

### QUICK START

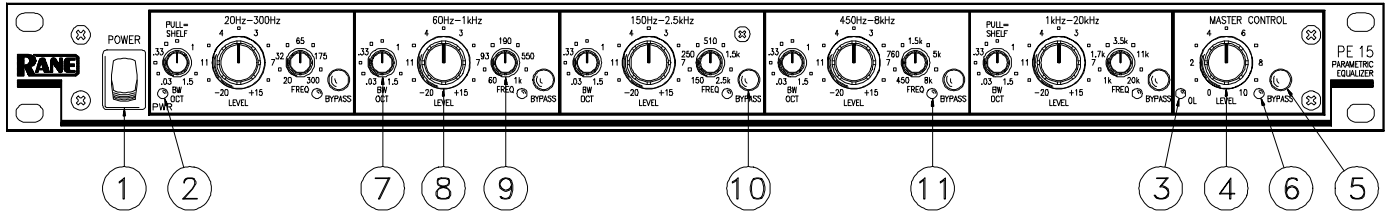
If all else fails, read the manual. Yeah, yeah. But nothing is going to fail and you, being one smart cookie, don't need to read the stupid manual. But you should read this section just to cover your affairs. So, quickly, here goes.

The PE 15 has few hidden gotchas. One of these may be the shelving feature of Bands 1 and 5. Remember that pulling on the bandwidth (BW) knob causes it to come forward with a positive click, indicating the Shelf Mode is active. Use Shelving Bands 1 and 5 like Bass and Treble tone controls, where you want control over the whole top or bottom ends of the spectrum.

Hook-up is simple. The PE 15 accepts all combinations of balanced or unbalanced, 3-pin (XLR), or 1/4" TRS or TS connectors. However, note the **INPUT** connectors are wired in parallel and may not be used together. **Use only one at a time. They will not function as a summing type of Input for two different sources, but they may be** used in a daisy chain fashion to feed other units. On the other hand (to randomly pick a hackneyed expression), you may use the paralleled **OUTPUTS** to drive two destinations.

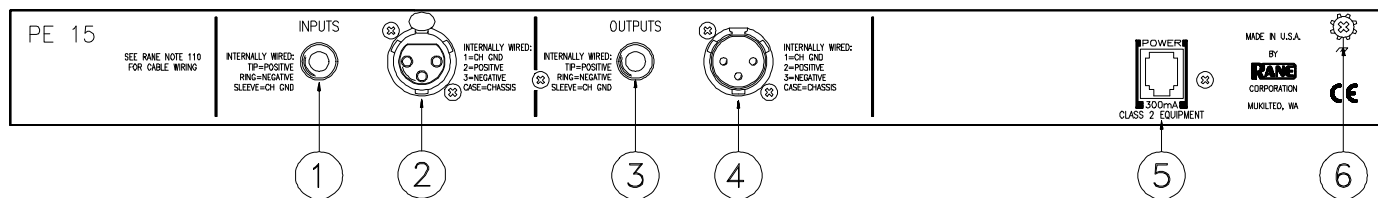
*Never connect anything except a Rane approved AC power supply to the thing that looks like a red telephone jack on the rear of the PE 15.*

# FRONT PANEL DESCRIPTION



- 1. POWER switch.** The key to life in any electronic device. This switch allows power to flow from the source to the very soul of the PE 15, thereby empowering all its vital functions.
- 2. POWER indicator.** When this yellow LED is lit, the unit is ready to serve.
- 3. OVERLOAD indicator.** This red LED illuminates whenever the signal level at the Input, Output, or any of the five equalizer stages comes within 3-4 dB of clipping.
- 4. MASTER LEVEL control.** Full counterclockwise rotation of this control provides full Input attenuation; full clockwise rotation yields 20 dB of gain through the unit. Unity gain is approximately 12:00, (Central Daylight Time).
- 5. Overall BYPASS switch.** Engaging this pushbutton provides a complete hard-wire bypass of the PE 15, including signal ground. In the *out* position, the Input to the unit is processed through all of the active electronics. This is a passive control requiring no power to operate.
- 6. Overall BYPASS indicator.** A lit red LED indicates the unit is in the Bypass mode.
- 7. BANDWIDTH controls (Q).** Full counterclockwise rotation yields a bandwidth of  $1/_{30}$  octave ( $Q=43$ ) in the respective filter, while full clockwise rotation gives a 1.5 octave ( $Q=0.9$ ) bandwidth. (Pulling this control to the out position on Bands 1 and 5 switches the filters to their Shelf Mode.)
- 8. Filter LEVEL controls.** The center detent position guarantees flat response through the respective filter due to its grounded center-tap. Full clockwise rotation delivers +15 dB of boost, while full counterclockwise rotation yields -20 dB of cut.
- 9. FREQUENCY sweep controls.** Controls the center frequency of the filter band (or the Turnover Frequency for Shelf Mode). Available sweep range is approximately four octaves.
- 10. Filter BYPASS switches.** Each of the five filter BYPASS switches disables the respective filter providing instant comparison between flat response and equalized response.
- 11. Filter BYPASS LED.** Illuminates when the band is in BYPASS.

## REAR PANEL DESCRIPTION



- 1. 1/4" TRS INPUT jack.** A differentially active balanced, auto unbalanced 1/4" Input connector; tip = positive, ring = negative, and sleeve = chassis ground. For unbalanced operation, use a 2 conductor (mono) plug; connect the tip to the signal line and the sleeve to ground. If a 3 conductor plug is used for unbalanced operation, be sure to ground the ring. This Input parallels the 3-pin connector and may be used for daisy chaining purposes, *but may not be used to sum two different Inputs.*
- 2. 3-pin (XLR) INPUT jack.** This Input parallels the 1/4" connector and is wired: pin 1 chassis ground (shield, screen, etc.), pin 2 positive, and pin 3 negative. For unbalanced applications, be sure to use pin 2 as hot and *ground pin 3.* Making this connection engages the auto unbalanced Input mode. As above, you may use this connector for daisy chaining to drive other equipment, but it *must not be used for summing purposes.*
- 3. 1/4" TRS OUTPUT jack.** This jack is an active balanced Output. The tip is signal positive, the ring is signal negative and the sleeve is chassis ground. This jack parallels the 3-pin Output connector and may be used simultaneously to give two Outputs. For unbalanced applications, the preferred choice is to use a TRS (tip-ring-sleeve) plug and leave the ring open; however, a standard TS (mono) plug may be substituted without damage.
- 4. 3-pin (XLR) OUTPUT jack.** This Output parallels the above. Wiring is per IEC/ANSI/AES standards: pin 1 ground, pin 2 positive, and pin 3 negative.
- 5. Remote POWER supply input.** This unit is supplied from the factory with a Model RS 1 Remote AC Power Supply suitable for connection to this jack. This unit requires an 18 volt AC center-tapped transformer only. *This is not a telephone jack. Never use a power supply other than the one supplied or a Rane approved replacement.*
- 6. Chassis ground point.** A 6-32 screw is used for chassis grounding purposes. See below for details.

### CHASSIS GROUNDING

If after hooking up your system it exhibits excessive hum or buzzing, there is an incompatibility in the grounding configuration between units somewhere. Your mission, should you accept it, is to discover how your particular system wants to be grounded. Here are some things to try:

1. Try combinations of lifting grounds on units that are supplied with ground lift switches or links.
2. If your equipment is in a rack, verify that all chassis are tied to a good earth ground, either through the line cord grounding pin or the rack screws to another grounded chassis.
3. Units with outboard power supplies do NOT ground the chassis through the line cord. Make sure that these units are grounded either to another chassis which is earth grounded, or directly to the grounding screw on an AC outlet cover by means of a wire connected to a screw on the chassis with a star washer to guarantee proper contact.

Please refer to RaneNote 110, "Sound System Interconnection" elsewhere in this manual for further information on system grounding.

## PE 15 CONNECTION

The PE 15 is compatible with all line-level (-10 dBV and +4 dBu) interfaces and products. However, guitars, microphones and other low level products *must* be preamplified before connecting to the PE 15.

The proper connection of this unit to a system is a relatively simple matter, the specifics of which may vary greatly depending on the application. Use a PE 15 anywhere line-level frequency contouring is required. This includes live sound reinforcement systems, recording studios, clubs, etc.

The most common location to insert a parametric equalizer is immediately preceding the active crossover or power amplifier. This provides the means to correct loudspeaker deficiencies and other acoustic corrections required in any system for high quality reproduction. Many systems employ both a graphic and parametric equalizer connected in series. The graphic being used to correct for acoustic anomalies, while the parametric helps source correction, loudspeaker compensation and feedback control. In these situations, the order of placement is not critical, however the PE 15 does feature true actively balanced differential outputs which may be a consideration in installations requiring very long cable runs between the equalizers and the power amplifiers or crossovers.

The ¼" TRS and 3-pin (XLR) INPUT connectors are wired in parallel and are actively balanced. These Inputs are provided primarily to give the user a choice between two types of connectors. *They will not sum from two different sources.* For further information on this subject, please consult the RaneNote titled, "WHY NOT WYE?" (available from the factory or the Rane web site). The two Inputs may be used in a daisy chain application where the Input to the PE 15 also must feed another piece of equipment.

The outputs of the PE 15 also provide the choice between ¼" TRS connectors and 3-pin variety. They also are wired in parallel and are actively balanced. Both Outputs may be used simultaneously.

All 3-pin connectors used by Rane are wired per the IEC/ANSI/AES standard as follows: pin 2 positive, pin 3 negative and pin 1 chassis ground.

Unbalanced use of a PE 15 requires you to take some particular steps in wiring. On the Input, use either a mono ¼" connector (no ring), or short pin 3 to pin 1 and drive pin 2 for 3-pin connectors. On the Output leave pin 3 open and take the signal from pin 2 (hot) and pin 1 (chassis ground). When using ¼" plugs, the preferred arrangement is to use a tip-ring-sleeve version and leave the ring open. Alternatively, a mono plug may be used.

## OPERATING INSTRUCTIONS

Once the PE 15 is properly installed, it is then time to twist some knobs. Power up the system in the normal fashion, always turning on the power amplifiers last. It is good practice to start at the head of the system, turning on any sound sources and mixers first, equalization devices next, and finally power amplifiers. Following this power-up sequence minimizes the change of high gain stage turn-on transients finding their way to the loudspeakers. It is very wise to start with the PE 15's MASTER CONTROL all the way down and the five LEVEL controls set to their center detents. This eliminates the possibility of surprises encountered by having 15 dB of boost centered at a feedback frequency!

With either a canned or live source applied, advance the MASTER CONTROL until normal system gain is achieved. Now you are ready to make some adjustments. A detailed discussion on room equalization lies outside the scope of this manual; however, a few words can't hurt.

Experienced sound people almost always use some sort of realtime analyzer (RTA) as an aid in setting equalization. An RTA allows you to see the frequency response changes as you do them. This is invaluable in achieving better sound.

As a notch filter, the PE 15 works very well in increasing system headroom by attenuating system peaks that create feedback problems. The obvious goal in notching is to remove only the problem areas and nothing else. With this in mind, it is always a good idea to first try to notch out feedback with the BW controls set to their full counterclockwise positions. The acoustic resonances causing feedback are generally so narrow that a filter bandwidth set at .03 ( $1/30$ ) octave easily cures the problem. To chase down the feedback frequency, start with the filter LEVEL control set to its full -20 dB position. With the BW still set to minimum, tune the FREQ control until the feedback goes away. It shouldn't take too much fine tuning to find the center of the resonance. Once you have achieved stability, advance the MASTER CONTROL until the feedback starts to reappear, then back it down slightly. If a -20 dB cut won't cure the problem, the resonance is extreme and must be dealt with in other ways. For example, move the speakers or the mics; hang some drapes; move some walls; burn down the building; or simply unplug the system—something must give!

### REGARDING PE15 NOISE

You may experience noise when using this unit with one or more bandwidth (BW) controls set to the narrowest (.03) possible setting. This is the *noisiest* possible setting. The most usual use for this setting is deep notching. e.g. for eliminating a specific frequency, such as problems caused by feedback or other oscillations. Most often only one filter is required. It should also be noted, there is a trade off between noise and desired results, when using narrow bandwidth notching. For example, where the system correction achieved out weighs the noise levels generated by the required setting.