

whirlwind / U.S. Audio

Operations Manual

MIX-5/MIX-5s

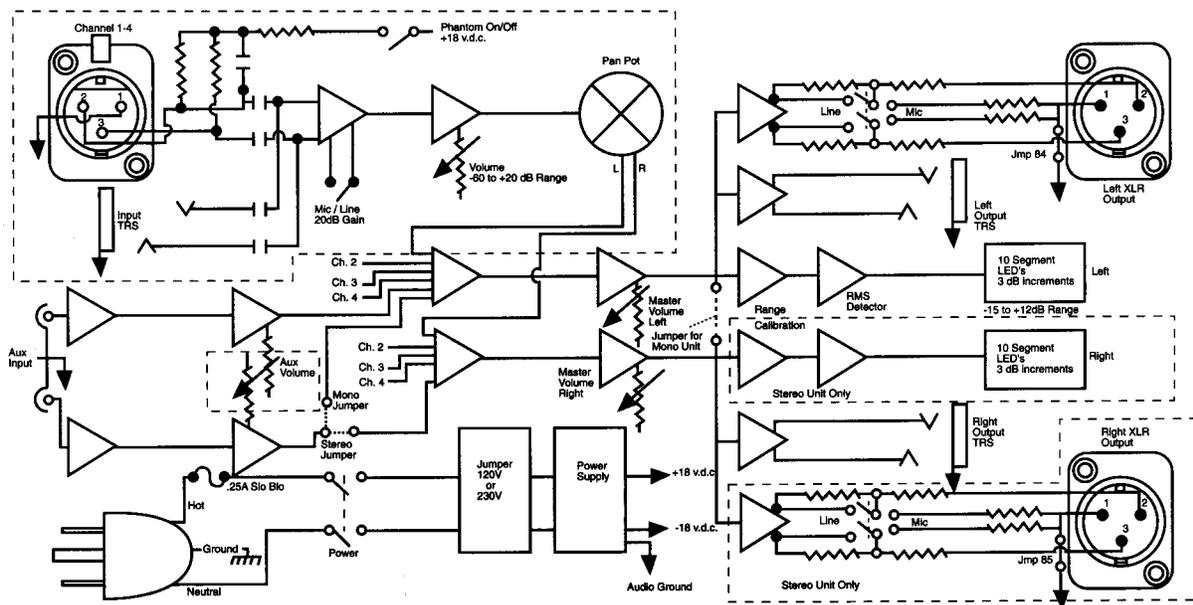


INTRODUCTION

Thank you for selecting the US Audio Mix 5. Both the Mix 5 Stereo and the Mix 5 Mono offer excellent value, delivering the highest quality audio performance at a low cost. Either unit provides up to 55dB of gain, with signal to noise ratios that approach digital quality and still have 10 to 15dB of headroom. With a full complement of hook-up hardware, both mixers are capable of handling any configuration of line or mic level signals as well as any combination of balanced or unbalanced XLR and 1/4" connectors.

UNPACKING

US Audio has made every effort to ensure that your equipment is received in the same perfect condition it was in when it left the factory. Please inspect your product for any signs of damage during shipping and report them to your dealer so that he can present a claim to the shipper. We recommend that you save your packaging material for use in the unlikely event that you will need to return your equipment for service.



Block Diagram:

Right channel sections and pan pots apply only to the Mix 5 Stereo.

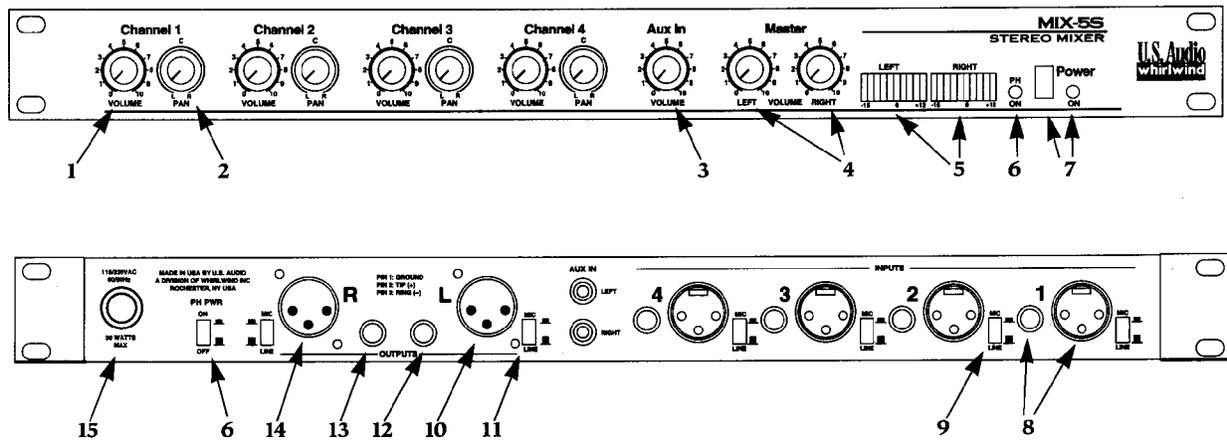
THEORY OF OPERATION

All of the XLR and 1/4" input and output jacks are active, electronically balanced circuits. The input section and all critical gain sections of the Mix 5 use the same IC for gain as top professional mixing boards. This IC, along with careful component selection and PC board layout, enables the Mix 5 to achieve professional quality signal reproduction. All the gain controls on the Mix 5 (Channel Gain, Aux and Master) have a range of -60 to +20dBm. With the input and output switches in the Line position and both the channel and master volume controls at the same settings, unity gain is approximately at the 9 O'clock knob position, 10dB gain at 12 O'clock, and 15dB gain at 3 O'clock. At the 5 O'clock position the unit provides 35dB of gain. The Mic position of the input switch provides another 20dB for a total of 55dB of gain. This feature allows the Mix 5 to adequately mix equipment with a wide range of audio level outputs. 60dB of attenuation in the Off position allows the Mix 5 to adequately "turn off" line level signals at the Mix 5 inputs.

The output section of the Mix 5 was designed to accommodate any configuration – line or mic level; XLR or 1/4"; balanced or unbalanced. Each channel's

output jacks are individually buffered so that using any combination of the outputs at any impedance will not affect the other outputs. With the Mic/Line switch in the Mic position, the XLR output is reduced 20dB (this switch does not affect the 1/4" jacks). The Mix 5 uses an H-Pad resistor network at the XLR to maintain the signal to noise ratio, regardless of the position of the Mic/Line switch. For the XLR outputs, if ground lifting of pin 1 is desired, jumpers JMP 84 and JMP 85 inside the unit can be clipped. Then, in Line mode pin 1 of the XLR is completely lifted and in Mic mode the XLR's pin 1 is ground isolated and referenced to pins 2 and 3. If unbalanced operation is desired from the XLR outputs, pin 2 is hot, pin 1 is ground, and pin 3 should be left UNCONNECTED.

The Mix 5 utilizes a dual primary power transformer that is configured with internal jumpers for 120 VAC 60Hz or 230 VAC 50Hz operation. There is an internal fuse on the hot side of the AC cord, and the power switch makes and breaks both the hot and neutral legs of the AC cord.



CONTROLS AND CONNECTIONS

1. Channel Volumes control input signals over a range of 60dBm attenuation at full off to 20dBm of gain at full on.

2. Pan Pots (Mix 5 Stereo only) are dual pots with center detent, providing over 65dB of stereo isolation from left to right channel. The center detent allows convenient and accurate setup, feeding signal equally to both channels.

3. Aux Input Pot controls the rear panel RCA input jacks. Input signals are actively summed in the Mix 5 Mono, and maintain stereo separation in the Mix 5 Stereo. Again, with a range of -60 to +20dB of gain, the Mix 5 Aux input will interface easily with most types of gear.

4. Master Volume Pots (one for Mix 5 Mono) determine the amount of signal from the summing amps that is fed to the output drivers and the meters. These also have a gain range of -60 to +20dBm.

5. LED dB Indicators are precisely calibrated in 3dB increments and span a range of -15 to +12dBm, measured unbalanced with the input switch in Line mode, at either the 1/4" output or the XLR output. (Add 6 dB for balanced output).

6. Phantom Power for each of the four input XLR jacks is activated by the rear panel pushbutton switch. Status is indicated by the front panel LED. Each channel is individually filtered to eliminate crosstalk through the supply rail. The Mix 5 supplies 18VDC with current limiting resistors chosen to ensure that the phantom supply will not fall below the AES minimum specification of 12VDC at a 5.2mA current draw. Most condenser type microphones draw between 1 and 3mA and will operate from 12 to 48VDC.

7. Power Switch connects AC to the transformer primary and the LED indicates that the unit is receiving power. Both sides of the AC line are switched and a mains fuse is located on the circuit board inside the unit.

8. Input 1/4" TRS and XLR Jacks are AC-coupled through phantom blocking capacitors with pin 2 positive, wired to tip, pin 3 negative, wired to ring, and pin 1

common, wired to sleeve. Audio ground is not connected to chassis ground.

9. Input Mic/Line Switch is engages an active circuit that applies 20dB of gain when in the Mic position. This gain is applied to both input jacks. For most input signals the Out or Line position will be appropriate.

10. Output Male XLR Jack (left for stereo) is balanced with pin 2 positive, pin 3 negative and pin 1 audio ground. For unbalanced operation use pins 1 and 2 leaving pin 3 UNCONNECTED. To internally lift pin 1 from common, open the unit and cut jumper JMP84.

11. Output Mic/Line Switches affect only the XLR output jack(s) by inserting a 20dB pad across pins 2 and 3 when in the Mic position.

12. Output 1/4" TRS Jack delivers the same signal as the XLR but has a separate driver circuit providing complete isolation from the XLR output. May be used either balanced with a TRS plug or unbalanced with a TS plug. Tip is positive, ring is negative and sleeve is audio ground. This jack can drive high impedance headphones directly, although one side is out of phase. A properly wired adapter cable can provide monitoring capabilities.

13. Output 1/4" TRS Jack is connected to the right output and is identical to #12 above for the Mix 5 Stereo. It provides a second active isolated TRS output in the Mix 5 Mono.

14. Output Male XLR Jack and Mic/Line Switch appear only on the Mix 5 Stereo and operate identically to #10 and #11 above, providing the right channel output. To internally lift pin 1 from common, open the unit and cut jumper JMP85.

15. Power Cord has a standard 15 amp plug for 120VAC and has no plug on the Mix 5MX or Mix 5sX 230VAC export models. Black is line, white is neutral and green is earth.

SPECIFICATIONS

Frequency Response

| | |
|-----------|---|
| Line mode | ± 3dB, 6Hz to 36kHz -0.4dB @ 20Hz -1dB @ 20kHz |
| Mic mode | ± 3dB, 18Hz to 36kHz -2.5dB @ 20Hz -1dB @ 20kHz |

Maximum Input Level

| | |
|-----------|--|
| Line mode | +22 dBm unbalanced +28 dBm balanced |
| Mic mode | - 2 dBm unbalanced +4 dBm balanced |

Input Impedance

| | |
|-----------|---------------------------------------|
| Line mode | 2k Ohm balanced or unbalanced |
| Mic mode | 600 Ohm balanced 2k Ohm unbalanced |

Maximum Output Level

| | |
|------------|--------|
| Balanced | +28dBm |
| Unbalanced | +22dBm |

Output Impedance XLRs

| | |
|-----------|----------|
| Line mode | 100 Ohms |
| Mic mode | 200 Ohms |

Output Impedance TRS

| | |
|------------|----------|
| Unbalanced | 60 Ohms |
| Balanced | 120 Ohms |

Rise Time 8uSec

Stereo Separation >65dBm

C.M.R. (Common Mode Rejection) of Input
> 55dBm @ 60Hz

Attenuation Of Line/Mic Output Switch

20dBm

Isolation Between 1/4" and XLR Outputs

>100dBm

Aux Input Impedance 10k Ohms

Maximum Level Aux Input

+22dBm

THD+N (Total Harmonic Distortion + Noise)

Line Mode @ 14dBm of Gain .005%

Line Mode @ Unity Gain .012%

Equivalent Input Noise

| Input Level (dBm) | Input Mic/Line Switch Position | Gain (dBm) | Headroom (dBm) | S/N Ratio (dBm) | E.I.N. (dBm) |
|--------------------------|---------------------------------------|-------------------|-----------------------|------------------------|---------------------|
| + 10 | Line | 0 | 13.8 | 88.3 | -88.3 |
| 0 | Line | 0 | 13.4 | 87 | -87 |
| 0 | Line | 10 | 12.3 | 85 | -75.3 |
| -10 | Line | 10 | 12.2 | 79.2 | -69.2 |
| -20 | Mic | 30 | 28 | 86 | -76 |
| -30 | Mic | 40 | 12.5 | 79.7 | -69.7 |
| -40 | Mic | 50 | 12.7 | 72.3 | -62.3 |
| -10 | Line | 14 | 18.4 | 75.8 | -71.8 |
| -10 | Mic | 14 | 7.8 | 84 | -80 |

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