

FAC 28 Active Crossover

General Description

Rane's Flex Series FAC 28 Active Crossover is possibly the first commercially available 8th-order Linkwitz-Riley circuit. Based upon Rane's proprietary state-variable tracking circuitry, both outputs are always in phase and locked in frequency. With 48dB/octave filter slopes, the crossover region is so narrow that all drivers benefit. The response is 48dB down just one octave away from the crossover frequency. This allows drivers to be operated only in their most linear regions. Beyond their linear limits all frequencies are attenuated so quickly that driver nonlinearities and interaction cease to be significant.

This narrowing of the crossover region also reduces the problems associated with time correcting speaker systems. Any misbehavior is restricted to such a small frequency band that simply correcting the phase differences between drivers is usually sufficient for most systems. For this reason, the FAC 28 provides a variable phase correction circuit to adjust for driver phase differences caused by misaligned speakers. This control varies the respective phase shift between outputs from 0 to 180 degrees. Combined with the built-in polarity

switches, complete phase correction control exists. When system requirements demand outboard digital time delay, the bypass switch removes the variable phase correction circuitry completely.

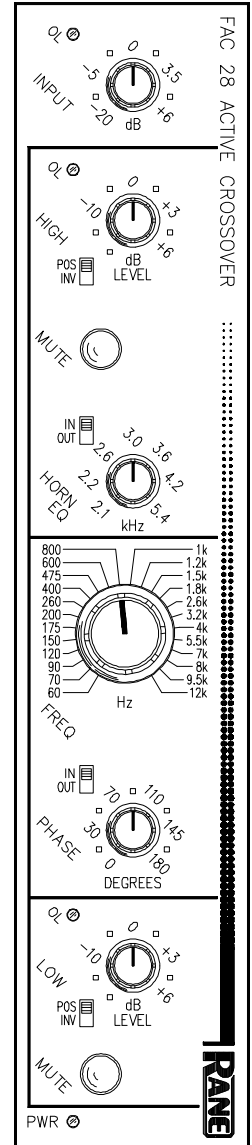
Equalization for constant-directivity horns is built-in and variable between 2.1kHz and 5.4kHz, covering all recommended boost points. The bypass switch allows complete removal of this circuitry when not required.

Frequency selection is done via the front panel 24-position selector switch. This switch drives FET switches for silent and precise control of each frequency point, guaranteeing the accuracy and repeatability of plug-in card designs while maintaining the flexibility of front panel control.

The mono two-way design of the FAC 28 ensures maximum flexibility. As requirements change, additional FAC 28s quickly expand the system. Each job is designed with exactly the right amount of crossover modules. Gone is the cost and frustration of buying more crossover than is needed, or making do with too little.

Features

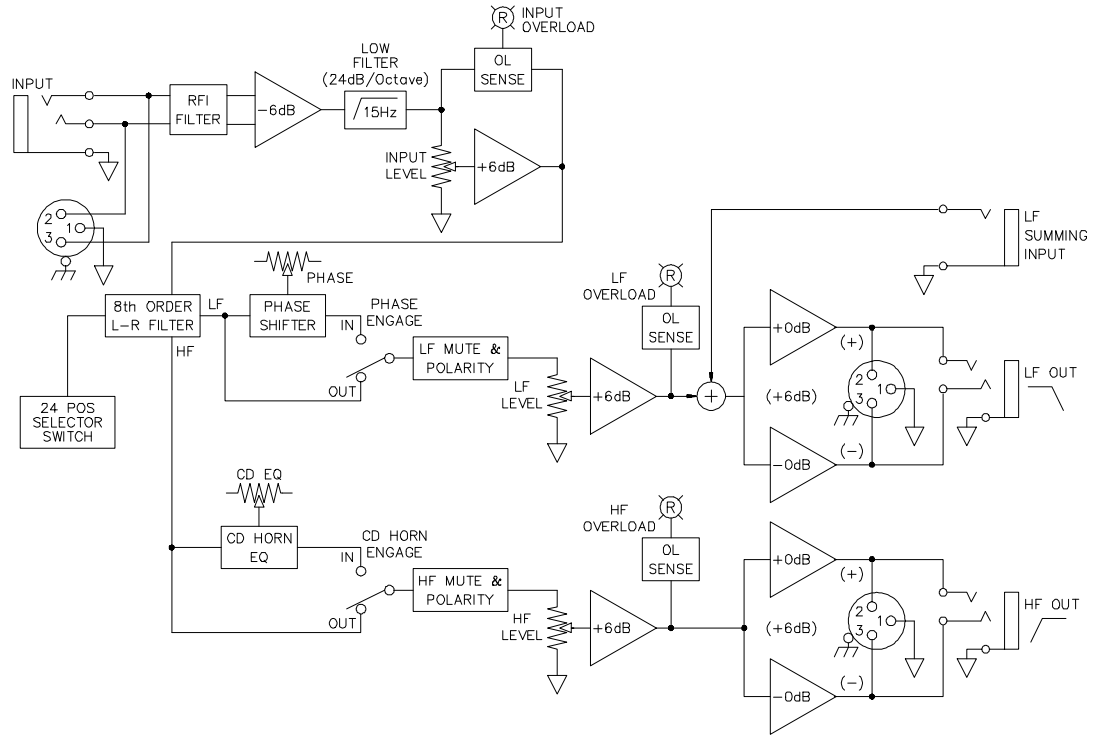
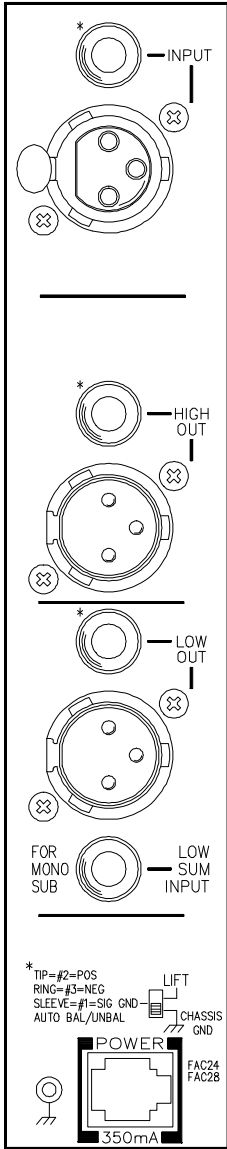
- 8th-ORDER LINKWITZ-RILEY
- 48dB/OCTAVE FILTER SLOPES
- MONO TWO-WAY
- VARIABLE PHASE CORRECTION
- CD HORN VARIABLE EQ
- PHASE POLARITY SWITCHES
- BAND MUTING SWITCHES
- 24 CROSSOVER FREQUENCIES
- LOW FILTER 15Hz 24dB/OCT
- SEPARATE IN/OUT OL LEDs
- FULLY BALANCED IN/OUTS



Parameter	Specification	Limit	Units	Conditions/Comments
Crossover: Alignment	Linkwitz-Riley			Exclusive 8th-Order State-Variable
.....Slopes	48dB/Octave			
.....Range	60-12kHz			24-Position Selector Switch
Variable Phase Correction	0-180	5%	deg	Relative Phase Between Outputs
CD Horn Equalization	Variable 2.1kHz-5.4kHz	5%	Hz	+3dB Corner Frequency
Phase Polarity Switches	Yes			Both Outputs
Input Gain Range	-20 to +6	-0/+2	dB	Balanced Out
Output Gain Ranges	Off to +6	-0/+2	dB	Balanced Out
Band Muting Switches	Yes			Both Outputs
Low Filter	15Hz, 24dB/Oct, Butterworth	3%	Hz	Internal Bypass
Frequency Response	15-85kHz	+0/-3	dB	
THD+Noise	0.04	.01	%	+4dBu, 20-20kHz
IM Distortion (SMPTE)	0.04	.01	%	60Hz/7kHz, 4:1, +4dBu
Signal-to-Noise Ratio	106/90 (re +20dBu/+4dBu)	2	dB	20kHz Noise Bandwidth; Unity Gain
Maximum Current	350		mA	RMS current from remote supply

Rear Panel

Block Diagram



Application Information

Carefully thoughtout design and features make hook-up and operation of the FAC 28 easy. First, providing full spectrum crossover frequency coverage with the 24-position switch allows one module to be used for any crossover position. A FAC 28 may be used for a deep-bass thundering sub-woofer system crossing over at 60Hz or as a sparkling crystalline super-tweeter

system crossed at 12kHz. Identical modules make life simpler.

Next, interconnect is easy. Fully balanced in/out and a ground lift switch reduce interference and ground loop susceptibility. Use the 3-pin connectors for the main input and the final outputs. Use the 1/4" TRS connectors for all inter-module wiring. Use 2-conductor with overall shield cable for all interconnect (avoid using mono mic cable and

unbalanced 1/4" connectors.)

When stringing several modules together for 3, 4, and 5-way systems, the FAC 28 reduces some confusion by assigning the relevant controls to be those found below the frequency selector switch. In each case (until you get to the last FAC 28), the upper-half of the unit is not used. So setting and changing the system during set-up involves only using the bottom row of controls in their natural order. For example, a 4-way system requires 3 modules. From left-to-right: the bottom controls of the 1st module adjust the Sub-woofer output; the bottom controls of the 2nd module adjust the Low Mid output; and the bottom controls of the 3rd module controls the High Mid output, while the top of the 3rd module controls the High output.

Monoed sub-woofer applications require summing of two LF outputs before driving the sub-woofer power amplifier. The LF Summing input of the FAC 28 facilitates this requirement. Simply patching one LF output to this input produces a monoed sub-woofer output.