

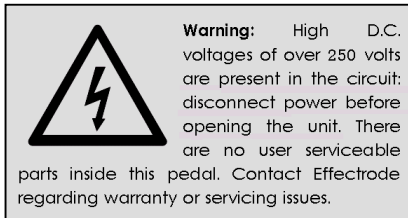
Specifications

- 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 dozens of 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

Introduction

The *Delta-Trem™* authentically recreates the alluring, hypnotic tone and feel of a vintage tube amp tremolo. This is accomplished by using a 'Raysistor' (photo-cell/lamp) and tube signal path—twice for stereo! This is an exceptionally warm and musical tremolo effect that blends well with clean and overdriven guitar. 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 dead-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.

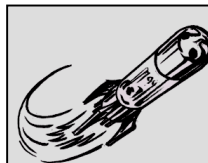
Thank you for trusting *Effectrode* to be your effects company. We wish you many years of musical enjoyment from this very special, hand-crafted, all-tube pedal.



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. *Sylvania* Mil-Spec N.O.S. tubes are highly recommended.



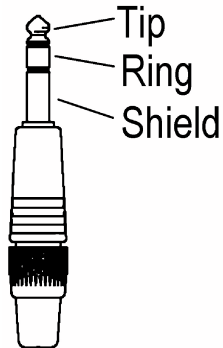
To extend tube life, it is recommended that the unit be allowed to warm-up for at least one minute after being switched on. This is to allow the heater filament in the tube to heat the cathode, which is coated with a layer of barium and strontium oxide. This oxide layer gets torn off the cathode, a process 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 made *Omeg* potentiometers. These are sealed units to prevent drying out or dust entering them, which means they never require periodic cleaning or lubrication. Additionally, a unique pot bushing system protects the pots from mechanical damage (i.e. being stepped on!)

With the internal jumper **Link** in place the 'Shape', 'Depth', 'Speed' and 'Rhythm' parameters of the 'Right' tremolo are the same as the 'Left' tremolo settings. Further, when the 'Tap/Sync' footswitch is pressed and held down, the 'Shape', 'Depth' and 'Speed' knobs become 'Wow' (speed variation), 'Dither' (wave shape dithering) and 'Phase' (variable from 0°-180°) controls for the 'Right' tremolo.

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 can 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 character of the tremolo by altering the L.F.O. wave shape. Wave shapes are continuously variable, transistioning seamlessly from one to another as the knob is rotated. More shapes can be accessed via the 3-way 'Filament/Fluid/Neon' toggle switch on the rear panel.

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 a staggering 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).

In 'tap tempo' mode the 'Speed' knob functions as a tap divide/multiply control when the 'Tap/Sync' footswitch is pressed and held down. Rotate the 'Speed' knob clockwise for $\frac{1}{4}$ (16th ♩), $\frac{1}{3}$ (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.

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' tremolo. To alter these parameters the 'Right' tremolo press and hold the 'Tap/Sync' footswitch whilst adjusting the knobs (with jumper **Link** removed).

Filament/Fluid/Neon switch selects between three banks of different L.F.O. waveforms. The 'Filament' bank contains subtle 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 of the *Delta-Trem*. Two or more successive presses (taps) of the footswitch set the speed according to the foot tap rate putting the pedal into 'tap tempo' mode. Moving the 'Speed' knob slightly will put the pedal back into 'standard' mode. One press just resets the tremolo to the beginning of its cycle allowing resynchronisation with the beat when playing in a live situation.

Note: Tremolo speed can also be set accurately using an external tap tempo controller such as the *Time Traveler™* pedal or any controller pedal that features a normally open momentary footswitch. Connection is made via the RCA jack socket on the rear panel of the *Delta-Trem*.

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.