

General Description

The Rane GE 130 Graphic Equalizer is a single-channel, 30-band, 1/3-octave design in a double rack-space unit, only 5 inches deep. Boost/cut range is +12/-15 dB on 45 mm filter slider controls.

The active filter sections feature Rane's innovative constant-Q (constant bandwidth) design. This 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, aside from the sliders, include an overall Level control as well as an Overload indicator. A Bypass switch allows direct comparison between the equalized and non-equalized signal.

The rear of the unit provides both XLR and Euroblock terminal connectors for the fully active balanced Input and Output. Output relays provide a brief turn-on delay, eliminating power-up thumps, and a hard-wire bypass in case of power failure.

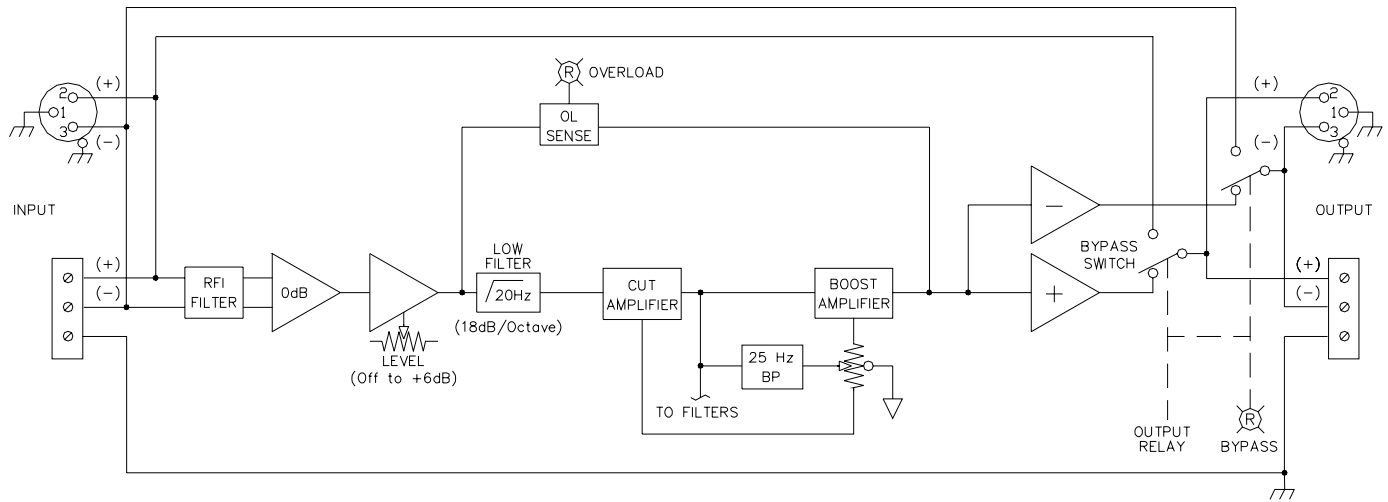
Features

- Constant-Q Bandwidth Design
- Overall Level Control
- Fail Safe Channel Bypass Switch
- 45 mm Filter Slide Controls
- +12 dB/-15 dB Boost/Cut Slider Range
- Grounded Center Detents
- Overload Indicators
- Infrasonic, Ultrasonic, and RFI Filters
- Fully Balanced Input and Output
- XLR and Euroblock Connectors
- UL/CSA/CE and 100/120/230 VAC Remote Power Supplies



Parameter	Specification	Limit	Units	Conditions/Comments
Equalizer:				
.....Bands	(30) 1/3-Octave ISO Spacing			From 25 Hz to 20 kHz
.....Type	Constant-Q			
.....Accuracy	3		%	Center frequency
.....Travel	45		mm	Positive grounded center detent
.....Range	+12 dB Boost, -15 dB Cut	1	dB	
Inputs: Type	Active Balanced/Unbalanced			
.....Connectors	XLR & Euroblock			
.....Impedance	20k Balanced; 10k Unbalanced	min	ohms	
.....Maximum Level	22	1	dBu	
Outputs: Type	Active Balanced			
.....Connectors	XLR & Euroblock			
.....Impedance	200 Balanced; 100 Unbalanced	1%	ohms	
.....Maximum Level	+21 Balanced; +15 Unbalanced	1	dBu	2k ohms
	+19 Balanced; +13 Unbalanced	1	dBu	600 ohms
Overall Gain Range	Off to 0 (Unbalanced Out)	0	dB	Sliders centered
	Off to +6 (Balanced Out)	typ	dB	Sliders centered
Fail-Safe Bypass Switches	Yes			
LED Thresholds: Overload	3	1	dB	Below clipping
RFI Filters	Yes			
Infrasonic Filters	20 Hz, 18 dB/Oct., Butterworth	3%	Hz	
Frequency Response	20-140 kHz	+0/-3	dB	
THD+Noise	0.009	.002	%	+4 dBu, 20-20 kHz
IM Distortion (SMPTE)	0.005	.003	%	60 Hz/7 kHz, 4:1, +4 dBu
Signal-to-Noise Ratio	re +20 dBu/+4 dBu			22 kHz noise bandwidth
	107/91	2	dB	Sliders centered, unity gain, bal.
	88/72	2	dB	Full boost, unity gain, bal.
	103/87	2	dB	Full cut, unity gain, bal.
Unit: Agency Listing				
.....120 VAC model	Class 2 Equipment UL CSA			National Electrical Code Exempt Class 2 equipment Exempt Class 2 equipment
.....230 VAC model	CE-EMC CE-Safety			EMC directive 89/336/EEC Exempt Art. 1 of LVD 73/23/EEC
Power Supply: Agency Listing				
.....120 VAC model	UL CSA			File No. E88261 File No. LR58948
.....230 VAC model	CE-EMC CE-Safety			EMC directive 89/336/EEC LV directive 73/23/EEC
.....100 VAC model	Built to JIS			Japan only
Power Supply Requirement	18 VAC w/center tap		Vrms	RS 1 (see data sheet)
Maximum Current	300		mA	RMS Current from remote supply
Unit: Construction	All Steel			
.....Size	3.5" H x 19" W x 5.25" D (2U)			(4.4 cm x 48.3 cm x 13.3 cm)
.....Weight	7 lb			(3.2 kg)
Shipping: Size	4.5" x 20.3" x 13.75"			(11.5 cm x 52 cm x 35 cm)
.....Weight	12 lb			(5.4 kg)
Note: 0 dBu = 0.775 Vrms				

Block Diagram

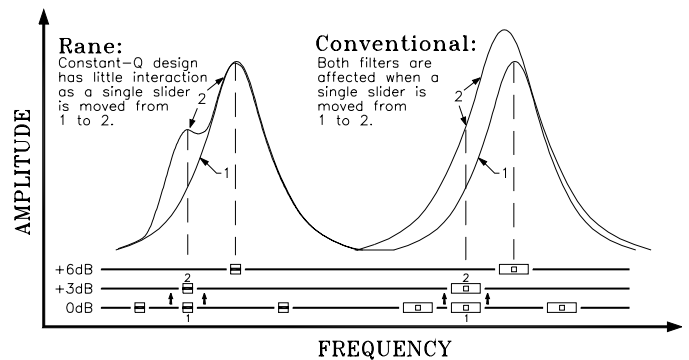
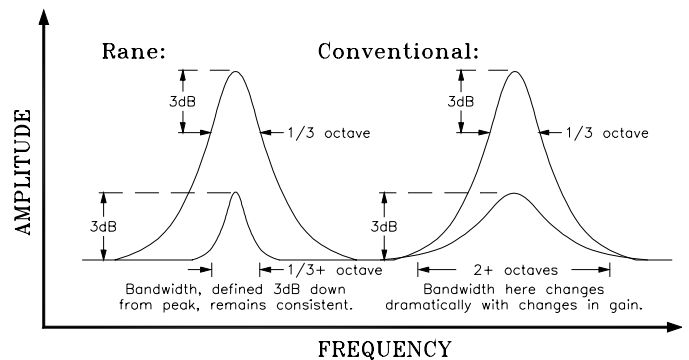


Application Information

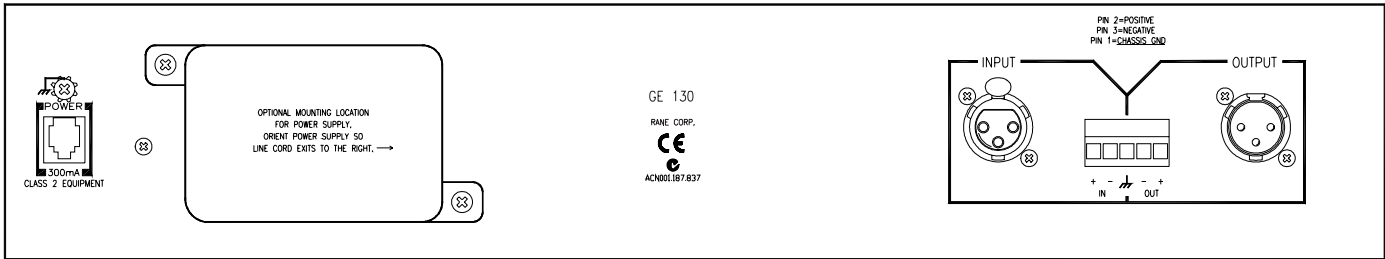
Constant-Q graphic equalizers arose from the sound professional's need for greater control with less interaction than previously possible with proportional-Q equalizers. Truth in slider position became a requirement. The curve traced out by the slider positions on constant-Q designs indeed represents the actual changes to the frequency response. On proportional-Q designs they do not.

Use a constant-Q graphic the same way as a proportional-Q graphic. Desired results are achieved quicker, with far less after-adjustment to the adjacent sliders. Eliminating a phenomena Rane calls "equalizing the equalizer."

The accompanying figures dramatically show the advantages of constant-Q designs. For a brief explanation of Rane's design philosophy please see RaneNote 101, "Constant-Q Graphic Equalizers," available from your Rane dealer, the Rane web site or the factory.



Rear Panels



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 1/3-octave. A boost range of +12 dB and a cut range of -15 dB shall be provided. A detented and positively grounded 0 dB point shall be provided on 45 mm linear sliders with dust dams.

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

The input and output shall be active balanced designs terminated with both XLR and Euroblock connectors. RFI

filters shall be provided. The unit shall provide a bypass feature requiring no power to operate, and automatic bypass in case of power failure. 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 detachable power supply connected to 120 VAC (230 VAC where applicable) and meet CE requirements. The unit shall be entirely constructed from cold-rolled steel.

The unit shall be a Rane Corporation GE 130 Graphic Equalizer.

Available Accessories

- SC 3.5 Security Cover

References

1. D. Bohn, "Constant-Q Graphic Equalizers," *Rane Note 101*, (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," *Rane Note 115*, (1986).
6. D. Bohn, "Operator Adjustable Equalizers: An Overview," *Rane Note 122*, (1990).