

# S-4™

## Automatic Mixer Operating Guide





Intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



Intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

**CAUTION:** Risk of electrical shock — DO NOT OPEN!

**CAUTION:** To reduce the risk of electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

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**WARNING:** To prevent electrical shock or fire hazard, do not expose this appliance to rain or moisture. Before using this appliance, read the operating guide for further warnings.



Este símbolo tiene el propósito, de alertar al usuario de la presencia de “(voltaje) peligroso” sin aislamiento dentro de la caja del producto y que puede tener una magnitud suficiente como para constituir riesgo de descarga eléctrica.



Este símbolo tiene el propósito de alertar al usuario de la presencia de instrucciones importantes sobre la operación y mantenimiento en la información que viene con el producto.

**PRECAUCION:** Riesgo de descarga eléctrica ¡NO ABRIR!

**PRECAUCION:** Para disminuir el riesgo de descarga eléctrica, no abra la cubierta. No hay piezas útiles dentro. Deje todo mantenimiento en manos del personal técnico cualificado.

**ADVERTENCIA:** Para evitar descargas eléctricas o peligro de incendio, no deje expuesto a la lluvia o humedad este aparato. Antes de usar este aparato, lea más advertencias en la guía de operación.



Ce symbole est utilisé dans ce manuel pour indiquer à l'utilisateur la présence d'une tension dangereuse pouvant être d'amplitude suffisante pour constituer un risque de choc électrique.



Ce symbole est utilisé dans ce manuel pour indiquer à l'utilisateur qu'il ou qu'elle trouvera d'importantes instructions concernant l'utilisation et l'entretien de l'appareil dans le paragraphe signalé.

**ATTENTION:** Risques de choc électrique — NE PAS OUVRIR!

**ATTENTION:** Afin de réduire le risque de choc électrique, ne pas enlever le couvercle. Il ne se trouve à l'intérieur aucune pièce pouvant être réparée par l'utilisateur. Confiez l'entretien et la réparation de l'appareil à un réparateur Peavey agréé.

**AVERTISSEMENT:** Afin de prévenir les risques de décharge électrique ou de feu, n'exposez pas cet appareil à la pluie ou à l'humidité. Avant d'utiliser cet appareil, lisez attentivement les avertissements supplémentaires de ce manuel.



Dieses Symbol soll den Anwender vor unisolierten gefährlichen Spannungen innerhalb des Gehäuses warnen, die von Ausreichender Stärke sind, um einen elektrischen Schlag verursachen zu können.



Dieses Symbol soll den Benutzer auf wichtige Instruktionen in der Bedienungsanleitung aufmerksam machen, die Handhabung und Wartung des Produkts betreffen.

**VORSICHT:** Risiko — Elektrischer Schlag! Nicht öffnen!

**VORSICHT:** Um das Risiko eines elektrischen Schlages zu vermeiden, nicht die Abdeckung entfernen. Es befinden sich keine Teile darin, die vom Anwender repariert werden könnten. Reparaturen nur von qualifiziertem Fachpersonal durchführen lassen.

**ACHTUNG:** Um einen elektrischen Schlag oder Feuergefahr zu vermeiden, sollte dieses Gerät nicht dem Regen oder Feuchtigkeit ausgesetzt werden. Vor Inbetriebnahme unbedingt die Bedienungsanleitung lesen.

## IMPORTANT SAFETY INSTRUCTIONS

**WARNING:** When using electrical products, basic cautions should always be followed, including the following:

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any of the ventilation openings. Install in accordance with manufacturer's 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. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point they exit from the apparatus.
11. Note for UK only: If the colors of the wires in the mains lead of this unit do not correspond with the terminals in your plug, proceed as follows:
  - a) The wire that is colored green and yellow must be connected to the terminal that is marked by the letter E, the earth symbol, colored green or colored green and yellow.
  - b) The wire that is colored blue must be connected to the terminal that is marked with the letter N or the color black.
  - c) The wire that is colored brown must be connected to the terminal that is marked with the letter L or the color red.
12. Only use attachments/accessories provided by the manufacturer.
13. Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
14.  Unplug this apparatus during lightning storms or when unused for long periods of time.
15. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
16. Never break off the ground pin. Write for our free booklet "Shock Hazard and Grounding." Connect only to a power supply of the type marked on the unit adjacent to the power supply cord.
17. If this product is to be mounted in an equipment rack, rear support should be provided.
18. Exposure to extremely high noise levels may cause a permanent hearing loss. Individuals vary considerably in susceptibility to noise-induced hearing loss, but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a sufficient time. The U.S. Government's Occupational and Health Administration (OSHA) has specified the following permissible noise level exposures:

Duration Per Day In Hours	Sound Level dBA, Slow Response
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

According to OSHA, any exposure in excess of the above permissible limits could result in some hearing loss. Ear plugs or protectors to the ear canals or over the ears must be worn when operating this amplification system in order to prevent a permanent hearing loss, if exposure is in excess of the limits as set forth above. To ensure against potentially dangerous exposure to high sound pressure levels, it is recommended that all persons exposed to equipment capable of producing high sound pressure levels such as this amplification system be protected by hearing protectors while this unit is in operation.

**SAVE THESE INSTRUCTIONS!**

## S-4™ Automatic Mixing Console

### Description

The Sanctuary Series S-4 is a result of Peavey Electronic's continuing commitment to bring high quality sound and ease of operation to the worship environment. Automatic mixing is an important sound system tool that not only simplifies the mixing of spoken word microphones, but also improves sound quality and increases available microphone gain for soft-spoken individuals. The S-4 uses the Sanctuary Series design approach of building on the experience of people that mix sound for worship to create products that uniquely fit the church market.

The S-4 is a single-rack-space, four-channel automatic mixing console that not only serves as a main mixer in applications where microphone-mixing requirements are simple, but also is a powerful sub-mixer or automix controller in systems of any size. Unlike other automatic mixers on the market, the S-4 combines much-needed features like our patented microphone priority, our patent-pending Mid Morph™ and compressor to provide unsurpassed versatility in a single box. These features, combined with the selectable low-cut filter, allow the sound quality to be optimized on each channel. If more than four channels are needed, up to 10 S-4 mixers can be linked with TRS cables.

The power of the S-4 is not limited to the worship services. The S-4 is also an outstanding performer in dramatic productions, panel discussions and conferences.

### How does it work?

The S-4 automatic mixer does what a good mix engineer would do by watching the incoming signals and turning down unneeded and low priority inputs to give dominance to the microphone(s) being used. This gain-sharing Automix™ technology not only simplifies operation and reduces background noise, but it also allows maximum microphone gain before feedback.

The priority feature integrated into the automix computer solves another problem. When a person wearing a wireless mic walks close to a stationary mic such as at a pulpit, both mics pick up the same source and cause interference called comb-filtering (a swishing or hollow sound). By giving the wireless mic priority, the pulpit mic is turned down, minimizing this problem.

The S-4 further reduces the required human intervention with its patent-pending integration of soft-knee compressors. When the person speaking gets too loud, the compressor can turn down the gain to help keep the overall volume under control.

### Features

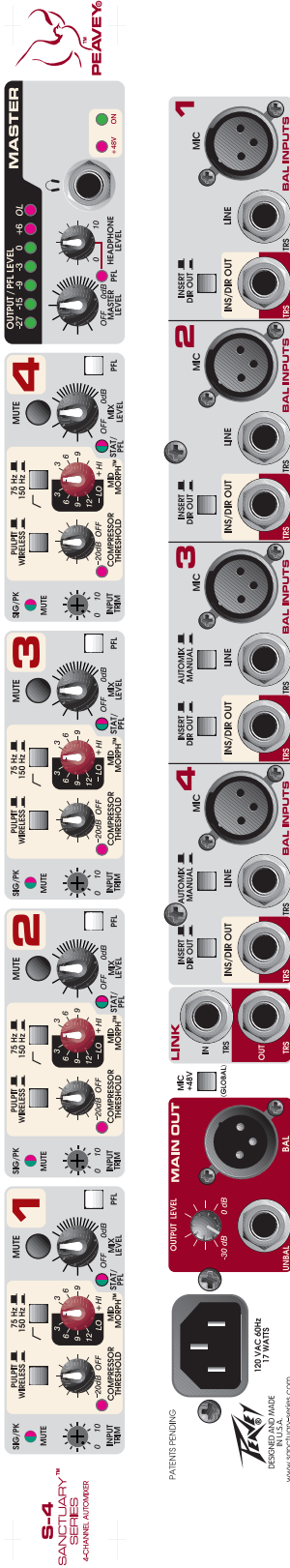
Each channel has:

- Studio quality high gain pre-amplifiers with XLR mic and 1/4" line inputs
- 48 Volt phantom power
- Selectable microphone priority
- Mid Morph EQ to improve clarity
- Low-cut filter selectable between 75 Hz and 150 Hz to reduce rumble and proximity effect
- Soft-knee compressor with variable threshold to control dynamic range
- Microphone gain control that can be adjusted without tools but is secure from accidental change
- PFL switch for setup and testing
- Signal activity and peak indicator that monitors the signal at multiple points
- Channel insert or direct output 1/4" connector
- Automatic/manual operation switch on Inputs 3 and 4

Master Section:

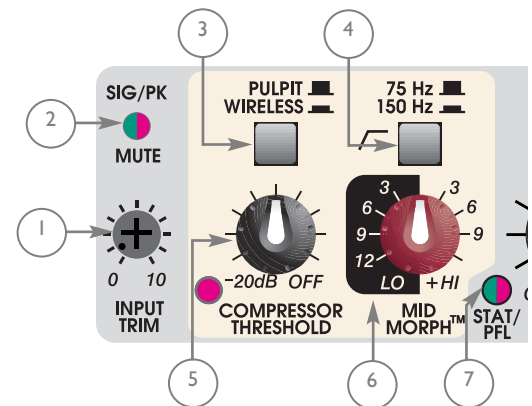
- Master output level control
- Seven-segment LED output/PFL meter
- Headphone output with level control to monitor main output or PFL
- Phantom power switch
- Independent XLR balanced and 1/4" unbalanced outputs
- Output level trim control
- Link jacks for combining multiple S-4 mixers

# CHANNEL & MASTER FUNCTIONS

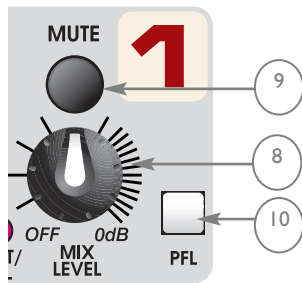


PATENTS PENDING  
 DESIGNED AND MADE IN THE USA  
 www.peavey.com

1. **INPUT TRIM:** This control adjusts the gain of the input preamplifier, which sets the operating level for the channel. We recommend that the gain be adjusted so that ringing does not occur with the channel's mix level control set to maximum. The signal present LED (green) should be lit most of the time and the clip LED (red) should never light. If the channel mix control is typically below the 12 o'clock position, the gain can be lowered further to make mix adjustments simpler. The channel level can be checked by engaging the PFL button and observing the signal on the meter and in the headphones. This control can be adjusted with your fingers but is recessed to prevent accidental adjustment.
2. **SIGNAL/MUTE/CLIP LED:** This light tells three stories. It illuminates green when the channel signal level exceeds  $-20$  dBu, giving a quick visual indication that audio is present in the channel. If the signal level nears the overload point, it flashes red, warning that gain should be reduced. If the mute switch is pressed, it lights red continuously to indicate that the channel is off.
3. **WIRELESS/PULPIT PRIORITY ASSIGNMENT:** When a person speaks into a mic connected to the S-4, the Automix™ circuitry reduces gain of other channels with lower signal levels. If the signal level is the same on two channels, each channel gets the same gain if their priority is the same. However, when a person wearing a wireless microphone walks near another microphone that is on, the resulting interference, called comb filtering, can hinder intelligibility and cause distraction. Setting this switch to the wireless position (high priority) gives the channel dominance over pulpit priority inputs and wireless priority inputs with a lower signal level. (A wireless microphone should have precedence over a fixed podium microphone to reduce the comb filtering effects that occur when both pick up the same source.) For applications such as meetings and panel discussions, the moderator or main speaker can have priority even if he/she is not using a wireless microphone.



4. **75 Hz/150 Hz LOW-CUT FILTER:** The low-cut filter switch selects 75 Hz or 150 Hz for the low cut filter frequency. The filter slope was intentionally chosen to be 12 dB/octave so it can also be used for equalization. This filter can help reduce microphone stand and handling noise and also reduce the proximity effect.
5. **COMPRESSOR THRESHOLD:** Each channel has a built-in soft-knee compressor to help keep loud voices from getting out of control. This control sets the point where compression begins. When the amount of gain reduction exceeds 3 dB, the red LED beside it illuminates. To set this control, begin at the maximum position and turn it counterclockwise to the point where the LED lights only on loud peaks. If the LED blinks most of the time, the threshold should be raised. If compression is not required, set this control to maximum (off).
6. **Mid Morph™ EQ:** Where most midrange controls work at just one frequency, Mid Morph works at two. When turned counterclockwise, it reduces the volume of low/mid frequencies to reduce muddiness. When turned clockwise, it boosts high/mid frequencies to add intelligibility to vocals. Either way, improved vocal or instrument definition can be achieved.
7. **STATUS/PFL:** This light is green when the channel is active and is a dominant Automix channel. It will also light green if the channel is in manual mode. If it is not lit, it does not mean that the channel is off, but that the level is being attenuated. The light will change color to red when the PFL switch is pressed, showing that this channel has been assigned to the PFL monitoring bus.



8. MIX LEVEL: This control adjusts the level of the channel in the main output. It is a part of the Automix™ circuitry and affects priority and sharing ratios. It is recommended that the gain be set to keep this control between 12 o'clock and full clockwise. The system is calibrated with this control set fully clockwise.

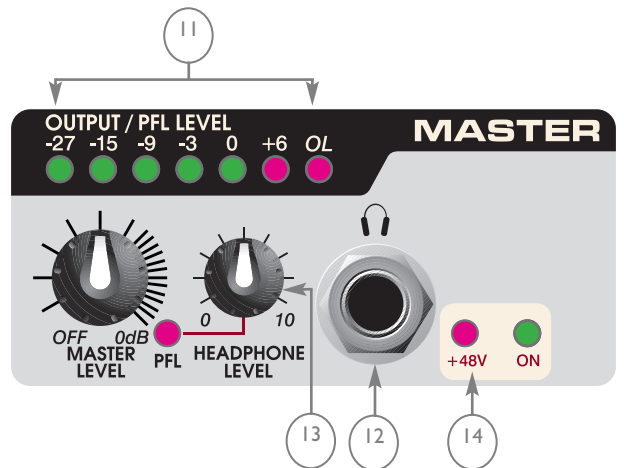
9. MUTE: This control mutes the channel in the main and direct outputs and removes the signal from the Automix computer. The Signal/Pk/Mute LED lights red to indicate that the channel is off.

10. PFL: PFL is an acronym for Pre-Fader Listen. When pressed, this switch sends the channel signal (picked up before the mix level control) to the headphone circuitry and output meter for monitoring. This is useful in setting input gain and EQ, pre-checking that the mic is working and confirming who is speaking on that channel when things get out of control. (Not that it ever happens!)

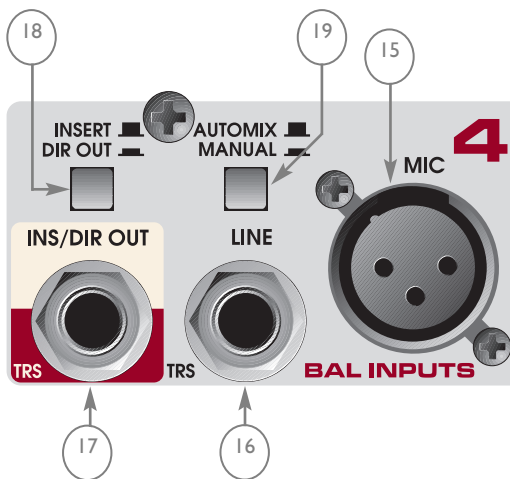
11. OUTPUT/PFL METER: The output meter array indicates the main output signal level. With the back panel output control set to 0, this corresponds to +4 dBu at the output connectors. When PFL is active, this meter shows the level of that channel, and the PFL LED in the master section lights to indicate that the headphones and meter are monitoring an input.

12. HEADPHONE OUTPUT: This stereo jack (TRS) drives the headphones. The level is set by the headphone level control. Tip=Left, Ring=Right, Shield=Ground.

13. HEADPHONE LEVEL: This control sets the headphone volume. The headphone output normally monitors the main S-4™ output. If a PFL button is activated, the PFL LED illuminates and the headphone output and meter switch to the PFL bus.



14. +48V LED: Lights to indicate that the phantom mic supply is on.



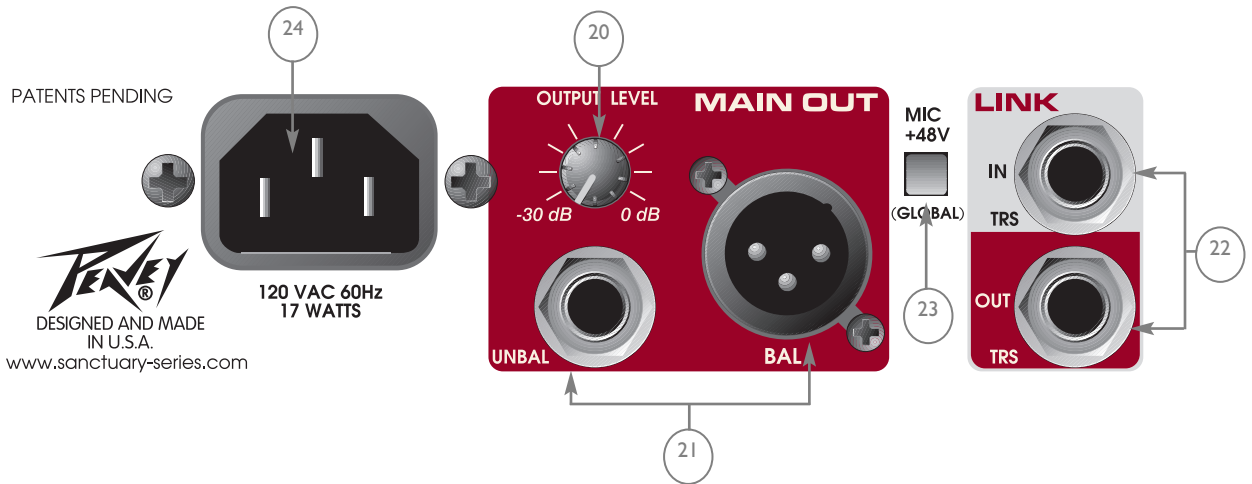
15. MIC INPUT: XLR balanced microphone with phantom power. Because of the wide range of gain adjustment, signal levels from -68 dBu to +22 dBu can be accommodated.

16. LINE INPUT: 1/4" balanced (TRS) 10k Ohm impedance input can be used with balanced or unbalanced sources. It has 20 dB less gain than the XLR input and does not have phantom power available. The mic and line inputs should not be used simultaneously.

17. INS/DIR: This 1/4" jack is switch selected to function as either a channel insert or a direct output connector. When the selector switch is set to DIR position, the unbalanced output signal is post EQ, post fader and post Automix. One application of this output is for the user who wishes to maintain the other mix console but bring each microphone up on its own fader. When the switch is in the insert position, the jack serves as a TRS insert jack allowing signal processing, such as EQ, to be inserted into the input signal chain. The insert jack is wired as: Tip=Send, Ring=Return, Sleeve=Ground and is post low-cut filter. When set to direct out the jack is wired as: Tip=Out, Ring=No Connection, Sleeve=Ground.

18. INSERT/DIRECT OUT SWITCH: This switch changes the function of the INS/DIR from direct out to channel insert.

19. AUTOMIX/MANUAL SWITCH: Channels 3 and 4 can be removed from the Automix system. When set to manual, the channel functions as a normal input channel but still has the advantage of the built-in compressor. When the S-4s are used as the main sound system mixer, manual inputs can be used for music sources.



20. **MAIN OUTPUT LEVEL:** This back panel control is an attenuator on the main XLR and 1/4" outputs. It is provided to match the nominal operating levels of the S-4™ to the inputs of either a mixing console, power amplifier or recording device. It has a 30 dB attenuation range, allowing it to adjust from line to microphone levels as required.

21. **MAIN OUTPUTS (XLR and 1/4"):** These independent, 1/4" unbalanced and XLR balanced outputs have their level set by the master level control and the rear panel trim control. The nominal levels are +4dBu with the output trim set to 0.



**NOTE:** Pin 1 of the XLR output connector is connected to chassis ground using a resistor-capacitor network to minimize the chance of ground loops when connected to the main sound system.

22. **LINK IN and LINK OUT:** These TRS 1/4" jacks are used to interconnect S-4 mixers when additional inputs are required. A single TRS-TRS shielded cable connected between the link out of the first S-4 and the link in of the next S-4 ties together audio and control signals. Up to 10 units can be slaved together using this system. When the S-4s are linked, the same audio signal appears at each S-4 output. The front panel master level and rear panel output level controls only affect the signal level from that S-4's output.



**NOTE:** The S-4's are NOT connected in a ring. The link in jack of the first and the link out jack of the last S-4 mixers must be empty.

23. **MIC +48V:** A rear panel switch applies 48 Volt phantom power to the input XLR connectors for powering microphones that require it. If phantom power is used, do not connect unbalanced dynamic microphones or other devices to the XLR inputs that cannot handle this voltage. An LED on the front panel indicates that phantom power is on. Phantom power is not applied to the 1/4" line inputs.

24. **AC MAINS INPUT:** Connect the line cord to this connector to provide power to the unit. Damage to the equipment may result if improper line voltage is used. Operate only with the specified AC input voltage applied.



#### U.S DOMESTIC AC MAINS CORD

The mains cord supplied with the unit is a heavyduty, three-conductor type with a conventional 120 VAC plug with ground pin. If the outlet used does not have a ground pin, a suitable grounding adapter should be used and the third wire should be grounded properly.

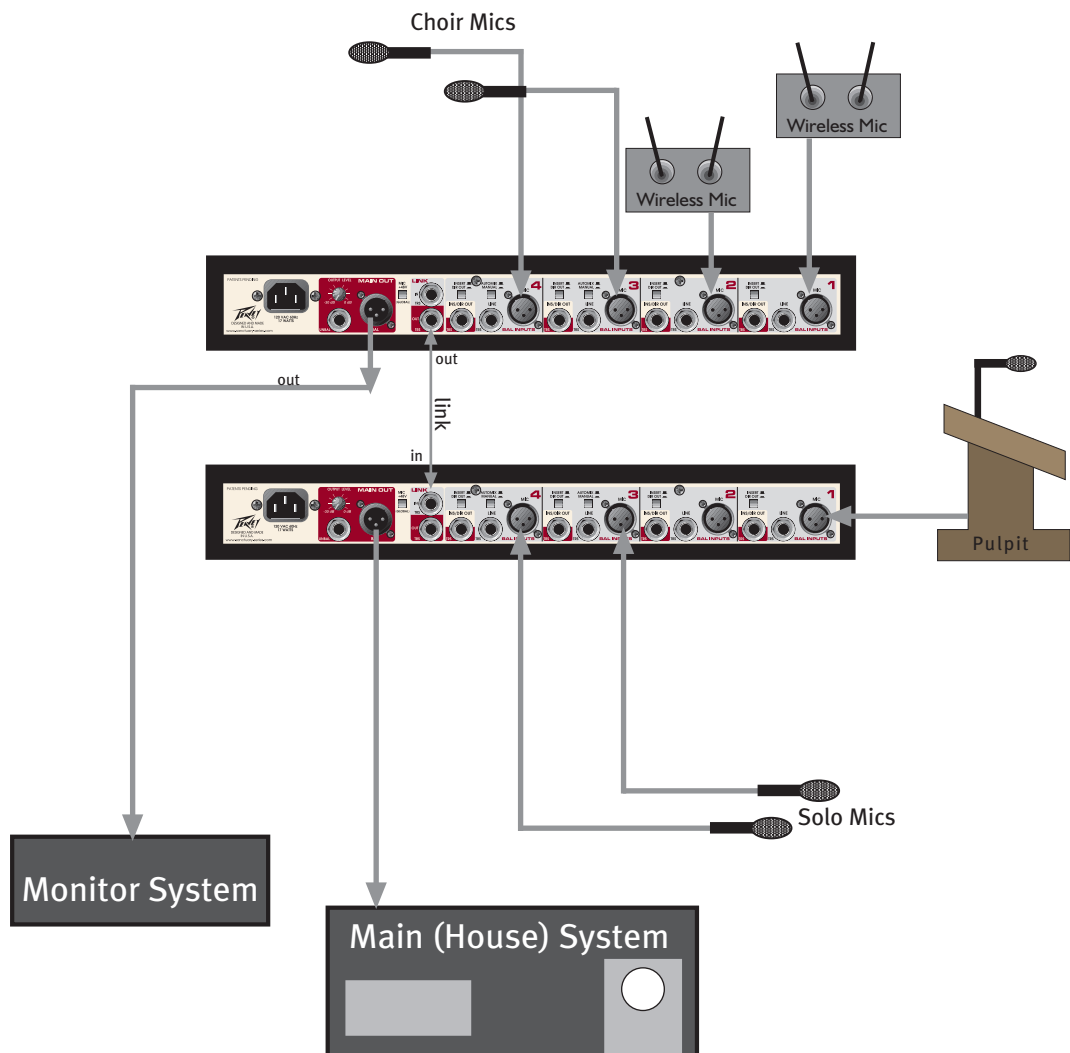
**Never break off the ground pin on any equipment. It is provided for your safety.**

## SETUP AND APPLICATION

The S-4™ is a versatile mixer with features that allow it to be used in many applications and connected in many ways. It is difficult to cover all applications here, but four different schemes are detailed below. Read through the suggested methods and determine what best fits your needs. If you have two or more S-4 mixers linked, designate one as the master unit and use its output connectors and controls.

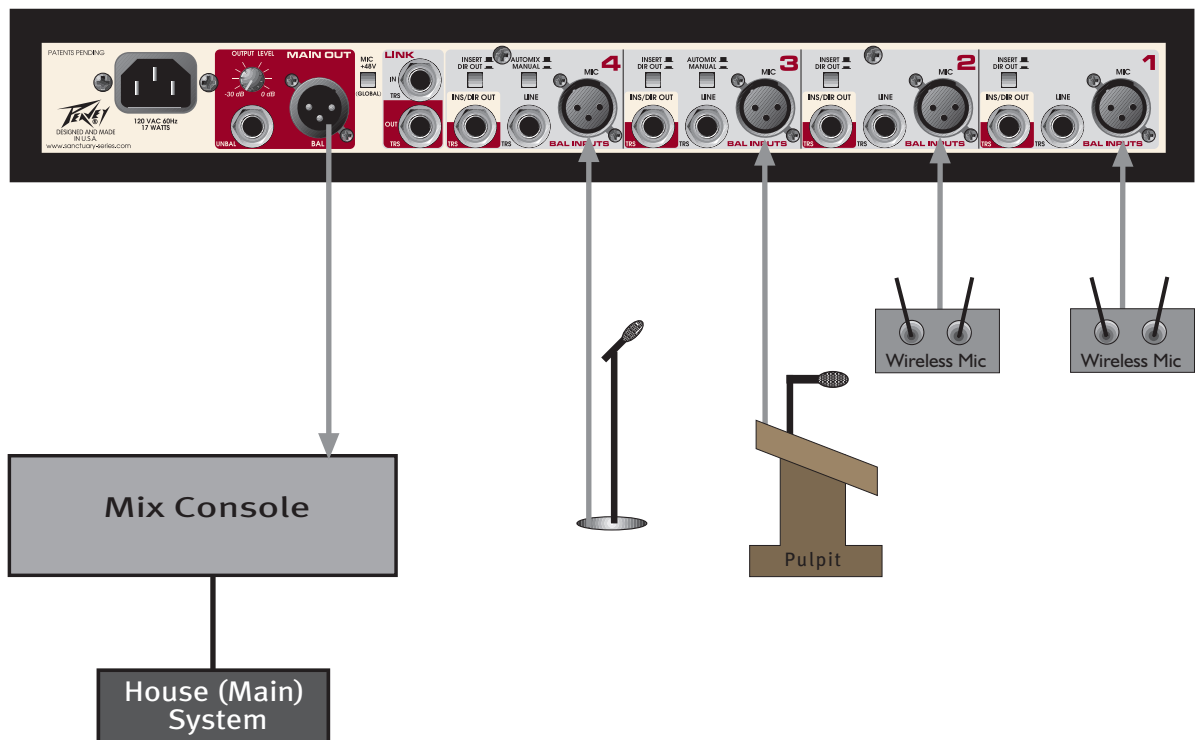
### Main sound system mixer:

The S-4 (or linked S-4s) makes an excellent main mixer for applications where minimal adjustments or hands-off operation is required. The Automix™ circuitry and compressor allow the S-4 to be set and left unattended in many applications. The S-4's versatile EQ provides all of the tone adjustment necessary in most cases. Setting a channel to manual mode configures it for music. Connect the S-4 balanced XLR output (preferred) or unbalanced 1/4" output to the main sound system input.



## Sub-mixer:

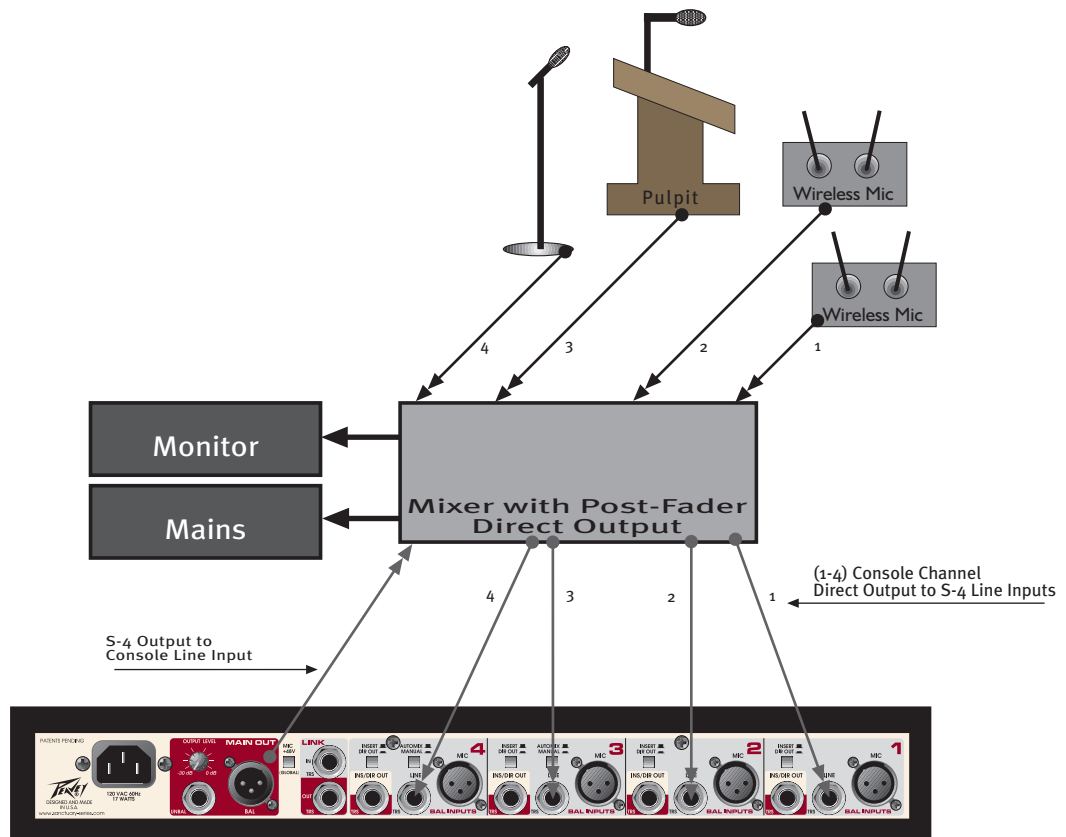
Existing sound systems can also benefit from Automix™ technology by the addition of one or more S-4™ automatic mixers. The Automix feature increases the available microphone gain, reduces background noise and virtually eliminates comb-filtering on spoken word microphones. Spoken word microphones premixed by the S-4 are sent to one input on the existing mix console. The S-4(s) should be conveniently mounted so their front panel controls can be operated as needed. Not only does this add the power of automatic mixing to your existing system, but it also frees additional input channels for music. Connect your spoken word microphones to the S-4 and its balanced XLR output (preferred) or unbalanced 1/4" output to a mix console input.



## Automix™ controller (console with post-fader direct outputs):

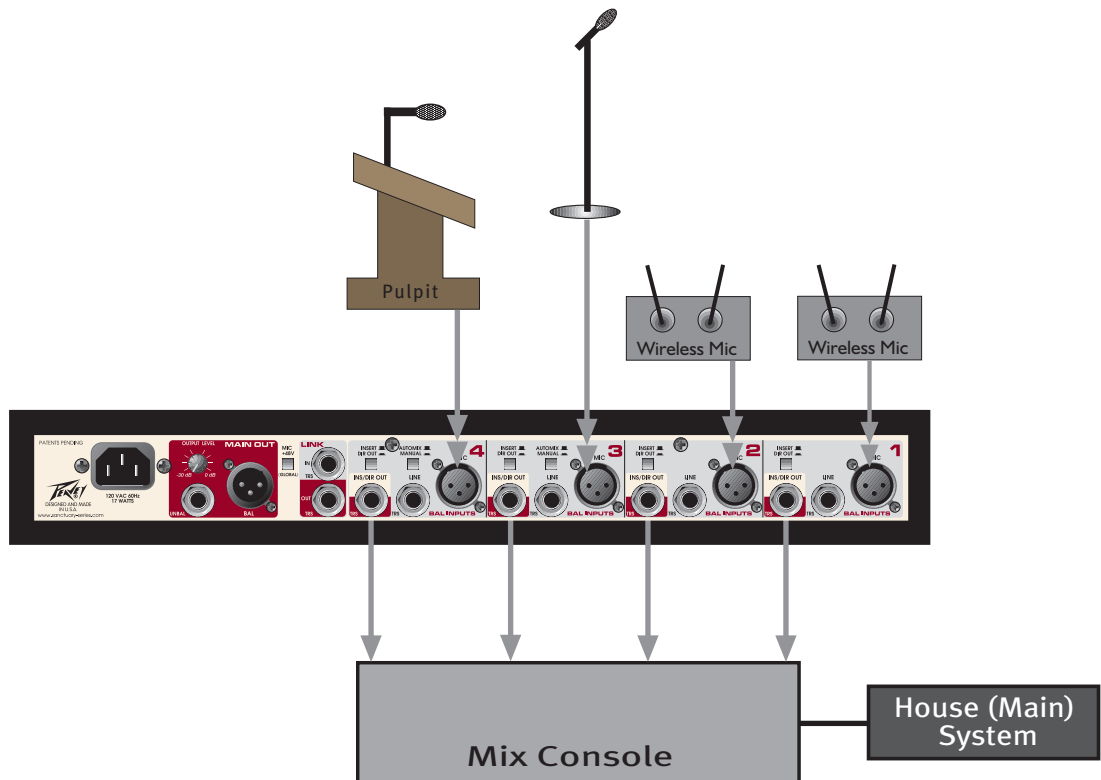
If you want to add the power of automixing but still want the microphones with their own faders on your existing console, there are two approaches that can be used.

The best Automix "controller" approach requires post-fader channel direct outputs on your mix console. Connect the mics to the console inputs, then send the console direct outputs to the line inputs on the S-4™ (do not assign the console inputs to a bus). The S-4 output is then connected to the console via a return or line input. Connecting the S-4 in this fashion allows adjustments made on the console channel to be seen by the Automix computer.



## Automix™ controller (using S-4™ direct outputs):

If console direct outputs are not available, an alternate approach can be used. Connect the direct outputs of the S-4 to the console line inputs. This approach gains most of the Automix advantages but has some potential weaknesses that need to be addressed. Channels should be muted using the S-4 mute switches (not the console's mutes) so that the signal is removed from the S-4 Automix gain computer. The console channel gain should be carefully set so that all Automix channels are the same. Big gain adjustments made at the console are not seen by the S-4 but can affect the Automix. With that warning, if care is taken, this approach can work well. Mount the S-4(s) so the mix engineer has easy access to its controls.



## SETTING LEVELS

To get proper performance (low noise and distortion) from the S-4™ mixer and your sound system, the gain controls throughout the chain must be properly adjusted. There are two basic parts to this process: setting the S-4 operating levels and the operating levels of the mix console or sound system. The S-4 channel gain controls should be adjusted so that the output meter reads 0 during normal use with the channel and master controls set at 0 (maximum). The back panel output level control and the mix console or sound system input controls are then adjusted for proper level in the room.



*NOTE! An assistant will be required for most of the following adjustments. It will be assumed that whenever a microphone is tested, the assistant is speaking into the microphone at a level typical of actual use.*

### Preparation

For all applications, except when used as an Automix™ controller using the console direct outputs, start by:

Connecting the microphones to the S-4 inputs.

Set all channel gains to minimum.

Set channel mix level to 0 (maximum).

Set the Mid Morph™ EQ to 0.

Set the low-cut filter to 75 Hz.

Set the master level to 0 (maximum).

Set the rear panel output level to -30 dB (minimum).

Mute all inputs except one that will be used for the initial setup.

With the assistant speaking at the un-muted microphone, increase the S-4 preamp gain until the output meter reaches 0. The S-4 is now adjusted for proper level on the first channel and can be used for next step.

Now the output of the S-4 must be calibrated to the sound system equipment. Use the procedure below that fits your application.

### Main sound system mixer

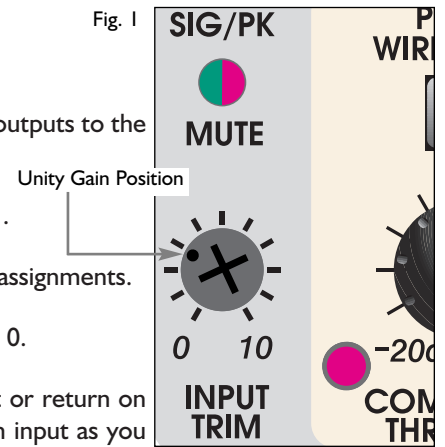
- A. If you have not done so already, connect the S-4 output to the main sound system input. The preferred connection is to use the XLR balanced output.
- B. Increase the back panel output level control until either the sound level in the room is at moderate-loud level or ringing is heard on the end of words. Adjust until ringing is not audible. (A sound contractor may wish to set the back panel level control to 0 and use the sound system level controls to make this adjustment.)
- C. Proceed to "Completing the Setup" (below).

### Sound system submixer

- A. If you have not done so already, connect the S-4 output to an input on your mix console. You might want to consider using an input channel near the master controls where it will be easy to find if needed. The preferred connection is to use the XLR balanced output, but an unbalanced 1/4" connection to the channel line input can be used.
- B. Set the console channel gain control to minimum and the channel fader to 0.
- C. Increase the S-4 back panel output level control until either the sound level in the room is at a moderate-loud level or ringing is heard on the end of words. Reduce the level until ringing is not audible. If you are connected to a console line input and have turned the S-4 output level all the way up but have not reached the proper level, then set the S-4 output level at 0 and increase the console's channel gain to reach the proper level.
- D. Proceed to "Completing the Setup" (below).

### Automix™ controller using mix Console Direct outputs:

- A. Connect your microphones to the mix console inputs.
- B. Connect the corresponding mix-console, post-fader channel direct outputs to the line inputs on the S-4™.
- C. Set the S-4 gain controls to the unity gain position shown in figure 1.
- D. Set the console's fader to 0 (unity gain) and turn off all group (bus) assignments.
- E. Adjust the console gain controls so that the S-4 output meter reads 0.
- F. If you have not done so already, connect the S-4 output to an input or return on your mix console. You might want to consider using an aux return input as you will not want to adjust this control once it is set, but any line input can be used.



- G. Increase the S-4 back panel output level control until either the sound level in the room is at moderate-loud level or ringing is heard on the end of words. Reduce the level until ringing is not audible. If you are connected to a console line input and have turned the S-4 output level all the way up but have not reached the proper level, then set the S-4 output level at 0 and increase the console's channel gain to reach the proper level.
- H. Proceed to "Completing the Setup" (below).

### Automix controller using the S-4 Direct outputs:

- A. Set the rear panel switches to direct out (switch in).
- B. Connect the direct outputs (unbalanced) to the console inputs using TS 1/4" cables.
- C. Set the console channel fader to 0.
- D. Adjust the console channel gain control for proper level in the room without ringing.
- E. Proceed to "Completing the Setup" (below).

### Completing the setup

- A. Unmute one channel at a time and adjust its gain for a nice level in the room.
- B. Adjust the Mid Morph™ control for a natural sound quality.
- C. Set the low cut filter frequency as needed to suppress handling noise, low rumble or excess bass due to close proximity of sound source to the microphone. This is a 12 dB/octave filter so do not be afraid to use the 150 Hz setting if it improves the sound.
- D. Set the mix level control at 0, and readjust the gain so that the microphone is just below ringing. In operation, if you have to reduce the mix level control below the 12:00 position to get the desired volume at normal speaking levels, set the level control at 12:00 and reduce the gain until the desired level is achieved.

**Note:** if you are using the S-4 as an Automix controller, leave the mix level controls at 0.

- E. Adjust the compression threshold control counterclockwise so that the red compression LED only "blinks on" when the person speaking starts getting loud. This can help control the volume of loud speakers. However, if the threshold is set too low, (the LED is on much of the time) the volume will be unnecessarily limited and feedback can be the result.
- F. Repeat steps A-E for each microphone.

## GLOSSARY

**Gain** † Amplification of an audio signal. A negative gain (in dB) is an attenuation or reduction of level of the signal.

**Ringing** † The resonance (“ringing”) sounds heard (often at the end of words) when the sound system is close to acoustic feedback.

**Gain before feedback** † How much you can increase the gain of a mic (turn it up) before feedback occurs. You have sufficient “gain before feedback” if you can turn up the gain on a mic and get acceptable volume with getting feedback or ringing.

**Directional mic** † A mic that picks up sound better from one direction than other. Cardioid mics are an example. They pick up well from the front, slightly less from the sides and very little from the rear. This can be used to advantage by reducing the pickup of sound from monitor or sound system speakers. (It only works though if the back of the mic (end with the cord in most cases) is pointed at the speaker. When a singer bends down and points the front of the mic at the monitor speaker, only the Feedback Ferret® or the channel mute can prevent feedback.

**Compressor** † A audio compressor reduces the dynamic range of an signal by reducing (compressing) the gain when the signal gets loud. The threshold control sets the point above which compression takes place.

**Dynamic Range** † Dynamic Range describes the variation from soft to loud speech or music. Too wide a dynamic range can result in sound that is difficult to hear when it is soft or perceived as too loud when loud. Sound with too little dynamic range can be hard to listen to for long periods of time (the “elevator music” sound).

**Expander** † An expander performs the opposite function of a compressor. It expands (widens) dynamic range. It is most often used to turn down the sound from microphones when they are not in use.

**Noise Reduction** † Background noise is reduced through use of automatic mixing circuitry and other circuitry that reduces the gain of mics when not in use.

**Auto-Level** † Automatic Level Control. This circuit reduces dynamic range so that the volume does not get too loud or too soft. It increases the gain at low levels to reduce noise and compresses it at higher levels to control volume.

**Feedback (Acoustic Feedback)** † Loud howling sound heard from the speaker system. It is caused by sound from the speaker system reentering the microphone louder than the original sound. The sound keeps getting louder and we hear what we know as acoustic feedback.

**Comb Filter** † Although this sounds like a personal hygiene item, it actual refers to the frequency response that results from combining two signals from one source where one is delayed. Although this may sound complicated, it occurs when sound is picked up simultaneously by two mics that are slightly different distances from the sound source. As the source (person) moves, you hear a sort of a swishing phasing sound. The priority feature on the automix helps prevent this problem.

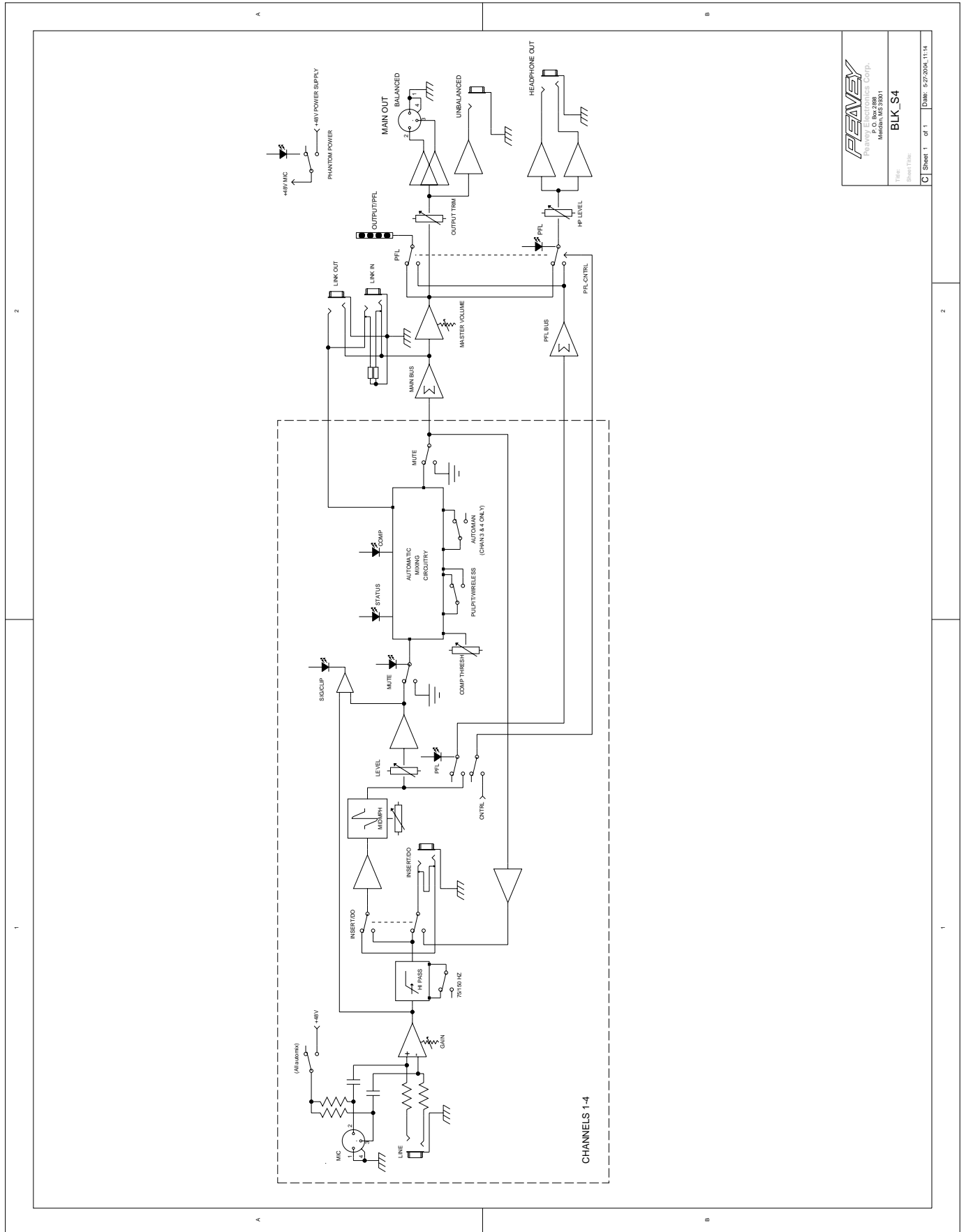
**Foldback** † Sending sound back to the person speaking or performing so they can better hear themselves.

**Fader** † The slide control on the mixer used to adjust the mix of microphone signals.

**EQ (Equalization)** † Equalization is really a fancy word for tone controls that allow the user to equalize or emphasize/de-emphasize the sound at certain frequencies.

**Threshold** † On a compressor or expander, this is the signal level where the circuit starts working.

# S-4™ Block Diagram



<b>PIEAVEY</b>	
PIEAVEY ELECTRONICS, CO. (P.)	
P. O. Box 25888 Midvale, UT 84051	
<b>BLK_S4</b>	
Title:	Sheet Title:
C Sheet 1 of 1	Date: 5/27/2004 11:14

# S-4™ SPECIFICATIONS

## Input Specifications:

Function	Input Z (Ohms) Min	Input Gain Setting	Input Levels			Bal / Unbal	Connector
			Min**	Nominal*	Max		
XLR Input (150 Ohms)	2.2K	Max Gain (68 db)	-64 dBu	-56 dBu	-48 dBu	Bal	XLR: Pin 1 Gnd, Pin 2 (+), Pin 3 (-)
		Min Gain (2 db)	+2 dBu	+10 dBu	+22 dBu		
Line (10K Ohms)	10K	Max Gain (48 db)	-44 dBu	-36 dBu	-28 dBu	Bal	1/4" TRS Phone: Tip (+), Ring (-), Sleeve Ground
		Min Gain (-18 db)	+22 dBu	+28 dBu	>30 dBu		

\*\* Min input level (Sensitivity) is the smallest signal that will produce nominal output (+4 dBu) with channel and master faders set for maximum gain

\* Nominal settings are defined as the master level control set at maximum, and the channel mix level set at 50%, with the gain adjustment pot as specified.

## Output Specifications:

Function	Minimum Load Z (Ohms)	Output Level		Bal / Unbal	Connector
		Nominal	Max		
Main	600	+4 dBu	+22 dBu	Unbal	1/4" Phone  XLR: Pin 1 Gnd, Pin 2 (+) Pin 3 (-)
			+22 dBu	Bal	
Direct/Insert	600	+4 dBu	+22 dBu	Unbal	1/4" Phone
Headphone	8	None Specified	135 mW (32 Ohms)	Unbal	1/4" TRS Phone: Tip Left, Ring Right Sleeve Ground

0 dBu=0.775V (RMS)

+4 dBu=1.23 (RMS)

**Hum & Noise**

Output	Residual Noise	S/N Ratio (Ref. +4 dBu)	Test Conditions
Main	-101 dBu	105 dB	All level controls down
	-88 dBu	92 dB	Master level maximum, Chan Mix levels at minimum, All Channels Muted
	-88 dBu	92 dB	All level controls maximum, with input gain at minimum

(Hum & Noise measurements: 22 Hz to 22 kHz BW)

**Gain:**

Mic input Gain Adj Range: 2 dB to 68 dB  
 Mic input to Main output 68 dB (Max Gain)

Line input Gain Adj Range -18 dB to 48 dB  
 Line input to Main output 48 dB (Max Gain)

**Frequency Response:**

Mic Input to Main Output (with 75 HZ LC filter) 75Hz (-3 dB) to 55KHz (-1 dB)

**Total Harmonic Distortion (THD):**

0.05% 20Hz to 20KHz Mic to Main output (22 Hz - 22 KHz BW)

**Equivalent Input Noise (EIN):**

-129.8 dBu (Input terminated with 150 Ohms, maximum gain)

**Crosstalk:**

80 dB Adjacent Input Channels (20 Hz - 20 KHz)

**Common Mode Rejection Ratio (Mic Input):**

60dB min (20 Hz - 20 KHz)  
 70 dB typ @ 1 KHz

Meters: 7 position LED, peak reading.  
 (0 dB= +4 dBu)

Signal / Overload Indicators: Lights 2 dB below clipping

Dimensions: 19" W x 8.125" D x 1.75" H

Weight: 9 Lbs. 4.1 Kg

Power Requirements: 120VAC 60 Hz, 17 Watts

# PEAVEY ELECTRONICS CORPORATION LIMITED WARRANTY

EFFECTIVE DATE: JULY 1, 1998

## What This Warranty Covers

Your Peavey Warranty covers defects in material and workmanship in Peavey products purchased and serviced in the U.S.A. and Canada.

## What This Warranty Does Not Cover

The Warranty does not cover: (1) damage caused by accident, misuse, abuse, improper installation or operation, rental, product modification or neglect; (2) damage occurring during shipment; (3) damage caused by repair or service performed by persons not authorized by Peavey; (4) products on which the serial number has been altered, defaced or removed; (5) products not purchased from an Authorized Peavey Dealer.

## Who This Warranty Protects

This Warranty protects only the original retail purchaser of the product.

## How Long This Warranty Lasts

The Warranty begins on the date of purchase by the original retail purchaser. The duration of the Warranty is as follows:

Product Category	Duration
Guitars/Basses, Amplifiers, Pre-Amplifiers, Mixers, Electronic Crossovers and Equalizers	2 years *(+ 3 years)
Drums	2 years *(+ 1 year)
Enclosures	3 years *(+ 2 years)
Digital Effect Devices and Keyboard and MIDI Controllers	1 year *(+ 1 year)
Microphones	2 years
Speaker Components (incl. speakers, baskets, drivers, diaphragm replacement kits and passive crossovers) and all Accessories	1 year
Tubes and Meters	90 days

[\*Denotes additional warranty period applicable if optional Warranty Registration Card is completed and returned to Peavey by original retail purchaser within 90 days of purchase.]

## What Peavey Will Do

We will repair or replace (at Peavey's discretion) products covered by warranty at no charge for labor or materials. If the product or component must be shipped to Peavey for warranty service, the consumer must pay initial shipping charges. If the repairs are covered by warranty, Peavey will pay the return shipping charges.

## How To Get Warranty Service

- (1) Take the defective item and your sales receipt or other proof of date of purchase to your Authorized Peavey Dealer or Authorized Peavey Service Center. OR
- (2) Ship the defective item, prepaid, to Peavey Electronics Corporation, International Service Center, 412 Highway 11 & 80 East, Meridian, MS 39301 or Peavey Canada Ltd., 95 Shields Court, Markham, Ontario, Canada L3R 9T5. Include a detailed description of the problem, together with a copy of your sales receipt or other proof of date of purchase as evidence of warranty coverage. Also provide a complete return address.

## Limitation of Implied Warranties

ANY IMPLIED WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE LENGTH OF THIS WARRANTY.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

## Exclusions of Damages

PEAVEY'S LIABILITY FOR ANY DEFECTIVE PRODUCT IS LIMITED TO THE REPAIR OR REPLACEMENT OF THE PRODUCT, AT PEAVEY'S OPTION. IF WE ELECT TO REPLACE THE PRODUCT, THE REPLACEMENT MAY BE A RECONDITIONED UNIT. PEAVEY SHALL NOT BE LIABLE FOR DAMAGES BASED ON INCONVENIENCE, LOSS OF USE, LOST PROFITS, LOST SAVINGS, DAMAGE TO ANY OTHER EQUIPMENT OR OTHER ITEMS AT THE SITE OF USE, OR ANY OTHER DAMAGES WHETHER INCIDENTAL, CONSEQUENTIAL OR OTHERWISE, EVEN IF PEAVEY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

If you have any questions about this warranty or service received or if you need assistance in locating an Authorized Service Center, please contact the Peavey International Service Center at (601) 483-5365 / Peavey Canada Ltd. at (905) 475-2578.

*FEATURES AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.*



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