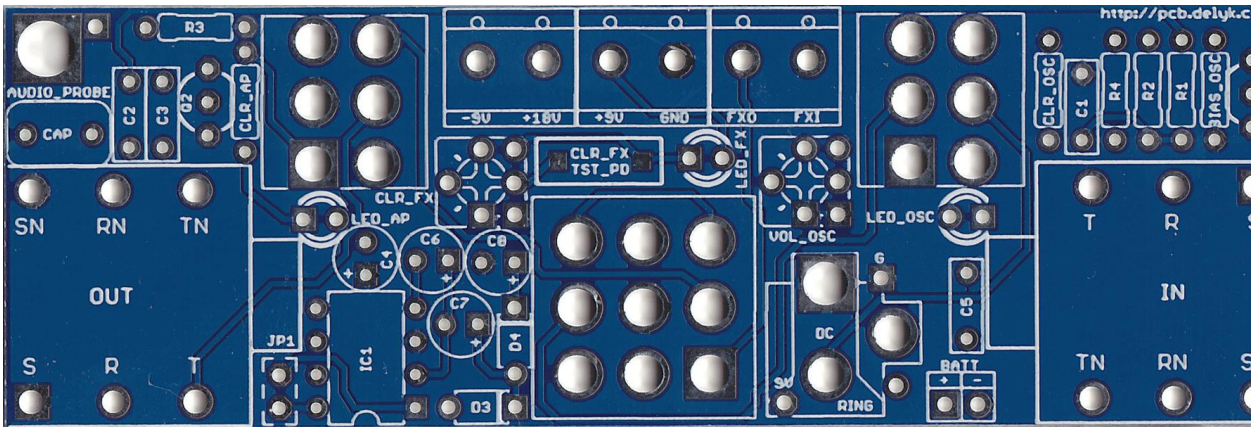

Effects Tester Mk II

Build Document

Bill of Materials

Resistors

You can use whatever value you prefer for the CLRs. Personally, I like 6k8.

P/N	Value
R1	27k
R2	27k
R3	4k7
R4	4k7
BIAS_OSC	22R
CLR_AP	6k8
CLR_OSC	6k8

Diodes

P/N	Value	Notes
LED_AP		Use whatever 3mm you want for an LED. Square pad is short leg (cathode).
LED_FX		Use whatever 3mm you want for an LED. Square pad is short leg (cathode).
LED_OSC		Use whatever 3mm you want for an LED. Square pad is short leg (cathode).
D3	1N5817	
D4	1N5817	

Capacitors

P/N	Value	Type	Notes
C1	22nF	Film Box	
C2	10nF	Film Box	
C3	10nF	Film Box	
C4	47uF	Aluminum Electrolytic	At least 16V. Used for the -9V part.
C5	100nF	Film Box	
C6	10uF	Aluminum Electrolytic	50V
C7	10uF	Aluminum Electrolytic	50V. Used for the 18V part.
C8	10uF	Aluminum Electrolytic	50V. Used for the 18V part.
CAP	100nF	Film Box/Mylar	I used a Mylar greenie, but you can use a film box or whatever.

Integrated Circuits

P/N	Value	Notes
IC1	MAX1044/7660S/LT1054	If you use the LT1054, keep JP1 open. If you use MAX1044 or 7660S, jump JP1.

Transistors

P/N	Value	Notes
Q1	2N3904	
Q2	2N3904	

Potentiometers

P/N	Value	Notes
CLR_FX	15k	Use any type of trimpot. While 15k works great, depending on the selected LED, you may consider a higher value.
VOL_OSC	10k	Use any type of trimpot. While 10k will work, I've found that I prefer 250k.

Jacks

P/N	Notes
DC	Designed for this.
IN	Designed for this.
OUT	Designed for this.

Miscellaneous

Qty	Value	Notes
3	DG301 (2 block)	Terminal block. You can use two of the 3 block, if you want.
1	Battery Clip	Totally unnecessary.
1	Binding Post	Use with a DMM probe/banana plug.
2	8-pin Socket	Use one for the charge pump IC if you want. Cut up the other to socket LEDs if you want.
2	DPDT On-On Switch	Used for the audio probe and tone generator.
1	3PDT On-On Switch	You can use a footswitch if you want; I liked an actual toggle. Used for the effects.
1	2-pin header	2.54 mm pitch (100 mil). Use this to allow an actual jumper with the charge pump. Note: If you solder in the charge pump, then (if needed), solder this jumper. No need to allow a changeable jumper if you won't change the charge pump.
1	Mini Jumper	2.54 mm pitch (100 mil). Same as above. No need for this if you solder the jumper in or charge pump.

Build Notes

- The binding post for the audio probe isn't necessary, but it is handy. If you choose not to use it, there's a small pad next to the large hole. Use this to solder in a regular wire.
- You don't have to use a Kobiconn DC. I don't know why you wouldn't, but if you don't, there are small pads near the DC jack that you can use for the TRS/TS of any other center-negative jack.

Usage

There are five main functions to this tester.

Effects Circuit Tester

Like the Mk I, use the Mk II to simply test the validity of an effects circuit. To do this:

1. Ensure all switches are off.
2. Ensure the Mk II is unplugged (no battery and no wall wart).
3. Connect your effects board to the terminal blocks
    a. GND
    b. Voltage (-9V, 9V, or 18V [whichever's appropriate])
    c. FX Input
    d. FX Output
4. Plug in your guitar and amp.
5. Plug in the battery or wall wart.
6. Play your guitar and notice your bypassed tone (usually purely clean).
7. Switch on the 3PDT and notice the effect of the circuit!

Tone Generator

The Mk II now includes a simple tone generator. This will assist you in troubleshooting some problematic aspects of the circuit. It also means you don't constantly have to strum a guitar.

1. Ensure all switches are off.
2. Ensure the Mk II is unplugged (no battery and no wall wart).
3. Connect your effects board to the terminal blocks
    a. GND
    b. Voltage (-9V, 9V, or 18V [whichever's appropriate])
    c. FX Input
    d. FX Output
4. Plug in your amp. Guitar is optional.
5. Plug in the battery or wall wart.
6. Switch on the DPDT near the input jack.
7. Notice a boring tone.
8. Switch on the 3PDT and notice the tone through the circuit!

Audio Probe

The audio probe is possibly the most helpful part of the Mk II. It allows you to hunt down the problem in the effects circuit. Personally, it's most helpful to use this with the Tone Generator turned on. That way, you're not strumming your guitar, then picking up a probe to find the issue.

I prefer to use the binding post and then plug in a digital multimeter's test lead. If not, you can use a wire instead.

1. Ensure all switches are off.
2. Ensure the Mk II is unplugged (no battery and no wall wart).
3. Connect your effects board to the terminal blocks
    a. GND
    b. Voltage (-9V, 9V, or 18V [whichever's appropriate])
    c. FX Input
    d. FX Output
4. Plug in your amp. Guitar is optional.
5. Plug in the battery or wall wart.
6. Switch on the DPDT near the input jack (tone generator).
7. Switch on the 3PDT.
8. Switch on the DPDT near the output jack (audio probe). NOTE: It's ok if the tone generator bleeds through a little bit.
9. Follow the audio path of the circuit, touching parts along the way with the probe, to determine where the issue is.

Charge Pump

I offer a charge pump utility board that's design to allow a bit more functionality. Take a look!

This charge pump allows you to use three different voltages: -9V, 9V, and approximately 18V. If your effects circuit requires -9V (think old fuzz faces), then plug your GND into GND and the voltage into -9V. If you want to try a circuit with 18V (maybe an overdrive circuit), then connect your GND into GND and the voltage into 18V.

Please note, if you are going to use 18V, make sure all the capacitors in your effect is rated at least 25V!

LED Resistor "Calculator"

Some like it dark. Some like it bright. Some like it in the pot, nine days … whatever.

Using the trim pot marked CLR_FX, dial in the brightness you like for the LED_FX. **Caution: do not turn the trim pot all the way to max, or you'll bust the LED. While this is fun, if you didn't socket, you'll have to desolder/resolder.**

When you find the brightness you like, unplug the DC power, then touch the two DMM probes to the test pads marked CLR_FX TST_PD. Read the resistance. Now, when you are putting an LED in your effects pedal, you can use a fixed resistor for this value!

Schematic