

QUICK START

Welcome to the section for all too busy to actually read the manual. We provide this quick start as a service to our best customers (the ones who buy the product.) Let's get started...

There are two ways to connect audio to the FVL 22, #6 terminal strips or Patch I/O points. To use the terminals, attach the balanced lines to the "+", "-", and **SHIELD GROUND** terminals. To run the FVL 22 unbalanced, attach the positive lead to the "+" terminal and leave the "-" terminal open. To use the FVL 22 as an external level control/limiter for a mixer or other device with tip = send, ring = return insert points, simply use the **PATCH I/O** ¼" TRS jack. Note: PATCH I/O is an unbalanced signal. Use two conductor cable with shield.

Install your remote control device (5k to 100k linear taper potentiometer, voltage ramp, or switch) and run two or three wires to the FVL 22. If you are using an external voltage, run one wire per Channel to the **V1** terminal for Channel 1, **V2** for Channel 2, and a ground wire to **COMMON GND**. To use the provided 10VDC reference, connect a second wire from **VREF1** or **VREF2** to your pot or switch. Refer to the wiring diagrams on the back page of this manual.

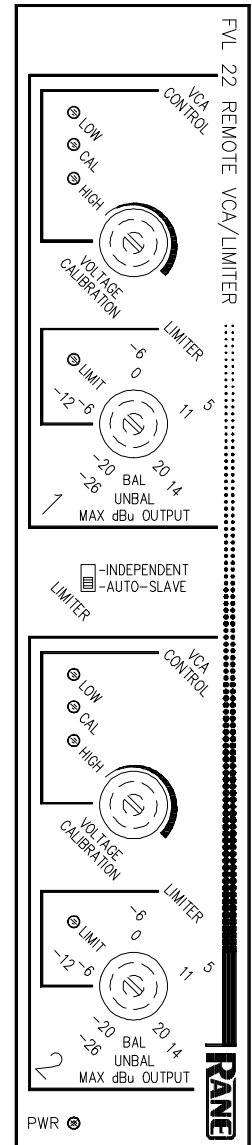
The VCA's in the FVL 22 provide maximum attenuation of the signal level when a given voltage is detected between V1 or V2 and COMMON GND. Reducing this voltage with a pot, ramp, or switch increases the audio signal level. (0 volts or open = VCA full on.)

To calibrate: set the remote pot, ramp or switch to it's maximum voltage. Adjust the **VOLT-AGE CALIBRATION** control until the green **CAL** indicator is lit.

Rotate the **LIMITER** threshold control to the level you never wish to exceed at the output. The **AUTO-SLAVE** switch position locks the limiter control circuitry for stereo applications, limiting both Channels equally when either Channel goes into limit.

Upon completion of the setup procedures, use the supplied hole plugs to prevent unauthorized adjustments.

Never connect anything except an approved Rane AC Power supply to the thing that looks like a red telephone jack on the rear of the FVL 22. This is an AC power input and requires special attention if you do not have a power supply *exactly* like the one originally packed with your unit. Rane models FRS 8, RAP 10 or VC 18 power supplies are acceptable as well. Please see the full explanation of power supply requirements elsewhere in this manual.



SYSTEM CONNECTION

When connecting the FVL 22 to other components for the first time, leave the power supply for last. This allows for mistakes to be identified by visual inspection and corrected before power is applied and it becomes too late.

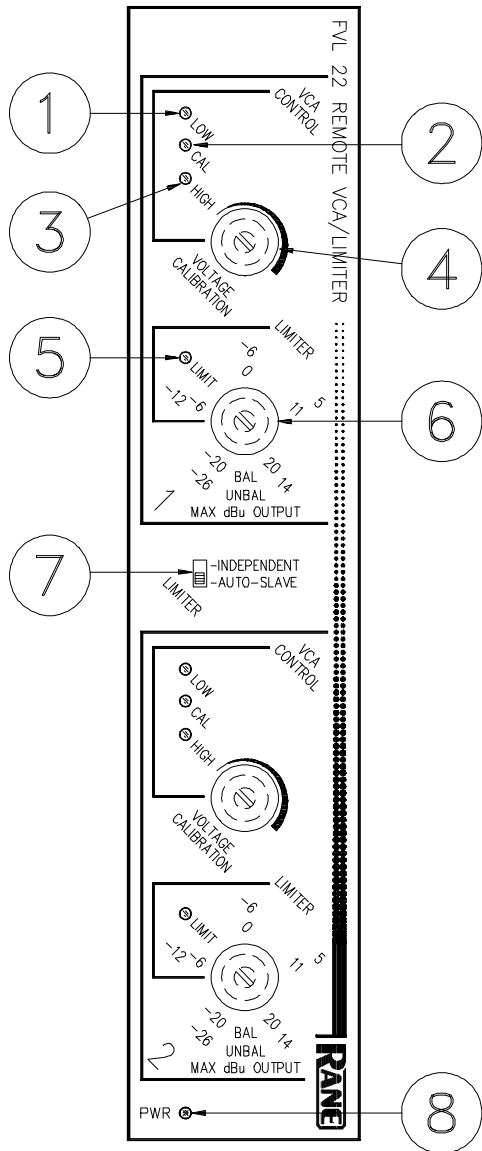
INPUTS and **OUTPUTS** on the FVL 22 are connected via terminal strips or the PATCH I/O jack. Using the terminals, attach the balanced lines to the "+", "-", and **SHIELD GROUND** terminals. To run the FVL 22 unbalanced, attach the positive lead to the "+" terminal and leave the "-" terminal open. To use the FVL 22 as an external processor for a mixer or other device with tip = send, ring = return insert points, use the **PATCH I/O** ¼" TRS jack with a two conductor shielded cable (the PATCH I/O is unbalanced).

EXTERNAL VCA CONTROL. The VCA's in the FVL 22 provide maximum attenuation of the signal level when a voltage is detected between V1 and V2 and COMMON GND.

Reducing this voltage with a pot, voltage ramp, or switch increases the audio signal level. (0 volts or open = full VCA on.) This voltage is provided by the VREF terminal on the FVL 22 or derived by existing voltage sources at the remote device location. Refer to the wiring diagrams on the last page of this manual.

POWERING UP. A good visual inspection often eliminates disasters before applying power. It cannot be overstated how important it is to use the correct power supply with this and all Flex products. The RS 1 single AC power supply (included with each module) as well as the Rane FRS 8, RAP 10 and VC 18 power supplies are the only supplies certain to work properly with the unit. If another supply is considered, it must be an AC supply. It must have an 18 to 24 volt center-tapped output and be wired to a 6-in mod connector in accordance with the requirements of the Rane standard.

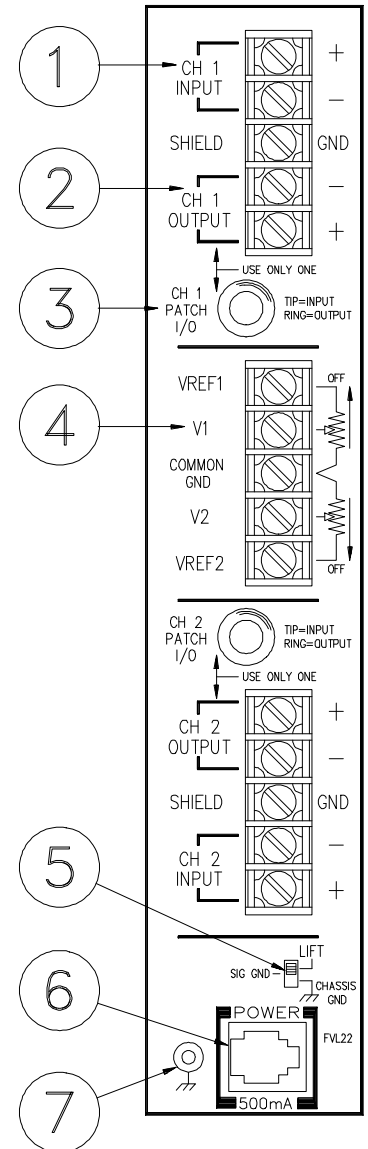
FRONT PANEL DESCRIPTION



- 1. LOW CALIBRATION LED.** The VCA's in the FVL 22 *attenuate the most* with the *highest* voltage across V1 and COMMON GND. Setting the remote pot, ramp or switch to provide its highest voltage readies the FVL 22 for calibration. During calibration, if this LED is on, adjust the VOLTAGE CALIBRATION control clockwise, until the CAL indicator comes *on*.
- 2. CAL LED.** This LED illuminates when the maximum voltage is present between V1 and COMMON GND and the calibration is just right.
- 3. HIGH CALIBRATION LED.** During calibration, if this LED is on, adjust VOLTAGE CALIBRATION counterclockwise, until the CAL indicator comes on.
- 4. VOLTAGE CALIBRATION ADJUST.** Use this screwdriver-adjust control to set the VCA circuitry calibration when the external voltage at V1 is set to its maximum level.
- 5. LIMIT THRESHOLD LED.** When this LED illuminates, the preset level threshold of the limiter has been exceeded.
- 6. LIMITER ADJUST.** Rotate this screwdriver-adjust control to calibrate the point at which the output limits. The inner ring of numbers show the angle to rotate this control for balanced operation, the outer ring for unbalanced output levels.
- 7. AUTO-SLAVE SWITCH.** In the INDEPENDENT position, each Limiter Channel operates separately. In the AUTO-SLAVE position, both Channels attenuate the same amount when either one exceeds its threshold.
- 8. POWER INDICATOR.** Indicates the power *on* condition of the FVL 22.

REAR PANEL DESCRIPTION

1. **AUDIO INPUT TERMINALS.** Attach balanced input lines to the “+”, “-”, and SHIELD GROUND #6 terminals. To run the FVL 22 unbalanced, attach the positive lead to the “+” terminal and leave the “-” terminal open.
2. **AUDIO OUTPUT TERMINALS.** Attach balanced output lines to the “+”, “-”, and SHIELD GROUND #6 terminals. To run the FVL 22 unbalanced, attach the positive lead to the “+” terminal and leave the “-” terminal open.
3. **PATCH I/O JACK** provides a convenient method to use the FVL 22 as an external processor for a mixer or other device with tip = send, ring = return insert points. Use a two conductor shielded Tip-Ring-Sleeve cable. Use of the PATCH I/O jack automatically disconnects the terminal strip input.
4. **VOLTAGE CONTROL.** These terminals are your gateway to the VCA control circuitry. The VREF terminal provides a precise 10VDC reference voltage output. The V1 terminal accepts a given voltage (+5 to 24VDC), which when properly calibrated, provides maximum attenuation. As this voltage *decreases*, the audio level *increases*. Decrease this voltage with whatever method suits your application (Potentiometer, switch, or voltage ramp—see back page for details).
5. **GROUND LIFT SWITCH** provides the ability to separate chassis ground and signal ground. Normally, this switch should be in the LIFT position. In some circumstances it may be necessary to move it to the opposite position to eliminate stubborn hum and buzz problems. See the CHASSIS GROUNDING note below for details. *CAUTION:* If you are tempted to try moving this switch with your amplifier levels turned up, *don't be. Always turn your amplifier levels down before changing your grounds around* and then bring them up slowly.
6. **POWER INPUT CONNECTOR.** This is the spot where the “appropriate power supply” connects. Again, for a complete definition of the power supply, look to the first page for information concerning the source nearest you.
7. **GROUND CONNECTOR.** Since the FVL 22 is powered from a remote AC power supply which does not carry chassis ground through to the grounding pin of the AC cord, this 6-32 screw has been provided in case your system does not have another earth grounding means such as through rack rails, etc. Its use or disuse should be determined by your specific application.



OPERATING INSTRUCTIONS

The FVL 22 is a two Channel Voltage Controlled Amplifier (VCA) providing the following functions—an audio level control, and a limiter.

REMOTE AUDIO LEVEL CONTROL

Applying a control voltage to the V1 or V2 terminals sets the gain through the unit. This voltage is controlled from a remote potentiometer, switch or ramp. A 10 volt reference is provided at the VREF terminal or you may provide your own 5 to 25 volt source remotely.

With zero volts applied to V1 or V2, there is no attenuation of the signal (unity gain). As the control voltage *increases*, the signal *attenuates*. When the maximum calibrated control voltage is applied, there is maximum attenuation of the signal.

To calibrate the unit, apply the maximum voltage (an unattenuated pot, a closed switch, or maximum voltage ramp) to V1. Adjust the screwdriver VOLTAGE CALIBRATION control until the CAL indicator is illuminated. This allows the maximum attenuation over the control voltage range.

Figures 1-4 show wiring diagrams to suit most applications.

Figure 1. Remote Pot Using FVL 22 Reference

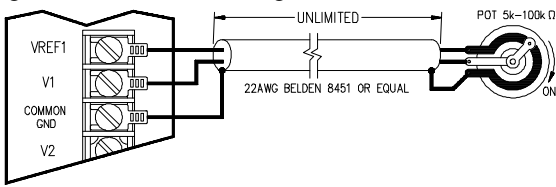


Figure 2. Remote Switch With Remote Reference

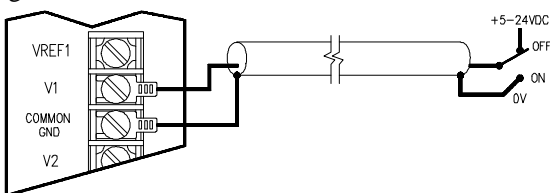


Figure 3. Voltage Ramp (from +5 to +24VDC)

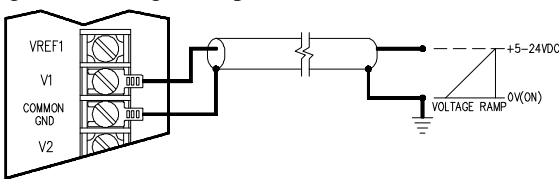
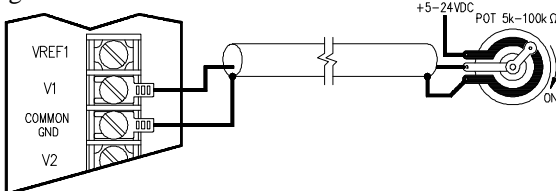


Figure 4. Remote Pot With Remote Reference



LIMITER

The limiter function limits the maximum output level of the FVL 22. To set the limiter, rotate the screwdriver-adjust LIMITER control fully counterclockwise. Then advance it clockwise to the maximum dBu output desired. Note that this control has two scales, one for balanced operation and one for balanced operation. Be sure to use the proper scale for your application.

When used in conjunction with the audio level control feature above, note that the limiter takes precedence. The audio level can only be controlled when it is under the threshold of the limiter (i.e. when the LIMIT indicator is off).

The limiter has an additional feature—AUTO-SLAVE. This switch ties the control circuitry of the two limiters together. If either Channel's level exceeds its set threshold, both Channels limit the same amount. This retains spectral balance for bi-amped loudspeakers or preserved stereo image in stereo applications.

Remember, Auto-Slave only affects the limiters, not the VCAs.

IMPORTANT NOTE

CHASSIS GROUNDING

Rane Flex modules are supplied with a rear or side mounted ground-lift switch. The unit is shipped with this switch in the "grounded" position, tying circuit ground to chassis ground. If after hooking up your system it exhibits excessive hum or buzzing, there is an incompatibility in the grounding configuration between units somewhere. Your mission, should you accept it, is to discover how your particular system wants to be grounded. Here are some things to try:

1. Try combinations of lifting grounds on units that are supplied with ground lift switches or links.
2. If your equipment is in a rack, verify that all chassis are tied to a good earth ground, either through the line cord grounding pin or the rack screws to another grounded chassis.
3. Units with outboard power supplies do NOT ground the chassis through the line cord. Make sure that these units are grounded either to another chassis which is earth grounded, or directly to the grounding screw on an AC outlet cover by means of a wire connected to a screw on the chassis with a star washer to guarantee proper contact.

Please refer to Rane Note 110 (supplied with your unit and available on request at no charge if you lose it) for further information on system grounding.