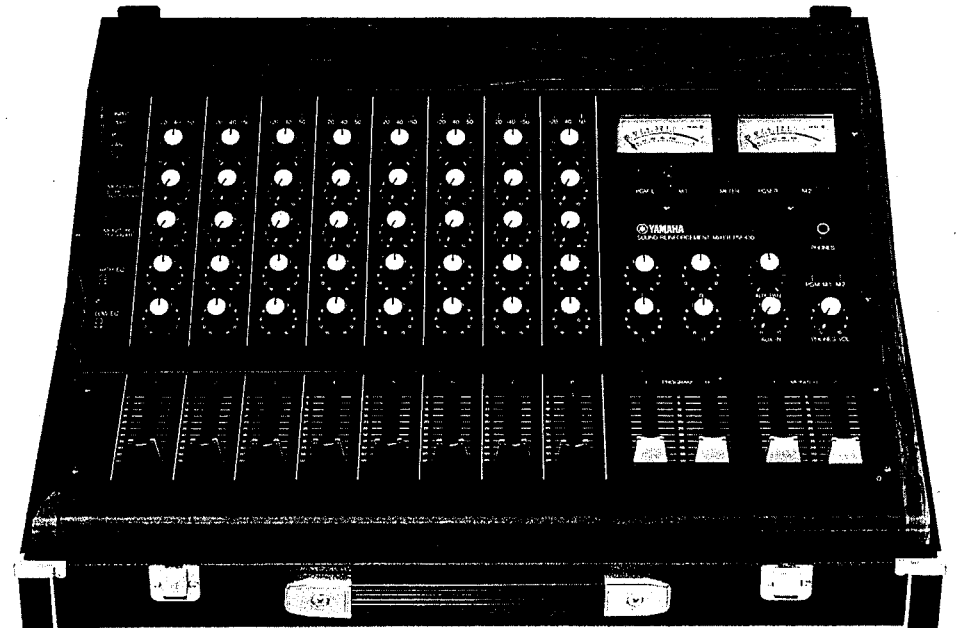


# SOUND REINFORCEMENT MIXER OWNER'S MANUAL PM-430



## **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-430 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-430.

# FEATURES

The PM-430 is a professional 8-channel input, stereo output 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-430 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.

## 8-Channel Inputs

The PM-430 has 8-channel inputs with XLR connectors. Each channel has its own individual FADER, LOW/HIGH-EQ, MONITOR 1, MONITOR 2 and PAN controls and INPUT level switches.

## Switchable Input Level

All eight input channels have 3-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

The smooth sliding 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

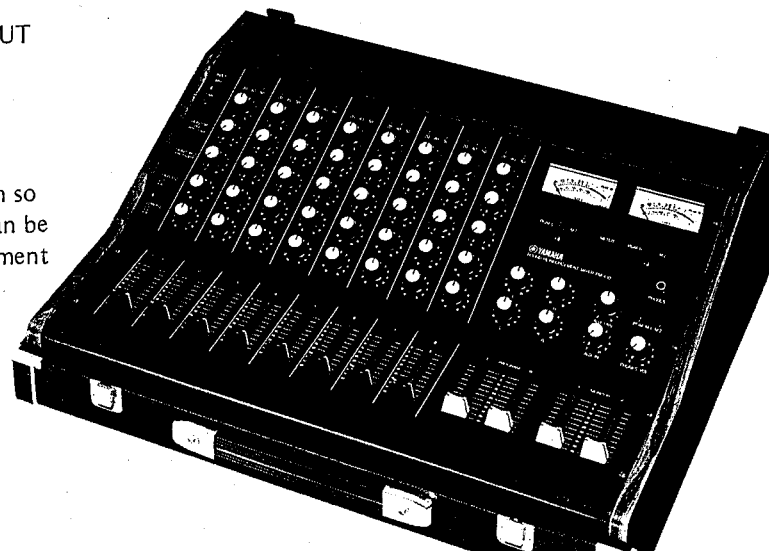
This wide choice offers great flexibility for use with a wide range of equipment. In addition to the 8 low impedance INPUT channels, the PM-430 has 2 HIGH LEVEL input channels, SUB IN, AUX IN and FROM ECHO inputs. Outputs include PROGRAM OUT A/B, AUX OUT, MONITOR OUT and TO ECHO.

## Switchable VU meters and LED's

The two VU meters offer a visual indication of the average audio output level of the Program or Monitor channels, depending on the setting of the Meter Function switch. The LED's (Light Emitting Diodes) respond faster than the VU meters and give the operator a means of evaluating actual output headroom.

## Sturdy Construction

This unit has a hard protective cover which enables it to withstand rough handling on the road. All solid state circuitry increases portability.



# PRECAUTIONS

## Precautions

The PM-430 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.

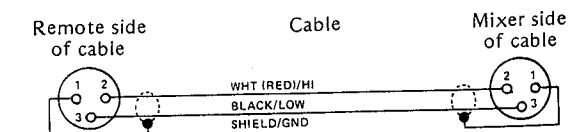
Be sure the POWER switch is off before plugging in the power cord.

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.

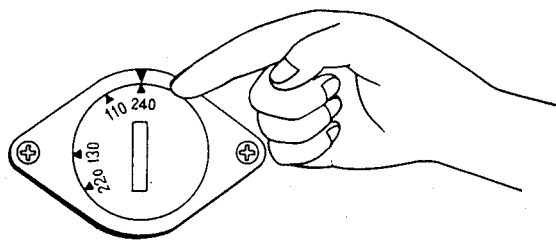
The PM-430 XLR connector configuration is as follows.



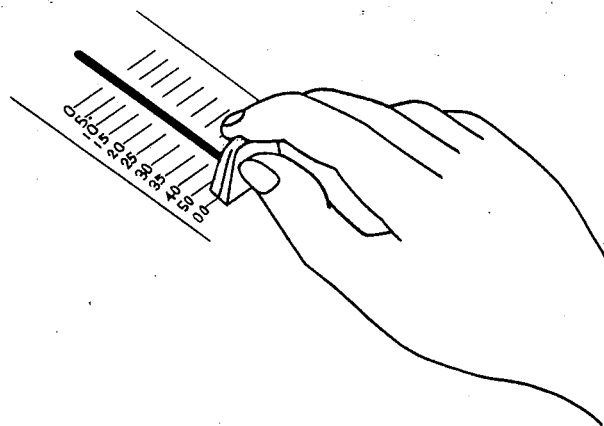
# & CONNECTIONS

## Connecting Up

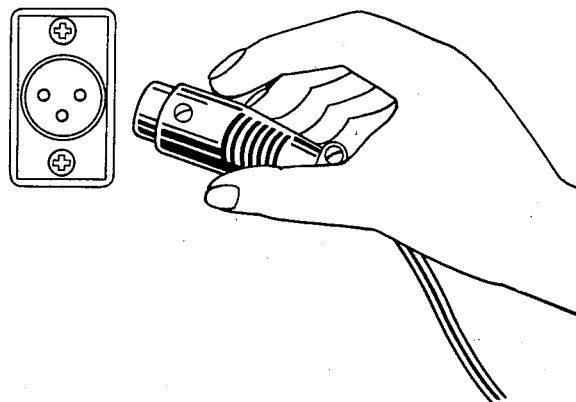
1. Before plugging in the power cord, make sure the **VOLTAGE SELECTOR** on the rear panel is properly set for your locality. (U.S., Canadian and Australian models are preset and thus don't have this feature.) For the British Standard model, please refer to the instructions on the right side of this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



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

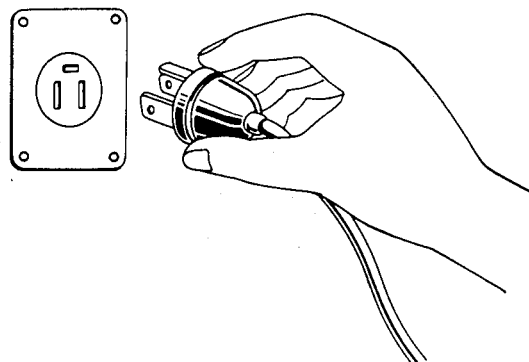


3. Connect your power amp, etc. to the output jacks.



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  $\perp$  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:

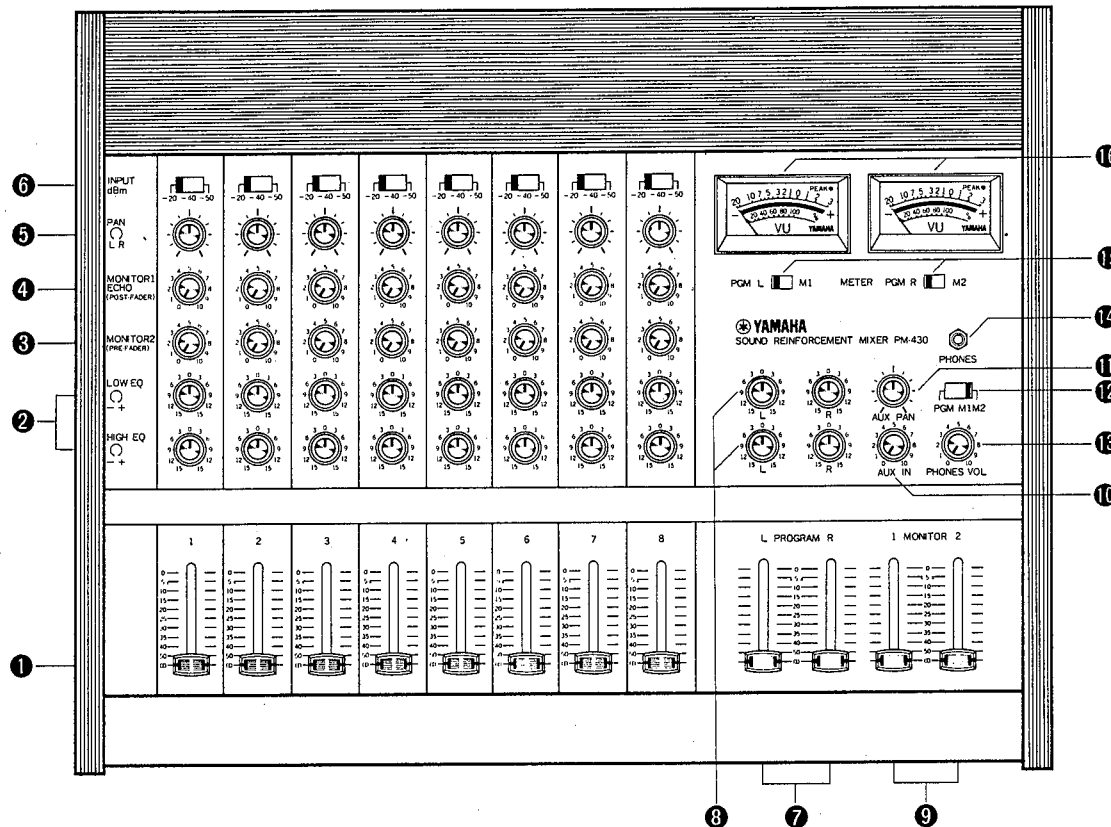
The wires in the mains lead are coloured in accordance with the following code.

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

### WARNING:

This apparatus must be earthed.

# FRONT PANEL



## FRONT PANEL

### The Input Channels

#### 1 CHANNEL FADER (INPUT FADER)

The straight-line Fader provides continuously variable adjustment of the channel's output to the PROGRAM (L & R) mix buses and the MONITOR 1 mix buses (via the MONITOR 1 control). The Fader is accurately calibrated in dB of attenuation relative to maximum level. Setting at 5dB (·) 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.

#### 2 EQUALIZER

Two controls alter the frequency response of the channel input, allowing you to achieve a variety of tonal characteristics. The LOW and HIGH controls provide  $\pm 15$ dB of continuously variable shelving equalization at 100Hz and 10KHz respectively. Centering the controls provides flat audio response by defeating the equalization. Both controls are calibrated in dB of boost and cut.

#### 3 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.

#### 4 MONITOR 1 VOLUME

The 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.

#### 5 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.

#### 6 INPUT LEVEL SWITCH

This switch changes the input attenuation to accommodate nominal levels of -50, -40 or -20dBm. These sensitivities correspond to low-output dynamic microphones, medium-output condenser microphones, electric instrument preamps or lines, and low-level (hi-fi) 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.

## The Output Section

#### 7 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.

#### 8 PROGRAM EQUALIZERS

A pair of HIGH and LOW controls is associated with the left and right MASTER PROGRAM channels. Individual microphone and instrument tonal characteristics can be enhanced with the CHANNEL EQ, and the PROGRAM EQ then contour the overall mix.

#### 9 MONITOR MASTER FADERS

These also are the same Yamaha dB calibrated Faders used elsewhere in the PM-430. These Faders set the overall level of the mixes which feed the MONITOR 1, MONITOR 2 and TO ECHO outputs. (TO ECHO is the same mix as MONITOR 1.)

#### 10 AUXILIARY INPUT VOLUME

This rotary control attenuates the incoming AUX IN

# REAR PANEL

signal. AUX IN Volume permits the AUX IN signal to be balanced with the level on the PROGRAM mix buses.

## 11 AUXILIARY INPUT PAN POT

This rotary control assigns the AUX IN signal to the stereo PROGRAM mixing buses. The panning is the same as the input channel PAN pots.

## 12 HEADPHONE SELECT SWITCH

This 3-position slide switch selects the program fed to the Headphone output. PGM position derives signal from the left and right PROGRAM mix buses, so the headphones carry a stereo program. M1 and M2 positions derive signal from the MONITOR 1 or 2 mixing bus, so the headphones carry a monaural program when either of these positions is selected. In all cases, the headphone feed is pre-MASTER Fader, making the phones volume independent of the MONITOR or PROGRAM outputs.

## 13 PHONES VOLUME

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

## 14 HEADPHONE OUTPUT JACK

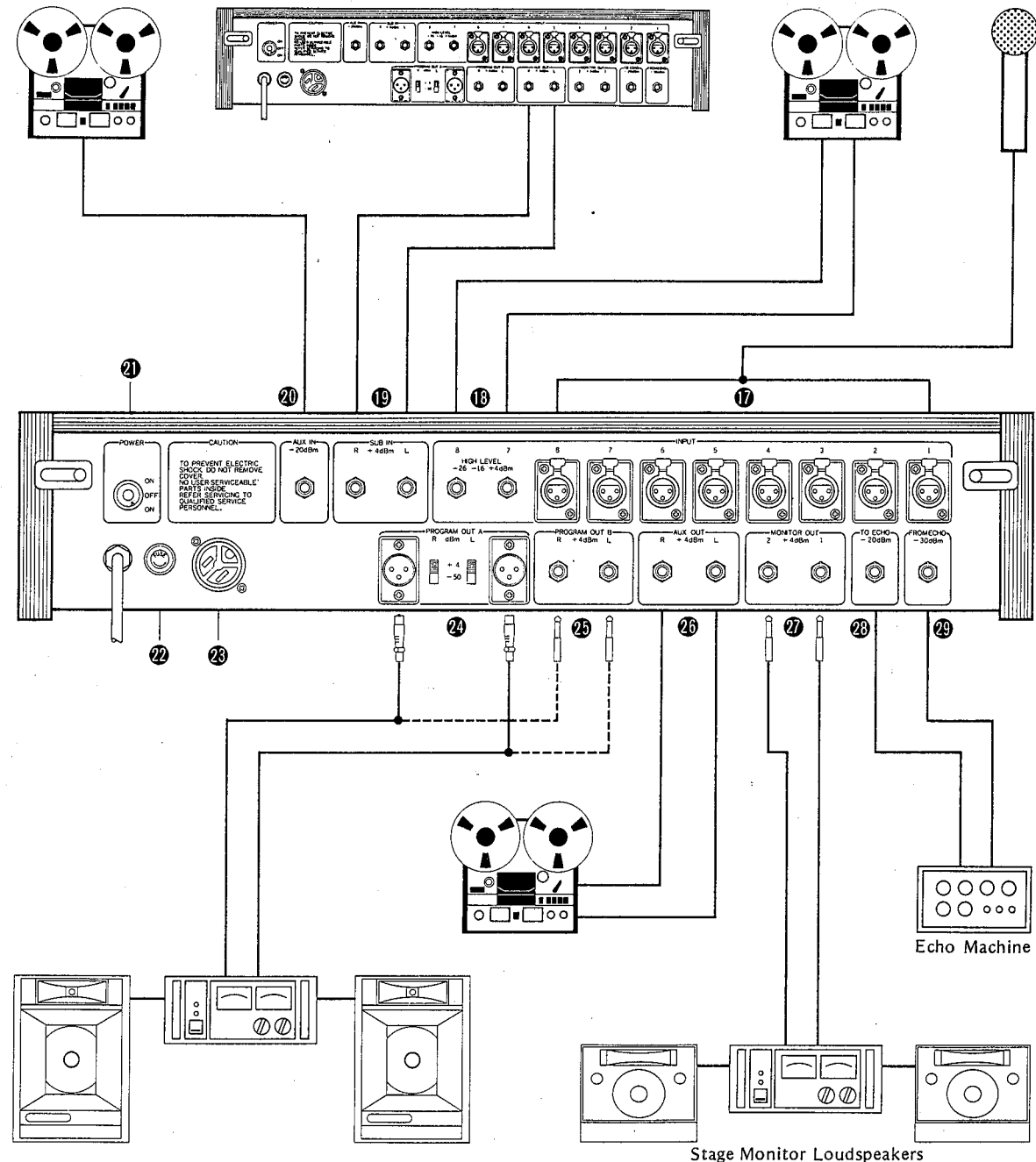
This stereo phone jack is for connection of any stereo headphones of 8 ohm or higher impedance. The phones jack may be used to monitor any of the sources chosen with the Headphone Select switch.

## 15 METER FUNCTION SWITCHES

These slide switches assign each VU meter and LED peak indicator to either of two circuits. The left meter can be switched to display the level at the LEFT PROGRAM output or the MONITOR 1 output. The right meter can be switched to display the level at the RIGHT PROGRAM output or the MONITOR 2 output.

## 16 VU METERS & PEAK LEVEL INDICATORS

The VU meters provide a visual indication of the average audio output level of the PROGRAM or MONITOR channels (depending on the setting of the Meter Function switches). 0 VU is equal to a +4dBm nominal level at the PROGRAM B or MONITOR outputs. 0 VU may equal either +4dBm or -50dBm at the rear-panel PROGRAM A output switches. The red rear-panel PROGRAM A output switches. 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 10dBm above nominal.



Stage Monitor Loudspeakers

## REAR PANEL

### 17 CHANNEL 1-8 LOW IMPEDANCE INPUTS

These XLR connectors are transformer-isolated, floating, and designed to accept low impedance sources of from  $-50$  to  $-20$ dBm nominal level. Typical inputs include 150 to 250 ohm microphones, electronic instruments (lo-Z outputs) and medium-level (hi-fi) lines.

### 18 CHANNEL 7 & 8 HIGH INPUTS

These standard phone jacks are unbalanced, and accept low or high impedance sources of from  $-26$  to  $+4$ dBm nominal level. Typical inputs include hi-fi type equipment, electronic instruments (hi-Z outputs), and high-level 600 ohm lines. These jacks are wired in parallel with the low impedance inputs on channels 7 & 8.

### 19 SUB IN JACKS

These standard phone jacks are unbalanced and accept high level (nominal  $+4$ dBm) sources of low or high impedance. SUB IN L & R feed directly the stereo program mix, making them suitable inputs for connection of other mixers, such as a PM-180 or another PM-430.

### 20 AUX IN JACK

This standard phone jack is unbalanced and accepts low or high impedance sources at nominal  $-20$ dBm levels (actual sensitivity is adjustable by means of the AUX IN Volume control), and signal is assigned to the left and right program mix via the AUX PAN pot. AUX IN is useful for hi-fi type equipment, hi-fi reverbs and electronic instrument line-level sources. AUX IN may be used as a monaural sub-mixer input.

### 21 POWER SWITCH

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

### 22 POWER FUSE

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.

### 23 AC OUTLET or VOLTAGE SELECTOR

Not provided in certain areas.

### 24 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 a nominal  $+4$ dBm @ 600 ohm or  $-50$ dBm @ 150 ohm

rating, depending on the setting of the adjacent slide switches. The switches change the level and impedance to correspond to microphone or line inputs. (They do not affect the PROGRAM B outputs.)

### 25 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 they carry the same signal as the PROGRAM A outputs, but without transformer isolation. The nominal output level is  $+4$ dBm. PROGRAM B will drive any 150 ohm or higher impedance input, and may be used to drive power amplifiers, tape recorders, effects units, or other mixers.

### 26 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  $+4$ dBm level. AUX OUT is excellent for submixed feeds to on-stage monitor mixers, where the output 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.

### 27 MONITOR OUT JACKS

These standard phone jacks carry the MONITOR 1 and MONITOR 2 outputs, and are unbalanced, low-impedance circuits with a nominal  $+4$ dBm level. MONITOR 1 is a post-fader, post-equalizer mix, whereas MONITOR 2 is a pre-fader, post-equalizer mix. Both outputs are suitable for feed to stage monitors (fold-back), tape machines or accessory devices.

### 28 TO ECHO JACK

This standard phone jack carries the same signal as the MONITOR 1 output, but at  $-20$ dBm. TO ECHO is well suited for feed to echo chambers, tape 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.

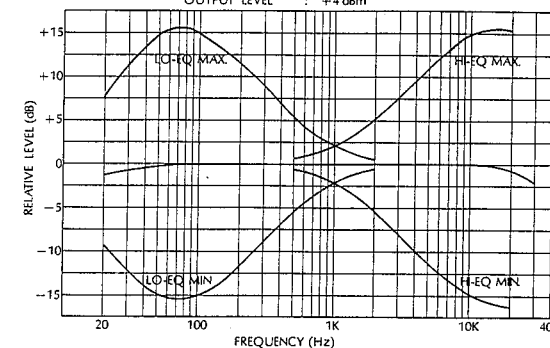
### 29 FROM ECHO JACK

This standard phone jack is unbalanced and accepts low or high impedance sources at nominal  $-30$ dBm 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 is also suitable for playing monaural pre-recorded background music during intermissions (i.e. from a portable cassette recorder).

## Frequency Response PM-430

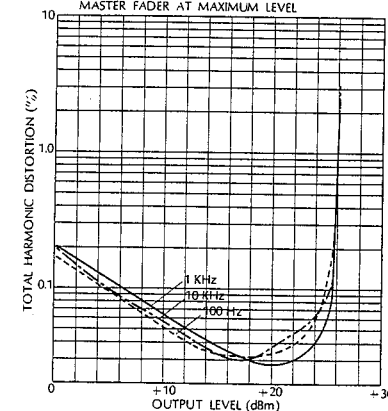
INPUT TERMINAL : CH1 (LEVEL SWITCH -50 dBm)  
OUTPUT TERMINAL : PGM A  
DUMMY LOAD : 600  $\Omega$   
OUTPUT LEVEL : +4 dBm



## Total Harmonic Distortion PM-430

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

INPUT FADER AT MAXIMUM LEVEL  
MASTER FADER AT MAXIMUM LEVEL



# SPECIFICATIONS

## PM-430 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, HIGH)
Maximum Input Level	+10dBm (Input Level Switch at -20dBm) -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, 23W
Finish	Black panel and leatherette-covered hard case
Dimensions (W x D x H)	59.5 x 51.6 x 18.8cm (23-3/8 x 20-3/8 x 7-3/8")
Net Weight	16Kg (35.3 lbs.)

## INPUT SPECIFICATIONS

Connection	Level Sw.	Nominal Impedance	Sensitivity* (at Max. Gain)	Input Level		Connector** in Mixer
				Nominal	Max. before Clip	
INPUT 1 ~ 8	-50dBm -40dBm -20dBm	150 ~ 600Ω Mics & Lines	-62dBm ( 0.6mV) -52dBm ( 2mV) -32dBm ( 20mV)	-50dBm ( 2.5mV) -40dBm ( 7.8mV) -20dBm ( 78mV)	-21dBm ( 69mV) -11dBm ( 218mV) +9dBm ( 2.18V)	XLR-3-31
INPUT 7, 8 (HIGH)	-50dBm -40dBm -20dBm	10KΩ Mics & Lines	-38dBm ( 9.8mV) -28dBm ( 31mV) -8dBm ( 310mV)	-26dBm ( 39mV) -16dBm ( 123mV) +4dBm ( 1.23V)	+3dBm ( 1.09V) +13dBm ( 3.46V) +33dBm ( 34.6V)	Phone Jack
AUX IN		5KΩ Lines	-32dBm ( 20mV)	-20dBm ( 78mV)		Phone Jack
SUB IN (L, R)		5KΩ Lines	-2dBm ( 620mV)	+4dBm ( 1.23V)	+47dBm ( 173V)	Phone Jack
FROM ECHO		5KΩ Lines	-36dBm ( 12mV)	-30dBm ( 25mV)	-10dBm ( 250mV)	Phone Jack

## 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 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

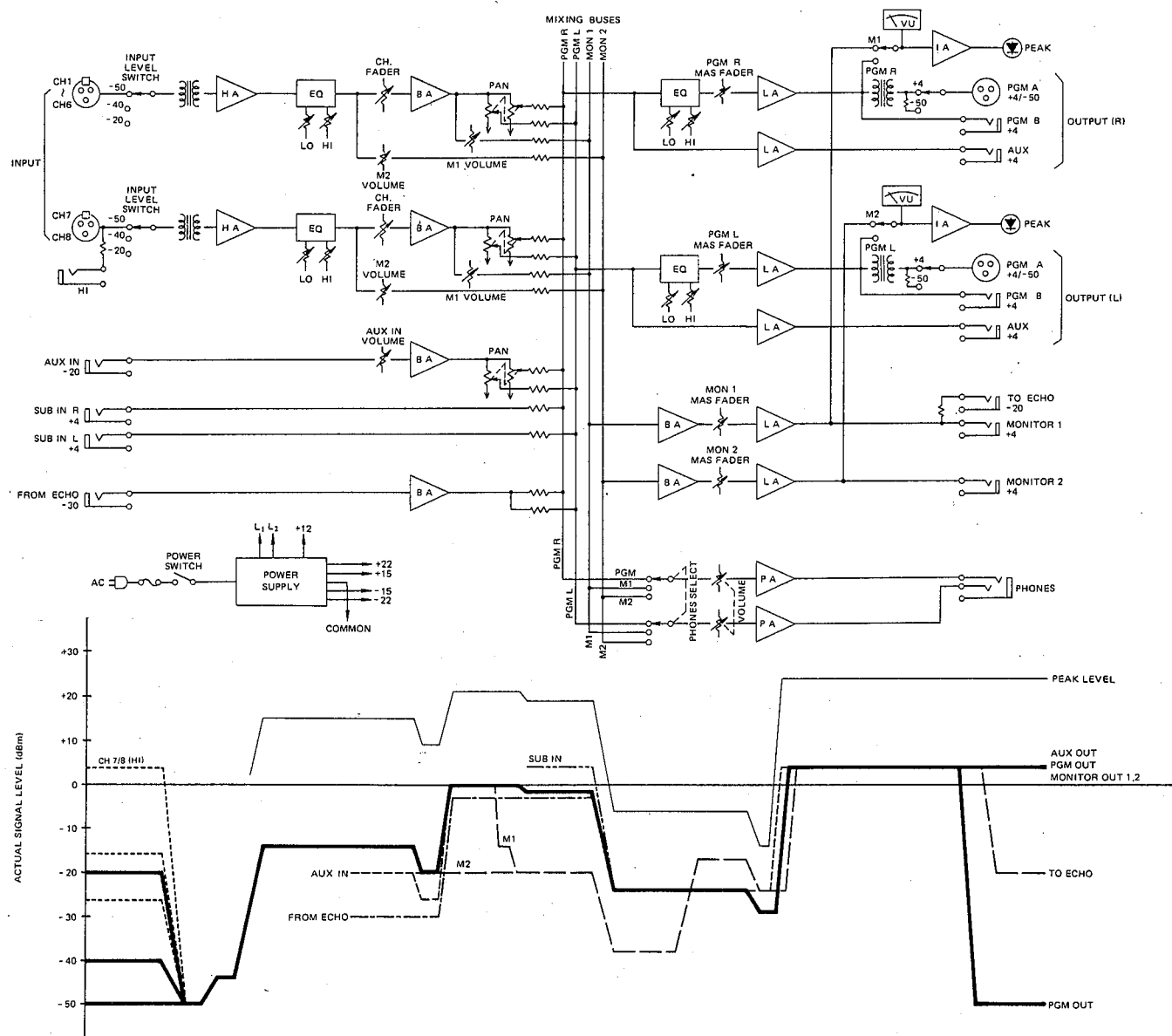
\*This is the level required to produce on output of +4dBm (1.23V).

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



# BLOCK & LEVEL DIAGRAMS

## PM-430 Block & Level Diagrams



SINCE 1887  **YAMAHA**  
NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN