

Specifications

- Input impedance: Greater than $1M\Omega$
- Output impedance: Less than $1K\Omega$
- Controls: Peak Reduction, Gain, Boost, Attack and Knee
- Features: Dynamic tube equaliser, active tube boost and tube buffered output circuitry
- All tube: Super low-noise parallel tube input stage (four tube sections) operating in class-A
- Photo-optical: Ultra-linear, low distortion photo-resistive attenuator (fast attack time $< 1\text{ms}$)
- True bypass: With 'anti-pop' foot-switching circuitry
- Power requirements: 12VDC @ 1A centre positive
- Dimensions: width 7.5" depth 4.8" height 1.3"
- Weight: 2lb (on Earth); $\frac{1}{4}$ lb (on Callisto)
- Construction: Solid die-cast aluminum box
- Finish: Tough light-grey powder coat



Warning: High D.C. voltages of over 250 volts are present in the circuit; disconnect power before opening the unit. There are no user serviceable parts inside this pedal. Contact Effectrode regarding warranty or servicing issues.

Serial #

LA-1A

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Leveling Amplifier

Owner's Manual



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Introduction

The *Effectrode* LA-1A Leveling Amplifier was designed with one purpose in mind: to enable artists and engineers extract every last nuance from a musical performance... without compromise. Tubes are renowned for being unparalleled tone enhancers, adding warmth, depth and clarity to recorded and live instruments and *Effectrode* wanted to push their performance beyond current limits. To that end we based our LA-1A on a parallel tube plate design — the type of tube circuitry only ever found in high-end tube phono preamp stages for turntables (remember those?).

Parallel tube design minimises the noise floor and maximises the signal to noise ratio of your instrument. It's an expensive way of achieving noise reduction, as four identical input tube stages are required, however it yields stellar tone quality without the compromise of noise gates or 'cutting' certain frequencies with equalisation. The parallel tube design has never been built into a stompbox or even a professional studio leveling amplifier/compressor before, making the LA-1A something truly special.

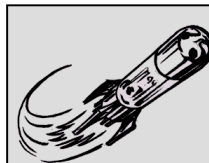
Thank you for supporting *Effectrode* pedals. We wish you many years of musical enjoyment from this very special hand-built, all-tube pedal.



Phil Taylor — Designer

Tubes

The 12AU7 and 12AT7 tubes in the LA-1A can be swapped with equivalent miniature 9-pin double triode tubes from other manufacturers — Mil-Spec N.O.S. tube types, such as the long-plate *Philips* JAN 6189W or JAN 5814A are highly recommended in the 12AU7 position and JAN 12AT7WC in the 12AT7 position. Although vintage long-plate tubes are generally more microphonic than short-plate designs they are highly sought after by engineers and musicians seeking sweeter and richer tones.



To extend tube life, it is recommended that the unit be allowed to warm-up for at least one minute after being switched on. This is to allow the heater filament in the tube to heat the cathode, which is coated with a layer of barium and strontium oxide. This oxide layer gets torn off the cathode, a process known as cathode stripping, if the cathode has not reached its correct operating temperature. If operated well within their ratings, good quality signal tubes can last 100,000 hours or more: that's well over 11 years of continuous use. If you use your pedal for only 4 hours a day, they should last over 25 years. (We can't warranty tubes for this period, however experience shows that such lifetimes are probable).

Pots

This pedal is fitted with custom British manufactured *Omega* sealed-for-life potentiometers. These sealed pots prevent dust and dirt from getting inside them so they never require cleaning or lubrication.



The release time of the LA-1A is determined by the photocell in the gain attenuator. The cell has a desirable two-stage decay characteristic where it releases within 40 to 80ms to approximately half its off resistance when light is absent. The remainder of the release then takes place over several seconds. Additionally,

the recovery time of the photocell depends on light duration and intensity. In use this results in a faster release time for short signal bursts and a slower release when the signal remains continuously above the compression threshold. This is analogous to how the human ear recovers from high sound pressure levels and is why photo-optical compression sounds so incredibly natural and transparent.

Side-Chain Circuit the LA-1A is based on 'feed-back' control circuitry where the signal used to drive the side-chain is affected by the gain-reduced signal. This type of control circuitry is preferred over 'feed-forward' for its more musical characteristics.

There's also some pre-emphasis on the side-chain similar to an "A" weighted filter curve. This curve characteristic mimics the way human ear works when exposed to high sound pressure levels. Here it works to minimise the 'pumping' that occurs when the LA-1A is processing low-frequency material.

Controls

Peak Reduction knob sets both the threshold and the amount of signal compression. When adjusting the compression or sustain a good starting point is the 9 o'clock position where subtle leveling enhances note detail, creating a fuller, warmer tone. As the knob is rotated clockwise the volume level of loud notes is reduced relative to quieter ones, squashing playing dynamics — this is the definitive sound of many country and funk-style guitar riffs.

Gain knob adjusts the 'make-up gain' and is used to match the relative levels of bypassed and effected signal. It can also provide +15dBu of tube boost when the 'Peak Reduction' knob fully counter-clockwise (zero compressor).

Boost knob gives an additional +6dB of gain (on top of the make up gain) — this is useful when soloing on guitar or bass and can push the input stage of a tube amp into overdrive very nicely too. The 'Boost' footswitch engages (red LED lit) and bypasses (green LED lit) the boost.

Attack and **Knee** knobs allow the compression character to be tailored perfectly to suit instruments that are challenging to amplify or record. For example, active 5-string bass guitars, nylon and steel string acoustic guitars fitted with piezo pickups and even especially 'difficult' stringed instruments such as hammered dulcimer, harpsichord or tar.

Rotating the 'Attack' knob clockwise increases how fast the side-chain reacts, i.e. the speed at which compression kicks in. The 'Knee' knob alters the input/output curve, i.e. how the LA-1A transitions into compression — rotate clockwise and the LA-1A becomes a limiter and counter-clockwise for compression.

When the **Dynamic EQ** toggle switch is in the 'down' position the LA-1A dynamically boosts high frequency material. With the 'Peak Reduction' knob fully counter-clockwise (zero compression) dynamic eq is inactive, however as the knob is rotated clockwise, and the pedal begins compressing, the effect becomes increasingly pronounced. Fabulous for jangly 12-string Rickenbacker guitar sounds.

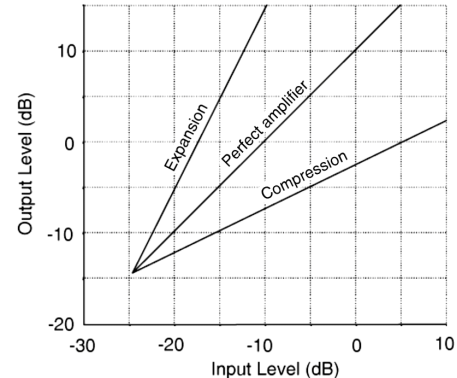
Bypass Footswitch utilises quiet true bypass switching to minimise 'pops' or 'thump' when engaging the pedal and ensure there is no loss of guitar tone when the pedal is bypassed.

Balanced Direct Out ¼" TRS (stereo) jack socket allows connection of the LA-1A to mixing desk, computer soundcard or external audio capture device. This output is fully balanced and transformer isolated, eliminating earth loops and reducing hum to an absolute minimum and features a gain pad (0dB, +10dB and +20dB) to facilitate matching with any line or instrument level gear. The *Triad Magnetics* audio transformer also imparts it's own character to enhance and sweeten the direct sound.

External Select ¼" TRS (stereo) jack socket. This enables an external footswitch, such as the *Fender*® 'Twin Reverb' Amp tremolo/reverb dual latching footswitch), to be utilised for remote bypass switching and activating the tube boost.

Theory of Operation

The graph below compares the input/output characteristics of a compressor, perfect amplifier and expander. It can be seen that an amplifier provides a fixed gain independent of the signal level, whereas a compressor adjusts gain in response to changes in input level.



The larger the input signal, the lower the gain, resulting in a reduction of dynamic range or compression of the signal. Conversely, an expander increases the dynamic range of a signal.