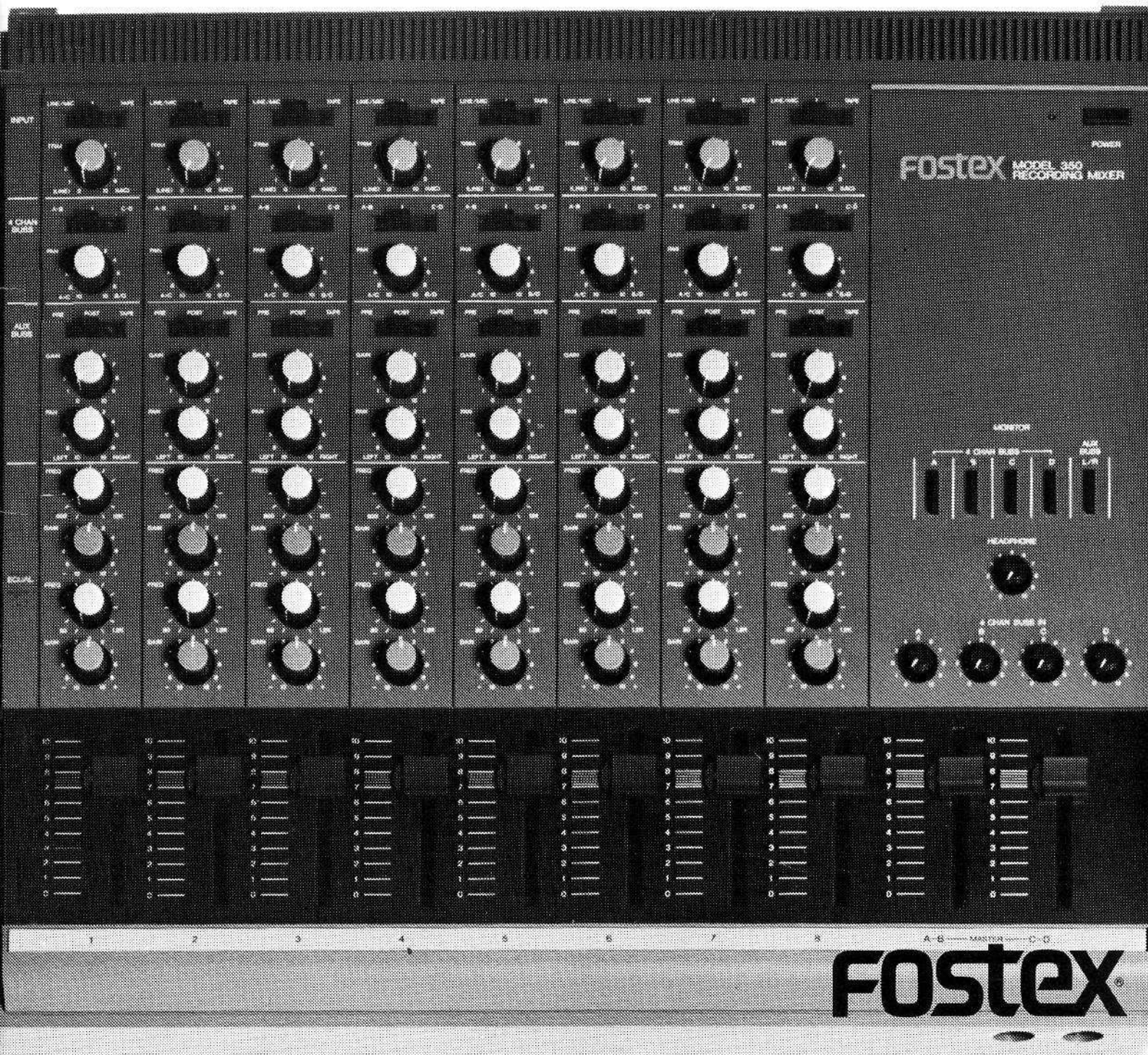


# Model 350

RECORDING/MIXER

## Owner's Manual

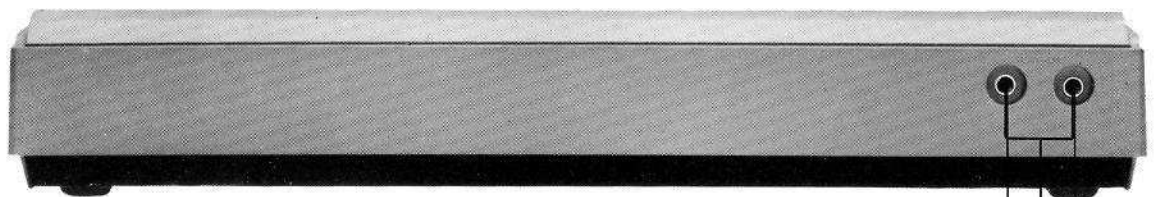
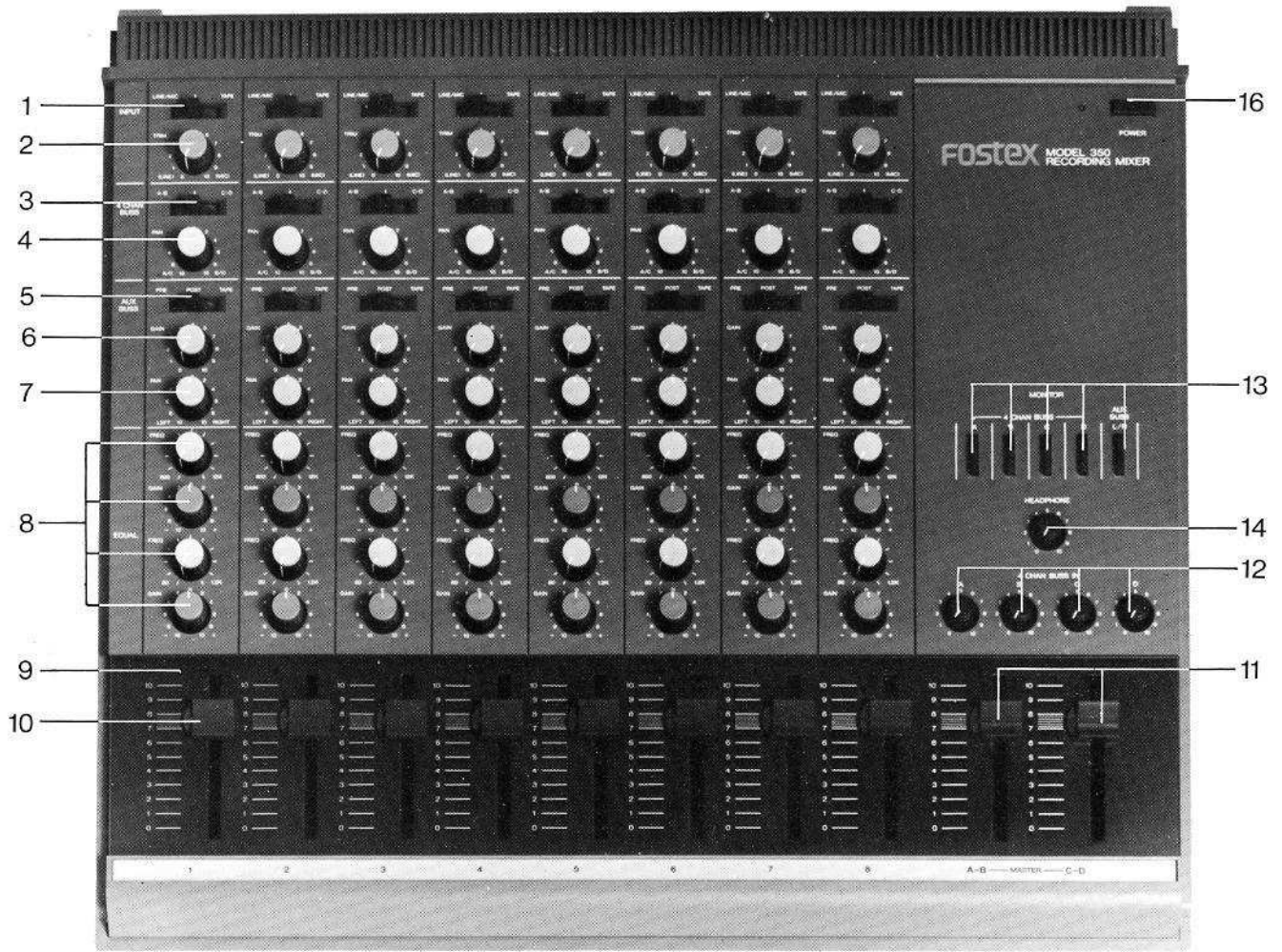


<b>TABLE OF CONTENTS</b>		<b>PAGE</b>
<b>SECTION 1</b>	Feature Descriptions	2
<b>SECTION 2</b>	Introduction	4
<b>SECTION 3</b>	Interconnections & Installation	4
<b>SECTION 4</b>	External Effects & Processing	5
<b>SECTION 5</b>	Using the Parametric Equalizer	6
<b>SECTION 6</b>	Multitrack Applications	7
<b>SECTION 7</b>	AV Production/Disco Applications	9
<b>SECTION 8</b>	P.A. Applications	10
<b>SECTION 9</b>	Maintenance	11
<b>SECTION 10</b>	Accessories	11
<b>SECTION 11</b>	Block Diagram	12
<b>SECTION 12</b>	Specifications	13
<b>SECTION 13</b>	Bibliography	14
	Safety Instructions	15

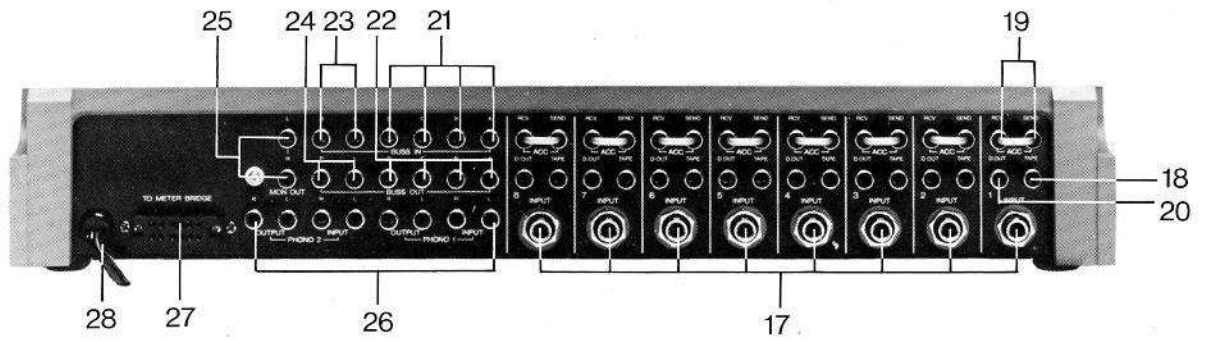
**WARNING: To avoid possible electric shock hazard,  
do not expose this appliance to rain or moisture.  
There are no user-serviceable parts inside.  
Refer servicing to qualified service personnel.**

Figure, 2-1

CONTROL LAYOUT



REAR PANEL



## SECTION 1 FEATURE DESCRIPTIONS

### 1. INPUT SELECTOR.

A three position switch to select which of the signals applied to the input connectors is to be routed to the preamplifier and fader.

LINE/MIC: In this position, signal applied to the input phone jack on the rear panel is routed to the preamplifier.

OFF: The input signals are shut off completely.

TAPE: The signal applied to the TAPE connector on the rear panel is routed to the preamplifier.

### 2. INPUT LEVEL TRIM.

When the input selector is set at Line/Mic position, this TRIM control adjusts gain of the preamplifier over a range of 0 to 50 dB.

Clockwise: Maximum gain, which matches the nominal level of most microphones.

Counter-clockwise: Minimum gain, for nominal line level of  $-10\text{dBV}$ , or  $0.3\text{V r.m.s.}$

When the input selector is set at Tape position, this TRIM control adjusts gain of the preamplifier over a range of 0 to 30 dB.

Clockwise: Maximum gain of  $20\text{dB}$  and thus matches a level of  $-30\text{dBV}$  ( $0.01\text{V}$ ).

Counter-clockwise: Minimum gain ( $0\text{ dB}$ ) and thus matches a level of  $-10\text{dBV}$ , or  $0.3\text{V r.m.s.}$

### 3. 4 CHANNEL BUSS SELECTOR.

In combination with the pan control located directly beneath, this switch assigns the signal to the 4 channel buss output group.

A-B: This signal will appear at output A or B or both, depending on the pan control position, and its final level determined by the left-most master fader.

OFF: The signal is muted at this point.

C-D: The signal will appear at output C or D or both, depending on the pan control position, and its final level determined by the right-most master fader.

### 4. PAN CONTROL.

Distributes the signal in panoramic fashion between 4 channel buss outputs A-B or C-D as selected above.

Counter-clockwise: To A only, if selected, or C only, if selected.

Clockwise: To B only, if selected, or D only, if selected.

Centered: Equally distributed to A and B, if selected, or C and D, if selected.

All other intermediate positions of this control will vary the A-B level ratio or C-D ratio as graphically illustrated by the pointer. In typical monitoring arrangements, the acoustic image of the signal will be sensed to move or "pan" from left to right as the control is rotated C.C.W. to C.W. Extreme C.C.W. or C.W. settings enable you to route the signal to the selected buss only.

### AUX BUSS SEND CONTROLS.

#### 5. INPUT SELECTOR.

Signals to be sent to the auxiliary buss are selected by this switch.

PRE: In this position, the input channel signal BEFORE the input fader and equalizer will be selected.

POST: This selects input channel signal AFTER the input fader and equalizer.

TAPE: Output of the tape recorder plugged into the "tape-in" connector on the rear will be selected.

#### 6. GAIN POT.

Controls the level of signal as selected above.

#### 7. PAN POT.

Positions the signal selected above between the left and right auxiliary busses, (as described in (4) above).

### PARAMETRIC EQUALIZER.

#### 8. A two band parametric type equalizer offering wide range of tonal correction.

The high frequency control adjusts resonance between  $800\text{Hz}$  and  $12\text{kHz}$ . The gain knob immediately below it adjusts the effectiveness over a range of  $\pm 12\text{ dB}$ .

The low frequency control adjusts resonance between  $80\text{Hz}$  and  $1.2\text{kHz}$ . Its attendant gain knob also adjusts the effectiveness of the selected frequency over a range of  $\pm 12\text{dB}$ . For more information see Section 5.

#### 9. OVERLOAD INDICATOR.

A fast electronic circuit triggers this red LED indicator to show near overload in the input amplifier. When the red LED ignites, reduce the setting of the trim control accordingly.

#### 10. INPUT FADER.

This is the "active" input channel level control on your 350. If the trim control and other presets have been adjusted properly, the fader should typically be about 7 or 8 on the scale for best performance. As will become obvious in use however, you will have many occasions to change this setting, such as compensation for a performer temporarily moving off-mic, killing an unused input, or expressive fading of an instrument. The 7—8 setting should be considered nominal.

### OUTPUT SECTION.

#### 11. FOUR CHANNEL BUSS MASTER FADER.

These two faders control the overall output level of channels A-B, C-D as marked.

#### 12. FOUR CHANNEL BUSS INPUT LEVEL.

These controls give individual level control over the echo return or other signals applied via the "buss-in" jacks on the rear panel.

### MONITOR SECTION.

#### 13. MONITOR SELECT SWITCH.

With these pushbuttons, channel A,B,C, or D of the 4 channel buss, and the left/right output of the Aux buss can be applied to the monitor and headphone amplifier circuits.

With A and B pushbuttons pressed at the same time, signal



from A is applied to the left monitor channel and B to the right. Pressing A or B only, the respective signal is applied to *both* left and right monitor channels. (The acoustic image of the signal will appear centered between the two monitor speakers or headphones).

Push buttons for groups C and D provide the same function as above. The left channel and right channel signals of the Aux buss can be applied to the monitor circuit by depressing the fifth button.

#### **14. HEADPHONE LEVEL CONTROL.**

A stereo level control which controls the level of the monitor signal as selected by the pushbuttons above.

#### **15. HEADPHONE JACKS.**

Two stereo jacks wired in parallel for two stereo headphone sets. Note: Do not use a mono single pole type plug in these jacks as this will short-circuit one of the outputs and will result in distortion, and may cause damage to the internal circuits.

#### **16. POWER SWITCH.**

Depressing this switch applies AC power to the model 350 and cause the red LED to glow.

When the optional meter bridge is installed on this mixer, the meters will illuminate when power is switched on.

#### **REAR PANEL.**

All inputs and outputs (except headphone) are available on the rear panel. The panel divides logically into inputs, outputs and monitoring.

#### **17. INPUT JACK.**

The channel input jack which matches levels from  $-60\text{dBV}$  ( $1\text{mV}$ ) through  $-10\text{dBV}$  ( $0.3\text{V}$ ). Input impedance is approximately  $50\text{k}\Omega$ .

#### **18. TAPE IN JACK.**

Input pin jack connector for receiving the outputs of a multitrack recorder. It can also be used to receive outputs from an echo device, reverb unit or other line source.

#### **19. ACCESSORY SEND/RECEIVE.**

This is the "patch point" between the preamplifier output and the input fader (refer to block diagram) where an external processor such as an equalizer may be plugged in.

#### **20. DIRECT OUT.**

Output signal after input fader and equalizer. No separate level control is provided, however, this multi-purpose output can be used with a submixer (or alone) as the signal for an effects unit, or the direct input to a multitrack machine, etc.

#### **21. 4 CHANNEL BUSS IN.**

Input connectors for accepting the output of an external effects unit, or echo receive. This level is controlled by the four buss in level controls above the master faders.

#### **22. 4 CHANNEL BUSS OUT.**

The four channel buss outputs for feeding a multitrack recorder, P.A., etc.

#### **23. AUX BUSS IN (left and right).**

Input jacks for mixing the outputs from an external signal processor, or aux receive. No level control is provided for this input.

#### **24. AUX BUSS OUT.**

Stereo output to feed the monitor amplifier or echo unit etc.

#### **25. MONITOR OUTPUT.**

Signal from the monitor selector pushbuttons, normally connected to cue and monitor amplifiers.

#### **26. PHONO INPUT/OUTPUT.**

Two stereo phono pre-amplifier, which are completely independent of the mixer circuits.

Connect the magnetic cartridges directly to the inputs. Corresponding output connection to the mixer may be made to any channel using a phono/phono or phono/phone patch cord to any of the input channels; to the input jack, accessory receive or tape input.

#### **27. METER BRIDGE CONNECTOR.**

This is a multipin connector reserved for connection to the optional meter bridge.

#### **28. POWER CORD.**

Connect to AC supply as indicated.

**NOTE:** Please ensure that your AC supply voltage is as indicated on the rear of the Model 350 mixer.

## SECTION 2 INTRODUCTION

The Fostex 350 mixer is a versatile 8 × 4 × 2 mixer designed for recording, production and P.A. applications, utilizing the popular unbalanced input/output format. It incorporates the latest in electronic technology and offers many new concepts in terms of operation and layout.

Each input section utilizes a peak indicating L.E.D. which provides an obvious warning of approaching overload. The mixer also facilitates an optional meter bridge for monitoring explicit levels of all output busses where necessary.

When the 350 is used with the Fostex A-Series open-reel recorder-reproducers, the L.E.D.'s and the recorder's meters will suffice in most applications.

The organization of the 350 provides some particularly convenient functions such as switching from multitrack record to mixdown without repatching, stereo monitoring, and two stereo headphone jacks. Control layout is essentially the same as signal flow, and parametric type equalization on each of the 8 inputs provides a broad range of effects and "sweetening". Eight separate accessory send and receive circuits provides additional flexibility in all applications.

Fostex's engineers, who pioneered the development of personal multitrack and mixing equipment, designed the 350 to meet the needs of the serious small studio or production

facility as well as stage and P.A. users. It combines ease of operation, reliability and flexibility in an extremely compact package, and is particularly compatible with multitrack equipment such as the Fostex 8 track, 1/4" recorder Model A-8. Your 350 should provide years of top audio performance with a minimum of service, using reasonable care.

### HOW TO USE THIS MANUAL

While it may be possible to "get by" without reading this manual, the utmost in creative results can only be obtained when one is thoroughly acquainted with the 350 and its full capabilities. We suggest quickly reading this manual once before using the 350, then re-reading the manual later, after becoming familiar with the basic functions of the mixer.

Section 1 contains brief descriptions of each feature and control. This is handy for quick references, although for a more detailed step-by-step guide to connection and use, consult Section 3. The remainder of the manual will illustrate in more detail, the use of external processing equipment, the equalizers, and examples of mixing for multitrack, production, and P.A. Then, most important, study and refer to the block diagram in Section 11. You will find this to be an important aid when reading the use and applications sections of this manual, as well as providing you with more intimate understanding of the 350 and its potential.

## SECTION 3 INTERCONNECTIONS AND INSTALLATION

Whatever the application, certain procedures should be followed for setting the mixer up for use.

The power cord of the mixer should be connected to an AC supply of the correct voltage.

While the outputs of the Model 350 incorporate a circuit to prevent an audible power on "thump", it is always advisable to turn the power on to amplifiers or tape recorders connected to the outputs of the mixer AFTER the mixer has been switched on.

### CONNECTING THE INPUTS.

The input circuits of the Model 350 are such that they may accommodate an extremely wide range of input signals. You may connect virtually any signal, ranging from microphone to tape recorder level, directly to the input jack.

While the circuit design accepts both the direct output of electric instruments and microphones, it is advisable to use a matching transformer such as the Fostex Model 1030 when using low impedance microphones over long runs or via a multi-conductor cable. Not only does this provide a degree of extra noiseless gain, but also reduces pickup of induced hums, buzzes and RFI.

**NOTE:** *Never connect any signal output rated in "Watts" to any input of the model 350. These are often high voltage signals ordinarily intended for loudspeakers. If you need to make such a connection use a "Direct Injection" or "DI" box, or direct box obtainable from your dealer. Failure to do this may result in damage to the circuits of the Model 350, and/or the power amplifier.*

To set the input trim, adjust this control on maximum signal peaks until the LED above the corresponding fader just ceases to flash. This will be the optimum input level. Should the signal level rise, the LED will start to flash again, giving you clear indication that you should reduce the setting of the trim control again. "Tape in" (18) and "buss in" (21), accept a - 10dBV (0.3V) level. This is compatible with all Fostex recording equipment and most other musicians' studio equipment. These inputs will also accept a nominal level of 0dBm, which are standards in many professional studios, though the overload headroom will be somewhat lower.

Remember, as long as your input LED is not flashing, you are not overloading any of the input amplifiers. If required you can include a simple input attenuator in line with your input signal. If in doubt consult your dealer.

### CONNECTING THE OUTPUTS.

All outputs are at a nominal - 10dBV (0.3V) level. This signal level is compatible with all Fostex recording equipment and most other musician's studio equipment.

While you may find that certain recorders, amplifiers or signal processors are specified with a nominal "0dBm" or "0dBV" level, these often have a front panel input control or pre-set which will readily accommodate this - 10dBV level.

It is important to set the input level control on equipment connected to the mixer outputs, to an optimum setting to achieve the best minimum noise, and maximum overload performance.

If using the optional meter bridge, connect an audio oscillator to the input of one of the channels, set the trim, level and routing controls so that you obtain "zero" level on the VU meter. Now adjust the input level control on the following equipment to give the same "zero" reading on its meter. If you are not using the optional meter bridge, adjust the input trim control just below the setting where the input overload LED flashes, set the 4 channel buss pan pot to center and the input and master faders to the normal operation area (between 7 & 8). The output level from the mixer "buss out" will

be approximately  $-10\text{dBV}$ , when the overload LED just starts to ignite. If an audio oscillator is not available, you can improvise by connecting a microphone and playing a single note on an organ or other keyboard or by vocally sustaining a note. Setting correct levels is a prime factor in attaining the maximum dynamic range performance from any professional audio system. While presetting inputs to external equipment need only be done once, individual input channel levels must be trimmed when mixing various sources via various microphones.

## SECTION 4 EXTERNAL EFFECTS AND PROCESSING

External effects may be used with Model 350 in two separate and distinct ways.

If it is required to add an effect such as reverberation or echo to all channels, use the auxiliary buss send and 4 channel buss in. To process an individual channel, use the accessory send and receive jacks. Before processing, a brief discussion of echo and reverberation is in order.

The nearest thing in real life to what is commonly termed echo, is the effect of the repeats which you hear when you shout in the midst of a mountain range. In the studio this can be achieved by feeding the output of the play head of a tape recorder or special tape loop deck back to the record heads. Many electronic devices using "bucket brigade" and digital electronics are available, and these do much the same job. This effect is normally reserved as a special effect only, and should not be confused with reverberation. The sound of reverb is similar to that of a large empty concert hall. Reflections of the original sound are so close and diffuse, that no

distinct repeats are heard. This effect is often simulated by devices employing a large metal plate or torsionally driven coiled springs. The effect is normally used to fill out the sound of a vocal or instrument which has been closed-miked, or is otherwise void of natural reverberation. Added judiciously it will provide commercial fullness and body to a recording. Used excessively it can create exaggerated illusions of space and loss of clarity and intelligibility.

The echo or reverb effect is proportionately added to the direct signal passing through the mixer.

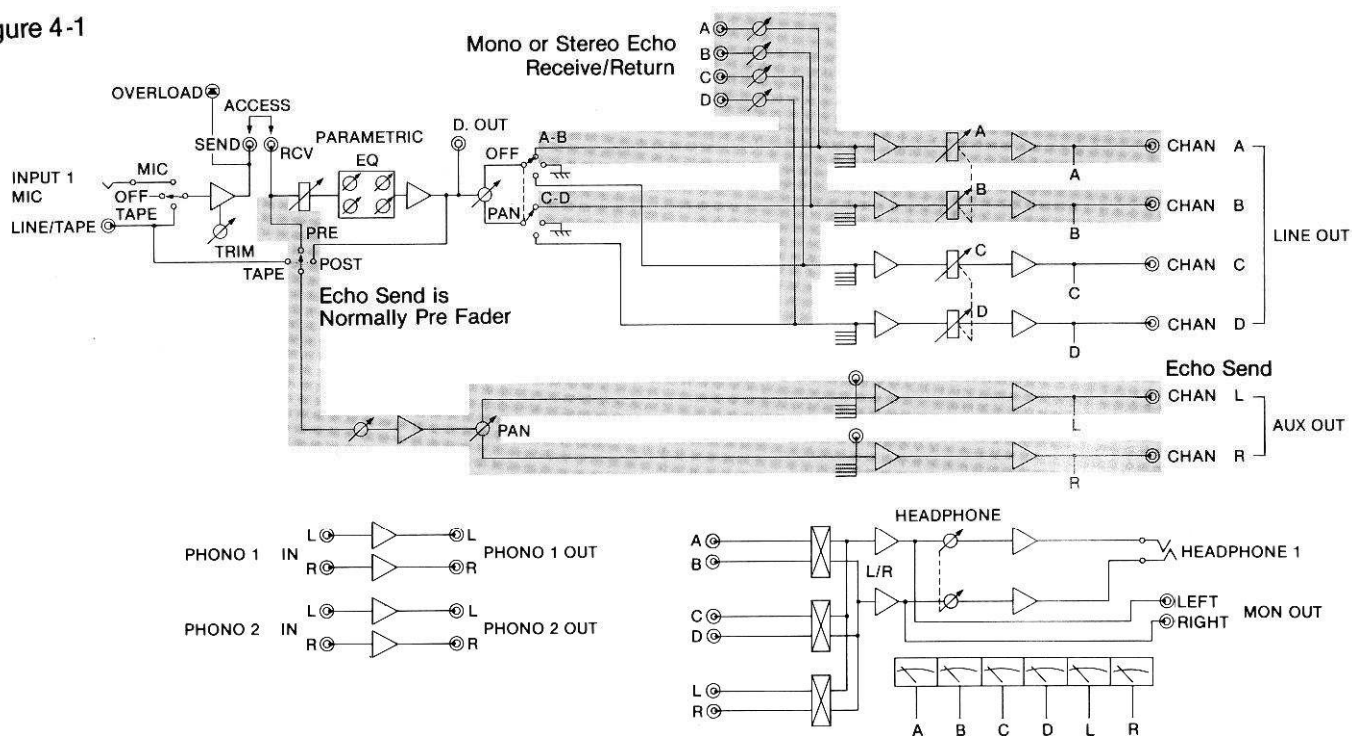
The following describes how to connect either an echo or reverb, or in fact any other effect such as a phaser, flanger, doubler, etc., to the Model 350 signal path.

The auxiliary buss is used to send part of the input signal to the effect unit.

Once processed, the effect signal rejoins the direct signal in the appropriate four channel buss mixing amplifier.

In simplified form, the signal path looks like this:

Figure 4-1



Connect that input to the effect unit from the AUX Buss Output (24). If your device is stereo, use both left and right signals. If it is mono, use the left or right buss only, and direct the aux signal to that output by use of the channel "aux pan pot" (7). If working in mono, you can of course use the free aux buss output as a separate, independent mix, using the "aux buss pan pot" for routing.

Connect the output of the effect unit to any one of the "4 channel buss in" connectors (21). If you require a mono effect return to feed two inputs simultaneously, use a "Y" adaptor to split the signal to feed two inputs. Make sure that levels are compatible in accordance with the specifications of both the Model 350 and the effect unit. Also make sure that there is no direct path in the effect unit such as a "dry" control or switch. If this is present it may add more of the original signal back to itself and could cause various cancellation and degradation problems. If such a direct path exists, switch it out.

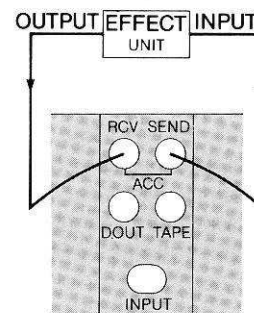
When operating, use the "aux buss select" switch (5) on any channel to route either the pre-fader (effect level independent of input fader setting) or post-fader (effect level is controlled by input fader setting) channel signal to the effect unit. Use the "aux buss pan pot" (7) for further routing or positioning. Use the "gain pot" (6) to adjust the level. Adjust the appropriate "4 channel buss input" control (12) for the required effect return level.

## SIGNAL PROCESSING ON INDIVIDUAL CHANNELS

Devices such as compressors, flangers, noise gates or extra equalizers can simply be connected to individual channels on the Model 350 by way of the corresponding "accessory send/receive" jacks (19). Ideally there should be no nominal gain through the unit and it should be compatible in terms of the input and output impedances and levels. Remove the link connecting the two accessory jacks and connect the "send" to the input of the processor, and its output back to the "receive" connector. Also refer to manufacturer specifications when connecting any external equipment.

Figure 4-2, Effects patch.

Connection of effects unit to one channel (Accessory patch.)



## SECTION 5 USING THE PARAMETRIC EQUALIZER

The Model 350 incorporates two band parametric type equalizers which have considerable advantage over simple bass and treble controls that affect the entire low or high frequency bands.

When equalizing individual instruments it is preferable to emphasize a narrow band around a preselected frequency. While a graphic equalizer or switched frequency may provide a greater selection of frequencies, the parametric design permits you to find the fundamental tonal qualities of instruments of those frequency bands which give you the maximum control over the sound. In PA applications, you will find that you can tune out acoustic feedback or ringing, or correct a gross house resonance.

**IMPORTANT:** Before using any equalizer, always try to achieve the sound that you want by moving the position of the microphone or changing the microphone type. Learn to use good microphone technique before applying electronic tone correction.

### TYPICAL EQUALIZATION RESPONSE GRAPH

INSTRUMENT	CUTTING	BOOSTING	OTHER COMMENTS
Human Voice	Scratchy at 2kHz Nasal at 1kHz Popping p's below 80Hz.	Hot at 8 or 12kHz Clarity above 3kHz Body at 200—400Hz	Tend towards thin when blending many voices
Piano	Tinny at 1—2kHz Boomy at 320Hz	Presence at 5kHz Bass at 125Hz	Not too much bass when mixing with rhythm section
Electric Guitar	Muddy below 80Hz	Clarity at 3.2kHz Bass at 125Hz	
Acoustic Guitar	Tinny at 2—3.2kHz Boomy at 200Hz	Sparkle above 5kHz Full at 125Hz	
Electric Bass	Tinny at 1kHz Boomy at 125Hz	Growl at 620Hz Bass below 80Hz	Sound varies greatly with strings used
String Bass	Hollow at 620Hz Boomy at 200Hz	Slap at 3.2—5kHz Bass below 200Hz	
Snare Drum	Annoying at 1kHz	Crisp above 2kHz Full at 125Hz Deep at 80Hz	Also try adjusting tightness of snare wires.
Bass Drum	Floppy at 620Hz Boomy below 80Hz	Slap at 3.2—5kHz Bass at 80—125Hz	Usually record with front drum head off Put blanket inside of drum resting against the head.



## SECTION 6 MULTITRACK APPLICATIONS

Multitrack recording is generally considered to be the process of recording a performance in sequence, building tracks one or more at a time, then reviewing, changing, and adding new ideas, until each part is idealized. A single performer can thus create an entity not possible in real time, or individuals in a group may perform as many (or few) "takes" as necessary without imposing on the others. When all tracks have been satisfactorily recorded, one can take whatever time is required to combine them into an artistic composite in the "mixdown" process. Even at this point, flexibilities are available to change the sound or character of the separate tracks by means of electronic effects. Further, a performer not available at the initial recording date may be included hours, days or weeks later. It is this process that the commercial recording companies have come to rely on, both in terms of economics as well as artistic flexibility. The "personal multitrack" concept of Fostex has made this process available to the independent musician.

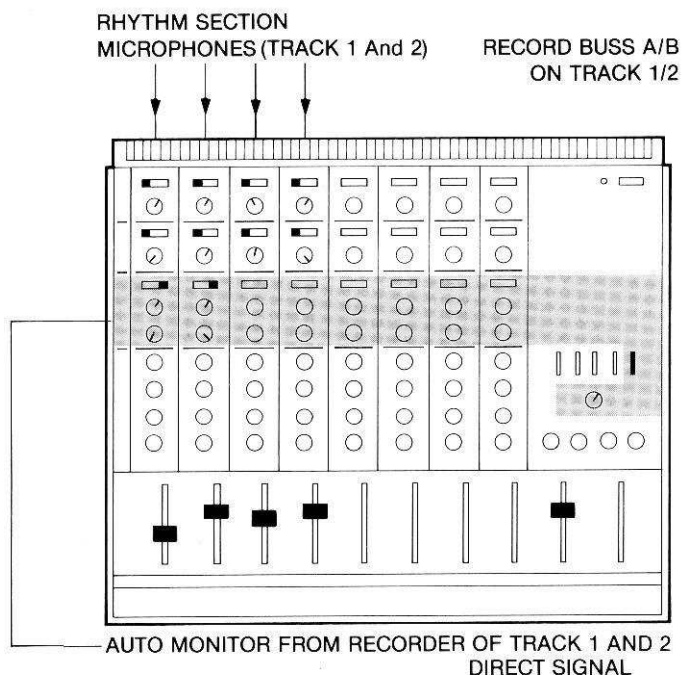
Typically, the procedure begins with a basic rhythm track which provides the "meter" for the sections to come. Unlike ordinary real-time recording in mono or stereo, realtive balance of the instruments or ensemble is of no concern during the recording phase (unless they are combined on a given track). Rather, an emphasis is made in getting the maximum undistorted level on each track in the interest of maximizing signal-to-noise ratios. Final balance is achieved during mixdown or re-recording, and the end product is a conventional mono or stereo tape or cassette.

While specifically designed to work with the Fostex A-8, A-4 and A-2 recorders, the mixer will interface satisfactorily with most makes of recorders provided that levels are matched correctly.

### RECORDING BASIC TRACKS.

The recording of signal onto separate tracks is reasonably straight-forward. Once levels have been set, route the inputs by way of the four channel buss switch (3) and pan pot (4) to

Figure 6-1, Record rhythm section on tracks 1 and 2.



whichever tracks are selected. For four channel recording, output busses A, B, C, and D correspond to tracks 1, 2, 3 and 4, and for the eight track patch shown below they are also applied to tracks 5, 6, 7 and 8 respectively.

Other than specialized effects for guitars and other instruments, original recording should be as free from effects as possible. Echo, equalization, gating etc., are normally applied during the mix-down process.

### OVERDUBBING AND MONITORING.

During the recording and overdubbing process, monitoring what you are recording as well as what is on tape is the key to a successful session. It is important to become fully acquainted with the multitrack monitoring facilities offered by the Model 350.

Figure 6-2, Overdub lead instruments on tracks 3 and 4.

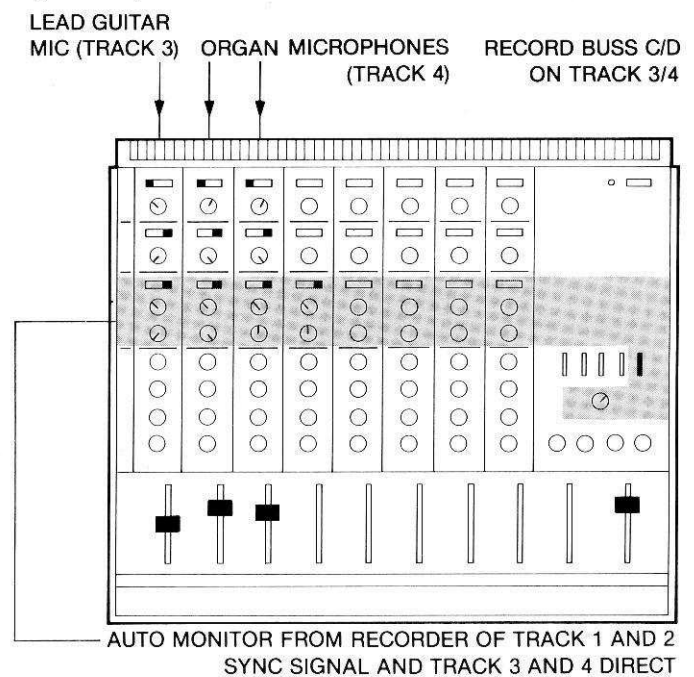
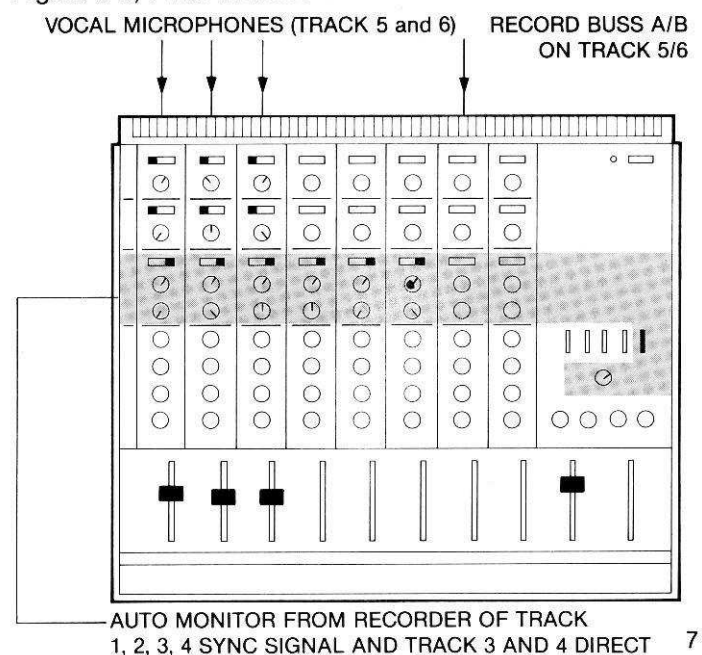


Figure 6-3, Final overdub of vocals on tracks 5 and 6.



The AUX buss of the mixer is used for this purpose. The technique employed is similar to that used in much larger consoles, and its use should be clearly understood. During overdub, the stereo Aux buss is used for multichannel monitoring.

A. Select "Aux buss L/R" only on the monitor select buttons (11) and use the monitor output to drive an external power amplifier or listen using the headphone amplifier.

B. Move the "Aux Buss" input selector (5) to the "TAPE" position, on channels 1 to 4 for four track or on all channels 1 to 8 for eight track monitoring.

You can now use the aux buss and the eight associated gain and pan-pots as a "monitor Mix" section.

C. This method of operation relies on the fact that most tape machines that are likely to be operated with the Model 350 (including Fostex Recorders) offer an automatic monitor facility. This switches the signal at the recorder output jacks, depending on the running mode of that tape recorder track as follows:

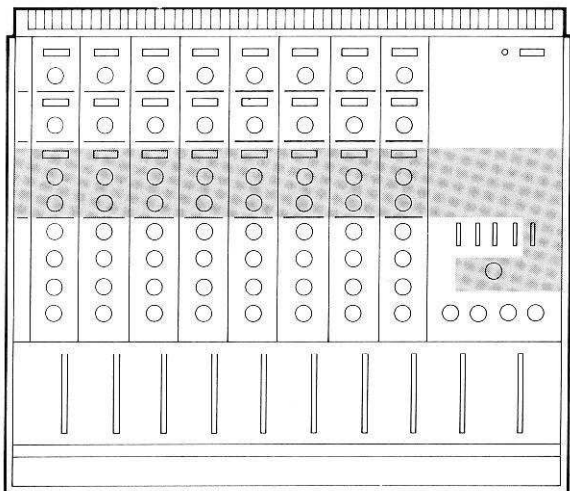
- (i) Input signal applied: If the track is switched to record.
- (ii) Sync playback signal: If the tape recorder is running and any other track is switched to record.
- (iii) Playback signal: If the tape recorder is set to play, and no tracks are set to record.

If this automatic monitor facility is not available, it may be necessary to switch the "monitor select" on the tape recorder to apply the correct signal to the corresponding tape recorder output.

D. This arrangement now provides the correct signal whether live or recorded at the appropriate aux "gain" pot (6) on each channel. Using the corresponding pan-pots you can create a stereo "monitor mix" of both what is already recorded and what you are recording.

IMPORTANT: While this created "monitor mix" section is located within similarly numbered input channels, it is, in this mode, entirely separate from those input channels (see block diagram).

Figure 6-4, Monitoring during recording (can be very small, but show this panel)



You can still record the signal from input channel one onto track four (via four channel buss D), while using the "aux gain" control (6) physically in the same channel, to monitor track one.

E. If your recorder will not provide a direct input signal during playback or recording, i.e., no automatic monitor, you may prefer to use the monitor switching on the Model 350 rather than having to switch the monitoring on the tape recorder at every pass. In this case, switch all the recorder monitor selectors to playback, and connect as before.

Use the "monitor mix" section as described above, to mix and monitor the recorded signal only. To listen to the live signal, depress the appropriate monitor select button (13) to apply the signal to the monitoring circuit as described previously.

**MIXDOWN.**

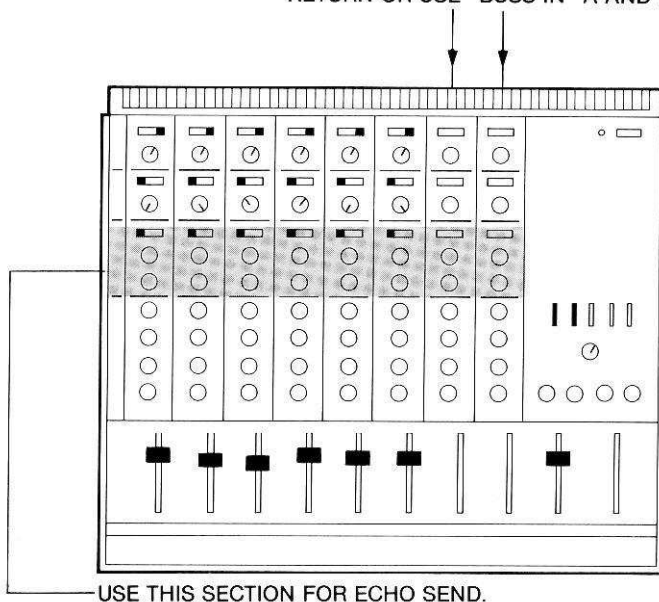
When all the required tracks have been recorded, they must be finally mixed together, adding effects, into a mono or stereo master tape. The Model 350 offers facilities to do this with no need to repatch the system.

For mixdown, switch the appropriate "input selectors" (1) to the "tape" position. Output busses A and B are commonly used for mixdown so switch the "four channel buss selectors" to the A & B buss, and select monitoring by depressing A & B buttons on the monitor select section. Mixing of these signals can now be performed in the normal way. Apply equalization if required and, if you want to use an echo or other effects system, refer to section 4 of this manual.

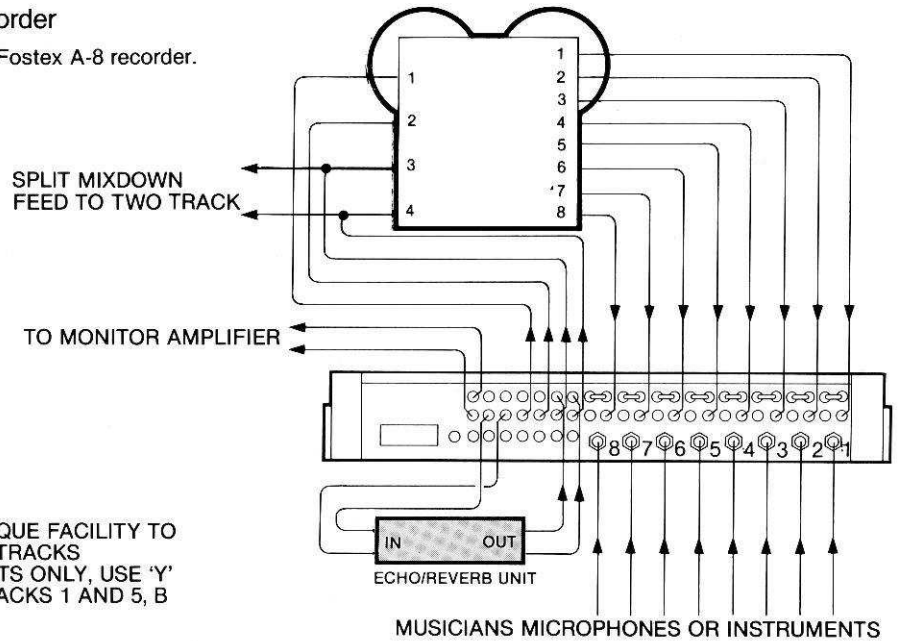
For information on where to find out more about the art of multitrack recording, look to the list at the back of this manual.

Figure 6-5, Record final mix.

PLAYBACK ALL 6 TRACKS SET TWO TRACK TO RECORD.  
SPARE CHANNELS 7 AND 8 MAY BE USE FOR ECHO RETURN OR USE "BUSS IN" A AND B



**Figure 6-6, Using 350 with model A-8 recorder**  
 Typical hookup for eight track recording with the Fostex A-8 recorder.



**IMPORTANT: THE A-8 RECORDER HAS THE UNIQUE FACILITY TO RECORD THE FOUR BUSES ONTO THE EIGHT TRACKS IF USING A RECORDER WITH 8 SEPARATE INPUTS ONLY, USE 'Y' TYPE SPLITTERS TO CONNECT OUTPUT A TO TRACKS 1 AND 5, B TO TRACKS 2 AND 6 ETC.**

## SECTION 7 AV PRODUCTION/DISCO APPLICATIONS

Sophisticated switching, and two stereo pre-amplifiers are features making the 350 ideal for broadcast production or disco applications.

The two phono amplifiers are totally separate from the audio electronics of the mixer and may be used independently.

Normally connect the turntable's phono cable directly to the preamp input, and its corresponding output directly to the 350 input jack (if trim control is required), or accessory receive of any input channel.

These pre-amplifiers can also be used as four independent mono pre-amplifiers.

Observe all the previous instructions for setting levels, and interconnections. To physically couple a pair of adjacent faders for stereo use, you may use the optional Model 9900 Fader Link. You can use the stereo auxiliary buss for echo as described in section 4, or to provide an independent stereo mix for foldback, recording or low level PA for a club foyer, etc.

Using the four channel buss and associated switching, operation and monitoring is greatly simplified.

Use the output buss A and B to feed your master recorder or amplifier system and reserve C and D for pre monitoring.

Use headphone or amplifier/speaker monitoring, but remember that using loudspeakers at high level near a turntable may cause low frequency feedback, so take care.

Using the four channel buss selector (3), select the four channel buss A-B for feeding the signal to the outputs, or C-D for pre-listen.

In this latter monitor mode, as long as both master faders (11) are in the same position, you will be able to monitor aurally, or in conjunction with the optional meter bridge, the exact level that will appear on the A-B buss when it is selected. The advantage here is that you can now either: (i) switch the input(s) directly to the output channels A-B with the selector switch (3), at full level or (ii), know the exact level to which to

fade up if introducing the new signal, using a fade up or cross fade technique.

An interesting possibility arises due to the inclusion of the parametric equalizer (8) on each channel. If you have a mono recording or disc and you are working in stereo, feeding the same signal to two channels (set recorder to mono or feed direct out of one channel to accessory receive of another) by applying differing amounts of boost and cut at different frequencies, you may simulate a stereo effect from the mono signal. Adding reverberation to one of the channels will also enhance the stereo effect.

### TYPICAL HOOK-UPS.

A simple hook-up permits you to connect two turntables, a stereo tape recorder or cartridge machine, and a couple of microphones to the Model 350.

This arrangement is ideal for an AV Production or disco system. There are many applications, especially in club situations, where it is necessary to control a series of live microphones as well as a disco function from turntables and tape decks.

Because the Model 350 has switched inputs (normally intended for multitrack recording) these can be used to select various signal sources.

By feeding the outputs of the phono preamps and stereo recorder or jingle machine outputs into the "tape in" sockets instead of the normal input jacks, you can now feed eight microphones, possibly seven from a stage area and one local DJ or announcer mike, into the eight input jacks. Using the input selector switches (1) you can now switch the mixer between Disco Operation and PA use.

Monitoring techniques follow as above, allowing you to check input levels, and even stereo balance before being sent out as program.



## SECTION 8 P.A. APPLICATIONS

Modern PA applications require more than a simple mixer feeding one main amplifier and speaker system. This applies both to musical performances and theatrical applications.

The 350 mixer has the versatility to provide these extra-facilities. Stereo is an obvious requirement, though the effect must be used with care. A recording type mix of signals, with half the instruments coming out of the right channel only, is not likely to please the part of the audience seated in front of the stage left speaker!

You can use the Aux buss as described in section 4 for echo purposes, but again a word of caution: Auditorium acoustics usually provide an adequate degree of natural reverberation for musical instruments, therefore the special repeat echo effect should be reserved for use with vocal signals. It may be coupled directly to the channel "direct out" jack (20) or used in the accessory send/receive path (19).

The auxiliary buss can alternatively be used to provide a monitor mix for musicians on stage. Being stereo, and completely independent of actual levels in the main mix (by selecting "pre" on the aux buss selector switch (5), by using the pan-pot as a "differential" routing control you can in fact provide two separate monitor mixes, giving the vocalist more of the rhythm, and the instrumentalists more of the vocals.

A further technique, normally associated with much more expensive consoles, is to use the four buss system as a pair of stereo busses A-B and C-D to separate control of the vocal and instrumental parts of the performance, and so have a more refined control of the overall mix. To employ this technique, connect the main stereo PA feed to the monitor output (25). Depress all four buttons A, B, C, and D on the "monitor select" (13). This will make A and C appear on the left monitor output and B and D appear on the right.

You can now freely select the individual channels to either output buss A-B for vocal or C-D for instruments using 4 channel buss selector and pan pot (3) and (4).

In operation you have complete control over the individual levels of the vocal and instrumental "sub-groups" as they

are commonly known, enabling you to keep close control over the balance using only two faders.

This technique is also extremely useful in drama or conference sound reinforcement whereby inputs may be allocated to the two output groups depending on the actual stage performance area (and hence microphone location) being covered.

If you are using the mixer locally, i.e., on stage, with microphone cables not exceeding 8 to 10 feet, connect microphones directly. However, if you intend to use a "snake" or "multi" type of connection to the stage, operating over a considerable distance, we recommend that you use the Fostex Model 1030 Mic input transformers to be located at the mixer end.

You may want to record the performance on a multitrack machine. There are several alternatives.

(i) Connect the direct outputs of selected channels directly to the inputs of the tape recorder and set levels accordingly.

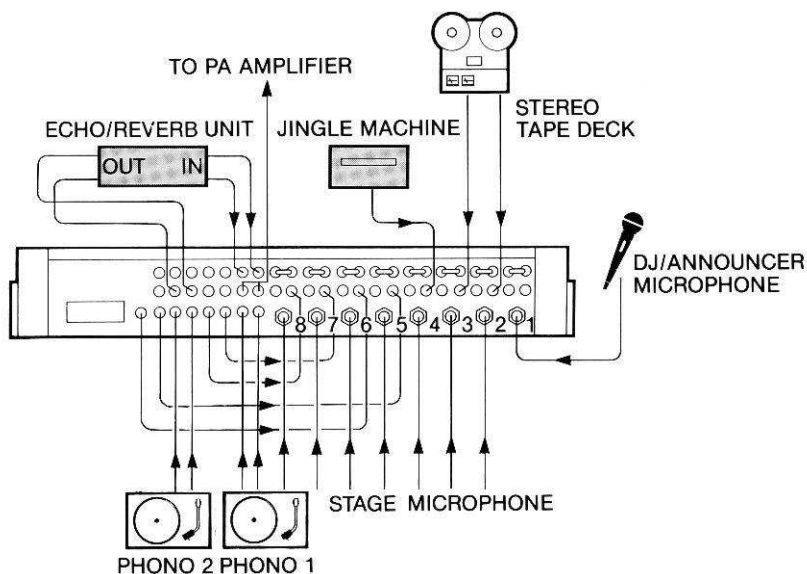
(ii) If you are using only four tracks you can record the main stereo mix (use a Y split lead) plus two selected "direct outs" from channels such as vocal or lead instrument, which can be finally balanced during mixdown.

(iii) Use the Aux buss as a stereo mix for the recorder, and selected "direct outs" for other tracks.

(iv) Or, use Aux buss as your feed for the main PA system, then use the 4 channel buss as your four channel recording mix. As suggested in the previous section on AV/Disco, you can use the tape return channels as selectable alternative input for the Model 350. This will enable you to easily switch the mixer around for mixing in effects from disc or tape, or provide disco or interval music facilities.

The conveniently situated overload indicators simplify level setting. You will learn after a short while the "nominal" or "average" setting for the input trim pots. If any of these flash during the performance, reduce the appropriate trim control setting (2) accordingly. A typical hook up for PA and disco (Fig. 8-1).

Figure 8-1, Disco/PA hook-up





## SECTION 9 MAINTENANCE

Servicing should be referred only to qualified service personnel. No user-maintenance procedures are recommended other than occasional cleaning of the external surfaces with a damp soft cloth. In low humidity environments, cleaning of the meter faces on the 3060 meter bridge may create sufficient static charge to displace the indicator needles. If this occurs, add a *small* amount of detergent when moistening the cloth. Do not moisten cloth such that any liquid may flow into the 350. Avoid any spillage or debris into the fader slots. At Fostex we use the best components and strictly quality control all our products before they leave our factories.

If problems occur, check first that you have made all connections correctly, and you are operating the unit properly. Isolate the mixer from any external processing equipment that can interrupt the signal flow. Then recheck your input and output switching.

If you cannot solve the problem yourself or there is good reason to think that the equipment is at fault, contact your dealer or Fostex Representative.

## SECTION 10 ACCESSORIES

Several Fostex accessories are available to help you to get the most out of your Model 350.

### **Model 9900 Fader Link:**

A simple device which bridges two adjacent input channels for stereo operation, or the two master faders for synchronized output fades.

### **Model 1030 MIC Input Transformer:**

If you are using long cable runs, or you have a low sensitivity, low impedance microphone, it is advisable to use the accessory transformer, which has an XLR type balanced input, and fits directly to the input jack of the Model 350.

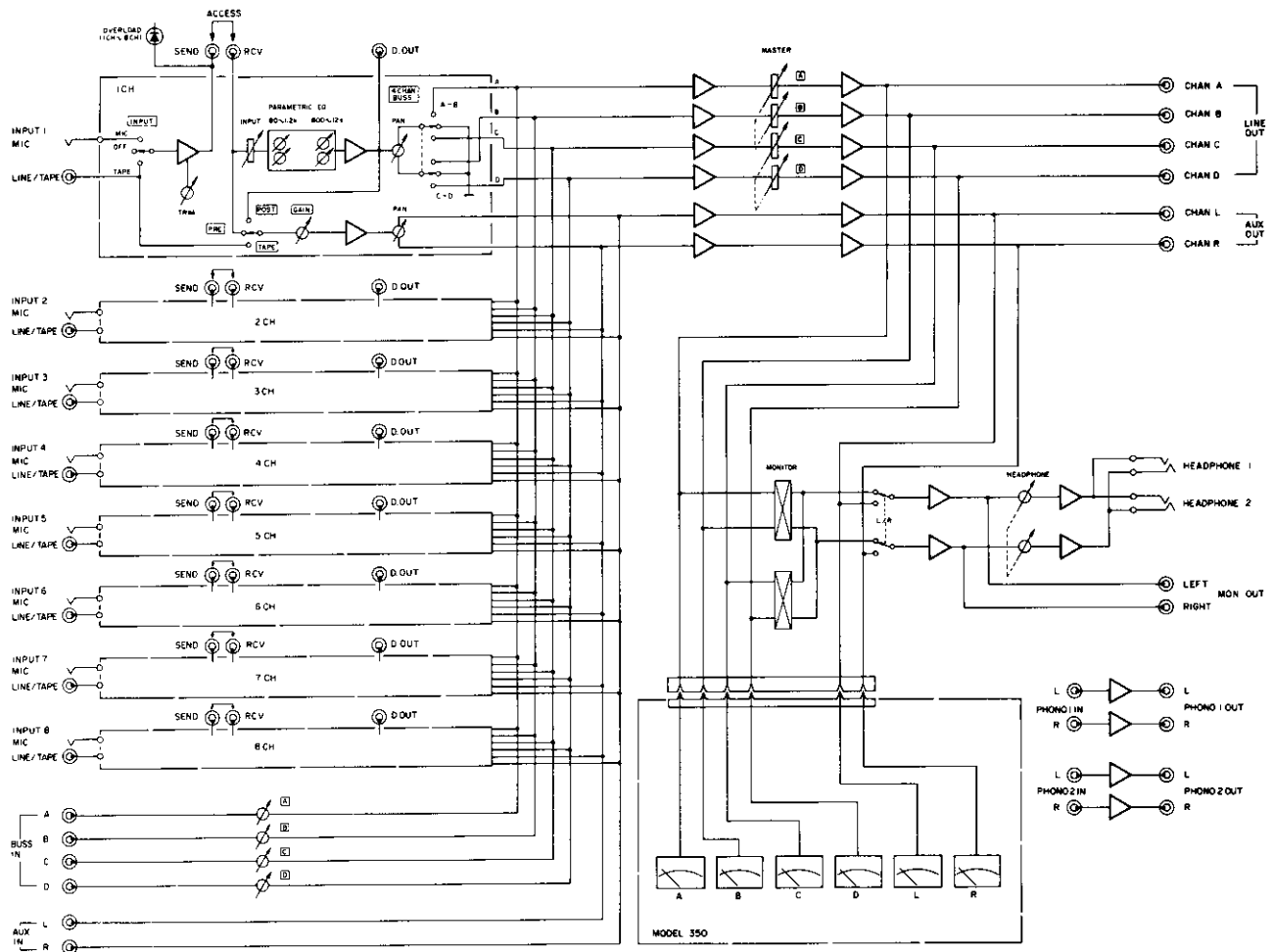
### **Model 3060 Meter Bridge:**

An optional metering unit which fits directly to the Model 350 by way of the knurled screws on the side panels. This is simply attached, and connects via the single, multipin connector to the rear panel of the mixer. The six VU type meters are connected to the four channel buss and auxiliary buss, giving accurate visual monitoring of levels. The meters illuminate when power is switched on.

### **Model 9030 Flight Case.**

Also accommodates Model 3060 meter bridge. Ideal for heavy road use.

# SECTION 11 BLOCK DIAGRAM



## SECTION 12 SPECIFICATIONS

<b>MIC/LINE INPUT (X8)</b>		<b>MONITOR OUT (X2)</b>	
<b>Mic impedance</b>	10K $\Omega$ or less	<b>Output load impedance</b>	10K $\Omega$ or higher
<b>Input impedance</b>	50K $\Omega$	<b>Nominal output level</b>	- 10dBV (0.3V)
<b>Nominal input level</b>	Mic: - 60dBV (1mV)	<b>Maximum output level</b>	+ 15dBV (5.6V)
	Line: - 10dBV (0.3V)		
<b>Minimum input level</b>	- 66dBV (0.5mV)	<b>HEADPHONE OUTPUT (stereo)</b>	
<b>Maximum input level</b>	+ 12dB (4V)	<b>Load impedance</b>	8 $\Omega$ or higher (4 $\Omega$ minimum)
		<b>Maximum output</b>	100mW at 8 $\Omega$
<b>TAPE INPUT (X8)</b>		<b>FREQUENCY RESPONSE</b>	
<b>Input impedance</b>	20K $\Omega$	<b>4 Chan Buss/Out</b>	20Hz - 20KHz, $\pm$ 1dB
<b>Nominal input level</b>	- 10dBV (0.3V)	<b>Headphone</b>	50Hz - 15KHz, $\pm$ 2dB
<b>Minimum input level</b>	- 16dBV (0.16V)		
<b>Maximum input level</b>	+ 12dBV (4V)	<b>EQUIVALENT INPUT NOISE</b>	- 128dB, wtd.
<b>4 CHAN BUSS IN</b>		<b>SIGNAL TO NOISE RATIO</b>	
<b>Input impedance</b>	10K $\Omega$	<b>One mic input</b>	68dB, wtd.
<b>Nominal input level</b>	- 10dBV (0.3V)	<b>8 mic inputs</b>	58dB, wtd.
<b>Maximum input level</b>	+ 25dBV (18V)	<b>One line input</b>	75dB, wtd.
<b>2 CHAN BUSS IN</b>		<b>8 line inputs</b>	65dB, wtd.
<b>Input impedance</b>	20K $\Omega$	<b>EQUALIZER</b>	
<b>Nominal input level</b>	- 10dBV (0.3V)	<b>Variable, <math>\pm</math> 12dB</b>	80Hz - 1.2kHz
<b>Maximum input level</b>	+ 15dBV (5.6V)		800Hz - 12kHz
<b>PHONO IN (X4)</b>		<b>CROSSTALK</b>	65dB at 1kHz
<b>Input impedance</b>	50K $\Omega$	<b>THD (overall)</b>	0.03% at 1kHz nominal level
<b>Nominal input level</b>	- 54dBV (2mV)	<b>FADER ATTENUATION</b>	65dB or more at 1kHz
<b>EQUALIZATION</b>	RIAA	<b>POWER REQUIREMENTS</b>	120V AC, 60Hz, 14W*
<b>PHONO OUT (X4)</b>		<b>DIMENSIONS</b>	3-3/4"(H) $\times$ 18-1/2"(W) $\times$ 16"(D)
<b>Output load impedance</b>	10K $\Omega$ or higher		95mm(H) $\times$ 460mm(W) $\times$ 405mm(D)
<b>Nominal output level</b>	- 10dBV (0.3V)	<b>WEIGHT</b>	Net 18 lbs. (8Kg.)
<b>4 CHAN BUSS OUT</b>			
<b>Output load impedance</b>	10K $\Omega$ or higher		
<b>Nominal output level</b>	- 10dBV (0.3V)		
<b>Maximum output level</b>	+ 15dBV (5.6V)		
<b>2 CHAN BUSS OUT</b>			
<b>Output load impedance</b>	10K $\Omega$ or higher		
<b>Nominal output level</b>	- 10dBV (0.3V)		
<b>Maximum output level</b>	+ 15dBV (5.6V)		

Fostex reserves the right to change specifications without notice.

\*220-240V AC, 50Hz available outside U.S.A.

## SECTION 13 **BIBLIOGRAPHY**

For more information about multitrack recording techniques and creative sound in general, we recommend the following:

A. Modern Recording Techniques: An authoritative introduction to modern recording studio technique, from the humblest setup right through to 24 track installations. Published by Howard W. Sams & Co., available through the Recording Institute of America Inc. 15 Columbus Circle, New York, New York 10023. U.S.A.

B. Various publications both constructional and theory, including "Setting Up and using a Multi-channel Studio" # 781 from: TAB Books, Blue Ridge Summit, PA 17214. U.S.A.

A Last Few Words.

As you have seen from this manual, the Model 350 is an extremely versatile mixing console. It has been designed to work specifically with other Fostex brand equipment and accessories, and is compatible with most other recording equipment. If you have any doubt about use and application, or compatibility with other equipment, check with your local dealer or Fostex Representative.

At Fostex we are ready to help you with any operational or technical difficulties that you may have, and we welcome any comments or suggestions. If you have found any new creative ways with the Model 350 please let us know.



## SAFETY INSTRUCTIONS

### WARNING

#### “READ BEFORE OPERATING”

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, etc.
6. 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.
7. Heat—The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.
8. 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.
9. 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.
10. Cleaning—The appliance should be cleaned only as recommended by the manufacturer.
11. Nonuse Periods—The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
12. Object and Liquid Entry—Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
13. 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.
14. 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.

**Fostex**

FOSTEX CORPORATION 512, MIYAZAWACHO, AKISHIMA, TOKYO, JAPAN

FOSTEX CORPORATION OF AMERICA 15431 BLACKBURN AVE., NORWALK, CA 90650, U.S.A.

© PRINTED IN JAPAN FEB. 1983 8288005000