

AMIX Series Automatic Mixers

Installer's Manual

**AMIX-4
AMIX-8**

Warranty

All Intelix products are guaranteed against malfunction due to defects in materials or workmanship for two years after date of purchase. If a malfunction does occur during the specified period, the defective product will be repaired/replaced, at Intelix's option, without charge. Furthermore, the "Fresh Start" program ensures that a product which has been repaired/replaced is itself guaranteed for an additional two years.

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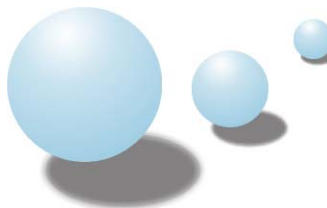
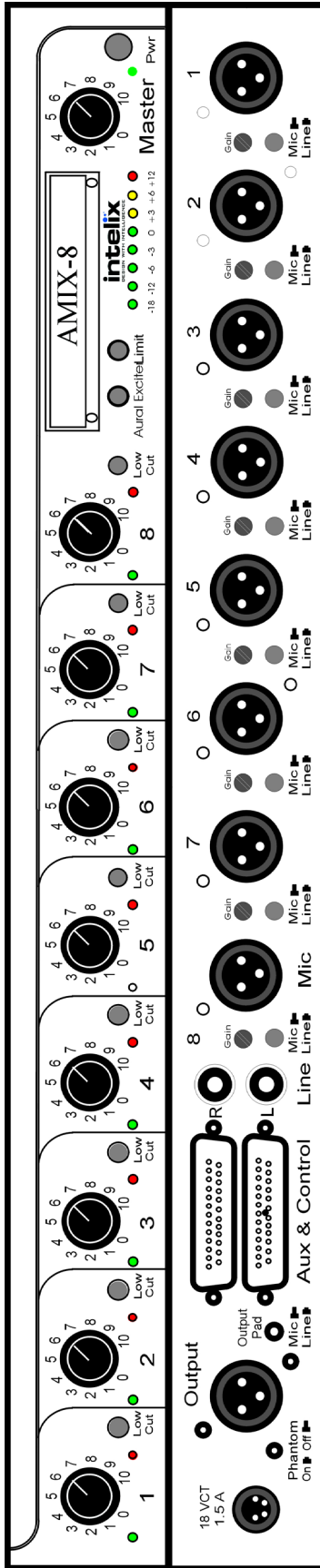


Table of Contents

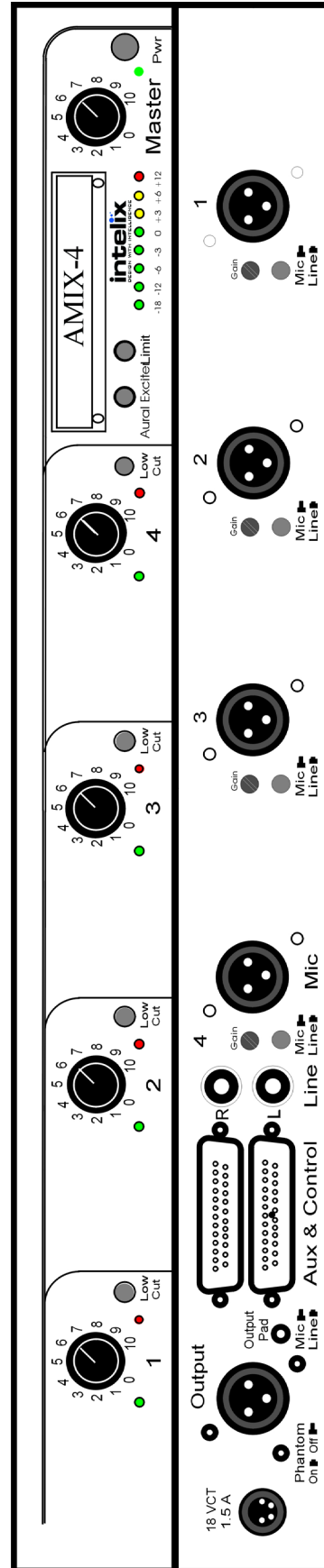
1.0 Introduction.....	7
1.0 Introduction.....	7
1.1 Safety Instructions.....	7
1.2 Maintenance Guidelines.....	7
1.3 Quick Start for the AMIX Mixer.....	8
1.3.1 Unpack and connect.....	8
1.3.2 Power and set-up.....	8
1.3.3 Fine tuning.....	8
1.3.4 Optional special features activation.....	8
1.3.5 Linking multiple mixers.....	8
 2.0 Panel Descriptions.....	 9
2.0 Panel Descriptions.....	9
2.1 Mixer Front Panel.....	9
2.2 Mixer Front Panel AccessWindow.....	10
2.3 Mixer Rear Panel.....	11
 3.0 AMIX Functions.....	 12
3.0 AMIX Functions.....	12
3.1 Threshold Sensitive Gating.....	12
3.2 Number of Open Microphones.....	12
3.3 Hold Time Potentiometer.....	12
3.4 Off-Attenuation Amount Potentiometer.....	12
3.5 User Selectable Modes of Operation.....	13
3.5.1 Last mic on.....	13
3.5.2 First come, first served.....	13
3.6 Priority Override.....	13
3.7 AMIX Channel Exclusion.....	14
3.8 AMIX Software Version.....	14
 4.0 Installation.....	 15
4.0 Installation of the AMIX Mixer.....	15
4.1 Unpack, Connect, and Power-up.....	15
4.2 Connect Inputs.....	15
4.3 Channel 4 or 8.....	15
4.4 Connect Output.....	16
4.5 Power Up.....	16
4.5.1 Connect the mixer power supply.....	16
4.5.2 Power up the mixer.....	16

5.0 Gain Structure.....	17
5.0 Gain Structure.....	17
5.1 Setting the AMIX Mixer Channels.....	18
6.0 Mixer Fine Tuning.....	19
6.0 Mixer Fine Tuning.....	19
6.1 Low Cut Switch.....	19
6.2 Phantom Power Switch.....	19
6.3 Aphex Aural Exciter.....	19
6.4 Output Limit Switch.....	19
6.5 Select Bar Graph Readout.....	20
6.6 The Ground Lift Jumper.....	20
6.7 Rack the Mixer.....	20
7.0 Setting AMIX Functions.....	21
7.0 Setting AMIX Functions.....	21
7.1 Channel Isolation.....	22
7.2 Fine Tuning AMIX Functions.....	22
8.0 External Control.....	23
8.0 External Control.....	23
8.1 The Connectors.....	23
8.2 DC Control.....	24
8.2.1 Remote volume control.....	24
8.2.2 Connecting a remote volume control.....	24
8.2.3 Remote mute control.....	24
8.2.3.1 Wiring an external mute switch.....	24
8.2.3.2 Wiring an external combination mute switch and volume control.....	25
8.3 Circuit Board Map.....	25
8.4 Master Output Insert Patching.....	26
9.0 Passive Mixer Linking.....	27
9.0 Passive Mixer Linking.....	27
9.1 Making the Cables.....	27
9.2 Connecting the Cables.....	27
10.0 AMIX-LINK Module.....	28
10.0 AMIX-LINK Module.....	28
10.1 Quick Start for AMIX-LINK.....	29

10.1.1	Installing the AMIX-LINK.....	29
10.1.2	Setting the DIP switches.....	29
10.1.3	Connecting the control chain.....	29
10.1.4	Connecting the audio chain.....	29
10.2	Installation of the AMIX-LINK.....	30
10.2.1	Installing.....	30
10.2.2	Removing Jumper J1.....	30
10.3	AMIX-LINK Connector Descriptions.....	31
10.3.1	Gate logic output port description.....	31
10.3.2	M-out/S-in and M-in/S-out port description.....	31
10.3.3	Insert, link in, and link out port description.....	31
10.3.4	The ReO port description.....	31
10.3.5	The RS232 port description.....	32
10.3.6	Control pin port description.....	32
10.4	Connecting the AMIX-LINK Ports.....	32
10.4.1	Connecting to the gate logic output port.....	32
10.4.2	Connecting to the ReO port.....	33
10.4.3	Connecting to the RS232 port.....	34
10.4.4	Connecting to the control pin port.....	35
10.4.5	Wiring external devices to the control pin port.....	35
10.4.6	Setting internal jumpers for the control pin port.....	36
10.4.6.1	To set jumpers.....	36
10.5	Wiring the Link In and Link Out Ports.....	37
10.5.1	Tapping and patching with the AMIX-LINK.....	37
10.5.2	Using the link in port as a balanced link input.....	38
10.5.2.1	If your source is balanced.....	39
10.5.2.2	If your source is unbalanced.....	39
11.0	Troubleshooting Tips.....	40
12.0	Technical Specifications and Line Drawings.....	41



AMIX-4 Front and Rear



AMIX-8 Front and Rear

1.0 Introduction

This manual describes the components and operation of the Intelix AMIX Automatic Mic/line Mixer and the Intelix AMIX-LINK link module. A sophisticated auto-mixer, AMIX provides several modes of automatic mixing: *last mic on*, *first-come*, *first-serve*, and *priority override*.

Features include:

- 4 or 8-channel automatic mixing
- NOM automixing
- Threshold sensitive gating
- Optional RS232 or ReO control
- Linkable
- Chairperson (filibuster) override
- Phantom power

Essentially, AMIX is an automixer designed to work seamlessly within an integrated media environment.

1.1 Safety Instructions

Read all directions carefully *before use*.

The AMIX system includes a variety of electrical equipment; all precautions usually taken with electrical equipment must be abided by. Specifically:

- **Grounding:** verify both the AMIX mixer and the devices connected to it are properly grounded.
- **Power Supply:** use only the power supply provided by the manufacturer or one that meets the manufacturer's specifications.
- **Cords and Cables:** route all cords and cables so that they will not be trip hazards or subject to damage (from being run over or pinched) which could cause them to become shock hazards. Pay particular attention to cords at plugs, convenience receptacles, and the point where they enter the mixer.
- **Fire:** if the mixer or other electrical equipment catches fire, extinguish the fire using a carbon dioxide (CO₂) extinguisher or any extinguisher rated for electrical fires. Never use a water extinguisher.

1.2 Maintenance Guidelines

Electronic devices operate best in clean, *well-ventilated* environments. The AMIX mixer contains many electronic components in a compact arrangement, thereby generating more heat than the average electronic device. It should be located where it will be well-ventilated and far from other heat-generating equipment, such as amplifiers.

The main ventilation ports are in the sides of the chassis. To operate properly, they should be kept clear of other components (cables, etc.). When several AMIX mixers are located together, the amount of heat generated may be difficult to dissipate if the units are stacked directly on each other. *Ensure adequate ventilation is provided on the sides, ambient air temperature does not exceed 72 degrees F, and an open rack space is left above and below the units.*

To minimize hum in the system, avoid placing cables near EMF-producing devices such as electrical motors, fluorescent lights, AC power lines, and SCR dimmers.

Keep the mixer and other equipment clean and free of dust by occasionally wiping with a soft, damp cloth.

Protect the mixer from electrical damage by disconnecting it from the power source whenever it will be unused for a week or longer.

1.3 Quick Start for the AMIX Mixer

1.3.1 Unpack and connect

1. Check mixer for shipping damage.
2. Turn both mixer and amplifier volume controls to zero.
3. Connect inputs and set the input pad switch for each channel to the appropriate level (either mic or line). *Set all unused channels to line level.*
4. Connect output and set the output pad switch at the appropriate (either mic or line) level.
5. Set low cut filter switch “on” for *all active channels*.

1.3.2 Power and set up

1. Connect mixer’s AC power supply.
2. Power up mixer and amplifier.
3. Enable automatic mixing by pushing the AMIX engage button to the “in” position.
4. For basic operation ensure that all DIP switches (except switch 8) are down.

1.3.3 Fine tuning

Adjust the gain screw on the back of the mixer for each individual channel so that the clip/gate-on LED is steady on at “normal” voice level. Make sure to adjust the individual channel gains so that each mic is “isolated” (only one comes on at a time).

Adjust attenuation time and amount pots on the AMIX if desired (factory settings are one second and ∞ dB respectively).

1.3.4 Optional: special features activation

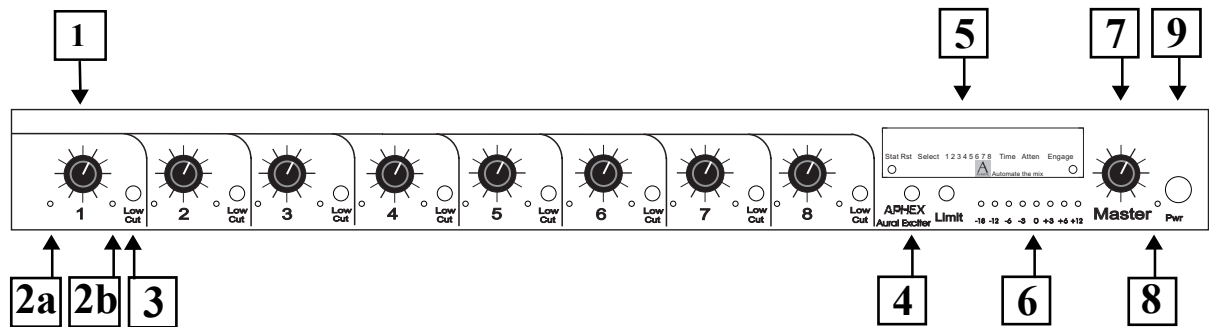
Attach DC control points and audio bus connections to the DB25 connector on the rear panel for direct out; insert patching to enable remote volume control and mute control.

1.3.5 Linking multiple mixers

All AMIX mixers may be linked together serially (“daisy chained”) in one of two ways. The simplest and most flexible method is by using the Intelix AMIX-LINK module. If the application does not require the use of the AMIX-LINK (e.g., simple linking of two mixers), the mixers may be daisy chained using interconnect cables. For more information, please refer to sections 9 and 10.

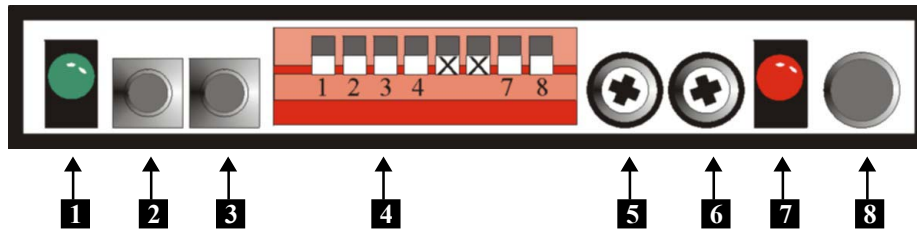
2.0 Panel Descriptions

2.1 Mixer Front Panel (AMIX-8 shown)



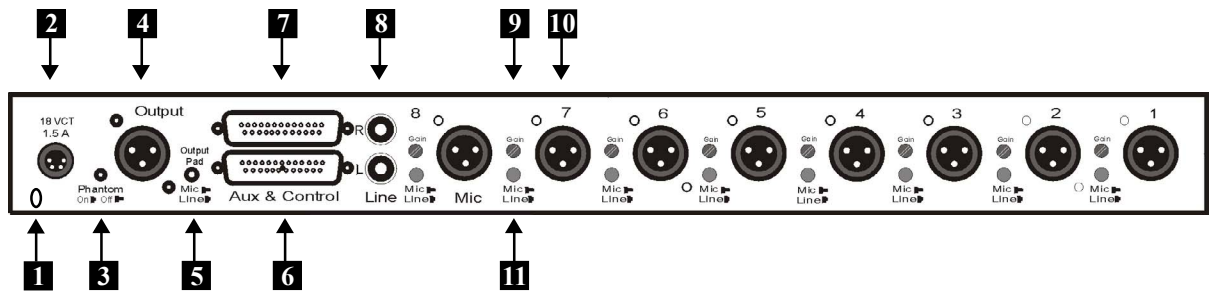
- 1 Channel Volume Knob** (four on AMIX 4; eight on AMIX 8): controls volume of channel input.
- 2a Signal Present LED (Green)**: if lit, indicates at least a -10 dB input signal.
- 2b Signal Clip/Gate On LED (Red)**: if lit, indicates a +18 dB or greater input signal (possible signal distortion). If automix is enabled, LED indicates channel on status.
- 3 Low Cut Switch**: helps eliminate low frequency noise (rumble, etc.).
- 4 Aphex® Aural Exciter® Switch**: improves quality of output signal by adding supplementary harmonic information.
- 5 Output Limiter Switch**: eliminates clipping distortion of output by controlling dynamic range.
- 6 LED Bar Graph Output Meter**: displays output signal level in decibels, ranging from -18 (green) to +12 (red) dB.
- 7 Master Output Volume Knob**: controls output signal level.
- 8 Power Indicator LED (red)**: displays powered state. Lit when power is on.
- 9 Power Switch Button**: push to power unit (“in” position). Push to power down unit (“out” position).

2.2 Mixer Front Panel Access Window



- 1 Status LED (Green):** if lit, AMIX is operating in linked mode; i.e., at least two mixers are connected together and their switches are correctly configured.
- 2 Reset Button:** restarts AMIX software without powering-down the whole mixer. Resetting causes the clip (red) LEDs to display a pattern which indicates software version number (see section 3.8).
- 3 Select Button:** used to exclude individual channels from automix.
- 4 DIP Switches 1-8**
 - Switch 1:** selects link mode control configuration (up = master, down = slave)
 - Switch 2:** selects “last mic on” function (up = last mic on)
 - Switch 3:** selects “first-come, first-serve” function (up = first come, first serve)
 - Switch 4:** selects mixer link mode (up = unlink, down = link)
 - Switch 5:** selects escape mode (up=escape mode, down = no escape mode)
 - Switches 6,7:** unused
 - Switch 8:** controls reset mode--up toggles reset to factory defaults (full on), down toggles preset on reset (preset determined by RS232 command Preset on Reset). If no preset is defined, then reset uses preset 0 (live crosspoints). Recommended for users of RS232 control. Full on reset is limited by front panel controls.
- 5 Hold Time Potentiometer:** controls the amount of time (ranging from 13 milliseconds to 1.7 sec.) that an open mic will stay on after there is no direct sound input to it.
- 6 Off-Attenuation Potentiometer:** controls the amount (from 0 to ∞ dB) by which the level of an open mic is reduced when it is not gated on.
- 7 AMIX Enable/Disable LED (Red):** indicates AMIX module’s functional state. Lit when AMIX is *enabled*.
- 8 Enable/Disable Button:** push (“in” position) to enable AMIX functions. Push (“out” position) to disable.

2.3 Mixer Rear Panel (AMIX-8 shown)



- 1 Ground Lift Jumper:** jumper J4; connects chassis to electronic ground.
- 2 AC Power Jack:** power supply input; accepts a 4-pin DIN connection from an 18VCT 1.5 Amp transformer.
- 3 Phantom Power Switch:** *when activated*, supplies +15V DC power (for condenser microphones) to all channels with the mic/line switch set to mic position.
- 4 Master XLR Output Jack:** balanced male XLR jack for master bus output.
- 5 Master Mic/Line Switch:** selects master output to either mic level (-50 dBu) or line level (0 dBu).
- 6 DB25 Control Pin Connector:** connection points for DC remote control and insert patching and linking.
- 7 AMIX-LINK Connector:** location for installing AMIX-LINK.
- 8 RCA input jacks:** stereo line level input connections for channel 8 (8001 models) or channel 4 (4001 models).
- 9 Channel Input Gain/Trim Control Potentiometer:** adjusts gain of input stage over a range of 40 dBu.
- 10 XLR input Jack:** balanced male XLR input connection, one per channel.
- 11 Input Mic/Line Switch:** selects mic level (-50 dBu) or line level (0 dBu) for corresponding channel.

3.0 AMIX Functions

In addition to standard mixing functions, AMIX also provides **standard automatic mixer functions**.

3.1 Threshold Sensitive Gating

Each AMIX mic/line channel will gate on and off when a signal is present. The threshold level at which the gate-on occurs is set by the channel's trim control. Properly adjusting the threshold level of each channel ensures an acoustic source will not gate-on multiple AMIX channels.

3.2 Number of Open Microphones Attenuator (NOM)

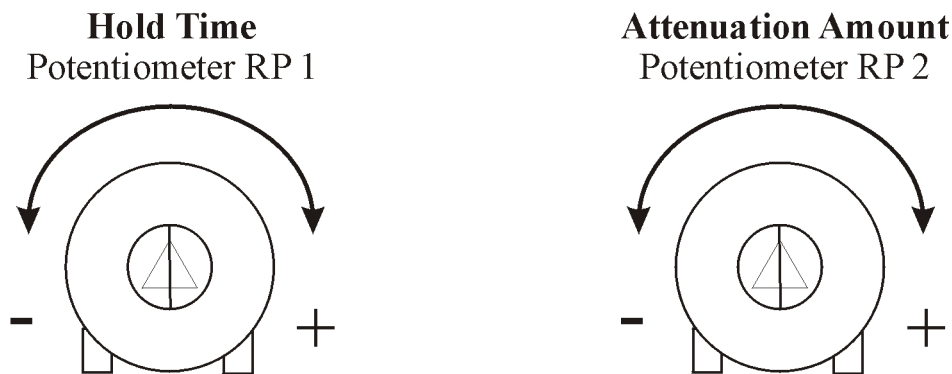
This function attenuates the master output circuit by 3 dB when the number of channels gated on doubles. This is an automatic function and compensates for reduced gain before feedback when multiple channels are open.

3.3 Hold Time Potentiometer

This pot (**RP1**) controls the amount of time (from 13 milliseconds to 1.7 seconds) that an open mic will stay on without direct sound input. This time keeps the open mic from cutting off sharply when a source pauses between phrases or otherwise rests *briefly*. The factory setting is one second; i.e., the left-most half of the LEDs on the temporary bargraph are lit.

Note: When either the hold time pot or the off-attenuation pot are turned, the red clip LEDs become a temporary bargraph, indicating the setting of the pot.

If the amount of hold time is set too short, the mic turning on and off may cut out parts of what is being said. Set up the hold time using one channel. Watch the “clip” LED associated with that channel to see how much time elapses between the end of sound input and the LED going off (when the LED is lit, the mic is on.)



3.4 Off-Attenuation Amount Potentiometer

This pot (**RP2**) controls the level to which the signal of an open mic is reduced when it is not active (not gated on). Reducing the signal rather than turning the mic off completely makes the gating off and on less obvious, resulting in a smoother sound. The amount of reduction

available using the pot ranges from 0 to ∞ dB. The factory setting is ∞ dB; i.e., all temporary bargraph LEDs are lit. Press reset to check the current setting.

Note: If the off attenuation level is set too high, the amount of gain possible before feedback will be reduced. When Last Mic On is active, there will always be an open mic, and therefore some background noise will always be present. In this case, it may be useful to increase the Off-Attenuation amount (set it near ∞ dB) to reduce the level of the background noise from “off” inputs.

3.5 User Selectable Modes of Operation

Modes are selectable via the front panel DIP switches (see section 2.2 for dip switch settings). In linked mode the master unit controls these functions for the entire linked chain.

3.5.1 Last mic on

The last channel to gate-on remains open until another channel is activated. This function is critical in an environment which requires continual background sound; e.g., broadcast feed or recording. **DIP switch 2** activates this mode in the “up” position and it initiates with the highest number channel on.

3.5.2 First come, first served

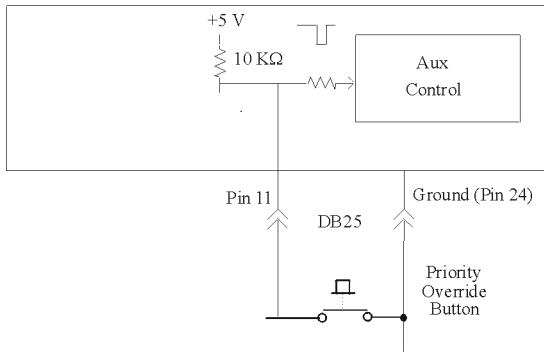
Only one channel may be active at a time. All channels exhibit equal priority. When a channel is active, all others are inactive until the active channel drops below threshold and is gated off. This function is useful in environments where only one source should be active at a time; e.g., boardrooms, teleconferences, or courtrooms. DIP switch 3 activates this mode in the “up” position.

This function is affected by the Hold Time Pot. When *first come, first served* is active, the active channel will continue as long as there is no lengthy pause allowing another channel to become active (indicated by the front panel LEDs). If the Hold Time Pot is set at the shorter end of its range (13 milliseconds), then any pause in the active channel’s input (such as the talker taking a breath) will cause the channel to shut off. For *first come, first served* control to be effective, the Hold Time Pot should be set near the longer end of its range (1 to 1.7 seconds); i.e., the majority of the LEDs should be lit on the temporary bargraph.

3.6 Priority Override

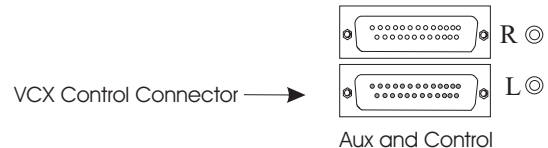
Channel 8 (on AMIX-8) or channel 4 (on AMIX-4) becomes active while all other channels are muted. This mode is activated by an external switch connected to the DC control connector on the rear of the mixer. This function is used when chairperson priority is necessary.

This AMIX function allows an external (user wired) switch to override the automatic mixing function by forcing Channel 8 to be *on* and all the other channels to be *off*. In stand-alone mode, the switch is wired to the mixer that the talker is using. When mixers are linked, the switch must be wired to the master mixer to be effective. The following diagram shows the wiring of the switch.



Note: when a AMIX-LINK is installed, the pins used for priority override are pins “rmtswitch” and ground on the Control pin port.

Note: The DB25 to which the switch is wired is the *lower* one; i.e., the DB25 used for DC control connections.



3.7 AMIX Channel Exclusion

An individual channel may be deselected from automixing. When deselected, a channel no longer has threshold sensitive gating, and is simply open. The channel is no longer part of the NOM equation. All other user selectable modes of operation will not affect the deselected channel. This function is used in any case where automixing is undesirable; e.g., background music source or distant mic source.

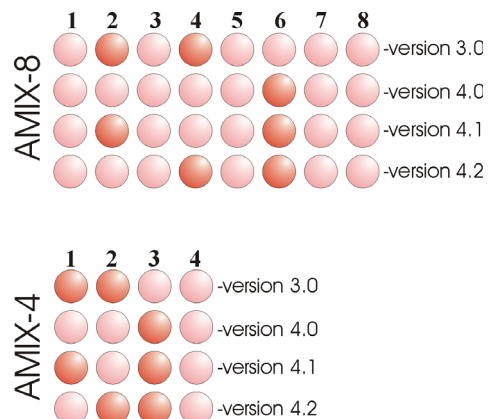
To select channels for automix from the front panel, follow these steps:

- 1) Press the “select” switch. All clip LEDs will be lit (except for channels that have been excluded from automix). Channel 1’s LED will blink periodically (AMIX-8 only).
- 2) Press the “select” button repeatedly until the clip LED for the desired channel is blinking.
- 3) Hold the select button for 2 seconds or more to toggle the setting of automix include/exclude. When the LED is on that channel is included, and will be automixed. If the LED is off, that channel will be excluded from automix.

This process is also available through RS232 commands.

3.8 AMIX Software Version

AMIX Software version is indicated by patterns in the LEDs on the front panel of the unit during power up or during reset.



4.0 Installation of the AMIX Mixer

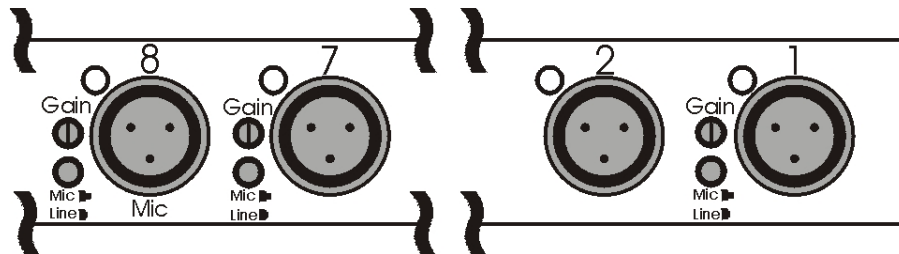
4.1 Unpack, Connect, and Power-up

- A. Take the mixer out of its box and inspect for shipping damage. If there is obvious physical damage contact Intelix before proceeding.
- B. Turn all *mixer* Volume Control Knobs (individual channels and master) to zero.
Turn *external amplifier* volume controls to zero.



4.2 Connect Inputs

For each input channel (up to 4 for AMIX-4; up to 8 for AMIX-8), insert the XLR input connector into the desired XLR Input Jack on the rear panel.



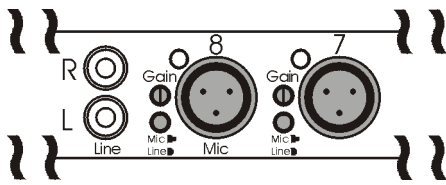
Press the XLR Input Pad Microphone/Line Switch to appropriate position: “in” for line input or “out” for mic input. Note that the input from some microphones is actually close to line level (-20 dB) and for such mics, the Switch should be at “line”.

Note: Set all unused channels to line level.

4.3 Channel 4 (on AMIX-4) or 8 (on AMIX-8)

This channel accepts two types of inputs. Two inputs may be connected to the channel at the same time, but only one at a time may be mixed.

The position of the channel’s XLR Input Pad Microphone/Line Switch determines which input is mixed into the output: in the “mic” position, it uses the input connected to the XLR Input Jack; in the “line” position, it uses the input connected to the RCA Jacks.



Note: This channel accepts stereo inputs via the RCA jacks. The channel's output to the mixer is the mono sum of the "R" and "L" RCA jack inputs.

The XLR jack for this channel accepts *only mic level inputs*.

4.4 Connect Output

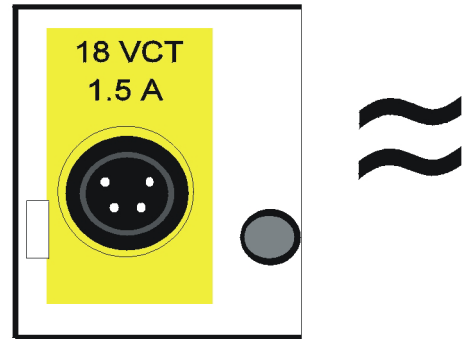
A connection should be made between the Master Output XLR Jack and an input jack of the amplifier or other downstream equipment.

Press Output Pad Microphone/Line Switch to appropriate position: "in" for line-level output (0 dBu) or "out" for mic-level (-50 dBu) output.

4.5 Power Up

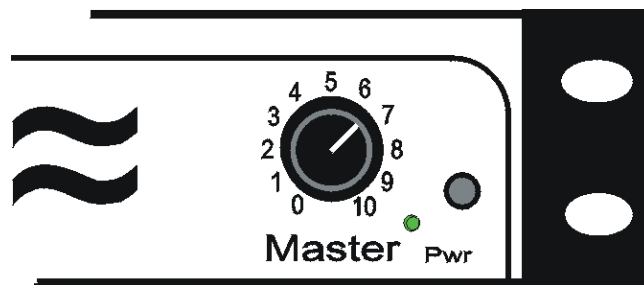
4.5.1 Connect the mixer power supply

Connect the mixer's power supply to an AC power outlet and then to the AC Power Jack on the far left side of the rear panel.



4.5.2 Power up the mixer

- 1) Press the Power Switch to the "in" position (the power indicator LED will light if mixer is powered).
- 2) Set the Master Output Volume Knob to "7".
- 3) Power up the external amplifier.



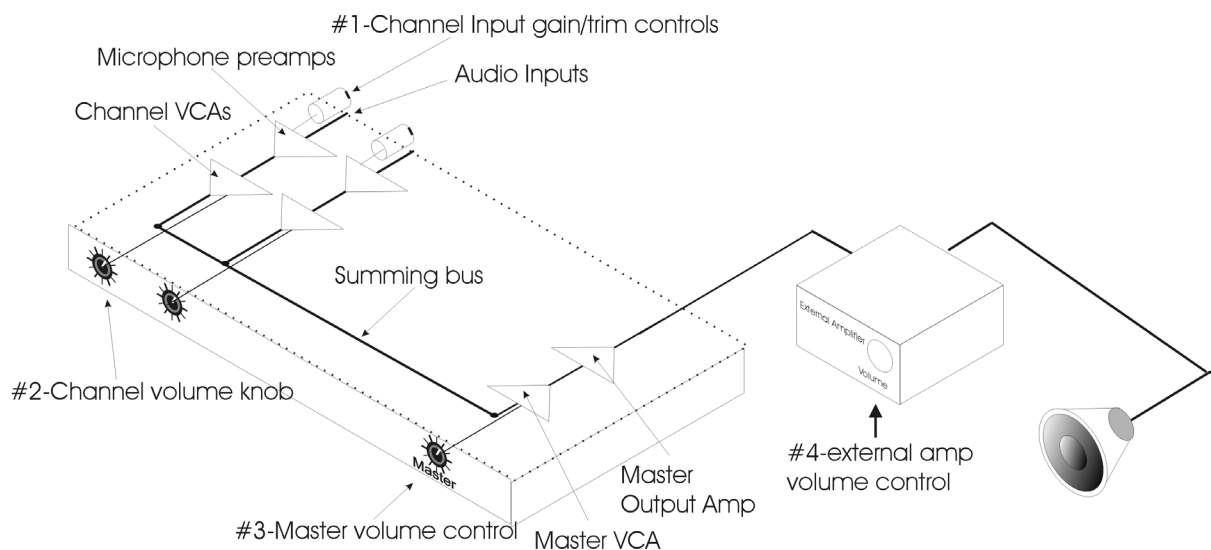
5.0 Gain Structure

To obtain the best performance from your Intelix AMIX mic/line mixer, you should first understand the basic gain structure of the unit. There are four stages of gain adjustment (labelled #1 through #4 in the drawing below):

- 1) **channel input gain/trim control**: this rear panel potentiometer controls the gain of the microphone preamplifier.
- 2) **channel volume knob**: this front panel potentiometer controls (through the channel VCA) the amount of channel that is fed to the mixer's summing bus.
- 3) **master volume control**: this front panel potentiometer controls (through the master VCA) the amplification of the summing bus to the output connector.
- 4) **external amplifier volume control** (not part of the mixer): sets the final listening level of the loudspeakers.

The goal of setting up the mixer's gain structure is to adjust these four controls for the desired volume, while maintaining the best possible signal-to-noise ratio (S/N) through the mixer. This is done by setting controls 2 and 3 at "7" where S/N and headroom are optimized, using controls 1 and 4 to achieve maximum gain before distortion. *Gain structure must be set with all AMIX functions disabled.*

In order to maintain the highest level of S/N in the mixer, the audio signals are never brought through the front panel controls of the Intelix mixer. Instead, each front panel pot controls a Voltage Controlled Attenuator (VCA), which controls the associated amplification stage. The channel VCAs do not control an amplifier, but are attenuation only devices which determine the amount of each channel's contribution to the summing bus.



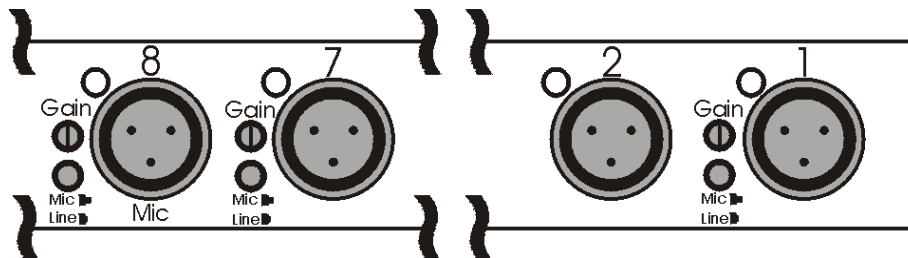
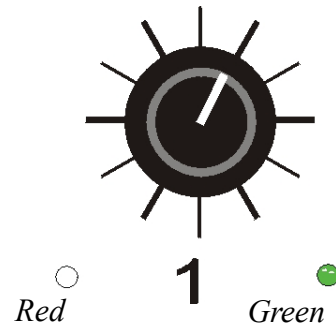
5.1 Setting the AMIX Mixer Channels

Preliminary steps:

- 1) Connect audio sources to channel inputs
- 2) Connect the mixer output to an external amplifier
- 3) Set input mic/line switches for each channel and the output
- 4) Turn on phantom power switch (if condenser microphones are in use)
- 5) Turn the master volume control to “0”

For each channel follow these steps:

- 1) Set the channel volume control to “0”
- 2) While driving the channel input at its normal level, adjust the rear panel input gain/trim control clockwise until the peak (red) LED for the channel is illuminated. Then turn the input gain/trim control counterclockwise until the red LED goes out. Note that the signal present (green) LED will stay lit during this procedure.
- 3) Turn the master output volume knob to “7”.
- 4) Adjust external amplifier volume to the desired acoustic level.
- 5) Adjust individual channel volume knobs to the desired levels, as indicated on the bar graph (the bar graph monitors the output, but if one channel is adjusted at a time, the graph will reflect only that channel).

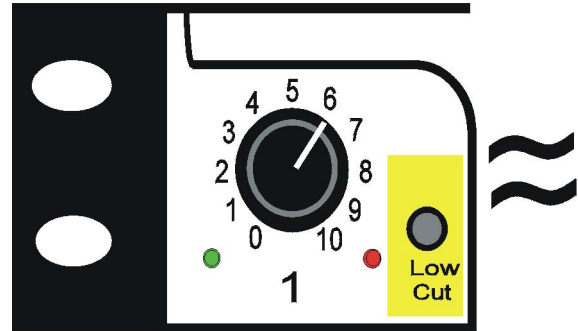


6.0 Mixer Fine Tuning

6.1 Low Cut Switch

To remove excessive bass response from an individual channel, press that channel's low cut switch.

The low cut feature helps eliminate low frequency noise (signals of 150 Hz or lower; e.g., ventilation rumble). This feature is primarily used with mic-level inputs and is particularly effective with hand-held microphones.



6.2 Phantom Power Switch



If a condenser microphone is not independently powered, press the phantom power switch to the *on* position. This will cause the mixer to power condenser mics through the mic cable. When the phantom power switch is in the *on* position, all channels whose mic/line switches are in the mic position receive phantom power (+15 VDC).

6.3 Aphex® Aural Exciter®

This feature enhances signal intelligibility by adding supplementary harmonic information. It is especially effective at clarifying speech.

To engage the Aural Exciter®, press the Aphex Exciter switch to the *on* position.



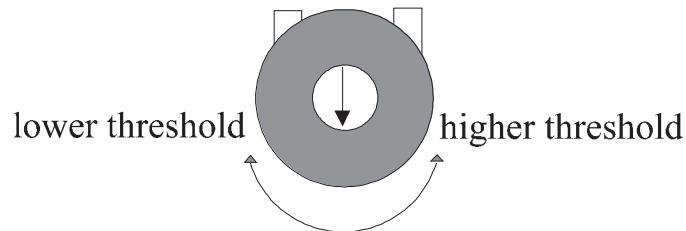
6.4 Output Limit Switch

The Output Limiter is a safety feature which protects the entire audio system from excessive volume levels. It ensures the signal leaving the mixer does not exceed the system's safe dynamic range. The factory setting is 0 dBu, but the threshold is variable from -20 dBu to +20 dBu and is set by adjusting a potentiometer inside the mixer chassis (see sec. 8.3 for location of Output Limiter Threshold Potentiometer).

If during ordinary use one or more inputs *occasionally* exceed the maximum input levels set up during the set up procedure (sec. 5.0) (i.e., the red (+12 dB) LED on the bar graph meter occasionally lights), press the Output Limiter Switch to the *on* position.

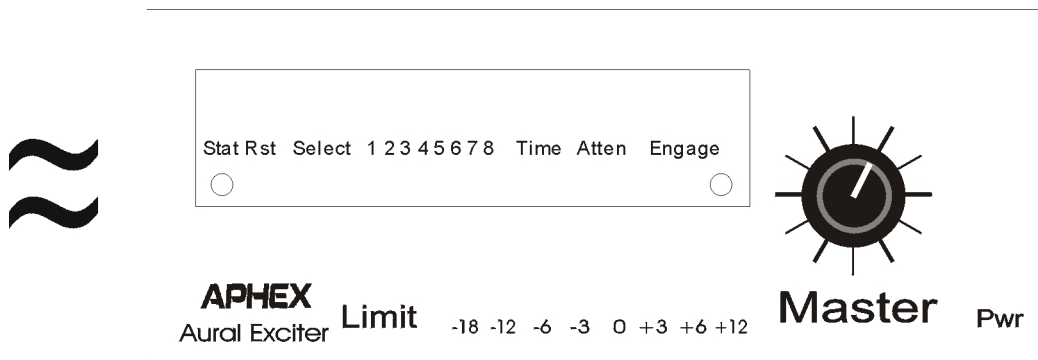
If during ordinary use one or more inputs *continually* exceed the maximum level (i.e., the red LED continually lights), *the input volume must be reset*; return to the set up procedure as defined in Section 5.

Note: *If the amplifier/speaker combination is such that the speakers can be overdriven to failure, always operate the mixer with the Output Limit Switch in the on position.*



6.5 Select Bar Graph Readout

The **LED Bar Graph Output Meter** may be set to register either the peak or average level of the output audio signal. To do so requires opening the chassis. The locations of the jumpers for this are shown in section 8.3. The factory setting is to the *average* level; i.e., the Average Bar Graph Jumper (J 3) is in place. To select peak level, move the jumper from J3 to the Peak Bar Graph Jumper (J 2) instead. For the meter to operate, a jumper must be in one of these two positions. *Never place jumpers in both positions.*



6.6 The Ground Lift Jumper

The ground lift jumper on all AMIX series mixers is a feature designed to help prevent ground loops. When jumper J4 is present, it grounds the mixer to its chassis. If the mixer is installed in a non-metal cabinet, the jumper is left in place. When the mixer is installed in a grounded metal rack frame, use a needle-nose pliers to remove the jumper via the ground lift jumper access (see Section 2.3).

6.7 Rack the Mixer

Install the mixer in the rack or other cabinet where it will be when in use. The mixer should be located away from heat sources, including other electronic components which generate a large amount of heat, such as amplifiers. Verify the unit is well-secured.

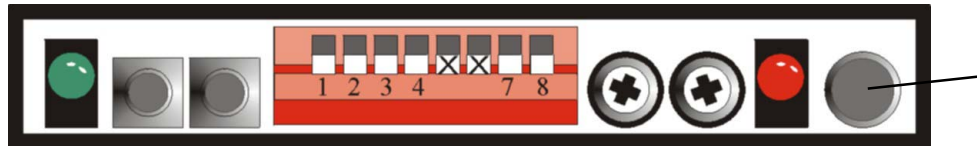
7.0 Setting AMIX Functions

Before proceeding to the adjustment of AMIX functions, ensure the following steps have been completed:

- 1) Turn all volume knobs on both the mixer and the amplifier to zero.
- 2) Connect inputs and set all mic/line switches to their appropriate levels (all unused channels should be set to “line”).
- 3) Connect the output and set the mic/line switch appropriately.
- 4) Turn on the low cut switches for all active channels.
- 5) Connect the mixer power supply and plug into an AC outlet.
- 6) Power up the mixer and the amplifier.

Now proceed to the following steps:

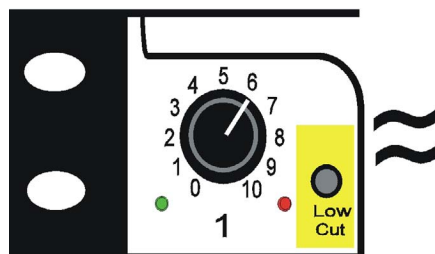
- A. Power the AMIX module by pushing button 8 on the right-hand side of the AMIX module to the “in” position. *Activating the AMIX functions will cause the level of background noise transmitted by the mixer to change.* This is because the AMIX module is *automatically* controlling the output level of the mixed signal.



- B. Adjust the input volume *for each channel*. **Note:** Channel isolation is an iterative process, it may be necessary to go through checking all the mics more than once in-order to have each channel completely isolated.

Set Signal Present Level:

- 1) Turn all volume levels to zero.
- 2) Place microphones in the positions they will occupy during the event.
- 3) For each channel, speak in a normal tone into the mic being adjusted. Use a small screwdriver to turn the rear panel input gain/trim control clockwise until the red Signal Clip LED is steady on. The LED acts as channel on indicator.
- 4) Turn on the amplifier and set the mixer’s master volume to 6 or 7. Adjust the front panel volume control knob for each channel to the desired level (rather than using the clip LED as a guide because of its dual function as a signal detect LE



C. Select special modes and functions by setting DIP switches 1-4:

Switch 1: selects link mode control configuration (up = master, down = slave).

Switch 2: selects “last mic on” function (up = last mic on).

Switch 3: selects “first-come, first-serve” function (up = first come, first serve).

Switch 4: selects automatic mixing *linking* mode (up = unlink, down = link).

For stand-alone operation, whenever a mixer is physically linked, Switch 4 must be set in the “up” (stand-alone) position.

7.1 Channel Isolation

With the volume control knobs at the positions which give the desired volume for each channel, verify that each mic is “isolated”. To do this, return to mic 1 and make sure that speaking into it causes *no other mic* to come on; i.e., the Signal Clip LED (Red) for that only that channel is lit. If other mics come on, then re-adjust the gain for those channels (decrease gain by adjusting the rear panel pot). Repeat for each individual mic.

Note: When changing the mixer from stand-alone to linked operation or vice versa, the channel isolation procedure may have to be performed again.

7.2 Fine Tuning AMIX Functions

AMIX mixers operating in the automatic-mix mode have several features which require additional adjustment in order to optimize the mixed sound. Because the signals are mixed automatically, any adjustment to the gain of one channel will influence all the others; *making such a change may necessitate making changes to the settings of other channels.*

There are *two potentiometers* (pots) on the front panel (see Section 2.2) that may need adjustment, especially when linking or unlinking mixers, or changing the status of functions such as *Last Mic On*.

The relative values at which the pots are set can easily be gauged during adjustment using the red (clip) channel LEDs. The LEDs act as a temporary bargraph for the two pots: when the pots are full-on, the LEDs are all lit (AMIX-4 has four LEDs and AMIX-8 has eight LEDs). When the pots are full-off, none of the LEDs are lit. This bargraph function begins when the pots are rotated and lasts for a few seconds after the adjustment stops.

Adjust these pots by powering the AMIX module and using only one mic. Observe the behavior of the red LED associated with that mic and adjust the pots to the desired response levels.

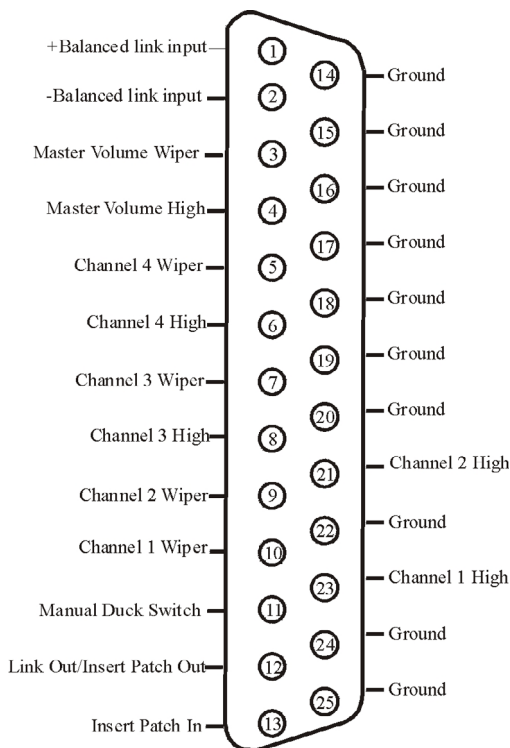
In linked mode, the master unit controls both these functions for all the units in the chain; i.e., only the pots on the master units are active; all others are disabled.

8.0 External Control

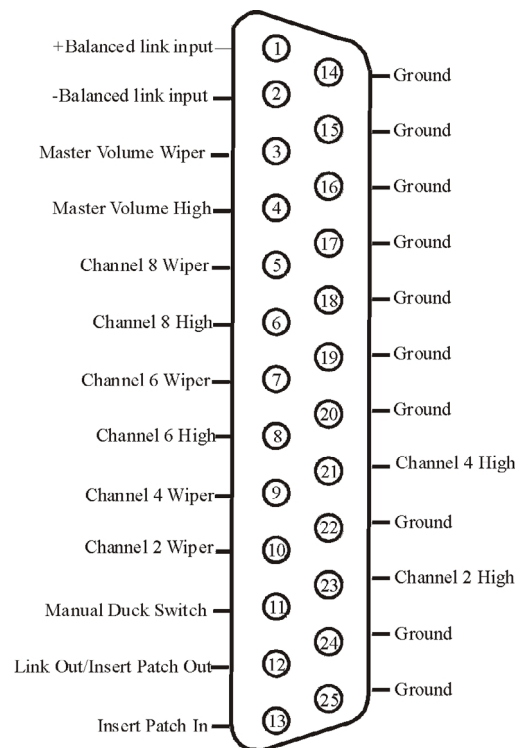
Intelix AMIX series mixers have several special built-in features which make the remote control and muting of both the individual channel inputs and the master output easy to activate and simple to change. The ability to enable external audio signal modifications, such as insert patching and direct outs, is also built-in. The activation of all built-in features requires wiring of external devices (potentiometers, switches, etc.) to a male DB25 connector.

8.1 The Connectors

All external controls and signal sources are attached via the DB25 Control Pin Connector. Note that AMIX-4 has external control over all channels, while the AMIX-8 has external control only over even numbered channels.



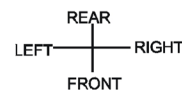
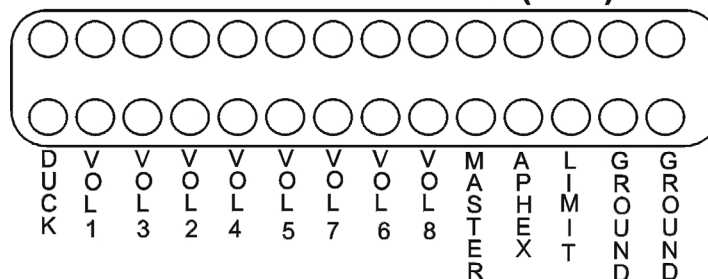
The female DB25 pinout for AMIX-4 mixers. The view is of the rear panel.



The female DB25 pinout for AMIX-8 mixers. The view is of the rear panel.

DC CONTROL LINE PINS (P 12)

Header P12 is inside the mixer chassis and contains jumpers that must be correctly set for external control.



8.2 DC Control

AMIX Series mixers are configurable for external control of individual channel volume by a DC voltage. Up to 4 input channels and the master output volume can be connected to remote controls simultaneously.

Note: *The following instructions assume that the remote control device is a 10K Ω potentiometer. If another device is used, these instructions may require modification.*

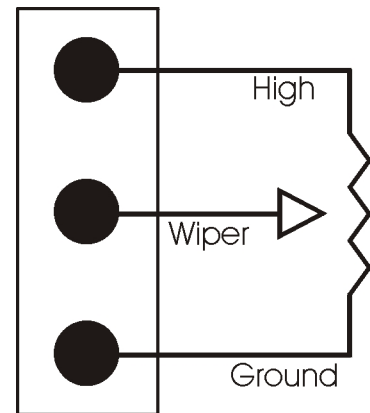
8.2.1 Remote volume control

When a remote control device (typically a linear 10k Ω pot) is installed, it controls the percentage of the volume possible as defined by the Volume Control Knob on the front panel for that channel. For example, if the Volume Control Knob is set at 8, and the remote pot is set at 5, the result will be 4 (50% of 8). *Only when the Volume Control Knob is set at 10 does the remote device have full control over the channel's input level.*

8.2.2 Connecting a remote volume control

The following instructions show how to connect a linear 10k Ω pot to a single channel as a remote volume control. Repeat this process for each channel to be remotely controlled.

- 1) Remove the channel's jumper from header P12 (see Section 8.3 for locations).
- 2) Connect a wire between one end of the potentiometer and the channel's high pin on the DB25 connector.
- 3) Connect a wire between the other end of the potentiometer and a ground pin on the DB25 connector.
- 4) Connect a wire from the wiper of the potentiometer and the channel's wiper pin on the DB25 connector.



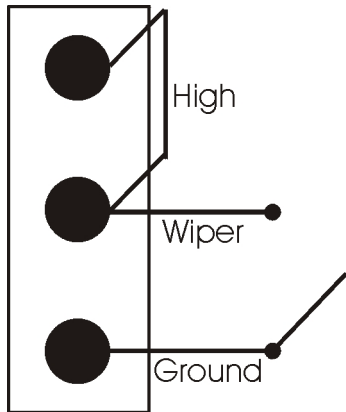
8.2.3 Remote mute control

All channels whose high and wiper pins are brought out to the DB25 connector can be remotely muted.

This is done by connecting a switch (or other dry contact closure) between the channel's wiper pin and ground. Shown are two ways to wire a channel for external muting. Note that remote mute control can be used alone or in combination with remote volume control.

8.2.3.1 Wiring an external mute switch

The following instructions show how to connect a single channel for remote muting. Repeat this process for each channel to be remotely muted.

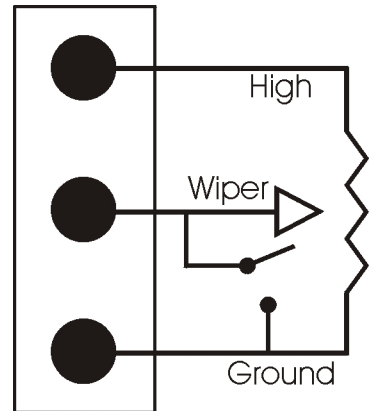


- 1) Connect a wire from the high pin of the channel to be muted.
- 2) Connect the other end of that wire to the wiper pin of the channel to be muted.
- 3) Connect a wire from one side of the switch to the wiper pin of the channel to be muted, the same pin as step 2.
- 4) Connect a wire from the other side of the switch to a ground pin on the DB25 connector.

8.2.3.2 Wiring an external combination mute switch and volume control

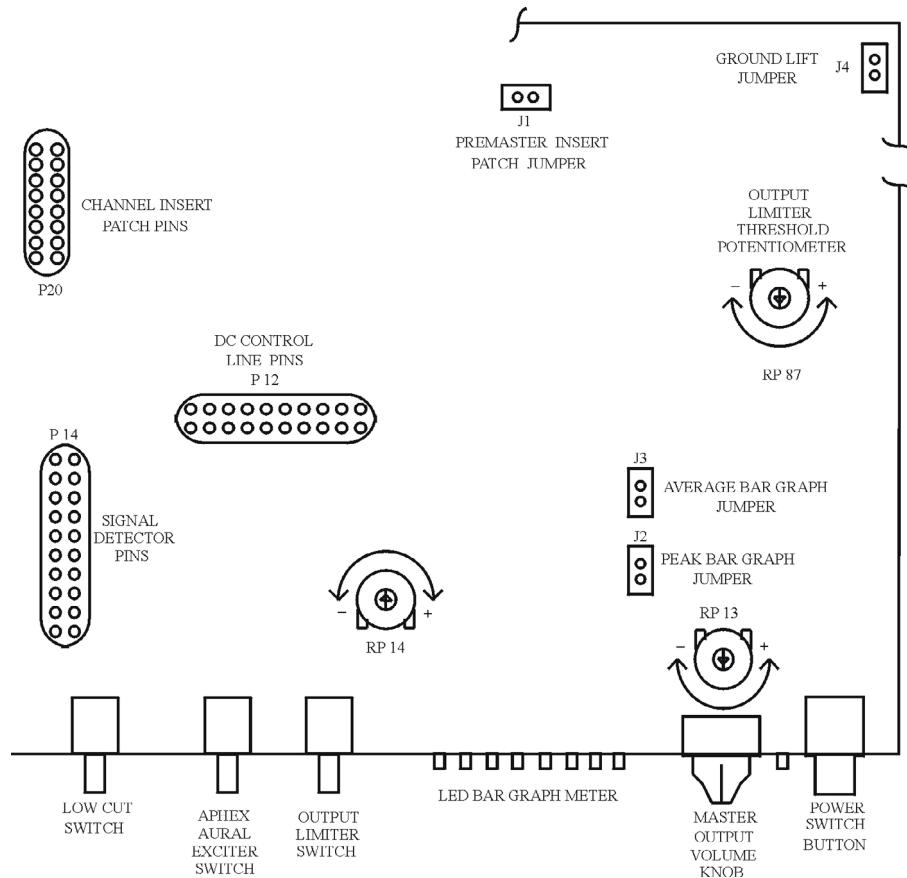
The following instructions show how to connect a linear 10k Ω pot to a single channel for remote muting and a remote mute switch. Repeat this process for each channel to be remotely controlled.

- 1) Remove the channel's jumper from P12.
- 2) Connect a wire from one side of the switch to the wiper pin of the channel to be muted.
- 3) Connect a wire from the other side of the switch to a ground pin on the DB25 connector.
- 4) Connect a wire from one end of the pot to the channel's high pin.
- 5) Connect a wire from the other end of the pot to a ground on the DB25 connector.
- 6) Connect a wire from the wiper of the pot to the channel's wiper pin on the DB25 connector.



8.3 Circuit Board Map

The following drawing shows the location of several components on the AMIX circuit board which are user accessible to fine tune some AMIX functions. The components include potentiometers RP13 and RP14, as well as the ground lift jumper J4 and the Premaster Insert Patch Jumper J1. Some components in this picture may be hidden from sight by the AMIX board.



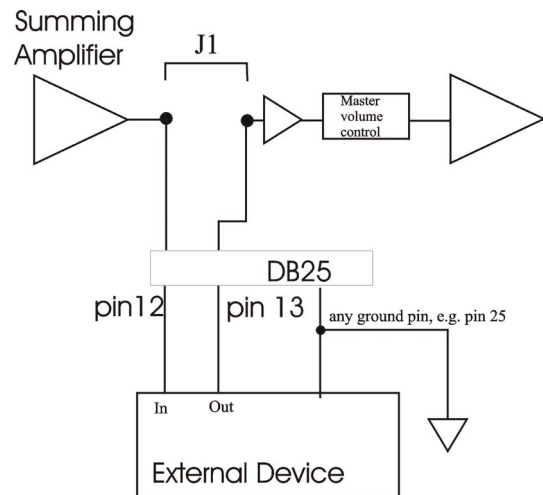
8.4 Master Output Insert Patching

If no AMIX-LINK is being used on the AMIX mixer, you can do master output insert patching. To use the patching feature of the AMIX mixer follow these directions:

- 1) Remove the top of the mixer chassis, and remove jumper J1.
- 2) Connect a wire from pin 12 of the DB25 connector to the input of the destination device.
- 3) Connect a wire from the output of the destination device to pin 13 of the DB25 connector.

This drawing illustrates the function of the patching feature of the AMIX mixer. The summed bus output is sent to an external device on pin 12 of the mixer's DB25. The external device's output is sent back to the mixer on pin 13 of the mixer's DB25. *Note that jumper J1 is removed for insert applications.*

Note: If a patched application is no longer desired, jumper J1 *must* be replaced.



9.0 Passive Mixer Linking

Mixer linking allows the user to add additional microphone or line level inputs as needed without the loss of inputs or automatic features.

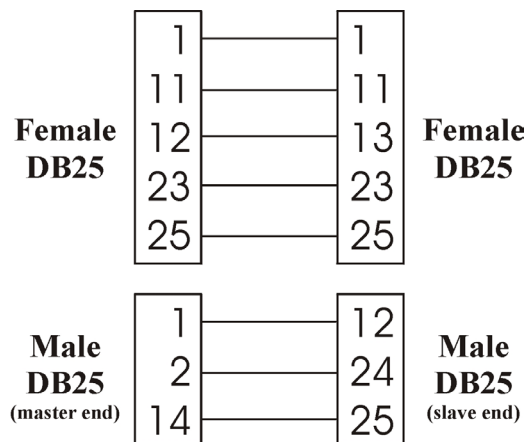
There are two methods of linking AMIX mixers, passive or active linking. Passive linking uses only cables, whereas active linking uses the Intelix AMIX-LINK. Passive linking is suitable for linking two mixers, whereas active linking is easier and more flexible. Using the AMIX-LINK, up to six AMIX mixers can be linked into a single stack. In any stack, one mixer is the master and all the others are slaves.

Linking involves three steps:

- 1) Set the DIP switches
- 2) Connect the control chain
- 3) Connect the audio chain

9.1 Making the Cables

Two cables must be made to link two mixers: the control cable (female DB25 to female DB25) and the audio cable (Male DB25 to Male DB25). **Note:** *The audio cable is not symmetrical*; i.e., the pin configurations at each end of the cable are different.

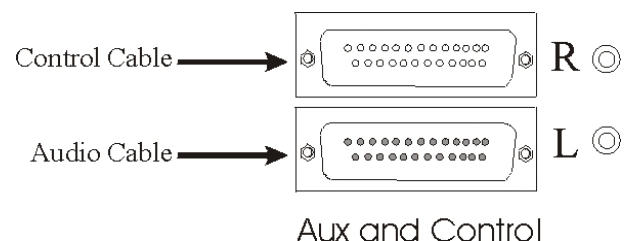


The wiring diagram for the control cable. This cable is symmetrical; i.e., either end can be connected to the master. No pins other than the ones shown should be connected.

The wiring diagram for the audio chain cable. This cable is *not symmetrical*; i.e., the ends must be connected as marked. **Label the ends of this cable!** No pins other than the ones shown should be connected.

9.2 Connecting the Cables

After the cables are made and tested for correct wiring, connect the control and audio chains as shown. The two control ports (the *upper* DB25) are connected together. The two audio ports (the *lower* DB25) are connected together, keeping in mind that the audio cable has a master end and a control end.

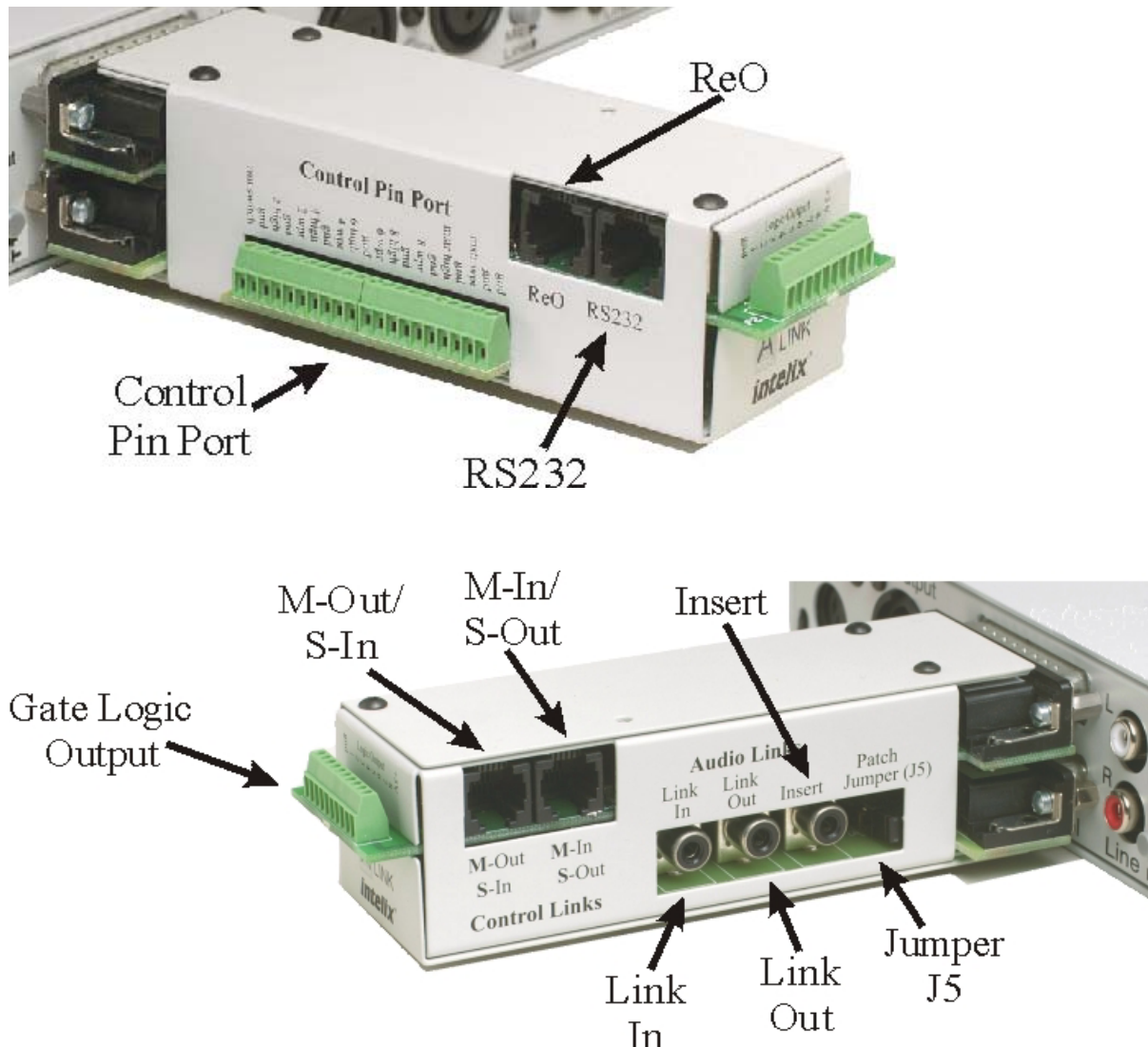


10.0 AMIX-LINK Module

This section describes the capabilities, operation and use of the AMIX-LINK Module. The Link Module is an accessory to the Intelix AMIX-4 and AMIX-8.

The Link Module attaches to the rear of the AMIX mixer chassis, dramatically extending the capability of the AMIX mixer. Two labeled views of the Link Module are shown below. The principle function of the Link Module is to:

- ◆ Provide a simple method of linking multiple AMIX mixers.
- ◆ Provide ports for external equipment audio patching capability.
- ◆ Provide a port allowing remote control of the AMIX mixer.
- ◆ Provide a port for full remote control via an external mini-mixer controller.
- ◆ Provide *signal present* indicators (one for each channel) used to control any desired remote function.
- ◆ Provide an RS232 computer control port to provide for computer control.



10.1 Quick Start for AMIX-LINK

This section gives instructions for setting up and linking two AMIX mixers using AMIX-LINK Modules.

10.1.1 Installing the AMIX-LINK

Plug the two male DB25 connectors on the AMIX-LINK firmly into the two female DB25 connectors on the back of the AMIX mixers. Tighten the four capture screws on each AMIX-LINK to secure the modules to the mixers. If you wish to use the insert/patch capacity of the AMIX mixer stack, please refer to section 10.2.2.

10.1.2 Setting the DIP switches

Decide which mixer will be the master, keeping in mind the master should be ergonomically convenient. The other mixer becomes the slave.

On the mixer you have designated as the master, set DIP switch 1 (on the far left) to the “up” position. This designates the mixer as a master. Set DIP switch 4 to the “down” position. This puts the mixer in linked mode.

On the slave mixer, set DIP switch 1 (on the left) to the “down” position. This designates the mixer as a slave. Set DIP switch 4 to the “down” position. This puts the mixer in linked mode.

10.1.3 Connecting the control chain

Using one of the included control cables (they have a RJ11 or phone type plug on both ends), connect the master mixer’s M-out/S-in port to the slave’s M-out/S-in port.

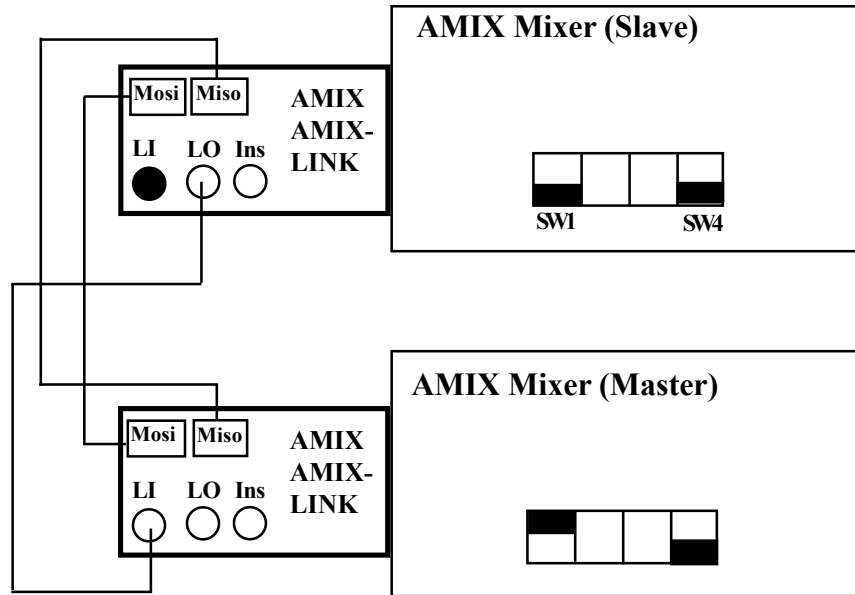
Using the other control cable, connect the slave’s M-in/S-out port to the master’s M-in/S-out port.

10.1.4 Connecting the audio chain

Using the included audio cables (they have an RCA phono plug on both ends), connect the slaves “Link Out” port to the master’s “Link In” port.

Note: There should be no connection to the master’s “Link Out” ports. The only connection to the slave’s “Link In” port should be the supplied shorting plug.

Fig. 7. This drawing shows the connections and switch settings required for the correct operation of a two mixer stack. The supplied grounding plug should be left in place in the Link In Port of the slave mixer as shown (the black disk).



10.2 Installation of the AMIX-LINK

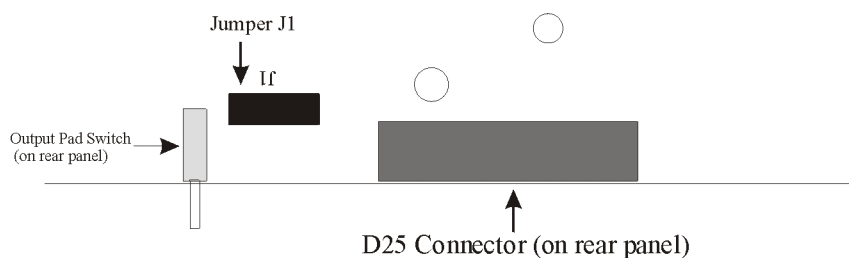
10.2.1 Installing

The AMIX-LINK's two DB25 connectors plug directly into the two DB25 connectors on the back of the AMIX. Secure the two AMIX-LINK connectors to the two AMIX connectors with the four captured screws of the AMIX-LINK's two DB25 connectors.

10.2.2 Removing Jumper J1

If you ever intend to use the insert/patch functions of the AMIX-LINK, the Jumper J1 *must* be removed from the mixer circuit board. This jumper is located as shown below. This drawing shows the mixer board, with the top of the chassis and the AMIX-LINK Module removed. The jumper J1 cannot be removed with the link module in place. After the AMIX-LINK Module is removed, locate, remove, and discard jumper J1, then reinstall the link module.

If you never intend to use the insert/patch functions of the AMIX mixer, leave J1 installed (as it comes from the factory).



The position of J1 on the AMIX mixer board. The drawing is looking down on the mixer from behind. Remove J1 by pulling straight up. The jumper may be discarded after removal.

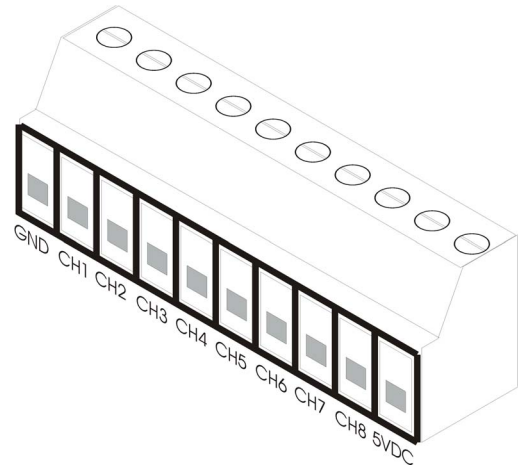
10.3 AMIX-LINK Connector Descriptions

This section provides a description of each port on the AMIX-LINK with a reference to the manual section explaining how to use that port.

10.3.1 Gate logic output port description

The Gate Logic Output port provides a digital output signal (active high) for each channel. This port provides “state” information which can be translated by a remote device into an action; e.g., remote camera that points at the current speaker. When a channel is gated on, its corresponding Gate Logic Output pin is driven high.

Pin assignment of the Gate Logic Output port viewed from the back of the AMIX-LINK.



10.3.2 M-out/S-in and M-in/S-out port description

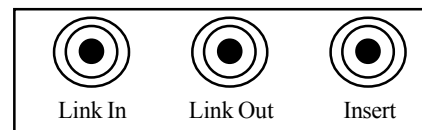
The M-out/S-in (Mosi) and M-in/S-out (Miso) RJ12 connection ports are used in linking multiple AMIX mixers. Mosi and Miso carry control signals around the control loop of the linked mixers.

10.3.3 Insert, Link In, and Link Out port description

The Link In and Link Out ports are used to carry the audio signals among the linked mixers. For each mixer in the stack, the Link In port is connected to the Link Out port of the previous mixer in the stack.

As a secondary function, the Link In and Link Out ports are used for the external equipment audio patching function. In this case, the Link Out port is used as an audio patch out port. It is used in conjunction with the Insert port to provide an input and output for the patching function.

The right side of the AMIX-LINK, showing the Link In, Link Out, and Insert ports.



10.3.4 The ReO port description

The ReO port allows the user to connect an Intelix mini-mixer controller to the AMIX. The mini-mixer is a small, portable controller. This device permits all AMIX channel levels, including the master, to be adjusted from a remote location.

10.3.5 The RS232 port description

The RS232 port is used to connect an external programmer to the AMIX mixer. Usually this is a laptop PC.

10.3.6 Control pin port description

The Control Pin Port provides direct connections to the manual control functions on the AMIX main circuit board. Controls attached to this port control master volume, as well as individual channel volumes and muting for channels 2, 4, 6, and 8 on eight channel mixers, and channels 1, 2, 3, and 4 on four channel mixers. The pin assignment of the Control Pin Port is shown below.

Control Pin Port pin assignment

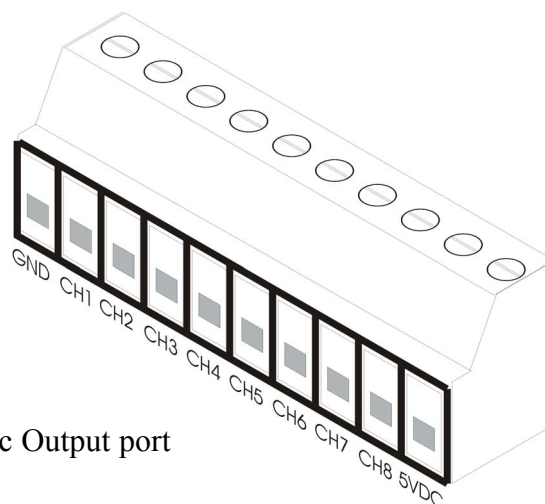
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
r	g	2	g	2	4	g	4	6	g	6	8	g	8	g	m	g	m	g	g
m	n	H	n	W	H	n	W	H	n	W	H	n	W	n	s	n	s	n	n
s	d	i	d	i	i	d	i	i	d	i	i	d	i	d	t	d	t	d	d
w		g		p	g		p	g		p	g		p		H		W		
i		h		e	h		e	h		e	h		e		i		p		
t				r			r			r			r		g		r		
c															h				
h																			

10.4 Connecting AMIX-LINK Ports

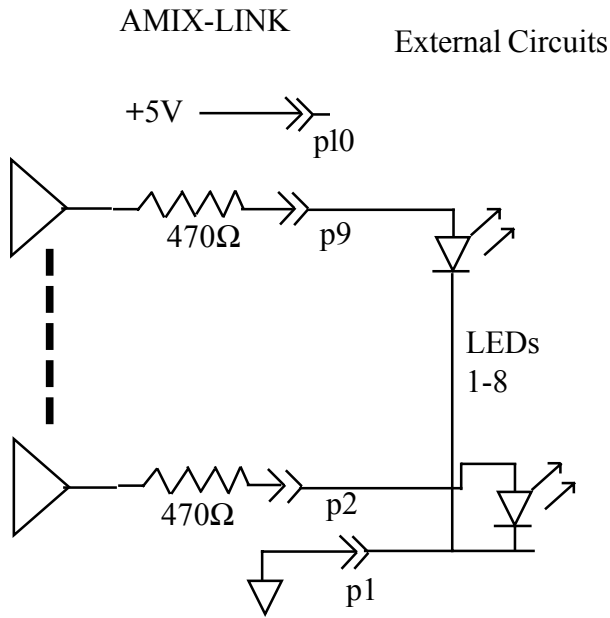
This section explains how to wire and use each port on the AMIX-LINK.

10.4.1 Connecting to the Gate Logic Output port

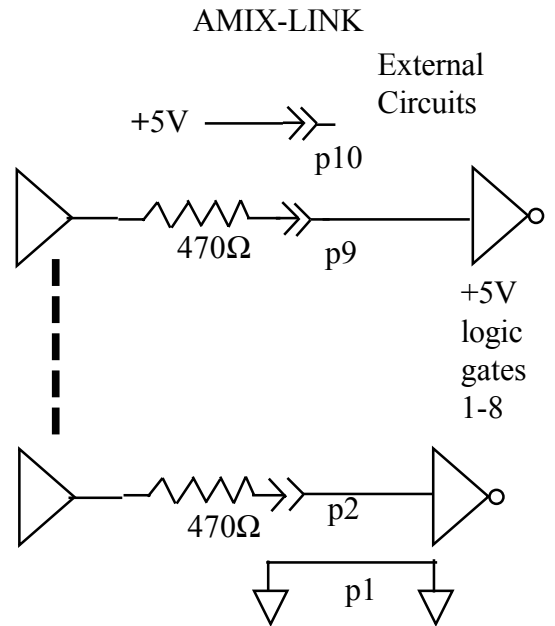
To make connections to the Gate Logic Output port, use a jeweler's screwdriver to loosen the top screw corresponding to the desired channel, insert a stripped 18-22 gauge signal wire into the back of the connector pin, and retighten the screw. Repeat for each channel to be connected. The wire from the channel becomes active (high) when that channel is gated on. This +5V TTL signal may be used for any signaling or control function (i.e., LEDs, 5 Volt logic, and relays).



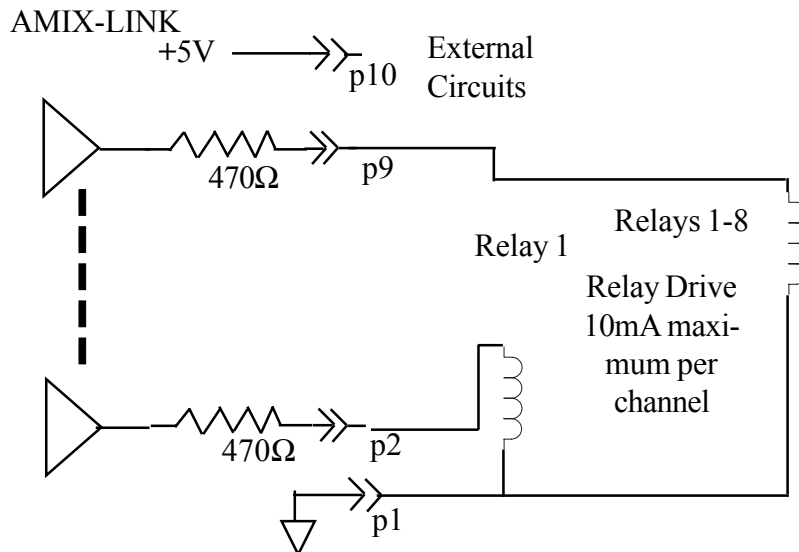
The Gate Logic Output port pinout



Example of the Gate Logic Output port used to control LEDs.



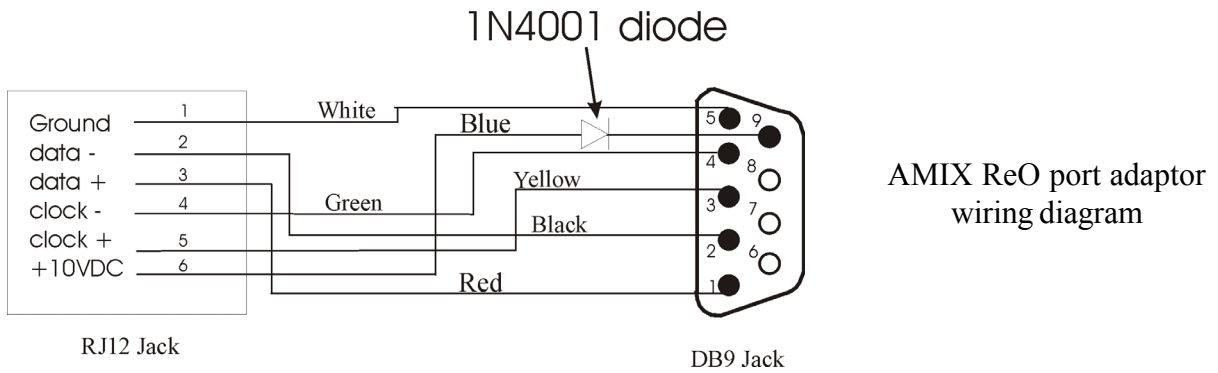
Example of using the Gate Logic Output Port to drive 5V logic circuits. Note that the logic outputs of the Gate Logic Output Port are active high.



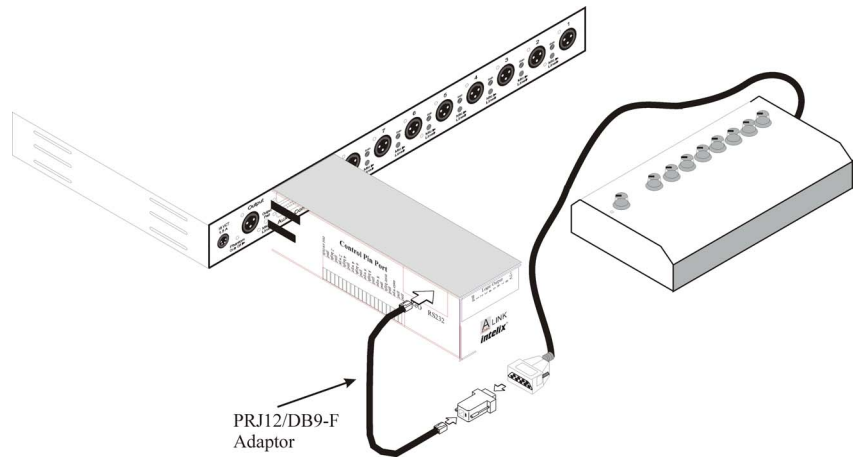
An example of using the control port to control a relay circuit.

10.4.2 Connecting to the ReO port

When remote control of all channels levels is required, the ReO port can be used to connect an Intelix mini-mixer to the AMIX mixer. This is accomplished by inserting an RCRJ11 adaptor into the ReO port of the AMIX-LINK. Then the cable provided with the mini-mixer can be connected between the adaptor and the mini-mixer. The AMIX mixer levels are now fully controllable from the remote mini-mixer. A stack of mixers *cannot* be controlled with a single mini-mixer; i.e., there must be one mini-mixer per mixer chassis.

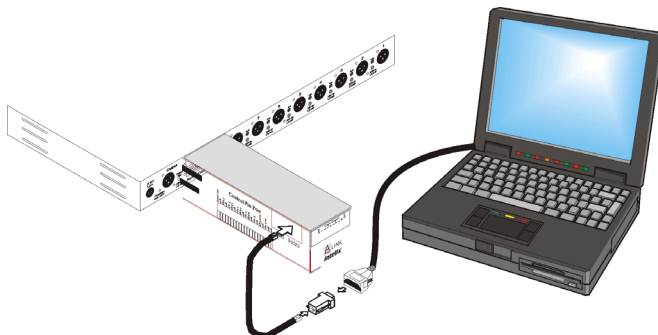
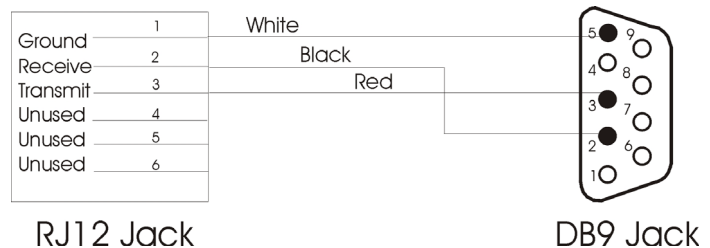


Typical connection of a mini-mixer to the AMIX mixer, using the PRJ12/DB9-F adaptor



10.4.3 Connecting to the RS232 port

The RS232 port is used to connect an RS232 controller to the AMIX. This is done by connecting the controller's output to the AMIX-LINK's RS232 RJ12 port. The adaptor from the controller's DB9 connector to the AMIX-LINK's RJ12 connector is made through the AMIX RS232 adaptor available from Intelix.



Typical connection of a laptop PC to the AMIX mixer, using the Intelix RS232 adaptor and a null modem cable.

10.4.4 Connecting to the control pin port

With proper connections to the Control Pin Port, the user can remotely control volume and muting of the following channels: 2, 4, 6, 8, and the master output. If it is necessary to have individual remote control over *all* channels, an Intelix mini-mixer connected through the ReO port should be used.

When a remote volume control is attached to a channel, it sets the proportion of the volume control setting on the mixer front panel. For example if the Volume Control Knob is set to 7 and the remote control is set at 3, the output volume is 30% of 7, or 2.1. The maximum possible volume in this example is 7, obtained when the remote control is at 10. Only if the mixer's volume control knob is set at 10 does the remote control have full control over the channel's volume.

Connecting a remote control devices to the AMIX-LINK Control Pin Port requires two steps:

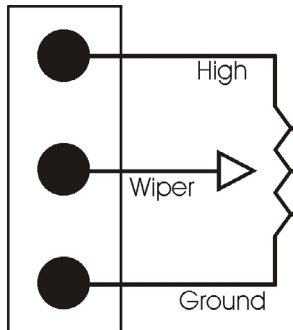
- ◆ Wiring external devices to the Control Pin Port pins
- ◆ Setting internal jumpers

Note:Wiring for the Priority Override Feature.

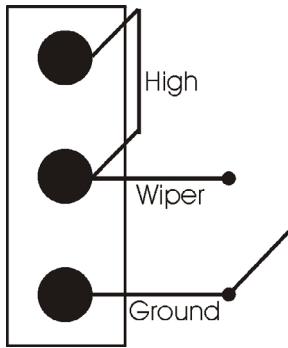
For a full explanation of the priority override feature, please see section 3.6. When using priority override with a Link Module, connect the remote switch across pins 1 and 2 (“rmtswitch” and “gnd”) of the Link Module's Control Pin Port.

10.4.5 Wiring external devices to the control pin port

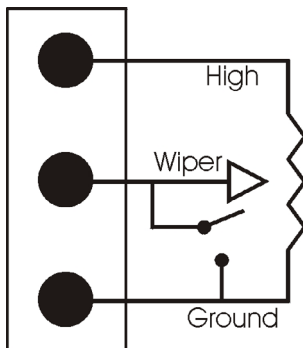
The following three figures explain how to make the connections to the pins of the Control Pin Port to implement the remote volume and muting control functions. The connector consists of twenty screw type connections. Connection to a pin is made by loosening the screw on top of the connector with a jeweler's screwdriver, inserting a stripped wire into the pins opening at the side of the connector, and retightening the screw. The connectors are most easily wired with 18 - 24 gauge wire, and each pin will accept two of any of these wire sizes.



Wiring diagram for a remote volume control. Connect one end of a 10-K Ω potentiometer (pot) to the High pin of the channel to be controlled. Connect the other end of the pot to the adjacent ground pin, connect the pot's wiper connection to the channel's wiper pin. All ground pins are equivalent and can be used interchangeably. The remote control is now connected. **Note: if the selected channel is the Master channel (i. e., the pot uses pins “mstr High” and “Mstr Wiper”, then the remote pot will control the master volume from the mixer).**



Wiring diagram for a remote mute switch. When the switch is depressed the channel to which it is connected will be muted until the switch is released. Connect a jumper wire between the selected channel's high pin and wiper pins. Connect one end of the mute switch to the channel's wiper pin (the same pin that is jumpered to the high pin). Connect the other end of the remote mute switch to the channel's ground pin. The mute switch for the selected channel is now wired.



Wiring diagram of combined remote volume control and remote mute switch. Depressing the switch will mute the selected channel until the switch is released. Then connect one end of the muting switch to the channel's wiper pin (the same pin that already contains the wiper connection of the volume control pot). Connect the other end of the mute switch to the channel's ground pin. The remote volume control and the remote muting switch are now wired.

10.4.6 Setting internal jumpers for the control pin port

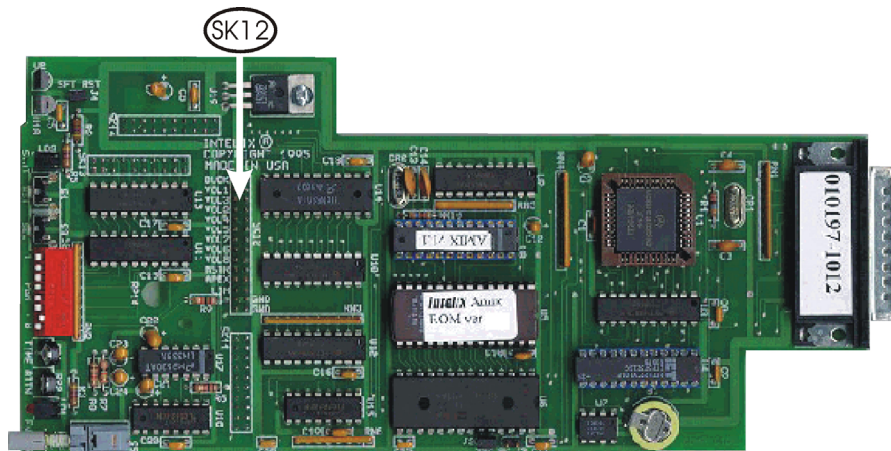
For each channel using a *remote volume control*, a jumper must be removed from the AMIX module circuit board inside the mixer chassis. These jumpers are on connector SK12 on the *AMIX circuit board*, as shown below. Remote muting switches require no jumper changes.

10.4.6.1 To set jumpers

Remove the ten screws holding the cover of the AMIX Mixer in place. Locate connector SK12 as shown below. For each channel using a remote volume control pot, remove the jumper corresponding to that pin from SK12. See Section 8.3 for jumper assignments. *SK12 is the same as P12.*

Note: While the cover is off, confirm that all channels *without* external remote controls have the corresponding jumper installed. Channels 1, 3, 5, and 7 should also have jumpers *installed*.

Replace the cover on the mixer, securing with the ten screws.



Pinout for AMIX-4



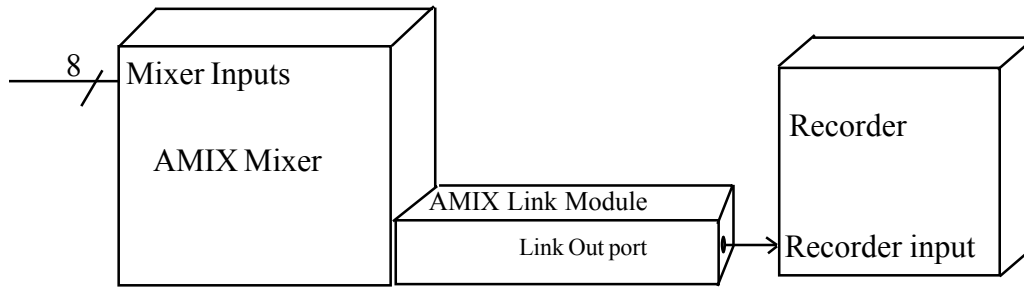
Pinout for AMIX-8

10.5 Using the Link In and Link Out Ports

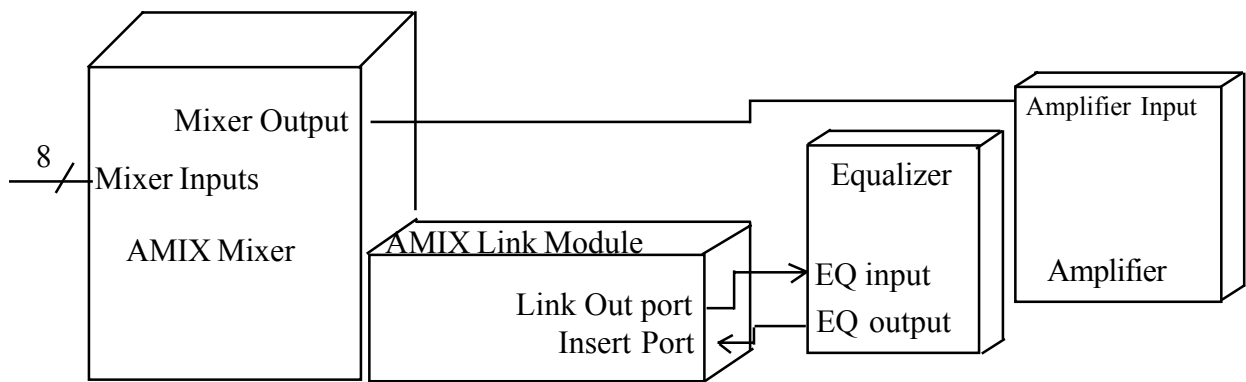
- ◆ Facilitate linking of multiple AMIX mixers
- ◆ Provide tapping and patching of the audio signal.
- ◆ Provide an extra mixer input

The AMIX-LINK allows the user to tap (insert) or patch an external device into the mixer audio output path. In order to use the insert or patch capabilities of the AMIX mixers, you *must* remove jumper J1.

Patching the mixer output routes the output signal to an external device, which *does* return the signal to the mixer. A patched output's level is controlled by the mixer. A diagram of a patched installation follows.



An example of a tapped installation. The mixer output via the Link Out port is sent to the recorder, which has final control of the audio level since the signal never returns to the mixer.



An example of a patched installation. The mixer maintains control of the final volume sent to the amplifier, since the external Equalizer returns the equalized audio to the mixer through the Insert port.

When a tapped installation is desired, the audio signal is taken from the Link Out port and routed to the external device.

In a patched installation the audio signal is taken from the Link Out port and routed to the external device, which sends the modified signal back to the mixer through the Insert port.

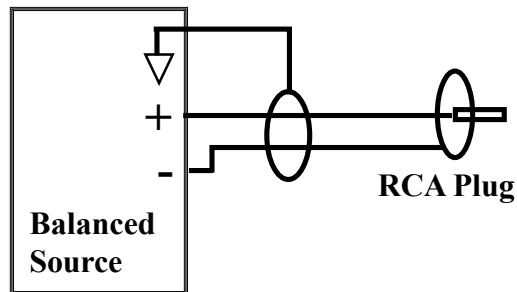
Note: When using the patching technique both jumper J1(Section 10.2.2) on the AMIX mixer circuit board and jumper J5 on the AMIX-LINK must be removed.

10.5.2 Using the Link In port as a balanced line input

If an additional balanced line-level input is needed, the Link In port will serve this function. This input goes directly to the summing bus and has no input volume control, thus input level control must be provided by the input device. The Link In Port is an *ungrounded* differential input. To correctly wire this input to the AMIX-LINK RCA port, follow the following directions.

10.5.2.1 If your source is balanced

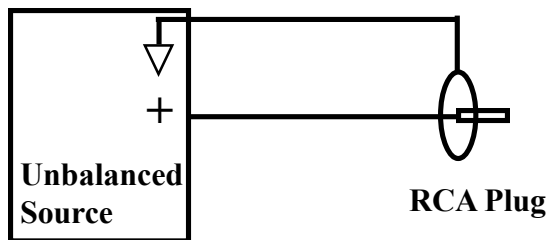
- ✓ Tie the braided shield to ground at the source end, and leave it unconnected at the AMIX-Link Module end.
- ✓ Tie the positive signal lead to an RCA connector center pin.
- ✓ Tie the negative signal lead to the RCA connector case.



Balanced source hookup.

10.5.2.2 If your source is unbalanced

- ✓ Tie the ground lead to the RCA connector case.
- ✓ Tie the positive signal lead to the RCA connector center pin.



Unbalanced source hookup.

11.0 Troubleshooting Tips

NO POWER

- Check the connections between the mixer and the power supply and the external AC power supply.
- Check the wall outlet.

NO SOUND

- Make sure the mic/line switch is in the proper position. (This is the most likely cause.)
- Make sure both the master and channel input controls are turned up.
- Check that the source signal cable(s) is properly connected and undamaged.
- Adjust trim/gain potentiometer(s) to increase gain.
- If there is still no sound, try changing input source(s) to different channel(s).
- Make sure that jumper J1 is in place (see page 30).

DISTORTED SOUND

- Turn down the *master* volume control. If distortion persists, input channel(s) is likely cause.
- Check position of *all* line/mic switches.
Check the position of DIP switch number 8 it should be in the up position unless you have special reset requirements (see page 13).
- Determine the distorting input channel(s) by checking them one at a time.
- Decrease gain of input channel(s) causing distortion. (By turning the gain/trim control potentiometer on the rear panel.).

EXCESSIVE HISS or HUM

Hiss: Make sure the volume control knobs for all the unused channels are set at “0” and in line position. Make sure the mic/line switch is in the correct position for both the input and output.

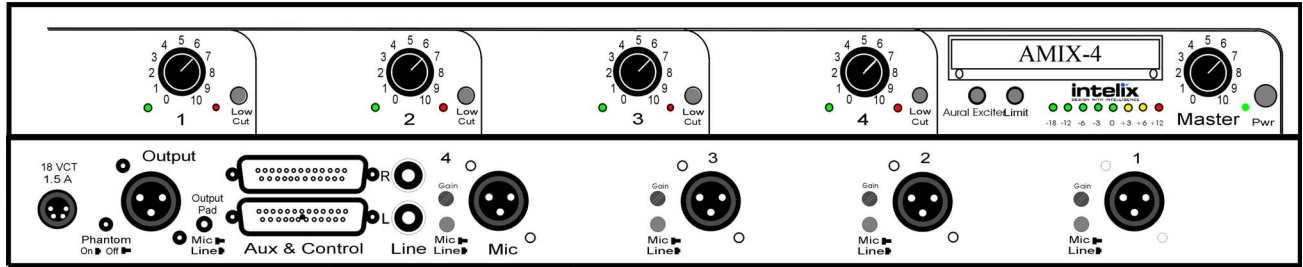
Hum: Mics lines can easily cause hum. Make sure to locate them away from vibration and magnetic field sources (motors, power supplies and lines, and data lines).

Check mic lines, especially the shield, for damage.

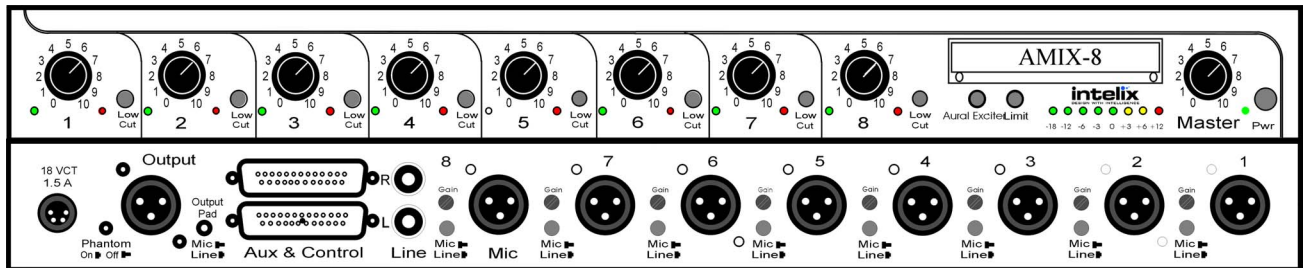
Another common source of hum is a *ground loop*, which can result from connecting two or more *powered* devices together. Turn the master volume down. If the hum is still present, the ground loop or other cause is **not** in the mixer, but in the connections or devices after the mixer in the audio path.

If the hum is “in” the mixer, first check to see if the Ground Lift Jumper (**J4**) is present. It should be removed, unless the mixer is in a nonmetal cabinet. Check for unbalanced connections; use balanced connections, if possible. For all unbalanced connections, try to disconnect the signal line ground to “lift” the ground.

12.0 Technical Specifications and Line Drawings



AMIX-4 Front and Rear



AMIX-8 Front and Rear

Specifications

GENERAL

Frequency Response	±5 dB from 20 Hz to 20 kHz +0, -3 dB from 10 Hz to 30 kHz
Max Voltage Gain	96 dB
Signal to Noise	Ref +26 dBu @ 54 dB sys gain = 90dB
Equivalent Input Noise	-129 dB @ 150 Ohms, 20 Hz to 20 kHz
Crosstalk	better than -90 dB
Channel Gating	
<i>Holdtime</i>	13 ms 1.7s potentiometer
<i>Off-Attenuation</i>	0 to ∞ dB potentiometer
Bar Graph	-18, -12, -6, -3, 0, +3, +6, +12VU
<i>Reading</i>	Avg. or Peak, Main or Aux
<i>Attack</i>	1.7 ms
<i>Decay</i>	650 ms
Signal Present Indicators	Peak reading, -10 dBu threshold
Input Clip Indicators	Peak reading, +13dBu threshold
Limiter Threshold	
<i>Adjustment</i>	-10 to +10dBu
Control Options	RS232, DC, Logic, ReO
Aux DC Volume Control	
<i>Voltage</i>	0-5V DC
Nominal Remote DC Volume	
<i>Control Resistance</i>	10 kOhms (linear)
Power Requirements	18VAC Center-Tapped, 21VA
Dimensions	19" x 9" x 1.75" (48.2 cm x 22.8 cm x 4.4 cm) 15" total depth with AMIX-LINK
Shipping Weight (average)	12.5 lb (5.7 kg)

INPUTS

Input Trim Range	40 dB
Input Impedance	3.5 kOhms Mic / 15 kOhms Line
Nominal Source Impedance	150 Ohms
Mic/Line Pad	-50 dB
Max Input Level	+20 dBu (line pad on)
Low Cut Filter	12 dB per octave @ 120 Hz
Aux Input Impedance	20 kOhms balanced

OUTPUTS

Output Impedance	(balanced)	440 Ohms
	(unbalanced)	220 Ohms
Nominal Load Impedance	600 Ohms	
Nominal Level	+4 dBu RMS	
Maximum Level	+26 dBu RMS (balanced)	
Main Out Mic/Line Pad	-50 dB	



Notes