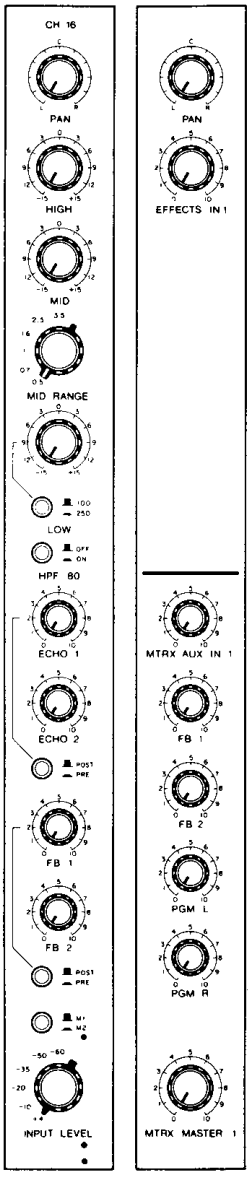
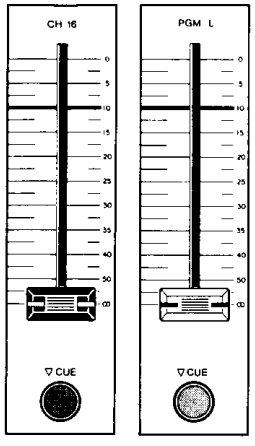


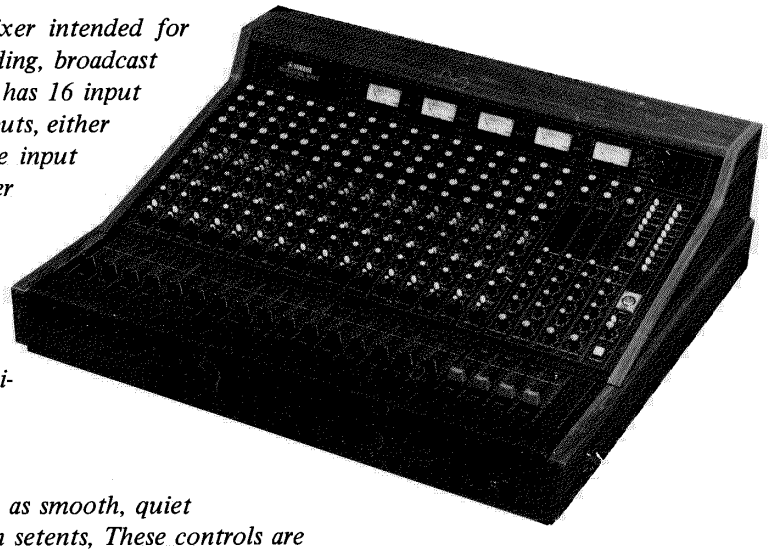


YAMAHA PROFESSIONAL SERIES MIXER

M916

OWNER'S MANUAL

The Yamaha M916 is a sophisticated professional Mixer intended for fixed or portable sound reinforcement, as well as recording, broadcast production, or any critical sound mixing application. it has 16 input channels. Each channel has a pair of switch-selectable inputs, either of which is usable with mic or line level sources. The input channels also have interstage patch points (EQ Out/Fader In jacks). Similar insert point, also are provided for the program, echo and oldback busses. The M916 has 11 mixing busses (including a 6 x 4 matrix), and theatrical and broadcast jobs. In large scale concert reinforcement environments, the M916 can be used as an adjunct to the main mixing console or as a stage monitor mixer.



The M916 is built of only the finest components such as smooth, quiet faders, and equalizers with center-tapped "flat" position setents, These controls are calibrated accurately, in dB, for precise, repeatable settings that save valuable set-up time. To ensure the M916 holds up under "real world" conditions, it is equipped with a bipolar 25 volt power supply that affords a generous margin of headroom (an easy +24 dBm output). Internally the M916 has the convenience of modular plug-in circuitry, and-outside a solid front panel adds to strength and durability. You'll appreciate the extra refinements in the M916's advanced technology, reliability and human engineering. For example, the pick-off points for the switch selectable pre-post echo and foldback sends may be changed by means of simple jumper rewiring. Similarly, 10 dB of gain can be added to the Mixer's program, echo and/or foldback outputs, and the sentitivity of the effects and matrix auxiliary inputs can be increased 24 dB by simple jumper changes. To take full advantage of your M916 mixer, please read this manual carefully.

CONTENTS

WARNING : TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.
THERE ARE NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO A QUALIFIED SOUND EQUIPMENT TECHNICIAN.

GENERAL SPECIFICATIONS

Frequency Responce (+4 dB/600 ohms)	+0, –3 dB, 20 Hz to 20kHz; +0, –0.5 dB, 30 Hz to 15 kHz.
Total Harmonic Distortion (THD)	Less than 0.6% at +10 dB*output, 20 Hz to 20 kHz; Less than 0.1% at +20 dB*output, 70 Hz to 20 kHz.
Hum & Noise (20 Hz to 20 kHz, input termination of 150 ohms, all output assign switches ON, Input Level switches at "–60")**	–127 dB Equivalent Input Noise (EIN) –95 dB* residual output noise ; all Faders down. –78 dB (82dB S/N) PGM OUT ; Master Fader at nominal level and all Input Faders down. –63 dB (67dB S/N) PGM OUT ; Master Fader and one Input Fader at nominal level. –73dB (77dB S/N) MTRX OUT ; Matrix mix and Master level controls at maximum, one Master Fader at nominal level and all Input Faders down. –63 dB (67dB S/N) MTRX OUT ; Matrix mix and Master level controls at maximum, one Master Fader and one Input Fader at nominal level. –73 dB (77dB S/N) FB or ECHO OUT ; Master Fader or level control at nominal level and all FB or ECHO mix controls at minimum level. –63 dB (67dB S/N) FB or ECHO OUT ; Master Fader or level control and one FB or ECHO mix control at nominal level.
Crosstalk	–60 dB at 1 kHz : adjacent Inputs. –60 dB at 1 kHz : Input to Output.
Maximum Voltage Gain (Input level switch at "–60", where applicable)	PGM 84 dB : CHANNEL IN to PGM OUT. MTRX 84 dB : CHANNEL IN to MTRX OUT. FB 94 dB : CHANNEL IN to FB OUT. ECHO 94 dB : CHANNEL IN to ECHO OUT. SUB IN 10 dB : SUB IN to PGM OUT. EFFECTS IN 20 dB : EFFECTS IN to PGM OUT. MTRX AUX IN 10 dB : MTRX AUX IN to MTRX OUT.
Channel Equalization (± 15 dB Maximum)	HIGH 10 kHz Shelving MID 500, 700, 1 k, 1.6 k, 2.5 k, 3.5 kHz Peaking LOW 100, 250 Hz Shelving
High Pass Filter	18 dB/octave roll-off below 80 Hz.
Talkback	Microphone or Line input XLR, preamp, level control, and push-to-talk switch; to PGM/MTRX busses, FB busses, ECHO busses.
Inputs to Mixer	32 x CHANNEL IN (16 M1, 16 M2, both mic/line). 6 x SUB IN (Submixer Input to PGM, FB & ECHO busses). 2 x EFFECT IN (Auxiliary program input and effects return). 2 x MTRX AUX IN (Auxiliary program input and effects return). 1 x TB IN (Mic/Line In). 16 x INTER-STAGE PATCH (FADER IN) 6 x MASTER IN (2 ea. for PGM, FB & ECHO).
Mixing Busses	2 x Main PGM (L&R); 4 x MTRX; 2 x FB; 2 x ECHO; 1 x CUE (preview).
Mixer Outputs	2 x PGM; 4 x MTRX; 2 x FB; 2 x ECHO; 2 x Headphone (one 2-channel jack). 16 x INTER-STAGE PATCH (EQ OUT); 6 x MASTER OUT (2 ea. for PGM, FB & ECHO).

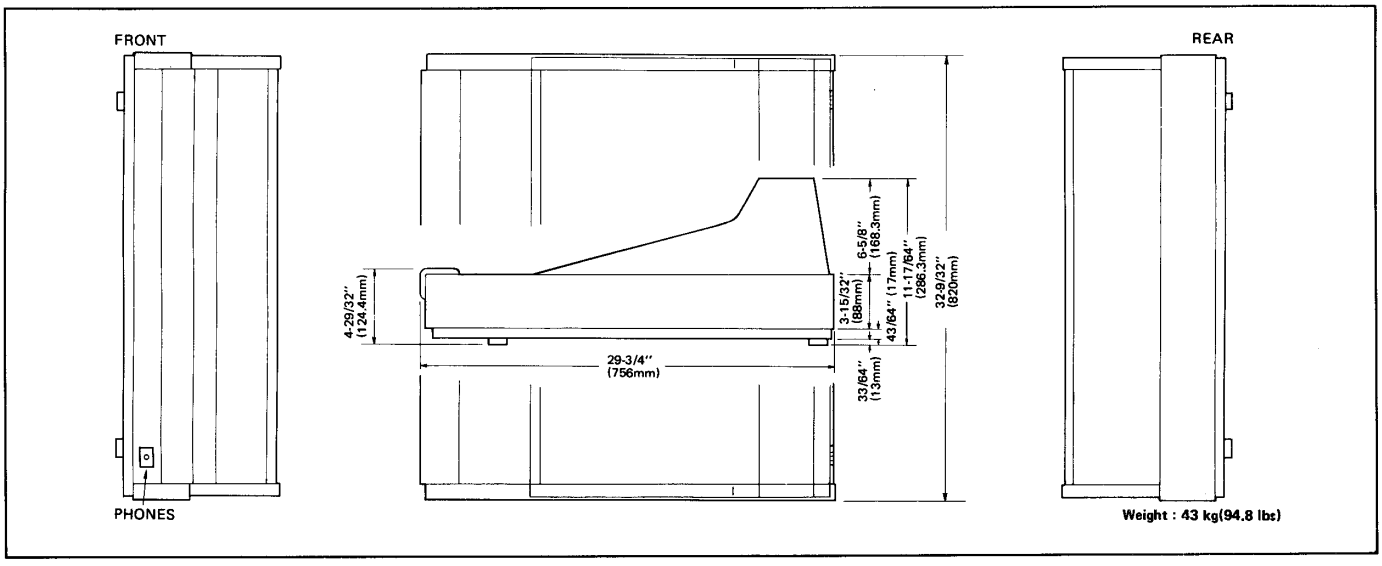
Inputs and Outputs	(See accompanying tables of "Input Characteristics" and "Output Characteristics").
VU Meters (0 VU @ +4 dB)	5 x illuminated meters; switchable for PGM/MTRX, FB/MTRX or ECHO 1/ECHO 2/CUE.
Peak Indicators	2 LEDs built into each Input Channel. "GREEN" turns ON when the pre-Fader level reaches 13 dB below clipping. "RED" turns ON when the pre-Fader level reaches 3 dB below clipping. LED (red) built into each VU meter turns ON when post-Master Fader level reaches 10 dB below clipping.
Phantom Power	For remote powering of condenser microphones, +48 V DC can be switched on via a rear panel phantom power switch. Voltage is applied to pins 2 and 3 of the input XLR connectors via a pair of 6.8 kohm isolation/current-limiting resistors that feed each balanced input transformer. (U.S.A., Canadian Model = 40 V DC)
Finish	Black panel, padded armrest, rosewood veneer cabinet, color coded knobs.
Dimensions	32-9/32" wide x 29-3/4" deep x 11-17/64" high (820 mm wide x 756 mm deep x 286 mm high).
Weight	94.8 pounds (43 kg)
Power Supply	Self-contained module inside console, fused and fully regulated.
Line Voltage and Power Consumption	U.S.A. : 120V 85W Canadian : 120V 100VA General : 240V 90W (Selectable 110/120/220/240V).

* 0 dB is referenced to 0.775V RMS (0 dBm @ 600ohms).

** Measured with 6 dB/octave filter @ 12.47 kHz : equivalent to a 20 kHz filter with infinite dB/octave attenuation.

Specifications subject to change without notice or obligation.

DIMENSIONS



INPUT/OUTPUT SPECIFICATIONS

INPUT SPECIFICATIONS

Connection	Level Switch*	Actual Load Impedance	For Use With Nominal	Sensitivity**	Input Level		Connector In Console***
					Nominal	Max. Before Clip	
CHANNEL INPUTS (M1 + M2, 1 – 16)	–60dB	800Ω	50 to 250Ω microphones or 600Ω line level sources	–80dB(0.08mV)	–60dB(0.78mV)	–30dB(24.5mV)	XLR-3-31
	–50dB	800Ω		–70dB(0.25mV)	–50dB(2.5mV)	–20dB(78mV)	
	–35dB	800Ω		–55dB(1.4mV)	–35dB(14mV)	–5dB(436mV)	
	–20dB	1kΩ		–40dB(7.8mV)	–20dB(78mV)	+10dB(2.45V)	
	–10dB	2kΩ		–30dB(24.5mV)	–10dB(245mV)	+20dB(7.75V)	
	+ 4dB	4kΩ		–16dB(123mV)	+ 4dB(1.23V)	+24dB(12.3V)	
MTRX AUX IN(1-4)		5kΩ	600Ω lines	–10dB(245mV)†	+ 4dB(1.23V)	+24dB(12.3V)	Phone Jack
EFFECTS IN(1,2)		5kΩ	600Ω lines	–20dB(78mV) †	+ 4dB(1.23V)	+24dB(12.3V)	Phone Jack
SUB IN PGM(L,R)		1kΩ	600Ω lines	– 6dB(388mV)	+ 4dB(1.23V)	+24dB(12.3V)	Phone Jack
SUB IN FB(1,2)							
SUB IN ECHO(1,2)							
TALKBACK IN	–50dB	800Ω	50 to 250Ω mic	–70dB(0.25mV)	–50dB(2.5mV)	–20dB(78mV)	XLR-3-31
	+ 4dB	12kΩ	600Ω lines	–16dB(123mV)	+ 4dB(1.23V)	+24dB(12.3V)	
CH PATCH FADER IN (1-16)		10kΩ	600Ω lines	–26dB(39mV)	– 6dB(388mV)	+24dB(12.3V)	Phone Jack
PGM MASTER IN (L,R)		10kΩ	600Ω lines	–16dB(123mV)	– 6dB(388mV)	+24dB(12.3V)	Phone Jack
FB MASTER IN (1,2)							
ECHO MASTER IN (1,2)							

OUTPUT SPECIFICATIONS

Connection	Actual Source Impedance	For Use With Nominal	Output Level		Connector In Console***
			Nominal	Max. Before Clip	
PGM OUT (L,R)	150Ω	600Ω Lines	+ 4dB(1.23V)	+24dB(12.3V)	XLR-3-32
MTRX OUT (1-4)					
FB OUT (1,2)					
ECHO OUT (1,2)					
CH PATCH EQ OUT (1-16)	600Ω	10kΩ Lines	– 6dB(388mV)	+24dB(12.3V)	Phone Jack
PGM MASTER OUT (L,R)					
FB MASTER OUT (1,2)					
ECHO MASTER OUT (1,2)					
HEADPHONES	25Ω	8Ω Phones	– 6dB(388mV)	+ 4dB(1.23V)	Phone Jack
		600Ω Lines	+ 8dB(1.95V)	+18dB(6.16V)	

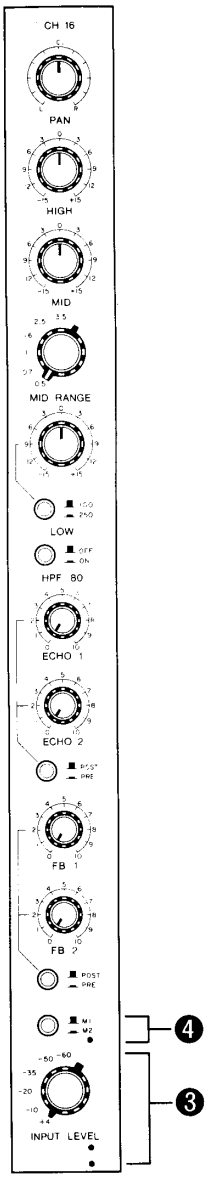
* Inthese specifications, when dB represents a specific voltage, 0 db is referenced to 0.775 volts RMS.

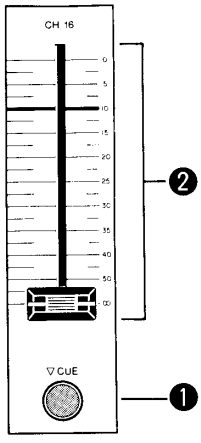
** Sensitivity is the lowest level that will produce an output of +4 dB (1.23V), or the nominal output level when the unit is set to maximum gain.

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

† Higher sensitivity when circuit is internally restrapped to bypass 24 dB pad.

All specifications subject to change without notice or obligation.





NOTE: It is not necessary that you be able to read a block diagram in order to understand and use this mixer. However, the block diagram on page 21 can be thought of as a "road map" to the mixer, one that can give you a wider perspective to evaluate the following descriptions.

INPUT CHANNELS

❶ CUE BUTTON

Pressing the CUE button applies the channel input signal to the cue bus for preview or "solo" monitoring with the headphones and/or the Cue/Echo VU meter. (Any other signals being monitored in the headphones are automatically disconnected when the headphone Cue button is engaged.) While the cue signal is not affected by the Fader, it is affected by the Input Level Selector, Filter, EQ and anything connected in between the channel's Interstage Patch Out/In jacks.

❷ CHANNEL FADER

The Fader continuously varies the channel output level to the Left and Right program mixing busses. It affects the channel's Foldback and Echo bus sends only when their respective Pre-Post switches are in Post position. 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 +4 dB. The Fader is calibrated in dB of attenuation.

❸ INPUT LEVEL SWITCH AND LED PEAK INDICATORS

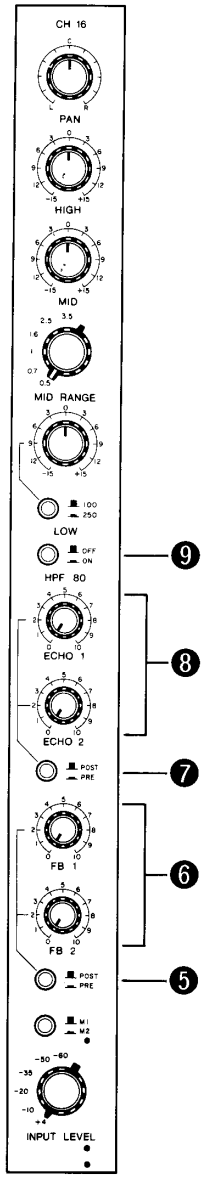
The Input Level switch changes the input sensitivity to accommodate nominal input levels of –60, –50, –35, –20, –10 or +4 dB. Respectively, these levels correspond to low level dynamic or ribbon mics, medium and high level condenser mics, preamplified electric instruments, and low or high line level audio processing or mixing equipment.

Adjacent are two LED indicators that help the operator determine the proper setting of the Input Level switch. The green LED shows when the preamplified input signal is peaking in a safe range by turning On when the level reaches or exceeds 13 dB below clipping. The red LED turns On, warning of impending distortion, when the level reaches or exceeds 3 dB below clipping.

To establish the Input Level switch setting that yields the best combination of maximum headroom and minimum noise characteristics, first set it at +4 dB position. Then apply a typical input signal to that channel (e.g., talk or sing into the microphone, play the instrument to which the channel is connected, etc.). Turn the Input Level switch to more sensitive settings (toward the "–60" end of the scale) until the green LED begins to flash during most peaks, or until the green LED remains On and the red LED flashes occasionally. If the red LED flashes often or stays On, reduce the Input Level switch sensitivity (turn it up toward the "+4" end of the scale).

❹ INPUT SELECTOR & INDICATOR

Two identical but separate inputs are provided for each channel, making it unnecessary to unplug and reconnect cables in order to change the input source. Instead, the Input Selector pushbutton determines which of the channel's two XLR connectors, M1 or M2, actually supplies the audio signal to the channel; the adjacent amber LED turns On when the M2 input is active. As an example, the mixer's M1 inputs might be used for "live" microphones, while the M2 inputs could be used for playback from a multi-track tape machine; this will generally require resetting the Input Level switches to the appropriate sensitivity, but no cables need be moved around. In some instances, the M1 inputs could be used for one set of microphones, and M2 for another set, corresponding to two different "scenes" in a given production.



❺ FOLDBACK PRE-POST SWITCH

The mixer is factory wired to derive the foldback signal from either or two points, depending on the setting of this switch. PRE position (button in) takes the foldback send ahead of the channel Fader and Equalizer. This is done because program changes intended for house feed could distract performers who use the foldback circuit for stage monitoring (hearing themselves). POST Position (button out) derives the foldback signal after the Fader and EQ, as may be desired for special effects, or where the foldback busses instead serve as additional echo/effects busses or auxiliary mixing busses. The Pre-Post switch simultaneously affects both the FB1 and FB2 sends.

NOTE: In some applications, it is preferable to have the PRE position be Pre-Fader/Post-EQ rather than Pre Fader & EQ. The M916 is equipped with internal jumpers that make it easy for a qualified service technician to change the "Pre" function in this manner. The modification can be performed on a channel-by-channel basis; a given channel's FB1 and FB2 sends both will be affected by the jumper change. Refer to page 16 of this manual for additional information.

❻ FOLDBACK MIX LEVEL CONTROLS (FOLDBACK SEND LEVEL)

The mixer has two foldback mixing busses. The channel's F.B. 1 and F.B. 2 control adjust the amount of channel signal applied to the corresponding foldback mixing busses.

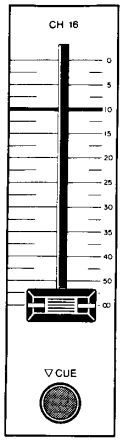
❼ ECHO PRE-POST SWITCH

The mixer is factory wired to derive the echo signal from either of two points, depending on the setting of this switch. POST position (button out) derives signal after the channel Equalizer and Fader. Because the feed is post EQ, it sends the echo/effects device the same tonal balance sent to the program busses. Because the feed is post Fader, the channel contribution to the echo or effects device always tracks the channel output level to the program busses. PRE position (button in) still derives the echo send after the Equalizer, but it is ahead of the channel Fader. This makes it possible to fade a channel in the main program mix, but have it "linger" in the echo mix. PRE is also useful where the echo busses are being used as auxiliary program mixing busses. The Pre-Post switch simultaneously affects both the Echo 1 and Echo 2 sends.

NOTE: In some applications, it is preferable to have the PRE position be Pre-Fader &-EQ rather than Pre Fader/Post EQ. The M916 is equipped with internal jumpers that make it easy for a qualified service technian to change the "Pre" function in this manner. The modification can be performed on a channel-by-channel basis; a given channel's Echo 1 and Echo 2 sends both will be affected by the jumper change. Refer to page 16 of this manual for additional information.

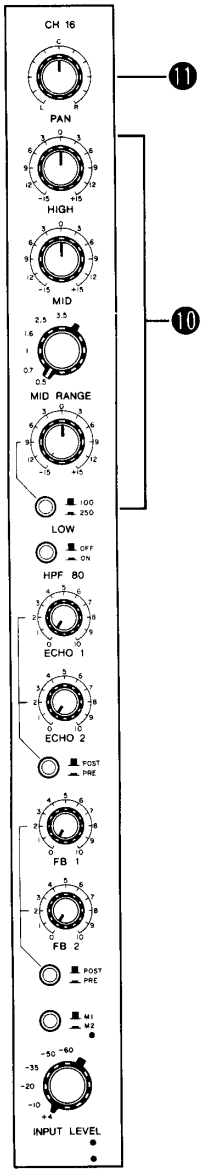
❽ ECHO MIX LEVEL CONTROLS (ECHO SEND LEVEL)

The mixer has two echo mixing busses. The channel's Echo 1 and Echo 2 controls adjust the amount of channel signal applied to the corresponding echo mixing busses.



❾ HIGH PASS FILTER (HPF) SWITCH

The channel circuitry includes an 18 dB per octave High Pass Filter with an 80 Hz turnover frequency. Pressing in the HPF button engages the filter. When the button is up, the filter is bypassed. The filter is useful for eliminating unwanted low frequency sounds without significantly affecting the rest of the program. Typical applications include cutting wind noise, vocal "P" pops, stage rumble, and low frequency leakage from adjacent instruments. In general, it is a good practice to use the filter to protect woofers from unnecessary over-excursion due to the presence of unneeded low frequency or sub-sonic components, especially if a microphone is dropped or kicked; the filter should be bypassed (switch up) only when low frequencies are intentionally sought, as with an organ, drum, bass guitar, and so forth.



⑩ EQUALIZER (EQ)

Each M916 channel Equalizer can be adjusted for up to 15 dB of boost or cut at three different frequency ranges. However, separate switches provide a choice of the frequencies affected, so there are actually 9 different EQ points per channel. The controls are calibrated in dB; centering them in the detented "0" position ensures flat audio response by grounding the equalizer control.

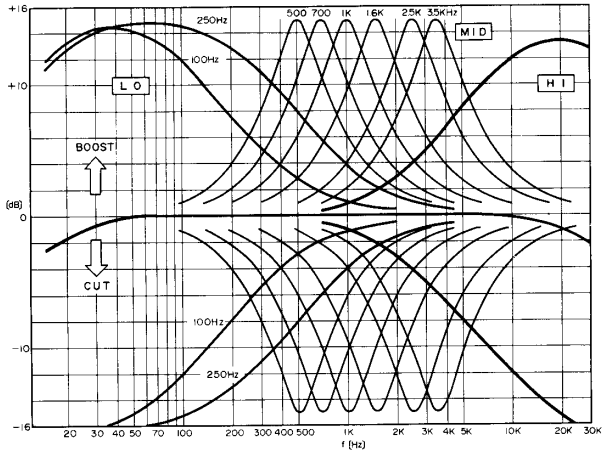
The LOW EQ section provides shelving type equalization with a knee at 100 Hz (adjacent pushbutton up) or 250 Hz (pushbutton down).

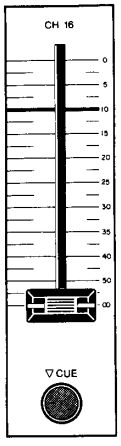
The MID EQ section provides peaking type equalization at 0.5 kHz (500 Hz), 0.7 kHz (700 Hz), 1 kHz, 1.6 kHz, 2.5 kHz or 3.5 kHz, depending on the setting of the rotary selector switch beneath the boost/cut control.

The HIGH EQ section provides shelving type equalization at 10 kHz.

In many mixes, EQ is used to modify tonal characteristcs for better separation (i.e., given similar-sounding instruments on two channels, you might boost one channel's Mid control and boost the other's High control). EQ can be used to correct certain acoustic imbalances, such as using High boost to liven up a "dead" room, or Low cut to avoid the boominess in some rooms. Another use of EQ is to avoid leakage and excess noise without significantly changing the sound. For example, if a bass drum is the only sound on a given channel, you might wish to cut the High control and thus eliminate background hiss as well as leakage from high frequency instruments such as strings. Since bass drums don't produce much high frequency sound, the EQ does not drastically change the instrument's sound.

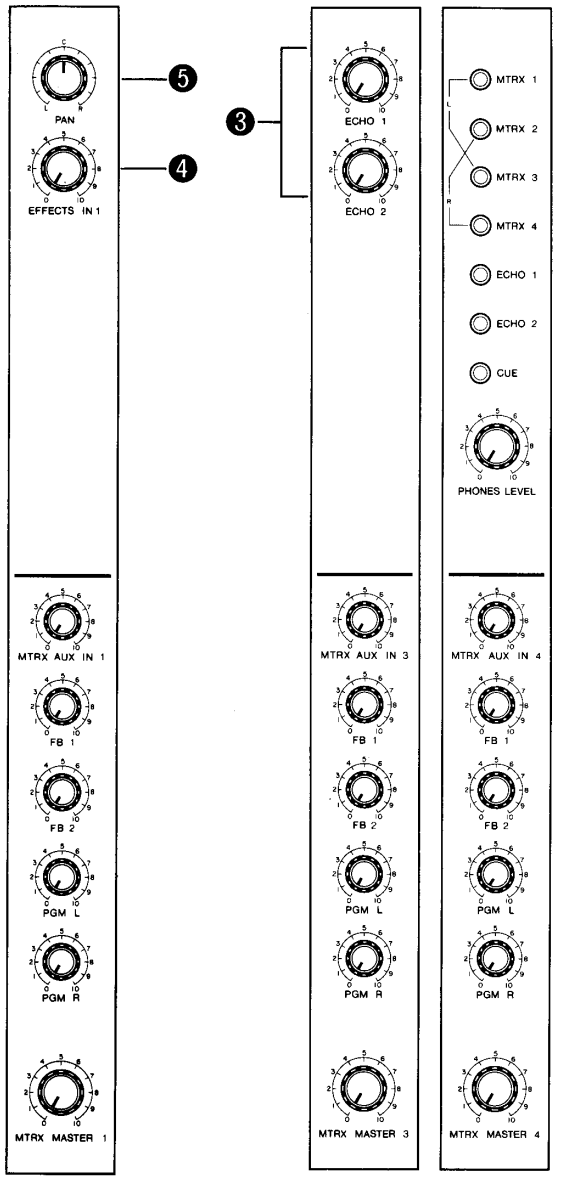
EQUALIZER CHARACTERISTICS

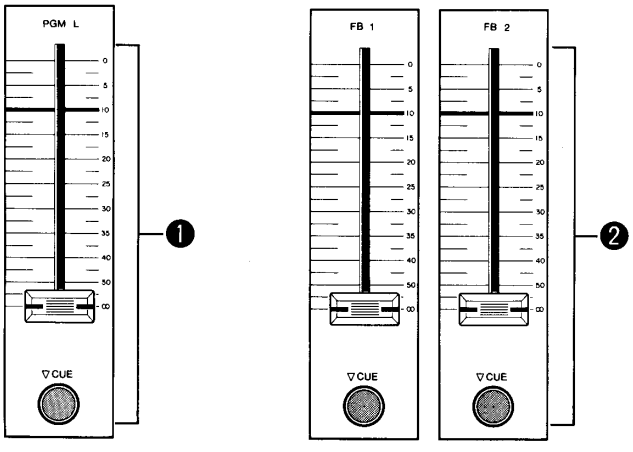




⑪ PAN POT

This rotary control assigns the channel Fader output to the stereo program mix busses, anywhere from all the way Left to all the way Right. Centering the Pan pot places the signal equally in both buses (the acoustic "image" is centered); at this point, each bus is fed a signal 3 dB 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.





MASTER OUTPUT SECTION

❶ PGM L AND PGM R MASTER FADERS & CUE BUTTONS

These Master Faders adjust the overall level of their respective Left and Right Program mixing busses prior to feeding the Program outputs. These Faders control all signals assigned by the channel Pan controls, Effects In Pan controls and Program Sub Inputs. The nominal Fader setting is –10 position. The Cue button beneath each Fader is similar to the Cue button beneath the Input faders, assigning the signal, before the Master Fader, to the cue bus for monitoring via the headphones and or Cue VU meter.

❷ F.B. 1 & 2 (FOLDBACK) MASTER FADERS & CUE BUTTONS

These Master Faders adjust the overall level of the Foldback mix busses prior to feeding the Foldback 1 & 2 outputs. The faders control all signals from the channel F.B. controls and from the F.B. Sub Inputs. The nominal fader setting is –10 position. The Cue bottons function like the Cue buttons on the adjacent Program Master Faders.

❸ ECHO SEND MASTER LEVEL CONTROLS

These two rotary level controls adjust the overall level of the Echo (effects) mix busses prior to feeding the Echo 1 & 2 outputs. The Send Masters control all signals from the channel Echo controls, and from the Echo Sub Inputs. Nominal setting is "#7" on the control scale.

EFFECTS RETURN SECTION

There are two Effects Inputs, which may be used for "return" to the program mix of echo/reverb signals, or of other special effects that were "sent" out of the mixer's echo or foldback outputs. Alternately, the Effects inputs can be used as auxiliary line inputs. Each Effects Inputs is provided with its own set of the following two controls:

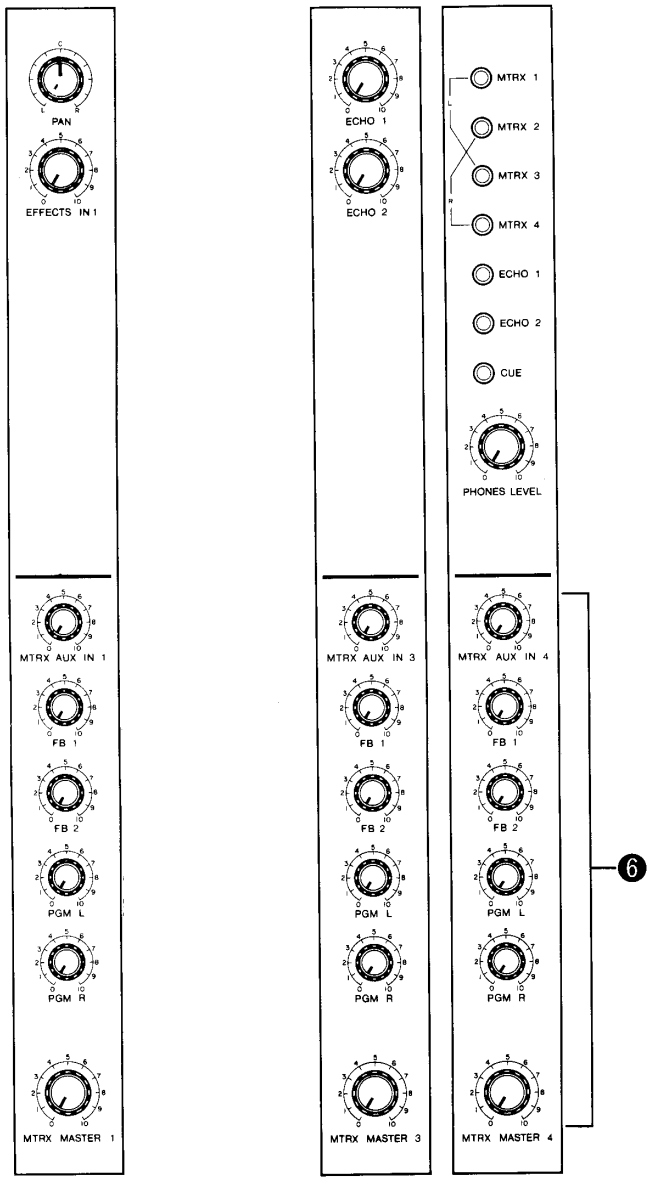
❹ EFFECTS IN LEVEL CONTROLS

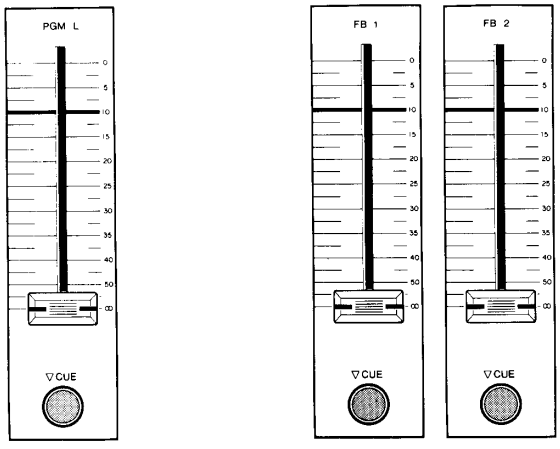
These two rotary level controls adjust the level of the incoming signal from the respective Effects Inputs (1 & 2).

NOTE: The nominal sensitivity of each Effects Input can be changed from + 4 dB to –20 dB by means of internal jumpers that can be repositioned by any qualified service technician. Refer to page 16 of this manual for additional information.

❺ EFFECTS 1 & 2 PAN CONTROLS

These two controls adjust the assignment of their respective Effects Inputs to the Left and Right PGM mixing busses.





❻ MATRIX CHANNEL 1 (Typical of all 4 matrix channels)

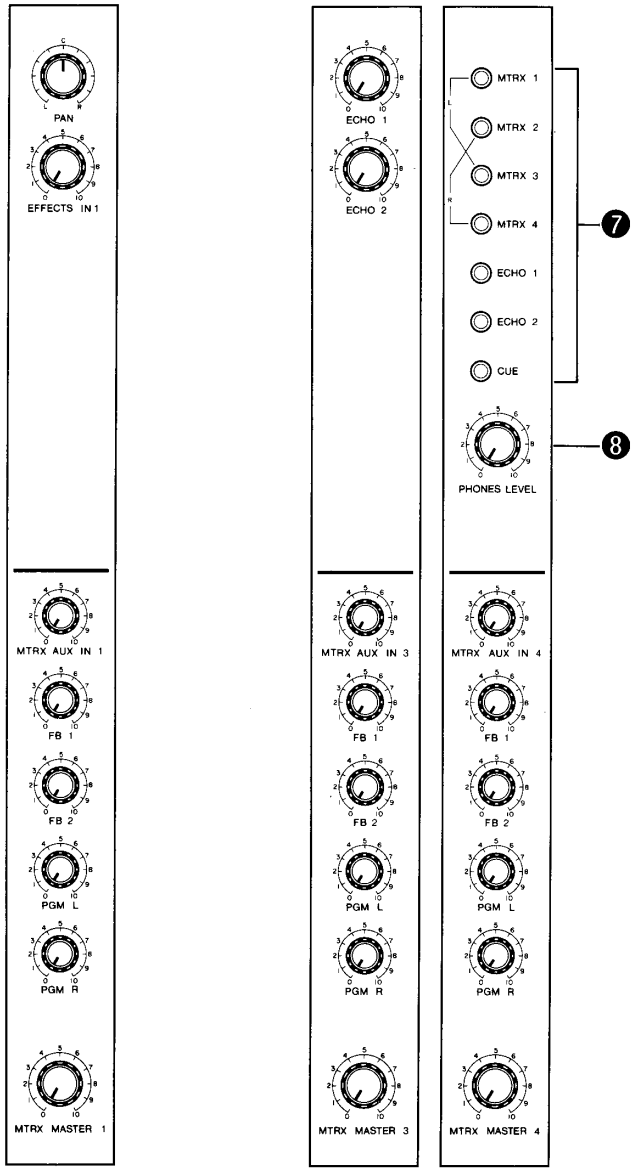
Each channel of the Mix Matrix is a vertical row of level controls that can be used to create a discrete mono combination of various signal sources. The Mix Matrix is really a 5-input by 4-output "mixer-within-a-mixer", and some of its many uses are described in the Applications discussions, beginning on page 17.

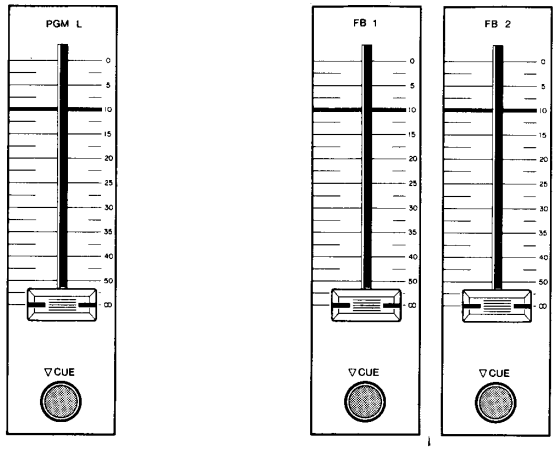
From top to bottom, the mix Matrix controls are as follows:

1. Matrix Auxiliary Input
2. Foldback 1 mixing bus
3. Foldback 2 mixing bus
4. Program Left mixing bus
5. Program Right mixing bus
6. Matrix Master

The Matrix Aux In controls on each channel adjust the incoming level from the four respectively numbered Matrix Aux Inputs on the rear panel. The same two Foldback and two Program inputs are fed to all matrix channels, and are derived after the bus Master Faders, so master fades do affect matrix levels. Each matrix channel can be used to develop a specific balance of the four busses (plus the aux input), and the Matrix Masters then set the overall output level for their matrix channels.

NOTE: The nominal sensitivity of each Matrix Aux Input can be changed from +4 dB to −20 dB by means of internal jumpers that can be repositioned by any qualified service technician. Refer to page 16 of this manual for additional information.





❼ HEADPHONE SOURCE SELECT BUTTONS

Seven pushbuttons select various signal sources to feed the headphones. Any combination of buttons may be engaged simultaneously. The following chart describes the functions.

SELECTOR BUTTON	WHERE IT APPEARS IN THE PHONES
1. Mix Matrix channel 1	Left headphone*
2. Mix Matrix channel 2	Right headphone*
3. Mix Matrix channel 3	Left headphone*
4. Mix Matrix channel 4	Right headphone*
5. Echo 1 output	Both headphones (center mono)
6. Echo 2 output	Both headphones (center mono)
7. Cue bus	Both headphones (center mono)†

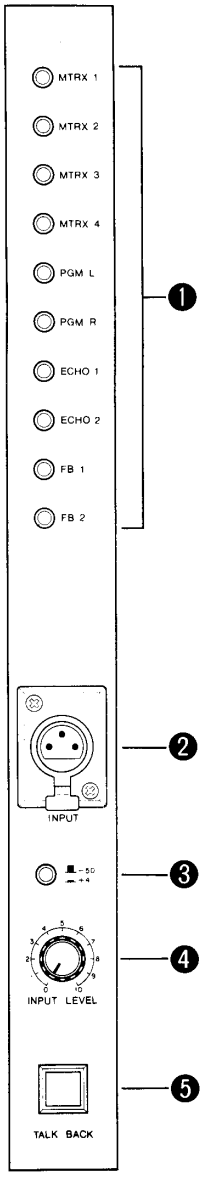
* While the stereo program mix cannot be assigned directly to the Phones, it is nonetheless easy to monitor. In the Mix Matrix itself, assign the Left program bus to Matrix channel 1 and the Right program to Matrix channel 2. Then engage Headphone Selector buttons 1 & 2 to hear the program in stereo. (Matrix and Headphone Select 3 & 4 could be used similarly, or for stereo monitoring of the Foldback busses when they are used for an auxiliary stereo mix.)

† Pressing the Cue Headphone Selector automatically bypasses any of the other selector buttons; although the buttons remain engaged, only the cue bus will be heard in the phones so long as this Cue button is down. The cue signal heard comes from any input or master channels whose Cue buttons are engaged.

❽ PHONES LEVEL CONTROL

This two-gang rotary control simultaneously adjusts the level in the left and right headphones. Adjusting this control affects only the level in the Phones output jack, not the busses themselves.

NOTE: The Headphone output, not illustrated here, is a standard 1/4" (6.3 mm) stereo phone jack on the right front edge of the mixer. It will drive conventional 8-ohm or higher impedance stereo phones. However, it can be used to drive a power amplifier and monitor speakers for studio applications (a splitter cable would be necessary to drive the left and right amplifiers).



Talkback, when used with a microphone, is useful for communicating with performers, for identifying recordings (voice slating), and for making announcements from the mixing area. The talkback feature can be used for prerecorded music during intermissions and for setups. Talkback also can be used to introduce oscillator tones for calibration and testing, or as an auxiliary direct-to-bus microphone or line input.

❶ TALKBACK ASSIGN BUTTONS

Ten pushbuttons assign the talkback input to feed various busses. Any combination of the following buttons may be engaged simultaneously:

1. Mix Matrix channel 1
2. Mix Matrix channel 2
3. Mix Matrix channel 3
4. Mix Matrix channel 4
5. Left Program bus
6. Right Program bus
7. Echo 1 bus
8. Echo 2 bus
9. Foldback 1 bus
10. Foldback 2 bus

❷ TALKBACK INPUT CONNECTOR

This 3-pin female XLR connector is a balanced, transformer-isolated input which accepts a low impedance microphone or a line level source and applies it to the mixing busses selected with the Talkback Assign buttons.

❸ TALKBACK INPUT LEVEL SWITCH

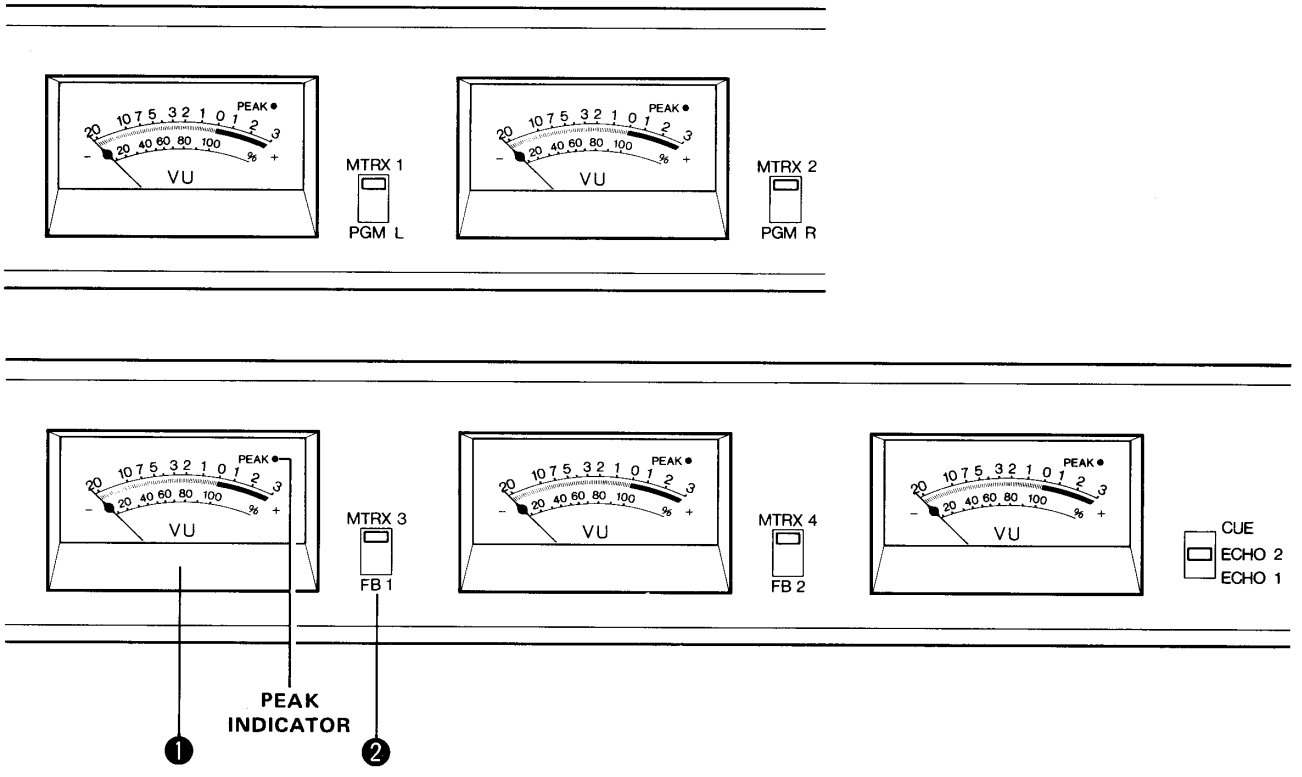
When this button is up, the nominal Talkback Input level is −50 dB, suitable for a microphone. When the button is down, the nominal level is +4 dB; this is suitable for most line-level sources since there is adequate sensitivity in "+4" position to obtain +4 output with input levels as low as −16 dB. "+4" position creates a true line input by means of both a pre-transformer pad and a preamp gain change.

❹ TALKBACK INPUT LEVEL CONTROL

This rotary control adjusts the level of the talkback signal. It should be used in conjunction with the proper Input Level switch setting, "+4" or "−50."

❺ TALKBACK ON/OFF SWITCH

When the button is up, it is Off, preventing the Talkback input from going anywhere. Pressing it down applies Talkback to whatever bus or busses have been selected with the Talkback Assign switches. (It is a push-to-talk switch).



❶ VU METER (TYPICAL OF ALL 5 METERS)

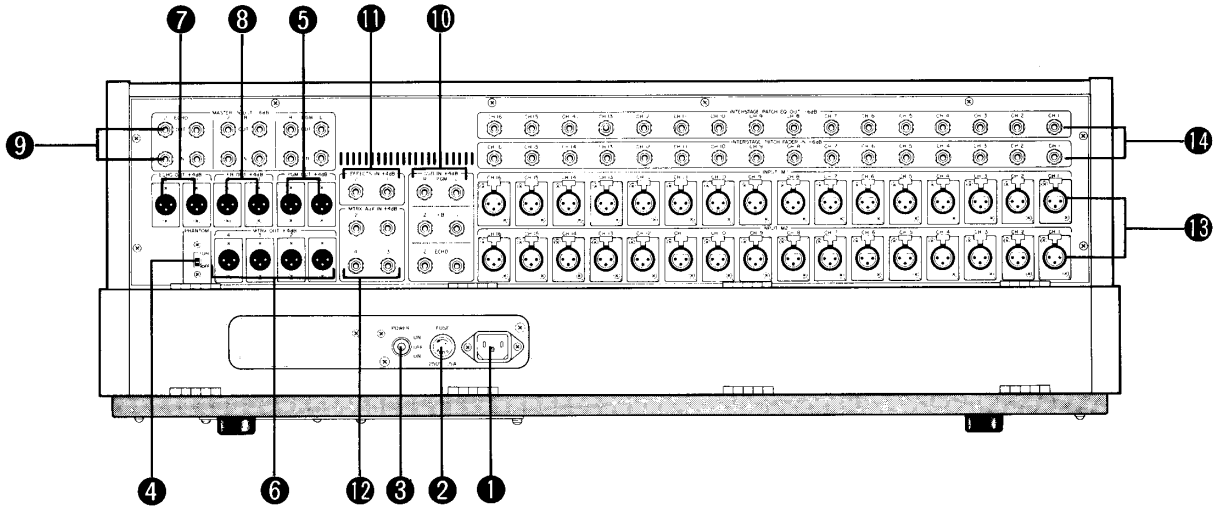
The illuminated meter has standard VU ballistics, designed to provide a good indication of average perceived program level. The meter is calibrated so a "O" indication represents a +4 dBm output level. To monitor any brief peaks that are too fast for accurate meter response, a red LED is installed in the upper right corner of the meter. A peak detection circuit turns on the LED when the signal level reaches or exceeds 10 dB below clipping (i.e., +14 dBm output). This warns the operator of impending clipping and provides an opportunity to adjust levels before distortion becomes noticeable.

❷ METER ASSIGNMENT SWITCH (TYPICAL OF ALL 5 METERS)

Each VU meter can be assigned to monitor more than one source, depending on the setting of the adjacent lever switch. Facing the mixer, from left to right, the Meter selections are:

1. Mix Matrix Channel 1 — or — Left Program Output
2. Mix Matrix Channel 2 — or — Right Program Output
3. Mix Matrix Channel 3 — or — Foldback 1 Output
4. Mix Matrix Channel 4 — or — Foldback 2 Output
5. Cue Bus — or — Echo 1 Output — or — Echo 2 Output

INSTALLATION & REAR PANEL FEATURES



NOTE: All XLR connectors in the M916 are wired as follows: pin 2=signal high, pin 3=signal low, pin 1=shield.

❶ AC POWER CONNECTOR

This 3-prong NEMA connector accepts the mixer's detachable AC power cord (grounded type). In the U.S. and Canada, the built-in power module is wired for 110 to 120 V AC mains, 50 or 60 Hz, and uses a maximum of 85 Watts. Because the power supply is fully regulated, typical line voltage variations will not adversely affect performance.

The mixer should be AC grounded for safety and for proper shielding; a 3-wire power cable is provided for this purpose. If a 3-wire outlet is not available, or if there is any chance the outlet may not be grounded, a separate jumper wire must be connected from the mixer chassis to an earth ground. Cold water pipes generally provide good grounds, although if they are insulated by a length of PVC pipe or a water meter, cold water pipes are not good grounds. (An electrical wire bypasses some meters, supplying ground continuity for the cold water pipes.) Avoid hot water pipes and gas pipes. When in doubt, use a length of copper pipe driven into moist, salted earth, burying at least 1.5m (5') of pipe, or one of the newer chemical type ground rods.

❷ FUSE

The fuse should only be replaced with the same type and rating: 3AG, 1.5A in the U.S. and Canada.

❸ AC POWER SWITCH

This 3-position switch turns on the AC power to the mixer, as indicated by the VU meter lamps. The switch has two "on" positions for reversing the polarity of the incoming power line, just like turning over the AC plug in the wall outlet, which reduces hum in some instances.

❹ PHANTOM POWER SWITCH

When on, the switch applies +48 V* DC across pins 2 & 3 of the active channel input jack (M1 or M2), via a pair of 6.8 kohm resistors, for remote powering of condenser microphones. This will not harm dynamic microphones. To avoid hum with certain unbalanced sources, phantom power may be shut off. (*USA, Canadian Model= 40V)

❺ PGM OUT 1 & 2 CONNECTORS

These post PGM 1 (Left) and PGM 2 (Right) Master Fader outputs are male XLR connectors, transformer-isolated (floating) with +4 dBm (1.23 V) nominal level. The actual source impedance is 150 ohms, and the outputs will drive 600 ohm or higher impedance loads, including virtually all professional graphic equalizers, electronic crossovers, power amplifiers, and tape recorders.

❻ MATRIX OUT 1 – 4 CONNECTORS

These post Matrix Master Level Control outputs are male XLR connectors, transformer-isolated (floating) with +4 dBm (1.23 V) nominal level. The actual source impedance is 150 ohms, and the outputs will drive 600 ohm or higher impedance loads, just like the PGM outputs. The difference between MTRX OUT and PGM OUT really depends on the application. In a sound reinforcement system for a large house, MTRX OUT can be more useful because different mixes can be fed to near stage and house fill speakers. In a simultaneous recording/reinforcement application, PGM might feed the stereo recorder and MTRX feed the house speakers. In broadcast work, MTRX can be used to do mono feeds and mix-minus feeds, whereas PGM can be used for stereo feeds.

❼ ECHO OUT 1 & 2 CONNECTORS

These post Echo Fader outputs are male XLR connectors, transformer-isolated (floating) with +4 dBm (1.23 V) nominal level. The actual source impedance is 150 ohms, and the outputs will drive 600 ohm or higher impedance loads, including virtually all professional echo and reverb devices. If echo or other effects are not required, the outputs may be used as additional foldback sends or for making a stereo tape recording.

❽ FB OUT 1 & 2 CONNECTORS

These post Foldback Master Fader outputs are male XLR connectors, transformer-isolated (floating) with +4 dBm (1.23 V) nominal level. The actual source impedance is 150 ohms, and the outputs will drive 600 ohm or higher impedance loads, including virtually all professional graphic equalizers, electronic crossovers, and power amplifiers.

❾ MASTER IN/OUT JACKS (PGM L & R, FB 1 & 2, ECHO 1 & 2)

NOTE: While the Master In/Out jacks are located in different circuits (PGM, F.B., and ECHO), the functions are essentially identical for all six patch points.

These standard 1/4" (6.3 mm) phone jacks form pairs of unbalanced outputs and inputs, and are intended as patch points for insertion of auxiliary signal processing equipment. The nominal level is –6 dB (388 mV), output source impedance is 100 ohms (for feed to 10 kohm or higher impedance inputs), and input impedance is 10 kohms (for use with 600 ohm sources).

The patch points come just before their respective Master Faders. For any given jack pair, the signal normally flows from the output to the input via internal jumpers. A plug can be inserted in the Out jack without disturbing the internal signal flow, so the Insert Out jacks can be used to "split" the pre-Master signal for feed to high impedance circuits. When a plug is inserted in the Insert In jack, the internal jumper is disconnected, and the external signal is fed to the Master Fader.

❿ SUB IN JACKS (PGM L & R, FB 1 & 2, ECHO 1 & 2)

NOTE: While the Sub Inputs feed different busses (PGM, F.B., and ECHO), the functions are essentially identical for all three pair of jacks.

These standard 1/4" (6.3 mm) phone jacks are unbalanced inputs that apply a nominal +4 dB (1.23 V) signal to the respective program, foldback and echo mix busses via internal isolation/attenuation pads. Actual input impedance is 1 kohms, and the inputs are intended for nominal 600 ohm sources.

Sub Inputs may be used for linking the program, foldback and/or echo outputs of another mixer to those of the M916 for expansion of the mixing system, or for applying any suitable line-level source(s) to the mixer subject only to the respective M916 Master Faders. A common use of the PGM sub inputs, for example, is to introduce a pre-recorded program from a stereo tape recorder without "using up" input channels.

⓫ EFFECTS IN 1 & 2 JACKS

These standard 1/4" (6.3 mm) phone jacks are unbalanced inputs that apply signal to the Left and/or Right program mixing busses via the respective Effects 1 & 2 Level controls and Pan Pots. Actual input impedance is 5 kohms, and nominal level is +4 dB (1.23 V), although an internal jumper may be moved on each input to change its nominal level to –20 dB (78 mV), as described on page 16. The inputs are intended for nominal 600 ohm sources, such as the return from echo or reverb devices, the output of a tape recorder, or the line output of another mixer.

⓬ MATRIX AUX IN 1 – 4 JACKS

These standard 1/4" (6.3 mm) phone jacks are unbalanced inputs that apply signal to the correspondingly numbered Mix Matrix channels via their Matrix Aux In Level controls. Actual input impedance is 5 kohms, and nominal level is +4 dB (1.23 V), although an internal jumper may be moved on each input to change its nominal level to –20 dB (78 mV), as described on page 16. The inputs are intended for nominal 600 ohm sources, such as the output of a tape recorder, the line output of another mixer, or the return from an echo/effects device.

⓭ CHANNEL INPUT M1 & M2 CONNECTORS (x 32)

These thirty two female XLR connectors are arranged in two banks of 16 channels each; whether a given channel's M1 or M2 connector is "live" depends on the setting of the channel's front panel M1/M2 switch. These XLR's are balanced, transformer-isolated inputs that apply nominal –60 dB (0.78 mV) to +4 dB (1.23 V) signals (depending on Input Selector settings) to their respective input channels. The actual input impedance is 1 kohm except when the Input Selector is in +4 dB position, which raises the impedance to 3.3 kohms. This accommodates nominal 50 to 250 ohm (low impedance) professional microphones as well as 600 ohm line level sources. 48 V DC phantom power for condenser microphones is applied to XLR pins 2 & 3 when (a) the Phantom Power switch is On, and (b) the corresponding input, M1 or M2, is selected on the front panel.

⓮ INTERSTAGE PATCH POINTS 1 – 16 (EQ OUT/FADER IN)

Thirty two standard 1/4" (6.3 mm) phone jacks are arranged in two banks of 16 channels, forming pairs of unbalanced outputs and inputs. They are intended as patch points for insertion of auxiliary signal processing equipment such as compressor/limiters, graphic or parametric EQ, noise gates, etc. The interstage patch points come just after their respective channel equalizers (EQ OUT) and just before the channel Faders (FADER IN). For any given channel, the signal normally flows from the EQ Out to the Fader In jack via an internal jumper. A cable can be plugged into the EQ Out jack without disturbing the internal jumper. Thus, the E Out jacks can be used to "split" the channel signal for direct feed to high impedance circuits, such as the input to a multi-track tape recorder, or the line input of an auxiliary mixer. When a plug is inserted in the Fader In jack, the internal jumper is disconnected, and the external signal then feeds the channel Fader. The nominal level is –6 dB (388 mV), output source impedance is 600 ohms (for feed to 10 kohm or higher impedance inputs), and input impedance is 10 kohms (for use with 600 ohm sources).

Hook-up Cables & Hum Avoidance

The mixer's primary input and output circuits are equipped with transformer-isolated XLR connectors. When used with the appropriate mating 2-conductor shielded cables (e.g., standard microphone cables), these circuits afford the optimum protection against hum, buzz, and other noise pick-up. Belden No. 8412, or its equivalent, is an excellent cable due to its heavy construction, and should be used for all portable applications. "Snake" cables containing multiple shielded pairs must be handled very carefully because the leads tend to be fragile, and a broken conductor cannot be repaired.

The M916 XLR connectors are wired with Pin 2 as "audio high" and Pin 3 as "audio low", in accordance with DIN and JIS standards. Some professional equipment and microphones are wired with Pins 2 & 3 reversed; generally this will cause no problem, other than a polarity reversal. However, if such a piece of equipment uses an XLR connector as an unbalanced input, or if an M916 XLR is connected, via an adapter cable, to an unbalanced phone jack, the "high" side of the audio circuit could be grounded. In this case, invert the wiring of pins 2 & 3 in one XLR of the interconnecting cable (or use a suitable polarity-reversal adapter). Regardless of XLR polarity, if hum is encountered, try cutting the shield connection at one end of the XLR cable.

All phone jacks (except the stereo headphone jack) are intended for use with standard Tip/Sleeve 1/4" (6.3 mm) phone plugs and single-conductor shielded cable. Hum reduction should <u>not</u> be attempted by cutting the shield on these cables. Instead, restrict unbalanced cables to 10 feet (3.1 meters), and try to set up the system so that either (a) the equipment involved is all connected to the same AC circuit, or (b) the third-wire AC mains ground is used on only one piece of equipment, typically the mixer. Remember, breaking a ground path can create a shock hazard. In some cases, moving the mixer's 3-position Power switch to the other ON position will reduce hum without sacrificing safety.

When routing any cables, especially unbalanced cables, avoid strong sources of electro-magnetic interference (EMI) or radio frequency interference (RFI) such as electric motors, fluorescent lights, dimmer panels, and so forth. To avoid crosstalk-induced feedback, never bundle microphone input cables with mixer output cables; these cables should cross at right angles where practical.

More About the Theory of Grounding

Careful grounding procedures are essential for proper operation, not only of the mixer, but of the entire audio system. Many grounding techniques exist, and certainly there are several ways to achieve a satisfactorily grounded audio system. Several books have been written on the subject. For further information, consult the following sources: THE AUDIO CYCLOPEDIA by Howard M. Tremaine (Pub. Howard W. Same); SOUND SYSTEM ENGINEERING by Don and Carolyn Davis (Pub. Howard W. Sams); GROUNDING AND SHIELDING IN INSTRUMENTATION by Ralph Morrison (Pub. John Wiley & Sons).

Ground loops (also called "hum loops"), are often caused by multiple paths from equipment grounds to the AC main ground ("earth" ground). Ground loops tend to induce hum and allow noise to develop in an audio system; in severe instances, equipment may begin to oscillate due to ground loops. This oscillation can cause distortion and even damage to amplifiers and loudspeakers. One way to avoid ground loops is to make sure that there is just one path to the AC ground (earth ground) for the entire audio system. One popular method, though not necessarily the best or only one, is to cut the shield ground of XLR cables at the input side of the cable. Another technique is to ground all shields at one piece of equipment, typically the mixer, and to cut the shields at the other ends of the cables. (With unbalanced phone jack cables, the shield must be connected at both ends.)

Connect the mixer to the power mains ONLY AFTER CONFIRMING THAT THE VOLTAGE AND LINE FREQUENCY ARE CORRECT. (By all means, USE A VOLTMETER ..... it can save your equipment and the show.) It is also a good idea to check for proper polarity in the AC outlet. The power Switch on the mixer should be Off before connecting the mixer to the mains. As a further precaution, disconnect the mixer from the mains while audio cables are being installed.

WARNING: (for U.S.A) In any audio system installation, governmental and insurance underwriters' electrical codes must be observed. These codes are based on safety, and may vary in different localities; in all cases, local codes take precedence over any suggestions contained in this manual. As set forth in the Mixer Warranty, Yamaha International Corporation shall not be liable for incidental or consequential damages, including injury to persons or property, resulting from improper, unsafe or illegal installation or use of the Mixer or of any related equipment; neither shall the Corporation be liable for any such damages arising from defects or damage resulting from accident, neglect, misuse, modification, mistreatment, tampering or any act of nature.

Mixer Placement

The M916 is a fully portable, self-contained mixer built in a hard, protective case. It may be placed on a table top or a shelf at any convenient working height, or it can be recessed for permanent, low profile mounting.

Whether recessed, or table top mounted, the mixer should be on a level suface, with sufficient rear panel clearance for the input and output cables.

OPTIONAL FUNCTIONS OF THE M916

Several circuits in the M916 have been designed so that an optional function may be obtained by means of a simple internal wiring change (installation, removal or moving of a jumper wire). In all cases, the work can be done in minutes, using only a soldering iron and a short jumper wire.

However, the work should be done only by a qualified audio technician. Your Yamaha dealer or authorized Yamaha repair center will be happy to assist.

NOTE: Whenever a given circuit is modified as described in the following paragraphs, we recommend that a descriptive label be attached to the mixer. In this manner, faster setups and or better mixing will be aided by displaying the mixer's current functional status to the operator.

Adding 10 dB of Gain to the Output Stages

The M916 Program, Echo and Foldback output stages are designed so that the overall gain can be increased by 10 dB simply by installing a jumper wire on the respective line amplifier. This extra 10 dB of gain can be useful in situations where microphones must be used at a distance, such as in churches or theatrical performances. The mixer is supplied in the lower gain configuration because in other cases the gain is not required, and it would merely amplify noise unnecessarily.

Increasing the Effects Input and Matrix Aux Input Sensitivity by 24 dB

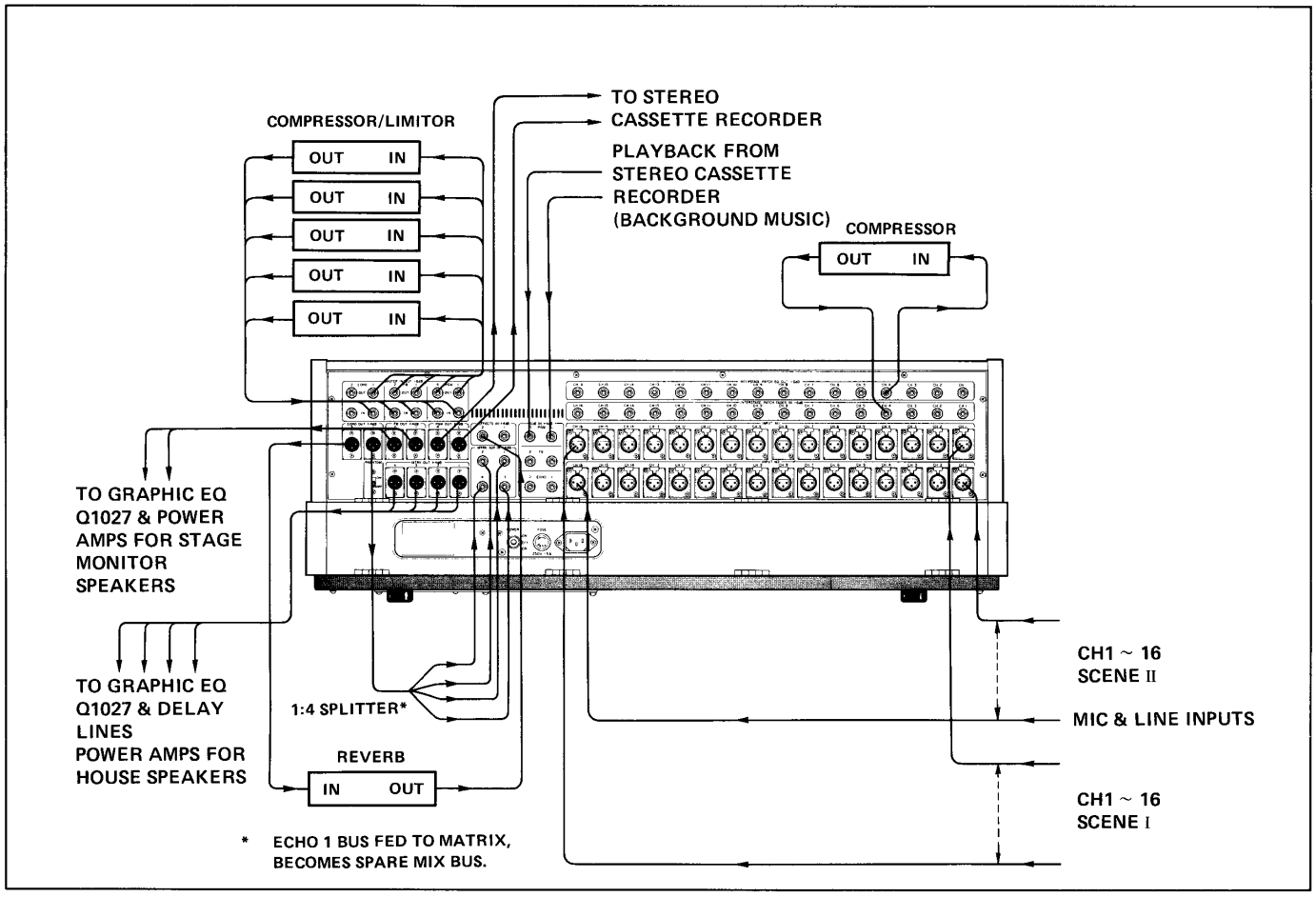
The M916 Effects Inputs (1 & 2) and Matrix Aux Inputs (1 – 4) are designed so that their sensitivity can be increased 24 dB simply by installing a jumper wire on the respective input circuit, which bypasses a built-in 24 dB pad. As factory supplied, the M916's +4 dB input sensitivity provides compatibility with professional sound equipment having +4 dB nominal output levels. There are models of professional equipment, as well as hi-fi and so-called "semi-pro" models, that have nominal output levels from −20 dB to −10 dB. To ensure adequate volume when feeding the M916 Effect Inputs or Matrix Aux Inputs from this equipment, the M916 pads can be bypassed. This changes the nominal input sensitivity to −20 dB.

Changing the Point Where Pre-Fader Signal is Derived for the Input Channel's Echo and Foldback Sends

A Pre-Post switch adjacent to the pair of Foldback send controls, and another next to the Echo sends, on each input channel determine whether the associated controls derive signal after the Fader and Equalizer (POST) or before the Fader (PRE). As factory wired, however, the specific location of the Pre-Fader Echo and Foldback sends differ; Echo is Pre-Fader and Pre-EQ, whereas Foldback is Pre-fader but Post-EQ. The M916 is designed so that the Echo "Pre" send can be changed to be Pre-Fader/Post-EQ by means of a simple jumper change on the channel circuit board. Similarly, the Foldback "Pre" send can be changed to be Pre-Fader & Pre-EQ.

APPLICATIONS

The following are but a few of the many ways the M916 can be used. As you become familiar with this versatile mixer, you will undoubtedly devise you own unique setups and operating techniques.



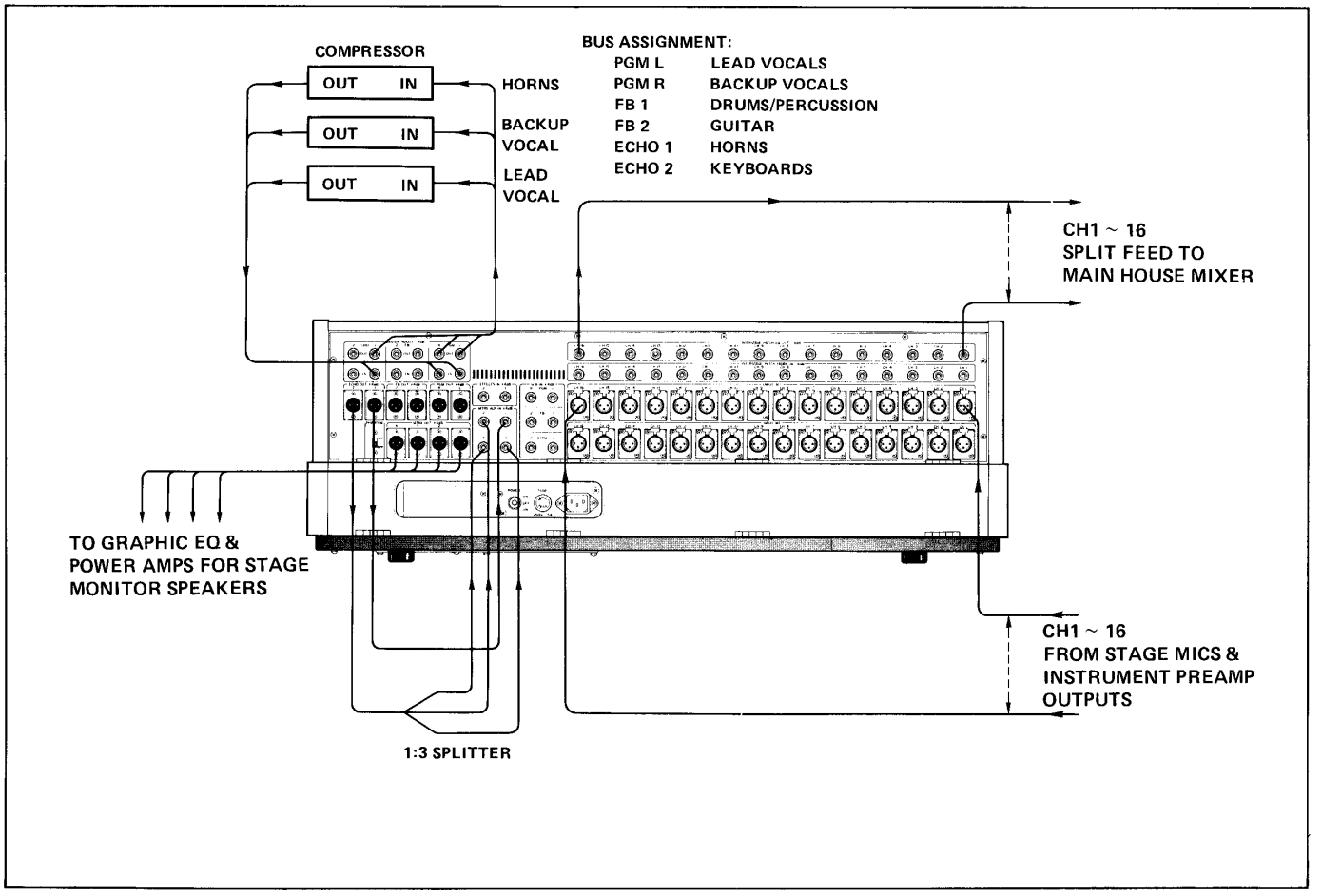
General Sound Reinforcement

Microphones and preamplified electric instrument outputs can be connected to the M916 inputs. Equipment or mics used exclusively by separate acts or in different "scenes" can be connected to the alternate (M2) inputs for fast changeovers. If echo/reverb needs are minimal, one or both echo busses can be used for additional foldback (stage monitoring).

Master patch Out/In points can be used for compressors, although a single loud sound can "duck" the entire mix; a good alternative is to compress only those few inputs which really require the gain riding (via their channel interstage patch points). Master patch points are also good places to connect parametric and/or graphic EQ for house tuning, or digital delay lines for distributed speaker systems. To get the most out of the Mix matrix, the program and foldback busses may be used for sub-grouping of different sources; i.e., brass, drums/percussion, vocal backup, lead vocal, etc. The Mix Matrix outputs are then used to feed power amps (& speakers) for various zones in the main house, the stage, and other areas. With all bus Master Faders at nominal settings, a basic balance of the sub-groups can be established independently for each zone of the sound system by using its matrix channel and Matrix Master.

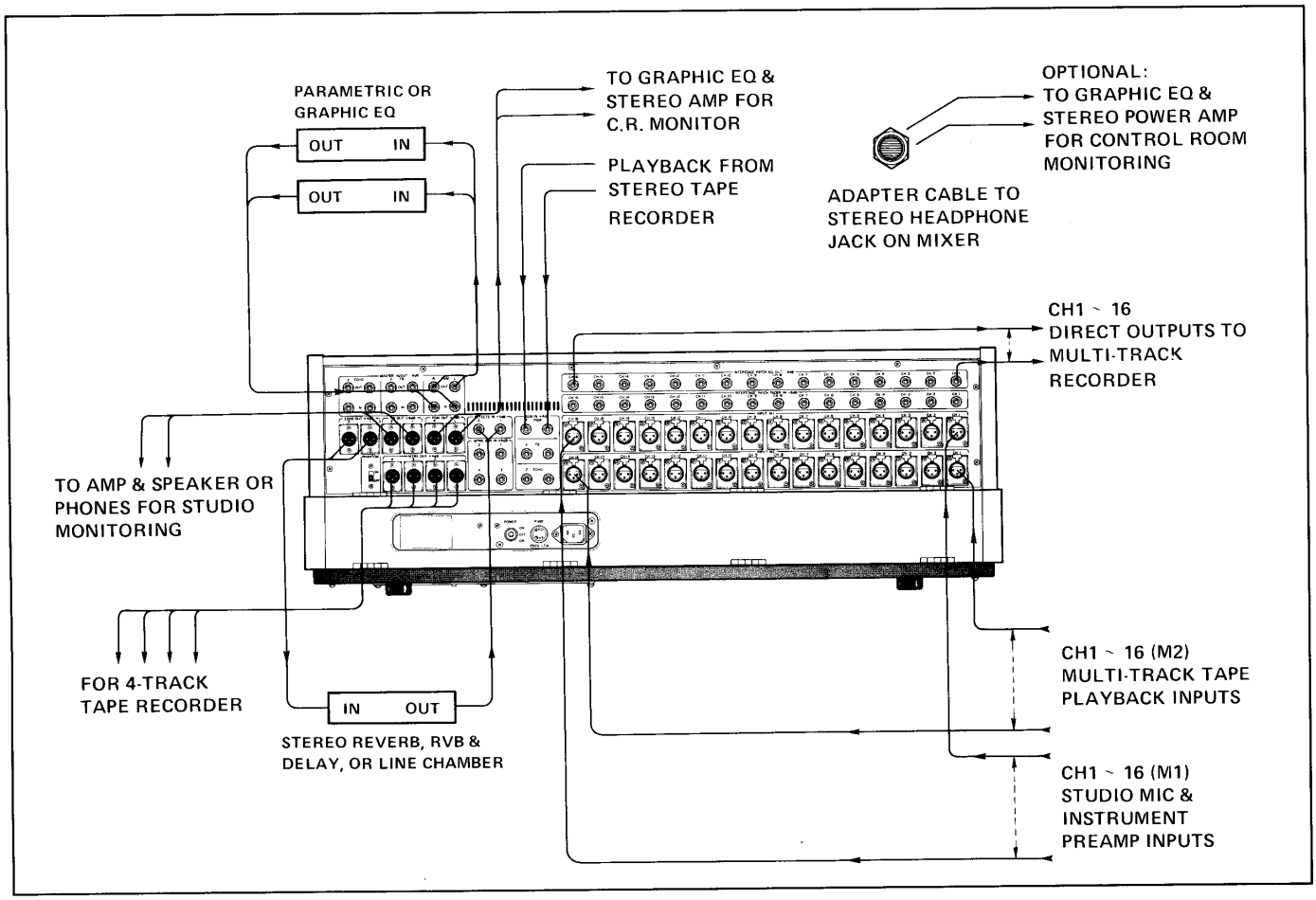
There are a number of advantages to this approach. For instance, if the brass level is too high in all outputs, only one Master Fader need be adjusted, and the balance will simultaneously change in all matrix outputs. For program fades, all Matrix Masters may be brought down; the previously established balance for each zone of the sound system reappears as soon as its Master is again brought back to nominal setting. Also, if any recordings are being made directly from the program outputs their fades need not follow the house fades because the Matrix Master controls do not affect the recording levels.

In the absence of a dedicated stage monitor mixer, the M916's foldback and echo busses may be used to obtain 4 different monitor mixes. If the echo busses are needed for echo and effects, and the 2 foldback busses alone are inadequate for monitoring, try this; feed the house sound system from the M916 program outputs, and use the Mix Matrix to create 4 different stage monitor mixes.



Stage Monitoring

In a stage monitor mixer, it is generally desirable to obtain many different output mixes. The M916, while not specifically designed for this purpose, can be used advantageously. The 2 foldback outputs and 2 echo outputs alone can provide 4 monitor mixes. Instead, however, these busses and the 2 program busses, can be used as vocal and instrumental subgroups. While the echo busses do not directly appear on the Mix Matrix, the echo outputs can be patched into the Matrix Auxiliary Inputs. (Alternately, the echo sends can be used for echo or reverb in applications where the vocalist(s) prefer "wet" monitors.) This total of 6 subgroups can then be combined on the Mix Matrix to achieve 4 distinct monitor mixes. The subgrouped outputs (program, foldback and echo) can be fed to the main mixing console for incorporation in the house mix. Alternatively, the channel Interstage Patch outputs can be used to feed the preamplified inputs to the house mixer.



Recording

When a multi-track tape recording is being made, the recorder can be fed directly from the channel Interstage Patch Out jacks. Microphones and instruments being recorded can be connected to the M1 channel inputs, and the multitrack recorder line output can be connected to the M2 channel inputs (for later remixing). The Mix Matrix need not be used if simple stereo monitoring is required; the Left and Right program outputs can be used for control room monitoring, and the Foldback outputs for studio monitoring. However, by using the headphone output for control room monitoring, the Cue bus can then be used for soloing inputs or busses. If doing a 4-channel recording, or monitoring the multi-channel recording or mixdown via 4 speakers, the Mix Matrix can be useful. Set the channel Foldback sends to "Pre" position, and use the Foldback and program busses as sub-groups. The four matrix channels are then used to do the 4-channel recording mix; echo may be added to the recording mix via the matrix aux inputs, or via the effects inputs to the program busses.

In some cases it is desirable initially to make a "dry" stereo recording from the mixer's program outputs (one without echo or other special effects), but to monitor the recording "wet" (with echo or effects). This can be done simply by using the Matrix to drive the monitor speakers, and connecting the echo/effects return line(s) to the Mix Matrix auxiliary inputs rather than to the mixer's effects inputs; the Matrix Aux In level controls will then enable the effects to be mixed into the monitors, but since the tape machine is fed from the master program outputs, it remain "dry."

Television Production

The input channel Interstage Patch outputs are useful for "splitting" preamplified mic signals to feed other mixers, such as a separate foldback mixer. These patch Out/In points also may be used for compressors or, in the case of telephone remote inputs, for special equalizers. The Mix Matrix is helpful in creating mix-minus feeds. These are sent to boom mic and camera operators's IFB systems (interruptible fold back intercoms), as well as to contestants or separated groups of people who must not hear certain portions of the program. The Mix Matrix is also useful in creating a mono mix of the show for a VTR feed. The soon-to-come stereo T.V. sound will be easy to achieve using two Mix Matrix channels.

For remote production, pre-production, or post-production work, the Mix Matrix might best be used to feed various VTR's with different audio mixes, to provide primary and secondary feeds to transmission, or even to mix a reference tape (mono or stereo cassette).

The Effects Inputs, if not needed for reverb, can be used as auxiliary line inputs from adjacent studios, tapes, and so forth.

Theatrical Production

The typical production has several scenes, each with different mic setups, and some with special effects. The twin XLR's per input channel may aid in quick change-over of some mic or line inputs. Where the main reinforcement system is monaural, the stereo program busses can both be utilized to mix different scenes, and can be externally combined to feed a mono power amp. The next scene may then be preset on the unused Left or Right output, and the transition made smoothly by using the PGM Master Faders.

In some setups, each scene may need to be fed to different combinations of various house speakers, and this is where the Mix Matrix is invaluable. The 2 program busses can be assigned to spread across the stage, across audience fill channels, or into special effects speakers. The Mix Matrix Master Faders may be used to activate the "effects" speakers on cue.

It may be useful to restrap the mixer for the available 10 dB of extra output gain, especially if ceiling mics or floor-mounted "mic mice" are used.

MAINTENANCE & SERVICE

Panel and Cabinet Cleaning

The black panels should be cleaned with a damp sponge. Stubborn soil can be removed with a mild detergent solution, such as dishwashing detergent. Strong detergents and chemical solvents may damage the plastic fittings.

The wood veneer cabinet will retain its beautiful finish with very little care. When it looks dull or soiled, apply any liquid or paste furniture polish and buff with a soft cloth; aerosols should be avoided because the solvents may damage adjacent portions of the mixer, especially the meter faces.

Spare Parts

The M916 is built for high reliability, but accidents and failures may occur. A spare circuit card or power supply can save the show in just seconds. We recommend that in all critical applications, one spare of each major circuit card, and one spare power supply be kept handy. These items are available through your Yamaha dealer.

Fuse Replacement

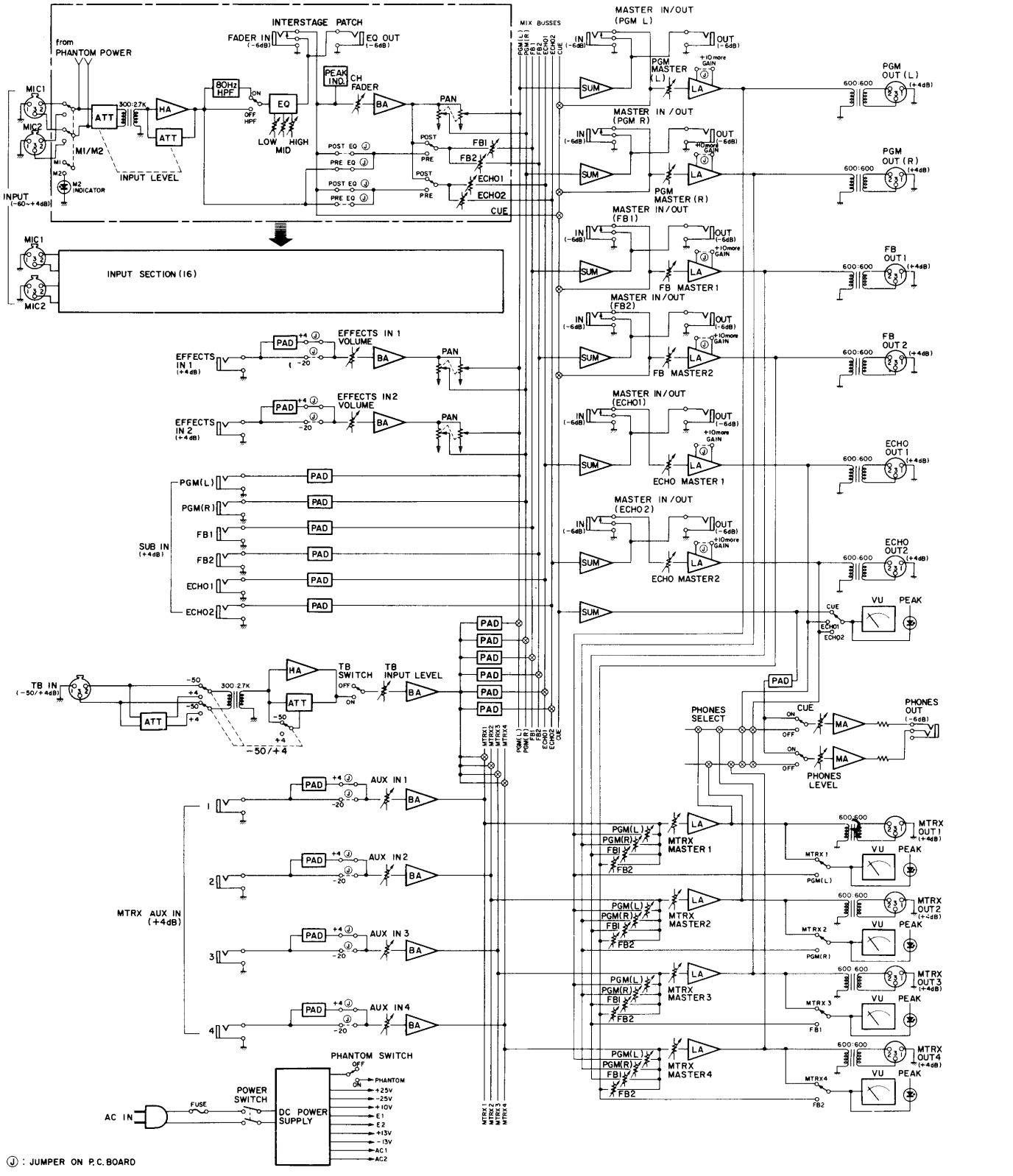
The rear panel is fitted with a fuse holder for the AC line. The fuse should be replaced with one of the identical value and type. If a fuse continues to fail, do not install a higher value fuse; find the cause of the failures and correct it. In the event the problem cannot be located, see the "Service" directions at the end of this section.

Access to the Mixer Interior

WARNING: There are no user-serviceable parts inside the mixer. Only qualified service personnel should attempt to open the unit for any purpose. Lethal voltages are present inside the mixer, and the AC line cord should be disconnected prior to opening it.

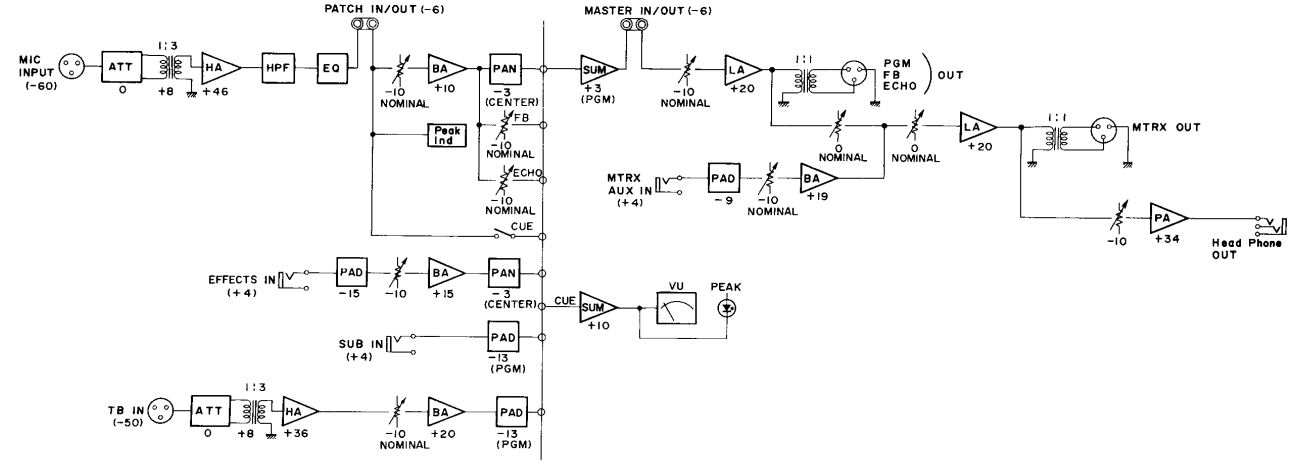
Two meter lamps are provided for each VU meter, one on either side. A lamp may be removed by pulling its lamp holder out of the rubber grommet, replacing the lamp, and reinserting the lamp into the grommet. Access to the meters is obtained by removing the screws from the slanted rear portion of the front panel, near the wood edge, and tilting that panel backward. Secondary fuses are located on the power supply module.

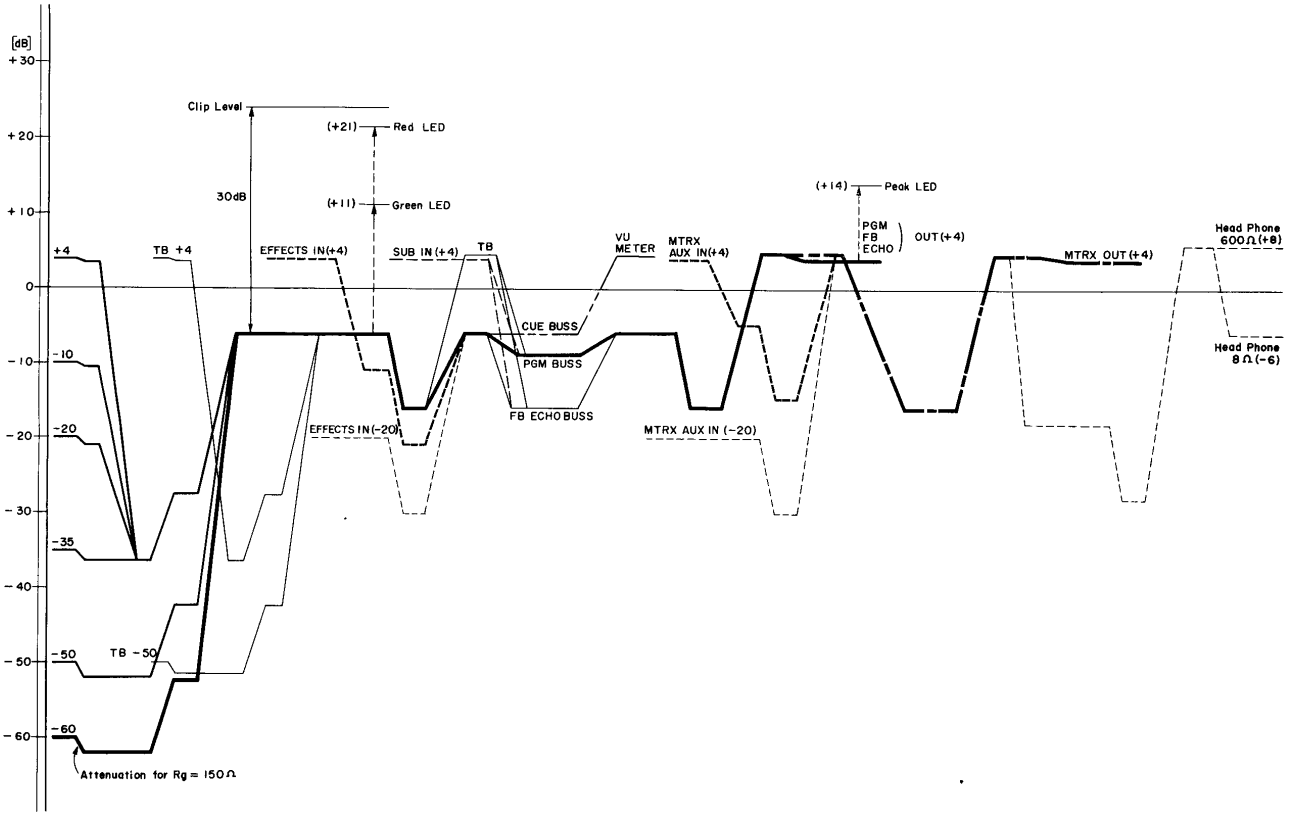
BLOCK DIAGRAM



Ⓙ : JUMPER ON P.C.BOARD

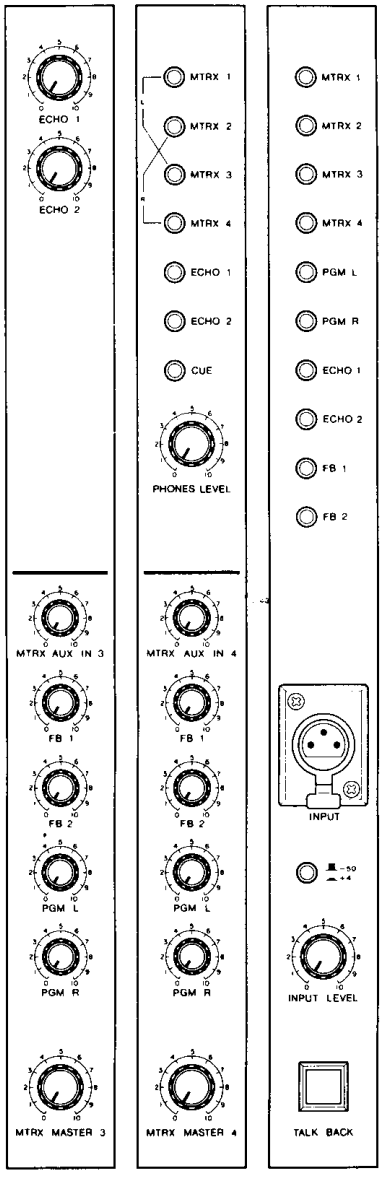
LEVEL DIAGRAM

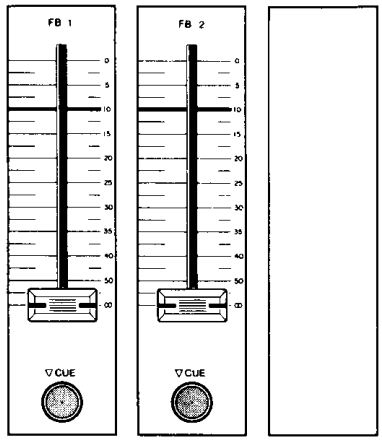




Service

The M916 mixer 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 dealer.





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