

If you are like me and most other hobbyist, you have a huge box of “goodies”, those little things that are just too cool looking to through away and fully intend to “someday” use them. Well I finally decided to go through that box and build something using nothing but “extra” parts.

My project: A prototyping test bed complete with 3.3, 5, and 12 volt power supplied, measuring tools, and breadboard.

Goal: I wanted to use 100% salvaged parts for this project However I must admit that I purchased 2 breadboards from Spark Fun, as all of the ones I already have weren't the size I needed. To justify it, I purchased them, decided I didn't need them and threw them in my junk box. The next day I dug them out and said “Oh look, these will work grate!” So the project is actually 99% junk.

The result: A PSU that provides 3.3, 5, 12, and 24 volts DC outputs, a Digital Oscilloscope, a 3.5x3.5 breadboard, 1K ohm POT, and a 100K ohm POT, and plenty of room for expansion.



Details:



I used scrap 0.25" ABS sheet for the sides and rear panels. The main PSU is from an old computer, here I remote the Power cord, main power switch, and the fuse out the side. This is because I want to be able to push the unit all the way back against the back of my bench. I can't do that with a cord sticking out the back.



A scrap piece of 16 gauge sheet aluminum worked out great for the Front. Very easy to cut and bend. I had to make a Break (bender) to bend this by the way.

If you are wondering why I mounted the Bread boards on an angle, it's because the Unit will be sitting about 1.5' to 2 feet back on the bench. When I stand at my bench it gives me a "top down" view of the Breadboard as well as the DC Scope. This way I don't have to lean over the top.

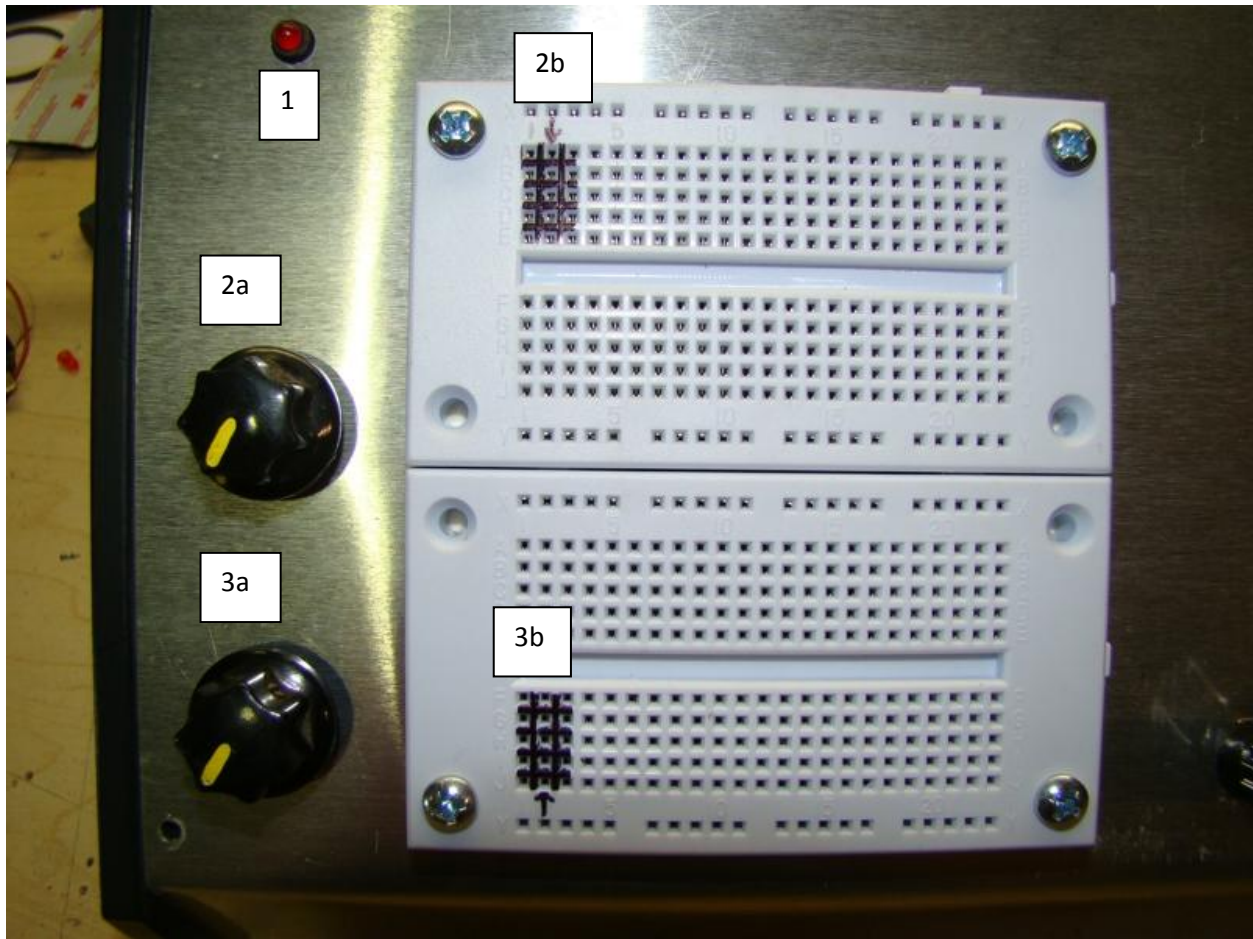


The Back, again 0.25" ABS. I left a 1" gap at the bottom for air flow.



The bottom frame is an anodized aluminum plate salvaged from a 2500 watt power inverter. The cut outs are from where the transformers use to sit. ON the left you can see the bottom of the main power supply, the cooling fan in the middle, and fuses on the right soldered to a proto board. Fuse changes are easy! No need to disassemble the unit.

I had to cut the plate to size and then bend over the “feet” you see on the right. The left side was already bent at a 90.



1. Left over LED for the main power indicator.
2. POT scavenged out of an old discarded project.
 - a. 100K Ohm POT
 - b. The POT is connected to the top 3 columns of the bread board from the underside for easy bread board connection. Arrow indicates the whippier arm.
3. POT scavenged out of an old discarded project.
 - a. 1K Ohm POT
 - b. This POT is connected to the bottom 3 columns.

The Top row on the board is also internally connected to the 3.3 volt supply, the Center two rows are internally connected to ground and the bottom row is internally connected to the 5 volts supply.

TIP: Notice that the indicator marks on the knobs of the POTS are nice bright yellow. These were very dingy white color, most of which has chipped out over time. When engraved lettering, or marks such as these become unreadable, use this method to revitalize the engraving. Choose a grease pencil of a color that will stand out on the background. Grind the grease pencil into the engraving until the engraved marks are packed tight with grease pencil material. Use a clean rag and whip the left over off the surface of the item. This will also polish up the grease material and make it shine. The grease pencil stays pliable and won't dry out and fall out of the engraving.



Kind of a bad picture, but here I have a switch, left over from other projects, for each power output.

Black Binding post are Ground, Green on the Left is 3.3 volt output, Red is 5 volt output, yellow is 12 volt, and the green on the right is 24 volt out, the open hole and additional green post is for a future POT to create a 0 – 24 volt variable output.

I wanted to use a different color for the 24v out, but these were the only colors I had in my junk box.

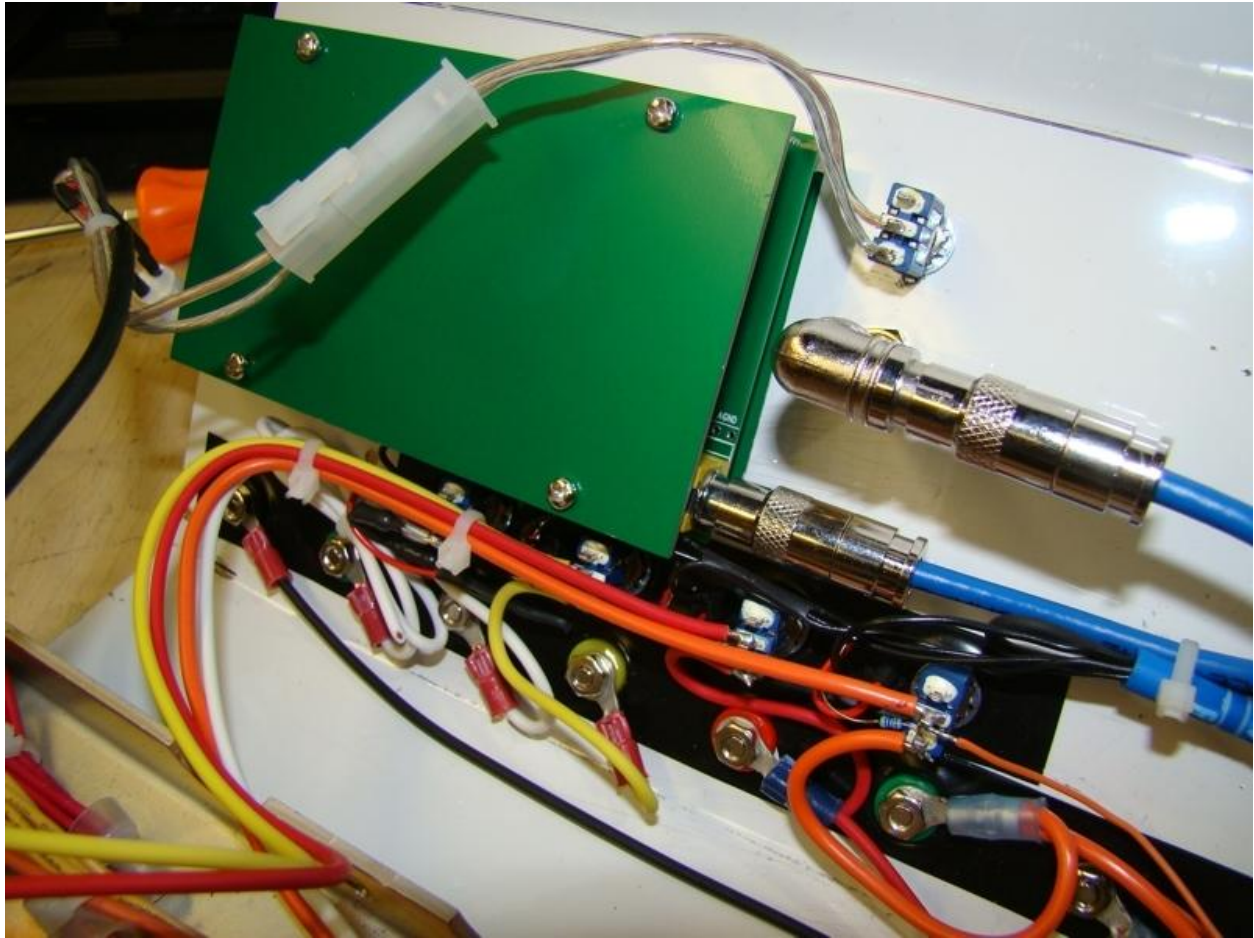
Above the post you can see the Digital O-Scope. I purchased this a while ago from <http://www.dpcav.com/xcart/product.php?productid=16330> and I decided to add it into this project.

I would love to see Spark Fun take this idea and improve on it. Upgrade the screen a bit and add a high impedance voltmeter and current meter to it.

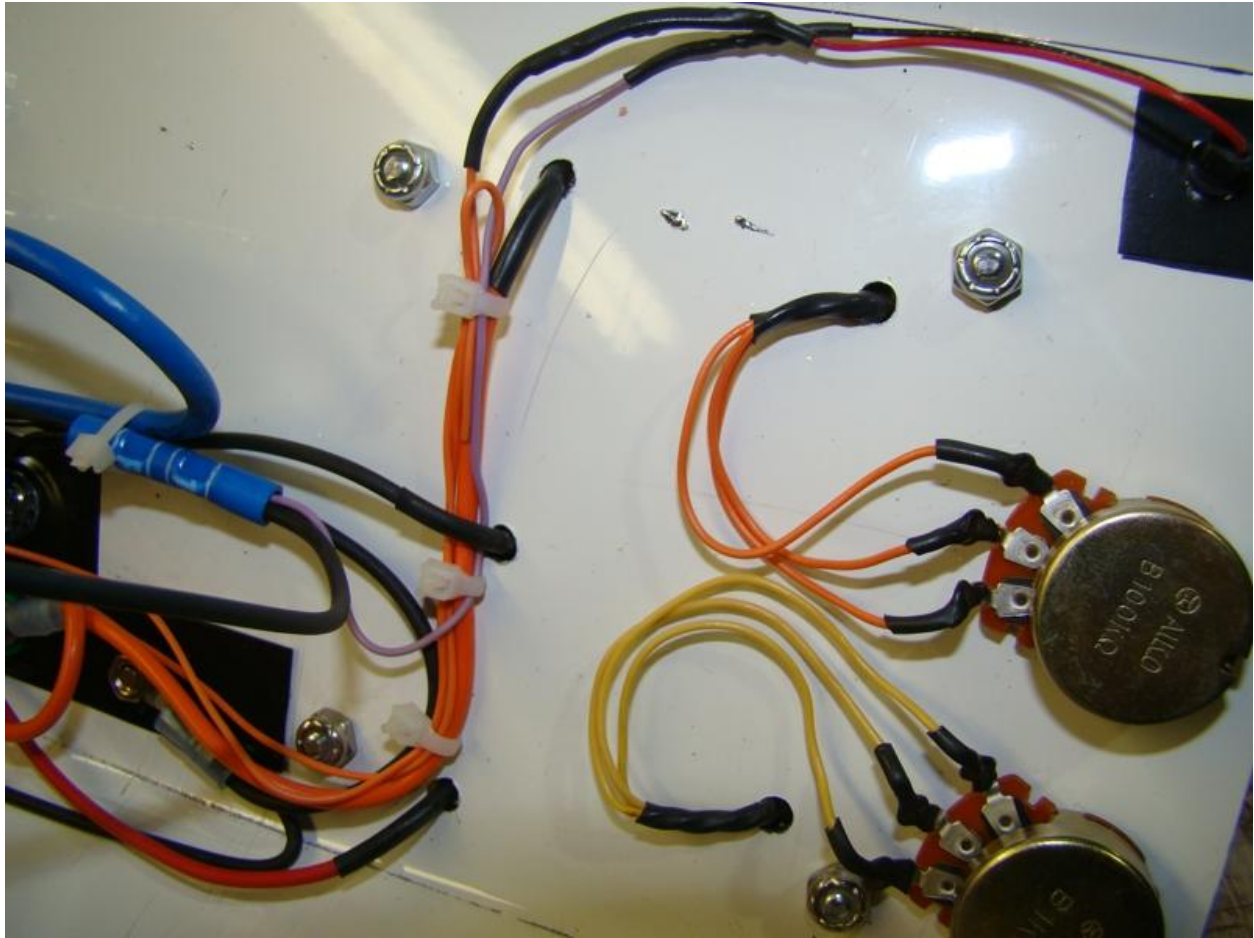
I also added a switch to turn it on and off and remote the probe connection out the front, the RCA jack.



Another look at the Binding post and DC Scope, all powered ON.

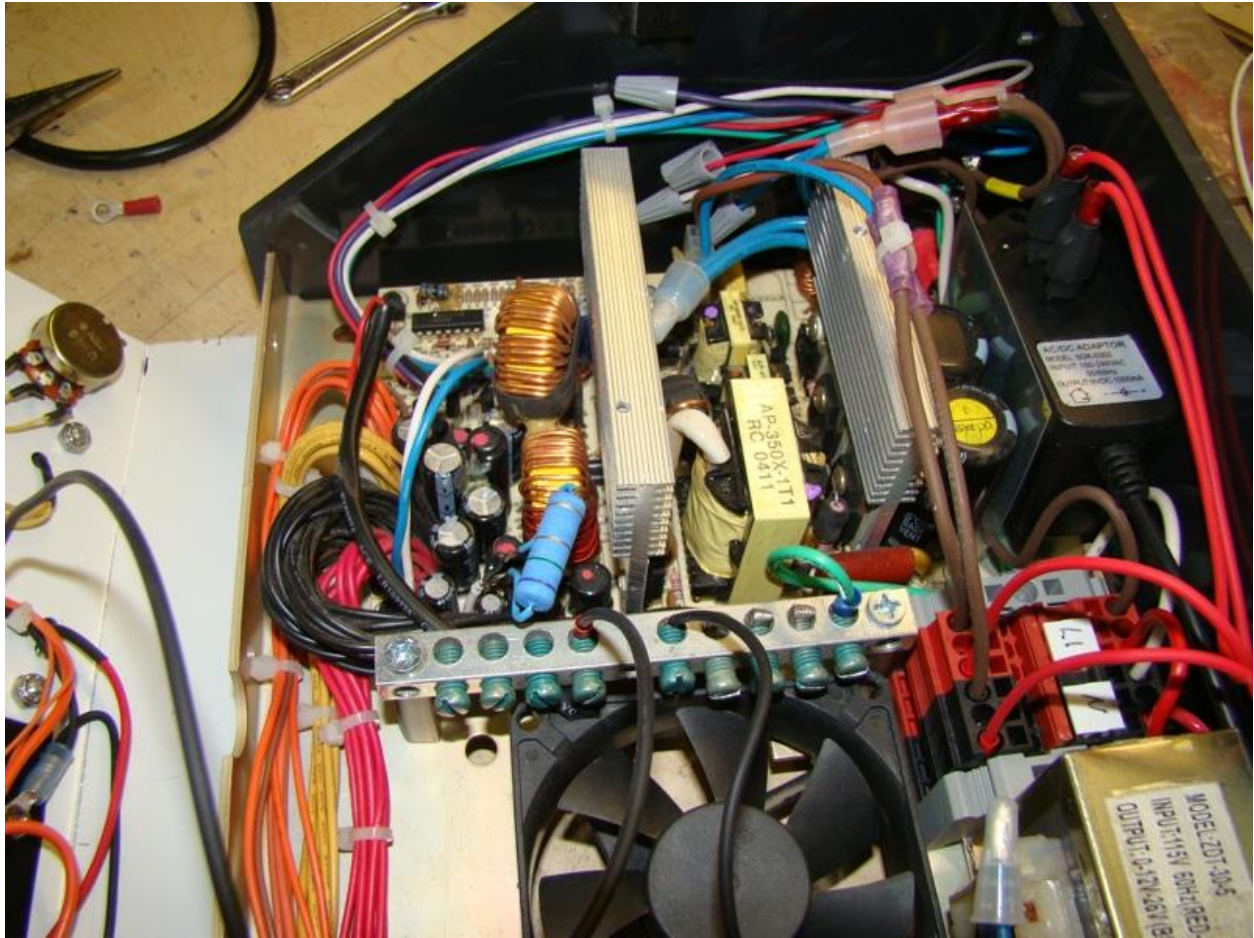


Inside the cover, back side of the DC Scope and the Binding post.



Here is the back side of the POTs and the wiring to the bread board. Towards the right you can see a Orange, Black, and red wire going into thru the cover. These are power feed to the bread board. The top row is 3.3 volt powered, the Center 2 rows are ground and the bottom row is 5 volt powered.

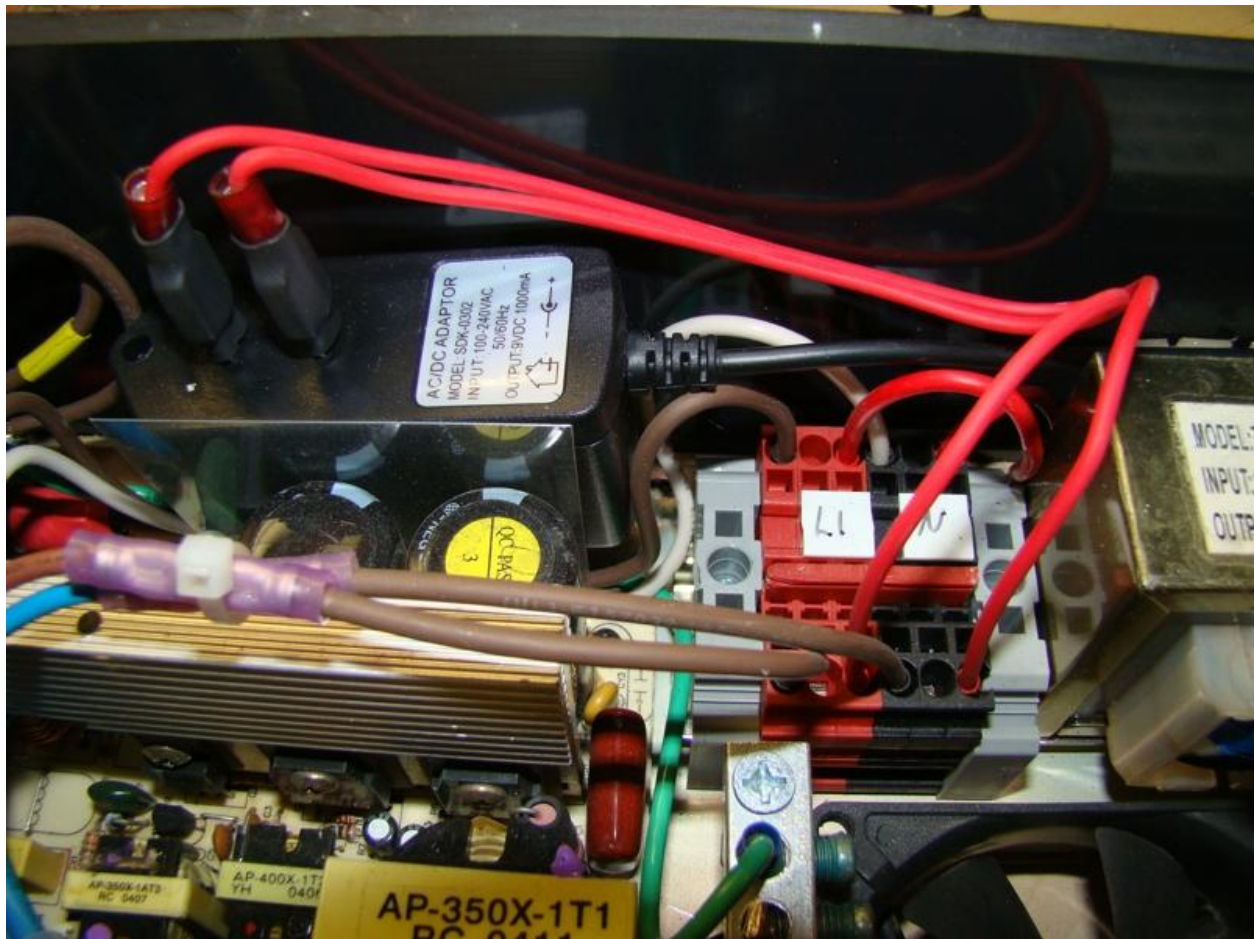
This eliminates the need to connect to the binding post to bring power over to the bread board – IT'S ALREADY THERE!.



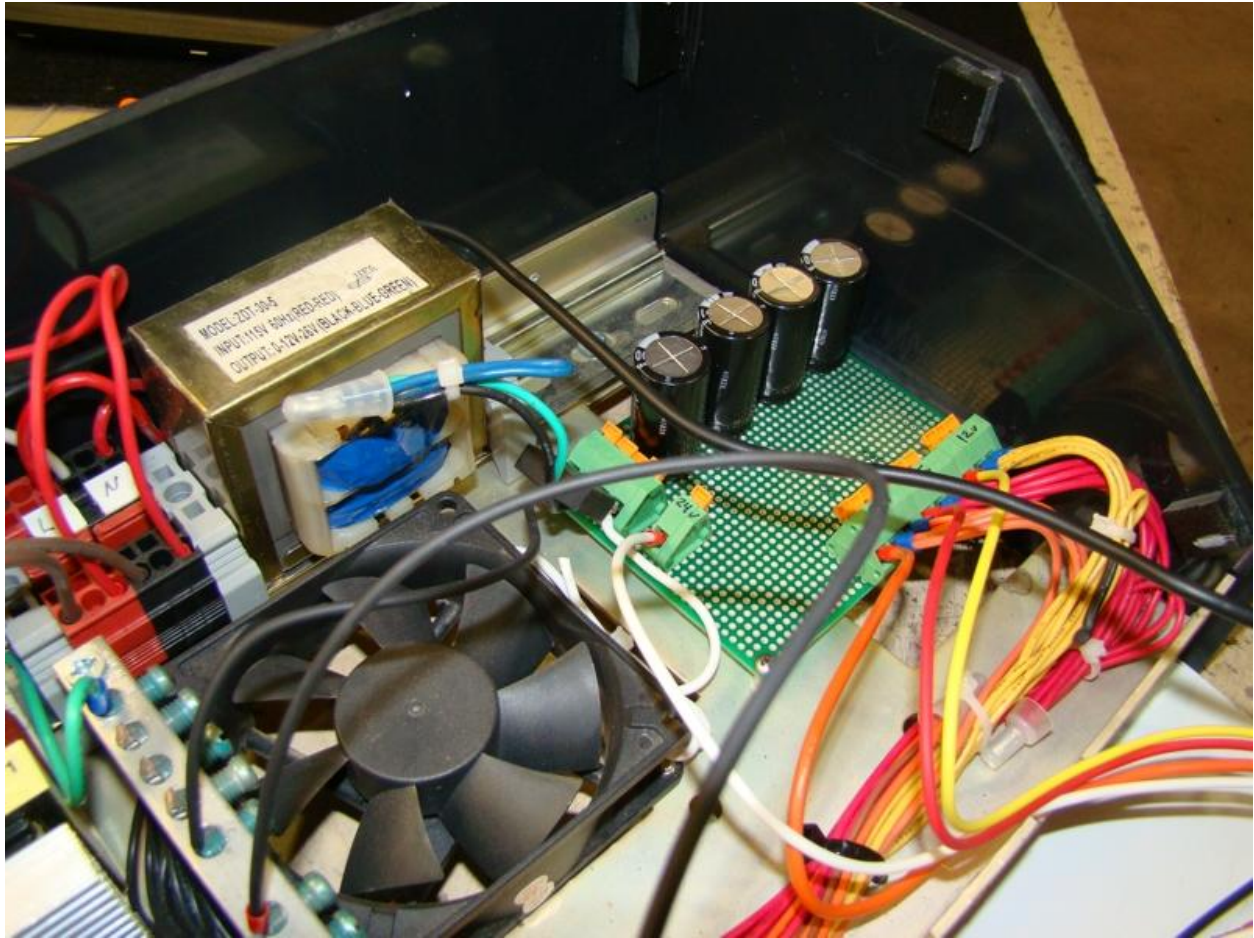
The main power supply is a scavenged 250 watt PSU from an old computer. There are numerous guides and tutorials on the net that explains how to turn a computer PSU into a standalone PSU so I won't go into that here.

I relocated the PSU power fan to blow out the bottom center. Air is pulled up from the bottom holes on either side.

For the main ground I used an old ground bar from a 110 volt breaker box. You can see one of the stand offs – Created from a 1/4x1/4 plastic light tube. Lights removed of course.

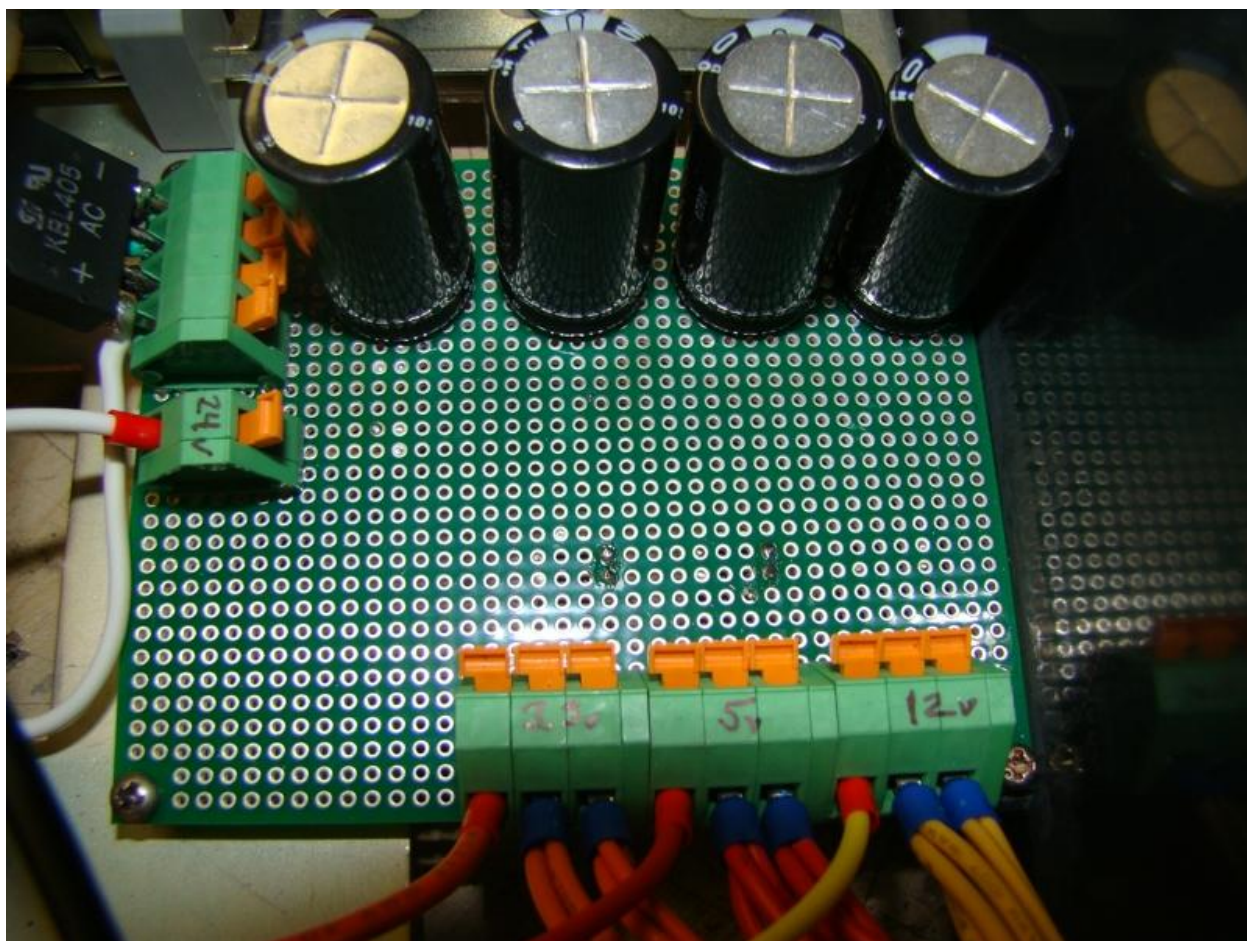


This is the power supply wall wart for the DC Scope. I tied it into the main 110 volt input which also powers the main PSU. I used some extra spring cage connectors to tie it all together. I could have powered the DC Scope directly from the DC voltage, but this helps keep the voltages separate from my projects.



On the right you can see another transformer, scavenged from an old broken soldering iron. It had a 24 volt output so I decided to trow that in as well. I used it to create an unregulated 24 volt supply, which is actually about 36 volts from the Peak to Peak wave. So, when I gain an extra V reg I may throw that in too. And I am waiting for some extra parts to add in my 0-24 adjustable voltage.

I also might add a 24v 20 watt Halogen across the out put for a crude dummy load to help filter the 24 volt out.



Another look at the Perf board (which was in my junk box and I believe purchased from Spark Fun).

I soldered spring cage connectors to the top side for each connection to the Fuse holders soldered to the underside. All the wires from the PSU run into the connectors, through the fuse, and out the left wire of the same color.

I also have room for some expansion later.



I'd like to find a small junk voltmeter to put in that empty space in the center. I have an old selector switch I want to use with it so I can select an output and monitor the voltage. I also plan to add more Bread boards to the top with commonly used components like 555 timers, a couple of Arduinos and some resistor arrays.

And when I add the labeling, I will be using a leftover sheet of clear stick on labels!

Thanks for viewing!

Jassper.