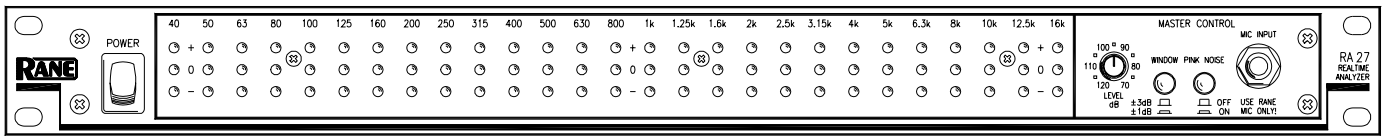


General Description

The Rane RA 27 Realtime Analyzer is a single rack space unit providing 27 bands of realtime frequency/amplitude information in a 3-LED vertical band format. Broadband signals applied to either the Microphone or Line inputs of the RA 27 are divided into 1/3 octave increments by ANSI Class II filters. The outputs of these are applied to LEDs on the front panel to visually indicate the amplitude of each band. In operation, the RA 27 is used to visually judge the character of the Pink Noise signal received by the measurement microphone. The operator may now adjust a 1/3 octave equalizer for optimum response of a sound system based on the readings presented by the LED display.

Front panel controls include an input Level sensitivity adjustment, calibrated in dB SPL, a Window switch which calibrates the sensitivity of the metering system, and a Pink Noise on/off switch. The MIC 1 is a flat-response microphone supplied with each RA 27 connects to the front panel Mic Input jack *only*. These factory tested microphones are flat to within 1 dB from 20 Hz to 16 kHz. An Aux Mic Input is provided on the rear panel, allowing the user to use a microphone of another type.

To provide a reference for proper use of the RA 27, a pseudo-random digital Pink Noise generator is included in the unit. The output of the Pink Noise generator is flat within 1 dB from 16 Hz to 20 kHz and has a crest factor of 4.

The rear panel of the RA 27 includes a Pink Noise Output jack, Aux Mic Input (XLR), a Line Input (¼" unbalanced), and a recessed Pink Noise Level adjustment.

The included Rane MIC 1 condenser microphone is a professional quality back-electret condenser microphone with an omnidirectional pickup pattern. Its power is provided from the RA 27, but may be powered via batteries for other uses (see RaneNote 104, *"Microphones and the RA 27"*).

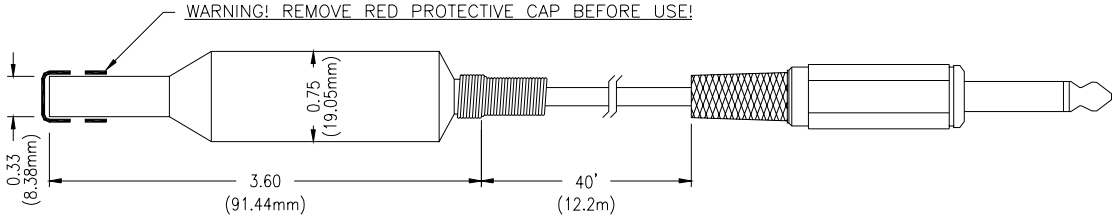
The MIC 1 comes complete with an extra long 40 ft (12.2m) cord to facilitate distant placing of the microphone from the analyzer. Included with the RA 27 is a zippered, weather-resistant carrying/storage bag for added convenience and protection of the mic. The MIC 1 has a non-reflective black wrinkle powder-coat finish that is extremely durable and scratch resistant.

When ordering the MIC 1 separately, please contact the Parts Department and specify part number 11151.

Features

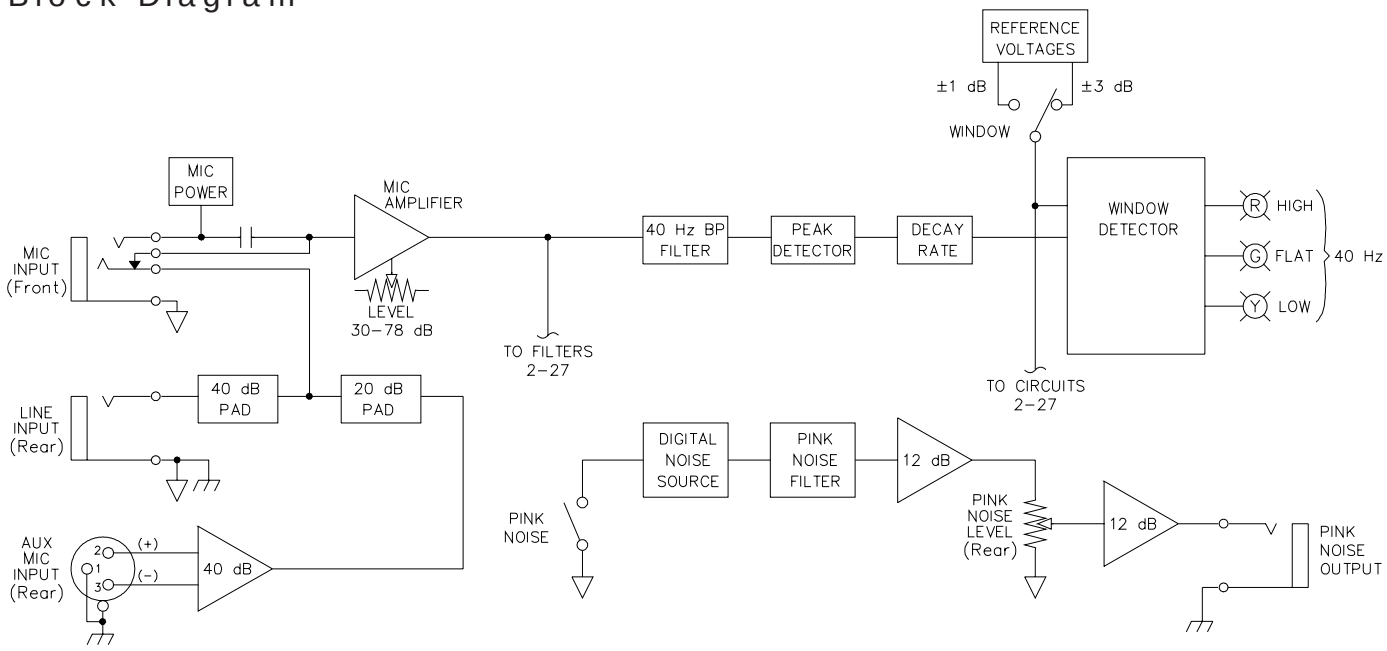
- 27 ANSI Class II Filter Bands
- 3-color LED display per band
- Digital Pink Noise generator
- Flat-response Microphone with 40-foot cable
- 3 dB/1 dB Window switch
- Aux Microphone Input
- Line Input
- Analyzer Sensitivity control
- Pink Noise Level control
- Meets CE requirements

Rane MIC 1 (included)



Parameter	Specification	Limit	Units	Conditions/Comments
Analyzer: Range	±1 or ±3	0.3	dB	Switch selectable “green” window
.....Level	70 to 120	5	dB	Microphone loudness SPL
.....Frequency Response	40 Hz-16 kHz	0.5	dB	
.....Attack Time Constant	Peak Instantaneous			
Frequency Accuracy	5		%	
Analyzer Filters	ANSI Class II			
Pink Noise: Type	Pseudo-random Digital			Crest factor: 4
Level	Off to +4	1	dBu	
Response	16 Hz-20 kHz	1	dB	
Aux Mic Input: Type	Active Balanced/Unbalanced			
.....Connector	3-Pin XLR type			
.....Impedance	100k	1%	ohms	
.....Max Gain	98	3	dB	
.....Min Level	15	5	uV	
Line Input: Type	Active Unbalanced			
.....Connector	¼" TRS			
.....Impedance	100k	5%	ohms	
.....Max Gain	38	3	dB	
.....Min Level	15	5	mV	
Microphone: Type	Back-Electret Condenser			6 mm capsule
.....Frequency Response	20 to 16,000	1	dB	+2 dB at 20 kHz
.....Polar Pattern	Omnidirectional			
.....Impedance	1.8k	5%	ohms	With 2.2k ohms load
.....Sensitivity	-64	3	dBV	re 0 dB=1V/µbar, 1 kHz
	(0.63 mV @ 74 dB SPL)			1 µbar = 74 dB SPL
.....Maximum SPL	140		dB	1 kHz
.....Signal-To-Noise Ratio	58 (re 94 dB SPL)	Min	dB	1 kHz, A-weighted
.....Phasing	Non-inverting			Positive pressure on diaphragm equals positive output voltage
.....Power: Voltage Range	1.5 to 10		VDC	Absolute min & max ratings
.....Rated Voltage	2.0	10%	VDC	
.....Sensitivity Loss	-3 dB @ 1.5 VDC			
.....Current Demand	0.5	Max	mA	At 2.0 VDC
.....Cable	Attached; 40 ft (12.2 m) Long			1 cond. shielded; ¼" TS phone
.....Case	6" x 9" (15.2 cm x 22.9 cm)			Zippered heavy black vinyl
.....Storage Temperature	-20 to 60		oC	-4 to 140 oF
.....Operating Temperature	-18 to 50		oC	0 to 122 oF
.....Relative Humidity	0 to 95		%	Operating or storage
Line Voltage: Domestic	95-130 VAC, 50/60 Hz			
.....Export	190-250 VAC, 50 Hz			
Unit: Agency Listing				
.....120 VAC Model	COLA			(City of Los Angeles)
.....230 VAC Model	CE-EMC certified EN55013 & EN55020			EMC Directive 89/336/EEC
	CE-Safety certified EN60065			LV directive 73/23/EEC
.....Size	1.75"H x 19"W x 8.5"D (1U)			(4.4 cm x 48.3 cm x 21.6 cm)
.....Weight	8 lb			(3.6 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

All professional sound systems suffer the mercy of driver responses, room resonances, phase interactions, crossover adjustments and other factors which destroy the sound quality. Unfortunately the human ear, though very sensitive, is neither calibrated nor consistent, and is generally unable to determine exactly where and by how much a system's response is lacking. Recognizing this fact, experienced sound technicians invariably employ some type of realtime analyzer to identify system deficiencies, then quickly and accurately correct them. However, the high cost and complexity of traditional analyzer designs reserved their use to an elite few, leaving the majority of sound system users to a hit-and-miss equalizer guessing game.

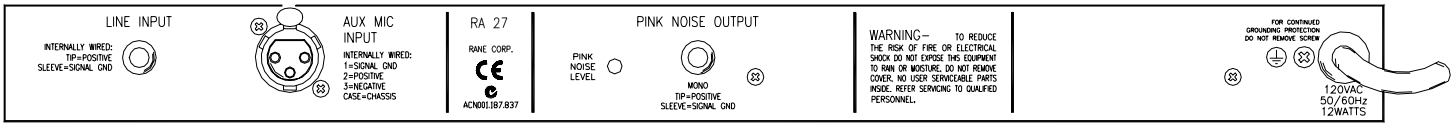
Realizing this, Rane set out to literally redefine the design and application of the realtime analyzer, developing a complete, innovative analyzer system which is simple, quick, extremely accurate and incredibly cost-effective. The concept for the RA 27 was to take the fear, cost and complexity out of realtime analyzers. By designing a simplified analyzer in a single rack space unit, Rane created an extremely useful piece of sound reinforcement gear. One where a small venue can be equalized within minutes with accurate visual guidance.

Instead of the traditionally complex and costly LED matrix array, the RA 27 uses an ingenious color-coded display which instantly gives you all the practical information needed from an analyzer. For each frequency band there is a column of three LEDs: red, green and yellow from top down. If the red LED is lit, response is too high; if the yellow LED is lit, response is too low. In either case you simply adjust the corresponding slider on your graphic equalizer until the green LED lights. When all the green LEDs are lit, your system is aligned to 1 dB or 3 dB accuracy—your choice. Just that simple. And when you finish the pink noise test, unplug the Microphone from the front panel jack and the display will automatically monitor the program through the Auxiliary Line level Input section. Now you can keep an eye on problem feedback frequencies during the performance and make quick, effective adjustments.

The RA 27 comes complete with built-in Pink Noise generator and a flat response condenser microphone with 40 foot cable and case. The Auxiliary Mic Input on the RA 27 allows system alignment to the response of your microphone, yielding more favorable results in choral, orchestral or other similar situations where the same microphone model is used to provide all program input.

The RA 27 will enable accurate system performance time after time, in every location, with incredible ease and speed. In just a few short minutes you obtain minimum feedback and clean, uncolored sound. From here, further EQ can easily and effectively be accomplished by ear. Once the RA 27 gives you the consistent flat reference point, you may fatten the bass, sweeten the highs or make any further adjustments to suit the particular type of music, audience and location. With so much sound quality to gain at such little cost, no professional sound system is complete without the RA 27.

Rear Panel



Architectural Specifications

The realtime analyzer shall provide three LEDs for each of 27 bands located on standard ISO center frequencies, and be contained in a rack mount chassis requiring one (1) rack space. A red LED shall indicate signal level in excess of the selected range; a green LED shall indicate signal levels within the selected range; and a yellow LED shall indicate signal levels less than the selected range.

A switchable 1 dB or 3 dB range shall be provided, as well as an input level control with a range of 70-120 dB SPL.

The unit shall come complete with an electret condenser microphone with a 40-foot cord packed in a carrying case.

A digital pseudo-random number generator based pink noise source shall be built-in.

A line level auxiliary input shall be included and be of active unbalanced design terminated with ¼" TRS (tip-ring-sleeve) connector. An auxiliary microphone input shall be provided with a three pin connector and balanced amplifier input stage.

The unit shall be capable of operation by means of its own built-in power supply connected to 120 VAC (240 VAC where applicable) and meet CE requirements. The unit shall be entirely constructed from cold-rolled steel.

The unit shall be a Rane Corporation Model RA 27.

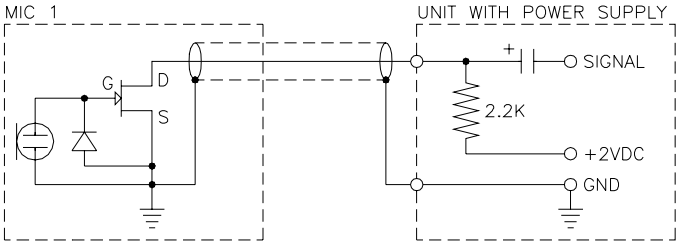
MIC 1 Details

The MIC 1 is a back-electret condenser microphone. The "back-electret" is an improved version of the standard electret condenser design where the polarization charge voltage, or electret bias, is applied to the rear backplate. This provides increased mechanical strength, improved resistance to environmental effects, and better sensitivity and stability of the charge. Since the electret is permanently charged (we think 30 years qualifies as permanent) it does not need the high voltage powering common to standard condenser designs—a major benefit. This benefit is reduced, however, by the electret requiring an impedance converter (built-in JFET) which *does* need low voltage powering. So, as always, you just can't quite win.

Details of the simple power supply appear in the Electrical Diagram below. As shown, the recommended standard operating voltage is +2 VDC supplied through a 2.2k ohm resistor. Usually the 2 volts is zener regulated to a higher voltage and resistively divided down. Regulation and tolerances are not critical; however, the supply should be as noise free as possible. While 2 volts is recommended, the MIC 1 runs equally well up to 10 volts. *When using higher voltages be sure to observe the absolute maximum voltage limit of 10 volts.* See RaneNote 104 "*Microphones and the RA 27*" for more details and battery power options for the MIC 1.

Available Accessories

- SC 1.7 Security Cover (to cover the lights?!?)
- MIC 1 (order part # 11151)



MIC 1 Electrical Diagram