

## QUICK START

The GE 27 and GE 14 are extremely accurate instruments capable of precise equalization down to a fraction of a dB. However, equalizing a sound system by ear is very difficult to do with any degree of accuracy, even with years of training.

To obtain the best performance from your equalizer it is strongly recommended that you use some type of realtime analyzer. Any equalizer used in conjunction with a well designed analyzer system will be significantly more effective in reducing feedback and providing consistent, optimum sound quality in varying acoustical environments.

If you don't have an analyzer (such as the Rane RA 27), then you will have to resort to Section 2408, paragraph 84-B of the Performing Musicians Code, which reads:

“Fiddle with it until it sounds good.”

This fiddling process can be both time-consuming and frustrating with a 1/3 or 2/3 octave equalizer—you can end up chasing your own tail until all the sliders wind up at full boost, unless you have a basic procedure to follow. If you haven't one of your own, here's a procedure you might try.

Point to remember: All things are relative. This applies especially well to tonal perception. What sounds like too little bass could really be too much midrange, and so on.

The idea is to start with some frequency area and use it as a reference for further comparison; then leave this area pretty much alone and make your adjustments elsewhere. Otherwise you might wind up hopelessly trapped in Murphy's EQ Syndrome, which roughly reads:

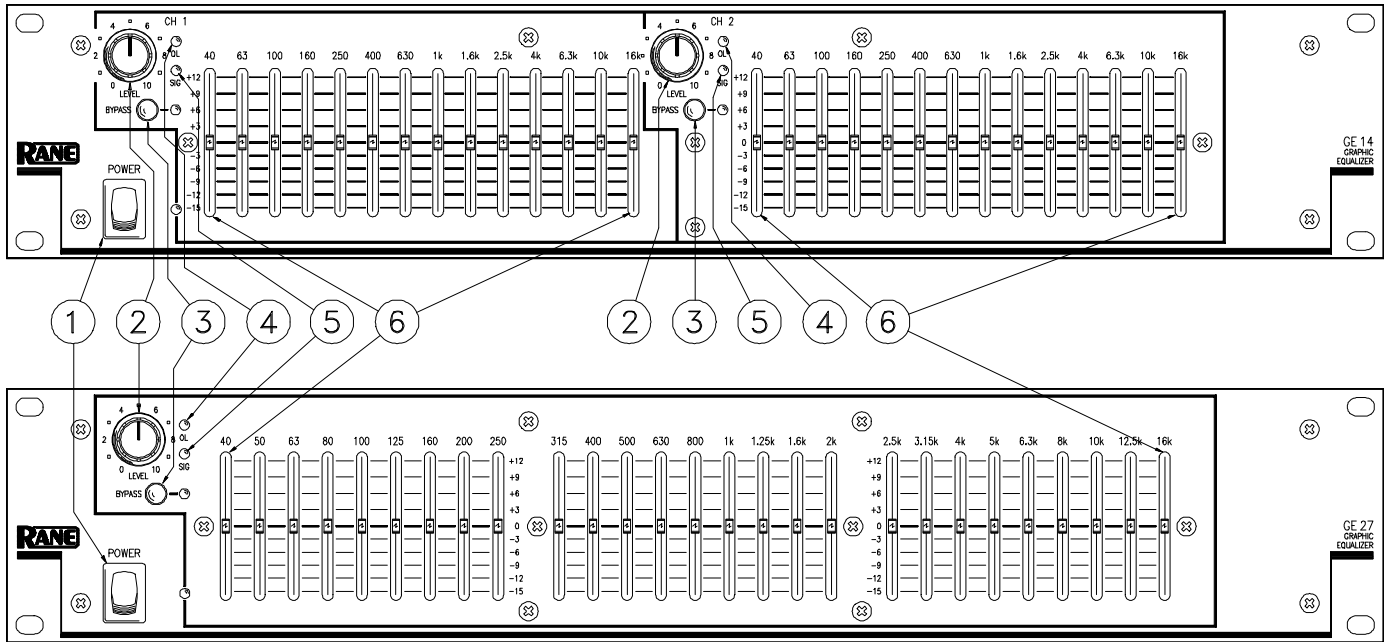
“O.K., we need more low end here; now add a little presence at 10k or so; hmmm, mid range is off a little, so I'll bump up 800 and 1k; now I need more punch, so up with 80, 100 and 125; darn, presence is still not there, so more of the 5k and 6.3k, vocals seem a little buried—needs more 1.25k and 1k...” and so on until all the sliders are near full boost and you have a high-dollar volume control.

To avoid this, choose an area in which you know your speakers perform well, such as around 1kHz. Leave this area at roughly center position on the sliders and then compare bass, mid bass, mid highs and highs to the 1kHz area. Then if, for example, the overall sound appears to be “boomy”, muddy, or lacking in midrange, turn *down* the mid bass and/or mid highs—don't turn *up* the 1kHz midrange area instead, or you'll be headed right into the vicious circle.

Once you are familiar with your own system, you will develop your own procedure. The golden rule is:

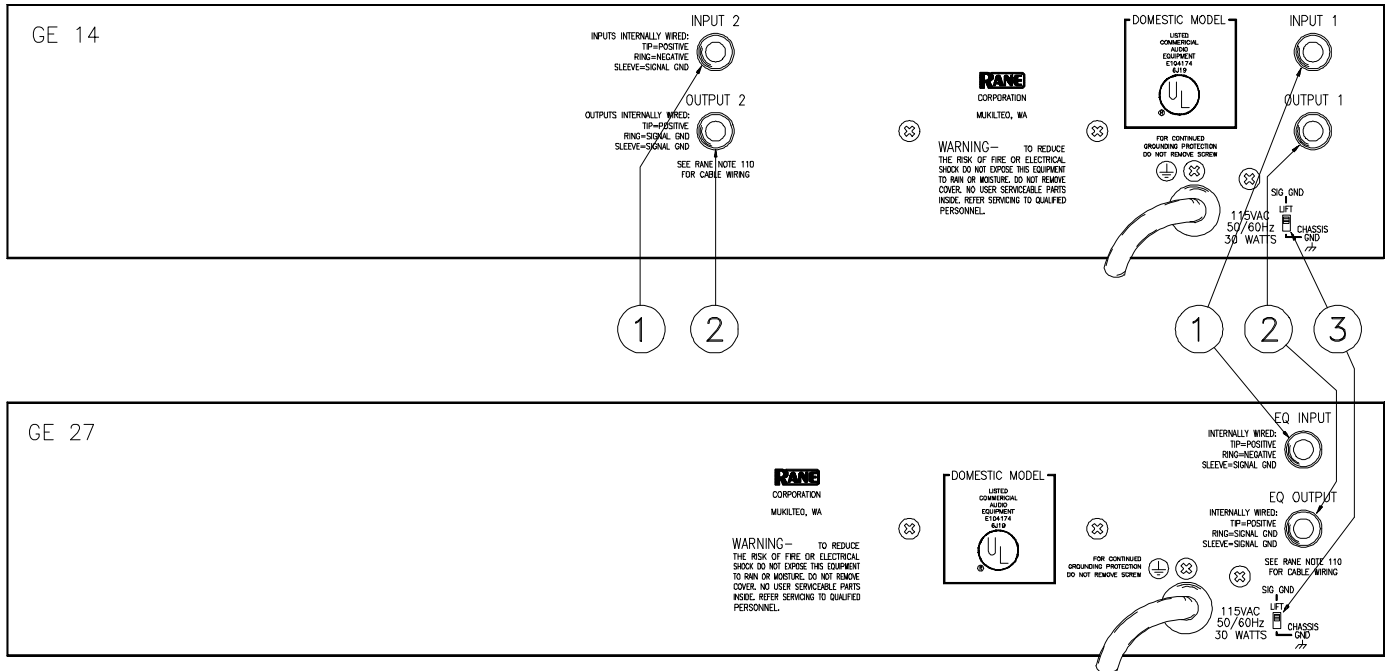
“Whatever Works, Works.”

# FRONT PANEL DESCRIPTION



- 1. POWER Switch:** It comes as no surprise that this switch turns the GE 27/GE 14 on and off. An LED is located to the right of this switch that illuminates when the unit is turned on. *Each output of the GE 27/GE 14 is fitted with a relay which provides delayed turn-on and instant turn-off to avoid switching transients.*
- 2. LEVEL Control:** This sets the overall Level through the GE 27, or the Level of each Channel through the GE 14. Use this control to turn down the Input if the overload LED ever lights. *The approximate unity gain position of the knob, with all sliders centered is "7.5". Full clockwise position of the knob yields 6-8dB of line gain with sliders centered.*
- 3. BYPASS Switch:** This is a passive or "hard-wired" type Bypass, which means that the Equalizer is completely Bypassed when this switch is *in*. The Input jack is connected directly to the Output jack internally, with no active elements in series. The red LED right next to the BYPASS switch lights whenever it is engaged.
- 4. OVERLOAD Indicator:** This red LED lights whenever signal through the GE 27/GE 14 reaches 4dB below clipping. Occasional flashing of this LED is usually safe, but consistent blinking means there is danger of clipping.
- 5. SIGNAL PRESENT Indicator:** This green LED lights with any Input of -20dBu or greater. This indicator assists in signal tracing should the need arise (and it will, sooner or later, so help us Murphy).
- 6. Filter Slider Controls:** These 45mm sliders control the amount of boost or cut at the indicated frequency. All filters are constant-Q for constant bandwidth at any level of boost or cut, on ISO centers, and calibrated in 3dB increments on the front panel.

# REAR PANEL DESCRIPTION



- 1. INPUT Jack:** This is a ¼" TRS (Tip-Ring-Sleeve) jack which automatically accommodates either balanced or unbalanced Input signals. For unbalanced operation, use a mono (single-conductor) shielded ¼" patch cord. For balanced operation, use a two-conductor shielded cable wired to a stereo TRS ¼" male plug as in Rane Note 110 (supplied with this unit).
  - 2. OUTPUT Jack:** This is a ¼" TRS (Tip-Ring-Sleeve) jack which delivers an unbalanced Output signal. Tip is "+" or "hot", ring is signal ground, and the sleeve is not connected. To drive unbalanced equipment, use a shielded mono patch cable.
  - 3. GROUND LIFT Switch:** This switch provides the ability to separate chassis ground and signal ground. Normally, this switch should be in the LIFT position. In some circumstances, moving it to the opposite position eliminates stubborn hum and buzz problems.
- If you are tempted to try moving this switch with your power amplifiers turned on and up, **DON'T BE**. *Always turn your amplifier levels down before changing your grounds around* and then bring the level up slowly.

## INSTALLATION

### STANDARD SOUND REINFORCEMENT MAIN SPEAKER EQUALIZATION

1. The GE 27 and GE 14 Inputs are automatic balanced/unbalanced/floating and the Outputs are normal unbalanced. If the output of the mixer is unbalanced, use a shielded mono ¼" patch cord to the GE 27 or GE 14 Input(s). If the mixer is balanced, use a shielded two-conductor cable with a (TRS) ¼" plug on one end for the Equalizer and a 3-pin or (TRS) ¼" plug on the other end, whichever is required to match the mixer output jack. Wire this cable as shown in Rane Note 110 supplied with this unit.

2. For mono operation of the main speakers with the GE 27, use a "Y" connector to drive both left and right amplifier channels from the GE 27 Output.

3. If the Equalizer is located more than 10 feet from the amp rack, obtain a direct box or balancing line transformer to be installed at the output of the GE 14 or GE 27. Rane models FBB 44 and FLT 22 can fill this requirement. Running an unbalanced line through a snake to the stage usually results in excessive hum and/or buzz in the system.

### POWERED MIXER MAIN (AND MONITOR) SPEAKER EQUALIZATION

1. Most powered mixers utilize unbalanced outputs, so use shielded mono ¼" patch cords (or uncoiled type guitar cords) for connections to the equalizer.

2. Most powered mixers that contain built-in graphic equalizers provide separate inputs and output for this equalizer. Connect the line out of the mixer to the GE 27 or GE 14 Input, and the GE Output to the amp input. If the built-in equalizer is *not* bypassable, set all mixer/equalizer sliders to the center (0dB) position and use only the GE 27 or GE 14 sliders for adjustments.

3. You can patch a bypassable built-in equalizer into your monitor system by connecting the GE 27 or GE 14 between the monitor out and the monitor amplifier input.

### STAGE MONITOR EQUALIZATION

1. The connection between the equalizer and the monitor amp, usually a long one, should be *balanced* whenever possible. Use a direct box or balancing line transformer at the Output of the GE 14 or GE 27. Rane models FBB 44 and FLT 22 can fill this need.

2. When testing for feedback levels and using the GE 27 or GE 14 to reduce feedback, be sure to test each monitor speaker/stage mic combination separately, then make final EQ adjustment according to the demands of the speaker/mic combination most prone to feedback. Cut the appropriate slider(s) *just* enough to eliminate feedback—further attenuation only makes the monitors harder to hear.

## IMPORTANT NOTE

### CHASSIS GROUNDING

Rane commercial equalizers are supplied with a rear mounted ground-lift switch. The unit is shipped with this switch in the "grounded" position, tying circuit ground to chassis ground. 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 Rane Note 110 (supplied with your unit and available on request at no charge if you lose it) for further information on system grounding.

# 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:

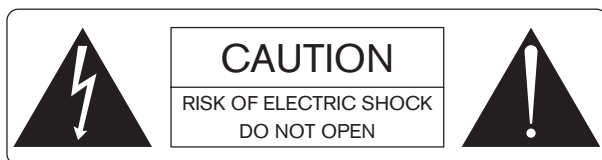
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**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.