

M2500-24/32/40C /48C/56C

MIXING CONSOLE

SERVICE MANUAL



M2500-56C

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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 : This 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 principal-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 bus in the unit (heavy gauge black wires connect to this bus.)

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

LITHIUM BATTERY HANDLING

This product uses a lithium battery for memory back-up.

WARNING : Lithium batteries are dangerous because they can be exploded by improper handling. Observe the following precautions when handling or replacing lithium batteries.

- Leave lithium battery replacement to qualified service personnel.
- Always replace with batteries of the same type.
- When installing on the PC board by soldering, solder using the connection terminals provided on the battery cells.
- Never solder directly to the cells. Perform the soldering as quickly as possible.
- Never reverse the battery polarities when installing.
- Do not short the batteries.
- Do not attempt to recharge these batteries.
- Do not disassemble the batteries.
- Never heat batteries or throw them into fire.

ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig handling. Udskiftning ma kun ske med batteri af samme fabrikat og type. lever det brugte batteri tilbage til leverandren.

VARNING

Explosionsfara vid felaktigt batteribyte.

Anvand samma batterityp eller en ekvivalent typ som rekommenderas av apparatillverkaren.

Kassera anvant batteri enligt fabrikantens instruktion.

VAROITUS

Paristo voi rajahtaa, jos se on virheellisesti asennettu.

Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.

Havita kaytetty paristo valmistajan ohjeiden mukaisesti.

The following information complies with Dutch official Gazette 1995. 45; ESSENTIALS OF ORDER ON THE COLLECTION OF BATTERIES.

- Please refer to the disassembly procedure for the removal of Back-up Battery.
- Leest u voor het verwijderen van de backup batterij deze beschrijving.

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 WHATSOEVER 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.

WARNING

Components having special characteristics are marked  and must be replaced with parts having specification equal to those originally installed.

SPECIFICATIONS

General specifications

0 dB is referenced to 0.775 Vrms.

Total Harmonic Distortion (Master output)	Less than 0.1% (THD+N) 20 Hz–20 kHz @ +14 dB 600 Ω
Frequency Response (Master Output)	0+1, –3 dB 20 Hz–20 kHz @ +4 dB 600 Ω Gain control at minimum level
Hum & Noise (20 Hz–20 kHz)*1 Rs= 150 Ω	–128 dB Equivalent Input Noise. –99 dB Residual Output Noise. (STEREO OUT, MONO/C OUT, GROUP/AUX OUT, AUX OUT, AUX/GROUP OUT)
Input Gain= Max. Input Pad= OFF Input sensitivity= –60 dB	
	–64 dB(68 dB S/N) STEREO OUT Master Level control and one Ch fader at nominal level.
	–80 dB(84 dB S/N) STEREO OUT, MONO/C OUT Master fader at nominal level and all Ch assign SW's off and all GROUP to ST SW's off.
	–81 dB(85 dB S/N) GROUP1/AUX7–GROUP8/AUX14 OUT Master Level control at nominal level and all Ch assign SW's off. GROUP/AUX FLIP SW off.
	–75 dB(79 dB S/N) AUX1–6, AUX7/GROUP1–AUX14/GROUP8 OUT Master Level control at nominal level and all Ch send controls at minimum. GROUP/AUX FLIP SW off.
	–90 dB(94 dB S/N) MATRIX OUT Master level control at nominal level and all Matrix Mix controls at minimum level.
Crosstalk	–70 dB @ 1 kHz adjacent inputs. –70 dB @ 1 kHz input to output. (CH INPUT) –50 dB @ 1 kHz input to output. (ST CH INPUT)
Maximum Voltage Gain GROUP/AUX FLIP SW= off	60 dB CH INPUT to CH INSERT OUT 84 dB CH INPUT to GROUP1/AUX7–GROUP8/ AUX14 OUT 80 dB CH INPUT to AUX1, 2 OUT(Pre Fader) 90 dB CH INPUT to AUX3–6, AUX7/GROUP1– AUX14/GROUP8 OUT(Post Fader) 84 dB CH INPUT to STEREO OUT(CH to ST) 70 dB CH INPUT to MONITOR OUT(PFL)
CH INPUT PAD SW	26 dB
CH INPUT GAIN control	44 dB variable
ST CH 1A, 2–4 INPUT GAIN control	40 dB variable
ST CH 1B INPUT GAIN control	30 dB variable
CH INPUT High Pass Filter	18 dB/octave roll-off below 80 Hz at –3 dB point.
CH INPUT Equalization +15, –15 dB maximum	HIGH 10 kHz (shelving) HIGH-MID 400– 8 kHz (peaking) LOW-MID 80–1.6 kHz (peaking) LOW 100 Hz (shelving)

ST CH INPUT Equalization

	HIGH	10 kHz (shelving)
	LOW	100 Hz (shelving)

Phantom Power +48 VDC is applied to 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 ON or OFF via +48V switches (with red LED) on each input channel.

CH LED Indicators

PEAK	LED(red) built into each CH INPUT turns on when pre-Fader level reaches +17 dB.
NOM	LED(yellow) built into each CH INPUT turns on when pre-Fader level reaches 0 dB.
SIGNAL	LED(green) built into each CH INPUT turns on when pre-Fader level reaches –13 dB.

ST CH LED Indicators

PEAK	LED(red) built into each ST CH INPUT turns on when pre-Fader [L+R] level reaches +17 dB.
NOM	LED(yellow) built into each ST CH INPUT turns on when pre-Fader [L+R] level reaches 0 dB.
SIGNAL	LED(green) built into each ST CH INPUT turns on when pre-Fader [L+R] level reaches –13 dB.

Oscillator/Noise

Switchable sine wave @ 100 Hz, 1 kHz or 10 kHz, or pink noise.

Scene Memory

Direct Scene Memory recall switches (1–8)
Switchable Scene Memory recall (1–128)

VU Meters

11 illuminated meters
(0VU= +4 dB output @ 600Ω load)
#1 ; GROUP1/AUX7•AUX1•AUX7/GROUP1•MATRIX1
#2 ; GROUP2/AUX8•AUX2•AUX8/GROUP2•MATRIX2
#3 ; GROUP3/AUX9•AUX3•AUX9/GROUP3•MATRIX3
#4 ; GROUP4/AUX10•AUX4•AUX10/GROUP4•MATRIX4
#5 ; GROUP5/AUX11•AUX5•AUX11/GROUP5•MATRIX5
#6 ; GROUP6/AUX12•AUX6•AUX12/GROUP6•MATRIX6
#7 ; GROUP7/AUX13•NONE•AUX13/GROUP7•MATRIX7
#8 ; GROUP8/AUX14•NONE•AUX14/GROUP8•MATRIX8
#9 ; STEREO L•PFL/AFL L
#10 ; MONO/C
#11 ; STEREO R•PFL/AFL R

VU Meter Peak Indicators

LED(red) built into each VU meter turns on when output signal is above the level 3 dB lower than clipping level.

Dimension

Height	265 mm
Depth	875 mm (except rear connectors)
Width	2385 mm(56C), 2142 mm(48C), 1899 mm(40C), 1642 mm(32), 1400 mm(24)

Weight

102kg(56C), 93kg(48C), 84kg(40C),
71kg(32), 62kg(24)

*1 Hum & Noise are measured with a 6 dB/octave filter @ 12.7 kHz; equivalent to a 20 kHz filter with infinite dB/octave attenuation.

For European Model

Purchaser/User information specified in EN55103-1 and EN55103-2.
Conformed Environment: E1, E2, E3 and E4.

Input/output characteristics

Input specifications

Connection	PAD	Gain Trim	Actual Load Impedance	For Use With Nominal	Input Level *1			Connector In Mixer	
					Sensitivity *9	Nominal	Max before Clip		
CH INPUT (1-n) *8	0	-60	3 k Ω	50–600 Ω Mics & 600 Ω Lines	-80 dB(0.078 mV)	-60 dB(0.775 mV)	-40 dB(7.75 mV)	XLR-3-31 type *2	
	26				-54 dB(1.55 mV)	-34 dB(15.5 mV)	-14 dB(155 mV)		
	0	-16			-36 dB(12.3 mV)	-16 dB(123 mV)	+4 dB(1.23 V)		
	26				-10 dB(245 mV)	+10 dB(2.45 V)	+30 dB(24.5 V)		
ST CH 1A INPUT [L, R]		-30	5 k Ω	600 Ω Lines	-50 dB(2.45 mV)	-30 dB(24.5 mV)	-10 dB(245 mV)		
		+10			-10 dB(245 mV)	+10 dB(2.45 V)	+30 dB(24.5 V)		
ST CH 1B INPUT [L, R]		-20	10 k Ω	600 Ω Lines	-40 dB(7.75 mV)	-20 dB(77.5 mV)	0 dB(0.775 V)		Phono Jack *3
		+10			-10 dB(245 mV)	+10 dB(2.45 V)	+30 dB(24.5 V)		
ST CH INPUT [L, R] (2–4)		-30	5 k Ω	600 Ω Lines	-50 dB(2.45 mV)	-30 dB(24.5 mV)	-10 dB(245 mV)	Phone Jack(TRS) *4	
		+10			-10 dB(245 mV)	+10 dB(2.45 V)	+30 dB(24.5 V)		
TALKBACK IN			10 k Ω	50–600 Ω Mics	-66 dB(0.388 mV)	-50 dB(2.45 mV)	-20 dB(77.5 mV)	XLR-3-31 type *5	
MATRIX SUB IN [L, R]			10 k Ω	600 Ω Lines	-2 dB(0.616 V)	+4 dB(1.23 V)	+24 dB(12.3 V)	Phone Jack(TRS) *6	
STEREO [L, R] MONO/C SUB IN					-6 dB(388 mV)				
CH INSERT IN (1-n) *8			10 k Ω	600 Ω Lines	-26 dB(38.8 mV)	0 dB(0.775 V)	+20 dB(7.75 V)	Phone Jack(TRS) *7	
STEREO [L, R] MONO/C INSERT IN GRP/AUX INSERT IN (1/7–8/14) AUX INSERT IN (1–6)					-10 dB(245 mV)				

*1 0 dB=0.775 Vrms.

*2 Balanced.

*3 Unbalanced.

*4 Balanced (T=HOT, R=COLD, S=GND).

*5 Unbalanced.

*6 Unbalanced (T=SIGNAL, R=GND, S=GND).

*7 Unbalanced (T=OUTPUT, R=INPUT, S=GND).

*8 n=56, 48, 40, 32 or 24

*9 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 specifications

Connection	Actual Source Impedance	For Use With Nominal	Output Level *1		Connector In Mixer
			Nominal	Max before Clip	
STEREO OUT [L, R] MONO/C OUT GRP/AUX OUT (1/7–8/14) AUX/GRP OUT (7/1–14/8) AUX OUT (1–6) MONITOR OUT [L, R, MONO/C] MATRIX OUT (1–8)	150 Ω	600 Ω Lines	+4 dB(1.23 V)	+24 dB(12.3 V)	XLR-3-32 type *2
CH INSERT OUT (1-n) *5 STEREO INSERT OUT [L, R] MONO/C INSERT OUT GRP/AUX INSERT OUT (1/7–8/14) AUX INSERT IN (1–6)	600 Ω	10 k Ω Lines	0 dB(0.775 V)	+20 dB(7.75 V)	Phone Jack(TRS) *3
PHONES OUT [L, R]	100 Ω	8 Ω Phones	10 mW	20 mW	Stereo Phone Jack *4
		40 Ω Phones	30 mW	75 mW	

*1 0 dB=0.775 Vrms.

*2 Balanced.

*3 Unbalanced (T=OUTPUT, R=INPUT, S=GND).

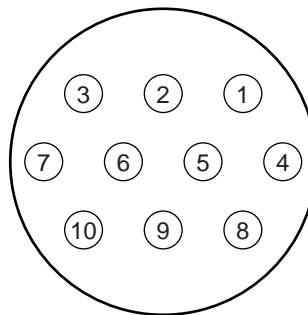
*4 Unbalanced.

*5 n=56, 48, 40, 32 or 24

Other

Connector wiring

Pin No.	Signal name
1	Power supply remote
2	+15 V
3	±15 V GND
4	+48 V GND
5	-15 V
6	+12 V
7	+12 V GND / power supply remote
8	Power supply remote
9	+48 V
10	FRAME GND

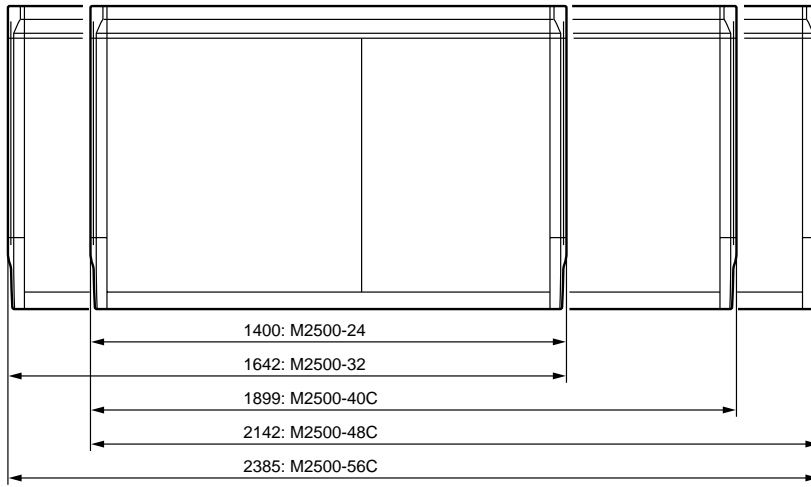


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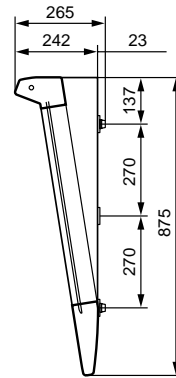
Power supply connection cable (3 m, 10 pin)

DIMENSIONS

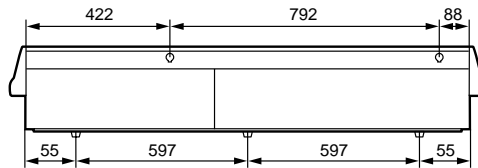
• Front



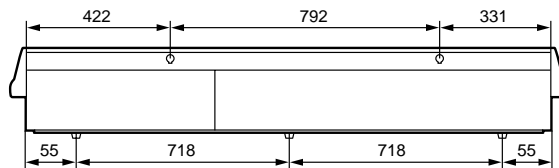
• Side



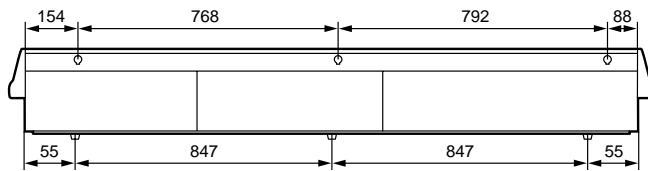
• Rear



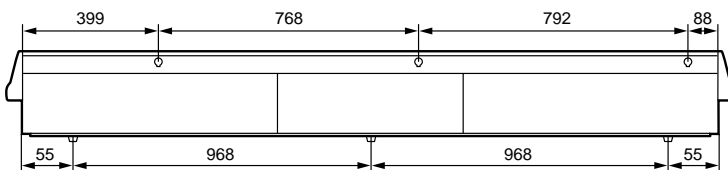
M2500-24



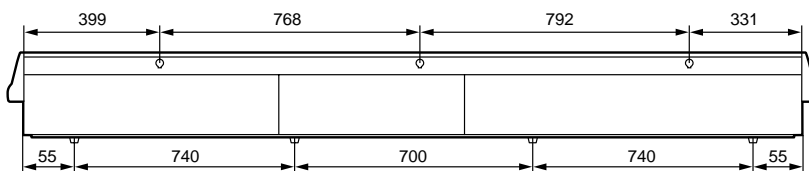
M2500-32



M2500-40C



M2500-48C



M2500-56C

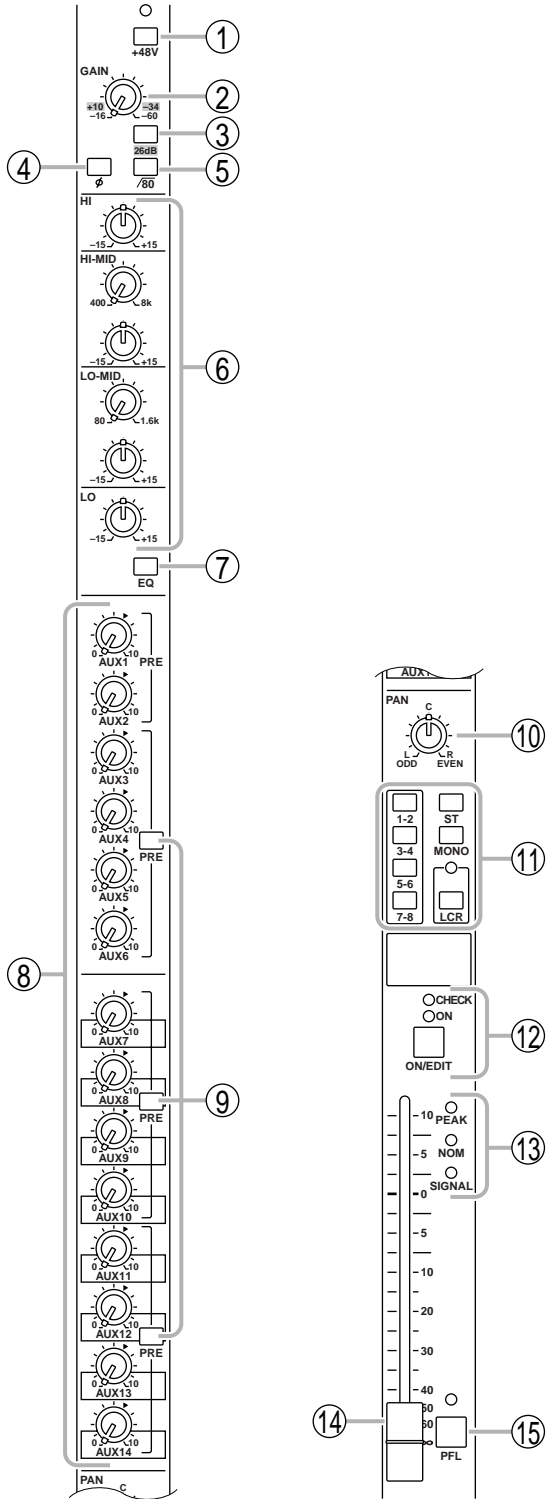
Units :mm

PANEL LAYOUT

• Control panel

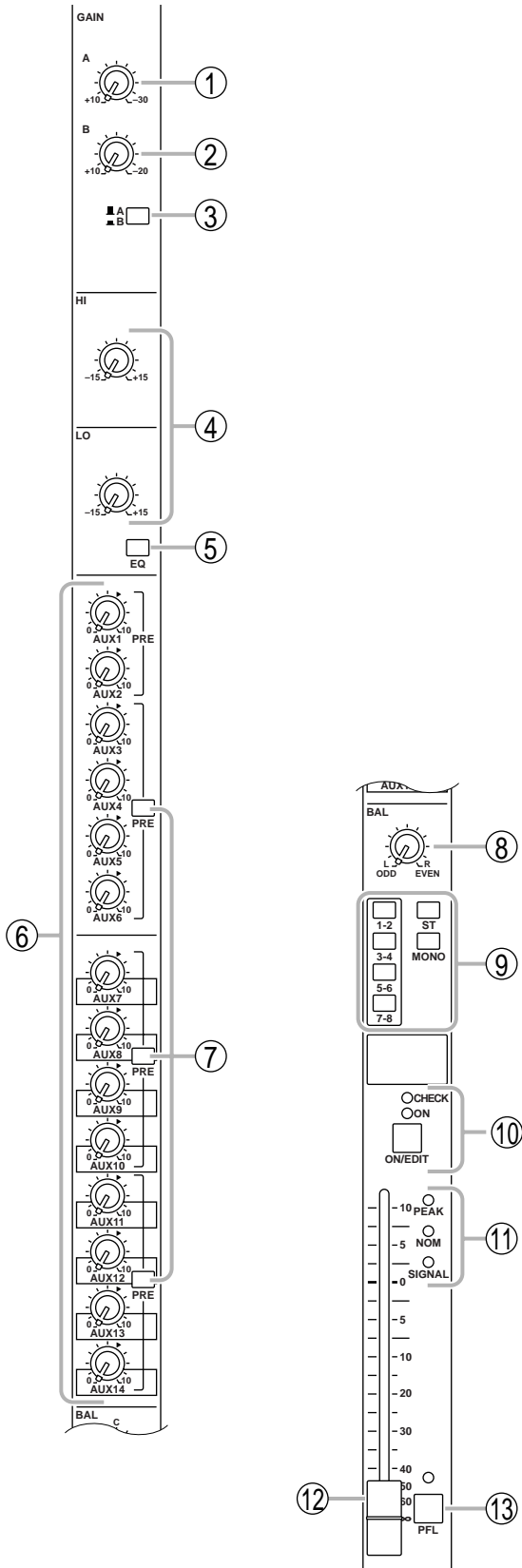
Input channel section

Monoaural input channels



- ① +48 V (phantom power) switch
- ② GAIN control
- ③ 26 dB pad switch
- ④ ϕ (phase) switch
- ⑤ 80 (high pass filter) switch
- ⑥ EQ controls
- ⑦ EQ switch
- ⑧ AUX 1–AUX 14 controls
- ⑨ PRE switches
- ⑩ PAN control
- ⑪ Channel assign switches
- ⑫ ON/EDIT switch / ON, CHECK indicators
- ⑬ PEAK/NOM/SIGNAL indicators
- ⑭ Channel fader
- ⑮ PFL (pre-fader listen) switch

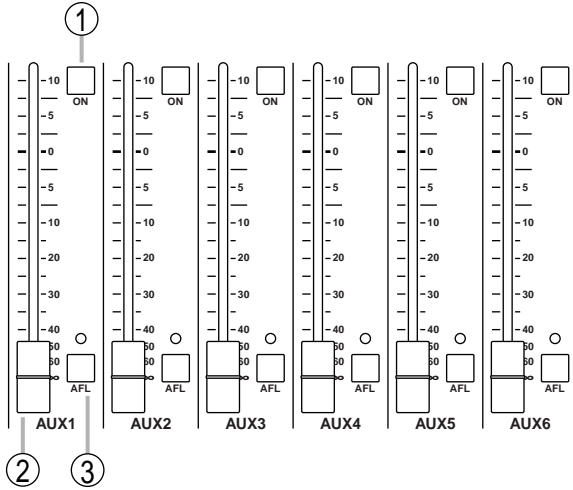
Stereo input channels



- ① GAIN A control
- ② GAIN B control
- ③ A/B switch
- ④ EQ controls
- ⑤ EQ switch
- ⑥ AUX 1–AUX 14 controls
- ⑦ PRE switches
- ⑧ BAL control
- ⑨ Channel assign switches
- ⑩ ON/EDIT switch / ON, CHECK indicators
- ⑪ PEAK/NOM/SIGNAL indicators
- ⑫ Channel fader
- ⑬ PFL (pre-fader listen) switch

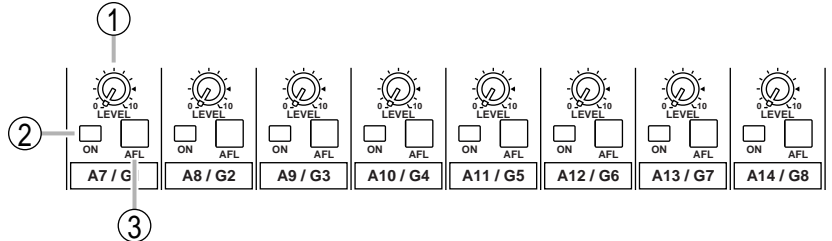
GROUP/AUX master section

AUX 1-6 section



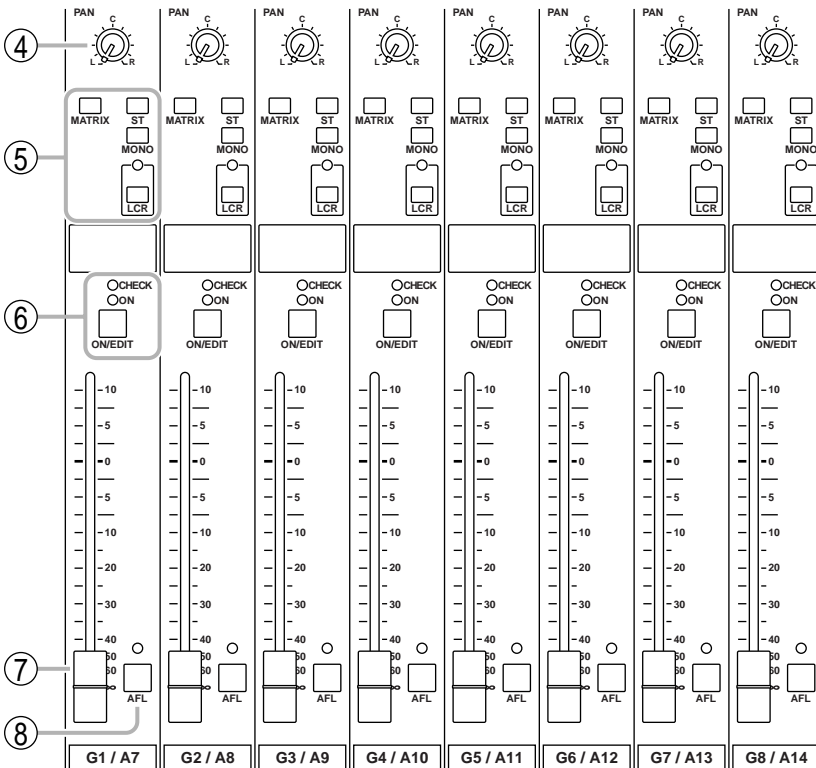
- ① ON switches
- ② AUX 1-6 master faders
- ③ AFL (after fader listen) switches

A7/G1-A14/G8 section



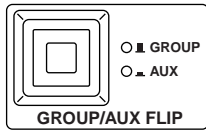
- ① LEVEL control
- ② ON switch
- ③ AFL switch

G1/A7-G8/A14 section



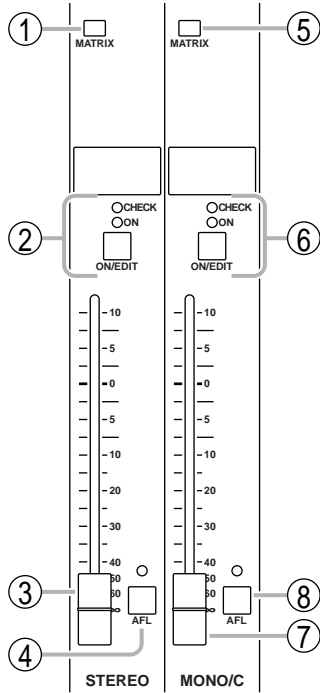
- ④ PAN control
- ⑤ Channel assign switches
- ⑥ ON/EDIT switch / ON, CHECK indicators
- ⑦ Fader
- ⑧ AFL (after fader listen) switch

GROUP/AUX FLIP switch



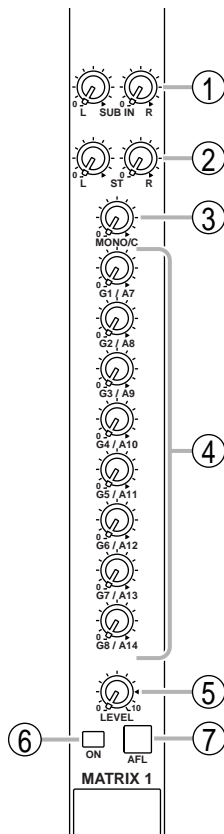
- When GROUP (■) is selected
- When AUX (■) is selected

Stereo/monaural master section
STEREO section MONO/C section



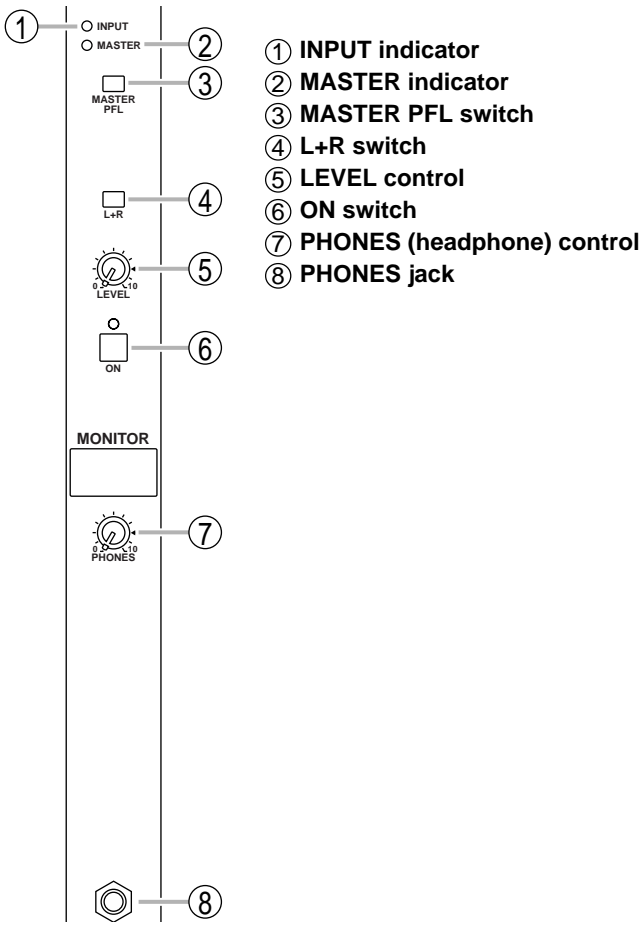
- ① MATRIX switch
- ② ON/EDIT switch / ON, CHECK indicators
- ③ Fader
- ④ AFL switch
- ⑤ MATRIX switch
- ⑥ ON/EDIT switch / ON, CHECK indicators
- ⑦ Fader
- ⑧ AFL switch

Matrix section

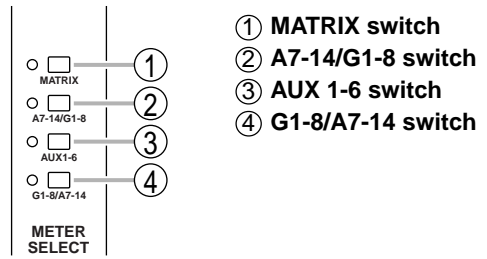


- ① SUB IN L/R control
- ② ST L/R controls
- ③ MONO/C control
- ④ G1/A7–G8/A14 controls
- ⑤ LEVEL control
- ⑥ ON switch
- ⑦ AFL switch

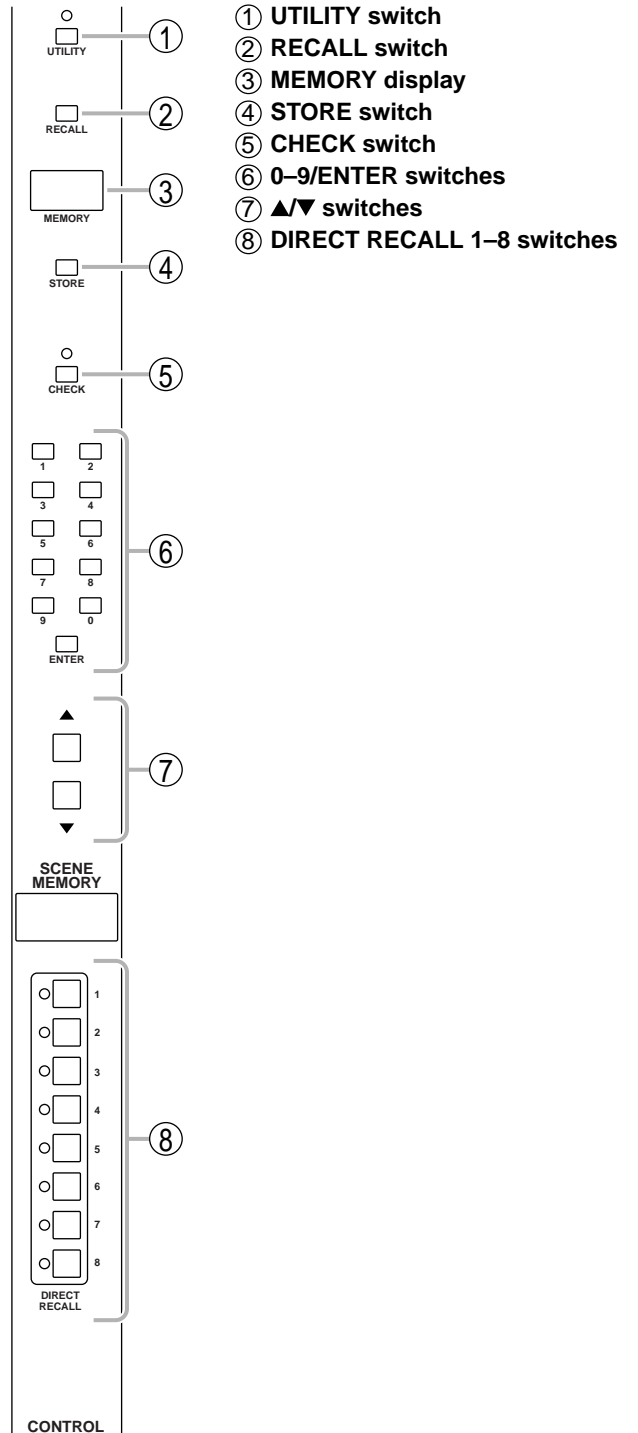
Monitor section



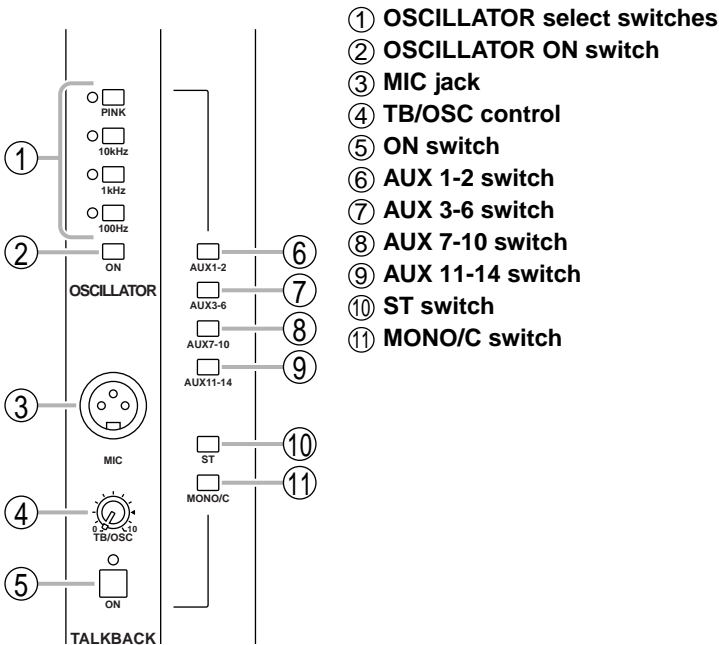
Meter select section



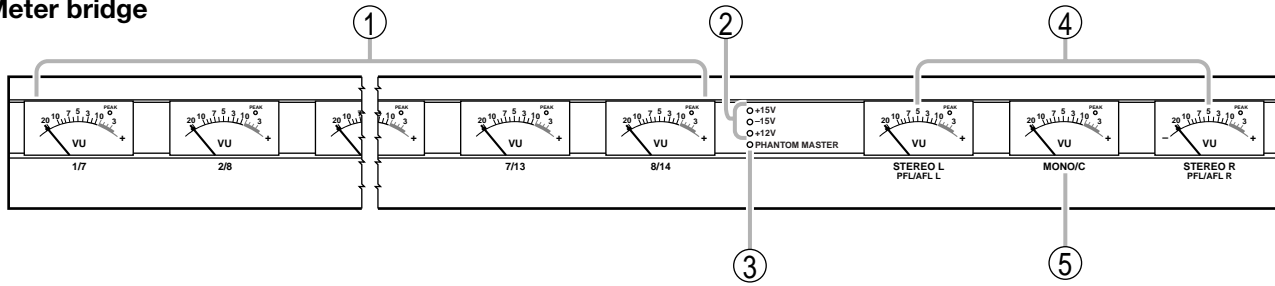
Control section



Talkback/oscillator section



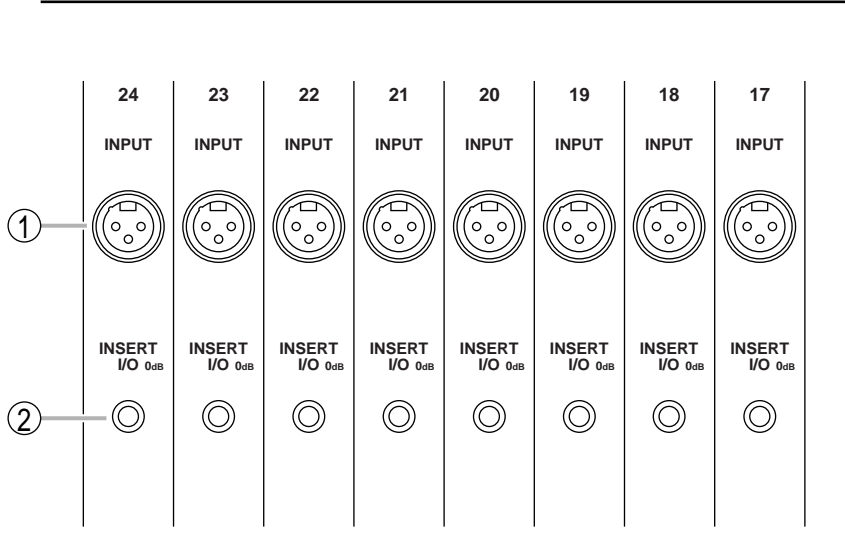
Meter bridge



- ① 1/7–8/14 level meters
- ② +15V/–15V/+12V indicators
- ③ PHANTOM MASTER indicator
- ④ STEREO, PFL/AFL level meters
- ⑤ MONO/C level meter

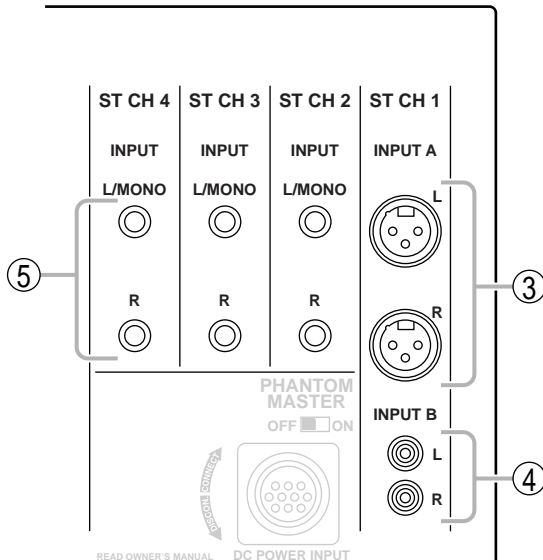
• **Rear panel**

Monaural input channel input/output jacks



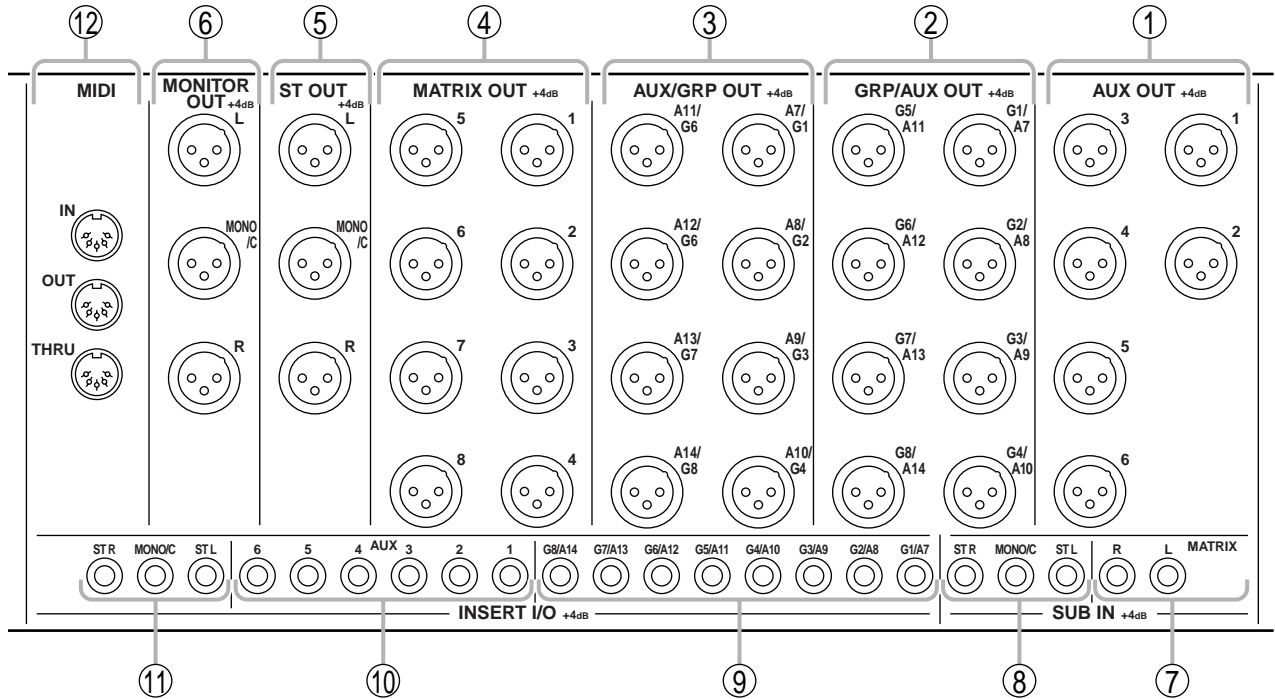
- ① INPUT jacks
- ② INSERT I/O jacks

Stereo input channel input/output jacks

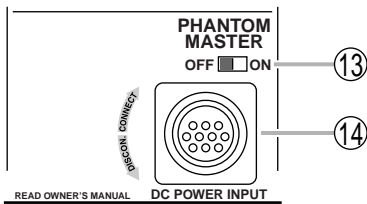


- ③ INPUT A jacks
- ④ INPUT B jacks
- ⑤ INPUT jacks

Master section input/output jacks

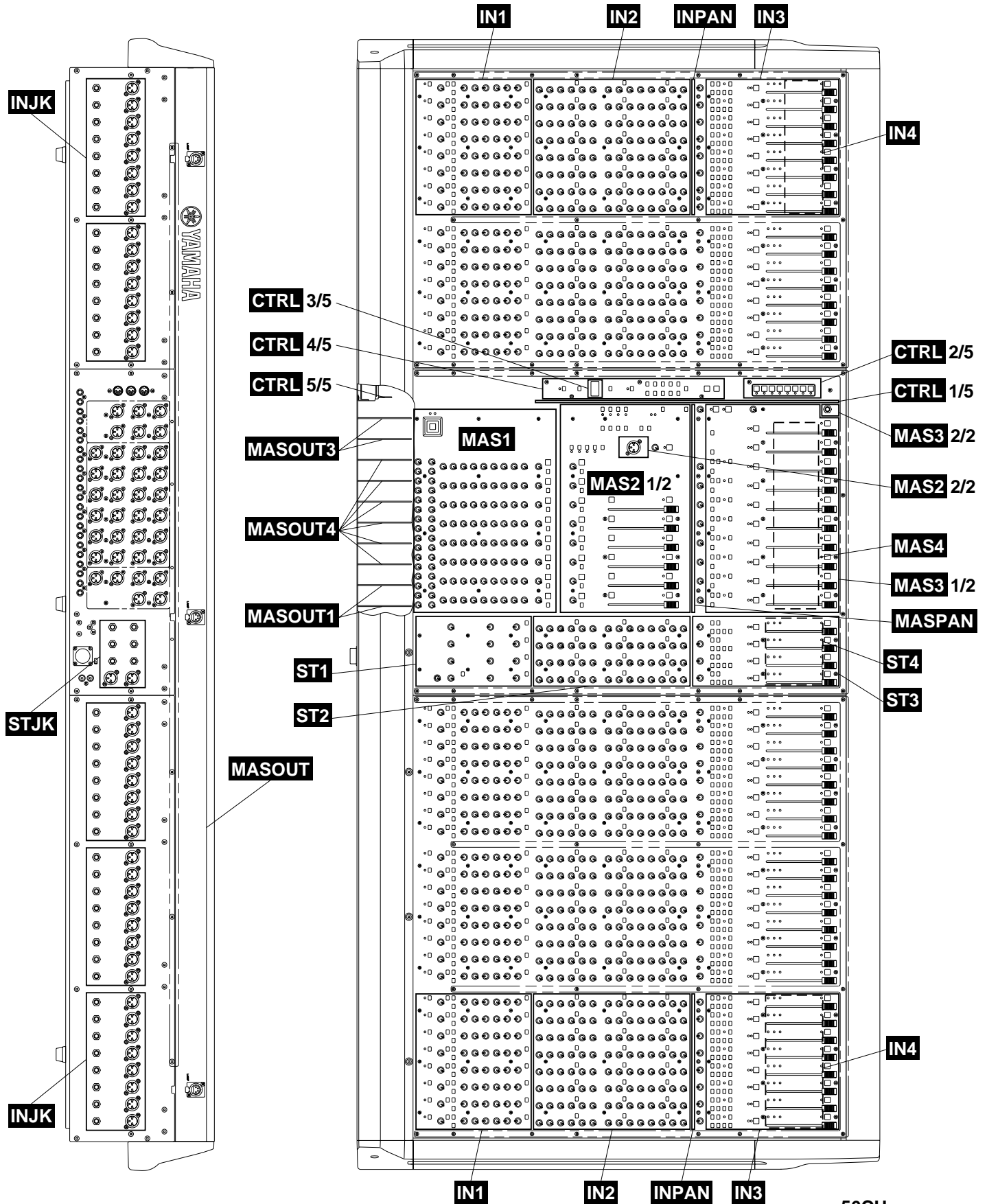


- ① AUX OUT jacks
- ② GRP/AUX OUT jacks
- ③ AUX/GRP OUT jacks
- ④ MATRIX OUT jacks
- ⑤ ST OUT, MONO/C OUT jacks
- ⑥ MONITOR OUT jacks
- ⑦ SUB IN MATRIX jacks
- ⑧ SUB IN ST L/R, MONO/C jack
- ⑨ INSERT I/O G1/A7–G8/A14 jacks
- ⑩ INSERT I/O AUX jacks
- ⑪ INSERT I/O ST L/R, MONO jacks
- ⑫ MIDI connectors



- ⑬ PHANTOM MASTER switch
- ⑭ DC POWER INPUT connector

CIRCUIT BOARD LAYOUT



• M2500-56C

