



General Description

The Rane ME15S microGraphic Equalizer is a two-channel, $\frac{2}{3}$ -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 pushbutton 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 $\frac{1}{4}$ " Tip-Ring-Sleeve balanced connectors. Unbalanced sources also may tie to the ME15S through mono $\frac{1}{4}$ " connectors (no ring connection).

Features

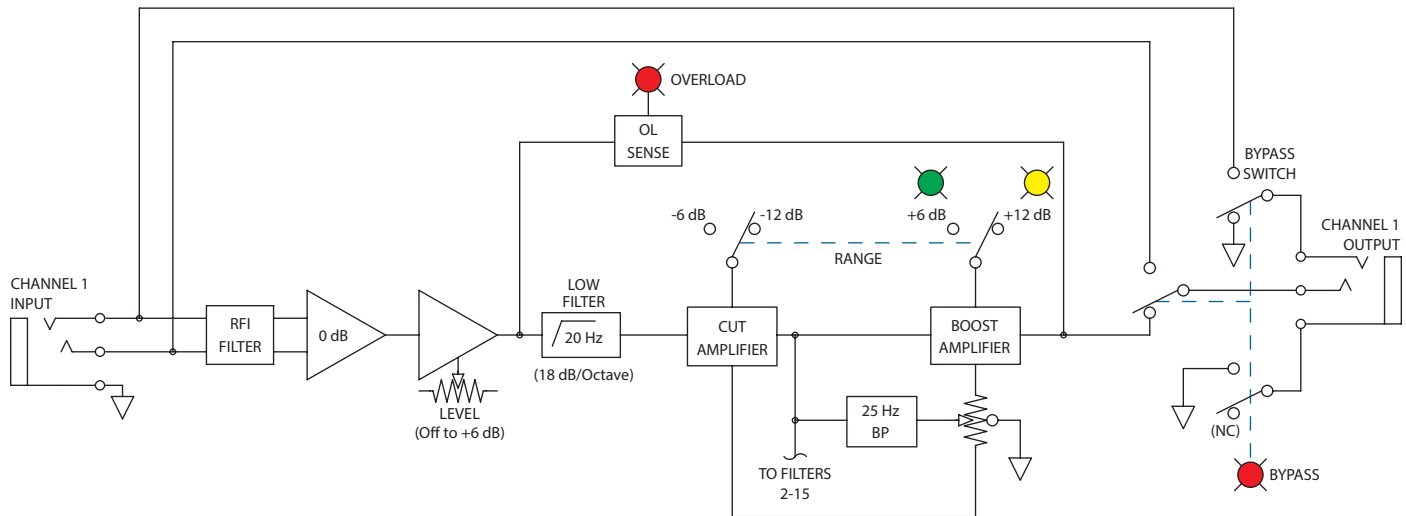
- Constant-Q Bandwidth Design
- Overall Level Control
- 20 mm Filter Slide Controls
- ± 6 dB or ± 12 dB Slider Range
- Passive Bypass Switch
- Grounded Center Detents at 0 dB
- Infrasonic, Ultrasonic, & RFI Filters
- Fully Balanced XLR Inputs and Outputs
- $\frac{1}{4}$ " TRS Balanced/Unbalanced Inputs and Outputs
- Universal internal switching power supply (100-240 VAC)

Features and Specifications

Parameter	Specification	Limit	Units	Conditions/Comments
Equalizer:				
.....Bands	(15) $\frac{2}{3}$ -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 & $\frac{1}{4}$ " TRS			
.....Impedance	20k balanced; 10k unbalanced	min	Ω	
.....Maximum Level	20	1	dBu	
Outputs: Type	Active balanced/unbalanced			
.....Connectors	XLR & $\frac{1}{4}$ " TRS			
.....Impedance	400 balanced 200 unbalanced	1%	Ω	
.....Maximum Level	+20 balanced +15 unbalanced	1	dBu	2 k Ω
	+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
Unit: Conformity	CE, FCC, cULus			
.....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 lb			(2.3 kg)
Shipping: Size	4.25" x 20.3" x 13.75"			(10.8 cm x 52 cm x 35 cm)
.....Weight	8 lb			(3.6 kg)
<i>Note: 0 dBu=0.775 Vrms</i>				

Block Diagram

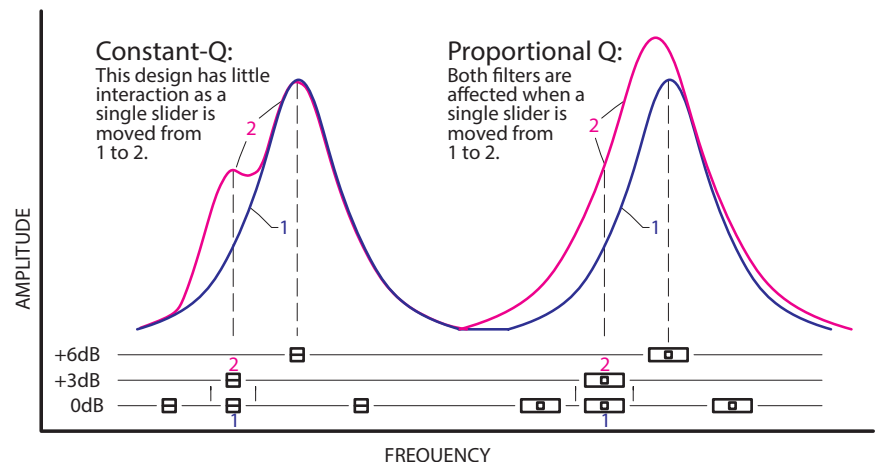
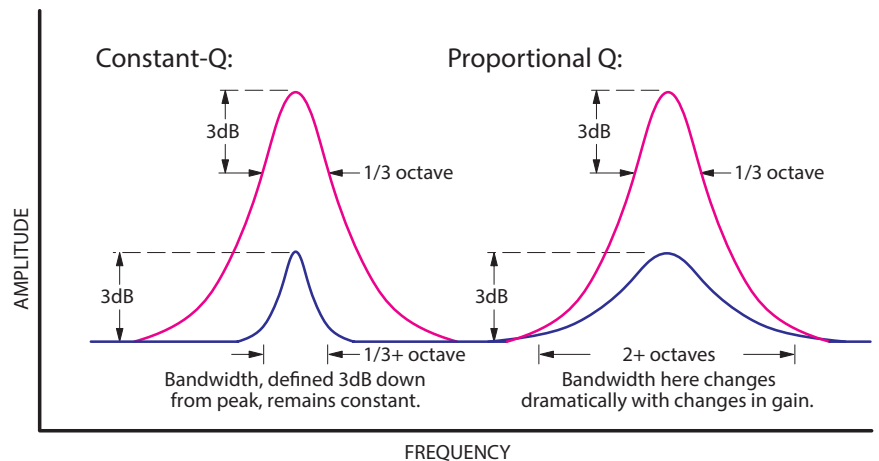
(both channels identical)



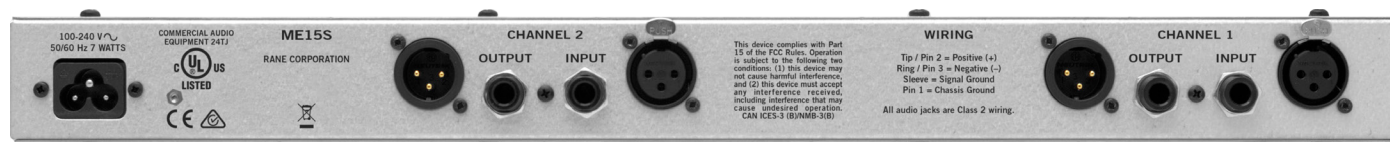
Constant-Q

Constant-Q graphic equalizers arose from the sound professional's need for greater control with less interaction than previously possible with conventional equalizers. You use a constant-Q graphic the same way you use a conventional graphic. You just get the desired results quicker, with far less after adjustment to the adjacent sliders.

The accompanying figures dramatically show the advantages of constant-Q designs. For more technical information, consult the references on the next page. Most are available at www.rane.com/library.html.



Rear Panel



Architectural Specifications

The graphic equalizer shall be of constant-Q design to minimize interactions between adjacent bands, and contain frequency bands located on standard ISO center frequencies. Each band shall have a bandwidth of $\frac{2}{3}$ -octave. A switchable boost/cut range of 12 dB or 6 dB shall be provided. A detented and positively grounded 0 dB point shall be provided on 20 mm linear sliders with dust dams.

A rotary overall level control shall be provided with a range from off to +6 dB of gain in balanced mode.

The inputs and outputs shall be active balanced/unbalanced designs terminated with both XLR and $\frac{1}{4}$ " TRS (tip-ring-sleeve) connectors. RFI filters shall be provided. The unit shall provide a passive bypass feature requiring no power to operate. Infrasonic and ultrasonic filters shall be built-in. LEDs shall be provided to indicate overload conditions.

The unit shall be capable of operation by means of its own built-in universal power supply operating at 100-240 VAC and meet CE requirements. The unit shall be UL and cUL listed. The unit shall be entirely constructed from cold-rolled steel.

The unit shall be a Rane Corporation ME15S Equalizer.

References

1. D. Bohn, "Constant-Q Graphic Equalizers," *RaneNote*, (1982).
2. D. Bohn, "A New Generation of Filters," *Sound and Video Contractor*, vol. 2, pp. 36-39 (Feb. 1984).
3. T. Pennington, "Constant-Q," *Studio Sound*, vol.27, pp. 82-85 (Oct. 1985).
4. D. Bohn, "Constant-Q Graphic Equalizers," *J. Audio Eng. Soc.*, vol. 34, pp. 611-626 (September 1986).
5. D. Bohn, "Exposing Equalizer Mythology," *RaneNote*, (1986).
6. D. Bohn, "Operator Adjustable Equalizers: An Overview," *RaneNote*, (1990).