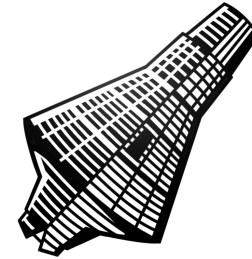



# Specifications

- Input impedance: Greater than  $1M\Omega$
- Output impedance: Less than  $40K\Omega$
- Controls: Fuzz and Volume
- Features: 'Hot'/'cold' bias switch
- Thermionic!: Based on a N.O.S. space-grade mil-spec subminiature triode vacuum tube
- True bypass: With 'anti-pop' or 'thump' foot-switching circuitry
- Power requirements: 12VDC @ 600mA - Centre positive 2.1mm barrel connector
- Dimensions: Width 4.75"; Depth 3.75"
- Weight: 12oz (on Earth); 4½oz (Mercury)
- Construction: Solid die-cast aluminum box
- Finish: Mustard powder coat

*Mercury*  
SPACE CHARGE FUZZ



	<p><b>Warning:</b> 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.</p>
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Serial # TF-3A



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

# Introduction

The *MERCURY™* fuzz pushes vacuum tubes beyond their normal operational limits to generate larger-than-life, devastatingly rich, liquid fuzz tones. The fuzz circuitry is built on a hand selected vintage space-grade tube and a matrix of NOS germanium point-contact crystal diodes—there's a lot of glass in this pedal! At lower fuzz settings the *MERCURY* cleans up to produce natural (real!) tube dirt and overdrive. As the 'Fuzz' knob is rolled up the pedal adds ever-increasing amounts of harmonic saturation and soaring sustain, stretching notes towards infinity until, at full throttle, the guitar signal is crushed into fuzzed-out oblivion.

Silver solder and top-notch audiophile grade components are utilised throughout the construction of this pedal. Instrumentation grade metal-film resistors are specified for their low noise and stability, polyester coupling capacitors for their ability to resolve fine signal detail. Ground-plane construction ensures lowest possible noise and hum.

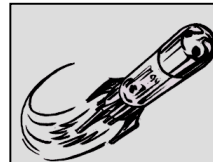
Thank you for supporting *Effectrode*—we really could not do what we do without your support. We wish you many years of musical enjoyment from this limited edition hand-built, all-tube fuzz pedal.



*Phil Taylor — Designer*

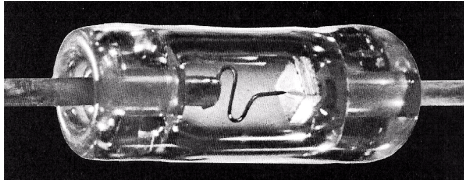
# Tubes

The *MERCURY* fuzz audio signal path is based on a *Sylvania* N.O.S. '6948' high- $\mu$  double triode. These miniscule tubes were originally developed by *Sylvania Electric* for guided nuclear missiles. They meet stringent military Mil-E-1 specifications for reliability and long service life under conditions of severe shock, vibration, high altitude, and high temperature and radiation levels—conditions that would destroy typical electronic components. *Sylvania* subminiature tubes represent the absolute pinnacle of thermionic technology; they are unquestionably the finest tubes manufactured by any company, ever.

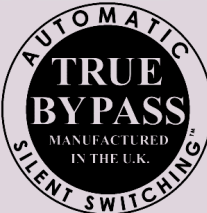


To extend tube life, it is recommended that the unit be allowed to warm-up for at least one minute after being switched on. This is to allow the heater filament in the tube to heat the cathode, which is coated with a layer of barium and strontium oxide. This oxide layer gets torn off the cathode, a process 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).

Within a few years germanium/galena 'cat-whiskers' were being used by amateur radio enthusiasts and in early commercial radios. The development of radar systems during WWII then led to a demand for a more reliable high frequency, low-noise detector/mixer—the 'diode'.



Millions of crystal diodes were manufactured in the 1940s for military radar use. *Sylvania* pioneered the use of germanium for diodes, with the introduction in 1946 of the 1N34—the world's first commercial germanium crystal diode.



All *Effectrode* pedals feature our innovative **Silent-Switching™** true bypass system, where an active audio circuit minimises the 'pop' or 'thump' when the effect is engaged. Additionally, as a failsafe, the circuitry will always default to bypass if power is interrupted to the pedal ensuring that you can continue to perform. Signals are switched using a precision audio relay with gold-plated contacts for superior tone and performance over multi-pole footswitches, which were not originally designed for constant use or audio signals. The relay also shortens the signal path so that signal is not routed through any internal wiring thus preventing noise contamination.

## Controls

**Fuzz** knob controls the signal level from the tube gain stages feeding the crystal diode clipping circuitry. This is a logarithmic control with a wide range going from a balanced, rich overdrive to endlessly sustaining, obliterated fuzz tones. The vacuum tube circuitry within the *MERCURY* makes this pedal exceptionally expressive and super touch sensitive. Setting the 'Fuzz' knob a little higher than you might normally use ensures it's possible to take advantage of pedal's dynamic response. Rolling back the volume of your guitar and picking lighter will produce a range of full-bodied, smooth, bluesy drive tones, however you can still dig in to push the *MERCURY* into heavier distortion sounds.

**Volume** knob is used to match the relative volume levels of the *MERCURY* fuzz when in bypass or engaged. When the effect is engaged the output level can be increased provide additional boost to push the input of a tube amp for further drive and distortion.

**Bias** toggle switch alters the biasing of the *MERCURY*'s second tube gain section: this affects the sensitivity, feel and character of the fuzz. In the 'up' position the tube is biased in its linear region creating symmetrical clipping distortion. In the 'middle' position it is 'cold' biased which results in asymmetrical clipping of the top half of the wave. And in the 'down' position the tube is 'hot' biased creating asymmetrical clipping of the bottom half of the wave.

Further, when biased for symmetrical clipping the *MERCURY* is operating at maximum gain generating maximum distortion and smooth, sustaining fuzz tones. Conversely, 'hot' and 'cold' biased asymmetrical clipping results in slightly reduced gain and a rougher, grittier distortion.

**Footswitch** allows selection between effectified (fuzzed) and non-effectified (dry) signal. Silent true bypass switching ensures there are no 'pops' or 'thump' when engaging the effect and that there is absolutely no loss of tone from your guitar to your amp when the effect is disengaged. Additionally, the tube signal path in this pedal is built to demanding audiophile specification to ensure hi-fidelity and signal integrity at all times—the benefit being that your guitar tone always remains pure and intact.

## Theory of Operation

The *MERCURY* operates on precisely the same principles as the original 'Astrotone' fuzz box. The Astrotone fuzz was made in New York City by *Universal Amplifier Corp* back in 1966-1968 and utilised what were, at the time, the very latest innovations in solid-state technology. Silicon transistors boosted the guitar signal to high levels so that passive shunt silicon diodes could 'clip' the top and bottom of the waveform creating a coarse, gnarly, rough-sounding distortion, a.k.a. fuzz.

Instead of transistors operating from a 9V PP3 battery, the *MERCURY* employs vacuum tubes running at real amp plate voltages of 300V to boost the guitar signal. The signal level is amplified to massive levels—far greater than in the Astrotone—before hitting the clipping diodes. In fact the signal voltage swing is so great that a matrix of series germanium diodes need to be used to handle the high voltages. The result is a colossal fuzz sound with beautifully complex and rich harmonic overtones and devastatingly smooth, liquid sustain.

## History of the Crystal Diode

The first crystal diodes were developed in the early 1900s. Wireless receivers (radios) utilised a thin wire in mechanical contact against the face of a crystal. The wire had to be manually adjusted to find the 'hot-spot' on the crystal for best radio wave detection. This device allowed current to pass in one direction only, and so rectified the received carrier signal to provide a DC voltage that could drive headphones.

