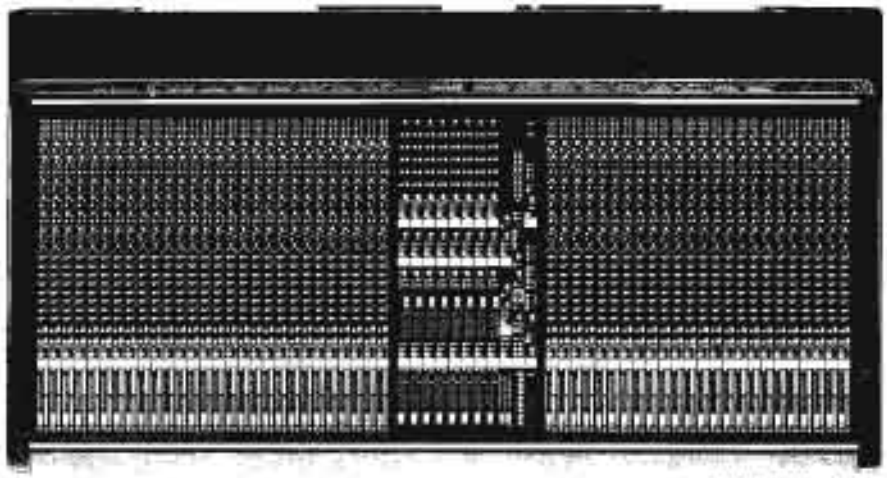
PROFESSIONAL AUDIO MIXING CONSOLE
PM4000
POWER SUPPLY for PM4000 Series
PW4000

SERVICE MANUAL



PM4000-48

PW4000

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PARTS LIST

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IMPORTANT NOTICE

This manual has been provided for the use of authorized Yamaha Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically Yamaha Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components and failure of the product to perform as specified. For these reasons, we advise all Yamaha product owners that all service required should be performed by an authorized Yamaha Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification, recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of Yamaha are continually striving to improve Yamaha products. Modifications are, therefore, inevitable and changes in specification are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and/or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHAT SO EVER!

Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!.

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

■ SPECIFICATIONS（総合仕様）

PM4000 Mixing Console General Specifications

Total Harmonic Distortion (Master Output)	<0.1% (THD+N) <0.01% (2nd – 10th harmonics)	20 Hz – 20 kHz @ +14 dBu, 600Ω 20 Hz – 20 kHz @ +14 dBu, 600Ω
Frequency Response (Master Output)	0 +1 dB, -3 dB	20 Hz – 20 kHz @ +4 dBu, 600Ω
Hum & Noise (48 Channels)	-128 dB	Equivalent Input Noise
(20 Hz – 20 kHz)	-100 dB	Residual Output Noise
RS + 150Ω	-85 dB (89 dB S/N)	GROUP OUT Master fader at nominal level, all channel assign switches OFF
Input Gain = Max.	-54 dB (58 dB S/N)	GROUP OUT Master fader at nominal level, one channel fader at nominal level
Input Pad = OFF	-84 dB (88 dB S/N)	STEREO OUT Master fader at nominal level, all channel assign switches OFF
Input Sensitivity = -70 dB	-94 dB (98 dB S/N)	MTRX OUT Master and Matrix mix controls at maximum level, all GROUP to MTRX switches OFF
Crosstalk	-80 dB @ 1 kHz, -70 dB @ 10 kHz	adjacent inputs or input to output
Maximum Voltage Gain	94 dB	CH IN to GROUP OUT/STEREO OUT (CH to ST)/MTRX OUT
	104 dB	CH IN to stereo out (G to ST)
	90 dB	CH IN to AUX OUT (PRE)/AUX ST OUT (PRE, LVL)
	100 dB	CH IN to AUX OUT (POST)/AUX ST OUT (POST, LVL)
	87 dB	CH IN to AUX ST OUT (PRE, PAN)
	84 dB	CH IN to CH DIRECT OUT
	104 dB	CH IN to MONITOR OUT (GROUP to MONITOR)
	84 dB	CH IN to MONITOR OUT (INPUT CUE)
	94 dB	ST IN (ST/L/R) to GROUP OUT
	91 dB	ST IN (L+R) to GROUP OUT
	87 dB	ST IN (ST/L/R) to AUX OUT (mono, PRE)
	90 dB	ST IN (L/R) to AUX OUT (mono, PRE)
	90 dB	ST IN (ST/L/R) to AUX ST OUT (stereo, PRE LVL)
	87 dB	ST IN (L+R) to AUX ST OUT (stereo, PRE LVL)
	87 dB	ST IN (ST/L/R) to AUX ST OUT (stereo, PRE, BAL)
	84 dB	ST IN (L+R) to AUX ST OUT (stereo, PRE, BAL)
	64 dB	TB IN to TB OUT
	0 dB	SUB IN (MTRX) to MTRX OUT
	10 dB	SUB IN (Others) to OUT (Others)
	10 dB	2TR IN to MONITOR OUT
Channel Equalization	±15 dB maximum	HIGH 1k – 20 kHz (shelving/peaking, Q = 0.5 – 3)
		HI-MID 0.4 k – 8 kHz (peaking, Q = 0.5 – 3)
		LO-MID 80 – 1.6 kHz (peaking, Q = 0.5 – 3)
		LOW 30 – 600 Hz (shelving/peaking, Q = 0.5 – 3)
Channel High Pass Filter	12 dB/octave	Roll off below 20 – 400 Hz @ -3 dB points
Oscillator/Noise Generator	Switchable sine wave @ 100 Hz, 1 kHz, 10 kHz or pink noise	Frequency sweepable at x0.2 – 2.0 nominal; less than 1% THD at +4 dBu
CH Preamp & EQ Peak Indicators	Red LED	Built into each input and stereo-in module; turns on when pre-EQ level or post-EQ level reaches 3 dB below clipping
Channel LED Meter	6 LEDs	Level meter built into each monaural and stereo input module

VU Meters (0 VU = +4 dBu output)	2 large meters	Illuminated meters: STEREO L,R
24 or 32 channel consoles	12 small meters	Illuminated meters, all switchable: #1 – #4; GROUP (1 – 4) / MTRX (1 – 4) / AUX (1 – 4) #5 – #8; GROUP (5 – 8) / MTRX (5 – 8) / AUX (5 – 8) #9; AUX ST1 L / MONITOR A L (pre-MONITOR control) #10; AUX ST1 R / MONITOR A R (pre-MONITOR control) #11; AUX ST 2 L / TB #12; AUX ST 2 R / OSC
40 or 48 channel consoles	16 small meters	Illuminated meters, all switchable: #1 – #8; GROUP (1 – 8) / MTRX (1 – 8) / AUX (1 – 8) #9; GROUP 1 / MTRX 1 / AUX ST1 L #10; GROUP 2 / MTRX 2 / AUX ST1R #11; GROUP 3 / MTRX 3 / AUX ST2L #12; GROUP 4 / MTRX 4 / AUX ST2R #13; GROUP 5 / MTRX 5 / MONITOR A L (pre) #14; GROUP 6 / MTRX 6 / MONITOR A R (pre) #15; GROUP 7 / MTRX 7 / TB #16; GROUP 8 / MTRX 8 / OSC
VU Meter Peak Indicators	LED (red)	Built into each VU meter, the LED turns on when the pre-line amp level reaches 3 dB below clipping
Phantom Power	+48 V dc	Available at balanced inputs (via 6.8 kΩ current limiting/isolation resistors) for powering condenser microphones; may be turned ON or OFF via rear-panel Phantom Master switch. When Master is ON, individual channels may be turned OFF or ON via +48V switches on the mono input, stereo input and talkback modules
Dimensions 48 Channel	2086 x 346 x 1121 mm	82-1/8 x 13-5/8 x 44-1/8 inches
(W x H x D) 40 Channel	1846 x 346 x 1121 mm	72-11/16 x 13-5/8 x 44-1/8 inches
32 Channel	1586 x 346 x 1121 mm	62-7/16 x 13-5/8 x 44-1/8 inches
24 Channel	1346 x 346 x 1121 mm	53 x 13-5/8 x 44-1/8 inches
Weight 48 Channel	183 kg	403 lbs. 7 oz
40 Channel	161 kg	354 lbs. 14 oz
32 Channel	137 kg	301 lbs. 15 oz
24 Channel	115 kg	253 lbs. 7 oz

PW4000 Power Supply Specifications

Power Requirements			
Japan	100 V, 50/60 Hz	48 Channel	1100 W
		40 Channel	1000 W
		32 Channel	900 W
		24 Channel	800 W
CSA/UL	120 V, 60 Hz	1500 VA	1250W
General	230/240 V, 50/60 Hz		1250W
DC Output Voltages		±19V 13 A +12V 8 A +48 V 0.7 A	
Fuses	Main (x3) Sub (x1)	6 A 250 V 2A 250 V	
Dimensions (W x H x D)	480.0 x 186.0 x 460.6 mm	18.8 x 7.3 x 18.1 inches	
Weight	36 kg	79.4 pounds	

INPUT CHARACTERISTICS

Connection	PAD	Gain Trim	Actual load Impedance	For use with Nominal	Input level (*3) Sensitivity (*4)	Nominal	Max before Clip	Connector in Mixer (*2)
CH IN 1 ~ [ch (*1) / ST CH IN 1 ~ 4ch	0	–70	3kΩ	50Ω ~ 600Ω mics and 600Ω lines	–90 dB (0.025 mV)	–70 dB (0.25 mV)	–48 dB (3.09 mV)	XLR-3-31 type
	30				–60 dB (0.775 mV)	–40 dB (7.75 mV)	–18 dB (97.6 mV)	
	0	–20			–40 dB (7.75 mV)	–20 dB (77.5 mV)	+2 dB (0.976 V)	
	30				–10 dB (245 mV)	+10 dB (2.45 V)	+32 dB (30.9 V)	
SUB IN / GROUP (1 ~ 8) / STEREO (L, R) / AUX (1 ~ 8) / AUX ST1, 2 (L, R) / CUE (L, R)			10kΩ	600Ω lines	–6 dB (388 mV)	+4 dB (1.23 V)	+26 dB (15.5 V)	XLR-3-31 type
MTRIX (1 ~ 8)					+4 dB (1.23 V)			
TALKBACK IN	–50		3kΩ	50 ~ 600Ω mics	–70 dB (0.25 mV)	–50 dB (2.45 mV)	–28 dB (30.3 mV)	XLR-3-31 type
	+4			600Ω lines	–16 dB (123 mV)	+4 dB (1.23 V)	+26 dB (15.5 V)	
INSERT IN / CH 1 ~ [ch (*1) / ST CH 1 ~ 4ch			10kΩ	600Ω lines	–16 dB (123 mV)	+4 dB (1.23 V)	+26 dB (15.5 V)	Phone Jack (TRS)
GROUP (1 ~ 8) / STEREO (L, R) / AUX (1 ~ 8) / AUX ST1, 2 (L, R)					–6 dB (388 mV)			
MTRIX (1 ~ 8)					+4 dB (1.23 V)			
2TR IN 1, 2 (L, R)			10kΩ	600Ω lines	–6 dB (388 mV)	+4 dB (1.23 V)	+26 dB (15.5 V)	XLR-3-31 type

NOTES: *1 PM4000 -24: 24 ch, -32: 32 ch, -40C: 40 ch, -48C: 48 ch
*2 All XLR connectors are electronically balanced. Phone jacks are balanced with Tip = signal high (+), Ring = signal low (–), and Sleeve = ground.
*3 In these specifications, when dB represents a specific voltage. 0 dB is referenced to 0.775 Vrms.
*4 Sensitivity is the lowest level that will produce an output of +4 dB (1.23 V), or the nominal output level when the unit is set to maximum level.

OUTPUT CHARACTERISTICS

Connection	Actual source Impedance	For use with Nominal	Output level (*3) Nominal	Max before Clip	Connector in Mixer (*2)
GROUP OUT (1 ~ 8) / STEREO OUT (L, R) / MTRIX OUT (1 ~ 8) / AUX OUT (1 ~ 8) / AUX ST1, 2 OUT (L, R) / TALKBACK OUT / OSC OUT	150 Ω	600Ω lines	+4 dB (1.23 V)	+24 dB (12.3 V)	XLR-3-32 type
CH DIRECT OUT 1 ~ [ch (*1)	150 Ω	600Ω lines	+4 dB (1.23 V)	+24 dB (12.3 V)	Phone Jack (TRS)
CH INSERT OUT 1 ~ [ch (*1) / ST CH INSERT OUT 1 ~ 4ch / GROUP INSERT OUT (1 ~ 8) / STEREO INSERT OUT (L, R) / MTRIX INSERT OUT (1 ~ 8) / AUX INSERT OUT (1 ~ 8) / AUX ST1, 2 INSERT OUT (L, R)	150 Ω	10kΩ lines	+4 dB (1.23 V)	+24 dB (12.3 V)	Phone Jack (TRS)
PHONES OUT 1, 2 (L, R)	15 Ω	8Ω Phones	75 mW	150 mW	Phone Jack (STEREO)
		40Ω Phones	65 mW	150 mW	

NOTES: *1 PM4000 -24: 24 ch, -32: 32 ch, -40C: 40 ch, -48C: 48 ch
*2 All XLR connectors are electronically balanced. Phone jacks are balanced with Tip = signal high (+), Ring = signal low (–), and Sleeve = ground. Phone Jacks (STEREO) are unblanced.
*3 In these specifications, when dB represents a specific voltage. 0 dB is referenced to 0.775 Vrms.

■入力仕様

コネクション	PAD	GAIN Trim	実効入力インピーダンス	ソースインピーダンス	入力レベル*4 感度*2	入力レベル*4 ノミナルレベル	入力レベル*4 MAX (クリップ時)	使用コネクタ*3
MONO CH IN *1 1～*ch	0	-70	3kΩ	50～600Ω Mics & 600Ω Lines	-90dB(0.025mV)	-70dB(0.25mV)	-48dB(3.09mV)	XLR-3-31type
	30				-60dB(0.775mV)	-40dB(7.75mV)	-18dB(97.6mV)	
STEREO CH IN 1～4ch	0	-20			-40dB(7.75mV)	-20dB(77.5mV)	+2dB(0.976V)	
	30				-10dB(245mV)	+10dB(2.45V)	+32dB(30.9V)	
SUB IN								
GROUP (1～8)			10kΩ	600ΩLines	-6dB(388mV)	+4dB(1.23V)	+26dB(15.5V)	XLR-3-31type
STEREO (L, R)								
AUX (1～8)								
AUX ST1,2(L, R)								
CUE (L, R)								
MTRX (1～8)			10kΩ	600ΩLines	+4dB(1.23V)	+4dB(1.23V)	+26dB(15.5V)	XLR-3-31type
TALKBACK IN	-50		3kΩ	50～600ΩMics	-70dB(0.25mV)	-50dB(2.45mV)	-28dB(30.9mV)	XLR-3-31type
	+4			600ΩLines	-16dB(123mV)	+4dB(1.23V)	+26dB(15.5V)	
INSERT IN								
CH*1 1～*ch			10kΩ	600ΩLines	-16dB(123mV)	+4dB(1.23V)	+26dB(15.5V)	Phones Jack(TRS)
ST CH 1～4ch								
GROUP (1～8)			10kΩ	600ΩLines	-6dB(388mV)	+4dB(1.23V)	+26dB(15.5V)	Phones Jack(TRS)
STEREO (L, R)								
AUX (1～8)								
AUX ST1,2(L, R)								
MTRX (1～8)			10kΩ	600ΩLines	+4dB(1.23V)	+4dB(1.23V)	+26dB(15.5V)	Phones Jack(TRS)
2TR IN 1,2 (L, R)			10kΩ	600ΩLines	-6dB(388mV)	+4dB(1.23V)	+26dB(15.5V)	XLR-3-31type

＊1 PM4000 －24：24ch,－32：32ch,－40C：40ch,－48C：48ch

＊2 規定出力レベル（＋4dB＝1.23V）の出力を得るために必要な最小の入力レベル

＊3 全てのXLRコネクタおよびフォーンジャックはバランスタイプ（T＝＋, R＝－, S＝GND）

＊4 0dB＝0.775Vrms

■出力仕様

コネクション		実効ソースインピーダンス	ノミナルレベル時	出力レベル*3 ノミナルレベル	出力レベル*3 MAX (クリップ時)	使用コネクタ
GROUP OUT	(1～8)	150Ω	600ΩLines	+4dB(1.23V)	+24dB(12.3V)	XLR-3-32type
STEREO OUT	(L, R)					
MTRX OUT	(1～8)					
AUX OUT	(1～8)					
AUX ST1,2 OUT	(L, R)					
MONITOR A,B OUT	(L, R)					
TALKBACK OUT						
OSC OUT						
CH DIRECT OUT*1	1～*CH	150Ω	600ΩLines	+4dB(1.23V)	+24dB(12.3V)	Phone Jack(TRS)
CH INSERT OUT*1	1～*CH	150Ω	10kΩLines	+4dB(1.23V)	+24dB(12.3V)	Phone Jack(TRS)
ST CH INSERT OUT	1～4ch					
GROUP INSERT OUT	(1～8)					
STEREO INSERT OUT	(L, R)					
MTRX INSERT OUT	(1～8)					
AUX INSERT OUT	(1～8)					
AUX ST1,2 INSERT OUT	(L, R)					
PHONES OUT 1,2	(L, R)	150Ω	8Ω Phones	75mW	150mW	Phones Jack(Stereo)
			40Ω Phones	65mW	150mW	

＊1 PM4000 －24：24ch,－32：32ch,－40C：40ch,－48C：48ch

＊2 全てのXLRコネクタおよびフォーンジャックはバランスタイプ（T＝＋, R＝－, S＝GND）

＊3 0dB＝0.775Vrms