

# Build an Anderson Powerpole™ Adapter for your Power Supply

Phil Salas – AD5X

## Introduction

The current ham radio +13.8VDC “standard” interface is the Anderson Powerpole™ connector. However, the typical power supply uses banana jacks/binding posts for its high-current DC output. In the past I’ve used banana-plug-to-Powerpole™ adapter cables. But I wanted something neater and more versatile – especially for my home lab set-up.

My goal was to make a simple, low profile Powerpole™ adapter that would not obscure any power supply controls or metering. Additionally, I wanted it to include two pairs of Powerpole™ connectors, handle up to 30 amps, and not require any modifications to the power supply. Therefore I decided to build a small adapter board assembly that would plug directly into the power supply banana jacks. And because I wanted to limit the height of the assembly, I elected to use a two-pair horizontally positioned Powerpole™ interface.

## The Powerpole™ Power Supply Adapter

The standard banana-jack center-to-center spacing used on test equipment is 0.75”, permitting the use of a common dual banana-plug. However, this test equipment banana-jack spacing does not necessarily apply to power supplies. As an example, my MFJ-4245 power supply center-to-center banana jack spacing is 1.35”, and my separate 0-30VDC variable voltage power supply has a 1.5” banana jack spacing. For this project I used the MFJ-4245 spacing, as that is my main bench power supply. However, this adapter board should be usable with any power supply by simply adjusting the adapter’s banana-plug spacing.

Table 1 is the list of parts needed. All parts except hardware and wire were obtained from Mouser Electronics ([www.mouser.com](http://www.mouser.com)). Note that the banana plugs are rated at 36-amps, the same as the Powerpole™ contact ratings used in this project. For current above 30-amps, I still use spade lugs on the binding posts and 10-gauge cable – but this is a rare requirement for me.

Table 1: PowerPole™ Adapter List of Materials

<u>QTY</u>	<u>Description</u>	<u>Mouser Part Number</u>
2	Banana Plug, 36 amp, bolt down	565-72918
1	Powerpole™ mounting bracket (2/4-pair)	879-1462G3
2	Black Powerpole™ connector & contact	879-1330G4
2	Red Powerpole™ connector & contact	879-1330
1	Single-sided copper clad board	590-503
Misc1	Two 6-32x3/8 screws, nuts & lockwashers, 3/16” wide braid and heat-shrink tubing or 14 gauge insulated stranded wire	

A 1.9” x 1.4” piece of single-sided pc board material is used for the adapter. Figure 1 shows the mechanical details of the copper side (the back side) of the pc board. Drill a 3/8”D hole in the center where the Powerpole™ assembly will mount and use a nibbling tool to cut-out the clearance area. Use a sharp hobby knife to score the pc board copper area that will be removed and tin the copper in this area. Then pull off the copper with tweezers while applying a soldering iron to this tinned area.

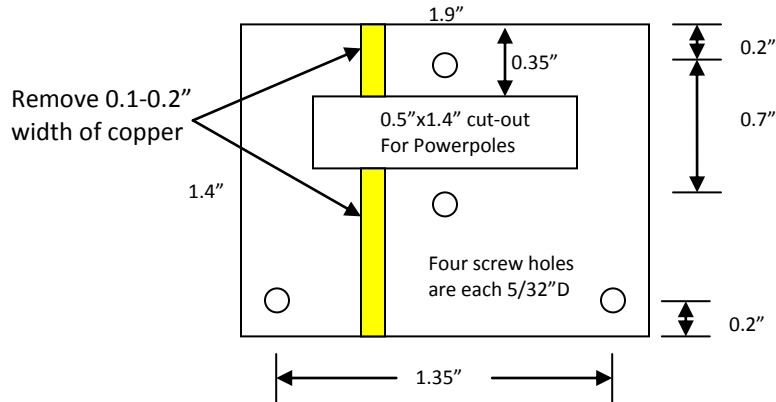


Figure 1: PC Board Mechanical Details

To ensure the banana plugs are perfectly aligned, loosely mount them to the two pc board bottom holes. Plug the assembly into the power supply banana jacks and tighten the banana plug mounting nuts. Then solder the banana plugs to the copper foil.

It is also important that the Powerpole™ connectors aren't arranged such that offsetting a mating connector won't result in reverse voltage being connected. Therefore, assemble each Powerpole™ pair correctly as shown in Figure 2, and then mount one Powerpole™ pair upside down with respect to the other Powerpole™ pair as shown in Figure 3.

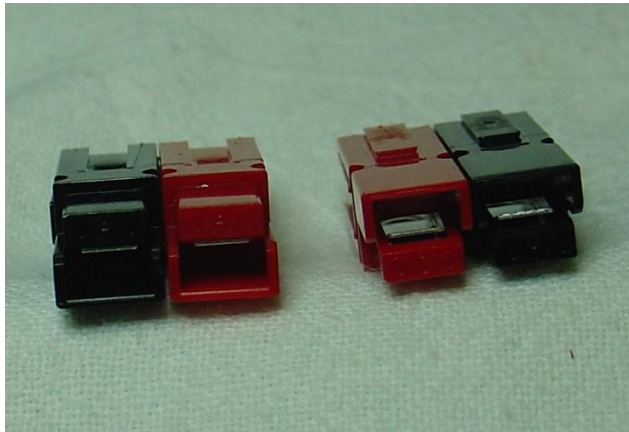


Figure 3: Properly assembled Powerpoles

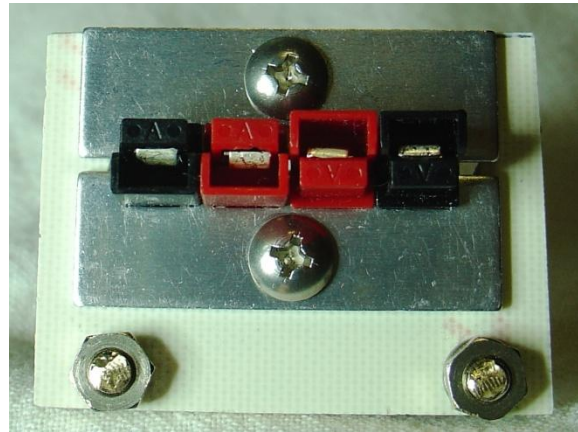


Figure 3: Mounted Powerpole™ connectors

Use 3/16"-wide braid or 14-gauge insulated stranded wire for the Powerpole™ connections. If you use braid, add heat-shrink tubing as shown in Figure 4.



Figure 4: Powerpole™ pin wiring

Tin the braid or wire ends, and the pc board copper areas where they will attach. Solder these ends to the pc board with plenty of solder while applying pressure with a toothpick or other non-metallic tool. Figure 5 is a wiring connection diagram, and Figure 6 shows the final assembly.

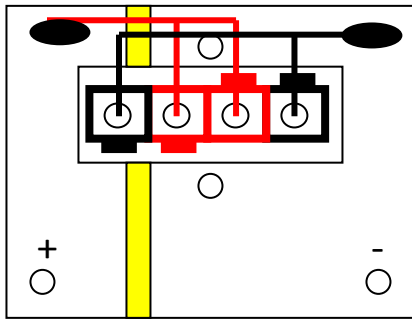


Figure 5: Wire connection diagram

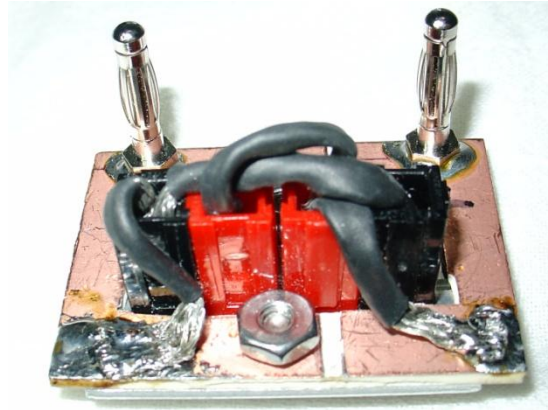


Figure 6: Copper-side completed assembly

Figure 7 shows the Powerpole™ adapter plugged into the banana jacks on the MFJ-4245 power supply. The adapter does not flex when plugging and unplugging cables due to the thickness of the pc board and the additional stiffening provided by the mounting brackets. And the adapter normally stays in place when unplugging cables due to the tight friction fit of the 30-amp banana plugs and the slight torque applied due to the offset of the Powerpole™ connectors and the banana jacks. However, placing your thumb on the adapter when removing Powerpole™ cables will always ensure the adapter will not be unplugged.



Figure 7: Powerpole™ adapter plugged into the author's power supply

Finally, if you only want a single Powerpole™ pair, or if you want to mount the pairs vertically, you can replace the 2/4 pair mounting bracket with a 1/2 pair mounting bracket (Mouser 879-1462G1).

### Conclusion

If your power supply has the more common banana jack interface, you may wish to build this Powerpole™ adapter. It is an easy project, and will make your DC power supply set-up neater and more convenient.

ARRL Life Member Phil Salas AD5X has been licensed since 1964. His ham radio interest led to BSEE and MSEE degrees from Virginia Tech and Southern Methodist University, respectively, followed by a 33 year career in microwave and lightwave design and management. Now retired, Phil enjoys tinkering with electronics projects, playing with his grandson, and mostly enjoying time with his wife and best friend Debbie N5UPT. You can reach Phil at [ad5x@arrl.net](mailto:ad5x@arrl.net).