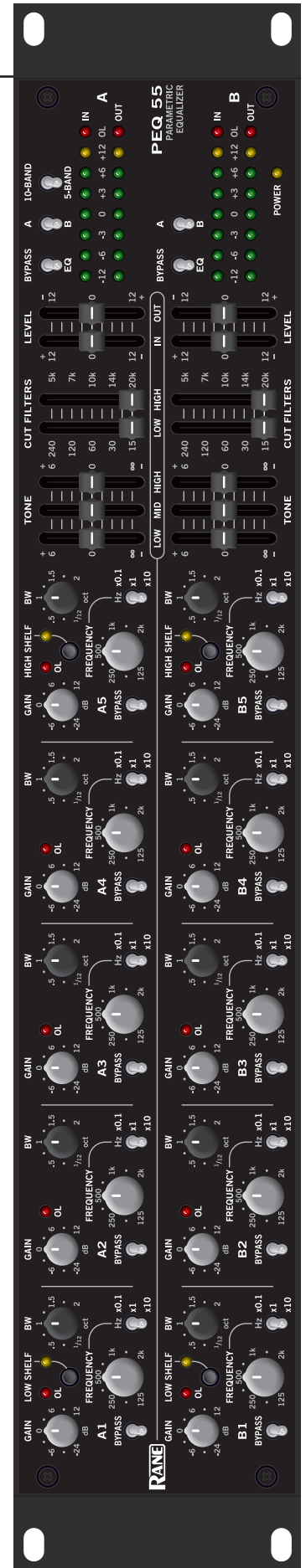




# PEQ 55

## PARAMETRIC EQUALIZER



# IMPORTANT SAFETY INSTRUCTIONS



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 ventilation openings. Install in accordance with manufacturer's instructions.
  8. Do not install near any heat sources such as radiators, 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 and plug from being walked on or pinched particularly at plugs, convenience receptacles, and the point where it exits from the apparatus.
  11. Only use attachments and accessories specified by Rane.
  12. Use only with the 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.
  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 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. The plug on the power cord is the AC mains disconnect device and must remain readily operable. To completely disconnect this apparatus from the AC mains, disconnect the power supply cord plug from the AC receptacle.
  16. This apparatus shall be connected to a mains socket outlet with a protective earthing connection.
  17. When permanently connected, an all-pole mains switch with a contact separation of at least 3 mm in each pole shall be incorporated in the electrical installation of the building.
  18. If rackmounting, provide adequate ventilation. Equipment may be located above or below this apparatus, but some equipment (like large power amplifiers) may cause an unacceptable amount of hum or may generate too much heat and degrade the performance of this apparatus.
  19. This apparatus may be installed in an industry standard equipment rack. Use screws through all mounting holes to provide the best support.
- WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

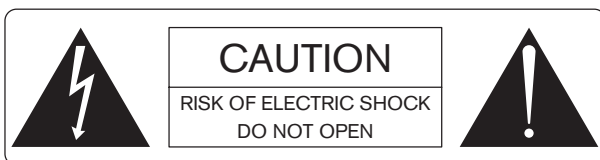
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**CAUTION:** Changes or modifications not expressly approved by Rane Corporation could void the user's authority to operate the equipment.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

## WARNING



To reduce the risk of electrical shock, do not open the unit. No user serviceable parts inside. Refer servicing to qualified service personnel.

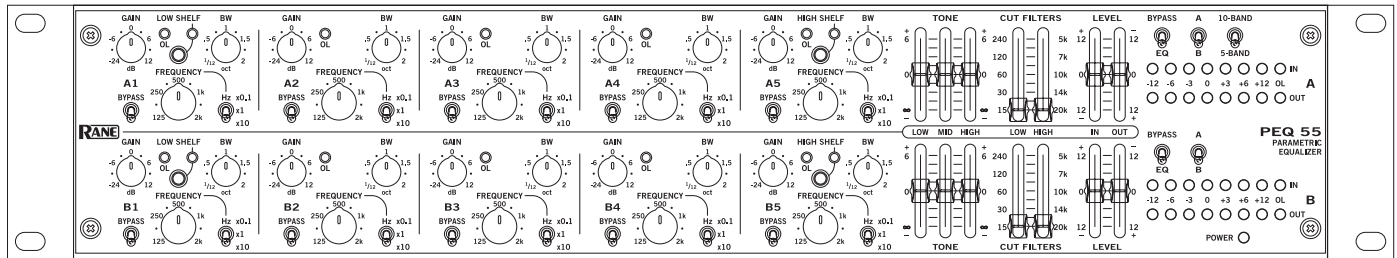
The symbols shown below are internationally accepted symbols that warn of potential hazards with electrical products.



This symbol indicates that a dangerous voltage constituting a risk of electric shock is present within this unit.



This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.



## Quick Start

Everyone knows how to use a parametric equalizer, right? You set the filter **GAIN** to its maximum and turn the **FREQUENCY** control until you find a pesky resonance that, when excited by a few extra dB, fries your speaker or causes hearing damage. There, problem solved. What did you say?

Connect the PEQ's Inputs and Outputs to virtually any type of audio device using XLR, 1/4" TRS or Euroblock connectors. You may use any combination of Outputs simultaneously if desired, but don't try to save a few bucks by plugging multiple sources into the Inputs and expecting them to mix — they won't. It will simply sound bad and no amount of EQ will fix it. Polarity convention on the XLR jacks is pin 2 positive, pin 3 negative and pin 1 shield (chassis ground).

With the wiring out of the way it's time to polish your golden ears and start making adjustments. Fire up some music and adjust the input and output **LEVELs** for good headroom and optimum signal-to-noise. Always heed the **OL** (overload) indicator! And check to make sure the channel **BYPASS/EQ** and individual filter **BYPASS** switches are properly engaged, and that the **FREQUENCY** multiplier switch (**x0.1**, **x1**, **x10**) is in the desired position.

Filter bands **A1** and **B1** feature a switchable **LOW SHELF** response. Bands **A5** and **B5** feature a switchable **HIGH SHELF**

response. Further flavor the mix using the channel **TONE** controls and **CUT FILTERS**.

The PEQ's **A/B** switches are an especially unique feature. Understand their use and you'll unlock some of the device's analog-controlled digital magic. Misunderstand their use and you're in for a few surprises. Repeat after me: *either audio channel can follow either set of filters, as set by the A/B switch.*

For example, in normal dual **5-BAND** mode set the top row switch to **A** (the Left channel), and the bottom row switch to **B** (the Right channel). These switches also affect the **CUT FILTERS**, **TONE** controls and **LEVELS**.

Or perhaps you want to equalize both sides of a stereo system identically using one set of controls. Set both switches to **A** and now the top row of filters controls both audio channels. Set both switches to **B** and use the bottom row of filters to create a totally different EQ curve. Do an A/B comparison of the two curves by toggling the (you guessed it) **A/B** switches. Try doing *that* with an analog EQ.

Need more filters? Switch to **10-BAND** mode and you now have ten fully overlapping filters to use on a stereo or mono source. The outputs mute momentarily when switching between **5-** and **10-BAND** modes.

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## Controls and Operation

### Parametric filter controls

**GAIN:** Range is +12 dB to -24 dB, with a 0 dB center detent.

**BW (bandwidth):** Range is  $1/12$  to 2 octaves with each dot representing  $1/4$  octave.

**FREQUENCY:** Total range is 12.5 Hz to 20 kHz, with the multiplier switch.

Each **Hz** multiplier covers a 4 octave range:

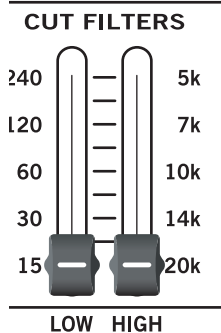
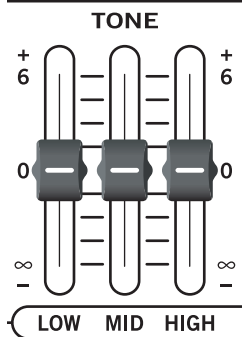
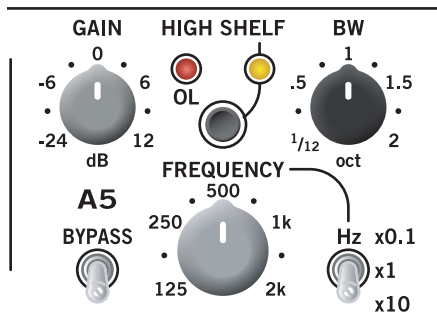
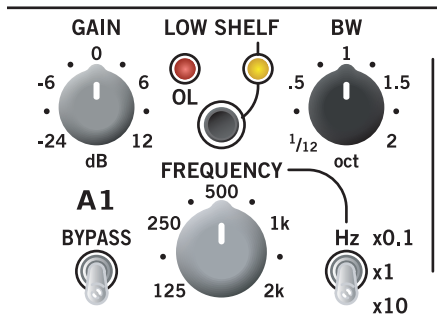
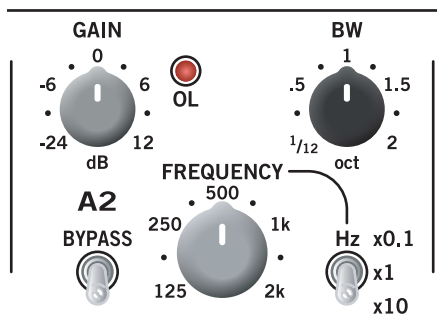
**x0.1** operates from 12.5 Hz to 200 Hz

**x1** operates from 125 Hz to 2 kHz

**x10** operates from 1.25 kHz to 20 kHz

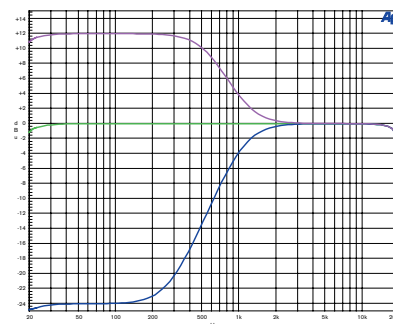
Individual switches **BYPASS** each filter without affecting the others.

Individual **OL (overload)** warning indicators light at 0 dBFS (digital clipping).



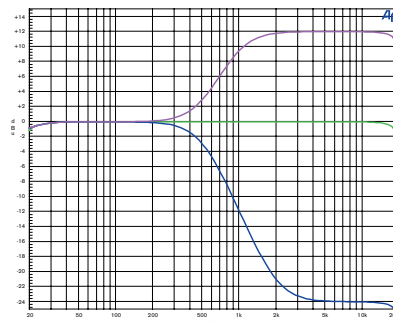
### Low Shelf

Filters **A1** and **B1** include a **LOW SHELF** mode. When the LOW SHELF switch is *in*, the yellow indicator is lit and the filter is in LOW SHELF mode. Filter **B1** LOW SHELF mode is disabled in 10-BAND mode. The BW control has no effect in LOW SHELF mode. The minimum Low Shelf frequency is 25 Hz (0.1 multiplier). Settings below 25 Hz default to 25 Hz.



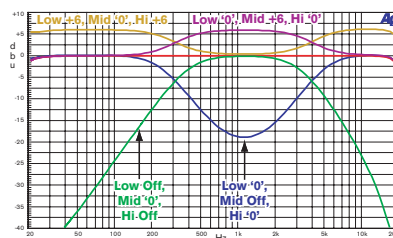
### High Shelf

Filters **A5** and **B5** include a **HIGH SHELF** mode. When the HIGH SHELF switch is *in*, the yellow indicator is lit and the filter is in HIGH SHELF mode. Filter **A5** HIGH SHELF mode is disabled in 10-BAND mode. The BW control has no effect in HIGH SHELF mode.



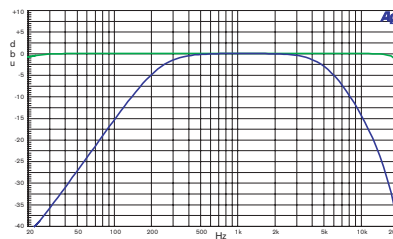
### Tone controls

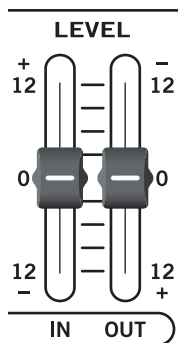
Independent, 3-band **TONE** controls are provided for each channel. The Low-Mid cutoff is 300 Hz. The Mid-High cutoff is 4 kHz. These Tone controls are enhanced, 2<sup>nd</sup>-order filters. The HIGH and LOW filters are shelving. Phase shift is zero degrees with the controls at their center detent. Only the A-channel Tone controls are active in 10-BAND mode.



### Cut Filters

2<sup>nd</sup>-order Butterworth **LOW-** and **HIGH-CUT FILTERS** are provided for each channel. The range of the LOW-CUT Filter is 15 Hz to 240 Hz. The range of the HIGH-CUT Filter is 5 kHz to 20 kHz. Only the A-channel controls are active in 10-BAND mode.





## In and Out Level controls

**LEVEL** controls serve three purposes, with the assistance of the **In** and **Out Meters**:

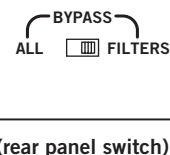
1. Adjust the **IN** signal level for good headroom and signal-to-noise.
2. Adjust the **OUT** signal level to compensate for changes in signal level due to filter boost/cut settings.
3. Adjust sensitivity. The operation of the **OUT LEVEL** control is reversed from the **IN LEVEL**. Pushing the control *up* **reduces** gain. Pushing the control *down* **increases** the gain. To easily adjust sensitivity without affecting the output signal level, grasp the **IN** and **OUT** controls and move them together. Only the A-channel **IN** and **OUT LEVELs** are active in **10-BAND** mode.

## In and Out Meters

**IN** and **OUT Meters** are peak responding and indicate signal level in dBu. Peak-dBu is held and displayed for 2 seconds. Attack is instantaneous. Decay is 500 ms for a 20 dB step. A and B meters remain active in linked 10-band mode.

## EQ Bypass

**BYPASS** switches have two modes of operation. If the rear panel switch is set to **BYPASS ALL**, all filters *and* level controls are bypassed. If this switch is set to **BYPASS FILTERS**, *only* the filters are bypassed. Filters include Parametric, Tone and Cut. An automatic relay bypass hardwires the Inputs to the Outputs when the **POWER** is off.



## A / B control switches

**A / B** switches determine which set of *controls* is used by channel A and channel B. There is a 100 ms mute to allow the filters to settle when the A/B control switch is changed. The only control *not* affected by the A / B switches is **BYPASS**. A / B control switches allow:

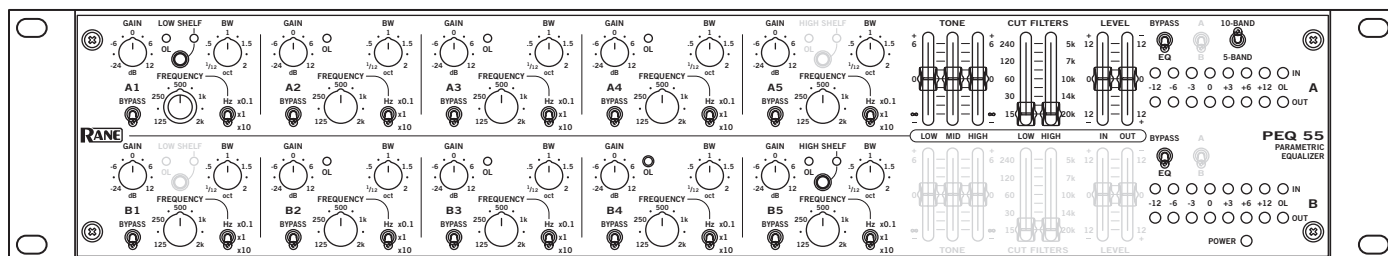
- Independent, dual mono operation
- A/B setting comparison
- 5-Band linked stereo operation (A or B controls affect both channels)
- Two “analog memories”

See the Applications section for example uses of the A / B switches.

## 10-Band mode / 5-Band mode

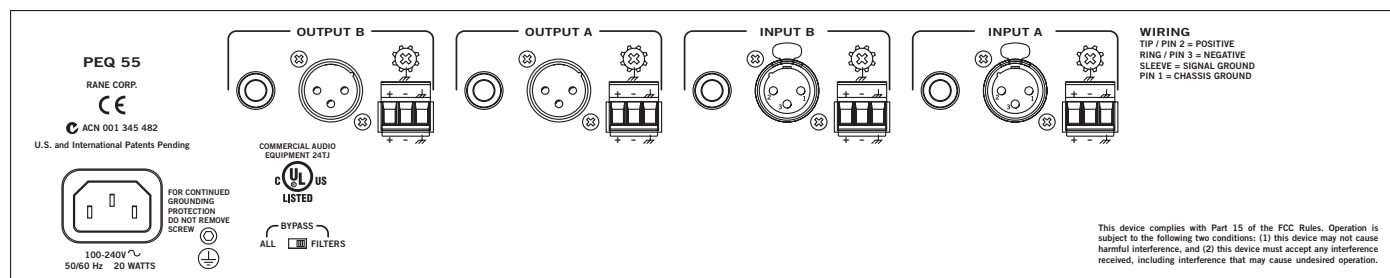
In **5-BAND** mode, the **PEQ 55** provides two independent 5-band parametric equalizers. A or B controls may be used to control each channel as described above. In **10-BAND** mode, both channels are stereo linked and operation is as follows:

1. All 10 filters affect both A and B Outputs, permitting mono or stereo linked operation.
2. Meters remain independent and active for both channels.
3. Channel A and B **BYPASS** switches remain active.
4. **A1 LOW SHELF** and **B5 HIGH SHELF** modes are available. (A5 high-shelf and B1 low-shelf filter modes are disabled.)
5. Channel A **TONE**, **CUT FILTERS** and **LEVEL** controls are active. (Channel B tone, cut-filter and level controls are disabled.)
6. A / B control switches are inactive.
7. The Outputs mute for 200 ms when switched between 10-BAND and 5-BAND modes.



The active control surface for 10-BAND mode. Inactive controls are grayed out.

## Rear Panel Connections



## Channel A and B INPUTS

Plug the outputs of the mixer or other source to these Inputs. Choose only one type of connector — the ¼" TRS, XLR, and Euroblock *do not sum*. *Note: In agreement with IEC and AES/ANSI standards, wiring convention is pin 2 positive, pin 3 is negative (return), pin 1 is shield chassis ground.* Refer to the *Sound Sytem Interconnection RaneNote*, supplied with this manual, for correct wiring to other connectors or unbalanced devices.

## Channel A and B OUTPUTS

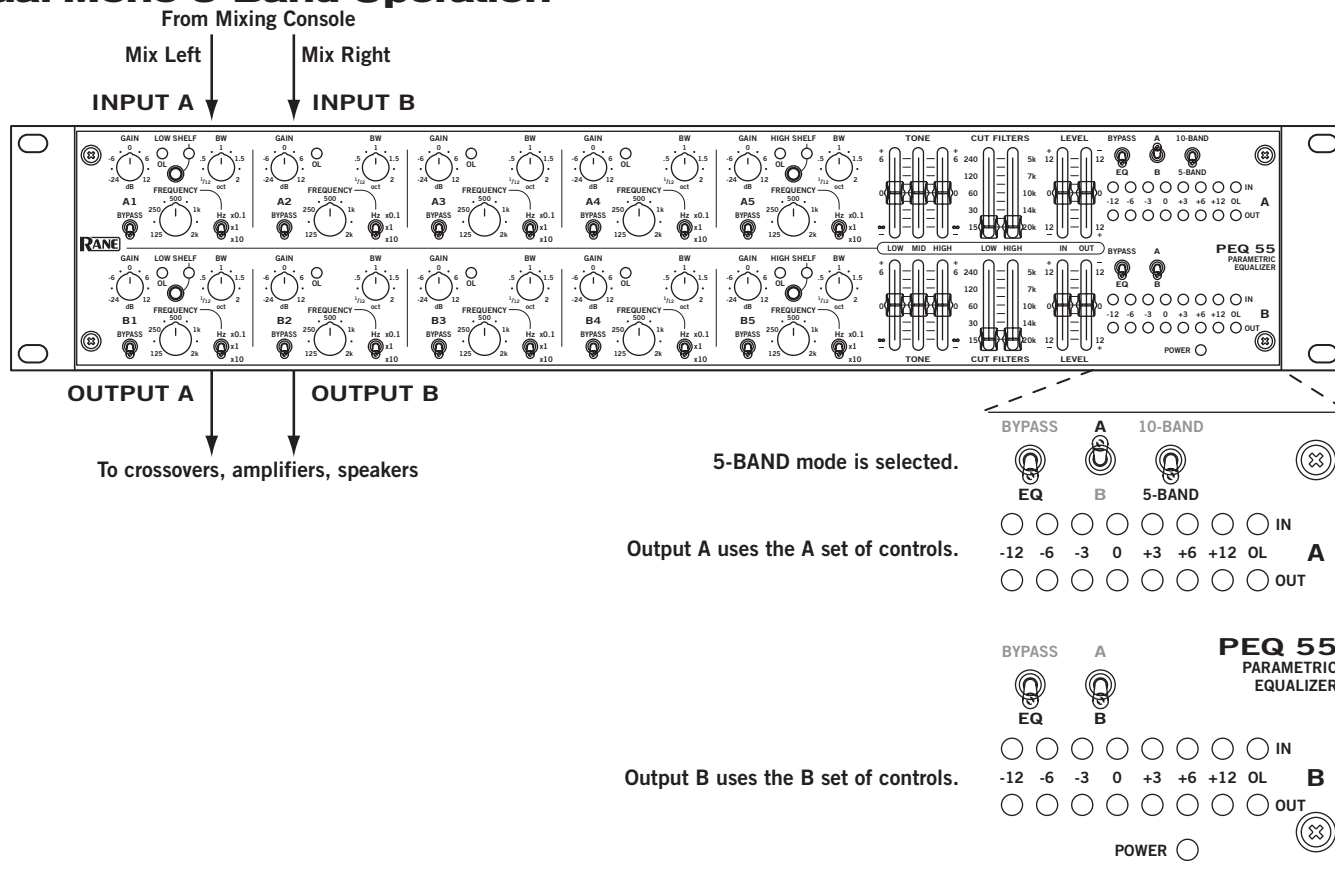
Connect these to the Inputs of an amplifier or mixer. The Outputs may be used simultaneously to drive different devices at once. All Outputs are balanced and follow the same “pin 2 hot” convention as the Inputs.

### Power connector

The PEQ 55 uses a universal internal switching power supply that accepts 100 to 240 VAC at 50 to 60 Hz, allowing it to work in most countries. The line cord attaches to a standard IEC appliance inlet. A US line cord is shipped with each unit.

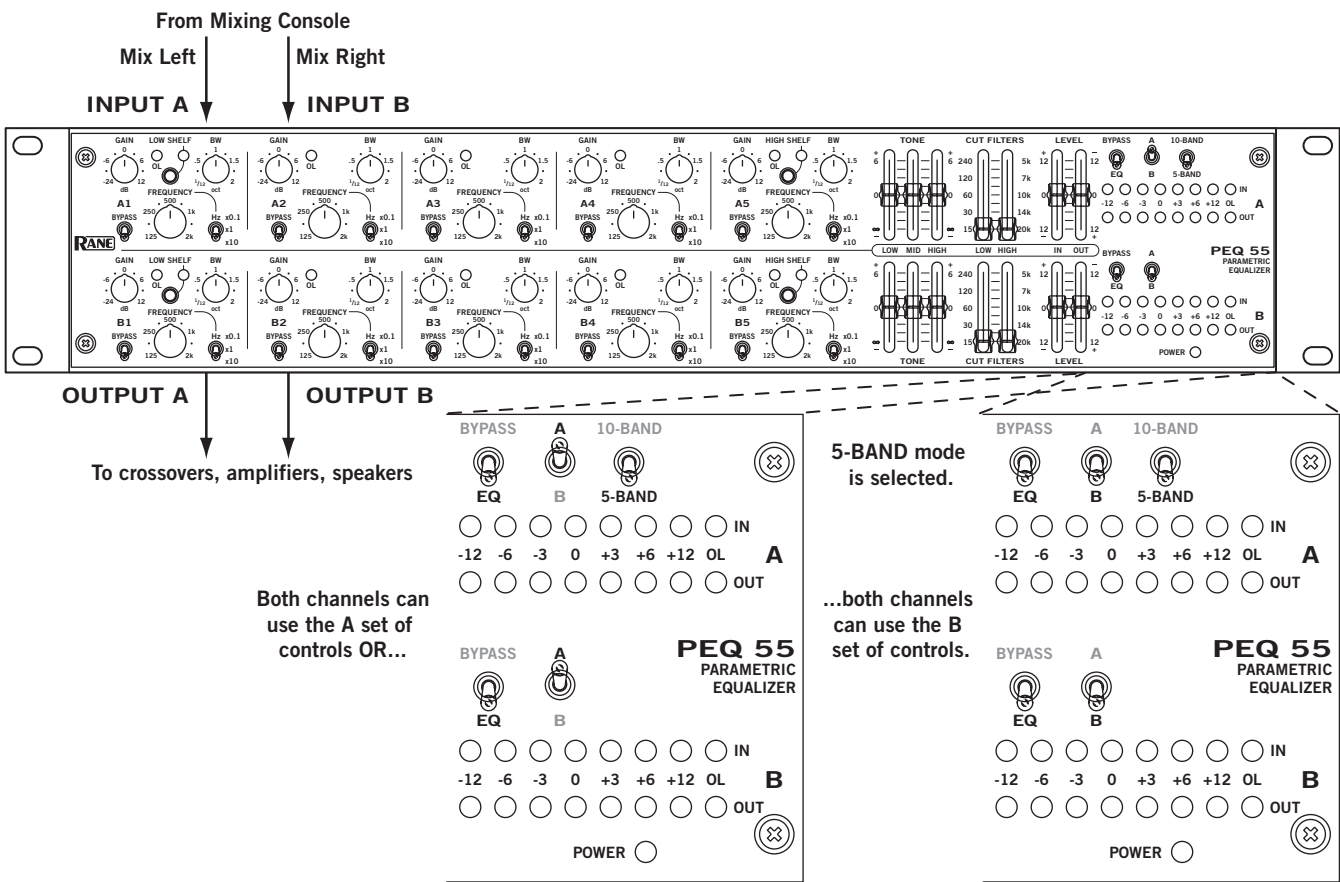
## APPLICATIONS

## Dual Mono 5-Band Operation

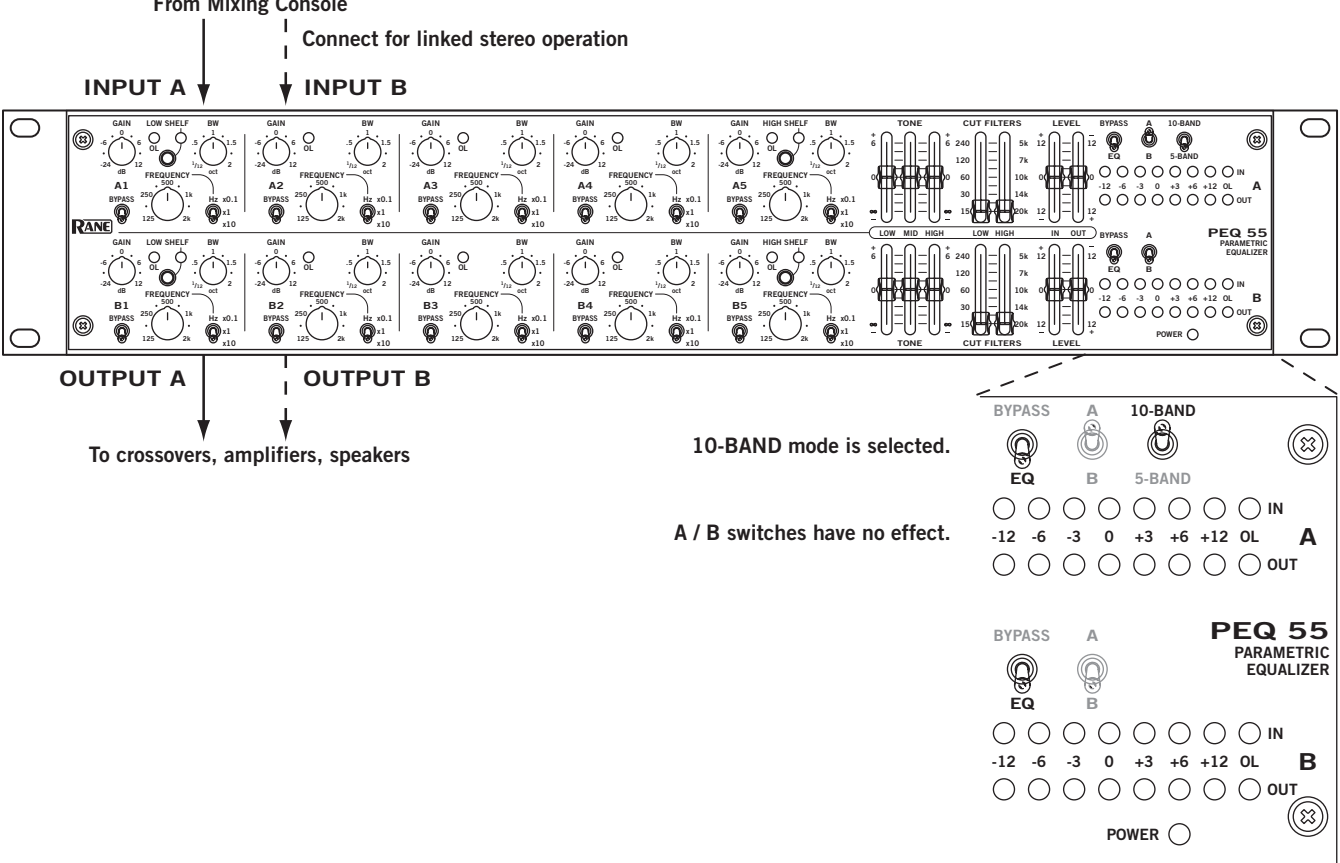




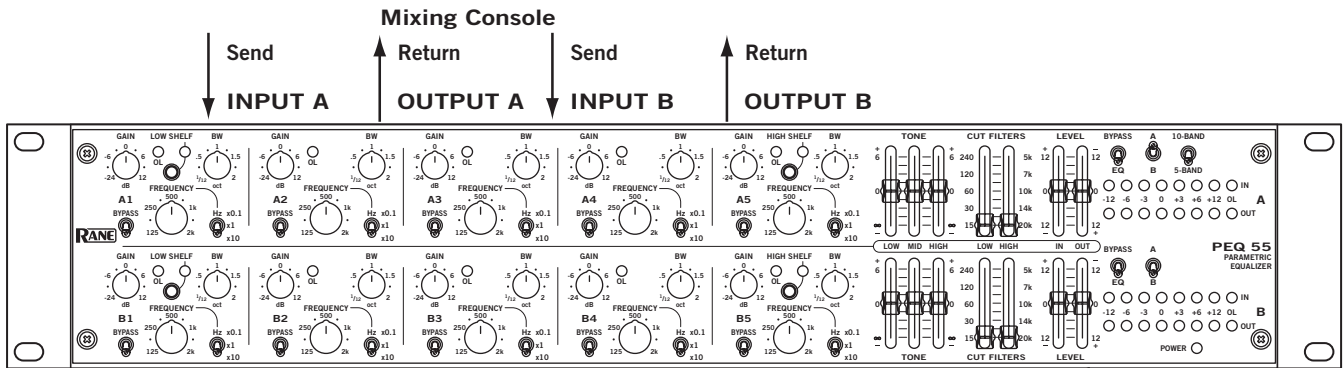
# Linked Stereo 5-Band Operation



# Mono or Linked Stereo 10-Band Operation

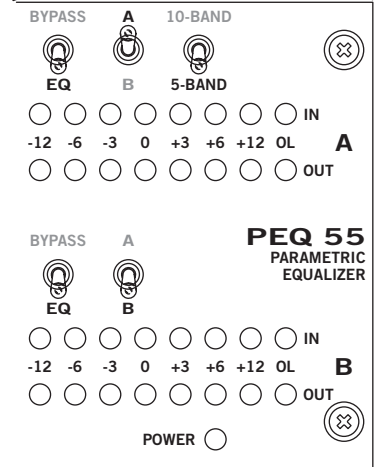
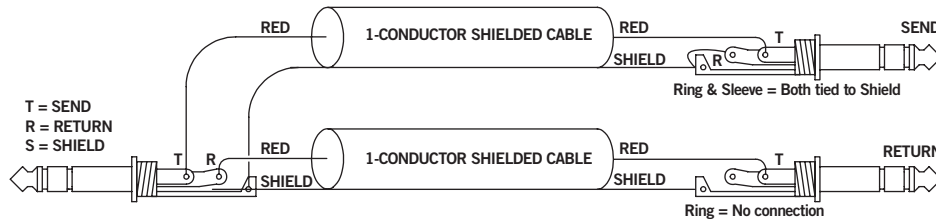


# Inserting the PEQ 55 on an Instrument Channel or Group Output

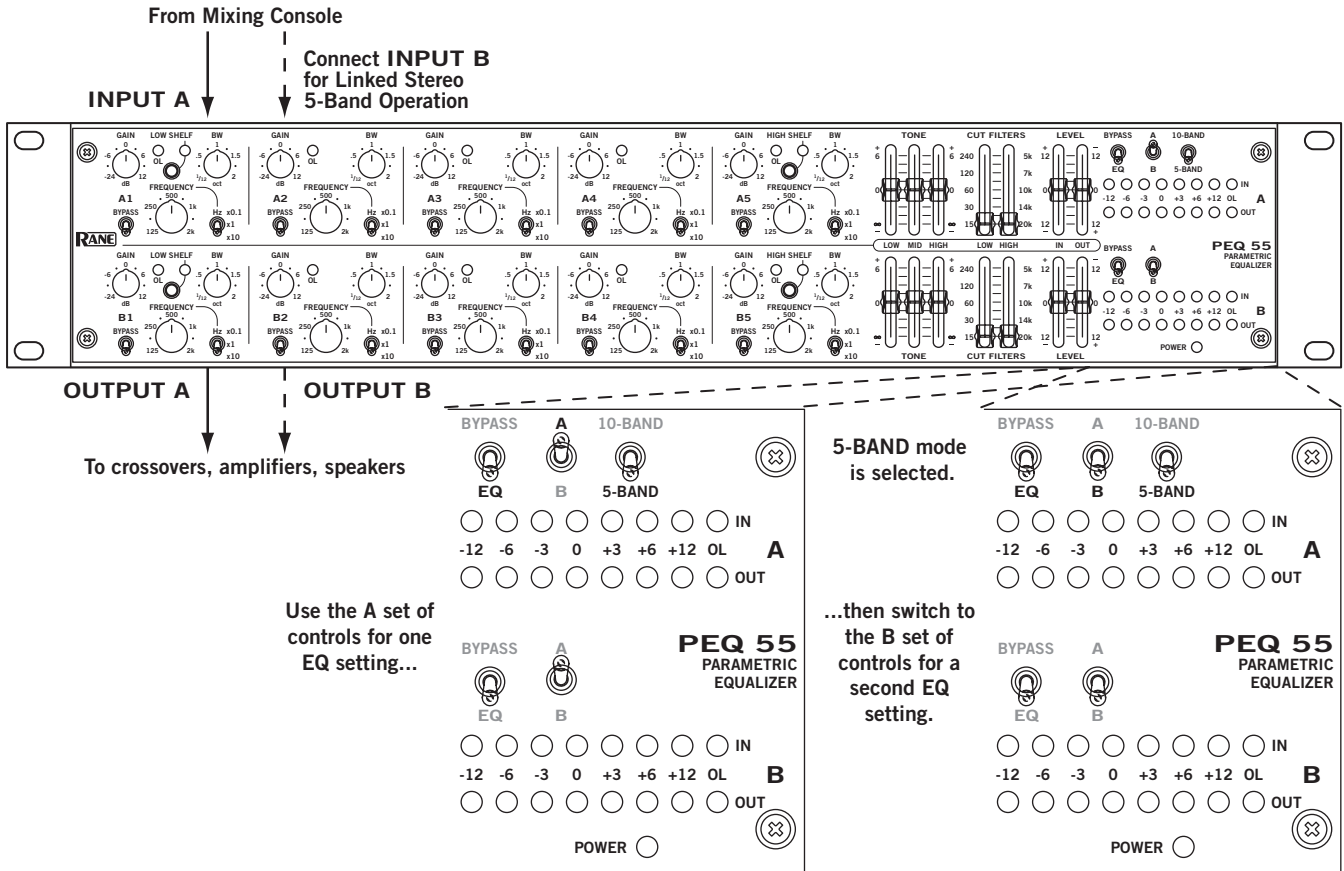


**Important:**  
See the Sound Sytem Interconnection RaneNote (included with this manual) for information about connecting balanced and unbalanced equipment.

If your mixer uses TRS Insert jacks (unbalanced), we recommend using cable wired as shown below.



## Using the A / B Controls to Switch Between Two Different EQ Settings





## PEQ 55 Settings Templates

[illegible][illegible]

## **Additional Resources**

Unless you truly have golden ears, most people have a hard time knowing exactly where to set each control. Luckily there are several computer-based tools available to help.

### **Goldline**

The TEF20 performs Time, Energy and Frequency measurements using the science of Time Delay Spectrometry (TDS)  
*[www.gold-line.com/tef/tef.htm](http://www.gold-line.com/tef/tef.htm)*

### **Sia Software Company**

SmaartLive and SIA Acoustic Tools sound system measurement, acoustic analysis and real-time control software.  
*[www.siasoft.com](http://www.siasoft.com)*

### **Terrasonde**

The Audio Toolbox combines test procedures and acoustic analysis functions in a handy little package.  
*[www.terrasonde.com](http://www.terrasonde.com)*