keys are used to navigate through the list of available characters (essentially the ASCII character set) and the ENTER key is used to insert the characters into the name at the cursor position.

There are two “special” characters, INSERT and DELETE, which insert a space at the cursor position, and delete the character at the cursor position, respectively.

Names can be up to 16 characters long and can contain any mixture of letters, numbers and punctuation (including spaces).

Numbers can be entered directly using the number keypad [22].

- 5) When you have entered the name, use the shuttle wheel to change the center portion to point to the left of the screen.
- 6) Use the cursor keys to move the cursor to the on-screen NAME - > button and press ENTER.

This will copy the name from the editing area to the currently-selected library area.

It is also possible to copy a name from an existing library area into the editing area. In this way, a group of settings relating to a particular project can be built up, all starting with the same characters for easy identification.

- 1) With the center portion of the library screen “pointing” to the right, use the jog dial to select an already named library entry.
- 2) Use the cursor keys to select the on-screen < - NAME button and then press the ENTER key.

The name of the currently-selected library entry will be transferred to the editing area, where it can be edited as described above.

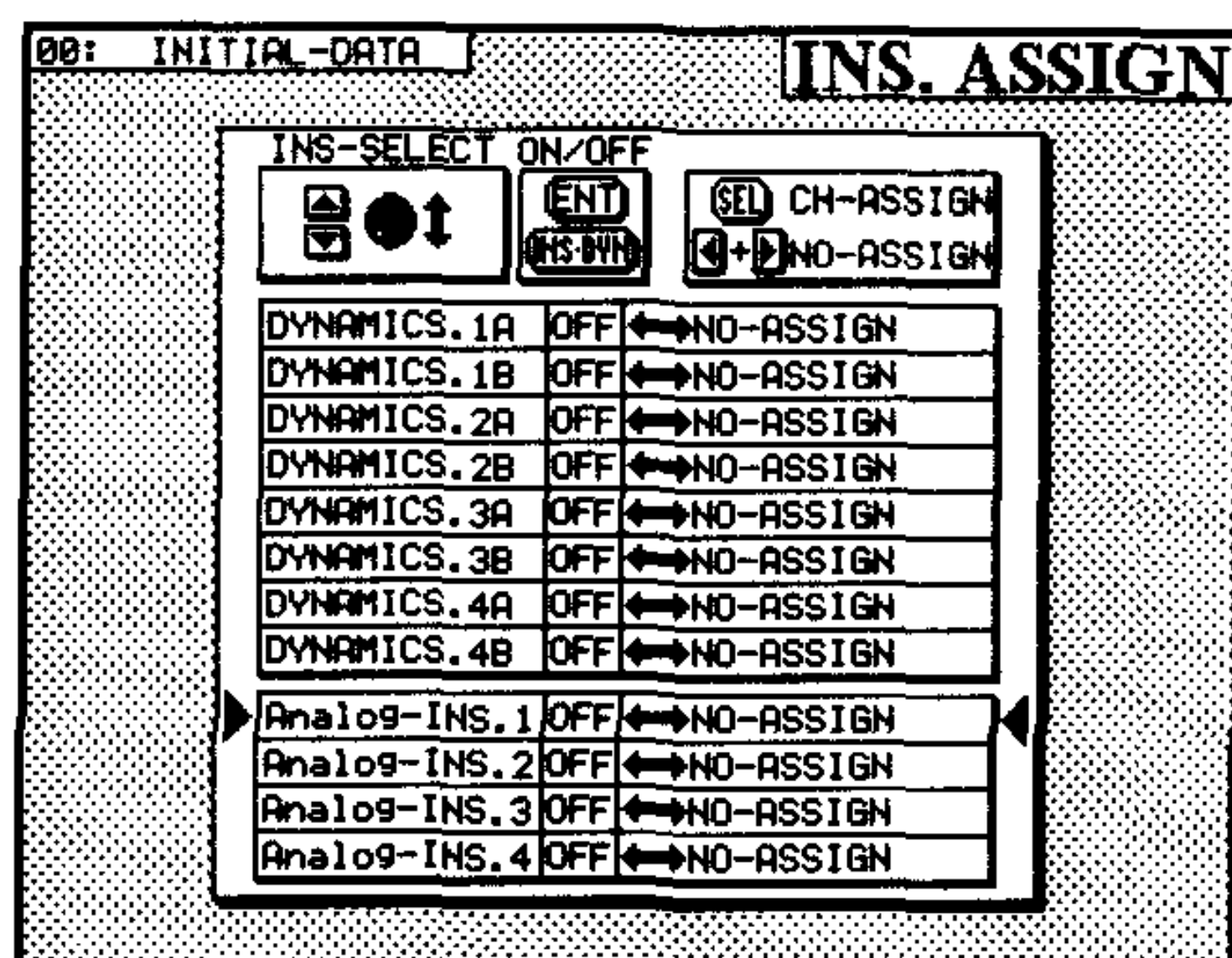
6.7 Insert points

After the equalization section, there is a meter take-off point (see 6.5, “Metering signals”), and, parallel to this, an insertion output. At this point, the insert may be routed to one of the external matrix insert loops [68] as connected in 5.1.6, “Matrix inserts”, or to the internal dynamic processors.

6.7.1 Insertion (external)

To assign a channel to one of the four external matrix insert loops:

- 1) Use the SHIFT key to turn the SHIFT indicator on.
- 2) Press the INS ASSIGN key so that the following screen appears:



- 3) Use the jog dial or the UP and DOWN keys to move the cursor to one of the Analog-INS fields at the bottom of the list.
- 4) Press the SEL key of the channel which you wish to route through the insert loop.

- 5) A pop-up message will appear. Use ENTER to confirm.

If an assignment has already been made, the pop-up will show this so that you do not accidentally overwrite the setting.

- 6) If you want to clear an assigned insert, press and hold down the LEFT cursor key and press the RIGHT to clear that entry.

- 7) Use the ENTER key to switch the routed insert loop in and out.

If the insert loop is not switched in, naturally you will be unable to hear any effect of the external processor connected on the loop.

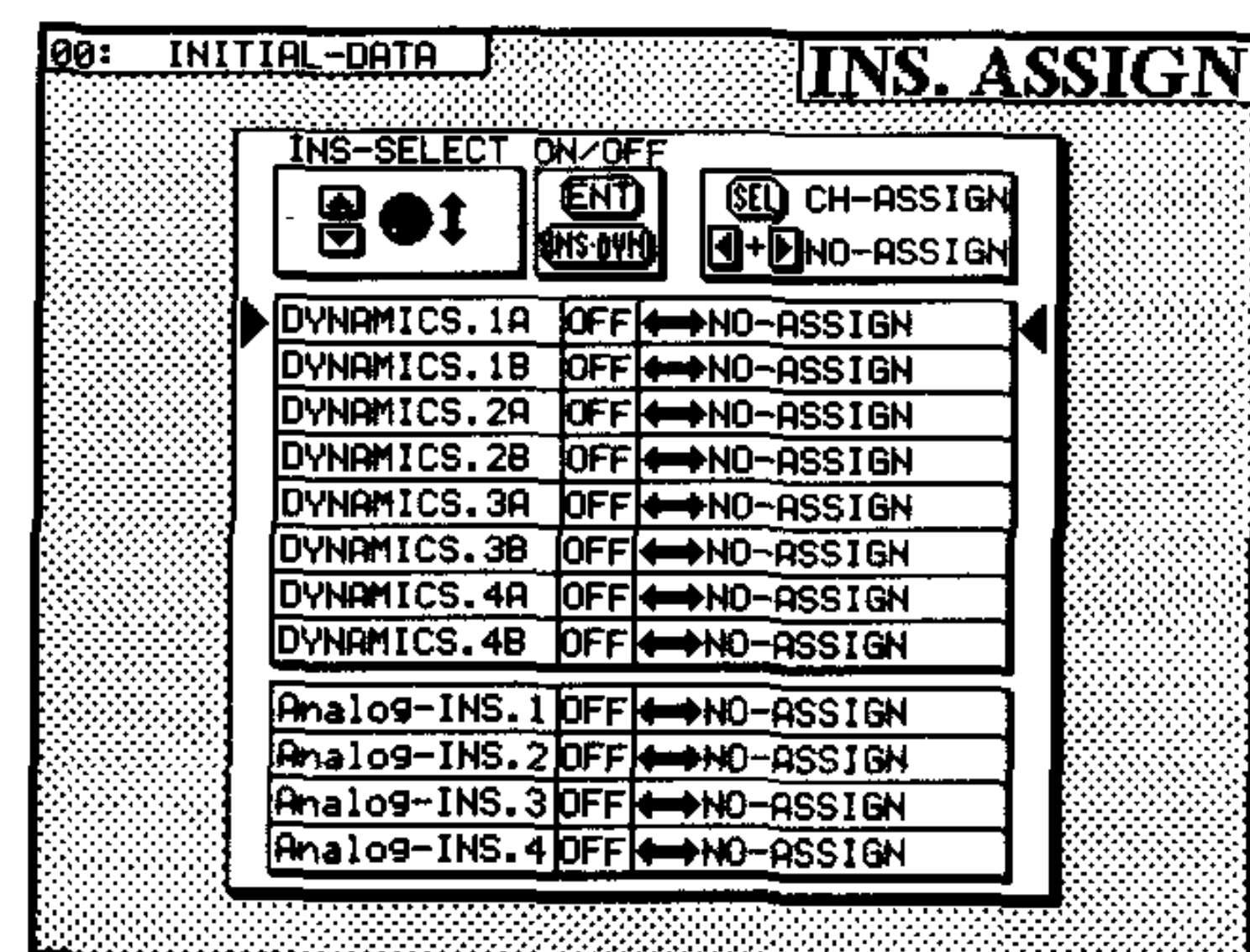
When using the MODULE screen, you should use the assignable control section's INSERT/DYNAMICS key to switch the insert loop in and out.

6.7.2 Insertion (internal)

As well as the four external insert patch points, there are eight internal digital dynamic processors which can be used as compressor/limiters and/or gates.

To route a channel through one of these processors:

- 1) Use the SHIFT key to turn the SHIFT indicator on.
- 2) Press the INS ASSIGN key, so that the following screen appears:



- 3) Use the jog dial or UP and DOWN cursor keys to select a dynamics processor from 1 through 8.
- 4) Press the SEL key of the channel you wish to route through the dynamics processor.
- 5) A pop-up message will appear. Use ENTER to confirm.

If an assignment has already been made, the pop-up will show this so that you do not accidentally overwrite the setting.

- 6) If you want to clear an assigned insert, press and hold down the **LEFT** cursor key and press the **RIGHT** to clear that entry.
- 7) **Enable the routing with the ENTER key.**
If you do not enable the routing, you will not be able to hear the effects of the processor.

When using the **MODULE** screen, you should use the assignable control section's **INSERT/DYNAMICS** key to switch the insert loop in and out.

6.7.3 Editing the processor settings

When a channel has been routed through a processor, the processor parameters can then be edited graphically:

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator off.
 - 2) Press the **DYNAMICS** key.
- DYN2A&2B**

1A: 1B: 2A: 2B: 3A: 3B: 4A: 4B:
- The highlighted "tab" and title at the top right of the dynamics screen shows which processor is currently being edited.

NOTE

If you enter the **DYNAMICS** screen immediately after assigning a processor to an insert loop in the **INS ASSIGN** screen, that processor will automatically be selected for you. The step below is therefore unnecessary.

- 3) Use the eight switches of **PODs 17 through 20** to select the dynamic processor you want to edit.
You can also continue to press the **DYNAMICS** key until the processor you want to edit is highlighted.
- 4) If you wish to link together a pair of processors, use the cursor keys to move the cursor to the on-screen **LINK** button, and use the **ENTER** key or the jog dial to link the processors.
You can link processors 1A and 1B, 2A and 2B, etc. Other linkings are not possible.
- 5) If you have linked the two processors, you can select whether the signal received at **A** or **B** or **BOTH** will act as a trigger. Move the cursor to this on-screen field and use the jog dial or **ENTER** key to set the trigger source.
- 6) Turn on the processor loop by using the **SEL** keys to select the channel and press the **INSERT/**

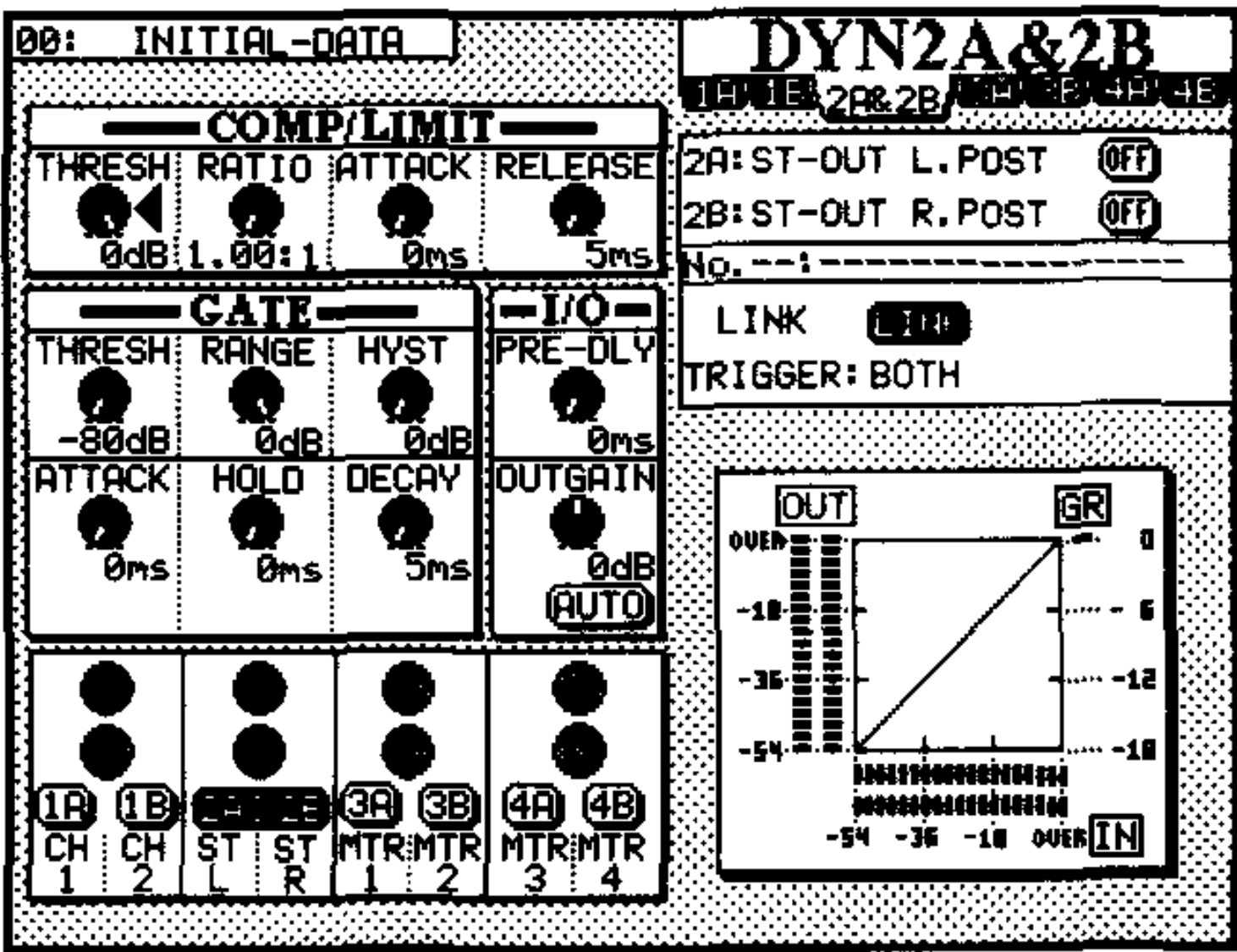
DYNAMICS key in the assignable control section.

Entering the module screen from the dynamics screen will automatically select the channel which has been routed through the dynamics processor.

Any module screen where the channel has been routed through a dynamics processor will show the gain reduction as a bargraph to the left of the fader position on the display screen.

A processor which has been turned off will show its response graph in a "gray" form, similar to a disabled EQ response curve.

You can now set the parameters for the dynamic processor as described below.



PODs 1 through 4 are used to set the parameters of the compressor/limiter. These are as follows:

POD	Parameter	Range
1	Threshold	0 to -48dB FS in 1dB increments
2	Ratio	From 1:1 to ∞:1 in 21 steps
3	Attack time	From 0 to 125ms in 1ms steps
4	Release time	From 5ms to 5s in non-linear steps

The gate parameters are:

POD	Parameter	Range
5	Threshold	-80dBFS to 0 dBFS in 1dB steps
6	Range	-60dB to 0dB in 1dB steps
7	Hysteresis	0 to 24dB in 1dB steps
9	Attack time	From 0 to 125ms in 1ms steps
10	Hold time	0 to 990ms in 10ms steps
11	Decay time	From 5ms to 5s in non-linear steps

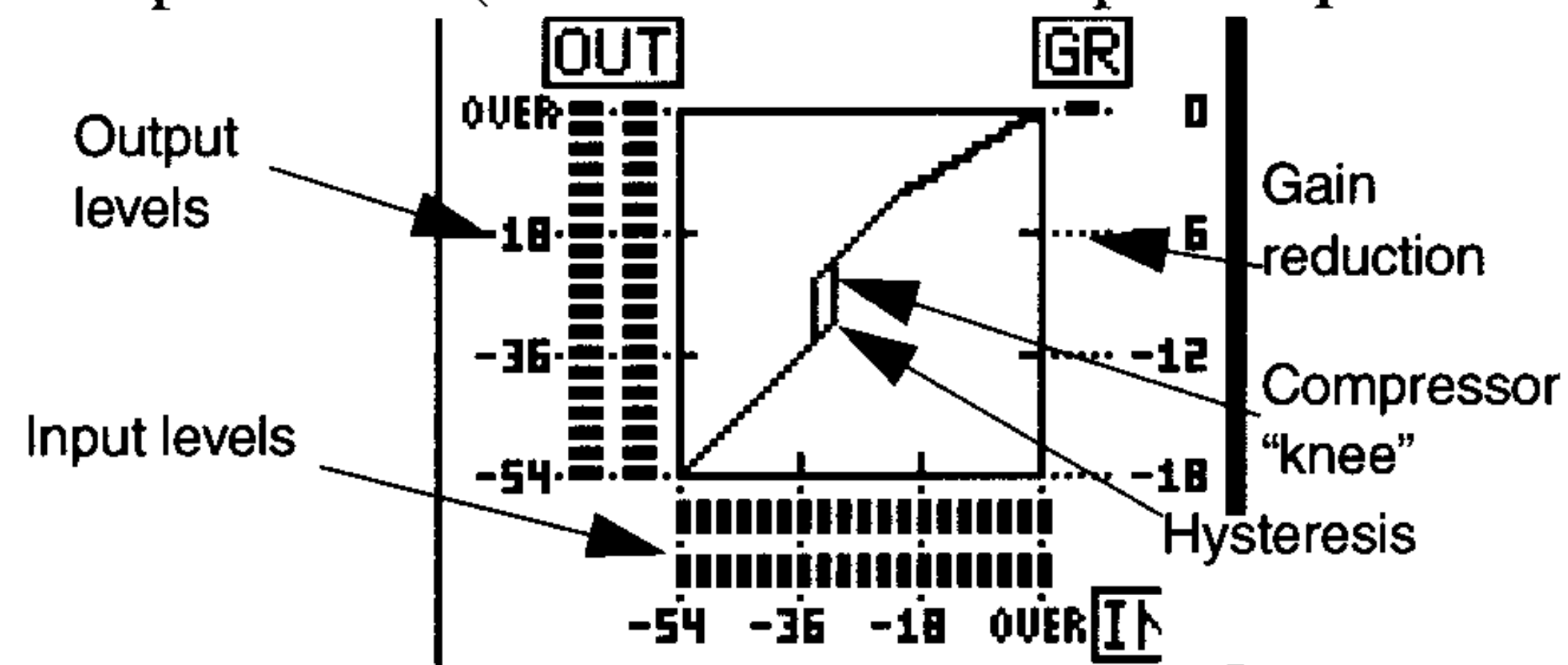
As these parameters are changed, the screen gives a graphic representation of the processor functions.

The rotary controls of **PODs 8 and 12** control the pre-delay and output gain (0 to 99ms in 1ms steps and 0 to 20dB FS in 1dB steps, respectively).

The AUTO makeup for a processor brings any compressed signal up to an optimum level. If the compression ratio or threshold is changed while the auto makeup is on, the level will be automatically adjusted to match the new settings. The output gain control will be reset to 0dB when the AUTO switch is on.

The manual output gain can also be used in conjunction with the auto makeup feature to allow for fine-tuning.

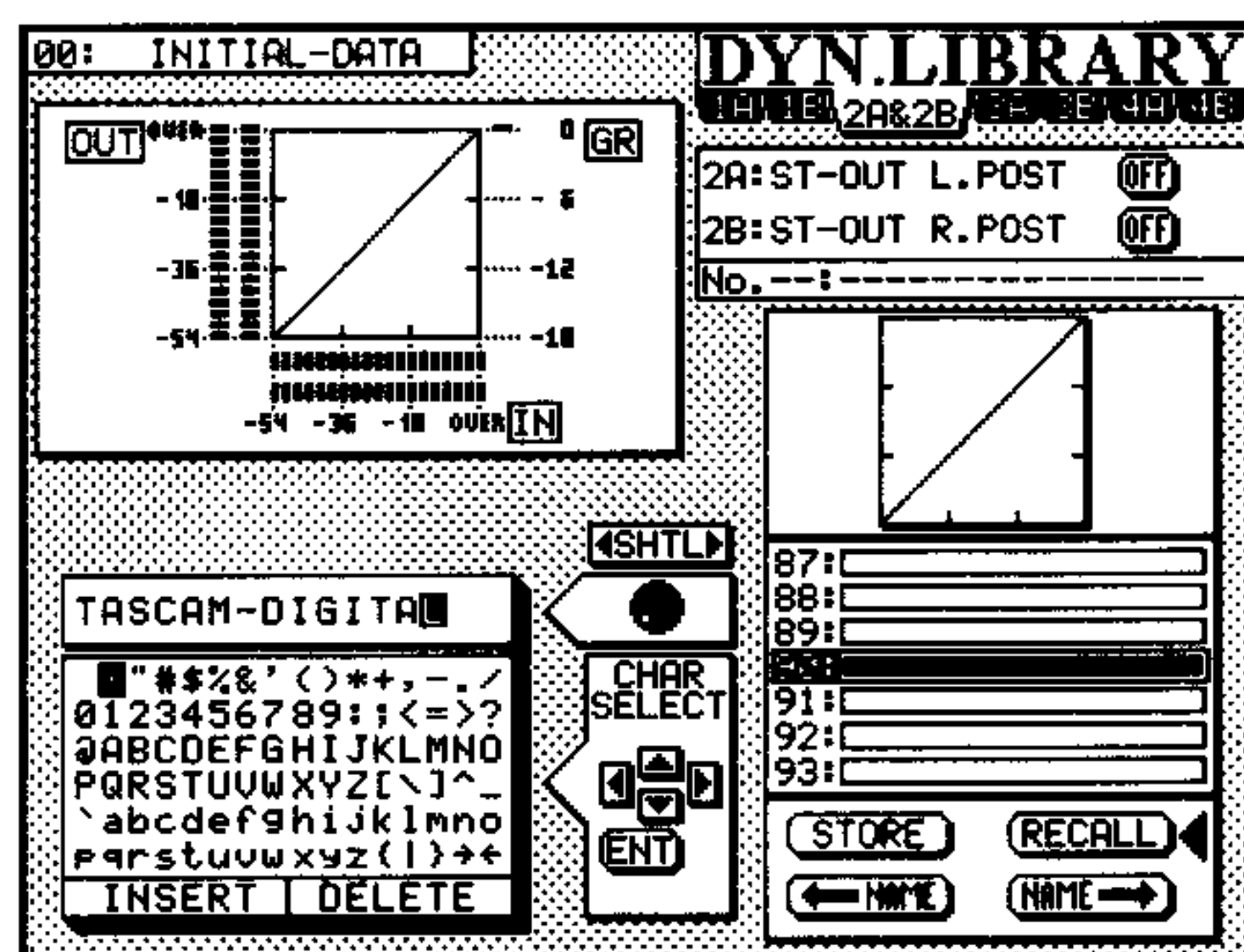
As signals are fed through the processor, the screen provides metering of the operation of the processor (this shows a linked pair of processors).



6.7.4 Retrieving dynamic processors from a library

As with the EQ, it is possible to store and recall dynamic processor settings from a library. A number of pre-set processor settings are provided with the TM-D8000, and you can also store your own commonly-used processor settings.

- 1) Press the DYNAMICS LIBRARY key [46]:



- 2) Make sure that the center portion of the screen is "pointing" to the right (turn the shuttle wheel counterclockwise if it is not).
- 3) Continue to press the key until the "tab" of the processor area into which you want to recall the library entry is highlighted at the top of the screen.

Although this cannot be seen on screen, the switches of PODs 17 through 20 can also be used

to select the processor into which the library entry should be recalled.

In the illustration above, the linked pair of 2A&2B has been highlighted. It has been assigned (post fader) to the stereo buss and is currently turned OFF.

The current settings are shown graphically at the top left of the screen.

- 4) Turn the jog dial to scroll through the list of library entries until you reach the entry you want to recall.

As an entry is highlighted, a graphical representation of the entry appears above the scrolling list.

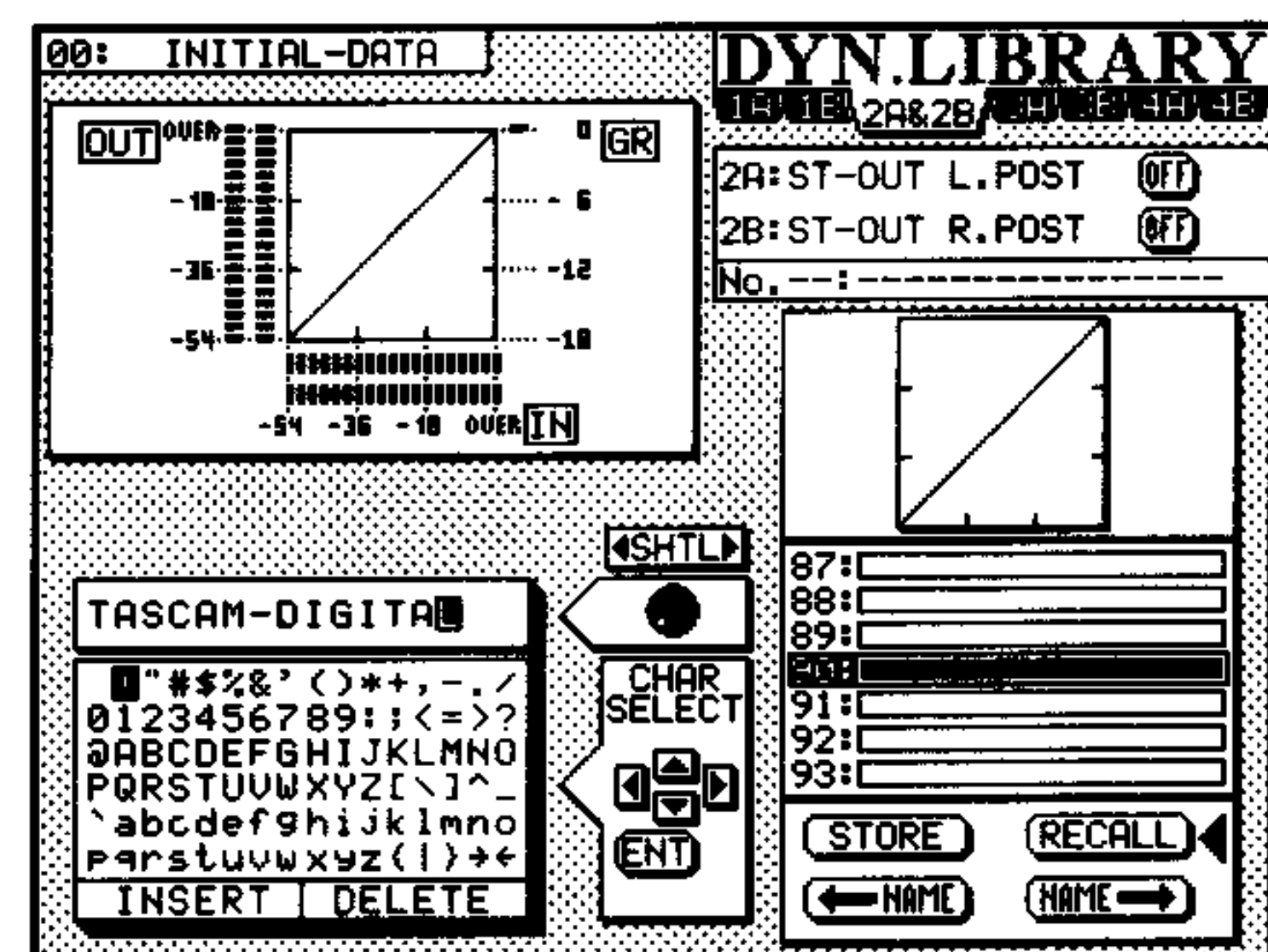
- 5) Use the cursor keys to move the cursor to the on-screen RECALL button, and press ENTER to recall the entry.

If there is no data in the library entry, an appropriate warning message will be briefly displayed on screen. No data will be recalled from the library.

6.7.5 Storing dynamic processor library entries

The steps of this process are similar to those involved in recalling entries:

- 1) Press the DYNAMICS LIBRARY key [46]:



- 2) Make sure that the center portion of the screen is "pointing" to the right (turn the shuttle wheel counterclockwise if it is not).
- 3) Continue to press the key until the "tab" of the processor area which you wish to store into the library entry is highlighted at the top of the screen.

Although this cannot be seen on screen, the switches of PODs 17 through 20 can be used to select the processor which will be stored in the library entry.

The current settings are shown graphically at the top left of the screen.

- 4) Turn the jog dial to scroll through the list of library areas until you reach the one into which you want to store the settings.

As an area is highlighted, a graphical representation of the data in that area (if any) appears above the scrolling list.

- 5) Use the cursor keys to move the cursor to the on-screen **STORE** button, and press **ENTER** to store the settings into the area.

If there is already data in the library area, an appropriate warning message will be briefly displayed on screen. Press **ENTER** to overwrite the existing data, or any of the cursor keys to cancel the store operation.

6.7.6 Naming and renaming dynamic processor library entries

When the dynamic library entry screen is displayed, the steps for naming and renaming entries in the library are identical to those involved in naming and renaming EQ library entries. Consult 6.6.5, "Naming and renaming EQ library entries" for details of how to perform this operation.

6.8 Delay settings

Following the insert point is the take-off point for pre-fade listen soloing (see 6.13.1, "PFL soloing").

Together with this is the take-off point for pre-fader AUX sends (see 6.10.1, "Setting AUX levels (i)").

Immediately following this on each channel is a delay which can be applied to slip tracks relative to each other, etc.

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.
- 2) Press **DELAY [40]**, so that a screen similar to the following appears:

00: INITIAL-DATA		DELAY(msec)	
CH1-16	MINI-16	MINI-16	MINI-24
CH1&2		CH3	CH4
0.0msec		0.0msec	0.0msec
0smpl		0smpl	0smpl
CH5	CH6	CH7	CH8
0.0msec	0.0msec	0.0msec	0.0msec
0smpl	0smpl	0smpl	0smpl
CH9	CH10	CH11	CH12
0.0msec	0.0msec	0.0msec	0.0msec
0smpl	0smpl	0smpl	0smpl
CH13	CH14	CH15	CH16
0.0msec	0.0msec	0.0msec	0.0msec
0smpl	0smpl	0smpl	0smpl

- 3) The rotary control of POD 4 is used as a switch to select the units in which delay is measured.

- 4) Press the **SEL** key of a channel belonging to the group (input channels 1 through 16, MTR channels 1 through 16 or MTR channels 17 through 24) to select the appropriate screen.
- 5) The right switch of each active POD is used to turn the delay for the channel on and off.
- 6) Use the rotary control to adjust the delay value.
The maximum delay is 4095 samples, which is equivalent to 92.9ms at 44.1kHz.
- 7) The left switch of each active POD is used to select the digit which will be edited by the rotary control.

This avoids the necessity of turning the control through 4096 steps, for example, if you want to set the delay to maximum.

The delay time is shown in samples and milliseconds as you adjust it. Note that you can only edit in the units as set by POD 4, however.

6.9 Channel faders

The channel faders are used to set the level from full attenuation to 10dB above nominal.

Faders may be grouped, as described in 6.16, "Fader grouping", and automation software may also change the level of the channel output without moving the fader. Hence, the fader position may not show the actual gain level from the channel.

Here, we describe the actual position of the fader as the "physical position" and the position the fader would be in, if it were set to the value of the actual channel gain level, as the "virtual position".

There are three ways of viewing physical vs. virtual fader positions:

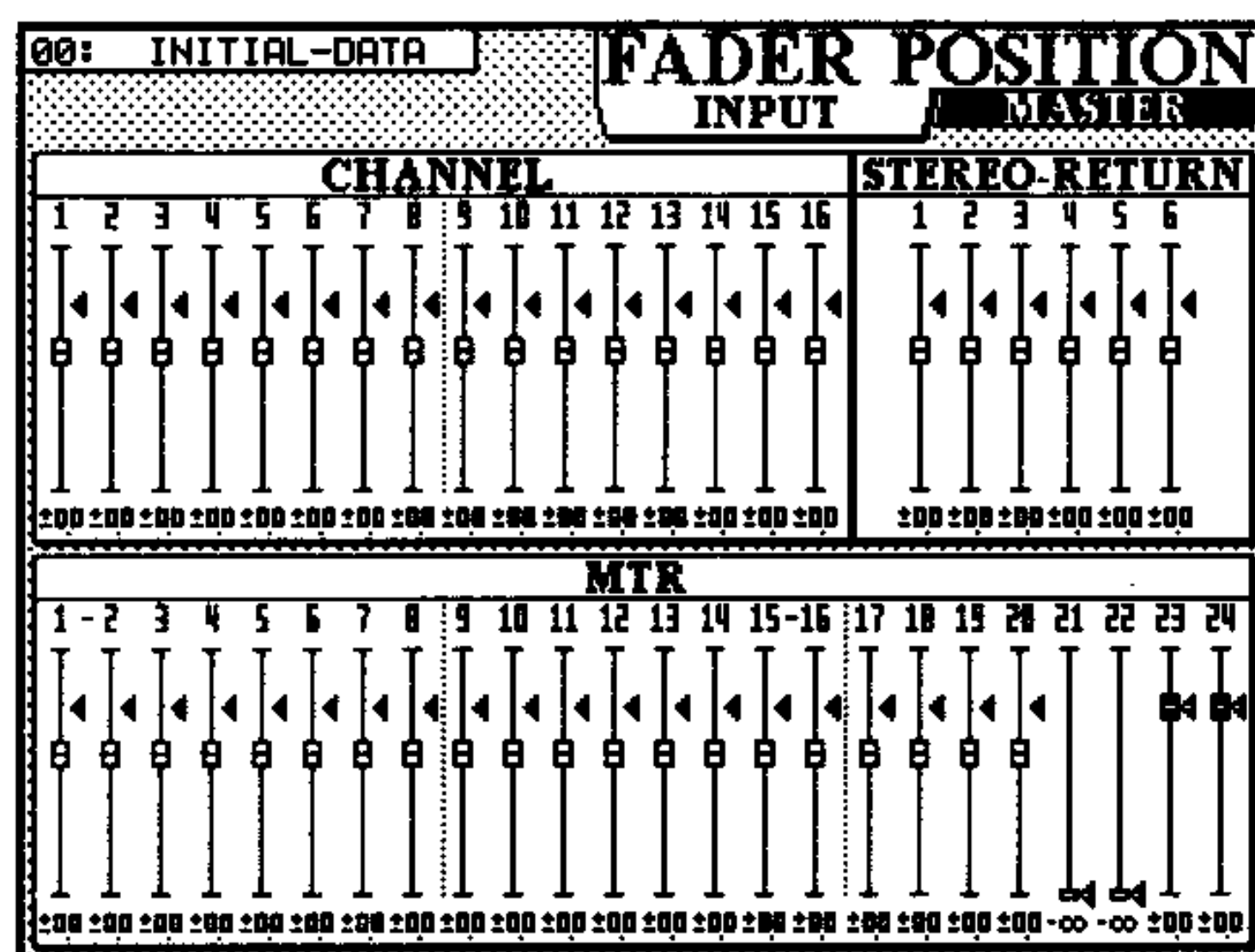
- 1) Use the **METER L FADER** and **S FADER** keys [3] to change the meter functions.

If either of these modes is selected, the meters will now show the virtual fader positions for either the large or small faders.

These two keys always refer to the large and small faders, regardless of the current swap status.

2) Press the **FADER POSITION** key [36].

The screen will change to show something like:



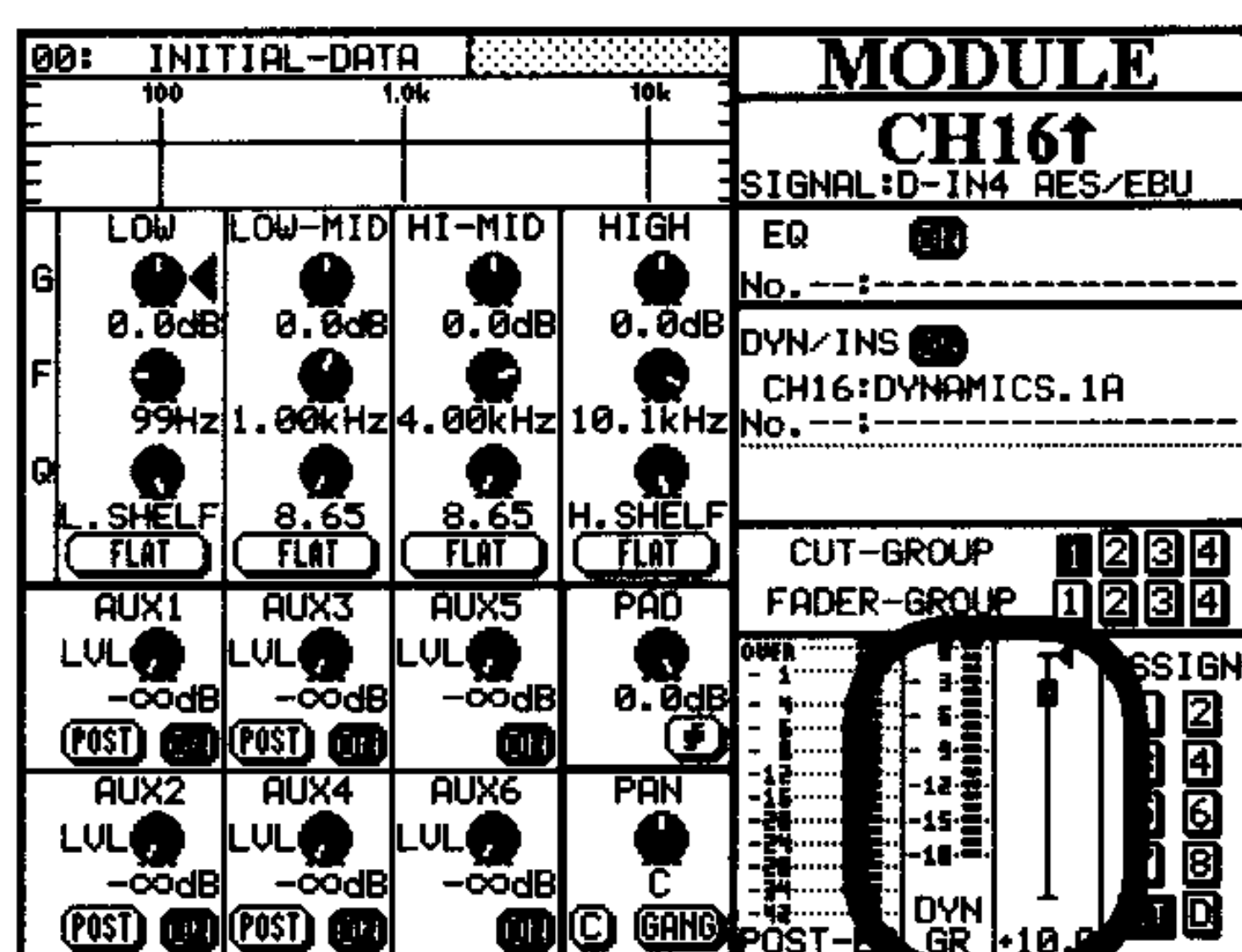
The square box represents the physical position of the fader, and the "<" represents the virtual fader position.

When a fader's physical and virtual position are the same (as they will be if there is no automation active, and the fader is not assigned to a fader group), the "<" will change to a solid triangle.

When the physical fader is at the nominal 0dB level (unity gain), the box will become solid.

The actual gain level is shown as a numerical value below the fader representation. If the fader has been cut, this will be shown here, as well as the shape of the physical fader symbol being changed to reflect this.

3) Press the **MODULE** key:



The physical and virtual fader positions for the selected channel are shown at the bottom of the screen. The symbols are the same as for the **FADER POSITION** screen as described above, but the gain level below the representation of the fader is shown to more precision (using one decimal place) for precise adjustment.

For full details of fader grouping and automation, see 6.16, "Fader grouping" and 11, "TM-D8000 automation".

6.9.1 CUT key

Immediately after the fader, the **CUT** switch [15] of each channel may be applied. This mutes the signal output from the channel. The **CUT** indicator will turn on for each channel that has been cut.

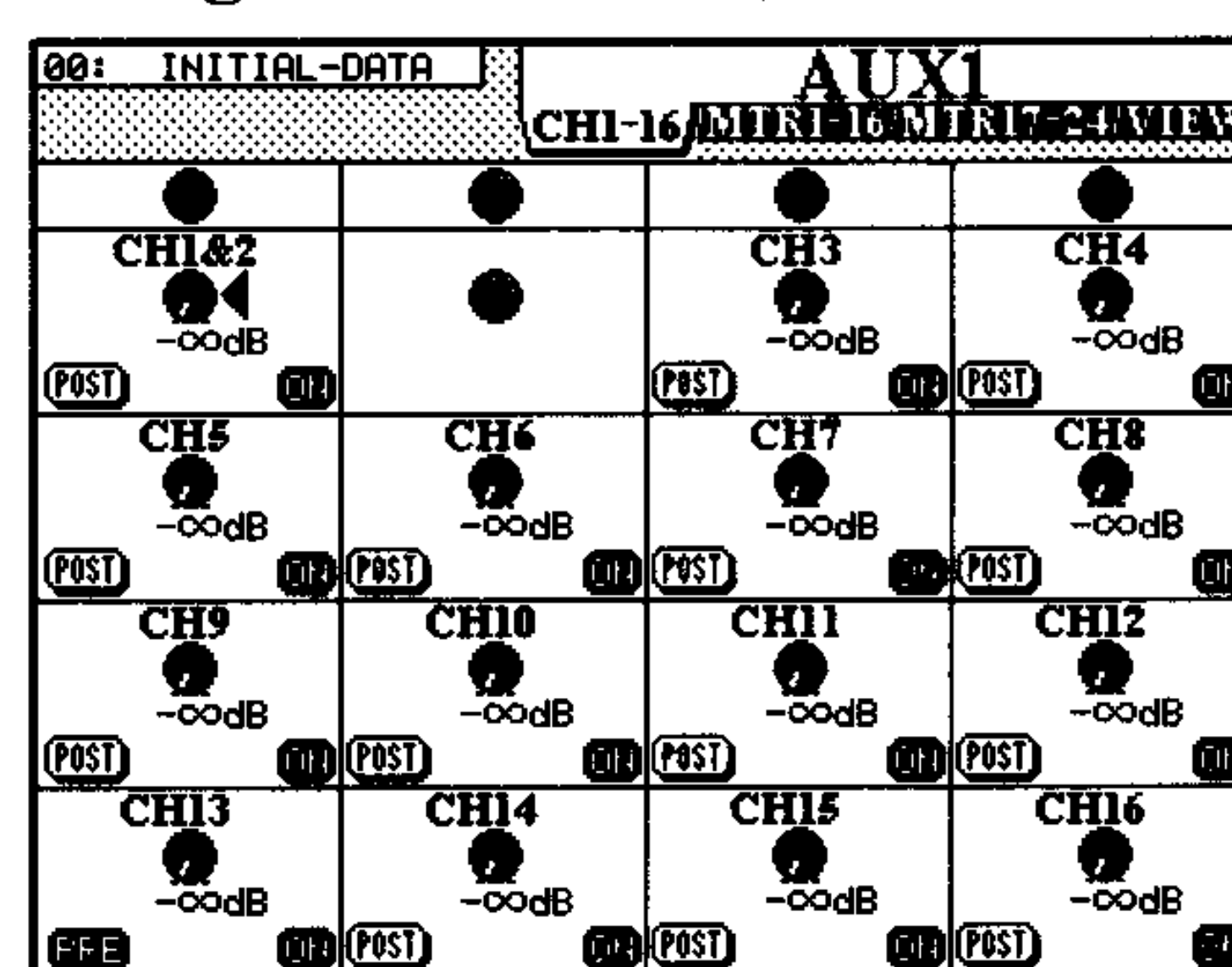
For convenience, four cut groups are supplied for grouped muting of channels (see 6.17, "Cut groups").

6.10 AUX sends (effect sends)

6.10.1 Setting AUX levels (i)

The following applies to either pre-fader or post-fader aux sends (the pre/post parameter is set using the same screen as the level).

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator off.
- 2) Press the **AUX** key of the aux buss to which you wish to send levels (in the example below, we have selected **AUX 1** and input channels 1 and 2 have been stereo linked (see 6.14, "Stereo linking of channels")):

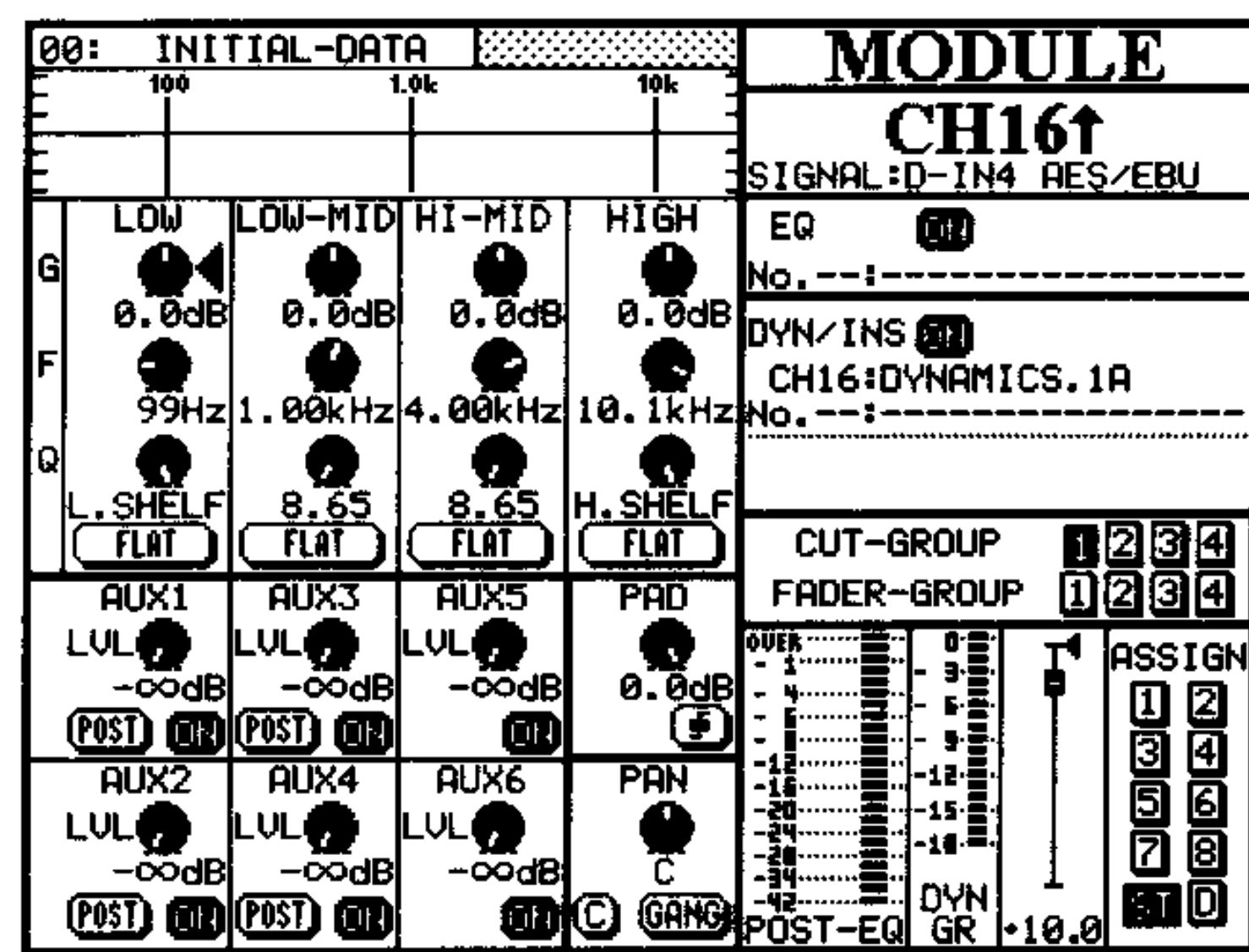


- 3) Select the group of channels (inputs or MTR) by pressing the **SEL** key of a channel belonging to the group you wish to edit.
- 4) Use the left switches of each active **POD** to switch between pre-fader and post-fader aux sends.
- 5) Use the right switches of each active **POD** to turn the aux send on and off.
- 6) Use the **PODs'** rotary control to set the aux send level from 0dB to full cut.

Setting the overall aux buss master setting is described in 6.10.3, "Linking AUX sends and setting levels".

6.10.2 Setting AUX levels (ii)

1) Press the MODULE key.



- 2) PODs 13 through 15 and 17 through 19 (“aux PODs”) now control the AUX sends for the channel selected using the SEL key.
- 3) The left switch of an aux POD controls whether the aux send is pre- or post-fader.
- 4) The right switch of an aux POD controls whether the aux send is on or off.
- 5) The rotary control of an aux POD controls the level at which the channel signal is sent to the aux buss.

NOTE

The VIEW “tab” allows you to view only (no settings are possible) the levels of the aux send from all channels simultaneously..

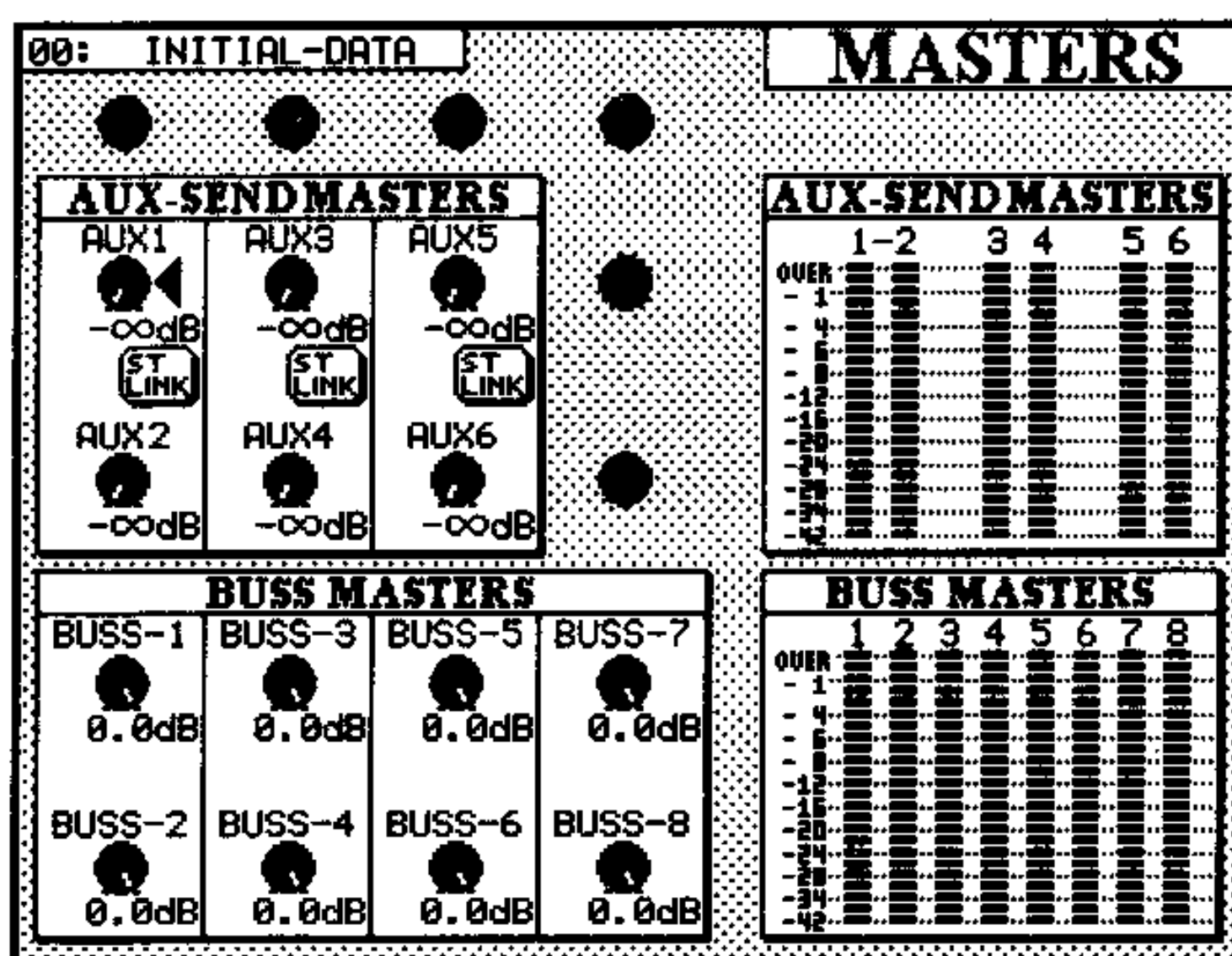
6.10.3 Linking AUX sends and setting levels

There are six auxiliary sends. These may be linked together in pairs to provide stereo sends.

AUX busses 3 and 4 can be either digital or analog (see 5.2.7, “Using digital AUX outputs”).

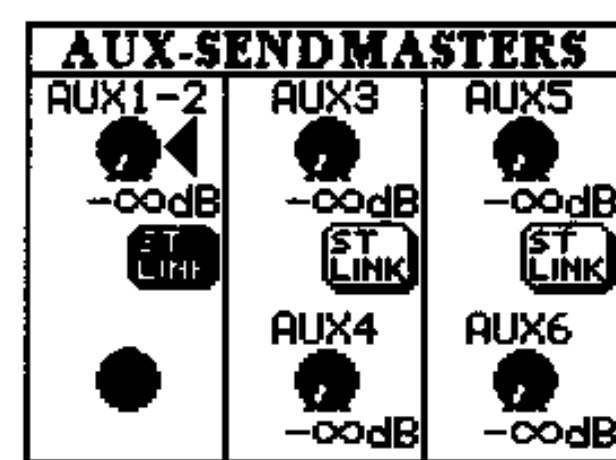
As well as the methods described in 6.14, “Stereo linking of channels”, there is another way of linking the AUX sends into pairs (1 and 2, 3 and 4, 5 and 6):

1) Press the MASTER key [35]:



2) Move the cursor to the on-screen ST LINK button of the pair you want to link, and press ENTER.

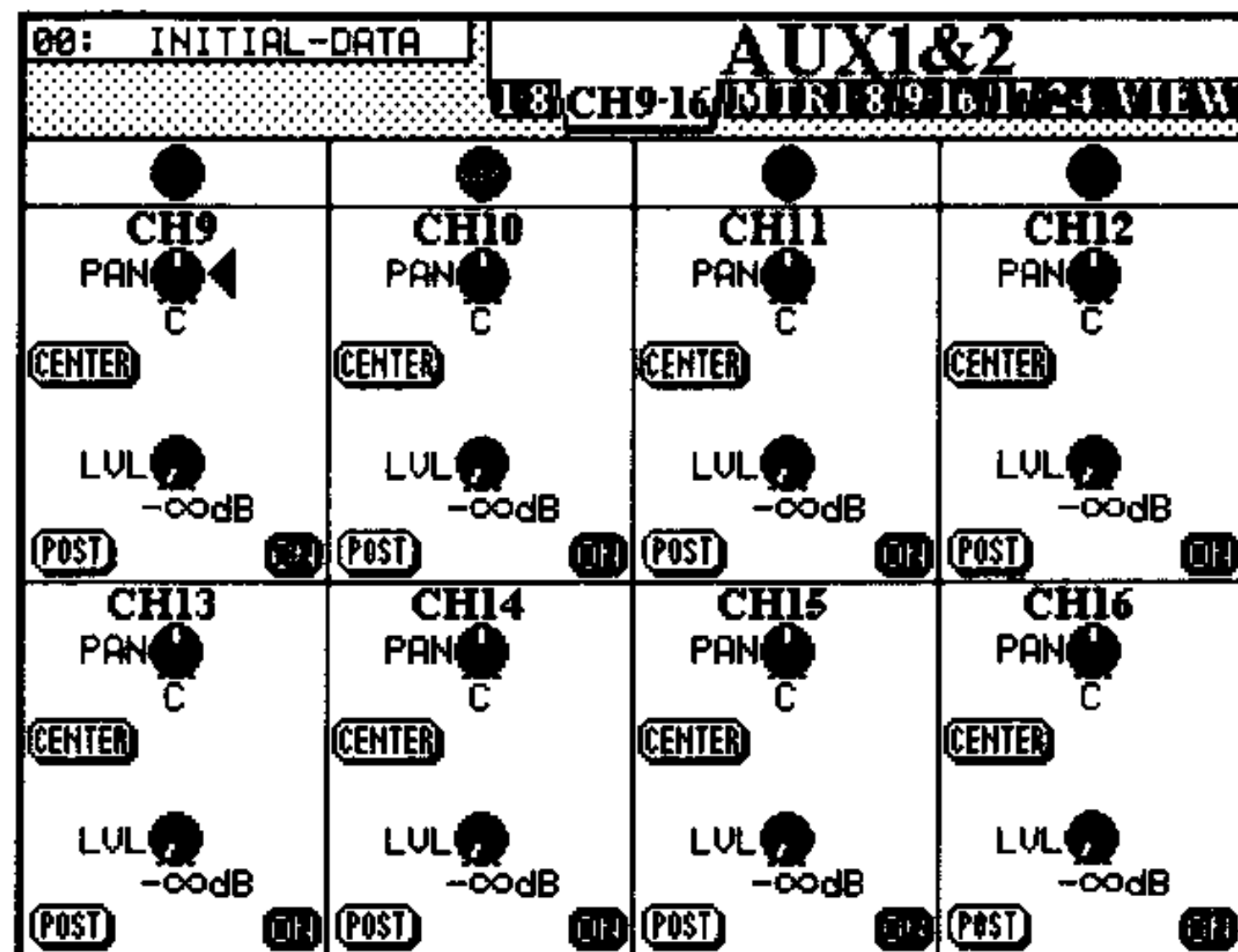
The screen will change as shown below (here, AUX sends 1 and 2 have been linked):



If a pair of AUX sends have been linked in this way, the AUX send screens will change slightly to reflect this.

This screen is also used to set the overall aux send levels. Use the appropriate POD controls (when unlinked, AUX sends 1 through 6 are controlled by PODs 5, 9, 6, 10, 7, 11, 8 and 12 respectively).

The AUX screens will appear in the following format (as in 6.10.2, “Setting AUX levels (ii)”, channels 1 and 2 have been stereo linked). This screen can be selected by pressing either the AUX 1 or the AUX 2 key:



1) The switches of pods 9 through 12 and 17 through 20 are used in the same way as previously described.

In the example above, POD 10 is not used, because of the stereo linking of channels 1 and 2.

2) The rotary controls of PODs 5 through 8 and 13 through 16 are used as pan controls, determining how much of the channel’s signal is being sent to the odd-numbered and how much to the eve-numbered aux busses.

There are 31 pan positions, from L 15 (hard left) through C (center) to R 15 (hard right).

When a pair of channels has been stereo linked, as above, the PAN control changes to a BAL (ance) control.

- 3) The rotary controls of pods 9 through 12, and 17 through 20 adjust the level of the channel signal sent to the aux busses.

In the example above, POD 10 is not used, because of the stereo linking of channels 1 and 2.

A similar process is involved when aux buss levels are set using the MODULE screens (the controls of the PODs which controlled the odd-numbered aux busses are now used as pan/balance controls).

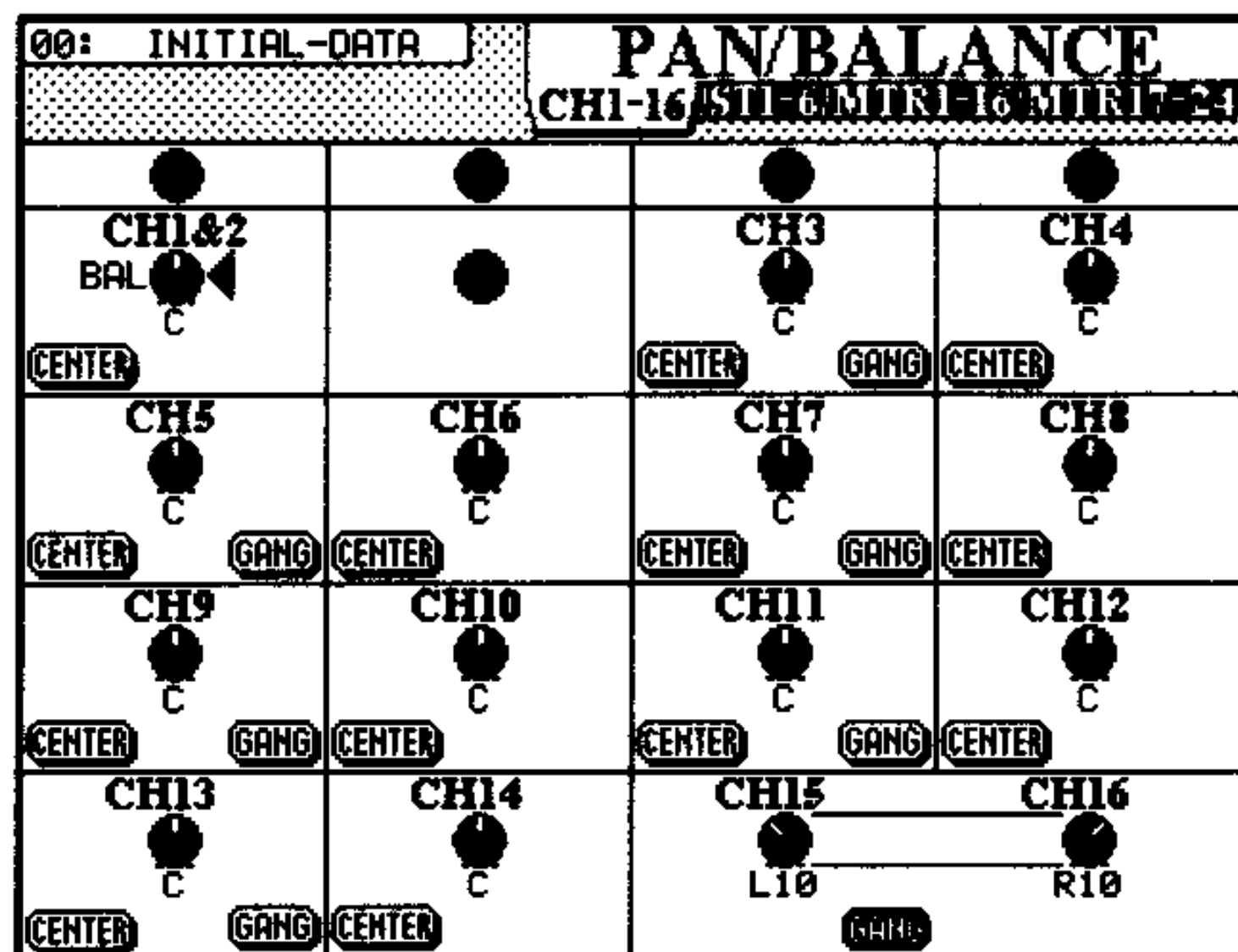
For details of how to use the AUX returns, see 6.18, "AUX returns (stereo returns)".

6.11 Pan controls

Following the aux sends controls, the channel signal is panned.

6.11.1 Panning channels (i)

- 1) Use the SHIFT key to turn the SHIFT indicator off.
- 2) Press the PAN/BAL key [33]:



In this illustration, channels 1 and 2 have been "stereo linked" together.

- 3) The right switch of all odd-numbered PODs from 5 onwards, which have not been assigned to stereo-linked channels, can be used to gang the pan controls of adjacent channels (see 6.11.2, "Ganged panpots").
- 4) The left switch of all odd-numbered PODs from 5 onwards, which have not been assigned to stereo-linked channels, or ganged together, can be used to center the panpot.
- 5) Channels which have been linked together in a stereo link do not have a panpot. Instead, they share a balance control, controlled by the POD control of the lower-numbered channel.

6.11.2 Ganged panpots

Ganged channels are arranged so that if the panpot of one is turned, the other channel is also panned by the same amount in the same direction. In the

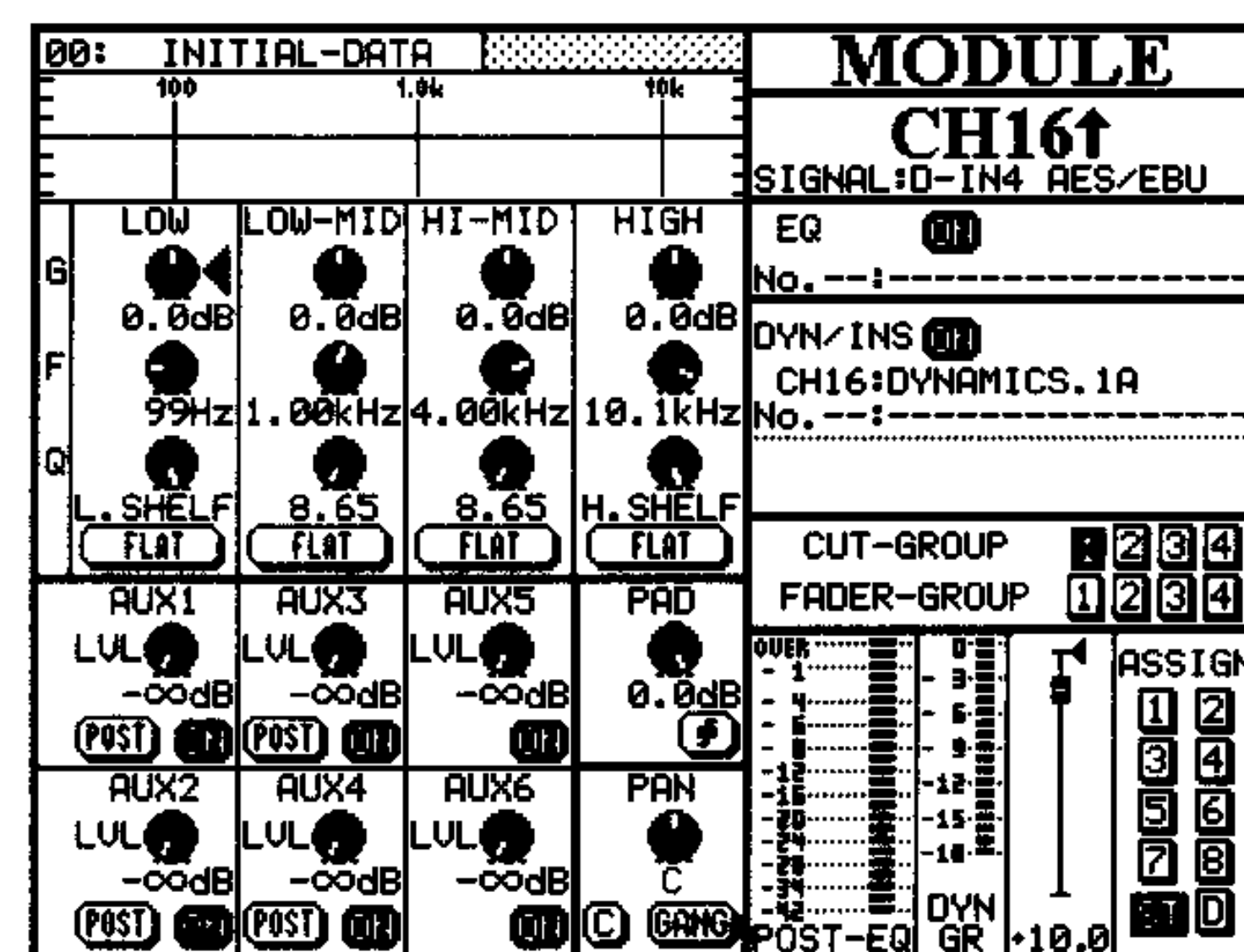
example above, channels 15 and 16 have been ganged, and are set to L 1 0 and R 1 0, respectively (a difference of 21 steps). If channel 15 is turned clockwise by 3 steps, so that it reaches the L 7 position, channel 16 will be panned to the right by 11 steps, resulting in a pan value of R 1 3.

No channel's panpot can be turned past the L 4 5 or R 4 5 position. If a ganged channel's panpot reaches either of the logical "end-stops", the channel with which it is ganged cannot have its panpot turned any further.

6.11.3 Panning channels (ii)

The MODULE screen also allows you to adjust the pan settings of individual channels, on an individual basis.

- 1) Press the MODULE key [31]:



- 2) The control and switches of POD 20 are used to control the PAN (or balance, for stereo-linked channels) and the centering of the channels.

Ganging of channels can only be carried out from the odd-numbered channels.

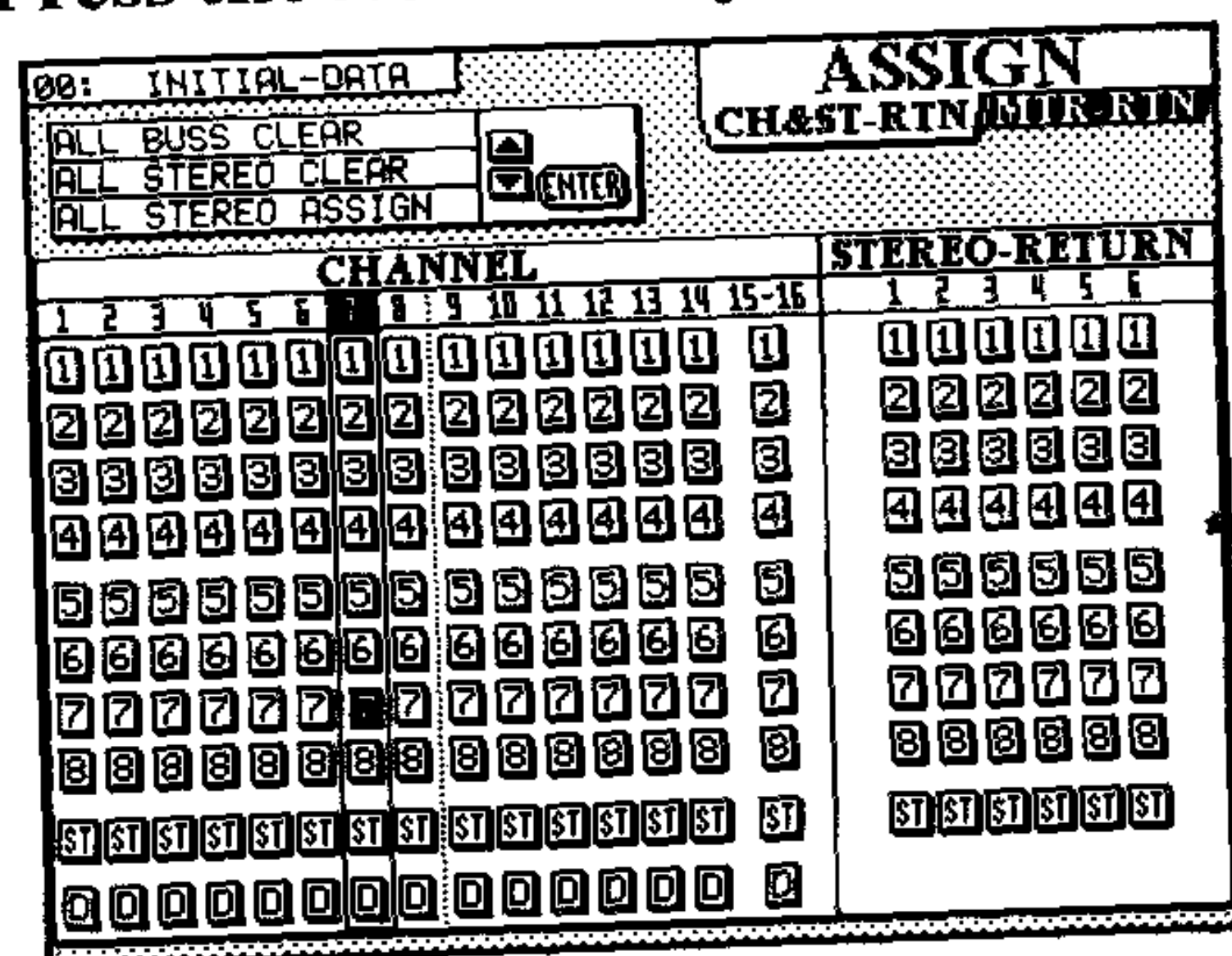
6.12 Channel-to-buss assignment (i)

There are eight output busses, as well as the stereo output buss. Input channels can also be assigned to a direct out function, as explained below.

NOTE

The eight output busses are not fader groups, and have no dedicated console controls. Their levels are set by rotary POD controls from the MASTER screen (see 6.15, "Output buss levels").

1) Press the ASSIGN key:



- 2) Use the channel SEL keys to select the appropriate group of channels, and highlight the appropriate channel (in the illustration above, input channel 7 has been selected).
- 3) Use the assignable control section's buss assignment switches to route the channel to any of the eight output busses, the stereo buss, or (input channels only) to a direct out (the channel is routed to buss 7 in the illustration above).

When assigning to the eight output busses, the odd-numbered busses will take as much of the channel signal as been panned to the left, and the even busses will take as much of the signal as has been panned to the right (similar to analog mixer buss routing).

The eight stereo busses are automatically output to the MTR tracks, "echoed" across the three MTR outputs. Buss 1 is output to MTR tracks 1, 9 and 17, buss 2 to MTR tracks 2, 10 and 18, etc.

The stereo (ST) setting bypasses the output busses, and routes the signal straight to the stereo output buss.

The direct out (D) is available for input channels 1 through 16 only. When this is selected, the signal is routed directly (without passing through a buss) to the appropriate MTR output channel through the TDIF-1 MTR 1-8 and MTR 9-16 connectors [86].

6.12.1 "Global" settings

There are three "global" settings in this screen which can be used to simplify the process of channel routing:

ALL ASSIGN CLEAR will remove all assignments of channels to any of the eight output busses and also any DIRECT OUT channel assignments.

ALL STEREO CLEAR will remove all assignments of channels to the stereo buss.

ALL STEREO ASSIGN assigns all channels to the stereo buss.

To use these functions, use the UP and DOWN cursor keys to select one of the options, and ENTER to execute the option.

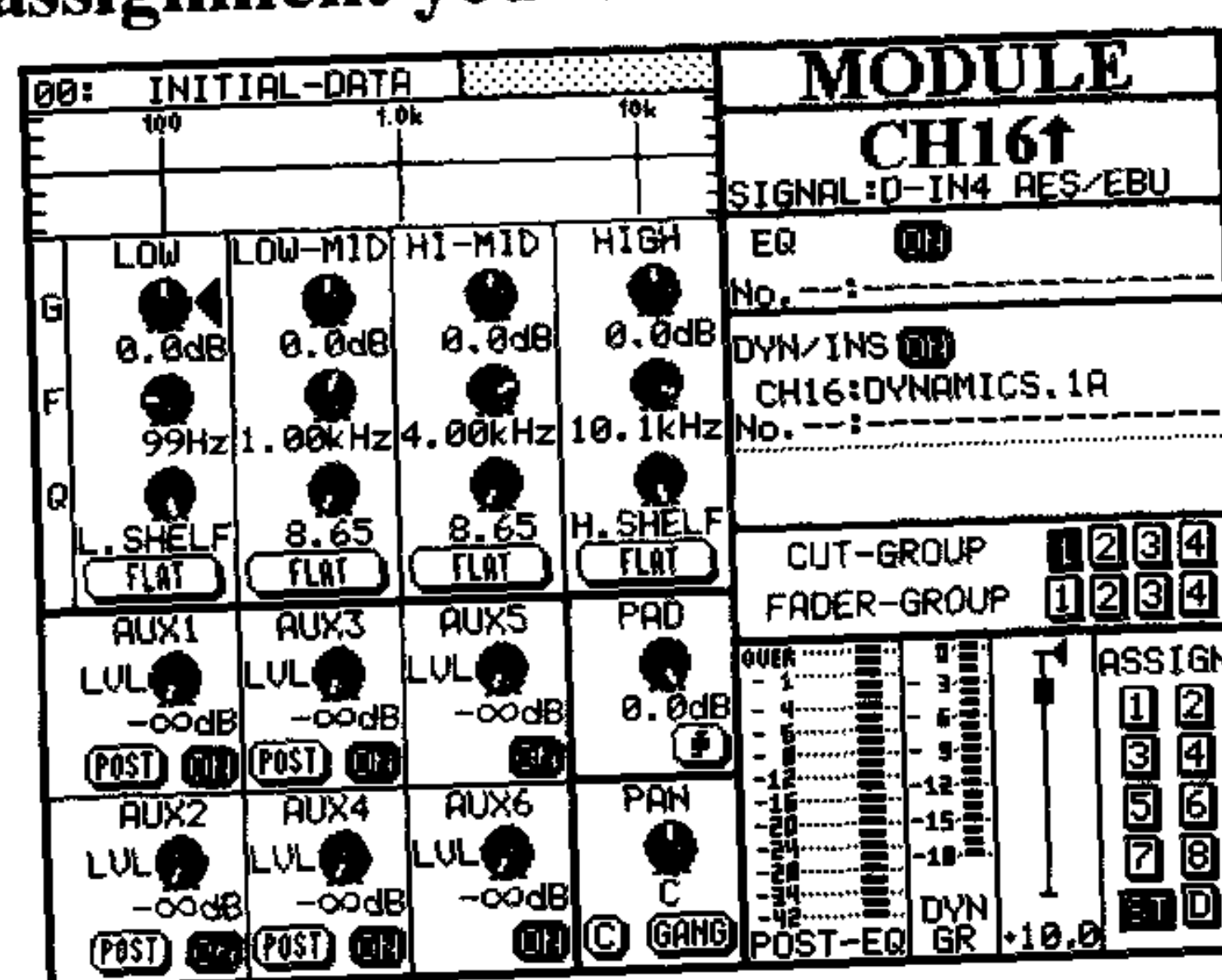
In all cases, all channels will be cleared or routed, regardless of the group of channels which is actually being displayed on screen at the time.

These functions can be useful in a multitrack session when recording has finished and the mix-down process is about to start, for example.

6.12.2 Channel-to-buss assignment (ii)

Assignment can also be made on a channel-by-channel basis:

- 1) Press the MODULE key.
- 2) Press the SEL key for the channel whose assignment you wish to alter.



- 3) Use the assignable control section's assignment keys to assign the selected channel to the required busses.

6.12.3 Storing routing tables

You can store frequently-used routing tables and setup parameters in a library, allowing quick recall of frequently-used setups for similar projects.

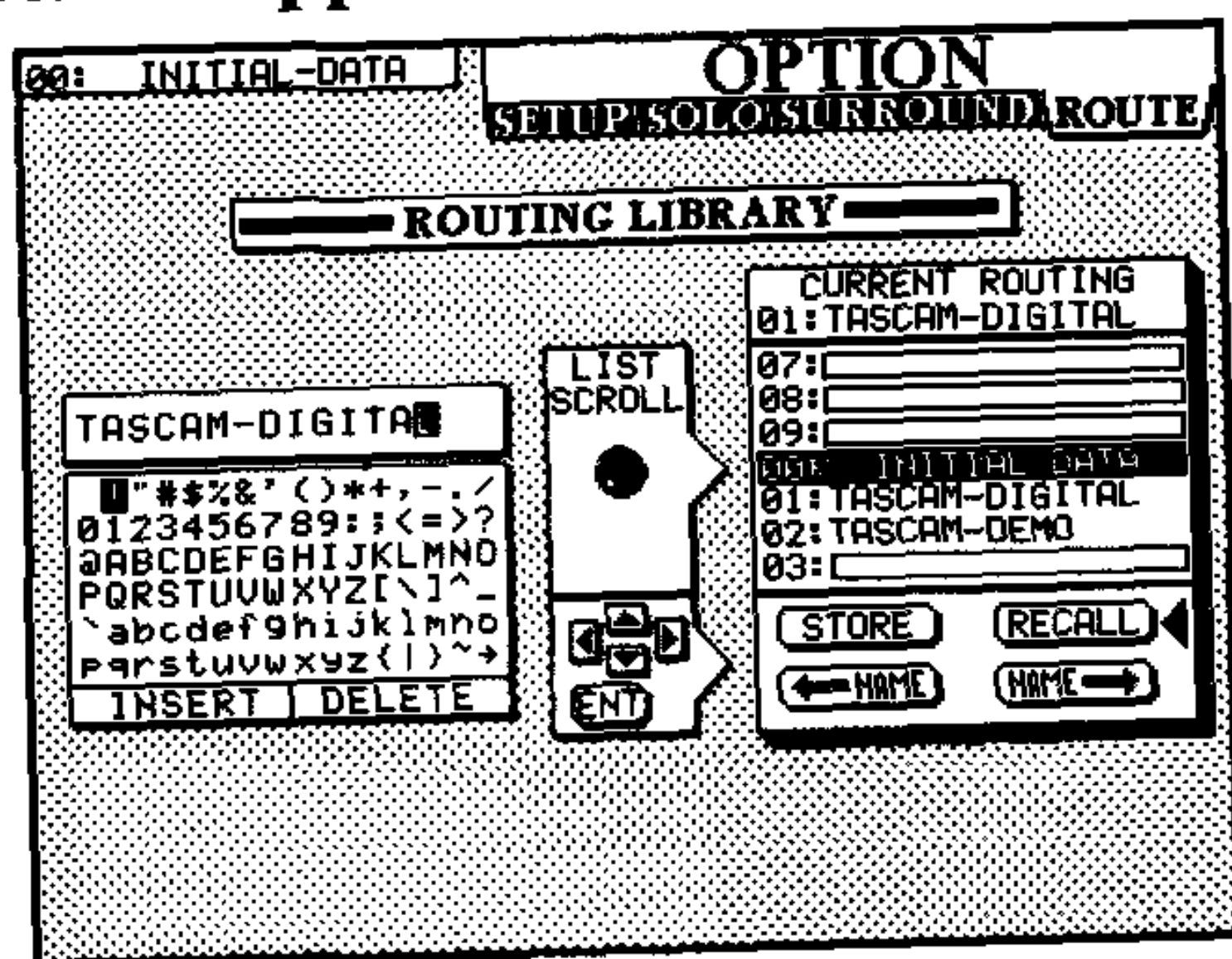
The parameters stored in a routing library entry are:

- Pad settings (6.4.1, "Pad and phase (i)")
- Phase settings (6.4.1, "Pad and phase (i)")
- Panpot gang settings (6.11.2, "Ganged panpots")
- Delay values and switch settings (6.8, "Delay settings")
- Channel-to-buss assignments (6.12, "Channel-to-buss assignment (i)")
- Stereo direct assignment (6.12, "Channel-to-buss assignment (i)")
- Cut grouping (6.17, "Cut groups")

- Fader grouping (6.16, “Fader grouping”)
- Input selections (5.1, “Audio connections (analog)” and 5.2, “Connection of digital equipment”)
- **D IN** connector selection (5.2.4, “Connecting AES/EBU or SPDIF devices as input sources”)

To store the current settings to a routing library entry:

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.
- 2) Press the **OPTION** key [43] until the following screen appears:



The currently-loaded routing library entry (if any) is shown above the scrolling list.

- 3) If the center part of the screen is not “pointing” to the right, use the shuttle wheel to change it.
- 4) Use the jog dial to scroll through the list until you come to an empty library entry or an entry that you know you can overwrite safely.
- 5) Use the cursor keys to move the cursor to the on-screen **STORE** button, and press **ENTER**.

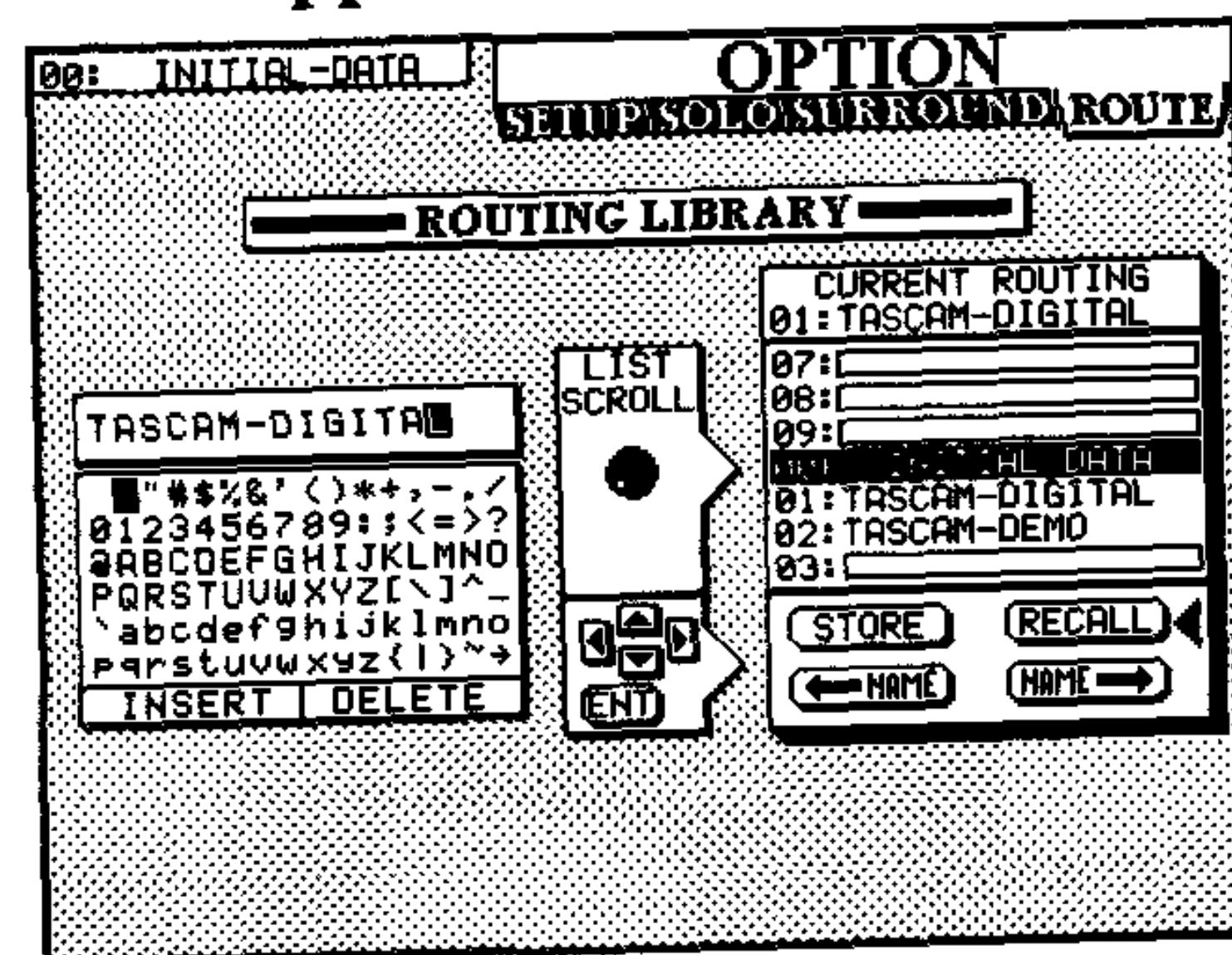
If the library entry already contains data, you will be asked if you want to overwrite the existing data. Press **ENTER** to overwrite, or one of the cursor keys to exit without overwriting data.

6.12.4 Loading routing tables from a library entry

The data stored in a routing table library, as described above, can be recalled for use at any time.

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.

- 2) Press the **OPTION** key [43] until the following screen appears:



The currently-loaded routing library entry (if any) is shown above the scrolling list.

- 3) If the center part of the screen is not “pointing” to the right, use the shuttle wheel to change it.
- 4) Use the jog dial to scroll through the list until you come to a library entry that you want to recall.
- 5) Use the cursor keys to move the cursor to the on-screen **RECALL** button, and press **ENTER**.

The routing table data stored in the library entry will be recalled and used as the current settings.

If the library entry is empty, an error message will be displayed.

6.12.5 Naming and renaming routing table library entries

Routing table library entries may be named and renamed in the same way as 6.6.5, “Naming and renaming EQ library entries”. See this section for details of how to perform this operation.

6.13 Soloing channels

Channels can be soloed pre-fader (post-EQ and pre-delay) or post-fader and pan (in place).

6.13.1 PFL soloing

To perform PFL soloing, press the **SOLO** key [14] with the **INPLACE** key [28] off.

The indicator will light, and the **PFL** indicator will flash. The signal output from the control room outputs will be a mono sum of all soloed channels.

The level of the PFL signals is controlled using the **PFL** control [28].

The output from the stereo and buss outputs will not be affected.

6.13.2 Inplace soloing

- 1) Press the **INPLACE** key [28] (the indicator will light).
- 2) Press the **SOLO** key [14] of any channel you want to solo.

The **SOLO** indicator of the channel will light, and the **CUT** indicators [15] of all non-soloed channels will light.

The output from the stereo buss (as monitored in the control room monitors) will be replaced by the summed signals of any solo channels. The outputs to the eight output busses will also be cut.

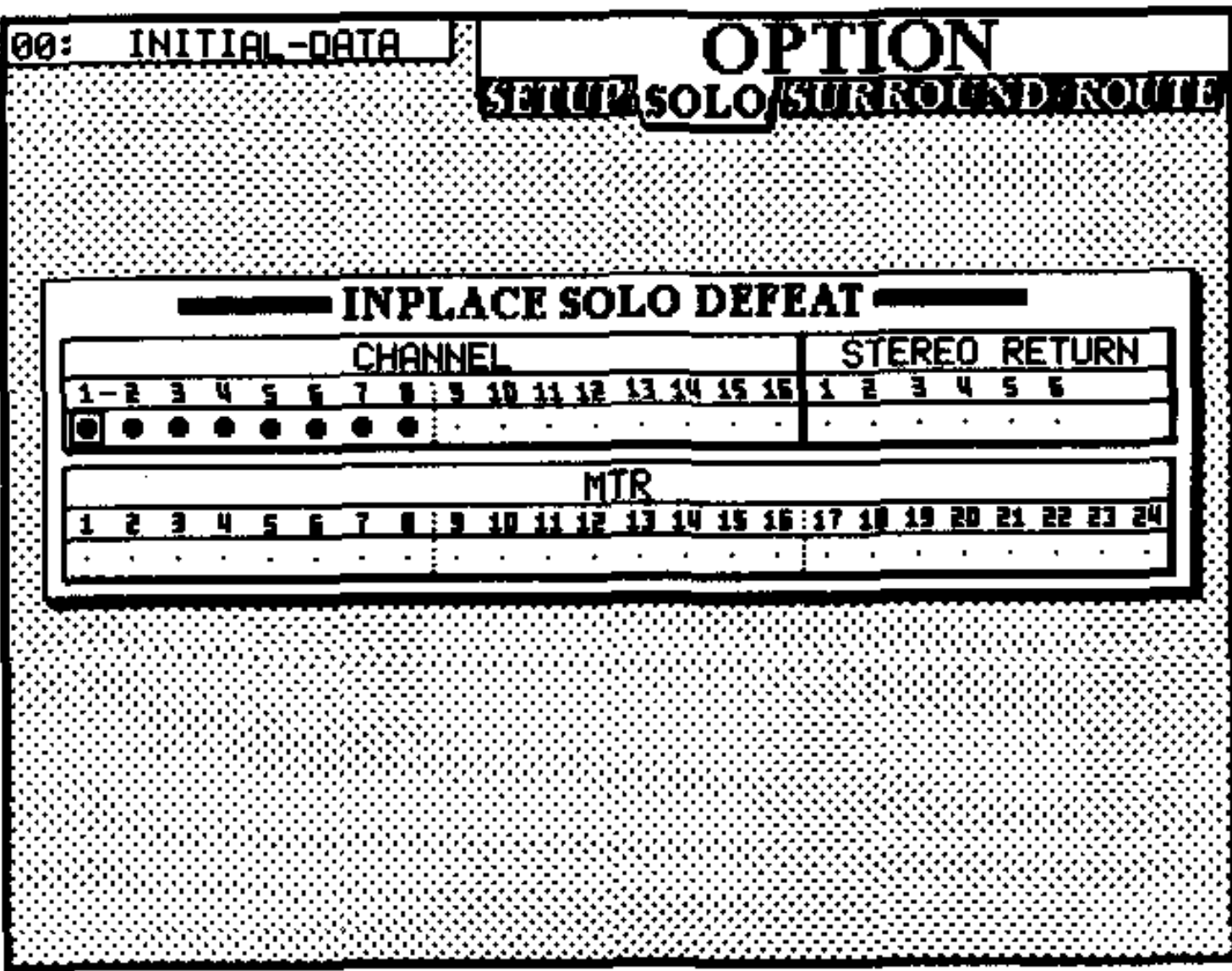
NOTE

Though inplace soloing is an extremely useful feature, it should not be performed when recording is in progress, as the outputs from all busses will almost certainly be changed to signals that you do not want to record.

6.13.3 Protecting channels from inplace solo

As explained above, the inadvertent use of inplace soloing can have disastrous effects on a recording session. To prevent such disasters, the TM-D8000 allows you to “solo safe” channels, preventing them from muting the output of other channels if the inplace mode is on, and the channel’s solo switch is pressed accidentally.

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.
- 2) Press the **OPTION** key [43] until the following screen appears:



If fader swap has been enabled (see 6.1, “Fader swap”), the screen will appear slightly differently (MTR returns will be on the top).

- 3) Use the **SEL** keys of the channels, or the jog dial or the cursor keys to select a channel.

- 4) Use the **ENTER** key to toggle **SOLO DEFEAT** for the selected channel on or off.

When solo defeat has been enabled for a channel, pressing the **SOLO** key of that channel while the **INPLACE** indicator is lit will have no effect.

6.14 Stereo linking of channels

So far, for the most part, channels have been described as though they were single (mono) channels. However, it is often convenient when recording stereo sources to link two channels together so that they can be treated as one.

When two channels are linked, the settings made in the **MODULE** (and most other screens) apply to both channels equally. The two channels are seen as one on the display screens, and the right (usually) **POD** of the pair is disabled.

You can link adjacent channels only, and the left channel of a stereo pair must be odd-numbered. In other words, you can link 1–2, 5–6, 15–16, etc., but **not** 1–3, 6–7 or 14–16. You can link both channel and **MTR** channels, as well as the **AUX** sends.

The **PAN** parameter is changed to a **BALANCE** parameter, and, naturally, **PAN** controls of linked channels cannot be ganged.

The channels of any stereo pair whose balance control is at the center will be 3dB down from the unlinked levels, since the balance follows an “equal power” curve.

As far as the dedicated controls are concerned, when two channels have been linked as a stereo pair, either **SEL** key can be used to select the pair.

However, only the fader and **CUT** and **SOLO** keys of the left channel of each pair is active.

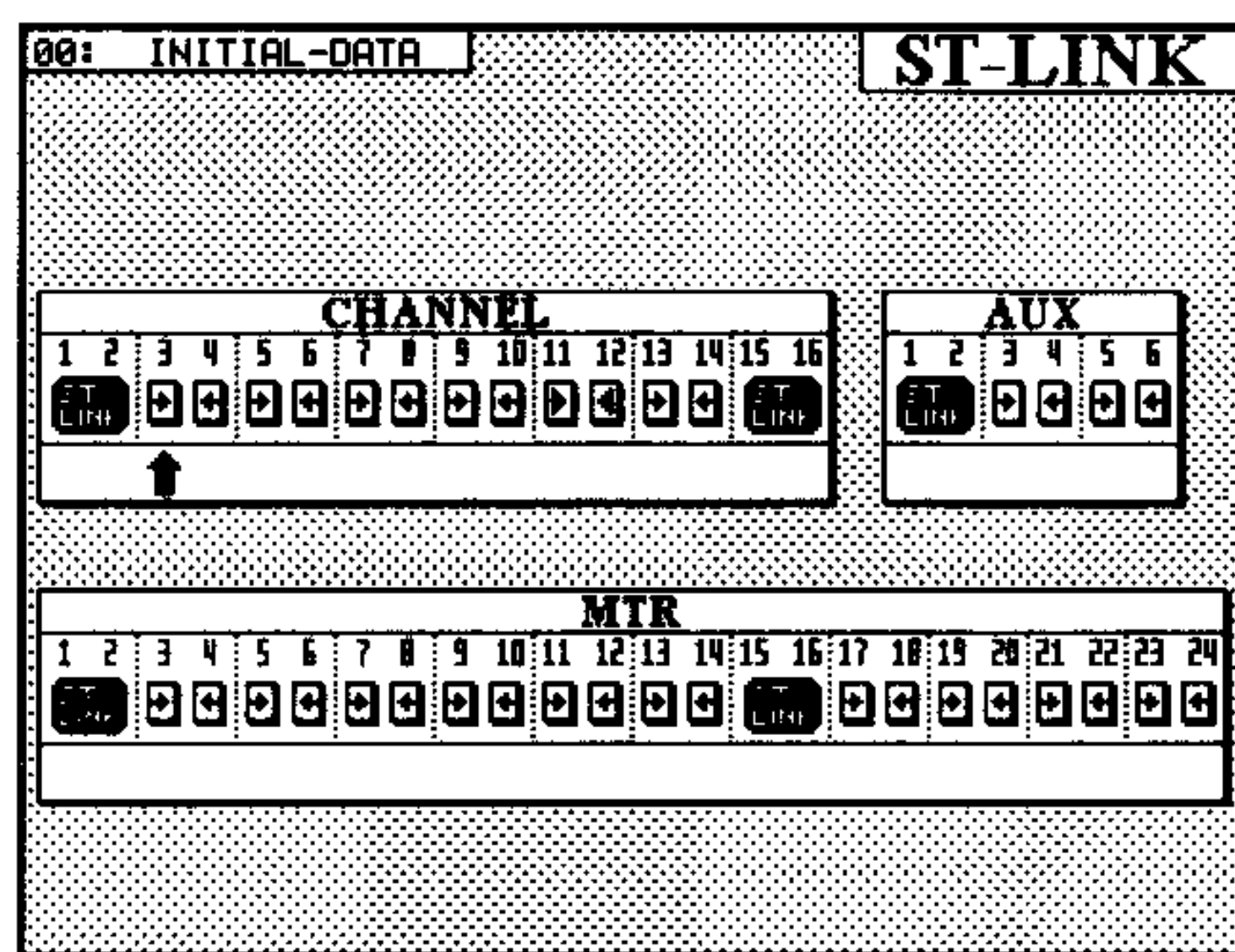
NOTE

If you press the right **CUT** or **SOLO** key, or move the fader of the right channel of a linked pair of channels, this will have no effect.

6.14.1 Linking channels (i)

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.

- 2) Press the **ST LINK** key [39]:



If fader swap has been enabled (see 6.1, “Fader swap”), this screen will appear slightly different (MTR channels will be at the top).

- 3) Use the **SEL** keys of the channels, or the jog dial, or the cursor keys to move the cursor to a pair of channels.
- 4) Use the **ENTER** key to toggle the link status between on and off.

6.14.2 Linking channels (ii)

This method of linking channels does not require a special screen mode.

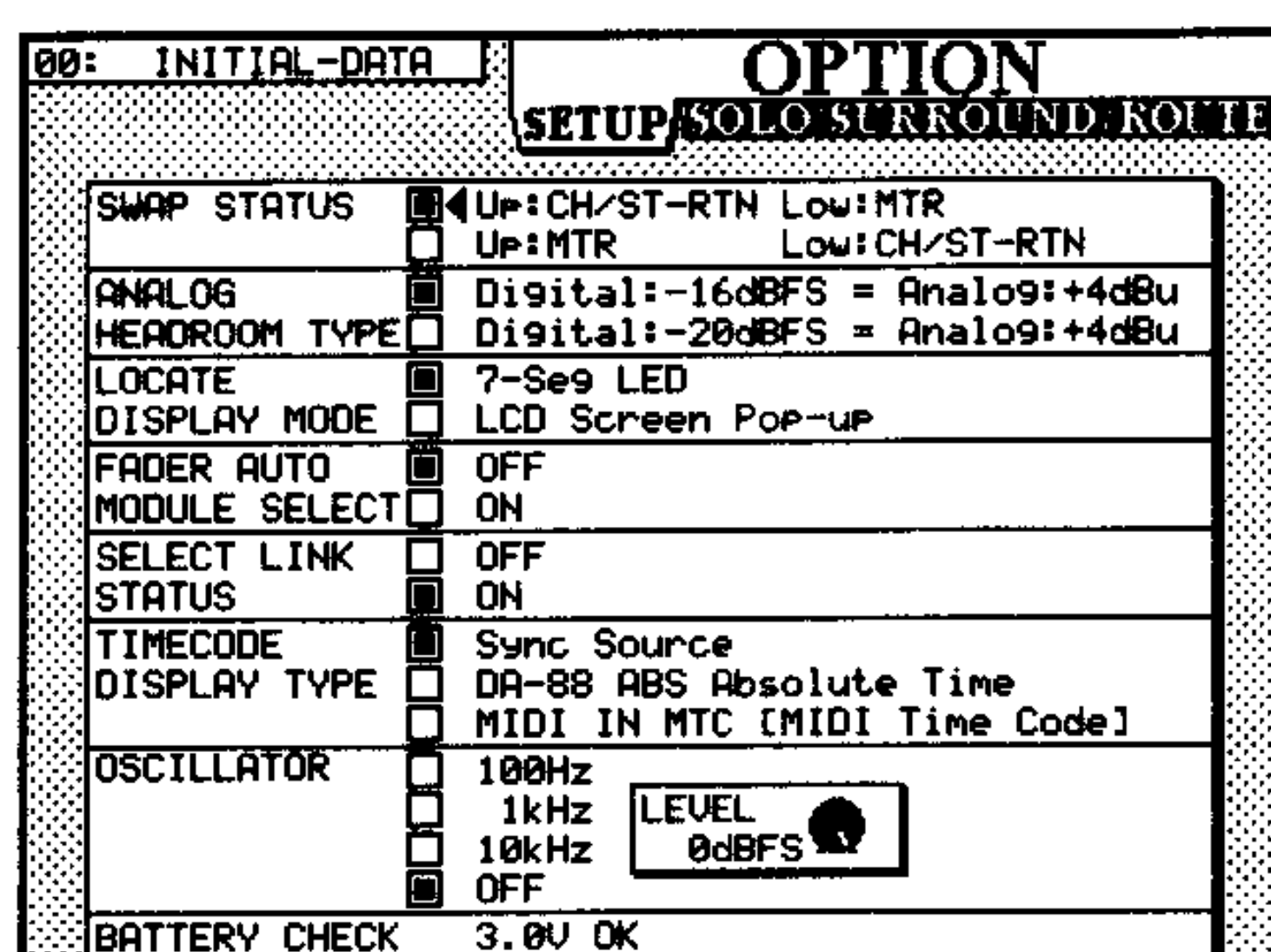
- 1) Press and hold down the **SEL** key of one of the channels you wish to link.
- 2) Press the **SEL** key of the other channel in the pair, and release both **SEL** keys.
- 3) A pop-up panel appears. Use **ENTER** to confirm the link, or a cursor key to cancel.

The channels are now linked.

6.14.3 Setting link options

You can disable stereo linking from the **SEL** keys (this does not affect your ability to perform stereo linking from the **ST-LINK** screen).

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.
- 2) Press the **OPTION** key until the following screen appears:



- 3) Use the cursor and **ENTER** keys to select the appropriate **SELECT LINK STATUS**, either **ON**, or **OFF**.

6.15 Output buss levels

The levels of the eight output busses are set using the **MASTER** screen. There are no dedicated hardware controls for adjusting the buss levels.

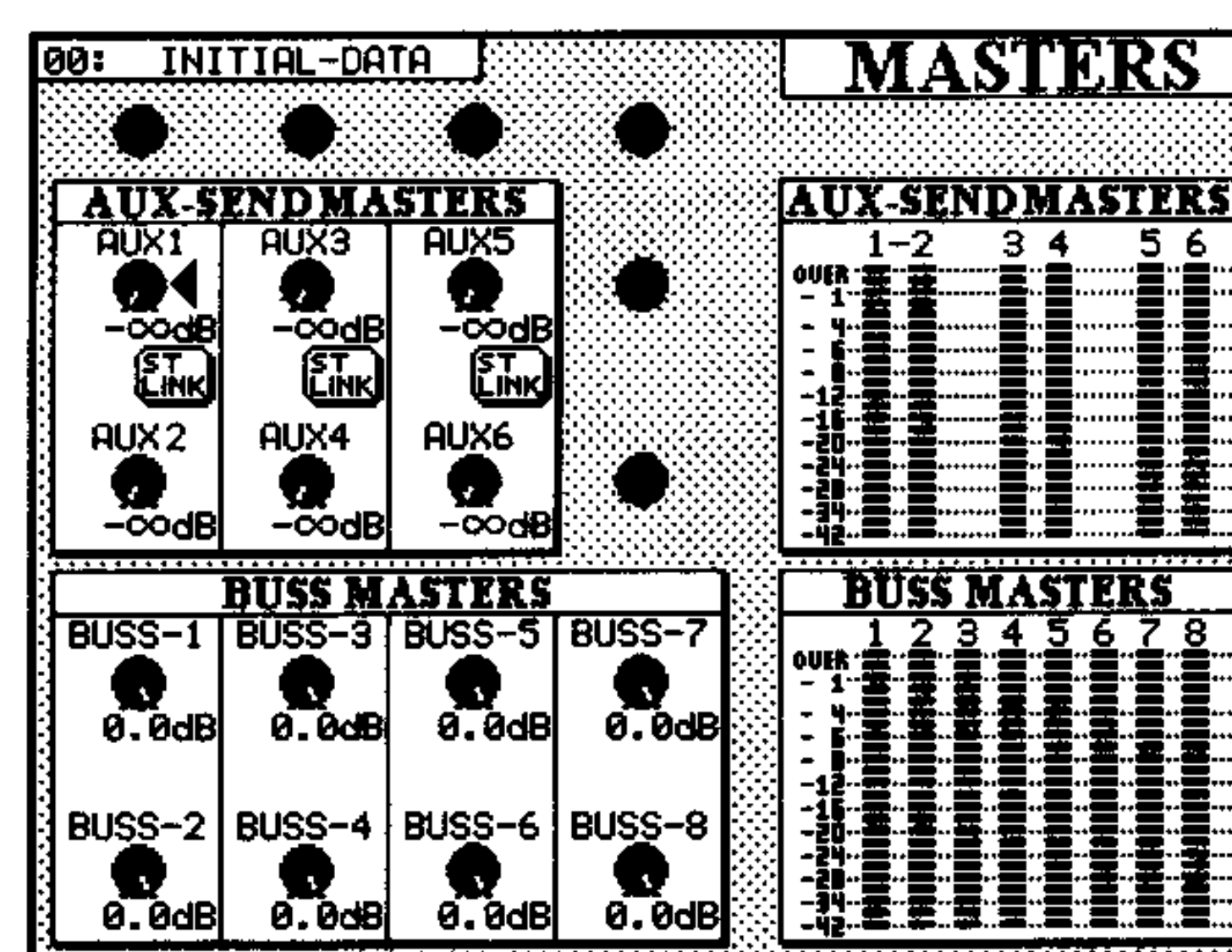
The busses are output to the appropriate channel of all **TDIF-1** connections, i.e. buss 1 is assigned to channel 1 of **MTR 1-8**, **MTR 9-16** and **MTR 17-24**, as well as to channel 1 of **D I/O 1** and **D I/O 2** if connected. If 3 **DTRS** units connected to the **MTR** units are regarded as one 24-track machine, buss 1 is therefore routed to tracks 1, 9 and 17, and similarly for the other busses.

If, however, an input channel has been routed to **DIRECT** (see 6.12, “Channel-to-buss assignment (i)”), the buss will not be routed to that tape track. Direct routing takes priority.

NOTE

The DA-38 and DA-98 **DTRS** machines support a Track Copy function, which allows you to override the “one-to-one” assignment of buss to track, if you need it. Remember, though, that with digital multitrack systems, “leakage” from adjacent tracks is not the problem that it is with analog systems, and so it is possible to position a bass guitar track next to a vocal track, for instance.

- 1) Press the **MASTER** key [35]:



- 2) The rotary controls of **PODs 13** through **20** are used to adjust the levels of the eight output busses.
- 3) The “soft” meters at the right of the screen show the buss signal levels.

The signals output from the eight busses can also be metered using the **METER MTR SEND** key [3]. If no direct track assignment has been selected, the three groups of eight meters will show identical readings.

6.16 Fader grouping

The TM-D8000 provides four fader groups, controlled by the fader group section at the right of the stereo master fader.

It is not possible for a channel to be assigned to more than one fader group.

Note that these are **not** the output busses. Their use is as master faders to affect the level of a group of channels simultaneously. These channels may be assigned to different output busses.

For example, a drum kit might be assigned to one fader group, but the kick, snare and hi-hat might be assigned to three busses, and a stereo overhead pair to another pair of busses. However, one fader might be used to control the levels of all these channels.

When a channel is assigned to the fader group, the output gain (i.e. the virtual fader position, see 6.9, "Channel faders") of the channel is calculated by adding the channel fader gain to that of the group fader.

For example:

- If both are at unity gain (nominal level) the virtual fader is at 0dB.
- If the channel fader is at +2dB and the group fader is at -10dB, the virtual fader is at -8dB.
- If the group fader is at +10dB and the channel fader is at -1dB, the virtual fader is at +9dB.

You can see the positions of the "virtual faders" either with the **FADER POSITION** screen (press the **FADER POSITION** key [36]) or by setting the meters to show **L FADER** or **S FADER**.

6.16.1 Assigning channels to the fader groups (i)

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.

- 2) Press the **GROUPING** key [38]:

The screenshot shows the 'GROUPING' screen with the following sections:

- CUT GROUP:** A table with columns for 'CUT GRP' (1-4) and 'CHANNEL' (1-24). It also has a 'STEREO RETURN' column.
- FADER GROUP:** A table with columns for 'FADER GRP' (1-4) and 'CHANNEL' (1-24). It also has a 'STEREO RETURN' column.
- STEREO RETURN:** A column on the right side of the screen.

The screen also displays 'INITIAL-DATA' and 'CUT GROUP' at the top.

This screen is used for both fader group and cut group assignments. In this section we are only concerned with the fader groups (at the bottom part of the screen).

- 3) Use the cursor keys, the channel **SEL** keys or the jog dial to move the cursor around the channels in the fader group section.

As you move the cursor, notice that the fader group indicator corresponding to the current cursor row will flash. In addition, all **SEL** indicators of channels whose faders are members of the group will flash (the **SEL** indicator of the channel which was previously selected for other editing purposes prior to the group assignments will go out).

- 4) When the cursor is at the intersection of the channel (column) and fader group (row) that you want to set, press the **ENTER** key.

If the channel is already assigned to a fader group, this assignment will be cleared when the new assignment is made.

- 5) If you want to clear a fader group assignment, move the cursor to an assigned intersection and press **ENTER**.

You can also move the cursor between fader groups by pressing the fader group **SEL** keys.

6.16.2 Assigning channels to the fader groups (ii)

You can also assign and de-assign channels to the fader groups using only the **SEL** keys.

- 1) Press and hold down the **SEL** key of the fader group [50] to which you want to assign or de-assign faders.

The **SEL** indicator of the currently selected fader will go out, and the **SEL** indicators of all channels currently assigned to the fader group will start to flash.

- 2) To assign a channel to the group, while holding down the **SEL** key of the fader group, press the non-flashing **SEL** key of any channel (showing

that the channel is not currently assigned to the fader group).

The channel **SEL** indicator will start to flash, showing that the channel is now assigned to the group.

- 3) To de-assign a channel from a fader group, press any flashing channel **SEL** key (showing that the channel is currently assigned to the fader group), while holding down the **SEL** key of the fader group.

- 4) When you have finished assigning channels to the fader group, release the **SEL** key of the fader group.

You can watch the effect of pressing the **SEL** keys by watching the **GROUPING** screen as described above.

6.17 Cut groups

In addition to fader groups, a channel can be assigned to one of four cut groups. A cut group allows the muting of a group of tracks with the push of one key. This can be useful for (for example) muting backing vocal microphones until the time for the vocal entry

A channel can belong to only one cut group at a time.

6.17.1 Assigning channels to the cut groups (i)

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.
- 2) Press the **GROUPING** key [38]:

00: INITIAL-DATA

CUT GROUP-**GROUPING**

CUT GRP

CHANNEL

STEREO RETURN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	1	2	3	4	5	6
1
2
3
4

CUT GRP

MTR

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24						
1
2
3
4

FADER GROUP-

CHANNEL

STEREO RETURN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	1	2	3	4	5	6
1
2
3
4

FADER GRP

MTR

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24						
1
2
3
4

In this section we are only concerned with the cut groups (at the top part of the screen).

- 3) Use the cursor keys, the channel **SEL** keys or the jog dial to move the cursor around the channels in the cut group section.

As you move the cursor, notice that the cut group indicator corresponding to the current cursor row will flash. In addition, all **SEL** indicators of channels which are members of the group will flash

(the **SEL** indicator of the channel which was previously selected for other editing purposes prior to the cut group assignments will go out).

- 4) When the cursor is at the intersection of the channel (column) and cut group (row) that you want to set, press the **ENTER** key.

If the channel is already assigned to a cut group, this assignment will be cleared when the new assignment is made.

- 5) If you want to clear a cut group assignment, move the cursor to an assigned intersection and press **ENTER**.

You can also move the cursor between fader groups by pressing the fader group **SEL** keys.

6.17.2 Assigning channels to the cut groups (ii)

You can also assign and de-assign channels to the cut groups using only the **SEL** keys.

- 1) Press and hold down the **SEL** key of the cut group [49] to which you want to assign or de-assign faders.

The **SEL** indicator of the currently selected fader will go out, and the **SEL** indicators of all channels currently assigned to the cut group will start to flash.

- 2) To assign a channel to the group, while holding down the **SEL** key of the cut group, press the non-flashing **SEL** key of any channel (showing that the channel is not currently assigned to the cut group).

The channel **SEL** indicator will start to flash, showing that the channel is now assigned to the group.

- 3) To de-assign a channel from a cut group, while holding down the **SEL** key of the cut group, press any flashing channel **SEL** key (showing that the channel is currently assigned to the cut group).

- 4) When you have finished assigning channels to the cut group, release the **SEL** key of the cut group.

You can watch the effect of pressing the **SEL** keys by watching the **GROUPING** screen as described above.

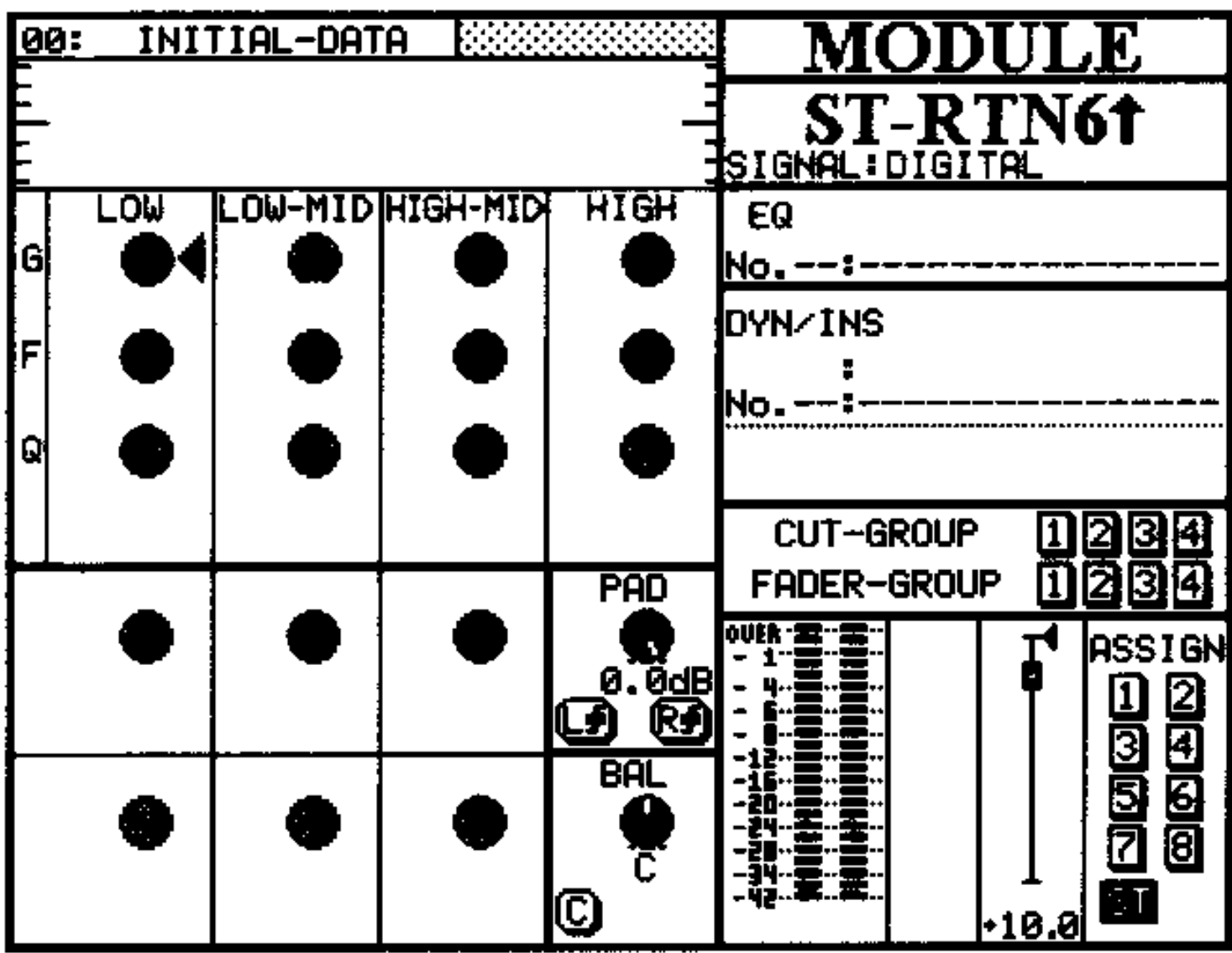
6.18 AUX returns (stereo returns)

The stereo AUX return channels are controlled by modules 17 through 22 of the input fader section (large or small faders, depending on status).

Typically, these are analog inputs [69], but stereo return 6 can be assigned to use a digital input (see 5.2.8, “Digital AUX return (6)”).

An analog trim control and signal indicator are provided on each module, identical to the ones provided for input channels. There is no phantom powering or **PAD** switch, however.

The **MODULE** screen for each of these AUX returns is slightly different from that of an ordinary channel (here the AUX 6 return is shown coming from an analog input):



There is no EQ possible on a stereo return and (naturally) no AUX send.

Phase may be edited individually for each channel, and a digital pad may be added.

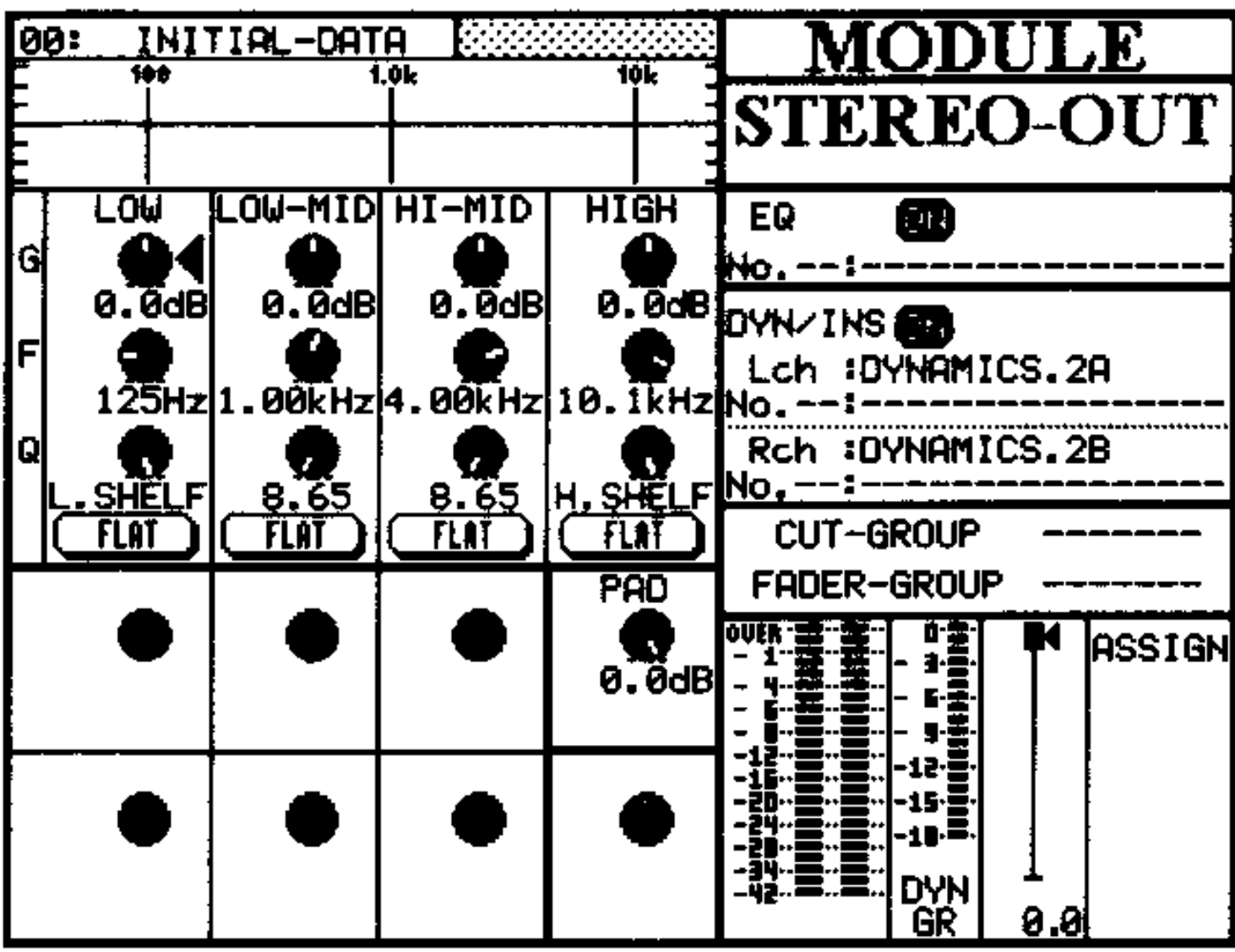
A stereo AUX return may be assigned to any of the eight output groups, or the stereo buss, but no direct out is available.

6.19 The stereo fader and output buss

As on a conventional console, the stereo fader controls the level of the signal of the signal output from the **STEREO OUTPUTS**. However, the TM-D8000 gives you a little more control over the sound from this buss than you usually get from an analog console of this size.

1) Press the **MODULE** key.

2) Press the **SEL** key of the **STEREO** module:



As you can see from the screen above, the stereo output is equipped with the same 4-band EQ facilities as all other channels (use PODs 1 through 12). See 6.6, “Equalization features” for full details. EQ settings can be stored to and recalled from library entries. This allows you to compensate for different monitoring equipment characteristics, etc.

In addition, dynamics processing is available, allowing compression, limiting and gating of the stereo outputs. The loop can be assigned pre-or post fader. Switch between these settings by repeated presses of the stereo **SEL** key in the matrix assignment screen (see 6.7.1, “Insertion (external)” and 6.7.2, “Insertion (internal)”).

A pre-EQ pad is also available.

There is no balance control for the stereo buss (this is performed by the relative levels and panning of the channels assigned to the stereo buss).

Naturally, no assignment of the stereo buss to other busses is possible.

6.19.1 Setting a reference level

Since analog headroom level standards when using digital equipment vary from place to place, the TM-D8000 allows you to pick one of two commonly-used reference levels: either -16dBFS (as used by TASCAM DTRS units, for example), or -20dBFS (as specified by SMPTE).

NOTE

By requesting a TASCAM-qualified service engineer to make internal adjustments, the reference level can be changed to -18dBFS (other levels may be available – consult your dealer for details). The display as described below will not change (it will still show -20dBFS), and the meter LEDs will not change, but the reference level will be changed. Note that this is an adjustment to be made by TASCAM-qualified engineers only.

This setting is indicated by the LEDs between the two stereo meters [5].

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.
- 2) Press the **OPTION** key [43] until the following screen appears:

- 3) Use the cursor keys to move the cursor to the **ANALOG HEADROOM TYPE** area, and select either **-16dBFS** or **-20dBFS** as appropriate.

Note that these figures are referenced to a nominal analog level of +4dBu.

- 4) Use **ENTER** to confirm your selection.

The appropriate reference LED on the stereo meters[5] will light.

6.20 Snapshot library

The TM-D8000 can store all digital console settings in a snapshot. The parameters stored are:

- Fader levels
- Cut settings
- EQ settings
- AUX send level and status
- Pan or balance settings (or surround settings)
- AUX master send levels and links
- Buss levels
- Channel linking
- Insert on/off, assignment, and dynamic processor settings

Note that analog settings (analog gain, pads, phantom powering, and line/mic switch settings) are not stored as part of a snapshot.

Up to 99 of these snapshots can be stored in a library and recalled, either manually, or under the control of MIDI Program Change messages (see 9.4.6, “Program Change Tables”).

The first entry in the library, number 00, is a “neutral” setting, which will reset all EQ to flat, all aux sends to minimum, etc., and reset all fader levels to 0dB.

Snapshots can be stored and recalled at any time, regardless of the currently-displayed screen.

The number and name of the currently-recalled snapshot are always displayed in the top left of the display screen. If any changes have been made to any of the parameters which are stored as part of a snapshot, the snapshot number will be followed by an inverse “E” (edited).

Snapshot 00, the **INITIAL-DATA** setting, is a special case. This is followed by an inverse “R” (read-only). This setting cannot be overwritten.

6.20.1 Recalling a snapshot

Snapshots can be recalled from any screen.

- 1) Use the **SNAPSHOT +** and **-** keys [47] to select a snapshot library entry number into which you want to store the data.

The **SNAPSHOT +** and **-** keys auto-repeat when held down (you don’t need to keep making repeated presses).

If the selected library entry has not yet had data stored to it, the name will be blank.

Selected library entries which have not been recalled will have their number displayed in inverse video.

- 2) Press the **SNAPSHOT RECALL** key to recall the snapshot memory.

If the recalled entry does not contain data, a message will pop up on screen briefly. The settings will not change.

WARNING

When you recall a library snapshot, the levels may be dramatically different from the current settings. If you do not know the contents of a snapshot, you should turn down the control-room and studio monitoring levels to avoid possible damage to your speakers (and ears!).

6.20.2 Storing a snapshot

Snapshots can be stored from any screen.

- 1) Use the **SNAPSHOT +** and **-** keys to select an area into which you want to store the current settings.

You cannot store data into library area 00, which is a read-only area. If you try to do this, an error message will be displayed.

- 2) Press the **SNAPSHOT STORE** key to store the current settings into the selected library area.

If the library area already contains data, a message will appear, asking if you are sure that you want to overwrite the existing entry.

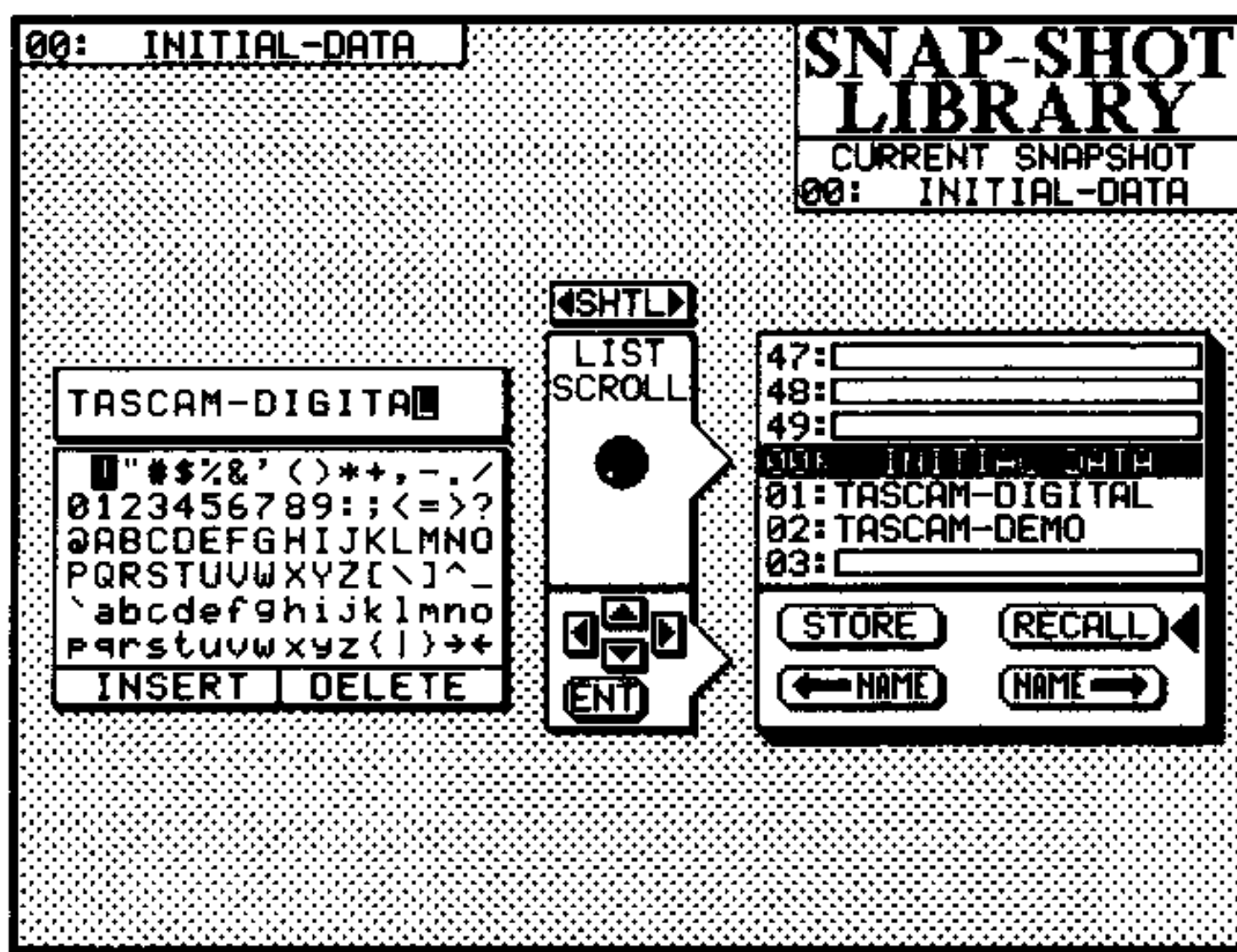
- 3) Press ENTER to overwrite the existing entry, or press any of the cursor keys to cancel the overwrite operation.

If you cancel the overwriting operation, you can then use the + and – keys to select another entry into which to store the current settings.

6.20.3 Naming snapshot library entries

Snapshot library entries can be renamed in the same way as EQ, etc. library entries (see 6.6.5, “Naming and renaming EQ library entries”).

- 1) Press the **SNAPSHOT** key to enter the snapshot library screen:



- 2) Use the shuttle wheel to select the scrolling list of snapshot entries on the right of the screen, and the jog dial to select an entry in that list.

The selected entry can then be renamed, or the name used as the basis for a name to be edited, in the same way as the EQ library entries, etc.

7 – Monitoring and talkback

The monitoring of signals when recording with the TM-D8000 can be controlled by a number of different features.

7.1 Basic concepts

When using a multitrack recorder, especially when overdubbing and performing punch operations, the signal that you will hear depends on the monitoring settings made on the multitrack recorder.

Before proceeding further, if you do not understand the way in which your recording equipment handles monitoring, please read the equipment manuals so that you have a good basic knowledge of what signals you should expect from the recorder in various situations. Without this knowledge, it will be almost impossible to “troubleshoot” your way through any difficulties which may arise.

7.1.1 Control room outputs

The control room outputs [62] are usually used to echo the signal output from the stereo buss (when the **STEREO** key is pressed).

However, the following options are also available by using the **CONTROL ROOM** selection keys [23]:

- Any one of the six AUX sends (see 6.10, “AUX sends (effect sends)”)
- Inputs from either of the two analog 2-track recorders connected at the **2TR IN** jacks [65].
- Any one of the four stereo digital inputs connected to the **D IN** jacks [84].

The output from the control room outputs can also be overridden by soloed tracks (see 6.13, “Soloing channels”).

The control room outputs are usually in stereo (or if a surround mode has been chosen, in the selected surround format), but can be “knocked down” to mono by using the latching **MONO** key.

The level of the signal is set by the **CR LEVEL** control.

If the level is to be temporarily reduced (to hold a conversation or take a telephone call, etc.) the latching **DIMMER** key with indicator provides a temporary 30dB of attenuation to the control room outputs.

The oscilloscope outputs [66] are duplicates of these outputs.

7.1.2 Studio outputs

The studio monitoring outputs [63] echo the signal output from the stereo buss by default.

The only exception to this is when the latching **CR** key (with indicator) [27] is pressed, when the studio monitors will echo the signal currently routed through the control room outputs.

The level of the signal output from the studio monitoring connectors is set independently using the **STUDIO** control. The level of the **CR** control (including dimming) has no effect on the level output from the studio monitors.

7.1.3 What goes onto the stereo buss?

From this, it can be seen that the assignment of appropriate signals to the stereo buss is the key to successful monitoring using the TM-D8000.

Obviously, when mixing down to a stereo image (or surround image), all wanted channels are naturally assigned to the stereo buss (or busses used for monitoring), but when laying down tracks, or overdubbing, the situation is a little different.

If a channel input is being routed to one of the eight output busses, and also to the stereo buss, if the tape outputs are not being monitored, you will monitor the inputs.

However, when you come to replay the take, you will have to monitor the off-tape signal. In addition, if you are routing more than one input signal to the same buss, you will be unable to hear the combined mix of these inputs as they are fed to the tape track.

It is therefore necessary that you should be able to monitor the tape busses (either send or return). This introduces another complication, though, because if an input channel is routed to a buss and also to the stereo buss, and the buss is monitored, the input channel will appear twice in the monitor mix.

NOTE

When monitoring while recording, therefore, you should not route any input channels or AUX returns to the stereo buss. Use the **ALL STEREO CLEAR** function as described in 6.12.1, ““Global” settings” as an easy way of removing all stereo buss assignments.

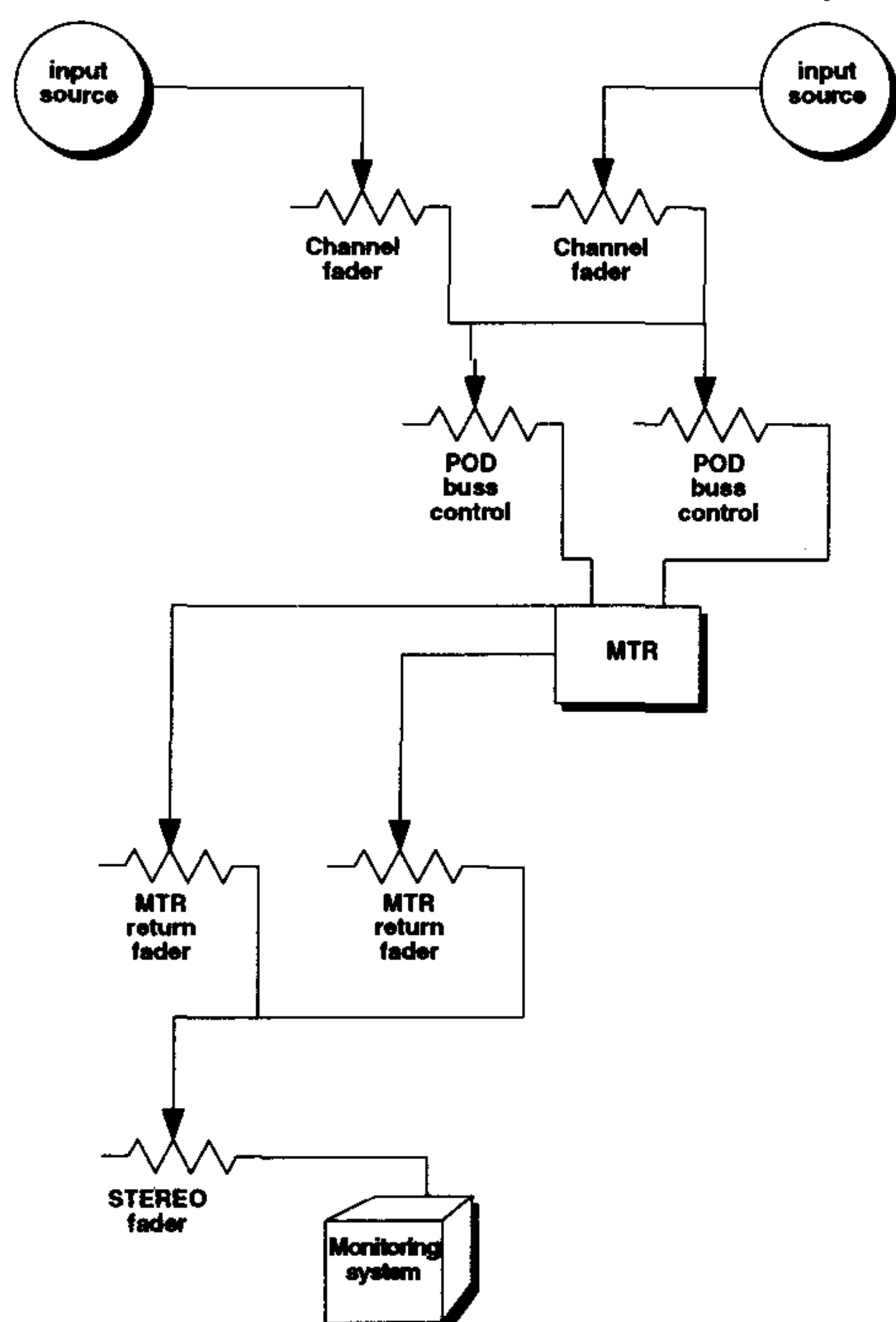
Likewise, any channels used for monitoring tape sends or returns should not be routed to any of the eight output busses, unless you are bouncing material from track to track.

WARNING

When using a channel to monitor a tape track, either when monitoring the send or the return path, make sure that you do not route the channel to the output buss which is feeding it. This will cause a feedback loop, and possible damage to your ears and speakers.

When you are monitoring the MTR channels, you can switch each MTR channel into one of two modes: MTR return or MTR send.

In MTR return mode, the channel is acting as a “tape monitor”, monitoring the signal output from the appropriate track of the tape (or disk) recorder (what exactly you hear in these cases depends on the mode that the recorder is currently in).



In MTR send mode, the channel is acting as a “send monitor”, monitoring either one of the eight output busses, or any of the direct out channels (see 6.12, “Channel-to-buss assignment (i)”).

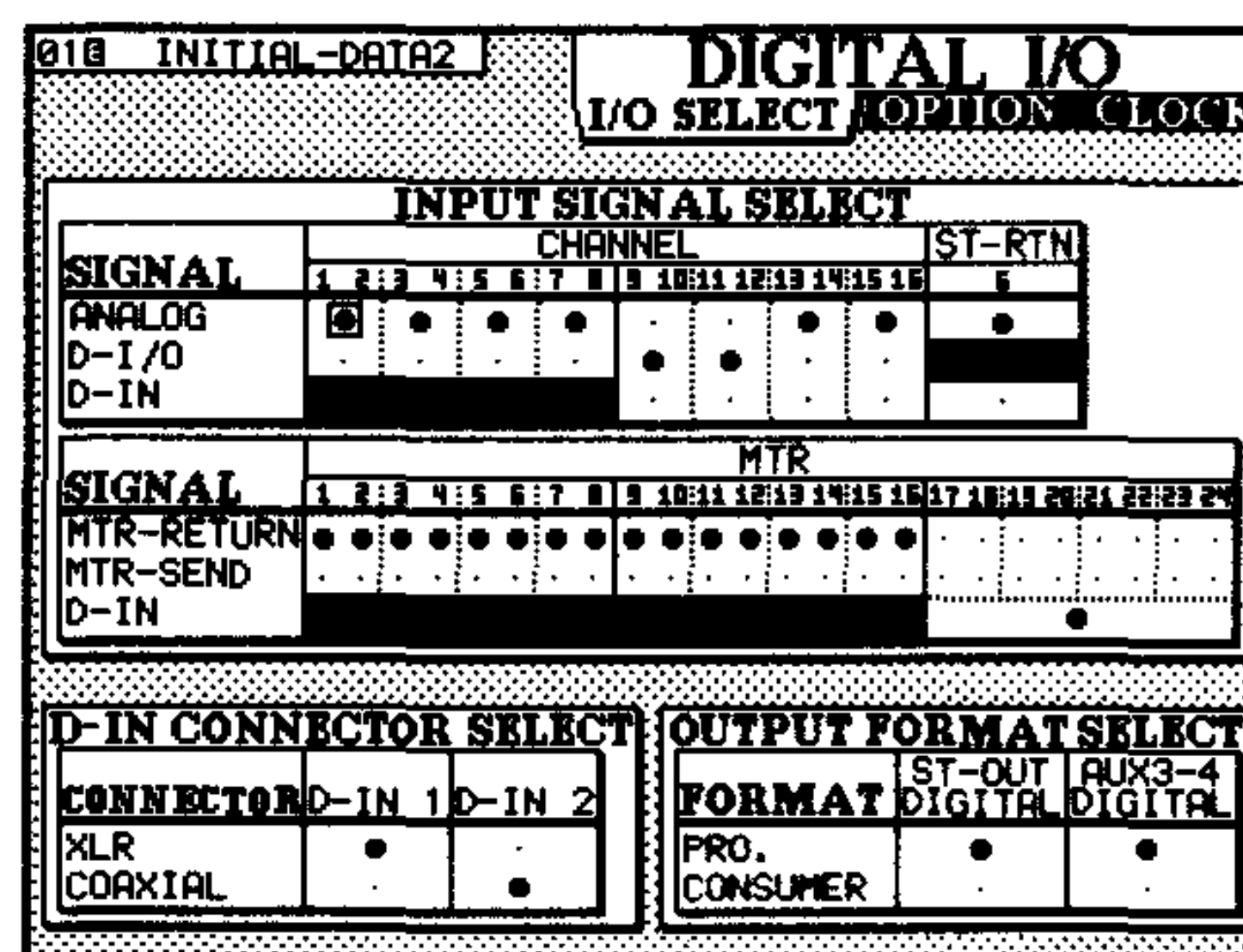
NOTES

When monitoring the MTR sends, the channel fader does **not** affect the level of the signal sent to the tape - simply the level of that send in the stereo (monitor) mix.

Likewise, any EQ, etc. adjustments made to the MTR channels will not affect the signal routed to the recorder, even if the channel is selected as an MTR send.

7.1.4 Changing between MTR send and MTR return (i)

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.
- 2) Press the **DIGITAL I/O** key [42] until the following screen appears:



- 3) Use the cursor keys to move the cursor to the **MTR** section of the screen.

In the screen above, this is in the center of the screen. If the faders have been swapped, it will be at the top.

- 4) Use the cursor keys to navigate to an **MTR** channel and the **ENTER** key to select either **MTR-RETURN** or **MTR-SEND**.

7.1.5 Changing between MTR send and MTR return (ii)

- 1) Press the **MODULE** key [31].
- 2) Use the **SEL** key of the MTR channel that you want to set up.
- 3) Use the **SEND/RETURN** key next to the **PODs** in the assignable control section to switch the input of the selected channel between **MTR** send and return.

This key has no effect on input channels.

7.2 Multitracking with live talent

In this situation we will assume that the TM-D8000 is being used as the console for a multi-track session where live talent is in the studio. Basic backing tracks have been recorded, and the vocal parts are now being overdubbed.

To cue the vocal entries, a slightly different mix should be supplied to the artiste (the bass line and kick drum need to be raised relative to the rest of the mix, and the foldback on the vocal track being recorded should be slightly louder than it will be in the final mix).

In the control room, however, the producer is concerned with the interplay of the vocal line and a particular previously recorded instrumental line - the bass line and kick drum may be unnecessary for this particular purpose, and should be reduced in the mix.

It is obviously necessary to produce two separate monitor mixes.

The way this can be done is as follows:

- Set the CR monitoring to **STEREO** (use the **CONTROL ROOM** selection keys [23]).
- Build up the mix using the MTR channels in MTR return mode. Most MTR recorders (including TASCAM's DTRS series of recorders) will allow an automatic mode where monitoring is automatically switched between tape and source during punch operations. Make sure that the input channels are **not** routed to the stereo buss.
- Turn the **STUDIO CR** key [27] off, so that the studio receives the stereo buss mix, and adjust the level of the feed to the studio headphone amplifier system.
- Stereo link AUX sends 1 and 2 (see 6.10.3, "Linking AUX sends and setting levels"). If you are recording "wet" with effects, and these AUX loops are being used by outboard processors, link another pair of AUX sends.
- Press the **AUX 1 CONTROL ROOM** selection key. This will enable monitoring of both the AUX 1 and AUX 2 busses, now that they have been linked in stereo.
- Build up the control room monitor mix by adjusting the level of the signal from the MTR return tracks sent to the AUX 1 and AUX 2 busses (see 6.10, "AUX sends (effect sends)").

This will provide two separate mixes which can easily be controlled from the TM-D8000 as the session progresses. Requests from the artiste for a "little more reverb on the vocals in the phones", for example, can be easily handled by sending part of the input channel through the reverb connected to one of AUX sends 3 through 6, and routing this to the stereo (monitoring buss) only, without it going to tape.

7.2.1 Multitracking with prerecorded sources

In video or movie post-production, it is more likely that a separate studio monitor mix is not

required (unless voiceovers or commentary are being recorded from an announcer's booth).

In this case, the stereo mix can be used as the only monitoring mix (control room only), making sure that no input channels are routed to the stereo mix, to avoid hearing them twice in the monitor mix.

An advantage of working in this way is that mix-down EQ settings, effects, etc. can be "previewed" on the stereo buss as recording progresses, as the multitrack recording is in progress, without the EQ or effect signals going to tape. At the time that mixdown takes place, the correct effects have already been selected and readied for use.

7.2.2 Headphone monitoring

The two headphone jacks [60] at the front of the TM-D8000 provide parallel outputs to the control room buss.

The level of the signal fed from the **PHONES** outputs can be varied independently of the control room outputs by using the **PHONES** level control [26].

7.3 Talkback

The built-in microphone [29] of the TM-D8000 is used to provide talkback facilities, and its level is controlled using the **COMMUNICATION** control.

The three non-latching talkback switches route the signal from the talkback microphone to:

SLATE	All output busses
STUDIO	The studio monitoring buss
AUX 1-2	Aux sends 1 and 2, meaning that they can be used as an auxiliary foldback system.

More than one of these switches can be pressed at the same time.

When any of the talkback switches is pressed (**TO SLATE**, **TO STUDIO** or **TO AUX 1-2**), the control room output signal is attenuated by 30dB.

As well as the internal microphone, an external "producer's box", with a talkback microphone and duplicates of the three talkback switches and tally LEDs can be connected to the **COMMUNICATION INPUT** 9-pin D-sub connector [61].

The switches should be non-latching "push-to-make", and the tally LEDs should be wired cathode-to-ground, with a dumping resistor of between 300Ω and 1.2kΩ.

There is no gain control for the external microphone—a suitable input level from the microphone must be provided here.

Neither the internal nor external talkback system has automatic priority over the other, and a “first come, first served” principle is employed.

For full details regarding the construction of a communication box, we suggest that you contact your TASCAM dealer or distributor.

7.4 Oscillator

The TM-D8000 also incorporates a sine wave oscillator which can be used for tape alignment, etc.

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.
- 2) Press the **OPTION** key [43] until the following screen appears:

00: INITIAL-DATA		OPTION	
		SETUP/SOLO/SURROUND/ROUTE	
SWAP STATUS	<input checked="" type="checkbox"/> Up:CH/ST-RTN Low:MTR	<input type="checkbox"/> Up:MTR	Low:CH/ST-RTN
ANALOG HEADROOM TYPE	<input checked="" type="checkbox"/> Digital:-16dBFS = Analog:+4dBu	<input type="checkbox"/> Digital:-20dBFS = Analog:+4dBu	
LOCATE	<input checked="" type="checkbox"/> 7-Seq LED	<input type="checkbox"/> LCD Screen Pop-up	
FADER AUTO	<input type="checkbox"/> OFF	<input checked="" type="checkbox"/> ON	
MODULE SELECT	<input type="checkbox"/> OFF	<input checked="" type="checkbox"/> ON	
SELECT LINK STATUS	<input type="checkbox"/> OFF	<input checked="" type="checkbox"/> ON	
TIMECODE	<input checked="" type="checkbox"/> Sync Source	<input type="checkbox"/> DA-88 ABS Absolute Time	
DISPLAY TYPE	<input type="checkbox"/> MIDI IN MTC [MIDI Time Code]		
OSCILLATOR	<input type="checkbox"/> 100Hz	<input type="checkbox"/> 1kHz	<input checked="" type="checkbox"/> 10kHz
	<input type="checkbox"/> OFF		
BATTERY CHECK	3.0V OK		

- 3) Use the cursor keys to move the cursor down to the **OSCILLATOR** section at the bottom of the screen, and select the frequency (100Hz, 1kHz, 10kHz).
- 4) Use **ENTER** to confirm the selection.
- 5) Use the rotary control of **POD 20** to set the level (from -72dB to 0dB).

The oscillator signal will be routed to all eight output busses (“slated”), at a point after the buss level controls.

WARNING

When the oscillator is on, its signal will be added to all other signals routed through the TM-D8000. This may cause a considerable jump in level, and possible damage to your ears and speakers.

Remember to turn the oscillator **OFF** when you have finished using it.

8 – Surround operations

This section gives information specific to the operation of the TM-D8000 in non-stereo (surround) modes. In addition to the stereo mode, the TM-D8000 allows you to select any of the following modes:

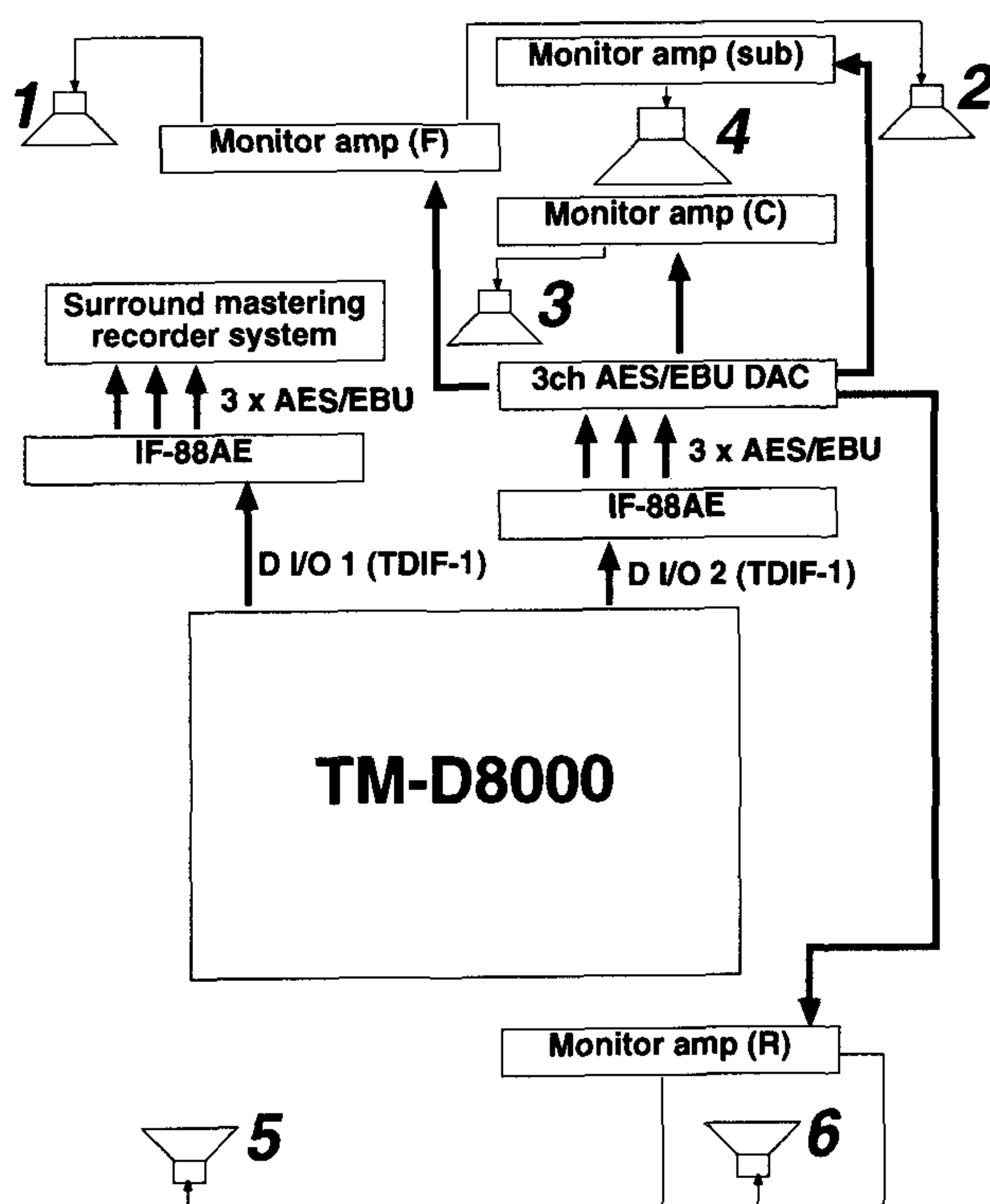
2	&	2	2 front and 2 rear
3	&	1	2 front + center and rear
3	&	2	2 front _ center + sub and 2 rear

These are explained below (8.2, “Selecting a surround mode”).

8.1 Principles of surround operation

When the TM-D8000 is used in surround mode, the output busses (from the **MTR** and the **D I/O** connectors) are used as surround channel busses and also to provide the recorder feeds. Since there are no analog outputs for these output busses, it is necessary to provide D/A converters from one of the **MTR** or **D I/O** 25-pin D-sub connectors to drive the monitor amplifiers, if a DTRS recorder is not being used.

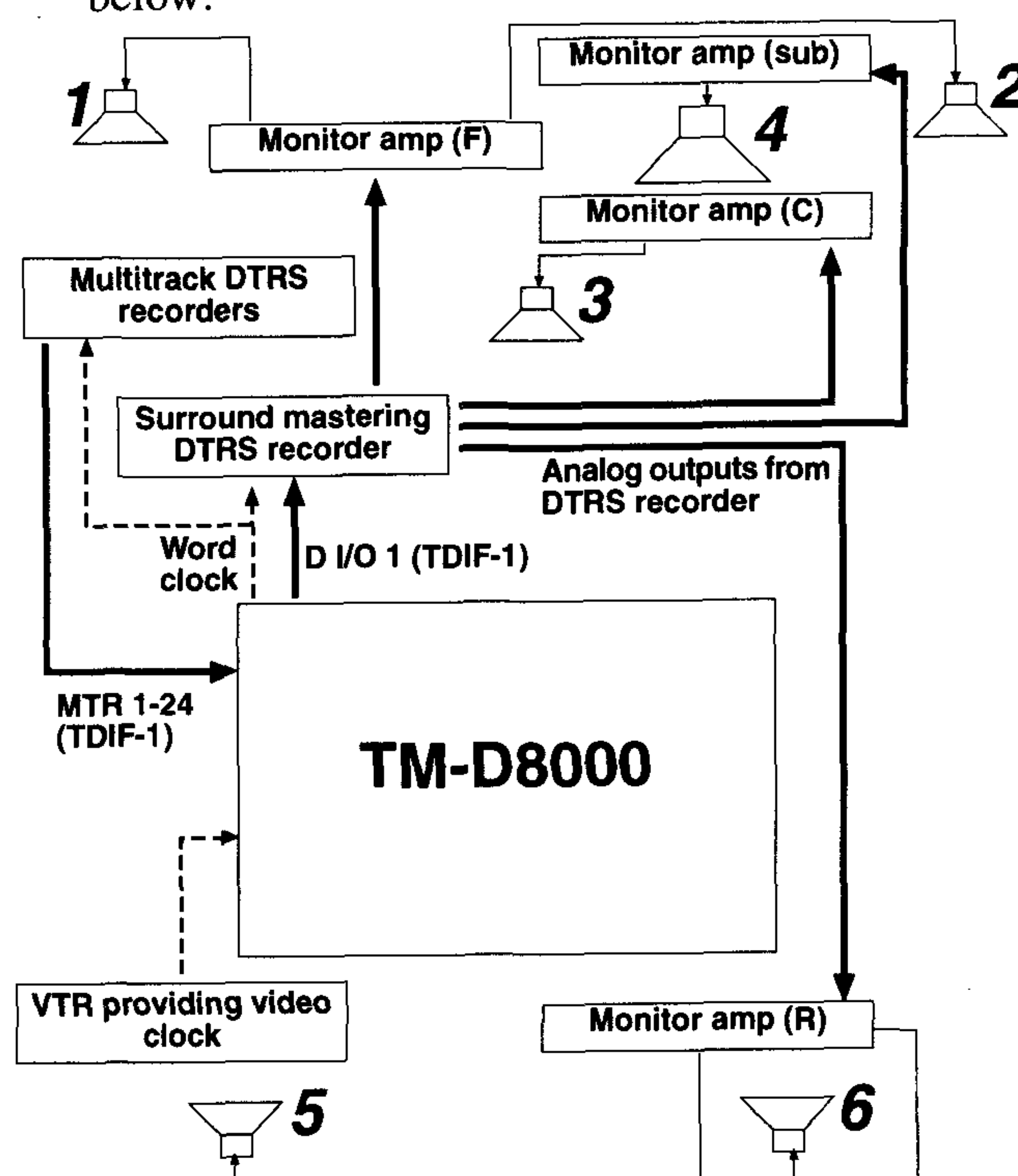
The digital multitrack recorder used to record the surround tracks can be connected directly to the TDIF1 connector (or through a format convertor if this is necessary).



The illustration above shows a “3+2” setup where in addition to the front center speaker, a sub-woofer is also used. The italic numbers by each speaker represent the buss numbers assigned to each speaker. However, these numbers may be changed, as described below (8.2, “Selecting a surround mode”).

In the example above, we show the **D I/O** outputs being used for both the monitoring and the mastering system (assuming that the **MTR** connectors are being used by DTRS units).

If a DTRS recorder or any other TDIF-1 device is used to master the surround tracks, the IF-88AE connected to MTR 1-8 will be unnecessary. Likewise, if an analog recorder is used to master the surround tracks, D/A converters will be needed between the IF-88AE and the recording system. However, care must be taken when synchronizing the clock sources. An example setup is shown below:



Note that in this example, the appropriately-numbered analog outputs from the DTRS recorder are being used to drive the monitoring system, eliminating the need for external D/A conversion.

8.1.1 Monitoring in surround modes

In contrast to the principles of monitoring when producing a stereo mix, where the stereo buss is used for the stereo mix, and the dedicated control room system is used to control the level of the monitoring, the surround modes use the output busses for both tape outputs and monitoring. An adjustment to the tape send level will therefore

produce a corresponding adjustment to the monitoring level.

Monitoring in surround mode is therefore much more a case of “what you hear is what you get”, as the monitor busses are exact parallels of the tape feeds.

NOTE

You can always control the volume of the front left and right speakers, regardless of the buss assignment, using the stereo buss and faders. This is an exception to the “what you hear is what you get” principle.

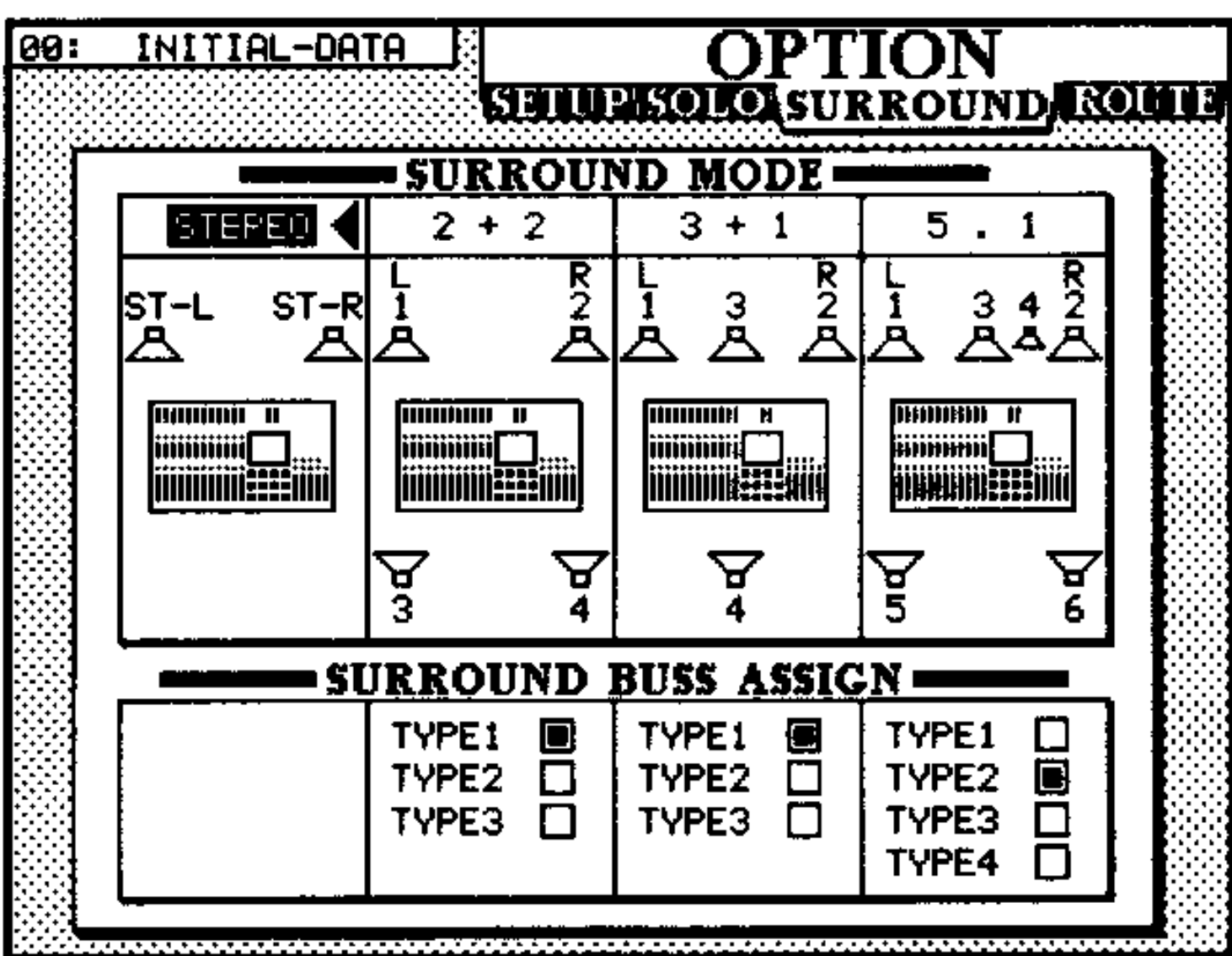
Studio monitoring is performed by the stereo buss in the same way as for a stereo mix. Use the group of eight MTR channels 17-24 in MTR SEND mode (see 7.1.3, “What goes onto the stereo buss?”) and route these through to the stereo buss.

The control room stereo buss may also be used for monitoring of aux sends, **D IN**, and even **2 TR IN** signals as usual.

8.2 Selecting a surround mode

The TM-D8000 allows you to select one of the three surround modes as mentioned above.

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.
- 2) Press the **OPTION** key [43] until the following screen appears:



- 3) Use the cursor keys to move the cursor along the top row (here shown by the **STEREO** option), and select the surround mode you want to use).
- 4) Press **ENTER** to confirm your selection. A “pop-up” box will appear, asking you if you are sure that you want to make this change. Press **ENTER** to confirm, or any of the cursor keys to cancel this change.

- 5) When you have selected a surround mode, move the cursor to the bottom of the screen and select a buss assignment type.

These types are detailed below.

Surround mode	Buss Assign Type	Output buss used for:						
		Front Left	Front Center	Front Right	Rear Left	Rear Center	Rear Right	Subwoofer
2+2	1	1	—	2	3	—	4	—
	2	1	—	3	2	—	4	—
	3	1	—	2	3	—	4	—
3+1	1	1	3	2	—	4	—	—
	2	1	2	3	—	4	—	—
	3	1	4	2	—	3	—	—
5+1	1	1	3	5	2	—	4	6
	2	1	3	2	5	—	6	4
	3	1	2	3	4	—	5	6
	4	1	5	2	3	—	4	6

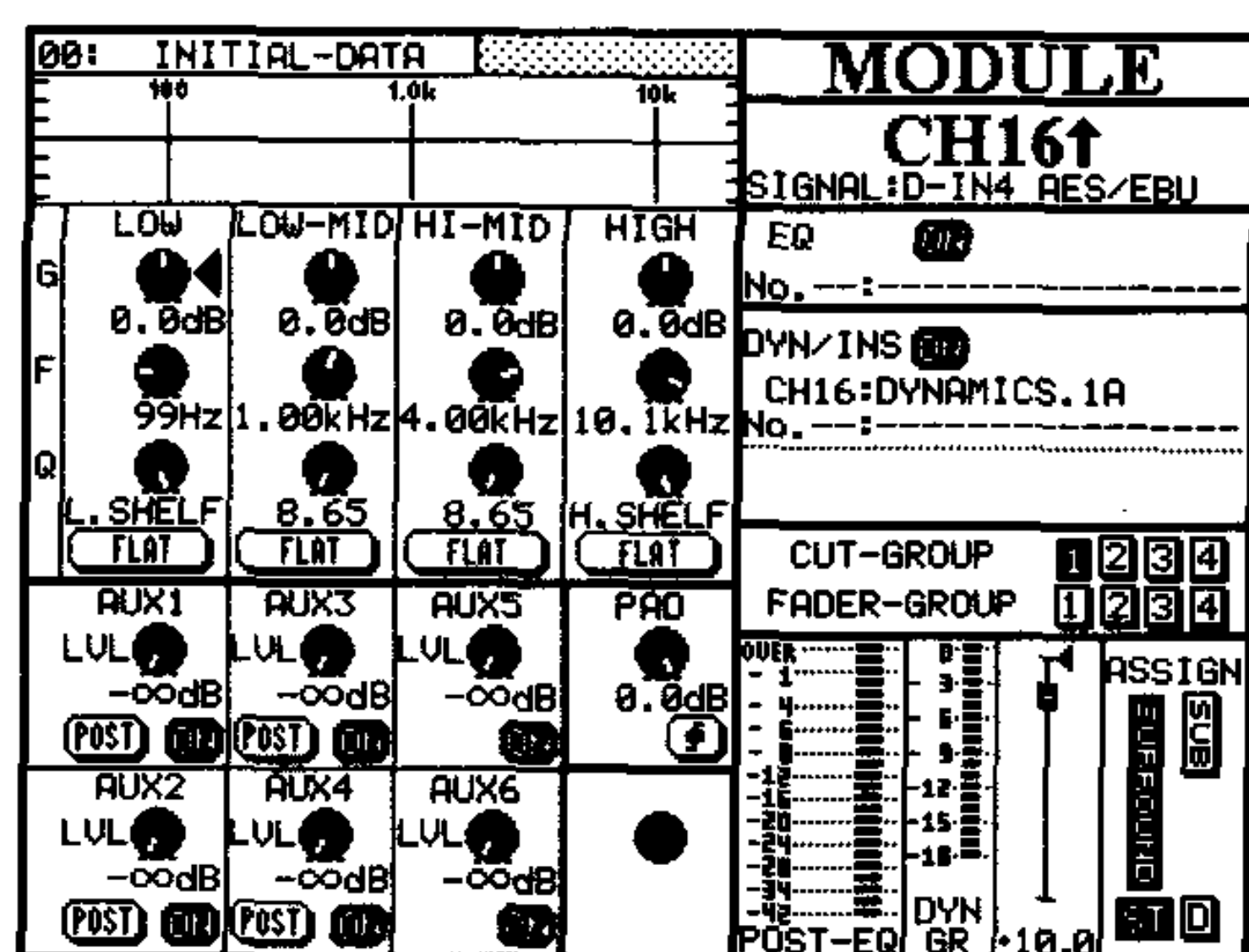
As you change the assignment type, the display changes to show the current buss-to-surround channel assignments. You are free to pick whichever type suits your method of working best, as there is no difference between these modes, except the number of the buss assigned to each channel.

- 6) Press **ENTER** to confirm your selection.
- When a surround mode has been selected, the buss assign screen (see 6.12, “Channel-to-buss assignment (i)”) will also be changed to reflect this.

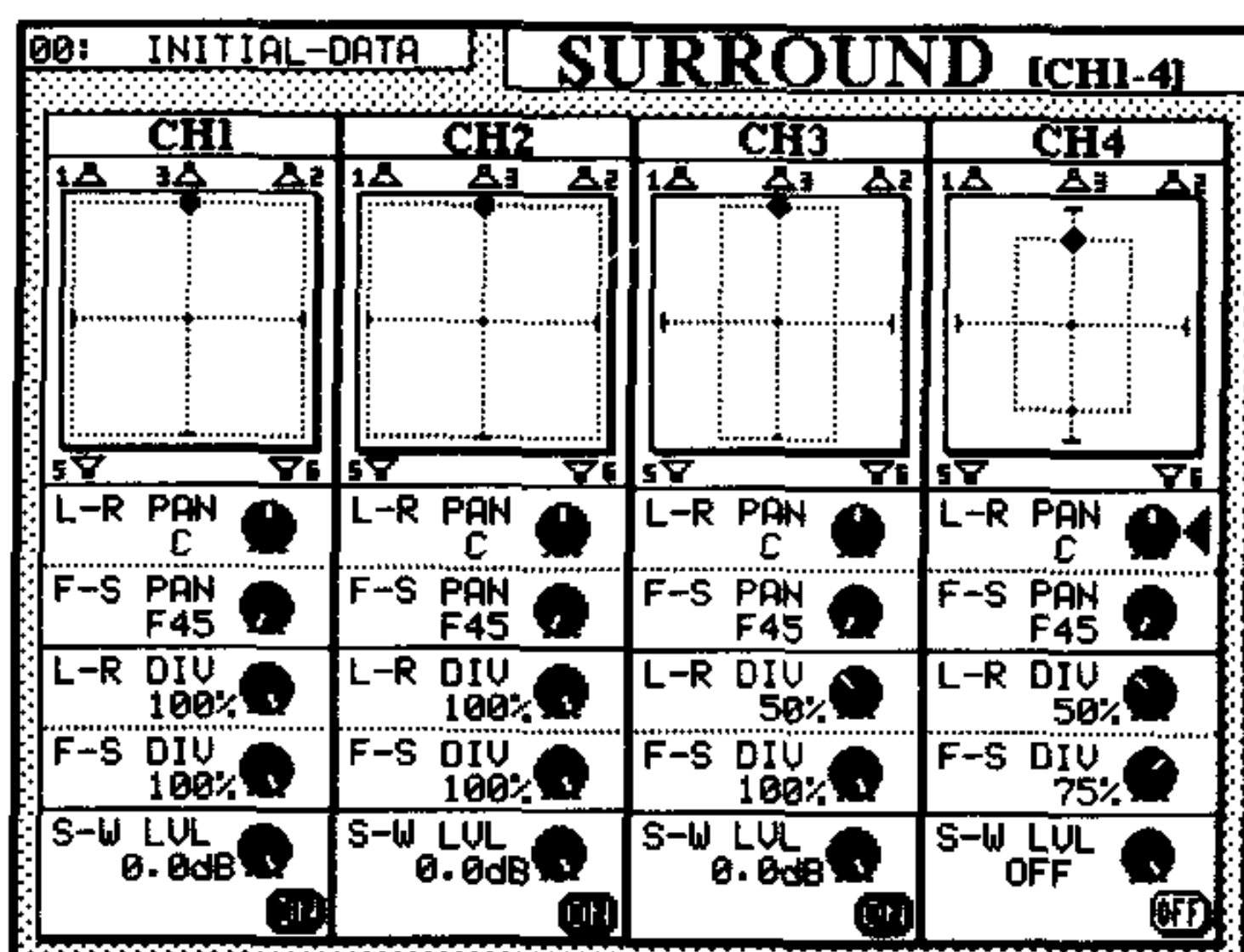
8.3 Panning channels in surround mode

It is obvious that conventional panpots will not provide the control necessary with the surround mode. Accordingly, the distribution of the channel between the different output busses requires more PODs per channel than do simple stereo panning and balance.

Because of this, panning is not possible from the individual module screens, which will be slightly modified, as shown below:



The **PAN/BAL** key [33] must be used to bring up a dedicated screen, four channels at a time:



On each channel, as well as the left and right pan control (PODs 1 through 4), there is also a control which allows the balance between the front and rear (PODs 5 through 8). Values range from 0 (center) to 45 in either direction.

In addition to these “balance controls”, there are also two divergence controls, one for left-right (PODs 9 through 12) and one for front-rear (PODs 13 through 16), which allow the “focussing” of a specific dimension. The higher the value (up to 100%), the wider the area within which the sound can be panned. At low values of this setting, the channel range becomes more focussed, until at 25%, it becomes close to a “point” dimension, and the range within which the source can be panned becomes correspondingly narrow.

As the values are changed, the display reflects the changes made, both in the position and the “focus” of the selected channel.

When a surround mode is selected, normal buss assignment is, of course, not possible. In module mode, the function of the **BUSS 1** key is therefore changed to allow you to switch the output of the selected channel to the surround output busses on and off.

8.3.1 Sub-channel (Subwoofer)

In the 3 & 2 mode, a separate control at the bottom of each channel’s set of surround balance controls (i.e. PODs 17 through 20) is used to control the level of the channel sent to the sub-channel (which is usually, but not always, a subwoofer).

The right switch of each of these PODs is used as an ON/OFF switch to turn the sub-channel output on or off for the selected channel. This enables you to make instant comparisons of the mix with or without the sub-channel speaker.

When surround mode 5+1 has been selected, and the screen is in module mode, since normal buss assignment is not possible, the function of the **BUSS 2** key is redefined to allow you to turn the sub-channel on and off.

8.3.2 External surround pan controls

The J. L Cooper controller can be used as a balance “joystick”, as an alternative to the POD controls. This should be connected to the computer used to control the automation of the TM-D8000, rather than directly to the TM-D8000.

9 – External devices and the TM-D8000

The on-board controls of the TM-D8000 can be used with a variety of external devices, meaning that many common studio operations are possible from the TM-D8000.

The TM-D8000 supports a number of common devices, and the modular nature of the software means that support for more devices may be provided in the future, as the system software of the TM-D8000 can be updated from a host computer.

Transmission between the TM-D8000 and external devices can be made using any of the following methods: direct DTRS remote protocol, MIDI control, or RS-422 protocol. In addition, the TM-D8000 is capable of providing signals on 4 GPI “channels”, as described in 5.3.9, “GPI-controlled devices”.

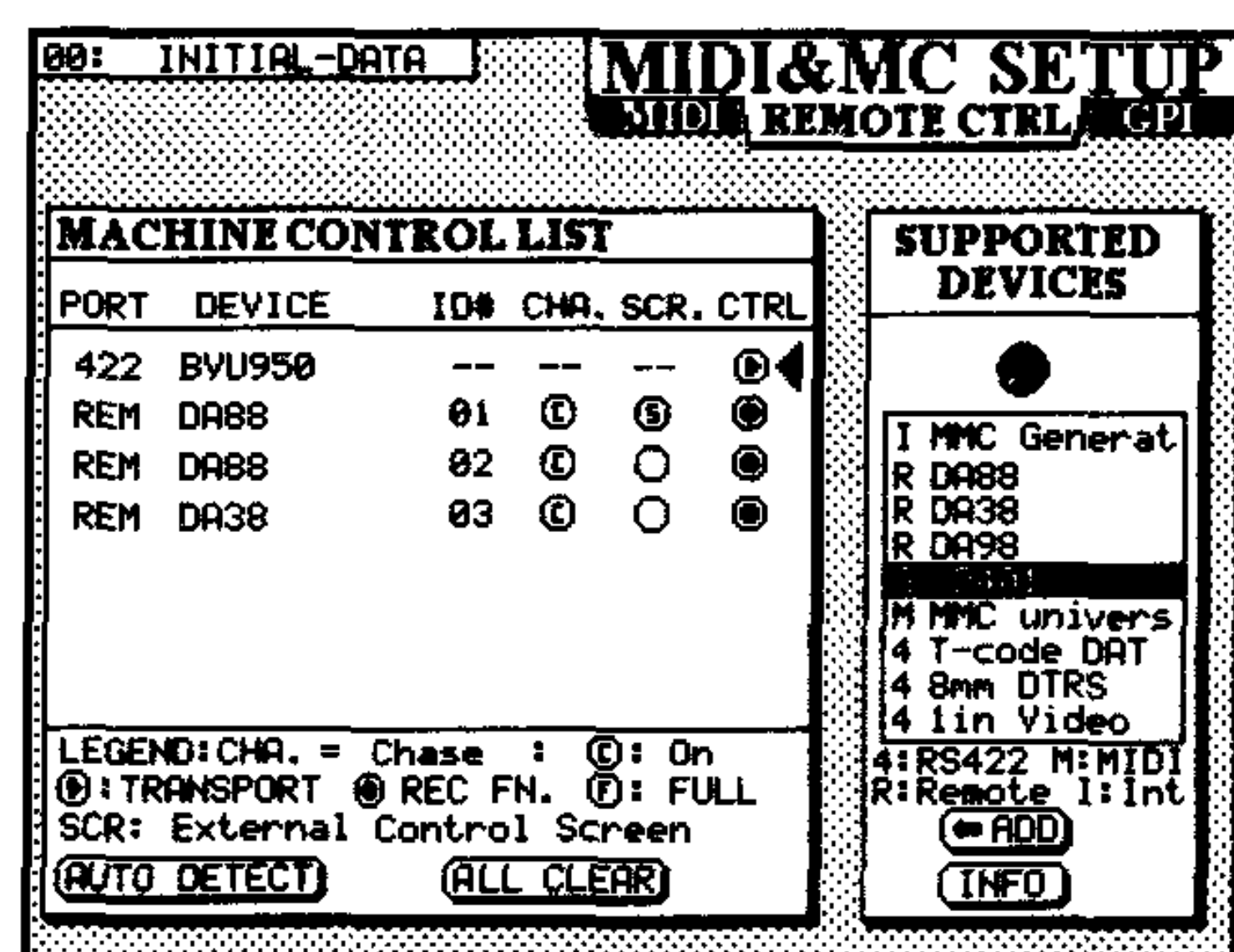
9.1 Control of remote units

Only one unit at a time can be controlled by the TM-D8000 (except for DTRS units linked in a control “daisy-chain”). It is therefore necessary to select the unit to be controlled, and the degree of control that the TM-D8000 will exercise over it (transport only, full control, etc.).

This is also briefly described in 5.3, “Synchronization and control connections”, but this section provides a more complete reference.

9.1.1 Adding and removing units

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.
- 2) Press the **MIDI/MC** key [41] until the following screen appears:



If you have just changed the studio setup which includes the TM-D8000, you may want to clear the list of any existing devices. Move the cursor to the

on-screen **ALL CLEAR** button, and press **ENTER** to clear the list.

You can either use the automatic detection function to scan for any connected devices, or you can enter the details of devices by picking them manually from the list on the right side of the screen.

- 3) To use the automatic detection function, move the cursor to the on-screen **AUTO DETECT** button, and press **ENTER**.

The TM-D8000 will scan for any devices connected using the **RS-422** or **REMOTE OUT** connectors. Any devices recognized by the TM-D8000 will be added to the list of available devices. Units connected via MIDI will **not** be automatically detected and added to the list.

Up to 16 devices may be added to the scrolling list, of which 7 are visible at any time.

- The way in which the unit is connected to the TM-D8000 will also be shown in the list (4=RS-422, M=MIDI, I=Internal, R=remote protocol). “Internal” refers only to the TM-D8000’s internal timecode generator.
 - If the link by which the unit is connected to the TM-D8000 supports IDs (e.g. the TASCAM remote protocol or MIDI), the ID of the unit will be shown in the list.
 - RS-422 units have no ID. DTRS units connected via the remote protocol cannot have their IDs changed from this screen.
 - The **CHA** column indicates the current chase setting of the remote unit (chase to external timecode). Only those devices controlled by the remote protocol (i.e. DTRS units) use this column. If the setup is composed of DTRS units only, then only the first unit in the chain should be chasing timecode and subsequent units in the chain will use DTRS chasing.
 - Some units will have an additional control screen available for special unit-specific parameters. These will have a circle mark shown in the **SCR** column to show that there is a screen available. Use the **ENTER** key to change this to a **Ⓢ**, showing that the device can now be controlled from the TM-D8000 using this special screen.
- 4) To add units to the list manually, move the cursor to the on-screen box containing the scrolling list, and use the jog dial to scroll

through the list of units which can be controlled by the TM-D8000.

This list may be updated using the Macintosh automation software as the system software is upgraded. Contact your TASCAM dealer for details of the latest version.

Press the on-screen INFO button to provide a brief popup description of the selected unit before adding it to the list.

NOTE


Note that various TASCAM units (e.g DTRS units and the SY-88 synchronizer board) may appear more than once in the list, once as a remote device, and once as an RS-422 device. This gives you flexibility when using the DTRS units and TM-D8000 with an external synchronizer/editor.


- 5) When the unit you want to add to the list is highlighted, move the cursor to the on-screen ADD button, and press ENTER.


9.1.2 Selecting units for control

When all units that may be used in the session have been selected and added to the list on the left of the screen, the units to be controlled must be chosen from the list.

The last column in the list (CTRL) shows the current control status of the unit.

A  in this column indicates that the TM-D8000 will control the transport functions of the unit.

A  in this column indicates that tracks may be armed and the recording status indicated using the REC FUNCTION keys and indicators [2] of the TM-D8000. See 9.1.10, "Track arming (REC FUNCTION)" for details.

A  means that there is full control over the remote unit.

NOTE

Not all of these options are available for all units, even if they are in the list. Some options, of course, simply do not apply to certain units (for example, you cannot arm tracks and record tracks on the internal timecode generator).

The transport and record modes can be "added" together to produce the "full" mode, or they can be assigned to different units, so that the TM-D8000 transport keys are used to control one unit, and the REC FUNCTION keys used to control another.

- 1) Use the UP and DOWN cursor keys to select the unit from the list.
- 2) Move the cursor to the control column and press ENTER until you have the appropriate control function selected for the unit you want.

If there is already a unit which is being controlled by the TM-D8000, you must clear the control for this unit before you can start to control another unit.

9.1.3 Machine Control Mapping memories

So that commonly-used machine control settings can be stored and recalled easily, the TM-D8000 provides 10 memories of machine control mappings (numbered from 0 through 9).

These memories include: the CHA setting, the SCR setting and the CTRL setting.

An example of the practical use of this, take the example of three DTRS units connected to a VTR. Usually, the transport keys will control the VTR, and the REC FUNCTION keys will control the three DTRS units. The DTRS units will be locked and chasing the VTR. Sometimes, though, it will be necessary to control the DTRS units directly (through the first DTRS). Recording functions are still assigned to the DTRS units.

These two setups can be stored to two different memories, and recalled instantly as necessary.

NOTE

When the on-screen ALL CLEAR button is pressed, all Machine Control Mapping memories will also be cleared.

To store the current machine control mapping into a memory:

- 1) Press and hold down the CLEAR key in the auto-punch section [21].
- 2) While holding down this key, also press and hold down the CLR key of the number keypad [22].
- 3) While holding down these two keys, press the key of the number keypad corresponding to the memory where you want to store the setting (0 through 9).

A pop-up window will appear, telling you that the Machine Control Mapping setting has been saved.

To recall a machine control mapping memory:

- 1) Press and hold down the **CLEAR** key in the auto-punch section [21].
- 2) While holding down this key, press the key of the number keypad corresponding to the memory you want to recall (0 through 9).

A pop-up window will appear, telling you that the Machine Control Mapping setting has been recalled.

9.1.4 Transport controls

Generally speaking, the transport controls on the TM-D8000 work in the same way as transport controls on other units. However, there are some points to be noted:

- With some units controlled from the transport keys (e.g. the internal timecode generator), when the unit is not in cueing mode, repeated presses of the fast transport key will speed up the rate at which the unit's location point is moved.
- As well as the on-console transport keys, these functions may be controlled from the Macintosh-hosted automation software or replicated by a JLCoper BB3 MIDI transport controller connected via MIDI to the TM-D8000.

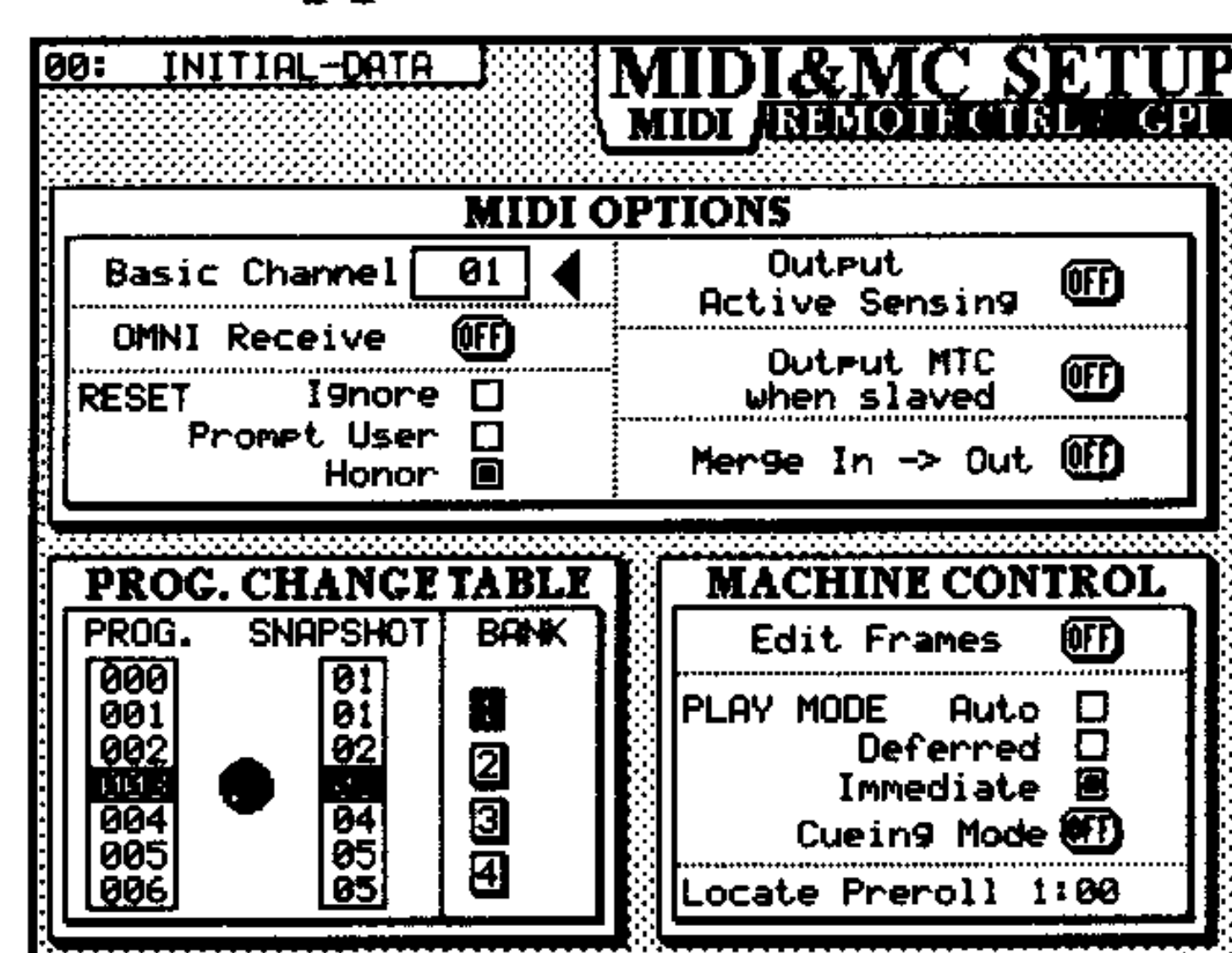
9.1.5 PLAY key function

In addition to the transport functions mentioned above, there is also a special function which determines the way in which the **PLAY** key works.

There are three settings: **AUTO**, **DEFERRED** and **IMMEDIATE**.

- When the setting is on **AUTO**, the **PLAY** indicator will flash as the unit is locating to a location point (see 9.3, "Location points, etc."). When the location point is reached, playback will start automatically. However, if the **PLAY** key is pressed before the location point is reached, the unit will stop locating and start playing.
- When the setting is on **DEFERRED**, the unit will stop after location is completed. However, if the **PLAY** key is pressed while the unit is locating, the **PLAY** indicator will flash, and playback will start when the location point is reached.
- **IMMEDIATE** mode means that the unit will stop after location is completed. If the **PLAY** key is pressed while the unit is locating, the machine will go straight into play mode, without locating.

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.
- 2) Press the **MIDI/MC** key [41] until the following screen appears:



- 3) Use the cursor keys to move the cursor to the **MACHINE CONTROL** section (lower right), and select the appropriate **PLAY MODE**.
- 4) Use **ENTER** to confirm your selection.

9.1.6 Cueing mode

The TM-D8000 can control units so that cueing mode is selected.

By "cueing mode", we mean that if the unit is in play mode, and either of the fast transport keys (forward or rewind) is pressed, the fast transport mode is not latched and the unit will be in cue mode (i.e. when the fast transport key is released, the unit will go back into play mode). To latch the unit in the fast transport mode, press the **STOP** key before entering fast transport mode.

If cueing mode is not selected, when a fast transport key is pressed, irrespective of the current transport mode, the unit will enter the fast transport mode, even when the fast transport key is released.

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on. Press the **MIDI/MC** key [41] until the screen above (as in 9.1.5, "PLAY key function") appears.
- 2) Move the cursor to the **CUEING MODE** field and use **ENTER** to set the mode on or off.

9.1.7 Jog/shuttle

When the **JOG/SHUTTLE** indicator [57] is turned on with the **JOG/SHUTTLE** key, the jog dial and shuttle wheel are used to control the remote unit.

The shuttle wheel will move the unit transport at various fixed speeds (the speeds available depend on the specifications of the unit being controlled).

The jog dial will control the unit transport at speeds up to normal speed (the exact speeds available depend on the unit being controlled, but for DTRS units, for example, this is down to 1/16 speed).

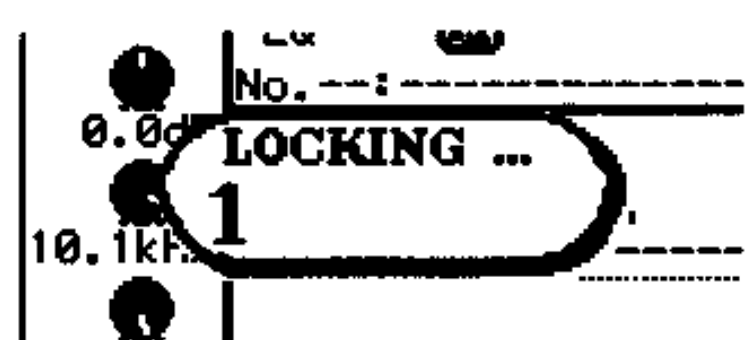
While the jog/shuttle mode is active, the transport keys can still be used, but moving either the jog dial or shuttle wheel will drop the unit back into the jog/shuttle mode.

However, going into record mode will clear the jog/shuttle mode (the indicator will go out).

When the **JOG/SHUTTLE** key is pressed to exit the jog/shuttle mode, the unit will go into stop mode if it was previously in cue mode, or else remain in the previous transport mode (play, etc.).

9.1.8 Chase mode (DTRS units only)

When the controlled unit is a DTRS unit which has other DTRS units slaved to it, a popup message will appear when the unit is dropped into play or record modes from another mode. This message displays the chase and lock status of the slaved units.



When the units have locked, the message will show this (LOCKED), and then go off-screen after 2 seconds.



If the chase lock slips at any time (because of tape drop-out, etc.), the pop-up message will appear again to alert you of the problem.

9.1.9 Control of DTRS units

In addition to the basic transport controls, a number of "specialist" controls are available to control a DTRS unit from the TM-D8000.

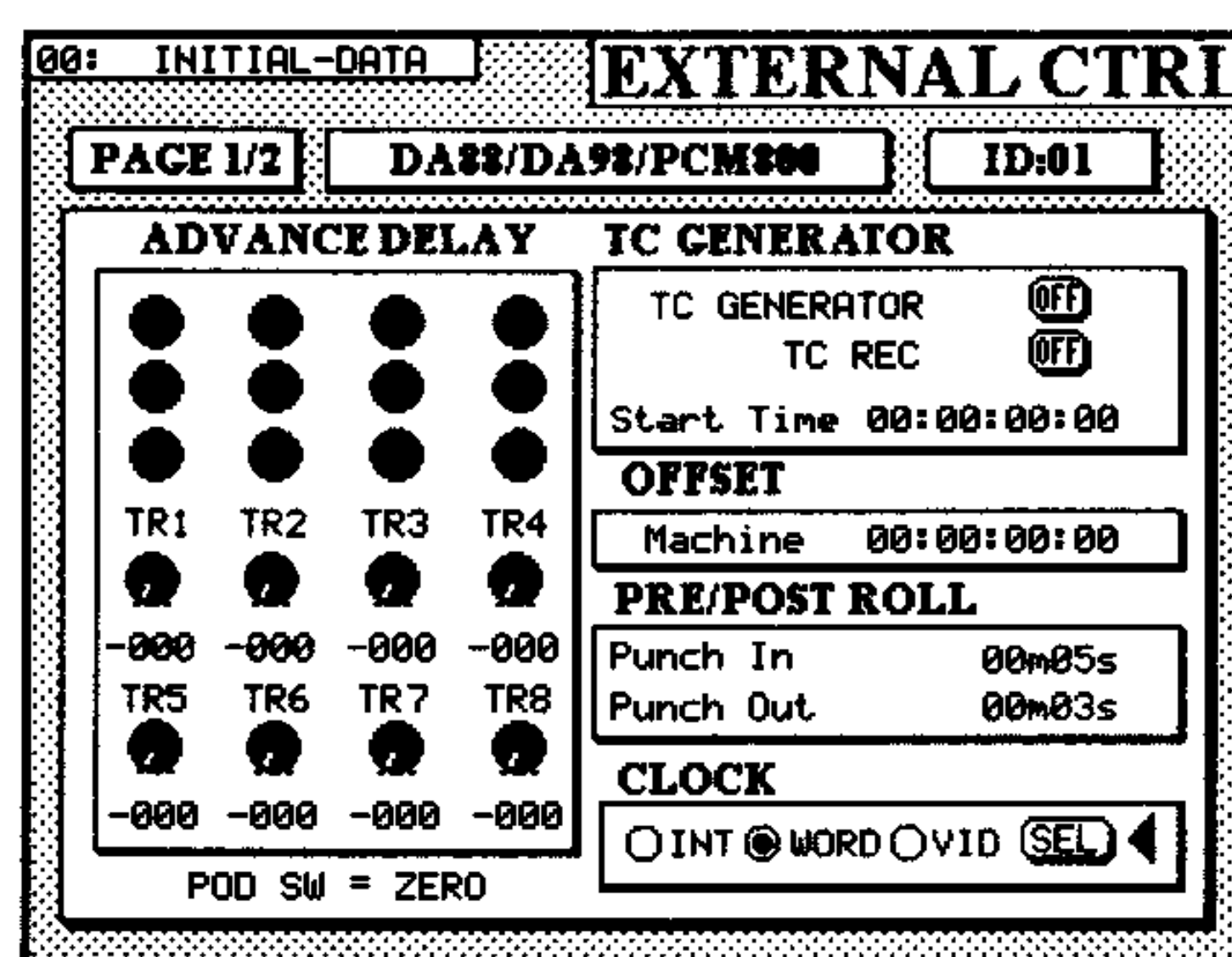
Currently, these settings allow you to change the individual track delay, machine offset and time-code functions, pre-roll and post-roll times for punch operations, as well as allowing you to select the word clock source on the DTRS unit.

1) Select a DTRS unit for on-screen control.

Press the on-screen **SCR** button in the Machine Control list (see 9.1.2, "Selecting units for control") so that it changes to a circled "S".

2) Use the **SHIFT** key to turn the **SHIFT** indicator off.

3) Press the **EXTERNAL CTRL** key [41] so that a screen similar to the following appears:



If there is more than 1 DTRS unit connected for on-screen control, make sure that you are controlling the correct unit (as shown in the ID heading at the top of the control screen).

Note that this screen shows a DA-88 (or Sony PCM800 unit) fitted with an SY-88 synchronizer board. The details of the screens for DA-38 units, etc. will differ from this, but the basic principles of operation are the same.

4) The rotary controls of PODs 13 through 20 are used to set the track delays for the individual tracks.

Pressing either switch of any of these PODs will reset the delay value for the appropriate track to zero.

5) Move the cursor to either the on-screen **TC GENERATOR** or **TC REC** button and use **ENTER** to turn it on or off.

6) Set the generator start time, as well as the machine offset time, by moving the cursor to these fields and using the number keypad to set the value. Press **ENTER** to confirm.

You can also use the jog dial to change the values in these fields.

7) Use the cursor keys and jog dial to select the settings for the pre-roll and post-roll times to be used in punch operations. Use **ENTER** to confirm these values.

8) Use the cursor keys and **ENTER** key to select the clock source for the DTRS unit.

9.1.10 Track arming (REC FUNCTION)

The **REC FUNCTION** keys and indicators [2] below each channel meter can be used to change and display the status of the recording tracks of the

remote unit (if this is supported and selected as in 9.1.2, "Selecting units for control" above).

When DTRS units are controlled using the remote protocol, keys 1 through 8 control unit 1, keys 9 through 16 control unit 2, and keys 17 through 24 control unit 3.

Keys 17 through 24 are used when a unit is selected for control through the RS-422 protocol. However, you should note that the track mappings on units controlled via RS-422 may not correspond exactly on a one-to-one basis with the track numbers of the TM-D8000's **REC FUNCTION** keys. Consult the manual of the controlled unit to discover what track mappings are available.

If a unit controlled through MMC is switched to have record function control, keys 9 through 16 are used with the MMC device.

The **ALL SAFE** key [4] is used to prevent recording on all tracks of the controlled unit. When the "all safe" mode is on, the indicator will light.

NOTE

You cannot use the **ALL SAFE** key while the controlled unit is in record mode.

9.2 Setting the timecode display source

When using the TM-D8000 to control external units, you should select the source of the timecode that is to be displayed on the time counter [7].

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.
- 2) Press the **OPTION** key [43] until the following screen appears:

- 3) Select the appropriate timecode source

This can be the timecode used as the source for automation synchronization (**Sync Source**), ABS timecode received from a DTRS recorder

through the **REMOTE OUTPUT** connector [79], or MIDI timecode received at the **MIDI IN** jack [76]).

- 4) Confirm your selection with the **ENTER** key.

NOTE

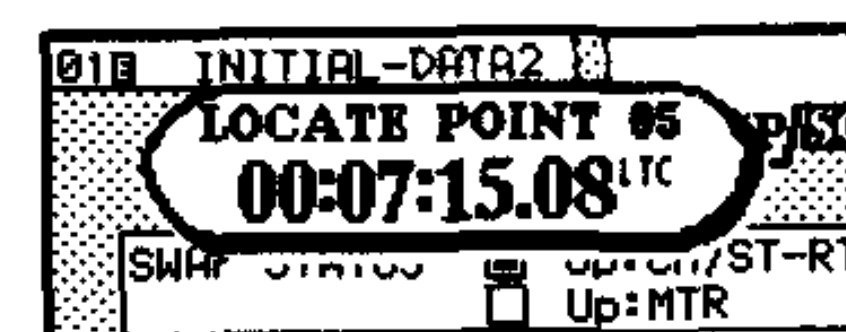
The received timecode may be echoed at the **MIDI OUT** port as MIDI timecode (see 9.4.5, "MIDI timecode"). There is no analog timecode output from the TM-D8000, and you will have to regenerate or reshape timecode from another unit if you want to "daisy-chain".

9.2.1 Setting location memory display

When using location points as described below (9.3, "Location points, etc.") the location points can be displayed either on the time counter [7], or on the display screen as a "pop-up" window.

If they are displayed on the time counter, the **LOC** indicator by the counter will be lit to show that the value currently being shown is not the current timecode.

If they are shown in the main display, a small "pop-up" will appear:



Use the **OPTION** screen as described above (9.2.1, "Setting location memory display") and select either the **7 SEG LED** (time counter) or **LCD SCREEN** (display screen) with the cursor keys.

9.2.2 Setting timecode setting resolution

Naturally, timecode inside the TM-D8000 is resolved to better than frame resolution.

However, for convenience, the TM-D8000 allows you to ignore the frames when inputting and viewing location memory points. This can be useful if you simply want to cue video scenes, for instance, before adding the final soundtrack.

When frames are "dropped" from the input and display of location points, there is no change made to the internal resolution to which the TM-D8000 resolves timecode.

To select the resolution:

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.

- 2) Press the **MIDI/MC** key [41] until the following screen appears:

- 3) Move the cursor to the **EDIT FRAMES** on-screen button.

When this button is **ON**, the frames can be entered and edited. When **OFF**, the visible resolution is to seconds only.

- 4) Use **ENTER** to turn the button on or off.

9.2.3 Timecode and control of DTRS recorders

Many of the basic control functions associated with DTRS recorders are described in 5.3.5, "Control of DTRS units" and 5.3.6, "Transport keys and DTRS units". However, there are other functions, such as location settings, which may be used with the DTRS units.

First, though, you must determine what timecode will be used as a reference on the TM-D8000, as described above (9.2, "Setting the timecode display source"). Since suitably-equipped DTRS units (e.g. DA-98s and DA-88s with the SY-88 synchronizer board) are capable of outputting all forms of timecode recognized by the TM-D8000, it is important to make this selection properly. If you do not, you may find yourself referenced to the wrong time.

9.3 Location points, etc.

Up to 10 location points may be set using the TM-D8000, for instant recall during a project.

9.3.1 Setting location pre-roll

The following steps allow you to set a pre-roll position for any locations. Note that this does not apply to manual locations (see 9.3.5, "Manual location") or to the repeat points (see 9.3.6, "Repeat play").

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.

- 2) Press the **MIDI/MC** key [41] until the **MIDI** screen appears, and move the cursor to the **Locate PreRoll** field:

- 3) Use the jog dial to adjust the pre-roll value.
- 4) Confirm the setting with the **ENTER** key.

If you change the value by mistake, simply use the cursor keys to move the cursor away from the field without pressing **ENTER**.

9.3.2 Setting location points "on-the-fly"

The following procedure applies whether timecode is being received, or stopped.

- 1) Press the **MEMO** key [54], and the indicator will flash.
- 2) Press any of the ten memory location point keys [55].

When the location point key is pressed, the appropriate display (see 9.2.1, "Setting location memory display") will show the current timecode as shown on the time counter.

- 3) To set another location point, repeat the steps above (press the **MEMO** key followed by the location key).

9.3.3 Setting and editing location points manually

You can also set location points using the number keypad [22].

- 1) Press the **EDIT** key [54], and the indicator will flash.
- 2) Press a non-lit (empty) location point key to which you want the value to be assigned.

The **EDIT** indicator will light steadily and the location point key's indicator will flash.

- 3) Use the number keys to enter the location point value.

The location point value will "fill up" from the right digit of the display and flash.

If frame resolution has been turned off (see 9.2.2, "Setting timecode setting resolution"), the "frame" digits will not be shown.

4) **Confirm the entry with the ENTER key.**

The location point key's indicator will light steadily and the **EDIT** indicator will go out.

5) **Press another location point key to enter another location point, or press the EDIT key, or locate to a location point to exit the mode.**

You can also edit existing location points in a similar way.

1) **Press the EDIT key [54] (the indicator will flash).**

2) **Press the location memory key of the location point you want to edit.**

The location point key's indicator will flash, and the **EDIT** indicator will light steadily.

3) **Use the number keypad or jog dial to change the value of the location point.**

4) **Press ENTER to confirm the new value.**

5) **Press the EDIT key so that the indicator goes out, or press another location memory key to edit another value, pressing EDIT when all edit operations are complete.**

9.3.4 Moving to a location point

When a location point has been set, either "on-the-fly" or manually, as described above, it is easy to locate to it.

1) **Press the location memory key of the location to which you want to go.**

While the location memory key is pressed, the location display will show the location point value.

The ten location keys will be lit when a non-zero location memory is stored in them. Depending on the controlled unit, when locating to a memory point, the location memory key may flash while location is under way. The location memory key will light again when location is complete, if it contains a non-zero value.

The transport indicators will show the current transport status of the controlled unit while location is proceeding.

If a pre-roll time has been set (see 9.3.1, "Setting location pre-roll"), this offset will be taken into account in the location procedure.

9.3.5 Manual location

You can also use the number keypad to enter a location point directly.

1) **Press the MANUAL LOCATE key [22].**

The indicator will light, and the location display will show the last-entered manual location time.

2) **Use the number keys or the jog dial to enter the location value.**

The location point value will "fill up" from the right of the display.

If frame resolution has been turned off (see 8.2.2, "Setting timecode resolution"), the "frame" digits will not be shown.

3) **Press ENTER to start the location process.**

You can store the current position into the manual location memory, making a temporary location point, in the following way:

1) **Press the MEMO key so that the indicator flashes.**

2) **Press the MANUAL LOCATE key.**

The display will then revert to incoming timecode.

Press **ENTER** to locate immediately to this point.

To locate to this point after performing other operations, press the **MANUAL LOCATE** key, followed by **ENTER**.

9.3.6 Repeat play

Using the **REPEAT** key [53], the controlled device can repeat playback between the two location memory points stored in the 9 and 10 memories.

As long as the **REPEAT** indicator is lit or flashing, the controlled unit will repeat between the two points. Depending on the controlled unit, the **REPEAT** indicator may light when the transport is inside the repeat time area, and flash when it is outside it.

If location memories 9 and 10 are reversed (i.e. 10 comes before 9), or too close together, or have not been set, the exact way that the unit will perform the repeat depends on the implementation of the repeat function on the controlled unit.

9.3.7 Auto-punch operations

The **RHSL**, **AUTO IN/OUT** and **CLEAR** keys are used for automatic punch operations on DTRS recorders. They work in the same way as the controls on DTRS units.

The punch-in and punch-out points may be viewed and edited by using the location memories 4 and 5 respectively. However, the previously-

stored location memories are not permanently overwritten and may be restored when exiting auto-punch mode.

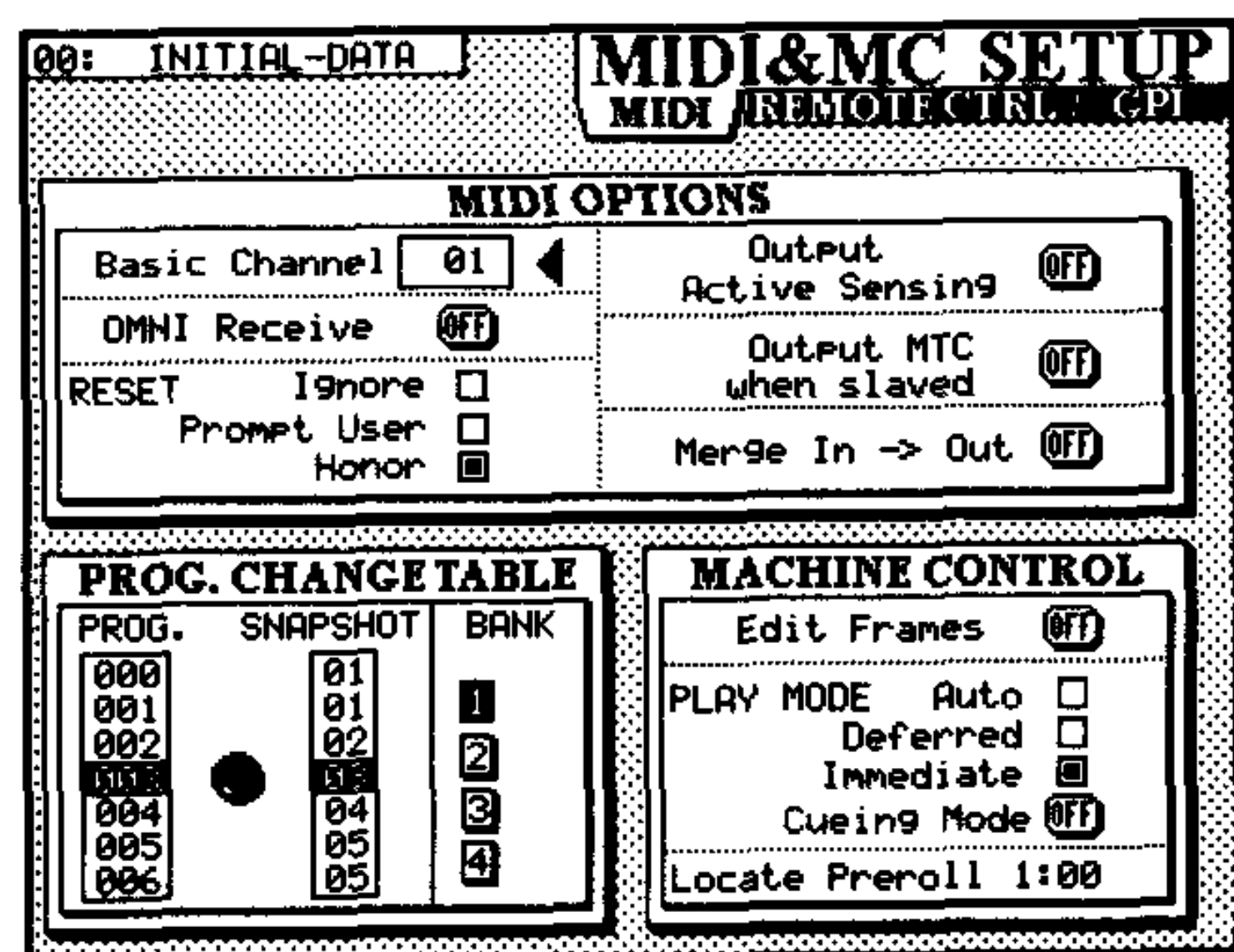
9.4 MIDI options

The TM-D8000 can be used together with MIDI for many purposes, both as a controller, and as a controlled device.

Of course, for any MIDI operations to take place, appropriate connections must be made to and from the TM-D8000's MIDI ports [76].

MIDI system parameters are all set from the same screen, accessed as follows.

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator on.
- 2) Press the **MIDI/MC** key [41] until the following screen appears:



9.4.1 MIDI channel

The TM-D8000 can be set to respond on any one of the 16 MIDI channels or to work in OMNI mode (MIDI messages received on any channel are recognized).

- 1) Turn OMNI on and off by moving the cursor to the on-screen **OMNI** button and pressing **ENTER**.
- 2) Move the cursor to the **Basic Channel** field, and use the number keypad or the jog dial to select the basic MIDI channel (1 through 16).

This MIDI channel will be used for the transmission of messages, as well as reception if OMNI is set to off. Of OMNI is on, this MIDI channel will be used for the transmission of messages, and MIDI messages received on any MIDI channel will be valid.

This number will also be used, with 70h (112 decimal) added, as the MMC ID for the TM-D8000.

- 3) Press **ENTER** to confirm this setting.

9.4.2 "Soft" MIDI THRU

Usually, the MIDI ports [76] act in the same way as described in the MIDI standard: **IN** is used to receive data, which is echoed by **THRU**. **OUT** is used to transmit data originated by the TM-D8000.

However, it is sometimes useful to have the received data interleaved with the data originated by the TM-D8000 from the **OUT** port. This can be achieved in the following way:

- 4) Use the **ENTER** key to change the setting of the on-screen **Merge In -> Out** button.

9.4.3 MIDI reset

The TM-D8000 can be set to respond to a MIDI Reset message in a variety of ways:

When set to **Honor**, the TM-D8000 will reset itself when it receives a valid Reset message.

Prompt User puts a pop-up message on the display when a valid Reset message is received, allowing you to choose whether the reset will take place or not.

Ignore will simply "throw away" the Reset message and take no action.

- 1) Move the cursor to the appropriate field and press **ENTER** to make the setting.

9.4.4 Active sensing

Active sensing messages transmitted from the TM-D8000 (a kind of "here I am" message sent three times a second) can be turned on or off.

Active Sensing messages will always be received. If the stream of Active Sensing messages stops (a cable is disconnected, etc.), a pop-up message will appear to alert you of this fact.

- 1) Move the cursor to the **Output Active Sensing** area, and use **ENTER** to turn the on-screen button on or off.

9.4.5 MIDI timecode

Whenever the TM-D8000's own internal generator is set as the timecode master (see 5.3.7, "Timecode synchronization"), this timecode will be output from the **MIDI OUT** port as MIDI Time Code.

However, if an external source (received at either of the **TIMECODE IN** connectors [80], or through the **DTRS REMOTE** connector [79], MIDI timecode is **not** automatically output.

- 1) Move the cursor to the **Output MTC** when **slaved on-screen button**, and turn it on and off with the **ENTER** key.

9.4.6 Program Change Tables

When a Program Change message destined for the TM-D8000 (i.e. on the correct channel, or on any channel when OMNI is on), a snapshot will be loaded.

The way in which snapshots are stored to the library is described in 6.20.2, "Storing a snapshot".

There are four banks of snapshot-to-program mapping tables (A through D). Only one, naturally, can be active at any one time.

- 1) Move the cursor to the on-screen bank button that you want to make active, and press **ENTER**.
To set up the active Program Change Table:

- 1) Use the jog dial to scroll through the list of Program Change numbers (0 through 127).
- 2) Select the Program Change number with the **ENTER** key.
- 3) Use the number keypad to enter a snapshot which will be recalled when the Program Change message is recalled.

You do not have to use **ENTER** to confirm the number entered. Use leading zeroes if necessary to clear old entries.

NOTE

Program Change messages are actually from 0 to 127, but some devices number their programs starting at 1, for a more "human" approach. In these cases, remember to offset Program Change messages by 1.

The TM-D8000 will now recall the snapshot in the active bank when the matching Program Change message is received. However, if there is no data in the snapshot, no data will be recalled (similar to the situation when recalling a snapshot manually, as described in 6.20.1, "Recalling a snapshot").

In addition, when a snapshot is recalled from the library, a Program Change message will be sent from the **MIDI OUT** port. The number of the message will correspond to the snapshot number in the active bank. This Program Change message will be sent whether the snapshot is recalled from the TM-D8000 itself, or is recalled under external control.

9.4.7 MIDI Device Control

The PODs of the TM-D8000 can be used to control a number of MIDI devices, such as reverb units, etc.

The exact list of devices which can be controlled depends on the version of the TM-D8000 system software installed. This software can be updated by transmitting it from the Macintosh-hosted automation software. Consult your TASCAM dealer for details of the latest version of the software, and the devices which can be controlled by the TM-D8000.

To control external MIDI devices:

- 1) Use the **SHIFT** key to turn the **SHIFT** indicator off.
- 2) Press the **EXT MIDI** key until a screen enabling you to control the desired MIDI device (as selected in the Machine Control screen) appears.
- 3) Use the **POD** controls, cursor keys and **ENTER** key to adjust the appropriate parameters.

Although the DTRS unit is not controlled by MIDI, see 9.1.9, "Control of DTRS units" for details of how switches, numeric values, etc. can be controlled on a remote unit by the TM-D8000.

10 – Specifications

10.1 Analog audio

Mic inputs (channels 1 through 16)	XLR-3-31 type, balanced (1=ground, 2=hot, 3=cold) Input impedance: 2.4k Ω Gain: +61dB to +13dB (pad off) Nominal input level: -50dBu (-57dBu to -9dBu) Headroom: +16dB
Line inputs (channels 1 through 16)	1/4" phone, balanced (tip = hot, ring = cold, sleeve=ground) Input impedance: 2.4k Ω Gain +41dB to -7dB (pad on) Nominal input level: +4dBu (-37dBu to +11dBu - pad on) Headroom: +16dB
Insert sends and returns (channels 1 through 16)	1/4" phone, unbalanced (sleeve = ground) Send (tip): output impedance = 100 Ω , nominal output level = +4dBu, maximum output level = +20dBu Return (ring): input impedance = 10k Ω , nominal input level = +4dBu, headroom = +16dB
Aux sends 1 through 6	1/4" phone, unbalanced Output impedance: 100 Ω Nominal output level: +4dBu Maximum output level: +20dBu
Stereo returns 1 through 6	1/4" phone, unbalanced (tip=signal, sleeve=ground) Input impedance: 10k Ω Nominal input level: +4dBu (-22dBu to +11dBu) Gain: +26dB to -7dB Headroom: +16dB
Matrix inserts 1 through 4	1/4" phone, unbalanced (sleeve = ground) Send (tip): output impedance = 100 Ω , nominal output level = +4dBu, maximum output level = +20dBu Return (ring): input impedance = 10k Ω , nominal input level = +4dBu, headroom = +16dB
Stereo outputs	XLR-3-32 type, balanced (1=ground, 2=hot, 3=cold) Output impedance: 75 Ω Nominal output level: +4dBu Maximum output level: +20dBu Headroom: +16dB RCA, unbalanced Output impedance: 100 Ω Nominal output level: -10dBV Maximum output level: +6dBV Headroom: +16dB

2TR IN 1	XLR-3-31 type, balanced (1 = ground, 2 = hot, 3 = cold) Input impedance: 20k Ω Nominal input level: +4dBu Gain: 0dB Headroom: > +20dB
2TR IN 2	RCA unbalanced Input impedance: 20k Ω Nominal input level: -10dBV Headroom: > +20dB
Scope outputs	1/4" phone stereo unbalanced (tip = left, ring = right, sleeve = ground) Output impedance: within 1k Ω Nominal output level: -2dBu Maximum output level: +14dBu Headroom: +16dB
CR output	XLR-3-32 type, balanced (1 = ground, 2 = hot, 3 = cold) Output impedance: 75 Ω Nominal output level: +4dBu Maximum output level: +20dBu Headroom: +16dB
Studio output	XLR-3-32 type, balanced (1 = ground, 2 = hot, 3 = cold) Output impedance: 75 Ω Nominal output level: +4dBu Maximum output level: +20dBu Headroom: +16dB
Phones outputs	1/4" phone, stereo (tip = left, ring = right, sleeve = ground) Nominal impedance: 30 Ω Maximum output level: 100mW + 100mW

10.2 Digital audio

MTR 1-8, MTR 9-16, MTR 17-24	Connector: 25-pin D-sub (female) Data is in TDIF-1 format	Sync out	BNC connector, unbalanced Output impedance: 75Ω Output level: TTL
D I/O 1, D I/O 2	Connector: 25-pin D-sub (female) Data is in TDIF-1 format	Sync thru	BNC connector, unbalanced
D IN 1 through D IN 4	Connector: XLR-3-31 type Data is in AES3-1992 format		
D IN 1, D IN 2	Connector: RCA Data is in IEC958 Consumer (SPDIF) format		
AUX SEND 3-4	Connector: XLR-3-31 type Data is in AES3-1992 format		
STEREO RETURN 6	Connector: RCA Data is in IEC958 Consumer (SPDIF) format		
Stereo outputs	Connector: XLR-3-31 type Data is in AES3-1992 format Connector: RCA Data is in IEC958 Consumer (SPDIF) format		

10.3 Control connections

RS-422	9-pin D-sub (female) RS-422
Remote output	15-pin D-sub male DTRS REMOTE IN/SYNC IN format (ver. 1)
TO HOST	8-pin mini-DIN RS-422 protocol
GPI outputs 1 and 2	1/4" phone (TRS) Sleeve = ground, Tip = (GPI1 EV1, GPI2 EV3), Ring = (GPI1 EV2, GPI2 EV4)
MIDI IN, OUT, THRU	5-pin DIN In accordance with MIDI standards

10.4 Synchronization connections

Timecode in	XLR-3-32 type, balanced (1 = ground, 2 = hot, 3 = cold) Input impedance: 20kΩ Input level: >−36dBu RCA, unbalanced Input impedance: 20kΩ Input level: >−30dBV
Comms remote input	See [61] for details of pinout.
Sync in	BNC connector, unbalanced Input impedance 75Ω (switchable) Word level: TTL Video level 0.5Vp-p to 2.0Vp-p Frame level: TTL

10.5 Analog I/O specifications

Mic/line inputs	<p>EIN: -126dBu, typically -127dBm with DIN audio weighting at 150Ω, gain at 60dB</p> <p>Frequency response: $+0.5\text{dB}/<-1.0\text{dB}$ 20Hz to 20kHz, gain at $+50\text{dB}$</p> <p>Total harmonic distortion: $< 0.01\%$ 20Hz to 20kHz with gain at $+60\text{dB}$ input at -42dBu</p> <p>Common mode rejection ratio: $> 70\text{dB}$ 20Hz to 20kHz with gain at $+60\text{dB}$</p>
Insert matrix returns	EIN: $> -67\text{dBu}$ with DIN audio weighting at $1\text{k}\Omega$
Stereo returns	<p>EIN: $> -97\text{dBu}$ with DIN audio weighting at $1\text{k}\Omega$</p> <p>Frequency response: $+0.5\text{dB}/<1.0\text{dB}$ 20Hz to 20kHz</p> <p>Total harmonic distortion: $< 0.1\%$, 20Hz to 20kHz, gain at $+26\text{dB}$, input -7dBu</p> <p>All measurements made at signal levels of $+18\text{dBu}$</p>
Stereo outputs (XLR)	<p>Noise level: $> -79\text{dBu}$ with DIN audio weighting, all channels, stereo return and MTR cut</p> <p>Frequency response: $+0.5\text{dB}/<1.0\text{dB}$ 20Hz to 20kHz</p> <p>Total harmonic distortion: $< 0.01\%$, 20Hz to 20kHz, output $= +18\text{dBu}$</p>
Aux sends	<p>Noise level: -79dBu with DIN audio weighting, all channels, stereo return and MTR cut</p> <p>Frequency response: $+0.5\text{dB}/<1.0\text{dB}$ 20Hz to 20kHz</p> <p>Total harmonic distortion: $< 0.01\%$, 20Hz to 20kHz, output $= +18\text{dBu}$</p>
2-track 1	<p>EIN $< -100\text{dBu}$, DIN audio weighting, at 150Ω</p> <p>Frequency response: $+0.5\text{dB}/-1\text{dB}$, 20Hz to 20kHz</p> <p>Common mode rejection ratio: better than 40dB, 20Hz to 20kHz at $+18\text{dB}$</p>
2-track 2	<p>EIN $< -100\text{dBV}$, DIN audio weighting, at 150Ω</p> <p>Frequency response: $+0.5\text{dB}/-1\text{dB}$, 20Hz to 20kHz</p>
C-R and studio outputs	<p>Noise level: $< -95\text{dBu}$ (CR), $< -98\text{dBu}$ (studio) with DIN audio weighting, CR and studio levels respectively to minimum</p> <p>Frequency response: $+0.5\text{dB}/<1.0\text{dB}$ 20Hz to 20kHz</p> <p>Total harmonic distortion: $< 0.01\%$, 20Hz to 20kHz, output $= +18\text{dBu}$</p>
Phones output	THD: Within 1% 20Hz to 20kHz at $10\text{mW} + 10\text{mW}$

10.6 System specifications

Noise level (DIN audio)	<p>-66dBu, 1 Mic to STEREO OUT, at maximum</p> <p>-53dBu: 16 Mic to STEREO OUT, at maximum</p> <p>-80dBu: 24 MTRs to STEREO OUT</p>
Total harmonic distortion	Less than 0.1% at nominal level
Frequency response	20Hz to 20kHz $-0.5\text{dB}/-1\text{dB}$
Crosstalk	<p>$> -90\text{dB}$ (at 1kHz)</p> <p>$> -67\text{dB}$ (10kHz CR OUT)</p>
Signal processing time	$< 1.25\text{ms}$ (MIC/LINE to XLR stereo out, $F_s=48\text{kHz}$)
Click	$< -35\text{dB}$
Fader attenuation:	$> 90\text{dB}$ @ 1kHz
Muting level	$> -90\text{dB}$ @ 1kHz
Internal sampling frequency	Stable to within $\pm 50\text{PPM}$
External sampling frequency	Can lock to $\pm 6\%$ of stated nominal frequency

10.7 Physical specifications

Power requirements:	<p>US: $120\text{VAC}/60\text{Hz}$</p> <p>Europe (EU) $230\text{VAC}/50\text{Hz}$</p> <p>Europe (non-EU) $230\text{V}/60\text{Hz}$</p> <p>Australia: $240\text{VAC}/50\text{Hz}$</p>
Power consumption:	125W
Dimensions (w x h x d) mm (in)	$1020 \times 315 \times 717$ ($40.2 \times 12.4 \times 28.2$)
Weight kg (lb)	40 (88)

10.8 Error and other messages

This section lists the error and pop-up messages that may be displayed by the TM-D8000. They fall into three categories: User messages, where an invalid entry has been made, confirm messages, where it is often necessary to respond to a question asked by the TM-D8000, and fatal error messages, where the TM-D8000 must be powered down and reset.

NOTE

If you have to restart the TM-D8000, remember to turn down the volume of the monitoring system when you do so.

In these error messages **XX** represents a library entry number from 00 through 99 and **YY** represents an input channel, an MTR channel or the STEREO-OUT buss.

10.8.1 Automation setup

Illegal time code!	The entered timecode is invalid and cannot be used	User
Time code running!	An attempt was made to change the frame type or start time while the internal generator was running	User

10.8.2 Dynamics library

DYN LibraryXX is Read Only!	A store action was attempted on a read-only dynamics library entry	User
Can't Recall DYN LibraryXX.	An attempt was made to recall an empty dynamics library entry	User
OK to overwrite DYN LibraryXX from YY?	An request was made to store to a non-empty dynamics library entry	Confirm
Stored to DYN LibraryXX from YY.	Storing to the dynamics library has been completed.	Confirm
DYN LibraryXX Recalled to YY.	Recalling the dynamics library entry has been completed.	Confirm

10.8.3 EQ Library

EQ LibraryXX is Read Only!	A store action was attempted on a read-only EQ library entry	User
Can't Recall EQ LibraryXX.	An attempt was made to recall an empty EQ library entry	User
OK to Overwrite EQ LibraryXX from YY?	A request was made to store to a non-empty EQ library position	Confirm
Stored to EQ LibraryXX from YY.	Storing to the EQ library has been completed	Confirm
EQ LibraryXX Recalled to YY.	Recalling the EQ library entry has been completed	Confirm

10.8.4 2 EQ

Copy [Source Channel] EQ to [Destination Channel]?	The user has pressed the key to copy EQ settings in the 2 EQ screen	Confirm
[Destination Channel] is in read mode.	The automation mode of the destination channel is READ.	User

10.8.5 Ins assign

Assign [Source Channel] to [Destination]?	The user has pressed a key to assign a channel in the insert assign screen.	Confirm
(Current assignment : [Source Channel])	If the selected dynamics or matrix ins has already been assigned, the old setting is also displayed	User

10.8.6 ST LINK using the SEL keys

ST LINK ON ([Source Channel] > [Destination Channel])	The user has pressed the keys to make a stereo link with [Source Channel] as the master	<i>Confirm</i>
ST LINK OFF ([L Channel] > [R Channel])	The user has pressed the keys to clear the stereo link between the 2 channels	<i>Confirm</i>

10.8.7 Snapshot library

SnapshotXX is Read Only!	A store action was attempted on a read-only snapshot library entry	<i>User</i>
Can't Recall Snapshot LibraryXX.	An attempt was made to recall an empty snapshot library entry	<i>User</i>
OK to Overwrite Snapshot LibraryXX?	An request was made to store to a non-empty snapshot memory	<i>Confirm</i>
Stored to Snapshot LibraryXX.	Storing to the snapshot library has been completed	<i>Confirm</i>
Snapshot LibraryXX Recalled.	Recalling the snapshot library entry has been completed	<i>Confirm</i>

10.8.8 Routing library

Routing LibXX is Read Only!	A store action was attempted on a read-only routing library entry	<i>User</i>
Can't Recall Routing LibXX.	An attempt was made to recall an empty routing library entry	<i>User</i>
OK to Overwrite Routing LibXX?	A request was made to store to a non-empty routing library entry	<i>Confirm</i>
Stored to Routing LibXX.	Storing to the Routing library has been completed	<i>Confirm</i>
Routing LibXX Recalled.	Recalling the Routing Library entry has been completed	<i>Confirm</i>

10.8.9 Communication with host computer

<RX_CNU Error> Can't Convert	An unrecognised host command was received – contact TASCAM service and inform them of this message	<i>Confirm</i>
<RX_CNU Error> Data Order Error	The order of the received host commands is wrong	<i>Confirm</i>
<TX_CNU Error> Can't Convert	An unrecognised internal command was attempted to be transmitted to the host	<i>Confirm</i>
<Bulk Data Error> Unexpected Bulk Command	An unrecognised bulk host command was received	<i>Confirm</i>

10.8.10 Machine Control

GPI Event List is Full	There is a maximum of 16 GPI events	<i>User</i>
List must be clear first	The auto detect button was pressed while there are devices already in the remote control list	<i>User</i>
Confirm All Clear?	The All clear button was pressed.	<i>Confirm</i>
It is already included	The user tried to add a device to the list which is already included.	<i>User</i>
Too many of this device	The mixer cannot control any more of this kind of device	<i>User</i>
Machine Control List Full	There is a maximum of 16 devices in the machine control list	<i>User</i>
Too many screens enabled	There is a maximum of 8 SCR assignments from the devices in the machine control list	<i>User</i>
The RS422 port is already assigned	There is already a device using the RS422 port in the machine control list	<i>User</i>
EXTERNAL CTRL. There are no screens currently defined	There are no SCR screens currently selected in the machine control list	<i>User</i>

The Internal MTC generator is not selected.	An attempt was made to use the internal MTC generator transport controller when the timecode source is not set to the internal generator.	<i>User</i>
Recalled MC Mapping #x >:xxxx	The key sequence to recall an MC mapping was pressed	<i>Confirm</i>
Saved MC Mapping #x >:xxxx	The key sequence to save an MC mapping was pressed	<i>Confirm</i>

10.8.11 Clock and synchronization

The main PLL became unlocked soon after changing the clock source. Please check it.	As written - it may be that there is a "clock loop" where the device designated as the clock master may be set to be a clock slave of the TM-D8000.	<i>Confirm</i>
The main PLL is not locking to the signal at the xxx connector.	The PLL lock status is not stable, suggesting a bad digital connection.	<i>Confirm</i>
The Clock signal at the xxx connector has become unstable, so the mixer has been muted	As written	<i>Confirm</i>
The Clock signal at the xxx connector is unavailable, so the mixer has been muted	When powering on, the master clock is unavailable.	<i>Confirm</i>
The signal at the xxx connector is asserting an FS of xx.xKHz	The current clock speed is determined by the external clock source and cannot be changed	<i>User</i>

10.8.12 Others

Excessive Simultaneous GPI triggers	More than 7 pulse-type GPI outputs were triggered in too short a time interval. After restarting, check the GPI trigger list for unreasonable usage	<i>Fatal</i>
MIDI active sensing has been discontinued	The MIDI device connected to the MIDI IN port has stopped sending data	<i>Confirm</i>
MIDI System Reset Received - Reboot or Ignore?	As written	<i>Confirm</i>

10.8.13 Fatal system error

If you see an error of this type, please make a note of the number displayed, and contact TASCAM Service, informing them of the number of the error, together with a brief description of the events leading up to the display, if possible:

Fatal Error : XX-YYYYYYYY-ZZ	As written, an unrecoverable software error has occurred	<i>Fatal</i>
------------------------------	--	--------------

10.9 MIDI Implementation Chart

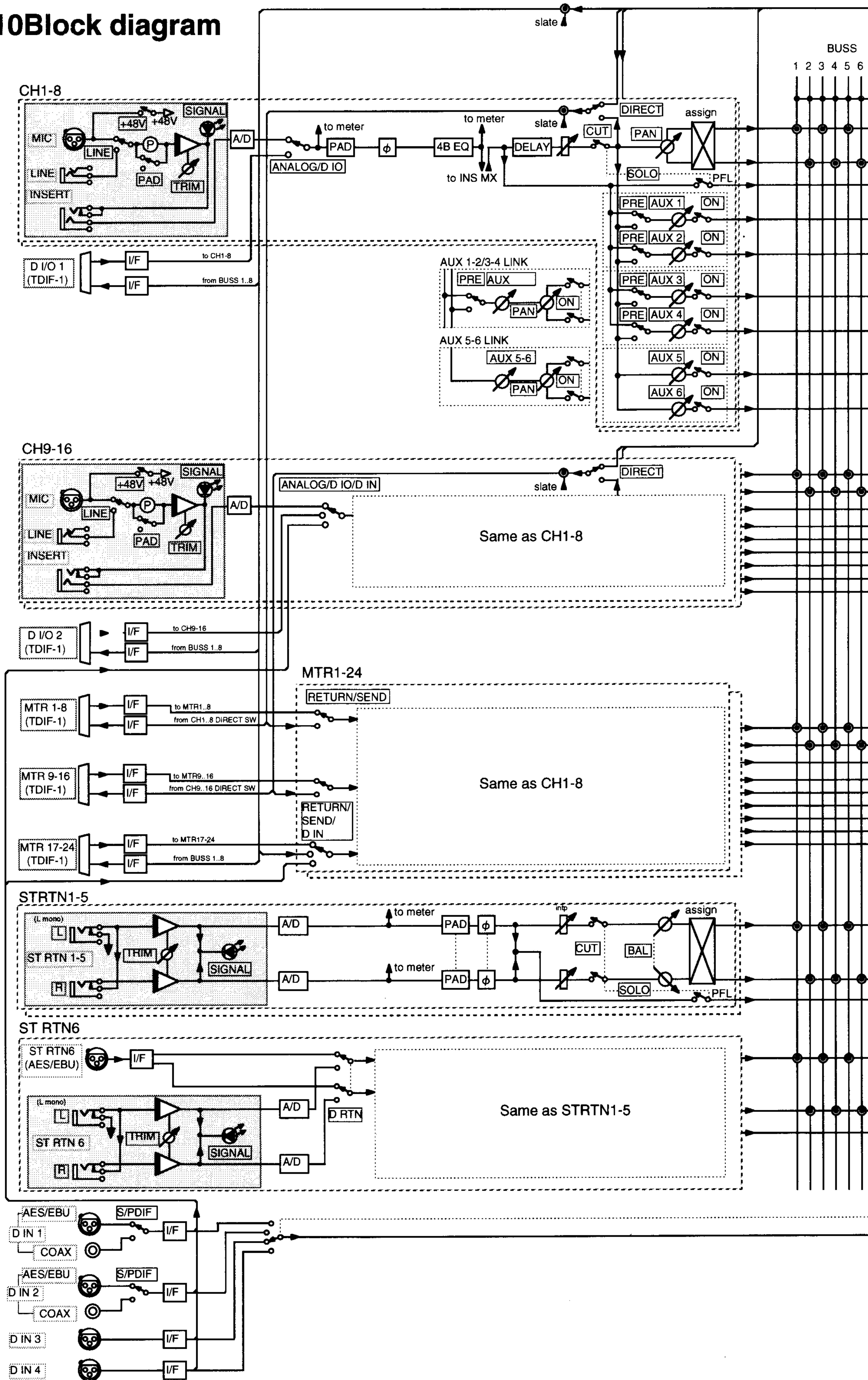
TASCAM Digital Mixer
Model name: TM-D8000

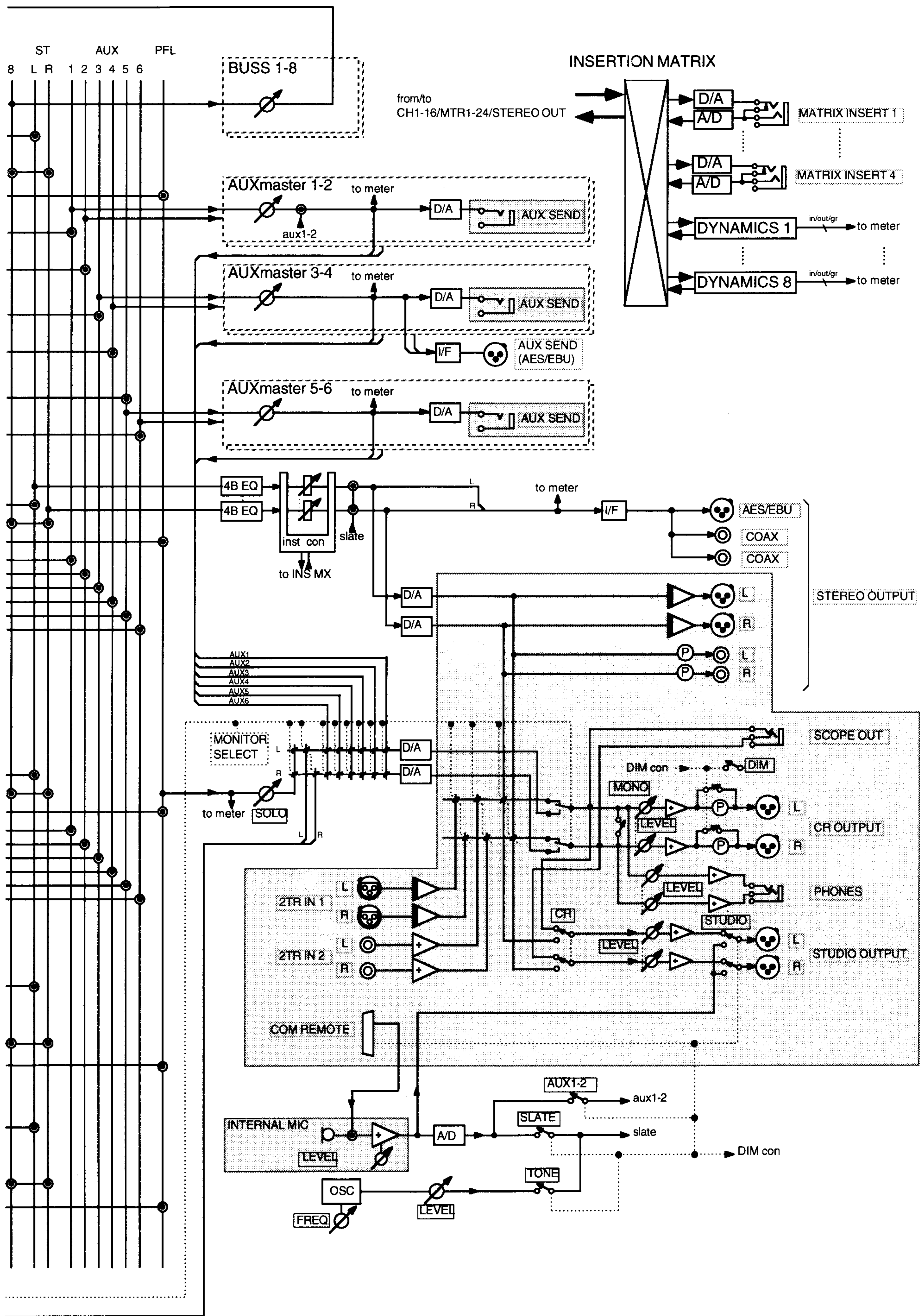
MIDI Implementation Chart

Date: 1997.06.26
Version: 1.00

Function	Transmitted	Recognized	Remarks
: Basic Default	: 1-16		
: Channel Changed	: 1-16	: 1-16	: Memorized
: Mode Default	: x		
: Messages	: x	: OMNI OFF/OMNI ON	: Memorized
: Altered	: ---	: OMNI OFF/OMNI ON	
: Note	: o		
: Number : True voice	: *****	: x	: External MIDI device
: Velocity Note ON	: o		: control *4
: Note OFF	: o	: o	
: After Key's	: o	: o	: External MIDI device
: Touch Ch's	: o	: x	: control *4
: Pitch Bender	: o	: x	: External MIDI device
: 0-95	: o	: o	
: 98-99	: o	: o	: T: External MIDI and
: Control		: o	: device and Automation
: Change 100-120	: o	: o	: R: Automation data
: Prog	: 0-127		
: Change : True #	: 0-99	: 0-127	: *3
: System Exclusive	: o	: 0-99	
: System : Song Pos	: x		: *1
: Song Sel	: x	: x	
: Common : Tune	: x	: x	
: System : Clock	: x		
: Real Time : Commands	: x	: x	
: Aux : Local ON/OFF	: x		
: All Notes OFF	: x	: x	: *1
: Mes- : Active Sense	: o	: o	
: sages: Reset	: x	: o	: T: On/off selectable
: Notes:			: Response selectable
: (T) : Transmitted	: *1		: All MIDI messages received may be merged with outgoing data:
: (R) : Recognized			: T, R MMC RP Ver 1.00 Identity Request + Identity Reply
			: T, R Teac SysEx for Automation Data
			: T, R MIDI File Dump for Flash ROM + Library Data Update
			: T, R MTC Full Message (R: Display only)
			: *2 MTC Quarter Frame Message (R: Display only)
			: *3 T: Snapshot recalled, External MIDI control
			: R: Snapshot recall
			: *4 R: Channel 16, Notes 21-25 activate the transport
Mode 1 : OMNI ON, POLY			
Mode 3 : OMNI OFF, POLY			
Mode 2 : OMNI ON, MONO			
Mode 4 : OMNI OFF, MONO			
			: o : Yes
			: x : No

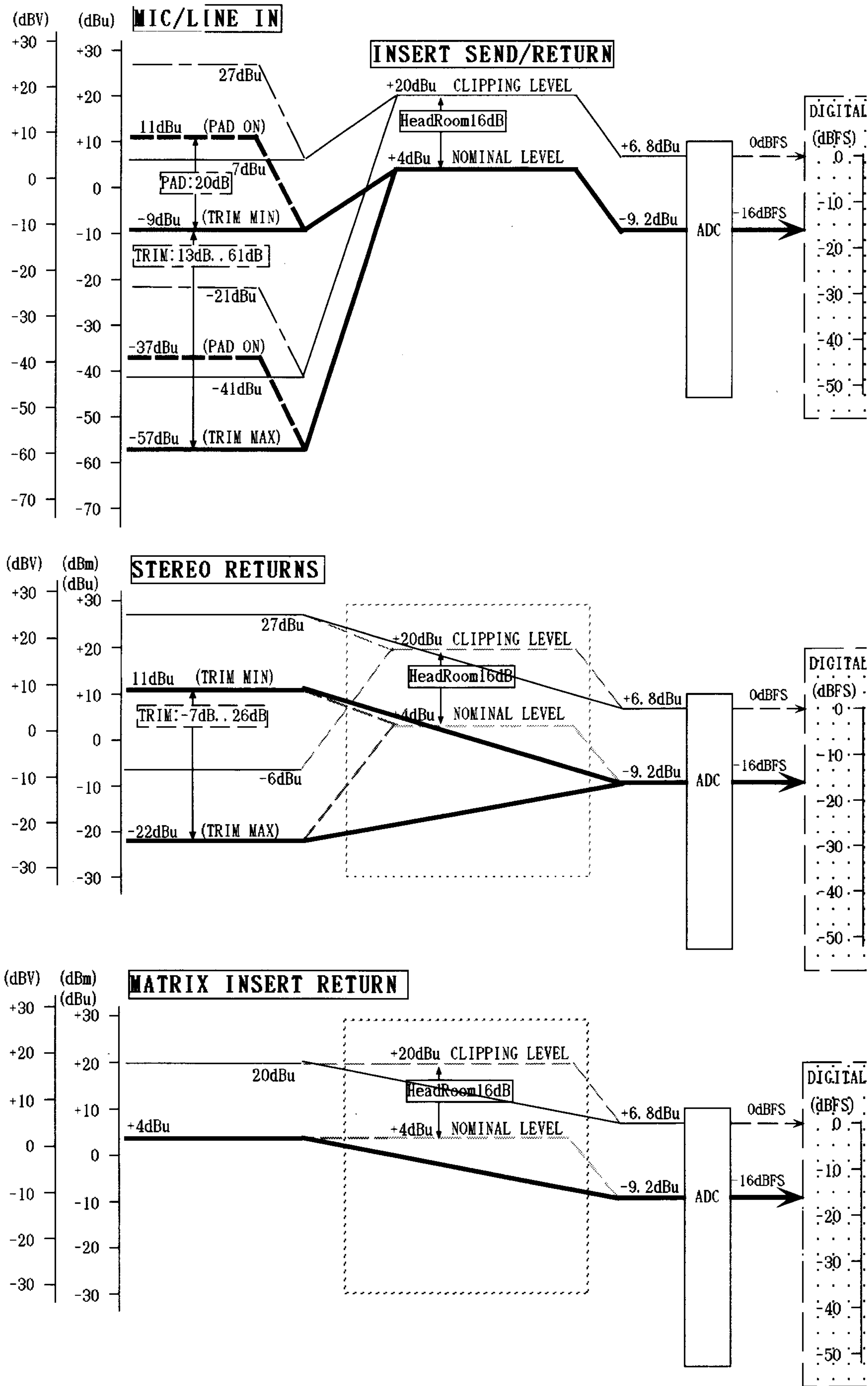
10.10Block diagram



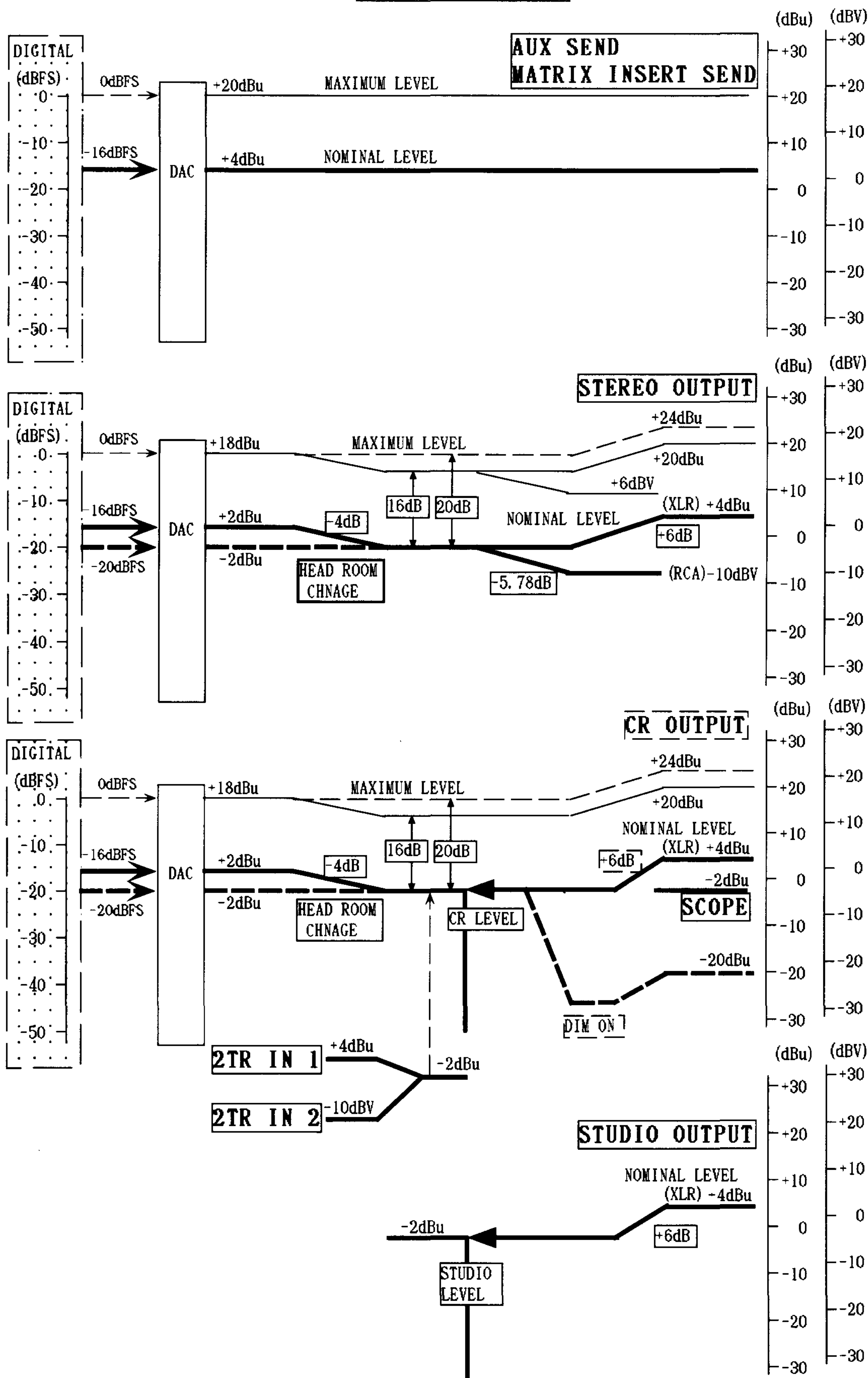


10.11Level diagram

The following diagrams show the levels at various points throughout the signal path of the TM-D8000.



NOTES: 0dBV = 1.0 Vrms
0dBu = 0.775 Vrms



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