VP 12

Vocal Processor

Features & Benefits

RANE — PURITY BY DESIGN

Introduction

The VP12 is a full featured vocal processor offering a plethora of processing functions for microphone control. This unit offers more precise control at a price well below any comparable product of it's kind, while maintaining superior audio quality.

Design

The VP12 is a single input, two output vocal processor. The unit features switchable microphone and line level inputs, de-esser, gate/expander, compressor and equalization with parametric and cut filters.

Target Markets

The primary market for the VP 12 is broadcast facilities that require vocal processing for on-air and production studio microphones. The secondary markets are any type of studio doing vocal recording (including voice-overs and ADR (additional dialog replacement) for film and video). The third market is live sound, including installed systems in churches, auditoriums, board rooms and other systems requiring precise vocal microphone control.

Input Section – Front Panel

INPUT GAIN control

This control adjusts microphone input level. Set this to make the OL (Overload) LED flash occasionally. If the OL LED is on constantly, the level is too high—no illumination means the level is too low. It's important to have this gain stage set up properly to maintain the best signal-to-noise ratio.
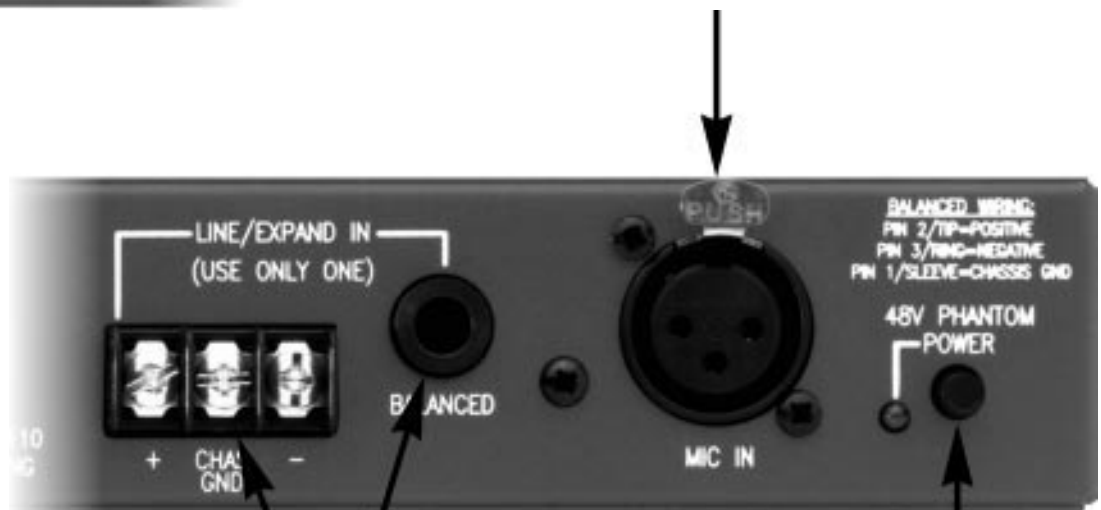
LINE/BOTH/MIC switch

This three position switch allows selection of which rear panel input is active: line, mic, or a sum of both inputs.
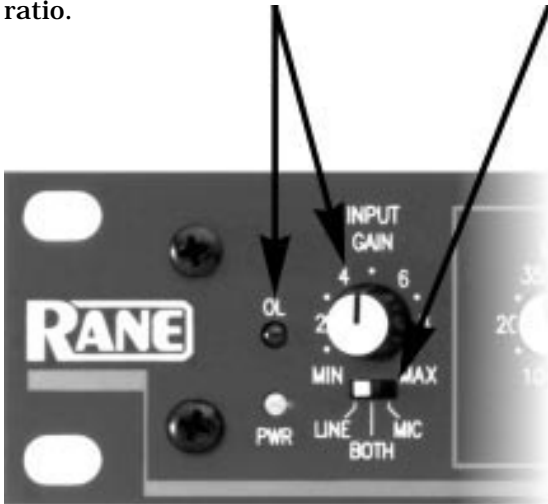
Input Section – Rear Panel

MIC IN

This XLR accepts microphone level inputs.

LINE/EXPAND IN connectors

Use either the balanced/unbalanced ¼" TRS *or* the screw terminals to connect a line level input. Do not use both.
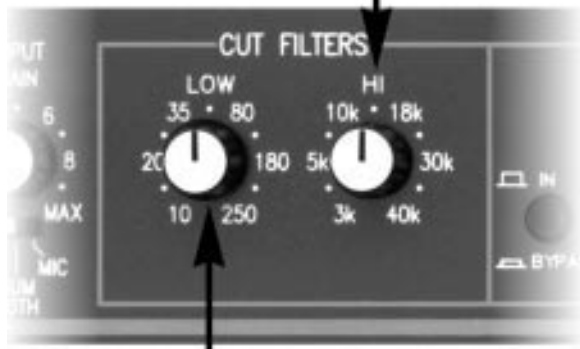
48V PHANTOM POWER switch

This engages 48V phantom power for condenser microphones. The associated red LED indicates that phantom power is on. Be sure the mic can accept 48V phantom.

Cut Filters

De-esser

DE-ESS THRESHOLD

This control determines the level in dBu that the upper frequencies (as set by the FREQUENCY control) must exceed to activate de-essing. A setting of -50 de-esses everything, while at 20 no de-essing occurs. The THRESHOLD LED illuminates when the de-esser threshold has been reached and the de-esser is active.

HI CUT FILTER

This control rolls the high frequencies off at a rate of 12 dB per octave. The frequency designator (3 kHz to 40 kHz) is the corner frequency at which the high end starts to roll off. Turned all the way clockwise, the high cut filter is essentially out of the circuit.

DE-ESS FREQUENCY

This control selects the upper range of frequencies that the de-esser circuit responds to. A setting of 700 Hz is for extreme de-essing, while 9 kHz provides very light de-essing.

LOW CUT FILTER

This control rolls the low frequencies off at a rate of 12 dB per octave. The frequency designator (10 Hz to 250 Hz) is the corner frequency at which the low end starts to roll off. Turned all the way counterclockwise, the low cut filter is essentially out of the circuit.

BYPASS switch

This allows de-essing to be bypassed for easy comparison between de-essed and non-de-essed signal.

DE-ESS RATIO switch

This sets the amont the sliding band filter will "slide" for a given amount of sibilance. The ratio settings are adjustable from MILD (a little de-essing), NORM (moderate de-essing), and MAX (heavy de-essing).

What is De-Essing?

In a nutshell, de-essing is nothing more than attenuation at specific frequencies. Sibilance (that annoying hi**sssss**ing of "ess" sounds that exhibits itself in some peoples' speech) manifests itself as an increased level, normally in the 3.5 kHz range. However, this frequency may vary from individual to individual, hence the de-esser frequency adjustment on the VP 12.

Large amounts of overall compression can actually accentuate sibilant sounds. This not only upsets the balance between high and low frequency speech components, but can drive the sound system into distortion.

Therefore, the best approach to controlling sibilance is a circuit that is adjustable to engage at and above specific frequencies. The characteristics of sibilance demand a circuit with a fast attack time and slow release time to ensure a smooth inaudible transition between the gain-reducing state and the constant-gain condition.

Through exhaustive testing of currently available de-esser circuits in other manufacturers' products, Rane found that most exhibit unwanted artifacts such as common compressor "pumping" and "breathing". Some exhibit 180° phase errors as well as uneven frequency responses (as much as +3 dB) at the de-esser corner frequency.

Deciding that there had to be a better way to accomplish sibilance control, the Rane engineering team designed and implemented a totally new circuit utilizing a revolutionary **adaptive servo controlled sliding band** circuit. Excellent buzz-words, but in simple English this means that instead of frequency dependent compression, we designed a sliding band filter that responds quickly and quietly.

The band pass filter, controlled by the de-esser FREQUENCY control, selects the frequencies above which sibilance resides, and since the filter is out of the signal path and in the detector path only, there are no summing or gain errors. The voltage controlled 6 dB per octave sliding band filter has an **adaptive ratio** that allows a quick response, but when it starts to attenuate the unwanted sibilance, the response slows down, providing a minimum of artifacts.

The graphs below visually demonstrate the new way versus the old way.
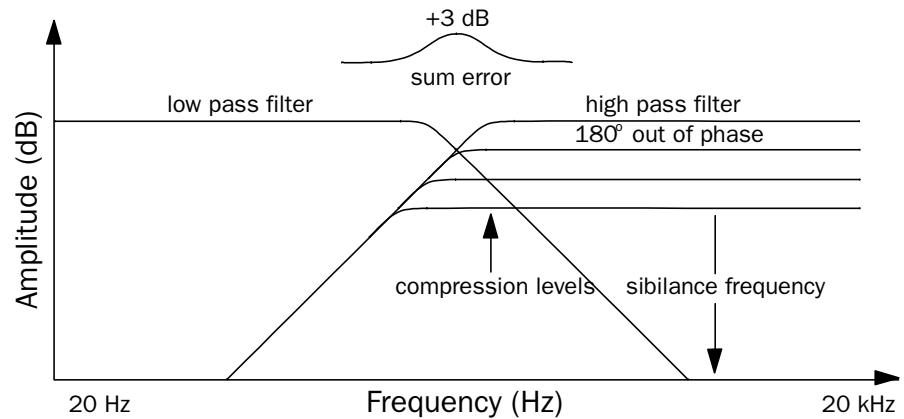
Other De-Esser Response
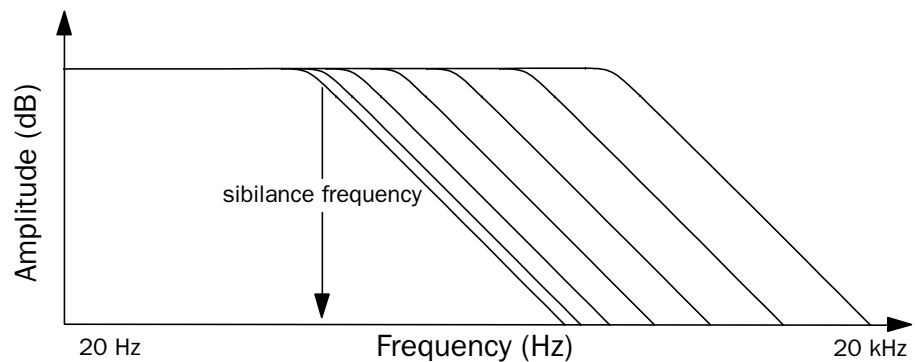
Rane De-Esser Response

Gate/Expander & Compressor

COMPRESSOR RATIO

Determines by how much the gain is held in check. Remember, higher ratios mean the compressor works harder, essentially turning it into a limiter. Ratios are expressed in X:1. A 1:1 ratio is no gain reduction, like being bypassed. A ratio of 10:1 means that for every 10 dB of signal over the threshold point, only 1 dB gets out—this is considered a limiter. A straight limiter is usually preset at 10:1 or higher; a compressor has a variable ratio that allows subtle compression to heavy limiting.

GATE/EXPANDER THRESHOLD

This control sets the point below which the output of the VP 12 is turned down or shut off, depending on the RATIO selected. The associated yellow LED indicates when the threshold has been reached.

COMPRESSOR THRESHOLD

This control sets the point above which the gain is held in check. The associated red LED indicates when the threshold has been reached.
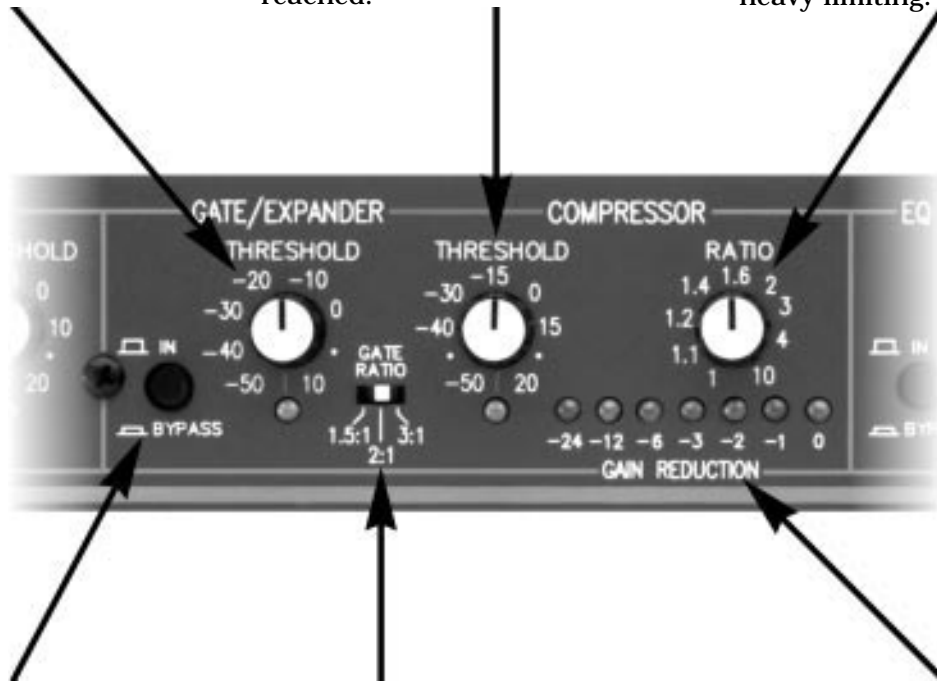
BYPASS switch

This switch allows gate/expansion and compression to be bypassed for easy comparison between processed and non-processed signal.

GATE RATIO switch

This switch determines how much the signal is turned down when the gate activates. For gating, effectively turn the signal off with a low GATE/EXPANDER THRESHOLD and high (3:1) GATE RATIO. For downward expanding, use a more moderate GATE/ EXPANDER THRESHOLD setting and a low (1.5:1) GATE RATIO.

GAIN REDUCTION meter

This gives a visual indication of how much compression is going on. The metering is still active in the bypass mode. This allows adjustment of the compression section "on the fly" while in bypass to visually verify how different settings will affect the signal.
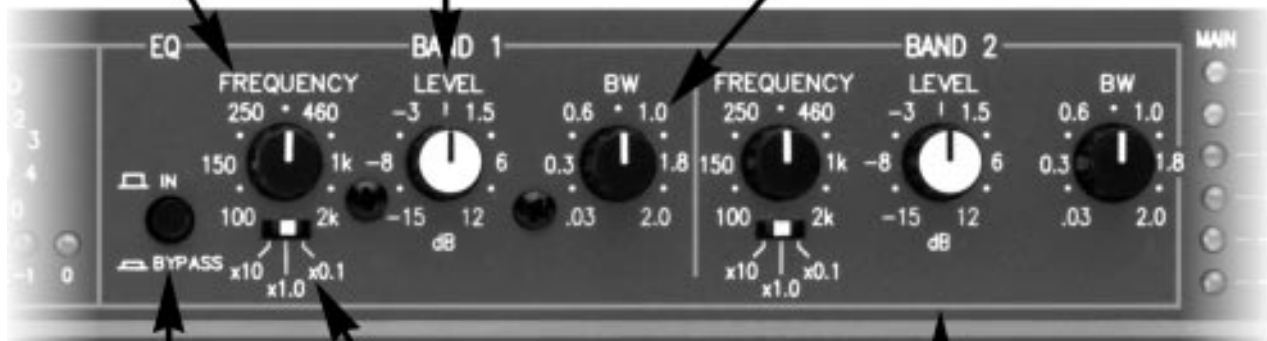
Parametric Equalizers

FREQUENCY control

This selects the specific center frequency to be affected. This control works along with the select switch below it to provide full audio spectrum frequency range for each band.

LEVEL control

This allows between +12 dB of boost and -15 dB of cut at the center frequency.

BW control

BW stands for "bandwidth". This allows selection of a skirt as narrow as .03 octave (feedback control) or as wide as 2.0 octaves (broad tonal shaping) around the center frequency.

BYPASS switch

This switch allows parametric equalizers to be bypassed for easy comparison between equalized and non-equalized signal.

FREQUENCY select switch

This ingenious little three-position switch allows you to select one of three frequency ranges, allowing the FREQUENCY control to cover the entire audio spectrum with greater resolution. The "x0.1" setting allows frequencies of 10 Hz to 200 Hz to be dialed in. The "x1.0" setting provides the 100 Hz to 2 kHz frequencies silkscreened on the front panel. The "x10" setting provides the frequencies of 1000 Hz (1 kHz) to 20 kHz.

BAND 2

The controls of this second parametric are the same as those found in BAND 1. Two bands allow for two separate frequencies to be modified. The two parametric bands are connected in series, so simply setting the filters to the same frequency can double the amount of boost or cut. Total cut for a single frequency can amount to -30 dB!

Output Section – Front Panel
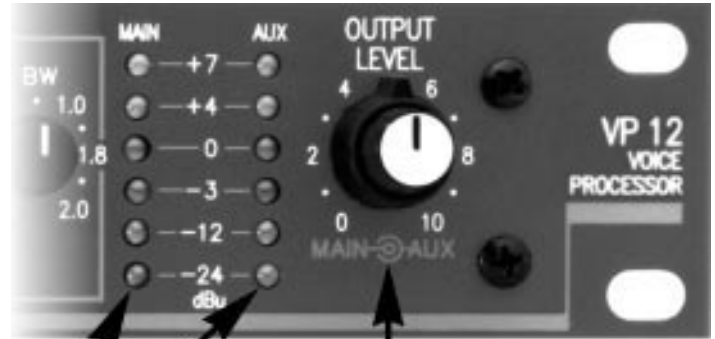
MAIN & AUX output meters

These six segment meters show the output levels. Note: If the rear panel MAIN OUT LEVEL is switched to MIC, the meter is no longer in dBu, but gives visual indication of available headroom.

MAIN & AUX OUTPUT LEVEL controls

This is a concentric rotary pot. The small diameter capped knob controls the main output, while the large diameter knob controls the aux output.

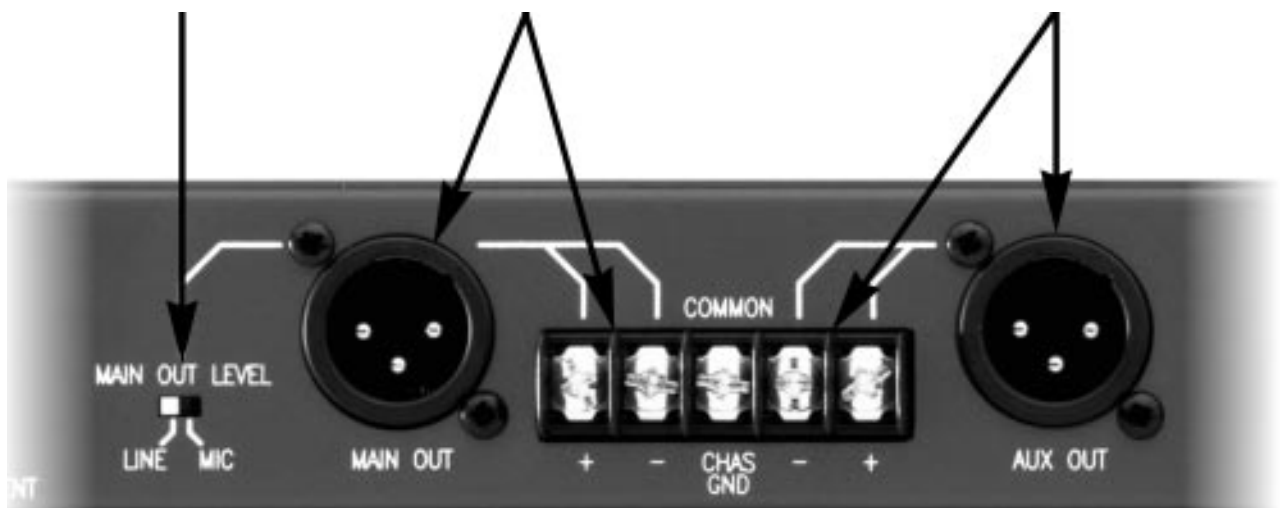# Output Section – Rear Panel

MAIN OUT LEVEL switch

This sets the output level for the Main output to either LINE or MIC level.
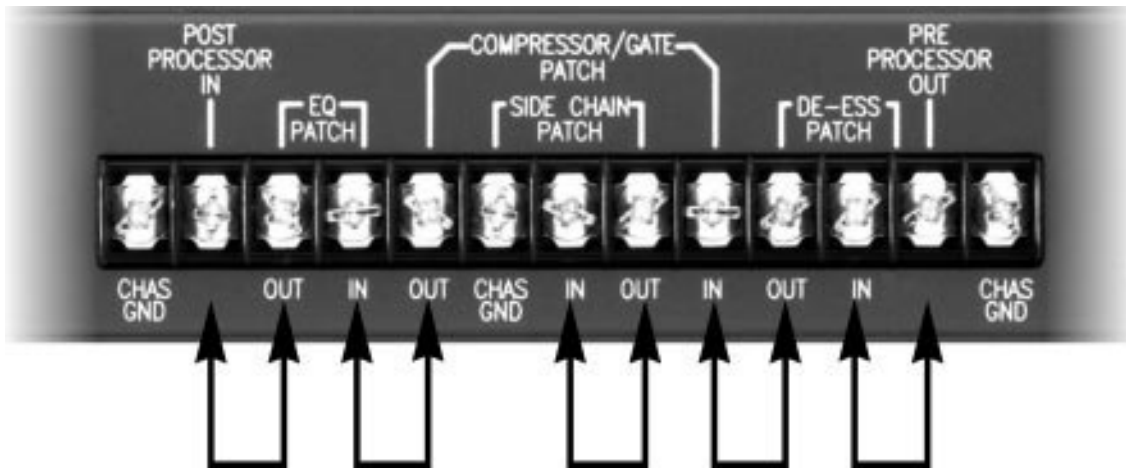
MAIN OUT

These XLR and screw terminals are fully balanced, and may both be used at the same time.

AUX OUT

These XLR and screw terminals are also fully balanced, and may both be used at the same time.

Screw Terminal Patch Strip

This strip is configured from the factory with all functions operational in the same left-to-right order as the front panel. Factory jumper locations are indicated by the arrows. This strip allows reconfiguring the order of processing functions and/or wiring around unwanted functions. The SIDE CHAIN PATCH allows the insertion of external processing.

Features and Benefits:

Feature: Line/Both/Mic Switch

Benefit: Allows summing of both mic and line inputs. No other voice processor has this feature.

Feature: High and Low Cut Filters

Benefit: Allows both high and low ends to be rolled off. Often with voice signal there is little or no audio in these areas, and this affords greater signal-to-noise ratio.

Feature: Adaptive Ratio Sliding Band De-esser Circuit.

Benefit: This totally new circuit design provides more accurate de-essing with fewer artifacts and more precise control than frequency dependent compression.

Feature: Frequency Multiplier on Parametric EQ.

Benefit: Allows each parametric band to cover 10 Hz to 20 kHz while maintaining precise control.

Feature: Parametric bands wired in series.

Benefit: Doubling up on a frequency in both bands allows twice the boost and cut.

Feature: Main and Aux Outputs

Benefit: Allows signal to be sent to the stereo input of the next device or to two different locations with independent level control.

Feature: Main Out Level (Mic-Line) Switch:

Benefit: Allows feeding a mic level signal to the mic input of a console.

Feature: Screw Terminal Patch Strip

Benefit: Allows processing functions to be re-arranged or bypassed.

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