



## Introduction:

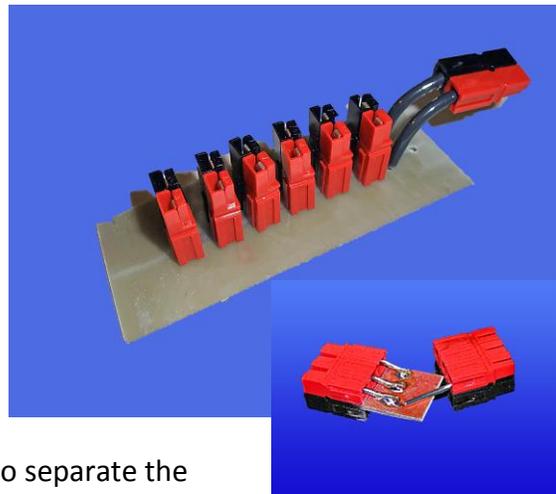
For any ham, there are moments that are 'priceless', like snagging that elusive rare DX station on a deserted island that hasn't been activated in 52 years. And certainly, working THE ham in Delaware or South Carolina on SweepStakes. Or, for a lot of us, seeing your latest project finished and working.

## History

I have been using Anderson Power Poles for power distribution for many years. Ever since a fellow modeler suggested I'd get more RPMs from my airplane's electric motor if I'd switch from the MOLEX tinned battery connectors to Silver plated APPs. Well, I tried it and never went back to the old connectors. When I became interested in ham radio, I was already familiar with APPs and quickly converted my radios to the better power connectors.

I began making splitters from scraps of copper-clad circuit board very quickly and made some for friends. They provide a quick means of supplying power to several devices from one source. But, they aren't fused.

Recently I began looking at getting a commercial power distribution box to supply power in my shack. I needed something on top of the table, instead of underneath so I could connect stuff more easily. I found an old piece of circuit board and stripped the copper off one side, and made a slit on the other side to separate the copper into two strips, drilled some holes and I had a neat little 6-way splitter I could screw to the wall over the table. But it still wasn't fused.



## Idea

At this point, the 'light' went off in my head, I had used female 'blade' connectors to put a fuse in one of my electric motors to prevent damage if the prop got stopped with the power on. I could strip the blue plastic from two terminals, and solder them in holes in the circuit board and make a fuse holder. All I need now is a container for it. Radio Shack has several small plastic "Project Boxes", and the 4 X 2 X 1 inch box looked like just the ticket. I bought one and went home and played with my CAD program until I had 6 PPs, 6 fuses and a PP for supply that would fit in this box.



Now to the PCB Layout program. I quickly transferred the dimensions of the holes onto a PCB drawing, added the outline to fit the RS box. Next I created a 'component' comprising the two PowerPoles and the "fuse holder" and placed 6 of them on the layout. Then, it seemed like a good idea to add a LED and resistor to indicate that power was "ON" to the device. Now I'm really "cookin' with gas". A phone call to Fred at Far Circuits (<http://farcircuits.net>) assured me he could use the ExpressPCB files I had generated and an order was placed.

I sized the fuse-holder holes to fit a 'blade' terminal I had from ACE Hardware. It is one of the Blue ones and with the plastic removed, the diameter is approx. 0.130 inches. You'll need 12 of these.

The holes for the PowerPoles are drilled for #12AWG wire. This will allow use of 30 Amp Power Pole terminals which are the most common size used and many of you already have some. You'll need 7 'sets' (a set is one Black and one Red with terminals) of these. One source of Power Poles is <http://www.powerwerx.com>. They offer them as singles or in quantity packaging. I suggest getting a bag of 20 sets as you will need 7 sets for this project and you will need more to fit on cables to plug into it. Once you start with a project like this, you will be putting PP's on just about everything you own.

The 30 Amp PP's will accept either #12 or # 14 wire. I suggest # 12 as the holes should allow this size to fit. You'll need about 1 foot of #12 Red/Black wire. Yeah, it looks nice if the short pigtail with the supply line is color coded. The rest don't matter, as the insulation is removed completely before inserting in the board.

If you want the LED, you need an LED, color of your choice, any one will do. You will also need a resistor to limit the current to the LED. The value isn't real critical, anything like 470 ohms, ¼ watt should do. And, of course the box from Radio Shack. A complete parts list is included on the last page. The PCB is available from [FAR Circuits](#), p/n NR4C-PDB-6 for \$6.00 each.

## Construction



Gather all the parts for the project sort them in separate containers. I find that the aluminum "Throw-away" muffin tins are ideal for small projects and inexpensive. Examine the PCB for errors, flaws and make sure the holes are all drilled and correctly sized for the components.

Now, strip 3/4" of insulation off one of the wires (Red or Black), twist the wires tightly and insert into a

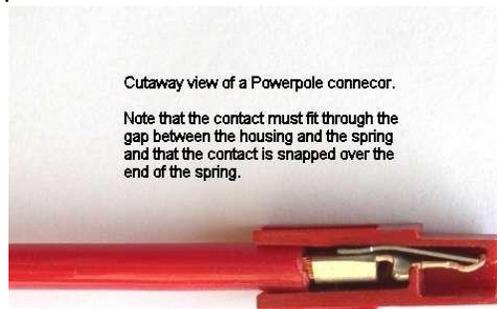


PP contact and crimp or solder in place. I like using the West Mountain Radio ratcheted crimper as it is positive, and quick. Cut the wire about 1 1/2 inches long and repeat until you have seven Red and Black wires with PP contacts attached.



This is a good time to make up the Power Pole connectors. Insert a contact with Red wire into the Red plastic housing. Refer to the cut-away and be sure to orient the contact properly. You

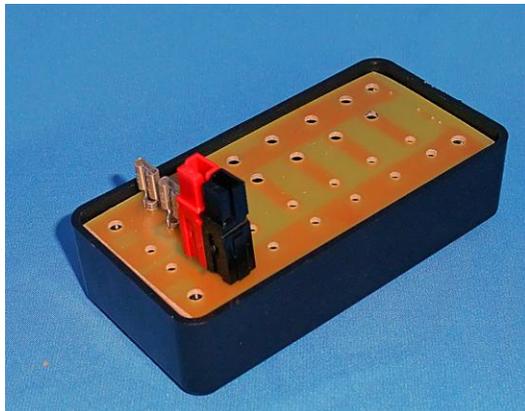
should feel two clicks as the contact seats properly into the housing. Note the contact lip fits over the spring which insures proper contact pressure.



Cutaway view of a Powerpole connector.

Note that the contact must fit through the gap between the housing and the spring and that the contact is snapped over the end of the spring.

Now use two pair of pliers and hold one of the insulated terminals between the rolled edges and remove the insulation from the other end. A quick twist will break it loose and allow it to be removed without distorting the contact area. You'll need twelve in all.



At this time, take one of the Power Pole assemblies and remove the remaining insulation with a clockwise twisting motion. Be sure the wire strands are twisted tightly together and insert the wires into the PCB. Just before the housing contacts the board, inspect carefully and make sure that a stray copper strand doesn't get away and cause a short. Test for shorts with an ohm-meter. Using a hot soldering iron (40 Watts or so), solder the wires on the bottom of the PCB while making sure the PP housing is tight

against the top of the board. Note that the Black is to the bottom, the INPUT PP is on the left and the small holes for the resistor/LED are on the right. Repeat this step until all the Power Pole connectors are soldered in place. I found that a small vise would hold the PP and I could press the board down and solder. Once one PP is mounted, the vise will clamp on it and hold things pretty well. The vise also helps align the Power Poles so they look neat.

It's time now to insert the 'fuse holders' or blade terminals. Place a terminal on both legs of a fuse and insert the terminal into the PCB and press down as far as it will go. Repeat this with the other fuses. Now turn over the board and solder the terminals to the PCB. Remove the fuses.

This is a good time to solder in the resistor to limit the LED current. Insert the resistor in the top two holes at the right end of the PCB. The LED is next, verify orientation. Apply 12 Volts to

the input PP and test the diode both ways. When properly aligned, it will light brightly. Note which way the "long" lead is oriented and insert through the holes in the PCB and solder.

### **Finish Up**

Cut twelve pieces of shrink tubing long enough to rest on top of the PCB and just extend to the top of the "fuse holders". Slip one piece over each terminal and shrink with a heat gun, hair dryer or other source of heat.

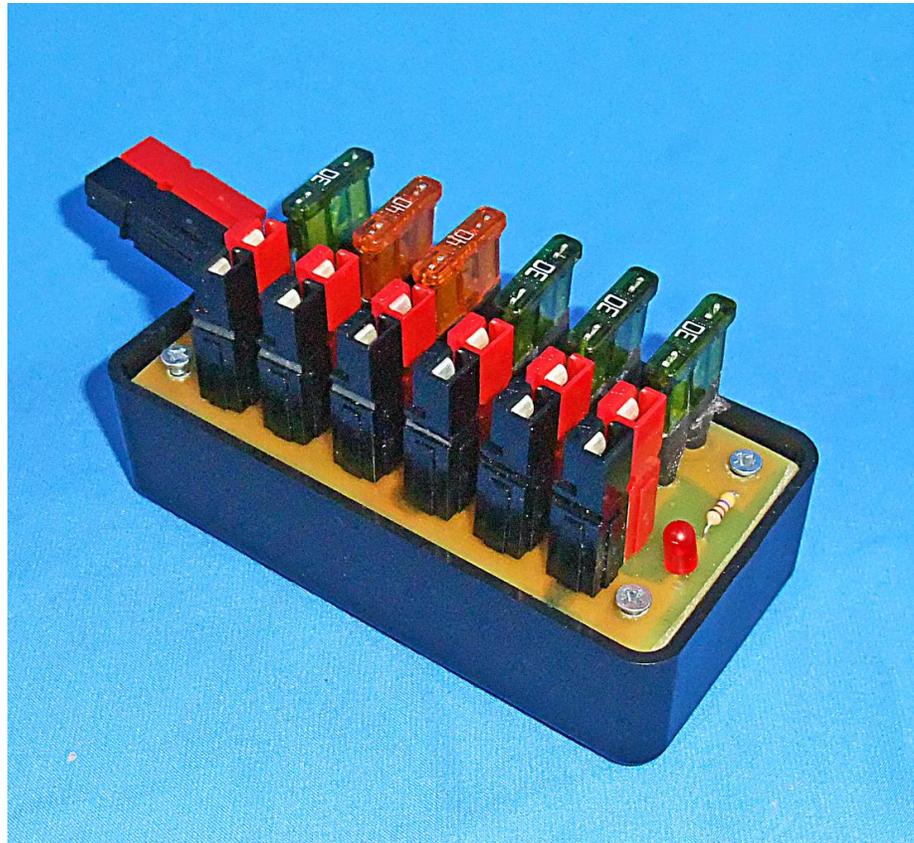
### **The Fun Part**

Now insert the fuses, and check for shorts one last time and if there are none, Use the sheet metal screws to mount the PCB to the box. Apply power and you should be greeted with a glowing LED.

I hope you have as much fun building and using this project as I had bringing it to you. Good luck, and "gud DX".

-73-

...bill



## Parts List

Item #	Part ID	Description	Quantity	Source
1	D1	LED	1	Radio Shack
2	R1	470 Ohm 1/4 W resistor	1	Radio Shack
3	PP1-7	30 Amp Power Poles set (1 Red/1 Black)	7	PowerWerx
4	Tm1-12	Insulated Terminal, .25 Tab 10-14 AWG (Blue)	12	Ace Hardware, or Auto Parts
5	Wire	12-14 inches #12 AWG Red and Black Wire	1 each	Radio Shack
6	F1-6	Fuses to suit service	6	Auto Parts
7	PCB	Circuit Board (Item ID: NR4C-PDB-6)	1	Far Circuits
8	Box	Project Box 4 X 2 X 1 in. P/N270-1802	1	Radio Shack
9	Tube	Shrink tubing that will just fit over the insulated terminals	1	Radio Shack
10	Screws	#4 Pan Head sheet metal screws	4	Ace Hardware