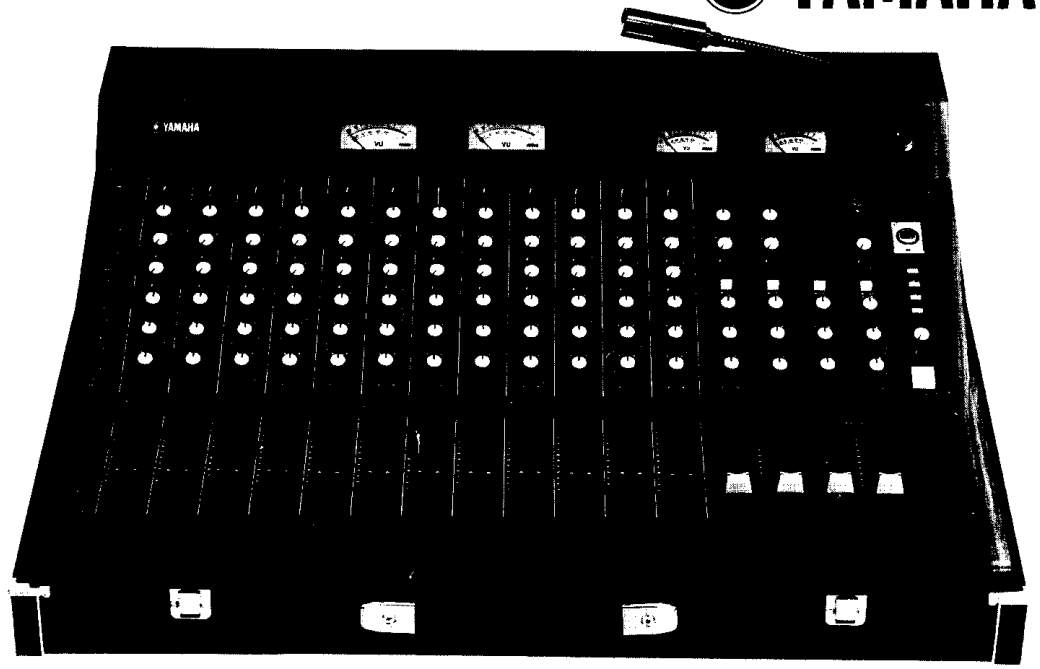


# SOUND REINFORCEMENT MIXER OWNER'S MANUAL PM-700



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## **Congratulations!**

You have just joined the large and growing family of satisfied users of Yamaha products. You have chosen wisely when you picked model PM-700 as your mixer. Years of dependable service await you.

Please read this OWNER'S MANUAL carefully before connecting your mixer. The few minutes spent with this manual will help you understand its operation and high performance. You will also learn how to connect the mixer properly and how to really get the most out of all the features Yamaha has incorporated into this mixer.

If you need any special help or service, see your Yamaha dealer. He knows what to do and will be happy to help you. You've made a good choice. We are confident you'll be satisfied with the performance and versatility of PM-700.

# FEATURES

The PM-700 is a professional 12-channel input, stereo output sound reinforcement mixer that meets the requirements of fixed or portable sound reinforcement, as well as sophisticated disco, broadcast production, and recording applications. Check the features here and study the explanations of the front and rear panels. You'll see immediately that the PM-700 has the flexibility, performance, and reliability you need in your work.

## Top Electrical Performance

This mixer is designed for top professional performance. It offers flat frequency response, low distortion and inaudible noise and crosstalk. Each sound is maintained at its original purity, or is controlled exactly as desired.

## 12-Channel Inputs

The PM-700 has 12-channel inputs with XLR connectors. Each channel has its own individual FADER, LOW/MIDDLE/HIGH-EQ, MONITOR 1, MONITOR 2 and PAN controls and INPUT level switches.

## Switchable Input Level

All twelve input channels have 6-position switches to change the input attenuation so the full range of the FADER controls can be used with varying microphone or instrument sensitivities.

## dB Calibrated FADER Controls

Yamaha's original feather-touch FADER controls for Input, Master Program and Monitor Master are accurately calibrated in dB of attenuation relative to maximum level.

## Wide Choice of Inputs and Outputs

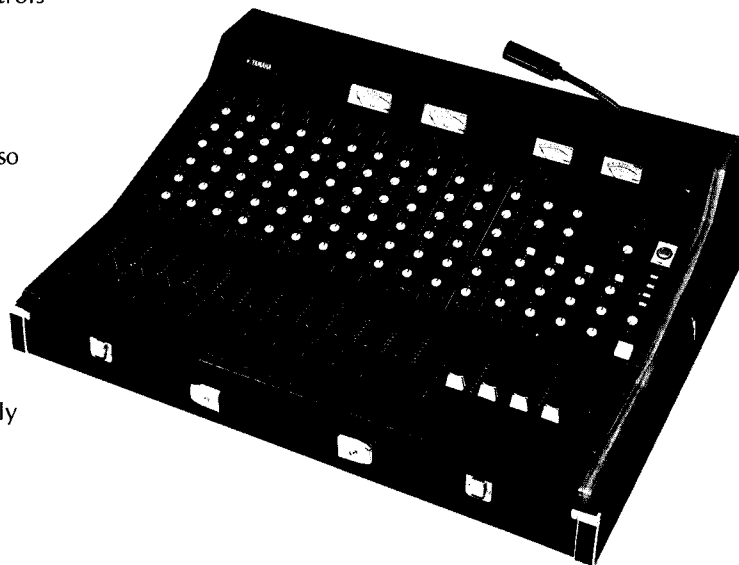
This wide choice offers great flexibility for use with a wide range of equipment. In addition to the 12 low impedance INPUT channels, the PM-700 has AUX IN 1 & 2, PROGRAM L & R SUB IN, MONITOR 1 & 2 SUB IN, and FROM ECHO inputs. Outputs include PROGRAM OUT A/B, MONITOR OUT A/B, AUX OUT and TO ECHO.

## Separate VU Meters

A pair of larger VU meters on the left provide a visual indication of average audio output level of the Left and Right Program output channels. Another pair of VU meters display the Monitor 1 and 2 output levels. The Monitor 1 VU meter is switchable to display the Cue mix level.

## Other Features

Three equalizer controls for all the input channels, Master Program channels and Monitor channels for greater tonal flexibility. Provision is made for Talkback with volume control and channel selector.



# PRECAUTIONS

## Precautions

The PM-700 is rugged and durable, but not indestructible. It has been designed to stand up to tough handling but certain precautions must be taken. The most frequent cause of trouble is improper use due to incomplete understanding of exactly what the mixer can and cannot do. You can easily avoid these mistakes by following the precautions listed here before plugging in or attempting to operate your mixer.

Be sure the POWER switch is off before plugging in the power cord.

Unplug the POWER cord, or at least make sure the POWER switch is off before connecting or disconnecting any cords.

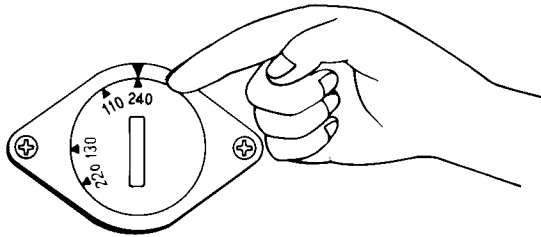
The mixer circuitry is guarded by a fuse. When replacing a fuse after the trouble has been corrected, be sure the new one is the exact same type and rating as specified on the rear panel.

Do not expose the mixer to direct sunlight and other sources of excessive heat, humidity, dust or shock.

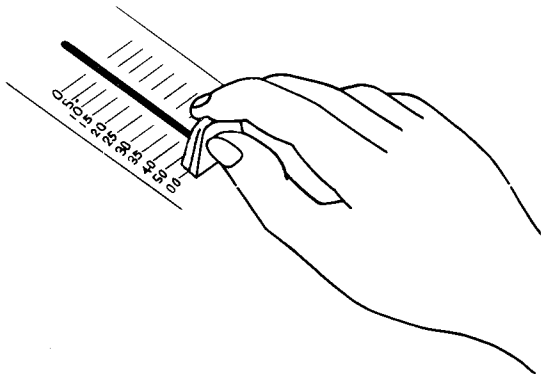
# & CONNECTIONS

## Connecting Up

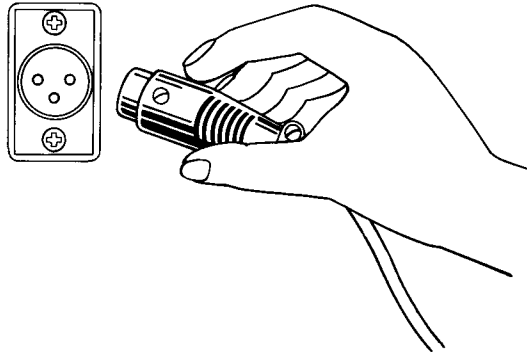
1. Before plugging in the power cord, make sure the **VOLTAGE SELECTOR** on the rear panel is properly set for your locality. (U.S., Canadian and Australian models are preset and thus don't have this feature.) For the British Standard model, please refer to the instructions on the right side of this page.



2. Set the front panel **FADER** controls to the minimum positions and make sure the **POWER** switch is **OFF**.

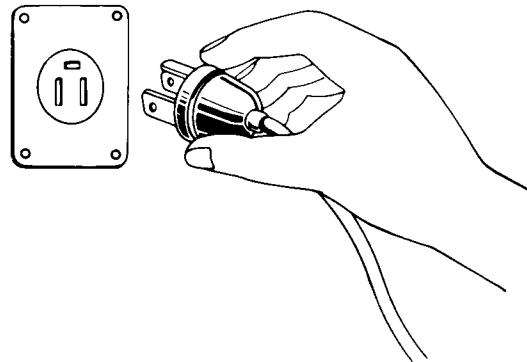


3. Connect your power amp, etc. to the output jacks.



4. Connect the input cords from your instruments and/or mics to the **INPUT**, **SUB IN**, **AUX IN**, and **FROM ECHO** jacks.

5. Plug in the power cord.



6. Turn on the **POWER** switch. Pick the **ON** position which has the lower hum level. (European and Australian models have only one **ON** position.)

7. Adjust the **FADER** and other controls. Now you are ready to mix sound sources as you like.

## FOR THE BRITISH STANDARD MODELS

As the colours of the wires in the mains lead of the apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows. The wire which is coloured **GREEN-and-YELLOW** must be connected to the terminal in the plug which is marked by the letter **E** or by the safety earth symbol  $\equiv$  or coloured **GREEN** or **GREEN-and-YELLOW**. The wire which is coloured **BLUE** must be connected to the terminal which is marked with the letter **N** or coloured **BLACK**. The wire which is coloured **BROWN** must be connected to the terminal which is marked with the letter **L** or coloured **RED**.

### IMPORTANT:

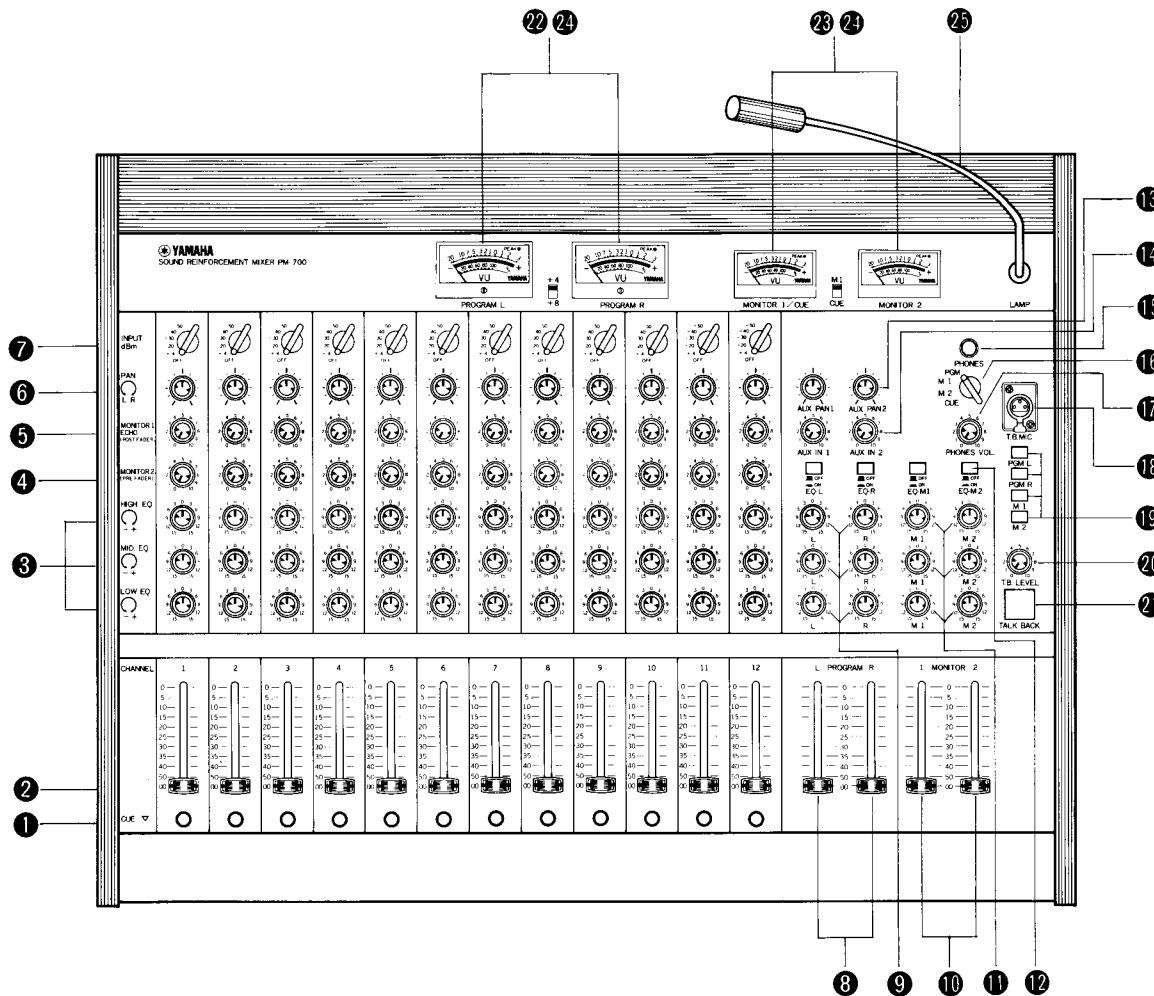
The wires in the mains lead are coloured in accordance with the following code.

**GREEN-and-YELLOW** . . . . . Earth  
**BLUE** . . . . . Neutral  
**BROWN** . . . . . Live

### WARNING:

This apparatus must be earthed.

# FRONT PANEL



## FRONT PANEL

### The Input Channels

#### 1 CUE BUTTON

Pressing this button applies the post-equalizer, pre-fader signal to the cue mixing bus, where it can be monitored via the headphone system. This permits the operator to preset the Input Level switch and

Equalizer prior to feeding the program or monitor mixing buses or outputs. CUE is also useful for trouble-shooting, making it possible to locate a problem input without disruption of the PROGRAM or MONITOR mixes. CUE may also be used to identify (or "solo") each input and to preview recorded or remote inputs for timing cues.

#### 2 CHANNEL FADER (INPUT FADER)

A straight-line control which provides continuously variable adjustment of the channel's output to the PROGRAM (L & R) and the MONITOR 1 mix buses (via the MONITOR 1 control). Close-tolerance machining, a conductive plastic element, and integral dust seals assure a long and reliable life of low-noise operation. Designed and built by Yamaha, this feather-touch Fader is accurately calibrated in dB of attenuation relative to maximum level. Setting at  $-6\text{dB}$  (·) provides a nominal level when a signal is fed at the same level as the level switch. Setting the control near the dot offers the best S/N ratio.

#### 3 EQUALIZER

These controls alter the frequency response of the channel input. The LOW and HIGH controls provide  $\pm 15\text{dB}$  of continuously variable shelving equalization at 100Hz and 10KHz respectively. The MIDDLE control provides  $\pm 15\text{dB}$  of continuously variable peaking equalization at 1.5KHz. Centering the controls provides flat audio response by defeating the equalization. All three controls are calibrated in dB of boost and cut.

#### 4 MONITOR 2 VOLUME

This rotary control assigns the post-equalizer, pre-fader signal to the MONITOR 2 mixing bus. The MONITOR 2 mix is useful for headphone cue mixing, or wherever independence from the program mix is desired. The MONITOR 2 mix also provides a means to make monaural tape recordings that are independent of program mixing variations. Stage monitors often are driven by MONITOR 2 so that program mix changes will not distract the performers.

#### 5 MONITOR 1 VOLUME

This rotary control assigns the post-equalizer, post-fader signal to the MONITOR 1 mixing bus. Used for monitoring when changes in the balance of the program mix must be heard in the monitor mix, MONITOR 1 also can be used to drive echo or reverb units, dressing room, lighting booth, projection room or other remote feeds.

## 6 PAN POT

This rotary control assigns the equalized, post-fader output of the channel to the stereo Program mixing buses. Centering the PAN pot places the signal equally in the left and right mix buses; panning to one side or the other gradually assigns the input signal to either the left or right program mix exclusively.

## 7 INPUT LEVEL SWITCH

This rotary switch changes the input attenuation and preamplifier gain to accommodate nominal levels of -50, -40, -30, -20 or +4dBm. These sensitivities correspond to low-output dynamic microphones, medium-output condenser microphones, electric instrument preamps or lines, low-level (hi-fi) line sources, and high-level line sources. When properly set, the Input Level switch provides the best combination of maximum headroom and minimum noise characteristics; at the same time, it maintains the fullest range of Fader travel. In OFF position, no signal flows to any of the channel outputs (i.e., regardless of cue, fader or monitor send settings, the channel is defeated).

## The Output Section

### 8 MASTER PROGRAM FADERS

The same type of Yamaha dB calibrated Faders used on the input channels also set the overall level of the stereo mix which is fed to the Program outputs. Labeled "PROGRAM", these MASTER Faders are useful for balancing the stereo image, and for overall program fades.

### 9 PROGRAM EQUALIZERS

A set of LOW, MIDDLE and HIGH controls is associated with the left and right MASTER PROGRAM channels. These equalizers operate exactly like the input channel equalizers, affording an added degree of tonal flexibility. Individual microphone, instrument or line characteristics can be enhanced with the CHANNEL EQ, and the PROGRAM EQ then contours the overall mix.

### 10 MONITOR MASTER FADERS

These also are the same Yamaha dB calibrated faders used elsewhere in the PM-700. These Faders set the overall level of the two mix buses which feed the MONITOR 1, MONITOR 2 and TO ECHO outputs. (TO ECHO is the same mix as MONITOR 1.)

### 11 MONITOR EQUALIZERS

These LOW, MIDDLE and HIGH controls, like the adjacent PROGRAM EQ, adjust the tone of the MONITOR 1 and 2 output.

### 12 EQUALIZER ON-OFF SWITCHES

An On-Off (bypass) switch permits instantaneous defeat of any output channel equalization (PROGRAM or MONITOR) for A-B comparisons during set-ups. When a button is OFF, the corresponding equalizer is bypassed. This feature can be especially valuable in critical tape recording applications where output equalization is not required, and for fast overall EQ correction of new "scenes".

### 13 AUXILIARY INPUT PAN POTS

These rotary controls assign the AUX IN 1 and AUX IN 2 signals to the stereo PROGRAM mixing buses.

### 14 AUXILIARY INPUT 1 & 2 VOLUME

These rotary controls attenuate the incoming AUX 1 and 2 signals to be balanced with the level on the PROGRAM Mix buses.

### 15 HEADPHONE OUTPUT JACK

This stereo phone jack is for connection of stereo headphones of 8 ohms or higher impedance. The phones may be used to monitor any of the mixes chosen with the Headphone Select switch.

### 16 HEADPHONE SELECT SWITCH

This 4-position rotary switch selects the program fed to the Headphone output.

### 17 PHONES VOLUME

This 2 gang rotary control sets the volume in the headphone output, assuring adequate monitoring regardless of mixing levels or loud environments.

### 18 TALKBACK MIC CONNECTOR

This XLR connector accepts any low impedance microphone. The microphone may be mounted directly on the panel, or it may be suspended on a flexible gooseneck to facilitate close-talking and thereby reduce the chance of feedback.

### 19 TALKBACK ASSIGN SWITCHES

Individual latching pushbuttons assign the talkback signal to the LEFT PROGRAM, RIGHT PROGRAM, MONITOR 1 and MONITOR 2 buses.

### 20 TALKBACK LEVEL CONTROL

This rotary control adjusts the gain of the talkback microphone preamplifier, enabling the operator to set the best level for his announcement or tape identification needs.

### 21 TALKBACK SWITCH

This push-to-talk switch activates the talkback mic input and eliminates the need for a switch on the microphone.

### 22 PROGRAM VU METERS

These VU meters provide a visual indication of the average audio output level on the associated Left and Right Program output channels. Depending on the setting of the adjacent Meter Range switch (+4/+8), 0 VU represents either a +4 or +8dBm output at Program B or Program A. The needle should point to 0 on the lower of the two meter scales when the mixer is turned off. If it does not adjust the screw below the meter face until it indicates 0.

### 23 MONITOR 2 & MONITOR 1/CUE VU METERS

These VU meters provide a visual indication of the average audio output level on the associated MONITOR 1 or MONITOR 2 output channels. Depending on the setting of the adjacent Meter Function switch (M1/CUE), the left meter will display either the CUE or the MONITOR 1 output level. 0 VU is equal to a +4dBm MONITOR OUTPUT.

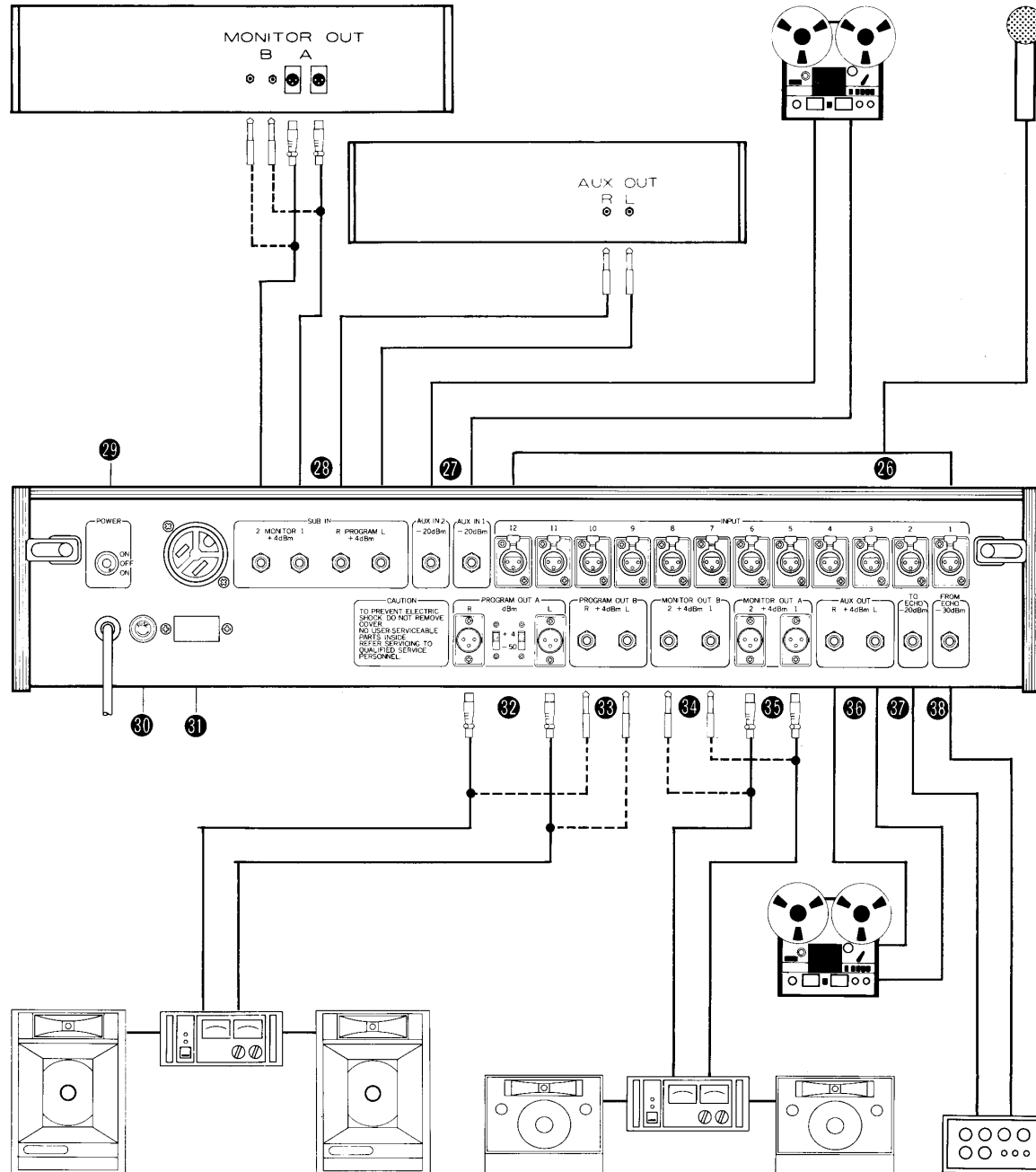
### 24 PEAK LEVEL INDICATORS

The red "dot" at the upper right corner of each VU meter is actually a peak-indicating LED (Light Emitting Diode). The LED responds to very brief transients, unlike the slower ballistics of the VU meter, turning on when the instantaneous level reaches 10dB above nominal. For example, while the VU meter displays a level of 0 VU (+4dBm), the LED may flash, indicating an actual energy level of at least +14dBm for as long as the LED remains lit.

### 25 CONVENIENCE LAMP OUTLET

A hooded lamp on a flexible gooseneck is provided with console, and is powered from this outlet. The lamp supplies controlled illumination for operating the console in dimly lit environments.

# REAR PANEL



## REAR PANEL

### 26 CHANNEL 1-12 INPUT CONNECTORS

These XLR connectors are transformer-isolated floating, and accept low impedance sources of from -50dBm to +4dBm nominal level. Typical inputs are 150 to 250 ohms microphones, electronic instruments, medium-level (hi-fi) lines, and high-level (professional 600 ohm) lines.

### 27 AUX IN 1 & 2 JACKS

These standard phone jacks are unbalanced and accept low or high impedance sources at nominal -20dBm levels (actual sensitivity is adjustable by means of the AUX IN Volume controls). AUX IN is useful for hi-fi type equipment, guitar-type reverbs, and electronic instrument line-level sources. AUX IN may be used instead of SUB IN to join the submixed output of a stereo mixer with the PM-700 stereo program mix. (The SUB IN jacks provided for this purpose do not offer the opportunity to pan or change the level of the incoming signal, and are of nominal +4dBm sensitivity, favoring the use of AUX IN in some cases.)

### 28 PROGRAM & MONITOR SUB IN JACKS

A pair of standard phone jacks is provided for the L & R PROGRAM mix buses and for the No. 1 and No. 2 MONITOR mix buses. These unbalanced high-impedance inputs accept low or high impedance sources at nominal +4dBm levels. The PROGRAM SUB IN jacks are a perfect input point for connection of other mixers (linking from the AUX OUT or PROGRAM OUT of another PM-700, as well as a PM-430, PM-180 etc.) Similarly, the MONITOR SUB IN jacks provide a means to insert pre-mixed audio into the stage monitor mix.

### 29 POWER SWITCH

Equipped with two ON positions to minimize hum without having to reverse the power cord (except for Australian and European models).

### 30 FUSE HOLDER

This fuse protects the primary (AC line) side of the power supply. It should be replaced only with a fuse of equivalent type and current rating.



- 31 **AC OUTLET and/or VOLTAGE SELECTOR**  
Not provided in certain areas.

- 32 **PROGRAM A OUTPUT CONNECTORS & SWITCHES**

These XLR connectors carry the left and right program outputs of the mixer. The PROGRAM A outputs are transformer-isolated, floating and have nominal +4dBm @ 600 ohm or -50dBm @ 150 ohm ratings, depending on the setting of the adjacent slide switches. The switches change the level and impedance to complement microphone or line inputs. (They do not affect the PROGRAM B outputs.)

- 33 **PROGRAM B OUTPUT JACKS**

These standard phone jacks carry the left and right program outputs of the mixer. They are low-impedance unbalanced circuits, and are nearly the same as the PROGRAM A outputs, but without transformer isolation. The nominal output level is +4dBm. PROGRAM B will drive any 150 ohm or higher impedance input, so it may be used to drive power amplifiers, tape recorders, effects units, or other mixers.

- 34 **MONITOR B OUTPUT JACKS**

The MONITOR B (1 & 2) output jacks carry the same signal as the MONITOR A (1 & 2) outputs, but are unbalanced (without transformer isolation). MONITOR B will drive any 150 ohm or higher impedance input, and has a nominal output level of +4dBm.

- 35 **MONITOR A OUTPUT CONNECTORS**

These XLR connectors carry the MONITOR 1 and 2 outputs. They are floating, transformer-isolated circuits, with a nominal +4dBm drive level for termination by any 150 ohm or higher impedance input.

- 36 **AUX OUT JACKS**

These standard phone jacks carry the left and right program outputs, but derive the program before the MASTER Faders or PROGRAM EQ. The outputs are unbalanced, low-impedance, with a nominal +4dBm level. AUX OUT is excellent for submixer feeds to on-stage monitor mixers, where the level and equalization requirements may differ from the main house mix. AUX OUT is also useful for feed to tape recorders, power amps, broadcast remotes, and echo or delay units.

- 37 **TO ECHO JACK**

This standard phone jack carries the same signal as the MONITOR 1 output, but at a lower nominal level (-20dBm). TO ECHO is well suited for feed to echo chambers, delay units or artificial reverberation devices since changes in the program mix will be accompanied by corresponding changes in echo or reverb composition. TO ECHO is also suitable for making monaural tape recordings, for a spare stage monitor feed (provided the amplifier has adequate input sensitivity), or for a submixed feed to certain monaural mixers.

- 38 **FROM ECHO JACK**

This standard phone jack is unbalanced and designed to accept low or high impedance sources at nominal -30dBm levels. FROM ECHO applies a monaural echo or reverb return signal directly (and in equal proportions) to both the left and right program mixing buses. The characteristics are matched to many guitar-type reverb units. This jack also is suitable for playing monaural pre-recorded background music during intermissions (i.e., from a portable cassette recorder).

### PANEL LAMP

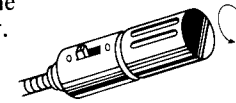
PM-700 has a hooded lamp attached to the control panel. It has a flexible gooseneck and is equipped with a switch.

Bulb: 12V 6W

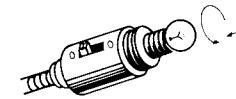
(When changing bulbs use one with the same rating.)

#### Changing the bulb

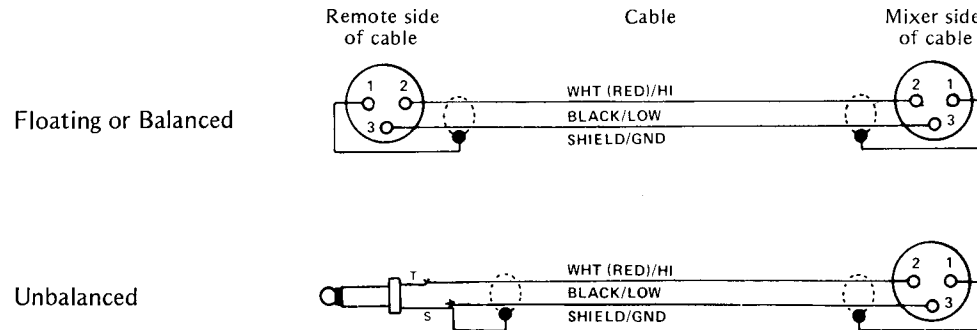
1. Turn the lamp hood to the left and remove the cover.



2. When you push in the bulb the lock is released and you can remove it.



### PM-700 CONNECTOR CONFIGURATION

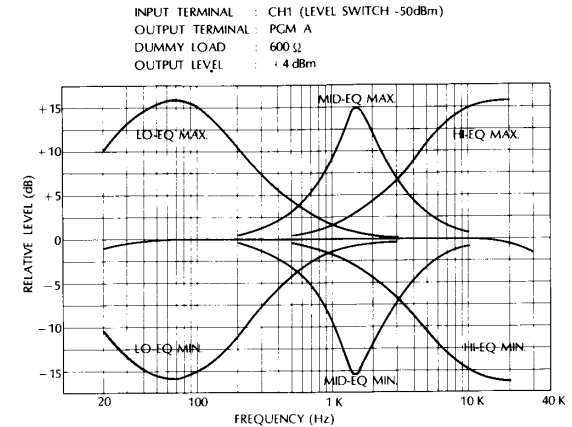


# SPECIFICATIONS

## PM-700 GENERAL SPECIFICATIONS

Frequency Response	±0.5dB (50Hz ~ 15KHz)
Total Harmonic Distortion	Less than 0.1% at +20dBm output (30Hz ~ 30KHz)
Hum and Noise (20Hz ~ 20KHz)	-123dBm (Equivalent Input Noise) -69dBm (Master Fader and one Input Fader at nominal level)
Maximum Voltage Gain (Input Level Switches at -50dBm, where applicable)	PGM 66dB MON 1 72dB MON 2 66dB AUX IN 36dB SUB IN 6dB
Equalization	±15dB (LOW, MID, HIGH)
Maximum Input Level	+34dBm (Input Level Switch at +4dBm) -20dBm (Input Level Switch at -50dBm)
Maximum Output Level	+24dBm (at less than 0.1% T.H.D.)
Crosstalk	-60dB (at 1KHz adjacent inputs)
Power Requirements	110, 117, 130, 220 or 240V AC, 50/60Hz, 45W
Finish	Black panel and leatherette-covered hard case
Dimensions (W x D x H)	78.5 x 66 x 23.3cm (30-7/8 x 26 x 9-1/8")
Net Weight	32Kg (70.5 lbs.)

## Frequency Response PM-700



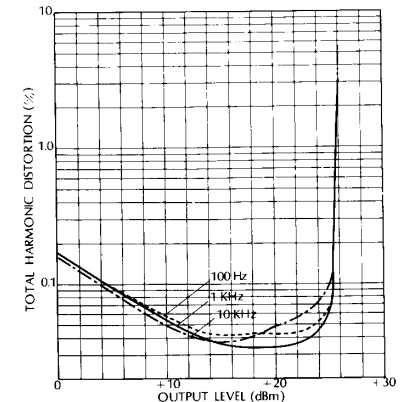
## INPUT SPECIFICATIONS

Connection	Level Sw.	Nominal Impedance	Sensitivity* (at Max. Gain)	Input Level		Connector** in Mixer
				Nominal	Max. before Clip	
INPUT 1 ~ 12	-50dBm -40dBm -30dBm -20dBm +4dBm	150 ~ 600Ω Mics & Lines	-62dBm ( 0.6mV) -52dBm ( 2mV) -42dBm ( 6.2mV) -32dBm ( 20mV) -8dBm (310mV)	-50dBm ( 2.5mV) -40dBm ( 7.8mV) -30dBm ( 25mV) -20dBm ( 78mV) +4dBm ( 1.23V)	-21dBm ( 69mV) -11dBm (218mV) -1dBm (690mV) +9dBm ( 2.18V) +33dBm ( 34.6V)	XLR-3-31
AUX IN 1, 2		5KΩ Lines	-32dBm ( 20mV)	-20dBm ( 78mV)		Phone Jack
PGM (L, R) SUB IN MON 1 MON 2		5KΩ Lines	-2dBm (620mV) -2dBm (620mV) -2dBm (620mV)	+4dBm ( 1.23V) +4dBm ( 1.23V) +4dBm ( 1.23V)	+47dBm ( 173V) +47dBm ( 173V) +47dBm ( 173V)	Phone Jack
FROM ECHO		5KΩ Lines	-36dBm ( 12mV)	-30dBm ( 25mV)	-10dBm (250mV)	Phone Jack
TALKBACK		150 ~ 600Ω Mics & Lines	-62dBm ( 0.6mV)	-50dBm ( 2.5mV)	-21dBm ( 69mV)	XLR-3-31

## Total Harmonic Distortion PM-700

INPUT TERMINAL : CH1 (LEVEL SWITCH -50dBm)  
OUTPUT TERMINAL : PGM A  
DUMMY LOAD : 600Ω

INPUT FADER AT MAXIMUM LEVEL  
MASTER FADER AT MAXIMUM LEVEL



## OUTPUT SPECIFICATIONS

Connection	Level Sw.	Nominal Impedance	Power Output Level		Connector** in Mixer
			Nominal	Max. before Clip	
PGM A (L, R)	+4dBm -50dBm	600Ω	+4dBm ( 1.23V) -50dBm ( 2.5mV)	+24dBm ( 12.3V) -30dBm ( 25mV)	XLR-3-32
PGM B (L, R)		600Ω	+4dBm ( 1.23V)	+24dBm ( 12.3V)	Phone Jack
MON A (1, 2)		600Ω	+4dBm ( 1.23V)	+24dBm ( 12.3V)	XLR-3-32
MON B (1, 2)		600Ω	+4dBm ( 1.23V)	+24dBm ( 12.3V)	Phone Jack
TO ECHO		600Ω	-20dBm ( 78mV)	0dBm (775mV)	Phone Jack
AUX OUT (L, R)		600Ω	+4dBm ( 1.23V)	+24dBm ( 12.3V)	Phone Jack
HEADPHONES		8Ω or greater	-10dBm (250mV)	+4dBm ( 1.23V)	Stereo Phone Jack

\*This is the level required to produce an output of +4dBm (1.23V).

\*\*All XLR connections are balanced and transformer-isolated. Phone jacks are unbalanced.

# BLOCK & LEVEL DIAGRAMS

## PM-700 Block & Level Diagrams

