

**PROFESSIONAL
AUDIO MIXING CONSOLE
PM1200**

**OPERATING MANUAL
MANUAL D'UTILISATION
BEDIENUNGSANLEITUNG**

YAMAHA

ORGANIZATION OF THIS MANUAL

Thank you for purchasing a Yamaha PM1200 series mixing console. Whether you have purchased the 16-, 24- or 32-channel model, the principles of operation are the same. Only the number of input channels varies from model to model.

The INTRODUCTION, INSTALLATION, CONNECTIONS and FRONT PANEL OPERATIONS sections will introduce you to the basic principles and operations using your mixing console, while the sections on OPERATING TIPS and SYSTEM EXAMPLES give you advice on practical applications. The remaining sections (, JUMPERS, LEVEL DIAGRAM, INPUT/OUTPUT SPECIFICATIONS and GENERAL SPECIFICATIONS) provide you with full technical information on your mixing console, which you may find useful when planning signal routing and using the full capabilities of this unit.

This manual assumes that you have a basic familiarity with the operation of mixing consoles and with some of the terminology used in sound reinforcement and recording studio environments.

We suggest that you read through this manual in order to make the most of your mixing console and to understand it fully.

IMPORTANT NOTICE FOR THE UNITED KINGDOM

Connecting the Plug and Cord

WARNING: THIS APPARATUS MUST BE EARTHED

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

GREEN-AND-YELLOW : EARTH
BLUE : NEUTRAL
BROWN : LIVE

As the colours of the wires in the mains lead of this 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 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.

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INTRODUCTION

The Yamaha PM1200 mixing console has been designed primarily for sound reinforcement applications, but its versatility makes it suitable for other applications, including sophisticated broadcast and recording systems. Features include:

- Two different types of input channel in the same mixing console—single-input for microphone inputs and mono line sources, and two-input for stereo sound sources at both microphone and line levels. This enables more flexibility in working, and more inputs to be handled efficiently in less desk space.
- 2 pads and a rotary gain control on each input channel, allowing 0, -10, -20, or -30 dB of pad in addition to up to -40 dB of continuous adjustment.
- +48 V phantom powering individually switchable on each input channel.
- Single Input channel insert points, allowing Post-EQ compression, gating, etc.
- Clip and signal indicators on each channel, which are jumper-selectable as pre- or post-EQ indicators.
- 4 AUX sends which may be selected from the front panel as pre- or post-fader. Two stereo AUX returns may be routed to pairs of output groups or to the stereo mix.
- Three-band EQ with sweepable MID frequency (350 Hz-5 kHz) on single-input channels, and two-band EQ on stereo input channels. All channels feature a switchable 80 Hz high-pass filter.
- Four output groups with insert and SUB IN facilities.
- A sophisticated flexible muting system, allowing 4 independent combinations of input channels to be chosen for muting.
- A flexible CUE/SOLO facility, giving complete control over monitoring of signals.
- ON/OFF switches (with illuminated indicators for an instant visual check) for each input channel, AUX send, group, and stereo master, making for easy silent muting of inputs and final output.
- Durable, long-throw, conductive plastic calibrated faders give smooth, easy dynamic control over the mix.
- Two PM1200 mixing consoles may be linked together (via the full SUB IN facilities), and the muting, cue, and solo facilities may also be linked, providing control from one “master” console.
- Talkback can be routed to groups, the stereo mix, or the AUX outputs. A 1 kHz line-up oscillator is also provided.
- XLR-3 type connectors provide balanced inputs and outputs, wired in accordance with DIN standards, with shield (earth) to pin 1, “hot” to pin 2 and “cold” to pin 3. SUB inputs use 1/4-inch phone connectors, and INSERTs are TRS phone connectors.

INSTALLATION

The following points should be borne in mind when installing your Yamaha PM1200 mixing console (either in a permanent installation, or when temporarily installing it for sound reinforcement).

- **AVOID EXCESSIVE HEAT, HUMIDITY, DUST AND VIBRATION**

Keep the mixing console away from locations where it is likely to be exposed to high temperatures or humidity. Avoid excessively dusty locations, or locations subject to strong vibration, as these can cause mechanical damage.

- **AVOID PHYSICAL SHOCKS TO THE MIXING CONSOLE**

Dropping the mixing console or otherwise subjecting it to mechanical shock can damage it. Handle it with care. We recommend that if the PM1200 is to be taken on the road, a suitable hard case or flight case is used for transportation.

- **DO NOT OPEN THE UNIT OR ATTEMPT REPAIRS OR MODIFICATIONS YOURSELF, OTHER THAN THOSE OUTLINED IN THIS MANUAL**

The PM1200 mixing console contains no user-serviceable parts. All maintenance should be carried out by qualified Yamaha service personnel. See the section on JUMPERS for details of how your mixing console can be reconfigured to your needs.

- **TURN OFF POWER BEFORE MAKING OR BREAKING CONNECTIONS**

Always turn the power to the PM1200 OFF before connecting or disconnecting cables. This will help to prevent damage to the mixing console itself, as well as to other connected equipment.

- **HANDLE CABLES CAREFULLY**

Always plug and unplug any cables (including the AC power cable) by gripping the connector, not the cord itself.

- **CLEAN WITH A SOFT DRY CLOTH**

Do not use solvents (benzine, thinner, etc) to clean the mixing console. Wipe it clean with a soft dry cloth.

- **IF YOUR MIXING CONSOLE IS FITTED WITH A GROUNDING CONNECTION, USE IT**

All mixing consoles provided with a 3-wire power cable should be grounded, both for safety, and for optimum shielding against noise. If a 3-pin AC outlet is not available, or you suspect that the AC outlet is not grounded, a separate ground connection must be made from the chassis of the console to an earth ground. Cold water pipes are generally a good ground, provided they are not insulated by PVC plastic, or fitted with a water meter. Avoid using hot water or gas pipes. If a convenient confirmed ground is not available, you can create one by driving a length of copper pipe to a depth of at least 1.5 meters (5 feet) into moist earth, or by using a chemical type grounding rod.

- **ALWAYS USE THE CORRECT POWER SOURCE**

Make sure that the power requirements as printed on the rear panel of the Power Supply Unit match your local AC mains supply:

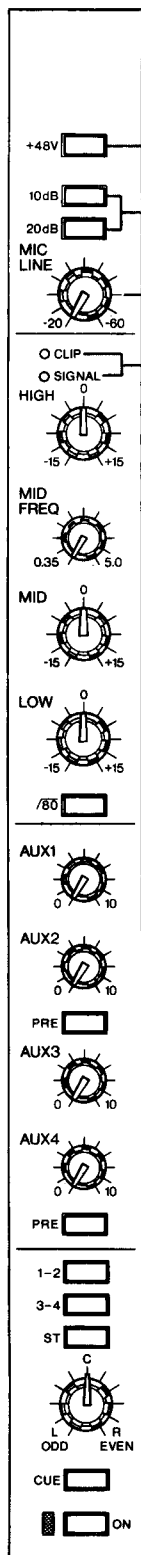
US and Canadian models	120 VAC, 60 Hz
General Model	220-240 VAC, 50 Hz

FRONT PANEL OPERATIONS

The front panel may conveniently be divided into several sections: the single-input input channels, the stereo input channels, the master section (together with the AUX master controls, and the stereo master and other functions). Accordingly, each will be described separately.

— SINGLE-INPUT INPUT CHANNEL —

This is the most common kind of input channel provided on the PM1200 series of mixing consoles. Working from top to bottom (roughly in signal order), the features of these channels are as follows:



① +48 V PHANTOM POWER SWITCH

This switches the +48 V phantom powering for condenser microphones ON or OFF for this input channel (when the switch is depressed, phantom powering is ON). However, phantom powering to all channels may be disabled by setting the PHANTOM MASTER switch to OFF.

IMPORTANT: Phantom powering should be ON only for balanced condenser microphones requiring an external power source. Unbalanced sources (line and microphone), self-powered condenser microphones and transformers with earthed center taps are liable to damage if phantom powering is applied.

② 10 dB and 20 dB PAD SWITCHES

These switches are both ON when down. They may be used singly or in combination in order to attenuate the signal entering the preamplifier stage by the number of decibels marked. If both switches are ON, the input will be attenuated by a total of 30 dB.

③ MIC/LINE GAIN CONTROL

This rotary control allows continuous attenuation of the input signal in conjunction with the attenuation pads by between -20 dB and -60 dB, allowing optimum matching with any signal source. This rotary control adjusts the gain of the head amplifier stage so that the optimum input signal level is achieved.

④ CLIP AND SIGNAL LED INDICATORS

These two LED indicators allow a useful check of the signal to the input channel. The SIGNAL indicator illuminates when a signal of 10 dB below the nominal level is received, and the CLIP indicator illuminates when the signal reaches 3 dB below the clipping point of the input channel circuit. If the CLIP indicator lights more than briefly on high-level transients, the MIC/LINE gain control and/or the attenuation pads should be used to attenuate the input signal.

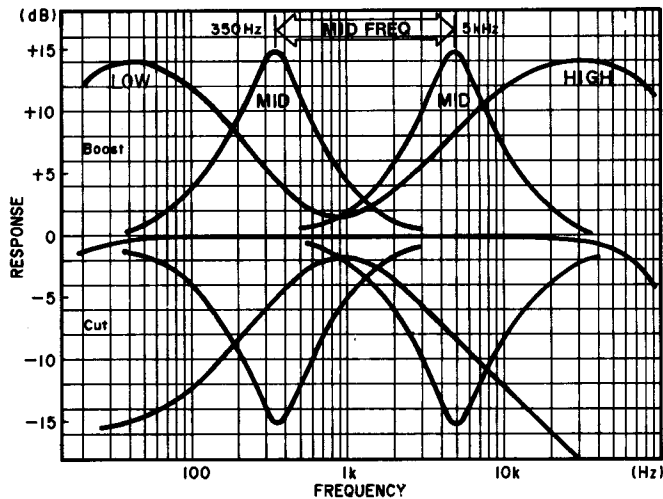
Note: As shipped, both these indicators operate post-EQ and pre-fader, as do the INSERT I/O points. This allows you to confirm the levels for signals sent to signal processors at the insert points.

However, the INSERT I/O points may be changed by internal jumper settings to be pre-EQ, pre-fader. If the insert points are changed, then the SIGNAL and CLIP indicator points may also be changed to be pre-EQ and pre-fader, to allow confirmation of the signal levels at the insert points.

5 EQUALIZATION CONTROLS

A three-band equalization circuit is provided, with shelving HIGH and LOW controls, and a peaking MID control with a sweepable center frequency (MID-FREQ).

Control	Maximum boost/cut	Frequency	Type
HIGH	± 15 dB	10 kHz	Shelving
MID	± 15 dB	350 Hz-5 kHz	Peaking
LOW	± 15 dB	100 Hz	Shelving



6 HIGH-PASS FILTER SWITCH (/80)

When ON (down), this switch provides a 12 dB/octave roll-off starting at 80 Hz. This may be used to eliminate wind noise, microphone "popping", or AC hum. This filter is included as part of the EQ section for all descriptions of facilities which are "pre-EQ" or "post-EQ".

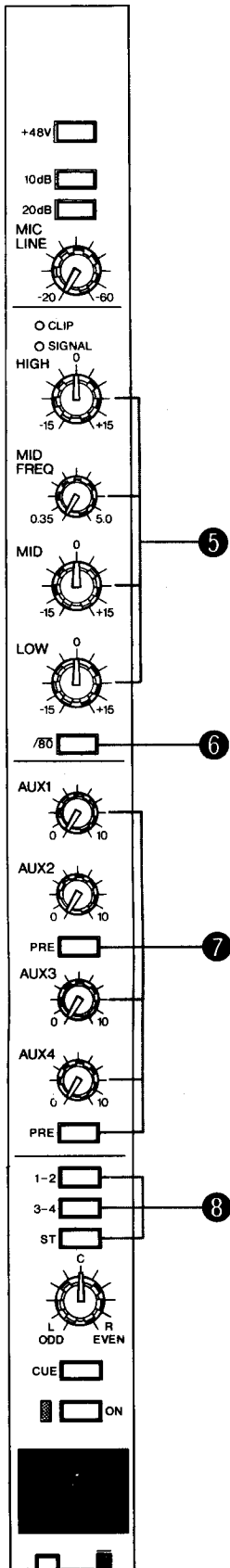
7 CHANNEL AUX CONTROLS (1-4) AND SWITCHES (1-2, 3-4)

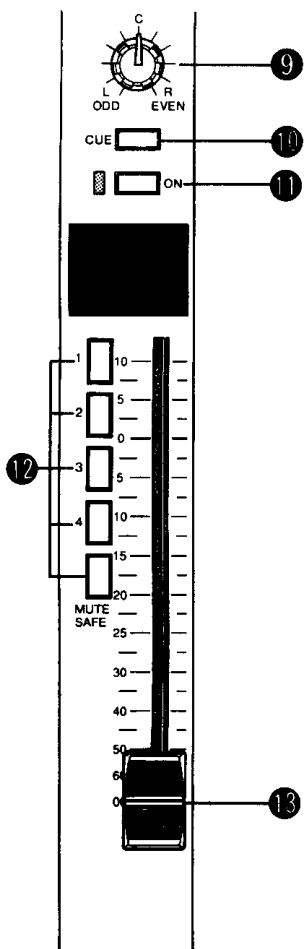
These rotary controls control the level of the signal fed from the input channel to the AUX busses. All channel AUX sends are summed, and the total AUX SEND level is determined by the master AUX SEND controls (above the group faders).

The two switches allow the assignment of the AUX sends to be either pre- (switch depressed) or post-fader (switch up) in two groups (1-2, and 3-4). When post-fader, the fader position will also affect the level of the signal sent to the AUX busses. In the pre-fader position, the AUX SENDs will also be pre-EQ (but this can be altered to post-EQ by having internal jumpers changed). Pre-fader AUX SENDs are especially useful for foldback mixes, and post-fader AUX SENDs for effects, but there is no hard and fast rule governing this.

8 CHANNEL ASSIGN SWITCHES (1-2, 3-4, ST)

These switches assign the final (post-fader and post-pan) signal from the input channel to the required group. There are three alternatives: groups 1-2, 3-4, and the Stereo outputs, which may be used singly or in combination. It is not possible using these switches alone to send an input channel to a single group (the PAN control must additionally be used).





9 PAN CONTROL

When this control is rotated fully counterclockwise, the post-fader output of this channel will be sent fully either to an odd-numbered group buss (1 or 3) if group assignment has been selected, or to the L buss of the stereo mix (if stereo assignment has been selected). Rotating the knob fully clockwise will send the output of this channel to an even-numbered output group buss (2 or 4) or the R buss of the stereo mix. Any intermediate setting will send the group signal to both busses (group or stereo) in proportion to the position of the PAN control. The "C" setting (center) sends the signal of this channel equally to both odd- and even-numbered groups or to the L and R busses of the stereo mix.

10 CUE SWITCH

When depressed, this switch adds the signal of the channel to the CUE buss (which can be monitored over headphones). To listen to one channel only, make sure that all other CUE switches are turned OFF.

However, this switch also serves another purpose. When the SOLO switch in the master section is set to ON, any channels with the CUE switch ON will be sent (post-fader) to the main buss. Any channels with this switch OFF will be muted.

11 ON SWITCH AND INDICATOR

When depressed (turned ON), the indicator will illuminate, showing that the signal from this channel is being sent to the specified busses. Turning this switch OFF will remove this channel signal from the mix, and may be used for minimizing noise in quiet passages for channels which are not needed at the time.

12 CHANNEL MUTING CONTROL (1-4 and MUTE SAFE)

The four MUTE buttons (1-4) are used to add the input channel to the "mute group(s)" corresponding to the button(s) depressed. Full details of this muting facility are given in the section on STEREO MASTER AND TALKBACK, AUX RETURNS, MUTE MASTER, ETC.

Pressing the MUTE SAFE button will remove the channel from all mute groups.

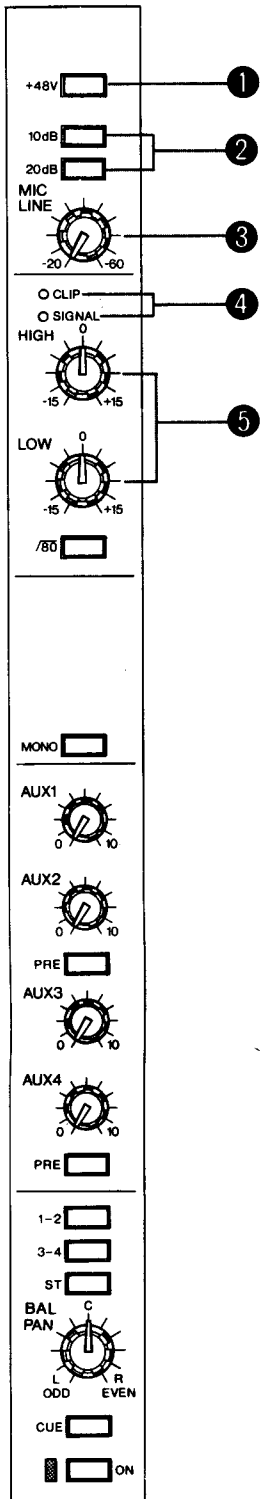
13 FADER

The long-travel, smooth-action conductive plastic linear fader permits precise adjustment of the final level of the signal from this channel to the assigned buss(es). The nominal position is marked at "0" by a pair of thick lines.

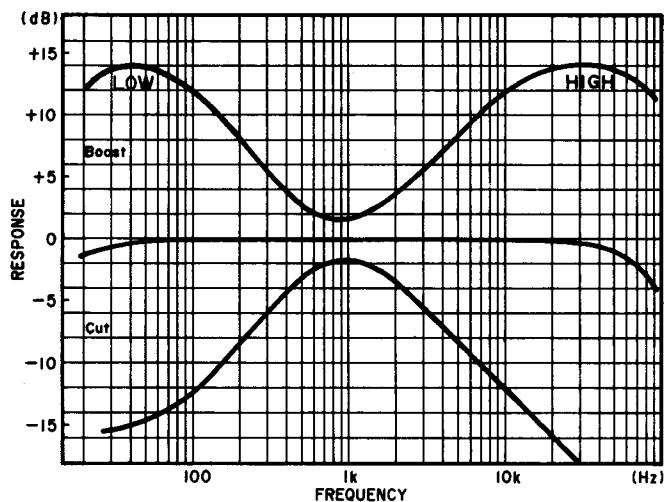
STEREO INPUT CHANNEL

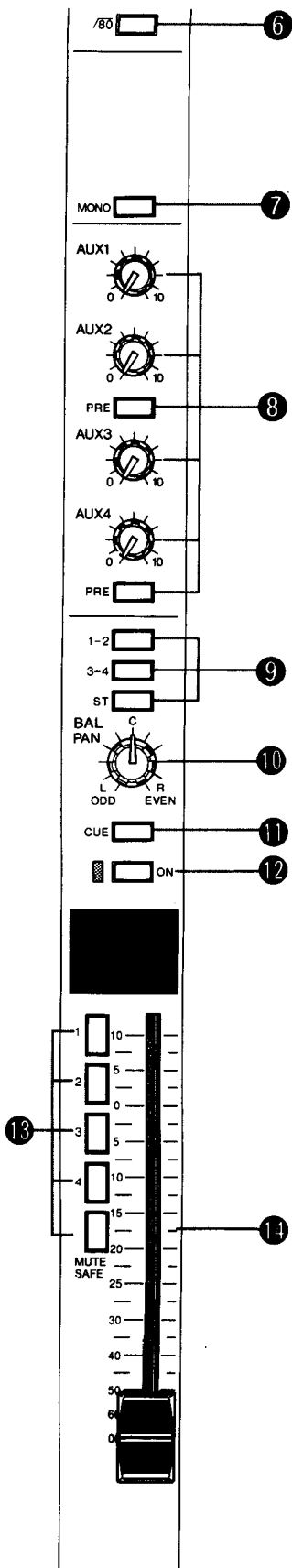
Two of these input channels are provided. As explained earlier, they allow the connection of a piece of equipment providing a stereo output (synthesizer, drum machine with internal level/pan mixer to a stereo output, effects unit, etc) while only using one input channel position. The facilities are much the same as on the single input channels, with a few differences, as described below:

- 1 +48 V PHANTOM POWER SWITCH**
As for single-input input channels. Remember, as a general rule, DO NOT USE phantom powering with line sources.
- 2 10 dB and 20 dB PAD SWITCHES**
As for single-input input channels.
- 3 MIC/LINE GAIN CONTROL**
As for single-input input channels.
- 4 CLIP AND SIGNAL LED INDICATORS**
As for single-input input channels. (The signal for indicators is detected by L,R positions.)
- 5 EQUALIZATION CONTROLS**
A two-band equalization circuit is provided, with shelving HIGH and LOW controls.



Control	Maximum boost/cut	Frequency	Type
HIGH	± 15 dB	10 kHz	Shelving
LOW	± 15 dB	100 Hz	Shelving





6 HIGH-PASS FILTER SWITCH (/80)

As for single-input input channels, this switch provides a 12 dB/octave roll-off at 80 Hz. This may be used to eliminate AC hum from electronic line sources.

7 MONO SWITCH

If the stereo input channel is to be used with a monaural source, this switch should be depressed. The monaural source should be connected to the L(MONO) connector on the back panel.

8 CHANNEL AUX SENDS (1-4) AND SWITCHES (1-2, 3-4)

As for single-input input channels.

9 CHANNEL ASSIGN SWITCHES (1-2, 3-4, ST)

As for single-input input channels.

10 BALANCE/PAN CONTROL (BAL/PAN)

In addition to acting as a PAN control (as in the single-input input channels when the MONO switch is pressed.), this control also affects the L/R balance of the input signal. The "C" position provides an equal balance between the L and R input signals of the channel. It operates post-fader (as with the PAN controls of the single-input input channels).

11 CUE SWITCH

As for single-input input channels.

12 ON SWITCH AND INDICATOR

As for single-input input channels.

13 CHANNEL MUTING CONTROL (1-4 and MUTE SAFE)

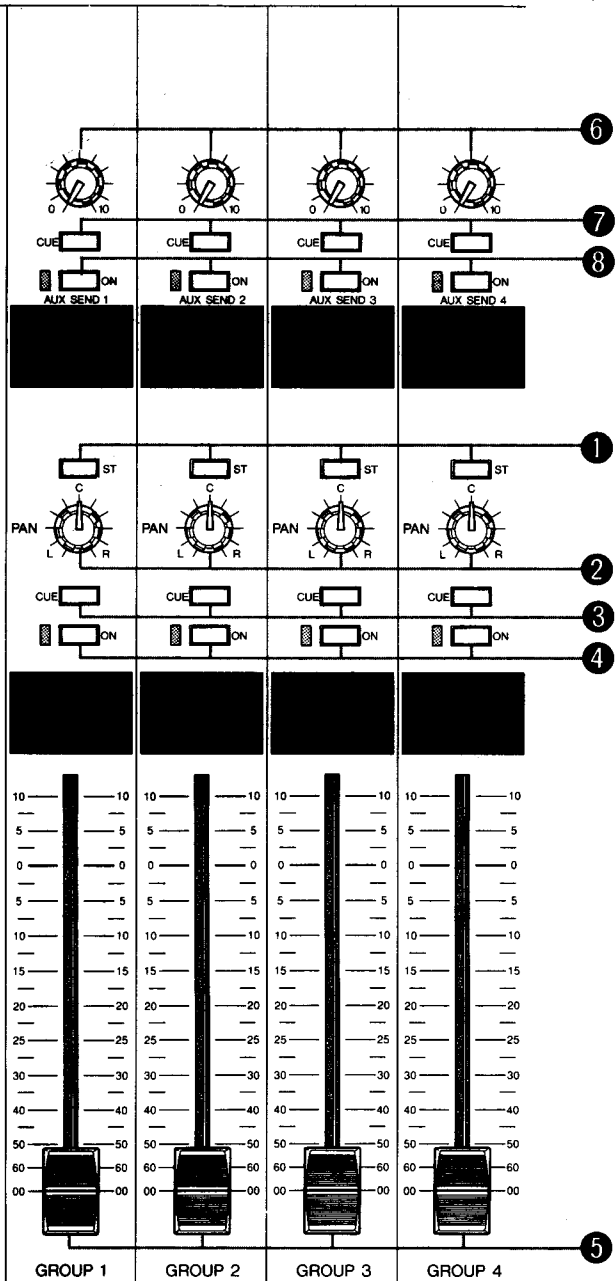
As for single-input input channels.

14 FADER

The long-travel, smooth-action conductive plastic linear fader permits precise adjustment of the final level of the signals from this channel to the assigned buss(es). This fader is, in fact, a ganged pair of faders operated by one control. The nominal position is marked at "0" by a pair of thick lines.

— MASTER SECTION —

As explained earlier in the sections on input channels, signals from the input channels may be assigned to pairs of groups. This grouping facility has many uses, for instance multi-track recording, or the ability to adjust the levels of whole groups of instruments (eg a drum kit) simultaneously without using twelve fingers on the input channel faders.



1 GROUP TO STEREO ASSIGN SWITCH (ST)

When depressed, this switch will route the output of the appropriate group (post-fader) to the stereo buss.

2 GROUP PAN CONTROL

When a group is routed to the stereo buss, this control alters the levels of the appropriate post-group fader signal sent to the L and R stereo busses. Turning it fully counterclockwise will send the group entirely to the L buss, and turning it fully clockwise will send it to the R buss. The "C" position sends the signal equally to the L and R busses.

3 GROUP CUE SWITCHES

These switches will add the signal of the appropriate group to the CUE buss. In the shipped configuration, this signal is pre-fader, but by having internal jumpers changed, this can be changed to a post-fader signal.

4 GROUP ON SWITCHES AND INDICATORS

When depressed, the appropriate indicator will illuminate, and the groups signal will be output. When up, these switches allow instant muting of the signals from the groups.

5 GROUP FADERS

These faders (of the same specification and calibration as the input channel faders) control the level of sound sent to from the groups to the GROUP OUT connectors, and to the stereo buss (if this has been assigned with the ST switches).

6 AUX SEND 1-4 (AUX SEND MASTER CONTROL)

These rotary controls control the overall level of the signal sent to the appropriate AUX SEND connector. They may be used for overall foldback level, or for adjusting the input level to a signal processor.

7 AUX CUE SWITCHES (1-4)

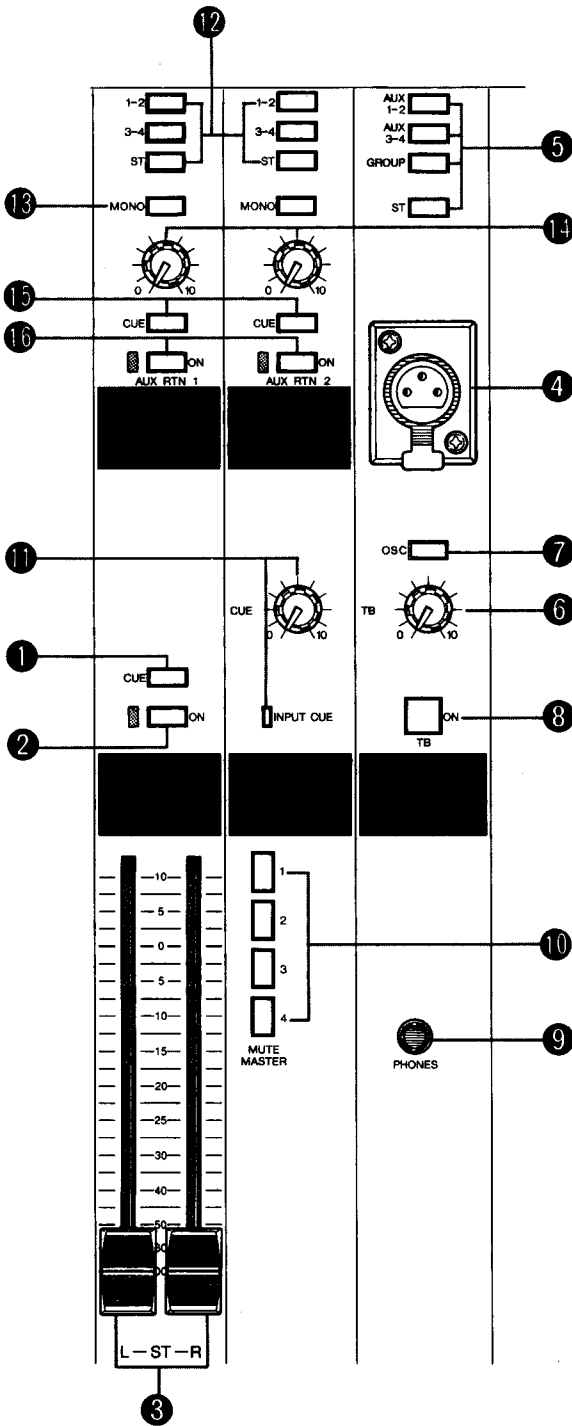
These switches add the signal of the appropriate AUX SEND to the CUE buss. As shipped from the factory, the signal sent to the CUE buss will be pre-AUX SEND, but by having the appropriate internal jumpers reset, this can be changed to be a post-AUX SEND signal.

8 AUX ON SWITCHES AND INDICATORS (1-4)

When these switches are depressed, the appropriate indicators illuminate, and the AUX SEND is enabled. When these switches are up, the AUX SEND signal is cut.

— STEREO MASTER AND TALKBACK, AUX RETURNS, MUTE MASTER, ETC —

In addition to the stereo master controls, this section deals with the other functions of the mixer (talkback, mute master, meters, etc) as described below:



1 STEREO CUE SWITCH

This switch adds the stereo signal to the CUE buss. As shipped, this signal is pre-fader, but by having internal jumpers reset, this signal may be made post-fader.

2 STEREO ON SWITCH AND INDICATOR

When this switch is depressed, the indicator will illuminate, and the stereo signal will be output. When this switch is up, no signal will be sent from the STEREO OUT connectors. Hence this switch may be used as a "master mute" facility.

3 STEREO MASTER FADERS

This pair of linear faders control the summed output of groups and individual input channels, regulating the level of the signal which is fed to the STEREO connectors. The configuration and calibration of these faders is the same as for input channel and group channel faders.

4 TALKBACK MIC CONNECTOR

This unbalanced XLR-3-31 type connector is provided for use with a talkback microphone (nominal 50-600 Ω). A gooseneck or headset type of microphone is suggested for easy hands-off operation. The wiring of this connector is as follows:

Pin	Signal
1	Ground
2	Signal
3	Ground

5 TALKBACK ASSIGN SWITCHES

When depressed, these switches will send the talkback signal to the appropriate buss(es): AUX 1-2, AUX 3-4, all GROUP busses, and the STEREO buss. Any combination of these may be chosen, allowing flexibility when using the talkback facility.

6 TALKBACK LEVEL CONTROL

This control adjusts the level of the talkback signal sent to the selected buss(es).

7 1 kHz OSCILLATOR SWITCH (OSC)

When depressed, and the TALKBACK switch is OFF, this switch sends a 1 kHz sine wave to the selected talkback buss(es). The level of this sine wave can be adjusted using the talkback level control. The sine wave is of high quality (<1 % THD @ +4 dB) and can thus be used for signal tracing, and also to provide a reference test tone at the beginning of a recording.

8 TALKBACK ON SWITCH

When this switch is ON (depressed), signals from the TALKBACK IN connector will be routed to the selected buss(es).

9 PHONES OUTPUT

This stereo headphone socket (standard 1/4 inch) is for use with headphones having a nominal impedance of 8 Ω to 40 Ω . The nominal output power is 1 mW to 3 mW respectively, and the maximum output power before clipping is 26 mW to 76 mW respectively. The output from the CUE buss is output through this connector.

10 MUTE MASTER SWITCHES (1-4)

These switches provide muting of "mute groups" selected by the MUTE switches on each input channel. Pressing a MUTE MASTER switch will cut out the signal from all channels which have the corresponding MUTE switch depressed. Pressing more than one MUTE MASTER switch will mute more than one mute group. Any channels which have their MUTE SAFE switch depressed will not be muted.

11 CUE LEVEL CONTROL AND INDICATOR

If the CUE switch of any input channel is depressed, this indicator will illuminate. The CUE level control adjusts the level of the CUE signal sent to the PHONES output, and the CUE OUT L and R outputs.

12 AUX RETURN ASSIGN SWITCHES (1-2)

The levels of the signals received at the AUX 1 and AUX 2 connectors are adjusted using the AUX RETURN LEVEL controls (14). The routing of these signals is then controlled by these switches. These signals may be routed to either a pair of output groups (1-2 or 3-4), or directly to the stereo buss.

13 AUX RETURN MONO SWITCHES (1-2)

If a mono signal is being used in AUX RETURN 1 or 2, it should be connected to the AUX RETURN L connector of the appropriate AUX loop, and the MONO switch should be depressed.

14 AUX RETURN LEVEL CONTROLS (1-2)

These controls adjust the level of the appropriate AUX RETURN signal which is fed to the selected buss(es).

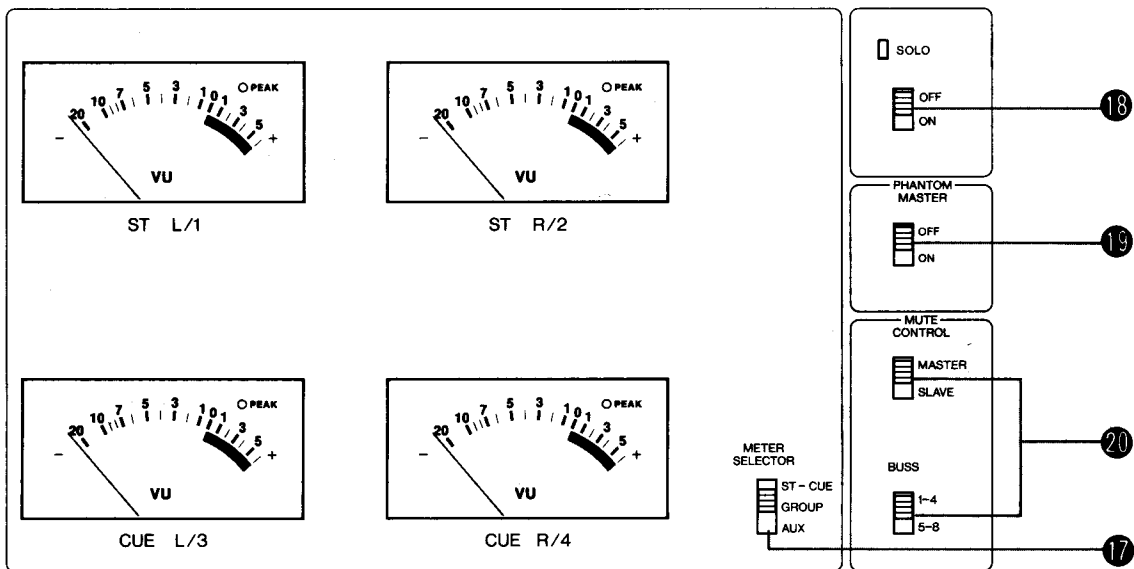
15 AUX RETURN CUE SWITCHES (1-2)

When these switches are depressed, the signal input at the appropriate AUX RETURN connector(s) is routed to the CUE buss. These signals are pre-AUX RETURN, so adjusting the AUX RETURN level controls will have no effect on the levels sent to the CUE buss.

16 AUX RETURN ON SWITCHES AND INDICATORS

When these switches are depressed, the appropriate AUX RETURN signal(s) will be routed to the selected buss(es). The indicator(s) will illuminate when depressed.

This facility is especially useful for instant introduction or removal of an effect from the mix, allowing you to compare "dry" with effected sound without having to make any other adjustments.



17 METERS AND METER SELECTOR SWITCH

The four large illuminated VU meters (0 VU = +4 dB) on the PM1200 series of mixers are multi-function meters, selectable with the 3-position METER SELECTOR switch. Each meter contains a peak LED (in the top right corner) which illuminates when a level of 14 dB is reached. In this way, clipping on high transient signals can be avoided, as the peak indicators respond to momentary transient signals which are not indicated by the VU meters.

When the METER SELECTOR switch is in the top (ST-CUE) position, the top pair of meters monitors the stereo L and R channels, and the bottom pair monitors the CUE L and R channels.

In the middle switch position (GROUP), the meters monitor the group levels, the number of the group being written under the meter.

The last switch position (AUX) monitors the AUX SEND levels, again, the number of the AUX group being written under the meter.

18 SOLO ON/OFF AND INDICATOR

This function changes the function of the Input channel CUE and AUX RTN CUE switches. When this switch is OFF, the CUE switches route the selected channels, etc to the CUE buss (headphones and CUE OUT). When this switch is ON, the indicator illuminates. The function of the CUE switches is now that of a SOLO switch-any Input channel, or AUX RTN which does not have its CUE switch depressed will be muted from the main busses. This is useful when carrying out soundchecks in rehearsal prior to a live performance.

When mixing during a live performance, make sure that this switch is OFF, to avoid accidental muting of channels if their CUE switch is pressed.

19 PHANTOM MASTER SWITCH

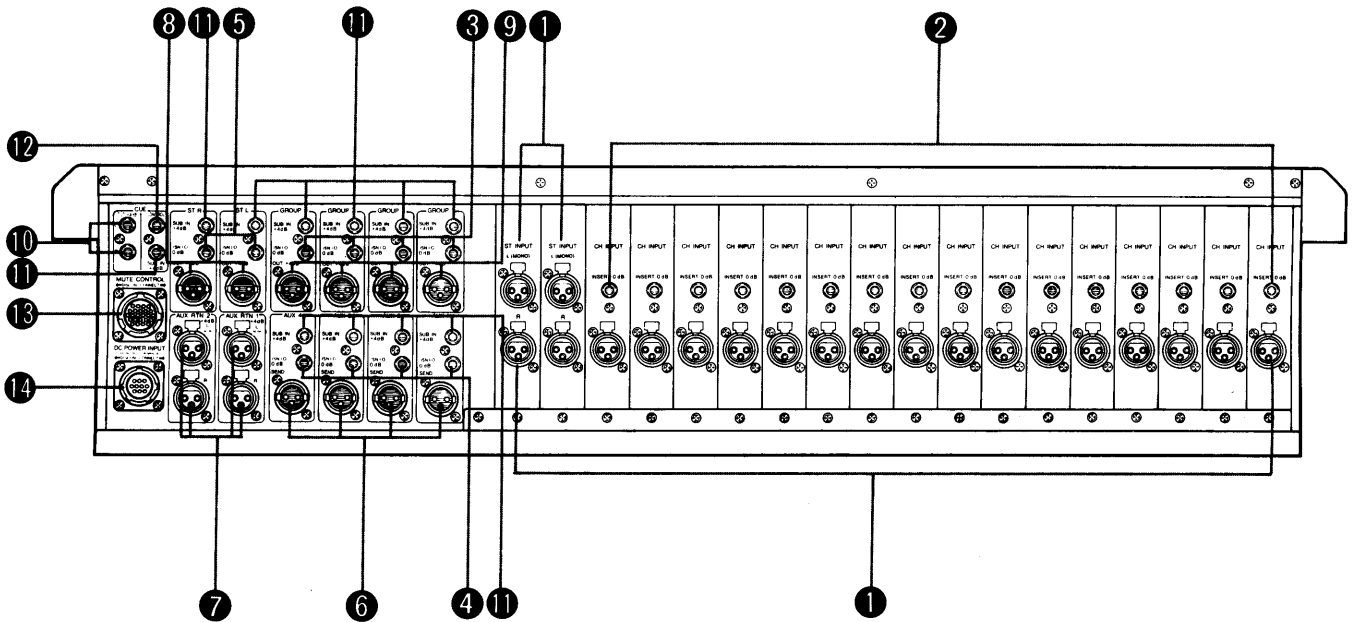
ALL phantom power can be disabled by setting this switch OFF. This is especially useful if work is being done with only line-level sources (eg remixing from multi-track tape) to avoid the possibility of accidentally pressing an input channel's +48 V switch and sending phantom power to the input channel connector.

20 MUTE CONTROL (MASTER/SLAVE AND 1-4/5-8) SWITCHES

These switches are for use when two PM1200 mixers are cascaded. The MUTE MASTER controls can be operated for both mixing consoles from one console alone. The MASTER/SLAVE switch determines whether the PM1200 will control (MASTER) or be controlled by (SLAVE) the MUTE MASTER controls of the other PM1200. If the PM1200 is being used in standalone mode, the muting functions will not work at all if this switch is set to "SLAVE".

The 1-4/5-8 switch assigns the number of the mute groups when the PM1200 is slaved to a PM1800, PM2800M or PM3000 mixing console. Since these mixing consoles have eight mute groups, it is necessary to determine the number which will be assigned to the PM1200's four mute groups when performing mute operations from the other console. This switch allows them to be assigned either as mute groups 1-4 or 5-8 with regard to the PM1800, PM2800M or PM3000. When the MUTE CONTROL MASTER/SLAVE switch is in the MASTER position, operation of this switch will have no effect.

CONNECTIONS



1 CHANNEL INPUT connectors

Each single-input input channel is fitted with an electronically balanced low-impedance XLR-3-31 type female connector. Each stereo input channel is fitted with two such connectors, allowing connection of stereo electronic keyboards, rhythm machines, tape sources, or stereo microphones while only using one input channel. If a mono source is to be connected to a stereo channel, use the L (MONO) connector and press the MONO switch of that channel ON. The wiring for all of these XLR type connectors is as follows (DIN specification):

Pin	Signal
1	Ground
2	Hot (+)
3	Cold (-)

Phantom power for condenser microphones (at +48 V) may be supplied from each channel, and this may be selected individually for each channel by using the +48 V control on the front panel. In addition, phantom powering may be completely disabled for all input channels by setting the PHANTOM MASTER switch on the front panel to OFF. See the sections on Input Channels for further details on phantom power.

Using the -10 dB, -20 dB and GAIN controls on each input channel, the gain of virtually any source - microphone or line, can be correctly matched.

MICROPHONE CABLES AND MICROPHONES CONNECTION

TO PREVENT HAZARD OR DAMAGE, ENSURE THAT ONLY MICROPHONE CABLES AND MICROPHONES DESIGNED TO THE IEC268-15A STANDARD ARE CONNECTED.

② CHANNEL INSERT IN/OUT connectors

A TRS (tip-ring-sleeve) unbalanced phone jack allows access to each single-input input channel between the equalization section and the channel fader. However, by changing internal jumpers, insertion may be made Pre-EQ. Stereo input channels are not fitted with these INSERT connectors. The INSERT level is a nominal 0 dB.

Possible uses for these connectors include compression and/or gating of signals prior to other effects being introduced, or equalization using a graphic equalizer, rather than the mixing console's own equalization. The wiring of these connectors is as follows:

Pin	Signal
Tip	Out (send)
Ring	In (return)
Sleeve	Ground

If no connector is inserted, the insert circuit is closed automatically, hence no jumpers are needed when the insert circuit is not being used.

③ GROUP INSERT connectors

In the same way that each single-input input channel is provided with a TRS insert point, each group is also provided with a similar insert point (four in all), wired and operating in the same way as individual channel insert points. This allows a signal processor (compression, gating, EQ, etc) to be inserted before the group fader. The INSERT level is a nominal 0 dB.

④ AUX INSERT connectors

A similar insert circuits is provided for each AUX circuit (four in all), allowing signal processing to be carried out prior to the AUX SEND of each AUX circuit. Wiring and operation of these TRS connectors is the same as that for input channel and group insert points. The INSERT level is a nominal 0 dB.

⑤ STEREO INSERT connectors

Two insert points are provided (L and R) to allow pre-fader signal processing to be carried out on the two STEREO outputs. Wiring and operation of these TRS connectors is the same as that for input channel, group and AUX insert points. The INSERT level is a nominal 0 dB.

⑥ AUX SEND (1,2,3,4) connectors

Four monaural balanced XLR-3-32 type connectors are provided for professional level (nominal +4 dB) output after the AUX SEND control. Wiring for these connectors is the same as for input channel connectors. The AUX OUTS can be used for effects send/return loops or for foldback.

⑦ AUX RETURN 1(L,R) ,2(L,R) connectors

Two pairs of balanced XLR-3-31 type connectors are provided to return stereo signals from the AUX 1 and AUX 2 effect/return loops. The level of these returned signals into the console is controlled by the AUX RTN 1 and AUX RTN 2 controls on the front panel. If only a single monaural signal is being returned, this should be routed through the appropriate AUX RETURN L connector, and the appropriate MONO switch engaged on the front panel AUX RTN section.

⑧ STEREO OUT (L, R) connectors

One pair of balanced XLR-3-32 type connectors provides a post-STEREO fader stereo output at professional levels (nominal +4 dB).

⑨ GROUP OUT (1-4) connectors

Four balanced XLR-3-32 type connectors provide post-GROUP fader outputs at professional levels (nominal +4 dB).

⑩ CUE OUT (L, R)

This pair of unbalanced phone connectors provide a stereo output at professional levels (nominal +4 dB) for the CUE facility (see the section on FRONT PANEL OPERATIONS for full details of this facility).

⑩ SUB IN (GROUP 1-4, STEREO L, R, AUX 1-4, CUE)

All these connectors are unbalanced phone connectors. They allow the connection of a sub-mixer to expand the basic capability of the PM1200 ("cascading"). For instance, a modern keyboard players will often use a small sub-mixer whose outputs can be fed into a two group SUB INs or the STEREO SUB INs to be summed with the PM1200's own group or stereo output signals. Any AUX SENDs from the sub-mixer can also be added to the PM1200's AUX send signals by connecting the sub-mixer's AUX OUTs to the PM1200's appropriate AUX SUB INs. The CUE signals of two mixing consoles can also be summed by connecting one PM1200's CUE OUT to another PM1200's CUE SUB IN.

⑪ CUE CONTROL

This stereo-type phone connector is for use when another PM1200 mixing console is being used in cascade (either as a master or a slave). It does not carry an audio signal, but carries control information for the CUE facility. Since the CUE facility can be used as CUE or SOLO function, this connection allows the switching of the CUE function on a cascaded PM1200. In this case, there is no need to assign either PM1200 as "Master" or "Slave". When making this connection, ensure that the two phone connector are "in phase" (tip-tip, ring-ring, sleeve-sleeve).

⑫ MUTE CONTROL CONNECTOR

This connector is another connector for use when cascading two PM1200 mixing consoles. Like the CUE CONTROL connector, it does not carry an audio signal, but control information as to which groups are being muted. A switch on the front panel determines whether an PM1200 functions as "Master" or "Slave" with regard to the muting function, and another switch determines the mute group buss number for the other mixing console when the master mixing console is a PM3000 or PM1800. See Page 14 (MUTE CONTROL SWITCHES) for details.

The connecting plug is SRCN6A25-24 type (made by JAE).

⑬ DC POWER INPUT CONNECTOR

This connector is used to connect the locking umbilical cable to the PW1200 power supply.

CAUTION: Always make sure that the power to the PW1200 is turned OFF before connecting or disconnecting this connector.

THE PW1200 POWER SUPPLY

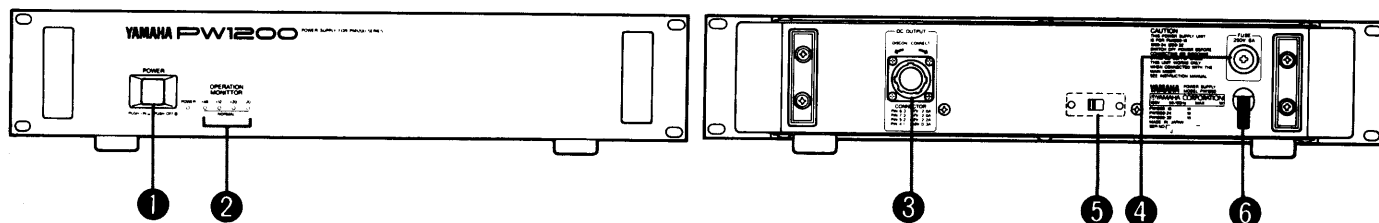
The PW1200 is a rack-mountable power supply designed to provide power for the PM1200 series of mixers. Since it is specifically designed for use with these mixers, DO NOT attempt to use it to supply power to any other equipment, or use any other power supply with your PM1200 mixer. (The PW1800 Power supply is also usable for PM1200 mixer.)

There are two export models of the PW1200 power supply - a 120 VAC model for use in the USA and Canada, and a general model for use elsewhere in the world. The general model is switchable between 240 VAC and 220 VAC.

MAKE SURE THAT YOU ARE USING THE RIGHT MODEL FOR YOUR LOCAL POWER SUPPLY!

FRONT PANEL

REAR PANEL



FRONT AND REAR PANEL

1 Power switch (POWER)

When this switch is depressed, AC power is supplied to the PW1200, and the correct DC voltages are supplied to the PM1200 console via the umbilical cable. The LED next to this switch indicates when the power is on.

2 Operation monitor

There are 4 green LED indicators to monitor the power supplied to the PM1200 mixing console (+48, +12, +17 and -17 volts). In normal operation, these LEDs should all be lit. If one or all go off, it means that there is a fault in the power being supplied to your PM1200. Contact your YAMAHA service center if this happens.

3 Umbilical connector

This locking multi-pin female connector supplies regulated power to the PM1200 from the PW1200. To lock the connector into place, push and turn clockwise. Reverse to unlock and remove the connector.

CAUTION: Always make sure that the power to the PW1200 is turned off before connecting or disconnecting this connector to or from either the console or the PW1200.

4 Fuses

This is the primary fuse of the PW1200 power supply. If it is blown replace it only with a fuse of the same current rating and type (6 A 250 V slow-blow for USA and Canadian model, T3.15A 250 V slow-blow for the general model).

Note: There are also internal fuses in the PW1200, as follows:

USA and Canadian model

- +17 VDC 6 A 250 V slow-blow
- 17 VDC 6 A 250 V slow-blow
- +12 VDC 6 A 250 V slow-blow
- +48 VDC 2 A 250 V slow-blow

General model

- +17 VDC T 6.3 A 250 V slow-blow
- 17 VDC T 6.3 A 250 V slow-blow
- +12 VDC T 6.3 A 250 V slow-blow
- +48 VDC T 2 A 250 V slow-blow

5 Voltage selector switch (general model only)

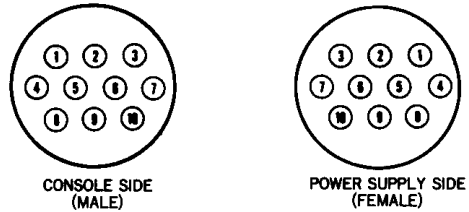
This switch selects the input voltage to the PW1200 to be either 220 V or 240 V. Make sure that it is set correctly for the voltage in your area.

6 Power cable

Used to connect the PW1200 to the AC mains.

PW1200 UMBILICAL CONNECTOR PIN ASSIGNMENTS

Pin	Function
1	E (+48 V)
2	E (+12 V)
3	E (± 17 V)
4	+48 V
5	+12 V
6	+17 V
7	-17 V
8	GND
9	DETECT A
10	DETECT B



Umbilical Connector Pin Assignments

GENERAL SPECIFICATIONS

Dimensions

HEIGHT 3-1/2 inches (88 mm) (excluding feet: add 10mm for feet)

DEPTH Overall, 13-3/16 inches (334.5 mm). Behind panel, 11-3/4 inches (299.5 mm)

WIDTH 18-7/8 inches (479 mm)

Weight

22 lb (10 kg)

Outputs

+17 VDC @ 1.8 A

-17 VDC @ 1.8 A

Ground (common) for 17 V

+12 VDC @ 1.5 A

+48 VDC @ 0.3 A

Ground (common) for 12 V

Chassis ground

AC Requirements

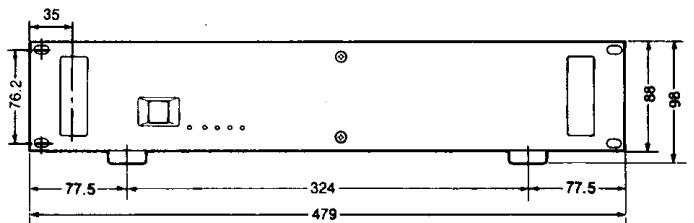
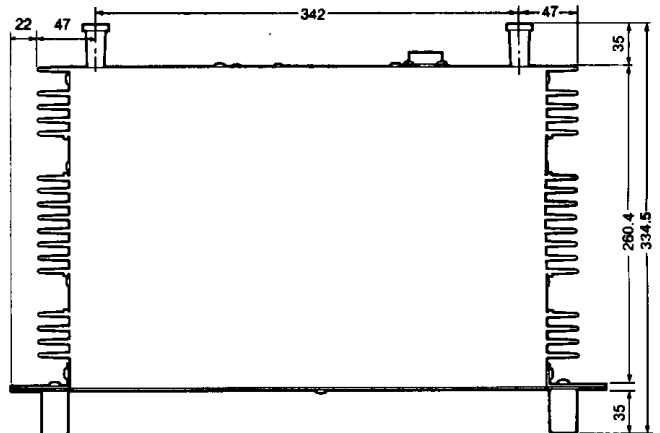
US and Canadian models: 120 V AC, 60 Hz

General model: 220/240 V (switch selectable),
50/60 Hz

Umbilical cable

Multi-conductor cable with locking connectors to supply power to the PM1200 console. Approximately 10 ft (3 meters) long.

*Specifications and appearance subject to change without notice



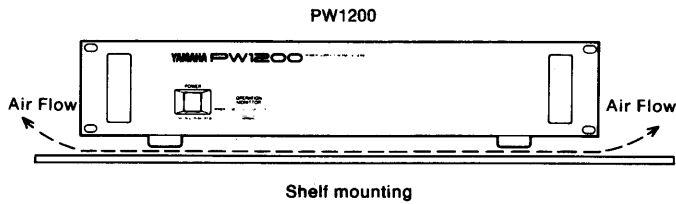
DIMENSIONS

Unit: mm

MOUNTING

Shelf Mounting

The PW1200 can be used on any flat, level surface as long as there is adequate ventilation. Do not remove the feet as this would block airflow through the bottom panel.



Permanent-installation Rack Mounting

The PW1200 can be mounted in any standard 19" electronic equipment rack. The rear panel of the rack should be left open to promote smooth airflow. Rear to the diagrams as below for ideal cooling configuration.

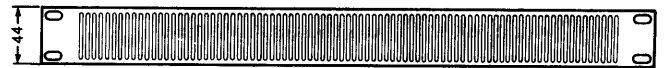
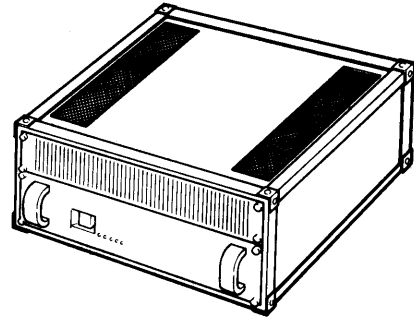
*One vented blanking panel (1U size) is necessary for each PW1200.



Rack mounting with vented blanking panels

Portable Rack Mounting

Road cases must be durable enough to withstand rough handling and airline travel. Use a vented blanking panel (1U size) above the PW1200 (like that shown below).



Blanking panel

Unit: mm

YAMAHA VP1 Ventilation panel may be provided as an optional accessory (open area should be at least 35% of total area).

CAUTION!

If unit(s) are to be used in a rack mounting installation, it is recommended that unit(s) should be used with blanking panel(s) as above.

OPERATING TIPS

As with every complex piece of equipment, care and practice are needed in order to obtain the best results. The following tips may serve as guidelines to help you get the best from your system:

- Use the GAIN and attenuation pads as sparingly as you can without inducing clipping. Overuse of these attenuators can result in a poor signal-to-noise ratio, as the mixing console's amplification must be used to compensate for the attenuation. Even a quality mixing console such as the PM1200 can introduce noise into the system.
- Remember that VU meters are "average" meters - not indicators of peak signal. Their sluggish response (by comparison with peak meters) means that simply "watching the needles" to guard against clipping is not a recommended practice. Watch the peak level LEDs on the meters and SIGNAL and CLIP indicators of individual input channels, and more importantly, use your ears, which, after all, are the ultimate test.
- Input transformers are an optional extra for the PM1200 series. There are pros and cons associated with the use of input transformers, and a full discussion of these is beyond the scope of this manual. However, you may care to look at this option as a possibility if you are plagued by noise and hum.
- The 1 kHz oscillator can be used as a test signal when tracing signals. For instance, if an effects loop is not returning, use of the oscillator, the PM1200's meters, and the meters on the signal processor can tell you how far the signal has reached in the chain, without the necessity for a test tape or program.

- Intelligent use of the mute groups can make the task of mixing less complex. For example, assume input channels 1-5 are used for drums, input channels 6-8 are used for percussion, and input channel 9 is used for bass. The following muting buttons are pressed on each input channel:

Input channels	Mute buttons
1-5 (drums)	1,3
6-8 (percussion)	2,3
9 (bass)	3,4

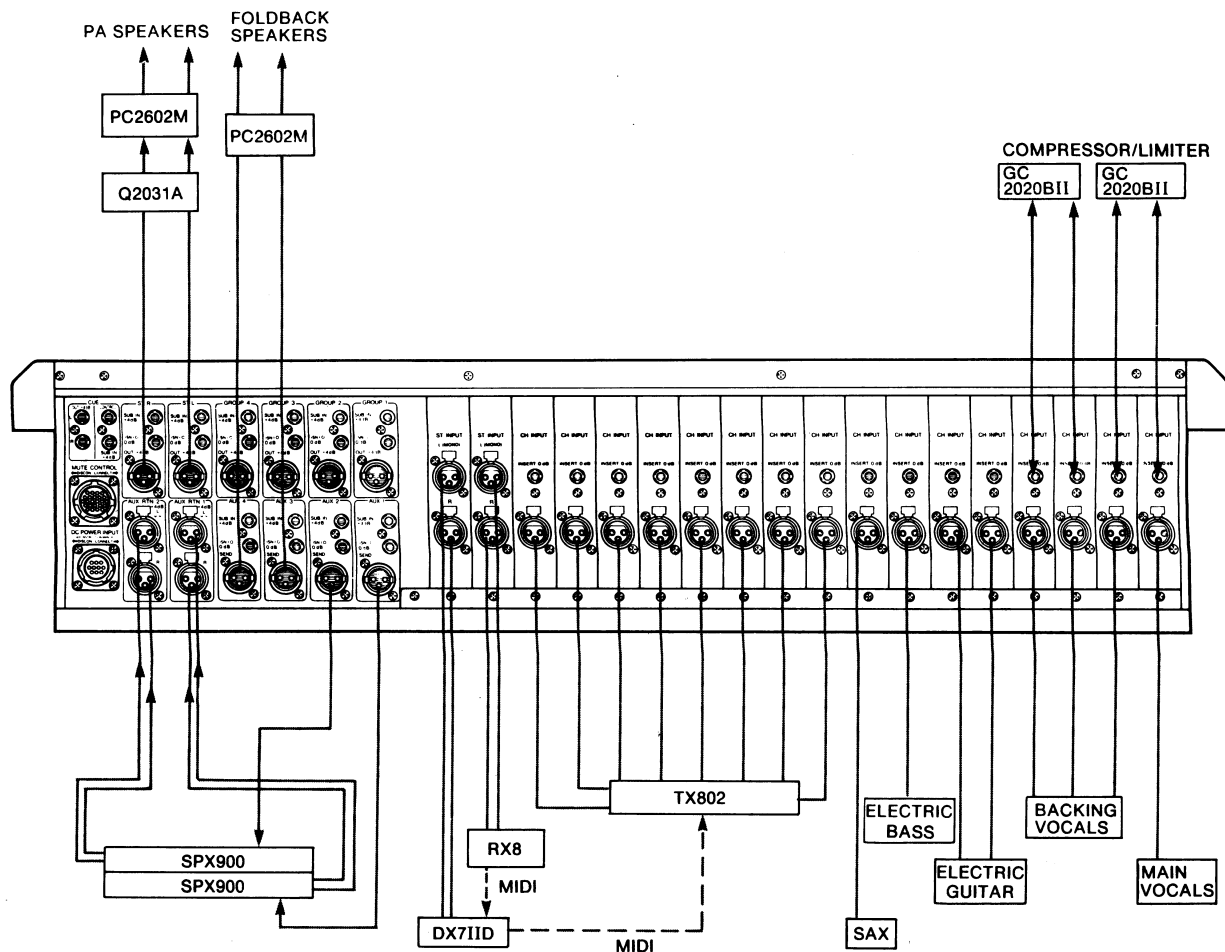
Pressing the following MUTE MASTER buttons will mute the following instruments:

MUTE MASTER	Instruments muted
1	drums
2	percussion
3	drums and percussion and bass
4	bass
1+4	drums and bass
1+2	drums and percussion
2+4	percussion and bass

This can save a lot of time and trouble when dropping instruments in and out of the mix.

SYSTEM EXAMPLES

LIVE SOUND REINFORCEMENT



In this example, a 16-channel PM1200 is being used as a sound reinforcement mixing console for an electronic rock group. Two stereo channels are being used to accept the stereo inputs from a DX7IID synthesizer, and an RX8 rhythm programmer. The lead vocal microphone is fed into the mixer, as are the backing vocal microphones and two microphones which are used to capture the ambient sound from the electric guitar and bass speakers.

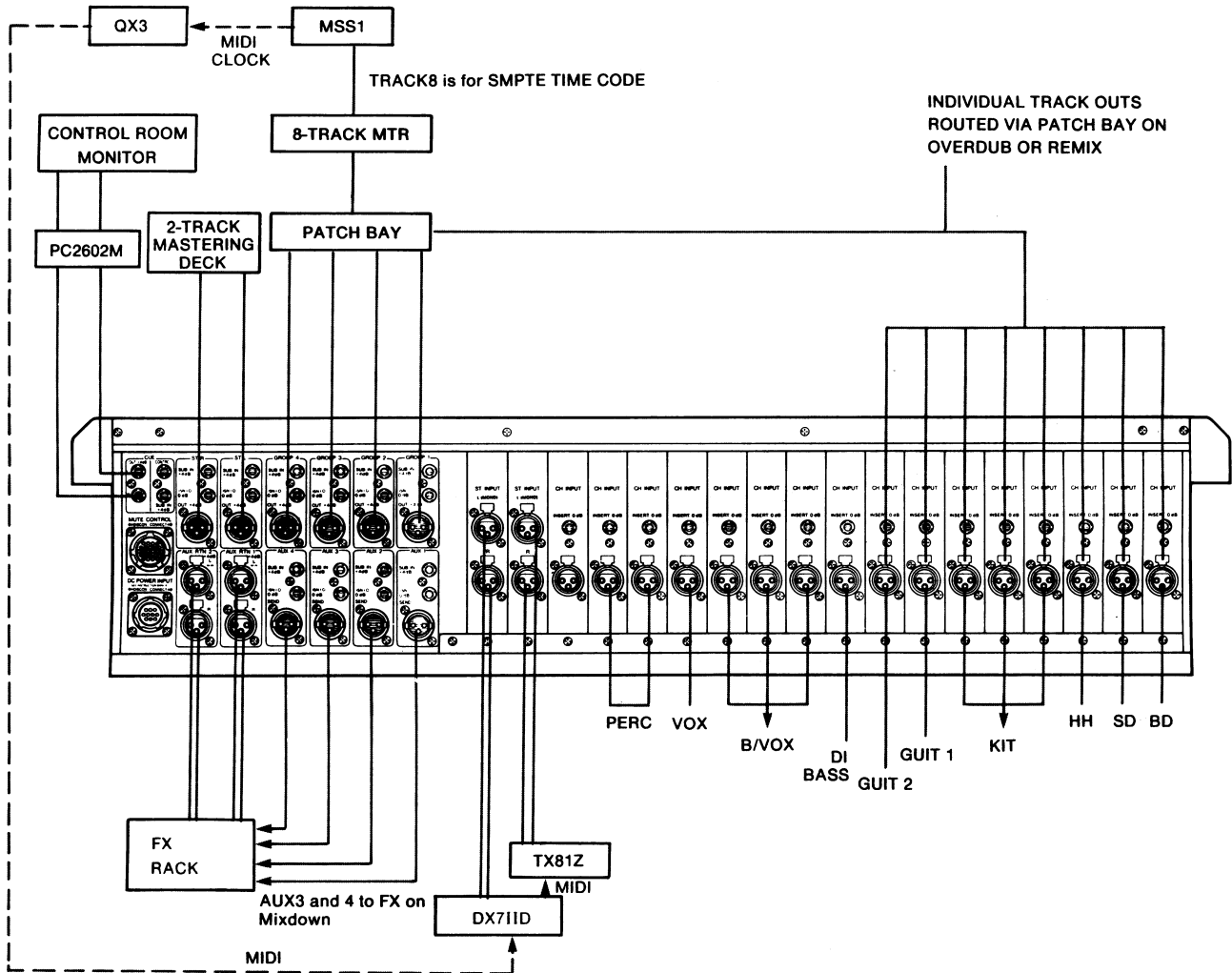
Two SPX900 digital effects units are used to provide reverb, effects, etc, and these are fed from and to the AUX1 and AUX2 busses. The AUX 3 and 4 busses are used for on-stage foldback.

MICROPHONE CABLES AND MICROPHONES CONNECTION

TO PREVENT HAZARD OR DAMAGE, ENSURE THAT ONLY MICROPHONE CABLES AND MICROPHONES DESIGNED TO THE IEC268-15A STANDARD ARE CONNECTED.

The main sound (from STEREO OUT) is fed through a two-channel graphic equalizer (Q2031A), to a stereo power amplifier (PC2602M) and speakers.

RECORDING IN AN 8-TRACK STUDIO



Though there are only four output groups on the PM1200, by using a patchbay, an 8-track multi-track recorder can be used successfully, recording 4 tracks at a time. Using MIDI instruments and a sequence recorder (such as the C1 with SEQUENCE, or the QX3), and using an SMPTE code track recorded on track 8 of the multi-track tape deck to synchronize tape to MIDI (with the MSS1), all MIDI-controlled instruments can be recorded onto tape in one take, only using two tracks of the tape. Not only does this save tracks on the tape, but a great deal of flexibility is achieved, even controlling effects units at the right point in the sequence. Eight (or seven, if SMPTE is being used) channels of the mixer can be reserved for tape playback, or if these are not available, the patchbay can be used to bring these into the mix as necessary.

The AUX 1 and 2 busses can be set to pre-fader, and used as two independent foldback mix busses (via headphones) while recording, and then switched to post-fader and re-patched for remixing, allowing more independently-controllable effects mixes to be brought into play. When recording is taking place, the talkback should be assigned to AUX 1 and 2 (ie to the artistes' headphones and no other buss).

JUMPERS

As mentioned earlier, a number of internal jumpers are provided so that the PM1200 can be customized according to your needs.

DO NOT ATTEMPT TO CHANGE THESE JUMPERS YOURSELF. Contact your nearest Yamaha service center and arrange for this to be done by trained service personnel. A charge will be required for this service.

The jumpers which may be changed are shown below:

Position	Function	Status when shipped
In every single-input input channel	Channel insert point either pre- or post-EQ	Post-EQ
In every single input channels	SIGNAL and CLIP indicators either pre- or post-EQ	Post-EQ
In every input channel	PRE position for AUX 1-2 and AUX 3-4 pre- or post-EQ	Pre-EQ
In each group block (1-4)	Output from GROUP OUT to the CUE buss is pre- or post-fader	Pre-fader
In each AUX SEND (1-4)	Output from AUX SEND to the CUE buss is pre- or post-AUX SEND control	Pre-AUX SEND control
In the stereo block	Output from STEREO OUT to the CUE buss is pre- or post-fader	Pre-fader

At this point it is worth mentioning that input modules (either single- or stereo input) are available separately from Yamaha. If you wish to change the configuration of your PM1200 mixing console, contact your Yamaha service center for details.

OPTIONS

The options for the PM1200 are as follows:

- (1) Single input module: IP1200
- (2) Stereo input module: SI1200*
- Stereo input module: SI1200T (input transformers built in)

* This option can provide additional stereo input channels. The supplied power supply PW1200 is capable of the following expansions:

- PM1200-16: All single input channels can be replaced with SI1200S. With the PW1200.
- PM1200-24: Up to 16 channels can be replaced with SI1200. For further replacement, an optional power supply, the PW1800 is required. With the PW1800, all input channels can be stereo.
- PM1200-32: Up to 6 channels can be replaced with SI1200S. For further replacement, an optional power supply, the PW1800, is required. With the PW1800, all input channels can be stereo.

- (3) Input transformer IT1200

* The IT1200 can be used with either the single input module (IP1200) or stereo input module (SI1200). However, advanced skills are required (soldering of the transformer lead wires, resistors, capacitors, etc.) to install the transformer correctly. Please consult your dealer for details.

- (4) Power supply PW1200
- (5) Power supply PW1800 (for use with additional stereo input modules)

INPUT/OUTPUT SPECIFICATIONS

INPUT CHARACTERISTICS

INPUT TERMINALS	Pad	Gain trim	Actual load impedance	Use with nominal	Input level			Console connector
					Sensitivity *	Nominal	Max before clipping	
CH Input (1-16, 24, 32) STEREO input (1-2, L, R)	0	-60	3 k Ω	50-600 Ω mic and 600 Ω line	-80 dB (0.08 mV)	-60 dB (0.78 mV)	-38 dB (9.76 mV)	XLR-3-31 type
	0				-40 dB (7.75 mV)	-20 dB (77.5 mV)	+2 dB (0.976 V)	
	10	-20			-30 dB (24.5 mV)	-10 dB (245 mV)	+12 dB (3.09 V)	
	20				-20 dB (77.5 mV)	0 dB (0.775 V)	+22 dB (9.76 V)	
	30				-10 dB (245 mV)	+10 dB (2.45 V)	+24 dB (12.3 V)	
AUX RETURN (1-2)			10 k Ω	600 Ω lines	-16 dB (123 mV)	+4 dB (1.23 V)	+24 dB (12.3 V)	XLR-3-31 type
TALKBACK IN			10 k Ω	50-600 Ω mic	-70 dB (0.25 mV)	-50 dB (2.45 mV)	-18 dB (97.6 mV)	XLR-3-31 type
SUB IN GROUP (1-4) STEREO (L, R) AUX (1-4) CUE			10 k Ω	600 Ω line	-6 dB (388 mV)	+4 dB (1.23 V)	+24 dB (12.3 V)	1/4-inch phone
INSERT IN CH (1-16/24/32)			10 k Ω	600 Ω line	-20 dB (77.5 mV)	0 dB (0.775 V)	+22 dB (9.76 V)	1/4-inch phone (TRS)
INSERT IN GROUP (1-4) STEREO (L, R) AUX (1-4)			10 k Ω	600 Ω line	-10 dB (245 mV)	0 dB (0.775 V)	+22 dB (9.76 V)	1/4-inch phone (TRS)

OUTPUT CHARACTERISTICS

OUTPUT TERMINALS	Actual Source Impedance	For use with Normal	Output level		Mixer connector
			Nominal	Max before clipping	
GROUP OUT (1-4) STEREO OUT (L, R) AUX SEND (1-4)	150 Ω	600 Ω line	+4 dB (1.23 V)	+24 dB (12.3 V)	XLR-3-32 type
CUE OUT (L, R)	600 Ω	10 k Ω lines	+4 dB (1.23 V)	+22 dB (9.76 V)	1/4-inch phone
INSERT OUT CH (1-16 /24/32) GROUP (1-4) STEREO (L, R) AUX (1-4)	600 Ω	10 k Ω line	0 dB (0.775 V)	+22 dB (9.76 V)	1/4-inch phone (TRS)
PHONES	100 Ω	8 Ω phones 40 Ω phones	1 mW 3 mW	26 mW 78 mW	Stereo 1/4-inch

0dB = 0.775V rms

* Output at +4dBu (1.23V)

All XLR connectors (except TALKBACK IN) are balanced

All phone connectors are unbalanced

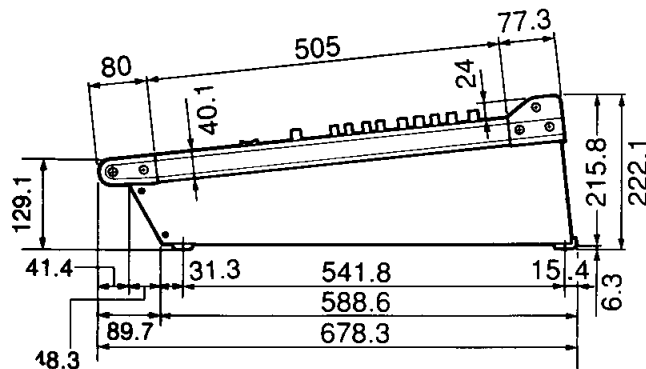
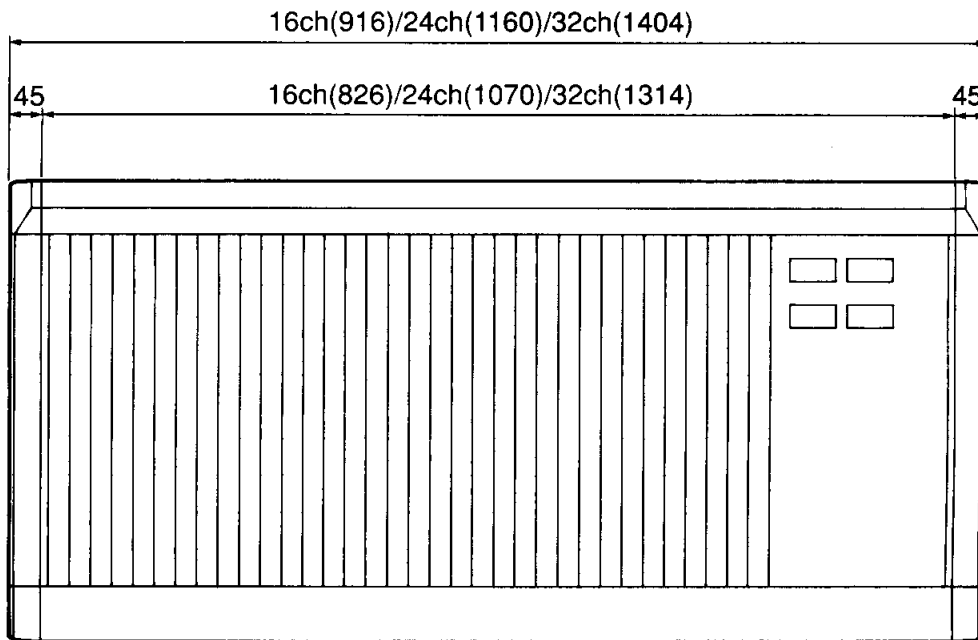
GENERAL SPECIFICATIONS

Total Harmonic Distortion	< 0.1 %	20 Hz-20 kHz @ +14 dB output into 600 Ω
Frequency Response	+1, -3 dB	20 Hz-20 kHz @ +4 dB output into 600 Ω
Hum and Noise (20 Hz-20 kHz) $R_s = 150 \Omega$ Input Pad = 0 dB Input sensitivity = -60 dB	-128 dB	Equivalent input noise
	-97 dB	Residual output noise (balanced output)
	-84 dB (88 dB S/N)	GROUP OUT Master fader nominal, all CH assign switches OFF
	-64 dB (68 dB S/N)	GROUP OUT Master fader nominal, one channel fader nominal
	-82 dB (86 dB S/N)	STEREO OUT Master fader nominal, all GROUP assign switches OFF
	-64 dB (68 dB S/N)	STEREO OUT Master fader nominal, one channel fader nominal
	-78 dB (82 dB S/N)	AUX SEND Master level control nominal, all channel AUX controls at minimum
	-64 dB (68 dB S/N)	AUX SEND Master level control nominal, one channel AUX control nominal
Maximum voltage gain	84 dB	CH IN to GROUP OUT
	84 dB	CH IN to STEREO OUT (CH to stereo)
	94 dB	CH IN to STEREO OUT (Group to stereo)
	84 dB	CH IN to AUX SEND (pre-fader)
	94 dB	CH IN to AUX SEND (post-fader)
	74 dB	CH IN to CUE OUT
	60 dB	CH IN to CH INSERT OUT
	84 dB	STEREO IN to GROUP OUT
	20 dB	AUX RETURN to GROUP OUT
	74 dB	TALKBACK IN to GROUP OUT
	10 dB	SUB IN to GROUP OUT, STEREO OUT, AUX SEND
Input gain control	40 dB (-60 to -20 dB)	variation in gain, stop to stop
Input pad switches	0/10/20/30 dB	attenuation
Single-input Channel equalization	± 15 dB max boost/cut	HIGH 10 kHz (shelving) MID 350 Hz-5 kHz (peaking) LOW 100 Hz (shelving)
Stereo input equalization	± 15 dB max boost/cut	HIGH 10 kHz (shelving) LOW 100 Hz (shelving)
Channel high-pass filter	12 dB/oct	roll-off 80 Hz
Crosstalk	-80 dB @ 1 kHz	adjacent inputs
	-70 dB @ 1 kHz	input to output
Oscillator	1 kHz sine wave	Less than 1 % THD @ +4 dB output
Signal clip indicators	2 LEDs	Built into input modules Green (SIGNAL) illuminates when post-EQ signal is 10 dB below nominal Red (CLIP) illuminates when post-EQ signal is 3 dB below clipping
VU meters (0VU=+4dB output)	4 illuminated meters	GROUP (1-4)/ AUX (1-4)/ STEREO(L,R)-CUE(L,R)
Peak indicators	Red LED	Built into each meter. Turns on when post-master fader signal level is at +14 dB
Phantom Power	+48 VDC	To balanced inputs (via 6.8 k Ω current limiting/isolation resistors) for powering condenser microphones.
Options		Input transformers IT1200 Single input module IP1200 Stereo input module SI1200 Stereo input module SI1200T (with IT1200)

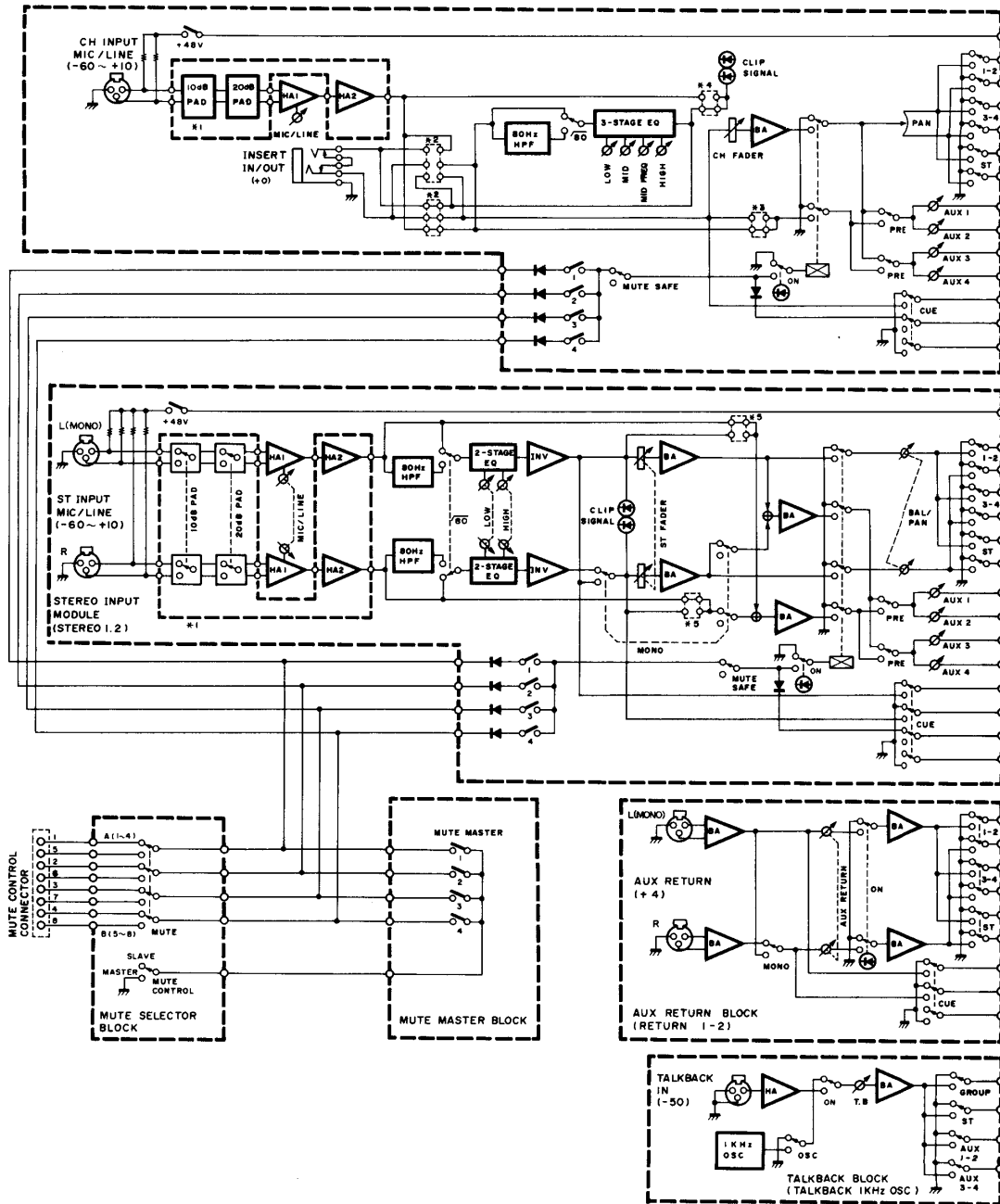
Power requirement	US&Canadian models	120 V AC 60 Hz
	General model	220/240V AC 50/60 Hz
Power Consumption	US&Canadian models General model	180 W

- 0dB=0.775 V r.m.s.
- Specifications and appearance subject to change without notice.

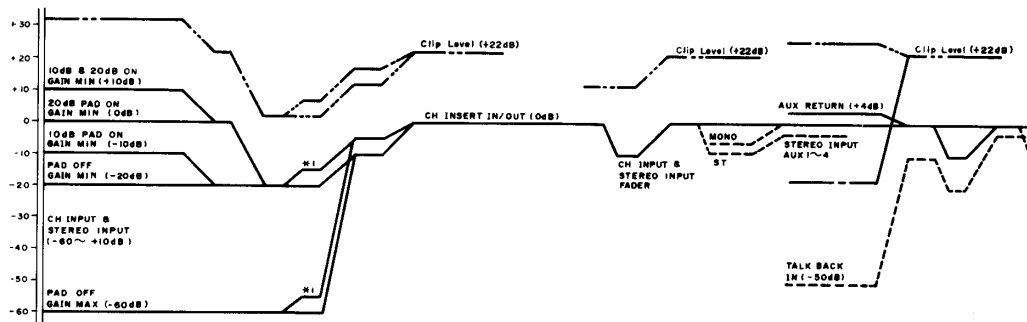
Dimensions	(mm)	(in)
Height	222.1	8-7/8
Depth	678.3	26-3/4
Width (16 ch)	916.0	36
Width (24 ch)	1160.0	45-3/4
Width (32 ch)	1404.0	55-3/8
Weight	(kg)	(lb)
16 ch	44	97
24 ch	56	123.5
32 ch	68	149.9

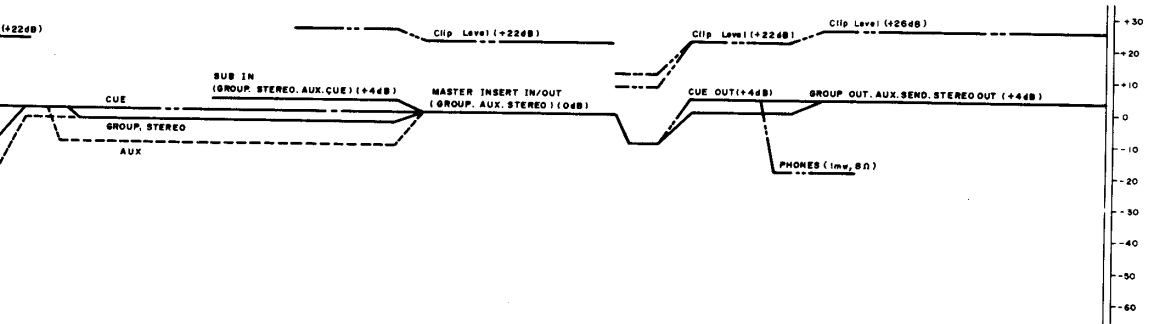
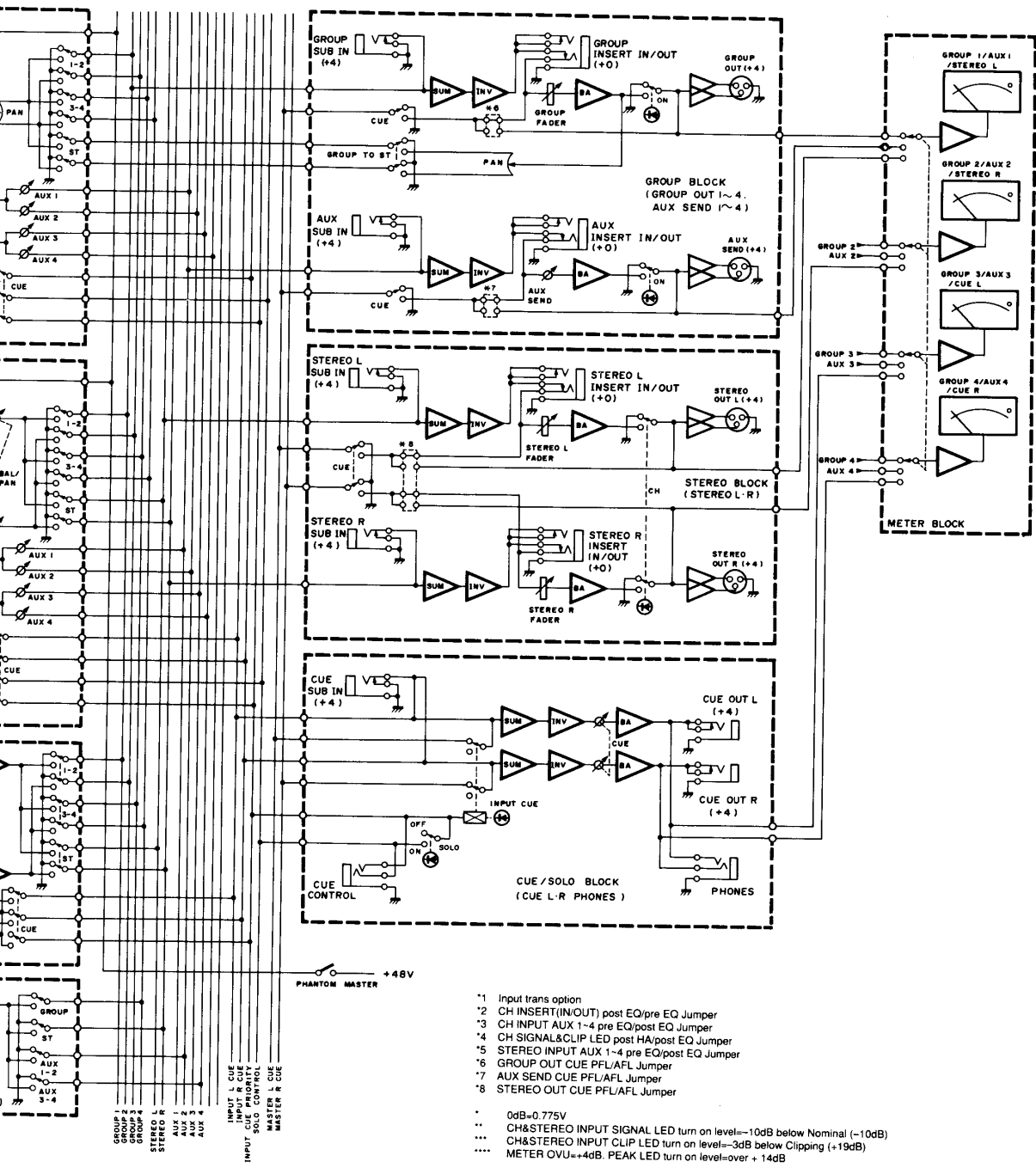


BLOCK DIAGRAM



LEVEL DIAGRAM





SERVICE

The PM1200 is supported by Yamaha's worldwide network of factory trained and qualified dealer service personnel. In the event of a problem, contact your nearest Yamaha PM1200 dealer. For the name of the nearest dealer, contact one of the Yamaha offices listed below.

ENTRETIEN

L'entretien la console PM1200 est assuré par le réseau mondial YAMAHA de personnel d'entretien qualifié et formé en usine des concessionnaires. En cas de problème, prendre contact avec le concessionnaire YAMAHA le plus proche. Se référer à la liste ci-dessous.

KUNDENDIENST

Für den PM1200 steht das weltweite YAMAHA Kundendienst netz mit qualifiziertem, werksgeschultem Personal zur Verfügung. Bei Störungen und Problemen wenden Sie sich bitte an Ihren nächsten YAMAHA PM1200-Händler. Die hiernach aufgeführten YAMAHA-Niederlassungen teilen Ihnen gerne die Namen und Adressen der YAMAHA-Händler in Ihrer Nähe mit.

YAMAHA CORPORATION

10-1 Nakazawa-Cho
Box 1
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