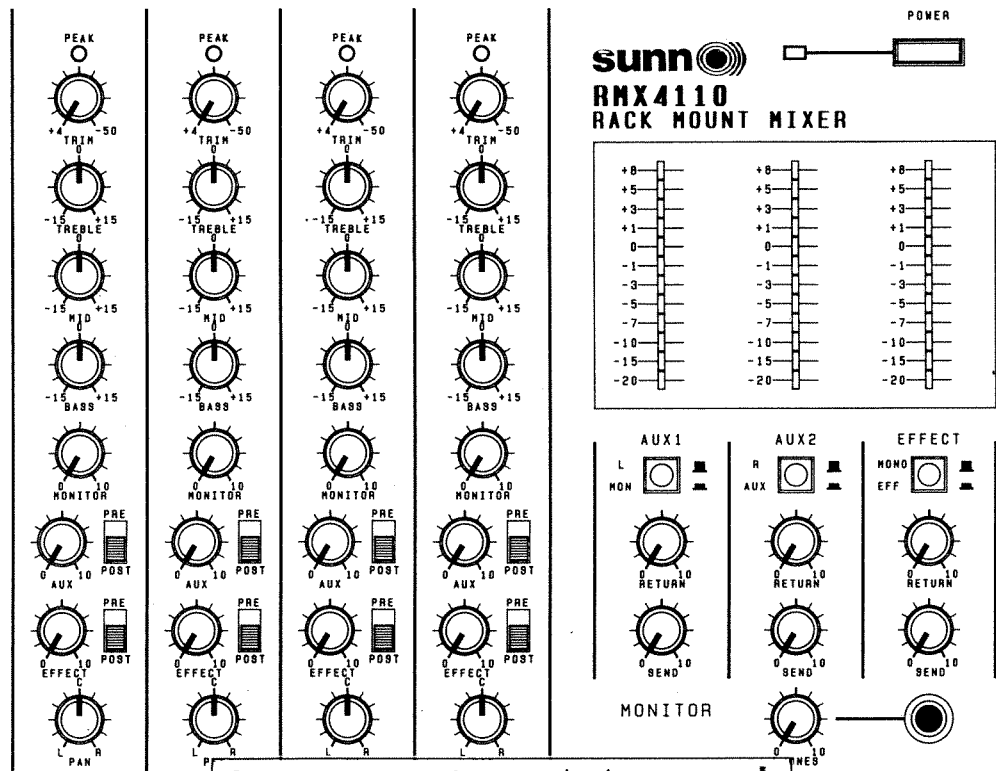


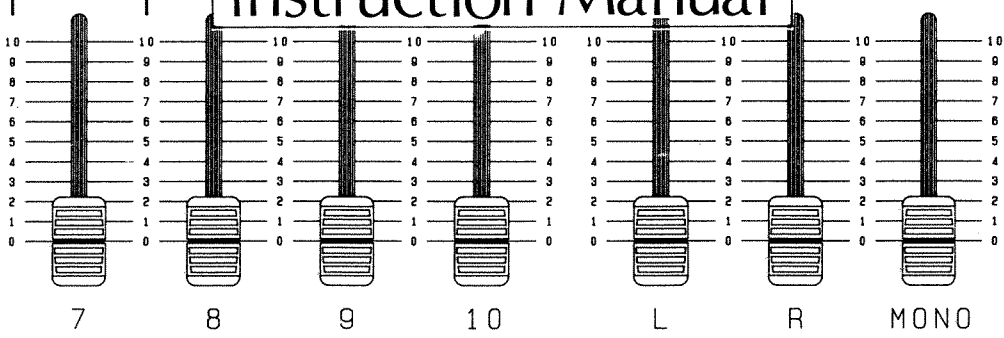


RMX4110

RACK MOUNT MIXER



Instruction Manual





SUNN RMX 4110 Rack Mount Mixer

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SECTION 1 INTRODUCTION

The SUNN RMX 4110 10 channel rack mount mixer is the latest development in compact, high performance mixers from the engineers at SUNN.

SUNN has been an innovator in the sound reinforcement field for over 25 years. The features and performance of the RMX 4110 demonstrate the attention to detail found in Sunn product for over a quarter of a century.

The RMX 4110 is designed for maximum versatility. All 10 input channels have both XLR and 1/4" balanced inputs. Many rack mount mixers available today offer only a portion of the input channels with XLR mic level inputs. The RMX 4110 mic inputs are differentially balanced XLRs, and are equipped with a continuously variable gain TRIM control so that literally any mic and many line level signals can be accommodated with channel faders set at nominal level. Channels 9 and 10 also have RCA input connectors in addition to the XLR and 1/4" jacks. Channels 1-8 incorporate 1/4" T-R-S (tip-ring-sleeve) connectors as insertion points. This allows patching of independent effects to that specific channel.

The RMX 4110 is equipped with three (3) independent send and return busses: 1) MONITOR, 2) EFFECTS, 3) AUX. Each buss has a separate 1/4" line level output.

There are three stereo return lines with the signal sent directly to the main left and right output buss. A unique front panel switching system on the RMX 4110 allows the AUX send to be either PRE or POST EQ and PRE FADER. The EFFECT buss switch selects the signal either PRE or POST FADER. The MONITOR buss is always PRE EQ and POST FADER.

The versatility designed into the SUNN RMX 4110 makes it ideal for numerous applications. Keyboard players, electronic drummers and guitar synthesists who need a compact mixer with multiple inputs for various sound sources will find the RMX 4110 perfect. Permanent installations in clubs, churches and schools need the type of flexibility found in the RMX 4110. When operated in accordance

with these instructions, your RMX 4110 will yield very low distortion, wide band-width audio reproduction. Noise is very low in this mixer thanks to well-engineered circuitry and a sensible internal grounding scheme that minimizes hum due to ground loops.

Take time to study the front and rear panels, read the detailed description of each control and connector in this manual. You will find the operation of this mixer to be very straightforward and easy to understand.

Your purchase of a SUNN product will reward you with years of high quality service no matter what the application. This is why we proudly say:

"SUNN.....THE SOUND CHOICE"



WARNING:
TO PREVENT FIRE OR SHOCK
HAZARD, DO NOT EXPOSE THIS
UNIT TO RAIN OR MOISTURE.

SECTION 2

BRIEF OPERATING INSTRUCTIONS

2.1 RMX4110 Front Panel features:

2.1.1 The Input Section

The 10 input channels of the RMX4110 are all identical in terms of features and functions.

1. PEAK LED

This red LED turns on when the post-EQ signal is 6dB below clipping.

2. TRIM

This knob provides 40 dB of continuously variable adjustment for the input preamp gain. It is always best to start with the TRIM control fully counter-clockwise and then increase the gain as needed.

3. TREBLE

+/- 15dB of boost and cut at 10kHz (shelving)

4. MID

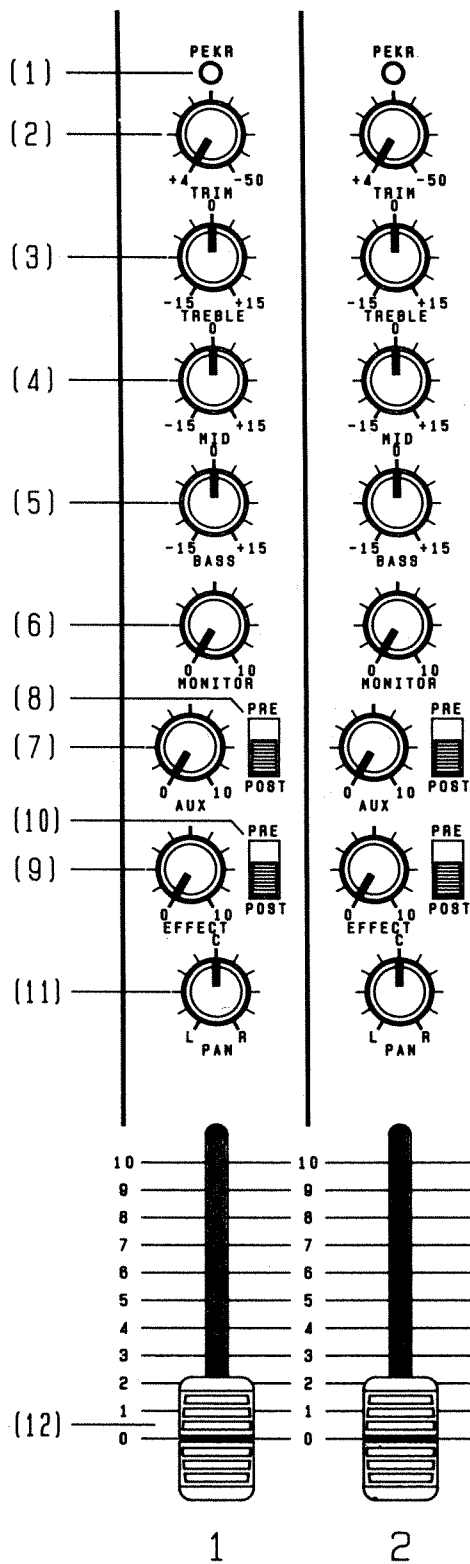
+/- 15dB of boost and cut with the band centered at 2kHz (peak)

5. BASS

+/- 15dB of boost and cut at 100Hz (peak)

6. MONITOR

Controls the amount of input signal sent directly to the MONITOR SEND control (24) in the Master Section. The signal is pre-EQ and pre fader.



7. AUX

Controls the amount of input signal sent directly to AUX SEND control (25) in the Master Section. The signal is selectable pre or post EQ and is always per fader.

8. AUX PRE/POST SWITCH

Selects whether the AUX signal will be pre or post EQ. With the AUX buss pre-EQ, AUX is now ideal for a second monitor mix. With the AUX buss post EQ, it can be used as a second effects buss.

9. EFFECT

Controls the amount of input signal sent directly to the EFFECT SEND control (26) in the Master Section. This control is always post EQ, but is selectable pre or post fader.

10. EFFECT PRE/POST SWITCH

Selects whether the EFFECT signal is pre or post fader.

11. PAN

This rotary control is known as a pan pot because it is a potentiometer (pot) which controls the stereo panorama (pan). It enables a mono input signal to be applied to the left and right program mixing busses in variable proportions. A center detent is provided for equal pan to both the left and right busses.

12. CHANNEL FADER

This linear fader sets the level of input signal sent to the three (3) main busses, Left, Right and Mono.

Figure 2-1. RMX4110 Input Channel



2.1.2 Master Section

13. POWER SWITCH

Turns the RMX4110 on and off. Make sure your mixer is properly connected to an appropriate AC source. DO NOT ALTER THE AC PLUG!

14. POWER ON LED

When lit, indicates the RMX4110 is on and receiving power.

15.12 SEGMENT LED DISPLAY

Switchable to show signal level of either LEFT or MONITOR outputs. L/MON button (18) selects display mode.

16.12 SEGMENT LED DISPLAY

Switchable to show signal level of either RIGHT or AUX outputs. R/AUX button (19) selects display mode.

17.12 SEGMENT LED DISPLAY

Switchable to show signal level of either MONO or EFF outputs. MONO/EFF button (20) selects display mode.

18. L/MON DISPLAY SELECT SWITCH

Selects which signal DISPLAY (15) will show. With the button up, the LEFT output is indicated, with the button down the MONITOR output is shown.

19. R/AUX DISPLAY SELECT SWITCH

Selects which signal DISPLAY (16) will show. With the button up, the RIGHT output is indicated, with the button down the AUX output is shown.

20. MONO/EFF DISPLAY SELECT SWITCH

Selects which signal DISPLAY (17) will show. With the button up, the MONO output is indicated, with the button down the EFFECT output is shown.

21. AUX 1 RETURN

Controls the level of return signal connected to AUX 1 RETURN jacks on rear panel (15).

22. AUX 2 RETURN

Controls the level of return signal connected to AUX 2 RETURN jacks on rear panel (16).

23. EFFECTS RETURN

Controls the level of return signal connected to EFFECT RETURN jack on rear panel (17).

24. MONITOR SEND

Sets the master level for the MONITOR buss. This control is directly connected to the MONITOR SEND jack (18) on the rear panel.

25. AUX SEND

Sets the master level for the AUX buss. This control is directly connected to the AUX SEND jack (17) on the rear panel.

26. EFFECT SEND

Sets the master level for the EFFECT buss. This control is directly connected to the EFFECT SEND jack (16) on the rear panel.

27. PHONES LEVEL CONTROL

Sets the overall level of the headphone amp. The headphone signal comes off the LEFT/RIGHT main buss and is pre master fader.

28. HEADPHONE JACK

Connection for standard stereo headphones of 600 ohm or higher impedance. (Do not use headphones having load impedance of 8 ohms, this may overload the output drive stage.)

29. LEFT MASTER FADER

Controls the level of all signal information on the LEFT stereo buss. This signal is present at the two (2) LEFT MASTER OUT jacks (12) on the rear panel.

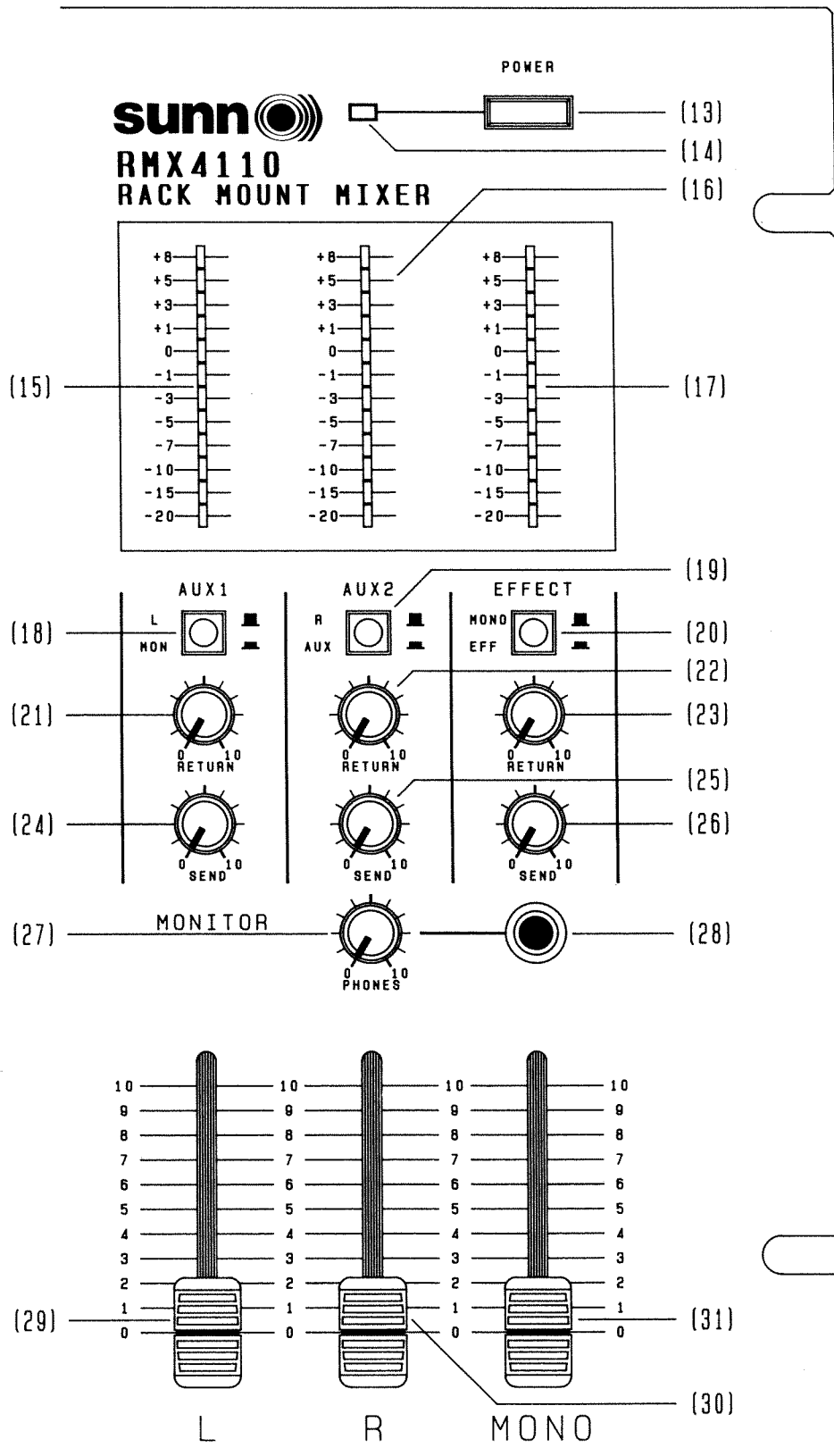
30. RIGHT MASTER FADER

Controls the level of all signal information on the RIGHT stereo buss. This signal is present at the two (2) RIGHT MASTER OUT jacks (11) on the rear panel.

31. MONO MASTER FADER

Controls the level of all signal information which is a sum of the LEFT and RIGHT MASTER outputs. This signal is present at the two (2) MONO MASTER OUT jacks (10) on the rear panel.

Figure 2-2. RMX4110 Master Section





2.1.3 Rear Panel

1.LINE CORD

Connect to appropriate AC source.
DO NOT ALTER 3 PRONG PLUG !

2.POWER RATING INFORMATION

Verify the information on your units matches the particular voltage used in your location (USA/CANADA 120V, U.K. 240V, JAPAN 100V 50/60Hz, EUROPE 220V).

3.GND (Auxiliary Ground Connector)

Chassis ground for external unit. This is useful if using a turntable connected to the RCA input on CH 9 and CH 10.

SIGNAL INPUT CONNECTORS

4.XLR MIC INPUTS

Balanced mic input.

5.1/4" LINE INPUT

Balanced Line level input. (T-R-S Jack)

6.RCA INPUT CONNECTOR

Direct line level connection into channel 10 using RCA style connector. This will simplify connecting a turntable, cassette tape deck or CD player.

7.RCA INPUT CONNECTOR

Direct line level connection into channel 9 using RCA style connector.

8.ON/OFF SWITCH FOR RCA INPUTS

Turns RCA connector for channels 9 and 10 on and off.

9.INSERTION JACK

T-R-S (tip-ring-sleeve) connector for individual channel patching of effects. Tip=Send, Ring=Return, Sleeve=Ground

MASTER OUTPUT SECTION

10.MONO MASTER OUTPUT

XLR and 1/4" balanced outputs. This is a summed from the Left and Right stereo buss. +4dBv output level

11.RIGHT MASTER OUTPUT

XLR and 1/4" balanced outputs of Right main buss. +4dBv output level

12.LEFT MASTER OUTPUT

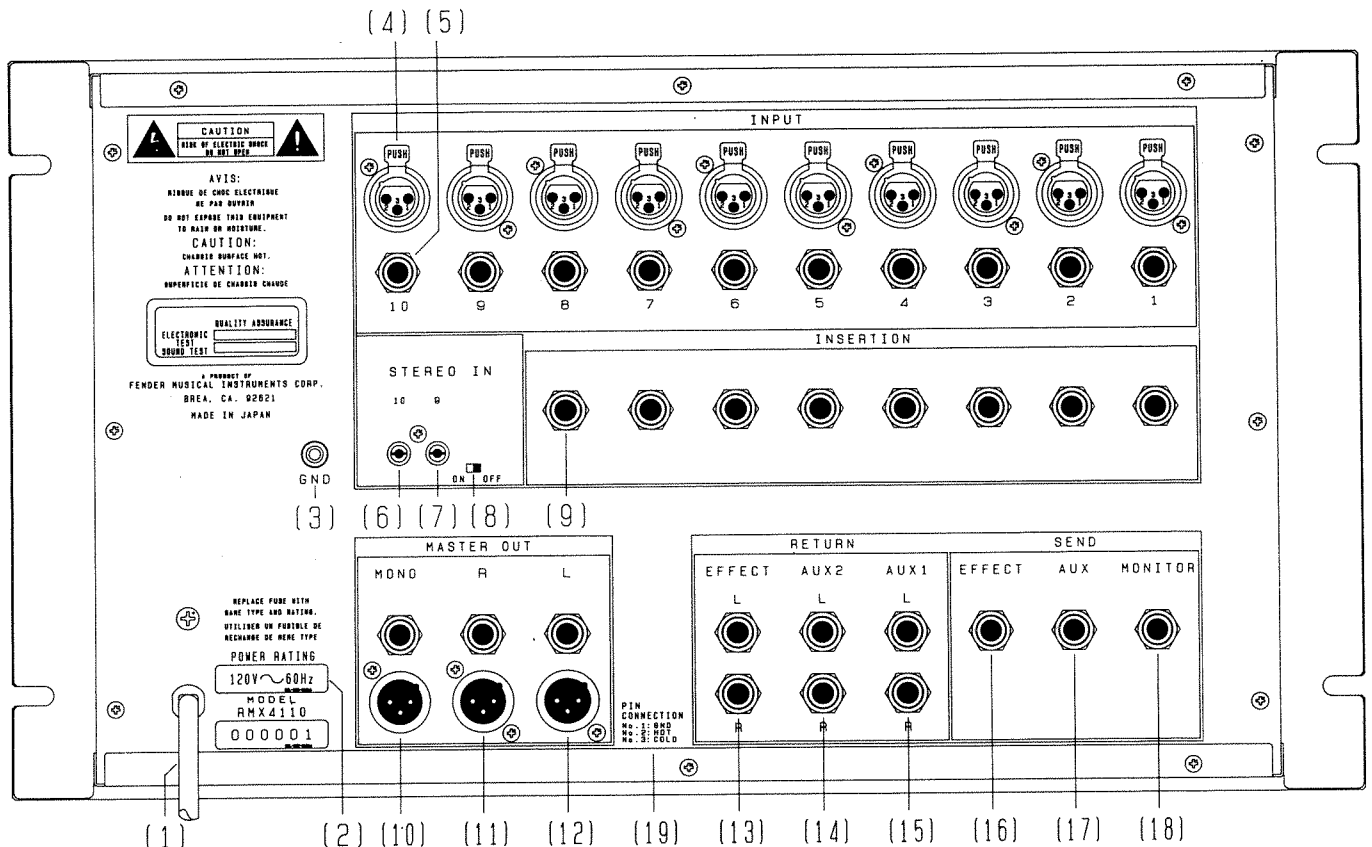
XLR and 1/4" balanced outputs of LEFT main buss. +4dBv output level

SIGNAL RETURN SECTION

13.EFFECT RETURN

Stereo return line going directly into the main Left/Right buss. The level of this signal is controlled by EFFECT RETURN control (23) .

Figure 2-3. RMX4110 Connector Panel Detail



14.AUX 2 RETURN

Stereo return line going directly into the main Left/Right buss. The level of this signal is controlled by AUX 2 RETURN control [22] .

15.AUX 1 RETURN

Stereo return line going directly into the main Left/Right buss. The level of this signal is controlled by AUX 1 RETURN control [21] .

AUX SEND SECTION

16.EFFECT SEND

Output jack for the EFFECT buss. The level of this signal is set by the EFFECT SEND control [26] .

17.AUX SEND

Output jack for the AUX buss. The level of this signal is set by the AUX SEND control [25] .

18.MONITOR SEND

Output jack for the MONITOR buss. The level of this signal is set by the MONITOR SEND control [24] .

19.PIN CONNECTION CHART

Shows method of cable wiring required for this unit.



SECTION 3 INSTALLATION

Rack Mounting the RMX4110

The RMX4110 is designed to directly fit into standard 19" rack enclosures. Make sure all mounting screws are in their proper place and tight before moving the rack enclosure.

Balanced Cables

Two-conductor (twisted pair) shielded cable is best of all XLR connections. Belden 8412, Canare L4E6S, or an equivalent are excellent choices due to their heavy duty construction, multiple strands that avoid breakage, good flexibility, and good shielding. Such cables are suitable for all portable applications, and for microphones. For permanent installation or for equipment confined to portable racks or cases, lighter duty cables such as Belden 8451, Canare L-2E5AT or an equivalent are suitable. Snakes (multi-core cables containing multiple shielded pairs) must be handled very carefully because the leads tend to be fragile, and a broken conductor cannot be repaired. If you use a snake, allow at least one two spare channels that can be used in case of breakage in one of the channels in use.

Layout

Never run AC power lines in the same conduit, or even closely bundled, with audio cables. Hum can be induced from the relatively high voltage AC circuits into the lower voltage audio circuits. A heavy object rolling or dropped across the cables could cut through insulation, shunt the AC into the audio cable, and instantly destroy the audio equipment. Instead, separate the AC cables and audio lines by as wide a distance as is practical, and where they must cross, try to have them do so as close to a right angle as possible, which minimizes induced noise.

Similarly, avoid closely bundling the line-level outputs from the RMX4110 with any mic-level inputs to the console. We recommend that you avoid using a snake for running mic lines from the stage and power amp feeds up to the stage. The close proximity of such cables promotes inductive and/or capacitive coupling of signals. If the stronger output signal

from the console leaks into the lower-level mic or line feeding a console input, and that weaker signal is amplified within the console, a feedback loop will be established. This will not always be heard as audible howling, but instead may manifest as very high frequency oscillation that indirectly causes distortion of the signal and that can precipitate premature component failure. Again, the best solution is to widely separate mic input cables from line-level output cables or, if not practical, to at least bundle them loosely.

For the same reasons that mic and line level cables should be separated; so, should the cables run between the power amp output and the speakers be separated from mic- or line-level cables. Speaker cables should be treated much like AC cables. If they cross other audio cables, they should do so at right angles. If they must be run along the same path, they should not be bundled tightly.

Balanced and Unbalanced Wiring

There are two basic types of signal transmission systems for low to medium level audio signals: the balanced line, and the unbalanced line. Either type can be used with high or low impedance circuits; the impedance of a line has no particular relationship to whether or not the line is balanced.

An unbalanced line is a two-wire system where the shield (ground) acts as one signal-carrying wire, and the center (hot) wire enclosed within that shield is the other signal-carrying wire.

A balanced line is a three-wire system where two signal wires carry an equal amount of potential or voltage with respect to the shield (ground) wire, but of opposite electrical polarity from each other. The shield (ground) in a balanced line does not carry any audio signal, and is intended strictly as a drain for noise current that may be induced in the cable from external sources.

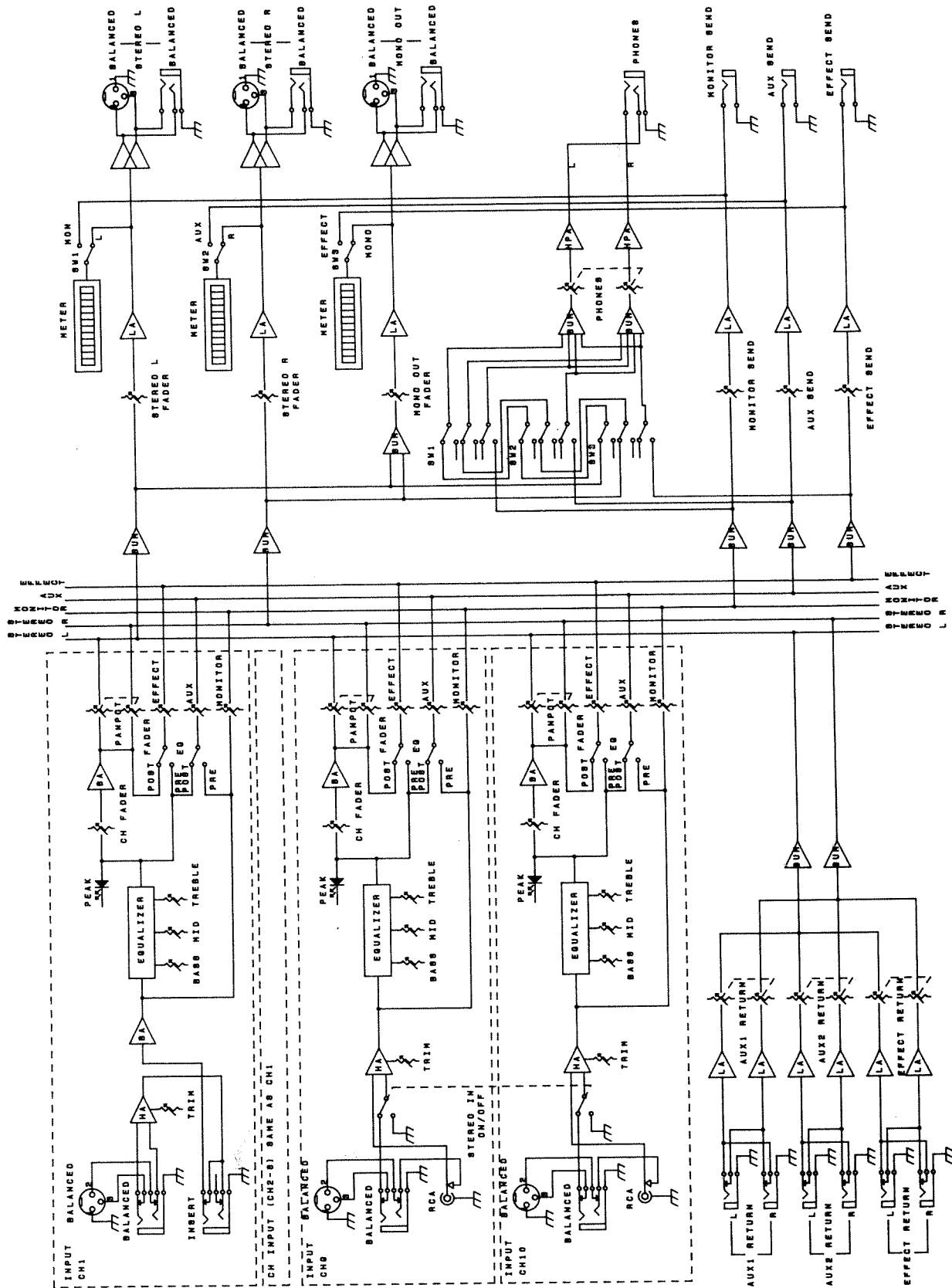
Balanced wiring is more expensive to implement than unbalanced wiring. It offers advantages, especially in portable sound systems, that may offset the added cost. There is nothing

inherently better or more professional about balanced wiring so that nature of the application should guide the selection.

Unbalanced wiring works best when high quality cable is used, the cable runs are relatively short, and one branch of AC power system feeds all the interconnected audio equipment. Such wiring is commonplace for broadcast signal transmission and laboratory test equipment.

Balanced wiring is useful for excluding some types of externally-generated noise. The two wires of a balanced cable both carry the same signal, but each wire is opposite in signal polarity to the other. In a balanced input, both of the signal-carrying wires have the same potential difference with respect to ground (they are balanced with respect to ground), and the input is designed to recognize only the difference in voltage between the two wires (hence the term balanced differential input). Should any electrostatic noise cut across a balanced cable, the noise voltage will appear equally with the same polarity on both signal-carrying wires. The noise is, therefore, ignored or rejected by the input circuit, which is sensitive to differing voltages across the two wires. (This is why the term common mode rejection applies; signals in common to the two center wires are rejected.) The RMX4110 utilizes balanced circuits for channel mic and line inputs. These preserve the advantages of balanced sources, yet will accept unbalanced sources (If you connect an unbalanced source you will lose the noise immunity advantages of a fully balanced circuit).

SECTION 4 BLOCK DIAGRAM





SECTION 5 SPECIFICATIONS

Total Harmonic Distortion	Less than 0.05% from 20 Hz to 20 kHz @ +4 dBv output
Frequency Response	20 Hz to 50 kHz +1, -3 dB @ +4 dBv output
Hum & Noise (Trim=Max, IHF-A)	-128 dBv Equivalent Input Noise -92 dBv Residual Output Noise -78 dBv Master Faders at Nominal Level and All CH Faders at Minimum Level -72 dBv Master Faders and one CH Fader at Nominal Level
Maximum Voltage Amplification	52 dB CH Input to L, R, MONO Output 45 dB CH Input to MONITOR, AUX, EFFECT Output 16 dB AUX1, AUX2, EFFECT Return to L, R, MONO Output
Crosstalk	-70 dB Adjacent Input Channels @ 1 kHz -70 dB L,R Output @ 1 kHz
Trim Control	40 dB Gain Range
Tone Control	
Input TREBLE EQ	+/-15 dB @ 10 kHz, shelving
Input MID EQ	+/-15 dB @ 2 kHz, peaking
Input BASS EQ	+/-15 dB @ 100 Hz, peaking
LED VU Meters	Switchable LEFT/MONITOR, RIGHT/AUX, MONO/EFFECT 0 VU = +4 dBv or 1.23 V rms Output Level
Indicators	
Peak Indicator	LED built into Each Channel Input. It turns on when Post-EQ Signal Level is 6dB below clipping.
Power	LED
Power Consumption	35 W @ AC 120 V, 60 Hz
Power Requirements	
US & Canadian /Europe /UK models	120 V, 60 Hz /220V, 50 Hz /240 V, 50 Hz
Dimensions	
(width × Height × Depth)	482 mm × 267 mm × 176 mm (19.0" × 10.5" × 6.9")
Weight	7.9 kg (17.4 pounds)

Input Specifications

Input Terminals	Impedance	Input Level		Connectors in Mixer
		Sensitivity	Max. before Clip	
Channel Input 1-10	10K ohm	-48 dBu (TRIM at -40) +4 dBu (TRIM at +4)	-17 dBu +17 dBu	3 Pin XLR female:Balanced 1/4" T/R/S Phone Jack:Balanced T=hot, R=cold, S=Gnd (Use T/S Phone Plug: Unbalanced)
Stereo Input (9,10 ch SW-on)	10K ohm	-48 dBu (TRIM at -40) +4 dBu (TRIM at +4)	-17 dBu +17 dBu	RCA Pin Jacks
Insertion Return 1-8	10K ohm	+4 dBu	+23dBu	T/R/S Phone Jack T=send,R=return,R=Gnd
AUX1,AUX2,EFFECT Return	47K ohm	-8 dBu	+20dBu	T/S Phone Jacks

Output Specifications

Output Terminals	Impedance	Output Level		Connectors in Mixer
		Nominal	Max. before Clip	
Master Out L, R, MONO	75 ohm	+4 dBv	+26dBv (Balanced) +22dBv (Unbalanced)	3 Pin XLR male:Balanced 1/4" T/R/S Phone Jack:Balanced T=hot, R=cold, S=Gnd (Use T/S Phone Plug: Unbalanced)
MONITOR, AUX, EFFECT	220 ohm	-2dBu @ 5 k ohm	+23dBu	T/S Phone Jacks
Insertion Send 1-8	100 ohm	+4dBu @ 5 k ohm	+23dBu	T/R/S Phone Jack T=send,R=return,R=Gnd
Phones Out L, R	100 ohm	—————	-4dBu, 31 mW (8 ohm) +20 dBu, 98 mW (600 ohm)	T/R/S Phone Jack T=left, R=right, S=comon (shield) (For 8 ohm or higher impedance stereo headphones)

0 dBu is referenced to 0.775 V rms. 0 dBv is 0 dBu @ 600 ohm.

NOTES



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