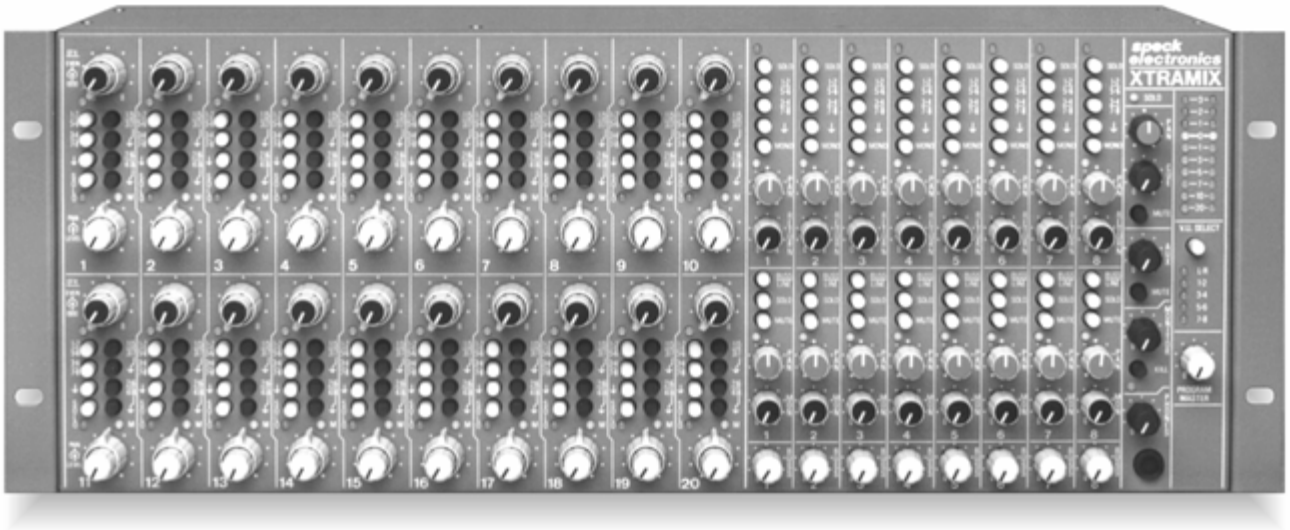
XTRAMIXcxi

~ Version 5 ~

Ultra Compact Studio Line Mixer

Reference Manual



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Edition

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Introduction

General

Thank you for purchasing our Xtramix Ultra Compact Line Mixer. The Xtramix was designed from the ground up as a high performance mixer dedicated to the project studio owner, recording studio, touring, or professional keyboard player.

The Xtramix has operational features that are unique to our products and are somewhat technical in nature. We hope this manual is easy to understand. If you have any questions regarding the Xtramix or any Speck product, do not hesitate to contact Speck Electronics. Our phone number is +760-723-4281.

Operator Safety Summary

Power source

This product and its power supply are intended to operate from an AC power source that does not apply more than 240 Volts RMS between the supply conductors or between either supply conductor and ground.

Grounding the product

The external power supply for the Xtramix is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before making any audio connection to the mixer. A protective ground connection, by the way of the grounding conductor in the power cord, is essential for safe operation.

Upon loss of the protective ground connection, all accessible conductive parts, including knobs and controls that may appear to be insulating, can render an electric shock.

Use the proper power cord

Use only the power cord and connector that is supplied with your power supply. The power cord must be in good condition.

Use the proper fuse

To avoid a fire hazard, use only a fuse of the correct type, voltage rating and current rating as specified on the chassis of the power supply and this manual.

Refer to the section in this manual regarding specific details on fuses.

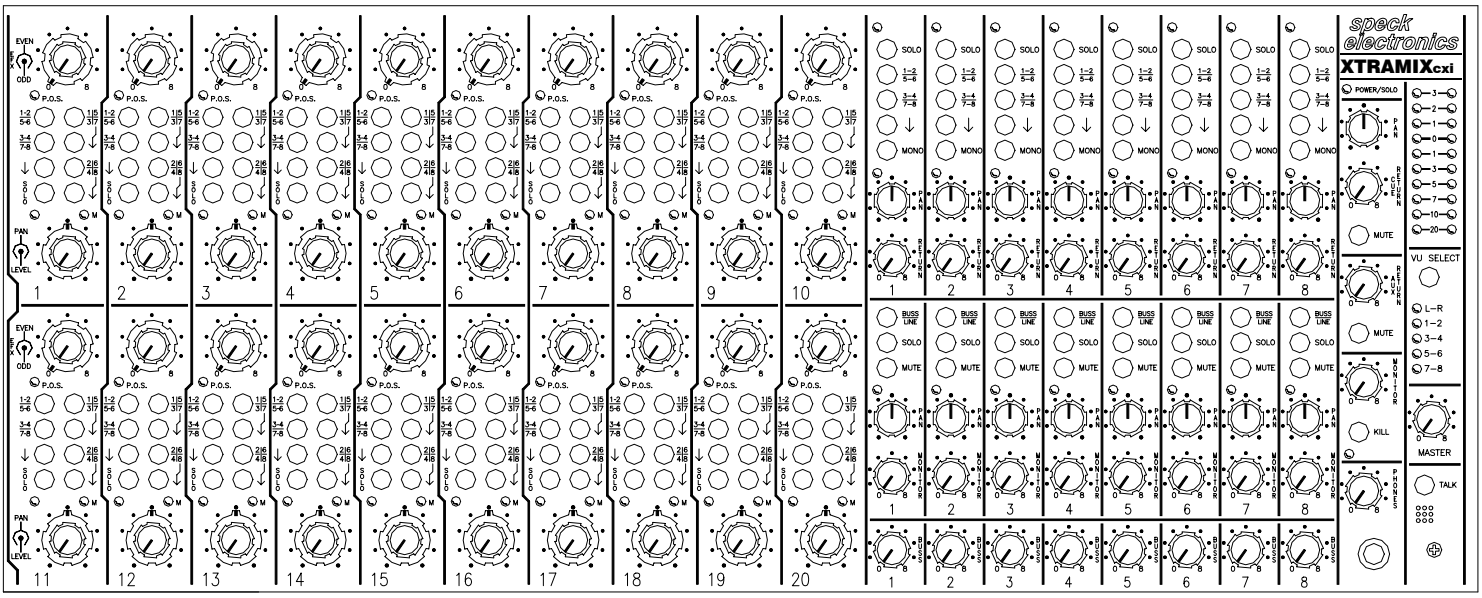


Figure 1a. Front Panel Layout

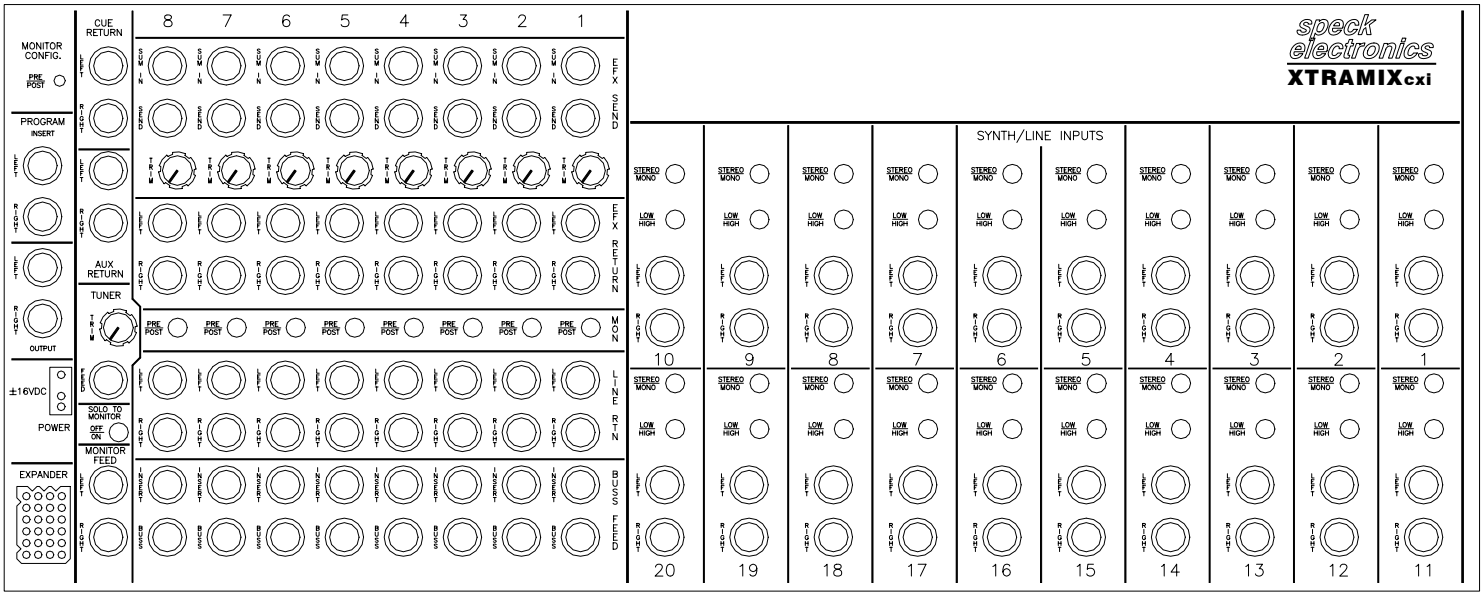


Figure 1b. Rear Panel Layout

Do not remove covers or panels

To avoid personal injury, do not remove the top cover from the power supply, or the rear panel of the Xtramix and never operate the external power supply without the cover properly installed. If it becomes necessary to remove the rear panel of the Xtramix for service, always unplug the AC power and disconnect the DC interface cable before proceeding.

General Description

The Xtramix is a high performance line audio mixer that may be used separately or as part of a larger mixing system.

When used as a rack mount recording mixer, the Xtramix provides 40 synth inputs (20 stereo inputs), 8 subgroup assign capability, and the ability to access up to 8 stereo effects devices. A complete 8 x 2 monitor and mix section allows the input channels and effects channels to be mixed to the stereo program, monitor and headphone outputs.

When used as a traditional synth/sampler mixer the Xtramix has the ability to be operated in many configurations. It may be used as a 70 input, 2 output compact keyboard mixer; or as a 56 input, 8 subgroup, 2 output keyboard mixer; or as a 40 synth or line input, 16 subgroup, 2 output mixer; or any combination of the above mentioned configurations.

The mixer is divided into three basic sections. The input section, the effects send and return section, and the master section.

Input section

The input section consists of 20 stereo input channels and has all the controls necessary to effectively control synth and sampler operation.

Channels include level control with 8 subgroup assign, a pan/balance control, 2 effects sends that are assignable to 8 effects busses, and the ability to solo the signal. The rear panel for each input channel offers balanced 1/4" TRS connectors for synth or line interface, an effects stereo/mono select switch, and a low/high input level select switch.

Effects section

The effects section provides total control for up to 8 stereo effects devices.

Each of the effects channels include an effects send master for its respective effects buss and associated effects sum input. The effects return includes a stereo effects return level, 8 subgroup assign, pan, in-place solo, and mono select switch. Each effects channel has a 1/4" TRS send jack, a 1/4" TRS effects sum in jack, and (2) balanced 1/4" TRS jacks for the left and right effects returns.

Master section

The master section provides the Xtramix with many choices for routing and controlling the line signals from the input section and effects devices from the effects section.

The master section includes 8 discrete subgroup level controls, a stereo program, stereo monitor, and stereo headphone controls. A stereo cue and stereo aux return allow a variety of signals to be mixed with the synth signals to the monitor and headphone outputs. The master section provides a full compliment of balanced 1/4" TRS input and output connectors that allow the Xtramix to adapt to a wide range of professional situations.

Features

- Twenty balanced stereo inputs may individually operate as mono input channels.
- Input channels offer high and low operating levels.
- Eight stereo effects returns with individual mono switching.
- Eight assignable subgroups available for all input channels and effects returns.
- Effects send outputs have summing points so that other mixers' aux outputs may be combined with the Xtramix sends.
- The solo circuit for input channels, effects returns and monitor section can feed headphones only or both headphones and monitor output.
- A separate tuner output follows the solo for quick isolation.

Standard Accessories

Regulated power supply

The Xtramix is supplied with an external rack mount Model PS3-1.5 regulated power supply that is capable of powering the Xtramix.

The PS3-1.5 power supply is supplied with a IEC power entry connector, a 3 conductor AC power cord, and a 6 foot DC cable. The DC cable has a 6 pin connector at one end that plugs into the power supply, and a 4 pin connector at the other end that plugs into the Xtramix. The cable may be secured to the rear chassis of the Xtramix for a positive connection.

CAUTION!

ALWAYS CHECK THE PROPER OPERATING VOLTAGE BEFORE OPERATING THE XTRAMIX.

IMPORTANT!

USE ONLY THE POWER SUPPLY THAT IS SPECIFIED FOR YOUR PRODUCT.

Rack mount adapters

The Xtramix is supplied with a set of rack mount adapters. If the intention is to mount the Xtramix in a standard 19" equipment rack, these adapters must be mounted to the left and right sides of the mixer.

Specifications

Line Input Impedance	15k Ohms
Effects Return Input Impedance	15k Ohms
Cue Return Input Impedance	15k Ohms
Aux Return Input Impedance	15k Ohms
Subgroup Insert Return Impedance	5k Ohms
Effects Sum In Impedance	10k Ohms

Effect Send Output Impedance Program Feed Output Impedance Monitor Feed Output Impedance Tuner Feed Output Impedance Subgroup Feed Output Impedance Subgroup Insert Send Impedance	All line outputs are designed to drive a 600 ohm load and may be operated into any load 600 ohms or greater.

	Normal	Maximum
Line Input Level (High Level)	0dBu	+28dBu
Line Input Level (Low Level)	-20dBu	+10dBu
Effects Return Input Level	+4dBu	+21dBu
Subgroup Insert Return Level	+4dBu	+21dBu
Cue Return Input Level	+4dBu	+21dBu
Aux Return Input Level	+4dBu	+21dBu

Specifications (Cont.)

	Normal	Maximum
Subgroup Feed Output Level	+4 dBu=0VU	+28dbu
Subgroup Insert Send Output Level	+4 dBu	+20dBu
Program Feed Output Level	+4 dBu=0VU	+28dBu
Monitor Feed Output Level	+4dBu	+21.5dBu
Effects Send Output Level	+4dBu	+21.5dBu
Tuner Feed Output Level	+4dBu	+20dBu
Headphone Output Level		4 Watts

	Unweighted	A-weighted
Output Distortion(THD+n) 22Hz to 22KHz	.0067%	.0037%

Frequency Response (Any primary line In to Program Out): 6Hz(-3dB) to 154kHz(-3dB)

Test Conditions:

0dBu signal at left input.
Input level control set to 3 o'clock position.
Input channel assigned to subgroup #1.
Subgroup master #1adjusted to indicate 0 VU.
Monitor channel #1 level set to 3 o'clock position.
Monitor pan pot centered.
Program master adjusted to indicate 0 VU.
Frequency response measured at program feed-left.

Residual Noise Measurement (Any primary line In to Program Out): -89 dBu (unweighted), -95 dBu (A-weighted)

Test Conditions:

0dBu signal at left input.
Input level control set to 3 o'clock position.
Input channel assigned to subgroup #1.
Subgroup master #1adjusted to indicate 0 VU.
Monitor channel #1 level set to 3 o'clock position.
Monitor pan pot centered.
Program master adjusted to indicate 0 VU.
Input signal removed and terminated with 100 Ohms.
Noise measured at program feed-left.

Power requirements (Mixer)	Bi-polar 16.25 volts DC, 1.3 Amp
Power requirements (Power Supply)	120/240 VAC, 1/.5 Amp
Dimensions (Xtramix)	HxWxD = 7" x 19" x 7" (178mm x 483mm x 178mm)
Dimensions (Power Supply)	HxWxD = 3.75 x 11.25 x 5.25 (95mm x 286mm x 133mm)
Shipping weight	Approximately 33 lbs (14.9Kg)

ALL MEASUREMENTS WERE PERFORMED WITH AN AUDIO PRECISION SYSTEM ONE TEST SET.

Initial Preparation

Unpacking and Inspection

The Xtramix is delivered in a special, protective container and was carefully inspected both mechanically and electrically before shipment. It should be physically free of mars and scratches and in perfect electrical order upon receipt. To confirm this, the product should be inspected for physical damage that may have occurred in transit. Any damage should be reported to your dealer and delivery company as soon as possible.

Environmental Considerations

The Xtramix will operate satisfactorily over a wide range of ambient temperatures, and the power supply will operate from 10 to 50 degrees C. If the power supply is installed in an equipment rack that also contains heat producing equipment such as power amplifiers or other power supplies, adequate ventilation should be provided. This will prolong component life and maximize operational stability.

While the internal circuitry of the Xtramix is fully shielded by the steel chassis, installation should nevertheless be planned to avoid locating the Xtramix or any low level audio equipment immediately adjacent to power amplifiers, power supplies, or any source of Electromagnetic emissions.

Grounding

To protect operating personnel, the National Electrical Manufacturers Association (NEMA) recommends that the instrument panel and rack cabinet be grounded. All Speck power supplies are equipped with a three conductor power cord which, when plugged into an appropriate receptacle, grounds the power supply. The offset pin on the power cord's three-prong plug is the ground wire.

The three conductor line cord and plug assembly is wired in accordance with NEMA convention (line - black, Neutral - white, and safety earth - green). Audio signal grounds and DC grounds from the mixer are isolated from the AC safety earth.

When using the Xtramix and its power supply outside North America, it may be necessary to adapt a different power cord for that specific country.

CAUTION!

DO NOT REMOVE, DEFEAT, OR DISABLE THE SAFETY EARTH TERMINAL ON THE POWER CORD. DO NOT USE A GROUND LIFT ON THE POWER SUPPLY.

Rack grounding

Merely affixing the Xtramix into an equipment rack is no guarantee that the product is making a reliable ground connection. The mounting rails in the equipment rack should never be depended upon for a ground connection.

Repacking For Shipment

The following information is provided as a general guide for repackaging your Xtramix for shipment. If you have any questions, contact Speck Electronics direct. Our phone number is +760-723-4281.

If the product is to be shipped to Speck Electronics for service or repair, attach a tag to the product, identifying the owner and indicating the service or repair to be accomplished. Include the model number and serial number of the product. Place the product in the original container if available. If the original container in not available, a suitable one can be purchased from Speck Electronics.

If the original container is not used, wrap the product in heavy plastic before placing in an inner container. Use plenty of packing material around all sides of the product and protect panel faces with cardboard strips. Mark shipping container with "Delicate Instrument" or "Fragile", and insure the shipment for the proper amount.

In most cases, it will be necessary to remove the rack mount adapters if the unit is returned in its original shipping container. When remounting the rack mount adapters, make certain you use the original mounting screws supplied with the Xtramix.

Installation

General

The following information should give you the basics on how to install the Xtramix and Power Supply. The proper installation of the Xtramix as a part of a larger system requires a clear understanding of audio wiring, AC distribution, grounding, and shielding techniques.

When the Xtramix is being installed into a larger system it may be necessary to retain the services of someone experienced in these matters.

Mechanical Installation

Before the mixer may be placed into its normal operating position, it will be necessary to install the rack mount adapters.

The Xtramix may be installed into any 19" wide equipment rack that uses standard E.I.A. universal spacing. The Xtramix may be affixed to standard E.I.A. rack rails using (4) 10-32 machine screws.

The location of the Xtramix should be such that the operator has a clear, unobstructed view of the front panel from his normal operating position. The unit should also be within easy reach of the operators normal position in order to facilitate the use of the front panel controls.

Physical Placement of Adjacent Equipment

Any device that emits a high EMI (Electro Magnetic Interference) or RFI (Radio Frequency Interference) energy field should be treated with suspicion. EMI is considered any unwanted signal which adversely affects the operation of the mixer or the mixing system. This subject is discussed in Chapter 5.

Electronic equipment such as power amplifiers, power supplies (especially wall mount type), video monitors, computers, certain synths and samplers must be located away from the Xtramix and its associated cables. It may be necessary to alter the positions of certain equipment that you feel would cause buzzes or hums in the mixer system.

Power Supply

The Xtramix is supplied with the Model PS3-1.5 power supply that offers a variety of mounting options. The power supply may be placed on any flat surface, permanently affixed to a flat surface, or mounted on a single rack rail with the optional rack mount adapter.

One of the primary reasons that the power supply of the Xtramix is external is to insure that the power transformer enclosed within the power supply chassis maintains a safe distance from the active electronics of the Xtramix. For that matter, any power supply (especially the small wall mount supplies), power amplifiers, or any strong power field device should be kept at a reasonable distance from the Xtramix. It is also important to keep the above mentioned devices clear of all interface cables, audio cables and harnesses.

The external power supply for the Xtramix does not provide an AC power switch. It is recommended the power supply be plugged into an AC strip that uses a power switch.

Mounting location

The power supply should not be installed directly above or below the mixer. It is recommended that it be installed in the rear of the equipment rack, providing that it remains at a reasonable distance from the mixer and cables, and has adequate ventilation.

The power supply normally generates a small amount of heat during operation. It is important that adequate ventilation is provided when planning the mounting location.

Configuring the AC Mains

The power supply may be wired to operate with 100 VAC, 120 VAC, 220 VAC, 230 VAC, or 240 VAC 50/60hz. Before applying AC power, you should verify that the voltage setting on your power supply is configured to match the AC requirements of your country. This procedure should be performed and checked by a qualified technician.

Unless otherwise specified on the panel of the supply, the power supply is wired for 120 VAC 50/60Hz operation and uses a North American IEC style AC plug.

To gain access to the inside of the power supply, it will be necessary to remove the top cover. This is accomplished by removing the 4 screws on the bottom of the power supply chassis. Make certain that the power supply is unplugged before proceeding.

There are 5 terminals available on the power transformer of the power supply. The configuration of the five terminals determine the operating voltage of the power supply. It is only necessary to change the black (line) and white (neutral) AC wires. Do not attempt to remove or change the Green AC safety wire or the multicolored wires used at the DC terminals. It is recommended that you measure the DC voltages at the DC connector before reconnection to the mixer.

AC wiring chart

The following chart represents the proper AC terminal configuration for the Model PS3-1.5 power supply.

FOR USE AT:	100 VAC	120 VAC	220 VAC	230 VAC	240 VAC
JUMPER AT:	1 & 3 2 & 4	1 & 3 2 & 4	2 & 3	2 & 3	2 & 3
APPLY A.C. AT:	5 & 1	4 & 1	1 & 5	4 & 1	4 & 1

Fuse chart

The following chart represents the proper fuse rating for the Model PS3-1.5 power supply. All fuses are 5 x 20mm Slow-Blow type.

100 VOLTS AC	1 AMP
120 VOLTS AC	1 AMP
220 VOLTS AC	.5 AMP
230 VOLTS AC	.5 AMP
240 VOLTS AC	.5 AMP

CAUTION!

ALWAYS CHECK THE PROPER OPERATING VOLTAGE BEFORE OPERATING THE XTRAMIX.

CAUTION!

DO NOT REMOVE, DEFEAT, OR DISABLE THE SAFETY EARTH TERMINAL ON THE POWER CORD. DO NOT USE A GROUND LIFT ON THE POWER SUPPLY.

Connecting the Power Supply

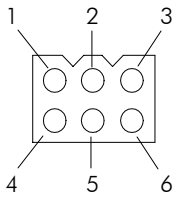
Before connecting the DC power supply connector to the Xtramix, make certain the power supply is not plugged in.

The power supply interface cable is a 3 conductor wire with a square plug on one end and a rectangular plug on the other end. Do not attempt to extend or modify this cable. Any attempt to modify this cable could result in severe damage to the Xtramix or power supply.

To connect the power supply to the mixer, first fit the square plug into the receptacle on the power supply. The connectors are keyed so they will only fit in one direction. Next, fit the rectangular plug into the connector at the rear of the Xtramix. These connectors are also keyed to fit in only one direction. Once the plug has been connected to the Xtramix, it may be secured with a cable tie to the adjacent cable tie holder.

Power supply DC pin assignment

The following chart represents the DC voltages available at the 6 pin connector on the Model PS3-1.5 Power Supply.



PIN 1 - DC COMMON
PIN 2 - MINUS 16.25 VOLTS DC
PIN 3 - N/C
PIN 4 - N/C
PIN 5 - N/C
PIN 6 - PLUS 16.25 VOLTS DC

Rack Mount Adapters

In order to install the Xtramix in a 19" equipment rack, it will be necessary to attach the two rack mount adapters to the main chassis of the Xtramix. Each rack mount adapter is attached to the main chassis of the mixer with (3) 6-32 x 3/16" Phillips machine screws.

Installation

Using a Phillips screwdriver, remove the (6) screws installed on both sides of the mixer. Position the adapters so the side with the small round holes match the threaded holes on the sides of the Xtramix, and the side with the oval shaped holes are towards the front panel of the mixer.

Attach the rack mount adapters to the left and right sides of the chassis with the (6) screws and tighten.

IMPORTANT!

ONLY USE THE SHORT SCREWS THAT ARE SUPPLIED WITH THE MIXER. USING LONGER SCREWS WILL DAMAGE THE INTERNAL CIRCUITRY OF THE MIXER.

Default Control Settings

Before any attempt is made to operate the mixer, it would be a good idea to set all the mixers controls to their neutral positions. This gives you a reference point to work from when adjusting controls and switches.

All volume controls including effects sends, effects returns, and master level controls should be set to their full counter-clockwise setting. All pan controls should be set centered. All pushbutton switches on the front and rear panel should be set to the out position.

When any future reference is made to the controls or switches of the Xtramix, is will be assumed that they have been set to their neutral positions.

Cleaning

The front and rear panels are a high quality painted surface and the panel lettering is applied using a silkscreen printing technique.

To clean the front or rear panel, wipe the surface gently using a soft lint-free cloth to avoid scratching the panel or markings. Paper towels are not recommended. Commercially available window cleaner solutions may be used; however, the solution should be applied to the cloth and not the panel to avoid the seepage of liquid to the inside of the enclosure.

IMPORTANT!

DO NOT USE BRUSHES OR FEATHER DUSTERS TO REMOVE DUST. THIS MAY CAUSE DUST TO FALL INTO THE OPENINGS AROUND THE PUSHBUTTON SWITCHES.

Interfacing Expanders

The Xtramix is wired with a 24 pin interface connector. This 24 pin connector will accommodate a second Xtramix configured as an expander.

Expander pin assignment

The following chart represents the audio and power connections available at the optional 24 pin rear interface connector.

PIN 1 -COMMON	PIN 13 -ASSIGN SUBGROUP 5
PIN 2 -PLUS 15 VDC	PIN 14 -ASSIGN SUBGROUP 6
PIN 3 -MINUS 15 VDC	PIN 15 -ASSIGN SUBGROUP 7
PIN 4 -SOLO SENSE	PIN 16 -ASSIGN SUBGROUP 8
PIN 5 -SOLO SIGNAL LEFT	PIN 17 -EFFECTS BUSS 1
PIN 6 -SOLO SIGNAL RIGHT	PIN 18 -EFFECTS BUSS 2
PIN 7 -PROGRAM RIGHT	PIN 19 -EFFECTS BUSS 3
PIN 8 -PROGRAM LEFT	PIN 20 -EFFECTS BUSS 4
PIN 9 -ASSIGN SUBGROUP 1	PIN 21 -EFFECTS BUSS 5
PIN 10 -ASSIGN SUBGROUP 2	PIN 22 -EFFECTS BUSS 6
PIN 11 -ASSIGN SUBGROUP 3	PIN 23 -EFFECTS BUSS 7
PIN 12 -ASSIGN SUBGROUP 4	PIN 24 -EFFECTS BUSS 8

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Operation

General

We hope to give you basic information on the operation of the Xtramix and adequately describe its controls, switches, and connectors.

It is assumed that you have a working knowledge of audio and signal flow. If this is your first mixer it is suggested that you purchase a book on the basic operation of audio mixers. Speck Electronics will be happy to suggest some publications on this subject.

FRONT PANEL CONTROLS

Input Channel

The input channel of the Xtramix is designed to accept most balanced or unbalanced stereo synth or line signals. Each input channel incorporates a stereo level and pan/balance on a dual concentric rotary potentiometer. 3 pushbutton switches are used in combination with the level and pan for assignment to the 8 subgroup busses. There are 2 effects sends on a dual concentric rotary pot, and 4 effects assign switches that are used in conjunction with the effects send pots for assignment to 8 effects send busses. Each channel also incorporates an in-place solo switch on the front panel, and high/low level select and effects stereo/mono select on the rear panel.

In order to monitor any active input channel at the Xtramix's monitor and program feeds, it must first be assigned to a subgroup or subgroup pair (see Subgroup Assign Section below). The only exception to this rule is when an input channel is soloed. Soloing an input channel will yield the same results whether it is assigned or not.

Throughout this manual, many references are made to the terms "Subgroup", "Bus", or "Bus/Subgroup". Depending on the context of the description, any one of these terms may be used. The terms "Subgroup", "Bus", or "Bus/Subgroup" generally apply to the 8 subgroups of the Xtramix, its pushbutton assign switches, respective controls, and connectors.

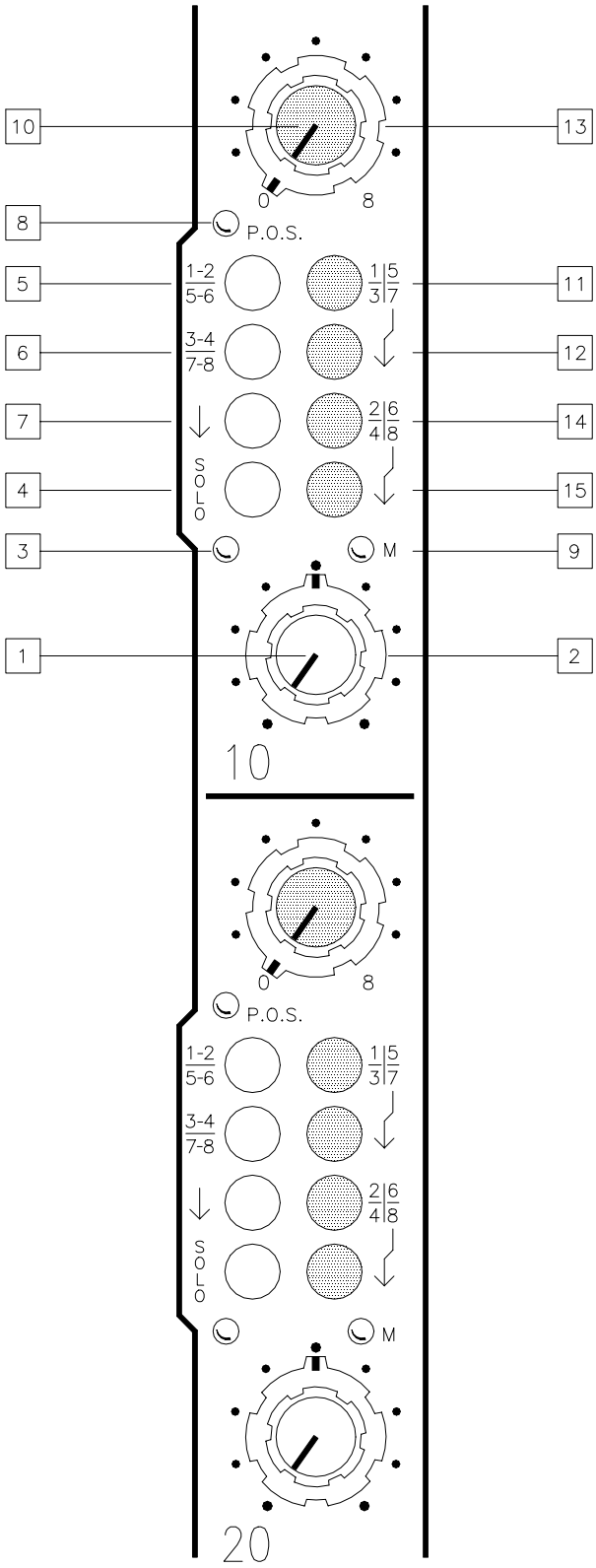

Figure 2. Input Channel

Refer to Figure 2 for location of items 1 thru 15.

1. Input Level Control

The smaller (inner) knob of the gray capped concentric is a dual rotary potentiometer that simultaneously and equally adjusts both the left and right channel levels.

2. Input Balance/Pan Control

The larger (outer) knob of the gray capped concentric when used in conjunction with the Channel Subgroup Assign Section (see below), allows an input channel to be assigned to any of eight individual subgroups or any of four subgroup pairs.

When an input channel is operated in the stereo mode, this control acts as an odd/even (left/right) balance for the selected subgroup pair.

If the channel is operated in the mono mode, then this control acts as a traditional assign pan for the selected odd/even subgroup pair. When panned to the left, this allows a mono signal to be assigned to any odd subgroup (1,3,5,7). When panned to the right it allows a mono signal to be assigned to any even subgroup (2,4,6,8). When placed to its center position, the mono signal may be assigned to an odd/even subgroup pair.

⇨ **Input channels and effect return channels do not automatically mix to the program, monitor, and headphone outputs -- They must be assigned to a subgroup first. Once assigned to a subgroup, the monitor level and pan for that respective subgroup is then adjusted to produce a stereo mix to the program, monitor and headphone outputs.**

3. Solo LED

This red LED illuminates any time its associated solo switch is depressed. The master solo LED will also illuminate, changing from green to red, when the solo switch is depressed.

4. In-Place Solo Switch

In-Place soloing allows you to isolate any stereo channel while maintaining its stereo perspective.

The source of the solo signal is the stereo or mono synth signal post (after) the channel's level control. When a solo switch is enabled, any adjustment to the channels level control will be evident in the monitor and/or headphone playback.

Any combination of input channels, effects returns, and monitor channels may be soloed without interrupting the flow of the signal to the Program Master Feed. A red LED directly below this switch will illuminate when the channel is soloed.

There are two types of In-Place solo incorporated into the Xtramix: Absolute and True. All input channel solos are Absolute In-place. This means that a soloed signal will be perceived in the same stereo or mono perspective being produced by the instrument itself. The solos on the effects returns and the monitor channels are True In-Place and follow the position of the channels pan/balance control.

Unlike True In-Place solo, the position of the input channel Balance/Pan control will have no bearing on the left/right perspective in the Absolute solo mode. Additionally, if a stereo instrument is connected to a channel being operated in the stereo mode (see Stereo/Mono Switch and Channel Input Connectors description, Rear Panel), then soloing that channel yields a stereo solo signal. If the channel is set to operate in mono, then soloing that channel will yield a centered mono solo signal.

The solo listening level can be controlled by either adjusting the Input Level Control, the Master Monitor or Headphone level, although adjusting the Master Monitor or Headphone level will not affect any relative balance created with the Input Level Control.

Be aware that the solo circuit activated by this or any other solo switch on the Xtramix will feed the Monitor Master and/or Headphones as well as the Tuner Feed outputs. The stereo program outputs are unaffected by the solo function.

Channel Subgroup Assign/Mute Section

This bank of pushbutton switches, in conjunction with the input channel Balance/Pan Control (see above), allows an input channel to be assigned to any of eight individual subgroups or any of four subgroup pairs.

A channel is “Muted” as long as it is not assigned to any subgroup(s).

5. 1-2/5-6 Subgroup Assign/ Mute Switch

When the Subgroup Assign Changeover Switch (see below) is in the up position, pressing the 1-2/5-6 Assign Switch routes the input channel signal to the 1-2 subgroup pair. When the Subgroup Assign Changeover Switch is in the down position, pressing the 1-2/5-6 Assign button routes the input channel signal to the 5-6 subgroup pair. In the up position, all signal flow to the 1-2 or 5-6 subgroups is muted.

6. 3-4/7-8 Subgroup Assign/ Mute Switch

When the Subgroup Assign Changeover Switch (see below) is in the up position, pressing the 3-4/7-8 Assign Switch routes the input channel signal to the 3-4 subgroup pair. When the Subgroup Assign Changeover Switch is in the down position, pressing the 3-4/7-8 Assign button routes the input channel signal to the 7-8 subgroup pair. In the up position, all signal flow to the 3-4 or 7-8 subgroups is muted.

7. Assign Changeover Switch

In the up position the Subgroup Assign Switches will select subgroups 1 thru 4. When depressed the Subgroup Assign Switches will select subgroups 5 thru 8.

8. Presence of Signal LED

This green LED will illuminate when a signal is present at the left or right channel. This provides for easy identification of an active synth even when a channel is unassigned (muted) and sound is inaudible.

9. Mono LED

This yellow LED illuminates when the channel's effects Stereo/Mono switch (See rear panel description) is depressed. This indicates that the left and right signals are being summed together creating a mono composite for the effects sends.

Effects Send Section

There are two Effects Send Controls available per input channel in the form of a black capped dual concentric potentiometer. The smaller (inner) knob is labeled as the "Odd" effects send and the outer (larger) knob is labeled as the "Even" effects send.

Each send can be selectively assigned to one of four effects busses, "Odd" (1/3/5/7) and "Even" (2/4/6/8). This is accomplished by the selection of the four black Effects Assign Switches.

Each stereo channel also incorporates an effects Stereo/Mono switch (located at the rear). When this switch is in the Mono position, the source for effects sends 1 thru 8 is the algebraic sum of the left and right synth signals, post (after) the input level control. When the Stereo/ Mono switch is in the Stereo position, the source for odd effects sends (1,3,5,&7) is the left synth signal, and the source for the even effects sends (2,4,6,&8) is the right synth signal.

The effects sends are designed to operate only when a Subgroup Assign Switch is depressed.

Odd Effects Sends

10. Odd Level Control

The smaller (inner) knob of the black capped concentric adjusts the level being sent to the selected "Odd" effects bus. This control is used in conjunction with the Odd Effects Assign Switch and Odd Assign Changeover Switch.

11. Odd Effects Assign Switch

When this button and the Odd Effects Changeover Switch (see below) are both in the up position, then effects send #1 is selected. Depressing only the Odd Effects Assign Switch changes the selection to effects #3. Note that the 1/3 symbol immediately to the right of the Assign Switch is meant to be read as 1 or 3.

12. Odd Effects Changeover Switch

Depressing this button accesses the 5/7 (5 or 7) effects sends. With this switch down, and the Odd Effects Assign Switch in the up position, effects send #5 is selected. When both buttons are depressed, then effects send #7 is selected.

Even Effects Sends

13. Even Level Control

The larger (outer) knob of the black capped concentric adjusts the level being sent to the selected "Even" effects bus. This control is used in conjunction with the Even Effects Assign Switch and Even Assign Changeover Switch.

14. Even Effects Assign Switch

When this button and the Even Effects Changeover Switch (see below) are both in the up position, then effects send #2 is selected. Depressing only the Even Effects Assign Switch changes the selection to effects send #4. Note that the 2/4 symbol immediately to the right of the Assign Switch is meant to be read as 2 or 4.

15. Even Effects Changeover Switch

Depressing this button accesses the 6/8 (6 or 8) effects sends. With this switch down and the Even Effects Assign Switch in the up position, effects send #6 is selected. When both buttons are depressed, then effects send #8 is selected.

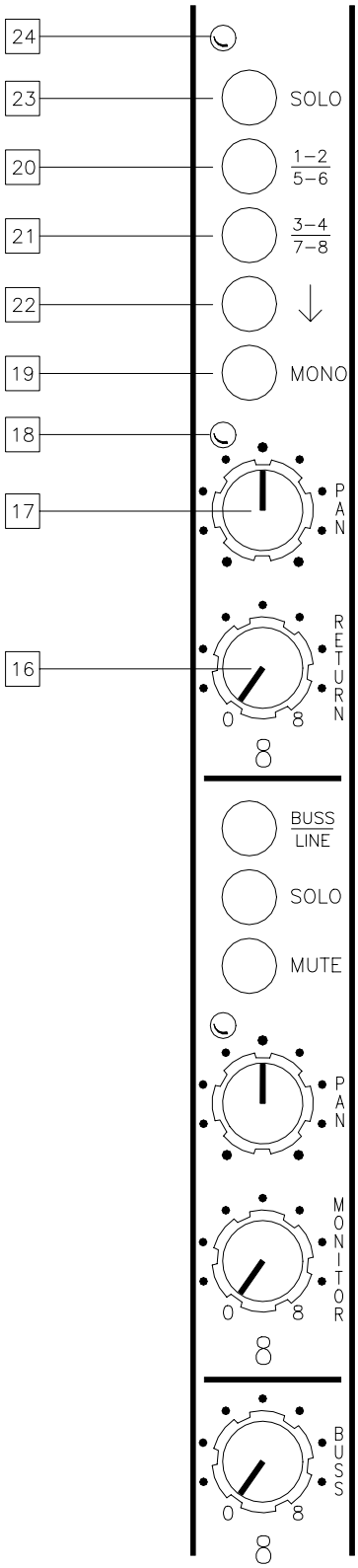

Figure 3. Stereo Effects Return Channel

Stereo Effects Return Section

There are eight stereo effects returns incorporated into the Xtramix. Each of the effects returns are individually assignable, in stereo or mono, to the eight subgroups. Each return channel also incorporates a stereo return level control, pan/balance control, stereo/mono select switch and in-place solo switch.

When not being used for an effects device, it is perfectly acceptable to connect a synth or sampler to an available effects return.

In order to monitor any active effects return at the Xtramix's monitor and program feeds, it must first be assigned to a subgroup or subgroup pair (refer to the Subgroup Assign Section). The only exception to this rule is when an effects return is soloed. Soloing an effects return will yield the same results whether it is assigned or unassigned.

Refer to Figure 3 for location of items 16 thru 24

16. Stereo Effects Return Level

This control is a dual rotary potentiometer that simultaneously and equally adjusts both the left and right channel levels. A Return Level setting of approximately two to three o'clock will yield an adequate level of effect when matched with an effects unit that is properly operated at a professional input/output level of +4dbu.

17. Effects Return Balance/ Pan Control

This control when used in conjunction with the Channel Subgroup Assign Switches, allows the effects return to be assigned to any of eight individual subgroups or any of four subgroup pairs. When an effects return is operated in the stereo mode, this control acts as an odd/even (left/right) balance for the selected subgroup pair.

If the effects return is operated in the mono mode (see Effects Return Mono Switch), then this control acts as a traditional assign pan for the selected subgroup pair. When panned to the left this control allows a mono signal to be assigned to any odd subgroup (1,3,5,7). When panned to the right it allows a mono signal to be assigned to any even subgroup (2,4,6,8). When placed to its center position, the mono signal may be assigned to an odd/even subgroup pair.

⇨ **Effects return channels and input channels do not automatically mix to the program, monitor, and headphone outputs -- They must be assigned to a subgroup first. Once assigned to a subgroup, the monitor level and pan for that respective subgroup is then adjusted to produce a stereo mix to the program, monitor and headphone outputs.**

18. Mono LED

This yellow LED illuminates when the Effects Return Stereo/Mono Switch (see below) is depressed. This indicates that the left and right signals are being summed together creating a mono composite.

19. Stereo Effects Return Mono Switch

Depressing this switch sums the left and right effects inputs creating a mono composite. This feature will prove useful if a stereo effect is to be assigned to a single subgroup or specifically placed somewhere in the left to right perspective of a stereo subgroup.

20. 1-2/5-6 Subgroup Assign/ Mute Switch

When the Subgroup Assign Changeover Switch (see below) is in the up position, then pressing the 1-2/5-6 Assign Switch routes the effects return signal to the 1-2 subgroup pair. When the Subgroup Assign Changeover Switch is in the down position, pressing the 1-2/5-6 Assign Switch routes the effects return signal to the 5-6 subgroup pair.

In the up position, all signal flow to the 1-2 or 5-6 subgroups is "Muted".

21. 3-4/7-8 Subgroup Assign/ Mute Switch

When the Subgroup Assign Changeover Switch (see below) is in the up position, then pressing the 3-4/7-8 Assign Switch routes the effects return signal to the 3-4 subgroup pair. When the Subgroup Assign Changeover Switch is in the down position, pressing the 3-4/7-8 Assign Switch routes the effects return signal to the 7-8 subgroup pair.

In the up position, all signal flow to the 3-4 or 7-8 subgroups is "Muted".

22. Assign Changeover Switch

In the up position the Subgroup Assign Switches will select subgroups 1 thru 4. When depressed the Subgroup Assign Switches will select subgroups 5 thru 8.

23. Effects Return Solo Switch

Depressing this switch allows you to isolate any effect return to the Monitor and/or Headphone outputs while maintaining stereo perspective. The source for the In-Place solo circuit is post (after) the volume control. This allows you to solo multiple effects returns while retaining their relative levels.

There are two types of In-Place solo incorporated into the Xtramix: Absolute and True. The stereo effect return solos are True In-Place. This means that the left/right perspective of a soloed effects return will be affected by the position of the effects return Balance/Pan control.

Additionally, if a stereo effects device is connected to a return being operated in the stereo mode, then soloing that channel yields a stereo solo signal. If the return is set to operate in mono, then soloing that channel will yield a mono solo signal.

The solo listening level can be controlled by either adjusting the Effects Return Level Control, the Master Monitor or Headphone level, although adjusting the Master Monitor or Headphone level will not affect any relative balance created with the Return Level Control

24. Solo LED

This red LED illuminates any time its associated Effects Return Solo Switch is depressed.

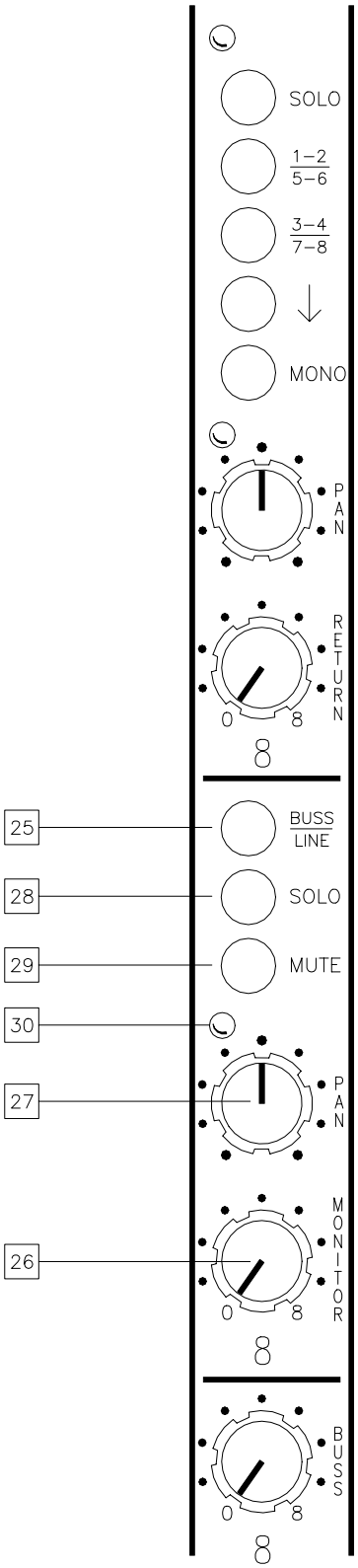

Figure 4. Monitor Channel

Monitor Section

This is the theoretical heart of the Xtramix. Here is where a stereo mix of all the subgroups is created, independent of the Bus/Subgroup Masters. The adjustment of the monitor section's Level and Pan controls create the stereo mix for the Program outputs, Monitor outputs and Headphone outputs.

There are three selectable modes of operation for each of the eight monitor positions:

A. Pre, or independent of the associated Bus/Subgroup Master (see Monitor Pre/Post switch rear panel).

B. Post, or dependent on the associated Bus/Subgroup Master (see Monitor Pre/Post switch rear panel).

C. As a stereo/mono input (see Bus/Line Switch below).

Personal requirements will determine whether to select the Pre or Post mode of operation.

Refer to Figure 4 for location of items 25 thru 30

25. Buss/Line Select Switch

This switch is the source select for the monitor channel. In the up position, this switch selects its respective mono assign subgroup bus. When depressed, this switch selects any stereo or mono signal present at the rear line input connectors.

26. Monitor Level Control

This knob determines the relative stereo mix level of all signals assigned to its associated assign subgroup. With the Monitor's Pre/Post switch (see rear panel) set to Pre, this control will function independent of the assign Subgroup Master Control. This means it is possible to send a subgroup signal to, for instance, an external mixing console while retaining independent control of that same signal for the monitor or program feeds of the Xtramix. This is considered to be the normal mode of operation for the monitor section.

The optimum starting point for this control is the three o'clock position. This should provide for the greatest range of adjustment for the input channels and effects returns as well as the Monitor Level Control itself.

If the Monitor's Pre/Post switch (see rear panel) is set to Post, then the Monitor Level Control will follow the Subgroup Master Control. This means that any level changes made to the Subgroup Master Control will directly affect the monitor level. This mode of operation would typically be reserved for situations where the Monitor and Program feeds need to directly reflect any changes made to a given Subgroup Master Control.

27. Monitor Pan/Balance Control

When the Bus/Line Switch on the monitor channel is selected to the Bus (subgroup) position, this control acts as a traditional left/right pan for the stereo Program, Monitor, and Headphone outputs.

When the Bus/Line Switch is selected to the Line position, the Pan/Balance Control acts as a left/right balance control for an incoming stereo line signal.

28. Monitor Solo Switch

Depressing this switch allows you to isolate any monitor channel to the Monitor and/or Headphone outputs while maintaining stereo perspective. The source for the In-Place solo circuit is post (after) the volume control, this allows you to solo multiple monitor channels while retaining their relative levels.

29. Monitor Mute Switch

Depressing this switch deletes the Bus/Subgroup signal from the Monitor, Program and Headphone feeds, although its associated bus/subgroup output will remain unaffected by the operation of this switch. When the channel's Bus/Line Switch is selected to the Line position the Mute Switch will delete the stereo line signal.

30. Solo/Mute LED

This dual colored LED indicates the status of the channel's Solo and Mute switches. When the Mute switch is depressed, the LED will illuminate green in color. When the In-Place Solo switch is depressed, the LED will illuminate red in color.

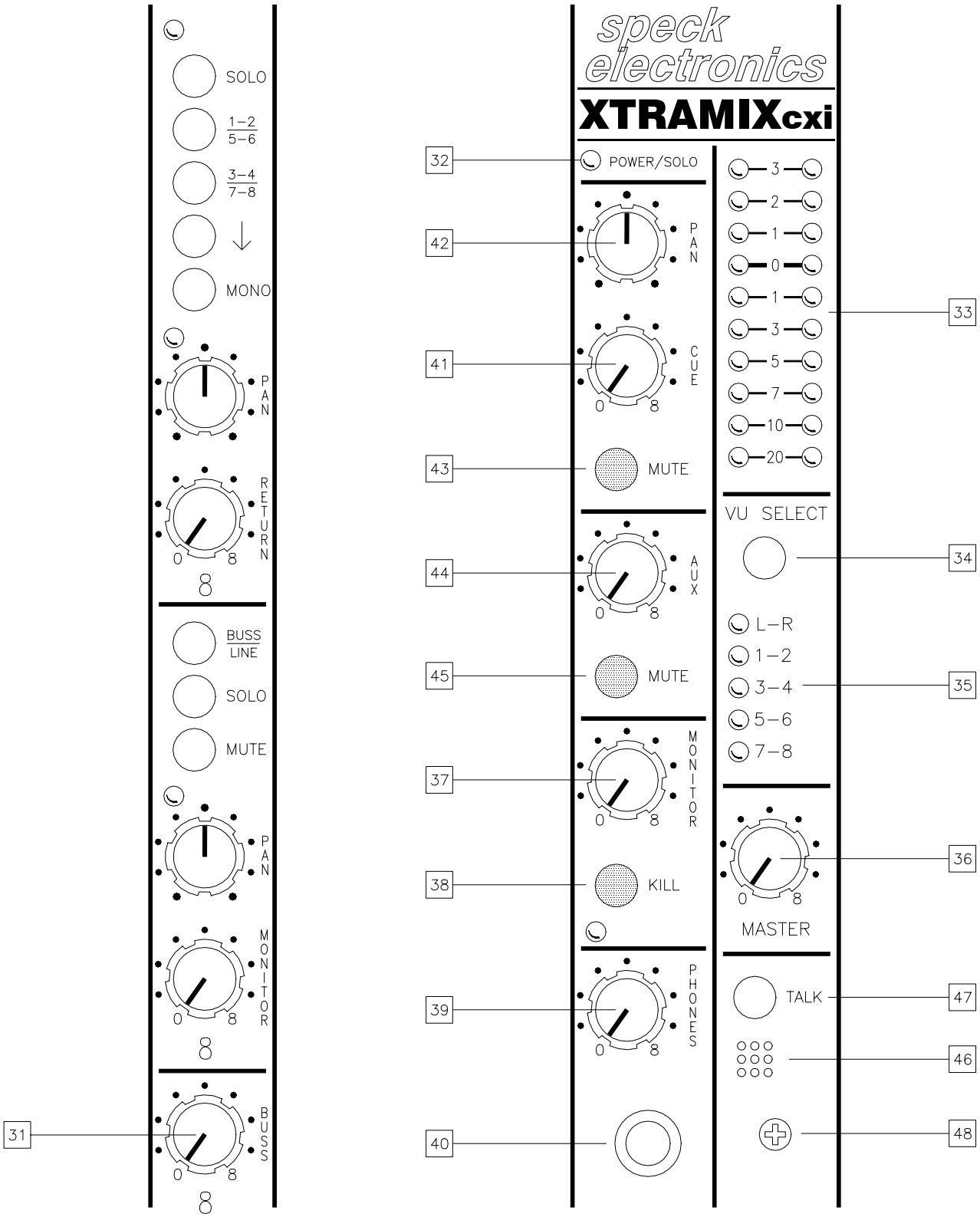

Figure 5. Master Section

Master Section

Refer to Figure 5 for location of items 31 thru 48.

31. Bus/Subgroup Masters 1-8

These are the individual master level controls for the eight subgroup outputs. Metering for the bus/subgroup outputs is provided by two LED VU meters in selectable pairs (1/2, 3/4, 5/6, 7/8).

The optimum starting point for a Bus/Subgroup Master is the three o'clock position. This should provide for the greatest range of adjustment at the input channels and effects returns as well as the Subgroup Master Control itself.

If a Subgroup Master Control is operated at a lower than normal setting, it may be an indication that the input channels and/or effects returns assigned to it are either adjusted to high or need to be set to a Low level status (see Input channel "High/Low" Switch on the rear panel).

When the monitor channel Pre/Post Switch is set to the Pre position, the operation of the Subgroup Master Control has no affect on the levels set for the monitor channel. If the Pre/Post switch is set to Post, then any level changes made to the Subgroup Master Control may be perceived as a level change to its respective monitor channel.

32. Power/Master Solo LED

This LED will illuminate green when the power is applied to the Xtramix. When any solo is depressed, this LED will change from green to red.

33. Dual VU Displays

These 10 segment VU (volume units) meters indicate the relative levels of the stereo program and 8 subgroup outputs, and are sensitive from -20db to +3db.

Depending on the position of the meter sensitivity trim pots, a meter reading of zero VU reflects a mixer output level of either +4dbu, the industry professional standard, -10dbV, or virtually any reference level you care to set. This VU meter circuit was designed to approximate the ballistics of a "Taut Band" analog style VU meter.

34. VU Meter Select Switch

This momentary switch selects the VU meters for the 8 subgroup outputs and the program master feed. To select a pair of meters, depress this switch until the desired pair is indicated on the lower LED's. The left and right program master feeds are automatically selected when the Xtramix is initially powered.

35. Meter Select Indicators

The 5 LED's indicate the selection of the respective VU meter pairs. The L-R, indicates the left/right program master is being displayed. The 1-2, 3-4, 5-6, or 7-8 indicates that the respective subgroup output pairs are being displayed.

Only one VU pair may be selected at a time.

36. Stereo Program Master

This pot acts as the master volume to the stereo program feed. It should be pointed out that the Left/Right program meters follow this master control, hence any adjustment to the Program Master Control is displayed at the program meters. A typical starting point for the Program Master Control is the three o'clock position. This setting should make it reasonably easy to achieve a 0 VU reading when using multiple synth and sampler patches without having to rely on excessive input level (see input channel) adjustments. If, however, a 0 VU reading is desired when using only one source (a single synth), it is perfectly acceptable to set the Program Master Control higher than the three o'clock position to obtain the necessary output.

The operation of the Program Master Control does not affect the operation of the Monitor level or Headphone level. If required, the Xtramix may be configured so the source of the Monitor and Headphone is post (after) the Program Master Level Control.

37. Stereo Monitor Master

This controls overall level to the stereo monitor feed and operates independent of the Program Master and Headphone Master. Typically, the monitor outputs would be connected to a stereo power amplifier for purposes of driving a personal monitoring system. However, in situations where the Xtramix is interfaced to, for instance, a large frame recording console and solo capability is desired, then it is completely acceptable to utilize the solo capable monitor outputs for this purpose. The integrity of this signal is virtually equivalent to that of the program outputs.

In so far as metering the monitor output is concerned (the program meters follow only the program); as long as the monitor and program levels, given the same physical adjustment (2, 3, 4 o'clock, etc.), will be equal. Establishing the monitor output level is simply a matter of matching the Program and Monitor Master Controls.

38. Monitor Kill Switch

This switch Mutes (Kills) the master monitor output without affecting the Program and Headphone outputs. When depressed, the LED directly below will illuminate, indicating the monitor signal has been Muted.

39. Stereo Headphone Level Control

This dual potentiometer controls the volume of the stereo headphone circuit. The operation of the Headphone Master Control does not affect the operation of the program level or monitor level.

40. Stereo Headphone Jack

This standard 1/4" stereo phone jack will accommodate most popular stereo headphones.

The tip of the stereo jack is the left headphone signal, and the ring of the jack is the right headphone signal.

Stereo Cue Return Section

This feature of the Xtramix allows an external Stereo Cue (otherwise known as headphone or foldback) mix to be integrated into the Xtramix's monitor and/or headphone feeds (see Solo to Monitor Switch, rear panel). This makes it possible to customize a balance between the Xtramix's stereo mix and, for instance, the cue feed from a studio control room.

The Cue Return is accessed via two unbalanced 1/4" TS phone type connectors. For more on these connections, see their rear panel descriptions. Also, as the source for such a signal is most likely the high level output of a power amplifier (via a dedicated headphone box), the input sensitivity of the Cue Return has been calibrated accordingly.

Do not attempt to connect the speaker terminals of any power amplifier directly into the Cue Return of the Xtramix.

The Stereo Cue Return Section includes the return level control, the return pan control, and the return mute switch. The Cue Return may be operated in mono when a single signal is plugged into the left input jack.

41. Cue Return Level Control

This dual potentiometer controls the level of an external stereo cue source and returns only to the Monitor and/or the Headphone outputs.

42. Cue Return Pan Control

This control allows the Cue Return to be panned anywhere in the stereo perspective.

43. Cue Mute Switch

This switch allows Muting of the Stereo Cue Return. Enabling this switch removes the stereo cue return signal from the Monitor and Headphone outputs.

Stereo Aux Return Section

This section allows an external stereo auxiliary source such as a DAT recorder, CD player/recorder or any stereo audio signal to be routed to the Monitor and/or Headphone outputs of the Xtramix.

The Stereo Aux Return Section includes the return level control, and the return mute switch. The Aux Return may be operated in mono when a single signal is plugged into the left input jack.

44. Aux Return Level Control

This dual potentiometer controls the level of an external stereo aux source and returns only to the Monitor and/or the Headphone outputs.

45. Aux Return Mute Switch

This switch allows the Muting of the Aux Return. Enabling this switch removes the stereo aux return signal from the Monitor and Headphone outputs.

Talkback Section

46. Talkback Mic

The talkback section of the Xtramix incorporates an internal omni-directional microphone. This sensitive microphone will operate most efficiently when the operator speaks at a distance of about two feet from the mike. This mike is activated by the Talkback Switch and is adjusted with the Talkback Trim Control.

47. Talkback Switch

This momentary switch activates the talkback circuit and permits the operator to talk or slate to the stereo master outputs.

When the Monitor Configuration Switch on the rear panel is set to the "pre" position, it is possible to talk or slate *only* to the program master outputs. When the Monitor Configuration Switch is set to the "post" position, the talk signal also appears on the monitor outputs.

48. Talkback Trim Control

This control adjusts the volume of the talkback circuit to the program output. The suggested setting for this control is approximately the two o'clock range and adjust as necessary.

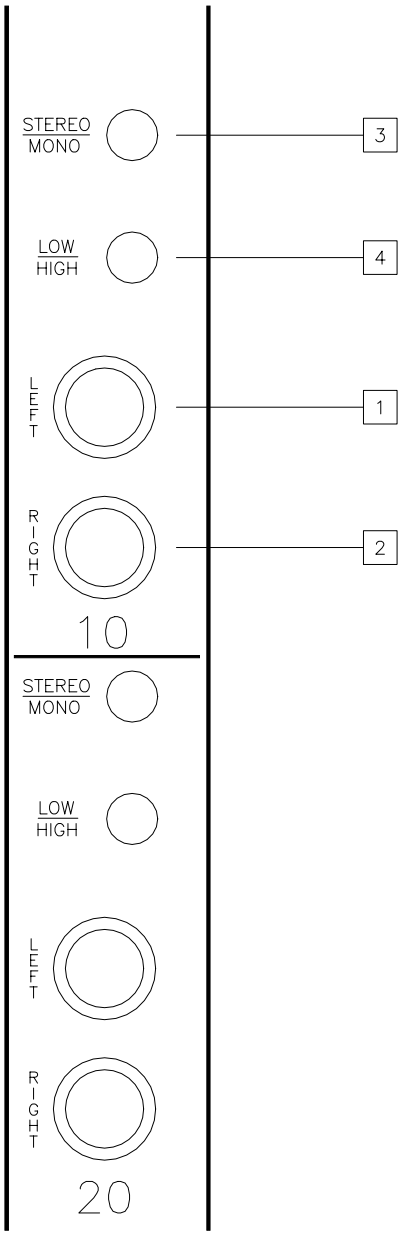

Figure 6. Input Channel Connectors and Switches

Input Channel Connections and Switches

REAR PANEL CONTROLS

Refer to Figure 6 for location of items 1 thru 4

1. Left/Mono Channel Input Jack

Typically, this input is used to connect one side of a stereo or dual voice source. When a channel is operated in the stereo mode, the left input is assignable via the Input Channel Level and Balance/Pan Controls to the four odd subgroups; 1,3,5,7.

2. Right Channel Input Jack

Typically, this input is utilized to connect the alternate side of a stereo or dual voice source. An input channel cannot function in stereo unless the right input is connected. When a channel is operated in the stereo mode, the right input is assignable via the Input Channel Level and Balance/ Pan Controls to the four even subgroups; 2,4,6,8.

Connections to the 20 stereo input channels of the Xtramix should be made with standard balanced tip, ring, and sleeve (TRS) 1/4" plugs as shown in Figure 7.

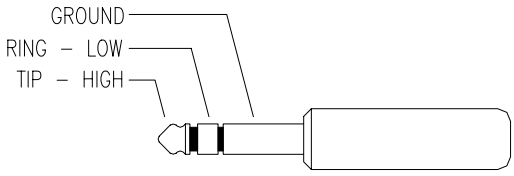

Fig 7 Stereo (TRS) plug

Mono or Single Source Connection

When connecting a single source (mono signal), to any stereo input channel, use only the left input connector. Doing so effectively converts the channel status from stereo to mono thereby eliminating the need for any external "Y" type connections.

3. Effects Stereo/Mono Select Switch

Each stereo channel incorporates an effects Stereo/Mono switch. When this switch is in the Stereo (out) position, the source for the odd effects sends (1,3,5, & 7) is the left input signal, and the source for the even effects sends (2,4,6, & 8) is the right input signal.

When the Stereo/Mono switch is in the Mono (in) position, the source for effects sends 1 thru 8 is the algebraic sum of the left and right synth signals, post (after) the input level control.

A yellow LED at the front of the input channel will illuminate whenever its Stereo/Mono Switch is depressed, indicating the Mono status of operation.

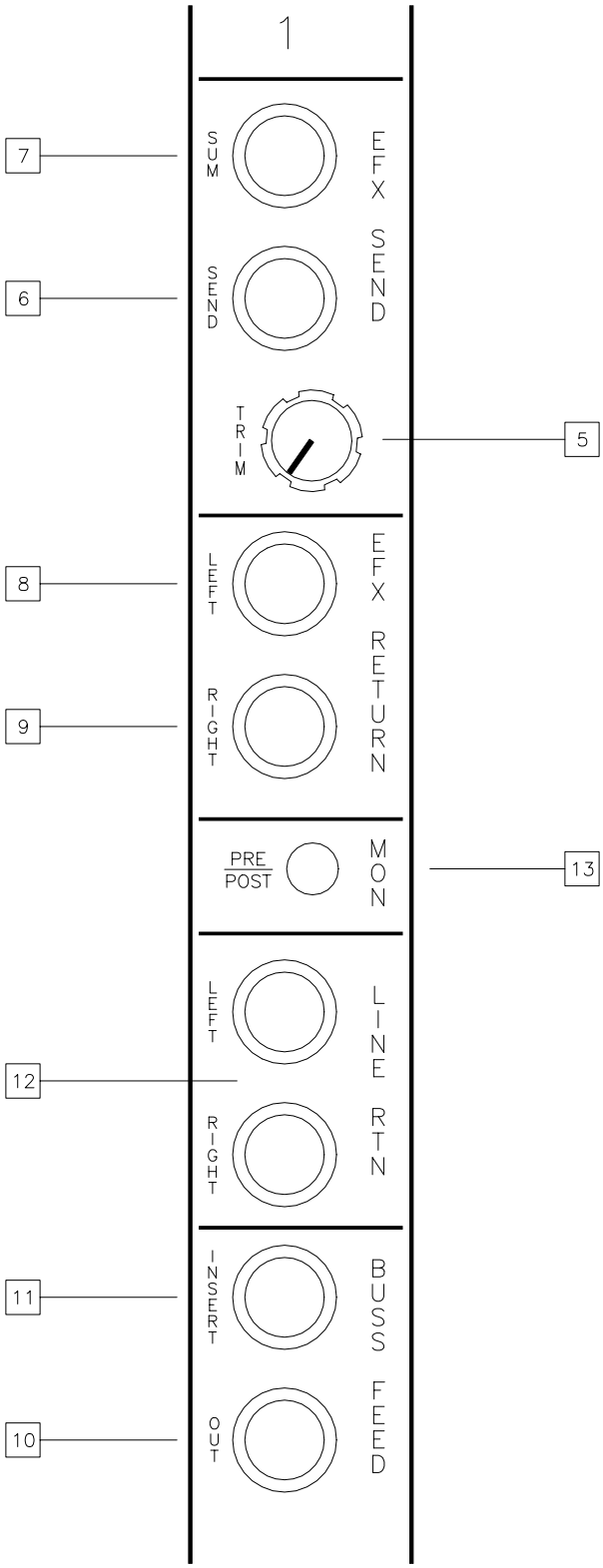

Figure 8. Effects, Monitor, and Subgroup Connectors

4. Low/ High Select Switch

Low/High refers to the output operating level of the signal source. It should be pointed out that the term Low/High has different meanings from one manufacturer to another. For the Xtramix, the term low and high refers to a medium strength line signal (-20dbu to 0dbu), and a high strength signal (0dbu to+28dbu) respectively.

To optimize the input channels of the Xtramix, the Low/High select circuit was designed to accommodate the wide range of audio signals that would normally be plugged into this mixer. The Low setting would be for most synth, samplers, and line level signals that tend to have a lower output signal amplitude. The High setting is intended for high output synths and samplers, or any high output audio signal. If you intend to connect a +4 dbm source into the input channel, the Low/High switch should be set to the High position.

If you find that the Input Level Control for that respective channel is always being operated in the lower range, the Low/High switch should be set to the High position.

Effects Send Connections and Switches

Refer to Figure 8 for location of items 5 thru 13

5. Effects Send Master Control

This potentiometer adjusts the output level (to the outboard effects device itself) of all channel signals routed to an Effects Send Master via its associated channel's Effects Send Controls. When matched with an effects unit that is properly operated at a professional input level of +4 dbu, the optimum setting for this pot is typically anywhere from 2 to 3 o'clock.

6. Effects Send Jack

Each of the 8 effects send channels has a separate 1/4" TRS connector to interface to the input of an effects device.

It is completely acceptable, from an electronic standpoint, to adapt this connector to the input of any effects device, regardless of the type of input connector utilized on the effects unit (unbalanced 1/4” TS, RCA, XL, barrier strip, etc.)

7. Effects Sum In Jack

This standard 1/4" TRS female phone jack allows the Effects or Auxiliary sends from another mixer, be it a large frame recording console or a rack mount sub-mixer, to be combined with the Xtramix's Effects Sends. The purpose of this is to allow simultaneous access to any effects device from both mixer sources, thereby creating one integrated system as opposed to having to dedicate separate effects units to each mixing source.

Simply connect an Effects or Auxiliary send from the external mixer to the Sum In Jack of any of the eight Xtramix send channels. While it makes sense, for the sake of continuity, to keep the Effects Send numbers matched (#1 of the external mixer to the Sum In point of #1 on the Xtramix, etc.) it is certainly not necessary.

Once the Sum In connection is made, then connect the input of any effects device to the Xtramix Effects Send Jack. It may take some experimentation to determine the best settings for each of the Effects Send Master (Trim) Controls. Try to achieve a situation where an Effects Send Control on any given input channel needs to be set between twelve and two o'clock to achieve a healthy effects device input level.

Effects Return Connections

Each Effects Return provides two discrete balanced 1/4" TRS connectors for connection from the outputs of a left/right stereo effects device.

8. Left Return Input Jack

Typically, this input is used to connect the left output of a stereo effects device. When an effects return is operated in the stereo mode, the left input is assignable to the four odd subgroups; 1, 3, 5, 7, (see Effects Return Assign Switches on the front panel)

9. Right Return Input Jack

Typically, this input is utilized to connect the right output of a stereo effects device. When an effects return is operated in the stereo mode, the right input is assignable to the four even subgroups; 2, 4, 6, 8 (see Effects Return Assign Switches on the front panel)

When using a single output effects unit, connect its output to either the left or right Effects Return Input and set the effects return channel for mono operation (see effects return Mono Switch on the front panel).

Assign Subgroup Connections

10. Assign Subgroup Feed Jack

Each Bus/Subgroup feed has a separate balanced 1/4" TRS connector. The Subgroup Feed provides a low impedance source for connection to the input of a multitrack analog, digital, or hard disk recorder.

Each Subgroup Feed is capable of driving three high impedance bridging inputs without any loading effects. This means that Subgroup Feed #1 could connect to tape inputs 1, 9, and 17, and Subgroup Feed #2 could connect to tape inputs 2, 10, and 18, etc. The Subgroup Feed may also connect to the line inputs of a recording console.

11. Assign Subgroup Insert Jack

Each Bus/Subgroup channel provides a 1/4" T.R.S. (tip, ring, sleeve) insert jack. The Insert Jack provides line level interstage access to the assign subgroup bus before (pre) the Subgroup Master Level Control. This means that any device interfaced to this jack will be processed before its respective Subgroup Master Control, and will not be affected by any adjustments of the Subgroup Master Control.

The Insert Jack may be utilized to connect limiters, equalizers, noise reduction, or automation.

The ring of the 1/4" jack is the unbalanced insert send (pre the assign Subgroup Master Control), the tip is the unbalanced insert return, and the sleeve is the signal ground. Any stereo 1/4" plug interfaced to this jack should be wired accordingly. (See figure 9b)

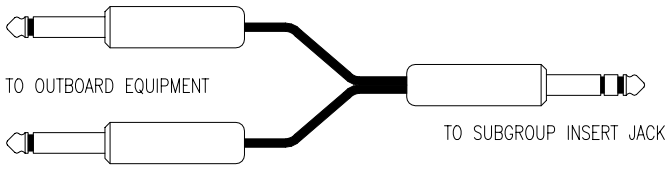

Fig 9a "Y" Cable

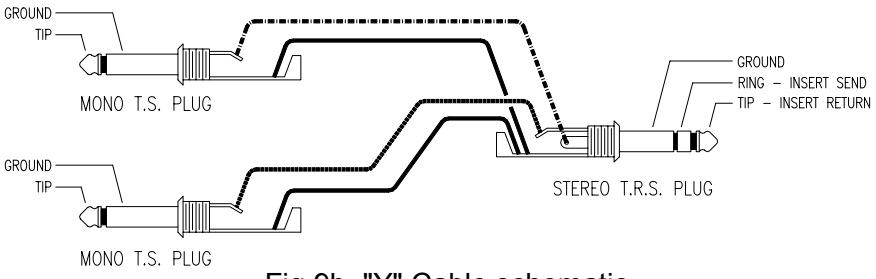

Fig 9b "Y" Cable schematic

Monitor Section Connections and Switches

12. Monitor Line Return Jacks

Each monitor channel provides a stereo balanced 1/4” TRS input for the return of any stereo line level signal, such as a analog, digital, or hard disk recorder. A discrete mono signal may be utilized when plugged into the left connector only. These 1/4" input connectors may be selected with the Bus/Line Switch on its respective monitor channel.

13. Monitor Pre/Post Select Switch

This switch selects the subgroup source for its respective monitor channel. In the Pre position, the source for the monitor channel is before (Pre) the assign Subgroup Master Control. When set to this position any adjustment to the Subgroup Master Control will have no direct affect on the monitor channel volume. In the Post position, the source for the monitor channel is after (Post) its respective Subgroup Master Control. This permits the monitor channel to follow any adjustment made to its respective Subgroup Master.

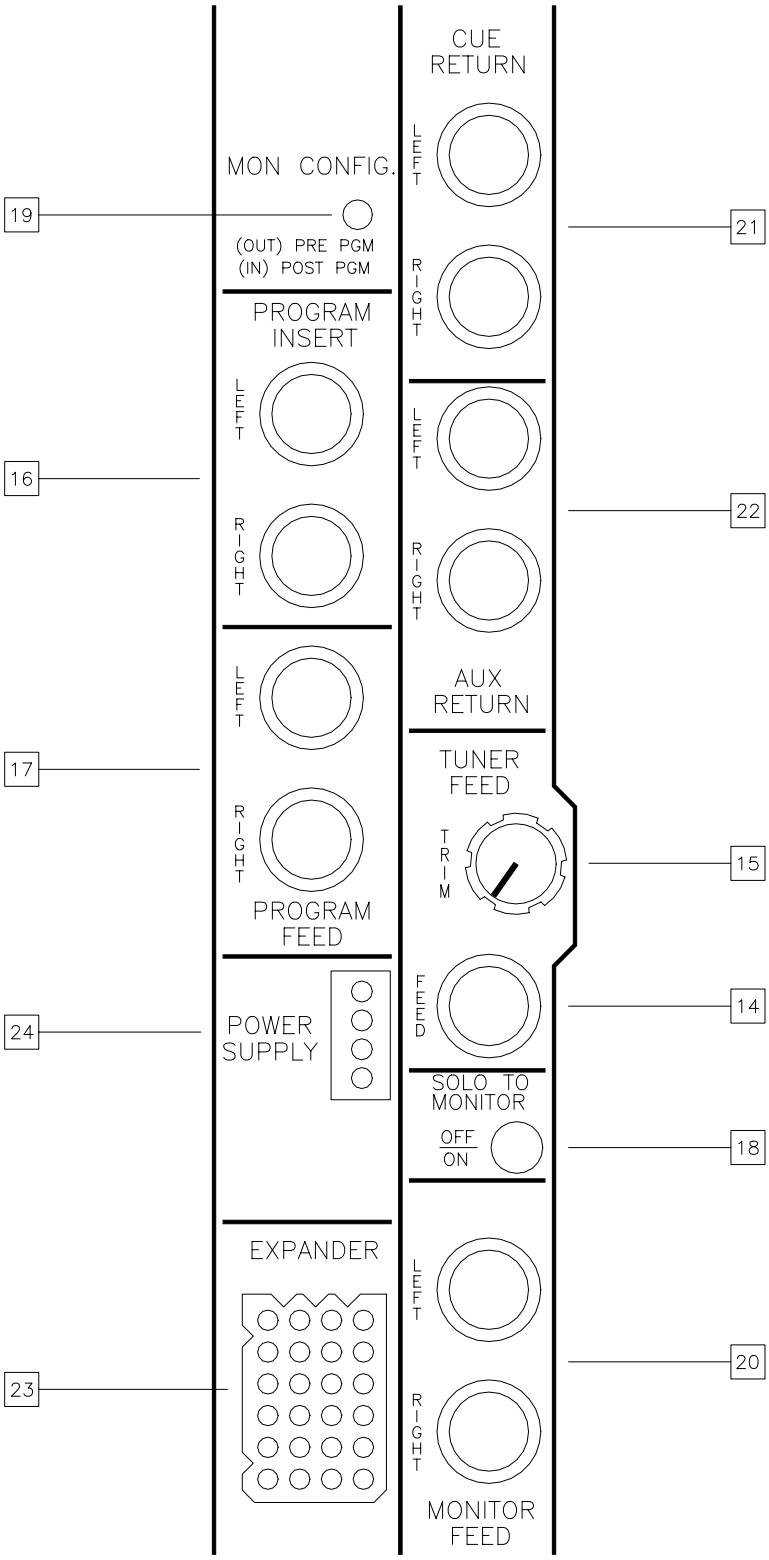

Figure 10. Master Input/Output Connectors

Tuner Section Connection and

Refer to Figure 10 for location of items 14 thru 24.

14. Tuner Feed Jack

This 1/4" TRS phone type connector provides a dedicated feed to an external tuning device. The source for the output is either the sum of all signals feeding the program master or any signal(s) that is soloed.

15. Tuner Level Control

This control adjusts the output volume to a dedicated tuning device. The source for this output is either the sum of all signals feeding the program master or any signals that are soloed. If, for example, you need to tune only one synth module while others are active, then simply depress its associated Solo Switch and it will be isolated to the Tuner Output Jack. There is ample gain available at this output so that even the softest synth patches will trigger the tuners circuitry. Start by positioning this control at the twelve o'clock mark, and adjust if necessary.

Master Input/Output Connections

16. Program Insert Jacks

The Insert Jack provides line level interstage access to the program bus before (pre) the Program Master Level Control. This means that any device interfaced to this jack will be processed before the Program Master Level Control and will not be affected by any adjustments of the Program Master Level Control.

The Insert Jack may be utilized to connect limiters, equalizers, noise reduction, or automation.

When the Xtramix is used as a recording mixer the insert jacks may be used to connect an external remote stereo slide fader. A remote slide fader would permit more precise control of the program level when fading out music.

When the Xtramix is used a keyboard mixer, the insert jacks may be used to connect to a stereo foot pedal. The stereo foot pedal would act as an expression pedal enabling the operator to have a "what you hear is what you get" control over the program, monitor and headphone output levels.

Each of the left and right program insert jacks employ a T.R.S. (tip, ring, sleeve) type jack. The ring of the 1/4" jack is the unbalanced insert send (pre the Program Master Level Control), the tip is the unbalanced insert return, and the sleeve is the signal ground.

Any stereo 1/4" plug interfaced to this jack should be wired accordingly. (See figure 11b)

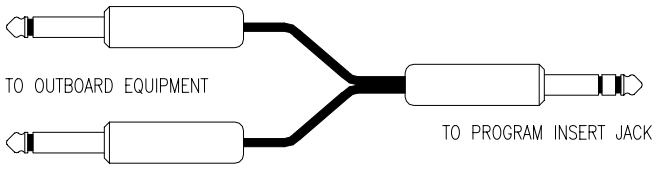

Fig 11a "Y" Cable

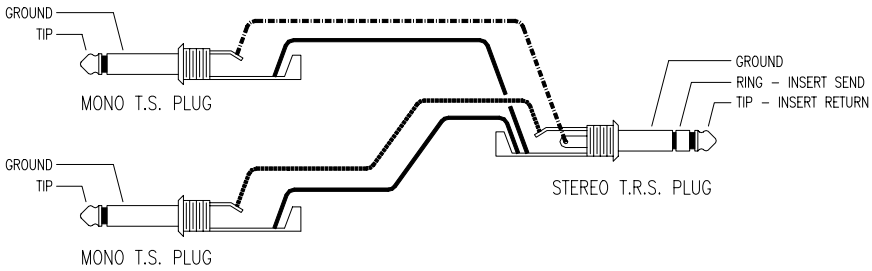

Fig 11b "Y" Cable schematic

17. Program Feed Jacks

These balanced 1/4" TRS phone type connectors are the left/right outputs for the stereo program master. The signal present at these jacks is adjusted by the Program Master Control on the front panel.

The left and right program feed is capable of driving up to three high impedance bridging inputs simultaneously. The Program Feed Jacks are available for interface to the input of an external console, stereo tape recorder, etc.

Connections to the balanced program feed jacks should be made with a 1/4" stereo tip, ring and sleeve (TRS) plug as shown below in figure 12 .

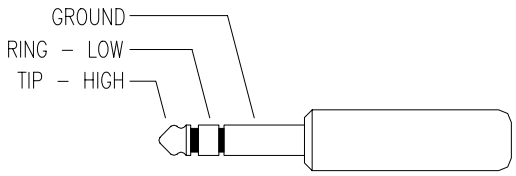

Fig 12. Stereo (TRS) plug

When connecting the balanced program outputs to an unbalanced input, it will be necessary to configure your cables in order to unbalance the signal.

18. Solo to Monitor Switch

This pushbutton switch introduces the Solo function, Cue, and Aux Returns to the master monitor outputs as well as the headphone outputs.

In the normal position (off), the Solo, Cue, and Aux are removed, and only the stereo mix is present at the monitor feed. When this switch is depressed (on), both the monitor and headphone feeds receive the Solo signal, Cue, and Aux Returns together with the stereo mix. The operation of this switch does not affect the program feed.

19. Monitor Configuration Select Switch

This switch selects the source for the monitor and headphone outputs. In the Pre position, the source for the monitor and headphones are before (Pre) the Program Master Control. When set to this position any adjustment to the Program Master Control will have no direct affect on the monitor or headphone output levels. In the Post position, the source for the monitor channel is after (Post) the Program Master Control. This permits the monitor and headphone level controls to follow any adjustment made by the Program Master Level Control.

For applications where the Xtramix is being used as a self contained recording mixer, it may be desirable to set this switch to the "post" position. In which case, whenever the program maser control on the front panel is used to fade out music to the Stereo mixdown recorder, the fadeout will automatically be adjusted to the monitor outputs and headphone outputs. This is how most recording consoles operate.

For applications where the Xtramix is used more like a conventional keyboard mixer, it may be desirable to set this switch to the "pre" position.

When set to the "pre" (factory default) position, level adjustments to the program level will not affect the monitor or headphone levels.

This switch is recessed behind the rear panel to prevent inadvertent actuation while plugging or unplugging connectors. The switch may be depressed by inserting a thin pointed object into the hole (such as a very small screwdriver).

20. Monitor Feed Jacks

These 1/4" TRS phone type connectors are available for hooking up a power amplifier that would be used for the control room monitor system, keyboard rack speakers , or a stage monitoring system. The signal present at these jacks is adjusted by the Monitor Master Control on the front panel.

21. Cue Return Input Jacks

These standard unbalanced 1/4" TS connectors are available for the connection of a stereo cue signal or any stereo audio signal. A discrete mono signal may be utilized when plugged into the left connector only.

Connections to the Cue return stereo input should be made with standard unbalanced tip and sleeve (TS) 1/4" plugs as shown in Figure 13.

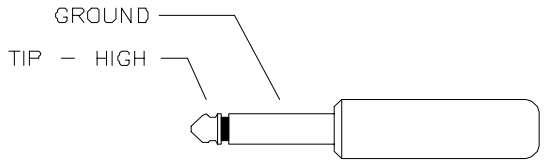

Fig 13. Mono (TS) plug

⇨ **Do not connect the speaker terminals of any power amplifier directly into the Cue Return Input Jacks.**

22. Aux Return Input Jacks

These standard unbalanced 1/4" TS connectors allow the interface of an external stereo signal, such as a DAT, or CD player. A discrete mono signal may be utilized when plugged into the left connector only.

Connections to the Cue return stereo input should be made with standard unbalanced tip and sleeve (TS) 1/4" plugs as shown in Figure 13.

Left/Right Meter Sensitivity Trim Controls (Not Shown)

There are the two trim pots located at the top of the mixer that adjust the sensitivity of the Left/Right VU meters. These trim pots in no way modify the electronic operation of the mixer. The trim pots have been calibrated at the factory to indicate 0 VU=+4 dbu. This means that when the VU meter indicates 0 VU, the subgroup outputs and the program outputs are delivering a +4dbu.

If required, the VU meters may be calibrated to indicate -10dbV. An AC voltmeter and signal generator will be required to perform this adjustment.

23. Expander Connector

This multipin connector may be used to interface the XTRAMIXcxi -01 expander.

Adding the XTRAMIXcxi -01 expander will increase the capacity of your system to 96 inputs and 8 outputs. Certain master functions are disabled on the XTRAMIXcxi -01 expander in order that all subgroup, effects, and stereo program busses are shared with the Xtramix master unit.

A special interface cable is supplied with the XTRAMIXcxi -01 expander at an additional cost.

Contact Speck Electronics for details on ordering this expander or converting your existing Xtramix to an expander.

For the pin assignment configuration and installation instructions, refer to the Installation Section in Chapter 3 of this manual.

24. Power Supply Connector

This 4 pin connector will accommodate the connector from the power supply cable. The connectors are keyed so they will only fit in one direction. For installation instructions refer to the Installation Section in Chapter 3 of this manual.

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Wiring and Other

General

It is assumed that in addition to the Xtramix, a considerable investment has been made in electronic equipment such as synthesizers, samplers, effects, and computers. We believe that the overall performance of the Xtramix and your mixing system is dependent on the condition and quality of this equipment.

A general discussion about AC, AC grounding, audio grounding, EMI, and quality wiring is discussed in this section. These subjects are very often overlooked or misunderstood, and should be given consideration when interfacing your equipment to any Speck product.

Start Simple

A quality installation is essential when wiring any Speck product. When the time comes to actually interconnect your equipment, proceed slowing. Interfacing the many pieces of electronic equipment to your mixer should be a logical, methodical process.

Start by connecting your headphones or monitor power amplifier, and then add one synth to the mixer at a time; carefully listening and monitoring your progress. If a problem arises, such as a buzz, hum, intermittent signal, or nonexistent signal, stop at that point and solve the problem before proceeding.

Audio Cable

Due to the high performance of the Xtramix mixing system, it is recommended that you use only the highest quality audio cable. A high quality cable by definition, is a cable that provides good mechanical strength, high microphonic noise immunity, high frequency response, low crosstalk and 100% shielding ability. All audio cable used with the Xtramix should be a 3 conductor foil shield type (2 inner conductors and a shield drain conductor). It is not recommended that the 2 conductor "off the shelf cables" be used.

Multipair Wire Harnesses

When multiple cables are necessary (which is generally the case with our products), multipair cable should be considered as an alternative to individual cables. Multipair cable and harnesses are generally available in 4, 8, 12, 16, 24, and 32 pair.

Connectors

All wire and cable interfaced to the Xtramix and Speck products should be terminated with high quality connectors. A 1/4" plug or XL connector should make a positive connection to its respective mating jack and provide adequate strain relief to its cable. All connectors should also have a metal shell to provide 100% shield for exposed conductors.

Feel free to check with Speck Electronics for assistance when selecting cable and connectors. Our phone number is +760-723-4281.

Proper AC Grounding

When you are evaluating voltage and current requirements for your audio system, it is important that your Xtramix mixing system and/or rack system does not exceed the capacity of your AC service. You should make certain that the earth (green) wire for the AC system makes a reliable earth connection, and determine as best as possible that the AC system is free of noise that could generate unwanted audible sounds or cause problems in microprocessor based equipment.

Quality AC System

When using a larger rack system it is recommended that a dedicated and isolated AC service be provided. This service should have its own AC wires, isolated receptacle, and breaker and not be shared with other unrelated equipment.

Even with an isolated AC system, it may still be necessary to make use of surge protectors, line filters, isolation transformers, or all of the above.

Power conditioners should be selected with care, since they sometimes generate undesirable switching noises in audio systems.

AC Distribution

When connecting many pieces of electronic equipment to an AC system it is important that the AC is properly distributed. It is better to connect all plugs to a common AC source than to have AC receptacles in different locations.

When installing a large audio system, it may be necessary to consult a qualified electrician that is familiar with the specialized style of electrical wiring required for recording studios.

CAUTION!

DO NOT REMOVE, DEFEAT, OR DISABLE THE SAFETY EARTH TERMINAL ON THE POWER CORD. DO NOT USE A GROUND LIFT ON THE POWER SUPPLY.

Clock Noise and AC

Clock noise is one of the greatest enemies of the audio racks AC system. If a synth or any microprocessor based device emits or somehow couples its clock signal with the neutral or earth of its own power cable, it will contaminate your AC system and carry the clock noise into other equipment; almost always with undesirable results.

Safety Earth Connection

The earth connection exists to protect you, your equipment and possibly your building from an electrical disaster. In a properly wired system, if a 120 volt AC wire were to break within your equipment's chassis, it should make contact with the Safety Earth Wire that is connected to the chassis, and blow the fuse or trip the circuit breaker until the problem has been corrected. Given the same circumstances, if the AC safety ground has been defeated with a ground lift or the AC service is incorrectly wired, the equipment's chassis and quite possibly everything attached in that rack would be "live" with 120 volts.

Electronics Earth

In an electronics context, an earth provides a path for unwanted EMI noise to be carried away from your audio equipment. If you disable your earth with a ground lift or do not have a reliable earth connection, the unwanted noise (EMI or RFI), will find an electrical path of least resistance. That will most likely be your audio equipment and would result in unwanted buzzes or hums.

Proper Audio Grounding and Shielding

In order for any audio signal, such as a synth signal to get from the synth to the mixer, it requires a minimum of 2 conductors. One conductor is the hot, or high, or whatever you are familiar with; the other conductor is the ground or common. Additionally, all audio wires must be protected from environmental occurrences such as EMI (Electro Magnetic Interference) and RFI (Radio Frequency Interference) with an outer shield. An outer shield protects the 2 inner conductors from outside interference, and prevents that cable from inducing its signal onto adjacent audio cables.

One common misconception is that the shield of a cable should act as the common. This may be acceptable for guitar cords or semi-professional applications, but not for professional applications. The audio signals must be carried only by the 2 inner conductors and the shield must act only to cover these 2 conductors without transmitting the signal from one location to another. It is recommended that the shield be attached to the common (ground) at one connector's end, and the shield not be connected at the other connector's end. It is recommended that all shields be connected at the mixer end, and the shields not be connected at the other ends (synths, effects, power amps, etc.).

If a patchbay is utilized in your mixing system, the rules for shielding may change. With a patchbay, normally all shields are connected at the patchbay jacks, and not connected at the mixer or external audio equipment.

EMI and RFI

The occurrence of EMI (Electro Magnetic Interference) and RFI (Radio Frequency Interference) in a synth and sampler based system should be of great concern and not overlooked when installing the Xtramix. EMI is defined as any unwanted signal which adversely affects the operation of the mixer or mixing system.

Stated simply, the undesirable effects of EMI may be perceived as a low frequency smooth sounding 60Hz hum; a low frequency "edgy" sounding 120Hz buzz; or a higher frequency "whine" caused by the timing circuits in microprocessor based devices.

Almost every electronic device generates some amount of EMI emissions. These emissions can be transmitted as electromagnetic radiation or simply conducted though audio cables and power cords. In the same respect, most electronic devices are also very susceptible to the EMI emissions generated by other electronic devices.

Sources of EMI

There are natural and man made sources of EMI that you can't do anything about. These sources include radio, TV, and radar transmitters, as well as motors, lights, and computers. Even the Sun and atmospheric conditions can be contributors to noise that you experience in your audio system.

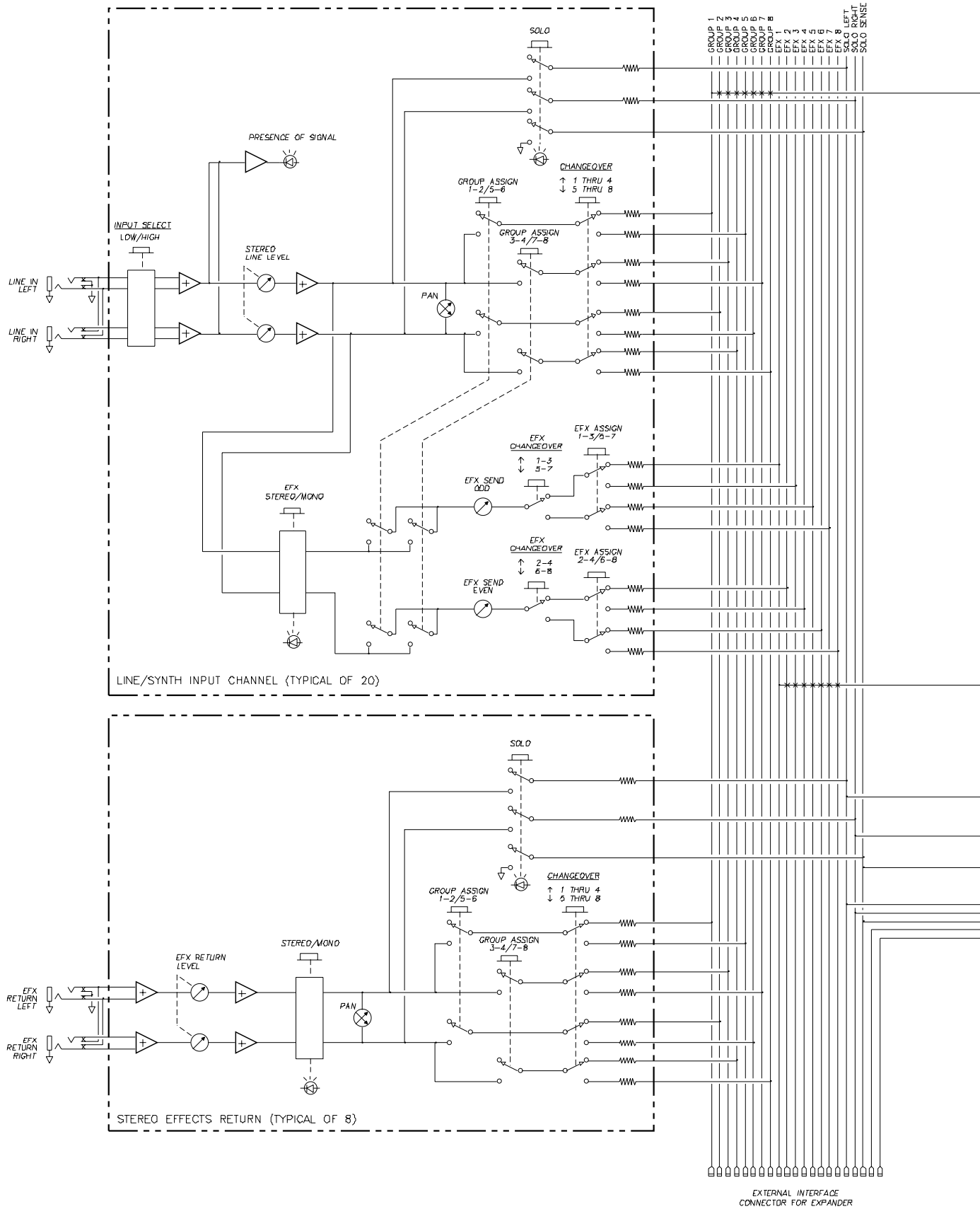
Reducing EMI

There are generally 3 elements that must be present for EMI to exist. These include the source of the EMI (conducted or radiated), the propagation medium by which EMI is transmitted (directly on the cables or through the air), and the receptor that suffers the adverse affects of EMI. If any of these 3 elements are eliminated or reduced, the EMI interference will be eliminated or reduced.

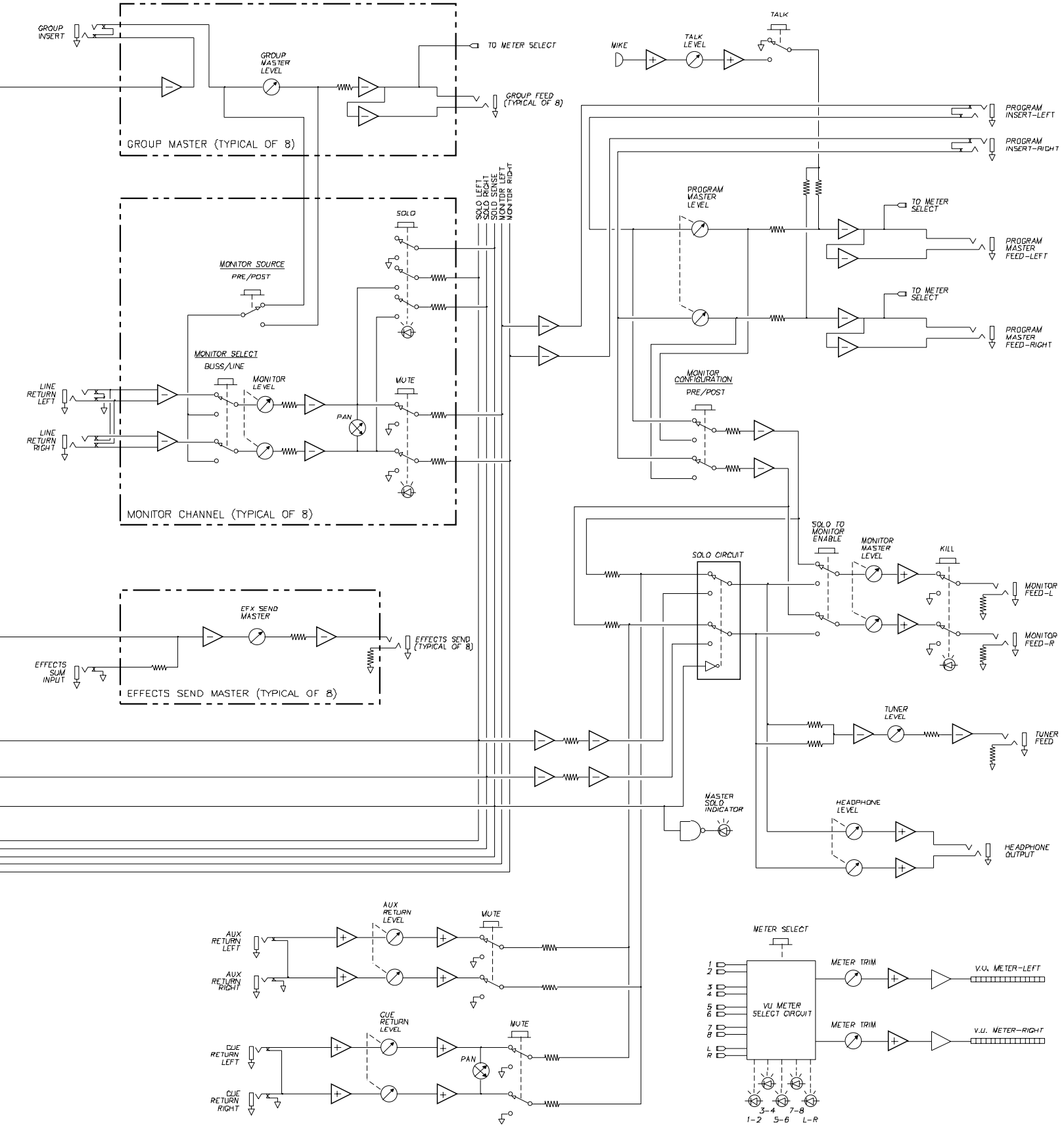
The more electronic equipment operating within an equipment rack, the higher the EMI emissions. The more audio cable and low level audio equipment that exists within the same rack, the greater possibility of unwanted noise. The result of EMI in an audio system manifests itself as a buzz, hum, whine, or all three.

The most common EMI occurrence in an audio system is radiated emissions from microprocessors in synths and samplers, and magnetic field sources from transformers and power supplies.

Signal Flow Diagram (Part A)



Signal Flow Diagram (Part B)



Connector Matrix for XTRAMIXcxi - Version 5

Input / Output Connection	Connector Type	Recommend Connector	Notes
Synth/Line Inputs 1-20	¼" T.R.S.	Switchcraft #297	Balanced
Effects Returns 1-8	¼" T.R.S.	Switchcraft #297	Balanced
Line Returns 1-8	¼" T.RS.	Switchcraft #297	Balanced
Aux Return L & R	¼" T.S	Switchcraft #280	Unbalanced
Cue Return L & R	¼" T.S.	Switchcraft #280	Unbalanced
Subgroup Outputs 1-8	¼" T.R.S.	Switchcraft #297	Balanced
Subgroup inserts 1-8	¼" T.R.S.	Switchcraft #297	Tip=Return, Ring=Send
Program Outputs L & R	¼" T.R.S.	Switchcraft #297	Balanced
Program Inserts L & R	¼" T.R.S.	Switchcraft #297	Tip=Return, Ring=Send
Monitor Outputs L & R	¼" T.R.S.	Switchcraft #297	Balanced
Effects Sends 1-8	¼" T.R.S.	Switchcraft #297	Balanced
Effects Sum 1-8	¼" T.R.S.	Switchcraft #297	Unbalanced
Tuner Output	¼" T.R.S.	Switchcraft #297	Balanced
Headphone Output	¼" T.R.S.		Tip=Left, Ring=Right

Important Notes:

All Input and output connectors on the Xtramix use the highest quality Swichcraft SN37A series jacks. Switchcraft brand mating plugs are therefore recommended because of their 100% compatibility, reliability and durability.

Neutrik brand plugs may also be used as an alternate.

Cables with molded plugs or any "off-brand" plugs that do not meet the exact mechanical specifications of Switchcraft are not recommended for use with the Xtramix.

The results from using "off-brand" plugs may vary from intermittent signals to a complete loss of signal connection or oscillation.