

FVL 22 Remote VCA/Limiter

General Description

The Rane FVL 22 Remote VCA/Limiter is a stereo (2-channel) general purpose Flex building block consisting of two remotely controlled, professional recording quality VCA's (voltage-controlled amplifiers) along with two Limiters. Each channel operates independently or they slave together to form a locked stereo pair. The FVL 22 uses *Analog Devices* VCA's for their superb noise and distortion performance.

A unique *voltage calibration feature* allows using a wide range of VCA control voltages. Ramp voltages may vary from standard +5VDC digital levels to +24VDC doorbell levels. Three LED indicators make calibration easy and positive.

Alternatively, the FVL 22 provides a tightly regulated +10VDC reference voltage for use with external potentiometer control. Potentiometer values may vary over a wide range of 5k to 100k ohms, using linear taper. Either type of control

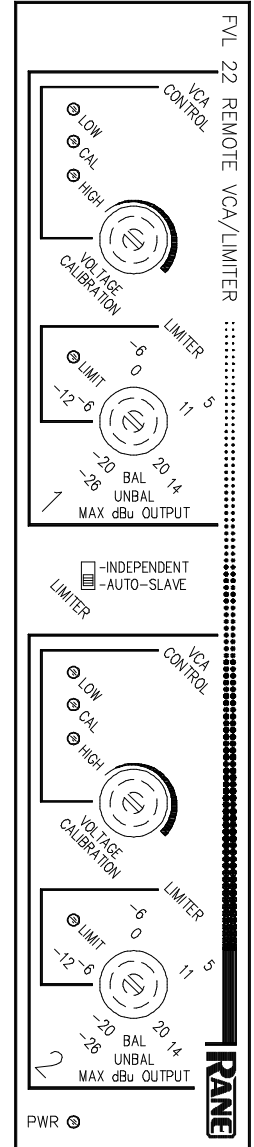
benefits from built-in *AC noise filters* provided on the VCA control lines. The noise filters prevent all false level changes caused by hum and noise induced on the DC control lines.

The Limiters operate over a wide balanced output range of -20dBu to +20dBu, and feature the same proven technology first made famous by Rane's popular DC 24 Dynamic Controller. The important Auto-Slave feature first introduced in the FPL 44 is incorporated as well.

The VOLTAGE CALIBRATION and LIMITER controls are screwdriver-adjust type, with hole-plugs for additional security. Inputs and outputs are fully balanced, but operate unbalanced when required. All interconnection is done using convenient, secure and economical terminal strips. Additionally, 1/4" TRS jacks provide quick single-cable interconnect to console patch points wired per the tip=send, ring=return convention. VCA control always uses the terminal strip.

Features

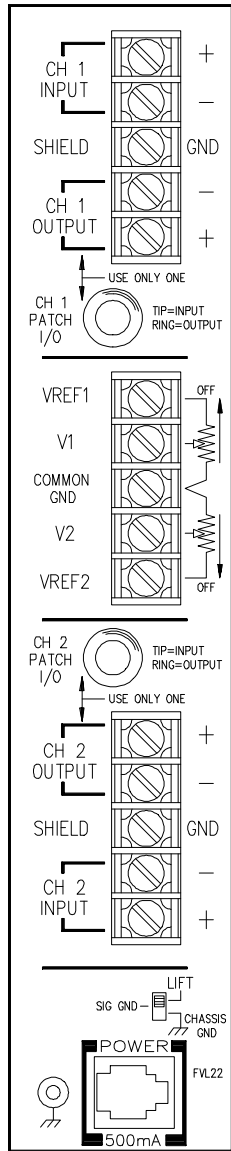
- TWO INDEPENDENT OR SLAVED CHANNELS
- RECORDING QUALITY VCA's
- VOLTAGE RAMP OR POTENTIOMETER CONTROL
- UNIQUE CALIBRATION ALLOWS 5-24VDC CONTROL
- NOISE REJECTION FILTERS ON CONTROL PORTS
- PRECISE +10VDC REFERENCE VOLTAGE
- ACCEPTS WIDE RANGE OF POTENTIOMETERS
- 40dB LIMITER RANGE
- BALANCED IN/OUT VIA TERMINAL STRIPS
- 1/4" PATCH JACK FOR INSERT LOOPS



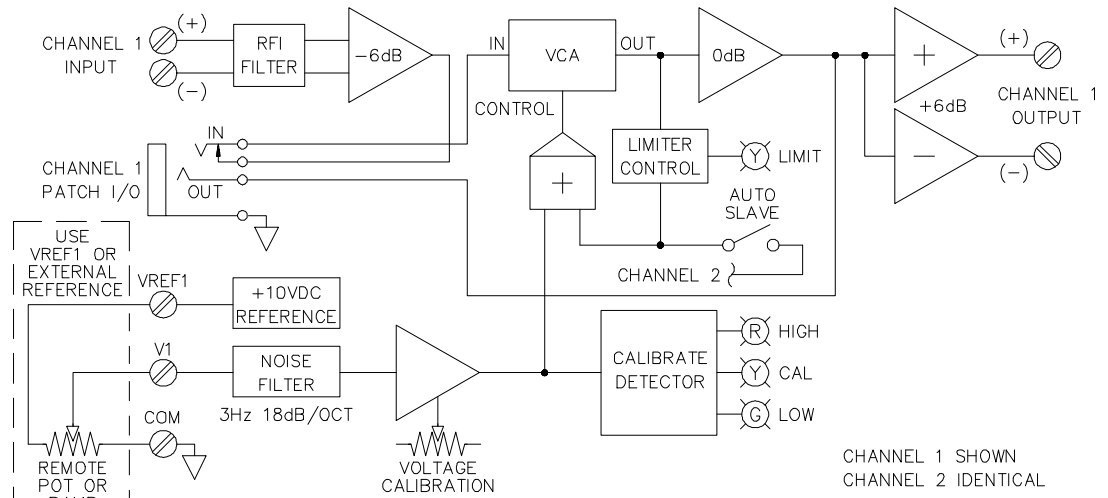
Parameter	Specification	Limit	Units	Conditions/Comments
Max In/Out	+20	1	dB	Balanced
VCA Control Voltage	5-24	10%	VDC	
Control Potentiometer Range	5k to 100k Audio or Linear Taper	20%	Ohms	(Linear Taper: See Rear)
VCA Tracking	0 to -50: less than 0.75		dB	Driving V1 & V2 Together
	-50 to -80: less than 1.0		dB	Driving V1 & V2 Together
VCA Range	0 to -80	1	dB	Maximum Attenuation
VCA Control Law	0 = On; 5-24 = Off		VDC	Voltage Applied to V1 or V2
Control Noise Filter	3Hz, 18dB/Octave	5%		Butterworth
Control Hum Rejection	-74 @ 50Hz; -78 @ 60Hz	2	dB	
Limiter Threshold Range	-20 to +20	2	dBu	Balanced Output Level
Overall Gain	0	0.5	dB	
THD + Noise	0.022	0.008	%	+4dBu, 20-20kHz, +20dB Threshold
IM Distortion (SMPTE)	0.015	0.005	%	60Hz/7kHz, 4:1, +4dBu
Signal-to-Noise Ratio	107	2	dB	Balanced Out re +20dBu, 20kHz BW
	91	2	dB	Balanced Out re +4dBu, 20kHz BW
Channel Crosstalk	90	2	dB	20-20kHz
Maximum Current	500		mA	RMS Current From Remote Supply

REMOTE VCA/LIMITER

Rear Panel



Block Diagram



Application Information

Use the FVL 22 anytime you need one or two channels of high quality VCA remote control of signal level. Additionally, the FVL 22 provides two channels of Limiting, practically for free.

VCA Control. The FVL 22 follows the usual convention of zero volts turns the VCA fully on, and some maximum positive voltage turns the VCA fully off. Choose between potentiometer, voltage ramp or switch control. The FVL 22 accepts a wide range (5k-100k) of linear taper potentiometers. A reference voltage of 10VDC is provided by the FVL 22, or you may use your own anywhere in the range of +5VDC to +24VDC. A unique,

for the limiter monitors the output of the VCA, not the input of the unit. Any time the output of the VCA exceeds the threshold set on the front panel (calibrated for both balanced and unbalanced use), limiting begins. The ratio of the limiter is set automatically and is a function of the excess level the system is attempting to deliver above the preset threshold. The attack and release times of the limiter are an automatic function of the speed at which the input signal is attempting to drive the output of the unit above the threshold level.

The AUTO-SLAVE limiter function allows both channels to track, or be slaved, together. When the LIMITER switch is in the AUTO-SLAVE position, limiting occurring on either channel causes equivalent limiting in the other channel. This retains the imaging and spectral balance in stereo applications.

Using Linear Taper Controls. Audio (or log) taper pots give the best attenuation distribution around the control, but linear pots are easier to get. You can approximate an audio taper by adding a resistor to the slider per the diagram shown.

simple calibration adjustment makes using external voltage references extremely easy. Similarly, voltage ramps with a maximum of +5VDC to +24VDC control the FVL 22 as well. Or, for simply two-state systems (e.g., On/Off, or On/-20dB, or -20/-60, or whatever), a switch closing between ground and any voltage up to +5VDC to +24VDC controls the VCAs. Note: When properly calibrated, the CAL indicator lights only for VCA fully off; all other conditions light the LOW indicator.

Limiter Section. The limiters in the FVL 22 use the same topology as the Rane FPL 44 Quad Limiter. This is a feedback, as opposed to a feedforward, design. The control circuit

