

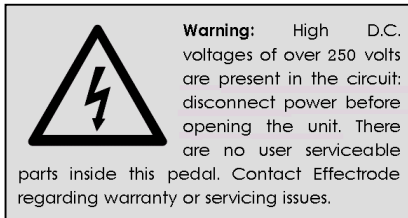
# Specifications

- Input impedance: greater than 1M $\Omega$
- Output impedance: less than 1K $\Omega$
- Controls: Shape, Depth, Speed and Rhythm
- Features: Raysistor and tube tremolo circuitry
- Expression pedal: Roland EV-5 or EV-7.
- Turquoise LEDs: pulsate with modulation speed for visual song tempo matching.
- Continuously variable L.F.O.: Three banks containing 48 different waveforms.
- Power requirements: 12VDC @ 1Amp
- Dimensions: width 7.5" depth 4.8" height 1.3"
- Weight: 2lb (on Earth); 2.1lb (Saturn)
- Construction: solid die-cast aluminum box
- Finish: Olive-brown powder coat



RAYSISTOR TREMOLO-PANNER

## Owner's Manual



Serial #

DT-2A



12 Broughton Crescent, Barlaston,  
Staffs, England. ST12 9DB  
[www.effectrode.com](http://www.effectrode.com)

# Introduction

The *Delta-Trem™* authentically recreates the alluring, hypnotic tone and feel of a vintage tube amp tremolo. This is accomplished by using a photo-optical vacuum tube signal path — twice for stereo! This is an exceptionally warm and musical tremolo effect that blends well with clean and overdriven guitar sounds. The dual signal path allows the pedal to operate in mono tremolo mode into a single amp or true stereo where the sound ‘ping-pongs’ between two amps for a huge, spacious tone.

Circuit operation is absolutely quiet with none of the audible ‘ticking’ sound often associated with tube amp tremolo. The *Delta-Trem* features an incredibly versatile L.F.O. (low frequency oscillator) that can reproduce the classic sound of the tube ‘vibrato’ in a vintage *Fender®* ‘Deluxe’ amp, the swirl of a *DeArmond™* mechanical-fluid tremolo and even the deep, swampy throb of the old ‘Valco’ amp trem. In short, the *Delta-Trem* gives guitarists easy access to classic rock ‘n’ roll, surf tremolo tones and much, much more with unparalleled warmth and clarity.

Thank you for trusting *Effectrode* to be your effects company. We wish you many years of musical enjoyment from this very special, hand-crafted, all-tube pedal.



*Phil Taylor — Designer*

# Tubes

The 12AU7 tubes in the *Delta-Trem* can be swapped with other 9-pin double triode tubes such as the 12AX7, 12A Y7, etc. These substitutions yield higher gain and mild overdrive for a ‘Leslie’ style growl as well as tonal differences depending on the tube type, manufacturer, etc. Mil-Spec NOS are recommended, if they can be obtained.



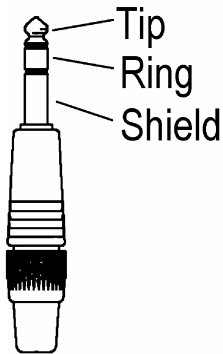
To extend tube life, it is recommended that the unit be allowed to warm-up for at least one minute after being switched on. This is to allow the heater filament in the tube to heat the cathode, which is coated with a layer of barium and strontium oxide. This oxide layer gets torn off the cathode, a process 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 manufactured *Omeg* potentiometers. These are sealed units so dust cannot enter them and they won’t dry out so never require periodic cleaning or lubrication. Also, our unique pot bushing system protects the pot from mechanical damage (i.e. being stepped on!)

An internal jumper can be used to **Sync** the tremolo rate of the 'Left' and 'Right' channel. With the jumper in place the L.F.O.s are synchronised, i.e. they oscillate at the same speed. In sync mode the 'Speed' knob functions as phase control for the 'Right' channel (variable between 0°-180°) when the 'Tap/Sync' footswitch is held down.

**CV (Control Voltage)** input allows the speed of the tremolo to be controlled with an expression pedal, such as the Roland EV-5 or EV-7. Other expression pedals may be used if their potentiometer has a resistance in the range of 10K to 250K and are wired as shown below.



Tip: wiper (pin2)  
Ring: +5V (pin 3)  
Shield: GND (pin 1)

The *Delta-Trem* tremolo speed can also be controlled using an external V.C.O. (voltage controlled oscillator). Voltage range must be in the range of 0 to 5 volts.

## Controls

**Shape** knob adjusts the fundamental character of the tremolo. 16 different L.F.O. wave shapes are continuously selectable using this knob with a further 32 being accessed via the 3-way 'Filament/Fluid/Neon' toggle switch on the rear panel.

In 'tap tempo' mode the 'Shape' knob functions as a tap divide/multiply control when the 'Tap/Sync' footswitch is pressed and held down. Rotate the knob clockwise for  $\frac{1}{4}$  (16th ♩),  $\frac{1}{8}$  (eighth ♩ triplet),  $\frac{1}{2}$  (eighth ♩),  $1/1$  (quarter ♩),  $3/2$  (dotted quarter ♩),  $2/1$  (half ♩),  $3/1$  (dotted half ♩),  $4/1$  (whole ♩) modulation speed divisors.

**Depth** knob controls the intensity of the tremolo effect from a subtle shimmer to deep amplitude for some good old Louisiana swamp blues. When fully counter-clockwise the tremolo effect is cancelled. This means the *Delta-Trem* is working as a tube buffer/booster adding warmth and some additional drive to the your guitar.

**Speed** knob sets the tremolo modulation rate. Rotating this knob clockwise increases the rate. The *Delta-Trem's* unique 'raysistor' circuitry is an astounding improvement on the primitive phase-shift neon oscillators found in vintage tube amps — being smoother, deeper, richer and super-quiet in operation (no audible 'ticking' noise).

**Rhythm** knob selects 1 of 8 different accented rhythmic patterns to emphasise specific tremolo pulse beats. The following time signatures are available: 1/1, 1/2 (march time), 3/4 (waltz time), 4/4 (rock/pop), 5/4 and 6/8 time along with other patterns. As the 'Rhythm' knob is rotated clockwise the time signature increases producing ever more complex patterns until the *Delta-Trem* begins to sound more like a sequencer than a tremolo!

Note: 'Shape', 'Depth', 'Speed' and 'Rhythm' knobs affect the 'Left' channel. To alter these parameters for the 'Right' channel press and hold down the 'Tap/Sync' footswitch whilst adjusting the knobs.

**Filament/Fluid/Neon** switch selects between 3 banks of 16 waveforms (48 total). The 'Filament' bank contains subtle hyper-triangle, sine and smoothed square wave shapes; the 'Fluid' bank contains rising saw, triangle and falling saw wave shapes; and the 'Neon' bank contains deep pulse wave shapes.

**Mono/Stereo** switch allows the *Delta-Trem* to work as a tremolo/panner/splitter for mono sources (such as guitar) or as a true stereo tremolo for use with stereo keyboards. When the switch is 'up' the input is mono (TS) and when 'down' it's stereo (TRS).

**Bypass** footswitch allows selection between 'effectified' (tube buffered tremolo) and 'non-effectified' (true bypassed 'dry') signal.

**Tap/Sync** footswitch sets the tremolo speed when the *Delta-Trem* is in 'tap tempo' mode. Two successive presses (taps) of the footswitch set the speed and one press resets the tremolo to the beginning of its cycle allowing resynchronisation with the beat when playing in a live situation.

Note: Pressing and holding down the 'Tap/Sync' footswitch and then moving the 'Filament/Fluid/Neon' toggle switch puts the *Delta-Trem* into 'tap tempo' mode. Moving the 'Speed' knob will put the pedal back into 'standard' mode.

Internal **Dwell** trim-pot sets the bias point of the filament lamp to alter the depth and character of the tremolo. To access the 'Dwell' trim-pot, first disconnect the power to the pedal, carefully unscrew the six screws underneath the pedal and then remove the base-plate. A small watchmaker's screwdriver or specialised trimming tool will be required to adjust the trim-pot.

**Tone Tip!** The *Delta-Trem* can be utilised as an audiophile tube boost/buffer/splitter when the 'Depth' knob set to minimum and with the 'Dwell' trim-pot maxed out.