

## QUICK START

So tell me honestly, do you actually read the manuals or do you just want to connect the thing and go? If you are one of the “gotta go now” crowd please read this short section. Even if you read slowly so as to savor every syllable, it only takes a couple of minutes and may save more of your valuable time later. The rest of this manual is dedicated to those who really want to know all the nitty-gritty details.

Wait a minute before plugging in the power supply. Hopefully the equipment to and from the GE 130 is balanced, with pin 2 “hot.” From the line level output preceding the GE 130, connect a XLR male connector to the **INPUT** jack on the rear of the GE 130. Connect a female XLR connector to the **OUTPUT** jack on the rear of the GE 130, to the next line level device in the signal chain.

Now plug in the power supply. The yellow **POWER** LED should illuminate, and if you have an audio source working and the rest of the signal chain completed, you will hear audio. With sliders centered and the **LEVEL** control at “7” (corresponds to about 2 o’clock), depress the **BYPASS** switch. If any difference in level exists, adjust the **LEVEL** control so the same volume exists whether **BYPASS** is *in* or *out*. You now have an expensive jumper wire. Fully utilizing the capabilities of the GE 130 requires moving some of the sliders, but you already knew that. To make best use of the GE 130, use some sort of an analyzer to adjust the sliders properly.

*Never connect anything except an RS 1 or other approved Rane AC power supply to the thing that looks like a telephone jack on the rear of the unit.* This is an AC supply and requires some special attention if you do not have an operational power supply *exactly* like the one that was originally packed with your unit.

## GE 130 CONNECTION

When first connecting the GE 130 to other components, *leave the power supply for last*. This gives you a chance to make mistakes and correct them without damaging your fragile speakers, ears and nerves.

### INPUTS

Both XLR and Euroblock Inputs are wired in parallel and are actively balanced. Each works equally well. Choose strictly from a required hardware point-of-view, there will be no performance trade-offs. The wiring convention adheres to American, British and International standards of pin 2 (+) hot, pin 3 (–) return, and pin 1 shield. Unbalanced operation involves using only pin 2 or “+” as signal, and pin 1 as shield or ground. It is not necessary to short any inputs to ground—it doesn’t hurt, it’s just not necessary. Use pin 1, or the shell, for shield ground.

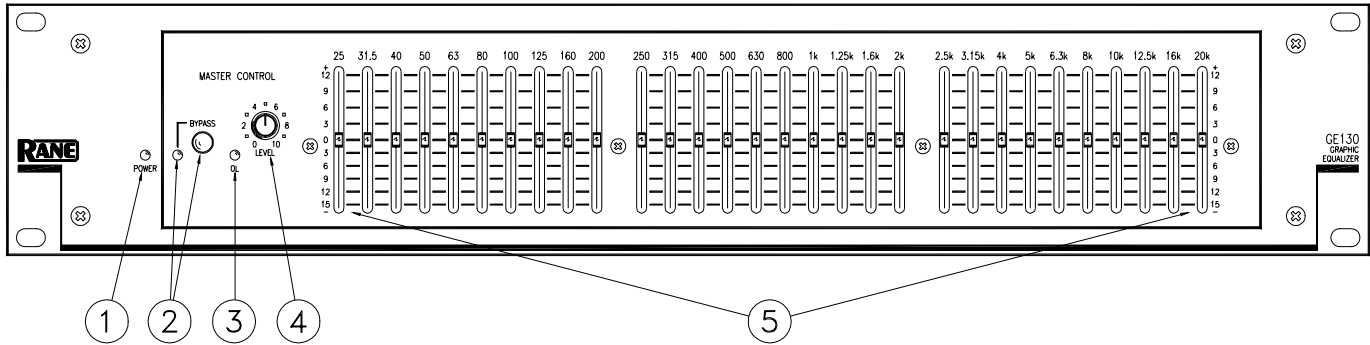
### OUTPUTS

The Outputs mimic the Inputs. Balanced output requires using pin 2 or “+”, and pin 3 for the signal ground. It does not require pin 1 or shield. The signal exists differentially between the two balanced leads; ground is not involved. For hum-free systems ground is used only for shielding.

### SIGNAL LEVELS

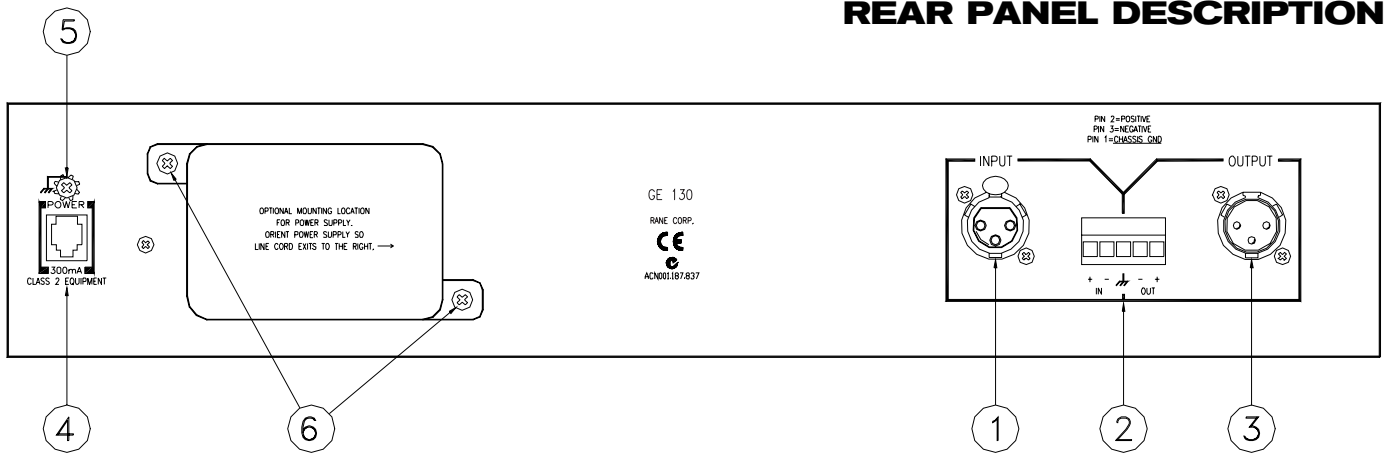
Signal levels from -10 dBV to +4 dBu are considered normal and within range (at least 20 dB of headroom exists above these levels). Do not directly connect microphones into the GE 130. These require a mic preamp.

## FRONT PANEL DESCRIPTION



- ① **POWER indicator** illuminates whenever the appropriate power supply is connected to the unit with the correct line voltage source.
- ② **BYPASS switch and indicator:** When the bypass switch is in the *in* position the red BYPASS LED illuminates and the unit is in the BYPASS mode. In this mode the audio signal is routed directly from the INPUT to the OUTPUT jacks without passing through any active circuitry (often referred to as hard-wire bypass). Use this switch to compare equalized and unequalized material. In the event of power failure, the GE 130 automatically goes into BYPASS.
- ③ **OVERLOAD indicator** illuminates if any section of the GE 130 is within 3 dB of clipping. Occasional blinking of this LED is acceptable, but if it remains on more than intermittently, turn down either the equalizer's LEVEL control or reduce the output level of the preceding component to avoid distortion.
- ④ **LEVEL control** sets the Level of the signal coming into the GE 130. Turn this control down if the OVERLOAD LED lights up steadily (meaning too strong an Input signal). Since actual unity gain depends on varying slider settings (which is why we have not marked a unity gain position on the front panel), use the BYPASS switch to determine the exact unity gain position of this LEVEL control by comparing EQ and BYPASS loudness.
- ⑤ **Filter Level slide controls:** Each of these sliders control the output level of each of the 30 bandpass filters.

## REAR PANEL DESCRIPTION



- ① **XLR INPUT connector** accommodates a balanced INPUT signal. Rane adheres to the international and US standard for balanced pin configuration: pin 1 is chassis ground (neutral), pin 2 is hot (positive), and pin 3 is signal return (negative). Choose either this XLR jack *or* the Euroblock—*don't use both*—they do not sum.
- ② **Euroblock INPUT and OUTPUT connector** supplies an alternate method of getting a signal in and out of the GE 130. The female portion of this connector may be removed so it is easier to connect the input/output wires. Use only one input connector, the XLR *or* the Euroblock.
- ③ **XLR OUTPUT connector** supplies a balanced OUTPUT signal. Rane adheres to the international and US standard for balanced pin configuration: pin 1 is chassis ground (neutral), pin 2 is hot (positive), and pin 3 is signal return (negative). It is permissible for both Euroblock and XLR OUTPUTS to connect to different devices simultaneously.
- ④ **Remote power supply input:** *Use only an RS 1 or other remote AC power supply approved by Rane.* The GE 130 is supplied from the factory with a remote power supply suitable for connection to this input jack. *It is not a telephone jack.* The power requirements of the GE 130 call for an 18-24 volt AC center-tapped transformer only.
- ⑤ **Chassis Ground Point:** A #6-32 screw and toothed washer is provided for chassis ground. Since the GE 130 does not get chassis ground through the AC cord, this point is provided in case your system does not have another earth ground such as the rack rails. See the Chassis Grounding note below for details.
- ⑥ **Optional power supply mounting location:** These screws can be used to mount the remote supply that came with the GE 130. Noise performance is only slightly degraded when the power supply is attached. The application will determine whether this option is of benefit. Noise performance will still meet those in published specifications if this option is used.

### 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 Rane Note 110 “Sound System Interconnection” (supplied with this manual and available on request at no charge) for further information on system grounding.

## OPERATING INSTRUCTIONS

Insuring the proper level of gain though the GE 130 is just as important as adjusting the equalizer bands. Improper gain distribution is a common cause of loss of system headroom and less than optimum noise performance.

The OVERLOAD LED informs of an imminent or passed overload to the equalizer. Occasional blinking of the OL with program source material is fine, indicating optimized signal-to-noise performance of the GE 130. Run the GE 130 with an input signal that is as hot as possible without the OL lighting more than occasionally.

The BYPASS switch allows comparison of equalized versus un-equalized signal. It is also useful in adjusting the level of the GE 130 for unity gain and best signal-to-noise performance. The gain of the GE 130 is optimized when there is no sound level difference between the bypassed and the active positions.

The overall gain range of the level control for the GE 130 is off to +6 dB for unbalanced operation, or off to +12 dB for balanced operation. The level difference between the equalizer in bypass or active can be significant. Adjust the LEVEL control so the signal level is the same between the bypassed and active positions of the BYPASS switch.

### GETTING STARTED

Here is one method of setting your equalizer that works well. Begin with the following settings:

1. Engage the **BYPASS** switch. (switch depressed, **BYPASS LED on**.)
2. Put all sliders in their center position (0 dB). The center position has a grounded detent.
3. Position the **CHANNEL LEVEL** controls about “6” for unbalanced operation and “7” for balanced operation.
4. Apply a signal to the system.
5. Verify the **OL LED** is not on—occasionally blinking during extreme peaks indicates an optimal setting. But if it lights up a lot or lights steadily, lower the output level of the previous device in the signal chain.
6. Release the **BYPASS** switch and begin adjusting the equalizer filters.
7. During filter band adjustments, if the **OL LED** lights more than occasionally, turn down the output of the previous device in the signal chain.
8. Once all filter bands are adjusted to your liking, compare the signal loudness with the equalizer bypassed and active. Adjust the **CHANNEL LEVEL** controls on the GE 130 so there is no difference between the levels of bypassed versus active.
9. The last step is to reconfirm that the **OL LED** lights only when there are large signal spikes in the program material, as in step 5 above.

For insight into how to use an equalizer, to alleviate acoustic problems or to adjust the overall tone of the program material, please read the following two sections.

### ACOUSTIC COMPENSATION

A graphic equalizer may be used to correct many acoustic problems. However, one should fully understand the ramifications of doing so. Acoustic problems are generally not consistent across the entire area of sound coverage. This is much more of a problem when setting up a sound system for large venues. In a typical large room or hall, there will be areas that have acoustic reinforcement problems and other areas where certain frequencies are almost entirely canceled out. Try to seek an acoustic remedy for acoustic problems whenever possible. When this is not possible or feasible, an equalizer may be used to compensate for an acoustic problem. But the problem is only improved at the point where the measurement is taken, other locations in the room may be adversely affected by the equalizer setting. For this reason, measure the acoustic response of the system from several locations and average the equalizer’s setting. Doing this helps most locations in the venue to have an equal sound quality.

The best way to “see” what the acoustic signature of the room is doing to sound is to use a real time analyzer or any of the many computerized measurement systems. Using these devices to analyze the response of the room and the sound system is the only accurate means available for setting an equalizer properly.

Equalization can be like spice in the hands of a master chef. A little goes a long way in improving sound quality, too much and the mix is spoiled. If modest amounts of equalization (6-8 dB) do not solve the problem, it is best remedied by other means. Avoid adding large amounts of boost below 63 Hz, especially when using vented bass cabinets. Boosting frequencies below the vented enclosure’s low frequency cutoff can easily cause over excursion of the speaker’s cone, causing premature failure. In addition, boosting low frequencies can make your power amplifier run hotter, leading to premature amplifier failure.

When equalizer adjustment is completed, compare the unequalized sound with the equalized sound by alternately engaging the BYPASS switch. Use familiar source material and walk around in the sound coverage area to insure that no anomalies have been introduced into the sound system. If it sounds good, you’re done.

### TONE CONTOURING

If a GE 130 is used for tone contouring by ear, be careful about adding upper bass (63 Hz to 200 Hz) as this can cause “muddiness” or loss of definition. (Also see the previous warning about boosting frequencies below 63 Hz.) Middle frequency problems usually express themselves by vocals having a nasal quality (too much mid band boost) or vocals not being easily understandable (usually caused by mid band frequencies being under represented in the overall sound). High band problems show as “sizzle”—not good, and is sometimes caused by too much high frequency boosting. This is most obvious with cymbals and hi-hats. To use the cooking metaphor, high frequencies should simmer, not sizzle.