

FM EMU

Fender – Marshall Emulator Clean Boost

The **FM EMU** is a tube-driven effect for guitar that emulates both the “Fender Sound” and the “Marshall Sound”, and gives the user the ability to dial-in any level of blend between the two tones.

Although it is designed as a clean boost, natural tube distortion will occur as the Gain is increased.

With the Blend knob all the way counter-clockwise, the boost is all “Fender”; mid-scooped, chimey, and lots of clarity. When the Blend Knob is all the way clockwise, the tone is full Marshall; Creamy and gritty, with a very present mid-range.

The **FM EMU** provides the best of both worlds; a Fender amp and a Marshall amp in one box. It can be dialed in to a tone that is uniquely yours, anywhere between the two extremes.

Design and Build:

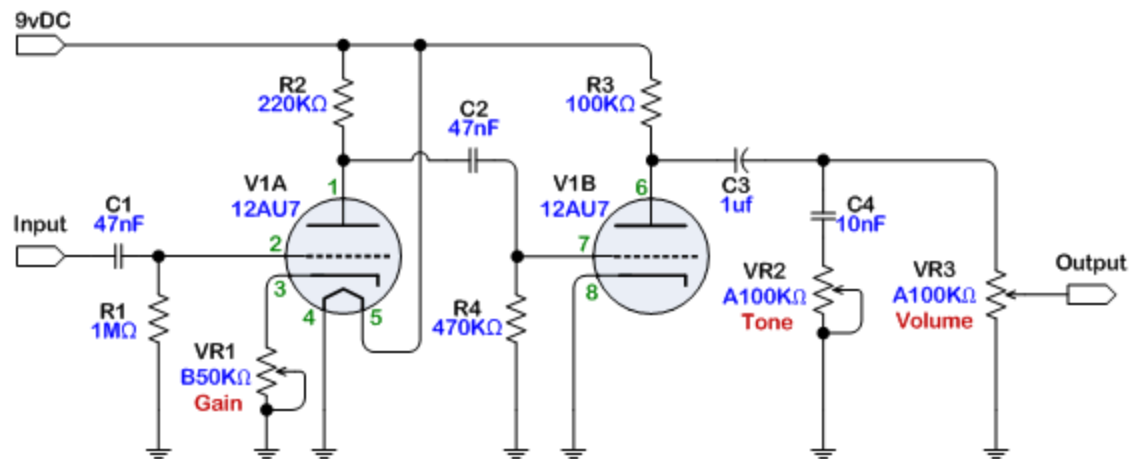
The concept of the FM EMU is to have a stand-alone effect that uses two 12AU7 vacuum tubes that provides 3 gain stages and mimics the tonal characteristics of a typical Fender preamp and a typical Marshall preamp, and the ability to blend the two signals at any ratio.

The design calls for a 12 VDC power supply for the tube filaments and a 24 VDC supply for the B+ voltage.

The design is loosely based on the Matsumin **Valve Caster**. The **Valve Caster** was a tube boost pedal designed to operate from a 9VDC supply (below).

matsumin Valve Caster

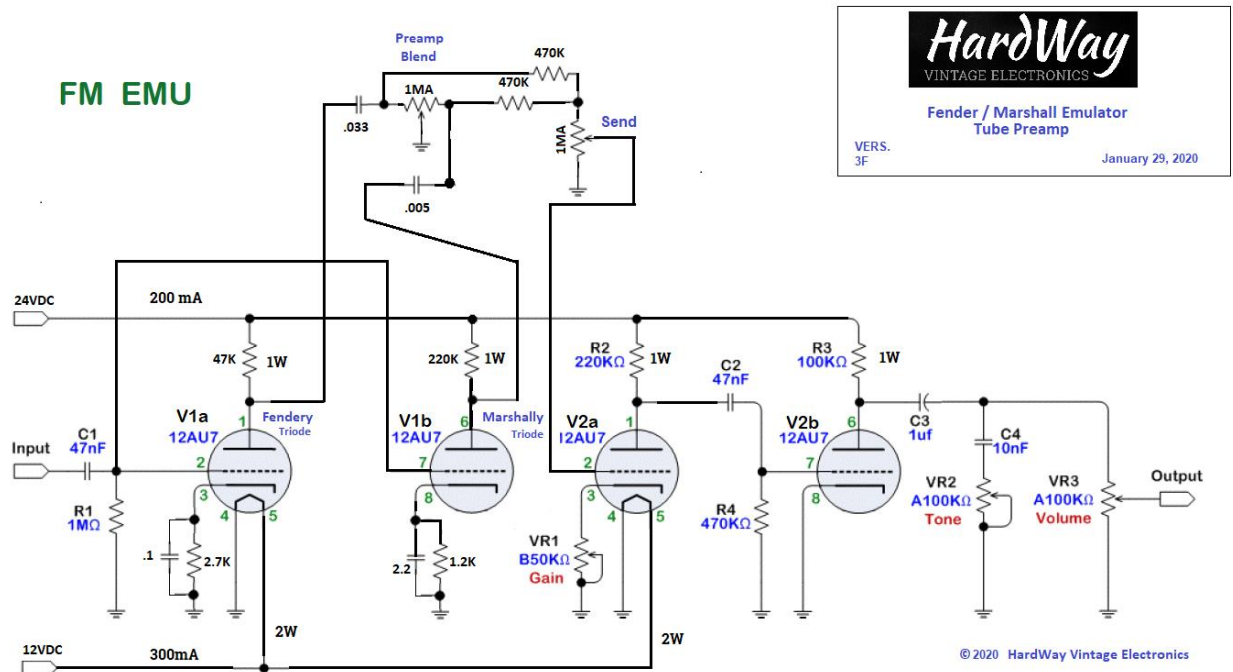
12AU7 tube boost and overdrive, running at 9 volts



drawn by dano/beavisaudio.com



The design for the FM EMU adds another 12AU7 dual triode tube, raises the voltage from 9 VDC to 12/24 VDC and incorporates the parallel signal blend feature of the McIntyre Fender/Marshall **Bluesmaker** amplifier, shown below:



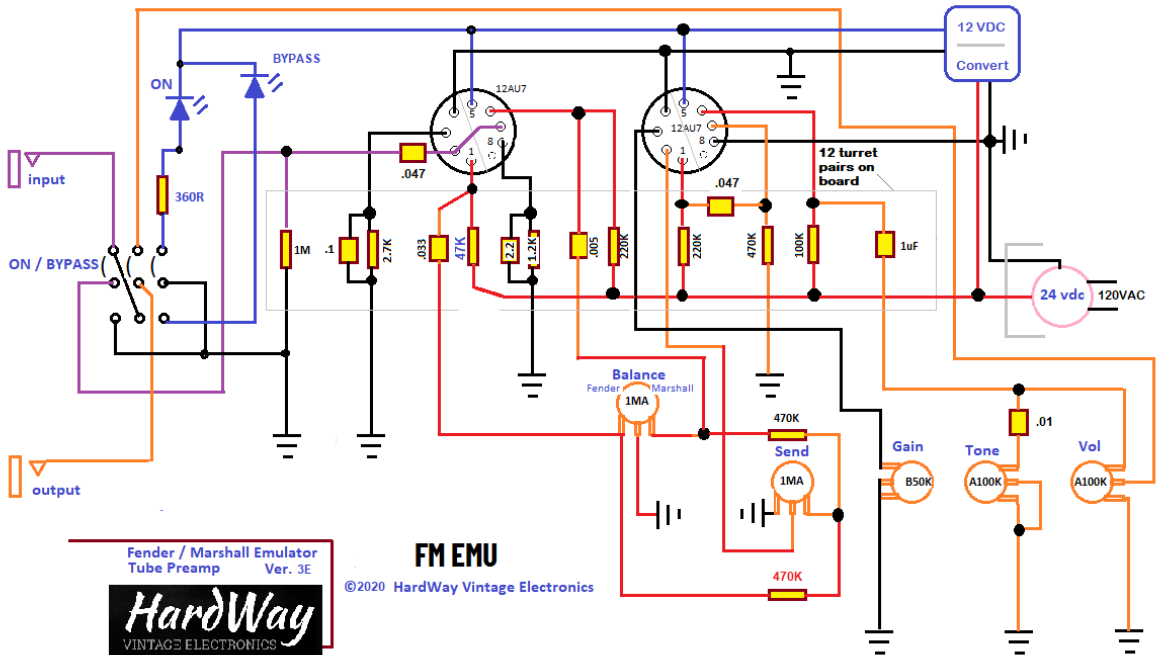
In the HardWay FM EMU design, there are dual power supplies – 12VDC for the tube filaments and 24VDC for the B+ voltage.

The parallel input preamp blend first stage is similar to the McIntyre circuit. The second 12AU7 tube adds two more gain stages with tone and volume controls similar to the Matsumin design.

The two different tones are established by both the preamp blend coupling capacitors (.033 uF for the Fender side and .005 uF for the Marshall side), and the cathode bypass sections (2.7K Ω / 0.1 uF for Fender, 1.2K Ω / 2.2uF for Marshall).

The Blend pot sets the ratio between the two signals and the Send pot modulates signal strength going to the V2a gain stage. The V2a has an adjustable gain through the 50K potentiometer.

The final gain stage, V2b, is followed by a simple Tone and Volume controls.



The layout of the FM EMU chassis is straightforward, and incorporates a true bypass switch, power indicating LEDs, and a 24V to 12V converter.

Here are some photos of the FM EMU prototype:

