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**FISHMAN<sup>®</sup>**

**USER GUIDE  
SA220**



Whenever this symbol appears, it alerts you to the presence of important operating and maintenance (servicing) instructions in the user's manual for this amplifier.



Wherever this symbol appears, it alerts you to the presence of uninsulated dangerous voltage inside the enclosure that may be sufficient to constitute a risk of shock.



## Important Safety Instructions

To ensure your personal safety and the safety of others, operate this apparatus only after reading these instructions and heeding the warnings listed below.

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 the ventilation openings. Install in accordance with the 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 the third prong are 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 the plugs, convenience receptacles and the point where they exit from the apparatus.
  11. Use only attachments/accessories specified by the manufacturer.
  12. 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.
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13. Unplug this apparatus during lightning storms or when unused for long periods of time.
  14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as a 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.
  15. Do not expose the apparatus to dripping or splashing liquids and do not place objects filled with liquids (such as a beverage container or a vase) on the apparatus.
  16. Warning" To reduce the risk of fire or electric shock, do not expose this apparatus to moisture.
  17. The apparatus should be connected to mains outlet with a protective earthing connection.



Disconnect device is Mains Plug, which should remain readily operable.

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## Welcome

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Thank you for making Fishman a part of your acoustic experience. We are proud to offer the finest acoustic amplification products available; high-quality professional-grade tools which empower you to sound your very best.

**Before using your SA220, carefully read the following sections:**

**Important Safety Instructions (Page 2)**

**Getting Started (Page 4 and 5)**

## Save Your Packing Materials

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The box and packing materials for the SA220 were specially designed to protect the amplifier during shipping. Save all this stuff in case you need to re-ship the SA220.

## Troubleshooting

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Should you have any problems, please check with your installer or refer to the online installation guide for this product. Technical support, troubleshooting tips and installation information can be found at <http://www.fishman.com/support/>

## Hear This!

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The SA220 amplifier is capable of cleanly reproducing the sound of your instrument at very high volume levels. Prolonged repeated exposure to high sound pressure levels (SPLs) without protection can cause permanent hearing loss. OSHA has set guidelines and specified permissible sound-exposure limits for those who work in high SPL environments.

### Permissible Noise Exposures

Duration per day, hours      Sound level dBA slow response

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8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

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To ensure against permanent hearing loss, wear hearing protection when you perform with amplification.



# Getting Started

Here are some basic setup tips to help get you going. To operate your SA220 safely, please read the entire manual, especially the Important Safety Instructions on page 2.

## Setting the SA220 on its Stand

SA220 is intended for use with the included tripod speaker stand in portable applications where the amplifier and stand are to be placed directly on a level, solid, flat surface. Do not substitute the speaker stand with a non-Fishman part or attempt to mount or suspend the SA220 in a permanent or temporary method other than that as described in this guide or by Fishman.

1. Locate the stand in a place that is free of obstructions, where it may be accidentally pushed over, or where it may be a trip hazard.
2. Loosen the lower of the two large thumbscrews and spread the tripod legs. **Follow the height warnings printed on the stand for safe operation** (Figure 1). Setting the height outside this area is forbidden. **Tighten the thumbscrew before placing the SA220 on the stand.**
3. Remove the safety pin and loosen the top large thumbscrews. Extend the top tube to the third hole or lower if you are seated while performing. **Replace the safety pin.** Allow the tube to rest on this pin and **tighten the top thumbscrew** (Figure 2).
4. Lift the SA220 using the handle on the back of the unit while supporting the weight with your other hand. A guide is molded into the underside of the SA220 and acts as an aid in positioning the SA220 onto the tripod. Once positioned, lower the SA220 onto the tripod until it rests firmly on the tube.

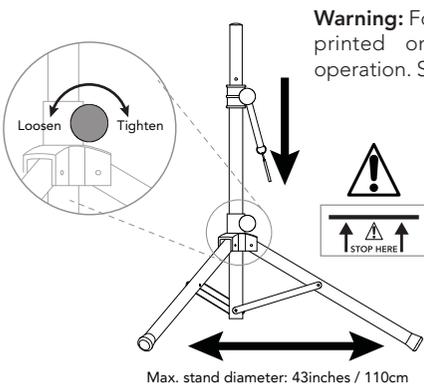


Figure 1.

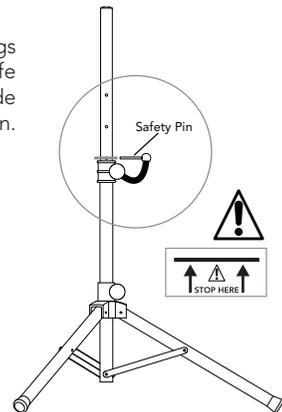


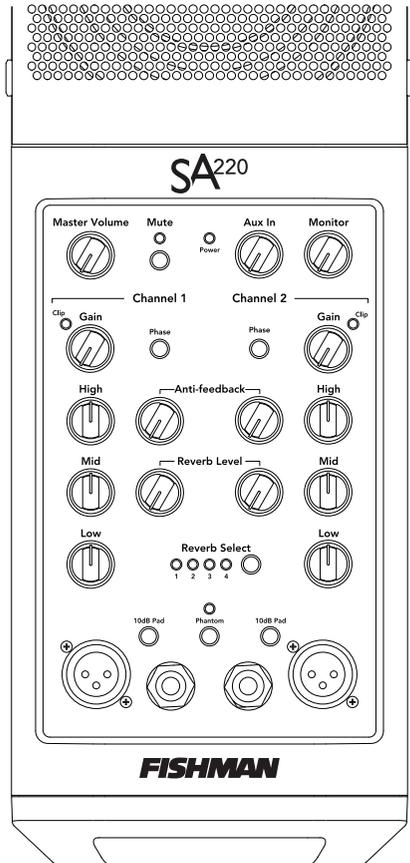
Figure 2.

## Cabling Precautions

When making your cable connections, always be sure to route the cables so that the audience, performers, or anyone else will not trip over them or accidentally pull the SA220 over.

## Setting SA220 Controls

1. Plug the provided AC line cord into the back of the amplifier.
2. Locate the Power switch and switch it off, then connect the power cord.
3. Plug the SA220 into an electrical outlet with the appropriate AC voltage.
4. Push in the Mute switch and turn on the Power switch. You should see the front panel power LED glow green.
5. Connect your instrument to the Channel 1 input with a shielded 1/4-inch cable.
6. Play aggressively and raise the Channel 1 Gain knob until the Clip LED flashes, then back off the Gain until no clipping occurs.
7. Set the controls as shown here.
8. Push the Mute switch (out) and slowly raise the Master Volume to the desired level.



## Front Panel Controls

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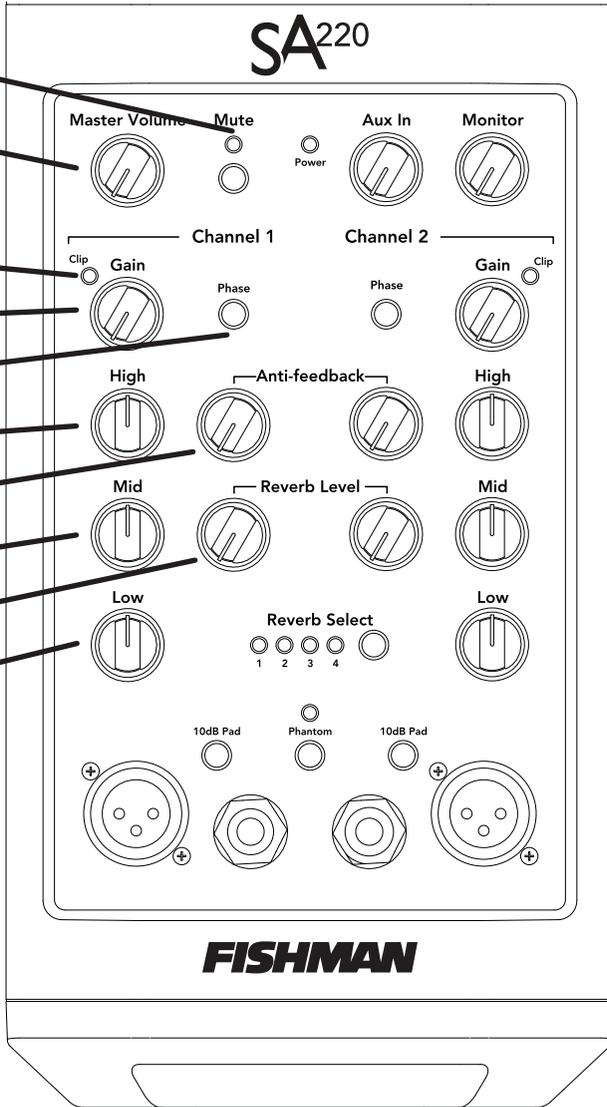
The following pages describe the functions of each control or jack on the SA220 front and rear panels. Refer to these numbered diagrams for each numbered control on the following pages.

1. **Mute** – The Mute switch shuts off the signals from Channels 1 and 2 to the speakers and all the XLR outputs. The mute does not affect the Aux Input, Monitor Input, Tuner Out or the effects sends.
2. **Master Volume** – Set the overall level of the SA220 with the Master Volume.

**Note: Controls 3 through 13 are identical for both channels.**

3. **Clip LED** – The Clip LED will light when the Gain level is too high and the signal becomes distorted. If the light comes on when you play, lower the Gain until the distortion goes away.
4. **Gain** – Use the Gain knob to set the level of the signal.
5. **Phase** – Use the Phase switch in conjunction with the Anti-Feedback filter to eliminate acoustic feedback. To learn more about acoustic feedback, see page 14.
6. **High** – Boost highs to add “air” to the sound of the instrument. With the knob set at 12 o’clock, the control is effectively out of the circuit.
7. **Anti-Feedback** – If you encounter low-frequency feedback, sweep this control to isolate and eliminate it. To learn more about acoustic feedback, see page 14.
8. **Mid** – This control affects how well the instrument blends in or stands out in the mix. At loud volumes a midrange cut will achieve a more natural sound. With the dial set at 12 o’clock, the control is effectively out of the circuit.
9. **Reverb Level** – Controls the amount of digital reverb in the channel.
10. **Low** – Boost here to add weight to the sound. In general, boost bass at low volumes and flatten it out (or cut) at higher levels. With the dial set at 12 o’clock, the control is effectively out of the circuit.

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- 2
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- 8
- 9
- 10

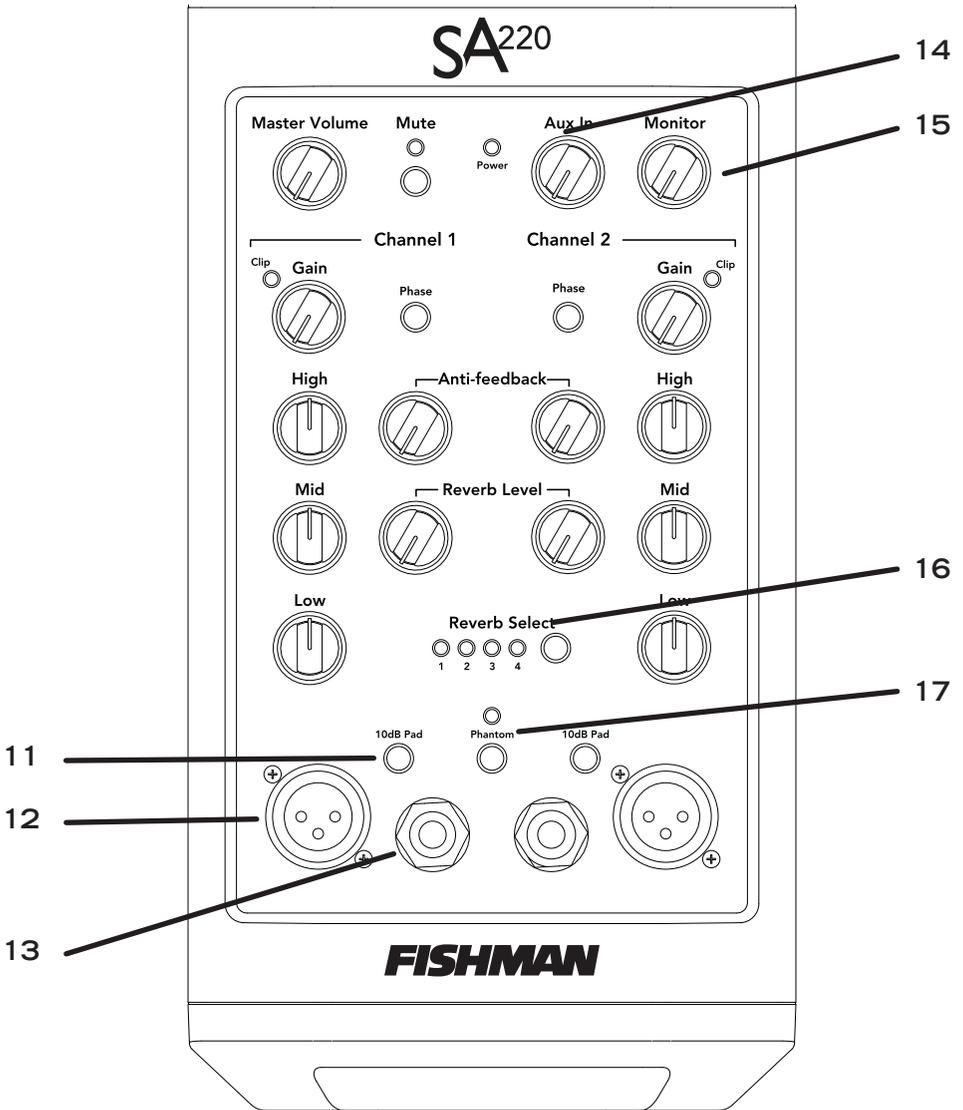


## Front Panel Controls (cont.)

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11. **10dB Pad** – If you have a high output pickup and the Clip LED comes on at low Gain settings, push this switch in for a more usable range.
12. **XLR Mic Input** – You may also connect an outboard preamp with balanced XLR out to this input.
13. **1/4" Instrument Input** – Accepts all types of passive or active acoustic pickups.  
  
Note: If you attempt to plug in both the XLR and 1/4-inch inputs at the same time, the XLR shuts off.
14. **Aux In** – Use this to control the level of a device plugged into the Aux Input. Note that the Aux channel is independent of the Mute switch, so you can play pre-recorded music on your breaks.
15. **Monitor** – Use this to control the level of the device you plug into the Monitor Input. See page 16 on Monitor input applications.
16. **Reverb (Select)** – Press the Reverb button to select among four preset reverb effects.
17. **Phantom Power** – Provides 48V to the XLR input for use with a condenser Microphone. The Phantom LED will light to indicate 48V is being supplied to the XLR jack.

For more information on Phantom Power, see page 17.



## Rear Panel Controls

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- 19. Channel 1 & 2 Effects Loop (Send)** – Patch an external effect (delay, reverb, chorus) through the send and return jacks for each channel. Use a standard 1/4-inch shielded instrument cable to connect the effects send to the input of the effect. This serial effects loop is located post-EQ and is compatible with battery-operated stompbox-style effects processors.
- 20. Channel 1 & 2 Effects Loop (Return)** – This is the effects return for each channel. Connect the Channel 2 return jack to the output of the effect.
- 21. Channel 1 & 2 D.I. Out (Pre-EQ)** – Use this output when you want a flat D.I. signal to go to the board. This pre-EQ output is always ground isolated to prevent ground loop hum.
- 22. Tuner Out** – Plug in an electronic tuner here. This output receives only the Channel 1 signal and is independent of the mute, so you can tune with the speakers and the XLR outs muted. The Tuner Out may also be used as pre-EQ unbalanced D.I. out for Channel 1.
- 23. Tweeter Level** – Set the front panel controls flat and adjust the tweeter level to where it sounds best to you.
- 24. AC Power**

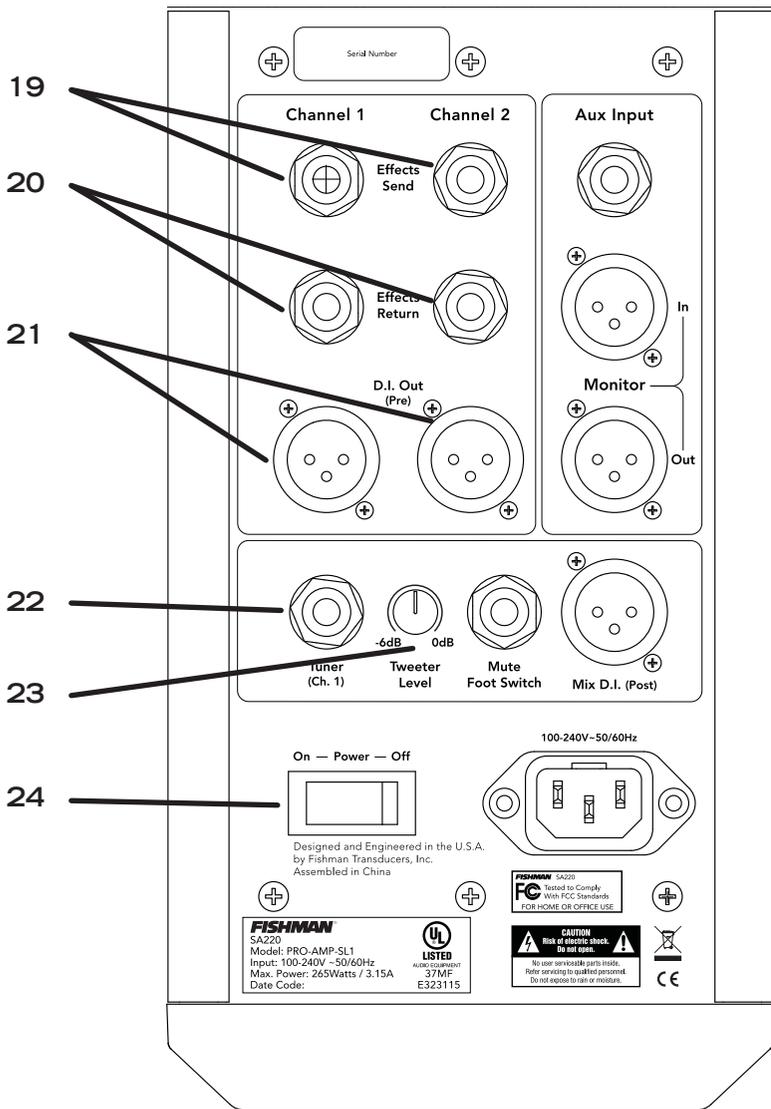
The SA220 has a universal power supply and can accept voltages from around the world.

For amplifiers purchased in the USA, Canada and Mexico, plug in the supplied detachable AC power cable.

For amplifiers purchased outside the USA and Canada, you will need to supply your own detachable AC cable. This cable must have an IEC-style 320 connector at one end, and a male AC plug appropriate for your region at the other.



Disconnect device is Mains Plug, which should remain readily operable.



## Rear Panel Controls (cont.)

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**25. Aux Input** – Plug in a line level stereo audio source such as a CD or MP3 player in this input. The 1/4 inch stereo (TRS) Aux Input mixes the signals to mono when amplified.

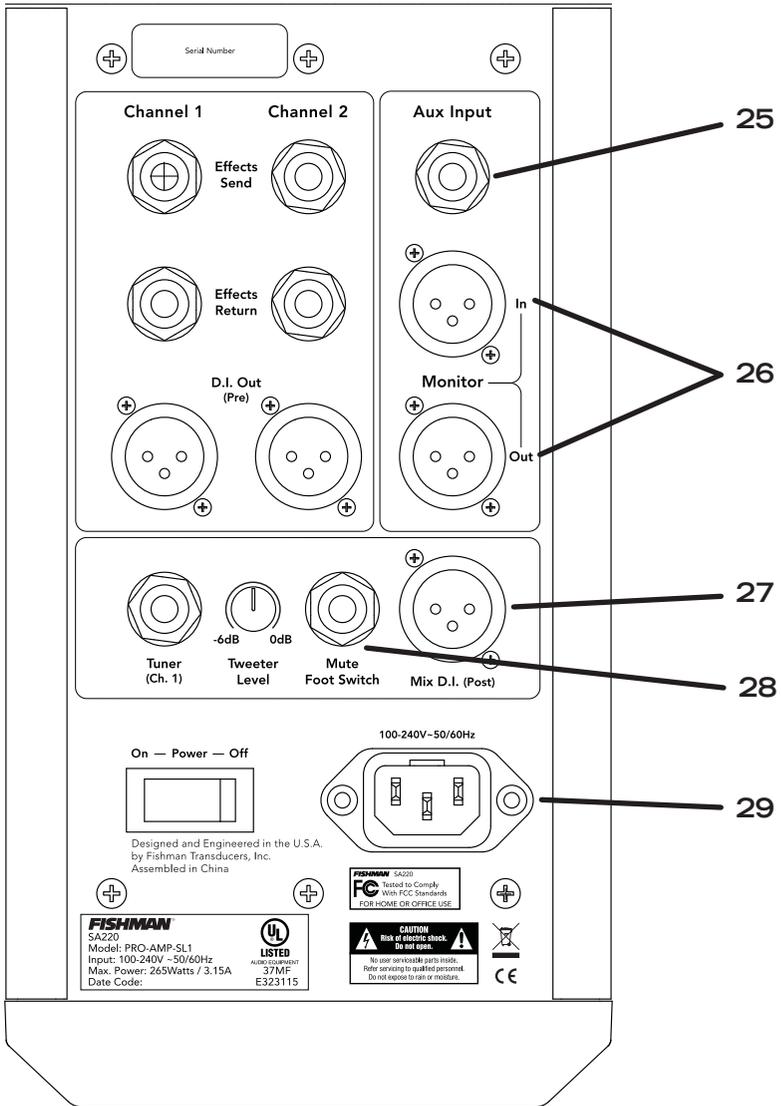
**26. Monitor In & Out** – The monitor feature on the SA220 allows two performers, each with a SA220, to send their own mix to each other. The Monitor level on the front panel then blends in the other players mix. It essentially acts as a monitor, allowing the performer to hear the other player more easily.

The Monitor In may also be used as another audio input, just like the Aux Input. The Monitor Out can serve a secondary function as another line level mix output. This output is always ground isolated to prevent ground loop hum.

**27. Mix D.I. (Post)** – Plug in here when you wish to send signals from both Channels and Aux Input to a mixing console. This post-EQ output is always ground isolated to prevent ground loop hum.

**28. Mute Foot Switch** – Plug a mono, on/off (latching type) foot switch into this jack for remote access to the Mute feature. The Mute Footswitch duplicates and overrides the front panel Mute switch.

**29. AC Power Input** – Connect the SA220 to the AC mains supply here.



## About Acoustic Feedback

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There are two features provided to help control acoustic feedback, the Phase switch and the Anti-Feedback notch control.

Feedback usually occurs in the lowest octaves of your instrument. The natural resonances which produce an instrument's tone also react with amplified sound. The louder an instrument is amplified, the more it will interact. Feedback occurs when a note on the instrument resonates in sync with the amplified sound, reinforcing and building to a sustained howl.

**Phase Switch** – The Phase switch flips the polarity of your instrument signal from positive to negative, changing its relationship to the sound coming from the amplifier. One phase setting usually provides better resistance to feedback than the other and will vary depending on the instrument and playing environment. Another approach to determining optimal phase is the selection which sounds or feels most natural when playing.

In certain playing environments the Phase switch may not have an audible impact. When not using the Phase switch for feedback suppression, it is recommended to leave it in the out (+) position.

The Phase switch also affects the signal polarity to the balanced D.I. and Monitor outputs, synchronizing the amplifier with other sound systems in use.

**Anti-Feedback** - The Anti-Feedback control is a variable frequency notch filter designed to subdue a resonant peak on the instrument which is prone to feedback. Turning the knob adjusts the center frequency of the filter, ranging from subsonic (off) to 330Hz at full clockwise.

When not being used for feedback, the Anti-Feedback notch can also be used as a tone control to subdue an unpleasant frequency in a microphone or room. Play a note which accentuates the offending frequency and turn the control until the intensity is diminished.

## Setting Phase and Anti-Feedback

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The Phase and Anti-feedback controls can be used to restrict the two most dominant feedback notes, allowing greater volume before feedback than otherwise possible. In most cases, the Phase switch is used to control the lower dominant note while the Anti-Feedback notch is used to control the higher.

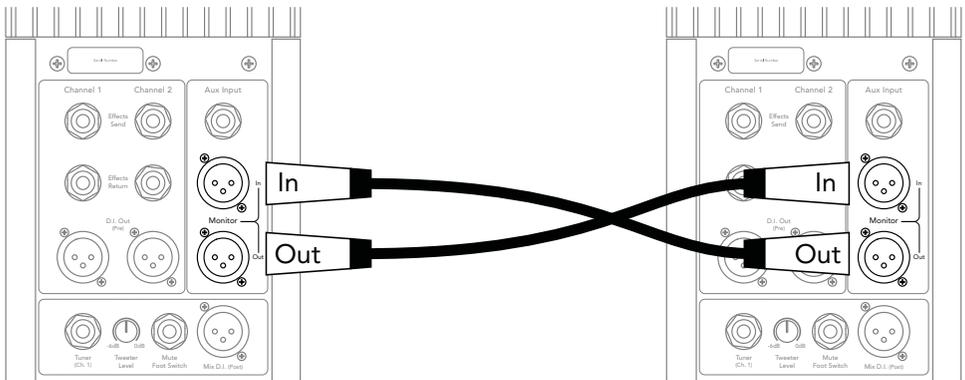
1. Start with the Anti-Feedback control turned down completely.
2. Turn up the level of the amp until feedback begins.
3. Flip between the two Phase positions. Each position will produce a different dominant feedback frequency. Listen to the frequencies and select the Phase position which allows the higher note to feedback while subduing the lower.
4. Adjust the Ant-Feedback clockwise until it subdues the frequency of the higher feedback note.

Since optimal tone is a matter of taste, one can also experiment with reversing the order, using the Phase switch to control the upper feedback note and the Anti-Feedback notch for the lower.

# Monitor Feature

The monitor feature on the SA220 allows two performers, each with a SA220, to “cross-feed” their EQ’d and mixed outputs to each other. This allows each player to turn up the other player’s mix as heard through their own SA220.

Connect two SA220s as shown, then turn up the Monitor knob to mix in the other performer’s SA220.



## Phantom Power FAQs

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**Q:** I have heard 48V phantom power can damage some audio devices. True?

**A:** Yes, phantom power can damage the following:

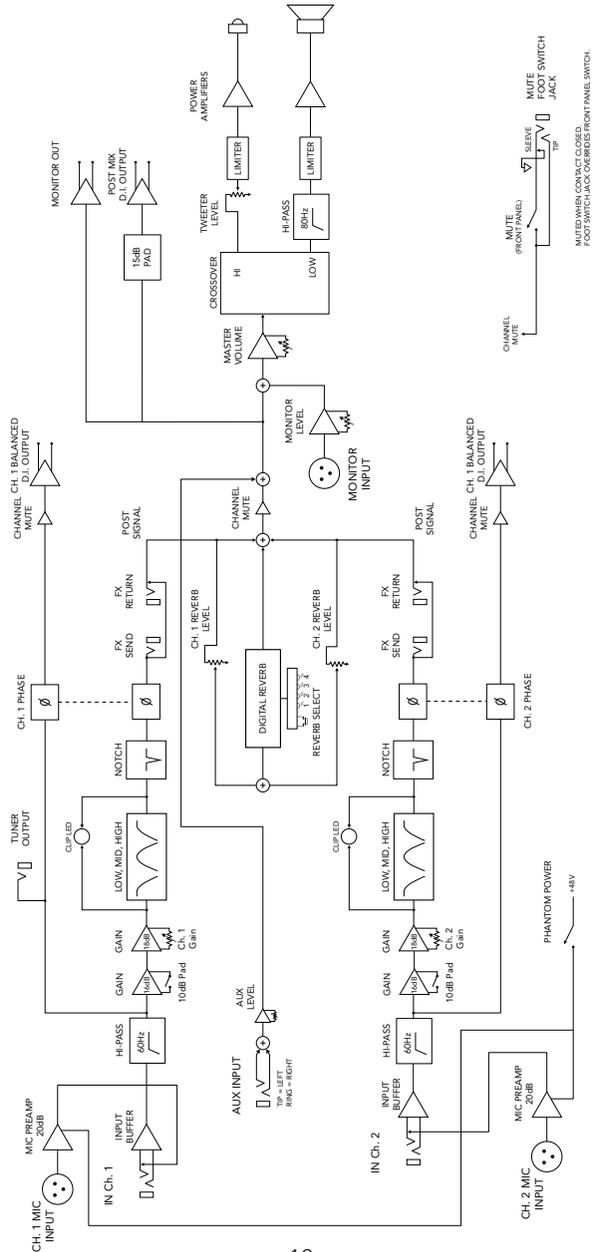
- 1: An unbalanced dynamic mic that has been modified for XLR.
- 2: A balanced line-level device that is not designed to accept phantom power (ex: some effects processors).  
Contact the manufacturer to confirm compatibility.
- 3: Some older balanced wireless receivers can be damaged by phantom power. Consult the manufacturer of the wireless unit for compatibility.
- 4: An instrument preamp or stompbox with an unbalanced output that is modified for XLR.
5. Many ribbon microphones.

**Q:** Which devices are safe with 48V phantom power?

**A:** All the following can be used safely with phantom power:

- 1: All balanced condenser microphones.
- 2: All balanced dynamic microphones.
- 3: Many new wireless units. Check with the manufacturer for compatibility.
- 4: A preamp/D.I. designed for phantom-power operation, such as the Fishman Pro-EQ Platinum.

# Block Diagram



## Technical Specifications

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### Channel 1 & 2 D.I. Out

Output Impedance 600 Ohm balanced  
Phantom power tolerant, ground isolated

### Channel 1 & 2 Effects Sends:

Output Impedance 2k Ohm  
Output Level -10dBV Nominal

### Channel 1 & 2 Effects Returns:

Input Impedance 20k Ohm  
Input Voltage +3dBV (1.4Vrms max)  
-10dBV Nominal

Sends and returns are compatible with battery operated effects processors

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### Mix D.I. Out:

Output Impedance 600 Ohm balanced  
Phantom power tolerant, ground isolated

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### Tuner Out:

Output Impedance 5k Ohm

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### Speaker System:

Woofers Six 4" patented dual-gap woofers with neodymium magnet  
Tweeter One 1" soft dome, neodymium magnet, ferrofluid cooled  
Tweeter Level Up to 6dB cut  
Crossover 4kHz (Bi-amplified with active crossover)

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### Amplifier:

Woofers 200Watts  
Tweeters 20Watts

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### Physical:

Dimensions 6.7" x 5.6" x 41.54" (16.92cm x 14.34cm x 105.5cm)  
Weight 24 lbs (11 kg) without stand and carry bag  
Ship Weight 43 lbs (19.5 kg)

Specifications and information in this manual subject to change without notice.

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