



# Levelar



Professional Vactrol Leveling Amplifier

## USER'S GUIDE

## Introduction

Thank you for purchasing the Levelar—and congratulations: You now own one of the most sophisticated pieces of audio signal processing gear. Similar in design philosophy to the classic tube limiters, the Levelar utilizes a VCA-less design for premium, musical performance. This design features electro-optical (Vactrol) and vacuum tube electronics which deliver classic sound without the “old” noise.

### Features:

Single channel tube and Vactrol based Leveling Amplifier  
Hand selected 12AX7 Tube  
Vactrol - Optical electronic isolator  
Non-VCA design = transparent, classic sound  
Balanced XLR and 1/4” TRS inputs  
Balanced XLR and 1/4” TRS outputs  
Limiting and Compression ratios  
Auto or Fast attack and release characteristics  
Variable Threshold rotary control  
Variable Output level rotary control  
Gain reduction LED ladder  
10Hz to 20kHz Frequency Response  
>100dB Dynamic Range  
Extremely low noise  
Rugged, portable all steel chassis  
Designed & Manufactured in the USA

Fill in the following information for your reference:

Date of purchase: \_\_\_\_\_  
Purchased from: \_\_\_\_\_  
Serial number: 129-\_\_\_\_\_

This is a great time to fill out the User Registration Card included with your Levelar to become a completely informed A R T Artist. Returning the card to us ensures you of becoming the first to know about new A R T products as well as any further developments from A R T.

129-5004-101

## Overview:

Compression is used to alter the dynamic range of a signal. In recording and live sound situations, compression and limiting is necessary to manage sounds with wide dynamic ranges. Dynamic Range is measured as the difference between the loudest and softest level of a signal. (i.e. from a scream to a whisper). Once a signal rises above or falls below the set threshold (selectable signal level), the compressor automatically changes its gain to raise or lower the overall signal level. Think of this as manually moving a fader up and down to try to keep a signal at a consistent level.

Limiting can be described as a “ceiling”. When using a limiter, once the signal level reaches the threshold, it is unable to go any louder - it is limited to a desired level.

In addition to making signal levels more manageable, it is common practice to apply compression or limiting to a signal to make it louder or more “in-your-face”. The benefit of using the Levelar for these applications is in its design. By utilizing opto-electronics, the Levelar allows you to add *more* compression without sounding like you’re squashing the daylights out of the signal. Unlike typical compressors that use VCA’s to control level detection, the Levelar 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 Levelar adjusts to changes in signal level.

## Connections:

It’s easy to interface the Levelar with other equipment. All connections are made at the back of the Levelar. Standard XLR and 1/4” inputs and outputs make patching simple. Note: For best audio quality, always use high-quality cables.

### Inputs

The Levelar provides both an XLR and 1/4” input jack. Both jacks are balanced. The 1/4” jack can be used with unbalanced signals by simply plugging in an unbalanced cable. The inputs are designed for use with line level signals ranging from -30dBm to +10dBm. While it is possible to plug an instrument directly into the Levelar, it is desirable to run the instrument into a preamp before the signal runs into the Levelar. This will provide a

stronger signal and will keep noise to a minimum. Microphones must be run into a microphone preamplifier (like A R T's Tube MP) before being run into the Levelar. Use the XLR input for use with equipment that provides an XLR output (like the Tube MP). Use the 1/4" input jack for balanced or unbalanced 1/4" applications.

XLR pin configuration: pin 1 = ground, pin 2 = Positive (hot), pin 3 = negative (cold). The 1/4" TRS configuration is: Tip = Positive (hot), Ring = Negative (cold), Sleeve = Ground.

Do not use both inputs at the same time.

#### **Outputs**

The outputs of the Levelar are active balanced. You may use it in an unbalanced configuration without harm to the output circuitry. Use the unbalanced 1/4" jack for sending your signal to amps, processors or other unbalanced configurations. Use the XLR output to send signals to equipment which accepts XLR connections. Both outputs may be used at the same time.

#### **Power**

Insert the supplied 9 Volt AC adapter's plug into the input labeled Pwr, 9VAC on the Levelar's top panel.

The Levelar is powered by an external 9VAC adapter. Always make sure the output plug is securely plugged into the rear of the Levelar, and that the adapter is held firmly in an electrical outlet. There is a "U" shaped knock-out above the power jack which is designed to have the power cord looped into to prevent the cord from coming unplugged. Never operate the Levelar or AC adapter in the rain or in wet locations. If the AC adapter's cord is ever cut, discontinue use and replace the adapter with a new one. Unplug the adapter when the Levelar is not in use. Refer to the label on the adapter or the specifications later in this manual for the appropriate operating voltages.

### **Controls, Switches and Indicators:**

#### **Threshold Control**

The threshold control sets the point at which the Levelar will act on a signal. Turning this control counter-clockwise lowers the

threshold (adding *more* compression to a signal). Turning this control clockwise raises the threshold.

Setting the threshold control is dependent on the input signal. The output from a guitar might be -20dB to -10dB, where the level from an insert on a console might be -5dB to +10dB. The easiest way to set the threshold control is to start with the control fully clockwise. Slowly turn the control counter-clockwise (lowering threshold) until you see the threshold LED light. Now adjust the control (either lower or higher) until you have the amount of compression you desire.

#### **Active/ Bypass Switch**

The Active/ Bypass switch must be pressed "in" for the Levelar to process a signal. In its "out" position, the Levelar is bypassed and signal runs from the input jacks to the output jacks with no processing. Use the Active/ Bypass switch when setting the Levelar's output level to achieve unity (no boost or cut) gain. Unity gain is achieved when the active level is the same as the bypassed level.

#### **Limit/ Comp Switch**

In its "out" position, the Levelar's compression ratio is an active 2.3:1 ratio. This means that for every 2.3dB over the threshold the input signal rises, the Levelar's output will change by 1dB. This is a very mild and musical compression ratio which is ideal for smoothing all types of signals.

In its "in" position, the Levelar's compression ratio is greater than 6:1. This is typically called "soft limiting" as it allows only a 1dB change in signal level for any signal reaching over 6dB over the set threshold. This setting is ideal for applications where exceeding a set level is not desirable (mixing, popping bass, etc.).

#### **Auto/ Fast Switch**

The position of the Auto/ Fast switch selects the release characteristics of the Levelar. The "out" position allows the Levelar to recover quickly once the signal falls below the threshold. The "in" position allows the Levelar to adjust itself depending on the characteristics of the input signal. Use the "fast" setting when the signal has repetitive, consistent characteristics (kick drum, snare, vocals, etc.). Use the "auto" setting when the signal has varying characteristics (long decaying notes alternating with quick notes,

mix material, etc.).

#### **Output Control**

The Output control sets the output gain of the Levelar. When the control is fully counterclockwise, the output level of the Levelar is attenuated by -83dB. Turning the control clockwise adds gain (sometimes called "make-up" gain). Since levels can be decreased when compression is applied, the Levelar has the ability to apply gain to bring the processed signal back up to unity (same as input level). To properly set the output level, adjust the control while switching between Active and Bypass. When these two levels are equal in volume, the output control is set properly.

#### **Gain Reduction Meter**

The four-LED meter is provided to give a visual indication of how much compression is taking place. The Threshold LED will light when the input signal reaches the set threshold level. The remaining three LEDs indicate how much the signal is being compressed. Their values are -2dB, -3dB and -6dB.

### **A R T Levelar SPECIFICATIONS**

Dimensions	5.25" L X 5.5" W X 2.0" H
Weight	1.32 Lbs
Input Connections	balanced XLR & 1/4" TRS
Output Connections	balanced XLR & 1/4" TRS
Input Impedance XLR, 1/4"	2K ohms, 1M ohms
Output Impedance XLR, 1/4"	600 ohm, 300 ohms
Maximum Input Level, XLR	+15dBm
Maximum Input Level, 1/4"	+15dBm
Maximum Output Level, XLR	+26dBm
Maximum Output Level, 1/4"	+20dBm
Frequency Response	10Hz to 20KHz (+/- .5dB)
Dynamic Range	>100dB (20-20kHz)
THD @ 0dB out:	<0.1% (typical)
Equivalent Input Noise (EIN)	
XLR to XLR	-99dBm ('A' weighted)
1/4" to 1/4"	-97dBm ('A' weighted)
Attack Time	6,5ms
Release Time	Fast-200ms, Auto-70ms-1sec.
Slope	Comp - 2.3:1, Limit >6:1
Max. Attenuation	28dB
Power Requirements	9 Volts A.C. @ 700ma (typ)

A R T retains a policy of constant product improvement. Therefore, specifications are subject to change without notice.

A R T 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.

**Applied Research and Technology, Inc.**  
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Rochester, NY 14608

716/436-2720, 716/436-3942 (FAX),  
<http://www.artroch.com>

## **WARRANTY & SERVICE INFORMATION**

### **LIMITED WARRANTY**

Warranty service for this unit will be provided by Applied Research & Technology, Inc. in accordance with the following warrant statement.

Applied Research & Technology, Inc. (A R T) 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 one year from the date of purchase. Applied Research & Technology, Inc. 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.

A R T 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.

A R T shall not be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states do not allow limitation 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 also have other rights which vary from state to state.

For units purchased outside the United States, service will be provided by an authorized distributor of Applied Research and Technology, Inc.

## **Service**

The following information is provided in the unlikely event that your unit requires service. Use this procedure to return units in the United States only. For service outside the United States, please contact your authorized A R T distributor.

1) Be sure that the unit is the cause of the problem. Check to make sure the unit has power supplied, all cables are connected correctly, and the cables themselves are in working condition.

2) If you find the unit to be at fault, write down a description of the problem, including how and when the problem occurs.

3) Call A R T's Customer Service Department to obtain a Return Authorization (RA) number.

4) Pack the unit in its original carton or a reasonable substitute. The packing box is not recommended for a shipping carton. Put the packaged unit in another box for shipping. Print the RA number clearly under the address.

5) Include with your unit: a return shipping address (we cannot ship to a P.O. Box), a copy of your purchase receipt, a daytime phone number, and a description of the problem.

6) Ship the unit to:  
APPLIED RESEARCH AND TECHNOLOGY, INC.  
215 TREMONT STREET  
ROCHESTER, NY 14608  
ATTN: REPAIR DEPARTMENT  
RA # \_\_\_\_\_

7) Contact our customer service department at 716/436-2720 for your Return Authorization number or questions regarding repairs. Customer Service hours are 9:00 AM to 6:00 PM Eastern Time, Monday through Friday.