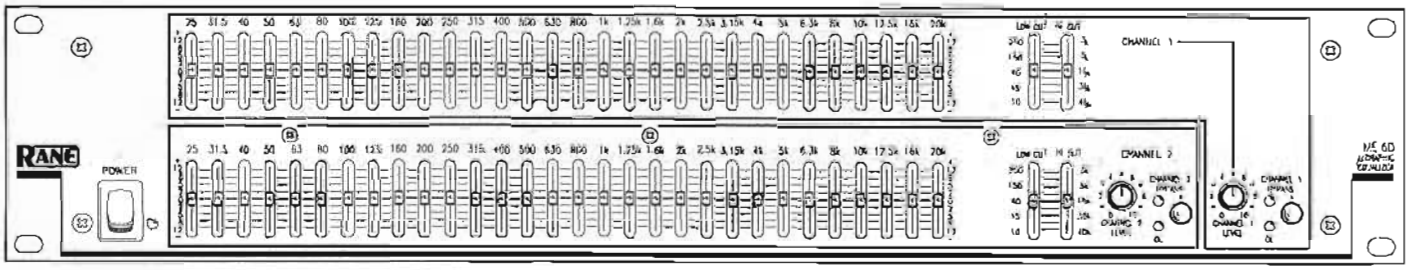
RANE OPERATING / SERVICE MANUAL ME 60

microGRAPHIC EQUALIZER



QUICK START

Okay, know-it-all. So you don't need to read the manual. Well do your mother a favor and just read this section and you don't have to read anything else. Ever.

Hook-up is intuitive. Just follow the silkscreened instructions on the rear of the unit. All three Inputs are wired in parallel (they do *not* sum); and all three Outputs are wired in parallel. Use any *one* Input and any or all Outputs. Polarity convention is per IEC/ANSI/AES standards of pin 2 positive, pin 3 negative and pin 1 ground. The ME 60 does not invert the signal. Use the ground lift (**SIG GND**) switch on the rear to help eliminate stubborn hum problems.

Set the **LO CUT** and **HI CUT** controls as necessary to restrict bandwidth. Full frequency response results from positioning them all the way to the bottom.

Anyone familiar with other graphic equalizers finds the ME 60 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 see the back page.

There, now was that so bad?

SYSTEM CONNECTION

When first connecting the ME 60 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.

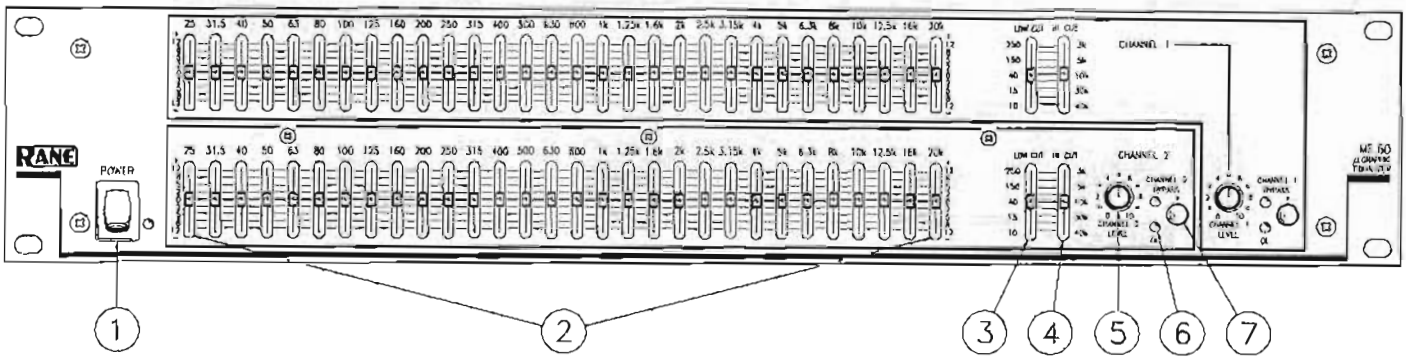
INPUTS. All three Inputs are wired in parallel and are actively balanced, except the unbalanced RCA phono. Each works equally well. Choose strictly from a required hardware point-of-view, there will be no performance trade-offs. The wiring convention adheres to American, British and International standards of pin 2 or tip being hot, pin 3 or ring being return, and pin 1 or sleeve being signal ground. Unbalanced operation involves using only pin 2 or tip as signal, and pin 1 or sleeve as 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 signal ground. 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 daisychaining 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 -10dBV to +4dBu are considered normal and within range (at least 20dB of headroom exists above these levels). Do not directly connect microphones into the ME 60. These require a mic preamp.

FRONT PANEL DESCRIPTION



1. **POWER SWITCH & INDICATOR.** Electrically speaking (as opposed to politically or financially) this controls the power to the ME 60 (as opposed to the people). The yellow LED lights any time this switch is closed and power has, in fact, actually flowed into the ME 60.

2. **FILTER LEVEL CONTROLS.** These slide controls set the individual levels for each of the constant-Q filters. Their range is ±12dB, and the grounded center-detent design ensures individual filters are off and bypassed when positioned to their centers.

3. **LO CUT FILTER CONTROL.** Sets the corner frequency (-3dB point) for the low cut filter (high pass). Adjustable from 10Hz to 250Hz.

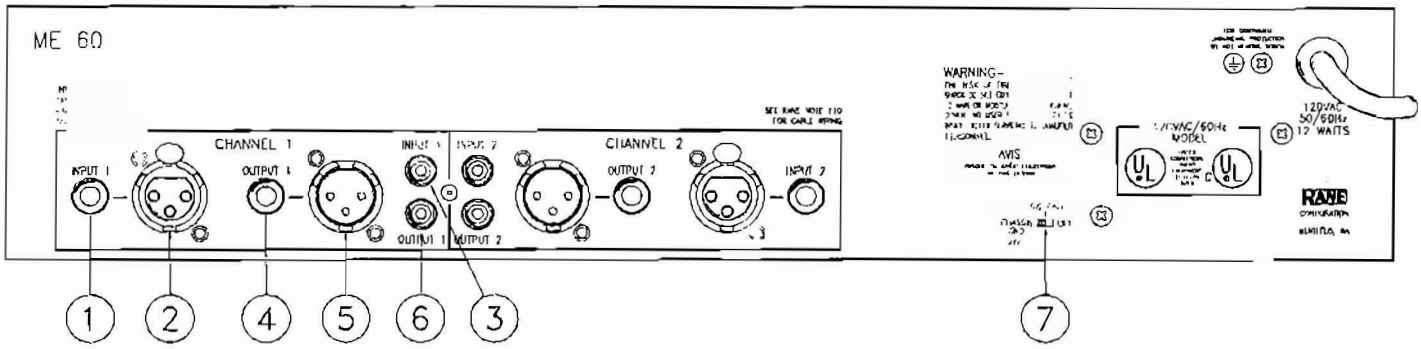
4. **HI CUT FILTER CONTROL.** Sets the corner frequency (-3dB point) for the high cut filter (low pass). Adjustable from 3kHz to 40kHz.

5. **CHANNEL LEVEL CONTROL.** Used to set the overall desired gain through the unit. The range is from Off to +12dB for balanced use, or from Off to +6dB for unbalanced operation. Unity gain is at approximately "6" (balanced) or "7" (unbalanced). Using the highest setting (without lighting the **OL** indicator) yields the best signal-to-noise performance.

6. **OVERLOAD INDICATOR.** This red **OL** LED monitors all critical points for excessive signal levels. It lights whenever these levels exceed 3dB below clipping. Occasional flickering is normal; however, it should not be allowed to light steadily.

7. **BYPASS SWITCH & INDICATOR.** This pushbutton switch activates the "hard-wire" bypass function. When engaged (red **BYPASS** LED on), all three pins of the input connectors directly connect to the same pins on the output connectors (hard-wired). Engaging this switch converts the ME 60 into a relatively expensive patch cord, but one with pretty lights.

REAR PANEL DESCRIPTION



1. ¼" **INPUT Connector.** This ¼" tip-ring-sleeve (TRS) connector parallels the 3-pin connector described below. Tip is positive, ring is negative and sleeve is signal ground.

2. **3-pin INPUT Connector.** Pin 2 is positive, pin 3 is negative and pin 1 is signal ground. For unbalanced operation, use pin 2 as hot and pin 1 as return. It is not necessary to ground pin 3.

3. **RCA Phono INPUT Connector.** This unbalanced connector provides for convenient hook-up to consumer products.

4. ¼" **OUTPUT Connector.** This ¼" TRS connector parallels the 3-pin connector described below. As before, tip is hot, ring is not and sleeve is signal ground.

5. **3-pin OUTPUT Connector.** Pin 2 is positive, pin 3 is negative and pin 1 is signal ground.

6. **RCA Phono OUTPUT Connector.** This unbalanced connector provides for convenient hook-up to consumer products.

7. **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.

OPERATING INSTRUCTIONS

Before attempting any audio equalization with the ME 60, it is important to optimize the **CHANNEL LEVEL** control setting. Improper gain distribution is a common cause of headroom loss and increased noise in audio systems.

The ME 60 provides you with an overall **BYPASS** switch and indicator as well as an **OL** (overload) LED as useful tools for optimizing this gain set-up. The **BYPASS** switch is useful for making quick A-B comparisons, i.e., comparing equalized (**BYPASS** out, LED off) versus unequalized (**BYPASS** in, LED on) sound. To do this freely, without danger of system damage, requires you set the level through the ME 60 to approximately unity. Failure to do so can produce alarming results.

The gain range of the ME 60 is Off to +6dB for unbalanced operation, or Off to +12dB for balanced use. The ME 60 is always unity gain in bypass, so if you add or reduce gain (beyond EQ make-up gain) the level differences between **BYPASS** switch being in or out can be startling. Therefore you want to set the **CHANNEL LEVEL** controls for equal in/out loudness levels.

To get started, make the following initial set-up adjustments:

1. **CHANNEL BYPASS** switches depressed (equals bypassed condition = red LED on).
2. **CHANNEL LEVEL** controls positioned at "7" for unbalanced, or "6" for balanced use.
3. All slide controls in center-detent positions (0dB boost/cut).
4. Apply signal to the system.
5. Check that an **OL** indicator is not on. If an **OL** LED is on, move its **CHANNEL LEVEL** control down just enough for it to go out. For optimum noise performance always take as much gain as possible without continuously lighting the OL light.
6. Release the **BYPASS** switch and you are ready to start equalizing the system.

Since acoustic compensation and tone contouring are two of the most common uses for equalization, here are a few words on each:

ACOUSTIC COMPENSATION. Acoustic compensation is controlled nicely with a device such as the ME 60. The best way to "see" what room acoustics are doing to your sound is to use either a real time analyzer or any of the many computerized measurement systems such as time delay spectrometry or other similar devices. This test equipment lets you analyze the response of the room and the sound system and is the only accurate means available for setting an equalizer properly.

It is a very good idea to always use as little equalization as possible. If modest amounts (try to not use more than 6-8dB) of equalization do not solve the problem, then other means should be tried.

Use the **BYPASS** switch to compare equalized with unequalized sound. Compare the two and set the equalizer as best you can using controlled noise sources, sweep signals, or source material that you are *very* familiar with. Try to avoid adding too much low end. This is an area where equalizers are frequently abused, causing lots of unnecessary stress on amplifiers and speakers. This is particularly important when using any sort of vented enclosure low frequency drivers. Too much level applied to a woofer below the cutoff frequency of its enclosure causes very large speaker excursions and very short life.

TONE CONTOURING with the ME 60 is accomplished mainly by ear. This you know how to do. Be careful though, not to introduce too much boost to the upper bass area (or the sub-bass area as in the last warning). Be aware that the ME 60 is capable of boosting signals up to 12dB (4 times as large!)—a level at which great care should be taken to prevent seismic disturbances.

IMPORTANT NOTE

CHASSIS GROUNDING

Rane professional 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 their line cords. Make sure 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.

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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.

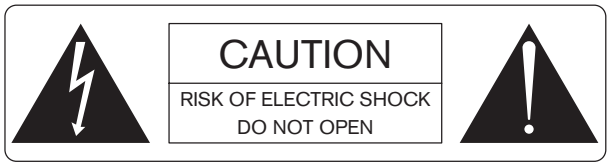
NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate 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.