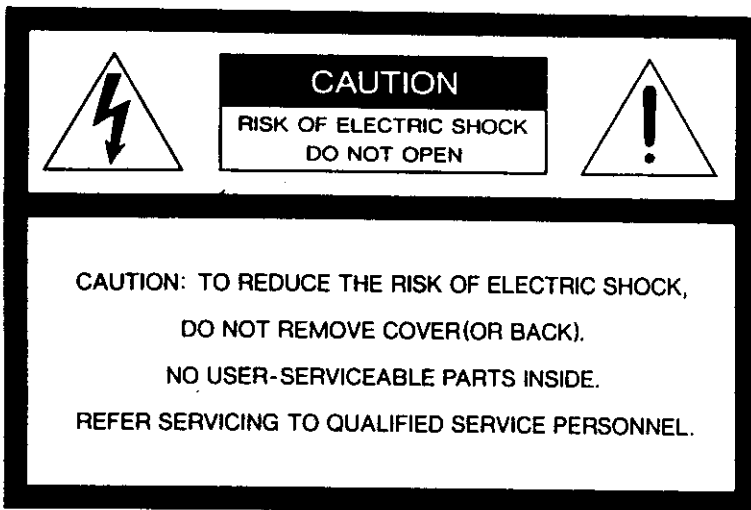


Fostex

MIDI Mixer
DCM100
Mixer Tablet
MIXTAB

Operation Manual



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



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

"WARNING"

"TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE."

SAFETY INSTRUCTIONS

1. Read Instructions — All the safety and operating instructions should be read before the appliance is operated.
2. Retain Instructions — The safety and operating instructions should be retained for future reference.
3. Heed Warnings — All warnings on the appliance and in the operating instructions should be adhered to.
4. Follow Instructions — All operating and use instructions should be followed.
5. Water and Moisture — The appliance should not be used near water — for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, and the like.
6. Carts and Stands — The appliance should be used only with a cart or stand that is recommended by the manufacturer.
7. Wall or Ceiling Mounting — The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.
8. Ventilation — The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.
9. Heat — The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.
10. Power Sources — The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
11. Grounding or Polarization — The precautions that should be taken so that the grounding or polarization means of an appliance is not defeated.
12. 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 appliance.
13. Cleaning — The appliance should be cleaned only as recommended by the manufacturer.
14. Nonuse Periods — The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
15. Object and Liquid Entry — Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
16. Damage Requiring Service — The appliance should be serviced by qualified service personnel when:
 - A. The power supply cord or the plug has been damaged; or
 - B. Objects have fallen, or liquid has been spilled into the appliance; or
 - C. The appliance has been exposed to rain; or
 - D. The appliance does not appear to operate normally or exhibits a marked change in performance; or
 - E. The appliance has been dropped, or the enclosure damaged.
17. Servicing — The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.



An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

INTRODUCTION

Thank you for purchasing the Fostex DCM100 MIDI Mixer. The DCM100 is a MIDI mixer with eight stereo input channels and two stereo auxiliary send/return circuits. All mixer settings are controlled digitally by external MIDI devices such as the MIXTAB Mixer Tablet. Used as a set, the DCM100 and the MIXTAB exploit the power of the MIDI standard to give you maximum mixing power and flexibility in compact, easily portable packages.

One major advantage of MIDI mixing is the ability to save entire sets of mixer settings as "scenes" which can be recalled in moments. You can also connect a single MIXTAB to two or three DCM100 MIDI Mixers, achieving full control over 24 stereo input channels with a minimum of mixer table space. Finally, the DCM100 gives you the option of control by other MIDI devices, such as a personal computer.

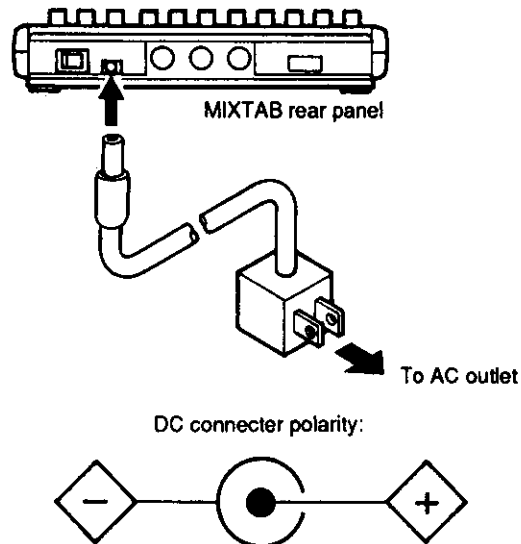
This Owner's Manual describes the use of the DCM100 and the MIXTAB as a paired set. It also contains specifications detailing the MIDI data types used by these devices. You will find this information helpful should you wish to employ either the DCM100 or the MIXTAB in combination with other MIDI equipment. Please read the manual carefully and keep it handy for future reference.

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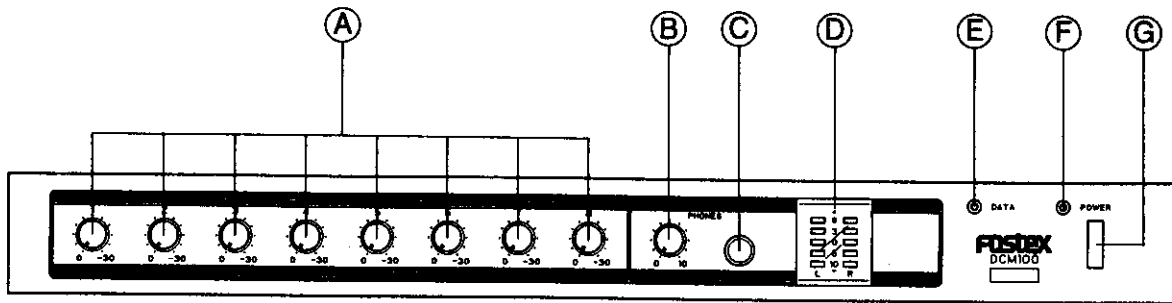
SAFETY PRECAUTIONS

- Never plug the DCM100 power cord or the MIXTAB adapter into an outlet with a voltage other than specified. Should you wish to power the DCM100 or the MIXTAB with a different voltage, consult your Fostex dealer or service center.
- Use only the supplied AC adapter to power the MIXTAB. In no case should you use an AC adapter made by another manufacturer. Connect the end of the DC cord to the MIXTAB before inserting the adapter in an AC outlet.



- Always grasp the plug of the DCM100 power cord and the MIXTAB's AC adapter directly when removing them from an AC outlet. Never pull on power cords to unplug equipment, as doing so can cause damage to the cords.
- To avoid the risk of electrical shock, never plug or unplug equipment when your hands are wet. Also, do not use the DCM100 or the MIXTAB if the insulation of the AC adapter cord becomes damaged or worn.
- Never open the DCM100 or MIXTAB cases or tamper with the components inside. Also, do not spill water or liquids on the equipment, or drop metal objects inside their cases. All of these actions pose the danger of electrical shock. If water or a foreign object should accidentally get inside one of the units, disconnect its power source immediately and contact your Fostex dealer or service center.
- Never connect the output of an amplifier (or any other equipment with output rated in watts) directly to a DCM100 input jack, as doing so could seriously damage its circuits. Refer to the Specifications (inside rear cover) for details regarding the DCM100's input and output impedances.
- To avoid damage due to power surges, always turn the DCM100's power switch on before switching on the power to connected equipment. If you connect or disconnect input and output plugs while the DCM100's power is turned on, be sure to turn the corresponding level controls down to their minimum settings.

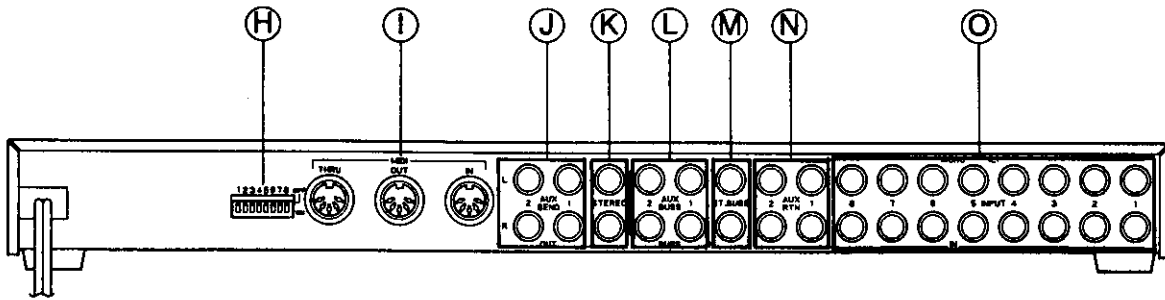
DCM100 CONTROLS AND TERMINALS



Front Panel

- (A) **INPUT TRIM CONTROL**
This knob trims the pre-amplifier gain of the signal input to the corresponding INPUT jacks (O). The DCM100's eight input channels accommodate an input range from -30 dBV to 0 dBV (line level).
- (B) **PHONES VOLUME CONTROL**
This knob adjusts the volume of the signal output by the PHONES jack (C).
- (C) **PHONES JACK**
You can connect a set of stereo headphones to this jack to monitor the mixer's stereo output. This jack outputs the same stereo signal as the STEREO OUT jacks (K).
- (D) **LEVEL METER**
These bar graph level meters indicate the levels of the signals output by the STEREO OUT jacks (K).
- (E) **DATA INDICATOR**
This LED lights when data is received at the MIDI IN terminal (I).
- (F) **POWER INDICATOR**
This LED lights when the POWER switch (G) is turned on.
- (G) **POWER SWITCH**
This switch turns the power to the DCM100 on and off.

Rear Panel



(H) DIP SWITCHES

These switches set the MIDI channel which the DCM100 uses to communicate with a MIDI controller. They also specify the initialization procedure it executes whenever the power is turned on, and select the volume curve used to interpret control messages adjusting the levels of input channels. The precise meaning of each of these switches is described on page 11.

(I) MIDI TERMINALS

These terminals allow the DCM100 to exchange MIDI data with other MIDI devices. The IN terminal accepts the input of control data from a controller such as the MIXTAB. The OUT terminal transmits feedback data indicating the mixer's status back to the controlling device. The THRU terminal passes on the data from MIDI IN to other MIDI devices, such as another DCM100. The proper methods for connecting MIDI devices to the DCM100 are explained on pages 13 and 14.

(J) AUX SEND JACKS

These jacks output a signal from the DCM100's AUX buss for input to a stereo signal processor. The DCM100 has two AUX busses, each of which outputs a stereo signal. The level of this signal is set by the corresponding AUX SEND control (7).

(K) STEREO OUT JACKS

These are the DCM100's main output jacks. They output the final mixed stereo signal, including processed signals input via the AUX RETURN jacks (N). They can be connected directly to an amplifier or PA system.

(L) AUX BUSS IN JACKS

These jacks input signals directly to the corresponding AUX busses. They are generally used when cascading the effect send output from a second mixer to the DCM100, in order to process the signals from both mixers with the same signal processor.

(M) STEREO BUSS IN JACKS

These jacks input a stereo signal directly to the STEREO buss. They are usually used to cascade the stereo output from a second mixer to the DCM100.

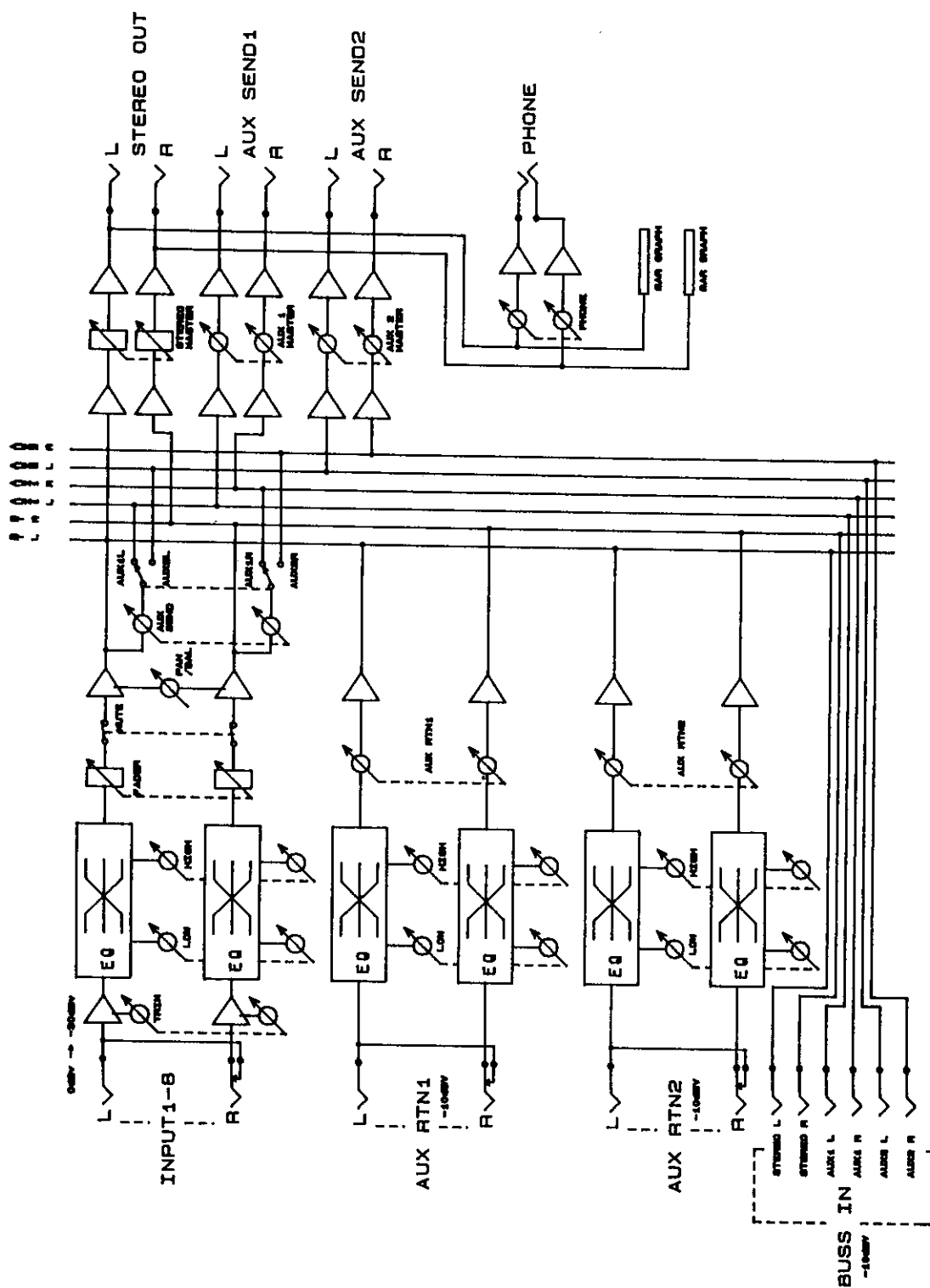
(N) AUX RETURN JACKS

These jacks receive the signal returned by a signal processor unit. This signal is fed to the STEREO buss after its level and tone are adjusted by the AUX RETURN (8) and AUX EQUALIZER (9) controls. There are two pairs of AUX RETURN jacks, each corresponding to one of the DCM100's AUX busses. Use only the upper (L) jack to input a mono return signal equally to both the right and left channels of the STEREO buss.

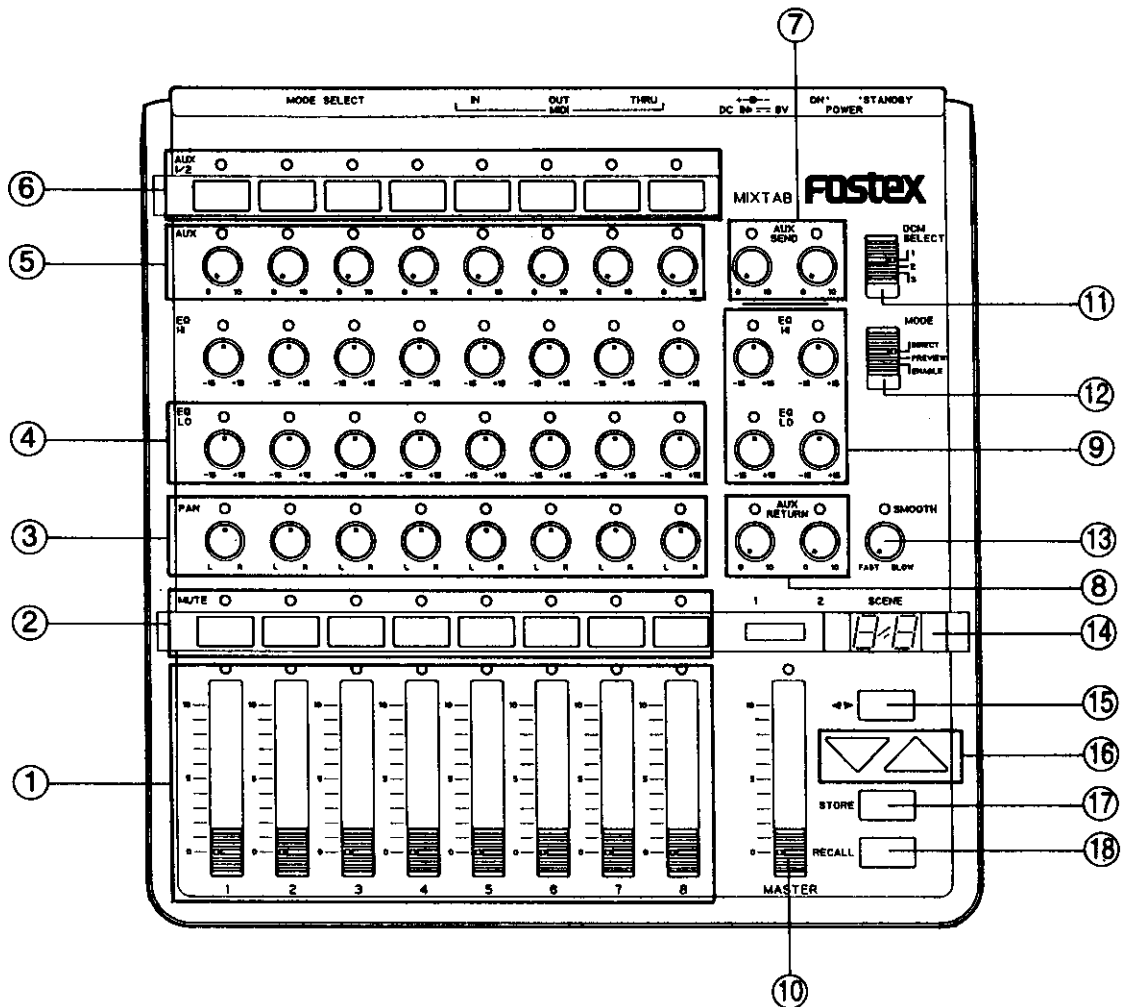
(O) INPUT JACKS

These jacks input stereo signals to the DCM100's eight input channels. Use only the upper (L) jack to input a mono signal equally to both the right and left sides of an input channel.

DCM100 CIRCUIT DIAGRAM



MIXTAB CONTROLS AND TERMINALS



Upper Panel

- (1) **INPUT FADER**
This fader adjusts the level of the signal input to the corresponding channel via its INPUT jacks (O).
- (2) **MUTE BUTTON**
This button mutes an input channel. To mute a channel, press and then release its MUTE button. The LED above the button will light, and all output from the channel will be muted. You can also mute all channels but one by pressing and holding for about three seconds the MUTE button of the channel you wish to hear. To hear a channel which has been muted, simply press and release its MUTE button.
- (3) **PAN CONTROL**
This knob adjusts the stereo positioning or balance of the channel's signal. When a mono signal is input, the PAN control moves its stereo position to the left or right. When a stereo signal is input, the PAN control adjusts its left-right balance.

- (4) EQUALIZER CONTROLS**
These knobs adjust the tone quality of the channel's signal. Each control governs a shelving equalizer which boosts or cuts frequencies within a range of ± 15 dB. The upper control affects frequencies above 10 kHz, whereas the lower control affects frequencies below 100 Hz.
- (5) AUX CONTROL**
This knob sets the volume of the channel signal that is sent to the AUX buss selected by the AUX 1/2 selector (6). It is used to adjust the level of that signal relative to those of other channels which have been sent to the same AUX buss. This control should be turned all the way down in order to send no signal to either AUX buss.
- (6) AUX 1/2 SELECTOR**
This button feeds a signal from the input channel to one of the DCM100's two AUX busses. The LED above the button lights when the AUX 2 buss is selected, and goes out when the AUX 1 buss is selected.
- (7) AUX SEND CONTROL**
This knob adjusts the master level of the combined AUX buss signal which is output by the corresponding AUX SEND jacks (J).
- (8) AUX RETURN CONTROL**
This knob adjusts the level of the returned AUX signal input via the corresponding AUX RETURN jacks (N).
- (9) AUX EQUALIZER CONTROLS**
These knobs adjust the tone quality of the AUX return signal. They control shelving equalizers having the same properties described above for the EQUALIZER CONTROLS (4).
- (10) MASTER VOLUME CONTROL**
This fader adjusts the overall volume of the STEREO buss signal output by the STEREO OUT jacks (K).
- (11) DCM SELECT SWITCH**
This switch selects between three DCM100 MIDI Mixers connected to the MIXTAB. Each switch position corresponds to a different MIDI channel. The method for connecting two or three DCM100s to one MIXTAB is explained on page 14. This switch should be set to 1 when only one DCM100 is used.
- (12) MODE SWITCH**
This switch selects between the MIXTAB's three modes. The functions of the LEDs above most of the panel controls vary depending on the mode selection, which determines how the MIXTAB handles the discrepancies (between DCM100 mixer parameters and its own control settings) that can occur when scenes are recalled. The three MIXTAB operation modes are explained in detail on page 22 and 23.
- (13) SMOOTH CONTROL**
This knob sets the degree to which the MIXTAB will thin out the MIDI data generated by operation of its controls. If you tend to adjust the control settings with fairly quick movements, you should turn this knob to the left for more thinning. When you change the controls slowly, you can turn it to the right.
- (14) SCENE DISPLAY**
This digital LED shows the number of the currently selected scene. The procedures for selecting, storing, and recalling scenes are described on page 21 and 22.

(15) DIGIT SELECTOR (↔) BUTTON

This button switches between the tens and ones digits of the SCENE display (14). A blinking dot appears in the display to the right of the selected digit. This digit can be raised or lowered using the INCREMENT and DECREMENT buttons (16).

(16) INCREMENT and DECREMENT BUTTONS

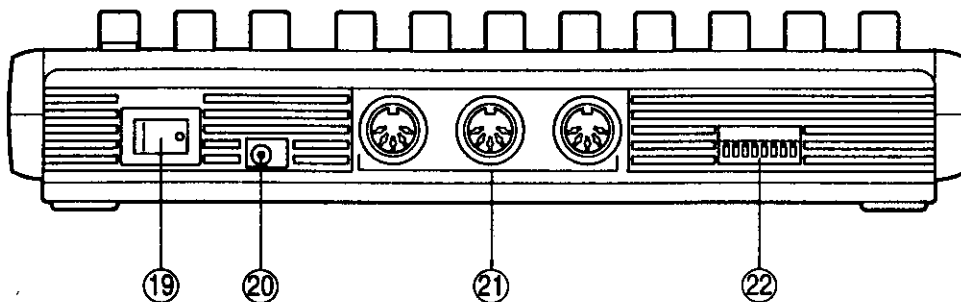
These buttons raise or lower the SCENE display (14) digit selected by the DIGIT SELECTOR button (15). They are also used in combination to initialize the DCM100's scene memory. Never press both of these buttons simultaneously unless you want to initialize the scene memory!

(17) STORE BUTTON

This button stores the current mixer settings in the scene shown by the SCENE display (14). The procedure for storing settings is described on page 21.

(18) RECALL BUTTON

This button recalls the mixer settings for the scene shown by the SCENE display (14). The procedure used to recall a scene is described on page 22.

Rear Panel**(19) POWER SWITCH**

This switch turns the power to the MIXTAB on and off.

(20) AC ADAPTER TERMINAL

The DC cord of the supplied AC adapter should be connected to this terminal before the adapter is plugged into an AC socket.

(21) MIDI TERMINALS

These terminals allow the MIXTAB to exchange MIDI data with other MIDI devices. The IN terminal accepts the input of feedback data from a device such as the DCM100. The OUT terminal transmits control data generated by movement of the MIXTAB's controls. The THRU terminal passes on the data from MIDI IN to other MIDI devices. The proper methods for connecting MIDI devices to the MIXTAB are explained on pages 13 and 14.

(22) DIP SWITCHES

These switches set the MIDI channels which the MIXTAB uses to communicate with connected DCM100 MIDI Mixers, and the circumstances under which it sends them dump requests. The precise meaning of each of these switches is described on page 9 and 10.

SETTING UP THE MIDI MIXER

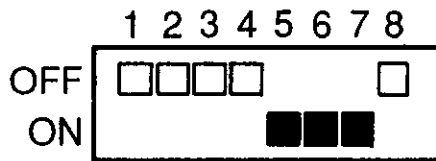
Before you can connect the DCM100 MIDI Mixer to your instruments and audio equipment, you should first check the settings of the DIP switches on the rear panels of both the DCM100 and the MIXTAB you will be using to control it, and then connect the two devices to each other with MIDI cables. The procedures for completing these preparatory tasks are described in detail below.

Make sure the POWER switches ((G) and (19)) of both devices are turned off when changing DIP switch settings or connecting MIDI cables.

Note: It is possible to change DIP switch settings with the power turned on. If you do so, however, any changes you make will not take effect until you turn the device's power off and then on again.

MIXTAB DIP Switches

The MIXTAB has a row of eight DIP switches (22) on its rear panel. These switches set the MIDI channel which the MIXTAB uses to communicate with a connected DCM100, and the circumstances under which it transmits dump requests. The meanings of each of these switches, and the positions they were set in when it left the Fostex factory, are shown in the table below.



Factory setting

SWITCH	DESCRIPTION	SETTING		FACTORY SETTING
		OFF	ON	
1	MIDI channel used to communicate with DCM100	See the table on page 10.		OFF
2				OFF
3				OFF
4				OFF
5	Power on dump request	NO	YES	ON
6	Scene recall dump request	NO	YES	ON
7	Channel offset dump request	NO	YES	ON
8	Unused	Always OFF		OFF

DIP switches 1 through 4 set the MIXTAB's MIDI channel. They can be set in any of sixteen different combinations, which correspond to the sixteen MIDI channels as shown in the table below.

CH.	DIP SWITCH SETTINGS				CH.	DIP SWITCH SETTINGS			
	1	2	3	4		1	2	3	4
1	OFF	OFF	OFF	OFF	9	OFF	OFF	OFF	ON
2	ON	OFF	OFF	OFF	10	ON	OFF	OFF	ON
3	OFF	ON	OFF	OFF	11	OFF	ON	OFF	ON
4	ON	ON	OFF	OFF	12	ON	ON	OFF	ON
5	OFF	OFF	ON	OFF	13	OFF	OFF	ON	ON
6	ON	OFF	ON	OFF	14	ON	OFF	ON	ON
7	OFF	ON	ON	OFF	15	OFF	ON	ON	ON
8	ON	ON	ON	OFF	16	ON	ON	ON	ON

These four switches were set to the OFF position when your MIXTAB left the factory. Thus, the MIXTAB is set to use MIDI channel 1 as its default channel. You can change this setting if you want the MIXTAB to use a different channel.

DIP switches 5 through 7 specify the circumstances under which the MIXTAB will send dump request messages to the DCM100. The DCM100 will respond to these requests with data indicating the values of all its control parameters, thereby informing the MIXTAB of its current status.

DIP switch 5 determines whether the MIXTAB will send a dump request whenever you turn its power on. You should leave this switch in the ON position unless you will be using your MIXTAB to send control data to a MIDI device which is incapable of responding to the dump request.

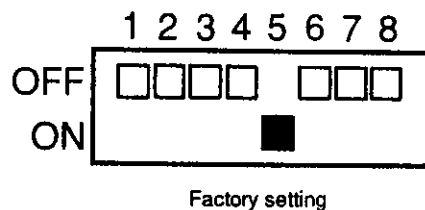
DIP switch 6 determines whether the MIXTAB will send a dump request whenever you use the Scene Recall function (described on page 22) to recall settings which the DCM100 has stored as a scene. This DIP switch should normally be left ON when using the MIXTAB and the DCM100 as a set.

DIP switch 7 determines whether the MIXTAB will send a dump request whenever the DCM SELECT switch (11) setting is changed. You can set this DIP switch to OFF unless you will be using your MIXTAB to control more than one DCM100. (The method for connecting two or three DCM100s to a single MIXTAB is described on page 14.)

DIP switch 8 is not used under the current MIXTAB specification. It should be left in the OFF position at all times.

DCM100 DIP Switches

The DCM100 has eight DIP switches (H) similar to those on the MIXTAB. In addition to the MIDI channel setting, these switches specify the initialization procedure that the DCM100 executes when the power is turned on, and the curve it uses to interpret control messages adjusting the levels of input channels. The meanings of each of these switches, and their factory-set positions, are shown in the table below.



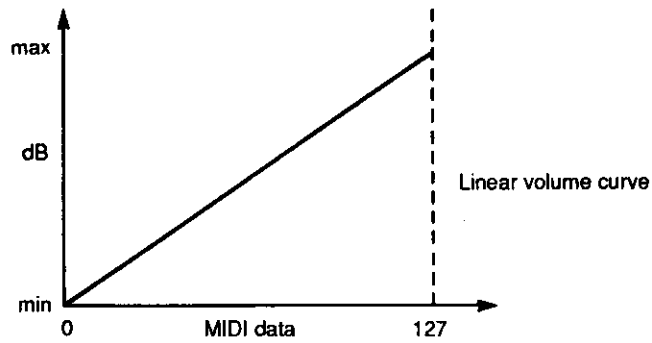
SWITCH	DESCRIPTION	SETTING		FACTORY SETTING
		OFF	ON	
1	MIDI channel used to communicate with MIXTAB	See the table on page 10.		OFF
2				OFF
3				OFF
4				OFF
5	Power on dump	No	Yes	ON
6	Power on settings	No	Yes	OFF
7	Channel volume curve	Linear	Analog	OFF
8	Unused	Always OFF		OFF

DIP switches 1 through 4 set the DCM100's MIDI channel in the manner described for the MIXTAB on the preceding page. You should set the DCM100 to use the same channel as that selected for the MIXTAB. (A DCM100 may be set to a different channel, as an exception to this rule, when two or three DCM100s are connected to a single MIXTAB using the method described on the following page.)

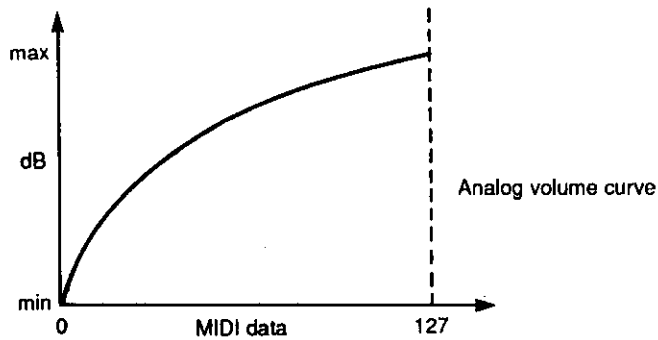
DIP switch 5 determines whether the DCM100 will send a dump of its settings automatically whenever you turn its power on. You should leave this switch in the ON position when using the DCM100 together with a MIXTAB.

DIP switch 6 selects the parameter values the DCM100 will use whenever it is turned on. When this switch is set to OFF — its default position — the DCM100 will use the initial settings listed on page 26. When it is set to ON, the DCM100 will automatically recall the settings which you store as Scene 0. (The Scene Store function is described on page 21.)

DIP switch 7 selects the volume curve that the DCM100 uses to interpret the control messages adjusting the levels of its input channels. The MIXTAB transmits these control messages in response to movements of its input faders (1). The linear volume curve, used when this switch is set to OFF, assigns decibels to MIDI data values in a linear relationship.



The analog volume curve produces a fader action much like that provided by the faders on most analog mixers. We recommend using this setting for most mixing tasks.

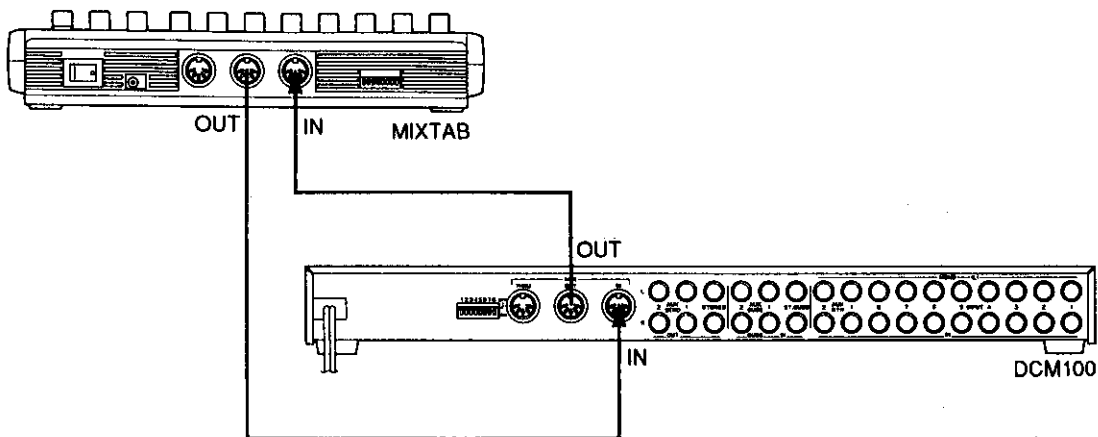


DIP switch 8 is not used under the current DCM100 specification. It should be left in the OFF position at all times.

MIDI Connections

You will need two MIDI cables to connect the DCM100 to a MIXTAB. One cable should connect the MIXTAB's MIDI OUT terminal (22) to the DCM100's MIDI IN (1). This cable will carry control data from the MIXTAB to the DCM100. The other cable should connect the DCM100's MIDI OUT and the MIXTAB's MIDI IN, to carry feedback data from the DCM100.

Note: Be sure to turn off the power to both the MIXTAB and the DCM100 when making or changing MIDI cable connections. Use only high-quality MIDI cables to ensure error-free communication.



Multiple DCM100s

It is possible to control up to three DCM100s using a single MIXTAB. To do so, you will need a MIDI merge box with at least three MIDI IN terminals (or a MIDI patch bay possessing a MIDI merge function).

First, you will have to set each of the DCM100s to a different MIDI channel. If you connect three DCM100s to a MIXTAB, the MIXTAB will communicate with them using three consecutive MIDI channels: the channel (x) selected by the MIXTAB's DIP switches (22), and the next two channels ($x+1$ and $x+2$). You can switch between these three channels using the DCM SELECT switch (11) on the MIXTAB control panel.

If you set your MIXTAB to use channel 11, for example, you will have to set the DIP switches (H) of your DCM100s so that they will use channels 11, 12, and 13, as shown below.

DEVICE	CH.	DIP SWITCH SETTINGS				DCM SELECT
		1	2	3	4	
MIXTAB	11	OFF	ON	OFF	ON	
DCM #1	11	OFF	ON	OFF	ON	1
DCM #2	12	ON	ON	OFF	ON	2
DCM #3	13	OFF	OFF	ON	ON	3

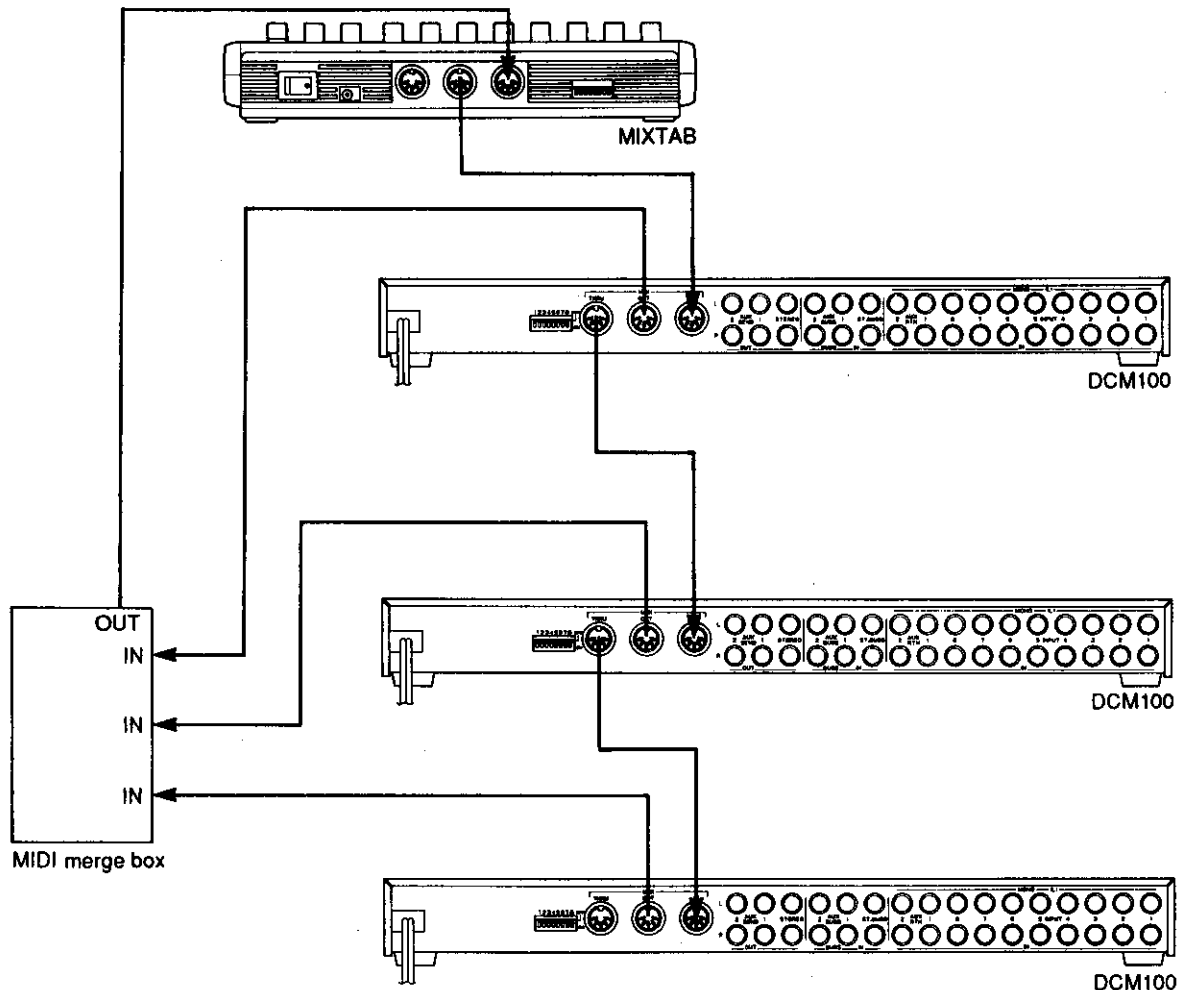
Channel 1 is considered to be the next channel after channel 16. Hence, if you set the MIXTAB to use channel 16, you must set the DCM100s to MIDI channels 16, 1 and 2.

If you connect only two DCM100s to a MIXTAB, you can use any two of the three consecutive channels specified by the MIXTAB channel setting.

Keep in mind, however, that the DCM SELECT switch settings you use to switch between the DCM100s will vary with the channels you use. Thus, if you were to connect a MIXTAB set to channel 11 to two DCM100s using channels 11 and 13, you would switch the DCM100s by moving the DCM SELECT switch to the "1" and "3" positions. The DCM SELECT switch "2" position would be useless in this case.

When connecting multiple DCM100s to a single MIXTAB, you should also set the MIXTAB's DIP switch 7 (22) to the ON position. This will cause the MIXTAB to transmit a dump request each time you select a different DCM100. The newly selected DCM100 will return data informing the MIXTAB about its settings in response.

Once you have finished setting the DIP switches on the MIXTAB and all DCM100s to be connected to it, you can start making your MIDI connections. Connect the MIDI OUT terminal (22) on the MIXTAB to the MIDI IN terminal (I) of the first DCM100, as described on the preceding page. Then connect the MIDI IN of each additional DCM100 to the MIDI THRU of the previous one. Finally, connect the MIDI OUT terminal of each DCM100 to the MIDI merge box, and the output of the merge box to the MIDI IN terminal on the rear of the MIXTAB.



Powering Up Your System

The DCM100 and the MIXTAB can normally be turned on in any order with respect to each other, unless you have set DIP switch 5 on either device to the OFF position. If you have done so for some reason, turn the devices on in the order shown below.

DCM100 DIP SWITCH 5	MIXTAB DIP SWITCH 5	POWER ON SEQUENCE
OFF	ON	Turn DCM100 on first.
ON	OFF	Turn MIXTAB on first.

As long as you turn the devices on the proper order, the DCM100 will dump its current parameter settings to the MIXTAB after the power is turned on. If this dump does not take place — as will happen in any case if you set DIP switch 5 OFF on both devices — the MIXTAB's controls will not match the DCM100's internal settings.

When turning your system on or off, keep in mind that the devices at the output end — such as amplifiers or PA equipment — should always be turned on last. This simple precaution will prevent damage to your speakers by output surges from the mixer or connected instruments. (Amps and PA equipment should also be turned off first, for the same reason.)

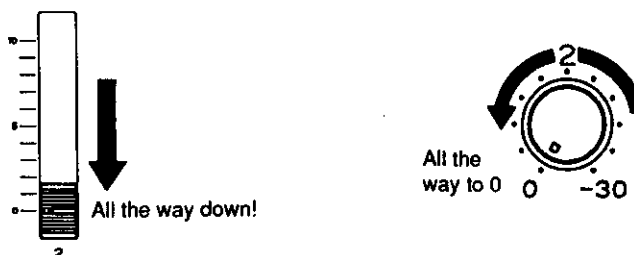
CONNECTING AUDIO EQUIPMENT

There is virtually no end to the variety of instruments and audio devices that you can connect to the DCM100. In this section we explain the fundamental principles that you should follow when connecting equipment to the DCM100. When connecting devices which do not fit the patterns described here, or when attempting more advanced applications, refer to the manuals for the equipment you wish to connect.

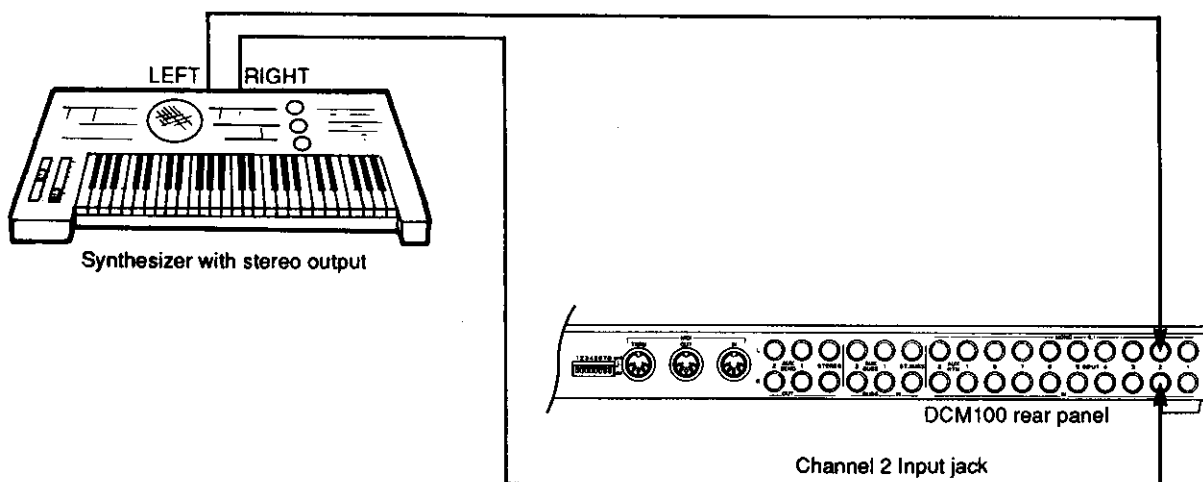
Connecting Instruments

There are two steps to connecting an instrument to the DCM100: after plugging it into the mixer, you must adjust the trim. Before you start, turn on the power to both the DCM100 and the MIXTAB. (Be sure to observe the cautions on the bottom of the preceding page when powering up your system.)

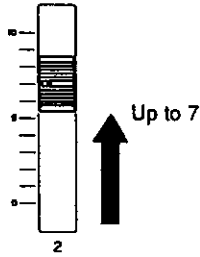
Before you connect an instrument, zero the volume for the channel it will use by sliding its INPUT fader (4) down to the "0" mark, and turn its INPUT TRIM control (A) all the way to the left. (If you plug instruments into the DCM100 with the channel volume turned up, the resulting noise could damage the speakers of any connected PA equipment.)



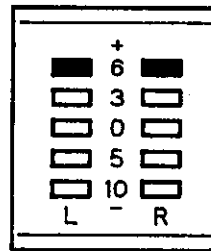
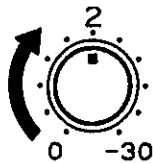
Now you can plug the instrument's output cables into the INPUT jacks (O) for an open channel. Use both of a channel's jacks if the instrument has stereo output, or the upper jack only for instruments with mono output.



Next, raise the channel's fader to a level of about 7.

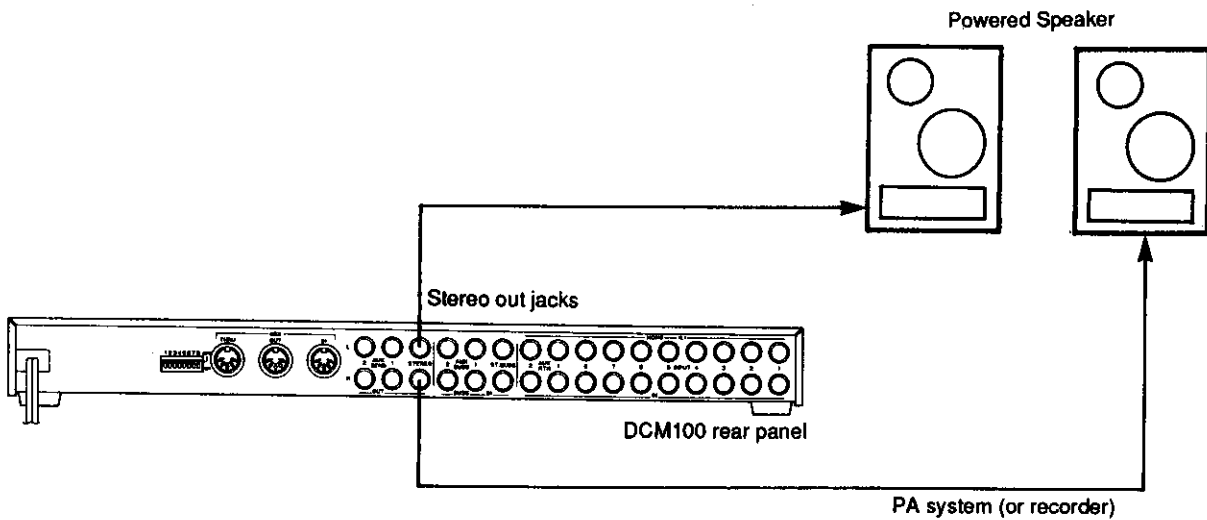


Then, while playing a few notes, adjust the INPUT TRIM control until the signal strength is appropriate. (The LEVEL meter (D) should peak somewhere around the "0" or "3" marks.)



Level meter peak

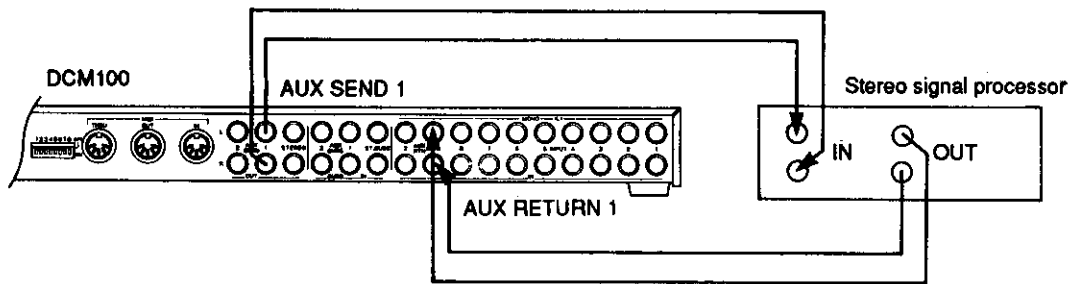
You will no doubt want to connect the DCM100 to an amplifier, PA system, or recorder. You can use the STEREO OUT jacks (K) on the rear panel for this purpose. Again, be sure to turn off the power to your amplifier or PA system when connecting it to the DCM100, in order to avoid damaging the speakers.



Connecting Signal Processors

Whether you will be using your MIDI mixer system for recording or live performances, you will probably want to connect it to a signal processor or two to add reverb and other effects to your sound. We recommend using a signal processor capable of handling both stereo input and stereo output.

Connect the signal processor's input jacks to one of the DCM100's sets of AUX SEND jacks (J), and its output jacks to the corresponding AUX RETURN jacks (N).



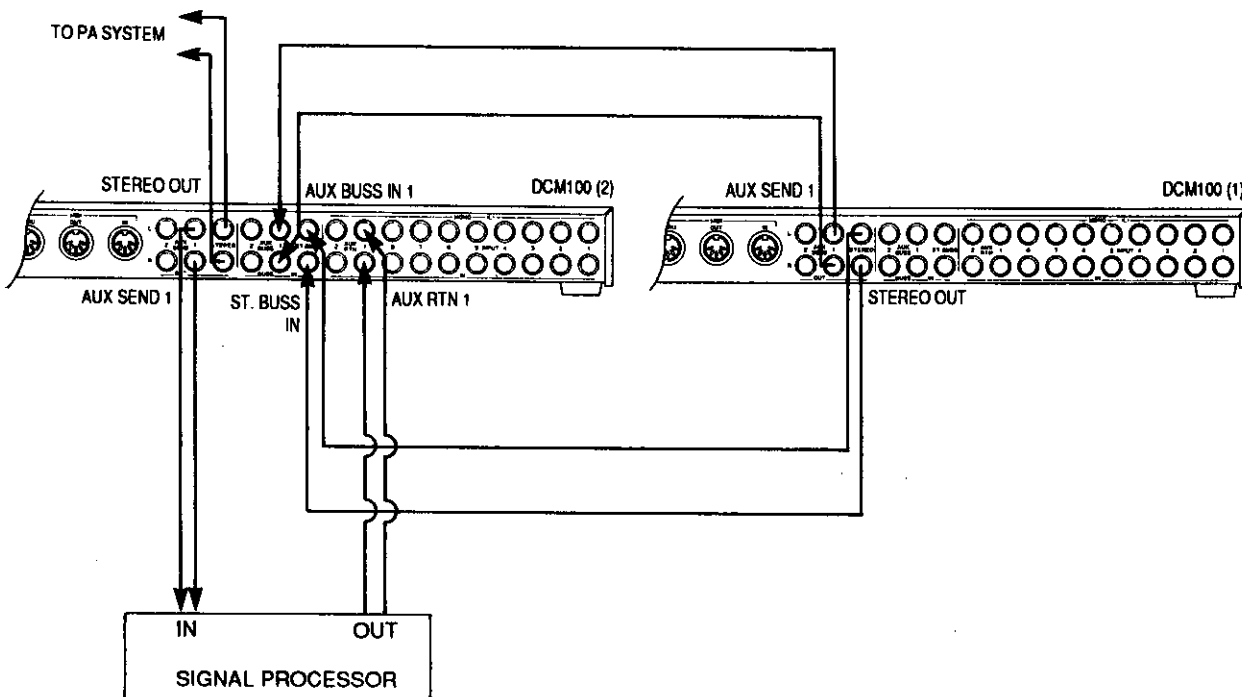
If your processing device provides only mono output, use the upper AUX RETURN jack. (You can connect either AUX SEND jack to a mono input signal processor; however, the signal that is sent may vary somewhat depending on your choice if stereo signals are being mixed by channels using the AUX buss in question.)

Cascading Mixers

If you use more than one mixer, you may wish to combine their output by linking them together in what is known as a "cascade" configuration. This arrangement will allow you to feed the combined output from all your mixers into a single PA system. If you use a DCM100 as the final mixer in the chain, it will also give you the option of running signals from each mixers through the same signal processing units.

Such an arrangement may prove particularly useful if you have connected multiple DCM100s to a single MIXTAB using the method described on page 13. The figure below shows the connections needed for a simple two-mixer cascade featuring two DCM100's.

In this figure, the STEREO OUT jacks (K) of the first DCM100 are connected to the STEREO BUSS IN jacks (M) of the second. Also, the AUX SEND jacks (J) of the first mixer are connected to the AUX BUSS IN jacks (L) of the second. This makes it possible to process signals from both mixers using the same stereo reverb and delay units. Note that it would be possible to add another mixer to this cascade by sending its output to the BUSS IN jacks of the first mixer.



USING THE MIXER FUNCTIONS

The DCM100 MIDI Mixer works much like any conventional mixer, save that all adjustments (other than input signal gain adjustment) are made digitally. Despite this internal difference, you can use the controls of the MIXTAB much as you would those of any other mixer.

(The MODE switch (12), the SMOOTH control (13), and the scene memory controls in the lower right corner of the MIXTAB's upper panel are exceptions to this rule, as they are dedicated to functions which are normally only available on digital mixers.)

To help you get an idea how the DCM100 functions as a mixer, this page describes briefly the flow of signals through the DCM100 mixer. In order to make this discussion easier to follow, we will explain the DCM100's functions in terms of the corresponding MIXTAB controls. For a more detailed explanation of these controls, see the description of the MIXTAB upper panel on pages 6 and 7.

Signal Flow

The signals input to each the INPUT jacks (O) for each channel are sent to the STEREO buss at levels set by the INPUT faders (1) after their stereo positions (or balance) and tone quality are adjusted by the PAN (3) and EQUALIZER controls (4).

The same signals are also sent to the AUX busses — one of the two AUX busses being selected for each channel by the AUX 1/2 selectors (6) — at levels set by the AUX controls (7). There they merge with signals input to the AUX BUSS IN jacks (L).

The AUX buss signals are output from their AUX SEND jacks (J) at levels set by the AUX SEND controls (7), and returned via the AUX RETURN jacks (N). The returned signals are sent to the STEREO buss after their levels and tone quality are adjusted by the AUX RETURN (8) and AUX EQUALIZER (9) controls.

In the STEREO buss, the returned signals join the original input signals and any signals input directly to the STEREO buss via the STEREO BUSS IN jacks (M). Finally, the STEREO buss signal is output from the STEREO OUT jacks (K) at a level set by the MASTER VOLUME control (10).

USING THE MIDI FUNCTIONS

The DCM100 and MIXTAB possess several functions which are normally not available on conventional mixers. Their Scene Store function allows you to save the current mixer settings as one of 100 "scenes" which the DCM100 will keep handy for instant recall. Also, the Scene Recall function is used to recall the settings of a selected scene.

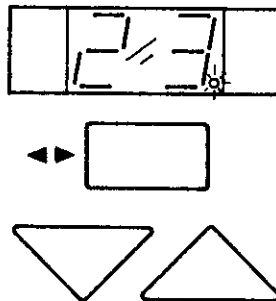
In addition to these scene memory functions, the MIXTAB has some special functions of its own which reflect its special status as a MIDI controller. For starters, we have already described (on page 13) the DCM SELECT switch (11) which selects between the three MIDI channels it uses to communicate with connected DCM100s.

Each of the MIXTAB's mixer controls is accompanied by an LED which indicates whether or not the current MIXTAB control settings match the internal settings of the DCM100 being controlled. You can adjust the operation of these LEDs by using the MODE switch (12) to select the operation mode most appropriate to your needs. Finally, the Smoothing function allows you to adjust the MIXTAB data transmission rate to match your mixing style.

The Scene Store Function

Use the simple procedure described below to save the current mixer settings in the DCM100's scene memory.

1. Use the DIGIT SELECTOR button (15) and the INCREMENT or DECREMENT buttons (16) to change the scene number in the display (14). You can select a scene number from 0 to 99.



2. Press the STORE button a second time to store the settings to the selected scene number.

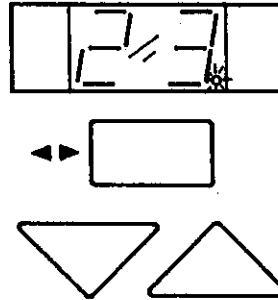


That's all there is to it. The scene number in the DISPLAY will blink for a few moments as the data is being stored. Wait until it stops blinking before moving any of the MIXTAB's controls.

The Scene Recall Function

The procedure for recalling a scene is much the same as that used to store it.

1. Use the DIGIT SELECTOR button (15) and the INCREMENT or DECREMENT buttons (16) to change the scene number in the display (14). You can select a scene number from 0 to 99.



2. Press the RECALL button a second time to recall the settings for the selected scene.



As with the Scene Store function, the scene number will blink for a few moments as the data is being recalled. Wait until it stops blinking before moving any of the MIXTAB's controls.

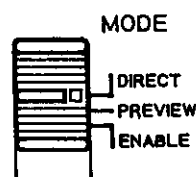
Scene Memory Initialization

The MIXTAB allows you to initialize the contents of the DCM100's memory, if you wish. To do so, press and hold both the INCREMENT and DIGIT SELECTOR buttons for about three seconds. The letters "Ac" will appear in the SCENE display (14), and the parameters of all scenes in the DCM100's scene memory will be reset to the initial values listed on page 26.

MIXTAB Operation Modes

Whenever you use the Scene Recall function to recall mixer settings, discrepancies can occur between the DCM100 parameters and their corresponding MIXTAB control settings. That is to say, the DCM100 will be using different mixer settings than those indicated by the MIXTAB upper panel controls.

To circumvent trouble which could be caused by such discrepancies, the MIXTAB has three operation modes, each of handles the discrepancies in a different manner. These modes are selected by the MODE switch (12).

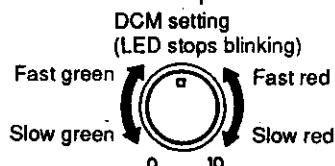


● **Direct mode**

Direct mode allows you to control the DCM100 much as you would operate a conventional mixer. In this mode, the MIXTAB will immediately send MIDI control data to the DCM100 whenever its controls are moved. The moment you move a control, its LED will light up orange to indicate that the MIXTAB is sending data. This mode thus allows you to make fast changes to the DCM100's parameters without concern for discrepancies which may exist between those values and the MIXTAB control settings. If there are any discrepancies, however, you may find that small changes in the positions of MIXTAB controls may create very large, sudden changes in the sound output by the DCM100.

● **Preview mode**

When you recall mixer settings with the MIXTAB in this mode, the LEDs above some or all of the MIXTAB's controls will start blinking red or green to show where discrepancies exist between controls and parameters.



The manner in which the LEDs blink will give you a clue as to the nature of the discrepancy. A control whose LED blinks green is set to a value lower than (or to the left of) the corresponding DCM100 setting. One whose LED blinks red is set to a value higher than (or to the right of) the DCM100 setting.

The speed with which the LED blinks tells you how close the MIXTAB and DCM100 settings are to each other. This will become apparent if you try moving the control. The LED will blink faster as the MIXTAB control approaches the DCM100 value, and more slowly as it moves away from it. It will stop blinking altogether when the MIXTAB control setting matches the DCM100 parameter value exactly.

The MIXTAB will not transmit any MIDI data — and so cannot affect the DCM100's settings — while it is in this mode. The Preview mode is thus useful when you want to match all of the MIXTAB's controls to the DCM100's settings before switching to Direct mode to make any changes.

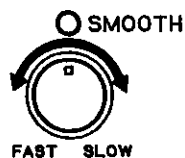
● **Enable mode**

The Enable mode functions like Preview mode up to the point where a MIXTAB control matches the DCM100 setting. Once the settings match, the LED will light up in orange as the MIXTAB begins transmitting data to adjust the DCM100 parameter value. This mode is therefore like a combination of the Preview and Direct modes. It allows you to make changes more quickly than in Preview mode; however, it is somewhat less precise.

Note: Please bear in mind that the Scene Store function, described on the preceding page, has nothing to do with the MIXTAB's control settings. It saves only the DCM100's internal settings. If the LEDs above any of the MIXTAB's controls are blinking red or green when you use this function, then the mixer settings being saved by the Scene Store function are not accurately reflected by the MIXTAB controls!

The Smoothing Function

The MIXTAB adjusts the DCM100's parameter settings by describing movements of its controls as finely-incremented MIDI data. Because these increments are so fine, fast movements of a control can produce more data than the DCM100 really needs. To compensate for this, the MIXTAB has a built-in Smoothing function which regulates the amount of MIDI data transmitted in response to control movements. This function is controlled by the SMOOTH control (13).



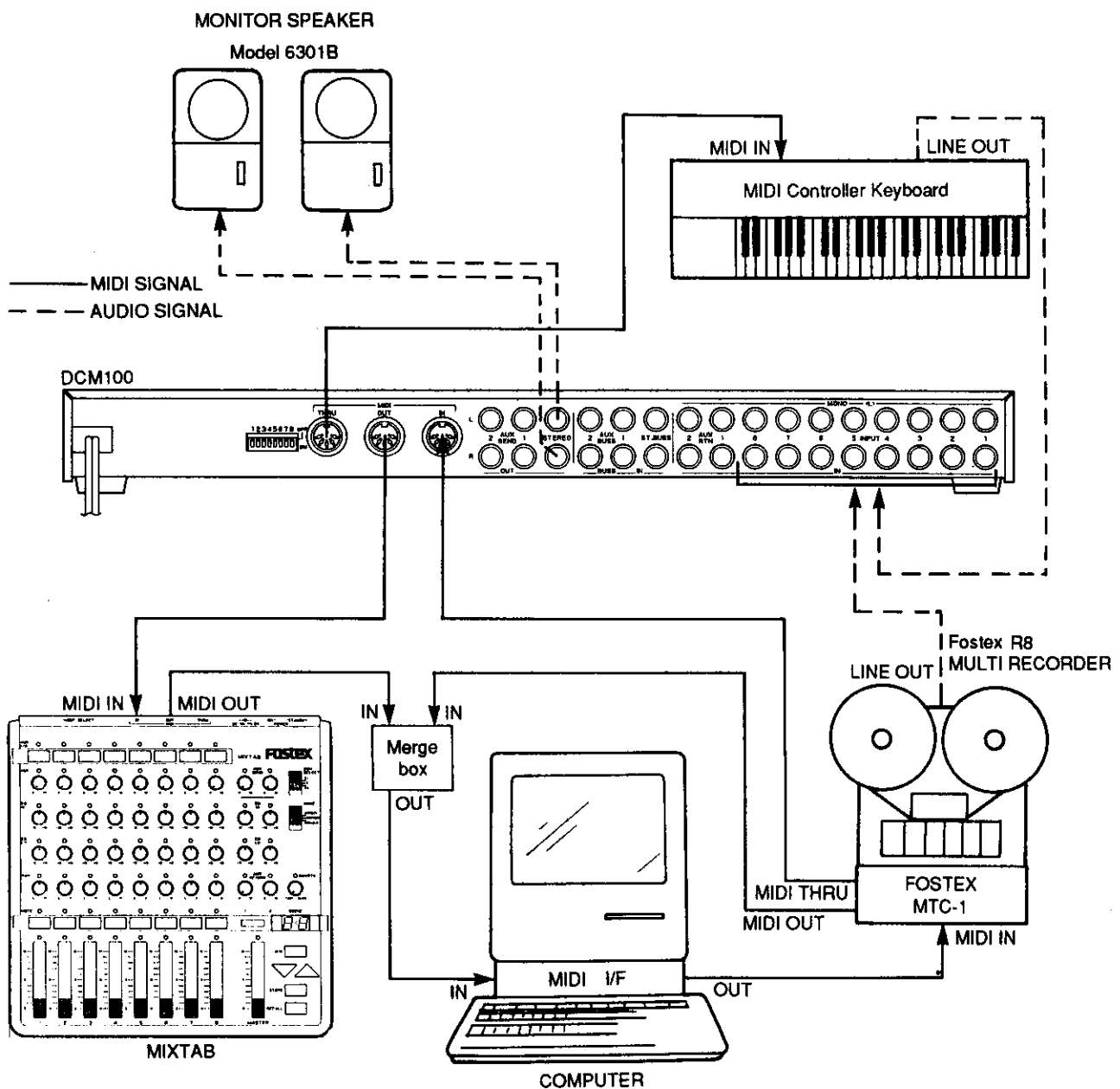
This control determines how much the MIXTAB will thin out the MIDI data generated by operation of its controls. If you will be adjusting your control settings with fairly quick movements, you should turn this knob to the left to thin the data out. If you move the controls slowly, you can turn it to the right to send more data.

Try turning the SMOOTH control to the left and right while raising and lowering a fader at what you consider a normal rate. If the SMOOTH control setting is too slow for your control movements, too much data will be sent and the mixer response will lag. If it is set too fast, the mixer will not get enough data for smooth adjustments, and so respond with jerky-sounding changes.

MIDI DATA SPECIFICATIONS

Throughout this manual we have described the operation of DCM100 parameters mainly in terms of the MIXTAB controls used to adjust them. This description, if practical, is also rather superficial. It overlooks the fact that the MIXTAB controls do not affect the sound directly — as do those of conventional analog mixers — but through the intermediation of MIDI data.

If you will be using the DCM100 and the MIXTAB as a set, then you may not have to worry about the format of the MIDI data they use to communicate with each other. However, the DCM100 and MIXTAB do not have to be used as a set. The DCM100 can also be controlled by other devices: you might, for example, want to control it using Cubase, a sequencing program released for the Macintosh by the Steinberg Corp.



If you are interested in such advanced applications, then you will need to know the data format used by these devices. The DCM100 and the MIXTAB use only two types of MIDI messages: control change and program change messages.

Control Change Messages

The DCM100 and MIXTAB transmit information regarding mixer parameters and control operations using control change messages. The MIDI control change message consists of a status byte having a hexadecimal value of BnH (the "n" indicates the MIDI channel being used) followed by two data bytes with decimal values from 0 to 127. The first data byte (the "control number") indicates the control or parameter being changed, whereas the second indicates its new value.

The following table lists the control numbers for the DCM100's mixer-related parameters. The number of the MIXTAB control which transmits each control number is given next to the parameter name. The control numbers for each parameter are followed by notes about the meaning of the third data byte, and the default values set for this byte when power to the DCM100 is first turned on.

The MIXTAB sends control change messages bearing the appropriate control numbers when its controls are moved. The DCM100 sends the same messages in response to received dump requests (control 49, explained on the following page) to inform the requesting device about its current status. When the dump request message specifies all parameters, it responds with all of the above control change messages, plus control change message no. 48 indicating the smoothing level. (It sends the same dump settings when its power is turned on if its DIP switch 5 is set to ON.) The DCM100 ignores dump requests specifying control numbers not listed in the table above.

In addition to these mixer-related control change messages, the DCM100 and MIXTAB use the following messages to communicate about their MIDI-related functions:

PARAMETER/FUNCTION	CTRL NO.	MEANING OF SECOND DATA BYTE
Dump Request	49	0 — 126 = requested parameter 127 = all parameters
Scene Store	50	0 — 99 = scene number
Scene Clear	51	0 — 99 = scene number 127 = all scenes

The MIXTAB transmits a Dump Request message specifying all parameters (second data byte = 127) when its power is turned on (if DIP switch 5 is ON), when a scene is recalled (if DIP switch 6 is ON), or when the DCM SELECT switch (11) is moved (if DIP switch 7 is ON). It does not transmit dump requests for individual parameters.

The MIXTAB transmits control change message number 51 when the INCREMENT (16) and DIGIT SELECTOR (15) buttons are pressed together to initialize the DCM100's scene memory. It is not capable of transmitting messages to initialize individual scenes, however. When the DCM100 receives this message, it sets the values for the parameters of the specified scene, or all scenes, to the initial values listed in the table on the preceding page.

Program Change Messages

The DCM100's Scene Recall function is invoked using the MIDI program change message rather than a control change number. The program change message consists of a status byte having a hexadecimal value of CnH (the "n" indicates the MIDI channel being used), followed by a data byte with a decimal value of 0 to 127, indicating the selected program number.

The MIXTAB transmits, and the DCM100 receives, only messages specifying program numbers from 00 to 99. The MIXTAB follows every program change message it transmits with a dump request message (control change 49) if its DIP switch 6 is set to ON.

TROUBLESHOOTING GUIDE

PROBLEM	CAUSE	SOLUTION
Can't turn on power to the MIXTAB.	The MIXTAB AC adapter is not connected properly.	Check the AC adapter connections at both the AC and MIXTAB ends.
The MIXTAB and DCM100 settings don't match after power is turned on.	The MIXTAB and DCM100 haven't been turned on in the proper order.	The order in which the MIXTAB and DCM100 should be turned on depends on their DIP switch settings. Check the explanation on page 13, and power up the devices in the proper order.
The MIXTAB won't control the DCM100.	<ol style="list-style-type: none"> The MIXTAB and the DCM100 are set to use different MIDI channels. The MIDI cables are not connected properly. 	<ol style="list-style-type: none"> Check the DIP switches ((H) and (22)) to make sure the DCM100 and MIXTAB channel settings match. (Be sure to turn the power off when changing DIP switch settings.) Also check the position of the DCM SELECT switch (11). Make sure the MIDI OUT on the MIXTAB is connected to the MIDI IN on the DCM100, and vice versa.
The MIXTAB can't change mixer settings.	The MODE switch (12) is set to "PREVIEW".	The MIXTAB can select scenes in Preview mode; however, it will not change the DCM100's mixer settings in this mode. Set the MODE switch (12) to either "DIRECT" or "ENABLE" when adjusting mixer settings.
The headphones produce no sound.	The PHONES VOLUME control (B) is set too low.	Turn up the PHONES VOLUME control (B) located on the DCM100 front panel.
The sound output by the DCM100 is distorted.	The INPUT TRIM controls (A) for the distorted channels are set too high.	Following the instructions on page 14, readjust the trim for affected channels to match the output level of the connected instruments.
The input to a particular channel is too low.	<ol style="list-style-type: none"> The INPUT TRIM control (A) or INPUT fader (1) for the channel is set too low. A microphone is connected to the channel in question. 	<ol style="list-style-type: none"> Increase the trim for the channel, following the instructions in page 14. The DCM100 is not designed to accommodate mike level input; therefore, it may not be possible to achieve a suitable input level.
Connected signal processors have no effect on a channel.	<ol style="list-style-type: none"> The channel in question is not switched to the correct AUX buss. The AUX send volume for the channel in question is set too low. 	<ol style="list-style-type: none"> Press the AUX 1/2 selector (6) to switch a channel between the DCM100's two AUX busses. Turn up the AUX control (5) for the channel to increase the signal being sent to the AUX buss. Also, make sure the AUX SEND (7) and AUX RETURN (8) controls for the selected AUX buss are set to appropriate levels.

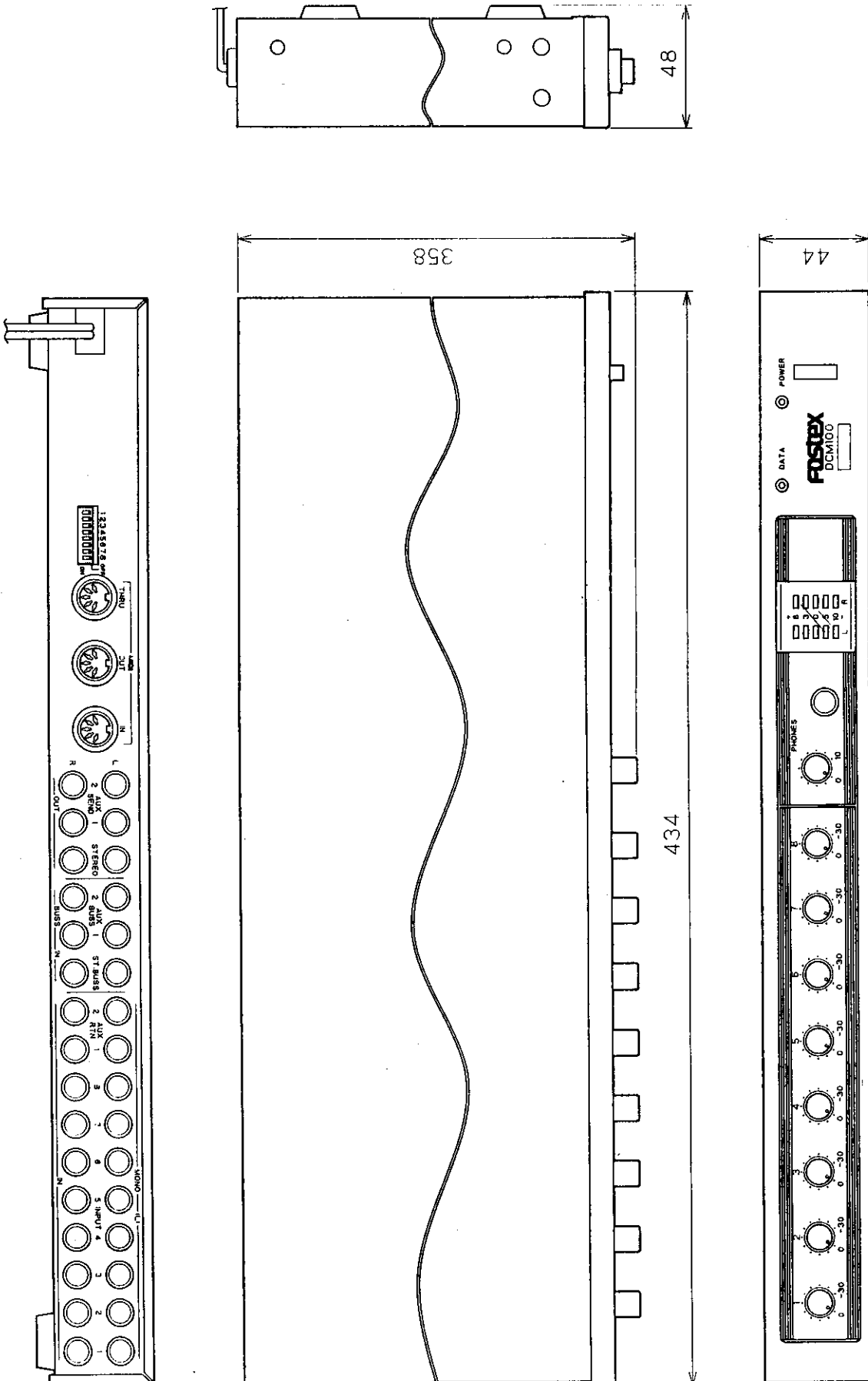
DCM100 SPECIFICATIONS

LINE INPUT 1 — 8 (L,R)	
Input impedance	30 k Ω
Nominal input level	0 dBV
Minimum input level	-30 dBV
AUX RETURN 1 — 2 (L,R)	
Input impedance	30 k Ω
Nominal input level	-10 dBV
BUSS IN (STEREO, AUX 1, AUX 2) (L,R)	
Input impedance	20 k Ω
Nominal input level	-10 dBV
STEREO OUTPUT (L,R)	
Output load impedance	10 k Ω or greater
Nominal output level	-10 dBV
AUX SEND 1 — 2 (L,R)	
Output load impedance	10 k Ω or greater
Nominal output level	-10 dBV
HEADPHONES	
Output load impedance	8 — 50 Ω
Maximum output level	100 mW/8 Ω
EQUALIZER (SHELVING)	
High	10 kHz, ± 15 dB
Low	100 Hz, ± 15 dB
FREQUENCY RESPONSE	
Line input	20 Hz — 20 kHz (± 1 dB)
Headphone output	80 Hz — 20 kHz (+1/-3 dB)
SIGNAL/NOISE RATIO	
	78 dB/WTD
DISTORTION	
Overall	0.03% (1 kHz/-10 dBV)
Headphones	0.7% (at 8 Ω , 1 kHz/100 mW)
CROSSTALK	
	70 dB (at 1 kHz)
POWER REQUIREMENT	
	120 VAC, 60 Hz, 15 W
	230/240 V \sim , 50 Hz, 15 W
DIMENSIONS (W \times D \times H)	
	434 \times 358 \times 44 mm
WEIGHT	
	Approx. 6 kg

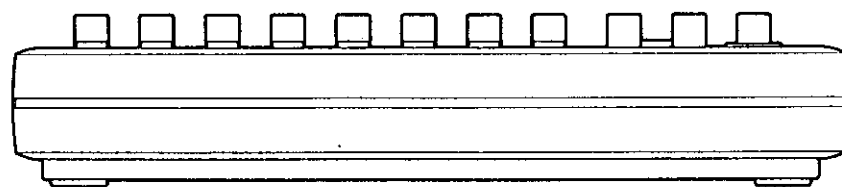
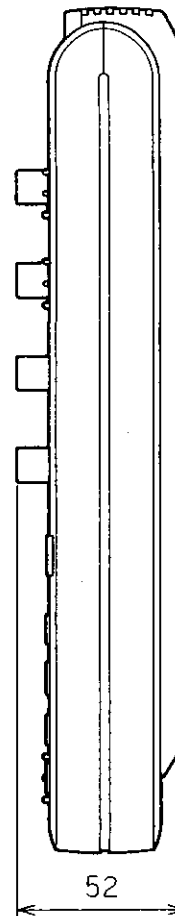
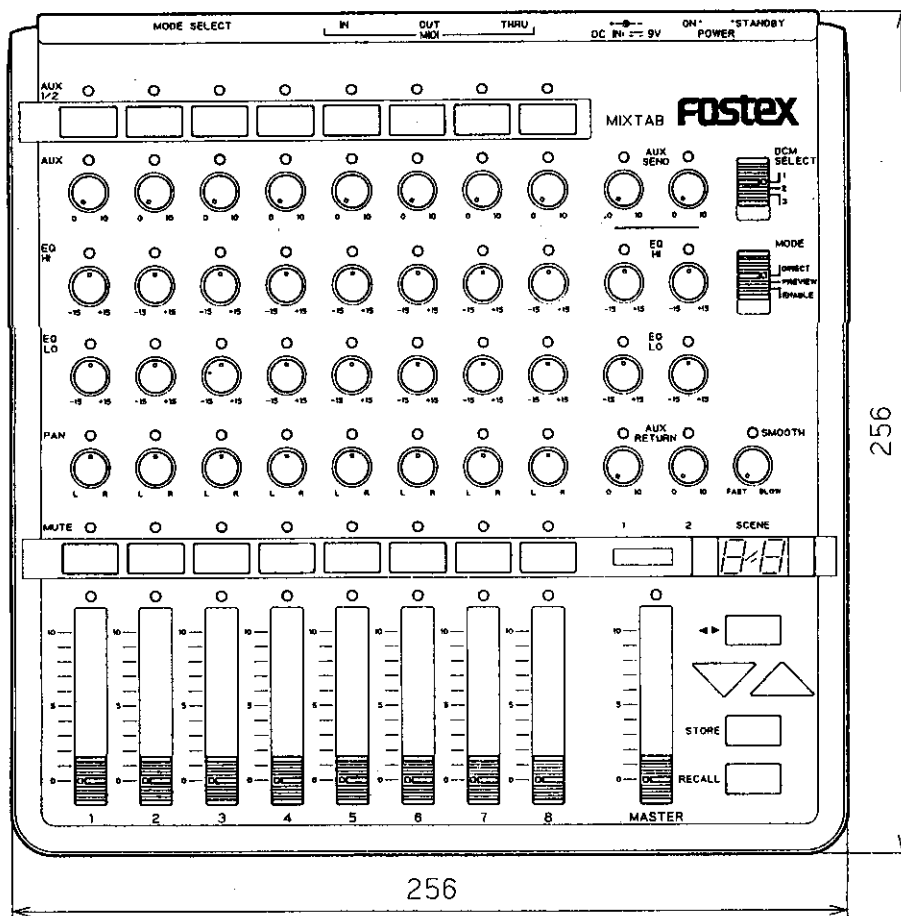
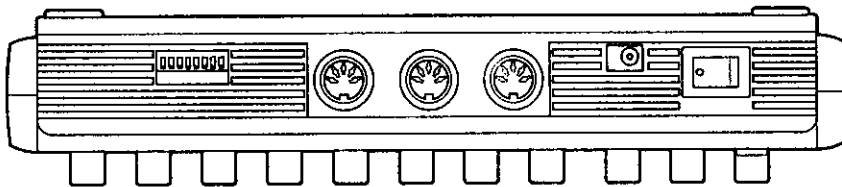
MIXTAB SPECIFICATIONS

POWER REQUIREMENT	DC 9 V, 200 mA (Fostex AC Adaptor)
DIMENSIONS (W \times D \times H)	256 \times 256 \times 52 mm
WEIGHT	Approx. 1 kg (adaptor excluded)

DCM100 DIMENSIONAL DRAWINGS



MIXTAB DIMENSIONAL DRAWINGS



Fostex

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