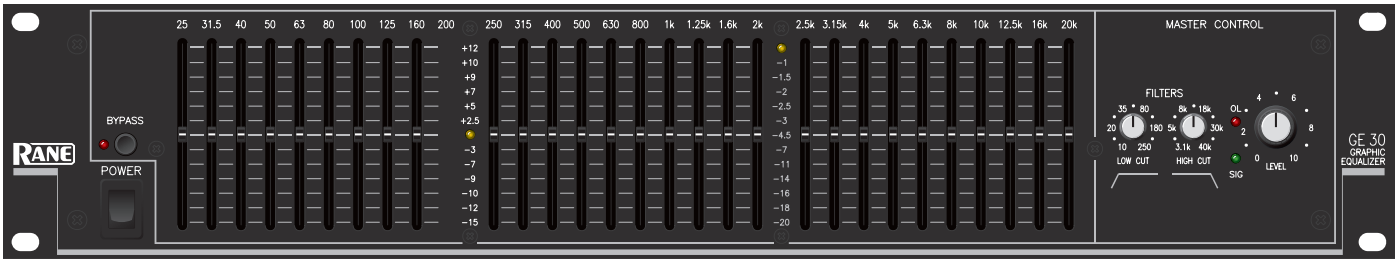


General Description

The Rane GE 30 is a single-channel, ⅓-octave equalizer. Housed in a two rack-space unit, the GE 30 features long throw, 60 mm high resolution slide controls on each filter band ensuring good resolution over their entire range.

The operating mode of the GE 30 is either Boost/Cut, or by pressing a button on the rear panel, may be Cut-Only. Another pushbutton on the rear panel allows the operator to select Active Balanced or Transformer Coupled balanced output.

The active filter sections of the GE 30 are of the constant bandwidth (Constant-Q) variety. 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. The bandwidth has also been carefully selected to ensure that two adjacent filters may be used to achieve curves with peaks in between the center frequencies of the filters (interpolating characteristic). This differs dramatically from conventional designs of the past. Earlier designs (dating back as far as 50 years) are encumbered with the unfortunate characteristic of changing bandwidth with changing boost/cut amounts.

Front panel controls and indicators, aside from the 30 filter level controls include an overall Level control as well as Signal present and Overload indicators. Sweepable band-limiting filters are provided on the front panel, covering a range of 10 Hz to 250 Hz on the low end and 3.1 kHz to 40 kHz on the high end.

The rear of the unit provides an XLR balanced input, an XLR balanced output and screw terminals duplicating both.

See the RaneNote, “Constant-Q Graphic Equalizers” for additional details.

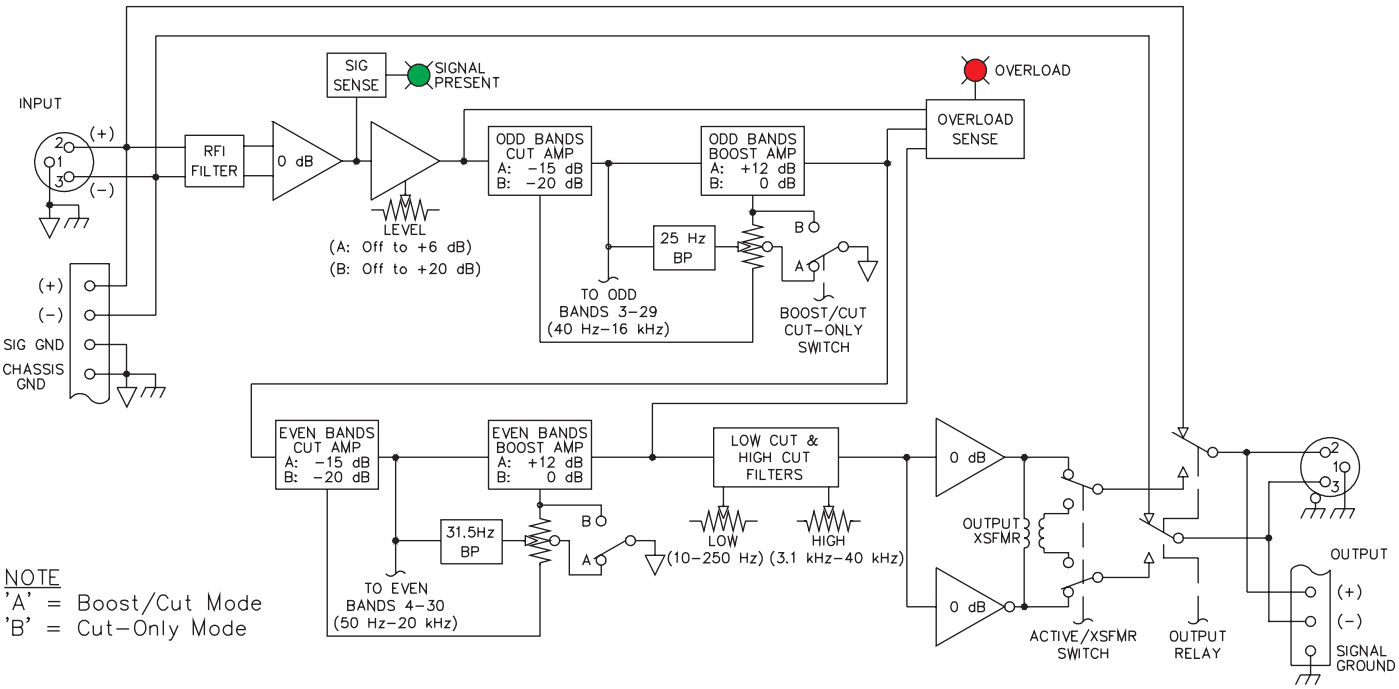
Features

- 1/3-Octave Constant-Q Bandwidth
- Interpolating Filter Response
- Boost/Cut or Cut Only
- Active or Transformer Balanced Output
- Adjustable Low/High Filters
- Power Failure Auto-Bypass
- 60 mm Filter Slide Controls
- Delayed (2 Second) Turn-On
- XLR & Screw Terminal Connectors
- Security Panel Included
- UL/CSA Listed Remote Power Supply (120V)
- CE (Low Voltage & EMC) Remote Power Supply (230V)

GE 30 Features and Specifications

Parameter	Specification	Limit	Units	Conditions/Comments
Equalizer: Bands	(30) ⅓-Octave ISO Spacing			From 25 Hz to 20 kHz
.....Type	Interpolating Constant-Q			Smooth combining
.....Accuracy	3		%	Center frequency
.....Travel	60		mm	Positive grounded center detent
.....Modes	Boost/Cut or Cut-Only			LED indicated, rear panel switch
.....Range	Boost: +12; Cut: -15	1	dB	Boost/Cut Mode
	Cut: -20	1	dB	Cut-Only Mode
Inputs: Type	Active Balanced/Unbalanced			
.....Connectors	#6 Screw Terminal & XLR			
.....Impedance	10k	1%	Ω	
.....Maximum Level	22	1	dBu	
Outputs: Type	Active Balanced & Transformer Coupled			Rear switch selectable
.....Connectors	#6 Screw Terminal & XLR			
.....Impedance	200	1%	Ω	100 Ω each leg to ground
.....Maximum Level	27	1	dBu	Into 2000 Ω or greater
	24	1	dBu	Into 600 Ω
Overall Gain Range	Off to +6	-0/+4	dB	Sliders centered
RFI Filter	Yes			
Adjustable Low Cut Filter	10 Hz-250 Hz, 12 dB per octave	10%	Hz	Sweepable
Adjustable High Cut Filter	3.1 kHz-40 kHz, 12 dB per octave	10%	Hz	Sweepable
On/Off Transient Muting	Yes			
Passive Bypass Switch	Yes			Auto-Bypass with power loss
LED Thresholds: Overload	20	1	dBu	Output or any internal level
.....Signal Present	-20	1	dBu	Input level
Frequency Response	10 Hz-40 kHz	+0/-3	dB	
THD+Noise	0.015	0.0015	%	+4 dBu, 20-20 kHz
	0.006	0.001	%	+4 dBu, 1 kHz
IM Distortion (SMPTE)	0.008	0.002	%	60 Hz / 7 kHz, 4:1, +4 dBu
Signal-to-Noise Ratio	re +20 dBu / +4 dBu			20 kHz noise BW; unbalanced
.....Boost/Cut Mode	111 / 95	2	dB	Sliders centered, max gain
	90 / 74	2	dB	Sliders full boost, max gain
	110 / 94	2	dB	Sliders full cut, max gain
.....Cut-Only Mode	104 / 88	2	dB	Sliders @ 0 dB, max gain
	110 / 94	2	dB	Sliders full cut, max gain
MTBF	11500		Hrs	Mil-Hdbk-217D, Section V
Security Panel	Included			
Unit: Agency Listing				
.....120 VAC model	Class 2 Equipment			National Electrical Code
	UL / CSA			Exempt Class 2 equipment
.....230 VAC model	CE-EMC			EMC directive 89/336/EEC
	CE-Safety Exempt			Per Art. 1 of LVD 73/23/EEC
Power Supply: Agency Listing				Class 2 Equipment
.....120 VAC model	UL			File no. E88261
	CSA			File no. LR58948
.....230 VAC model	CE-EMC			EMC directive 89/336/EEC
	CE-Safety			LV directive 73/23/EEC
.....100 VAC model	Built to JIS			Japan only
Maximum Current	650		mA	RMS current from remote supply
Power Supply Input	18 VAC w/center tap	10%	Vrms	Model RS 1
Unit: Construction	All Steel			
.....Size	3.5"H x 19"W x 8.5"D (2U)			(8.9 cm x 48.3 cm x 21.6 cm)
.....Weight	7 lb			(3.2 kg)
Shipping: Size	4.25" x 20.3" x 13.75"			(11 cm x 52 cm x 35 cm)
.....Weight	11 lb			(5.0 kg)
Note: 0 dBu=0.775 Vrms				

Block Diagram



Application Information

The GE 30 combines in one unit a full-featured Boost/Cut *and* Cut-only graphic equalizer. This allows the required equalizer choice to be made at the job site, on a unit-by-unit basis, instead of having to anticipate the requirements beforehand. Additionally, the GE 30 contains a built-in, switch-selectable Output Transformer. If direct active balanced drive is required, it is there; if, on the other hand, balanced Output Transformer isolation is necessary, it is also there. And the security cover is packed in the same box as the unit. No options. No beforehand decisions to be made that may bite you later.

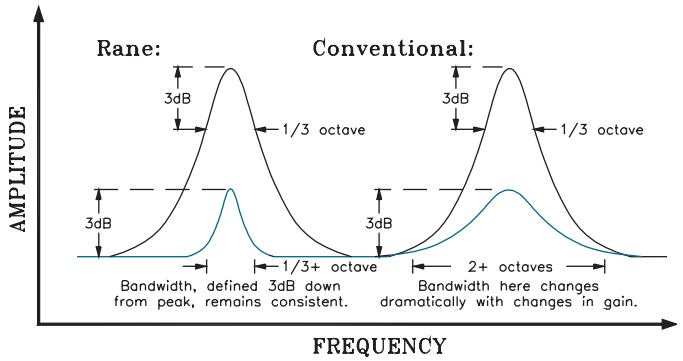
Aside from the many standard features, the GE 30 utilizes Rane's exclusive Interpolating Constant-Q circuitry. Designed to satisfy the need to Boost/Cut *between* standard ISO frequencies, interpolation by adjacent bands allows finer adjustments than previously possible with any graphic equalizer. Please see the RaneNote, "Constant-Q Graphic Equalizers" listed in the References section for more techincal details on interpolating.

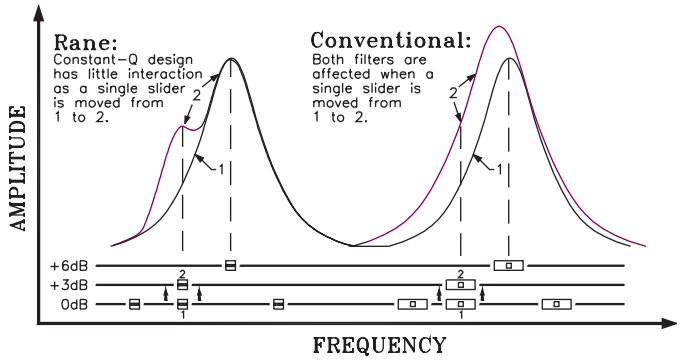
The GE 30 represents Rane's most refined constant-Q design. Constant-Q graphic equalizers arose from the sound professional's need for greater control with less interaction than previously possible with conventional equalizers. Truth in slider position became a requirement. The curve traced out by the slider positions on constant-Q designs indeed represents the actual changes to the frequency response. On conventional designs they do not.

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. Eliminating a phenomena Rane calls "equalizing the equalizer".

The accompanying figures dramatically show the advantages of constant-Q designs. For more technical information please consult the references shown on the back page.

Finally, what other professional graphic equalizer lists MTBF (Mean Time Between Failure) calculated per Mil Standards on their specification sheet?





Rear Panel

Architectural Specifications

The active equalizer shall be of Interpolating Constant-Q design and contain 30 bandpass filters with a fixed bandwidth of 1/3 octave and center frequencies fixed at precise 1/3 octave intervals in accordance with ISO recommendations. The equalizer shall be capable of operating in either the filter cut-only mode or in the filter boost/cut mode, by means of a rear panel mounted switch. In the cut-only mode each filter shall provide 0 to -20 dB attenuation at its center frequency. In the boost/cut mode each filter shall provide up to +12 dB boost and up to -15 dB cut at its center frequency from the 0 dB center detent control position. All frequency gain controls shall be the linear slider type with grounded center detent and 60mm of adjustment travel.

The active equalizer shall provide 12 dB/octave high-pass and low-pass filters, with rotary controls for continuously varying the -3 dB points from 10 Hz to 250 Hz and from 3.1 kHz to 40 kHz. The active equalizer shall provide a rotary gain control with a minimum range of Off to +20 dB in the cut-only mode and a minimum range of Off to +6 dB in the boost/cut mode. The equalizer shall provide a hard-wire bypass control with automatic default to bypass in the event of power loss.

The unit shall be exempt from agency safety requirements and the 120 VAC model shall be powered from a UL listed / CSA certified remote power supply. The 230 VAC model shall be powered from a remote power supply meeting LVD 73/23/EEC & EMCD 89/336/EEC standards.

The equalizer shall be capable of operating balanced or unbalanced through either direct-coupled active or transformer-coupled balanced/unbalanced output into 600 ohms minimum, by means of a rear panel mounted selector switch. The equalizer shall accept from 150 to 20,000 ohm input, balanced or unbalanced.

The active equalizer shall provide both professional three-pin and screw terminal connections for input and outputs on the rear panel. A steel security cover shall be provided with the equalizer.

The equalizer shall be Rane Corporation Model GE 30.

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).