RANE

ME15S
MICROGRAPHIC
EQUALIZER

User Guide (English)

Introduction

The Rane ME15S microGraphic Equalizer is a two-channel, 2/3-octave design with 20 mm sliders in a single rack space unit. It features a Range switch for high slider resolution in the ±6 dB mode, equivalent resolution to 45 mm sliders found on double rack-space models. The ±12 dB mode provides a wide range of control over system audio.

The active filter sections feature Rane's innovative constant-Q (constant bandwidth) design. Constant-Q means the bandwidth of each individual filter is guaranteed to be narrow enough to prevent unwarranted interaction between filters, yet wide enough to produce exactly the type of correction curve demanded by even the most unusual acoustic surroundings. This differs dramatically from conventional designs of the past, encumbered with the unfortunate characteristic of changing bandwidth when changing boost/cut amounts.

Front panel controls and indicators include an overall rotary Level control for each channel as well as Overload indicators. Passive push-button Bypass switches feature LED indicators, avoiding ambiguity by being *on* when the unit is Bypassed. (A *passive* Bypass switch requires no power to operate. This allows completion of the audio path should the power fail in the ME15S.)

Inputs and Outputs are electronically balanced designs, capable of unbalanced operation when required. They accept and drive all possible signal levels into normal load impedances. Balanced applications choose between the XLR or 1/4" (6.35 mm) Tip-Ring-Sleeve balanced connectors. Unbalanced sources also may tie to the ME15S through mono 1/4" connectors (no ring connection).

Features:

- Constant-Q Bandwidth Design
- Overall Level Control
- 20 mm Filter Slide Controls
- ±6 or ±12 dB Slider Range
- Passive Bypass Switch
- Grounded Center Detents at 0 dB

- Infrasonic, Ultrasonic, and RFI Filters
- Fully Balanced XLR Inputs and Outputs
- 1/4" TRS Balanced/Unbalanced Inputs and Outputs
- Universal internal switching power supply (100–240 VAC)

Box Contents
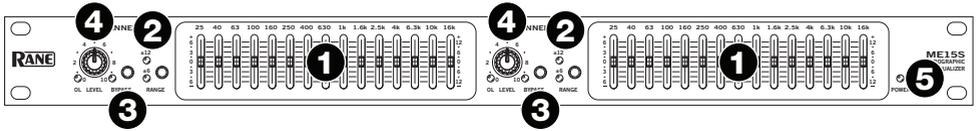
ME15S
Power Cable
User Guide
Safety & Warranty Manual

Support

For the latest information about this product (documentation, technical specifications, system requirements, compatibility information, etc.) and product registration, visit **rane.com**.

For additional product support, visit **rane.com/support**.

Features

Front Panel

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 ME15S. Turn this control down if its **OL** (OverLoad) **indicator** 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 ME15S is within 3 dB of clipping. Occasional blinking of these LEDs is acceptable, but if they remain on more than intermittently, turn down either the equalizer's Level control(s) or reduce the output level of the preceding component to avoid distortion.

5. **Power:** When the ME15S is plugged into 100-240 VAC, this glows yellow.

Rear Panel
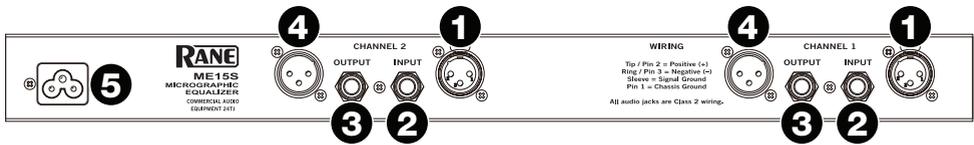
1. **XLR Inputs:** These inputs accommodate balanced signals. Rane adheres to the international and U.S. standard for balanced pin configurations: Pin 1 is chassis ground (neutral), pin 2 is hot (positive), and pin 3 is signal return (negative).

   Note: Choose between this input and the **1/4" TRS Input** jack—use only one, they do not sum.

2. **1/4" TRS Inputs:** These TRS (tip-ring-sleeve) 1/4" (6.35 mm) jacks accommodate either balanced or unbalanced signals. Balanced signals use microphone cable (two-conductor with shield) with TRS 1/4" plugs. Unbalanced signals use a mono 1/4" TS plug (single-conductor with shield), with its length kept under 10 feet (3 meters) to avoid hum and noise.

   Note: Choose between this and the **XLR Input** jack—use only one, they do not sum.

   Refer to the *Sound System Interconnection* RaneNote at **rane.com/note110** for unbalanced wiring instructions.

3. **1/4" TRS Outputs:** 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 where pin 1 is chassis ground (neutral), pin 2 is hot (positive), and pin 3 is signal return (negative).

   Refer to the *Sound System Interconnection* RaneNote at **rane.com/note110** for unbalanced wiring instructions.

4. **XLR Outputs:** These balanced outputs are wired per AES standards of pin 2 "hot," as described above in 1.

5. **Universal Voltage Input:** This miniature IEC 60320 C6 appliance inlet mates with an IEC 60320 C5 line cord (USA domestic). Do **not** lift the ground connection!

Setup

Items not listed under *Introduction* > *Box Contents* are sold separately.

Quick Start

You may use either the XLR or 1/4" (6.35 mm) TRS connectors for Inputs or Outputs. Hook-up is intuitive. Just follow the silkscreened 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 ME15S does not invert the signal. Only connect one **Input** type per channel. The XLR and 1/4" 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 ME15S just as familiar. Setting curves is as easy as it is on all Rane graphics thanks to our innovative constant-Q circuitry. For more information on setting up your curves, please refer to the *Operation* chapter.

Connection

Inputs

Both XLR and 1/4" 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 1/4" jacks. Parallel Output connectors allow 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 ME15S. These require a mic preamp.

Operation

Insuring the proper level of gain though the ME15S 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 (OL) 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 ME15S. Run the ME15S 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 ME15S for unity gain and best signal-to-noise performance. The gain of the ME15S 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 ME15S 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 positions (0 dB). The center position has a grounded detent.
3. Position the **Level** controls about "7" for unbalanced operation and "6" 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. 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 ME15S 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.

For further reading on equalizers, please refer to the RaneNotes *Constant-Q Graphic Equalizers* (**rane.com/note101**) and *Operator Adjustable Equalizers: An Overview* (**rane.com/note122**).

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 a physical 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 ensure that no anomalies have been introduced into the sound system. If it sounds good, you're done.

Tone Contouring

If a ME15S 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 are 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.

Appendix (English)

Technical Specifications

Parameter	Specification		Limit	Units	Conditions/Comments
Equalizer:					
Bands	(15) 2/3-octave ISO spacing				From 25 Hz to 16 kHz
Type	Constant-Q				
Accuracy	3			%	Center frequency
Travel	20			mm	Positive grounded center detent
Range	±12 or ±6		1	dB	Switch selectable
Inputs: Type	Active Balanced/Unbalanced				
Connectors	XLR & 1/4" TRS				
Impedance	20k balanced; 10k unbalanced		min	Ω	
Maximum Level	20		1	dBu	
Outputs: Type	Active Balanced/Unbalanced				
Connectors	XLR & 1/4" TRS				
Impedance	400 balanced	200 unbalanced	1%	Ω	
Maximum Level	+20 balanced	+15 unbalanced	1	dBu	2 kΩ or greater
	+19 balanced	+13 unbalanced	1	dBu	600 Ω
Overall Gain Range	Off to +0 (unbalanced output)		min	dB	Sliders centered
	Off to +6 (balanced output)		min	dB	Sliders centered
RFI Filters	Yes				
Passive Bypass Switches	Yes				
LED Thresholds: Overload	4		1	dB	Below clipping
Infrasonic Filter	20 Hz, 18 dB/octave, Butterworth		3%	Hz	
Frequency Response	20–100 kHz		+0/-3	dB	
THD+Noise	0.011		max	%	+4 dBu, 20–20 kHz, 20k BW
IM Distortion (SMPTE)	0.01		max	%	60 Hz/7 kHz, 4:1, +4 dBu
Signal-to-Noise Ratio	re +20 dBu	+4 dBu			20 kHz noise bandwidth
	107	91	2	dB	Sliders centered, unity gain, balanced
	92	76	2	dB	Full boost, unity gain, balanced
	104	88	2	dB	Full cut, unity gain, balanced
Channel Separation	85		min	dB	1 kHz
Common Mode Rejection	40		1	dB	1 kHz

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Parameter	Specification	Limit	Units	Conditions/Comments
Unit:				
Universal Line Voltage	100–240		VAC	50/60 Hz
Maximum Power	7		W	
Construction	All steel			
Size	1.75" H x 19" W x 5.25" D (1U)			(4.4 cm x 48.3 cm x 13.3 cm)
Weight	5 lbs.			(2.3 kg)

Note: 0 dBu = 0.775 Vrms

Specifications are subject to change without notice.

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