



MERCER COUNTY ARES/RACES Standard 12 VDC Power Connector



If you've ever traveled overseas, you know what a hassle it is trying to find a receptacle to accept the standard plug of your 110 Volt AC (VAC) devices. Here in the US we don't give a second thought that a device needing 110 VAC will fit the power receptacle in the wall.

Most Amateur Radio equipment now works on 12 Volts DC (VDC) and draws 10 to 25 amps on transmit. Despite this, we still don't have a standard 12 VDC plug and receptacle, something needed in an emergency when you might have to use alternate power sources or share equipment or batteries.

There have been suggested Amateur Radio 12VDC standards in the past such as the Molex 1545 or cigarette lighter plug, but most of these were expensive, cumbersome to install or couldn't handle currents greater than 7 amps. Fortunately, a new 12VDC standard based on the 30-amp Anderson Powerpole connector is sweeping the country and being adopted by ARES & RACES groups nationwide.

Mercer County ARES/RACES is adopting the 30 amp Anderson Powerpole as the standard 12VDC connector for our EOC and Red Cross Chapter and strongly encourages all ARES/RACES members to install them on any portable or mobile equipment and power supplies that you might bring in an emergency. You'll also find having a standard 12 VDC connector very useful around your shack!

Here are a few advantages of the 30 amp Anderson Powerpole connector as a 12 VDC amateur standard:

1. The 30 amp Anderson Powerpole has been adopted as the standard 12 VDC connector by over eighty Amateur Radio Organizations (including some entire state's RACES/ARES) organizations in the past year. A partial list of them can be found at www.powerwerx.com.
2. It is easy to assemble in a few minutes, either by soldering or by crimping with a Gardner-Bender GS-88 crimping tool available at Home Depot for \$8.50. You merely strip 5/16 inch of insulation from a 12 to 16-gauge wire, insert it into the contact barrel, crimp or solder it and snap the contact into the polycarbonate shell. Anderson also makes 15-amp contacts that will fit and mate, but since they cost the same as the 30 amp ones, it's easier just to buy one size. Wire smaller than 12 gauge for low power accessories can be accommodated in the 30-amp contacts simply by stripping 5/8 inch of insulation and folding the bare wire back on itself before inserting it into the contact barrel. Hints on installing Anderson Powerpoles can be found on the RIGrunner support page at <http://www.westmountainradio.com/supporttr.htm>
3. The connector is color coded red and black and is keyed to prevent misconnection. The black and red cases dovetail together side by side to make a neat connector.
4. It is inexpensive. A connector costs \$1.00 each per radio or power source in single unit quantities. Quantity prices are even cheaper.
5. The contacts are self-cleaning, can be connected or disconnected hot in a pinch, and unofficial tests have shown them handling more than 100 amps. The 30 amp rating is actually the rating of the wire size that the contact barrel accepts (12 to 16 gauge), but 45 amp contacts for 8 to 10 gauge wire that mate with the standard 30 amp ones are also available.
6. The connector is keyed but genderless, meaning that the same parts can be used as both a 12VDC radio plug and power supply receptacle. This reduces the inventory you need to keep on hand. It also means that you can configure a jumper cable with an appropriate limiting resistor to recharge HT batteries from storage batteries in the field, etc.
7. If you want to get elegant, West Radio Products makes a series of nice 40 amp 12 VDC fused distribution panel based on this connector, called the RIGrunners. Because the input to it is also based on

the Anderson Powerpole connector, the source of 12 VDC power to your entire station can be switched in less than a minute, an obvious advantage if you need to switch to a storage battery in an emergency. Amateur stations in critical locations, such as EOC's and Red Cross chapters should plan their 12 VDC power distribution around it. Alternatively, Anderson makes Powerpole mounting clips so you can build your own panel if you wish.

8. For convenience, the Delaware Valley Radio Association has a small supply of the connectors locally and will resell them at cost for folks who might want just a few for a rig or two and don't want the hassle of shipping charges for one or two of them. For info, contact Gary at k2gw@arrl.net or at a club meeting.

Manufacturer Info:

Anderson Power Products
13 Pratts Junction Road
PO Box 579
Sterling, MA 01564
www.andersonpower.com

Anderson 1330 series Powerpole connector part numbers:

Red polycarbonate Housing	(1 needed)	1327
Black polycarbonate Housing	(1 needed)	1327G6
30 Amp Contacts	(2 needed)	1331

Links for more information on this Amateur Radio standard:

<http://www.races.net/sca/powrpole.html>

www.powerwerx.com

<http://www.westmountainradio.com/faqrr.htm>

(There are many more ARES & RACES sites that repeat the standard. Search for Anderson Powepole using Google.com and you'll see how widespread this standard has become)

Vendors selling the 30 Amp Anderson Power pole include:

West Mountain Radio
18 Sheehan Avenue
Norwalk, CT 06854
(203) 853-8080

www.westmountainradio.com/RIGrunner.htm

PowerWerx.com
401 South Harbor Blvd. F320
La Habra, CA 90631
(714) 570-3303

<http://www.powerwerx.com>

info@powerwerx.com

Wes Allen, K7WWG
2870 S.W. 199th Place
Aloha, OR 97006
(503) 649-3295

<http://www.dcpwr.com>

wesa@dnc.net

Cable X-Perts
416 Diens Drive
Wheeling, IL 60090
(800) 828-3340

<http://www.cablexperts.com> (under DC Power)

cxp@ix.netcom.com

Allied Electronics

(parts #803-0100, 803-0108, 803-0125, 803-0164)

Constant Power Technologies
2911 W. Fairmount Ave.,
Phoenix, AZ. 85017-4614
(602) 265-3081

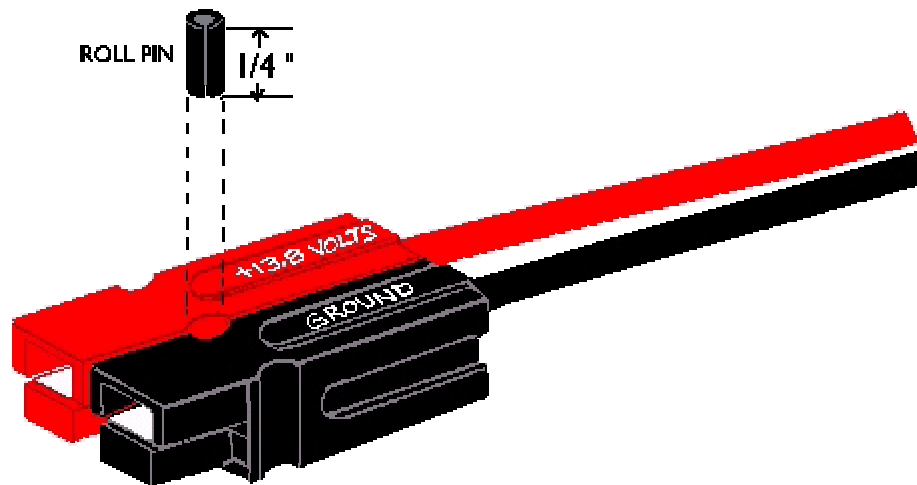
Richard Heryford, WD6ESZ
1175 Baker Street, Bldg. D-13, Apt #210
Costa Mesa, CA 92626
(714) 851-8176

wd6esz@quick.net

Anderson

Powerpole

Mercer County ARES/RACES prescribes the 30 Amp Anderson Powerpole as the standard dc power connector for use in EOC's, and recommends its use by individual ARES/RACES personnel as well. Using this standard, highly reliable connector allows quick and easy installation and substitution of radios, power supplies, batteries, and other equipment.



Housings should be mated according to the diagram above, viewing from the contact side (opposite the wire side), tongue down, hood up, RED on the LEFT, BLACK on the RIGHT. You may use a 3/32-inch-diameter roll pin, 1/4 inch long, to keep the housings from sliding apart.

Highly conductive silver-plated copper contacts allow minimal contact resistance at high currents. Self-wiping action on make and break keeps conducting surfaces clean. Contact dents keep connectors mated in high-vibration applications and provide quick-break, snap action upon disconnect.

Noncorrosive stainless-steel leaf springs maintain constant contact pressure—ideal for frequent connections/disconnections and intermittent overloading. Durable, high impact-resistant, polycarbonate housing with UL94V-2 flammability ratings comes in many colors for circuit traceability and coding.

Identical connector halves are genderless—making assembly quick and easy and reducing the number of parts stocked. Molded-in dovetails allow for a customized harness in a variety of configurations. When the connectors are disconnected, no metal parts are exposed.

Info on PowerPole Connectors from West Mountain Radio

The whole point to the RIGrunner is the standardization of all of your DC power connectors using PowerPole Connectors. You may easily install PowerPole Connectors on your cables by soldering or by using certain inexpensive crimp tools such as the \$9.95 Gardner Bender GB88 crimping tool that we offer. No other tools are required. After attaching the connector pins to your wires the color coded housings click together.

The Anderson Powerpole housings that we use conform to the ARES and RACES standard and are designated 15-45 amps. The rating range is a function of which connector pins are inserted in to the housings. The rating of the connectors is by the wire gauge that the connector pins accept, not the pins themselves.

The current rating for a wire is rated by the temperature rise of 25 degrees C. A 15, 30 or 45 amp Powerpole connector pin will actually withstand well over 100 amps without damage and close to 200 amps to actually cause permanent damage.

We have measured the voltage drop of a Powerpole 30 amp connector at an incredible .016 volts at 37 amps. We tested many samples at of both 30 and 45 amp connectors at 37 amps and the worst reading we got was .021 volts. We even plugged and unplugged one over 100 times and it actually improved.

A 30 amp Powerpole is the best choice for most connections. Even though a 30 amp connector is rated for 12-14 gauge wire they will accept 10 gauge with difficulty and smaller wire may be used by doubling over the wire.

The 45 amp Powerpoles are rated for 10-12 gauge wire and will take #8, with difficulty. 45 amp connector pins do not do not take any more current or have less resistance. They do take larger wire, but they cost more. They have a V shaped wire opening, not round like the 30 amp. making it somewhat harder to crimp and they must be crimped before soldering.

POWERPOLE CONNECTOR GENERAL INSTALLATION TIPS

From West Mountain Radio

Put the plastic connector housings together correctly, according to the RIGrunner / ARES /RACES standard the first time, they fit snugly and can be difficult to get apart. Put the connector housings together, BEFORE, putting the connector pins in, this makes it easier.

Always slide the connector body dovetail joints together! They will be damaged if you try to snap them together or apart. They ONLY slide together in one direction, this should be obvious by looking at them carefully. When they are snapped fully together you should notice that the pin "floats" slightly in the body, if it feels tight it may not be snapped in fully. Tug slightly to make sure the contact is locked in place.

Before soldering or crimping the pins, orient them so that they go in the bodies without twisting the wire. This is especially important with heavy wire.

When soldering the contact pins, be careful not to use too much solder. Keep the solder inside, where the wire goes. If a blob of solder gets on the outside of the connector body you may have trouble putting the pin in the housing. If you get solder on the contact surface you will not make a good contact.

When crimping the contact pins use a crimp that contains the wire completely inside the pin and doesn't spread the connector apart. A good crimp is one where the dimensions of the crimped portion are less than an uncrimped pin. If the crimp is flattened out you will not be able to easily push the pin in to the body.

The pins go in to the body, only one way. Check this out before you put them together, they should slide in and click. If you do not hear a click or they are not fully seated, fix it.

It is possible to use larger or smaller gauge wire with the 30 and 45 amp connectors that we carry. The 30 amp connector pins will work with #10 wire if you cut the end cleanly and carefully put each and every strand of that wire in to the pin. It may be easier to use 45 amp connectors on #10 wire. Using a smaller gauge wire in a 30 amp connector requires that you double up the wire for 14 gauge wire or smaller. Try to fill up the pin with wire before crimping or soldering.

A properly crimped pin should hold together with enough strength to unplug two pairs of connectors by pulling on the wires. This is not a normal way to unplug PowerPoles but if they fail this test you did not crimp them adequately.

Last but not least, MAKE SURE you have the polarity correct before plugging in you equipment. "Measure twice, cut once" as the saying goes.

POWERPOLE INSTALLATION USING THE GARDNER BENDER TOOL

The general instructions apply when using the Gardner Bender GS88 tool that we supply. This tool is a very nice, inexpensive crimping tool but it was not designed specifically for Anderson PowerPoles. It is not a full substitute for a real Anderson crimping tool. The real Anderson tool is \$150.00 (available from us on special order) and you may want to buy the real thing if you are going to do hundreds of PowerPoles. Purchasing one Anderson tool might be a good idea for a club or group to be used by the members in an effort to standardize DC connections for emergency setups.

The GB tool is sold by other PowerPole dealers and it was suggested to us by hams that were using the connectors. You can't beat it for the price. It also makes putting the connectors on easily, certainly easier than soldering.

Looking at the GB tool you will see it has three crimping dies and a cutter. We will refer to the dies as number one being closest to the cutter and number three being closest to the hinge.

You may use the cutters to cut the wire but you will need wire strippers to strip the wire. Using cutters to strip wire will nick the wires strands. Strip the wire insulation back 5/16", try not to nick the strands.

THE FOLLOWING IS WRITTEN PRIMARILY FOR 30 AMP CONNECTORS:

Put the connector pin over the wire making sure that all of the strands are inside the pin and the insulation is not. You will find it is possible to use up to 10 gauge wire in a 30 amp connector even though it is made for 12 to 14 gauge. The # 10 will have to be cut cleanly and you have to neatly twist it to get all of the strands inside. Smaller than # 14 will have to be doubled or tripled over to fill the connector recess and get a good crimp.

If you are using paired wire, rotate the pin so that it will fit in to the plastic body without twisting the wire. Put the assembly in the smaller number one die. Center the crimp portion of the pin in the die with the rounded portion of the die against the seam in the pin and the tongue of the die directly opposite. Making sure that the wire is fully inserted in to the pin crimp down firmly. Crimp with about 85 % of what is possible but without bottoming out the tool. You will notice that the crimp is now slightly wider than it was. Rotate the crimp 90 degrees and squeeze it again in the number three die but this time not as firmly. The idea is to make the width of the crimp just slightly less that it was uncrimped. Repeat the first crimp in the first die, but with less pressure.

THE FOLLOWING IS FOR 45 AMP CONNECTORS:

The GB tool may also be used for 45 amp pins but an extra step is required. These connectors come with the crimp portion open in a spread out "U". It is helpful to close up the "U" slightly with the front edge of the number one die. Put the crimp in the die like the 30 amp but put the wire in after the crimp pin is held inside the tool. The 45 amp pins will easily take # 10 wire and will almost take #8, you will probably have a problem getting the number # 8 wires insulation inside the plastic housings. To use the 45's with the larger wire,# 10 or higher, you should use the larger # 2 die instead of the smaller # 1.

AGAIN, MAKE SURE you have the polarity correct before plugging in you equipment.



PowerPole 30 amp pins. The top one is installed with the \$9.95 Gardner Bender tool and the bottom one was installed with an \$700.00 Anderson pneumatic tool..



This is the first crimp of a PowerPole 30 amp pin. Notice it is in the first die #1 with #12 wire and that the seam in the pin is against the rounded side of the tool's die. Make sure the end of the pin's crimp section is just below flush on the side of the tool.



This is the 2nd step of a PowerPole 30 amp pin. Notice that the pin is in the back die # 3 and is turned 90degrees. Do not crimp this very much, just enough to make the width of the crimped section less that what it was before you started. Again make sure the end of the pin's crimp section is just below flush on the side of the tool.



This is the 1st step of a PowerPole 45 amp pin. It is just squeezed slightly together before putting the wire in so that in the next step the sides of the crimp will form inward. If you skip this step you may have to toss the pin and start over.



This the crimp of the 45 amp pin. It is in the larger die #3 with # 10 wire. Again notice that the pin is below flush on the side of the tool. You still must do the sideways light crimp to reduce the width of the finished crimp so that it will fit in the connector body. You may want to repeat step 2 and 3.

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