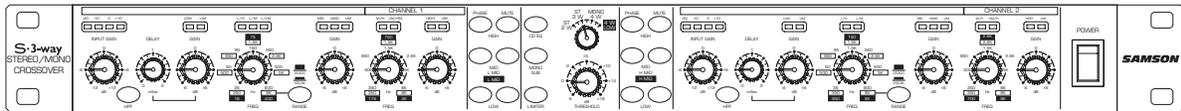


S·3-way



STEREO/MONO CROSSOVER

Owners Manual

SAMSON®

S Class Signal Processors

Safety Instructions

Caution: To reduce the hazard of electrical shock, do not remove cover or back.

No user serviceable parts inside. Please refer all servicing to qualified personnel.



WARNING: To reduce the risk of fire or electric shock, do not expose this unit to rain or moisture.

The lightning flash with an arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

Important Safety Instructions

1. Please read all instructions before operating the unit.
2. Keep these instructions for future reference.
3. Please heed all safety warnings.
4. Follow manufacturers instructions.
5. Do not use this unit near water or moisture.
6. Clean only with a damp cloth.
7. Do not block any of the ventilation openings. Install in accordance with the manufacturers instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or third prong is provided for your safety. When the provided plug does not fit your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on and pinched particularly at plugs, convenience receptacles and at the point at which they exit from the unit.
11. Unplug this unit during lightning storms or when unused for long periods of time.
12. Refer all servicing to qualified personnel. Servicing is required when the unit has been damaged in any way, such as power supply cord or plug damage, or if liquid has been spilled or objects have fallen into the unit, the unit has been exposed to rain or moisture, does not operate normally, or has been dropped.

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Introduction

Thank you for purchasing the Samson S•3-way electronic crossover. The Samson S•3-way is a one-space, dual channel electronic crossover capable of managing the frequency control for Stereo 2-Way, Stereo 3-Way, 4-Way Mono and 4-Way Mono Low speaker systems. The S•3-way is an ideal crossover solution for small and large PA systems, live sound venues, commercial installations, recording studio monitors and DJ set-ups. In addition to its flexibility in configuring to different sound systems, the S•3-way has advanced features such as Delay, CD Horn Equalization, dedicated Limiter and individual Phase and Mute switches per frequency band. S•3-way's convenient meters and frequency indicator LEDs provide instant status of important speaker management settings. The S•3-way is a complete electronic crossover solution, which will give you precise control and superior sound from your loudspeaker system.

In these pages, you'll find a detailed description of the features of the S•3-way electronic crossover, as well as a guided tour through its front and rear panels, step-by-step instructions for its setup and use, and full specifications. You'll also find a warranty card enclosed—please don't forget to fill it out and mail it in so that you can receive online technical support and so we can send you updated information about these and other Samson products in the future.

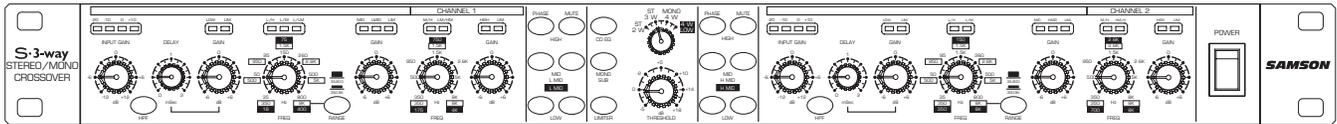
With proper care and adequate air circulation, your S•3-way will operate trouble free for many years. We recommend you record your serial number in the space provided below for future reference.

Serial number: _____

Date of purchase: _____

Should your unit ever require servicing, a Return Authorization number (RA) must be obtained before shipping your unit to Samson. Without this number, the unit will not be accepted. Please call Samson at 1-800-3SAMSON (1-800-372-6766) for a Return Authorization number prior to shipping your unit. Please retain the original packing materials and if possible, return the unit in the original carton and packing materials.

S•3-Way Features

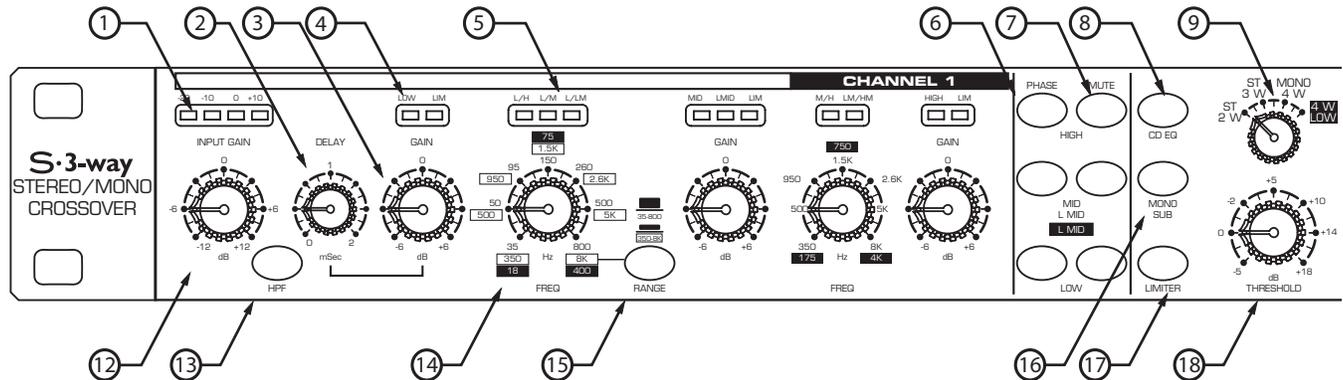


The Samson S•3-way electronic crossover utilizes the latest technology in speaker management design. Here are some of its main features:

- Full featured, Stereo 2-way, Stereo 3- way, Mono 4- way electronic crossover.
- Precision Linkwitz-Riley, 24 dB/Octave filters.
- High Pass Filter, Butterworth 25 Hz, 12 dB/Octave.
- Adjustable Low Frequency Delay for time aligning speaker stacks.
- Times 10 Multiplier Switch to adjust frequency range.
- Mode Indicator LED's providing quick visual display of operating mode.
- 4 Segment LED Input Meter allows easy gain adjustment.
- Output Mute switches for all individual outputs.
- Phase Switches invert the phase of the individual outputs.
- Constant Directivity EQ smooths the response of CD horns above 3.5 kHz.
- Mono Sub Switch sums the low frequency signal from both inputs and sends it to both low outputs.
- Peak Limiter with independent Threshold control and Peak LED.
- Advanced circuit design, utilizing low noise operational amplifiers and high quality VCAs.
- Servo balanced inputs and outputs on XLR connectors.
- High quality, 41 position detent pots and backlit switches.
- The stylish bead blasted electric blue anodized front-panel is as easy to read as it is to look at.
- Three-year extended warranty.

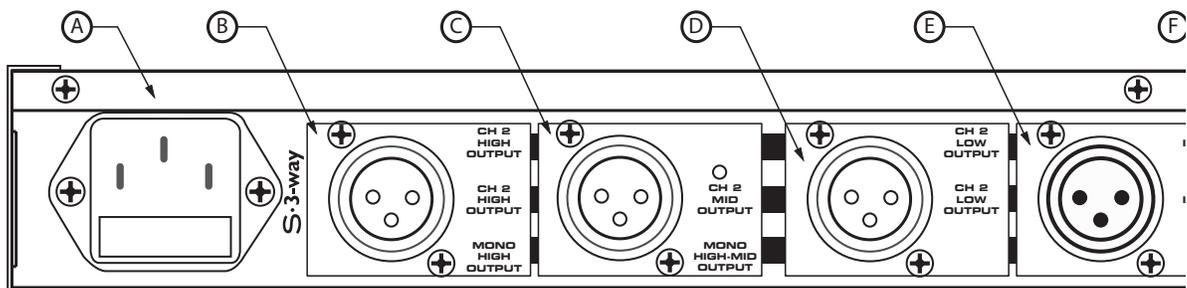
Controls and Functions

FRONT PANEL LAYOUT



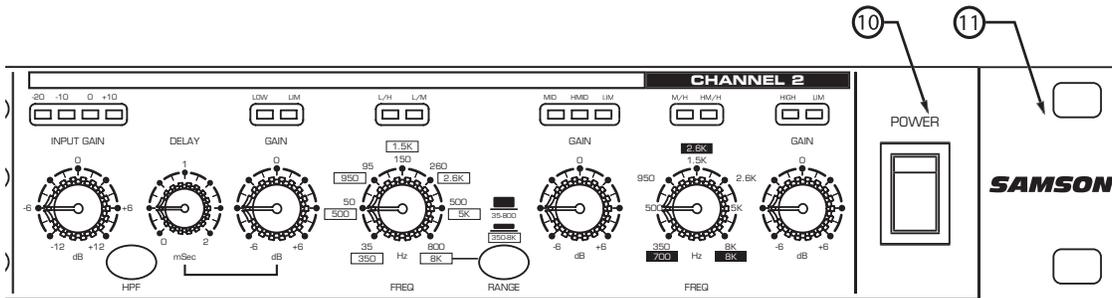
- ① **INPUT METER INDICATORS** - 4 LEDs display the amount of level present at the inputs.
- ② **DELAY** - Delay line adjusts from 0 to 2ms for time aligning the low frequency output.
- ③ **GAIN CONTROL** - Adjusts the output gain of the individual frequency bands.
- ④ **BAND AND LIMIT INDICATORS** - Indicates the bands that are in use depending on the mode selector and indicates when limiting of that band occurs.
- ⑤ **CROSSOVER BAND INDICATORS** - Indicates the crossover mode that is active depending on the mode selector frequencies.
- ⑥ **PHASE SWITCHES** - Used to select in or out of phase operation, individually per frequency band.
- ⑦ **MUTE SWITCHES** - Individual outputs can be shut completely off with the quick press of a button.
- ⑧ **CD EQ** - Activates the constant directivity horn EQ curve for smoothing the high frequency response of the sound system.
- ⑨ **OPERATING MODE SELECTOR** - Selects one of the 4 operating modes; 2-way stereo, 3-way stereo, 4-way mono and 4-way low.

REAR PANEL LAYOUT

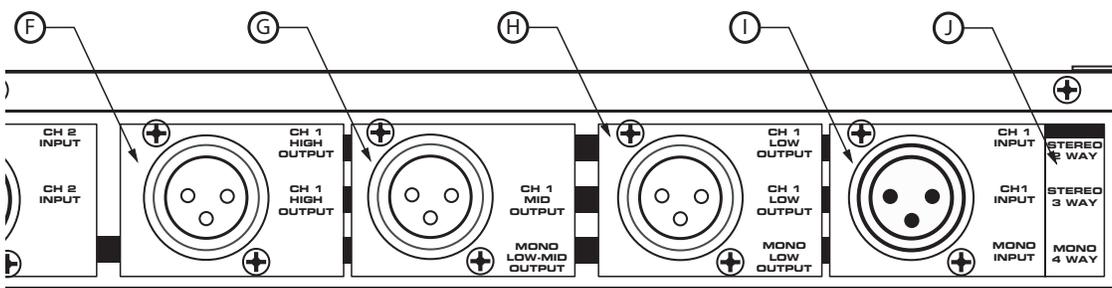


- Ⓐ **AC INLET** - IEC standard ac power cable connector with external fuse.
- Ⓑ **CHANNEL 2 HIGH OUTPUT** - XLR balanced line output.
- Ⓒ **CHANNEL 2 MID OUTPUT** - XLR balanced line output.
- Ⓓ **CHANNEL 2 LOW OUTPUT** - XLR balanced line output.

Controls and Functions



- 10 MAIN POWER SWITCH**- When turned on, activates the S+3-way.
- 11 RACK EARS**- Used for mounting into a standard 19-inch rack.
- 12 INPUT GAIN**- Used to adjust the input gain from -12dB to +12dB.
- 13 HPF SWITCH**- Engages the low frequency roll off at 25Hz.
- 14 FREQUENCY CONTROL**- The control that sets the crossover point dividing the frequency bands.
- 15 RANGE SWITCH** - Selects the range at which the frequency control operates from normal to times 10.
- 16 MONO SUB** - Selects mono operation for the sub bass output.
- 17 LIMITER** - Built- in peak limiter provides maximum output while offering extended speaker protection.
- 18 THRESHOLD** - Adjusts the level of the peak limiter.



- G CHANNEL 1 MID OUTPUT** - XLR balanced line output.
- H CHANNEL 1 LOW OUTPUT** - XLR balanced line output.
- I CHANNEL 2 INPUT** - XLR balanced line output.
- J MODE KEY** - Indicates the active outputs in all modes.

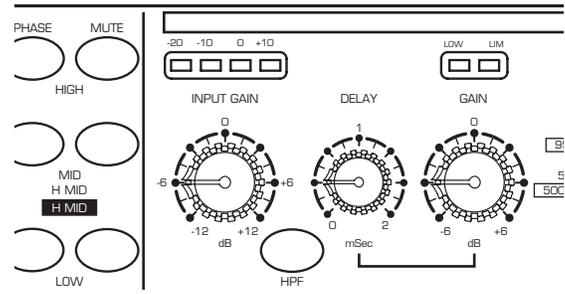
Operating the S•3-way

SETTING UP THE S•3-way

Whether you are an experienced audio engineer or just starting out, the next sections of this manual will help you get going with your S•3-way. Now that you have unpacked the unit and have become a bit familiar with the front panel controls, you can follow the next sections of this manual to begin to set-up and operate your new crossover. Further on in this manual, you will find detailed wiring diagrams of various speaker system set-ups. For detailed diagrams of connector and cable wiring, see page 15 in this manual.

MODE SWITCH

The S•3-way can be configured to operate in several modes including Stereo or Mono 2-way, Stereo or Mono 3-way and Mono 4-way. In addition, the S•3-way has a special operating mode; 4-way LOW which is used for ultra-low sub woofer applications. The Mode Switch, located in the center section of the unit, is used to select the operating mode. As you switch through the various operation modes, you will notice that several LED's on the panel are also changing. These are the Mode Indicator LED's and they help you keep track of the changing controls.

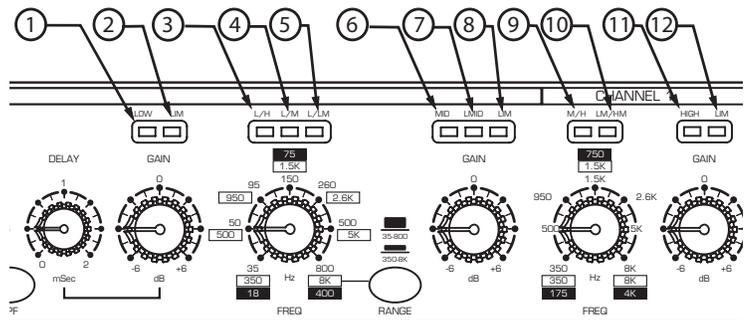


FREQUENCY BAND & LIMIT INDICATORS

Because the S•3-way can be configured to operate in several different size sound systems, the crossover controls may be adjusted for the frequency division between low, and high, or low and low-mid, or high mid to high depending on the mode. On some crossovers, it is very difficult to get a quick visualization as to what controls are controlling what function. The S•3-Way solves this problem by employing it's Mode Indicator LED's over the Frequency and Gain controls. These provide quick identification of the frequency band that is under control. In the diagrams below, you can see what functions are under control when the associated LED is lit. Also, over each Gain control is an LED that illuminates indicating that frequency band has entered into Limiting. More information on using the Limiter can be found on page 10.

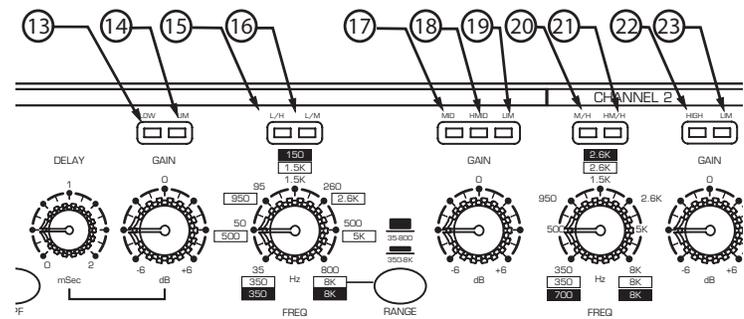
Channel One

- 1 LOW Low Frequency Gain
- 2 LIM Low Band Limiter
- 3 L/H Crossover Low to High
- 4 L/M Crossover Low to Mid
- 5 L/LM Crossover Low to Low-Mid
- 6 MID Mid Frequency Gain
- 7 LMID Low-Mid Gain
- 8 LIM Mid/Low-Mid Band Limiter
- 9 M/H Crossover Mid to High
- 10 LM/HM Crossover Low-Mid to High-Mid
- 11 HIGH High Frequency Gain
- 12 LIM High Band Limiter



Channel Two

- 13 LOW Low Frequency Gain
- 14 LIM Low Band Limiter
- 15 L/H Crossover Low to High
- 16 L/M Crossover Low to Mid
- 17 MID Mid Frequency Gain
- 18 HMID High-Mid Gain
- 19 LIM Mid/High-Mid Band Limiter
- 20 M/H Crossover Mid to High
- 21 HM/H Crossover High-Mid to High
- 22 HIGH High Frequency Gain
- 23 LIM High Band Limiter



Operating the S•3-Way

SETTING UP THE S•3-way FOR STEREO 3-way OPERATION

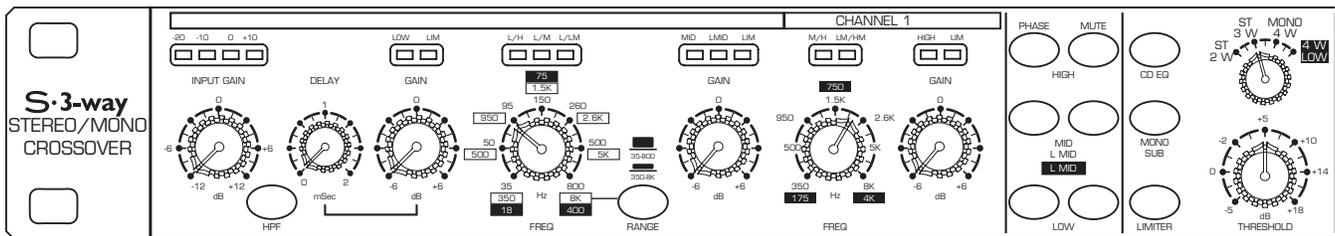
The following operating example is for a Stereo 3-way system using 15" sub, 12" mid range and 1" compression driver and both the left and right side. There are systems examples for other set-ups including stereo 2-way and 4-way mono operation.

CAUTION: Before you apply power to your speaker system amplifiers, be certain to set the frequency controls to the manufacturers recommended crossover points for the drivers or enclosures you are using.

NOTE: LAST ON / FIRST OFF

When running a loudspeaker system with one or multiple power amplifiers, it is highly recommended that you follow the LAST ON / FIRST OFF rule. When powering up your sound system, turn your power amplifier on last. When you power down your system, turn your power amplifiers off first. This will prevent any switching spikes you may get from other gear in your system, and help prevent unnecessary speaker damage.

- Connect both sets of inputs and outputs to the designated connectors on the rear panel. For a detailed cable-wiring diagram see page 15.
- * Set the controls to the following positions:



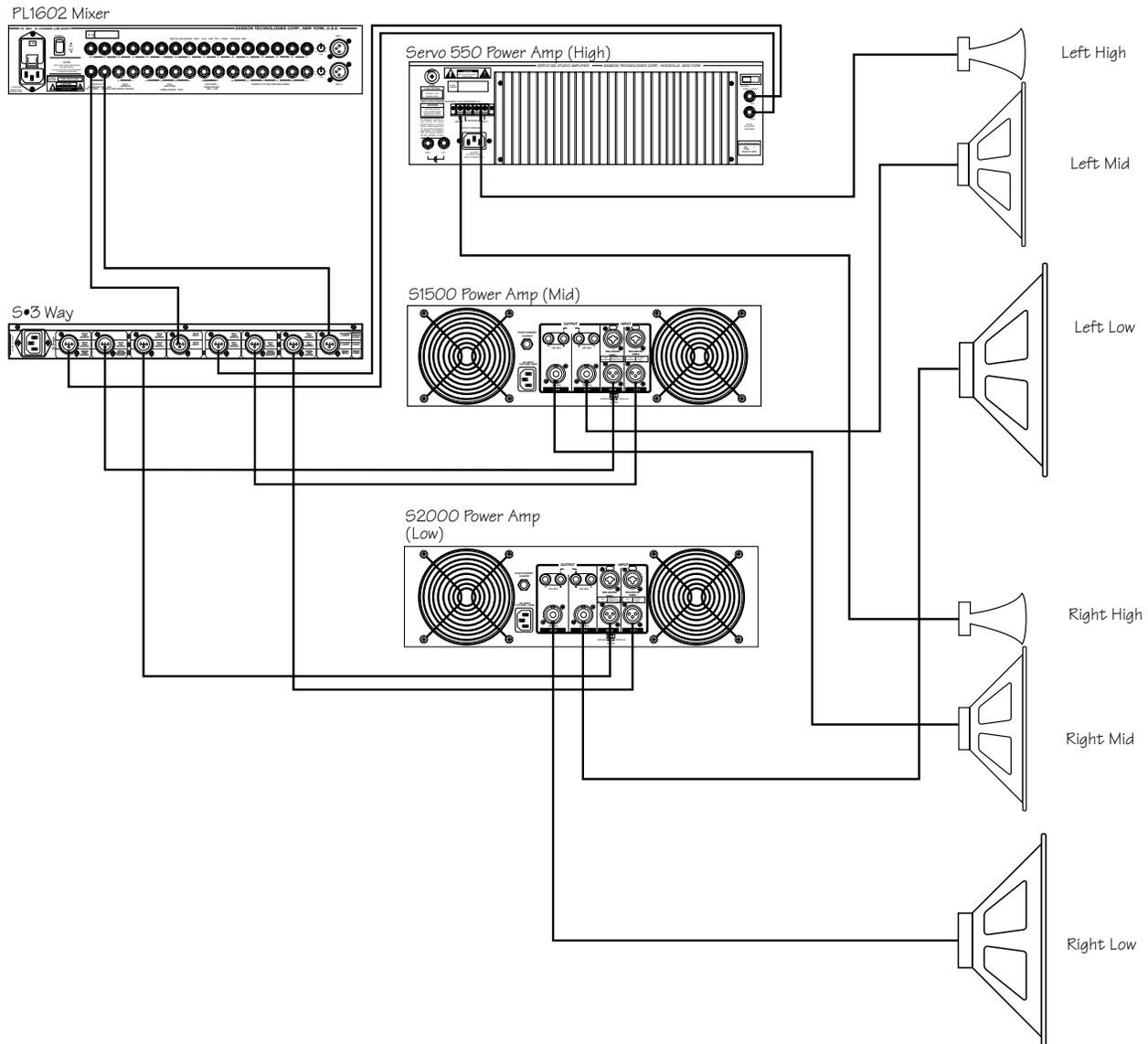
INPUT GAIN	-12	HIGH PHASE	OUT
DELAY	0	MID PHASE	OUT
LOW GAIN	-6	LOW PHASE	OUT
LOW/MID FREQUENCY	70Hz	HIGH MUTE	IN
RANGE SWITCH	OUT	MID MUTE	IN
MID GAIN	-6	LOW MUTE	IN
MID/HIGH FREQUENCY	2KHz	CD EQ	OUT
HIGH GAIN	-6	MONO SUB	OUT
MODE SWITCH	ST 3W	LIMITER	OUT
		THRESHOLD	+5

- Set the controls for the S•3-way's Channel 2 to the same positions.
- Set the Power Switch to the ON position.

Operating the S•3-Way

SETTING UP THE S•3-way FOR STEREO 3-way OPERATION (Continued)

- Connect the mixer's left output to the S•3-way's CH1 (Left) input and the mixer's right output to the S•3-way's CH2 (Right) input. Now connect the S•3-way's CH1 (Left) Low Output to the left input of the low end power amp, CH1 (Left) Mid Output to the left input of mid-range power amp, and (Left) High Output to the left input of High power amp. Now make the same connections for the S•3-way's CH2(Right) and amplifiers right side.



Operating the S•3-Way

SETTING UP THE S•3-way FOR STEREO 3-way OPERATION (Continued)

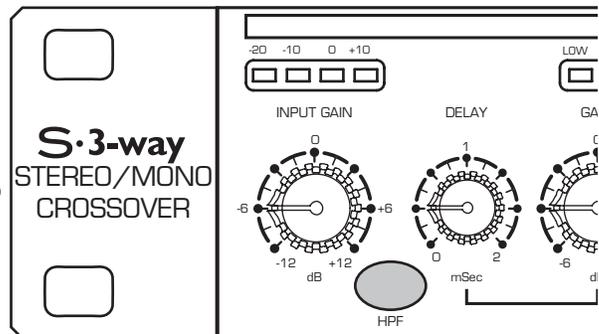
- Lower your power amplifier outputs to all the way off. Turn on all your power amplifiers. Run an audio signal (like some music from a CD) through your mixer and raise the output faders until you see the Input Meter LED's begin to light.
- Slowly raise the S•3-way's Input Gain until the Input Meter reads 0dB.
- Now raise your power amps to their normal operating level.
- Slowly raise the S•3-way's Ch1 (Left) Low Gain to 0 and then raise CH2 (Right) Low Gain to 0.
- Slowly raise the S•3-way's Ch1 (Left) Mid Gain to 0 and then raise CH2 (Right) MID Gain to 0.
- Slowly raise the S•3-way's Ch1 (Left) High Gain to 0 and then raise CH2 (Right) HIGH Gain 0.
- Now use your ears to adjust the balance between the low, mid and high end. You can continue to raise the Gain controls as you fine-tune the system. Watch the Peak Meters on your power amplifiers to ensure that you re running a clean signal.

S•3-way Controls

The Samson S•3-way features a variety of control functions that offer the sound engineer advanced control over a speaker system. The next section is a description of the control functions and how they are used to improve the overall sound of a sound reinforcement system.

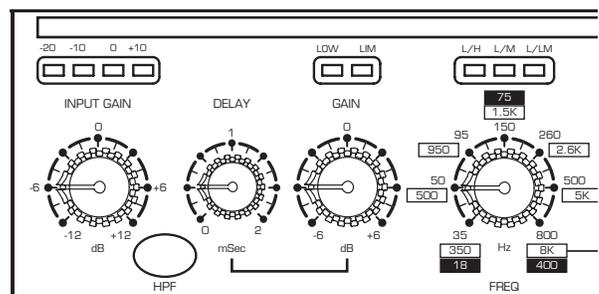
HIGH PASS FILTER

The S•3-way incorporates a HPF (High Pass Filter) which when engaged, activates a low frequency roll off at 25 Hz. By using the HPF you eliminate the sub-sonic frequencies sent to the low frequency power amplifier. Since the amplifier will try to reproduce these frequencies with the HPF is off, in most cases the result is simply wasted energy. By using the S•phone's HPF you send just the frequency you want to reproduce to your low frequency amplifiers and speakers.



DELAY

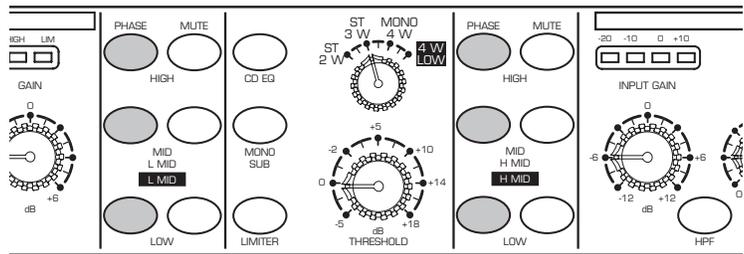
The S•3-way features a delay that can be set for up to two milli seconds of delay time for time aligning speaker stacks.



Operating the S•3-Way

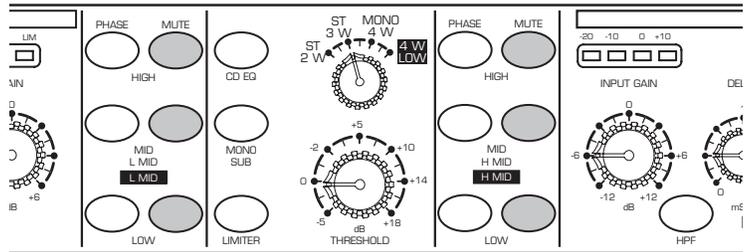
PHASE SWITCHES

The S•3-way incorporates individual PHASE reversal switches on each frequency band. When engaged, the LED illuminates indicating that the selected output is now 180 degrees out of phase.



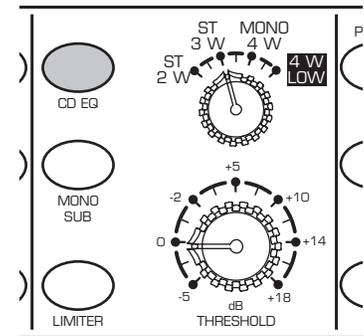
MUTE SWITCHES

The S•3-way features Mute switches on each frequency band. When engaged, the LED illuminates and that channel output is turned off. The MUTE switches are convenient for trouble shooting or for simply listening to each speaker section separately.



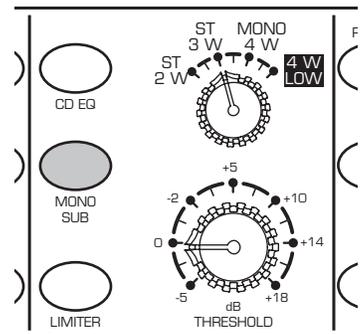
CD EQ SWITCH

Many of today's popular speaker enclosures feature Constant Directivity Horns. The S•3-way's CD EQ switch can be activated to apply a special equalization curve for smoothing and adding air to the high end of a loudspeaker system.



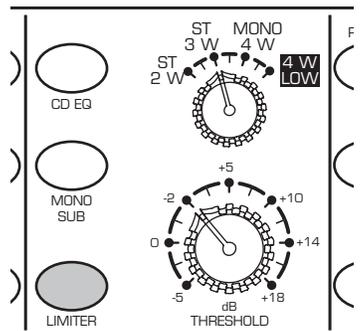
MONO SUB SWITCH

For easy operation of mono subwoofers, the S•3-way provides a MONO SUB switch. When activated, the low frequency band of Channel One and Two are summed together. The common low frequency signal is present at both Channel One and Channel Two's Outputs.



LIMITER

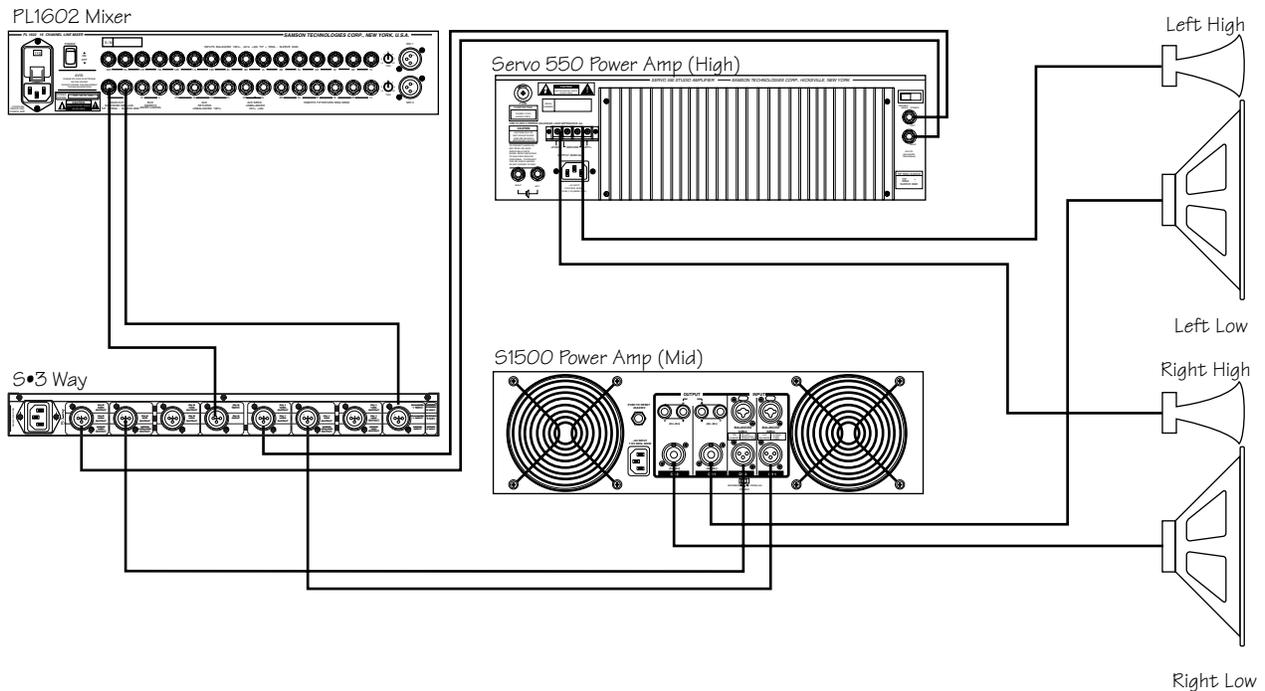
A Limiter is a specific form of a compressor configured to prevent peaks and for general overload protection. The S•3-way offers a Multi-Band Limiter with variable Threshold control. The operating range of the Limiter is from -5 to +18dB and when engaged, protects against signal peaks and overloads.



S•3-Way System Set-Ups

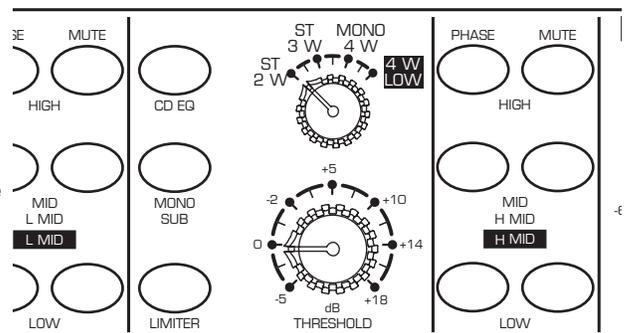
STEREO TWO-WAY OPERATION

If you're operating your PA system Stereo 2-way, wire your system as shown in the system diagram below:



Once you have your system wired-up, follow the steps below:

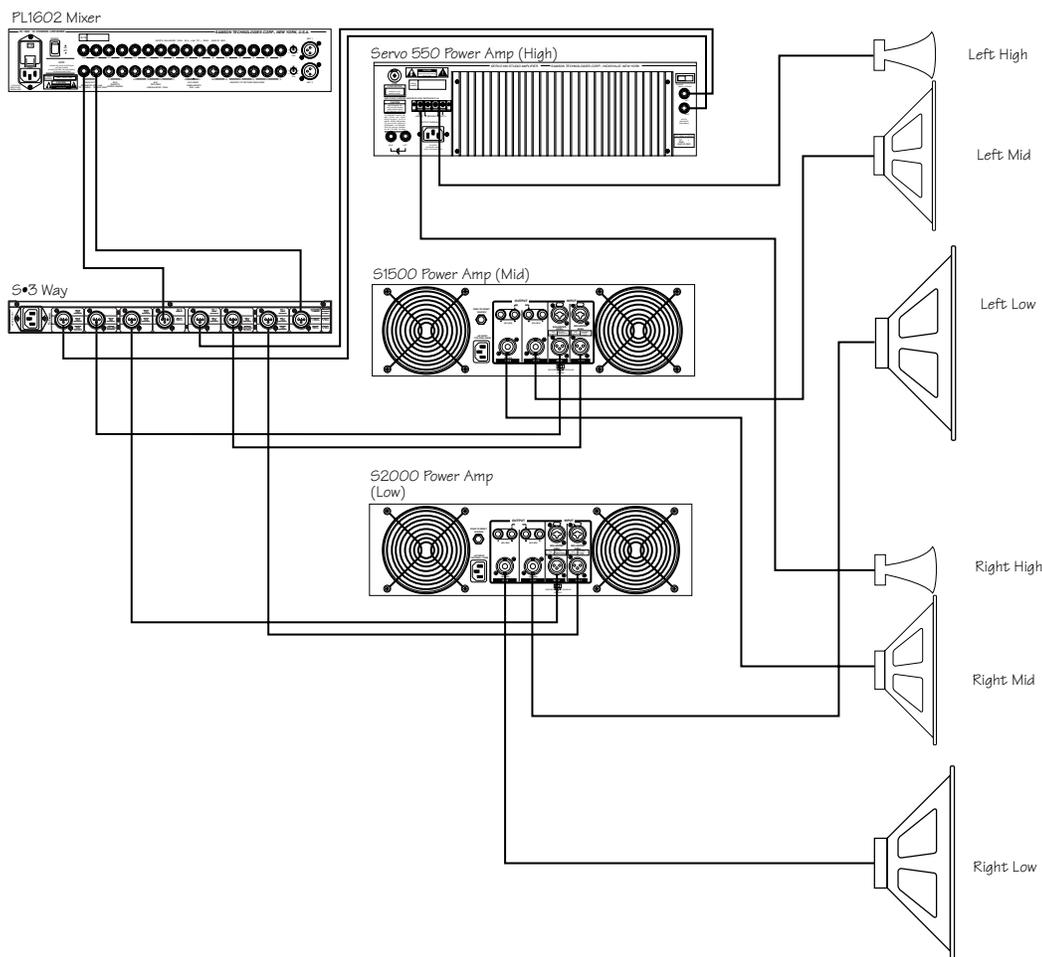
- Set the mode switch to the ST 2 W position. Notice how the BAND INDICATOR LED's change showing the frequencies that are now under control by the associated GAIN or FREQUENCY knobs.
- Use the first crossover on Channel 1 and 2 to set the desired frequency.
- Adjust Gain number 1 on Channel 1 and 2 for the Low frequency outputs.
- Adjust Gain number 3 on Channel 1 and 2 for the High frequency outputs.



S•3-Way System Set-Ups

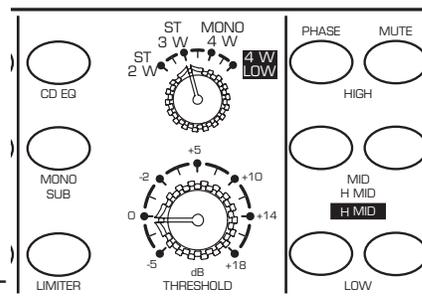
STEREO THREE WAY OPERATION

If you're operating your PA system Stereo 3-way, wire your system as shown in the system diagram below.



Once you have your system wired-up, follow the steps below:

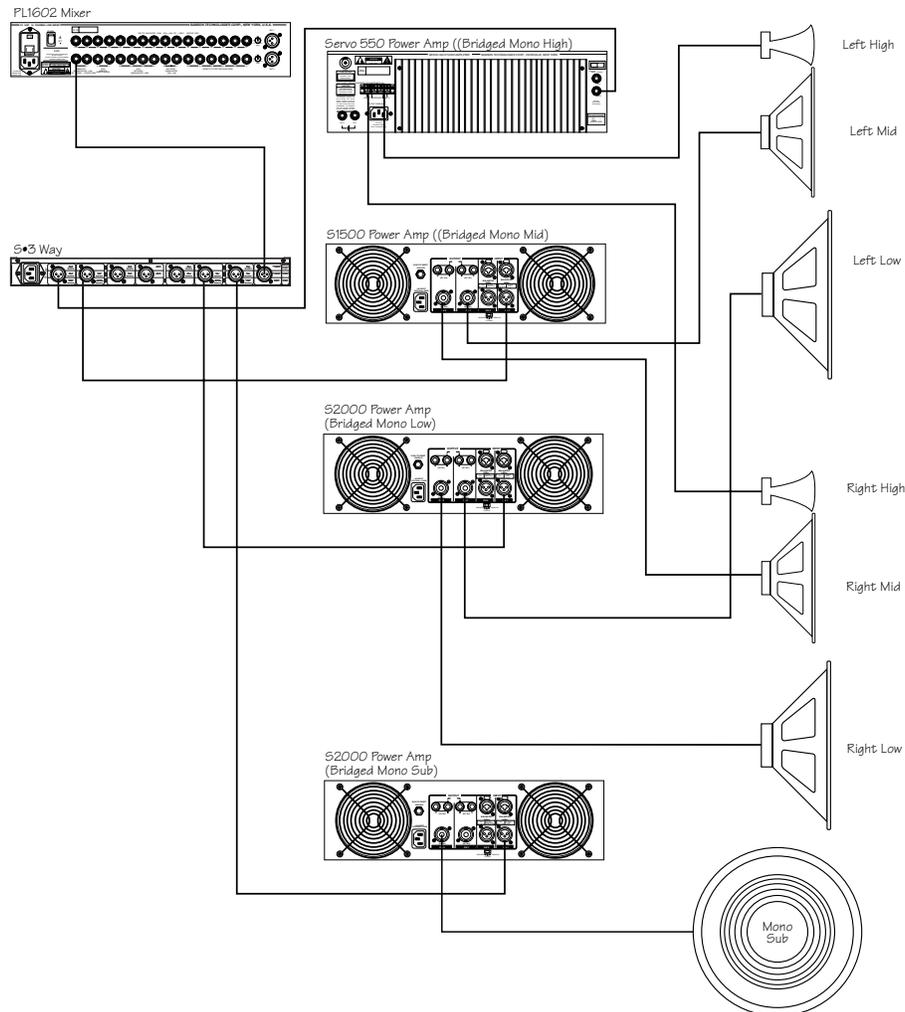
- Set the mode switch to the ST 3 W position. Notice how the BAND INDICATOR LED's change showing the frequencies that are now under control by the associated GAIN or FREQUENCY knobs.
- Look for the illuminated L/M BAND INDICATOR LED over the first FREQUENCY control. Now, use the first crossover FREQ on Channel 1 to set the desired frequency dividing the Low and Mid frequencies. Now, use the second crossover FREQ on Channel 1, indicated by the illuminated M/H LED, to set the desired frequency dividing the Mid and High frequencies. Repeat the same procedure for the Channel 2.
- Look for the illuminated LOW BAND INDICATOR LED over the GAIN control. Now, adjust the first gain control on Channel 1 to set the level of the Low frequency output. Look for the MID BAND INDICATOR LED over Channel 1's second GAIN control to adjust the MID output. Adjust the High output using Channel 1's third GAIN control designated by the HIGH BAND INDICATOR LED. Repeat the same procedure for Channel 2.



S•3-Way System Set-Ups

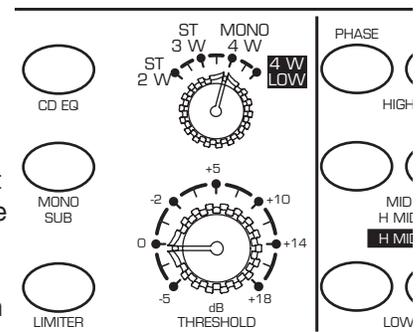
MONO FOUR WAY OPERATION

If you're operating your PA system Mono 4-way, wire your system as shown in the system diagram below.



Once you have your system wired-up, follow the steps below:

- Set the mode switch to the MONO 4 W position. Notice how the BAND INDICATOR LED's change showing the frequencies that are now under control by the associated GAIN or FREQUENCY knobs.
- Look for the illuminated L/LM BAND INDICATOR LED over the first FREQUENCY control. Now, use the first crossover FREQ on Channel 1 to set the desired frequency dividing the Low and Low-Mid frequencies. Now, use the second crossover FREQ on Channel 1, indicated by the illuminated LM/HM LED, to set the desired frequency dividing the Low-Mid and High-Mid frequencies. To set the frequency point dividing the High-Mid and High use Channel 2's second crossover FREQ which will have the HM/H BAND INDICATOR LED lit up.

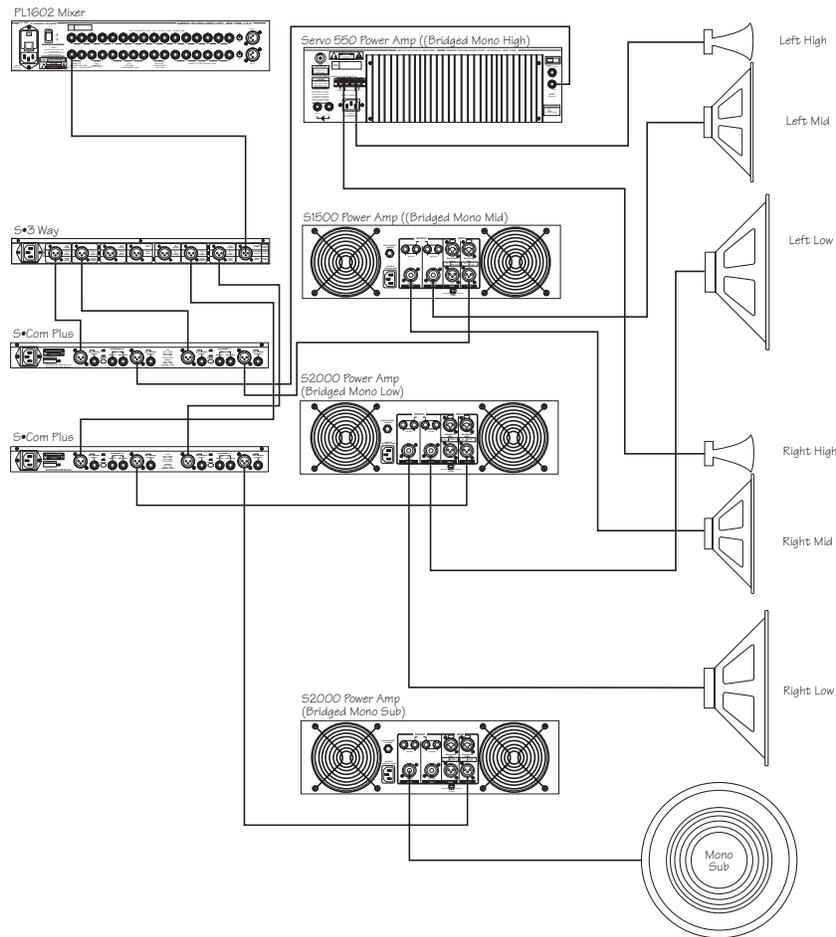


- Look for the illuminated LOW BAND INDICATOR LED over the first GAIN control. Now, adjust the first gain control on Channel 1 to set the level of the Low frequency output. Look for the LM/HM BAND INDICATOR over Channel 1's second GAIN control to adjust the LOW-MID output. The High-Mid level is adjusted by using Channel 2's second GAIN control indicated by the HMID LED. Adjust the High output using Channel 2's third GAIN control designated by the HIGH BAND INDICATOR LED.

S•3-Way System Set-Ups

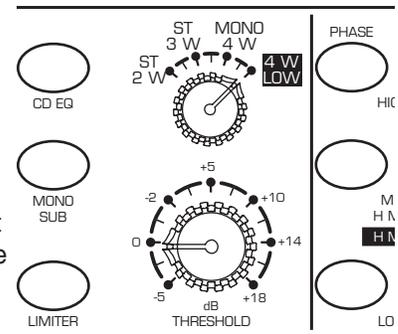
MONO FOUR-WAY LOW

The S•3way incorporates a special operating mode, MONO 4-WAY LOW for operating sub woofers at very low frequencies. In the MONO 4-WAY LOW mode the frequency divisions are half of those in MONO 4-WAY mode. If you're operating your PA system Mono 4-way LOW, wire your system as shown in the system diagram below:

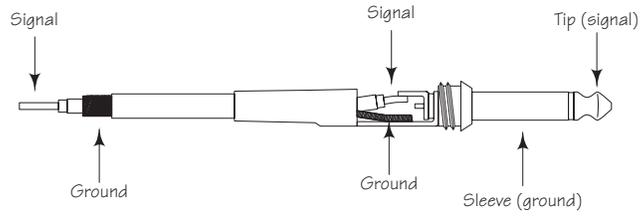


Once you have your system wired-up, follow the steps below:

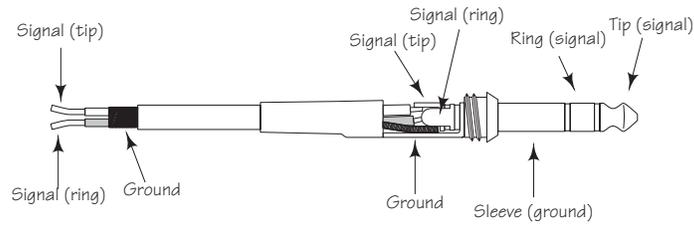
- Set the mode switch to the MONO 4 W position. Notice how the BAND INDICATOR LED's change showing the frequencies that are now under control by the associated GAIN or FREQUENCY knobs.
- Look for the illuminated L/LM BAND INDICATOR LED over the first FREQUENCY control. Now, use the first crossover FREQ on Channel 1 to set the desired frequency dividing the Low and Low-Mid frequencies. Now, use the second crossover FREQ on Channel 1, indicated by the illuminated LM/HM LED, to set the desired frequency dividing the Low-Mid and High-Mid frequencies. To set the frequency point dividing the High-Mid and High use Channel 2's second crossover FREQ which will have the HM/H BAND INDICATOR LED lit up.
- Look for the illuminated LOW BAND INDICATOR LED over the first GAIN control. Now, adjust the first gain control on Channel 1 to set the level of the Low frequency output. Look for the LM/HM BAND INDICATOR over Channel 1's second GAIN control to adjust the LOW-MID output. The High-Mid level is adjusted by using Channel's 2's second GAIN control indicated by the HMID LED. Adjust the High output using Channels 2's third GAIN control designated by the HIGH BAND INDICATOR LED.



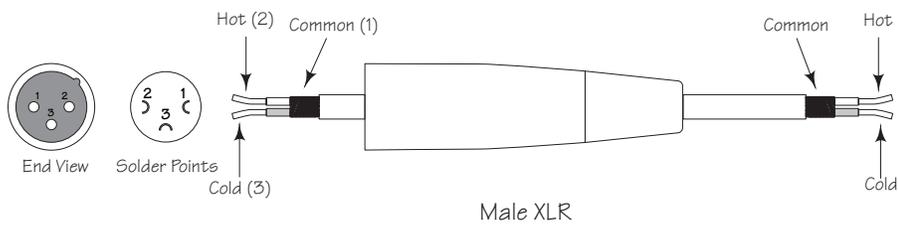
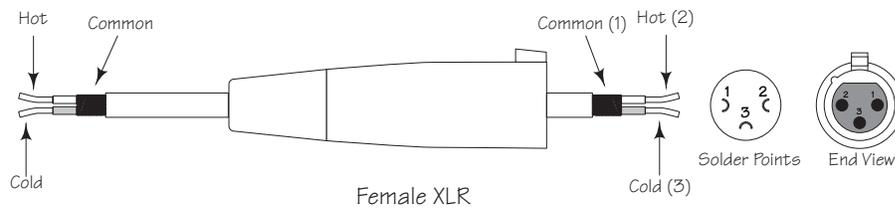
Unbalanced 1/4" Connector



Balanced TRS 1/4" Connector



XLR Balanced Wiring Guide



Specifications

Inputs

Female Balanced XLR
Impedance Balanced >15k Ohms
Max. Input level +26dBu balanced

Outputs

Male Balanced XLR
Impedance Balanced 100 Ohms
Max. Output Level +26 dBu

Global Specifications

Frequency Response <10 Hz to >90 kHz, +0/-3 dB
Signal to Noise
(Ref +4 dBu), 22 Hz to 22 kHz, un-weighted 90dB high out, mid 90dB, low 94dB, all outs >100dB muted.
CMRR Min.40dB, >55 dB @ 1 kHz

Crossover

Crossdover Type Linkwitz-Riley, 24 dB/Octave
Crossover 1 Channel 1 35 to 800Hz
350 to 8kHz / with 10X multiplier
18 to 400Hz /4 Way Low Mode
Crossover 1 Channel 2 35 to 800Hz
350 to 8kHz / with 10X multiplier
Crossover 2 Channel 1 350 to 8kHz
175 to 4kHz /4 Way Low Mode
Crossover 2 Channel 2 350 to 8kHz
700 to 8kHz /4 Way Low Mode

Function Switches

Front Panel
High Pass Filter -3dB @ 15Hz 3 pole, 18dB/Octave
Mute for individual outputs
Phase Inverts the phase of the individual output
CD EQ Corrects constant directivity horn frequencies above 3.5 kHz
Limiter engages limiter for all outputs
Mono Sub Sends the low frequency signal from both inputs to both low outputs

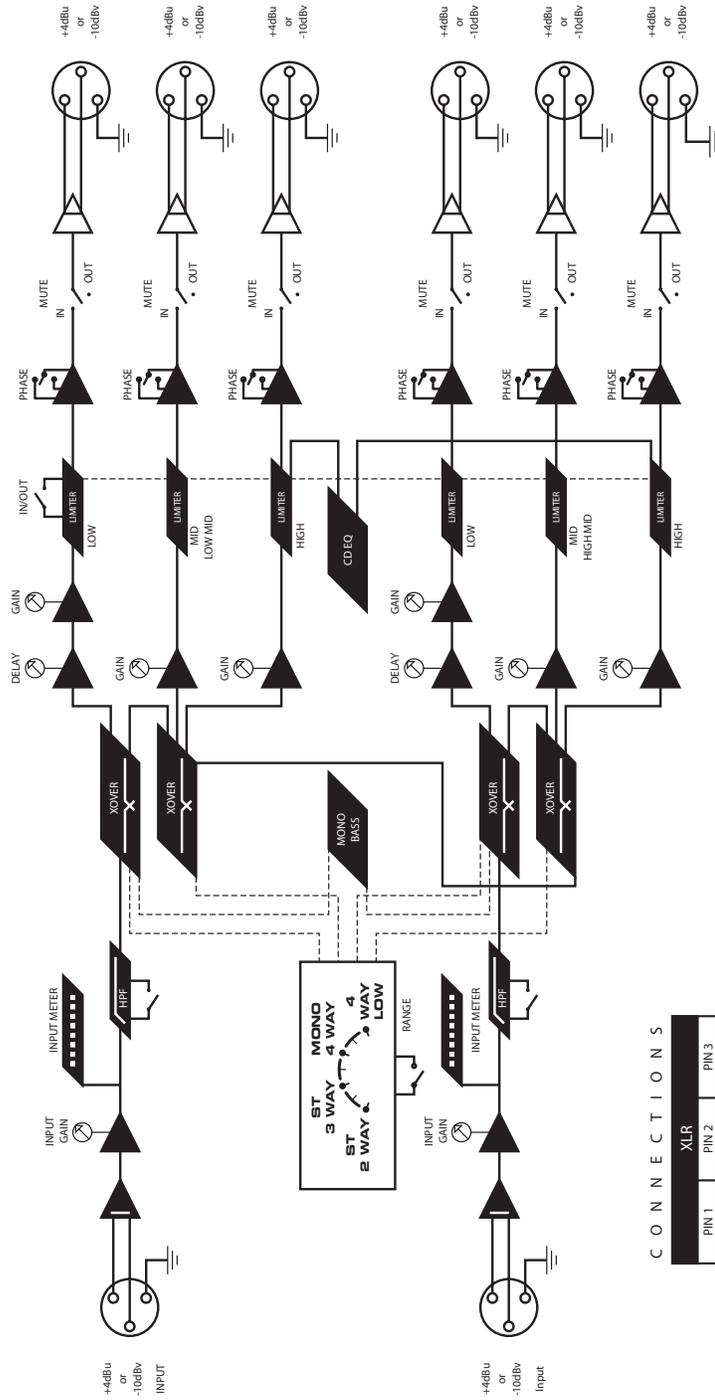
Power Supply

Mains Voltages USA/Canada 105-125 VAC ~, 60 Hz
Mains Voltages Europe 215 – 254 VAC~,50Hz
Power Consumption 14 Watts
Power Inlet Standard IEC receptacle / with Fuse

Physical

Dimensions 1 3/4" (44,5 mm) * 19" (482,6 mm) * 8 1/2" (217 mm)
Net Weight 6.6lbs., (3 kg)
Shipping Weight 9.4lbs., (4,3 kg)

Block Diagram



CONNECTIONS

XLR			
PIN 1	PIN 2	PIN 3	
GND	HOT	COLD	

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Modes	Operating Frequencies Ch 1 A	Operating Frequencies Ch 2 A	Operating Frequencies Ch 2 B
Stereo 2 Way	35Hz to 800Hz X1 or 350Hz to 8KHz	35Hz to 800Hz X1 or 350Hz to 8KHz	350Hz to 8KHz
Stereo 3 Way	35Hz to 800Hz X1 or 350Hz to 8KHz	35Hz to 800Hz X1 or 350Hz to 8KHz	350Hz to 8KHz
Mono 4 Way	35Hz to 800Hz		350Hz to 8KHz
Mono 4 Way Low	18Hz to 400Hz		700Hz to 8KHz

3 WAY STEREO / 4 WAY MONO XOVER

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