



## RPE 228 Two Channel 1/3-Octave Remote Programmable Equalizer

- **High Security Remote Control**

This equalizer is programmed by computer (PC compatible) via RS-232 serial port. The computer may be removed after programming, or left connected to recall memories exclusively. As many as 16 units at a time may be daisy-chained. A recessed Default button on the rear panel recalls Memory 1 in case of computer failure.
- **Interpolating Constant-Q with Bandlimiting Filters**

Each channel has 28 bands of 1/3-octave interpolating constant-Q filters for predictability and minimal interaction between bands. The boost/cut range is  $\pm 10$  dB in 0.5 dB steps. Low and high cut filters have a wide adjustment range (up to 200 Hz and down to 1 kHz).
- **16 Non-Volatile Memories**

No batteries are needed (EEPROM memory). The first 8 of the 16 stored Memories may be recalled by remote switch contact closures. Current settings are also non-volatile.
- **Separate Input & Output Level Controls**

$\pm 12$  dB range on input and output in 1 dB steps, with settings stored in each Memory.
- **Balanced Inputs & Cross-Coupled Outputs**

Euroblock terminals are used for audio (and remote switch recall) connections. Ground connection is to the chassis.
- **RaneWare<sup>®</sup> Windows<sup>®</sup> Software**

Rane's Windows-compatible software, called **RaneWare**, is included at no extra cost, allowing the units to be controlled in real time. The latest version of RaneWare is available at Rane's Internet site, <http://www.rane.com>. The software's easy-to-use graphical interface features graphic sliders, the computed true EQ response curve, control of all parameters, and extensive on-line help. Memories may be recalled, copied, and stored. A Site Control window is provided with password protection so that all units can recall stored memories without further access. *Local edit* mode allows curves to be edited without affecting a unit. These curves can then be sent to a unit or saved in a file. The software is operational even without an RPE 228 connected. The Rane RPD 1 may be used to control the RPE 228 from a remote location using a modem.

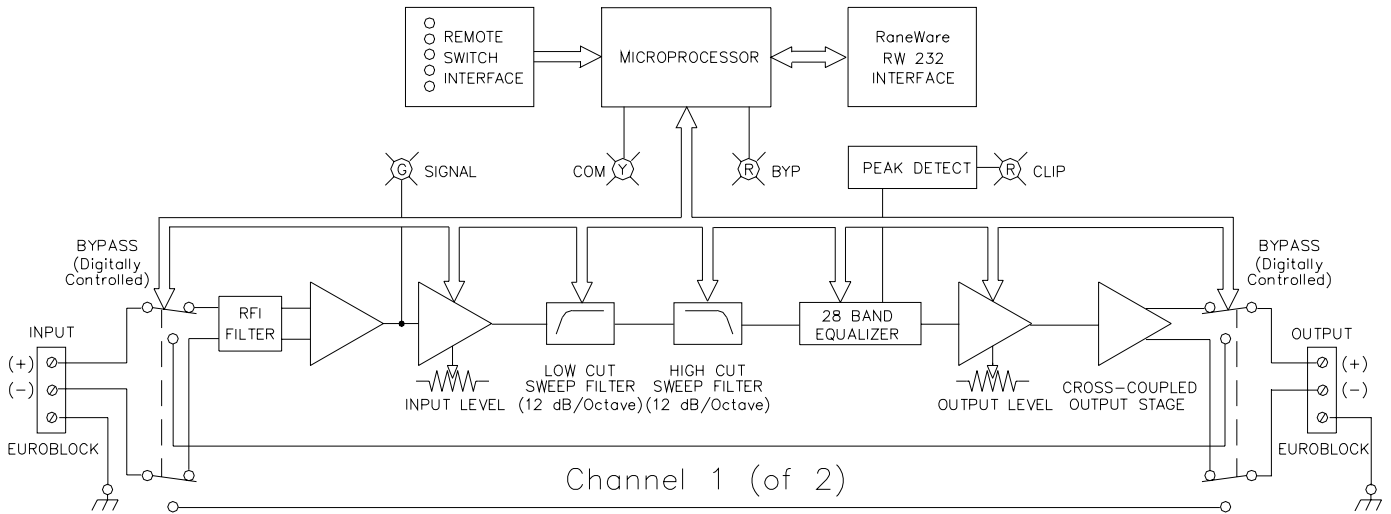
The following is recommended as a minimum system:

  - 80386SX with 80387 coprocessor, 33 MHz
  - Unused serial port
  - 4M RAM
  - Color monitor
  - Windows 3.1 or greater
- **UL/CSA Remote Power Supply (120 VAC)**
- **CE (Low Voltage & EMC) Remote Power Supply (230 VAC)**

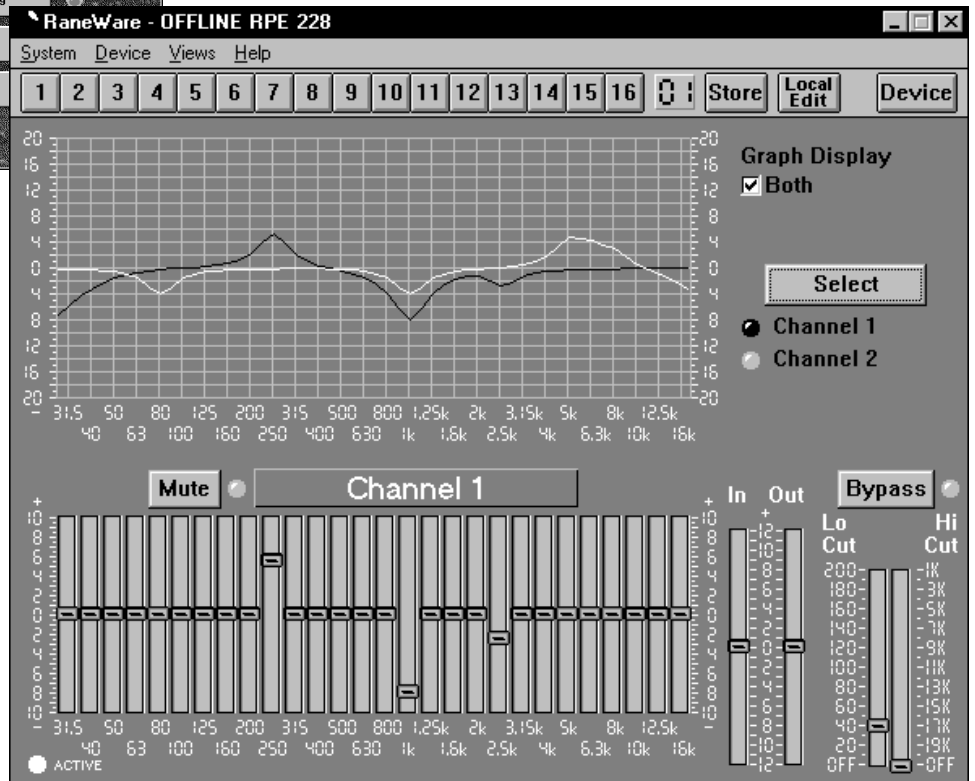
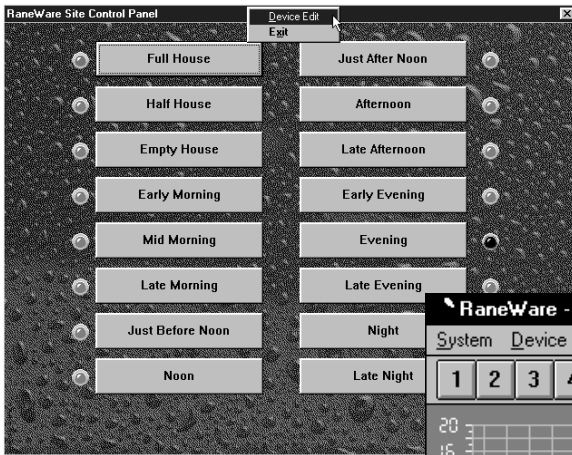


Parameter	Specification	Limit	Units	Conditions/Comments
Equalizer: Channels	2			Interpolating Constant-Q
.....Bands	(28) 1/3-Octave ISO Spacing			31.5 Hz to 16 kHz
.....Accuracy	3		%	Center Frequency
.....Range	±10	1	dB	
.....Step Size	0.5	0.25	dB	
.....Memories	16			Plus Current Settings
Inputs: Type	Active Balanced			
.....Connectors	Euroblock			
.....Impedance	40k	1%	Ohms	
.....Maximum Level	+20	1	dBu	
Outputs: Type	Active Cross-Coupled Balanced			
.....Connectors	Euroblock			
.....Impedance	50	0.1%	Ohms	Balanced: 25 Ohms Each Output
.....Maximum Level	+20	1	dBu	(>600 Ohms)
Communications Interface	RW 232 (RS-232)			
.....Cable Length	50 ft. Maximum			(15 m Maximum)
Overall Level Range	±12	1	dB	1 dB Step Size, Input or Output
RFI Filters	Yes			
Memory	EEPROM			Nonvolatile
Bypass Switches	Digitally Controlled			Auto-Bypass Upon Power Failure
Overload Indicator Thresholds	17.5	2	dBu	Input and Output Levels
Signal Present Thresholds	-27	5	dBu	Input Level
Sweepable Low Cut Filter	10 Hz-200 Hz, 12 dB/Oct	3%		10 Hz Step Size
Sweepable High Cut Filter	1 kHz-20 kHz, 12 dB/Oct	3%		1 kHz Step Size
Frequency Response	10-30 kHz	+0/-1	dB	Cut Filters "Off"
THD+Noise	0.02	0.005	%	+4dBu, 20-20 kHz
IM Distortion (SMPTE)	0.02	0.005	%	60 Hz / 7 kHz, 4:1, +4 dBu
Signal-to-Noise Ratio	re +4 dBu			20 kHz Noise BW, Balanced
	94	2	dB	All Bands Centered, Unity Gain*
	82	2	dB	All Bands Centered, Max Gain*
	77	2	dB	All Bands Full Cut, Unity Gain*
Channel Separation	70	3	dB	1 kHz
Unit: Agency Listing				
.....120 VAC Model	Class 2 Equipment U.L. 813 Exempt C.S.A. Exempt			National Electrical Code Class 2 Class 2
.....230 VAC Model	Certified FCC part 15J VDE, SELV CE (EMC) CE (Safety) Exempt			Class A Device Safety Extra Low Voltage EMC Directive 89/336/EEC Article 1 of LV Directive 73/23/EEC
Power Supply: Agency Listing				
.....120 VAC Model	U.L. Listed C.S.A. Certified			File no. E88261 File no. LR58948
.....230 VAC Model	CE (EMC) CE (Safety)			EMC Directive 89/336/EEC LV Directive 73/23/EEC
Power Supply: Requirement	18 VAC w/ center tap	0.1	Vrms	
.....Maximum Current	650		mA	RMS Current From Remote Supply
Unit: Construction	All Steel			
.....Size	1.75" H x 19" W x 8.5" D (1U)			(4.4 cm x 48.3 cm x 21.6 cm)
.....Weight	6 lb (w/o power supply)			(2.7 kg)
Shipping: Size	4.5" x 20.3" x 13.75"			(11.5 cm x 52 cm x 35 cm)
.....Weight	11 lb			(5.0 kg)
Note: 0 dBu=0.775 Vrms				*Level Controls Set at "0"

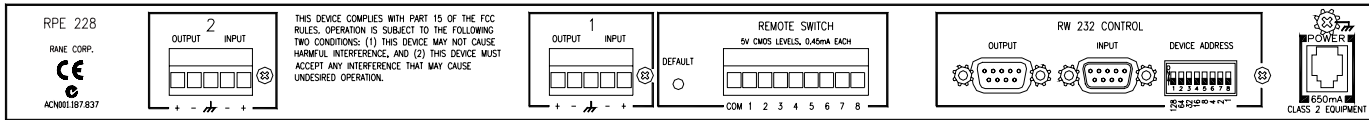
### Block Diagram



### RaneWare® Control Screens for Windows®



## Rear Panel



## Remote Switch Interface

The Remote Switch Interface provides contact closure control for the first eight preset memories. No computer is required after initial setup. There are nine terminals—one is chassis ground, and the other eight are for Memories 1-8. Momentary connection of one of these eight to ground causes

both channels of the unit to recall a preset Memory. Multiple units may be controlled by connecting these terminals in parallel. Either momentary or latching switches may be used. Use of a latching switch results in a Memory recall upon power-up. The latching switch should only close one contact at a time.

## Architectural Specifications

The programmable equalizer shall consist of two channels, each with 28 bands spaced on ISO centers from 31.5 Hz to 16 kHz, and be 1/3-octave wide, all as specified elsewhere. The amplitude control range of each band shall be +10 dB and -10 dB, adjustable in 0.5 dB steps. Each channel shall have adjustable low-cut and high-cut filters. The low-cut filter range shall be 10 Hz to 200 Hz in 10 Hz steps, or OFF. The high-cut filter range shall be 1 kHz to 20 kHz in 1 kHz steps, or OFF. The overall level range for each channel shall be  $\pm 12$  dB, adjustable in 1 dB steps. Individual bypass relays shall be provided for each channel.

The inputs and outputs shall be active balanced designs, with the outputs cross-coupled. A five terminal Euroblock shall be used for the audio I/O for each channel. The center terminal shall be chassis ground. The input impedance shall be 40k ohms, while the output impedance shall be 50 ohms,

balanced. Both shall be capable of processing audio signal levels of a maximum of +20 dBu. RFI input filters shall be provided. The frequency response of the unit shall be no more than 1dB down at 10 Hz and 30 kHz respectively.

Control of the unit shall be via RW 232. A device address switch, and RS-232 input and output jacks shall be provided. Front panel LED's shall indicate communication status, bypass status, signal presence, and overload for each channel.

The unit shall have certified compliance with FCC docket 20780 Part 15J for Class A computing devices, and EMCD 89/336/EEC. The 120 VAC model shall be powered from a UL listed, CSA certified remote power supply, and the 230 VAC model shall be powered from a remote power supply meeting LVD 73/23/EEC & EMCD 89/336/EEC standards. The chassis shall be constructed entirely from cold-rolled steel.

*The unit shall be a Rane Corporation Model RPE 228 Programmable Equalizer.*