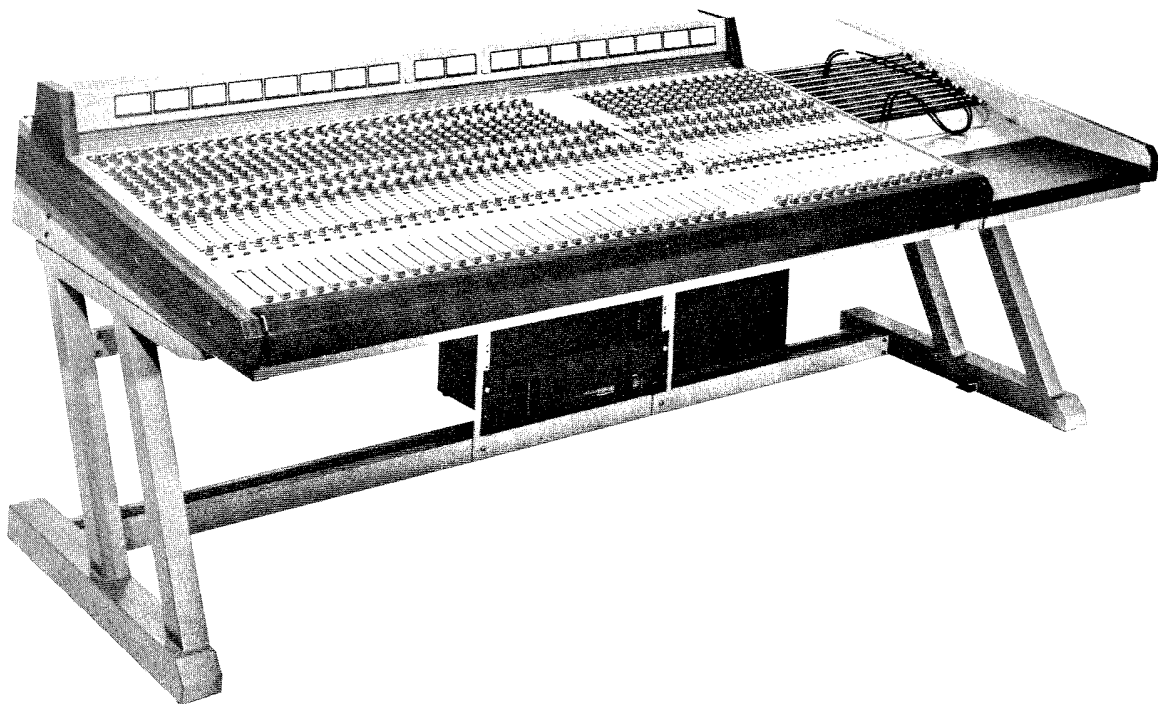


# TASCAM

TEAC Professional Division

# M-600 Series

Mixing Consoles



**OPERATION / MAINTENANCE**

5700090500

# SPECIFICATIONS OF THE PB-664

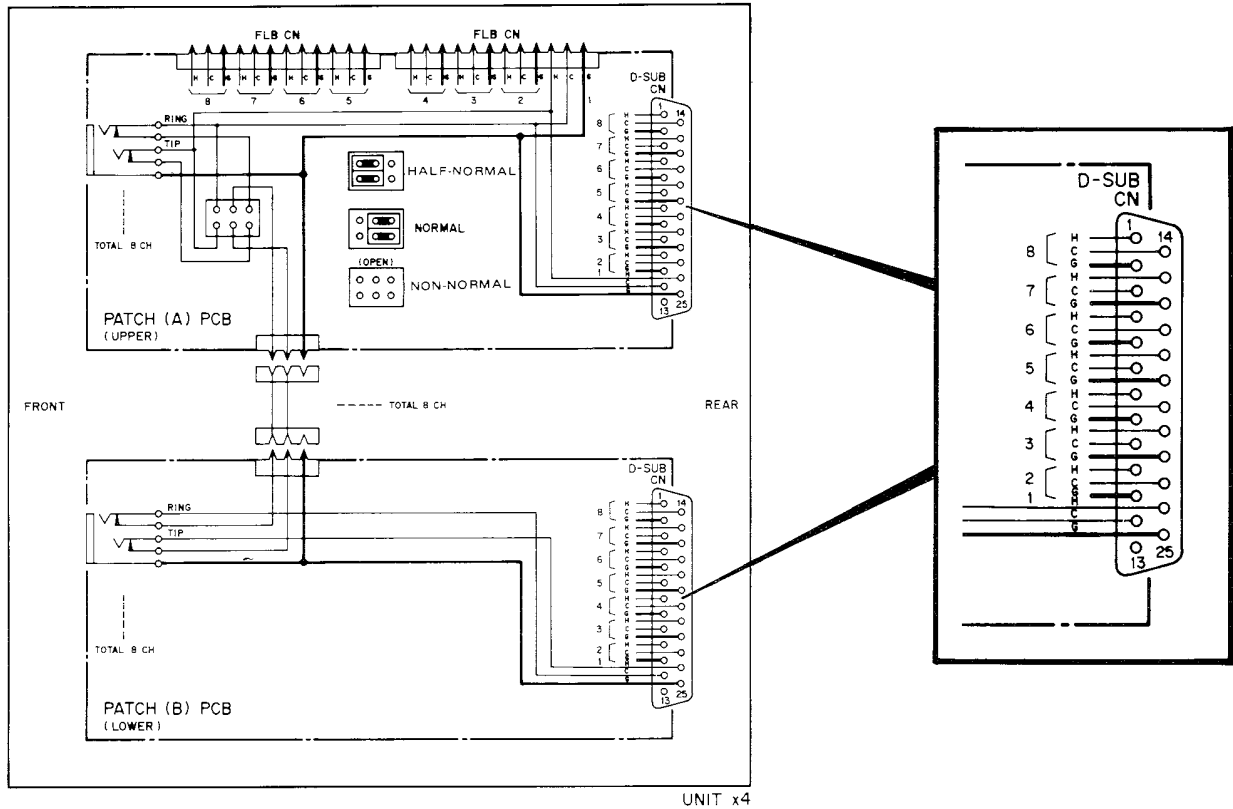
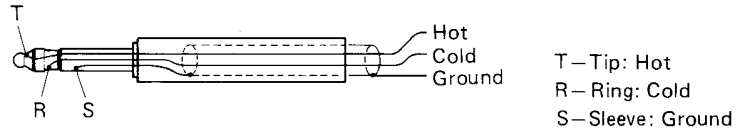
**Patch Points** : 64  
**Connections front** : 3-pole BANTAM jacks  
**Connections rear** : D-SUB 25-pin connectors  
**Dimensions (W x H x D)** : 482 x 44 x 69.5 mm (19" x 1-3/4" x 2-3/4")  
 (In the measuring width, the

projecting jacks are not included.) (See dimensions drawing)  
**Weight** : 1.3 kg (2.87 lbs.)  
**Standard Accessory** : Parallel Connector (Part No.5620134100)

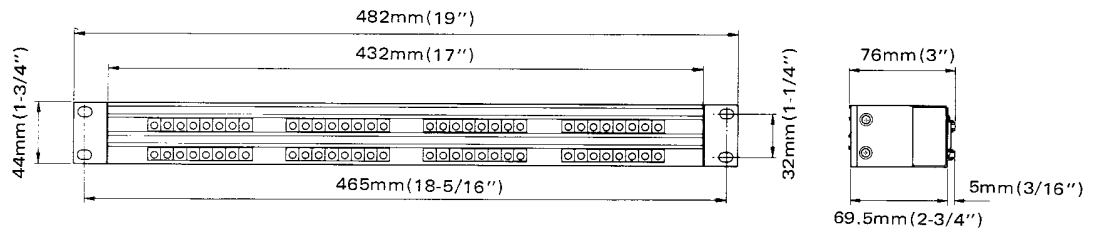
**Weight**  
**Standard Accessory**

## Internal Circuit Connection

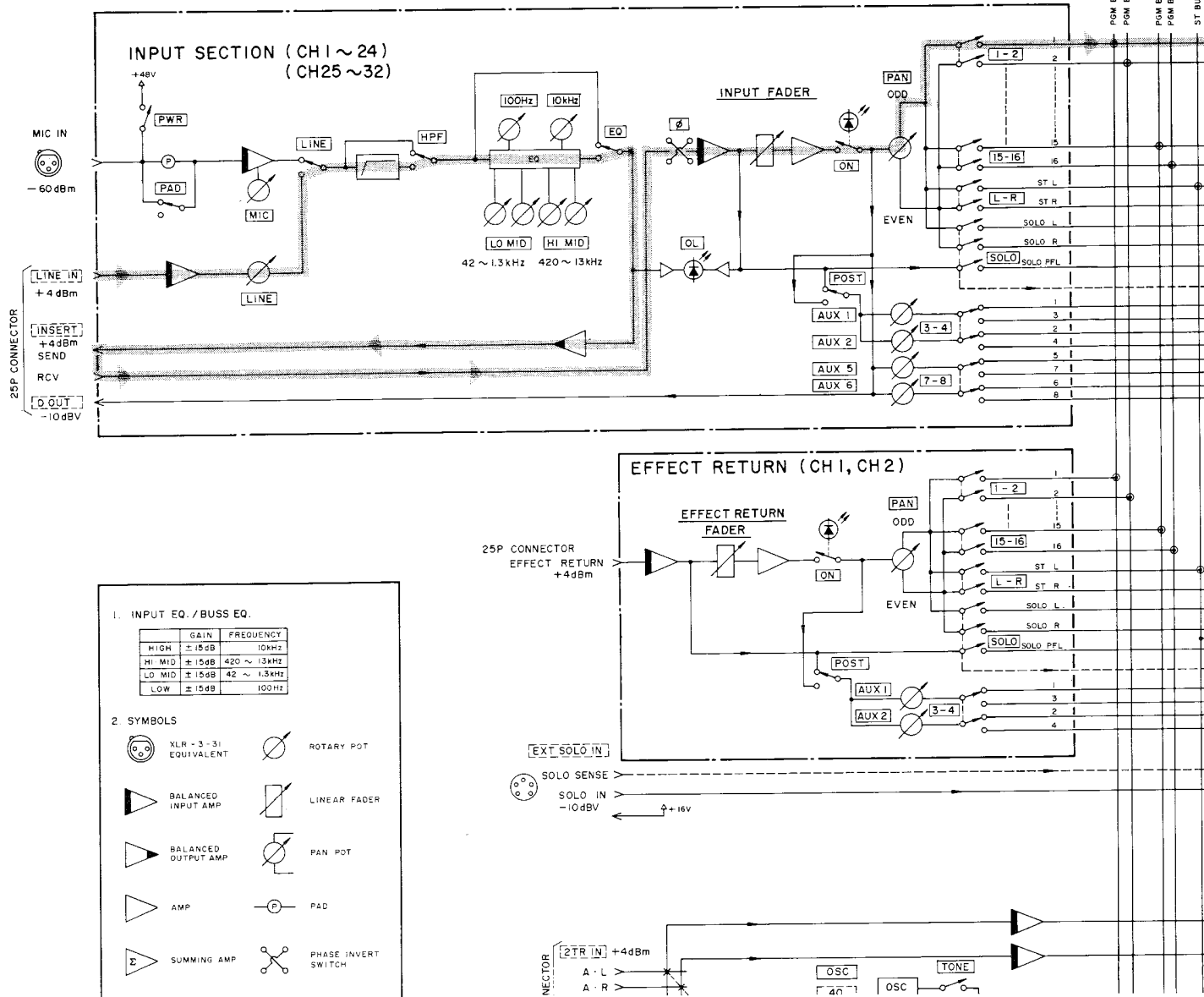
BANTAM Plug Polarity



## External Dimensions



## LINE IN Signal Flow



### 7 MIC Trim

The MIC trim provides variable attenuation for signals from the MIC IN connector. When used in conjunction with the PAD switch, it provides a maximum of 72 dB attenuation.

### 8 LINE Trim

The LINE trim provides variable attenuation for signals from the LINE IN connector in the range of -20 dB to +8 dB.

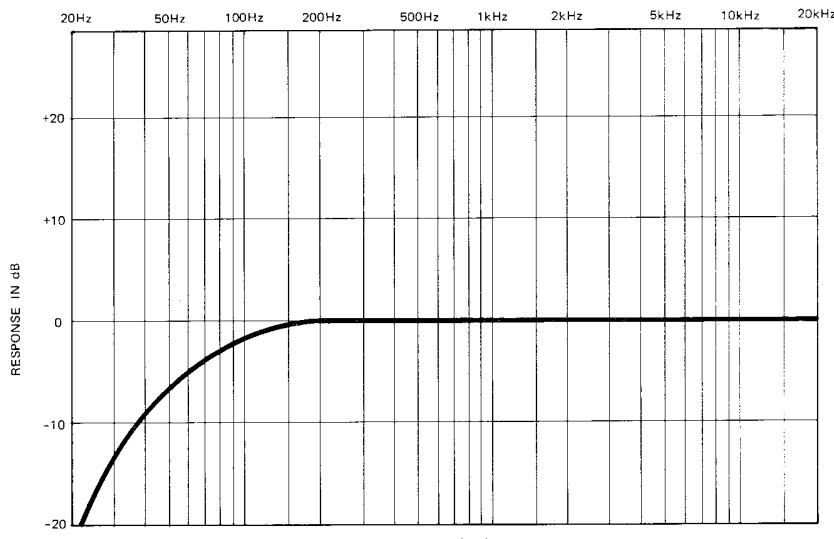
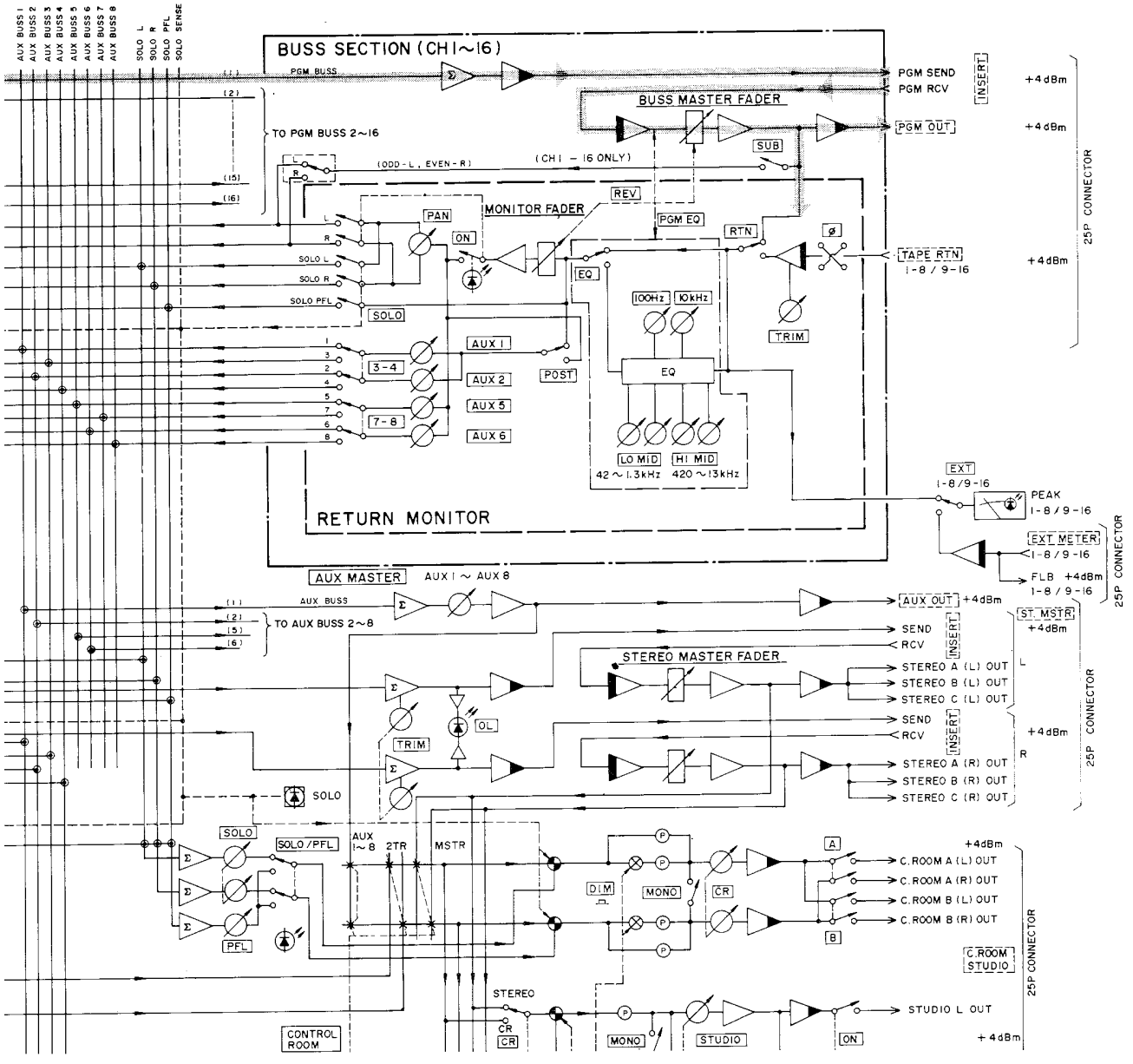
### 9 LINE Select Switch

A two position switch, LINE determines whether the signal from the MIC IN or LINE IN is sent to the rest of the channel strip. In its down/engaged position, LINE routes the LINE IN signal to the channel. In its up/disengaged position, the MIC IN signal goes to the channel strip.

### 10 HPF (High Pass Filter) Switch

If on/engaged, HPF will insert a filter with a cutoff frequency of 80 Hz and a cutoff rate of 12 dB per octave.

HPF is a two position switch. The filter is either on or off completely.



HPF Characteristics

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# FEATURES AND FUNCTIONS

## STANDARD INPUT MODULE

(Rear Panel)

### ① MIC Input Connector – Balanced –

This XLR connector is for use with balanced signals with an impedance of 200 to 600 ohms. Pin assignment is as follows: Pin 1 is shield, pin 2 low and pin 3 high.

\* Note that Phantom Power is available at the MIC INput. Make sure the PWR switch is off, if phantom power is not required.

### ② LINE Input Connector – Balanced –

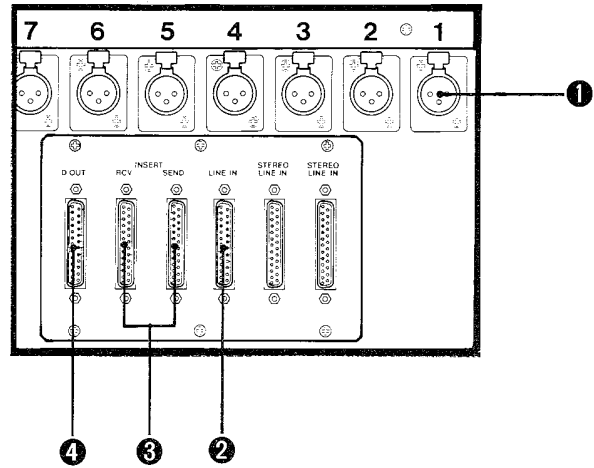
The LINE IN connector accepts balanced line level signals. Nominal input level is -20 dBm (0.08 V) (Trim max.) to +8 dBm (1.95 V) (Trim min). Input impedance is 40 k ohms.

### ③ INSERT SEND/RCV Connectors – Balanced –

The insertion point is provided post-EQ and pre-fader. It is most commonly used to place signal processing effects into the channel circuit.

### ④ D. (Direct) OUTput – Unbalanced –

The D.OUT provides access to the channel signal in its final form: the take-off point is post-fader, and before the channel ON switch. Nominal output level is -10 dBV (0.3 V). Output impedance is 100 ohms. When feeding balanced equipment, use the optional LA-40 Low Impedance Adapter.



## CHANNEL SECTION

(Top Panel)

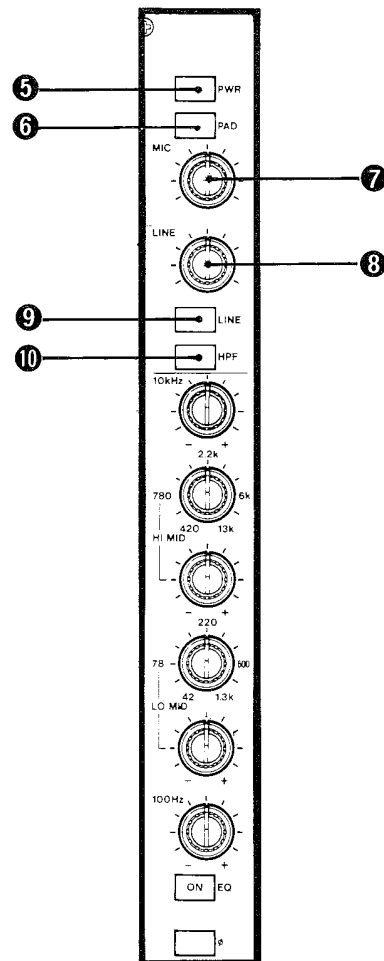
### ⑤ PWR (Phantom Power) On/Off Switch

+48 volts DC is applied in the M-600 Series mixers to both pins 2 and 3 of the MIC IN connector simultaneously. There are mics, though referred to as "phantom," that require a different voltage, or a different method of applying the voltage to the pins of the MIC IN connector. Before plugging in, check the phantom method of your mics.

\* Make sure to turn the PWR switch off when no phantom power microphones are used.

### ⑥ PAD Switch

The PAD switch provides a fixed attenuation of 30 dB to the MIC IN level before it reaches the transformerless, balanced input amplifier. Use this PAD in conjunction with the MIC trim to attain the proper signal level, depending on the OL (OverLoad) indicator status on each of the input channels as your guide.



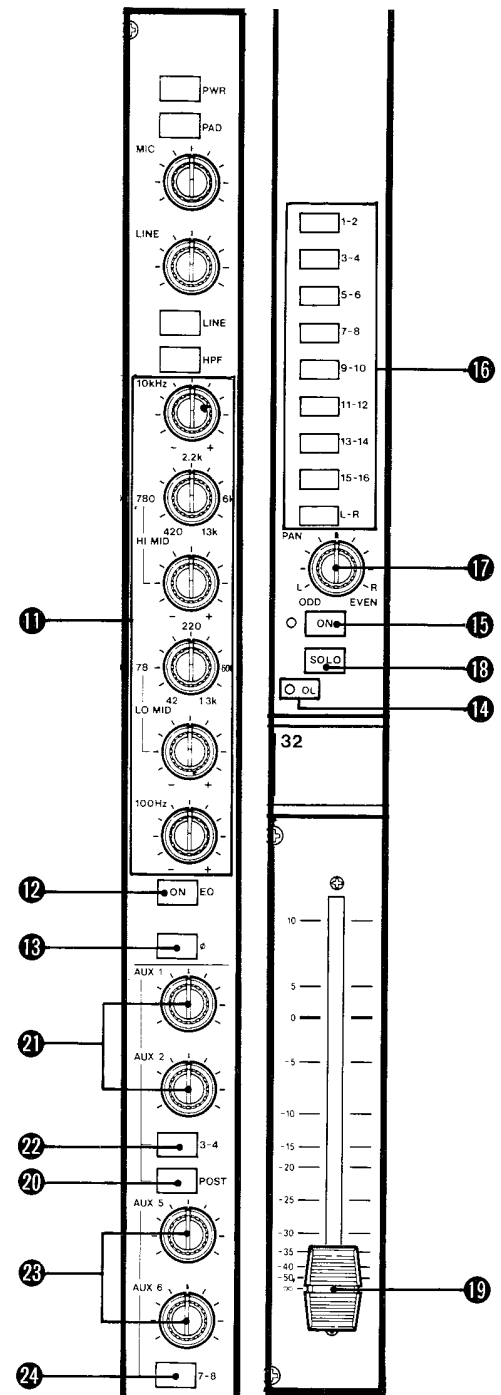
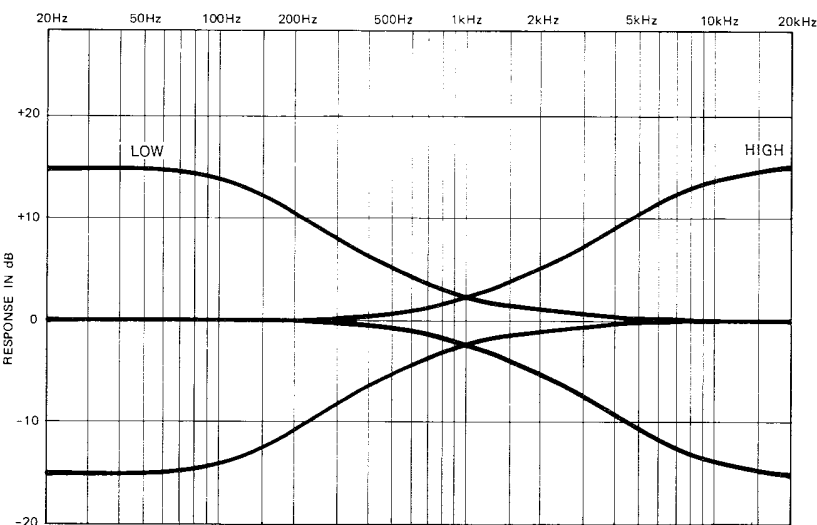
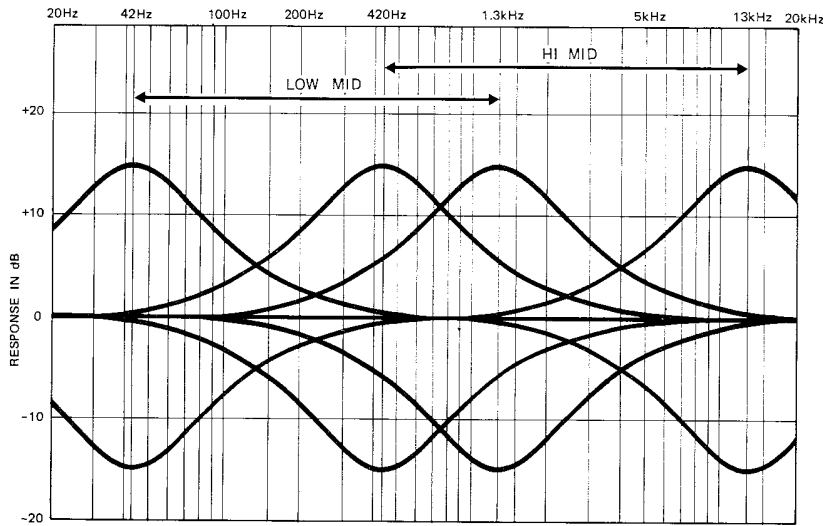
## 11 Equalizer

The EQ system is divided into four bands/sub-sections: High Frequency (controlling all signals above 10 kHz), High Midrange (for control over frequencies from 420 Hz to 13 kHz), Low Midrange (from 42 Hz to 1.3 kHz), and Low Frequency (all signals below 100 Hz).

The High Frequency section is shelving type and can apply 15 dB boost or cut at, and above 10 kHz.

The two middle range sections are sweep-type parametric that can apply 15 dB boost or cut at the variable center frequency.

The Low Frequency section is also shelving type and can apply 15 dB boost or cut at, and below 100 Hz.



25P CONNECTOR

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## 12 Equalizer ON Switch

You can choose not to route the signal through the equalizer system by using the EQ ON switch. If the switch is engaged (down), the signal in the channel will pass through the EQ electronics. If disengaged (up), the signal will bypass the EQ section, providing a flat frequency response.

## 13 Phase Reverse Switch ( $\phi$ )

This switch is used to reverse the phase of the signal in the channel. For a variety of reasons, input sources may be out-of-phase with one another. This feature makes it possible to assure consistent phase relationships of the input signals before they are summed in the busses.

## 14 OL (OverLoad) Indicator

The OL LED will light whenever signals of 3 dB below clipping point are detected; warning you of the need to use the PAD and MIC trim controls or the LINE trim control.

## 15 Channel ON Switch

This two position switch turns the input channel strip off and on. If the switch is down/engaged, the channel sends signal to the PAN, FADER, the post-fader AUXs, and the D.OUTs. When the channel is on, the LED next to the ON switch will be lit. If the ON switch is up/disengaged, the channel will, effectively be "off."

**NOTE:** Even if the channel is off, signal is routed to AUX send busses 1-4 when their send point is pre-fader (with the POST switch in the up position).

## 16 Channel Assign Switches

This group of switches routes signals from the channel strip via the PAN control to the PGM group busses or to the master stereo busses.

## 17 PAN Control

PAN determines the amount of signal that is sent to the odd and even PGM busses and Master busses. Any of the PGM and Left/Right master busses can receive signals if they are assigned by the Channel Assign Switches and the PAN is set to send them signal. Counterclockwise rotation of the PAN control sends the signal to the odd-numbered PGM (and Left) busses; its clockwise rotation sends the signal to the even-numbered PGM (and Right) busses. In positions other than completely clockwise or fully counterclockwise, PAN sends signal to both odd and even busses to a degree that is variable according to the PAN's position.

## 18 SOLO Switch

When the SOLO function is activated (the SOLO switch is pressed down), the signal(s) from the channel(s) where SOLO is activated will be heard in the control room monitor speakers. The signal is sent to the SOLO Master volume control, and then, through the SOLO/PFL switch, to the C. (Control) ROOM Outs L & R. The SOLO LED in the Master Module will light when the function is activated. The SOLO function temporarily overrides the selection made on the CONTROL ROOM monitor select switch rack on the Master Module.

When the Control Room Monitor Section is in SOLO mode (with the SOLO/PFL switch up), SOLO provides solo-in-place. Solo-in-place gives a true stereo representation that really helps the engineer make critical judgements and adjustments regarding stereo imaging, phase relationships, equalization or level settings.

## 19 Channel Fader

The 100-mm channel fader determines the final signal level sent to the PGM busses, the master stereo busses, the AUX 1-2 or 3-4 post-fader send point, the SOLO busses, and to the D. OUTs.

## AUXILIARY SEND SECTION

## 20 POST Switch

The POST switch only affects the channel signal sent to AUX busses 1-4. The AUX 5-8 send point is not switchable and is always post-fader. If the POST switch engaged (down), it routes the channel's signal from a point post-fader and after the ON switch to AUX 1-2 or AUX 3-4 busses as selected by the "3-4" switch. If the POST switch is disengaged (up), the take-off point for these AUXs will be pre-fader.

## 21 AUX 1 and 2 (or 3 and 4) Send Level Controls

These two level controls affect the signal level sent to AUX busses 1-4 (the 3-4 switch is engaged to send the channel's signal to the AUX busses 3 and 4).

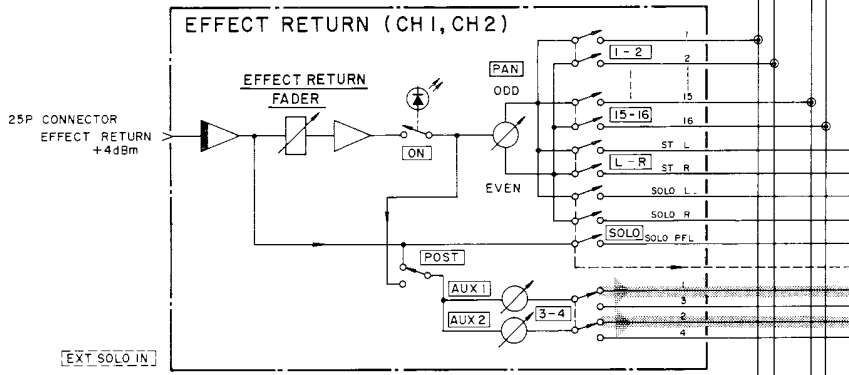
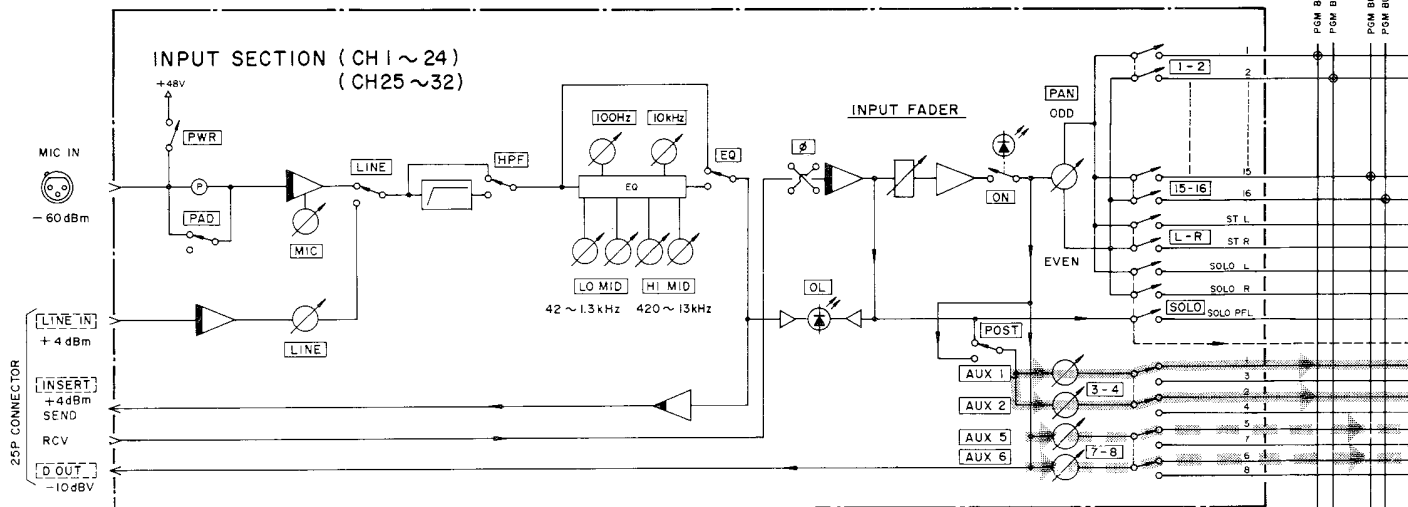
The AUX 1 through 4 sends can either be pre- or post-fader depending on the setting of the POST switch.

## 22 3-4 Select Switch

If the 3-4 switch is engaged (down), the channel's signal is sent to AUX busses 3 and 4 via the separate send level controls labelled AUX 1 and AUX 2. When the 3-4 switch is released (up), the same two level controls affect the signal sent to AUX busses 1 and 2.

# AUX Send Flow

Aux 1 - 4  
Aux 5 - 8

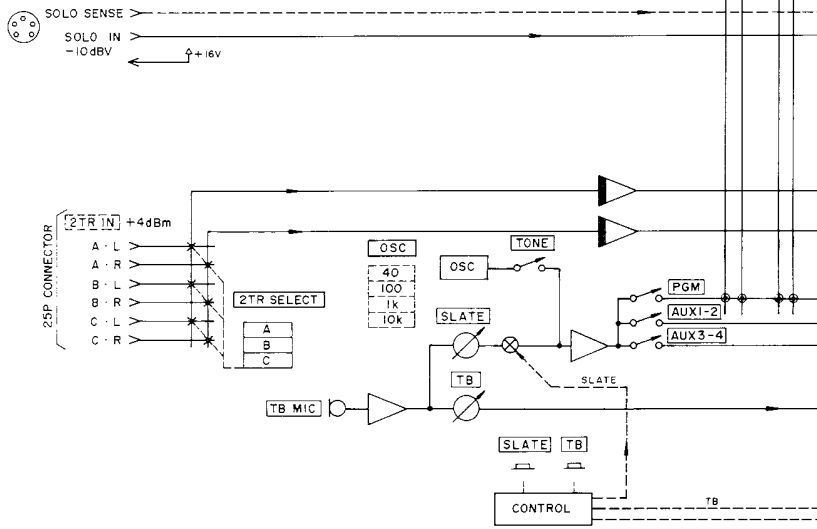


1. INPUT EQ. / BUSS EQ.

	GAIN	FREQUENCY
HIGH	±15dB	10kHz
HI MID	±15dB	420 ~ 13kHz
LO MID	±15dB	42 ~ 1.3kHz
LOW	±15dB	100Hz

2. SYMBOLS

- XLR - 3 - 31 EQUIVALENT
- BALANCED INPUT AMP
- BALANCED OUTPUT AMP
- AMP
- SUMMING AMP
- ELECTRIC SWITCH (TRANSFER A, B)
- MIC UNIT
- ROTARY POT
- LINEAR FADER
- PAN POT
- PAD
- PHASE INVERT SWITCH
- PUSH SWITCH (LOCK TYPE)
- PUSH SWITCH (LOCK TYPE)
- ELECTRIC SWITCH
- CONNECTION NODE
- SUMMING NODE
- SELECT SWITCH



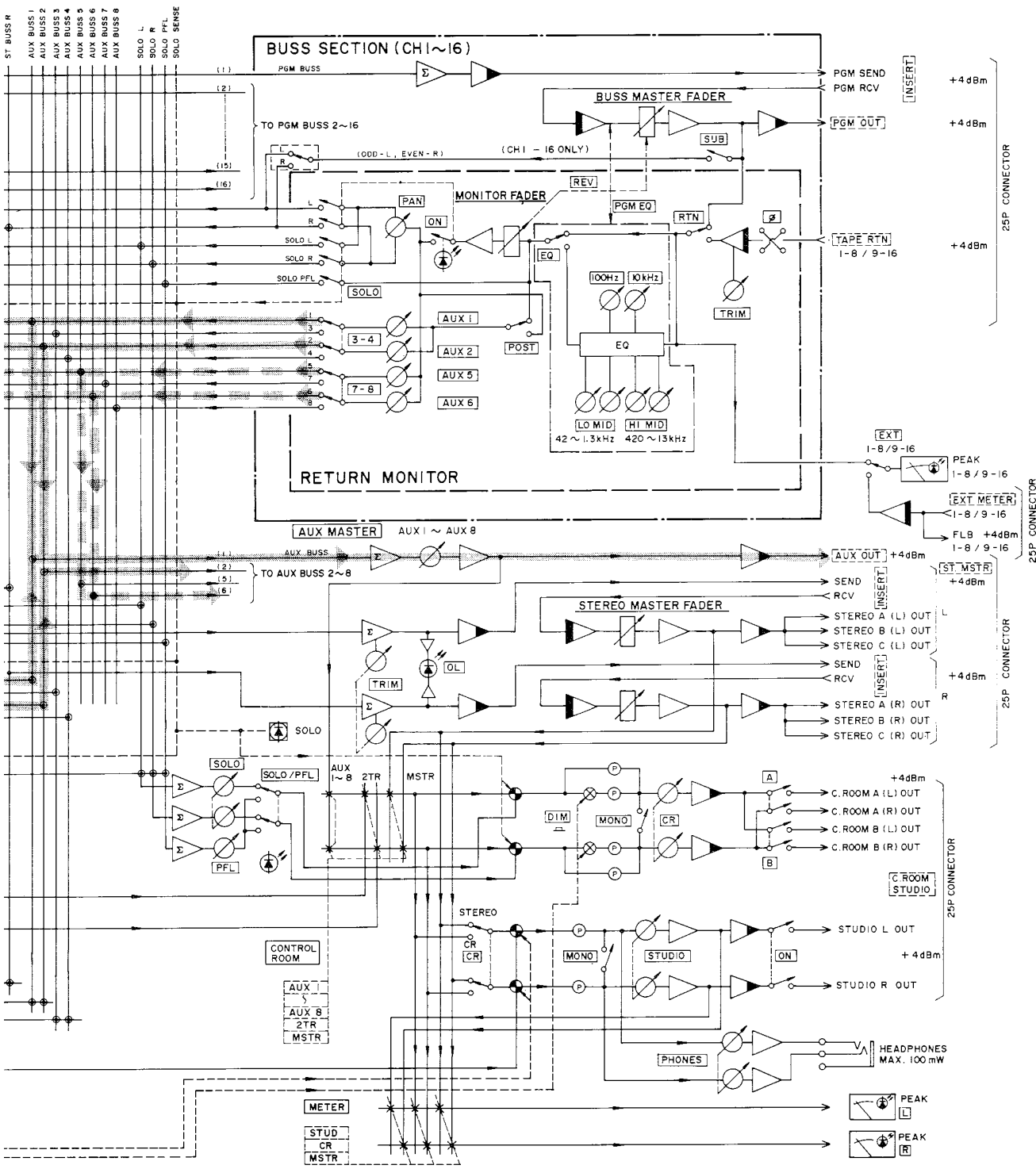
## 23 AUX 5 and 6 (or 7 and 8) Send Level

Unless the 7-8 switch is depressed, these controls affect the level of signal sent to AUX 5 and 6, respectively. If the 7-8 switch is down, they affect the level of signal sent to AUX 7 and 8. In contrast to the AUX sends 1 through 4, the AUX sends 5 through 8 are always derived post-fader.

## 24 7-8 Select Switch

If the 7-8 switch is engaged (down), the channel's signal is sent to the AUX 7 and 8 busses via the separate send level controls labelled AUX 5 and AUX 6. When the 7-8 switch is released (up), the channel's signal is sent to the AUX 5 and 6 busses via the same send level controls.



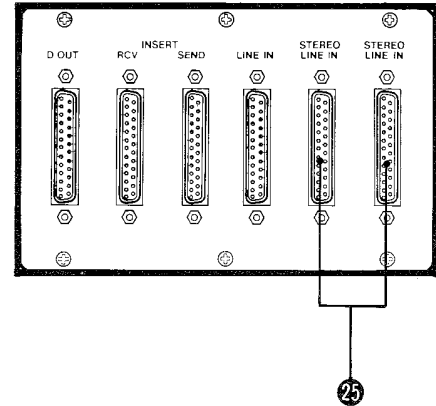


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**STEREO INPUT MODULE (OPTIONAL)**  
(Rear Panel)

**25 STEREO LINE INs, A and B —Balanced—**

Each of the stereo input channels has two line-in systems, A and B, either of which is selected by the A/B switch on the top panel. Nominal input level is -20 dBm (0.08 V) (TRIM max.) to +8 dBm (1.95 V) (TRIM min.). Input impedance is 40 kohms.



**CHANNEL SECTION**  
(Top Panel)

**26 LINE IN SELECT A/B Select Switch**

When this switch is on/down, the input at STEREO LINE IN B is activated. When the switch is released off/up, STEREO LINE IN A is activated instead of STEREO LINE IN B.

**27 Right Channel Phase Reverse Switch (  $\phi$  )**

The phase of the Right input will be reversed if this switch is pressed on/down. Occasionally your stereo sources may have phasing irregularities between their left and right channels. The Phase Reverse Switch can help these problems.

**28 Line TRIM Control**

TRIM provides a variable attenuation to the STEREO LINE INs in the range of -20 dB to +8 dB.

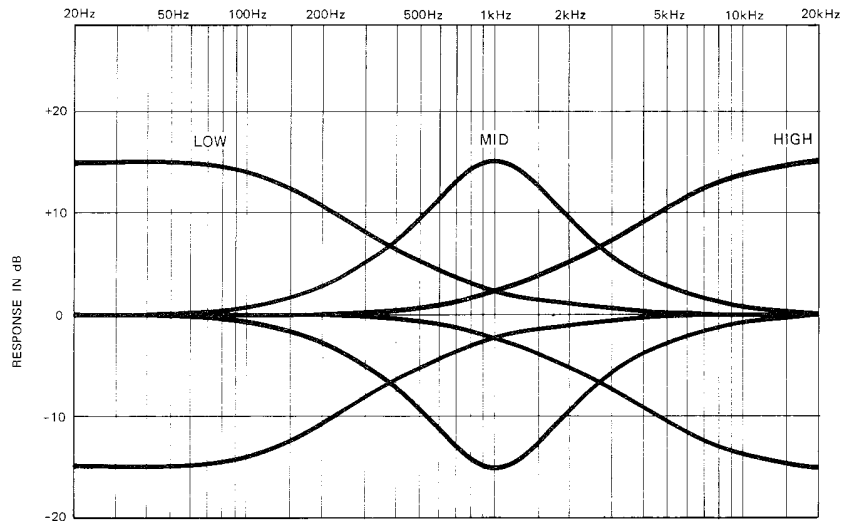
**29 HPF (High Pass Filter)**

If engaged, HPF will insert a filter with a cut-off frequency of 80 Hz and a cutoff rate of 12 dB per octave.

**30 Equalizer**

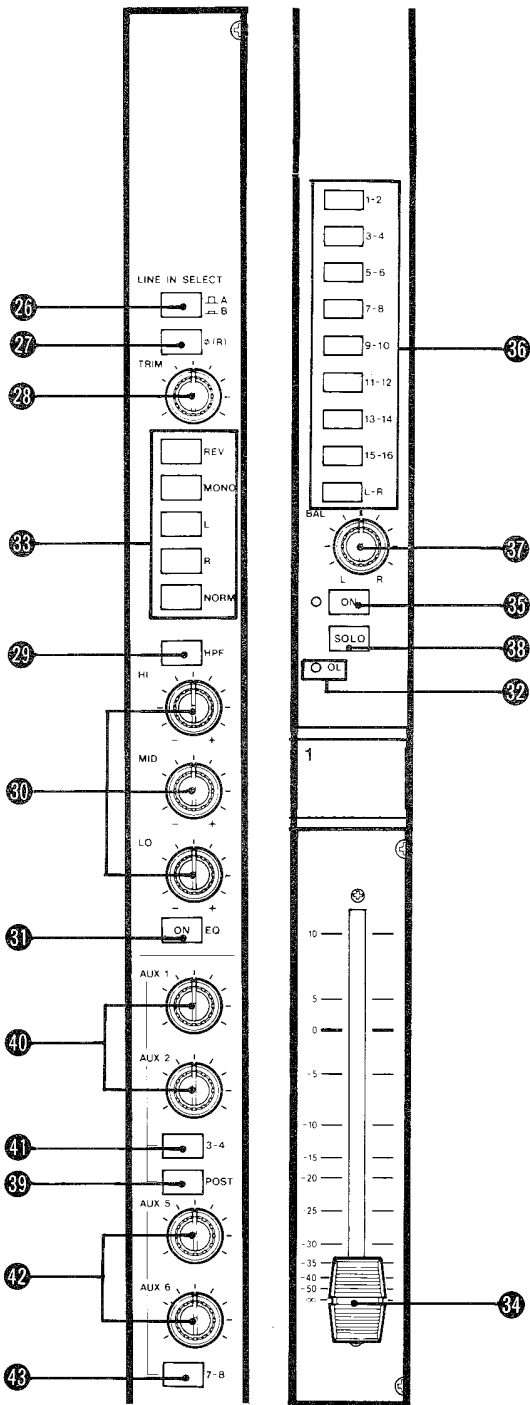
The equalizer fitted in the stereo input channels is a 3-band with shelving HI and LO and peaking MID controls.

- High Frequency : +/- 15 dB at 10 kHz
- Mid Frequency : +/- 15 dB at 1 kHz
- Low Frequency : +/- 15 dB at 100 Hz



25P CONNECTOR

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### 31 EQ ON Switch

When the switch is pressed on/down, the channel's signal is routed through the EQ electronics. When the switch is released off/up, the signal bypasses the EQ electronics.

### 32 OL (OverLoad) Indicator

The OL LED will light whenever signals of 3 dB below clipping point are detected. Use TRIM to attenuate any channel signals that register on the OL Indicator.

### 33 Input Mode Selector

There are five input modes:

- REV: The Left and Right input connections are reversed.
- MONO: The Left and Right inputs are summed together.
- L: The input to the Left channel feeds both the Left and Right channels.
- R: The input to the Right feeds both the Left and Right channels.
- NORM: The Left and Right inputs remain stereo and are sent on as they are.

### 34 Channel Fader

This fader adjusts the signal level sent to the PGM busses, the master stereo buss, the AUX busses, or to the SOLO buss. Both channels, Left and Right, are controlled simultaneously by this single fader.

### 35 Channel ON Switch

This switch turns the channel strip on and off. When the switch is pressed on, an LED will light next to the switch and the channel's signal is sent to the BAL(ance) pot, the assign switch rack, and to the AUX Post-fader send point.

**NOTE:** AUX Pre-fader sends 1-4 (with the POST switch off) are not affected by the position of the ON switch.

### 36 Assign Switch Rack

This group of switches sends the stereo channel signal from the fader to the PGM and the Left and Right busses.

### 37 BAL (ance) Control

The BAL pot functions in one of two ways, which is determined by the status of the Input Channel Mode select switches.

In NORM or REV modes, the Left channel's signal is sent to odd PGM (and Left) busses, and

**MONITOR SECTION—SINGLE MONITOR SYSTEM VERSION**  
(Top Panel)

**49 Phase Reverse Switch ( $\phi$ )**

The switch is used to reverse, bring back into phase, sources connected to the TAPE RTNs.

**50 TRIM Control**

The TRIM is used to attenuate signals from the TAPE RTNs within the range of -20 dB to +8 dB.

**51 Tape RTN Input Select Switch**

The two position RTN switch selects the input to the Monitor Section. When the switch is down, the monitor section receives signal from the TAPE RTN connectors. When the switch is up, the same-numbered PGM buss output is taken into the monitor section (buss 1 into monitor channel 1, buss 2 into monitor channel 2, and so on).

**52 Equalizer**

The EQ system in the Single Monitor section is identical to that used in the input channels. See the description in the Mono Input Channel section of this manual.

**53 EQ ON Switch**

In its disengaged/up position, this switch turns off/cancels the EQ. When the switch is engaged/down, the equalizer turns on.

**54 PGM EQ Switch**

This two position switch is used to locate/place the Equalizer (and its ON switch also) into the PGM Buss or the corresponding Monitor channel in a pre-fader position. When an equalization is desired on the PGM buss signals, press this switch on/down. Unless the PGM EQ switch is released up, the input to the corresponding monitor channel is routed around the EQ electronics.

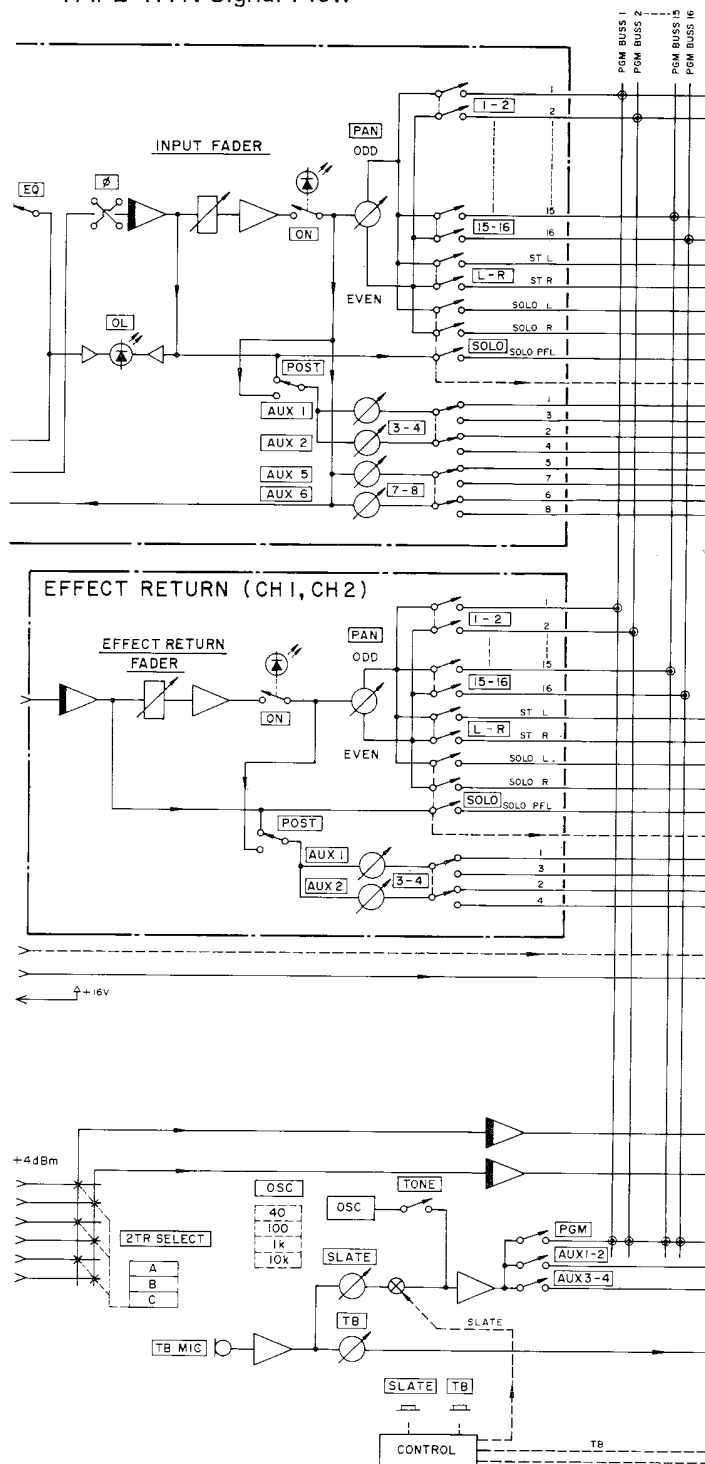
**55 Monitor Fader**

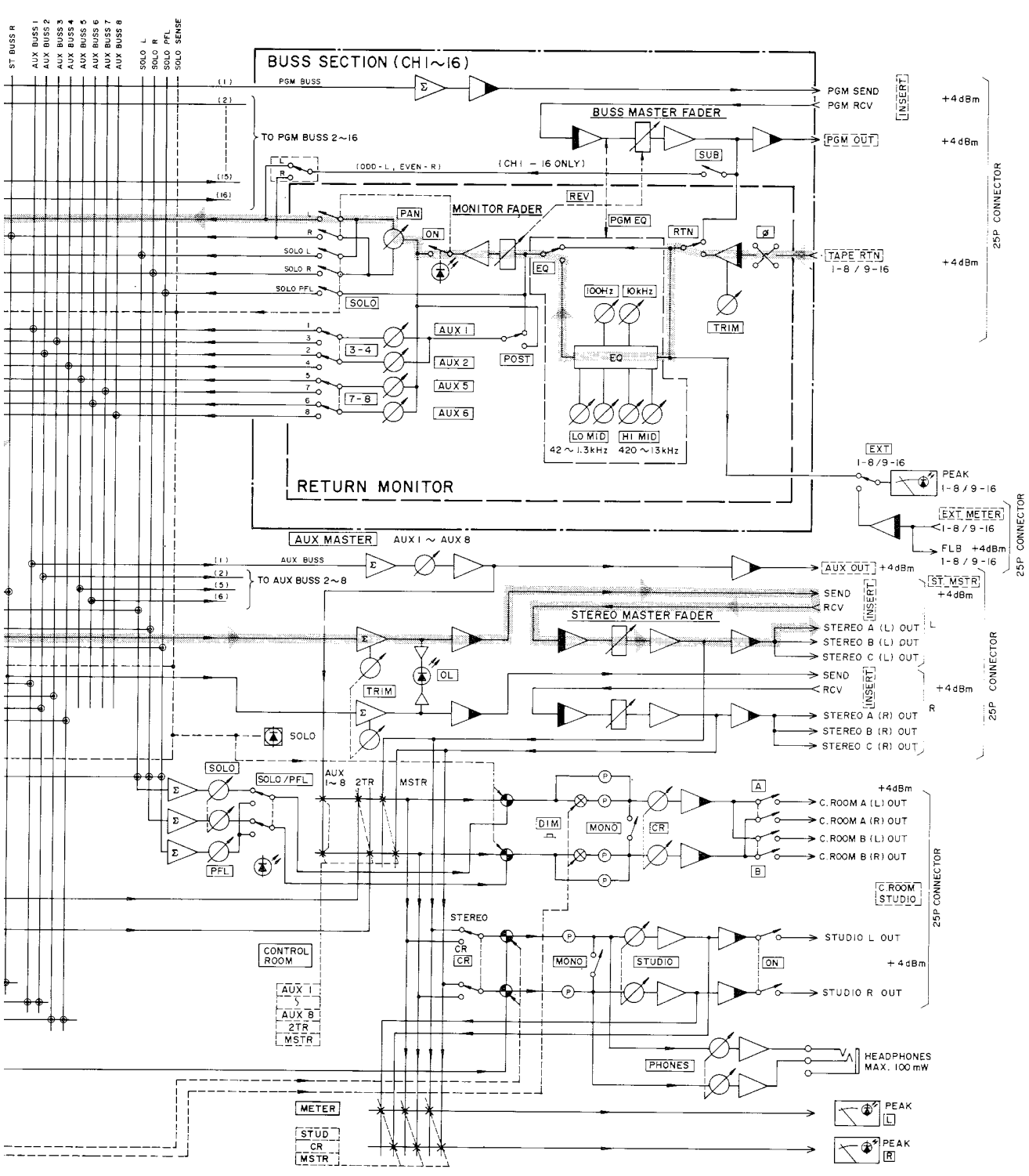
This fader controls the level of signal selected by the RTN input select switch.

**56 Fader REV(erse) Switch**

The REV switch is used to swap the 100-mm PGM buss fader and the 60-mm monitor fader. This feature allows you to use the longer fader to control either tape returns or busses in a variety of recording situations.

**TAPE RTN Signal Flow**





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**57 Monitor Channel ON Switch**

Similar to the ON switch in the input channels, this ON switch is used to turn each of the 16-monitor channels on and off, separately. The ON switch affects AUXs 5-8, but does not affect AUXs 1-4 unless they are assigned to the post-fader position by the POST switch. The ON switch, situated post-fader, does not affect the PFL (mono solo) function, but does affect the stereo-in-place SOLO.

**58 PAN Control**

The channels of the monitor section are mixed/summed to the stereo Left and Right busses. The degree to which any monitor channel, is sent to the Left and/or Right is controlled by the PAN. PAN places the monitor channel signal in the stereo "panorama."

**59 SOLO Switch**

Pressing the SOLO switch sends the monitor channel's signal to the control room monitor speakers by way of the SOLO master volume control on the Master Module, the SOLO/PFL switch, and the C.ROOM outs L & R. The use of SOLO defeats all other monitor channels that are not solo designated so that only those channels solo designated will be heard in the control room monitors.

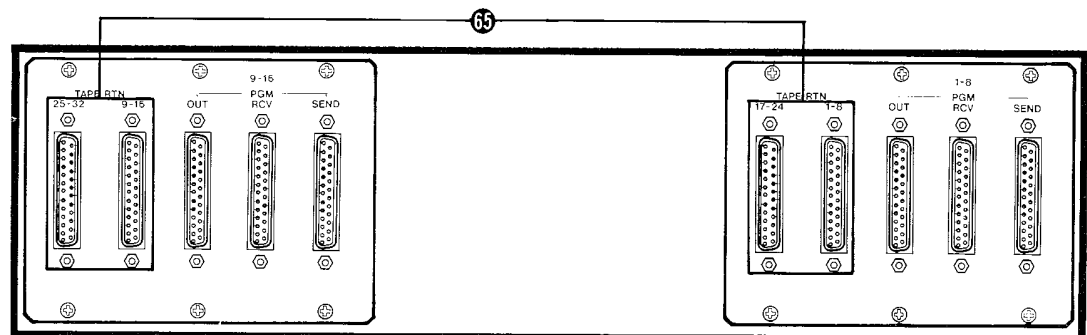
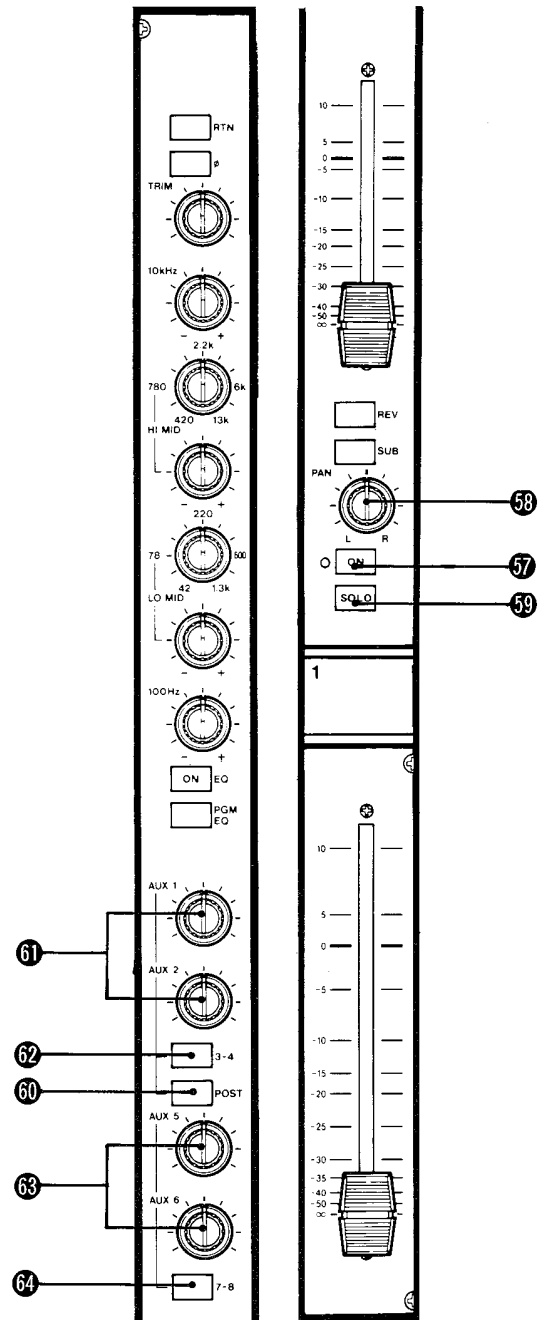
**AUXILIARY SEND SECTION (Single Monitor)**

**60 POST Switch**

Identical to the POST switch fitted in the input channels, the monitor POST switches the AUX 1 and 2 or 3 and 4 send points to post-fader or pre-fader (post-EQ).

**61 AUX 1 and 2 (or 3 and 4) Send Level Controls**

These two rotary pots control the send levels to AUXs 1-4. They either work on the levels for AUX 1 and AUX 2, as labelled or on AUX 3 and AUX 4 when the 3-4 switch is pressed down/engaged.



### 62 AUX 3-4 Select Switch

When this switch is up, the signal present in the monitor channel is sent to AUX busses 1 and 2; and when this switch is down, the signal is sent to AUX busses 3 and 4.

### 63 AUX 5 and 6 (or 7 and 8) Send Level Controls

These rotary pots control the send levels of AUX 5 and AUX 6. If the 7-8 switch is activated, the AUX 5 controls AUX 7's send level, and AUX 6 controls AUX 8.

### 64 AUX 7-8 Select Switch

This two position switch determines whether the AUX 5 and AUX 6 rotary pots control the levels of AUXs 5 and 6 or AUXs 7 and 8. When the switch is up, the signal present in the monitor section is sent to AUX busses 5 and 6; and when the switch is down, the signal is sent to AUX busses 7 and 8.

## MONITOR SECTION—DUAL MONITOR SYSTEM VERSION (Rear Panel)

### 65 TAPE RTN (Return) —Balanced—

These inputs may be used for any line-level source. Although they are primarily used for

multitrack recorder outputs, the TAPE RTNs may also be used as if they were normal inputs or for effects returns.

## MONITOR SECTION—DUAL MONITOR SYSTEM VERSION (Top Panel)

### 66 Tape RTN Input Select Switch

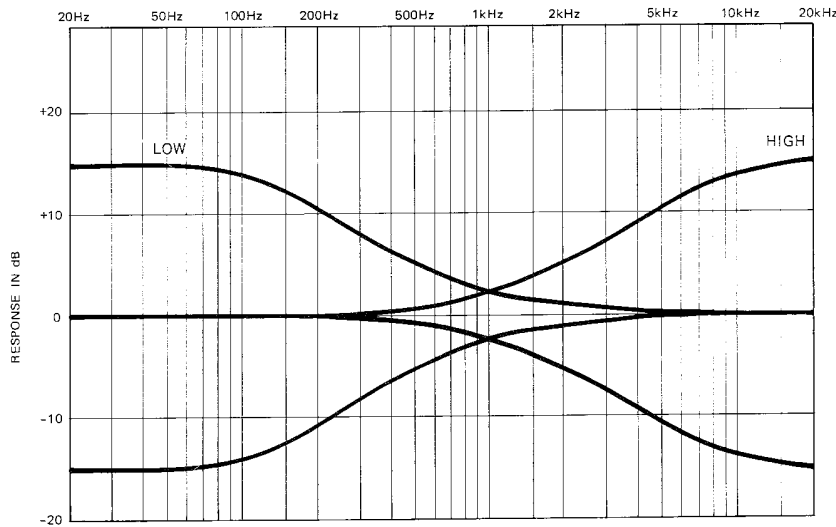
The RTN switch selects the input to the Monitor Section. When the switch is down, the monitor section receives signal from the TAPE RTN connector; most often these will be outputs from the multitrack machine. When the switches are up, PGM busses 1-16 are taken into the monitor section (buss 1 into channels 1/16, buss 2 into channels 2/18, buss 3 into channels 3/19, and so on).

### 67 Equalizer

The EQ system fitted in the Dual Monitor section is a 2-band shelving type.

High Frequency : +/- 15 dB at 10 kHz

Low Frequency : +/- 15 dB at 100 Hz

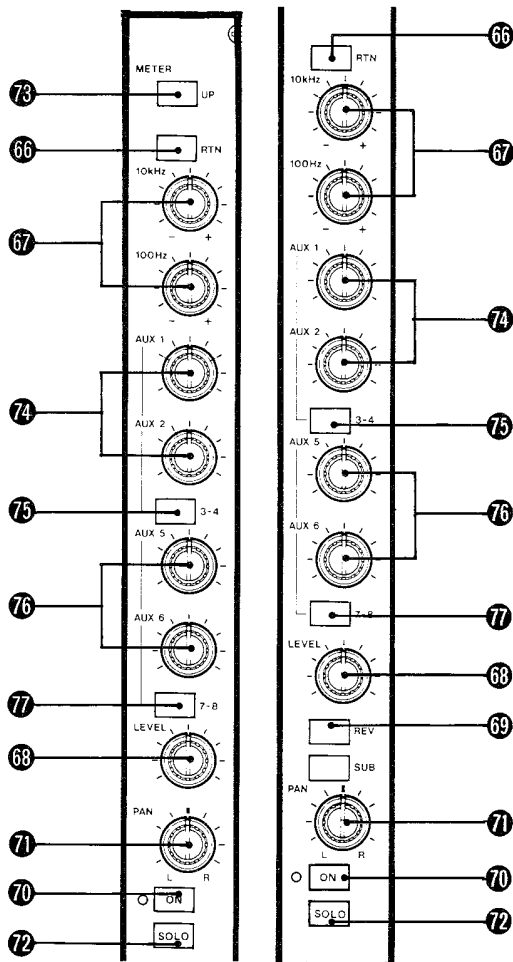


### 68 LEVEL Control

This control adjusts the level of signal selected by the RTN input select switch.

### 69 Fader/Rotary Control REV(erse) Switch (Channels 1-16 only)

The REV switch is used to swap the 100-mm PGM buss fader and the rotary monitor level control. This feature allows you to use the longer fader to control either tape returns or busses in a variety of recording situations.



Upper Half of Each Monitor Channel Strip (17-32)

Lower Half of Each Strip (1-16)

### 70 Monitor Channel ON Switch

Similar to the ON switch in the input channels, this ON switch is used to turn each of the 32 monitor channels on and off, individually. When the switch is pressed on, an LED lights next to the switch and the signal is sent to the PAN control and the AUX Post-fader send point to feed AUX busses 5 and 7 or 6 and 8. Even if the monitor channel is "off," signal is still sent to AUXs 1-4 and the SOLO buss.

### 71 PAN Control

The channels of the monitor section are mixed/summed to the stereo Left and Right busses. The degree to which any monitor channel is sent to the Left and/or Right is controlled by the PAN. PAN places the monitor channel signal in the stereo "panorama."

### 72 SOLO Switch

Pressing the SOLO switch sends the monitor channel's signal to the control room monitor speakers by way of the SOLO master volume control on the Master Module, the SOLO/PFL switch, and the C.ROOM Outs L & R. The use of SOLO defeats all other monitor channels that are not solo designated so that only those channels solo designated will be heard in the control room monitors.

### 73 METER UP Select Switch

This two position UP switch affects each pair of monitor channels (1/17, 2/18, 3/19 . . . 16/32) and when engaged (pressed down) it makes the UP(per) numbered channels (17-32) be registered by the Meters, individually; when disengaged (not pressed down) it switches each of the lower numbered channels (1-16) to the Meters. The metering source may either be the TAPE RTNs or the PGM busses, depending on the setting of the individual monitor channels' RTN switches.

### AUXILIARY SEND SECTION (Dual Monitor)

#### 74 AUX 1 and 2 (or 3 and 4) Send Level Control

These two rotary pots control the send levels to AUXs 1-4. They either work on the levels for AUX 1 and AUX 2, as labelled or on AUX 3 and AUX 4 when the 3-4 switch is pressed down/engaged. AUXs 1-4 are pre-LEVEL control.

#### 75 AUX 3-4 Select Switch

When this switch is up, the signal present in the monitor channel is sent to AUX busses 1 and 2; and when this switch is down, the signal is sent to AUX busses 3 and 4.

#### 76 AUX 5 and 6 (or 7 and 8) Send Level Controls

These rotary pots control the send levels of AUX 5 and AUX 6. If the 7-8 switch is activated, the AUX 5 controls AUX 7's send level, and AUX 6 controls AUX 8. AUXs 5-8 are post-LEVEL control.

#### 77 AUX 7-8 Select Switch

This two position switch determines whether the AUX 5 and AUX 6 rotary pots control the levels of AUXs 5 and 6 or AUXs 7 and 8. When the switch is up, the signal present in the monitor section is sent to AUX busses 5 and 6; and when the switch is down, the signal is sent to AUX busses 7 and 8.



## MASTER MODULE

The Master Module is divided into the four major sections: the Effect Return Section, the Aux/Stereo Buss Section, the Metering Section, and the Studio/Control Room Monitor Section. At first glance, there may be confusion regarding which controls work with which of the four major sections. Once you have worked through the following sections, any confusion should be relieved.

### EFFECTS RETURN SECTION (Rear Panel)

#### 78 Effects Return Connector —Balanced—

There are two of these inputs to the Effect Return Section, which are normally used by the output signals of effects devices. Nominal input level is +4 dBm (1.23 V). Input impedance is 40 kohms. These inputs are routed to two 100 mm faders in the Master Fader Module. While your M-600 has only two connectors that are designated Effects Returns, the mixer has the capability of handling many returning signals from effects devices. As an example, any of your TAPE RTN inputs to the Monitor section can be used to accept effects signals. This may be especially helpful on the Dual Monitor version.

### EFFECTS RETURN SECTION (Top Panel)

#### 79 Effects Return Fader

This 100 mm fader controls the level of signal sent to the Effects Return PAN control and the AUX POST-fader send point.

#### 80 ON Switch

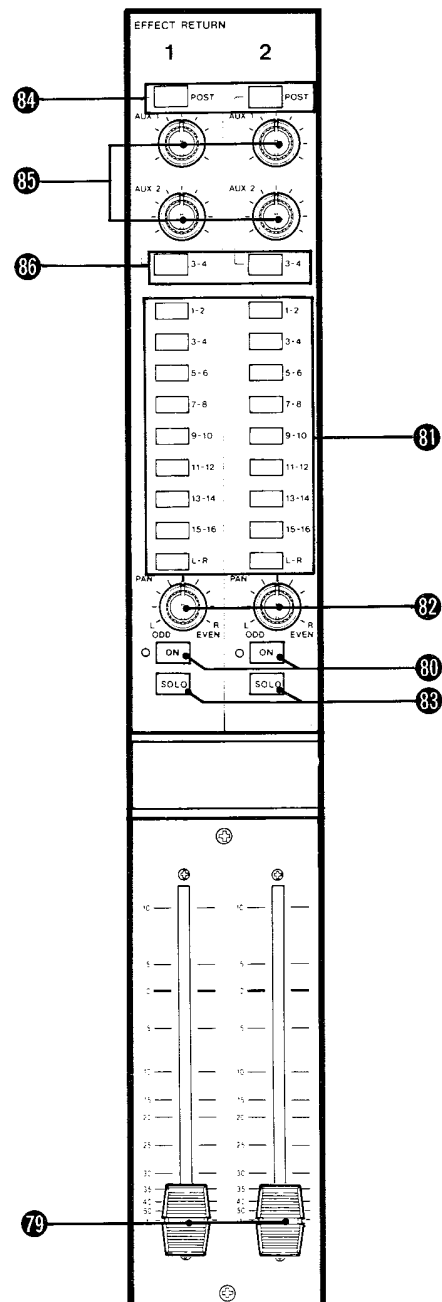
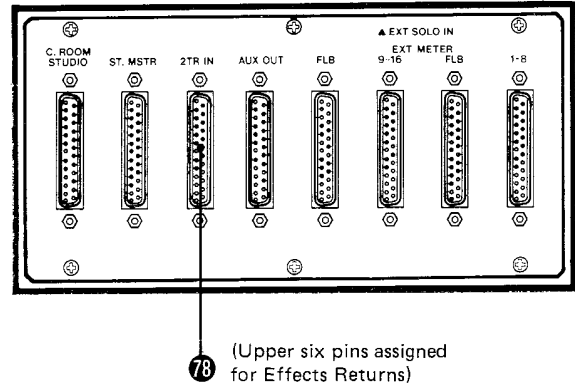
This is a two position on/off switch for the Effects Return system. When pressed down/on, signal from the effects return is sent to the PAN control and the AUX POST-fader send point. The status of this switch does not affect the AUX Pre-fader sends.

#### 81 Assign Switches

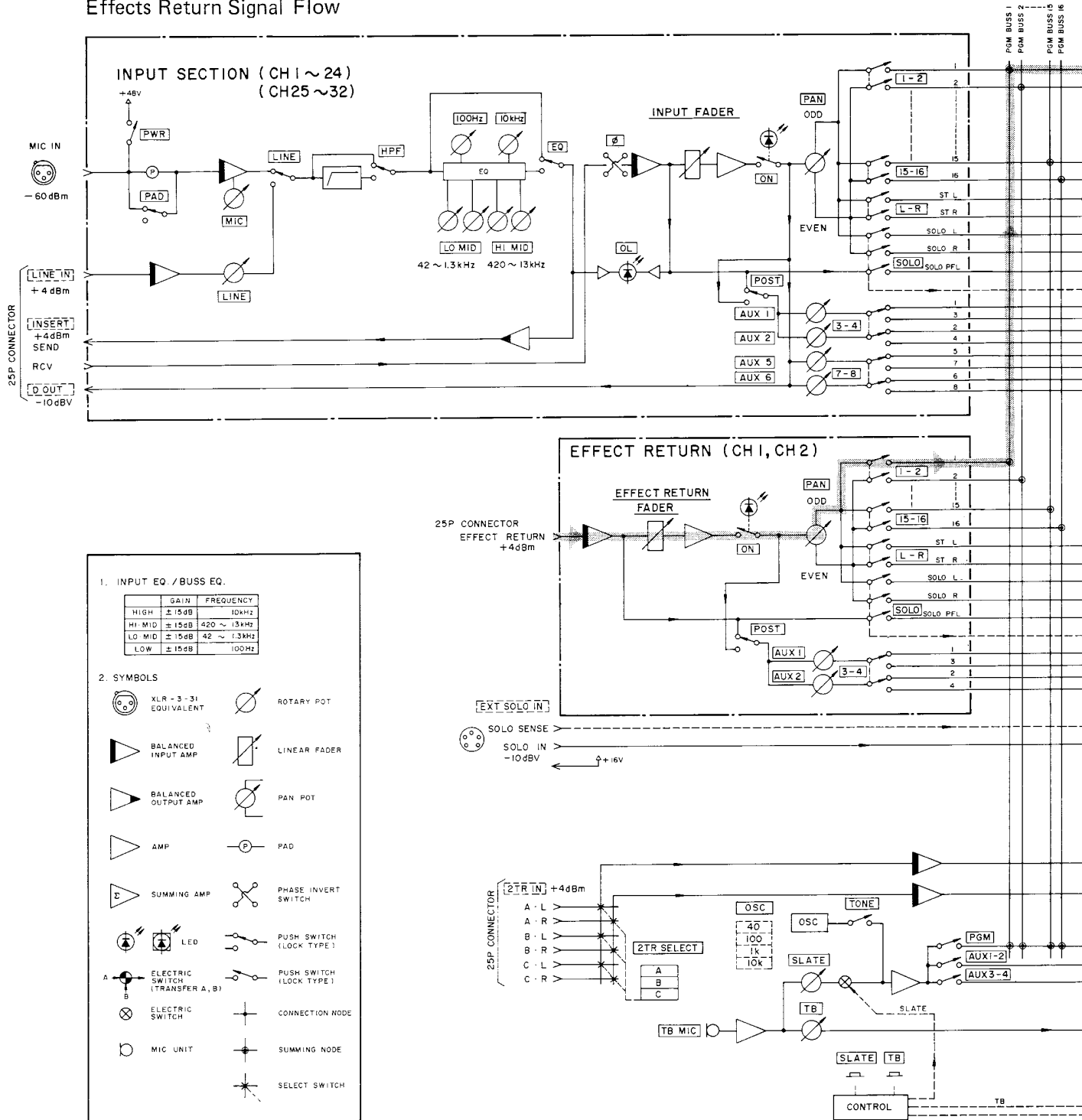
This group of switches sends the effects return signal from the fader to the desired PGM busses or Left or Right busses via the PAN control.

#### 82 PAN Control

PAN sends, in varying degrees, signal from the Effects Return system to the assigned PGM and Left/Right busses. See earlier descriptions for a more detailed explanation of the pan function.



## Effects Return Signal Flow



### 83 SOLO Switch

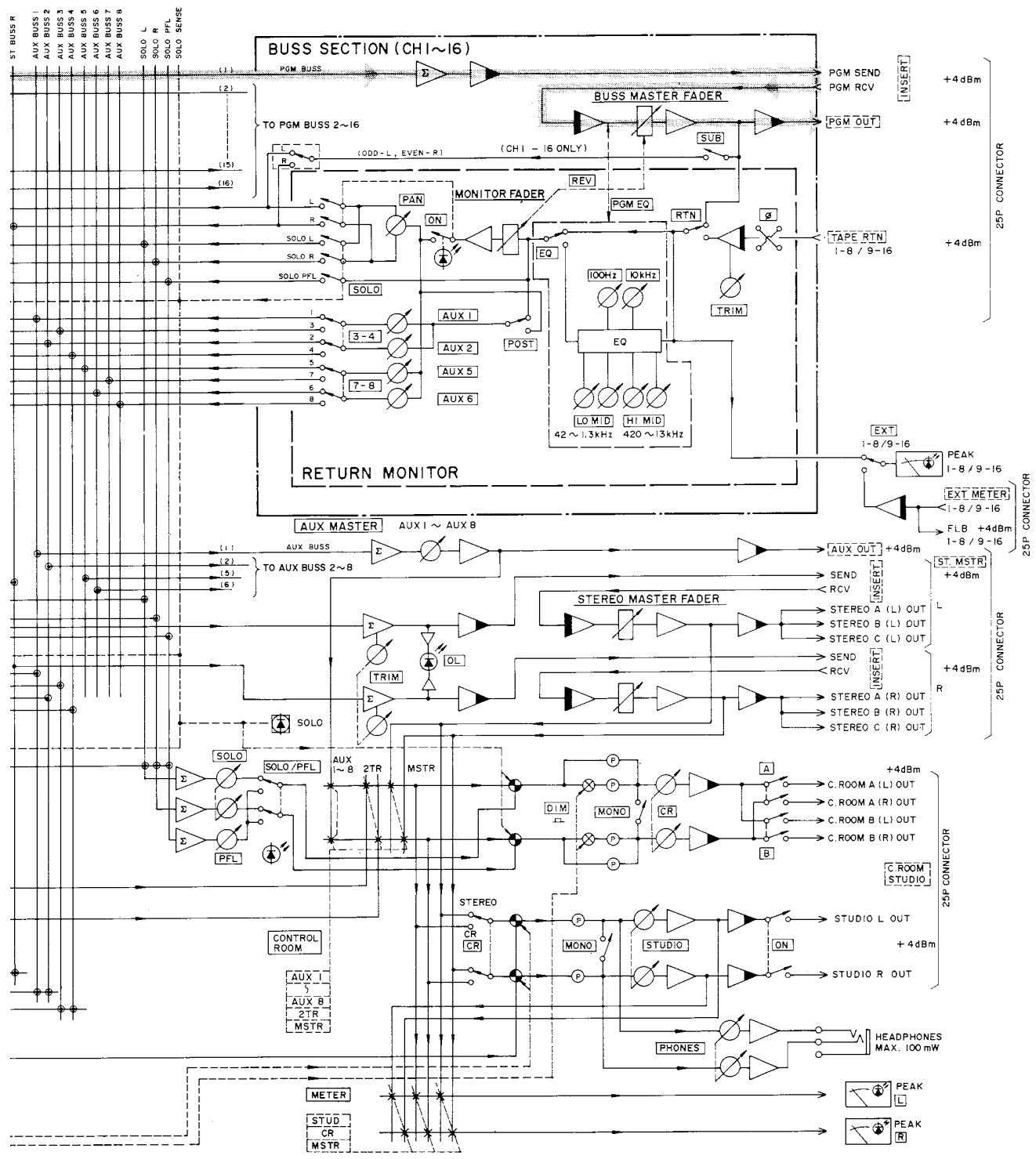
SOLO selects the Effects Return signal to be heard by itself, or in combination with other SOLO selected signals, in the control room monitor system. See other descriptions for a more detailed explanation of the solo function.

### 84 POST Switch

The effects return AUX sends can be switched pre-fader or post-fader by this switch.

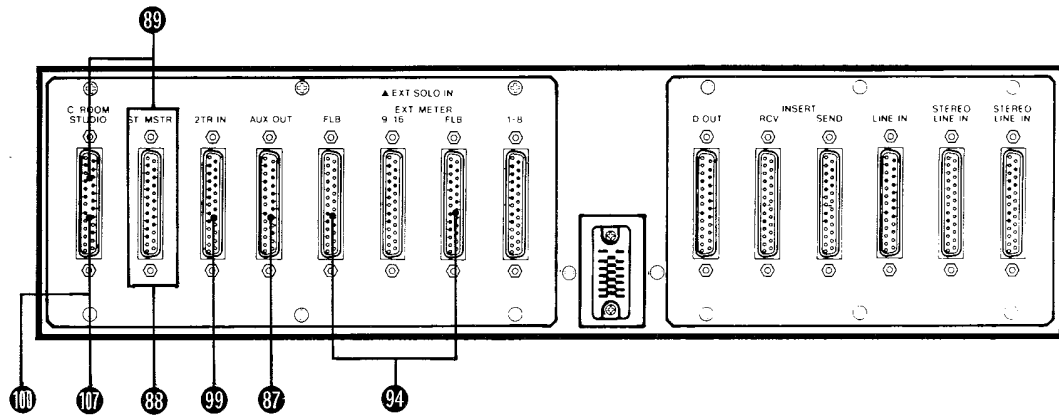
### 85 AUX 1 and 2 (or 3 and 4) Send Level Controls

These controls adjust either the AUX 1-2 send levels or the AUX 3-4 send levels depending on the position of the 3-4 select switch. The four AUX sends can be switched post-fader or pre-fader (post-EQ) by the POST switch.



**86 AUX 3-4 Select Switch**

The effects returns can be routed to AUX busses 1 and 2 or to AUX busses 3 and 4. When the 3-4 switch is pressed down/on, the AUX sends feed AUX busses 3 and 4; and when the switch is released, the AUX sends feed AUX busses 1 and 2.



**AUX/MASTER STEREO BUSS SECTION**  
(Rear Panel)

**87) AUX Outputs 1-8 –Balanced–**

These are the outputs from your AUX busses. The content of the signal in the busses is determined by controls found in the input channel strips, the Monitor channels, and effects return system where the AUX busses originate. Nominal output level is +4 dBm (1.23 V). Output impedance is 100 ohms.

**88) Stereo Buss Insert Send/RCV –Balanced–**

The insertion point is before the Stereo Master Fader and provides access to the signal flow within the individual Left and Right stereo busses.

**89) Stereo Outputs –Balanced–**

These are three pairs of left/right outputs, each pair of them carries the same signal from your stereo left/right busses. The content of the signal at these outputs is determined by the status of the controls in the input channel strips (L-R), the Master module (L-R) and the Monitor/PGM module (SUB). Nominal output level is +4 dBm (1.23 V). Output impedance is 100 ohms.

**AUX/MASTER STEREO BUSS SECTION**  
(Top Panel)

**90) AUX 1-8 Master Level Controls**

They control the overall level of the corresponding AUX busses, which originate from the input channel's AUX sends, the Tape Return section, and from the Effects Return section.

**91) MSTR (Master) Stereo TRIM Control**

Both Left and Right outputs from the stereo buss can be controlled by this TRIM. The Stereo Buss Inserts are also affected by TRIM, since the Inserts come post-TRIM and pre-fader.

**92) MSTR OL Indicator**

Excessive signal levels (3 dB below clipping point) entering the stereo buss will register on the MSTR OL (OverLoad) indicator. Use the MSTR TRIM to reduce signal levels in the stereo busses.

**93) Stereo Master Fader**

The Left and Right faders control the overall level of summed or mixed signals from 1) the Input Channel Section, 2) the Monitor Section, 3) the Effects Return Section, 4) the PGM Busses via the SUB switch on the Monitor/PGM Module.

**METERING SECTION**  
(Rear Panel)

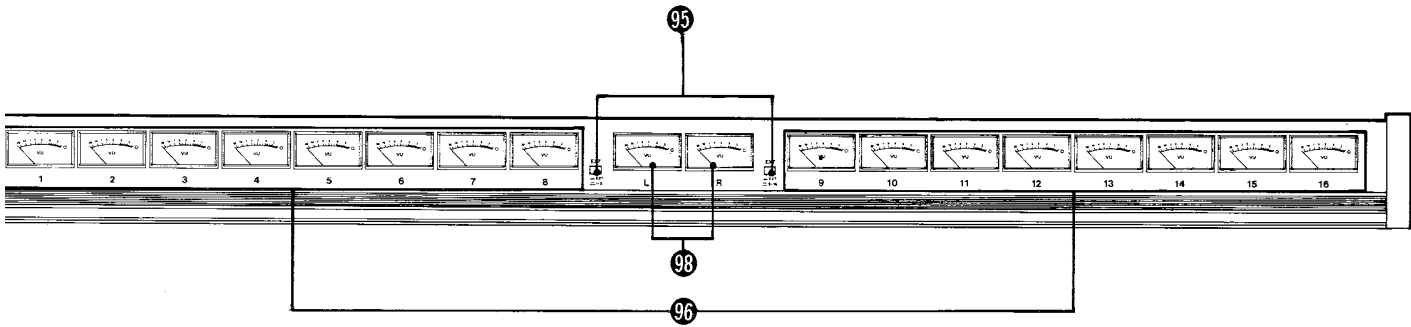
**94) EXTERNAL METER Inputs/FLB (Foldback) –Balanced–**

External signals can be monitored by the PGM meters if they are connected to EXT METER input(s). The status (down/on; up/off) of the EXT source select switch (item 95) determines whether or not the meters read the external sources. The signals feeding the EXT METER inputs are sent back to their source equipment via the FLB output connectors.

**METERING SECTION**  
(Top Panel)

**95) EXT Switch**

When the EXT switch is pressed on/down, external signals plugged into the EXT METERS are registered in the PGM meters. When the EXT switch is off/up, the 16 meters are connected to the corresponding tape return Monitor Channel and register the PGM buss output or whatever signal is plugged into the TAPE RTNs, which can be selected by the RTN input select switch.



### 96 PGM Meters 1-16

They display levels of the PGM buss outputs or the input to the Monitor Section depending on the position of the RTN switch. As mentioned previously, the PGM meters may also display the levels of any signals connected to EXT METER if the EXT switch is down/on.

In the dual monitor system, the 16 meters register signals from either the PGM buss or from the TAPE RTNs. The status of the UP switch determines whether TAPE RTNs 1-16 or 17-32 are being displayed by the meters.

The PEAK indicator in each of the meter will fire at 10 dB above nominal.

### 97 Stereo METER Source Select Switches

The Stereo Meters (Left and Right) can be switched to display one of three sources: the STUD(io) switch selects the STUDIO Outs, the CR switch the C.ROOM Outs, and the MSTR switch the Stereo Buss Outs.

### 98 Left and Right Meters

These Meters will display the source signals that are selected by the METER switches (STUD, CR, or MSTR).

The PEAK indicator in each of the meters will light at 10 dB above nominal.

### CONTROL ROOM MONITOR OUTPUT SECTION

(Rear Panel)

### 99 2TR INputs—Balanced—

Three pairs of L/R inputs, 1, 2, and 3, are provided. These may be used for two-track sources or as effects returns to the monitor mix. Nominal input level is +4 dBm (1.23 V). Input impedance is 40 kohms.

### 100 C. (Control) ROOM Outputs, A & B —Balanced—

The signal selected at the CONTROL ROOM Monitor Select Switch (item 102) is sent out through these connectors to the control room monitor system. Nominal output level is +4 dBm (1.23 V). Output impedance is 100 ohms.

### CONTROL ROOM MONITOR OUTPUT SECTION

(Top Panel)

### 101 2TR SELECT Switches, A, B, and C

2TR INs selected here are sent to the CONTROL ROOM Monitor Select Switch Rack.

### 102 CONTROL ROOM Monitor Select Switch Rack

There are 10 options and any combination of two or more of these switches may be pressed simultaneously. Each of the AUX switches 1-8 selects the corresponding AUX buss, the 2TR selects any one of the three 2TR IN, A, B, or C, as selected by the 2TR SELECT switches, and the MSTR switch selects the Stereo Buss Outs.

### 103 DIM(mer) Switch

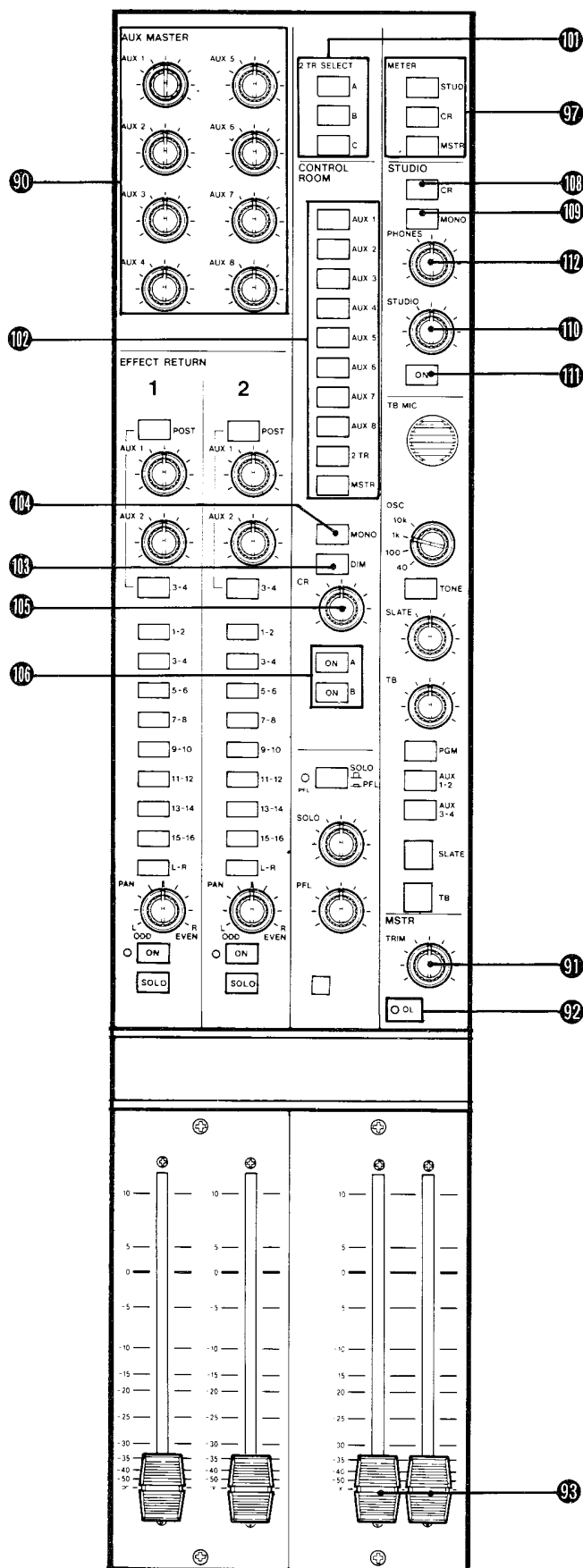
This switch provides a reduction of about 30 dB to the C.ROOM Out L and R levels.

### 104 MONO Switch

This switch causes the stereo monitor output signals to be summed together into a mono mix.

### 105 CR (Control Room) Monitor Level Control

Control room monitor output levels are adjusted by this rotary control. The nominal setting position is between the 2 and 3 o'clock points.



### 106 A/B ON Switch

Two complete monitor output systems are provided. They can be turned on and off, individually using these switches.

### STUDIO MONITOR OUTPUT SECTION (Rear Panel)

#### 107 STUDIO Outs –Balanced–

The signal available at the STUDIO Outs comes from either the master stereo buss or from the CONTROL ROOM monitor select switch rack (item 102), depending upon the position of the CR switch (item 108). Nominal output level is +4 dBm (1.23 V). Output impedance is 100 ohms.

### STUDIO MONITOR OUTPUT SECTION (Top Panel)

#### 108 Output Source Select Switch (CR)

When the CR switch is off (up position), the Stereo Buss Outs are monitored in the studio. When the switch is pressed on/down, the STUDIO Outs carry the signals selected on the CONTROL ROOM select switch rack (item 102).

#### 109 MONO Switch

When pressed on/down, the stereo STUDIO Outs are summed together into a mono mix.

#### 110 STUDIO Level Control

This control provides the final level adjustment to the studio monitor output level, in this way it is similar to the CR monitor level control. The nominal setting position is between the 2 and 3 o'clock points.

#### 111 Studio Monitor ON Switch

This switch turns the STUDIO Outs on and off. When the switch is released off/up, the STUDIO Outs are off.

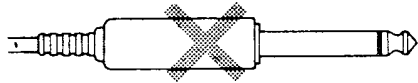
#### 112 PHONES Level Control

This control adjusts the monitoring level of the headphones plugged into the PHONES jack on the front of the M-600. The monitoring source is the same as that present at the STUDIO Outs. The studio monitor ON switch has no effect on the PHONES feed.

**113 PHONES Jack**

This feeds the stereo monitor headphones. Maximum output level is 100 mW + 100 mW (into 8 ohms).

This jack is to be used with STEREO HEADPHONES ONLY! NEVER use mono (2-wire) headphones. They will cause circuit failure!



(1/4" phone 2-connector)



(1/4" phone 3-connector)

**TALKBACK/SLATE SECTION  
(Top Panel)**

**114 TB MIC (Talkback Microphone)**

This built-in microphone is effective only when either the TB switch or the SLATE switch is pressed on/down. The talkback mic signal is sent to both the STUDIO Outs and the SLATE switch.

**115 TB Level Control**

This control determines the signal level sent from the talkback mic to the STUDIO Outs. TB does not affect the signals routed to the destination selected on the slate/test tone assign switch rack (PGM, AUX 1-2, AUX 3-4) (item 121).

**116 TB Switch**

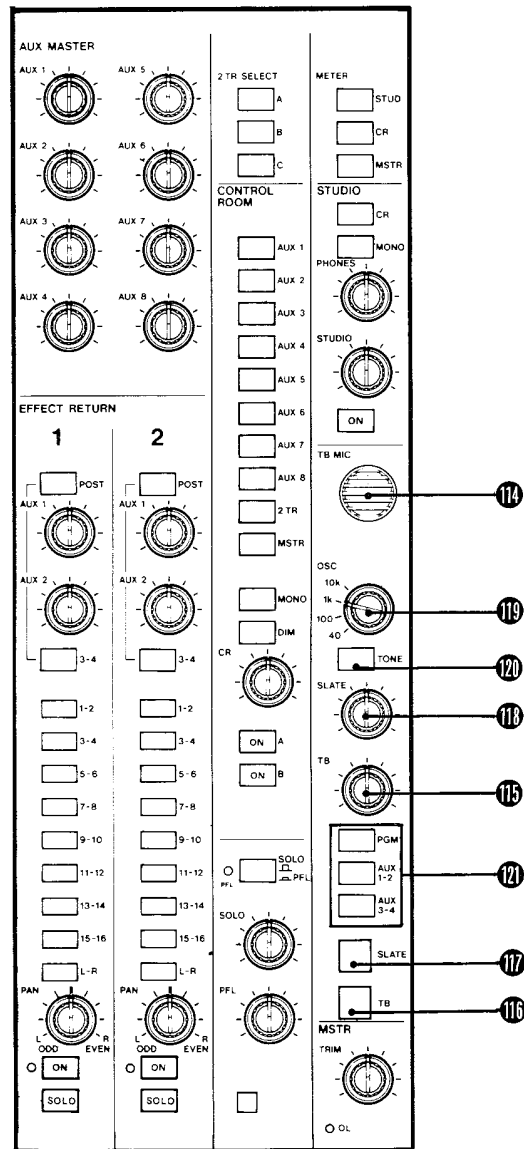
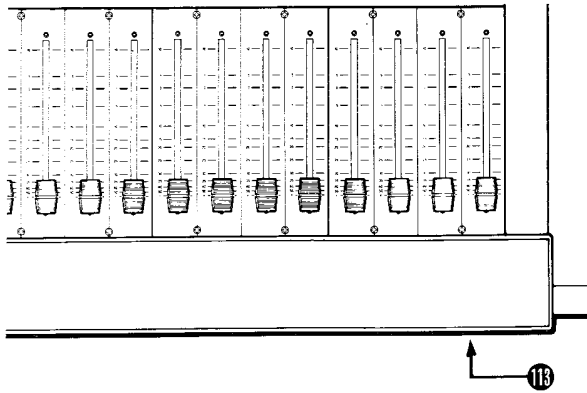
Signal cannot be sent from the talkback mic to the STUDIO Outs unless the TB switch is pressed on (down position). The talkback signal appears both at the STUDIO Outs and the PHONES Out, replacing/overriding whatever signal they have been carrying. When and while the TB switch is pressed on, the C.ROOM monitor outputs are muted (cut off), to prevent feedback (howling).

**117 SLATE Switch**

This switch is for tone-stripping the tapes. When the SLATE switch is pressed on (down position), the signal from the talkback mic is routed to the busses selected on the slate/test tone assign switch rack (item 121).

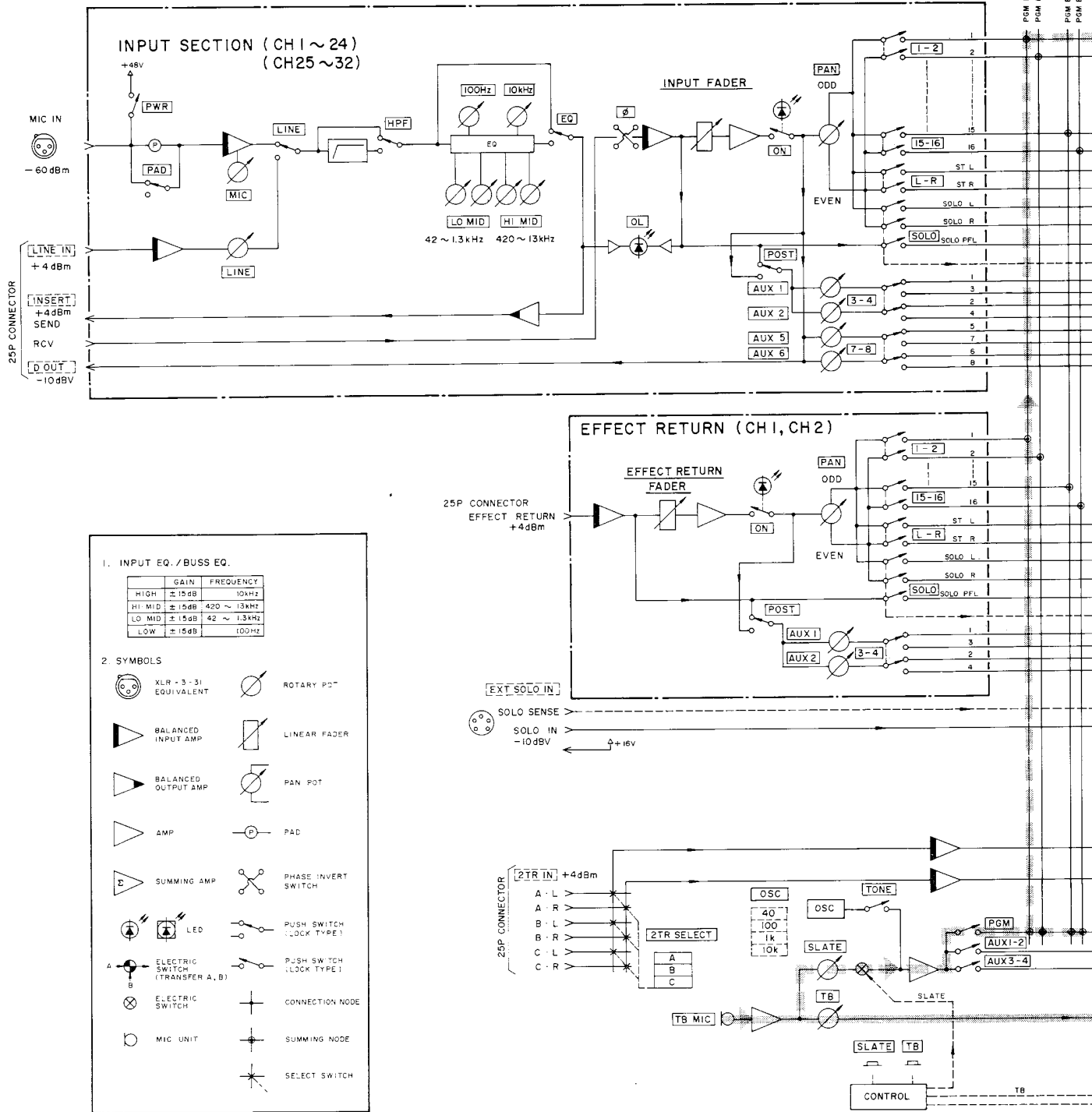
**118 SLATE Level Control**

This control adjusts the talkback bussing level.



# Talkback/Slate Signal Flow

Talkback  
Slate



## 119 Oscillator Output Select Switch

This four position switch selects the following oscillator frequencies:

40 Hz – Useful as slate tone for high speed searches.

100 Hz – This is for aligning equalizers.

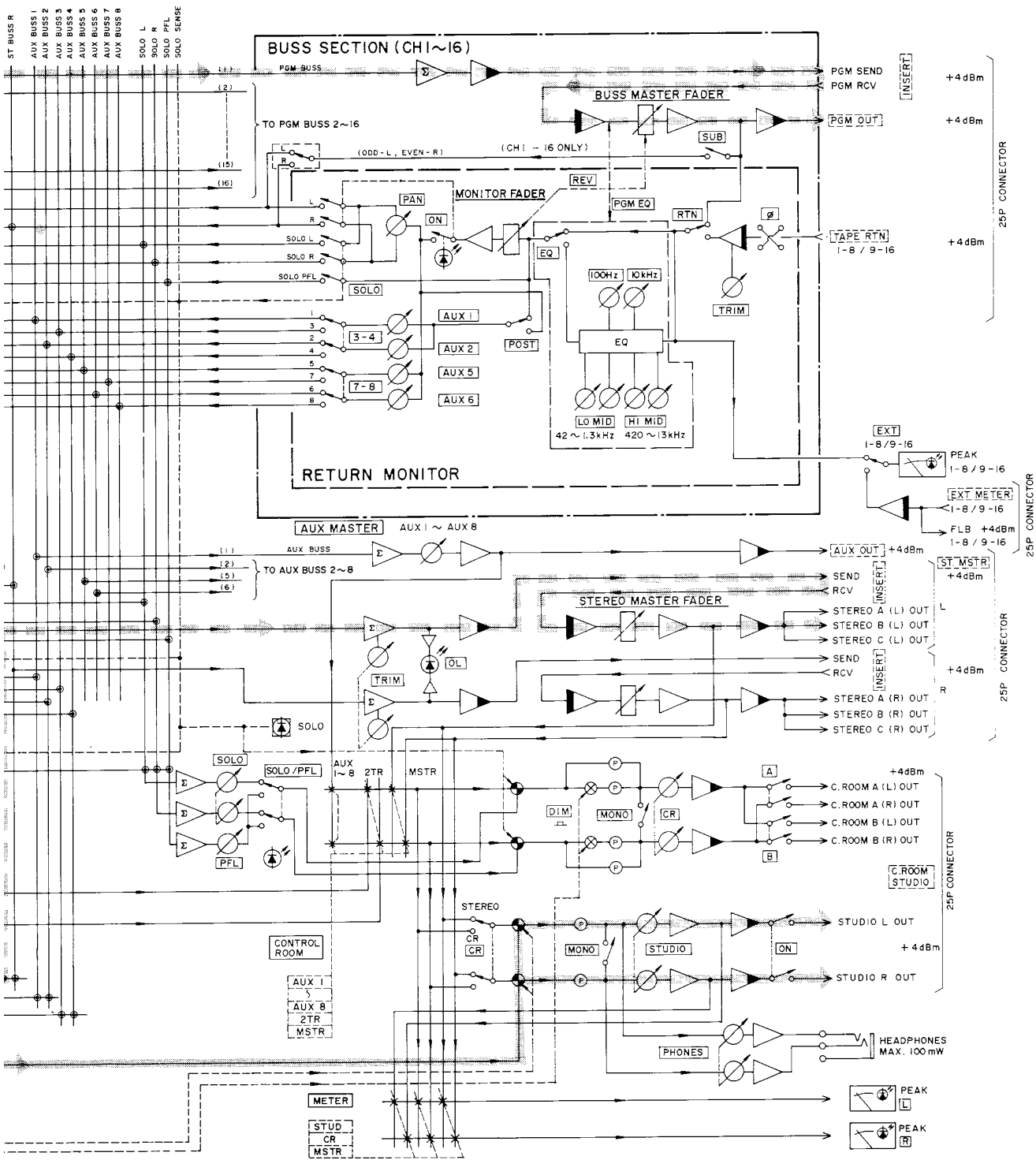
1 kHz – The basic set-up frequency (system calibration).

10 kHz – The standard alignment frequency allowing the cutting engineer to align the recorder's playback azimuth.

## 120 TONE Switch

This is the on/off switch of the built-in oscillator. When the TONE switch is pressed on, the output from the oscillator is made available at the slate/test tone assign switch rack.





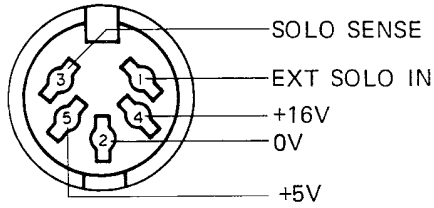
### 121 Slate/Test Tone Assign Switches

The talkback signal or the test tone from the oscillator is assignable to any combination of the three groups of busses, PGM busses 1-16 plus master stereo buss, AUX busses 1 and 2, and AUX busses 3 and 4. Slate/Test Tone bussing is effective only while these assign switch(es) are on/down.

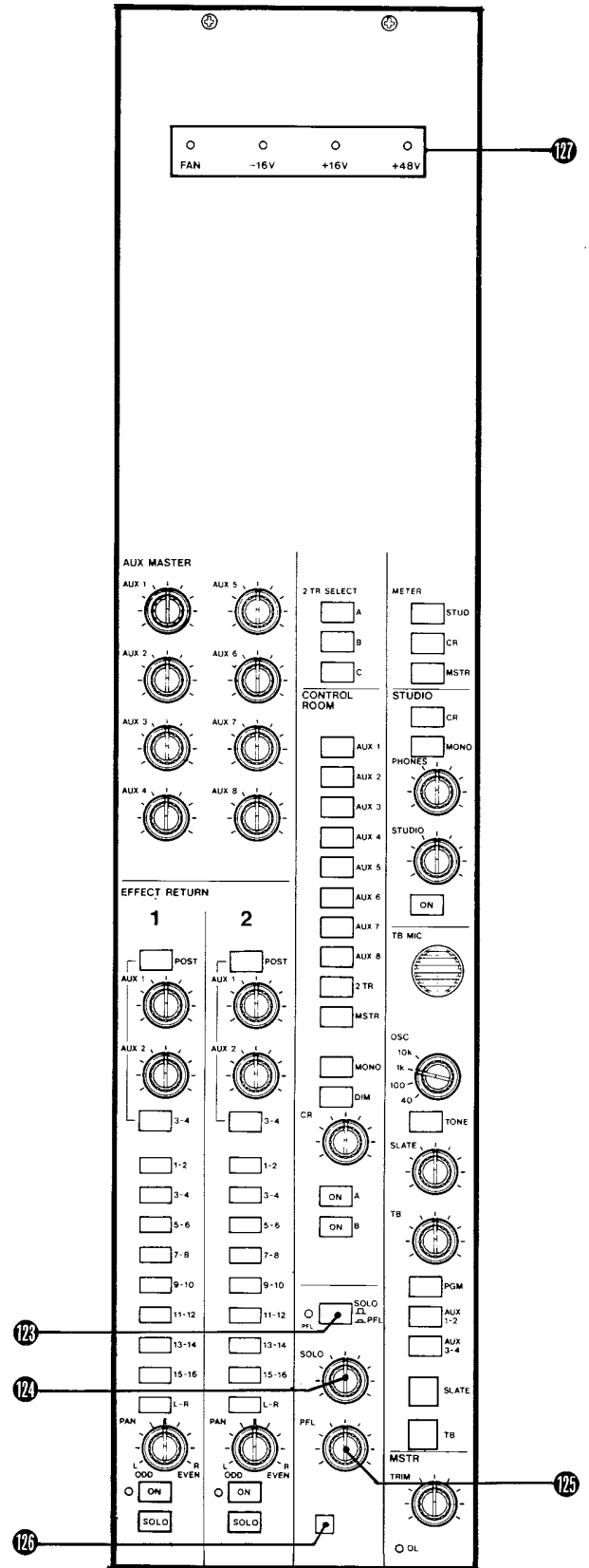
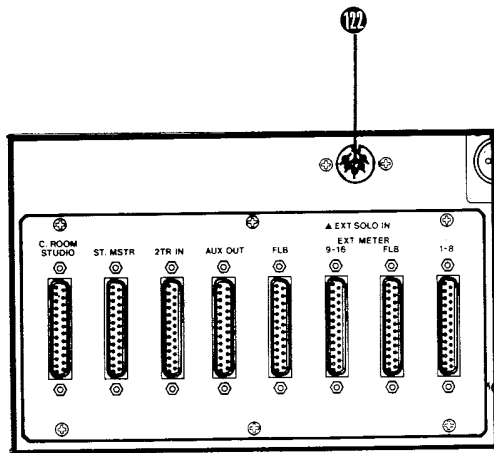
**SOLO/PFL SECTION**  
(Rear Panel)

**122 EXT SOLO INput —Unbalanced—**

This 5-pin DIN connector allows external solo signals and control signals to be added to the on-board system. Pin assignment is as follows:



25P CONNECTOR



### **123 SOLO/PFL Select Switch**

When one or more SOLO switches (in the Channels, the Monitor, or Effects Return system) and then the SOLO/PFL switch are pressed on/down, an LED will light next to the SOLO/PFL switch to show that the SOLO buss send point is switched pre-fader. In this PFL mode, the "soloed" signal will be heard center mono.

When the SOLO/PFL switch is released off/up (the LED goes off), the SOLO buss send point is switched post-PAN control and the Control Room Monitor Section enters stereo SOLO mode. The SOLO signal, taken post-PAN, is stereo, and in mixdown provides "in-place" SOLO monitor.

SOLOs or PFLs replace/override whatever signal or signals have been selected on the CONTROL ROOM Monitor Selected Switch Rack.

### **124 SOLO Master Level Control**

This adjusts the signal level of SOLOs. SOLOs are then sent on to the control room monitor system via the C. ROOM Outs L & R.

### **125 PFL Master Level Control**

This provides the final level adjustment to the PFL signals before they are sent to the C. ROOM Outs.

### **126 Master Solo Indicator**

This large indicator will light whenever any SOLO switches are pressed on/down, warning you that the Control Room Monitor section is in SOLO/PFL mode. As long as this indicator is lit, all selections made on the CONTROL ROOM Monitor Select Switch Rack are ineffective

## *OTHERS*

### **127 Voltage Supply/Heat-up Indicators**

At top of the Master Module are four LED indicators. All four should be lit steadily when the M-600 is functioning normally. They are from left to right:

FAN – will flash on and off when any electronic components inside the Power Supply Unit PSU-600 are abnormally hot.

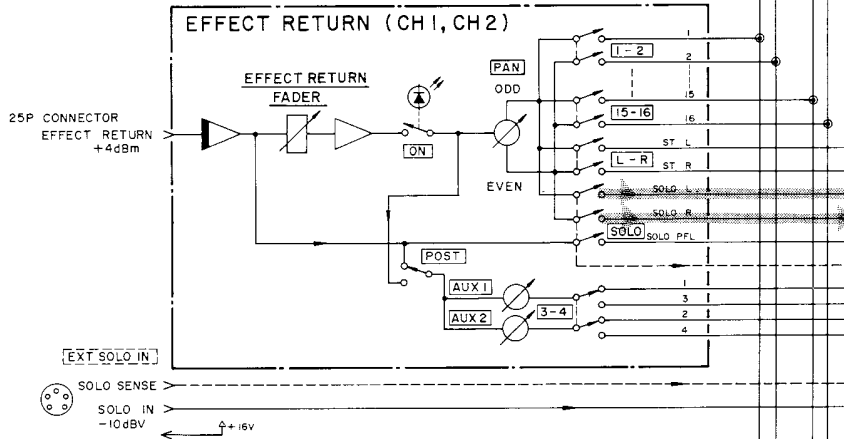
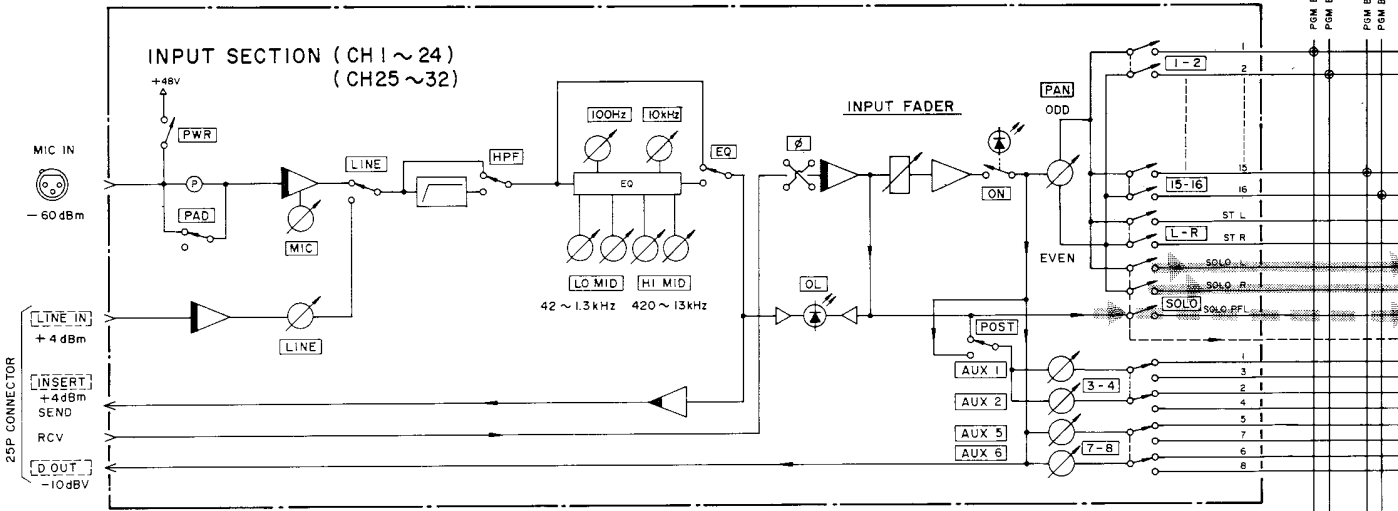
-16 V and +16 V – these two LEDs will dim when any abnormality is detected in the corresponding line voltage supplies.

+48 V – will dim to indicate that there is a problem in the phantom power supply.

If any of these indicators become dim or flash on and off, turn the M-600 off and refer to the maintenance section of this manual.

# SOLO/PFL Signal Flow

SOLO PFL

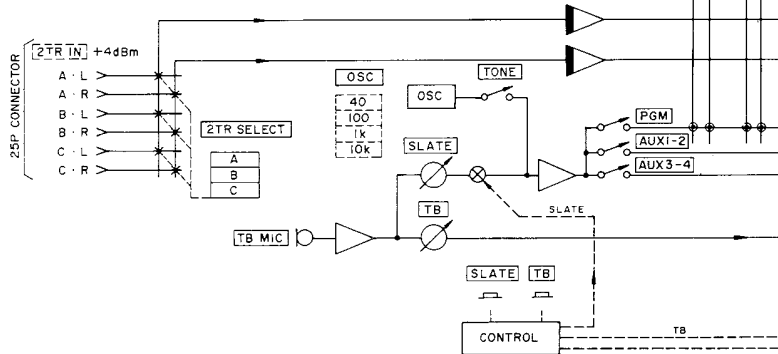


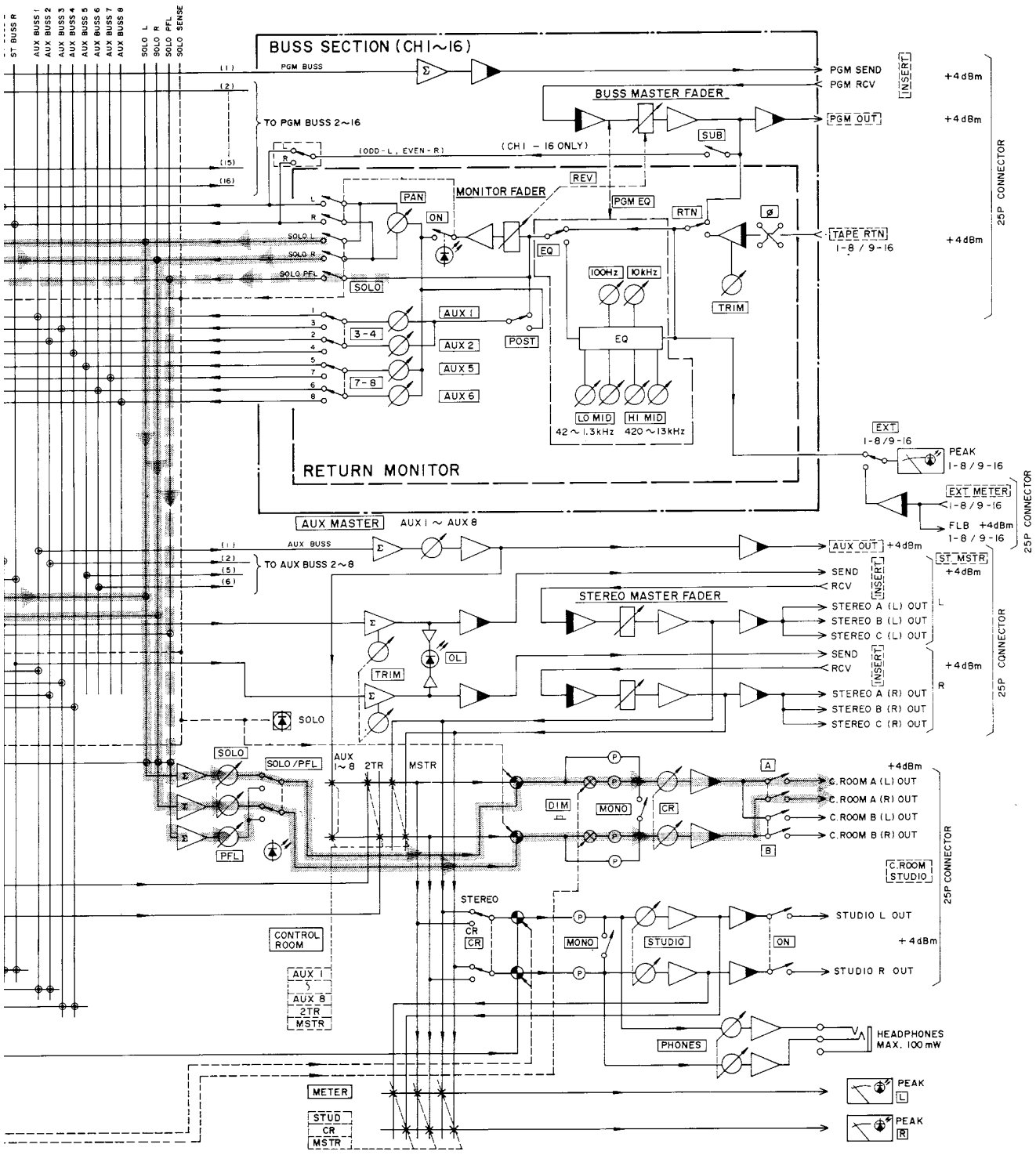
**1. INPUT EQ. / BUSS EQ.**

	GAIN	FREQUENCY
HIGH	± 15dB	10kHz
HI-MID	± 10dB	420 ~ 13kHz
LO-MID	± 15dB	42 ~ 1.3kHz
LOW	± 15dB	100Hz

**2. SYMBOLS**

	XLR - 3 - 31 EQUIVALENT		ROTARY POT
	BALANCED INPUT AMP		LINEAR FADER
	BALANCED OUTPUT AMP		PAN POT
	AMP		PAD
	SUMMING AMP		PHASE INVERT SWITCH
	LED		PUSH SWITCH (LOCK TYPE)
	ELECTRIC SWITCH (TRANSFER A, B)		PUSH SWITCH (LOCK TYPE)
	ELECTRIC SWITCH		CONNECTION NODE
	MIC UNIT		SUMMING NODE
			SELECT SWITCH





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## LA-40 SPECIFICATIONS

### BALANCED (INPUT)/BALANCED (OUTPUT), x 4

<b>Connectors:</b>	Input – XLR 3-31 type Output – XLR 3-32 type
<b>Input</b>	
<b>Input Impedance:</b>	600 ohm, balanced, transformerless
<b>Nominal Input Level:</b>	+4 dBm/-20 dBm switchable
<b>Maximum Input Level:</b>	+28 dBm, +4 dBm nominal +4 dBm, -20 dBm nominal
<b>Output</b>	
<b>Output Impedance:</b>	20 ohm, balanced
<b>Minimum Load Impedance:</b>	200 ohm, balanced
<b>Nominal Load Impedance:</b>	600 ohm, balanced
<b>Nominal Output Level:</b>	+4 dBm/-20 dBm switchable
<b>Maximum Output Level:</b>	+28 dBm, +4 dBm nominal +4 dBm, -20 dBm nominal

### TYPICAL PERFORMANCE

<b>Frequency Response:</b>	20 Hz – 20,000 Hz $\pm 0.5$ dB
<b>S/N Ratio (600 ohm source impedance, nominal levels)</b>	
<b>DIN:</b>	95 dB, +4 dBm 85 dB, -20 dBm
<b>IHF (A):</b>	100 dB, +4 dBm 84 dB, -20 dBm
<b>Crosstalk (adjacent channel):</b>	85 dB, 1,000 Hz, nominal level. 600 ohm termination
<b>Total Harmonic Distortion:</b>	0.008 %, 1,000 Hz, at +10 dB
<b>CMRR:</b>	70 dB, 1,000 Hz, nominal level

### BALANCED (INPUT)/UNBALANCED (OUTPUT), x 4

<b>Connectors:</b>	Input – XLR 3-31 type/1/4" phone jacks (3 conductor type) Output – RCA pig jacks
<b>Input</b>	
<b>Input Impedance:</b>	600 ohm transformerless, balanced
<b>Nominal Input Level:</b>	+4 dBm/-20 dBm switchable
<b>Maximum Input Level:</b>	+28 dBm, +4 dBm nominal +4 dBm, -20 dBm nominal
<b>Output</b>	
<b>Output Impedance:</b>	100 ohm, unbalanced
<b>Minimum Load Impedance:</b>	2 k ohm, unbalanced
<b>Nominal Load Impedance:</b>	10 k ohm, unbalanced
<b>Nominal Output Level:</b>	-10 dBV
<b>Maximum Output Level:</b>	+14 dBV

### TYPICAL PERFORMANCE

<b>Frequency Response:</b>	20 Hz – 20,000 Hz $\pm 0.5$ dB
<b>S/N Ratio (600 ohm source impedance, nominal levels)</b>	
<b>DIN:</b>	93 dB, +4 dBm 86 dB, -20 dBm

<b>IHF (A):</b>	96 dB, +4 dBm, 89 dB, -20 dBm
<b>Crosstalk (adjacent channel):</b>	90 dB, 1,000 Hz, nominal level. 600 ohm termination
<b>Total Harmonic Distortion:</b>	0.008 %, 1,000 Hz, at +10 dB

### UNBALANCED (INPUT)/BALANCED (OUTPUT), x 4

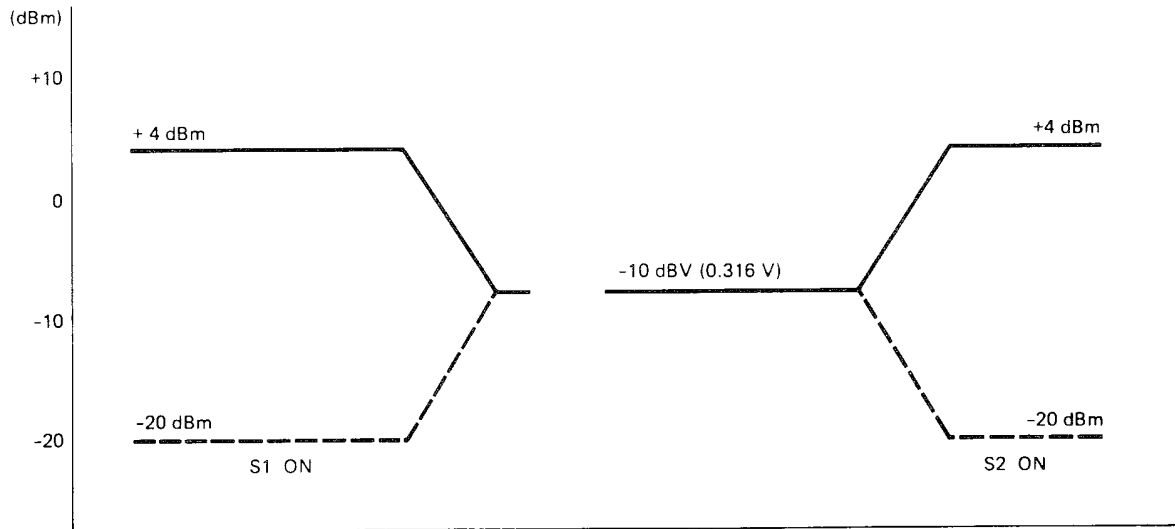
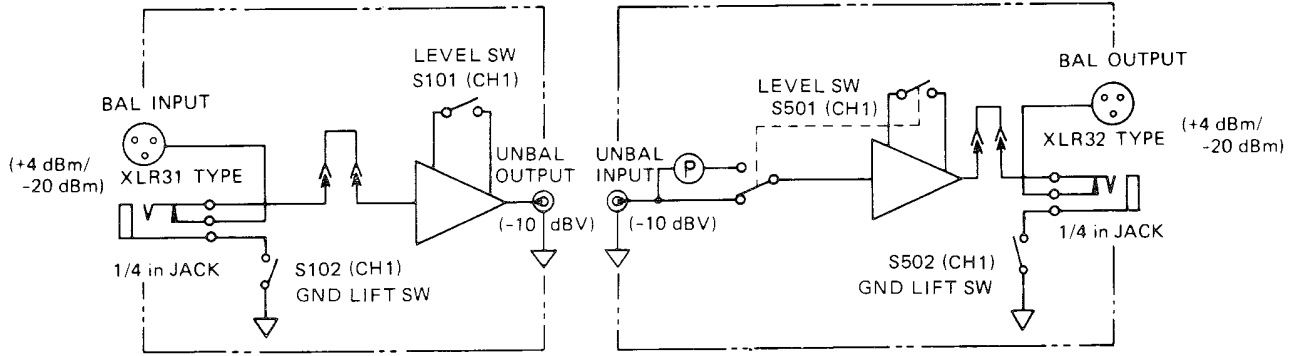
<b>Connectors:</b>	Input – RCA pin jacks Output – XLR 3-32 type /1/4" phone jacks (3 conductor type)
<b>Input</b>	
<b>Input Impedance:</b>	23.5 k ohm, unbalanced
<b>Nominal Input Level:</b>	-10 dBV
<b>Maximum Input Level:</b>	+14 dBV
<b>Output</b>	
<b>Output Impedance:</b>	20 ohm, balanced
<b>Minimum Load Impedance:</b>	200 ohm, balanced
<b>Nominal Load Impedance:</b>	600 ohm, balanced
<b>Nominal Output Level:</b>	+4 dBm/-20 dBm switchable
<b>Maximum Output Level:</b>	+28 dBm, +4 dBm nominal +4 dBm, -20 dBm nominal

### TYPICAL PERFORMANCE

<b>Frequency Response:</b>	20 Hz – 20,000 Hz $\pm 0.5$ dB
<b>S/N Ratio (100 ohm source impedance, nominal levels)</b>	
<b>DIN:</b>	97 dB, +4 dBm 81 dB, -20 dBm
<b>IHF (A):</b>	100 dB, +4 dBm 84 dB, -20 dBm
<b>Crosstalk:</b>	90 dB, 1,000 Hz, nominal level. 600 ohm termination
<b>Total Harmonic Distortion:</b>	0.008 %, 1,000 Hz, nominal levels
<b>CMRR:</b>	70 dB, 1,000 Hz, nominal level
<b>Power Requirement</b>	
<b>USA/CANADA:</b>	120 V AC, 60 Hz, 12.2 W
<b>EUROPE:</b>	220 V AC, 50 Hz, 8 W
<b>US/AUS:</b>	240 V AC, 50 Hz, 8 W
<b>GENERAL EXPORT:</b>	100/120/220/240 V AC, 50/60 Hz, 9 W
<b>Dimensions (W x H x D):</b>	482 x 51 x 263 mm (19" x 2" x 10-3/8")
<b>Weight:</b>	4.5 kg (9-15/16 lbs) net
<b>Note:</b>	CMRR is abbreviation for Common Mode Rejection Ratio.

Changes in specifications and features may be made without notice or obligation. In these specifications; 0 dBV is referenced to 1.0 Volt rms, 0 dBm is referenced to 0.775 Volts rms.

# BLOCK/LEVEL DIAGRAMS OF THE LA-40



# SPECIFICATIONS

## ELECTRICAL CHARACTERISTICS

### MIC INPUT

Source Impedance	200 ohms to 600 ohms, Nominal
Input Impedance	2.2 kohms, Balanced
Nominal Input Level	-68 dBm (0.3 mV) TRIM MAX ~ +4 dBm (1.23 V) TRIM MIN. PAD ON.
Headroom	24 dB
Pad	Attenuation 30 dB

High	10 kHz (Shelving)
Mid	1 kHz (Peaking)
Low	100 Hz (Shelving)
(Dual Monitor)	
2 Band	±15 dB
High	10 kHz (Shelving)
Low	100 Hz (Shelving)

### LINE INPUT/TAPE RETURN (Single Monitor)

Input Impedance	40 kohms-
Nominal Input Level	-20 dBm (0.08 V) TRIM MAX ~ +8 dBm (1.95 V) TRIM MIN.
Headroom	24 dB

### OVERLOAD LED INDICATION LEVEL

(Input, Master)	3 dB Below Clipping Level (100-kohm load)
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### DIM

Control Room Attenuation	30 dB
--------------------------	-------

### STEREO TRIM

Gain	0 dB — -20 dB
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### TEST TONE OSC FREQUENCY

40 Hz, 100 Hz, 1 kHz, 10 kHz
---------------------------------

### INSERT RCV/EFF RTN/2TR IN/ TAPE RETURN (Dual Monitor)

Input Impedance	40 kohms, Balanced
Nominal Input Level	+4 dBm (1.23 V)
Headroom	24 dB

### FADER ATTENTION

(At 1 kHz)	Better than 90 dB
------------	-------------------

### EXT SOLO

(DIN 5P)	
Input Impedance	22 kohms
Nominal Input Level	-10 dBV (0.3 V)
Power Supply	+16 V

### METER

16 + 2, VU Type with PEAK LED PEAK LED indicates 10 dB above nominal output level
---

### PGM OUT/AUX OUT/ST OUT/C. ROOM OUT/ STUDIO OUT/INSERT SEND

Output Impedance	100 ohms, Balanced
Nominal Output Level	+4 dBm (1.23 V)
Headroom	24 dB (10-kohm load)

### POWER REQUIREMENTS

USA/CANADA	120 V AC, 60 Hz
EUROPE	220 V AC, 50 Hz
UK/AUSTRALIA	240 V AC, 50 Hz
GENERAL EXPORT	100/120/220/240 V AC, 50/60 Hz

### D. OUTPUT

Output Impedance	100 ohms, Unbalanced
Nominal Output Level	-10 dBV (0.3 V)
Headroom	24 dB

### POWER CONSUMPTION

200 W
-------

### PERFORMANCE CHARACTERISTICS

### HEADPHONES

Maximum Output Power	100 mW + 100 mW (8-ohm Stereo phones)
----------------------	--

EQUIVALENT INPUT NOISE	DIN AUDIO (20 Hz — (150-ohm Source) 20 kHz)/IHF A WTD) -130 dB/-132 dB
------------------------	--

### HPF

80 Hz, 12 dB/OCT
------------------

SIGNAL TO NOISE RATIO <sup>1)</sup>	DIN AUDIO (20 Hz — 20 kHz)/IHF A WTD)
-------------------------------------	--

### EQUALIZER

(Input, Single Monitor)	
4 Band 2 Sweep	±15 dB
High	10 kHz (Shelving)
Hi-Mid	420 — 13 kHz (Sweep)
Lo-Mid	42 — 1.3 kHz (Sweep)
Low	100 Hz (Shelving)
(Stereo Input)	
3 Band	±15 dB

24 MIC to PGM OUT	55 dB/58 dB
32 MIC to PGM OUT	53 dB/56 dB
1 LINE to PGM OUT	85 dB/88 dB
24 LINE to PGM OUT	66 dB/70 dB
32 LINE to PGM OUT	65 dB/68 dB
1 LINE to AUX OUT	73 dB/76 dB
1 LINE to ST OUT	86 dB/89 dB
1 LINE to C. ROOM OUT	86 dB/89 dB
1 LINE to STUDIO OUT	86 dB/89 dB
1 LINE to SOLO OUT	86 dB/89 dB



**THD (Total Harmonic Distortion)**

**MIC to PGM OUT**

(20 Hz – 20 kHz, -20 dBm Input, +14 dBm Output)  
Less than 0.07 %  
(1 kHz, -20 dBm Input, +14 dBm Output)  
0.015 %

**LINE to PGM OUT**

(20 Hz – 20 kHz, +4 dBm Input, +14 dBm Output)  
Less than 0.05 %  
(1 kHz, +4 dBm Input, +14 dBm Output)  
0.015 %

**IMD (Intermodulation Distortion)**

**MIC to PGM OUT**

(-20 dBm Input, +14 dBm Output)  
Less than 0.03 %

**LINE to PGM OUT**

(+4 dBm Input, +14 dBm Output)  
Less than 0.03 %

**FREQUENCY RESPONSE<sup>1)</sup>**

**MIC to PGM OUT** 20 Hz – 20 kHz, +0.5 dB  
-1.5 dB

**LINE to PGM OUT** 20 Hz – 20 kHz, +0.5 dB  
**(LINE to ANY OUTPUTS)** -1.5 dB

**CROSSTALK**  
**(At 1 kHz)**

Better than 60 dB

**OTHERS**

**DIMENSIONS (W x H x D)**

**Console**

1680 x 305 x 1005 mm  
(66-1/8" x 12" x  
39-9/16")

**Power Supply Unit**

482 x 132 x 263 mm  
(19" x 5-3/16" x  
10-3/8")

**WEIGHT**

**Console**

120 kg (264.55 lbs)

**Power Supply Unit**

10 kg (22.06 lbs)

1) Measured with -60 dBm MIC input level/+4 dBm  
LINE input level.

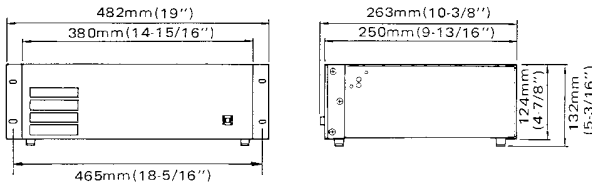
\* 0 dBm is referenced to 0.775 V.

\* 0 dBV is referenced to 1.0 V.

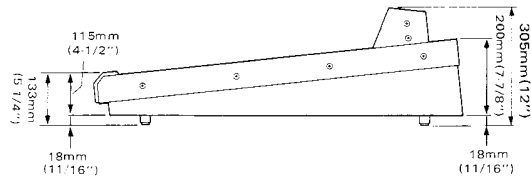
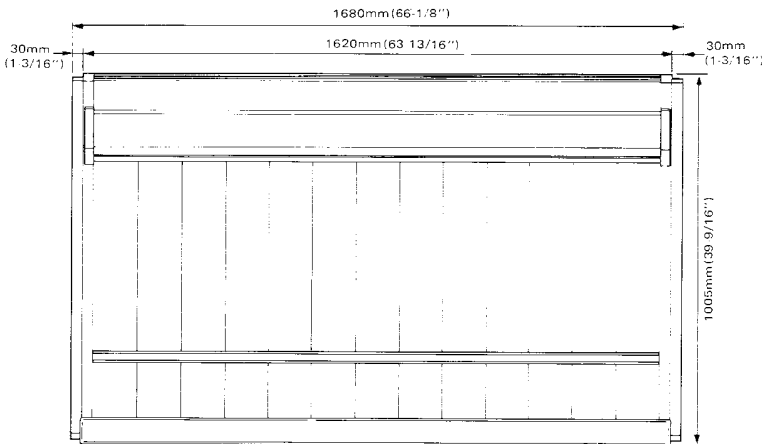
\* All faders at nominal settings.

Changes in specifications and features may be made  
without notice or obligation.

**Power Supply Unit**

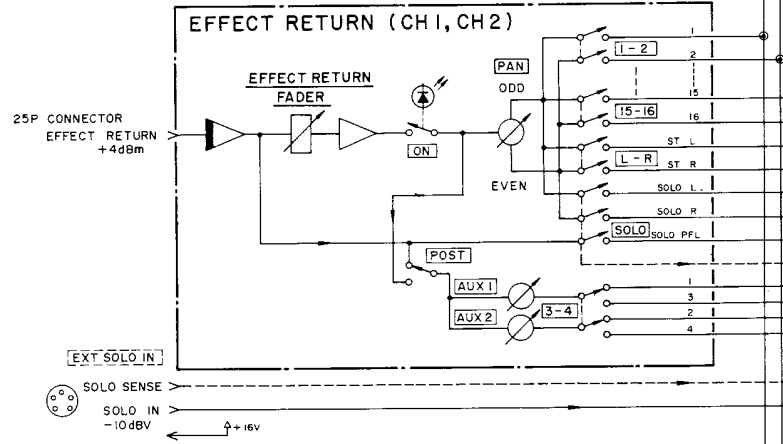
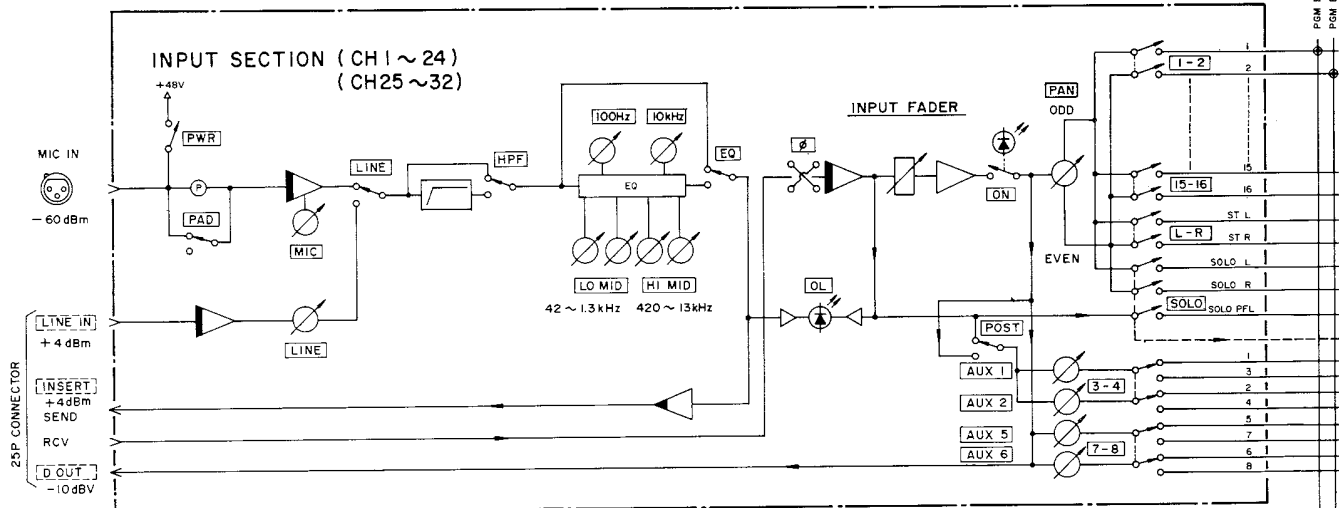


**Console**



# S BLOCK DIAGRAMS Single Monitor Version

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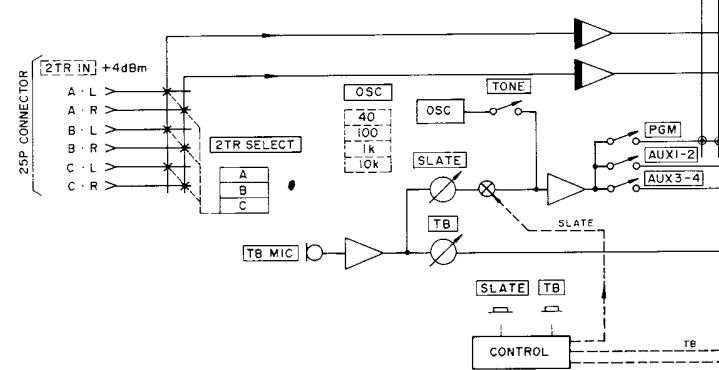


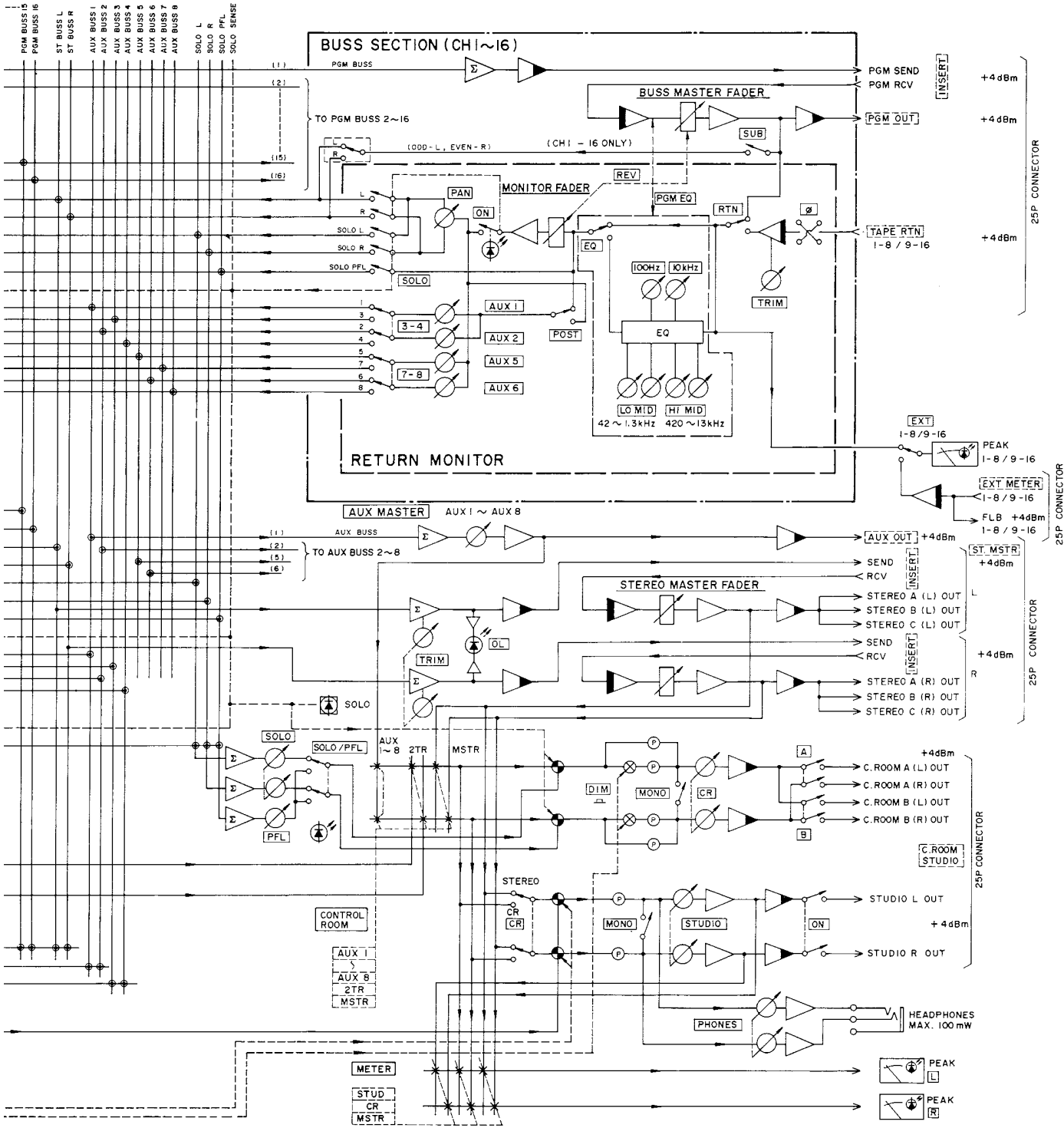
**1. INPUT EQ. / BUSS EQ.**

BAND	GAIN	FREQUENCY
HIGH	±15dB	10kHz
HI-MID	±15dB	420 ~ 13kHz
LO-MID	±15dB	42 ~ 1.3kHz
LOW	±15dB	100Hz

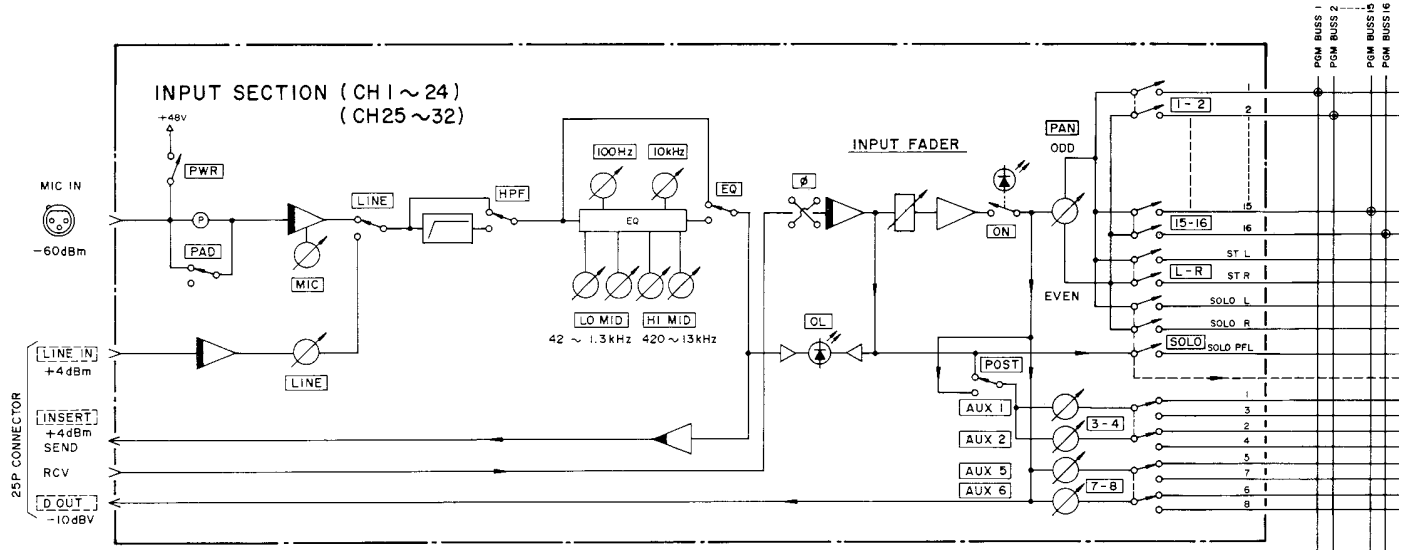
**2. SYMBOLS**

- XLR - 3 - 31 EQUIVALENT
- ROTARY POT
- BALANCED INPUT AMP
- LINEAR FADER
- BALANCED OUTPUT AMP
- PAN POT
- AMP
- PAD
- SUMMING AMP
- PHASE INVERT SWITCH
- LED
- PUSH SWITCH (LOCK TYPE)
- ELECTRIC SWITCH (TRANSFER A, B)
- PUSH SWITCH (LOCK TYPE)
- ELECTRIC SWITCH
- CONNECTION NODE
- MIC UNIT
- SUMMING NODE
- SELECT SWITCH





# Dual Monitor Version



**1. INPUT EQ.**

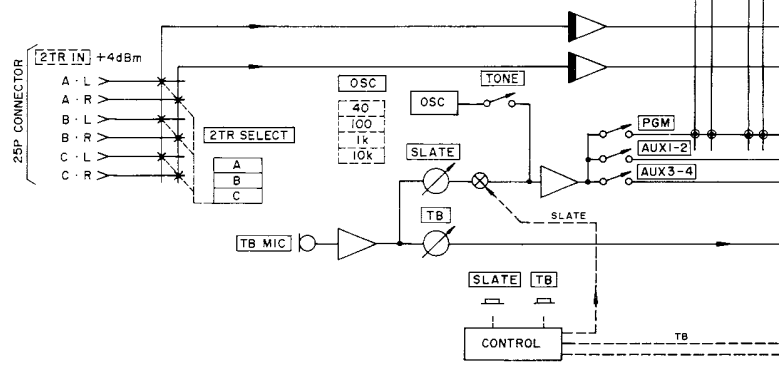
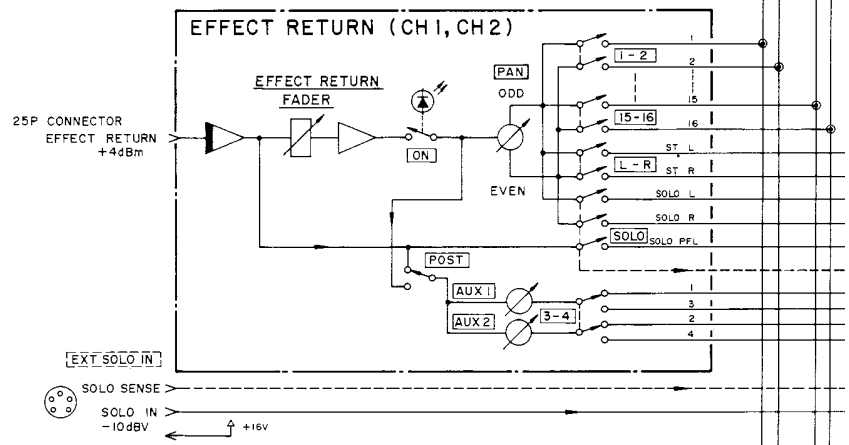
	GAIN	FREQUENCY
HIGH	±15dB	10kHz
HI-MID	±15dB	420 ~ 1.3kHz
LO-MID	±15dB	42 ~ 1.3kHz
LOW	±15dB	100Hz

**MONITOR EQ.**

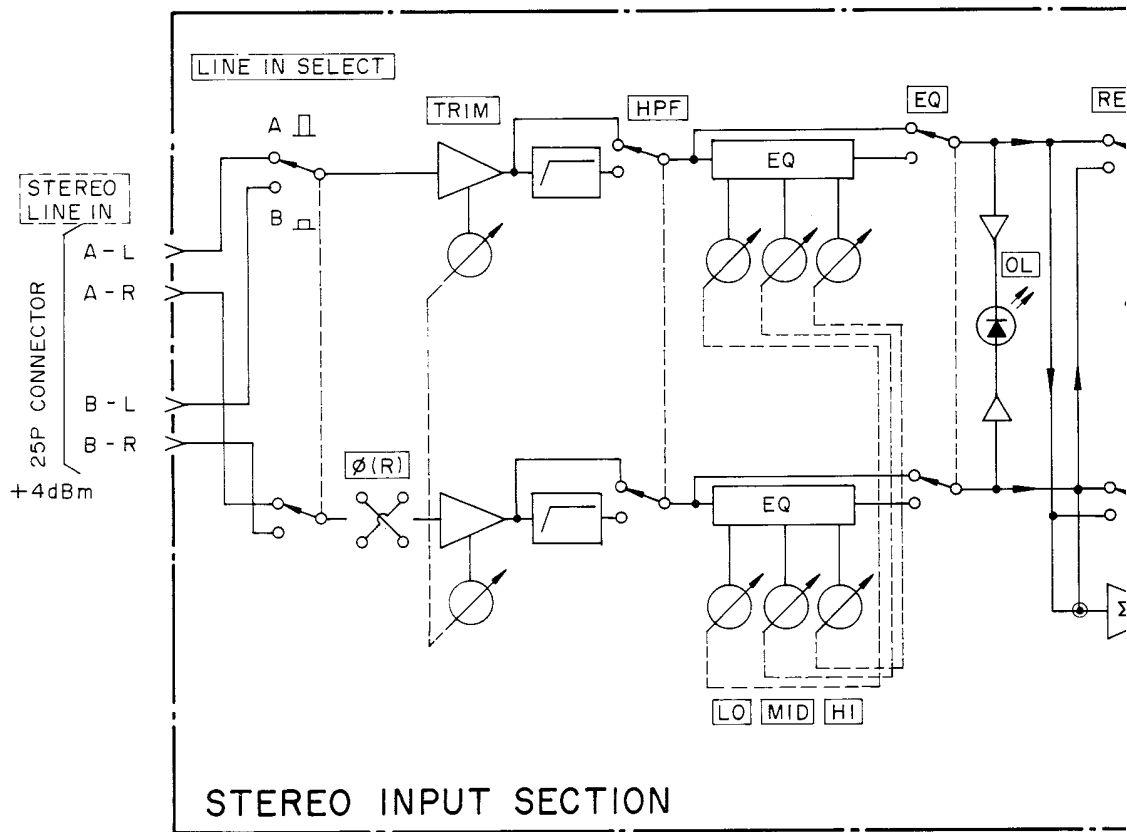
	GAIN	FREQUENCY
HIGH	±15dB	10kHz
LOW	±15dB	100Hz

**2. SYMBOLS**

	XLR - 3 - 31 EQUIVALENT		ROTARY POT
	BALANCED INPUT AMP		LINEAR FADER
	BALANCED OUTPUT AMP		PAN POT
	AMP		PAD
	SUMMING AMP		PHASE INVERT SWITCH
	LED		PUSH SWITCH (LOCK TYPE)
	ELECTRIC SWITCH (TRANSFER A, B)		PUSH SWITCH (LOCK TYPE)
	ELECTRIC SWITCH		CONNECTION NODE
	MIC UNIT		SUMMING NODE
			SELECT SWITCH



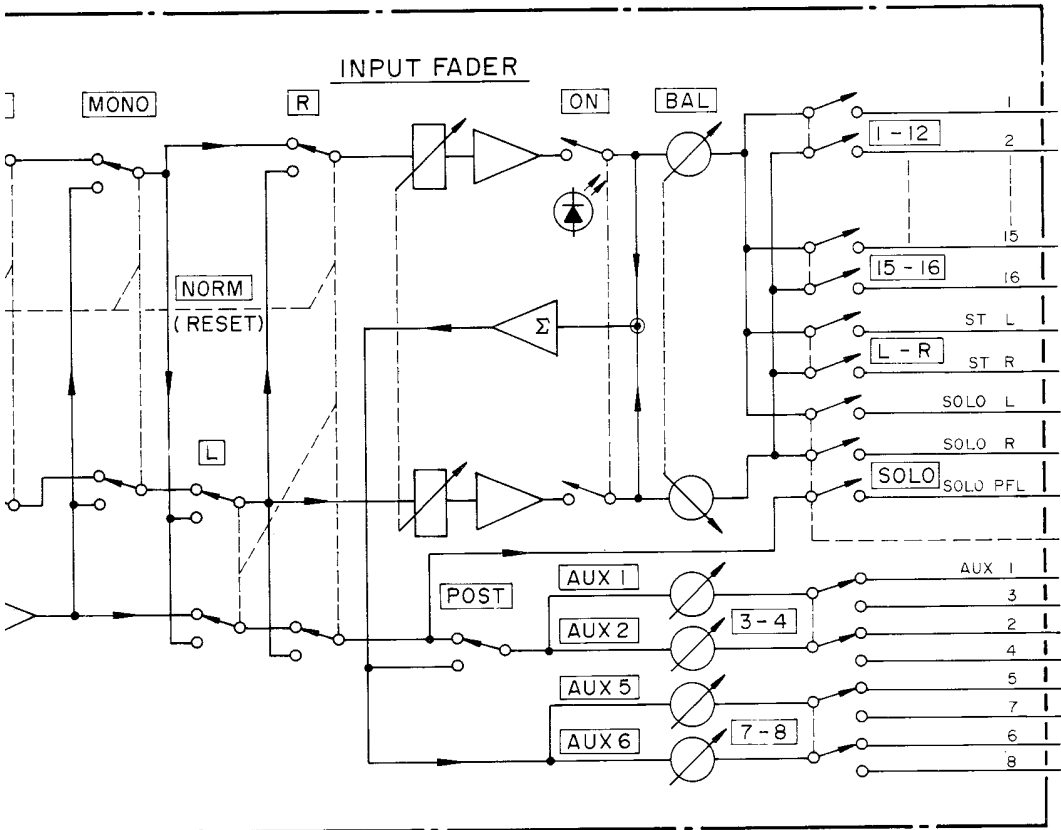
### Stereo Input Module



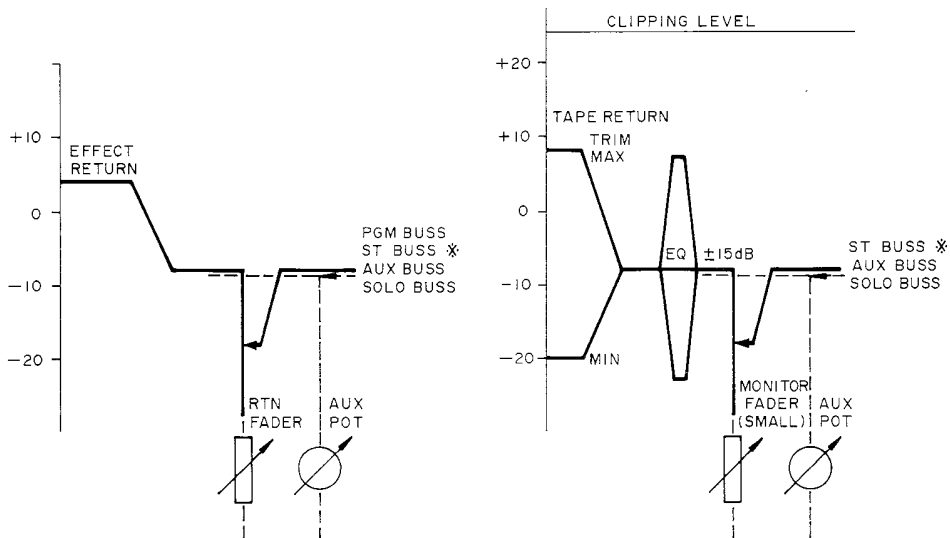
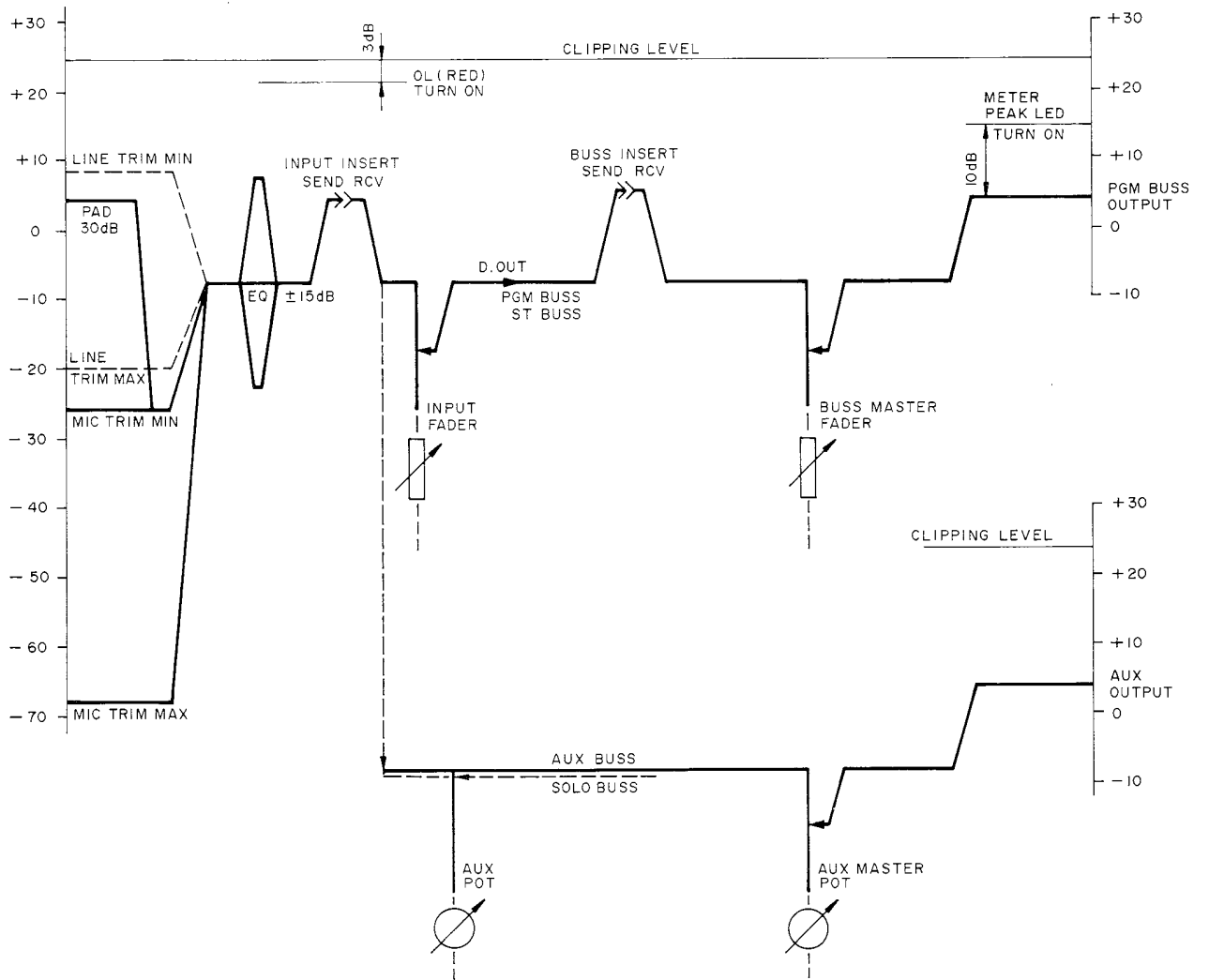
EQ.

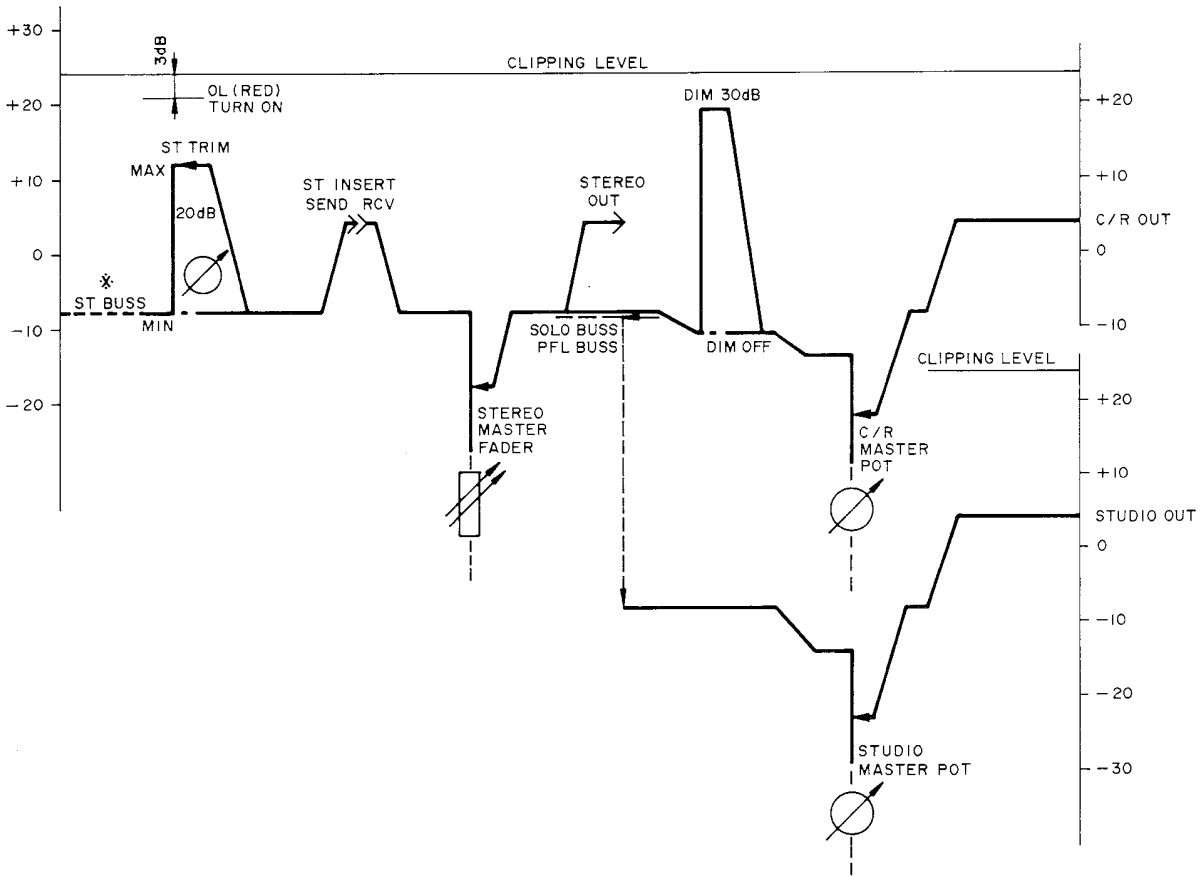
	GAIN	FREQUENCY
HIGH	±15dB	10kHz
MID	±15dB	1kHz
LOW	±15dB	100Hz

25P CONNECTOR



# LEVEL DIAGRAMS







# MAINTENANCE

# 1. INPUT/OUTPUT AND POWER SUPPLY CONNECTIONS

With exceptions of the MIC INputs, the EXT SOLO INput, and the power supply connections, all connections are via D-SUB connectors.

## 1-1. MIC IN Connectors

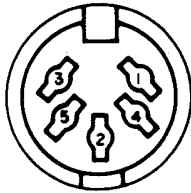
For MIC INs, XLR type connectors are used. Pin 1 is shield, pin 2 low and pin 3 high.

## 1-2. D-SUB Connectors

Refer to page 17.

## 1-3. EXT SOLO

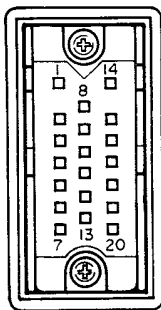
For external solo/control signals, DIN type connectors are used. Shown below is its pin assignment.



Pin No.	Function
1	EXT SOLO IN
2	0 V
3	SOLO SENSE
4	+16 V
5	+5 V

## 1-4. Power Supply Connector

This multipin connector carries the following voltages.



Pin No.	Output Voltage
1	M-600 Chassis GND
3, 4	+8 V DC
2, 8	GND (+8 V)
5, 6, 7	GND ( $\pm 16$ V, +48 V)
9, 10	NC
11, 17, 18	+16 V DC
12	NC
13, 19, 20	-16 V DC
14, 15	(Thermo-sensor connection)
16	+48 V DC

## 2. LEVEL SETTINGS AND OPERATION CHECKS

### 2-1. Adjustments Points and In/Out Nominal Levels

Adjustment points are provided only in the VU meter amplifiers and the master stereo amplifiers.

Nominal levels are:

- 60 dBm (775 mV) at MIC INs;
- 10 dBV (316 mV) at D.OUTs and SOLO IN;
- +4 dBm (1.23 V) at all other inputs/outputs.

Nominal load impedance is 10 kohms at every output except for the headphone output.

### 2-2. Initial Settings

Make the following settings:

#### INPUT MODULE (#601)

- PWR switch to off;
- PAD switch to off;
- MIC level control to minimum;
- LINE level control to minimum;
- LINE select switch to up/MIC position;
- HPF switch to off;
- All EQ knobs to center;
- EQ ON switch to off;
- $\phi$  switch to off;
- AUX 1/2 send level controls to minimum;
- 3-4 select switch to off;
- POST switch to off;
- AUX 5/6 send level controls to minimum;
- 7-8 select switch to off;
- All assign switches (1-2 thru L-R) to off;
- PAN pot to center;
- Channel ON switch to on;
- SOLO switch to off.

#### STEREO INPUT MODULE (#601ST) (Optional)

- LINE IN SELECT switch to up/A position;
- $\phi$  switch to off;
- TRIM pot to minimum;
- REV switch to off;
- MONO switch to off;
- L switch to off;
- R switch to off;
- NORM switch to off;
- HPF switch to off;
- All EQ knobs to center;
- EQ ON switch to off;
- AUX 1/2 send level controls to minimum;
- 3-4 switch to off;
- POST switch to off;
- AUX 5/6 send level controls to minimum;
- 7-8 switch to off;

- All assign switches (1-2 thru L-R) to off;
- BAL control to center;
- Channel ON switch to off;
- SOLO switch to off.

#### MASTER MODULE (#605)

(AUX MASTER Section)

All aux buss output level control, AUX 1 thru AUX 8, to minimum;

(EFFECT RETURNS 1/2)

- POST switches to off;
- AUX 1/2 send level controls to minimum;
- 3-4 select switches to off;
- All assign switches (1-2 thru L-R) to off;
- PAN pots to center;
- ON switches to on;
- SOLO switches to off;
- 2TR SELECT switches, A, B, and C, to off;

(CONTROL ROOM Section)

- All monitor source select switches (AUX 1 thru MSTR) to off;
- MONO switch to off;
- DIM switch to off;
- CR level control to minimum;
- Output system select switches A and B to off;

(Solo Section)

- SOLO/PFL switch to up/SOLO position;
- SOLO level control to minimum;
- PFL level control to minimum;

(Stereo METER Source Select Section)

- All three select switches, STUD, CR, and MSTR, to off;

(STUDIO Monitor Control Section)

- CR switch to off;
- MONO switch to off;
- PHONES level control to minimum;
- STUDIO level control to minimum;
- Studio monitor on/off switch to off;

(Talkback/Slate Section)

- OSC output selector to 1 kHz;
- TONE switch to off;
- SLATE level control to minimum;
- TB level control to minimum;
- Slate/test tone assign switches, PGM, AUX 1-2, and AUX 3-4, to off;
- TB switch to off;

(Stereo Buss)  
MSTR TRIM to maximum.

#### **SINGLE (16) MONITOR MODULE (#602A)**

RTN switch to off;  
 $\phi$  switch to off;  
TRIM pot to minimum;  
All four EQ knobs to center;  
EQ switch to off;  
PGM EQ switch to off;  
AUX 1/2 send level controls to minimum;  
3-4 selector switch to off;  
POST switch to off;  
AUX 5/6 send level controls to minimum;  
7-8 selector switch to off;  
Monitor fader to minimum ( $\infty$ );  
REV switch to off;  
SUB switch to off;  
PAN pot to center;  
Channel ON switch to off;  
SOLO switch to off.

#### **DUAL (32) MONITOR MODULE (#602B)**

METER-UP switch to off;  
RTN switch to off;  
EQ knobs (10 kHz, 100 Hz) to center;  
AUX 1/2 send level controls to minimum;  
3-4 selector switch to off;  
AUX 5/6 send level controls to minimum;  
7-8 selector switch to off;  
LEVEL control to minimum;  
PAN pot to center;  
Channel ON switch to off;  
SOLO switch to off.

#### **FADER MODULES**

Slide down to minimum ( $\infty$ ) all input/output faders in every section.

#### **2-3. Faders (in the Input section (#601 module), the PGM Buss section, and the Stereo Buss section)**

With a nominal level signal connected to the INSERT RCV in each of the three sections, check for nominal level at the output connectors specified below when the corresponding faders are set to about the 0 dB point on their scales. See Signal Flow Charts 2-1 and 2-2.

#### **Channel Faders**

Channel INSERT RCV  $\rightarrow$  D.OUT (with the channel ON switches engaged/down)

#### **PGM Buss Faders**

PGM INSERT RCV  $\rightarrow$  PGM OUT

Ensure the following:

1. 16-Monitor System (#602A Module) – Press the REV switch to swap the 100-mm buss fader for the 60-mm monitor fader and confirm that when the 60-mm fader is set to 0 dB position (approximately), it provides the nominal PGM OUT level.
2. 32-Monitor System (#602B Module) – Press the REV switch to swap the 100-mm buss fader for the rotary monitor LEVEL control and confirm that when the LEVEL control is set to the 3 o'clock position (approximately), it provides the nominal PGM OUT level.

#### **Stereo Master Faders**

Stereo Buss INSERT RCV  $\rightarrow$  STEREO OUT

#### **2-4. C.ROOM Outputs From CR Level Control/ DIM Switch/MONO Switch (2TR IN $\rightarrow$ C.ROOM Out)**

The C.ROOM Outs may carry the stereo master/aux busses and/or the 2TR INs, as selected by the CONTROL ROOM monitor source switches, unless replaced with SOLOs.

See Signal Flow Chart 2-2.

1. Engage (press down) the following switches on the Master Module: one of the 2TR SELECT switches (A, B, or C); the 2TR in the CONTROL ROOM monitor switch rack, and either the A or B Control Room output system switch.
2. Apply a nominal level signal to the 2TR INs, A, B, or C, as selected in previous step 1.
3. Check for nominal level at the C. ROOM Outs when the CR level control is set to the 3 o'clock position (approximately).
4. With the CR level control set to the nominal position, press the DIM switch and check for a reduction of about 30 dB in the C.ROOM output level.
5. Remove either the R or L signal from the 2TR INs, press the MONO switch and check for the same level at both the L and R C. ROOM Outs.

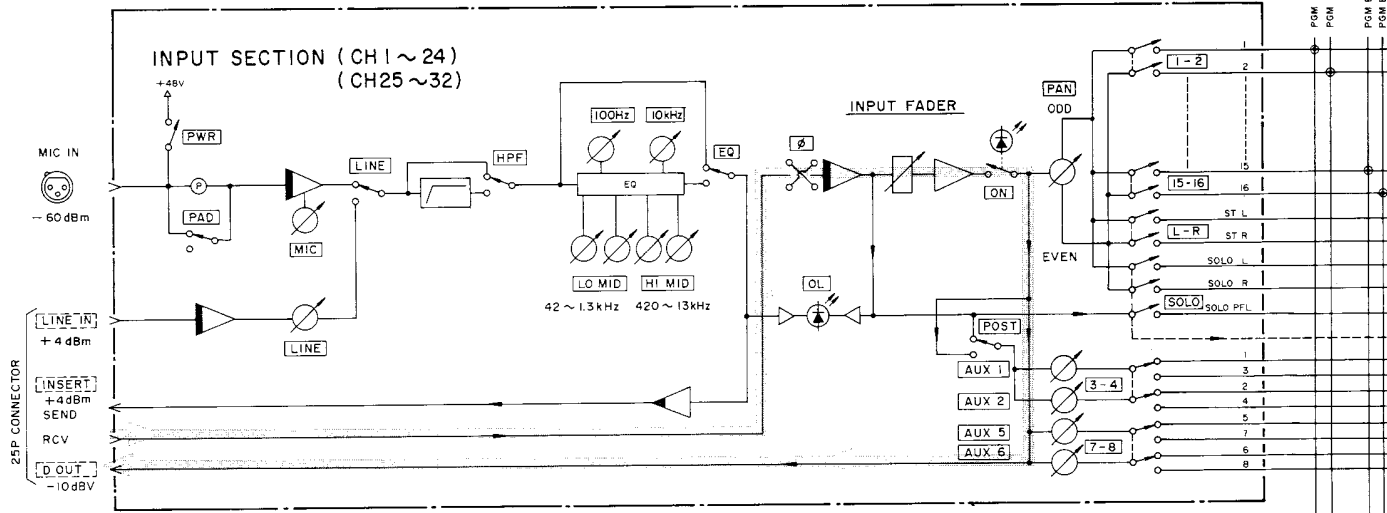


Chart 2-1

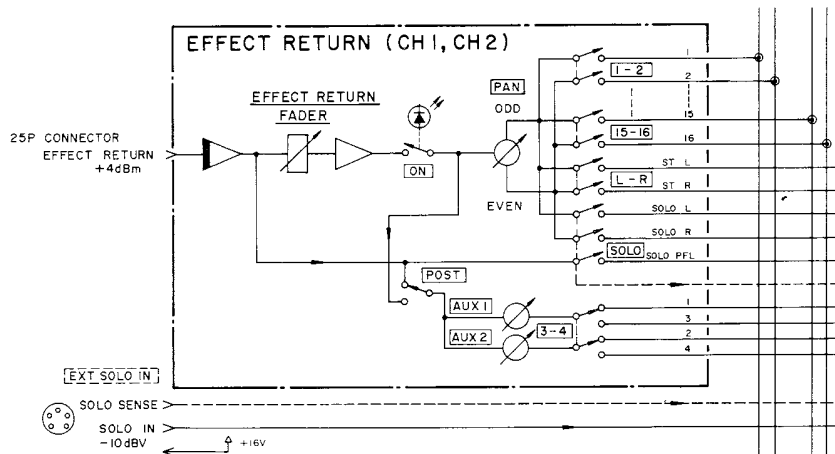
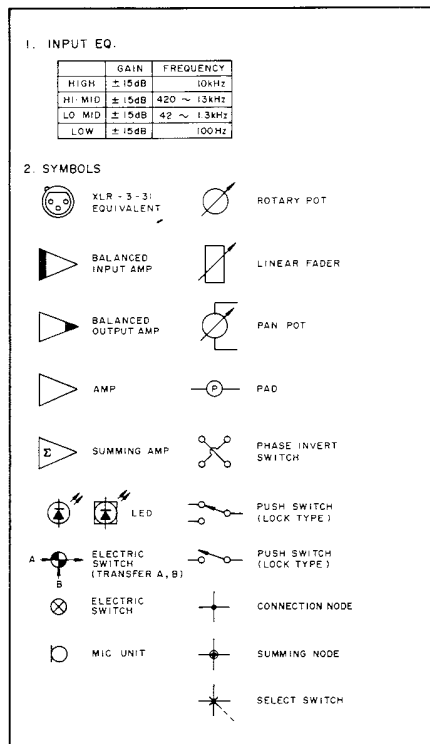
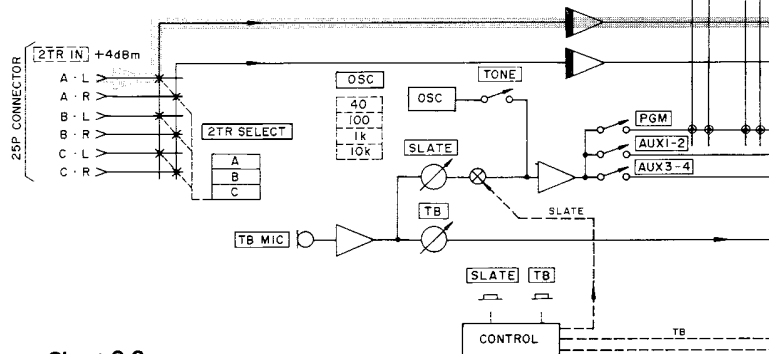
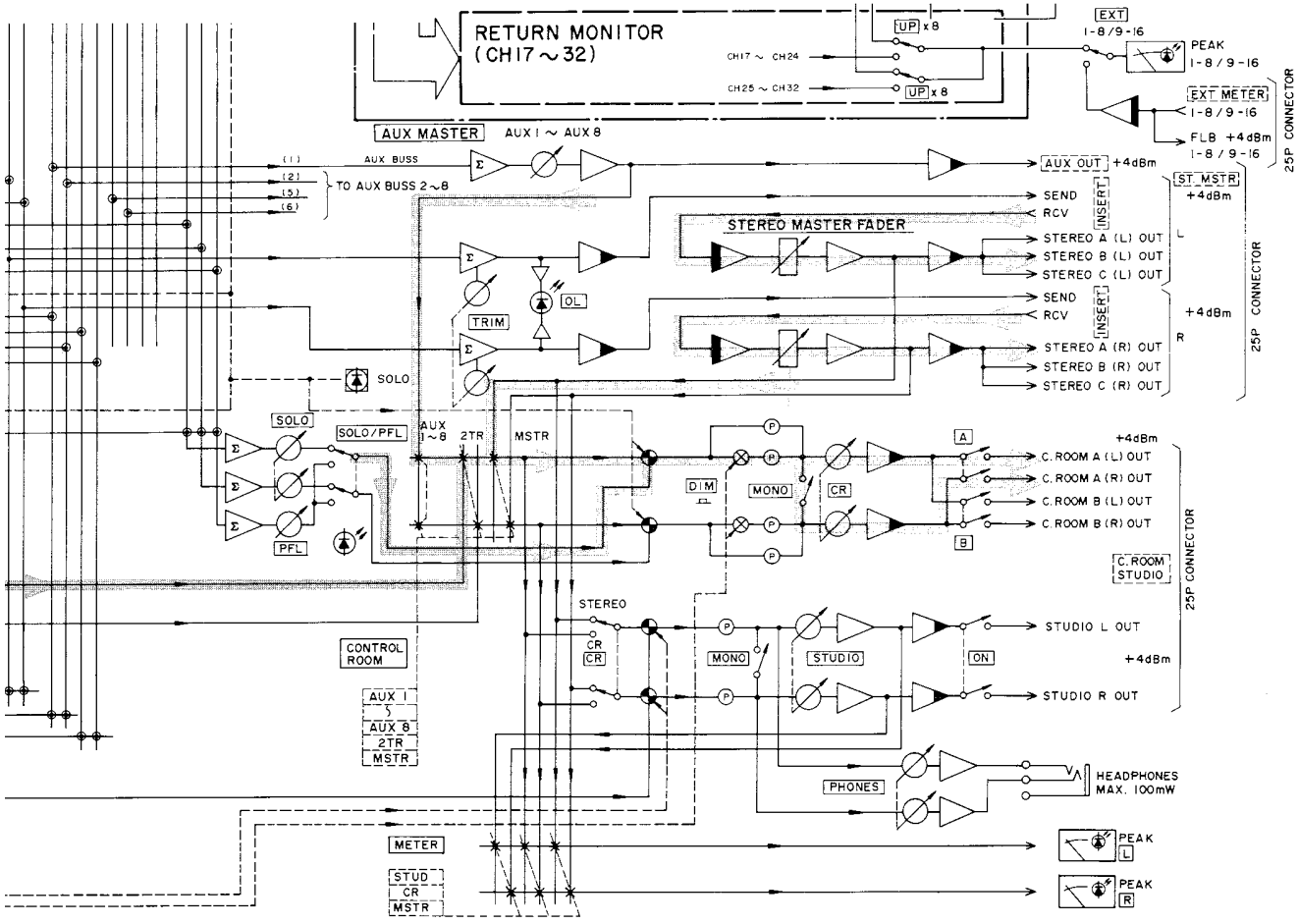
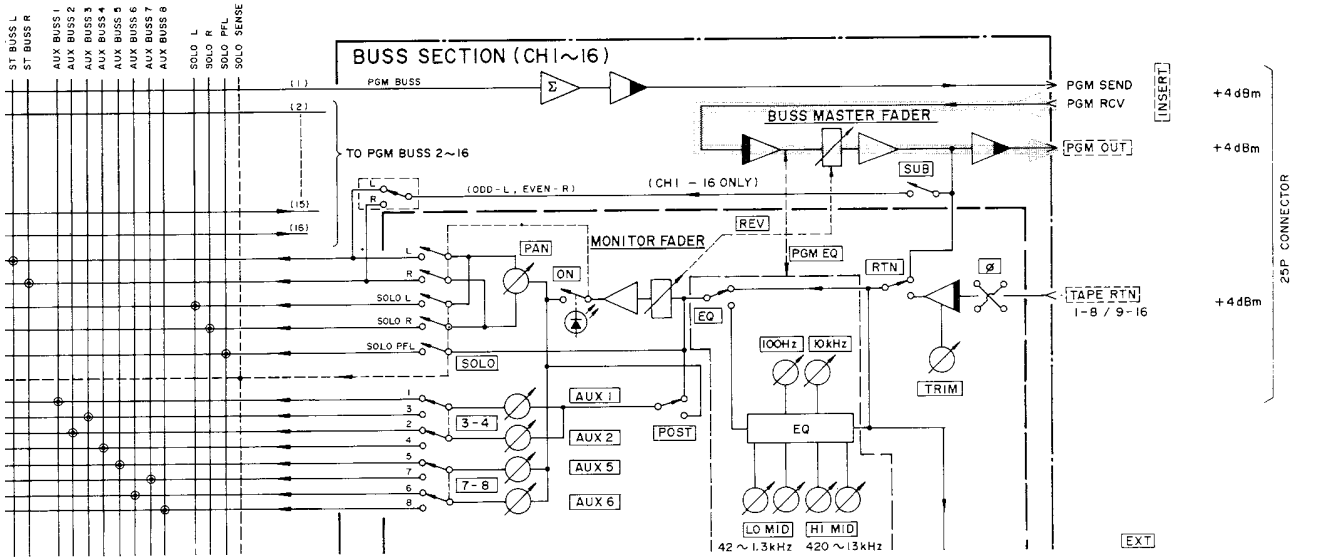


Chart 2-2



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## 2-5. Input Module (#601)

### 2-5-1. MIC Input Level Control (MIC IN → INSERT SEND)

See Signal Flow Chart 2-3.

Apply a nominal level signal to the MIC IN connectors and check for nominal level at the IN-

SERT SEND connectors when the MIC level control is set to the 4 o'clock position (approximately).

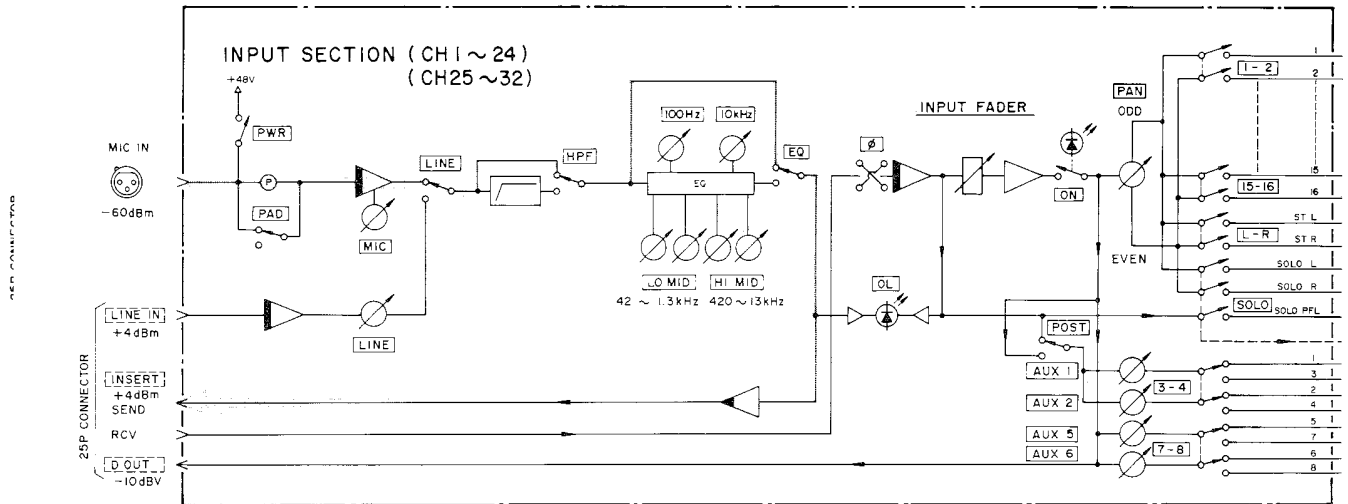


Chart 2-3

### 2-5-2. Mic PAD

While the INSERT SEND level is set to nominal as in previous paragraph 2-5-1, press the PAD switch, increase the MIC IN level by 30 dB and check for a level of  $4 \pm 2$  dBm at the INSERT SEND connectors.

Reset the MIC IN level to nominal and disengage the PAD switch by pressing it again.

### 2-5-4. HPF Characteristics

When either the MIC IN signal or the LINE IN signal is feeding the channel INSERT SEND (as in paragraph 2-5-1 or 2-5-3), note the INSERT SEND level variation by changing the frequency of the input signal from 1kHz to 80 Hz. The level at 80 Hz should be 3 dB lower than at 1 kHz (approximately).

### 2-5-3. LINE Level Control (LINE IN → INSERT SEND)

Press the LINE select switch and, applying a nominal level signal to the LINE IN connector, check for nominal level at the INSERT SEND connector when the LINE level control is set to the 11 o'clock position (approximately).

### 2-5-5. EQ Characteristics (MIC IN/LINE IN → INSERT SEND)

In the same conditions as in paragraph 2-5-1 (mic-in feed) or 2-5-3 (line-in feed), check each of the EQ systems by referring to table below.

Table 2-1

Input Signal Frequency (Hz)	EQ Knob Settings						INSERT SEND Output Level
	10 kHz	HI MID		LO MID		100 Hz	
		420 - 13k	GAIN	42 - 1.3k	GAIN		
100	Center	Center(2.2k)	Center	Center(220)	Center	Max(+)/Min(-)	+4 dBm $\pm$ 13 dB or more
10k	Max(+)/Min(-)	↑	↑	↑	↑	Center	↑
42 ~ 1.3k	Center	↑	↑	42 ~ 1.3k	Max(+)/Min(-)	↑	+4 dBm $\pm$ 15 dB or more (42 Hz to 1.3 kHz)
420 ~ 13k	↑	420 ~ 13k	Max(+)/Min(-)	Center(220)	Center	↑	+4 dBm $\pm$ 15 dB or more (420 Hz to 13 kHz)

#### **2-5-6. PGM OUTs From PGM Buss Assign Switches/PAN Pots (MIC IN/LINE IN → PGM OUT)**

Channel signals are assignable to PGM (group) busses 1-16, by the assign switches (Signal Flow Chart 2-4).

With both the channel faders and the PGM buss master faders set as in sub-section 2-3 and the MIC or LINE control set as in paragraph 2-5-1 or 2-5-3, perform the following check.

Connect between INSERT SEND and RCV in the input channels, the PGM busses and the stereo L and R busses, to proceed to perform the following tests.

1. Press the assign switches to route the channel signals to the PGM OUTs.
2. Turn PAN fully left (ODD) and check for nominal level at odd-numbered PGM OUTs; and turn PAN fully right (EVEN) and check for nominal level at even-numbered PGM OUTs.

When PAN set to center to send the same level both to odd and even PGM busses, the output level from these should be about 3 dB lower than nominal (approximately).

#### **2-5-7. STEREO OUTs, L & R, From L-R Assign Switches/PANs (MIC IN/LINE IN → STEREO OUTs L & R)**

Pressing the L-R switch will route the channel signal to the master stereo buss (Signal Flow Chart 2-4).

With both the channel faders and the PGM buss master faders set as in sub-section 2-3 and the MIC or LINE level control set as in paragraph 2-5-1 or 2-5-3, perform the following tests.

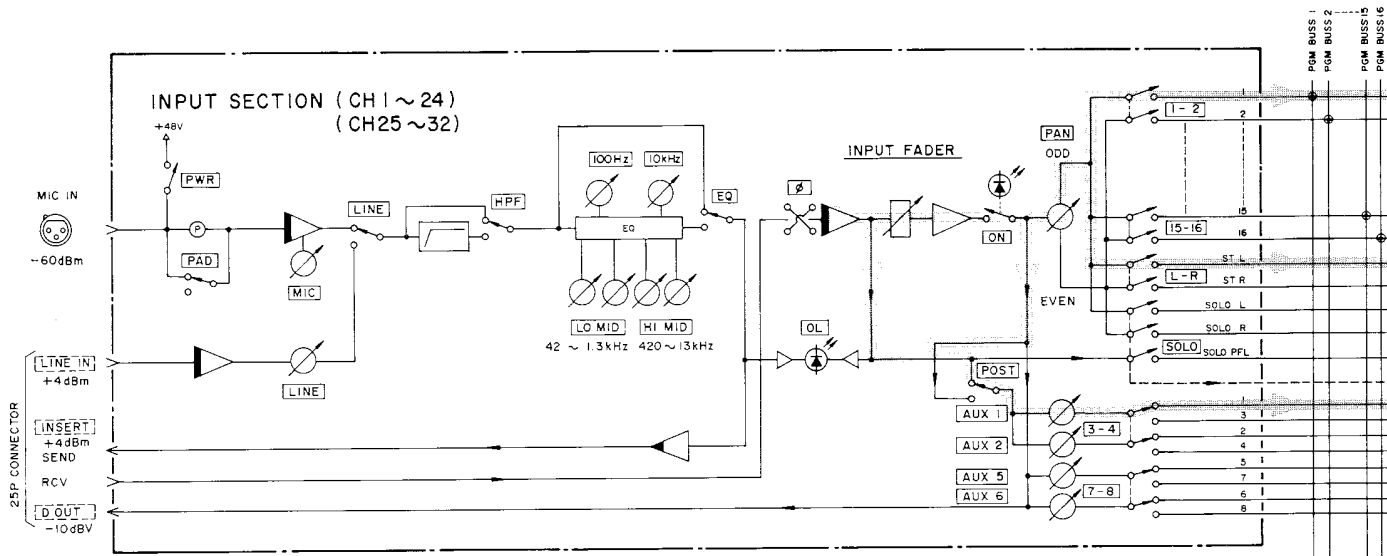
1. Press the L-R switch on the channel to which a test signal is applied.
2. Turn PAN fully left (L) and check for nominal level at the STEREO OUT "L" connector when the MSTR TRIM knob is set to maximum (fully right).
3. Similarly, check the STEREO OUT "R" level by turning PAN fully right (R).
4. Set the MSTR TRIM to minimum (fully left) and check for a reduction of about 20 dB in both the STEREO OUT "L" and "R" levels. If necessary, adjust semi-fixed resistors R380 (L) and R381(R) on the STUDIO PCB Ass'y.

#### **2-5-8. AUX OUTs From AUX Assign Switches/AUX Send Level Controls/POST Send Switches (INSERT RCV → AUX OUT)**

The POST switch provided in each of the input channels enables AUX sends 1-4 to be switched pre- or post-fader (Signal Flow Chart 2-4). With signal present at D.OUT as in sub-section 2-3 or in paragraph 2-5-6, check the following.

1. Set the AUX 1/2 send level control to maximum and check for nominal level at AUX OUTs 1 and 2 when the corresponding AUX MASTER controls are set to the 3 o'clock position (approximately).
2. Press the AUX send "3-4" switch and check for nominal level at AUX OUTs 3 and 4 when the corresponding AUX MASTER level controls are set to the 3 o'clock position (approximately).
3. Using the POST switches, switch the AUX 1-4 sends to post-fader and ensure that the corresponding AUX OUTs follow movements of the input channel faders.
4. Similarly, check AUX OUTs 5 to 8 (note that there is no POST switch on AUX sends 5-8).





#### 1. INPUT EQ.

GAIN	FREQUENCY
HIGH $\pm 15dB$	10kHz
HI-MID $\pm 15dB$	420 ~ 13kHz
LO-MID $\pm 15dB$	42 ~ 1.3kHz
LOW $\pm 15dB$	100Hz

#### MONITOR EQ.

GAIN	FREQUENCY
HIGH $\pm 15dB$	10kHz
LOW $\pm 15dB$	100Hz

#### 2. SYMBOLS

	XLR-3-31 EQUIVALENT		ROTARY POT
	BALANCED INPUT AMP		LINEAR FADER
	BALANCED OUTPUT AMP		PAN POT
	AMP		PAD
	SUMMING AMP		PHASE INVERT SWITCH
	LED		PUSH SWITCH (LOCK TYPE)
	ELECTRIC SWITCH (TRANSFER A, B)		PUSH SWITCH (LOCK TYPE)
	ELECTRIC SWITCH		CONNECTION NODE
	MIC UNIT		SUMMING NODE
			SELECT SWITCH

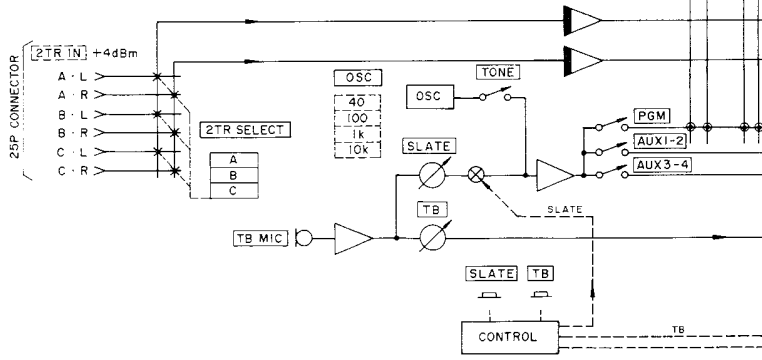
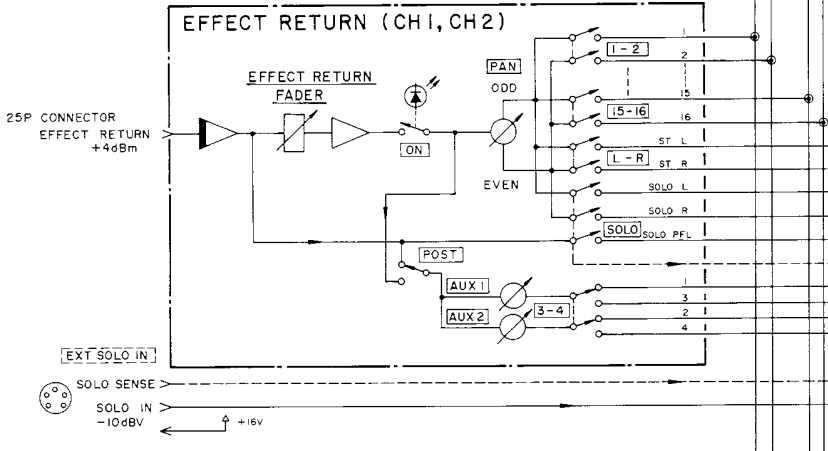
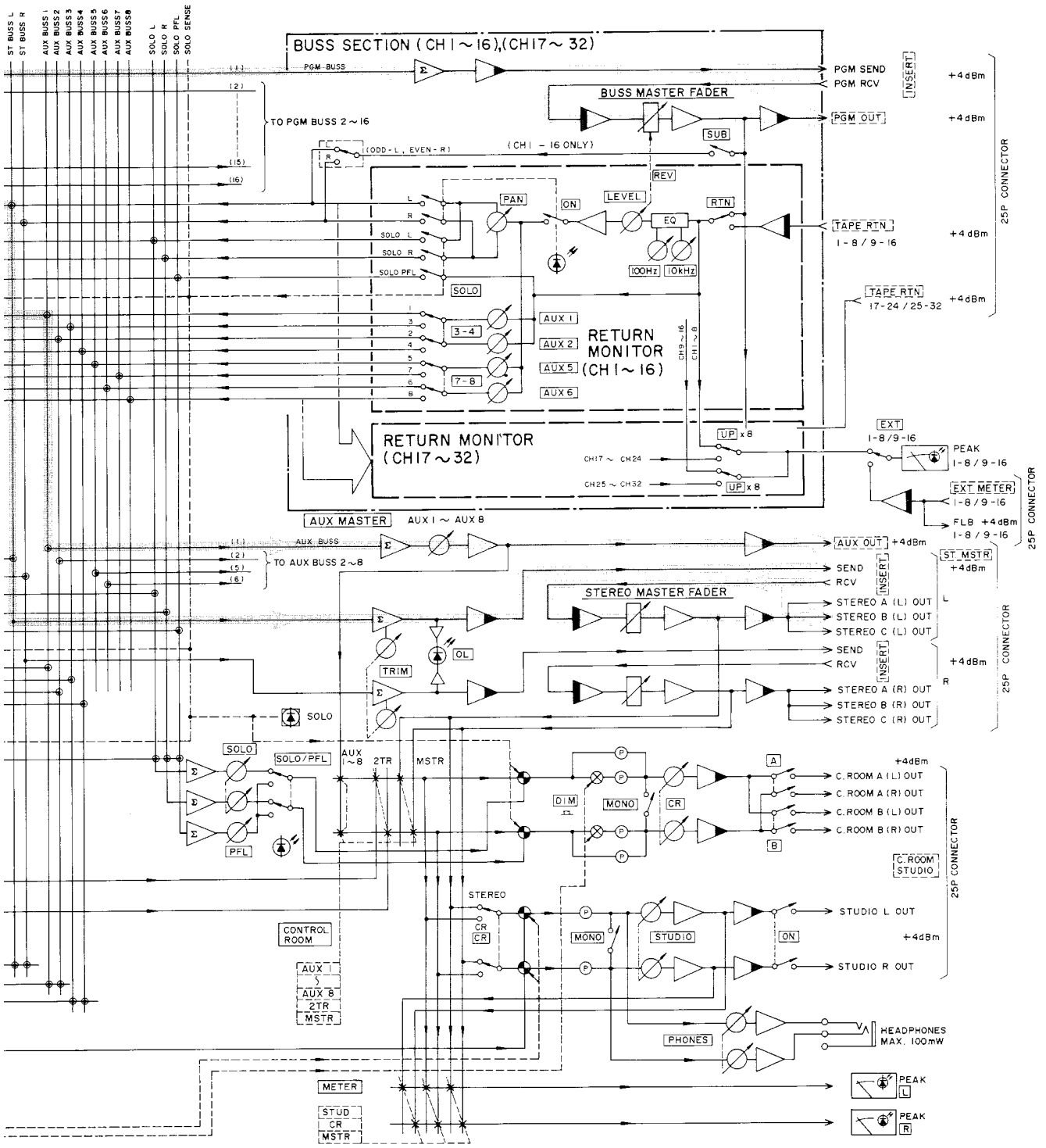


Chart 2-4

ie  
it  
L  
J-

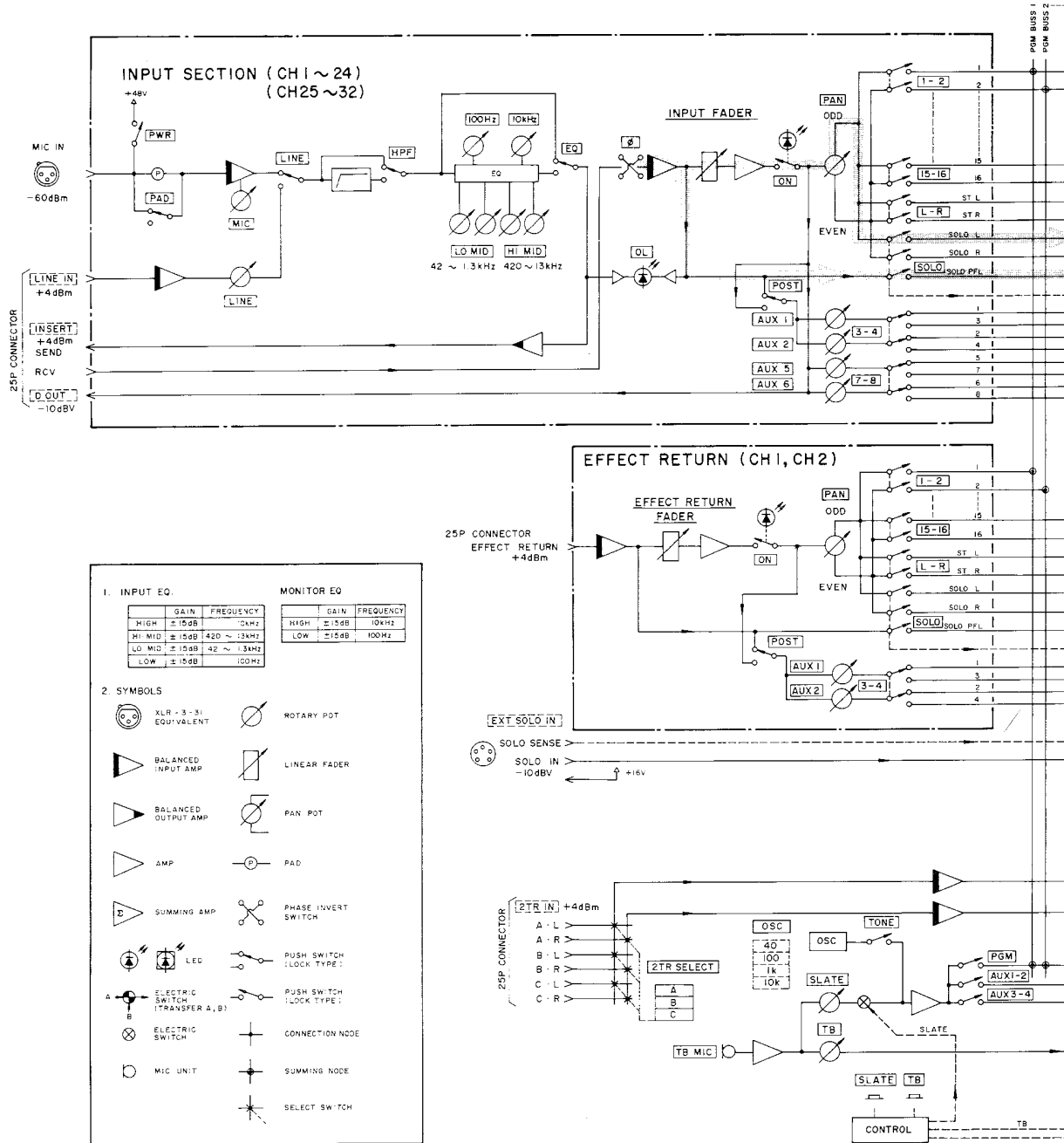


## 2-5-9. C.ROOM Outs From Channel SOLO Switch (INSERT RCV → C.ROOM Out)

By pressing the channel SOLO switch, that channel's signal is taken off post-fader/PAN (in SOLO-in-place mode) or pre-fader (in PFL mode), to be sent on to the C.ROOM Outs.

With a channel signal sent to the PGM busses as in paragraph 2-5-6 and the CR level control and the A/B output select switches in the C.ROOM output control section set as in sub-section 2-4, perform the following check.

1. Press the SOLO switch on the channel where a test signal is present and turn the channel PAN control fully left ("L" position). When one or more SOLO switches are pressed on, the C.ROOM output level should lower 30 dB. This is also the case when the DIM switch is pressed on.



2. Set the SOLO level control on the Master Module to the 3 o'clock position (approximately) and check for a nominal level post-fader/pan signal at the C.ROOM output L, either of the A or B output system.
3. Similarly, check the C.ROOM R output level by turning the PAN fully right ("R" position).

4. Press the SOLO/PFL switch to activate the PFL function and check for nominal level at the C.ROOM Outs L and R when the PFL volume control is turned up to maximum (approximately).

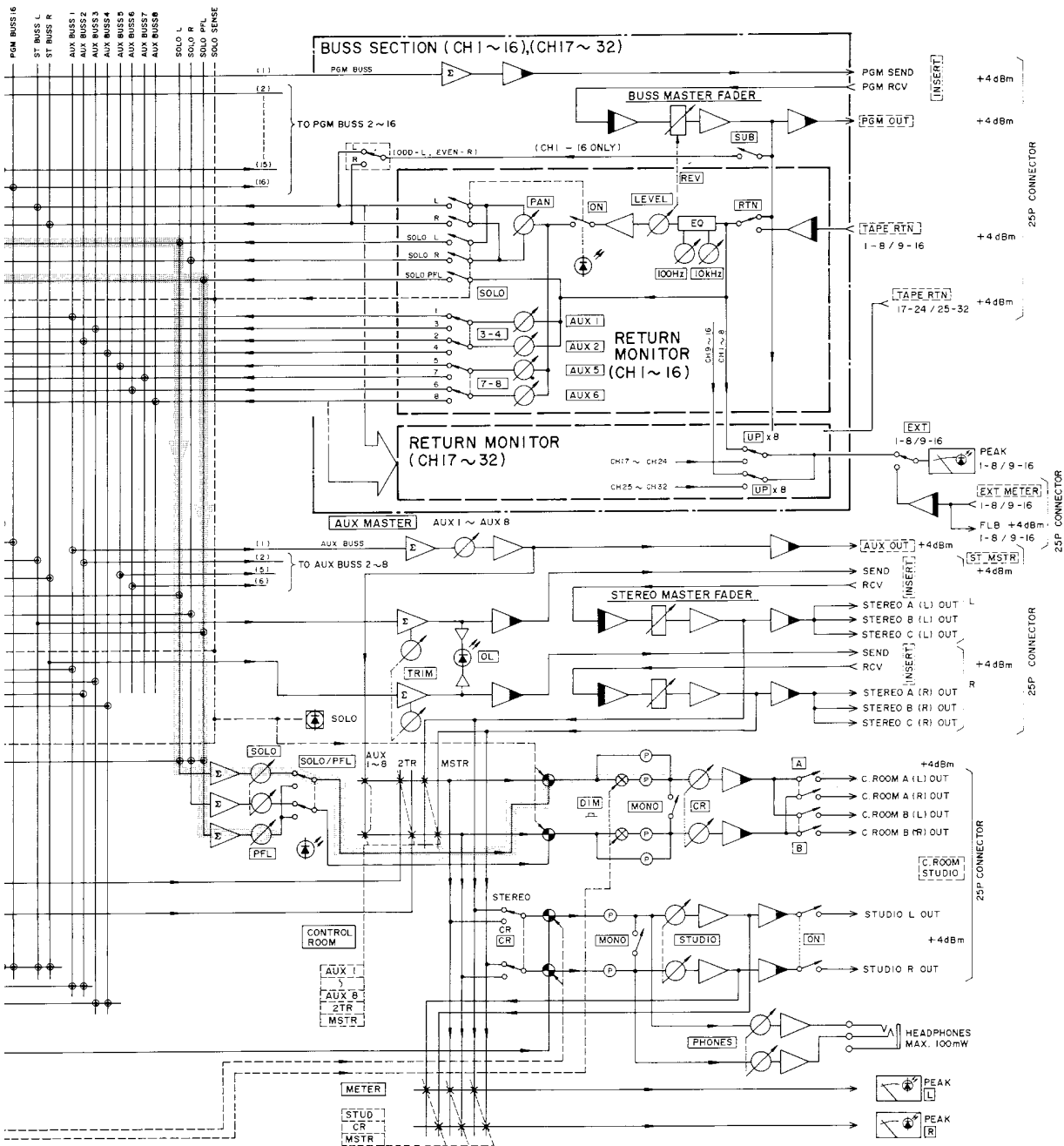


Chart 2-5

## 2-6. Stereo Input Module (#601ST) (Optional)

The same routing/panning system as in the mono channel module is used for sending the stereo channel signal to the PGM, STEREO, AUX, and C.ROOM busses (Signal Flow Chart 2-6).

### 2-6-1. TRIM and PGM 1-16 Assign Switches (STEREO LINE IN → PGM OUT)

1. Set PGM buss faders 1-16 to the nominal, 0 dB position on their scales (as in sub-section 2-3).
2. Apply a nominal level signal to LINE INs (L & R) A.
3. Engage the channel ON switch, set the channel fader to the 0 dB position, and turn the BAL control fully left (ODD position).
4. Press the assign switches to route the channel signal to PGM OUTs and check for nominal level at odd-numbered PGM OUTs when the TRIM pot is set to the 11 o'clock position (approximately).
5. Similarly, check signal flow to even-numbered PGM OUTs with the BAL control turned fully right (EVEN position).
6. Set the BAL control to center (12 o'clock position) and check for a level of about 3 dB lower than nominal both at the odd and even PGM OUTs.

### 2-6-2. STEREO OUTs L & R From L-R Assign Switch (STEREO LINE IN → STEREO OUT L/R)

Use the procedure given in paragraph 2-5-7.

### 2-6-3. AUX OUTs From AUX Select Switch, AUX Send Level Control, and POST Send Switch (STEREO LINE IN → AUX OUT)

Use the procedure given in paragraph 2-5-8.

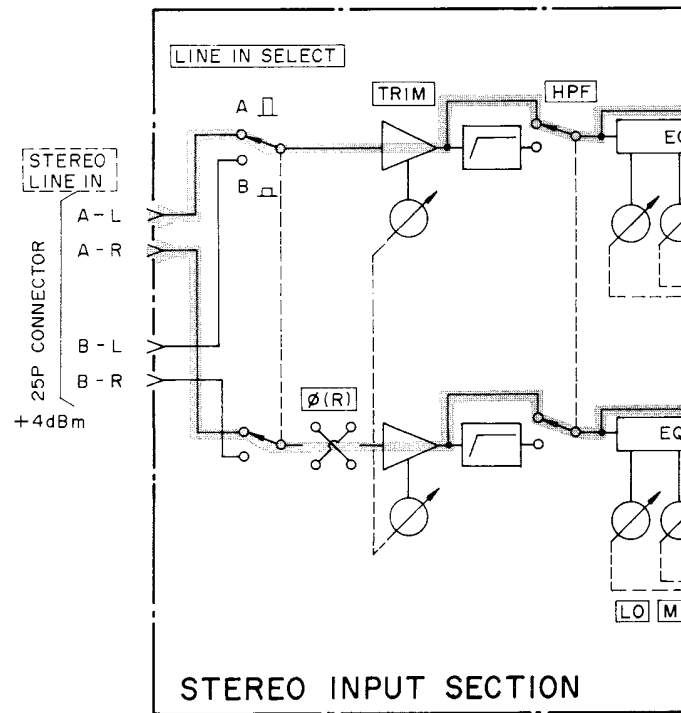
### 2-6-4. C.ROOM Outputs From Channel SOLO Switch (STEREO LINE IN → C.ROOM)

Use the procedure given in paragraph 2-5-9.

### 2-6-5. Input Mode Switching (REV, MONO, L, R, and NORM) (STEREO LINE IN → PGM OUT)

Making STEREO LINE INs feed PGM OUTs as in paragraph 2-6-1 (step 4), check the following:

1. Remove the STEREO LINE IN "L" signal.
2. Press the R, MONO, or REV switch and check that the LINE IN "R" signal is assignable not only to even PGM OUTs but also to odd PGM OUTs.  
Pressing the NORM switch should disengage the R, MONO, and REV switches.
3. Reconnect the LINE IN "L" signal and remove its "R" signal instead.
4. Press the L, MONO, or REV switch and check that the LINE IN "L" signal is assignable not only to odd PGM OUTs but also to even PGM OUTs.

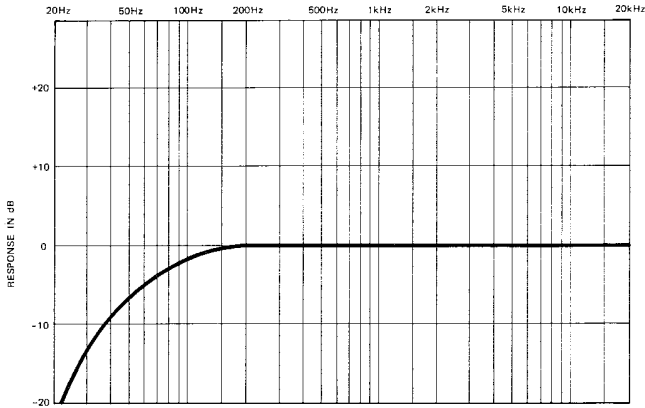


EQ.

	GAIN	FREQUENCY
HIGH	± 15 dB	10 kHz
MID	± 15 dB	1 kHz
LOW	± 15 dB	100 Hz

### 2-6-6. HPF Characteristics

With the same conditions as in paragraph 2-6-1, step 4, press the HPF switch and measure the SEND output levels both for 1 kHz and 80 Hz inputs. Difference between the two levels should be 3 dB (approximately).



### 2-6-7. EQ Characteristics

With the same conditions as in paragraph 2-6-1, step 4, press the EQ ON switch and check for the PGM OUT levels specified in table 2-2.

Table 2-2

Input Signal Frequency (Hz)	EQ Knob Settings			PGM OUT Level
	HI	MID	LO	
100	Center	Center	Max(+)/Min(-)	+4 dBm ±13 dB or more
1k	Center	Max(+)/Min(-)	Center	+4 dBm ±15 dB or more
10k	Max(+)/Min(-)	Center	Center	↑

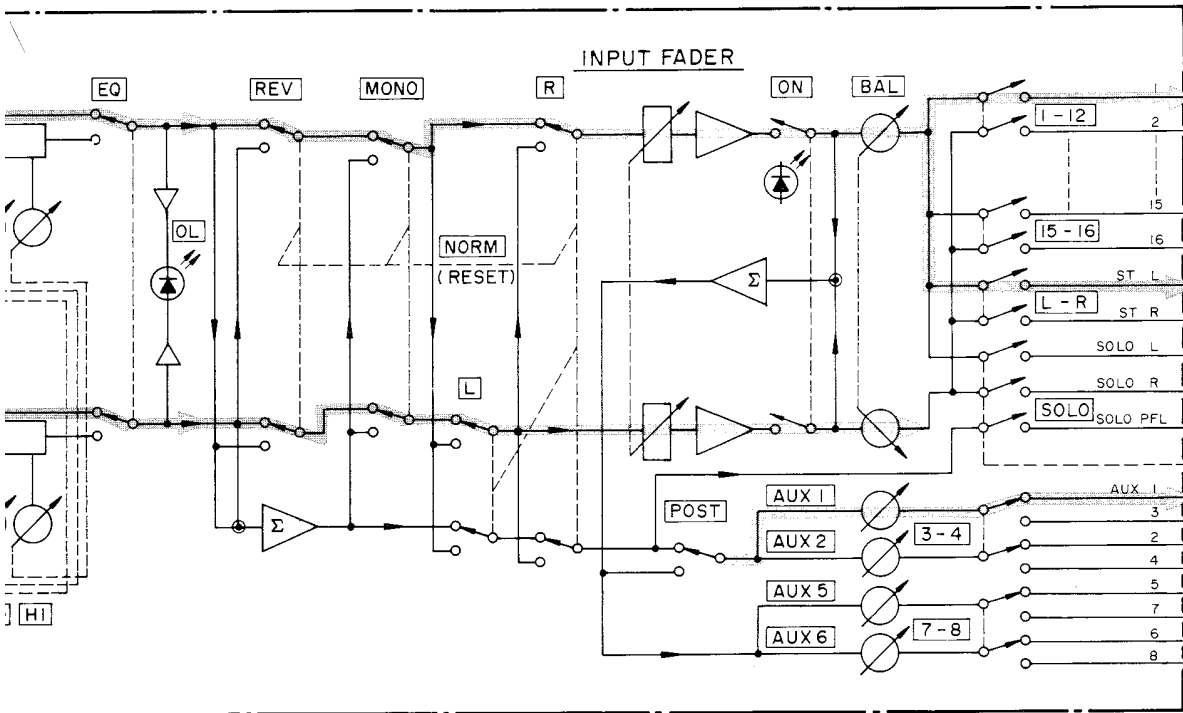


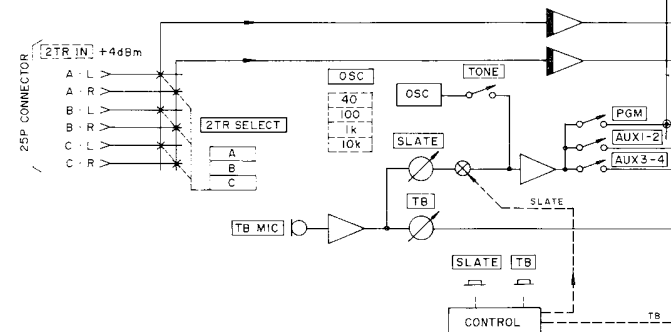
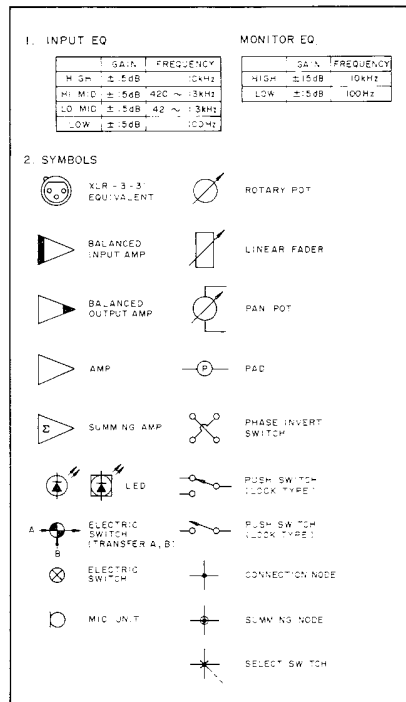
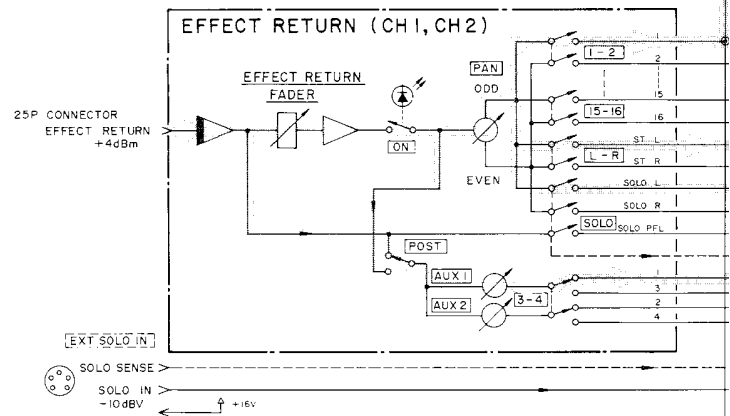
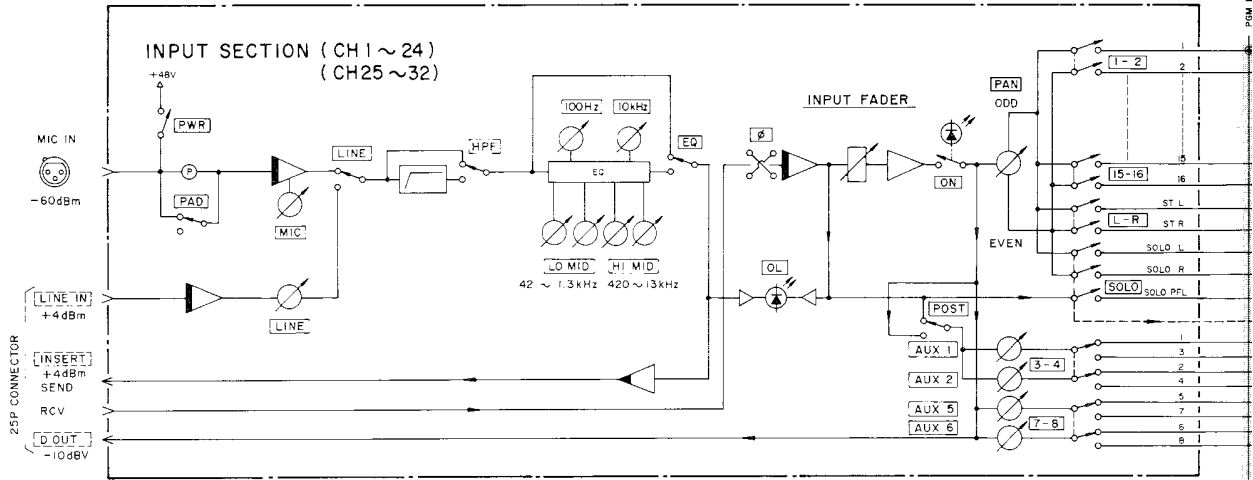
Chart 2-6

2-7. EFFECT RETURN System (EFFECT RTN  
→ PGM OUT, STEREO OUT, AUX OUT)

The same routing system as in the input channel section (#601 module) is used for sending the effects returns to the PGM, STEREO, AUX, and SOLO busses, except for AUX sends 5-8 which are not fitted in the Effects Return section (Signal Flow Chart 2-7).

Check the Effects Return Section as follows:

1. Set the buss master faders to the nominal 0 dB position (as in sub-section 2-3).
2. Engage the EFFECT RETURN ON switch on the Master Module and connect a nominal level signal to the EFFECT RETURN connector.



3. Press the PGM buss assign switches.
4. Turn the PAN knob fully left (ODD position) and check for nominal level at odd-numbered PGM OUTs when the Effects Return channel fader is set to the 0 dB position.
5. Similarly, check even-numbered PGM OUTs

6. Check signal flow to STEREO OUTs by referring to paragraph 2-5-7.
7. Check signal flow to AUX OUTs by referring to paragraph 2-5-8.

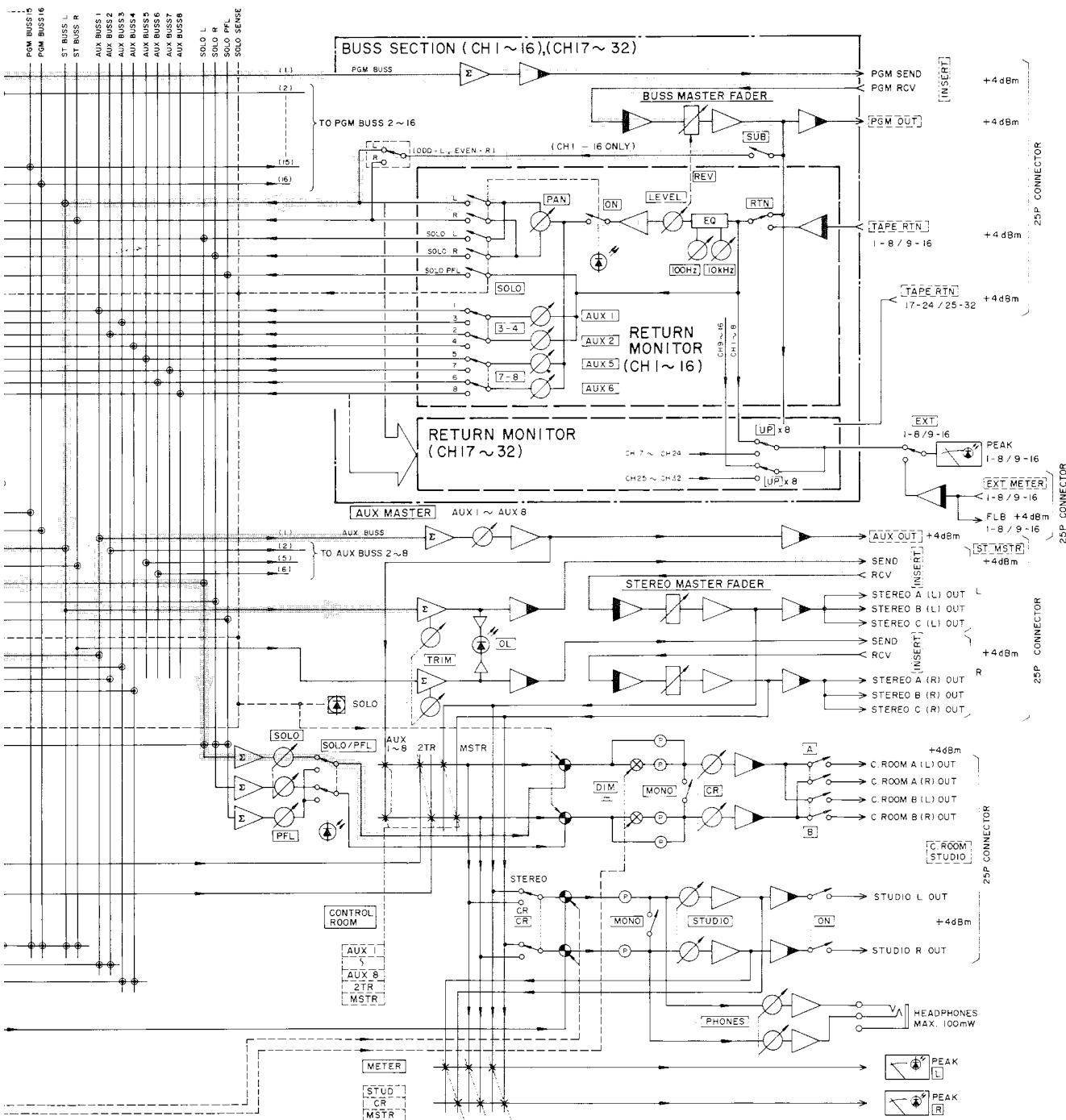


Chart 2-7



**2-8. 16-Monitor System(#602A Monitor Module)  
(TAPE RTN/PGM OUT → STEREO OUT,  
AUX OUT, C.ROOM Out)**

TAPE RTNs and PGM OUTs taken into the monitor section are routed to the STEREO, AUX, and C.ROOM busses by an identical switching system to that provided in the input channel module (#601).

In the monitor system is a circuit via which the PGM busses taken into the system are directly sent to the stereo Left and Right busses, without

passing through the EQ and assign electronics (Signal Flow Chart 2-8). This stereo-buss grouping circuit, which is activated by pressing the SUB switch, is factory set so that odd PGM busses are sent to the Left buss and even PGM busses are sent to the Right buss. This Left and Right addressing can be reversed using switch S205 on the Monitor B PCB assembly in the #602A Module (see Fig. 3-4, page 3-4).

1. Connect a nominal level signal to TAPE RTN and engage the corresponding monitor chan-

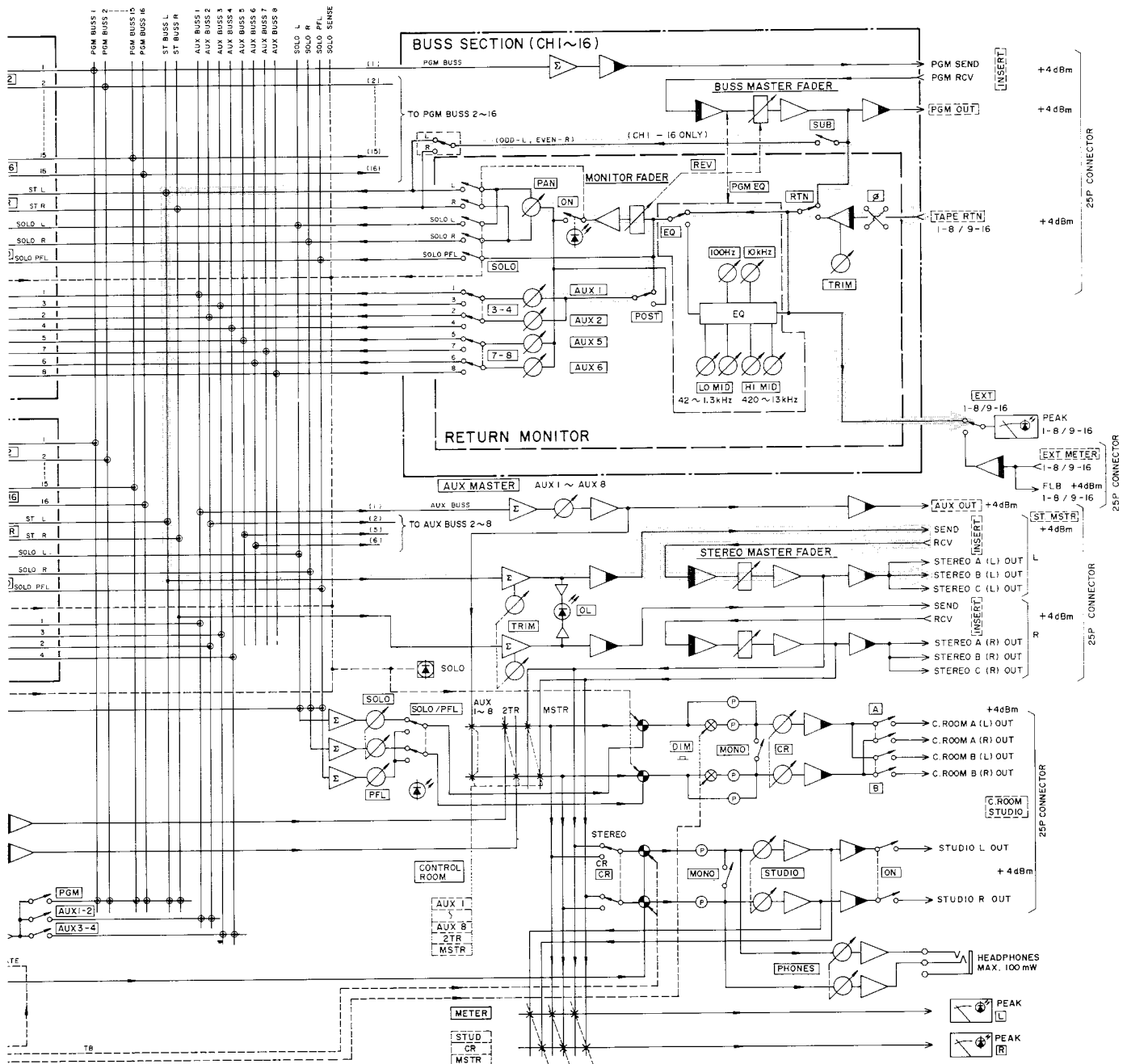


Chart 2-8

- nel's RTN switch (or make nominal level available at PGM OUT).
2. Turn the channel's TRIM pot until the corresponding meter registers 0 VU. The TRIM should now be at the 11 o'clock position (approximately).
  3. Make sure that the stereo master faders are set to the 0 dB, nominal position (as in subsection 2-3), and that the MSTR TRIM pot is set to maximum (as in paragraph 2-5-7).
  4. Engage the monitor channel ON switches and turn the PAN pots fully left (L position).
  5. Check for nominal level at STEREO OUT L when the monitor channel faders are raised to the 0 dB position. Then, swap the 100-mm PGM buss faders and the 60-mm monitor faders by pressing the REV switches and check that the swapped PGM buss faders provide, when set to the 0 dB position, the same nominal level at STEREO OUT L.
  6. Similarly, check STEREO OUT R with the PAN pots turned fully right (R position).
  7. Check signal flow to AUX OUTs by referring to paragraph 2-5-8.
  8. Check signal flow to C.ROOM outs by referring to paragraph 2-5-9.
  9. Check the EQ system by referring to paragraph 2-5-5, with the input/output set as in step 5 above.

### 2-9. 32-Monitor System (#602B Dual Monitor Module) (TAPE RTN/PGM OUT → STEREO OUT, AUX OUT, C.ROOM Out)

TAPE RTNs and PGM OUTs taken into the monitor section are routed to the output busses by an identical switching system to that provided in the mono input channel module (#601). In the monitor system is a circuit via which the PGM busses taken into the system are directly sent to the stereo Left and Right busses, without passing through the EQ and assign electronics (Signal Flow Chart 2-7). This stereo-buss grouping circuit, which is activated with the SUB switch, is factory set so that odd PGM busses are sent to the Left buss and even PGM busses to the Right buss. This Left and Right addressing can be reversed using switch S206 on the Monitor B PCB assembly in the #602B Module (see Fig. 3-5, page 3-5).

1. Connect a nominal level signal to TAPE RTN and engage the corresponding monitor channel's RTN switch (or make nominal level available at PGM OUT).

2. Check that the corresponding VU-meters give the 0 VU reading when the TRIM pots are turned up to maximum (approximately). (The meters are switched to display the monitor channels 17-32 when the UP switch is engaged/down.)
3. Make sure that the stereo master faders are set to the 0 dB, nominal position (as in subsection 2-3), and that the MSTR TRIM pot is set to maximum (as in paragraph 2-5-7).
4. Engage the monitor channel ON switches and turn the PAN pots fully left (L position).
5. Check for nominal level at STEREO OUT L when the rotary LEVEL controls are set to the 3 o'clock position (approximately). Then, swap the 100-mm PGM buss fader and the LEVEL control by engaging the REV switch and check for the same nominal level at STEREO OUT L when the PGM buss fader is set to the 0 dB position (approximately) (regardless of the signal taken into the monitor channels: PGM buss or TAPE RTN).
6. Similarly, check STEREO OUT R with the PAN pots turned fully right (R position).
7. Check signal flow to AUX OUTs by referring to paragraph 2-5-8.
8. Check signal flow to C.ROOM Outs by referring to paragraph 2-5-9.
9. With the input/output set as in step 6 above, check the EQ system fitted in the monitor channels by referring to table below.

Table 2-3

Input Frequency (Hz)	EQ Knob Setting		Output Level (at STEREO OUT) (with reference to nominal level)
	100	10 k	
100	+/-	Center	±15 dB or more
10 k	Center	+/-	±15 dB or more

ch  
IS-  
ce  
M  
ne  
IE  
If  
IE

25P CONNECTOR

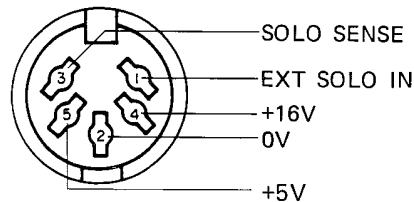
2-10. STUDIO OUTs, L & R  
(STEREO/C.ROOM Busses → STUDIO OUT)

The STUDIO OUTs carry the master stereo buss or signals selected on the Control Room Monitor select switch rack. The talkback mic signal is also available at the STUDIO OUTs. See Signal Flow Chart 2-9.

1. Engage the studio monitor ON switch (on the master module).
2. When the STEREO OUTs, L & R are feeding a nominal level signal (as in paragraph 2-5-7), set the STUDIO level control to the 2 o'clock position (approximately) and check for nominal level at the STUDIO OUTs L and R.

Then, switch the stereo L buss off and press the MONO switch to check that the same level signal is available both at the STUDIO OUTs, L and R.

2-11. EXT SOLO System (SOLO IN → C.ROOM/STUDIO OUT)



External solo signals are added to the on-board solo system via the EXT SOLO IN DIN con-



1. INPUT EQ.

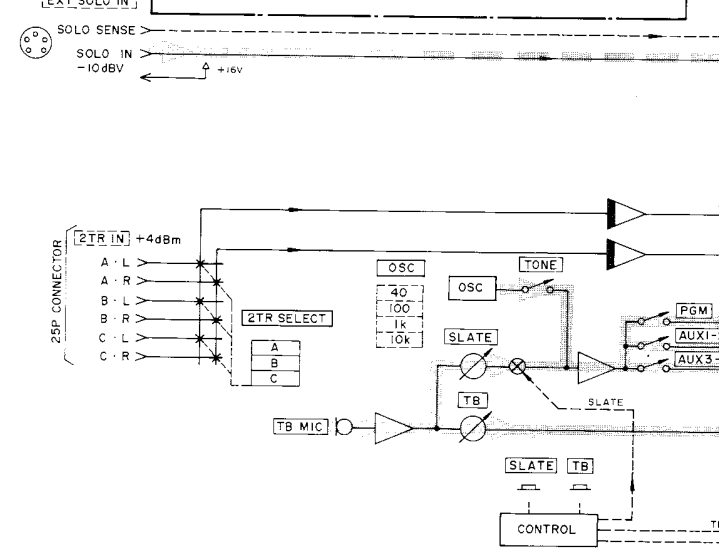
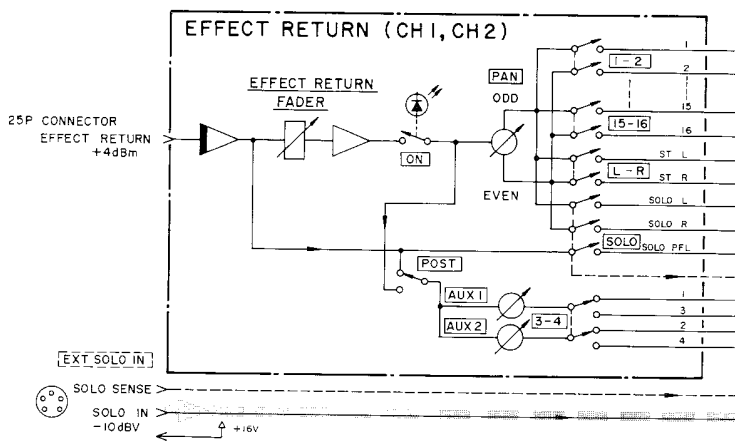
	GAIN	FREQUENCY
HIGH	±15dB	10kHz
HI-MID	±15dB	420 ~ 13kHz
LO-MID	±15dB	42 ~ 13kHz
LOW	±15dB	100Hz

MONITOR EQ.

	GAIN	FREQUENCY
HIGH	±15dB	10kHz
LOW	±15dB	100Hz

2. SYMBOLS

	XLR - 3-3 EQUIVALENT		ROTARY POT
	BALANCED INPUT AMP		LINEAR FADER
	BALANCED OUTPUT AMP		PAN POT
	AMP		PAD
	SUMMING AMP		PHASE INVERT SWITCH
	LED		PUSH SWITCH (LOCK TYPE)
	ELECTRIC SWITCH (TRANSFER A, B)		PUSH SWITCH (LOCK TYPE)
	ELECTRIC SWITCH		CONNECTION NODE
	MIC UNIT		SUMMING NODE
			SELECT SWITCH



necter the pin configuration of which is shown.

1. Connect a nominal level signal to the SOLO IN terminal (unbalanced).
2. Set the Control Room Monitor section as in paragraph 2-5-9; that is, the A or B output system switch is pressed on, the CR level control is set to the 3 o'clock position, and the SOLO master level control is set to maximum.
3. Jumper-connect between pins 3 and 5 of the EXT SOLO IN connector to check that the master solo LED lights and the SOLO IN signal is fed to the C.ROOM outs.

## 2-12. TEST TONE Bussing System

1. Set the OSC output frequency selector switch on the Master Module to 1 kHz position.
2. Engage the TONE switch and the PGM bussing switch. The oscillator TONE should be routed both to the stereo buss and the PGM busses. See Signal Flow Chart 2-10. If the AUX 1-2 bussing switch is pressed, the TONE should be routed to AUX busses 1 and 2. If the AUX 3-4 switch is pressed, the TONE should be routed to AUX busses 3 and 4.

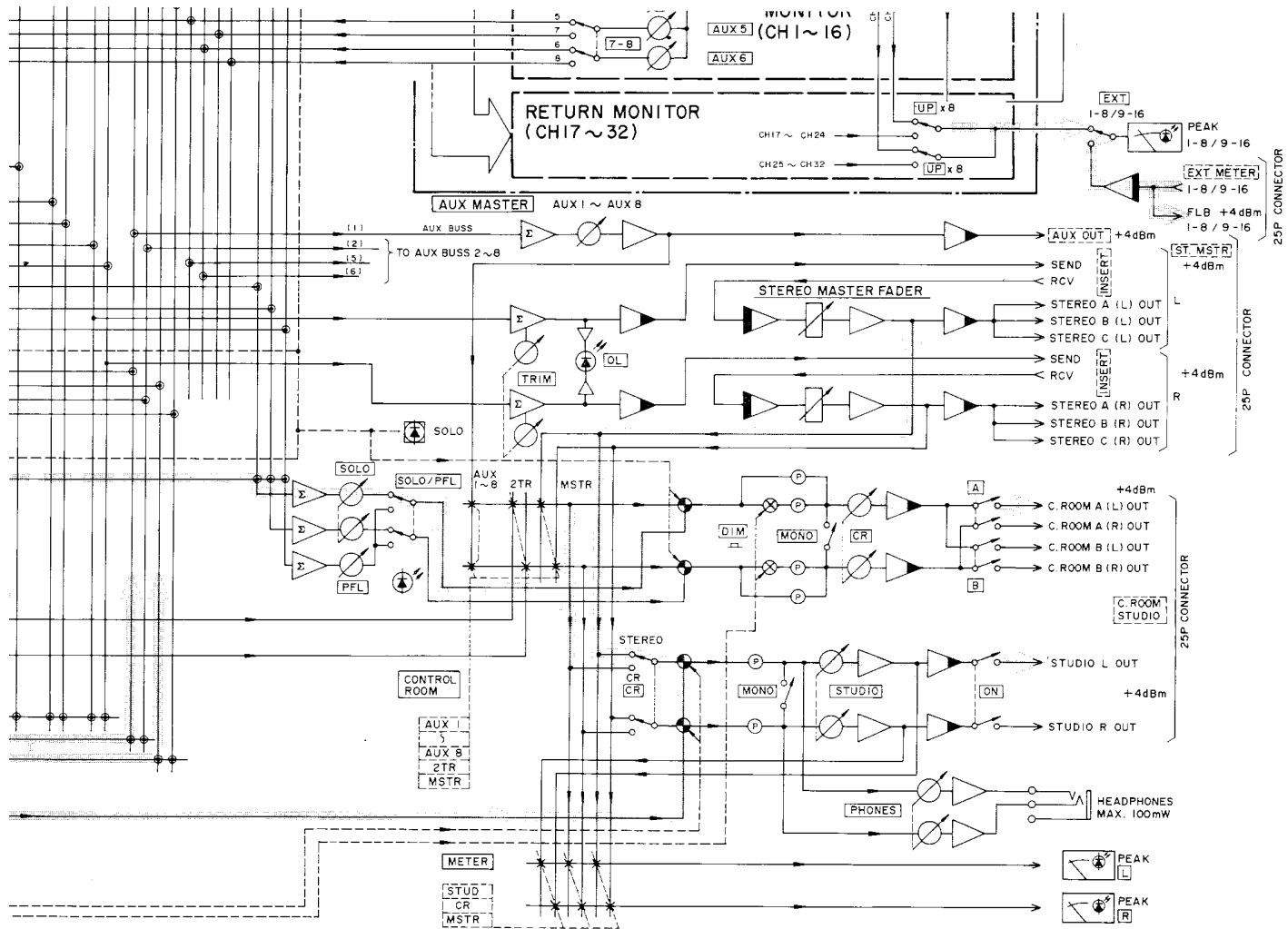


Chart 2-9

### 2-13. TALKBACK System

1. Engage the PGM bussing switch and the SLATE switch. Set the SLATE level control to a reasonable position and speak into the TB mic. The signal from the TB mic should be routed both to the stereo buss and the PGM busses. See Signal Flow Chart 2-9. If the AUX 1-2 bussing switch is pressed on, the TB signal should be routed to AUX busses 1 and 2; and if the AUX 3-4 bussing switch is pressed on, the TB signal should be routed to AUX busses 3 and 4.
2. Check that when the TB switch is pressed on, any signal does not appear at the C.ROOM outputs (cf. sub-section 2-4).
3. Check that when the TB switch is pressed on, the signal from the TB mic replaces whatever signals have been feeding the STUDIO OUTs.

### 2-14. Phase Reverse ( $\phi$ ) Switch

The signal phase reverse switch is fitted in the following sections:

- 1) Mono input channels (#601 Module) (in the INSERT RCV circuits)
- 2) Stereo input channels (#601ST Module) (in the R channel circuits)
- 3) 16-monitor channels (#602A Module) (in the TAPE RTN circuits)

A double-trace oscilloscope is required to perform the following check.

Connect the channel to be checked to one input terminal of the oscilloscope and a "reference" channel to the other input terminal. Then, press the switch and check that the signal phase in the channel under test is reversed  $180^\circ$ .

### 2-15. OL (OverLoad) Indicator

An LED for the OL indicator is fitted in the following:

- 1) Input Channel INSERT SEND amplifier;
- 2) STEREO LINE INput amplifier in the Stereo Input Module;
- 3) Master Stereo Buss INSERT SEND amplifier.

Each of the above LEDs should fire at 22 dB higher than nominal and go off at 2 dB lower than the ignition point.

### 2-16. VU-Meters

#### 2-16-1. PGM Meters 1-16

They monitor the PGM busses or the TAPE RTNs.

1. Check that the meters indicate 0 VU when the PGM OUTs are feeding the nominal level of +4 dBm. The PEAK indicator in each meter should light at 11 dB above nominal.
2. Engage the RTN switches to switch the meters to register signals from the TAPE RTNs, and check that the 0 VU is displayed when a nominal level signal is applied to the TAPE RTNs.  
For the 16-monitor system (#602A Module), the TRIM knob's nominal setting position should be at the 3 o'clock point on its scale. For the Dual Monitor system (#602B Module), press the UP switch to check the 16 meters are switched so they register TAPE RTNs 17-32. (See Signal Flow Chart 2-9.)
3. Check that when the EXT switch is pressed the 16 EXT METER INs are displayed by the meters.
4. If 0 VU was not displayed in steps 1 and 2 above, adjust semi-fixed resistors (one per METER PCB) located behind the meters.

#### 2-16-2. Left and Right Meters

They can be switched to display the STEREO OUTs, C.ROOM outs, or STUDIO OUTs.

Nominal level at each of these outputs should cause the meters to display 0 VU.

Adjustment pots are provided on the corresponding meter PCBs as with the PGM meters (previous paragraph 2-16-1).

#### 2-17. Frequency Response

Connect an oscillator to the input connectors and a level meter (reading capacity more than 100 kHz) to the output connectors, and set the input/output levels to nominal. Measurement results should be in the following limits:

MIC IN  $\rightarrow$  PGM OUT:  
20 Hz to 20 kHz  $\pm 1/-2$  dB  
Other Inputs  $\rightarrow$  Other Outputs:  
20 Hz to 20 kHz  $\pm 1/-2$  dB

## 2-18. THD

With the input/output levels set to nominal as in previous sub-section 2-17, connect a low distortion oscillator (its output being set to 1 kHz) to the input connectors, and a distortion meter to the output connectors via a 30 kHz LPF.

Readings on the distortion meter should be as follows:

- MIC IN → PGM OUT (-20 dBm in, 30 dB PAD):  
0.07 % (20 Hz to 20 kHz)  
LINE IN → PGM OUT (nominal input/output):  
0.05 % (20 Hz to 20 kHz)

## 2-19. S/N Ratio

Using the same settings as in sub-section 2-17, check S/N ratio against the chart below.

A 150-ohm dummy load need be connected to MIC INs. (Alternatively, use the 30 dB PAD switch.)

Table 2-4

			DIN	IHF-A
1	MIC IN →	PGM OUT	68	70
24	↑ →	↑	55	58
32	↑ →	↑	53	56
1	LINE IN →	PGM OUT	85	88
24	↑ →	↑	66	70
32	↑ →	↑	65	68
1	LINE IN →	AUX OUT	73	76
	↑ →	STEREO OUT	86	89
	↑ →	C. ROOM OUT	86	89
	↑ →	STUDIO OUT	86	89
	↑ →	SOLO OUT	86	89
	↑ →	HEADPHONES OUT	75	78

## 2-20. Headphones

Signals available at the headphone jack are derived from the STUDIO OUT buss, and this buss receives its signal either from the Stereo buss or the Control Room Monitor Select Switch Rack.

Connect a 8-ohm, 5W- (or more) load to the headphone jack. Set the Stereo and AUX buss outputs to nominal and connect a nominal signal to 2TR INs and check for a maximum output level of 100 mW (0.9 V) at the headphone jack by raising the PHONES volume.

## 2-21. Power Supply Pilot Lamps

Four pilot LEDs are provided at top of the Master Module. When the M-600 is functioning normally, they should be lit steadily. If a serious problem is engendered in major voltage supplies, their lighting status should change.

### 1. FAN LED

Attached to the heat sink of the power supply unit is a thermo-sensor that works when the temperature rises beyond 90°C.

When the thermo-sensor is activated, connections between pins 14 and 15 of the power supply connector (see paragraph 1-4) go "open" while the FAN LED begins to blink.

If the FAN LED blinks, check the following:

- 1) Free cooling air flow (not impeded by dust or any foreign objects);
- 2) Fan motor condition;
- 3) Voltages at each pin of the power supply connector.

If any abnormal voltages are detected, check if the corresponding voltage supply (or supplies) are not overloaded.

The FAN LED driving circuit is on the IND PCB assembly in the Master Module.

### 2. +16 V, -16 V LEDs

±16 Voltages are fed from the B Supply to the operational amplifier in the M-600. If these voltages drop below the operating voltage of that amplifier, then the LEDs will dim. If so, check potential between the following two groups of the connector pins and GND: pins 11, 17, 18 (+ voltage)/pins 13, 19, 20 (- voltage) (cf. paragraph 1-4).

If the potential is abnormal, check if the corresponding voltage supply circuits are not overloaded.

### 3. +48 V LED

+48 V is a phantom power supply. If this voltage drops, the LED should dim. Check potential between the connector pin 16 (+, high) and pin 3 (GND). If it is abnormal, check the +48 V supply circuit is not overloaded.