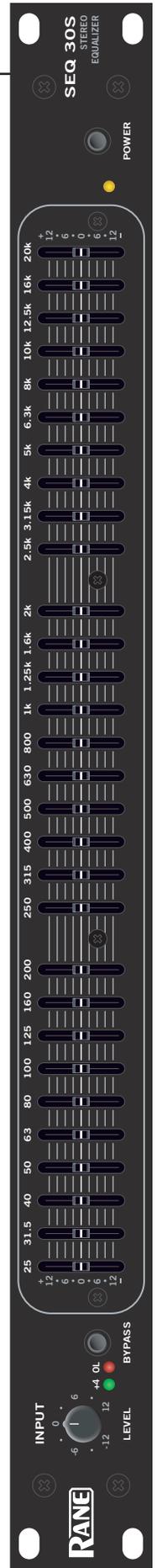




SEQ 30S

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.

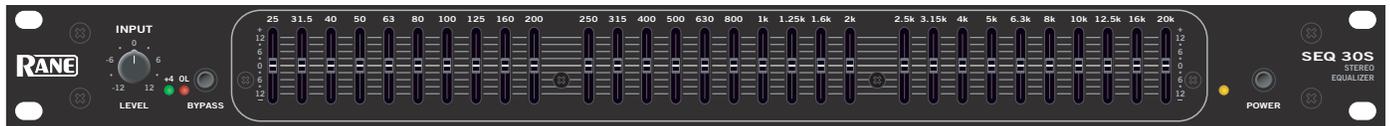
The symbols shown below are internationally accepted symbols that warn of potential hazards with electrical products.



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.



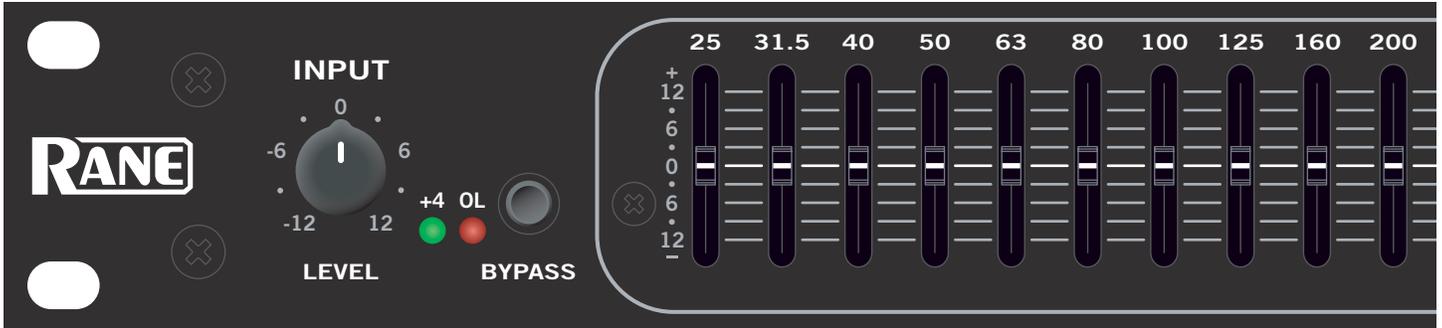
Quick Start

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

The SEQ 30S is a stereo equalizer, so adjusting any slider affects both channels simultaneously. Begin by setting all sliders to their center detent (0 dB), and the **INPUT LEVEL** to its center detent (0 dB). Try to make more cuts than boosts. After equalizing, use the **EQ** switch to compare equalized and non-equalized signal. While **EQ** is switched to **ACTIVE** (*out*), adjust the **INPUT LEVEL** to the same level as when **EQ** is switched to **BYPASS** (*in*).

You may use either the XLR or ¼" connectors for Inputs or Outputs. Connect only one **INPUT** type per channel. The XLR and ¼" TRS inputs do not sum. You may, however, use both types of **OUTPUTS** simultaneously if desired.

Front Panel Description



INPUT LEVEL control and indicators

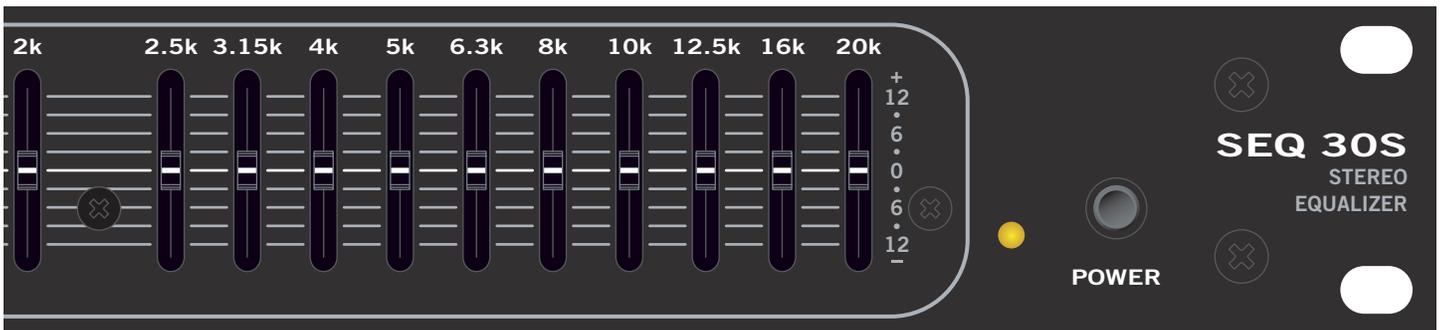
This controls the overall level. 0 dB gain is reached at the center detent with all sliders centered at their 0 dB detents. Set the INPUT LEVEL to give equal volumes with the EQ switched to ACTIVE or BYPASS, after setting the sliders (see EQ BYPASS switch below). Apply sufficient signal to the input to occasionally light the +4 dBu indicator. Flashing of the OL (overload) LED during peaks can be avoided by turning the INPUT LEVEL or boosted Filters down.

EQ BYPASS switch

When pressed to BYPASS, the filter sliders have no effect. Since actual unity gain depends on varying slider settings, use the BYPASS switch to determine the unity gain position of the INPUT LEVEL control by comparing ACTIVE and BYPASS volumes.

Filter level slide controls

Each of these sliders control the output level of both channels of the 30 bandpass filters. Center position is grounded for guaranteed flat response.



POWER switch and LED

Your basic, straightforward power switch. When the yellow LED is lit, the SEQ 30S is ready to go.

Rear Panel Description

LEFT & RIGHT INPUTS

Choose between the balanced XLR or the balanced/unbalanced 1/4" TRS jacks, but only use one. Inserting a 1/4" TS jack will work—however—always use balanced lines especially when connecting cables over 10 feet in length. Consult the *Sound System Interconnection* RaneNote located later in this booklet.

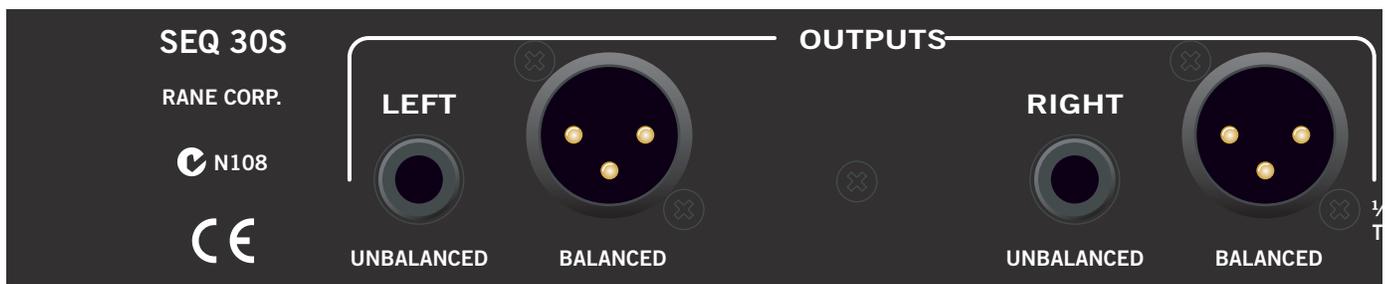
Cable Wiring

In agreement with IEC and AES/ANSI standards, XLR wiring convention is pin 2 Positive (hot), pin 3 Negative (cold), and pin 1 Signal ground (for unbalanced use). Pin 1 and the connector case or shell are tied to chassis ground.



LEFT & RIGHT OUTPUTS

Use either the Balanced XLR or the Unbalanced 1/4" TS jacks. Using both types of Outputs are permissible to drive two devices, such as an amplifier and a recorder.



SEQ 30S Connection

Exactly *where* you install your SEQ 30S into a sound system significantly affects such things as noise, system headroom, compressor/limiter performance and other factors influencing overall sound quality. Both *what* and *why* you are equalizing determines *where* you install it.

WHAT AND WHY

Tone contouring is accomplished mainly by ear. This you know how to do. Be careful not to introduce too much bass boost. Be aware that the SEQ 30S is capable of boosting signals up to 12 dB (4 times as large!)—a level at which great care should be taken to prevent seismic disturbances. Optimal gain setting is indicated by the +4 dBu indicator lighting occasionally, while the OL indicator does not light.

The SEQ 30S can be used to align crossovers and flatten speaker response. The best way to “see” what your sound system is doing, is to use a realtime analyzer. A 1/3-octave realtime analyzer is an accurate means for setting a 1/3-octave equalizer properly.

WHERE

For tone contouring, the equalizer may be used at any point in the signal chain, such as insert loops in a mixer to equalize a single instrument, sweeten a tape recording, etc. When an equalizer is used for acoustic correction, the equalizer should be one of the *last* pieces of gear in front of the amplifiers and active crossovers. Here are a few *general* guidelines useful in deciding exactly where to install the SEQ 30S in the system.

Downstream of the Compressor

Since system EQ is aimed at controlling *acoustic* problems, install it *after* any compressor, which is designed to operate on electrical signals. For one thing, the equalizer slider settings will change in each room location, which in turn affects the control voltage and threshold responses of the compressor, rendering it inconsistent. Secondly, large amounts of boost often cause tone differences by causing some frequencies to limit or compress before others.

After any System Gain

The best configuration is: mixer, compressor/limiter, equalizer, active crossover and power amplifier. Whenever headroom allows, try to take all the gain at the mixer, and run unity levels from then on. This also gives better noise performance from the mixer. Connect the SEQ 30S before the amplifier or crossover. Take any required line gain before the SEQ 30S. Avoid boosting gain in the crossover or power amps as this may increase noise. The SEQ 30S operates at unity gain with the INPUT LEVEL control at the 0 dB center detent when sliders average to center (0 dB). You can test this with the EQ BYPASS switch—adjust the INPUT LEVEL control so that volume does not change when switching between Active and BYPASS. For more details, read the RaneNote, “Setting Sound System Level Controls.”

Send/Receive Loops

Mixers, mixer/preamps and the like often provide send/receive loops for additional effects or EQ, and the SEQ 30S works well in this situation. Just be sure to keep input trim or gain controls turned up as far as the mixer input headroom will allow, to avoid taking excessive gain downstream and creating noise problems.

Operating Instructions

The SEQ 30S is an accurate, professional quality instrument capable of precise equalization down to a fraction of a dB. You can expect several advantages from your constant-Q equalizer over conventional designs: Moving one slider will not affect neighboring filters as much, so you won't spend time re-adjusting sliders (we call this “equalizing the equalizer”). You'll be able to obtain better feedback control without losing sound quality. All sliders maintain smooth, consistent and accurate calibrated control over filter levels, which is especially critical in low-profile equalizer designs. Because of this, the overall EQ adjustment process is significantly easier and more effective.

Equalizing a sound system by ear is a *very* difficult process to achieve successfully, especially in a timely manner. Although the human ear is very sensitive, it is *not* calibrated, nor consistent, and frankly the odds *against* a well behaved, clear sound system are very great when tuned by ear. Most people know when a sound system doesn't sound good, unfortunately they just can't tell exactly *why* and *where* it's not right. ***Because of this, we strongly recommend the use of a realtime analyzer to properly equalize your system with the SEQ 30S.***

A realtime analyzer helps you quickly achieve things nearly impossible by ear: flatten speaker response, minimize feedback, reduce room resonance and achieve accurate crossover alignment. In most cases, simply “normalizing” or “flattening” a sound system is a surprisingly drastic improvement, but *don't stop there*:

Remember this Rane proverb: “Look, don't stop, and listen.” Once you have aligned the system by **looking** at the analyzer, **don't stop** at this point. **Listen** to the music program and make additional adjustments to suit your taste, the type of music and your audience. Fatten the bass, sweeten the highs, brighten the mids. Since you are starting from a “tuned” system, your ear will not be fooled into thinking bass is too high when actually mids are too low, or that highs are too weak when really the mids are too strong.

Fact: analyzers don't have good taste—people do. Analyzers consistently and accurately “tell it like it is,” but ultimately, personal judgment determines what sounds good or appropriate. In fact, final optimum EQ settings, made *after* analyzer testing, will vary greatly depending on the type of music, sound pressure level, size of the venue and disposition of the audience.

Conclusion: *To consistently obtain the best sound from your system, use an analyzer and then your ears, in that order.* The analyzer supplies the consistency and calibration while your ears supply the good taste.