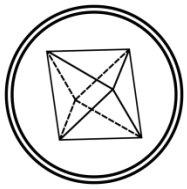

ELECTRONIC AUDIO EXPERIMENTS

Technical Document

Model feT Manual

Version 2

Last Revised: 21-Oct-20

John Snyder

INTRODUCTION

Thank you for your purchase of the Electronic Audio Experiments **Model feT**! This manual is an in-depth guide for properly using and enjoying your pedal.

The Model feT is my humble homage to the venerable Model T amplifier manufactured by Sunn in the early 1970s. The original Model T was Sunn's effort to compete with Marshall – by borrowing the Super Bass design (itself a shameless re-iteration of the Fender 5F6A Bassman) and adding their signature ultralinear power amplifier. This power amp, inspired by Dynaco tube hi-fi equipment, produced a formidable 150W of power with more clean headroom than the typical guitar amps of the time. Sunn was short-lived in its success, but the Model T developed a cult following because of its massive power output, deep bass response, and (in my opinion) its stark and imposing aesthetic. In conjunction with down-tuned guitars, a kick from the right distortion pedal, and enough patience to let a power chord feed back for 30 minutes, the amp redefined the sound of heavy music.

The Model feT itself comes from a long line of "amp-in-a-box" pedals intended to capture the sound of hard-to-find vintage amplifiers. The DIY pedal website Runoffgroove popularized the notion that JFETs, a type of transistor, could be used to emulate triode vacuum tubes (ironically, Sunn itself was early adopter of this practice in the Concert Lead/Bass amplifiers). Because JFETs are what as known as "depletion mode" devices, they may be biased in a manner akin to triodes. With allotments made for standard pedal operating voltages, simply dropping JFETs into the schematic of a tube amp can produce a convincing approximation of the amp in question. Without the contributions of ROG, this project would likely not exist. However, this method is not without limitations: JFETs do not perfectly mimic tubes, and many JFET amp emulations do not include any references to power amps, despite the power amp being critical to overdriven tones. A Model T pedal designed with this formula may suffer from a thin, harsh sound lacking in headroom—a far cry from its namesake.

The Model feT widens this scope by including an emulated power amp, making it a more complete emulation. After all, without an ultralinear power section, there is very little distinguishing the Model T from a Super Bass or 5F6 Bassman. I also performed thorough simulations to account for the subtle but critical differences between the frequency response and impedances of JFETs versus triodes, which more accurately reproduces the frequency response of the original amp. As a result, I believe this to be the most accurate Model T reproduction in solid-state format.

The Model fet may serve as an overdrive pedal into an existing amp, as a preamplifier going direct into a power amp (alternately into the effects return of an amp bypassing the preamp), or even into a DAW running a cab simulation. In any of these applications

it is equal suited to clean or overdriven tones. As you turn up the gain controls, you can go from the iconic “dirty clean” the Model T is known for all the way up to heavy rock tones with deep bass extension. When the Model feT is set for lower gain, it shapes the tone of other pedals stacked into it. At the end of a signal chain, it adds an entirely new dimension to existing fuzzes, distortions, boosts, and even modulation or time-based effects. When boosted the input stages provide their own overload, adding harmonic content and deepening the amount of distortion in the same way a cranked amplifier would with a loud pedal in front. Like the original Model T, the EQ curve is slightly mid-scooped in just the right spot, lending heft to the lows and clarity to the highs that enhances distortion and fuzz in front. The Model feT also has plenty of output level, which makes the cleaner sounds as usable as the heavy ones and also allows for overdriving an external tube power amp. With the Model feT, all the power and nuance of a cult classic amp can be right at your feet.

Thanks for reading!

-John Snyder, EAE

OPERATION

Only use a standard, reliable 9VDC center-negative supply with the Model feT (e.g. Truetone™, Voodoo Labs™, Strymon™, Cioks™, etc). The Model feT has a current draw of 70mA with the effect engaged. Power supplies with AC output or a DC voltage greater than 9V will risk damaging the pedal and voiding the warranty. The Model feT does not and cannot use batteries.

The Model feT has soft-touch relay bypass switching with true bypass. The relay will default to the bypass state in the event of power loss.

The Model feT may be used in various configurations, including:

- **Standard pedal use:** Model feT connected into an amplifier input, with or without other pedals. Works as a straightforward overdrive in this configuration.
- **Preamp with an existing amp:** connect to the effects return/power amp input of another amplifier. The Model replaces the existing preamp.
- **Preamp with a power amp:** connect to a dedicated power amp. Use a cabinet properly designed for guitar or bass use. If using full range speakers, see below.
- **Direct input:** connect to a mixer or DAW input. For best results, use in conjunction with an analog or digital speaker cabinet simulation.

Dialing in the Model feT for the first time is straightforward. Set all EQ knobs at noon, **Normal** control at 12:00, and **Brite** and **Master** at minimum. Turn on the pedal, and slowly bring up the **Master** until you reach the desired output level.

Depending on the output level of your instrument, you should have a light to medium overdrive tone. Adjust the gain of the **Normal** channel as desired, and correct for volume changes using **Master** if necessary. If you want more high-end bite or additional distortion, turn up the **Brite** control to blend in that channel. The **Brite** channel may of course be used on its own, though most users will find it thin-sounding without the normal channel. The configuration is identical to a four-input amp on the “Hi” input with the channels jumped.

The EQ is a standard FMV (Fender/Marshall/Vox) arrangement and should be familiar to most guitarists, despite its idiosyncrasies. A couple notes on this EQ:

- It is a highly interactive EQ, so control settings will have an impact on each other. For example, the **Midrange** control and **Treble** control overlap.
- Due to its placement in the circuit, it is more effective at lower gain settings, just like how a cranked tube amp tends to overwhelm the EQ settings because of power amp saturation.

- This tone stack is naturally scooped. In fact, the flattest response comes from setting **Bass** at 0, **Treble** at 0, and **Midrange** at 10.
- The Treble control actually starts to increase bass content if it is turned counterclockwise past 11:00 or so. Bass players and low-tuned guitarists may find this helpful.

Note: The Model feT can get ***EXTREMELY*** loud so starting from zero is recommended for new users. At higher gain settings, unity volume can be below 9:00. We gave this pedal a lot of power at the output, so that clean tones may be dialed in without sacrificing volume. Extremely high volume and gain settings can result in feedback with some setups.

Stacking Pedals

The Model feT shines when working with other pedals. Place the Model feT *after* your other pedals (at least boost/overdrive/fuzz), set the Model feT for a clean or low gain tone, and then see what happens when other pedals are added. Here's some we've tried:

- Rangemaster style boost: works great using the Normal channel set to medium gain, tightening it up for classic heavy metal tones
- Full range boost: can quickly overwhelm the input for a thicker, heavier sound
- Muff style fuzzes: go crazy, these work fabulously well. May need to use lower output settings if the Model feT is set for high gain
- Fuzz Face style fuzzes: these also have lots of output, so to stack evenly keep the fuzz level on the lower side
- Op amp distortions - the combination of even harmonics from an op amp drive and odd harmonics from the Model feT can be devastating. Some of the best Model T tones come from slamming it with a Proco Rat (or similar pedal)!

In conclusion…

The Model feT is far more than a soundalike overdrive for doom metal - it is a full preamplifier and a powerful tool for both live and studio tone shaping. Thanks again!

CHANGELOG

Version 2	Manual release for Model feT V3.7
Version 1	Manual release for Model feT V3.0

MFG. BY
ELECTRONIC AUDIO
EXPERIMENTS

www.electronicaudioexperiments.com