

Using Anderson PowerPoles

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I had difficulty with my station 12VDC power distribution. I have an Astron RS-50M 50 Amp power supply. It is one of the fancy ones with a connection post for an external deep cycle battery. Internal high current diodes allow the battery to supply power to my equipment during an AC power failure. Internal circuitry trickle charges the battery to keep it ready. It works great. The problem is how it connects to all the stuff in my ham shack.

There are four quarter inch brass studs on the back of my RS-50M to connect things to. One is negative (minus) ground. One is for the battery positive (plus) 12VDC connection. One is the regulated positive 12VDC uninterruptible power output. The fourth is a regulated positive 12VDC output tapped off up stream of the battery diodes.

You can probably imagine what the area around the back of the RD-50M looked like by the time I had a couple HF transceivers, a couple VHF FM transceivers, and half a dozen station accessories connected. It was a rat's nest of wires. Connecting anything new was both difficult and dangerous. There were so many wires I was never completely sure that I got thing hooked up correctly. Flipping the power switch back on after a new hookup or wiring change became a little scary.

I had been noticing that Anderson PowerPole connectors have been recommended for 12VDC power connections. I decided to give them a try. The first step was to figure out what the heck they are.



Anderson PowerPole 12VDC connector pair

It turns out that Anderson PowerPoles are a family of connectors available in a variety of sizes, current ratings, and colors. Ham groups have standardized on one the 15, 30, and 45 Amp rated versions. We use a pair made up (obviously) of a red and a black connector. The three current ratings all use the same connector body and the same contact size. The difference is in the size of wire they are designed to be used with. They all mate together correctly.

Another important characteristic of Anderson PowerPoles is that they are sexless. They can plug into each other. This is obviously handy. We don't have to worry about making sure we have the male and female connectors on the correct end of a cable. Their unique design in concert with the ham radio installation convention prevents accidental plus to minus cross connections.

PowerPoles are also self shielding. That is, there is no bare metal sticking out either at the front or the back to short out on something. That is a real advantage when it comes to power sources like big deep cycle batteries or high current power supplies. A short can quickly heat a wire to red hot and catch things on fire.



Anderson PowerPole cutaway

These connectors are simple to deal with but, like most things, have both good and not so good features. I've mentioned some good things already. The not so good is that careful assembly is critical. A little carelessness and the connector will not work as expected. Also, even though contact pressure is high enough for a low resistance connection, it takes relatively little force to unplug correctly assembled PowerPoles.



30 Amp PowerPoles

PowerPole assembly is simple. Crimp the metal contacts onto your wires. Snap the contacts into the connector bodies. Crimping is the preferred method of attaching the contacts to wires though soldering also works.

With a proper crimping tool, a crimped connection is far superior to a soldered connection. Always consider that method first before resorting to soldering. West Mountain Radio sells a professional model crimper for about \$50. MFJ sells a cheaper but harder to use model for under \$15. I use the West Mountain Radio crimper.

As I mentioned above, correct assembly is critical. Crimping often slightly deforms the contacts. Always compare a crimped contact with one that is new and uncrimped.

Correct the crimped contact to match the profile of the uncrimped contact. Also, crimping must not simply flatten the conductor cup. It must end up no wider than that of an uncrimped contact.

If you are soldering PowerPoles, you must not allow any solder to flow out onto the contact surface. Also you must remove any solder that flows out and increases its outside dimensions. It must be no larger than before it was soldered.

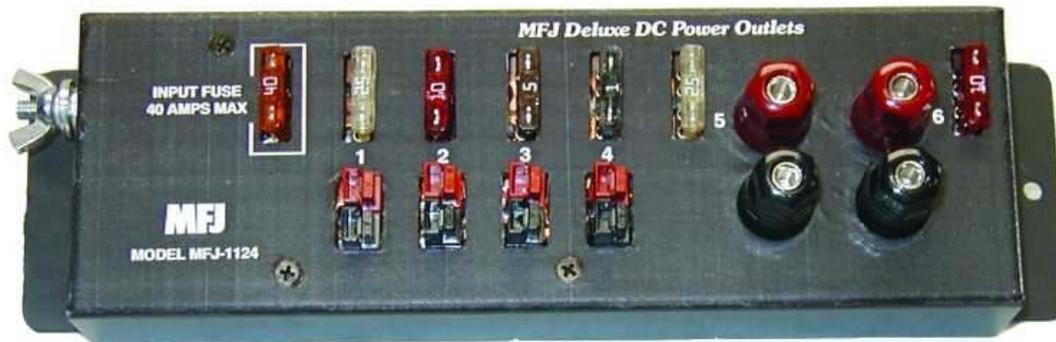
PowerPole connector bodies have molded in dovetails that allows them to be assembled in a wide range of configurations. The Amateur Radio 12VDC standard configuration is for one red and one black connector body hooked together side-by-side. Looking from the rear (wire) end of the connectors, with the connector hoods up, the red connector is on the right.

The PowerPole contacts must be oriented correctly on the ends of the wires before you attempt to snap them into the contact bodies. The contact must be free to float once they are snapped in place. That can happen only if the contacts are properly positioned. See the photo below.



Positioning contacts prior to insertion in contact bodies

Once the contacts are snapped into the connector bodies, they are ready to use. My next question was how to best use them. I decided I needed some sort of power distribution boxes or panels to plug stuff into. There is a number of different kinds available from MFJ, West Mountain Radio, PowerWerx, and others. I selected the MFJ-1124.



MFJ-1124

The MFJ-1124s come with a six foot long heavy duty power cable with ¼ inch lugs already installed. That allowed me to easily connect one to each of the 12VDC output posts on the back of the RM-50M power supply. Notice that the MFJ unit includes fuses for its outlet. This is a great safety feature.

I mounted the two outlet boxes on the back of the wall behind my radio desk. One of them is for equipment I for which I would like to be battery backed up. The other is for stuff I do not need battery power for like my main HF transceiver. I won't bother trying to operate it unless I have generator power available. I can have a generator running and powering my station within a few minutes if needed

I then put PowerPole connectors on my 12VDC station equipment power cords. Connecting my equipment to 12VDC power by simply plugging it in is really great. No sparks. No guessing if I have the correct wires connected to the right power supply post; and there are fuses to protect me from possible future mistakes or internal equipment short circuits.



NOGW's PowerPole power distribution.

Well, what have I learned from all this? Anderson PowerPoles work as advertised. That is, they work well. Their electrical connections appear to be both solid and reliable. I've seen no noticeable increase in voltage drop between the RS-50M output posts and my

transceivers as compared to direct connections. In one case the drop was significantly less. I will be using them for more of my 12VDC equipment.

While PowerPole connector assembly appears simple, it is necessary to be very careful. It is easy to make mistakes. I believe many of the complaints people voice on the internet about PowerPoles may be the result of assembly errors.

As I mentioned before, when PowerPole contacts are crimped or soldered, their shape and size must be carefully maintained. If they are bent slightly out of shape after a crimping, use your fingers and reshape them to match an uncrimped contact.

If you are putting PowerPoles on attached conductors like zip cord, both conductors must be exactly the same length. When the contacts are installed they must be oriented to slip into the connector bodies without twisting. The black and red connector bodies should be locked together before you insert the contacts. Once the contacts are snapped into place in the connector bodies, they must float free.

The black and red connector bodies are only friction locked together. Anderson provides some small rolled pins to lock the two together. Every write up I have seen warns against using them. Apparently, the pins can work free and possibly short something out. Instead of using metal pins to hold them together, a single, small drop of super-glue will do a better job. For situations where you might like them to come apart in the future, squeezing some RTV silicone sealer into the locking pin hole works well also.

The problem of the PowerPoles coming unplugged easily can be solved by running a tie wrap lengthwise over the mated connectors. Another method is to enclose the connectors in shrink tubing. Just keep in mind that they will come unplugged easily if pulled on unless you take some steps to prevent it. So far I've not used them in a situation where they would have any tension on them so haven't experienced a problem.

Should you convert to Anderson PowerPoles? You probably won't be sorry if you do. The conversion is not free though. Figure about \$1 per connector pair. My MFJ-1124 distribution boxes were \$65 each. The crimping tool was \$50. By the time I added a bag of 20 extra connector pairs, I was up to about \$200 for my setup. For simpler ham shacks, the extra convenience may not be worth the cost.

There is one situation where they are probably a good idea regardless of any cost. ARES now specifies Anderson PowerPole connectors for 12VDC connections. That organization is interested in equipment power supply compatibility among emergency responders. Any equipment you feel might be taken out of your shack and used in an emergency should be equipped with them. That is only about \$2 for two in-line PowerPoles installed in each power cord.

Do I recommend Anderson PowerPoles? Yes.