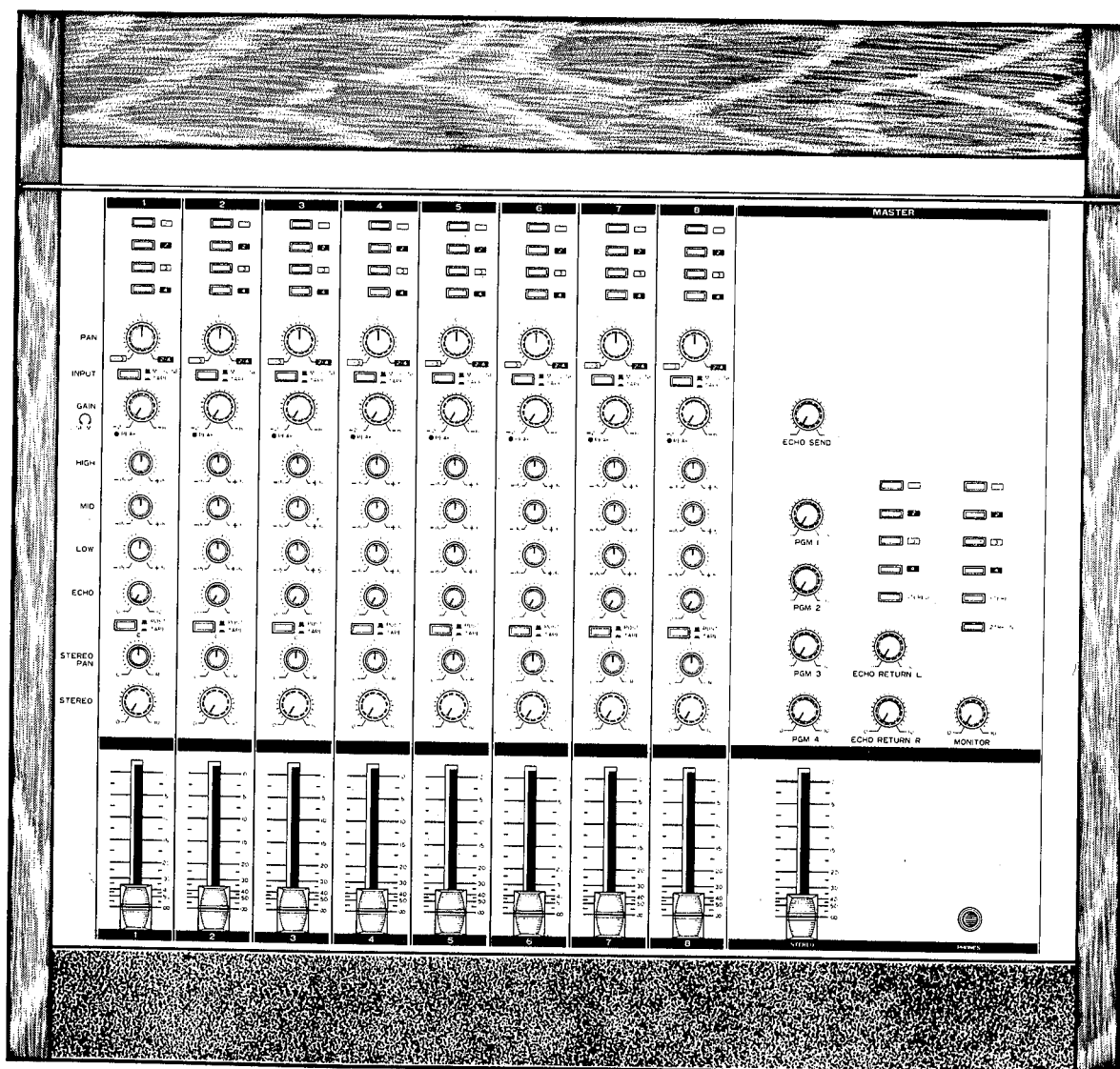


# YAMAHA

# RECORDING MIXER

# RM804

OPERATION MANUAL



*The RM804 is an 8-in/4-program-out mixer with many features including balanced mic/line inputs, an echo mixing buss, full monitoring capability and a SUB input for cascading a sub-mixer when more input channels are required. There are also continuously variable input gain controls for matching input sensitivity, 3-band equalization, and extensive VU metering for easy, accurate level control.*

*Drawing on Yamaha's vast background in the sound reinforcement field, the RM804 is a remarkably compact, multi-function, high-performance mixer that is ideal for 4 or 8 track recording applications.*

*In order to obtain the highest possible performance and make the most of the RM804's extensive professional features, we urge that you read this owner's manual thoroughly.*

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# SPECIFICATIONS, INPUT/OUTPUT SPECIFICATIONS

## FREQUENCY RESPONSE

+0, -3dB, 20Hz to 20kHz  
+0, -0.5dB, 30Hz to 15kHz

## TOTAL HARMONIC DISTORTION (THD)

Less than 0.1% @ 0dB, 20Hz to 20kHz

## HUM AND NOISE (6dB/Octave filter at 12.47kHz)

-127dB Equivalent input noise (EIN);  
-100dB residual output noise all faders down.  
-90dB PGM OUT; PGM Master level control at maximum level and all channel assign switches off.  
-80dB STEREO OUT; STEREO Master fader at maximum and all channel STEREO mix controls at minimum level.  
-80dB ECHO SEND; ECHO SEND level control at maximum and all channel ECHO mix controls at minimum level.

## MAXIMUM VOLTAGE GAIN

60dB; MIC IN to PGM OUT  
10dB; TAPE IN to PGM OUT  
70dB; MIC IN to STEREO OUT  
10dB; TAPE IN to STEREO OUT  
60dB; MIC IN to ECHO OUT  
84dB; MIC IN to MONITOR OUT  
20dB; ECHO RETURN to PGM OUT

## CHANNEL EQUALIZATION

LOW ±15dB at 100Hz, shelving.  
MID ±15dB at 2kHz, peaking.  
HIGH ±15dB at 10kHz, shelving.

## CROSSTALK

Less than -60dB @ 1kHz adjacent inputs.  
Less than -60dB @ 1kHz input to output.

## VU METERS

6 illuminated meters, 4 for PGM 1 ~ 4 and 2 for STEREO L-R (OVU = -10dB).

## PEAK INDICATORS

1 LEDs built into each Input channel and 1 in each VU meter. Input LEDs turn on RED when the signal after the GAIN control reaches or exceeds 3dB below clipping. Meter LEDs turn on 10dB below clipping.

## FINISH

Black painted panels, rosewood veneer cabinet, color coded knobs.

## POWER REQUIREMENTS

U.S. & Canadian Models: 120V, 60Hz  
General Model: 110 - 120/220 - 240V, 50/60Hz

## POWER CONSUMPTION

U.S. & Canadian Models: 27W  
General Model: 30W

## DIMENSIONS (W x D x H)

488 mm x 161 mm x 508 mm (19-1/4" x 6-3/8" x 20")

## WEIGHT

12kg (26.5 lbs)

## ● INPUT CHARACTERISTICS

Connection	Input Gain	Actual Load Impedance	For Use With Nominal	Sensitivity * (at Max. Gain)	Input Level		Connector **
					Nominal	Max. before clip	
INPUT	MIC	10kΩ	50 ~ 250Ω MIC	-70dB (0.245mV)	-60dB (0.775mV)	-30dB (24.5mV)	XLR-3-31
	LINE		600Ω LINE	-30dB (24.5mV)	-20dB (77.5mV)	10dB (2.45V)	
	TAPE	10kΩ	600Ω LINE	-20dB (77.5mV)	-10dB (245mV)	20dB (7.75V)	Pin Jack
ECHO RETURN (L, R)		25kΩ	600Ω LINE	-30dB (24.5mV)	-20dB (77.5mV)	20dB (7.75V)	Phone Jack
2 TRK IN (L, R)		10kΩ	600Ω LINE	-20dB (77.5mV)	-10dB (245mV)	20dB (7.75V)	Pin Jack
CH INSERT IN (ch1 ~ 8)		10kΩ	600Ω LINE	-10dB (245mV)	-10dB (245mV)	20dB (7.75V)	Pin Jack
SUB IN (ch1 ~ 4)		10kΩ	600Ω LINE	-10dB (245mV)	-10dB (245mV)	20dB (7.75V)	Pin Jack

## ● OUTPUT CHARACTERISTICS

Connection	Actual Source Impedance	For Use With Nominal	Output Level		Connector **
			Nominal	Max. before clip	
PGM OUT (1 ~ 4)	560Ω	10kΩ LINE	-10dB (245mV)	20dB (7.75V)	Pin Jack
ST OUT (L, R)	560Ω	10kΩ LINE	-10dB (245mV)	20dB (7.75V)	Pin Jack
ECHO SEND	560Ω	10kΩ LINE	-10dB (245mV)	20dB (7.75V)	Phone Jack
MONITOR OUT (L, R)	100Ω	10kΩ LINE	4dB (1.23V)	20dB (7.75V)	Phone Jack
CH INSERT OUT (ch1 ~ 8)	220Ω	10kΩ LINE	-10dB (245mV)	20dB (7.75V)	Pin Jack
CH DIRECT OUT (ch1 ~ 8)	100Ω	10kΩ LINE	-10dB (245mV)	20dB (7.75V)	Pin Jack
PHONES OUT	100Ω	8Ω PHONE	1mW	40mW	Stereo Phone Jack
		40Ω PHONE	3mW	130mW	

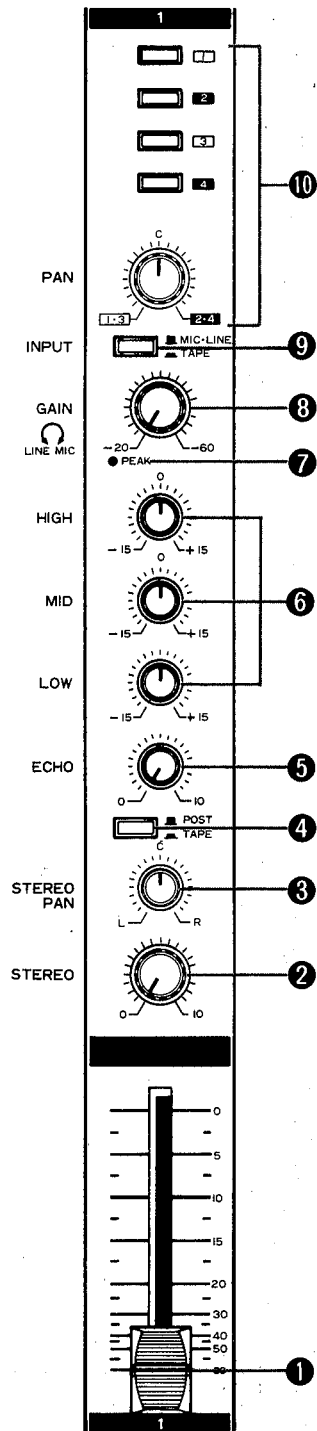
\* Sensitivity is the lowest level that will produce an output of -10dB (245mV), or the nominal output level when the unit is set to maximum gain.

\*\* All XLR connectors are floating (balanced) and transformer-isolated. Pin and Phone jacks are unbalanced.

● 0dB is referenced to 0.775 Vr.m.s.

● All specifications subject to change without notice.

### INPUT(CH1 ~ 8)



#### 1 CHANNEL FADER

The Fader continuously varies the channel output level to the four program mixing busses. The nominal setting is “-10” position, as indicated by a heavier calibration line. When the input signal is the same level as the Input Level switch setting, the nominal Fader setting applies an optimum level to the mixing busses; if the Master Fader is also at nominal, the mixer output level will be -10dB. The Fader is calibrated in dB of attenuation.

#### 2 STEREO MIX CONTROL

Adjusts the level of the TAPE IN or post-fader channel signal sent to the STEREO mixing buss.

#### 3 STEREO PAN

This rotary control assigns the output of STEREO mix control to the Stereo mix busses, anywhere from all the way left to all the way right. Centering the Pan pot places the signal equally in both busses (sound is centered); at this point, each bus is fed a signal 3dB below the maximum full-left or full-right panned level. This ensures that the combined stereo output power remains constant as the signal is panned.

#### 4 POST/TAPE SWITCH

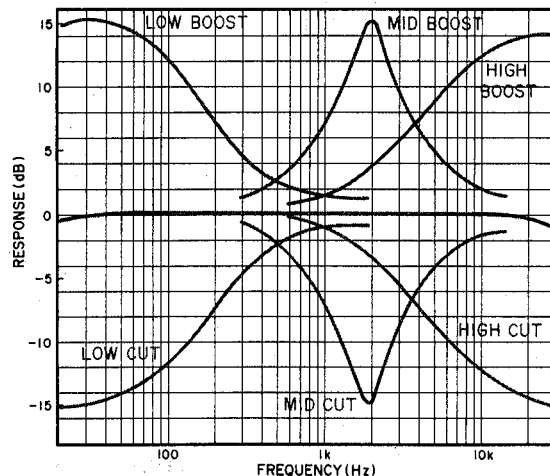
Selects the signal sent to the ECHO and STEREO controls. In the POST position the post-fader channel signal is sent to the ECHO and STEREO controls, and in the TAPE position the TAPE IN signal is sent to these controls.

#### 5 ECHO MIX CONTROL

Adjusts the level of the TAPE IN or post-fader channel signal sent to the ECHO mixing buss.

#### 6 EQUALIZER

The Low, Mid and High EQ controls alter the channel's frequency response with up to 15dB of boost (clockwise rotation) or cut (counterclockwise rotation). Continuously variable shelving-type equalization is provided at 100Hz (Low) and 10kHz (High); peaking equalization is provided at 2kHz (Mid). Refer to the illustration. The controls are calibrated in dB; centering them in the “0” position ensures flat audio response. In many mixes, EQ is used to modify tonal characteristics for better separation (i.e., given two similar-sounding instruments, you might boost one with the Mid control and boost the other with the High control).



## 7 PEAK INDICATOR

These peak indicator LEDs warn of impending clipping by flashing whenever the pre-fader signal reaches a level 3dB below clipping level.

## 8 GAIN CONTROL

Adjusts channel input sensitivity for optimum matching with the input source. Input sensitivity can be varied between -20 and -60dB, according to the level of the source signal. The optimum gain setting for the best balance of signal-to-noise ratio and dynamic range is achieved when the peak indicator flashes only occasionally with the channel fader

1 set around "10" on its scale.

## 9 INPUT SELECTOR

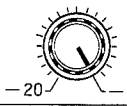
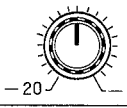
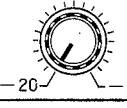
Selects either the INPUT (MIC/LINE) or TAPE input terminals.

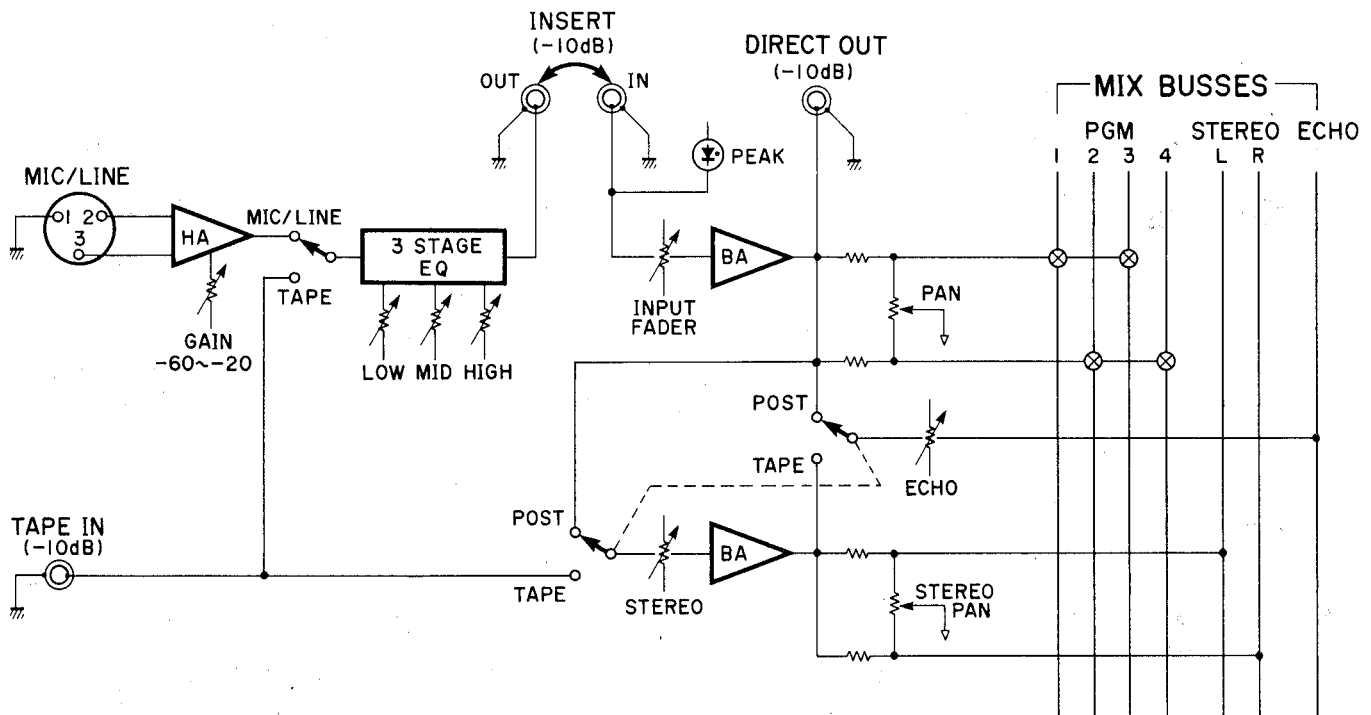
\* To prevent damage to peripheral equipment due to the transient noise produced when switching, lower the respective channel fader when operating this selector.

## 10 PAN & PGM ASSIGN SWITCHES

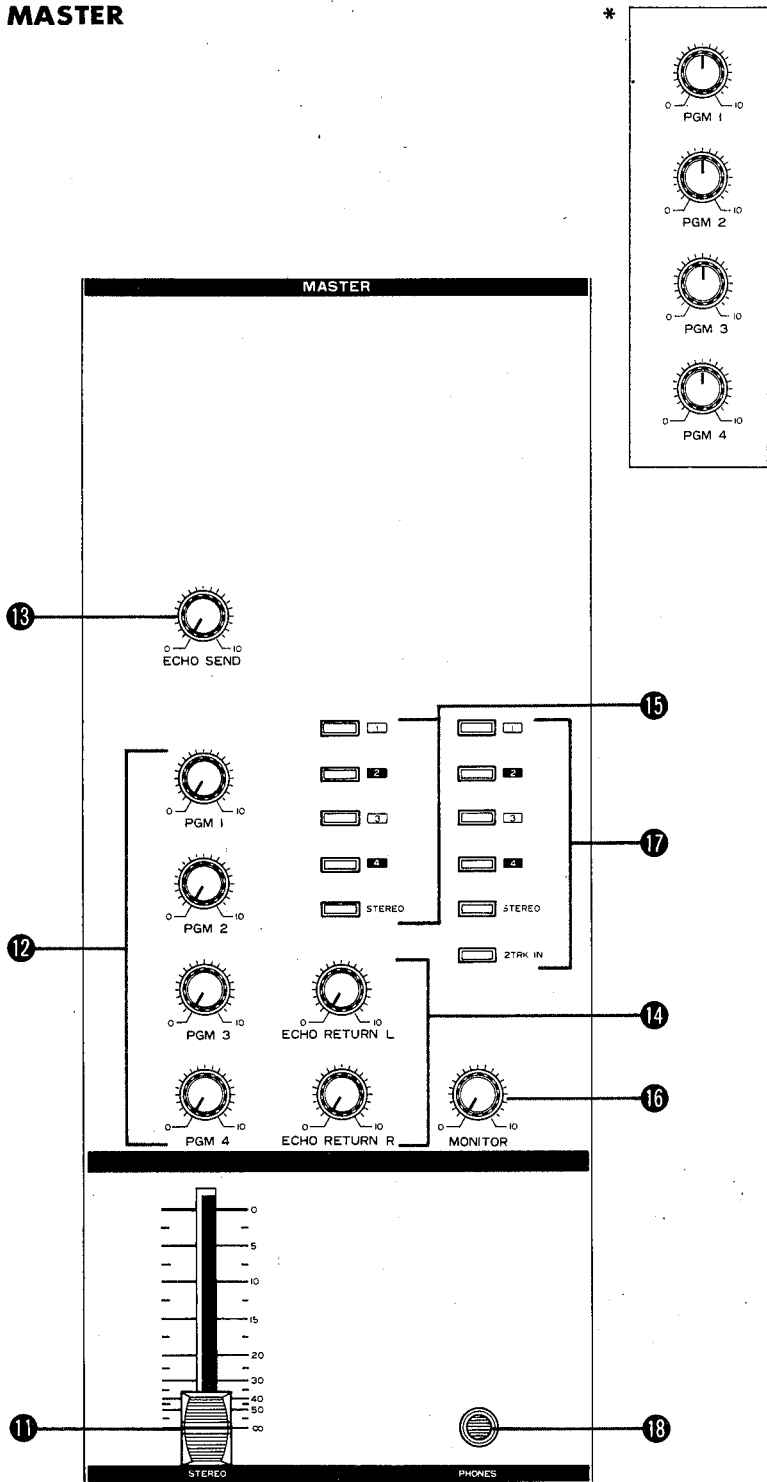
The PAN pot pans the post-fader signal between program busses 1, 3 and 2, 4, while the PGM assign switches determine which program busses are actually assigned (connected) to the respective channel.

### GENERAL SETTINGS OF INPUT LEVELS

GAIN	POSITION OF GAIN CONTROL	INPUT SOURCE
-60 ~ -50		Low-level microphone (dynamic type)
-35		High-level microphone (condenser type) Electrical, electronic musical instruments
-20		Low-level line (audio processing) Electrical, electronic musical instruments



**MASTER**



**11 STEREO MASTER FADER**

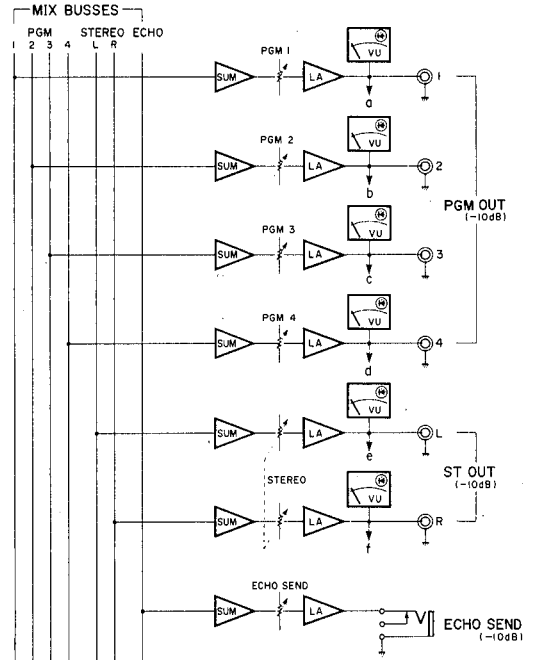
Determines the overall level of the signal on the stereo buss after the stereo mix has initially been set up using the channel STEREO mix controls. The stereo buss signals are output at the STEREO L, R terminals. Rated output is achieved with the fader at its "0" setting.

**12 PGM 1 ~ 4 MASTER LEVEL CONTROLS**

Adjust the overall level of each individual program buss after the channel balance has been set up using the input channel faders 1. Each program buss is output the respective PGM OUT 1 ~ 4 terminal. \*Drawing indicates nominal level control setting.

**13 ECHO SEND CONTROL**

Adjust the overall level of the signal output at the ECHO OUT terminal after the echo mix has been set up using the channel ECHO mix controls.

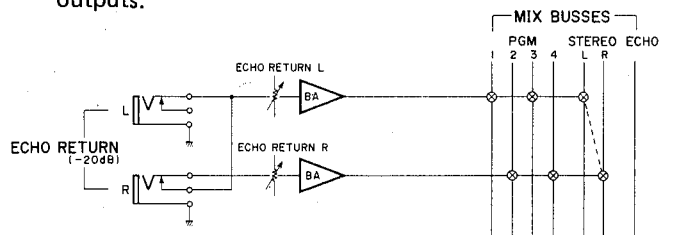


**14 ECHO RETURN L, R CONTROLS**

The ECHO RETURN L control determines the level at which a source signal input at the ECHO RETURN L jack is mixed into the PGM 1 and 3 busses, and into the STEREO L buss. Similarly, the ECHO RETURN R control determines the level at which a source input at the ECHO RETURN R jack is mixed into the PGM 2 and 4 busses, and into the STEREO R buss. If a source is plugged into the ECHO RETURN L jack only, this signal is treated as a mono source which can be mixed into both the PGM 1, 3/STEREO L and PGM 2, 4/STEREO R busses using the respective ECHO RETURN controls.

**15 ECHO RETURN ASSIGN SWITCHES**

Determine which busses are actually assigned (connected) to the ECHO RETURN L and R control outputs.



## MASTER & METER SECTION

### 16 MONITOR CONTROL

Determines the overall level at which the monitor source selected by the MONITOR selectors 17 is fed to the MONITOR OUT terminals and headphone jack.

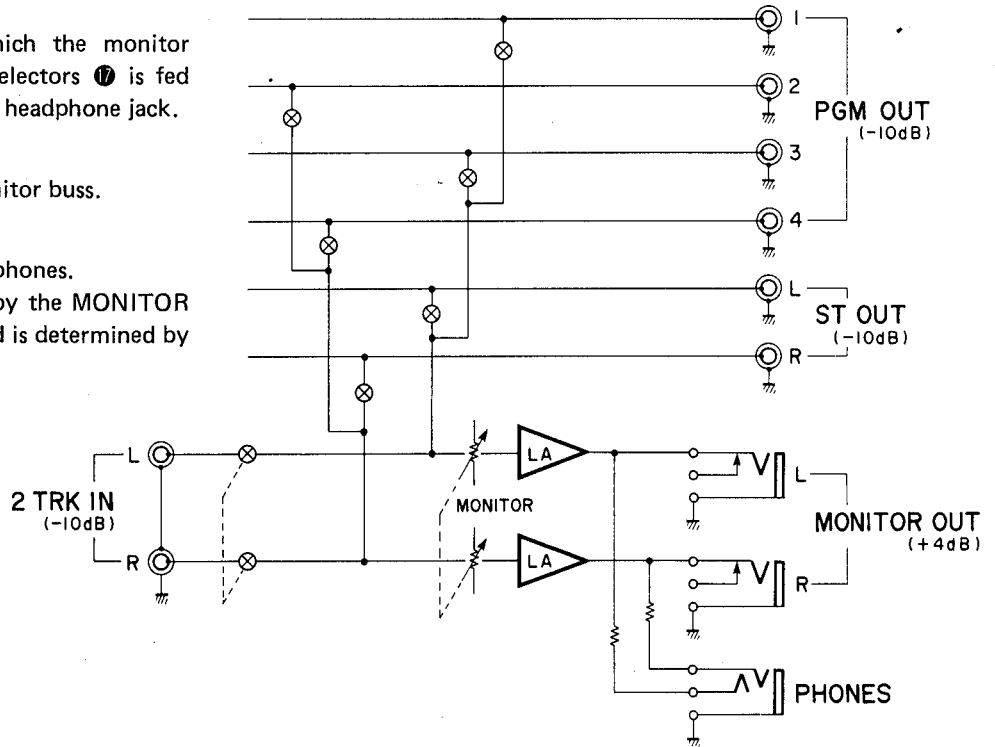
### 17 MONITOR SELECTORS

Determine the source sent to the monitor buss.

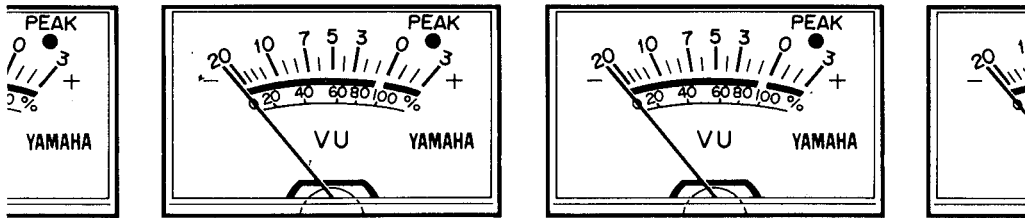
### 18 PHONES JACK

Output jack for standard stereo headphones.

The headphone level is determined by the MONITOR control 16 and the source monitored is determined by the MONITOR selectors 17.



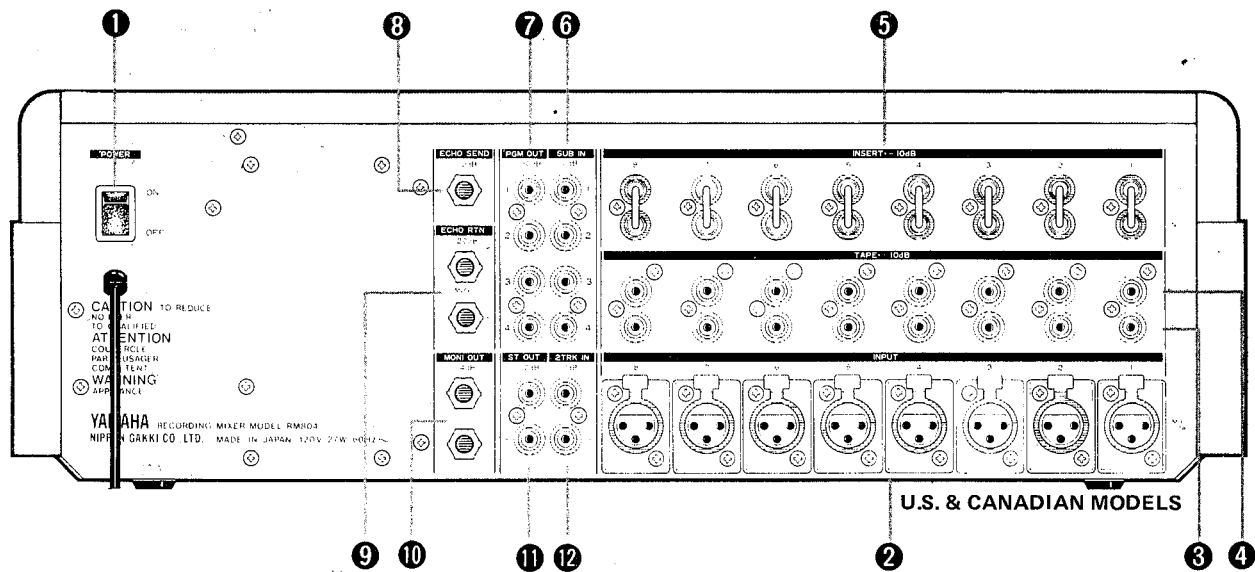
## METER



These are VU level meters with built-in peak indicator LEDs. The VU meters provide visual level monitoring of the PGM 1 ~ 4 busses and STEREO L and R busses. The rated output of  $-10\text{dB}$  (10k-ohm load) for each buss is produced when the respective VU meter reads 0 VU. The LED peak indicators flash whenever transient signal levels exceeding  $+7\text{dB}$  are encountered. Setting the STEREO master fader and PGM 1 ~ 4 master level controls so that their respective VU meters generally read between  $-10$  and 0 VU usually provides optimum S/N ratio and minimum distortion.

VU METER	-20VU	-10VU	-5VU	0VU	+3VU
OUTPUT LEVEL	-30dB	-20dB	-15dB	-10dB	-7dB
LEVEL	(24.5mV)	(77.5mV)	(138mV)	(245mV)	(489mV)

# REAR PANEL



## 1 POWER SWITCH

Turn ON to apply power to the unit. The VU meters light when power is turned on.

## 2 INPUT (MIC/LINE)

Balanced connectors for line or microphone input. Rated input level is  $-60$  to  $-20$ dB, microphone impedance is 50 to 250 ohms, and line impedance is 600 ohms.

## 3 TAPE IN $-10$ dB

Pin jack connectors for input of up to eight channels from a tape deck or several tape decks. Rated input level is  $-10$ dB; optimum input impedance is 600 ohms.

## 4 DIRECT OUT $-10$ dB

Directly outputs the signal from each input channel before mixing. Unbalanced pin jack output terminals. These outputs can be used with a 4 or 8 channel deck for real-time recording or after recording. Rated output level is  $-10$ dB, optimum impedance is 10K ohms.

## 5 INSERT IN/OUT $-10$ dB

Unbalanced inputs and outputs that permit inserting external signal processing equipment between the equalizer and fader stage of each input channel. Unplug the jumper cables only when inserting external equipment.

Rated level/optimum impedance:

IN  $-10$ dB/600 ohms

OUT  $-10$ dB/10K ohms.

## 6 SUB IN $-10$ dB

Unbalanced input for addition of a submixer in order to expand the number of available input channels. Unbalanced pin jacks with a rated input level of  $-10$ dB. Optimum impedance is 600 ohms.

## 7 PGM OUT $-10$ dB

Unbalanced output terminals for connection to a multitrack tape deck. Pin plugs with a rated output level of  $-10$ dB. Optimum impedance is 10K ohms.

## 8 ECHO SEND $-10$ dB

Outputs the echo mix to an external echo or reverb unit. Also may be used as a cue mix for a headphone amp. Level is determined by the input channel ECHO controls and the master ECHO SEND control. Standard  $1/4$ " phone plug with a rated output level of  $-10$ dB. Optimum impedance is 10K ohms.

## 9 ECHO RETURN $-20$ dB

Unbalanced inputs for return of the output signal from an external echo or reverb unit. A source plugged into the L terminal only is treated as a mono source and is sent to the L and R return busses. Standard  $1/4$ " phone plug with a rated input level of  $-10$ dB. Optimum impedance is 600 ohms. Also may be used for additional 2-track tape input.

## 10 MONITOR OUT $+4$ dB

Unbalanced monitor buss output. Standard  $1/4$ " phone plug with a rated output level of  $+4$ dB. Optimum impedance is 10K ohms.

## 11 ST OUT $-10$ dB

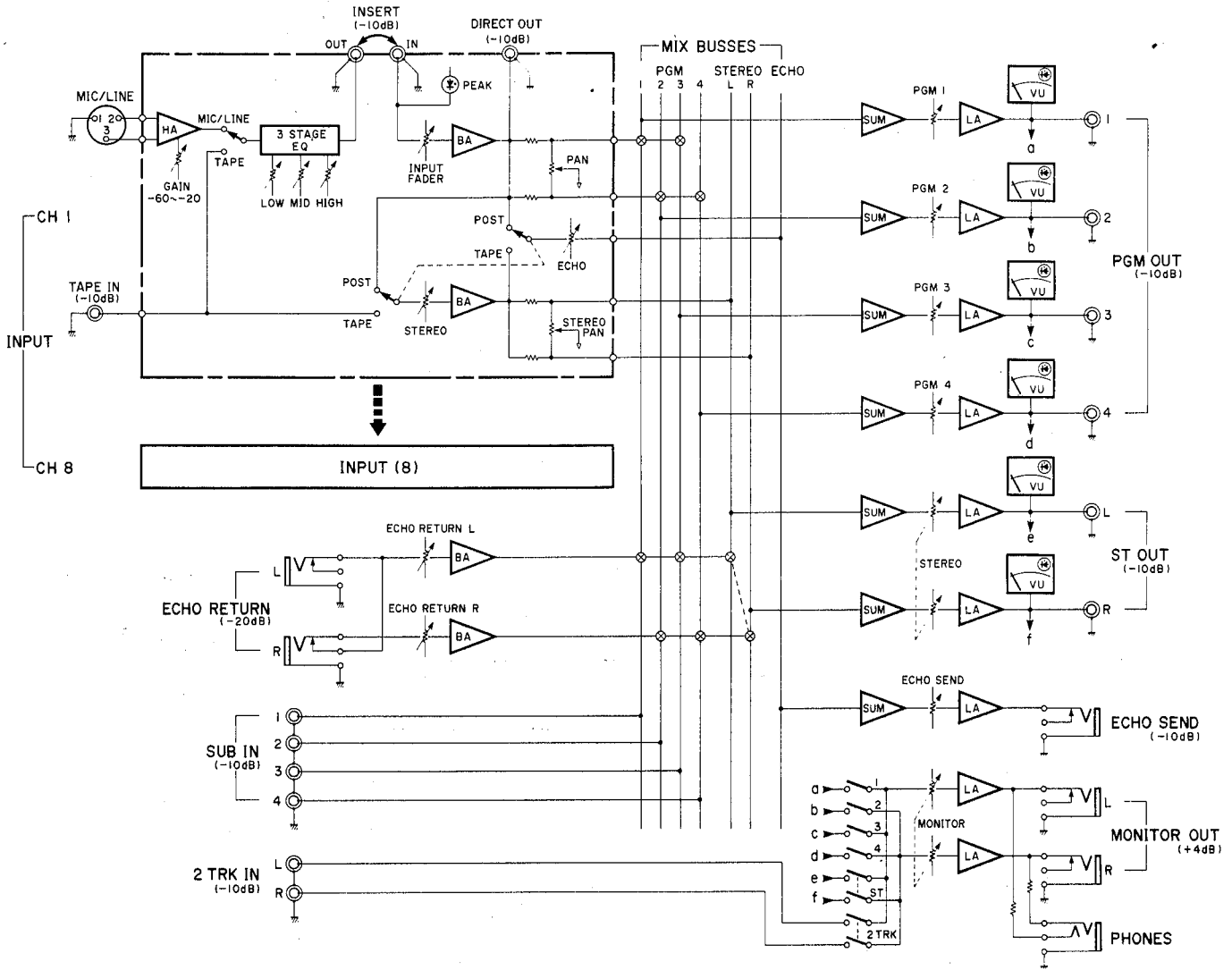
Outputs the stereo buss mix as determined by the input channel STEREO mix controls at the overall level determined by the STEREO master fader. Can be used as outputs to a 2-track recorder. Pin jacks with a rated output level of  $-10$ dB. Optimum impedance is 10K ohms.

## 12 2TRK IN $-10$ dB

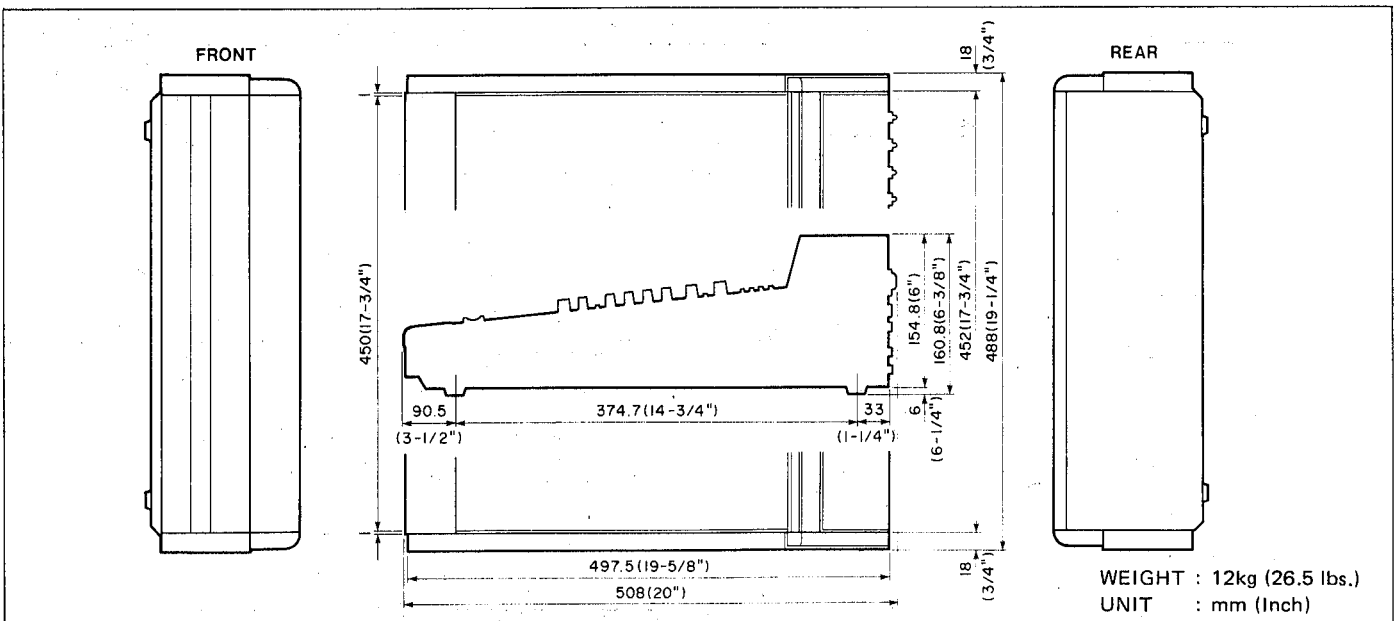
Unbalanced input terminals for connection to the outputs of a 2-track tape deck. Pin jacks with a rated input level of  $-10$ dB. Optimum impedance is 600 ohms.



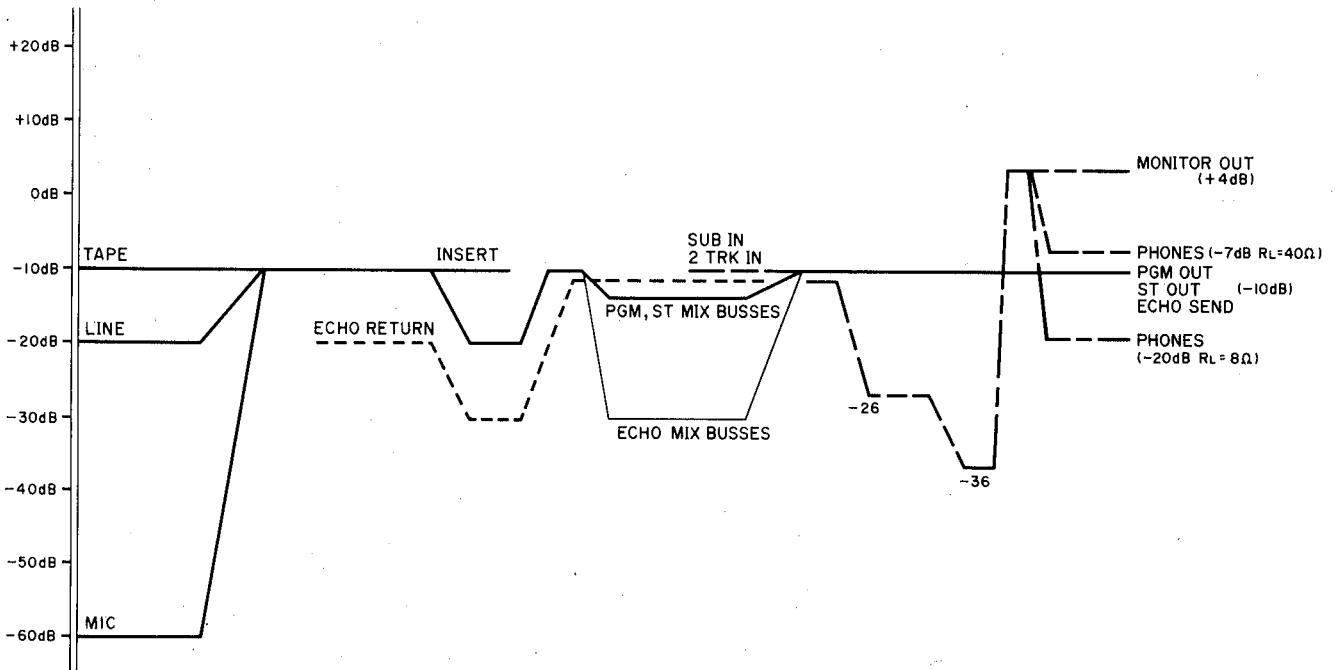
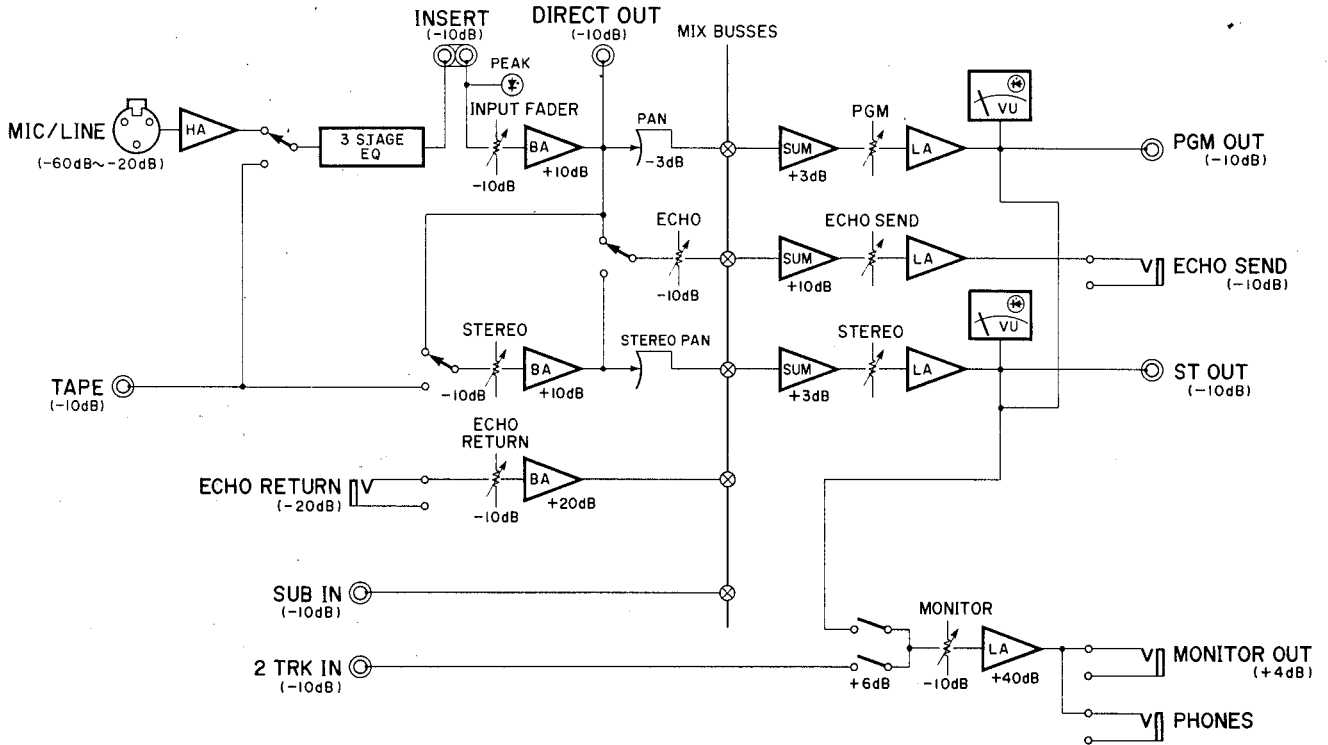
# BLOCK DIAGRAM/ DIMENSIONS



## DIMENSIONS



# LEVEL DIAGRAM



### **SERVICE**

The RM804 are supported by Yamaha's worldwide network of factory trained and qualified dealer service personnel. In the event of a problem, contact your nearest Yamaha dealer.

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