VLA 500

PROFESSIONAL OPTICAL LEVELING AMPLIFIER

USER'S GUIDE

A R T

APPLIED RESEARCH AND TECHNOLOGY

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LIST OF FIGURES

INTRODUCTION

Thank you for purchasing Applied Research and Technology's VLA 500. Offering a superb level of sound quality, the VLA 500 is a unique design that will enhance the sonic textures of your audio system for years to come. The VLA 500 is one of the finest audio compressors available. Developed in partnership with studio and live-sound engineers, the VLA 500 possesses a "sound" that is not available from any other compressor on the market - at any price! Unlike typical compressors, which use solid state feed-forward circuitry to control level detection, the VLA 500 is very musical. The nature of its operation is much like the way your eye adjusts to light. Just as your eye transparently adjusts to changes in light, the VLA 500 adjusts to changes in signal level.

The VLA 500 was designed and constructed with the absolute best components, assuring a lifetime of quiet, reliable performance.

The VLA 500 offers:

- Single channel opto-isolator based leveling amplifier
- Compatible with API 500 series racks.
- Low power, <100mA.
- Stereo linking of channels
- Analog Optical Isolator (AOI) used for gain reduction
- Non-VCA design = transparent, classic sound
- LED metering of gain reduction or output levels
- Balanced inputs and outputs
- 1/4- inch TRS active balanced inputs and outputs
- Variable Threshold & Ratio controls
- Variable Attack and Release controls
- Variable Output Level rotary control
- 10Hz to 100KHz frequency response (+/-0.5dB)
- >120dB dynamic range
- Low noise (-100dBm 'A' weighted EIN)
- 3 years parts and labor warranty

INSTALLATION

The ART VLA 500 may be used in a wide variety of applications and environments. In a rack-mountable, all-steel chassis, the unit is designed for continuous professional use. Mounting location is not critical, however for greater performance reliability we recommend that you not place the unit on top of power amps, or other sources of heat and/or strong magnetic fields.

Unpacking

Your VLA 500 was packed with care at the factory. The shipping carton was designed to protect it during initial shipment. Please retain this carton for use in transporting the VLA 500 when it is not installed in a rack, or in the unlikely event that you need to return your VLA 500 for servicing. The shipping carton should contain:

- The VLA 500
- This user's guide

Rack installation

Do NOT insert the VLA-500 in your 500 series rack while it is powered on. When you hot-plug the unit in this manner, you risk damage to the VLA-500 and/or the power supply.

Insert the VLA-500 into your 500 series rack making a secure connection to the rear connector. Use two flat head screws to lock the unit in place. Power up the rack and you are done!

FRONT PANEL CONTROLS and INDICATORS

THRESHOLD Control

The input THRESHOLD control sets the point above which the VLA 500 will act on a signal. Turning this control Counter-ClockWise (CCW) lowers the threshold (adding more compression to a signal). Turning this control ClockWise (CW) raises the threshold.

Proper setting of the THRESHOLD control is dependent on the input signal. The output of a guitar can be –20dB to –10dB, whereas the level from an insert on a mixing console can be –10dB to +15dB. The easiest way to set the THRESHOLD control is to start with the control fully clockwise. Slowly turn the control counter-clockwise (lowering the threshold) until the yellow (-0) LED light on the Gain Reduction meter begins to light. Next adjust the control (either lower or higher) for the desired amount of compression. Use the Gain Reduction meter as a visual guide to the amount of compression applied.

RATIO Control

The RATIO Control selects how strongly the compressor reacts to the input signal once that signal reaches or exceeds the threshold. This compression amount is expressed as a ratio of input to output. For example if a 4:1 compression ratio is chosen, for every 4dB over the threshold the input signal rises, the output level only rises by 1dB. In this case if the input signal increased 12dB over the threshold, the output level would only rise by 3dB.

In general, compression ratios of 10:1 and greater are considered “limiting”. The range of the RATIO control is (2:1 fully CCW) to (20:1 at full CW rotation).

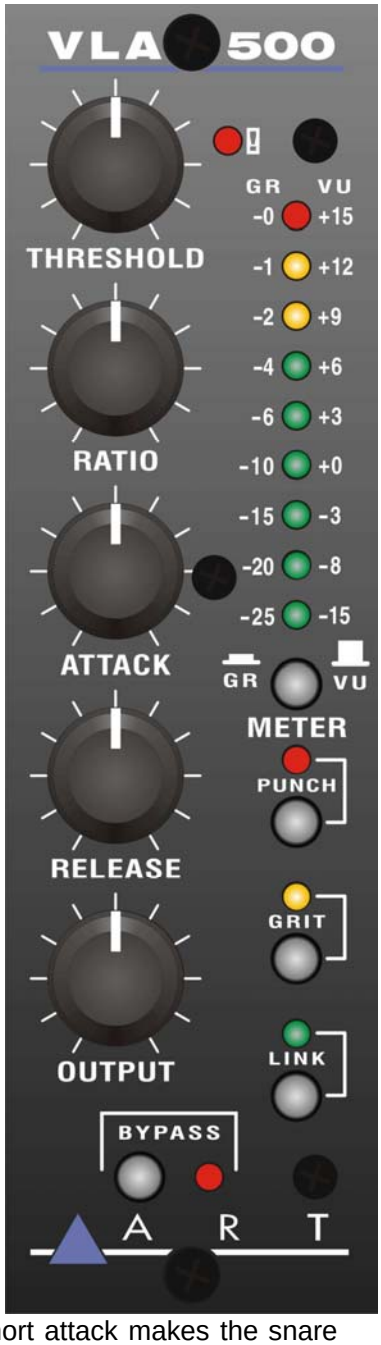

FIGURE 1 – Front controls

ATTACK Control

The ATTACK control sets the time it takes the Compressor/Limiter to respond to increases in signal level (by reducing gain). You can use this control to shape the “front end” of the dynamics envelope.

One example is to listen to a snare hit and adjust the ATTACK control. A short attack makes the snare sound “thin”. As the attack time goes longer (the knob is turned clockwise) you should hear more of the thump in the compressed snare. The downside is that this creates an overshoot, (or “transient”), the length of which is the time set by the ATTACK control.

Overshoots less than 1 msec. are very hard to hear even when they are clipped. If the ATTACK is set too fast, the gain may be reduced too much and thereby create a “pumping” sound[1].

[1] “Pumping” in a Compressor/Limiter sounds like the signal level is changing when it shouldn’t be.

Release Control

The RELEASE control sets the time the Compressor/Limiter takes to increase the gain after the input level drops.

Longer settings maintain the dynamics of the input signal, while shorter settings reduce the dynamics. Shorter settings will also increase the apparent reverberation, and at extreme gain reduction settings, lead to “breathing” artifacts[2]

Output Level Control

The OUTPUT level control serves two functions. It provides control over the overall output level and can mute the output signal when fully CCW. This control also optimizes the levels for the Punch and Grit functions (see below).

Bypass Switch

The VLA 500 BYPASS switch physically connects the input jack to the output jack (also known as a hardwire bypass). If the unit is powered on, the switch is lit when the unit is bypassed.

CLIP LED

The Clip LED is located next to THRESHOLD control and marked with a "!". This LED indicates clipping as it monitors various points in the VLA-500 circuitry. If the input signal is below +20dBu, adjusting the THRESHOLD or OUTPUT control may require adjusting. Note that the PUNCH and GRIT circuits are only monitored for clipping when active.

METER Mode Switch

This switch selects either the output signal level or gain reduction as the LED meter function. The color pattern of the LED will change depending on the selected mode.

VU / Gain Reduction Meter

The gain reduction or output level of the VLA 500 can be monitored by the LED VU meter.

When VU mode is selected, the meter lights from green (-15 to -6dB) to yellow (+9 dB, +12 dB) to red (+15dB). The ballistics characteristic of the meter provides an accurate indication of the average signal level present at the output of the unit.

The LED colors in Gain reduction mode are red except for the threshold indicator, which is yellow.

Punch switch

The PUNCH function "sweetens" the audio signal and controls overshoots at high levels. Using the PUNCH feature will help the processed audio stand out in a mix while controlling peak levels. This is especially useful in processing bass guitar and other instruments. You can also apply the PUNCH feature during mastering to add some 'air" and control peaks to maximize signal levels.

The OUTPUT control sets the threshold for the PUNCH circuit. Increasing the output level kicks in the PUNCH circuit at lower levels.

[2] “Breathing” is the sound of the Compressor/Limiter turning up the gain so quickly you can hear breaths between words during vocal processing.

Grit switch

The GRIT feature adds another color to the audio processed by the VLA-500by adding a little sustain and distortion to help audio stand out better in a mix while controlling overshoots. The OUTPUT control sets the threshold for the GRIT circuit. Increasing the output level kicks in the GRIT circuit at lower levels.

The Link Switch

Two channels of the VLA 500 can be configured for stereo operation by depressing the LINK switch. *Link Mode* ties the gain reduction attenuation of channels linked together. *Link Mode* ensures that each channel of the stereo input signal is processed identically to prevent any shifting or distortion of the stereo image.

Note: to maintain correct detector operation, the front panel controls need to be set to identical positions.

Input / Output

The VLA 500 XLR connects through your 500 series rack to the balanced input and output connectors.

Balanced Inputs

The inputs are designed for use with line level signals ranging from –30dBm to +20dBm. While it is possible to plug an instrument directly into the VLA 500, it is desirable to run the instrument into a preamp ahead of the VLA 500. This will provide a stronger signal and will keep noise to a minimum. Microphones must connect through a microphone preamplifier (like the ART Pro MPA II) before connecting into the VLA 500.

The input impedance of the VLA-500 is 10K Ohms.

NOTE: The VLA 500 has a passive (hardwire) bypass. This means that the bypass works even if the power is OFF.

Balanced Outputs

The analog output of the VLA 500 is active balanced. The output has a 100 Ohm impedance into a balanced or unbalanced load.

“0” VU on the LED meter corresponds to +0dBu (about 0.775 Volts RMS) at the output.

APPLICATIONS

The VLA 500 may be used as either a compressor or a limiter with all of the following:

- Multi-track recorder, DAT machine, hard disk recorder, or analog recorder.
- In a mixer's channel insert points.
- Between a microphone preamp and signal processors.
- Between preamplified electronic musical instruments (synthesizers, guitars, bass, samplers, acoustic instruments with pickups) and other line-level equipment.

Compressor application

The main application of the VLA 500 is to control the dynamic range of an audio signal. Plug a line level (post preamplifier or other gain stage) source into the input, and set the threshold and output controls to provide the desired amount of compression to the input signal.

Generally, 6dB of compression is a good starting point for most applications. Raw instruments may require more gain reduction if you want to add sustain.

The RATIO, ATTACK and RELEASE controls should start in the middle position (corresponding to 4:1 slope, 20msec attack and .5 Sec release). These adjustments will allow you to tame raw instruments to complement other signals in a final mix.

The Ratio control will set the general dynamics limits (the loudest to softest levels that determine the expressiveness of the output signal). Adjust the RELEASE control to as fast as possible to control dynamics and still keep a smooth tail. Adjust the Attack control to control the amount of "punch" you want on attack transients.

Depress the PUNCH switch to control overshoots and add character to the output signal. For even more character, experiment with the GRIT switch.

Limiter application

The VLA-500 can act as a peak limiter to protect subsequent stages from overload or clipping.

The Limiter settings are as follows: RATIO: fully CW (20:1), ATTACK: fully CCW (0.25 msec), RELEASE: fully CCW (0.15 Sec), PUNCH switch: IN. Adjust the Threshold to about 2 O'clock and the OUTPUT control to the center position. This setting will prevent signal levels from exceeding +3dBu.

If you need to set the limit to lower signal levels, monitor the output meter and adjust the OUTPUT control. If you need to set the maximum output level higher, disable the PUNCH function and rotate the OUTPUT control CW.

Stereo Mix and Mastering

Because of its low noise and excellent tonal qualities, the VLA 500 is ideal for processing mixes when recording to DAT, hard disk or analog recording devices. Used as a mastering device, the VLA 500 is capable of adding warmth and impact to the overall signal level. The VLA 500 is ideal for live use as well.

In this application, you would generally use two units, linked for stereo operation. It is critical that the settings on both units are identical or one of the channel's level info will be ignored. If the output controls are not set the same, the stereo image will be offset.

WARRANTY INFORMATION

Limited Warranty:

Applied Research and Technology will provide warranty and service for this unit in accordance with the following warrants:

Applied Research and Technology, (ART) warrants to the original purchaser that this product and the components thereof will be free from defects in workmanship and materials for a period of three years from the date of purchase. Applied Research and Technology will, without charge, repair or replace, at its option, defective product or component parts upon prepaid delivery to the factory service department or authorized service center, accompanied by proof of purchase date in the form of a valid sales receipt.

Exclusions:

This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs. This warranty is void if the serial number is altered, defaced, or removed.

ART reserves the right to make changes in design or make additions to or improvements upon this product without any obligation to install the same on products previously manufactured.

ART shall not be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states do not allow limitations of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific rights and you may have other rights, which vary from state to state.

For units purchased outside the United States, an authorized distributor of Applied Research and Technology will provide service.

SERVICE

The following information is provided in the unlikely event that your unit requires service.

1. Be sure that the unit is the cause of the problem. Check to make sure the unit has power, all cables are connected correctly, and the cables themselves are in working condition. You may want to consult with your dealer for assistance in troubleshooting or testing your particular configuration.

2. If you believe the ART unit is at fault, go to www.artproaudio.com. You may contact Customer Service for more assistance, or directly request a Return Authorization for service in the “resources” area of the website.

3. If you are returning the unit for service, pack the unit in its original carton or a reasonable substitute. The original packaging may not be suitable as a shipping carton, so consider putting the packaged unit in another box for shipping. Print the RA number clearly on the outside of the shipping box.

4. Include, with your unit, a note with the RA number and your contact information including a daytime phone number, preferably attached to the top of the unit.

SPECIFICATIONS

Input Impedance.....10k Ohms

Output Impedance.....100 Ohms

Maximum Levels
Inputs.....+20dBu
Output.....+20dBu

Output Gain.....+20dB max

Frequency Response .....20Hz to 100KHz (+/- 0.5dB)

Dynamic Range .....>120dB (20-20KHz)

THD @ 0dBm Out: .....<0.003% (@1kHz, typical)

Equivalent Input Noise (EIN): .....-102dBu ('A' weighted)

Attack Time ..... 0.25msec. to 50msec. variable

Release Time .....150msec. to 3 sec, variable

Slope .....Variable: 2:1 to 20:1

Maximum Gain Reduction 30dB

Dimensions.....5.23” H x 1.49” W x 6.6” D

.....133mm H x 38mm W x 168mm D

Weight .....0.7 lbs./ 0.32Kg

Power Requirements .....80mA (75mA @± 15V, 4mA@48V)

Note: 0 dBu = 0.775 VRMS, 0 dBV = 1 VRMS

ART maintains a policy of constant product improvement. ART reserves the right to make changes in design, or make additions to, or improvements upon, this product without any obligation to install same on products previously manufactured. Therefore, specifications are subject to change without notice.

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