Owner's Manual

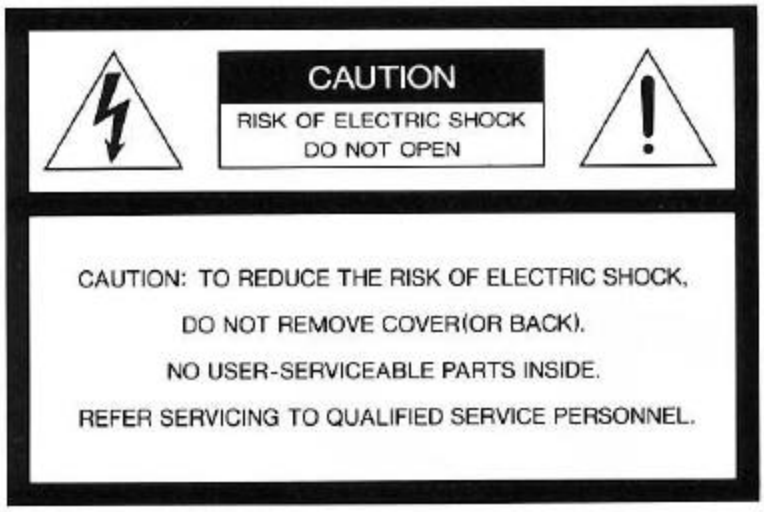
Model

812

RECORDING MIXER



FOSTEX®





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.



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.

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.

INTRODUCTION

Thank you very much for purchasing a Fostex Model 812 Recording Mixer.

The Model 812 is a 12-input recording mixer with all the necessary functions required for a multitrack recording. The Model 812 has all of the following features:

1. An 8-channel output, providing the perfect combination with an 8-track multitrack recorder.
2. Two Effect Sends (monaural) and an Auxilary Send (stereo), allowing a variety of sound effect processes possible.
3. The capability to send the AUX signal (while monitoring the recorder output signal) to the Effect Send 2 output, making it possible to, for example, cast a reverberation on this signal and thus simulate the recording environment without tampering with the output signals to the recorder.
4. Two parametric and one shelving equalizers, giving more flexibility to tone control, and, with the use of a solo monitor function and mute function, the mixing process is made even more easy.
5. Three stereo Effect Returns, allowing connections to various sound effect processors without sacrificing input channels to accept the output signals from the processors.
6. A DC24V phantom power source, enabling hookup to a high quality condenser microphone.
7. An FL level meter.
8. Space for connecting MIDI interfacing for future use with MIDI control.

We hope that you thoroughly read this Manual and will utilize the product to its fullest capabilities. With proper use and maintenance, you will enjoy many years of satisfied performance.

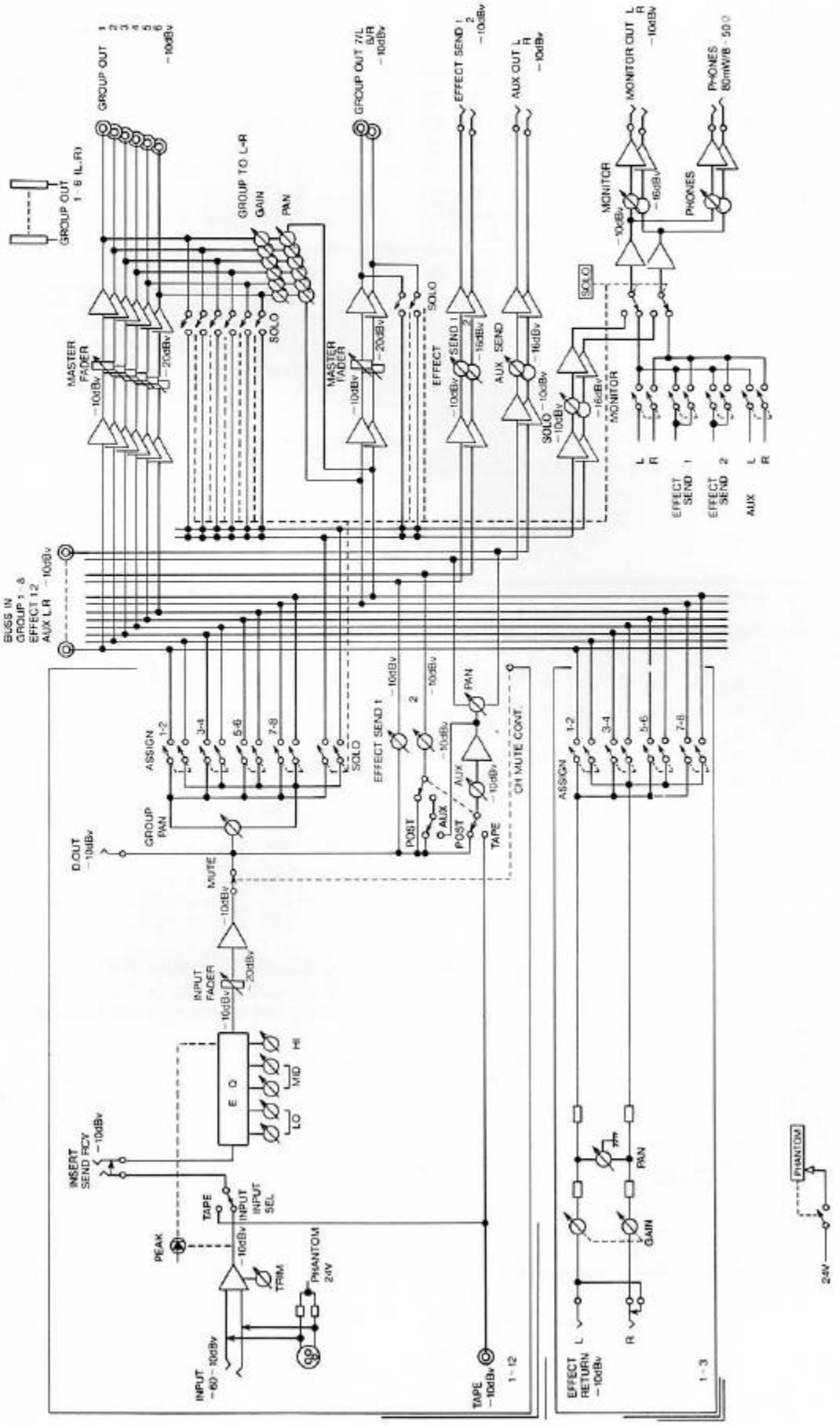
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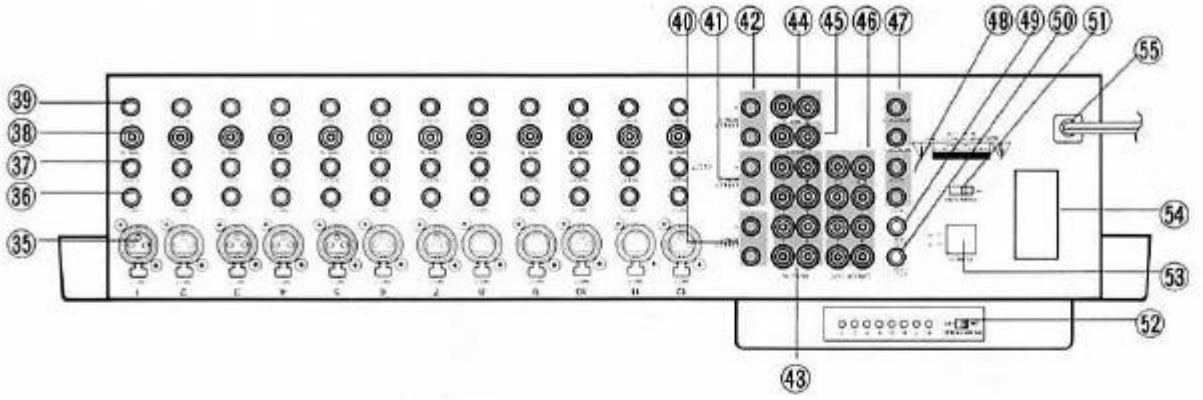
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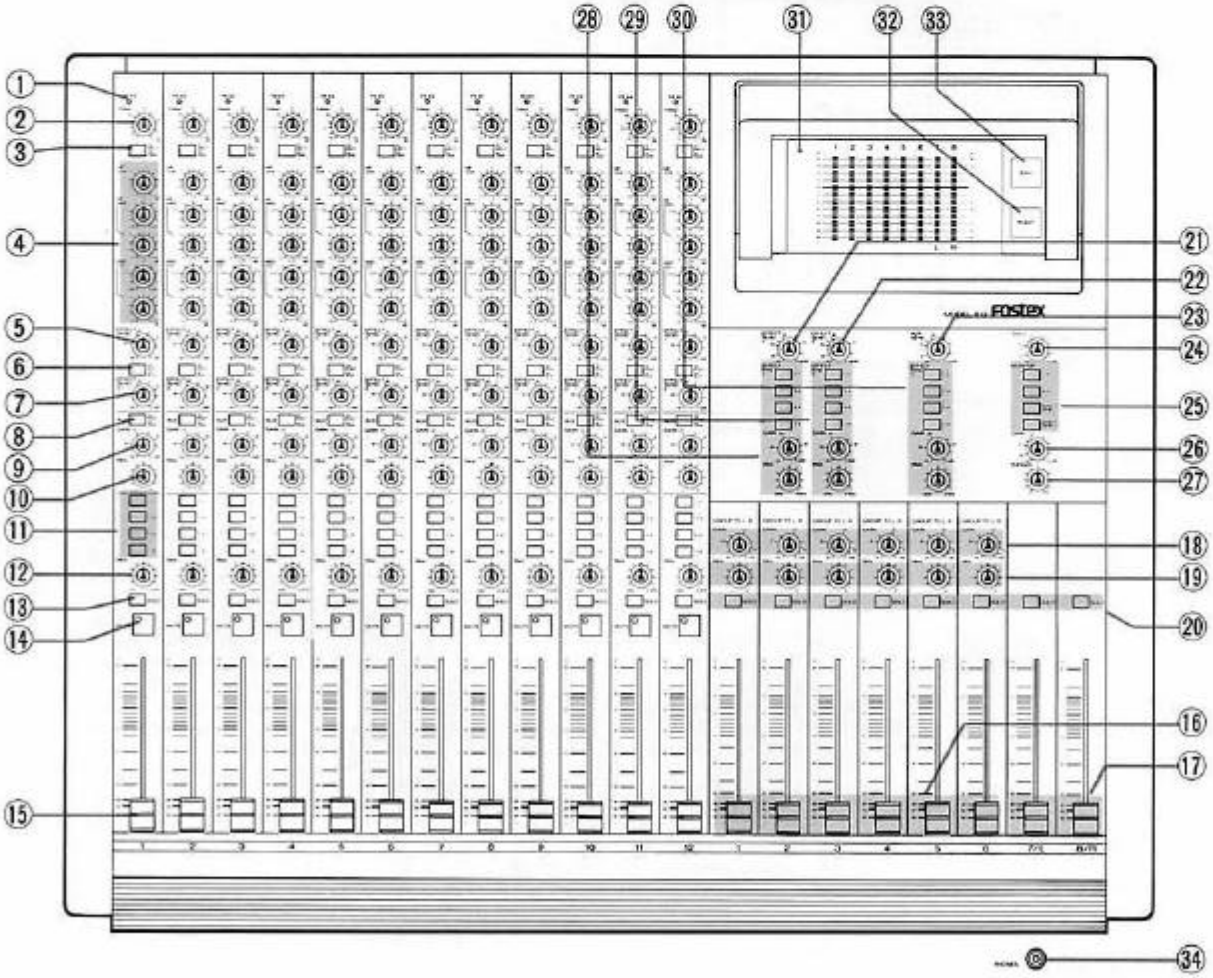
SECTION 1 SPECIFICATIONS

INPUT (×12)	
Microphone impedance	600Ω or less
Input impedance	2kΩ balanced XLR connector and 20kΩ unbalanced phone jack
Nominal input level	Microphone: −60dBV (1mV) Line: −10dBV (0.3V)
Minimum input level	−70dBV (0.3mV)
Maximum input level	+15dBV (5.6V)
TAPE INPUT (×12)	
Input impedance	20kΩ
Nominal input level	−10dBV (0.3V)
Minimum input level	−20dBV (0.1V)
Maximum input level	+15dBV (5.6V)
INSERT INPUT (×12)	
Input impedance	20kΩ
Nominal input level	−10dBV (0.3V)
INSERT OUTPUT (×12)	
Output load impedance	10kΩ or more
Nominal output level	−10dBV (0.3V)
Maximum output level	+15dBV (5.6V)
BUSS INPUT (GROUP×8, EFFECT×2, AUX (L/R)×1)	
Input impedance	20kΩ
Nominal input level	−10dBV (0.3V)
EFFECT RETURN (L/R) (×3)	
Input impedance	7kΩ
Nominal input level	−10dBV (0.3V)
Maximum input level	+25dBV (17.8V)
GROUP OUTPUT (×8)	
Output load impedance	10kΩ or more
Nominal output level	−10dBV (0.3V)
Maximum output level	+15dBV (5.6V)
EFFECT SEND (×2)	
Output load impedance	10kΩ or more
Nominal output level	−10dBV (0.3V)
Maximum output level	+15dBV (5.6V)
AUX OUTPUT (L/R) (×1)	
Output load impedance	10kΩ or more
Nominal output level	−10dBV (0.3V)
Maximum output level	+15dBV (5.6V)
MONITOR OUTPUT (L/R) (×1)	
Output load impedance	10kΩ or more
Nominal output level	−10dBV (0.3V)
Maximum output level	+15dBV (5.6V)
HEADPHONES OUTPUT (Stereo)	
Output load impedance	8 ~ 50Ω
Maximum output	80mW
DIRECT OUTPUT (×12)	
Output load impedance	10kΩ or more
Nominal output level	−10dBV (0.3V)
Maximum output level	+15dBV (5.6V)
FREQUENCY RESPONSE	
Microphone input	20 ~ 20kHz +1/−2dB
Line input	20 ~ 20kHz +1/−1dB
Monitor output	20 ~ 20kHz +1/−3dB
Headphones output	20 ~ 20kHz +1/−2dB
EQUIVALENT INPUT NOISE	−125dBV weighted
OVERALL SIGNAL TO NOISE	
1 mic input	65dB weighted
12 mic input	53dB weighted
T.H.D.	0.05% (1kHz, nominal level) 0.1% (headphones, 1kHz, 10mW/50Ω)
FADER ATTENUATION	70dB (1kHz)
CROSSTALK	65dB (1kHz)
PARAMETRIC EQUALIZER	60 ~ 1kHz ±15dB 400 ~ 6kHz ±15dB 10kHz ±15dB (SHELVING)
POWER REQUIREMENTS	100V 42W 120V 45W 220V 45W 240V 45W
DIMENSIONS (H×W×D)	175mm×670mm×530mm
WEIGHT	13kg (29lbs)
PHANTOM POWER SUPPLY	DC24V

SECTION 2 **BLOCK DIAGRAM**




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SECTION 3 GUIDE TO COMPONENTS

The numbers in ( ) indicate the location of the component.

FRONT PANEL

1. PEAK LED
This LED turns on when the input signal to INPUT jacks (35) and (36) or to the TAPE IN jack (38) is overloaded (+13dB). If the LED tends to turn on frequently, adjust the TRIM (2) or the EQUALIZER GAIN (4) until an appropriate level is reached. For details, refer to pg. ADJUSTING INPUT/OUTPUT LEVELS.

2. INPUT TRIM
This knob trims the pre-amplifier gain of the incoming signal from INPUT jacks (35) and (36). The TRIM responds to a wide range from −60dBV (microphone level) to −10dBV (line level). Please note that the input level from the TAPE IN jack (38) can not be adjusted.

3. INPUT SELECTOR (INPUT/TAPE)
This selects the signal to be sent to the INPUT FADER (15). INPUT(▮): The sound source coming into INPUT jacks (35) and (36) is selected (Used mainly when recording). TAPE(▂): The sound source coming into TAPE IN jack (38) is selected (Used mainly when mixing down).

4. EQUALIZER SECTION
This section adjusts the tone quality of the sound signal selected by the INPUT SELECTOR (3). For further details, refer to pg. THE PARAMETRIC EQUALIZER.

5. EFFECT SEND 1
This knob adjusts the output level of the post-FADER signal (the signal after adjusted by INPUT FADER (15)) before being sent to the EFFECT SEND 1 buss. The signal is sent to the EFFECT SEND 1 buss via the SEND 1 MASTER LEVEL knob (21) and is outputted from the EFFECT SEND 1 jack (50) and may be sent to effectors for processing.

6. EFFECT SEND 2 SELECTOR (AUX/POST)
This selector is effective only when the AUX SELECTOR (8) is set to TAPE (ie. is depressed). It selects the signal to be sent to EFFECT SEND 2 (7). POST(▮): The post-FADER signal is selected. AUX(▂): The signal from the TAPE IN jack (38) after being adjusted by AUX GAIN (9) is selected.
Note that when the AUX SELECTOR (8) is set to POST, this selector has no effect and thus, the signal sent to the EFFECT SEND 2 (7) will be POST.

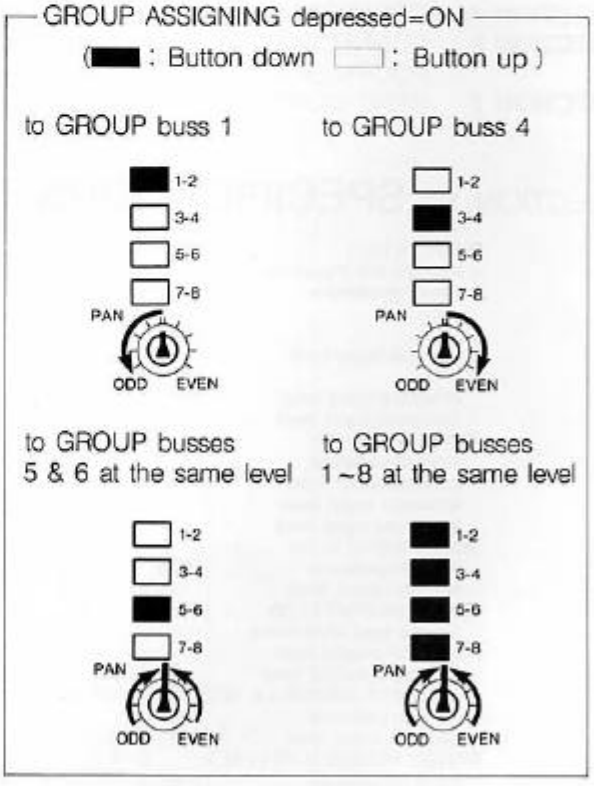
7. EFFECT SEND 2
This knob adjusts the output level of the signal being sent to the EFFECT SEND 2 buss. From here the signal then is sent to the SEND 2 MASTER LEVEL knob (22) and outputted from the EFFECT SEND 2 jack (49) and used for effect processing.

8. AUX INPUT SELECTOR (POST/TAPE)
This selects the signal to be sent to the AUX GAIN (9). POST(▮): The post-FADER signal is selected. TAPE(▂): The incoming signal to the TAPE IN jack (38) is selected. Usually, if one wants to process an effect using the post-FADER signal via the AUX GAIN (9), POST is selected. If one wants to monitor the output from the recorder while mixing-down, TAPE is selected.

9. AUX GAIN
This knob adjusts the level of the signal selected by the AUX SELECTOR (8) and sent to the AUX buss. The function of this knob varies depending on the status of the AUX SELECTOR (8). POST: serves as a stereo input type EFFECT SEND. TAPE: serves as a monitor volume control of the recorder output coming into TAPE IN jack (38). The signal which is sent to the AUX buss passes through the AUX MASTER LEVEL knob (23) and is outputted from the 48. AUX OUT jack and may be used as an input signal for stereo-input effectors.

10. AUX PAN
This pan adjusts the Left-Right balance of the signal being sent to the AUX buss from AUX GAIN (9). When the AUX SELECTOR (8) is in the POST position, it may be used for setting the L-R balance for the EFFECT SEND signal. When in the TAPE position, it may be used for setting the perspective of the recorder output monitor signal.

11. GROUP ASSIGN SWITCHES
These switches (along with GROUP PAN (12)) assign the signal sent from the INPUT FADER (15) to GROUP busses 1~8.



12. GROUP PAN
Along with the GROUP ASSIGN SWITCHES (11), the assigning is done as illustrated.

13. INPUT SOLO SWITCH
When this switch is pressed (ON), the SOLO LED (33) is turned on and the post-FADER signal of that channel is sent to the SOLO buss. The MONITOR SELECTOR (25) is overridden and the SOLO buss output signal is sent to both the MONITOR LEVEL knob (26) and PHONES VOLUME (27). In other words, the post-FADER signal of the particular channel can now be monitored using headphones or speakers. The monitored signal maintains the perspective set with the PAN pot (12), making equalizing adjustments with EQUALIZER (4) possible without any sound distortion. This feature affects only the signals sent to the MONITOR OUT jack (47) and PHONES jack (34).

14. MUTE SWITCH
When this switch is pressed, the LED located within the switch will toggle between ON and OFF. When the LED is ON, the signal entering the INPUT FADER (15) of that channel will be muted. This is the equivalent of completely lowering the INPUT FADER and is useful when one wants to cut out a channel without moving the FADER position. When the LED is OFF, the mute function is released.

15. INPUT FADER
This adjusts the level of the signal selected by the INPUT SELECTOR (3). As noise and distortion is minimum at the scale range of 0±5(dB), it is recommended to initially set the INPUT FADER within this range and then adjust with TRIM (2).

16. GROUP MASTER FADERS (busses 1~6)
These are the master faders for GROUP busses 1~6 respectively. Not only are the output signal levels to the GROUP OUT jacks (46) adjusted here, but also signal levels to the GROUP TO L-R SECTION (18) and (19) as well. Normally, this area is used to set the signal level of the output to TRACKS 1~6 of a multitrack recorder.

17. GROUP MASTER FADERS (busses 7/L, 8/R)
These two are the master faders for GROUP busses 7 and 8. They adjust the signal levels assigned directly to GROUP busses 7 and 8 (from GROUP ASSIGN (11) and (12)) as well as signal levels assigned via the GROUP TO L-R SECTION (18) and (19). Normally, these are used to set the signal level of the output to TRACKS 7 and 8 of a multitrack recorder. Also, when mixing-down, they may be used for signal level adjustment to a master recorder (ie. for fade-in/out purposes).

18. GROUP TO L-R GAIN
These knobs adjust the individual levels of GROUP busses 1-6 when assigning them to GROUP busses 7 and 8. For example, in a mixing-down situation, the source signals may be assigned to GROUP busses 1-6, then collectively sent to GROUP busses 7 and 8 after being adjusted at the GROUP TO L-R SECTION (18) and (19) and finally outputted to a master recorder.

19. GROUP TO L-R PAN
These knobs adjust the Left-Right perspective of the signals to be sent to GROUP busses 7 and 8. A turn towards L will send the signal towards GROUP buss 7 while R will send the signal towards GROUP buss 8. After being assigned to GROUP busses 7 and 8 from here, the signals are then outputted from GROUP OUT jacks 7/L and 8/R (46) via GROUP MASTER FADERS 7/L, 8 (17).

20. GROUP SOLO SWITCH
When this switch is pressed, the respective GROUP buss output signal is sent to the SOLO buss. Similar to the INPUT SOLO SWITCH, the MONITOR SELECTOR (25) is overridden and the signal sent to both the MONITOR OUT jack (47) and the PHONES jack (34), enabling monitoring with headphones or speakers.

21. EFFECT SEND 1 MASTER LEVEL KNOB
This knob adjusts the master level of the signals sent to the EFFECT SEND 1 buss, which is then outputted from the 50. EFFECT SEND 1 jack.

22. EFFECT SEND 2 MASTER LEVEL KNOB
This knob adjusts the master level of the signals sent to the EFFECT SEND 2 buss, which is then outputted from the 49. EFFECT SEND 2 jack.

23. AUX SEND MASTER LEVEL KNOB
This knob adjusts the master level of the signals sent to the AUX buss, which is then outputted from the 48. AUX OUT jack.

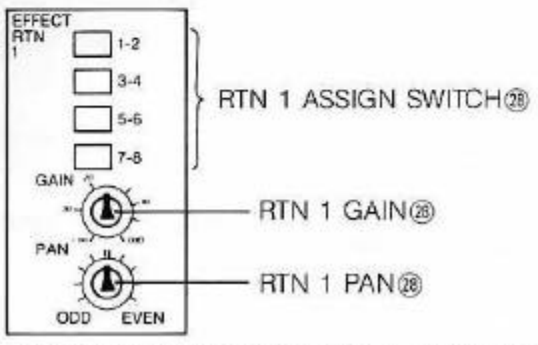
24. SOLO LEVEL KNOB
This knob adjusts the master level of the signals sent to the SOLO buss, which includes signals coming from INPUT SOLO switches and GROUP SOLO switches.

25. MONITOR SELECTOR
This selects the signal to be sent to MONITOR OUT jack (47) and PHONES jack (34). L-R: The output signal from GROUP busses 7 and 8. AUX: The output signal from the AUX buss (ie. to be outputted from the AUX OUT jack (48)). EFFECT SEND 1: The signal to be outputted from the EFFECT SEND 1 jack (50) is selected with a central perspective. EFFECT SEND 2: The signal to be outputted from the EFFECT SEND 2 jack (49) is selected with a central perspective.
In general, L-R is used when mixing-down. AUX is used when monitoring the output to a recorder. The selection is made when the respective switch is depressed.

26. MONITOR LEVEL KNOB
This knob adjusts the output level of the signal sent to the MONITOR OUT jack (47).

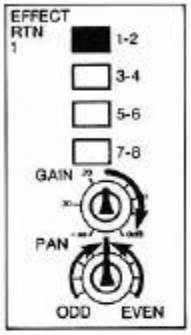
27. PHONES VOLUME
This controls the volume of the signal sent to the 34. PHONES jack.

28. EFFECT RETURN 1 SECTION
This section assigns the signal coming into EFFECT RTN 1 jacks (40) to GROUP busses 1-8.



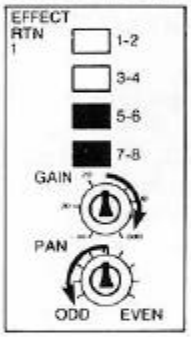
RTN 1 ASSIGN SWITCH RTN 1 GAIN RTN 1 PAN
The assigned buss(es) is determined by the use of the RTN 1 ASSIGN SWITCHES (28) and the RTN 1 PAN (28). The signal level is adjusted by RTN 1 GAIN (28).

However, note that the function of the RTN 1 PAN (28) depends on the connections made with the EFFECT RTN 1 jacks (40) (refer to the following illustrations).
When connections are made to both L and R of the EFFECT RTN 1 jacks (40), the 28. RTN 1 PAN serves as a L-R balance adjuster. Eg. 1: The LEFT output of a stereo output from a reverberator is sent to GROUP buss 1 while the RIGHT is sent to GROUP buss 2 at equal levels.



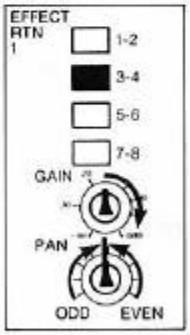
(■ : Button down
□ : Button up)

Eg. 2: The LEFT output of a stereo output from a reverberator is sent to GROUP busses 5 and 7 at equal levels while the RIGHT is sent nowhere.



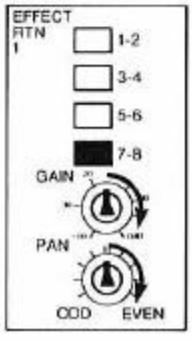
(■ : Button down
□ : Button up)

When a connection is made with only L, RTN 1 PAN (28) serves as a pan. Eg. 1: The monaural output from a delay is sent to GROUP busses 3 and 4 at equal levels.



(■ : Button down
□ : Button up)

Eg. 2: The monaural output from a delay is sent to only GROUP buss 8.



(■ : Button down
□ : Button up)

NOTE: When a connection is made with only R, it is not possible to assign the signal to an odd GROUP buss (ie. only to GROUP busses 2, 4, 6 and 8). In such a case, turn RTN 1 PAN (28) to the far right (EVEN) for level-matching purposes.

29. EFFECT RETURN 2 SECTION
This section assigns the signal(s) coming into the EFFECT RTN 2 jacks (41) to GROUP busses 1-8. The functions of the switches are the same as in the EFFECT RETURN 1 SECTION (28).

30. EFFECT RETURN 3 SECTION
This section assigns the signal(s) coming into EFFECT RTN 3 (42) jacks to GROUP busses 1-8. The functions of the switches are the same as in the EFFECT RETURN 1 SECTION (28).

31. FL BAR-GRAPH METER
This meter displays the output of GROUP OUT jacks 1-8/L from left to right respectively.

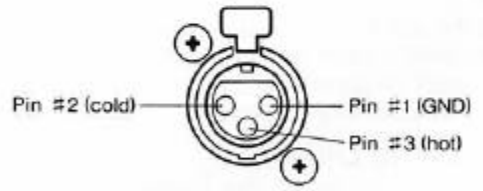
32. PHANTOM LED
This LED is lit when the PHANTOM switch (51) is ON.

33. SOLO LED
This LED is lit when an INPUT SOLO switch (13) or GROUP SOLO switch (20) is pressed.

34. PHONES JACK
The same signal to the MONITOR OUT jack (47) is outputted here.

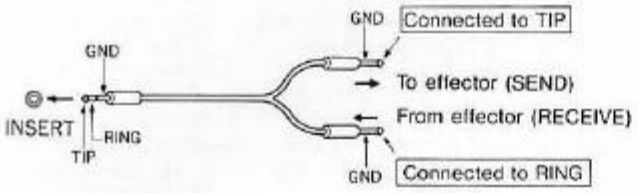
REAR PANEL

35. XLR INPUT JACK
This is an XLR-type jack. It is intended for a balanced input signal (3rd pin is HOT). However, it does accomodate an unbalanced signal as well; When connecting an unbalanced signal source, pins 1 and 2 become GROUND and the PHANTOM switch (51) MUST be turned OFF. Also, it is overridden when there is a plug connected to the PHONE INPUT jack (36), and the input signal to the XLR INPUT jack (if there is one) goes nowhere.



36. PHONE INPUT JACK
This is a 6ϕ phone-type input jack and is unbalanced. It does accomodate a balanced input signal, and, in such a case, the TIP will be HOT and the RING will be COLD.

37. INSERT JACK
From this jack, the post-FADER signal is sent out, possibly to an effect processor, and then returned to the same jack (see illustration). This jack is used mainly when hooking up effectors which modify the sound source signal itself, such as compressors, limiters and noise gates. The jack is of a stereo phone-type (TIP is SEND, RING is RECEIVE). If nothing is connected to this jack, the signal goes straight through from SEND to RECEIVE.



38. TAPE INPUT JACK
This jack is used mainly for the unbalanced output from the multitrack recorder in use.

39. DIRECT OUT JACK
The post-FADER signal from the particular channel is outputted from here (unbalanced). This jack may be used to send the signal to effectors.

40. EFFECT RETURN 1 JACK
Normally, the output from the effectors (unbalanced) will be returned here. The R of this jack also acts as a switch. When only L is plugged in, it is the equivalent of connecting the same signal with both L and R (ie. the L signal will be spliced equally between L and R). When both L and R are plugged in, a normal stereo input is carried through. When only R is plugged in, only R will receive the signal.

41. EFFECT RETURN 2 JACK
This functions the same as the EFFECT RTN 1 jack (40).

42. EFFECT RETURN 3 JACK
This functions the same as the EFFECT RTN 1 jack (40).

43. GROUP BUSS INPUT JACKS
These are the input jacks to GROUP busses 1-8/R. Usually, these are used as subsidiary inputs when there is a shortage of EFFECT RETURNS or when one hooks up another mixer to acheive a cascade effect.

44. AUX BUSS INPUT JACKS
These are the input jacks for the AUX buss (unbalanced). Usually, these are used when one hooks up another mixer to achieve a cascade effect.

45. EFFECT SEND BUSS INPUT JACKS
These jacks are input jacks for both EFFECT SEND 1 and SEND 2 busses (unbalanced). Usually, the EFFECT SEND outputs of other mixers are connected here to achieve a cascade effect.

46. GROUP OUT JACKS
These (unbalanced) output jacks for busses 1-8 are usually connected with the inputs to multitrack recorders.

47. MONITOR OUT JACKS
The signal selected by either MONITOR SELECTOR (25) or the SOLO buss signal (when in use) is sent here (unbalanced) after its level being adjusted by the MONITOR LEVEL knob (26). It may be used to hook up speakers for monitoring purposes.

48. AUX OUT JACKS
These are the output jacks for the AUX buss (unbalanced). They are usually connected to the inputs of an effector.

49. EFFECT SEND 2 JACK
This is the output jack for the EFFECT SEND 2 buss (unbalanced). It is usually connected with the input of an effector.

50. EFFECT SEND 1 JACK
This is the output jack for the EFFECT SEND 1 buss (unbalanced). It is usually connected with the input of an effector.

51. PHANTOM POWER SWITCH
When this switch is ON, a DC24V current will be supplied to pins 2 and 3 of the INPUT jacks (35) and (36) for all channels. When connecting a condensor microphone, turn the PHANTOM switch ON. NEVER connect a dynamic microphone when the switch is ON; It MUST be turned OFF when the microphone has no need for an exterior power supply.

52. PEAK HOLD SWITCH
When this switch is ON, the peak level indicated by the FL meter (31) will be held for approximately 4 seconds. When it is OFF, the peak level will not be held.

53. POWER SWITCH
After turning on the power to this unit, the muting time will be about 5 seconds.

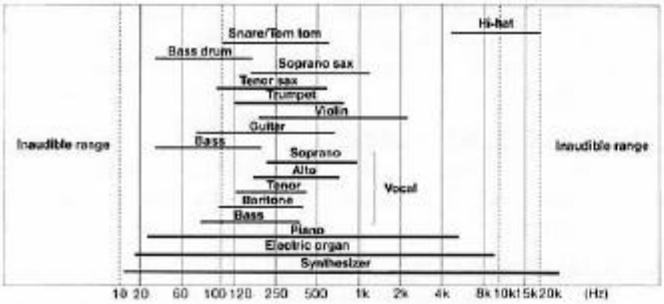
54. MIDI EXPANSION SLOTS
This space is allotted for future use with MIDI control. Do not remove the panel, since this may result in damage to this unit. Mounting will be done at the Service Station level.

55. POWER CORD

SECTION 4 THE PARAMETRIC EQUALIZER

The MODEL 812 features two single-band parametric equalizers along with a 10kHz fixed-frequency shelving-type equalizer at each input channel. The two parametric equalizers, which cover different frequency ranges, can set frequencies within the ranges of 60Hz ~ 1kHz and 400Hz ~ 6kHz, respectively. They are also capable of boosting and cutting within the ±15dB range, and will be highly effective when adding character to the tone quality of the sound signal by manipulating the fundamental frequency and/or harmonic overtones of the instruments/vocals.

FREQUENCY RANGES OF VARIOUS INSTRUMENTS



NOTE: Although the parametric equalizer is highly effective in the tone control of the original sound, during a microphone recording it is equally important that one adjusts the positioning of the microphones and/or the type of microphone in order to achieve the desired tone quality.

TYPICAL EQUALIZATION RESPONSE GRAPH

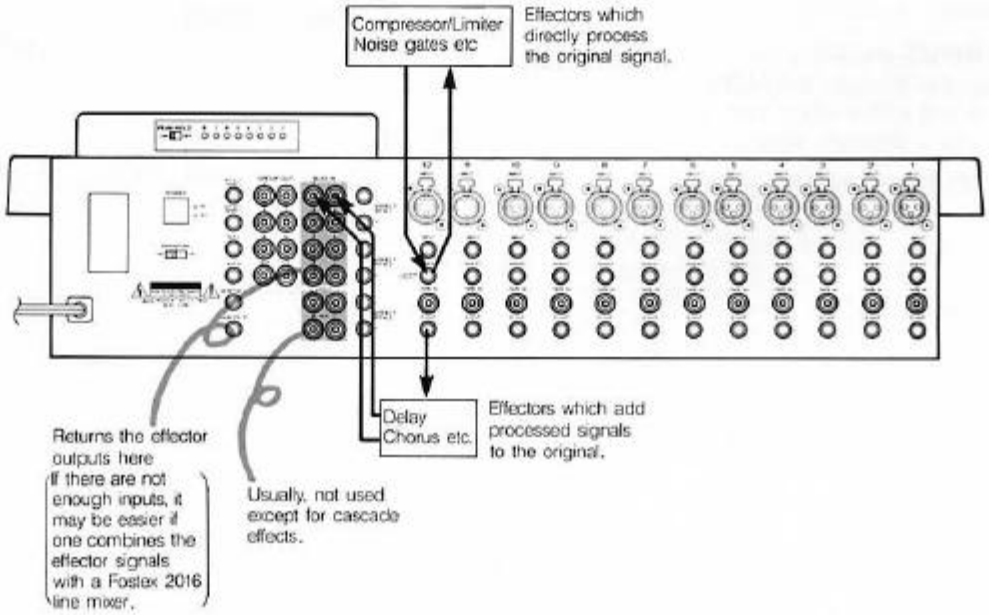
INSTRUMENT	CUTTING	BOOSTING
Human Voice	Scratchy at 2kHz Nasal at 1kHz Popping p's below 80Hz	Hot at 8 or 12kHz Clarity above 3kHz Body at 200 – 400Hz
Piano	Tinny at 1 – 2kHz Boomy at 320Hz	Presence at 5kHz Bass at 125Hz
Electric Guitar	Muddy below 80Hz	Clarity at 3.2kHz Bass at 125Hz
Acoustic Guitar	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
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
Bass Drum	Floppy at 620Hz Boomy below 80Hz	Slap at 3.2 – 5kHz Bass at 80 – 125Hz

- Depth of the sound by controlling frequency around 100Hz
- Add character by controlling frequency around 1kHz
- Voluminous sound by boosting 2 ~ 4kHz
- Clarity by boosting around 6kHz
- Sound brilliancy by boosting above 8kHz

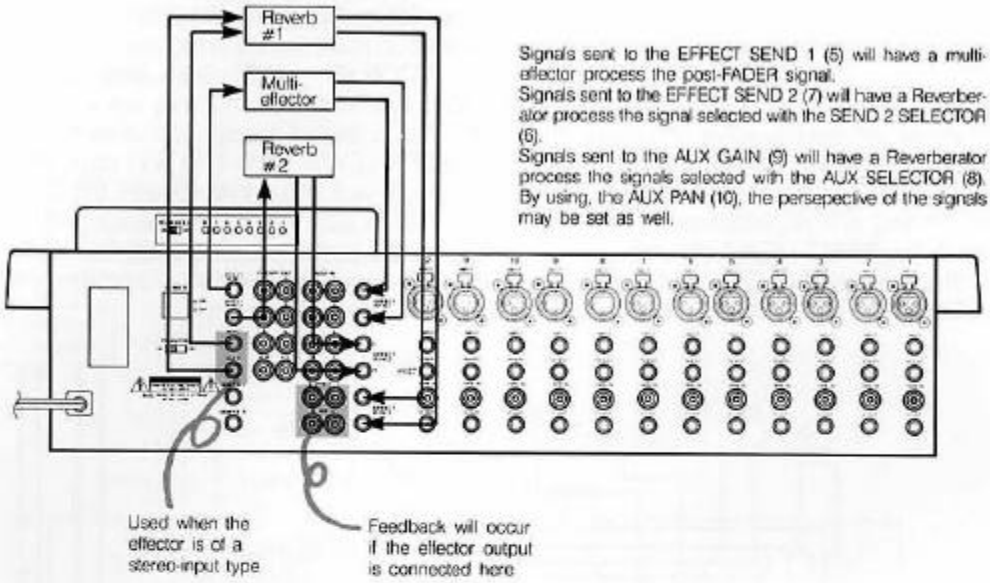
SECTION 5 CONNECTING EFFECTORS

Numerous kinds of sound manipulations are carried out during a multitrack recording through the use of various sound processors. Depending on the usage of a particular processor, connections to the Model 812 may vary. Please refer to the following illustrations.

1. When processing an effect on a particular channel (eg. compressors, limiters, delays, etc.)



2. When processing a common effect on all channels but with amount/perspective adjustments made per channel (eg. reverberators, exciters, etc.)



SECTION 6 CONNECTING PERIPHERAL EQUIPMENT

1. IMPEDANCE

Input and output impedances should be considered when connecting this unit to other equipment.
Impedance is the resistance value against alternating currents, such as sound signals and the unit used is the Ω (Ohm). If the output impedance of a given unit does not match the input impedance of another, this may result in sound distortion or even a breakdown. In general, the rule of thumb is that the output impedance should be low (low out) and the input impedance should be high (high in).
Refer to SPECIFICATIONS for the input and output impedances of this unit.
Note: Always use a Direct Box when connecting outputs indicated in watts (W), such as those of an amplifier, or when connecting instruments which require high input impedances. Failure to do so may result in damage to the power amplifier circuit as well as the unit itself.

2. ADJUSTING INPUT/OUTPUT LEVELS

The level adjustment of the incoming signal to INPUT jacks (35) or (36) is done with the TRIM (2) so as to prevent the frequent flashing of the PEAK LED (1).

ADJUSTMENT PROCEDURES

First, set the INPUT FADER (15) within the 0±5dB range, since this range is where the least noise/distortion occurs. Then adjust the input signal using the TRIM dial (2); The TRIM is −60dBV (microphone level) when turned to the far right and −10dBV (line level) when turned to the far left.

While adjusting the signal, it may be convenient to press the INPUT SOLO switch (13) of the particular channel, enabling monitoring of the post-FADER signal. In addition, please note that the PEAK LED will also light when the signal to the EQUALIZER SECTION (4) is overloaded. When adjusting with the TRIM, it is highly recommended that all EQUALIZER gains be turned to the flat position. If, after the trimming is finished and the desired tone quality adjusted, the PEAK LED still turns on, there is overloading at the EQUALIZER stage and either the input signal itself should be adjusted or the trimming be done over again.

All the nominal input/output impedances for this unit, except for inputs to INPUT jacks (35) and (36), are −10dBV (0.3V), therefore allowing direct hookups to most recording equipment. However, for connections with equipment with differing nominal impedances or professional equipment (+4dBm etc.), an attenuator or line amplifier (FOSTEX 5030 etc.) will be necessary.

SECTION 7 BASIC SIGNAL FLOW

In general, the basic flow of the sound signal during a multitrack recording can be separated into the following two routes:

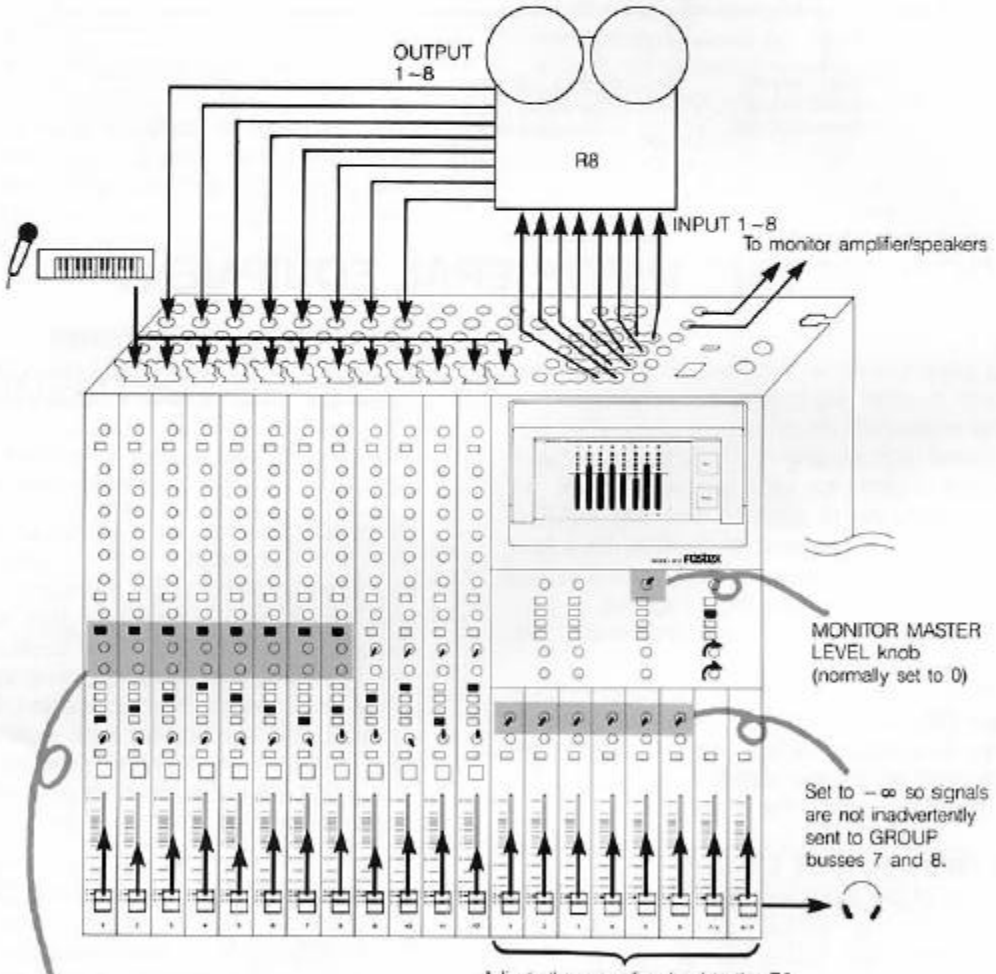
Route 1: Recording the inputted sound source(s) to a multitrack recorder.

Route 2: Monitoring the output signal(s) of a multitrack recorder while recording.

To illustrate these two routes, we will assume a live recording using a Model 812 mixer and a Fostex R8 multitrack recorder (Refer to the following illustration).

Route 1: The input signal coming in from the various instruments/microphones is sent to the INPUT FADER (15) (INPUT SELECTOR (3)→INPUT), then assigned to GROUP busses 1~8 by the ASSIGN SWITCHES (11) and PAN (12). Here, the overall level is adjusted with the GROUP MASTER FADERS (16) and (17) and finally outputted to the R8 recorder via GROUP OUT jacks 1~8/R (46).

Route 2: The output signals of tracks 1~8 of the R8 recorder (which is set to INPUT MONITOR; for details, refer to the instruction manual for the R8) are sent to AUX GAIN (9) (AUX SELECTOR (8)→TAPE). Then, according to the balance setting of the AUX PAN (10), they are sent to the AUX buss (L, R). The collected signals are level-adjusted with the AUX MASTER LEVEL knob (23) and outputted from the MONITOR OUT jack (47) and/or the PHONES jack (34) (MONITOR SELECTOR (25)→AUX). By adjusting the MONITOR LEVEL knob (26) and/or the PHONES VOLUME (27), monitor of the R8 output signals is now possible via speakers and/or headphones.



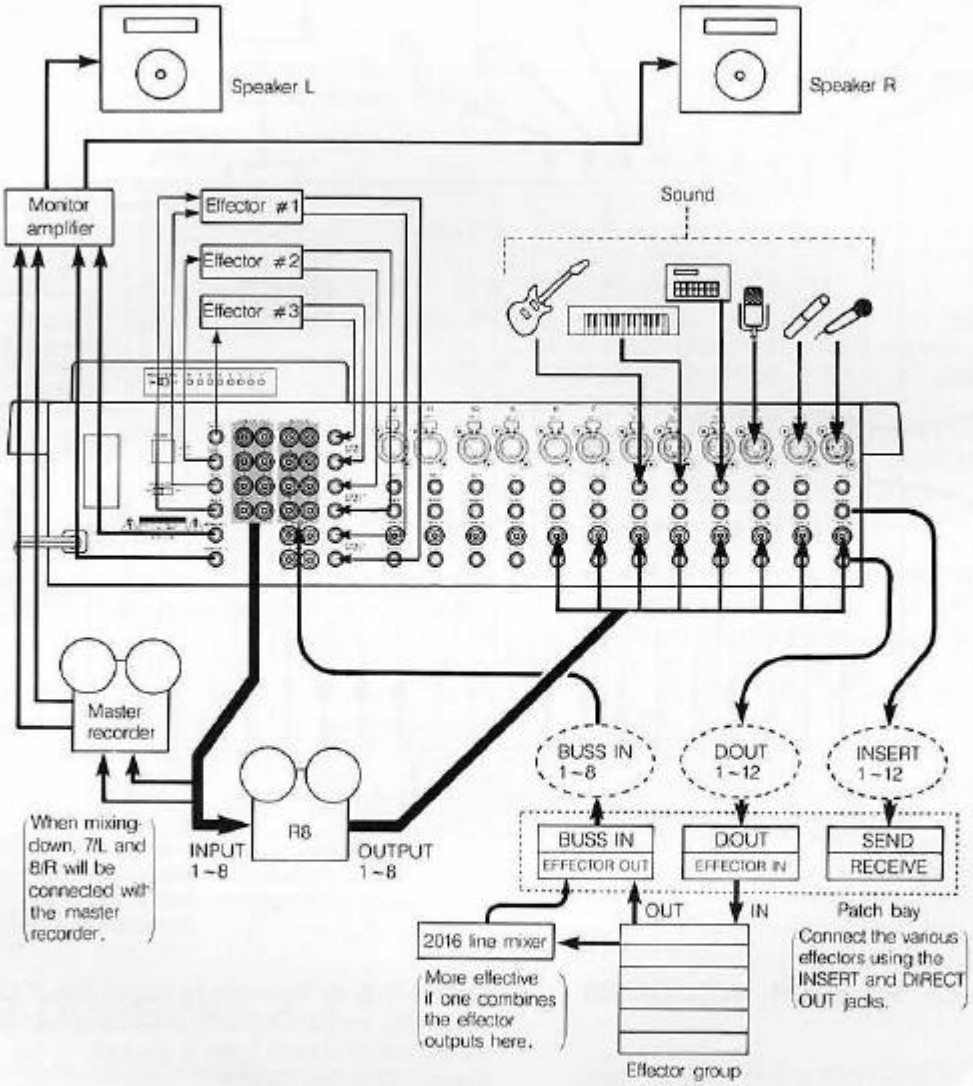
TRACK ASSIGNMENTS

R8 recording tracks	1	2	3	4	5	6	7	8
Input channels	4	10	3	5	6	2	1	7
		12		9		8		11

SECTION 8 MULTITRACK RECORDING

SAMPLE CONFIGURATION

The following diagram illustrates one of the basic configurations when using a Model 812 mixer for a multitrack recording. We hope that it will serve as a reference when deciding future configurations with your peripheral equipment.



I. BASIC TRACK RECORDING

What does basic track recording mean?

Usually, the initial step in a multitrack recording is what is known as "rhythm recording." In this case, "rhythm" refers to the integral instrumentation required to define the outline of the music, such as drums, percussion, basses etc. Here, we will refer to this rhythm recording as BASIC TRACK RECORDING.

We will assume the following assignments to illustrate the main aspects of a basic track recording.

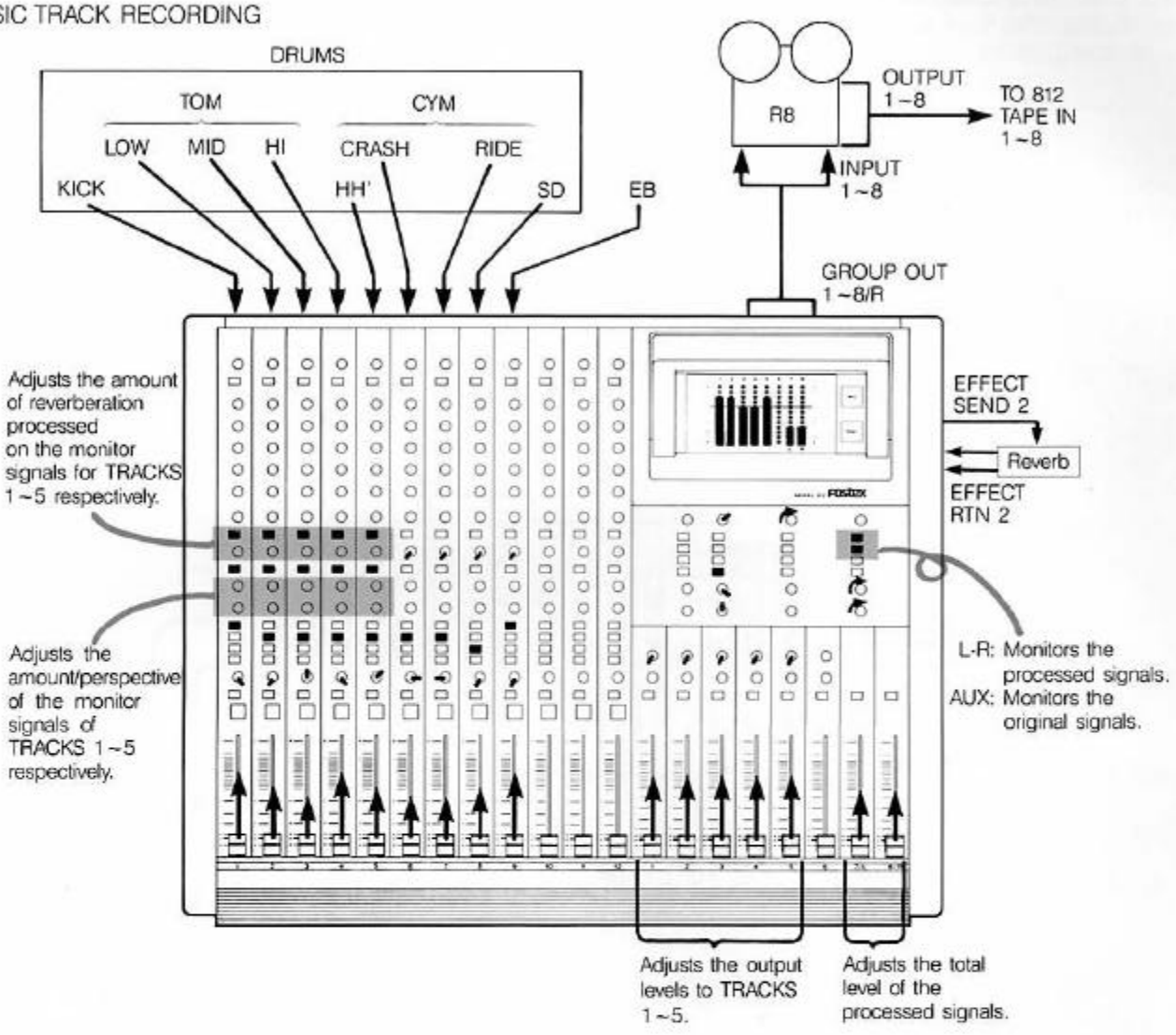
R8 Track Chart

TRK	1	2	3	4	5	6	7
SOURCE	EB (Elec. base)	KICK (Bass drum)	SD (Snare drum)	HI-HAT (hi-hat)	L←·····→R TOM RIDE	CRASH	EG (Elec. guitar)

Look at Figure 1. This configuration is intended so that the sound signals of the drums and electric bass picked up by a multi-microphone are recorded to the R8 recorder with the above track assignments.

After trimming the input gains and adjusting the tone quality (refer to pg. ADJUSTING INPUT/OUTPUT LEVELS and pg. THE PARAMETRIC EQUALIZER), we will set the necessary controls for this basic track recording.

Figure 1: BASIC TRACK RECORDING



SENDING THE SIGNALS TO THEIR DESIGNATED TRACKS

Track 1: Since the output from the GROUP OUT jack 1 (46) goes to track 1 of the R8, we want to send the post-fader signal of channel 9 to GROUP buss 1 (INPUT SELECTOR (3)→INPUT, ASSIGN SWITCH (11)→1-2, PAN (12)→ODD). Next, we want to adjust the level of the signal to GROUP OUT jack 1 (46), since this will be the recording level of the track. We do this by adjusting GROUP MASTER FADER 1 (16) while monitoring the level with the FL METER for track 1 (31).

Note: In this example, we will use GROUP busses 7 and 8 for monitoring the reverberation effect and therefore, to avoid undesired signals entering these busses, turn all of the GROUP TO L-R GAINS (18) to $-\infty$ (far left).

Track 2: Here, we want to send the KICK signal of channel 1 to GROUP buss 2. The process is similar to that of TRACK 1; Adjusting the total send level with the GROUP MASTER FADER (16) while monitoring the FL LEVEL METER (31) for GROUP buss 2 etc.

Tracks 3 & 4: We want to record the TOMS, HH, CRASH and RIDE to TRACKS 3 & 4 with a stereo perspective. First, for all the channels from 2 through 7, we select 3-4 using the ASSIGN SWITCHES of these channels. Then, by turning the PAN (12) as shown in Figure 1, we determine the proportion of the signal to be split between GROUP busses 3 and 4. For example, the LOW TOM (channel 2) will be sent only to GROUP buss 3 (PAN (8)→ODD), while the HH (channel 5) will be sent to both busses with a bias towards GROUP buss 4 (PAN (8)→somewhat more towards EVEN.) The final step will be to adjust the total output level with the GROUP MASTER FADERS (16) for busses 3 and 4. When monitoring the output level with the FL METERS (31), set the FADERS to 0. Then, after adjusting the relative levels with the INPUT FADERS (15), if the METERS (31) indicate an over level, instead of adjusting with GROUP MASTER FADERS (16), lower all INPUT FADERS (15) for channels 2~7 until the necessary level(s) is achieved.

Again, a reminder that all GAINs in the GROUP TO L-R SECTION (18) should be set to $-\infty$ since GROUP busses 7 and 8 will be used for monitoring in this example.

Track 5: Here, the SD signal of channel 8 is sent to TRACK 5 via GROUP buss 5 in the same manner as TRACK 1.

Effect Processing
Usually, effect processing is done during a mix-down and/or a ping-pong recording and not at this stage, however, we will illustrate one example where a compressor/limiter is processed onto the ELECTRIC BASS (EB) signal and a reverberation onto the TOMS (×3).

COMPRESSOR/LIMITER→EB

Connect a compressor/limiter to the INSERT jack (37) of channel 9 (refer to INSERT jack for procedures). An EB signal, being modified by the compressor/limiter, will now be recorded to TRACK 1.

REVERBERATOR→TOMS (×3)

Several methods are possible, but here we will use the EFFECT SEND 1 (5).
Connect the EFFECT SEND 1 jack (50) with the input of the reverberator and the output of the reverberator with the EFFECT RTN 1 jack (40).

1. Set the SEND 1 MASTER LEVEL knob (21) to 0 and adjust the amounts of the signals to be sent to the reverberator by using the respective EFFECT SEND 1 of channels 2~4.
2. Send the output of the reverberator to GROUP busses 3 and 4 (RTN 1 ASSIGN SWITCHES (28)→3-4, RTN 1 PAN (28)→center, RTN 1 GAIN (28)→0).
   Now the reverberated signals, as well as the original signals of the TOMS will be recorded to TRACKS 3 and 4.

MONITORING
Through the use of the EFFECT SEND 2 (7), the Model 812 is capable of processing an effect on the monitor signal of an incoming output from a recorder.
This feature allows for a more flexible monitoring environment where one can simulate the desired total effect without affecting with the signals being sent to the recorder.
In this example, we will use a reverberator to process the monitor signal. The monitoring methods for the outputs to TRACKS 1~5 will be the same as BASIC SIGNAL Flow on page 11.

Sending the Signal to the Reverberator
First select AUX with the SEND 2 SELECTOR (6) for channels 1~5. This has the purpose of sending the incoming TAPE signals (AUX SELECTOR (8)→TAPE) to the EFFECT SEND 2 buss. After adjusting the respective AUX GAIN (9) and EFFECT SEND 2 LEVEL knobs (7), the signals will be sent to the SEND 2 buss and, after a final adjustment with the SEND 2 MASTER LEVEL knob (22), routed to the reverberator.

Monitoring the Processed Signal
We will equally route the reverberator output from the EFFECT RTN 2 jack (41) to GROUP busses 7 and 8 by using the EFFECT RTN 2 SECTION (29) (RTN ASSIGN SWITCHES (29)→7-8, RTN PAN (29)→center, RTN GAIN (29)→0). The levels of the signals can now be adjusted with the MASTER FADERS for 7/L and 8/R (17). Then, by selecting L-R with the MONITOR SELECTOR (25), it is now possible to monitor the processed TRACKS 1~5 with the use of headphones or speakers connected with the MONITOR OUT jack (47) and/or PHONES jack (34). (Selecting AUX will enable monitor of the original signal.)
Note: For this example, do not select GROUP busses other than 7-8 with the RTN 2 ASSIGN SWITCHES since this will create an infinite loop. This will result in the processed signal to be recorded to TRACKS 1~5 and could cause howling (feedback).
For example, if the channel 5 signal is being sent to the EFFECT SEND 2 buss and 5-6 is selected at the RTN 2 ASSIGN SWITCHES (29), the following loop will be created.

ch.5 EFFECT SEND 2→Reverberator→GROUP buss 5→TRACK 5→ch.5 AUX GAIN
In order to prevent creating loops as above, it is also possible to connect the reverberator output to the AUX BUSS IN jack (44) and monitoring it by selecting AUX of the MONITOR SELECTOR (25). However, in this case, it will not be possible to adjust the master level of the processed signal.

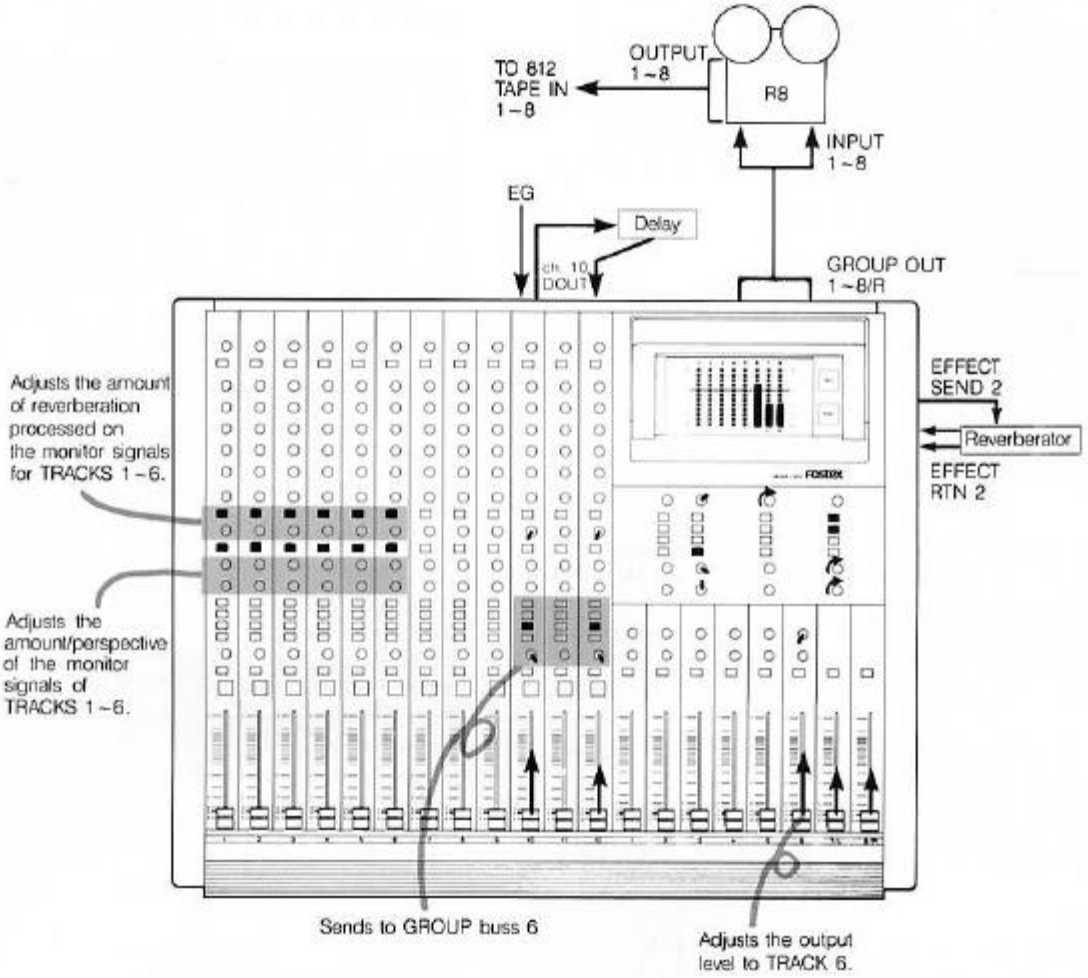
II. OVER-DUBBING

What does "over-dubbing" mean?
Over-dubbing is the process of recording a new sound source to a new sound track while simultaneously playing back the rest of the tracks with the recording head (synchronous play-back).

Look at Figure 2. This configuration is intended so that the sound signal from the ELECTRIC GUITAR (EG) will be "over-dubbed" to TRACK 6. TRACKS 1~5 will be monitored during their synchronous play-back. Also, a delay effect will be processed on the EG signal and also sent to TRACK 6.
The procedures for sending the EG signal to TRACK 6, monitoring the recorder outputs for TRACKS 1~6 and processing a reverberation on the monitor signal are all the same as in the BASIC TRACK RECORDING section.

For processing the delay effect, the EG signal will be sent to the processor via the DIRECT OUT jack (39) and the output from the processor will be sent to the INPUT jack (36) of channel 12 and routed to GROUP buss 6 along with the original sound signal (ch.12 INPUT SELECTOR (3)→INPUT, ASSIGN SWITCHES (11)→5-6, PAN (12)→EVEN). In doing so, the volume balances of the EG signal and its processed signal can be adjusted individually by using the INPUT FADERS (15) of channels 10 and 12 respectively. Individual equalizing is also possible.
Note: The EFFECT SEND 2 knobs (7) for channels 10 and 12 should be set to $-\infty$ in order to avoid the signals entering the EFFECT SEND 2 buss and distorting the reverberation balances while monitoring.

Figure 2: OVER-DUBBING



III. PING-PONG RECORDING

What does "ping-pong recording" mean?

"Ping-pong recording" is the process of mixing and recording tracks onto some other completely new track(s). This transferring of tracks can be done many times and thus, the going back and forth of the recording tracks is where its name comes from. The merits of a ping-pong recording lie in the fact that the "liberated" tracks can now be used for other purposes, such as over-dubbing.

Look at Figure 3. This is the configuration for mixing the pre-recorded TRACKS 1~6 in the previous examples and ping-pong recording them to TRACKS 7 and 8. Please note that, because the recorded TRACKS 7 and 8 can not be individually processed for effects during the mixing-down stage, the effects are processed on the source TRACKS 1~6 and routed along with the original signals to TRACKS 7 and 8.

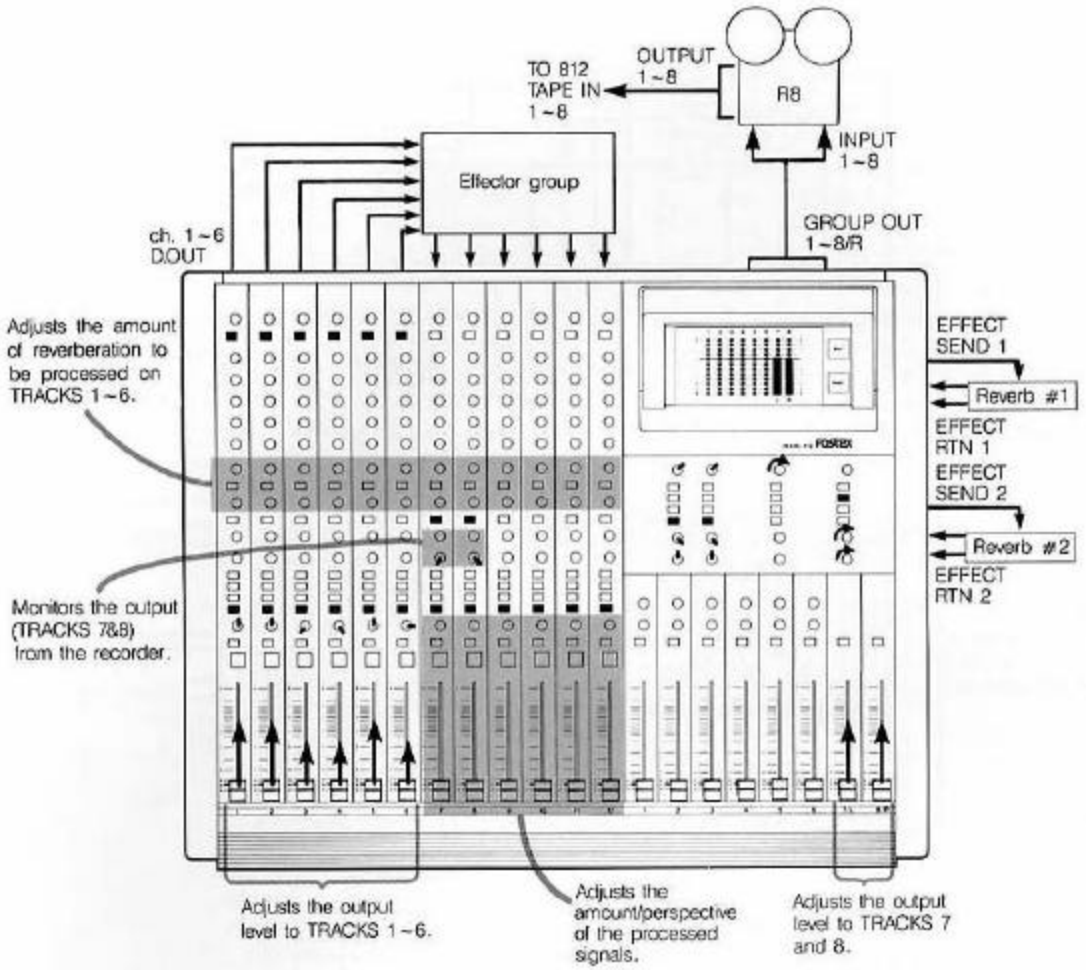
First, the original signals from TRACKS 1~6 of the R8 recorder are sent through the INPUT FADERS (15) to GROUP busses 7 and 8 (INPUT SELECTOR (3)→TAPE, ASSIGN SWITCHES (11)→7-8). The signals will be sent to the GROUP OUT jacks 7/L and 8/R (46) via GROUP MASTER FADERS 7/L, 8/R (17) and recorded to TRACKS 7 and 8. We will monitor the outputted signals to TRACKS 7 and 8 by sending the R8 recorder output to channels 7 and 8 to the AUX buss (AUX SELECTOR (8)→TAPE). After adjusting with AUX GAIN (9), we will route the signals to LEFT and RIGHT with the AUX PAN knobs of channels 7 and 8, respectively. Finally, after an level adjustment with the AUX MASTER LEVEL knob (23), the signals are now ready to be monitored (MONITOR SELECTOR (25)→AUX) with either the MONITOR LEVEL knob (26) or the PHONES VOLUME knob (27).

For effect processing done on individual channels, we will use the D.OUT jack (39) to send the signal to the processor(s) and the route the processor output to the INPUT jacks (35) or (36) of channels 7~12. From here, we will then send the signals to GROUP busses 7 and 8 (INPUT SELECTOR (3)→INPUT, INPUT ASSIGN SWITCHES (11)→7-8) with the respective perspective to be determined with the PAN pot (12).

For common effects processing with channels 1~6, EFFECT SENDS 1 and 2 will be used. In this example, both will be used to send signals to a reverberator. EFFECT SEND 1/2 will send the signal to reverberator #1/#2, which will then return it to the EFFECT RETURN 1/2 SECTION (28)/(29). From here, the signal will be distributed to GROUP busses 7 and 8 for output.

Note: For this example, DO NOT set the SEND 2 SELECTOR for channels 7 and 8 to AUX, nor the INPUT SELECTOR to TAPE, since this will create an infinite loop and may cause feedback.

Figure 3: PING-PONG RECORDING



IV. MIXING-DOWN

What does "mixing-down" mean?

"Mixing-down" is when one goes through a final mixing process, combining the various tracks of the multitrack recorder, and records the resulting stereo/monaural output to a separate master recorder. This is when the finishing touches are applied to the multitrack recording, from equalizing to effect processing, in order to create the desired total sound.

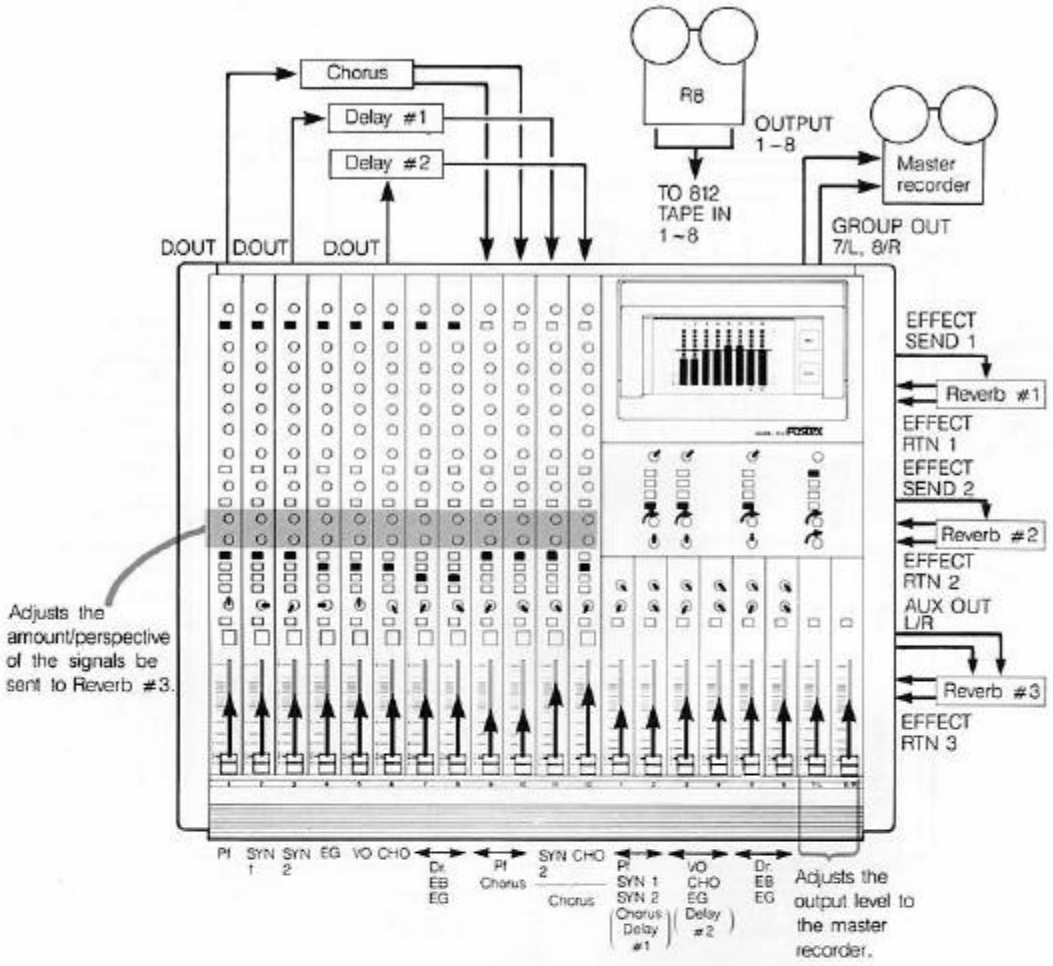
Look at Figure 4. This configuration is intended for processing various effects on the output signals of pre-recorded TRACKS 1~8, to mix them and finally record the stereo output to a master recorder. We will assume the following TRACK assignments.

The original signals sent to the INPUT FADERS (15) of channels 1~8 are routed to GROUP MASTER FADERS 1~6 (16) as in Figure 4 and then sent to GROUP busses 7 and 8 via the GROUP TO L-R SECTION (18) and (19).

In this example, GROUP MASTER FADERS 1 and 2, 3 and 4, 5 and 6 are grouped in stereo (ie. 1, 3, 5→LEFT, 2, 4, 6→RIGHT). This is set with the GROUP TO L-R PAN (19) (refer to Figure 4). Also, the GROUP TO L-R GAINS (18) are set to 0, so that the signals will be sent to GROUP busses 7 and 8 at the same levels as indicated by the FL METER (31) for GROUP busses 1~6.

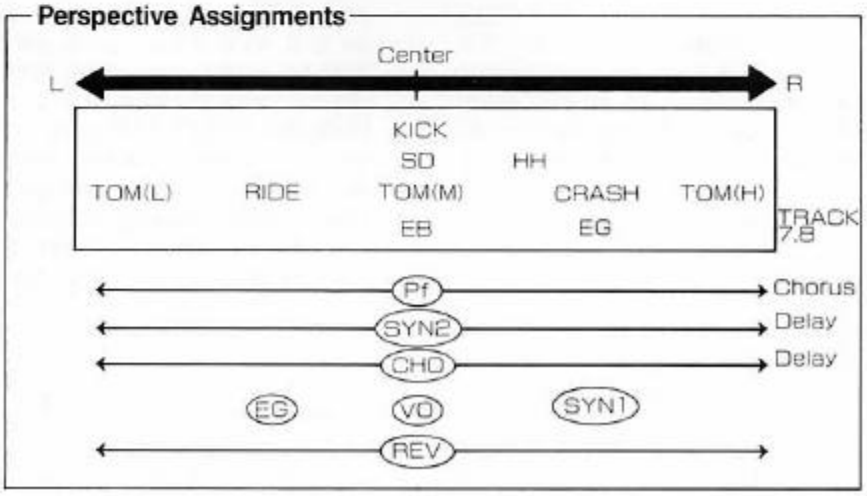
Using the DIRECT OUT jacks (39), we will process a chorus on the PF signal, and then expand it to a stereo signal (ie. split the chorus output between GROUP busses 1 and 2). Also, a single delay (short) will be processed on the SYN 2 and CHO signals, then, along with the original signals, expanded to stereo by giving them a L-R perspective.

Figure 4: MIXING-DOWN



In addition to the above individual sound effect processes, a common effect will be processed as well. EFFECT SEND 1 (5) will control the amount of the effect of reverberator #1, while EFFECT SEND 2 (7) will control reverberator #2. AUX GAIN (9) will control the amount of signal to be sent to reverberator #3 and AUX PAN (10) will determine the perspective to be sent (AUX SELECTOR (8)→POST).

All processed signals will be routed to GROUP busses 7 and 8 and along with the reproduced TRACKS 1~8 of the multitrack recorder and chorus/delay effects mixed-down to a master recorder via GROUP MASTER FADERS 7/L, 8/R (17) and GROUP OUT jacks 7/L, 8/R (46).
For monitoring the output signal, we will select L-R of the MONITOR SELECTOR (25).



MIXING-DOWN WITH MIDI EQUIPMENT

Here, we will illustrate a mixing-down situation where a multitrack recorder and a MIDI sequencer will synchronize their play-back recording and SMPTE time record SYNC signal on the edge track of an multitrack recorder, change the signal to a MIDI clock by using an interface

Look at Figure 5. This configuration is for synchronizing the output of a MIDI source with that of an R8 multitrack recorder (TRACK 8→SYNC signal), processing various sound effects and finally mixing-down the signals to GROUP busses 7 and 8

First the post-FADER signals of the MIDI sources will be routed to GROUP MASTER FADERS 5 and 6 (16) via the GROUP ASSIGN SECTION (11) and (12). A common-effect (effector #1) will then be processed on these signals using EFFECT SEND 1 (5). The processed signals will then be routed to GROUP MASTER FADERS 5 and 6 (16) with the original signals via the RTN 1 ASSIGN SECTION (28)

Using the EFFECT SEND 2 (7), another common effect (effector#2) will be processed on the input signals to channels 1~7 (SEND 2 SELECTOR (6)→AUX).

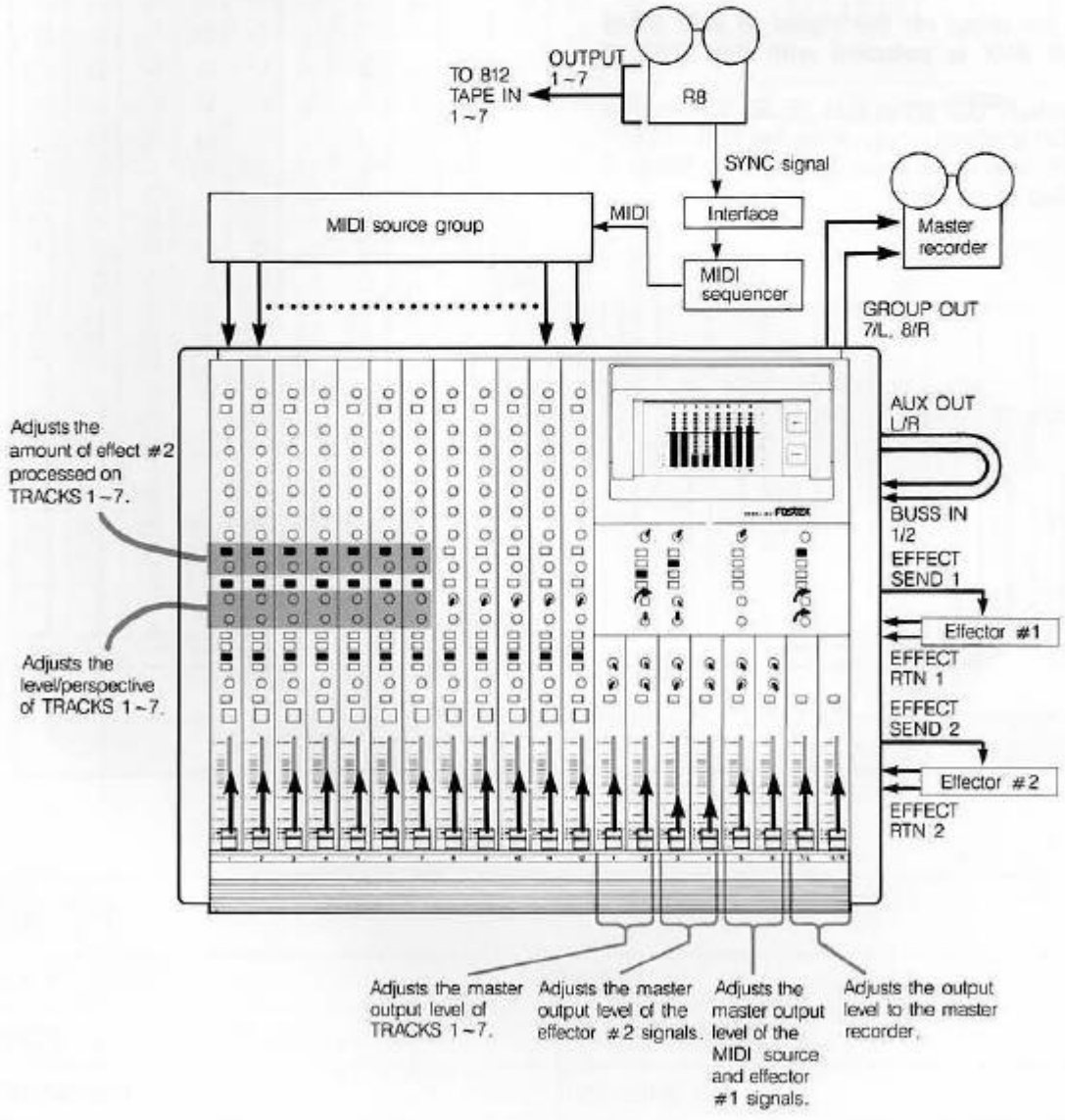
These will be grouped to GROUP MASTER FADERS 3 and 4 (16) via the RTN 2 ASSIGN SECTION (29).

The output of TRACKS 1~7 will be routed to AUX GAIN (9) (AUX SELECTOR (8)→TAPE). In order to group the mixed signals to GROUP MASTER FADERS 1 and 2 (16), the AUX OUT jack (48) will be "patched" (connected) to GROUP BUSS IN jacks 1 and 2 (43).

To recapitulate, the mixed original MIDI signals are sent to GROUP busses 1 and 2, processed signals (effector #2) to busses 3 and 4, a combination of original signals and processed signals (effector #1) to busses 5 and 6.

From here, the signals are sent to the GROUP TO L-R SECTION (18) and (19) and mixed down to a master recorder from GROUP MASTER FADERS 7/L, 8/R (17).

Figure 5: MIXING DOWN with MIDI



SECTION 9 TROUBLE SHOOTING

When the unit does not operate properly, please check the following.

Feedback occurs when a given track of a multitrack recorder is set to input monitor.
The output of the given track may be connected to the GROUP buss which is used for the output of this track. This will create an infinite loop and may be the cause of the feedback.

No signal is heard at the INPUT FADER (15).
You may have connected a monaural phone plug to the INSERT jack (37). This will send the signal to the effector, but will not return the signal back to the mixer.

Feedback occurs when increasing the signal level with EFFECT SEND 1 (5), EFFECT SEND 2 (7) and/or AUX GAIN (9).
You may have connected the SENDS of the EFFECT 1, EFFECT 2 and/or AUX with their respective INPUTS busses (44) and (45), creating a loop.

Cannot process an effect on the signal to AUX GAIN (9), even though AUX is selected with the SEND 2 SELECTOR (6).
You may have selected POST at the AUX SELECTOR (8). The SEND 2 SELECTOR is effective only when the AUX SELECTOR is set to TAPE, and if this is not the case the SEND 2 SELECTOR is forced to be POST.

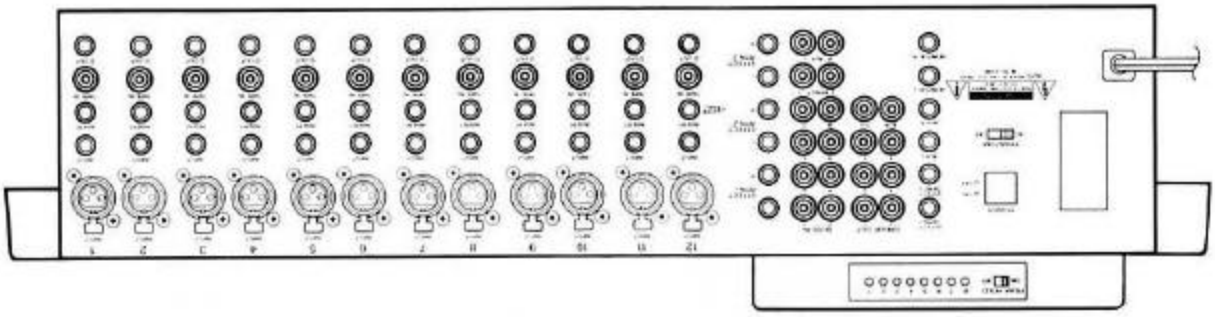
Cannot hear the monitor signal selected with the MONITOR SELECTOR (25).
Check if the SOLO LED (33) is lit; You may have pressed a SOLO SWITCH somewhere. Adjust the MONITOR LEVEL knob (26) and/or PHONES VOLUME (27).

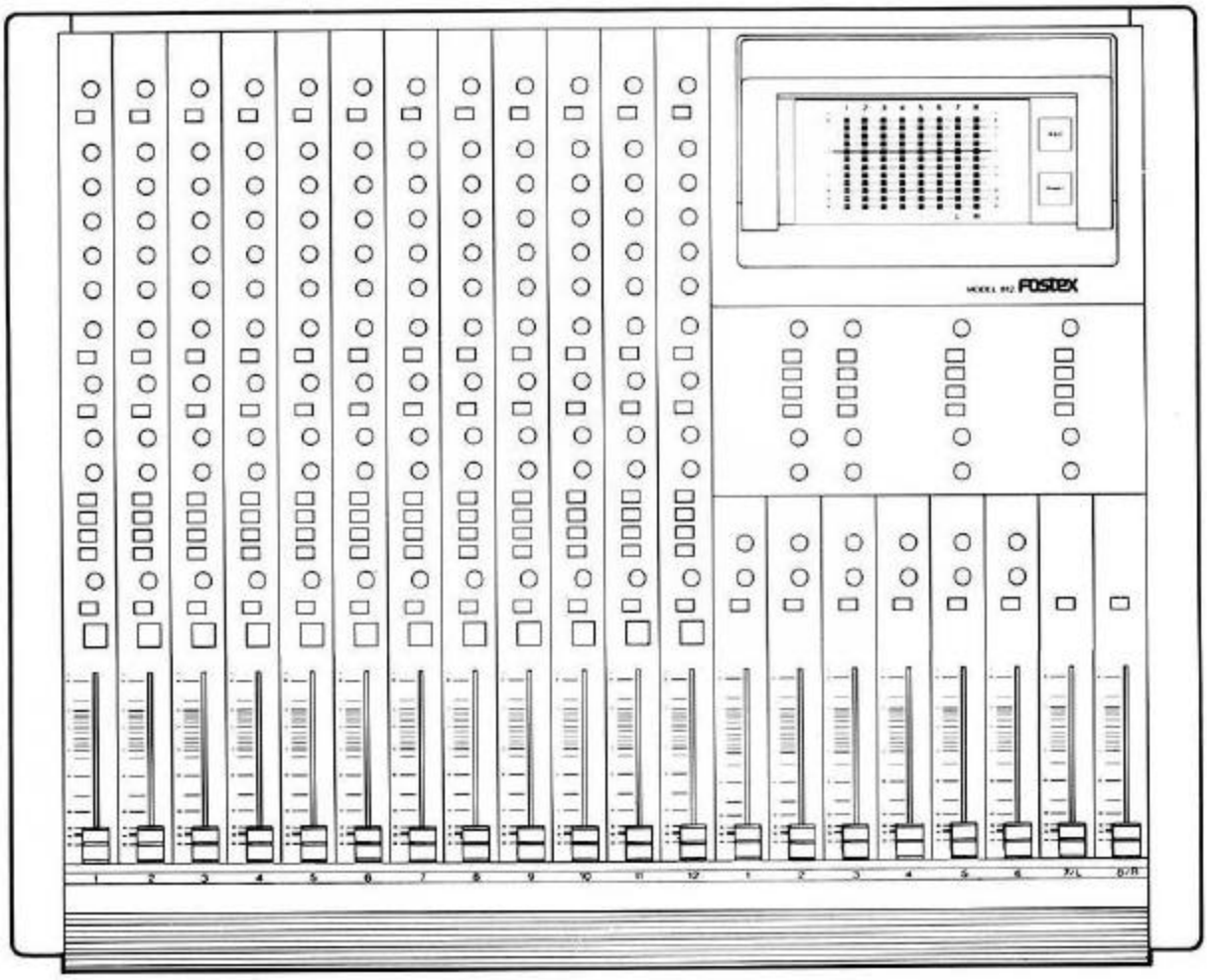
No sound is heard when a SOLO switch (13) and/or (20) is pressed.
Adjust the SOLO LEVEL knob (24).

The PEAK LED (1) lights frequently even after adjusting with the TRIM (2).
You may have raised the gain of the EQUALIZER (4) when controlling the tone quality, causing an overload at the EQUALIZER stage.

Sound is heard at GROUP MASTER FADERS 7/L, 8/R (17) even though no assigning is done to group busses 7 and 8.
You may have raised the GROUP TO L-R GAIN (18). When not in use, set these knobs to $-\infty$.

TRACK CHART





TITLE :	
TAKE :	DATE :
ARTIST :	PRODUCER :
ARRANGER :	ENGINEER :
RECORDER : NR :	STUDIO :

FOSTEX

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