

Using Wall Warts for Small Projects

Recently I have been building guitar pedals. Typically they are powered from a 9 Volt DC source. So far I have built copies of 3 pedals, a silicon transistor Fuzz Face, a clean boost pedal LBP-1 and a germanium transistor VOX Tone Bender MKII. I had a special interest in the Tone Bender because I wanted to build it using period germanium transistors which I did but unfortunately I didn't use all vintage parts. The original Fuzz Face and Tone Bender appear to be the mid to late 1960's vintage. The LBP-1 may be the same.

I powered the Fuzz Face and Tone Bender from wall warts. The LBP-1 was not supplied with a power source. Quite often guitar pedals are powered from a pedal board power source at 9 Volts. The Tone Bender was a special case because it's typically not compatible with a pedal board power source because it uses PNP transistors, negative DC voltage required. A separate power source was needed.

For the Fuzz Face I ended up using a 7.5 Volt DC wall wart because the actual voltage was about 10 Volts under a small load. This is a little high but good enough. The pedals I have built so far draw very little current. The "power on" LED's used draw more current than the rest of the circuit. It seems that for many wall warts that are rated at say 12 Volts at 300 ma, they are closest to 12 Volt at 300 ma and much higher at open circuit. Another problem I had was ripple from the wall wart that produced noticeable hum in the amp speaker. I ended up installing a large electrolytic capacitor on the pedal circuit board where the power entered. This brought the hum down to an acceptable level although I wasn't totally happy with it.

Digging through my box of wall warts I picked out a 9 Volt DC 200 ma one for the Tone Bender. The problem was that the open circuit voltage was 14.4 Volts DC. I didn't check it for ripple but probably had a lot. It wasn't acceptable. Thinking about this, I ended up installing a 3 terminal regulator on the pedal circuit board. The one use was a 7908. I didn't have a 9 Volt regulator but this 8 Volt one worked great. Also, it's the required negative regulator. This solved the high voltage and ripple problems. The required two low value capacitors were also installed at the input and output of the regulator. I could not detect any power supply ripple on the oscilloscope I was using at the time.



A 3 terminal regulator may be a simple solution when using crappy wall warts for a power source for certain projects. Also, the wall wart's advertised voltage becomes less critical. For example, you can select wall warts of various voltages to use for your project as long as they meet the regulator's specs including head room. Also, check to see if you need a heat sink.

About the guitar pedals

You may find that it's more expensive to build them than buy them off of Amazon unless you have a large supply of parts on hand although the more you build the cheaper they will get. I guess you can argue that the ones you built yourself might be better. Also, you can easily mod., them (optimize) to your liking. There is a lot of information about the above pedals on YouTube.

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