



ME 15B

microGRAPHIC 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:

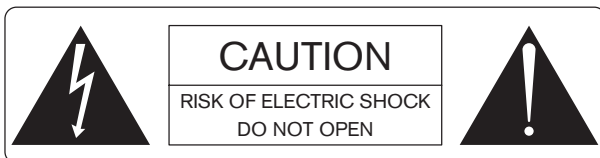
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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.

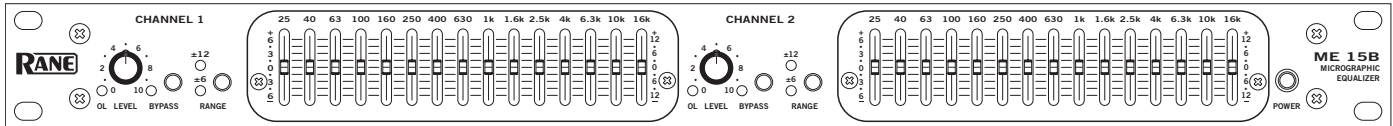
The symbols shown below are internationally accepted symbols that warn of potential hazards with electrical products.



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

If this is your first equalizer, please do yourself and your speakers a favor and read the complete manual. “An ounce of prevention...,” and all that.

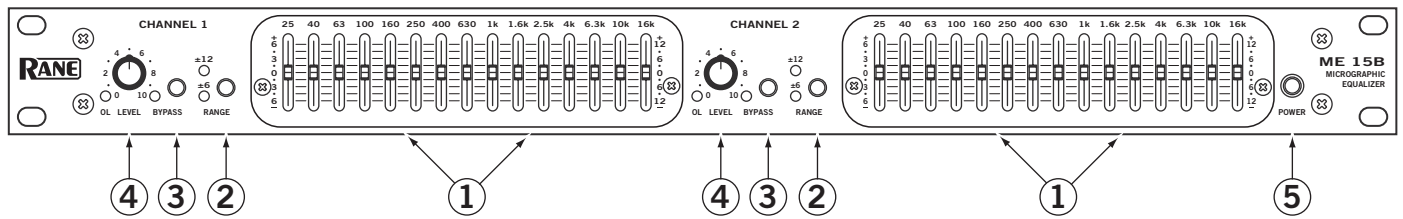
You may use either the XLR or ¼" TRS connectors for Inputs or Outputs. Hook-up is intuitive. Just follow the silk-screened instructions on the rear of the unit. Polarity convention is per IEC/ANSI/AES standards of pin 2 positive, pin 3 negative and pin 1 shield. The ME 15B does not invert the signal. Only connect one **INPUT** type per channel. The XLR and ¼" TRS

Inputs do not sum, *don't use both*, pick one or the other. You may, however, use both types of **OUTPUTS** simultaneously if desired.

Anyone familiar with other graphic equalizers finds the ME 15B just as familiar. Setting curves is as easy as it is on all Rane graphics thanks to our innovative constant-Q circuitry. If you feel you want more information on setting up your curves, please read on.

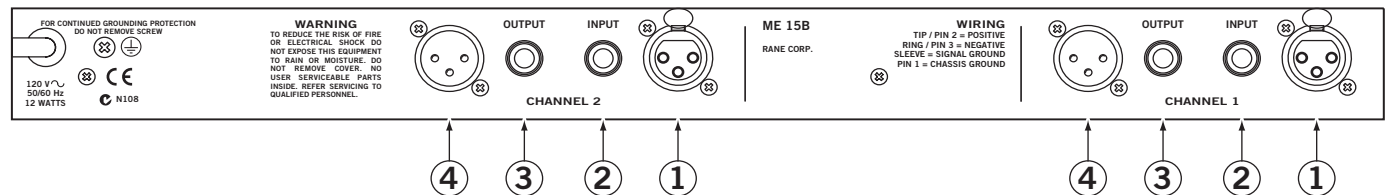
If you are familiar with equalizers, then hook-up, plug-in, turn-on and go!

FRONT PANEL DESCRIPTION



- ① **Filter level slide controls:** Each of these sliders controls the output level of each of the bandpass filters. Center position is detented and grounded for guaranteed flat response.
- ② **Filter RANGE switches:** The gain range of the filter sliders is switchable (as a group) from ± 6 dB for high resolution, to ± 12 dB for maximum boost/cut capability.
- ③ **BYPASS switches:** When the button is pushed and the red indicator is lit, this Channel is in the BYPASS mode: signal is routed directly from the Input to the Output without passing through any active circuitry (often referred to as “hard-wire bypass”). Use this switch to compare equalized and unequalized material, or to bypass the equalizer in the event of power loss or unit failure.
- ④ **LEVEL controls and OL indicators:** These control the level of signal coming into the ME 15B. Turn this control down if it's OL (OverLoad) 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 volumes. The OL indicator lights up if any section of the ME 15B is within 3 dB of clipping. Occasional blinking of these LEDs are acceptable, but if they remains on more than intermittently, turn down either the equalizer's LEVEL control(s) or reduce the output level of the preceding component to avoid audible distortion.
- ⑤ **POWER switch:** As you have astutely surmised by now, this switch powers up the ME15B (as long as the power cord is plugged in correctly).

REAR PANEL DESCRIPTION



- ① **XLR INPUT jacks:** These accommodate balanced signals. Rane adheres to the international and U.S. standard for balanced pin configurations: Pin 1 is chassis ground (neutral), pin 2 is hot (positive), and pin 3 is signal return (negative). *Choose between this and the 1/4" TRS Input jack—use only one—they do not sum.*
- ② **1/4" TRS INPUT jacks:** These are TRS (tip-ring-sleeve) 1/4" jacks accommodating either balanced or unbalanced signals. For unbalanced signals use a mono 1/4" TS plug (single conductor with shield), and keep its length under 10 feet (3 meters) to avoid hum and noise. For balanced signals use microphone cable (two conductor with shield) with TRS 1/4" plugs. *Choose between this and the XLR Input jack—use only one—they do not sum.* Refer to the included RaneNote, “Sound System Interconnection” for unbalanced wiring.
- ③ **XLR OUTPUT jacks:** These balanced outputs are wired per AES standards of pin 2 “hot”, as described above in ①.
- ④ **1/4" TRS OUTPUT jacks:** These are TRS (tip-ring-sleeve) 1/4" balanced jacks compatible with either balanced or unbalanced systems. For balanced systems, use a microphone cable wired with pin 1 is chassis ground (neutral), pin 2 is hot (positive), and pin 3 is signal return (negative). Refer to the RaneNote, “Sound System Interconnection” for unbalanced wiring.

ME 15B CONNECTION

When first connecting the ME 15B to other components, *leave the POWER switch off until the very last*. This gives you a chance to make mistakes and correct them without damaging your fragile speakers, ears and nerves.

INPUTS

Both XLR and ¼" TRS 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 or tip being hot, pin 3 or ring being return, and pin 1 or sleeve being shield. Unbalanced operation involves using only pin 2 or tip as signal, and pin 1 or sleeve 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 tip, and pin 3 or ring for the signal. 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.

EXPANDING

Expanding and/or daisy chaining the Inputs and Outputs normally uses the ¼" jacks. Three parallel Input connectors allows driving a second signal processor or amplifier without special cabling.

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 ME 15B. These require a mic preamp.

IMPORTANT NOTE

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.

OPERATING INSTRUCTIONS

Insuring the proper level of gain though the ME 15B 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 ME 15B. Run the ME 15B 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 ME 15B for unity gain and best signal-to-noise performance. The gain of the ME 15B 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 ME 15B 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 **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 **LEVEL** controls on the ME 15B 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 un-equalized 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 ME 15B is used for tone contouring by ear, be careful about adding upper bass (63 Hz to 200 Hz) as this causes “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.