

NTRAK

N-Scale Modular Railroading

T-TRAK

NTRAK Modular Railroading Society, Inc.

Tips SCALE Techniques

Assembling Anderson Powerpole Connectors

June 1, 2020

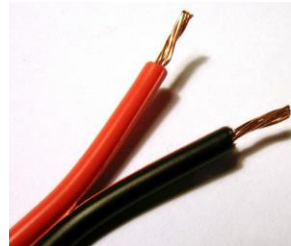
Both the NTRAK and T-TRAK Standards and Recommended Practices require the use of 12-gauge zip wire and Anderson 30A Powerpole Connectors. This TipsNTechniques describes how to make the connections to the Powerpole connectors.

Powerpole connectors were invented by the Anderson Power Products company in response to winning a bid in the mid-1960s from the Bay Area Rapid Transit (BART) in San Francisco. Powerpole connectors are widely used in Emergency Services, office furniture, wheelchairs, floor sweepers, power supplies, UPS systems and radio-controlled model aircraft.

Assembling Anderson Powerpole Connectors

To assemble a bus cable with Anderson Powerpole connectors, do the following:

- Start by putting the housings together in the desired configuration before putting the connector pins in the housings. The plastic housings are held together with dovetail joints. Always slide these joints together as they can be damaged if you try to snap them together or apart. They only slide together in one direction, which should be obvious by looking at them carefully. The photo below left shows the connectors in a horizontal configuration.



- Prepare the 12-gauge zip wire to be fastened into the Powerpole contact, by stripping approximately 5/16-inch insulation from each wire. See photo at right above.

Crimping vs. Soldering the Wire to the Contact

The contacts can be crimped or soldered to the wires. Anderson Power Products recommends crimping. Crimping is a more consistently reliable process, especially when done with a certified ratchet crimping tool. Soldering is very dependent on the soldering ability of the person doing the soldering, but when done properly it can be equal to crimping.

Unless you have expertise in soldering do not solder Powerpole connectors, crimp them

Crimping. A full certified ratchet crimper, such as the West Mountain Radio Crimper (see page 4) will

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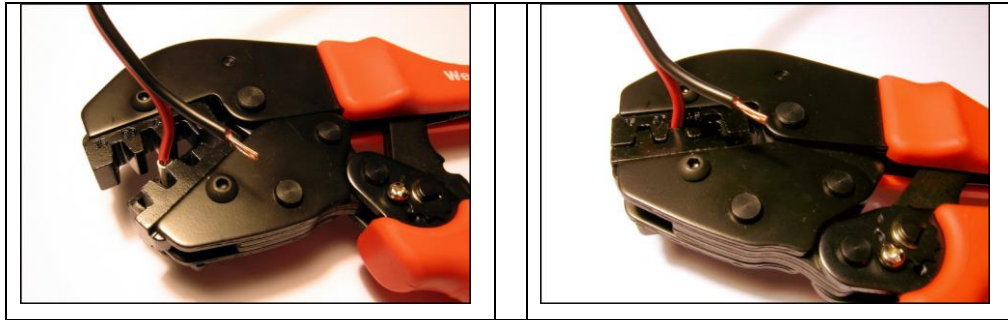
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consistently give the best results. Lower cost crimpers that don't have the ratcheting feature do not make consistently good crimps. Proceed as follows:

- Be careful when crimping. You may make the contact out of a round shape and it will not slide easily into the housing. To fix this you may have to rotate the contact 90 degrees from the original crimping orientation and re-crimp. The barrel of the contact must be round to slide into the housing.

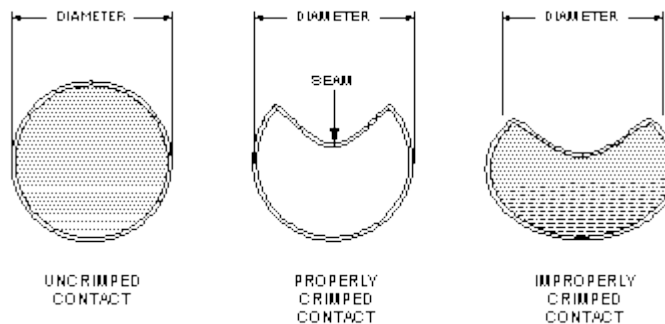
Pay attention to the orientation of the contacts when attaching them to the wire. Unless the zip wire is separated quite a ways back from the Powerpole connector, it is difficult to torque the wire to get it to fit into the housing. So be sure the contacts are oriented correctly when attached to the wires.

Place one contact in the appropriately sized slot in the crimper. The curved end of the contact faces down and the round end with the hole up. See photo below left.



Squeeze the handles of the ratchet crimping tool firmly until it clicks and is ready to release. Repeat for the second wire and contact. Note: if the crimper does not fully crimp it will not release the contact. See photo above right.

Note: You will not be able to insert the contacts into the housings if they are too wide after crimping (or soldering). See the diagrams below'



- Line up the wires with the installed contacts observing proper polarity and color with the housings.
- Insert each contact into a polarized housing. Push the contact in until a positive click is heard. Use a small screwdriver if needed. The cutaway view below shows how the finished connection will look.



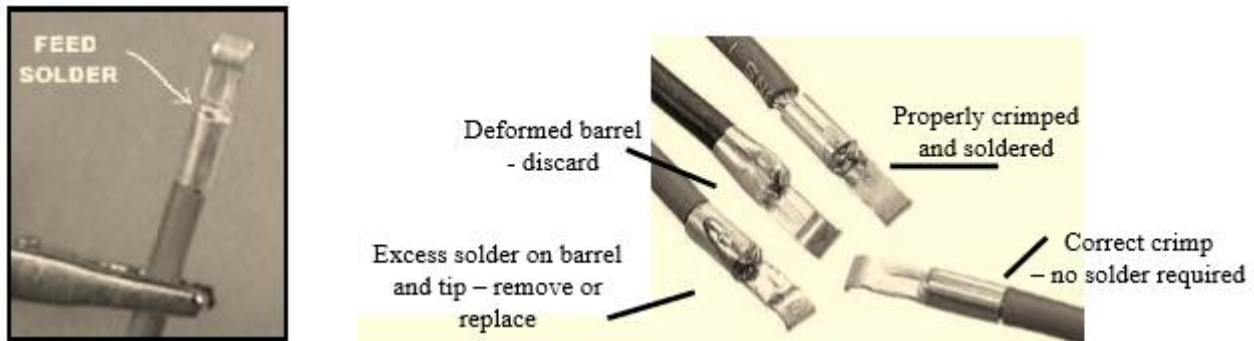
- Gently pull on the housings to make sure the connection is secure.

Soldering.

Unless you have expertise in soldering it is highly recommended you crimp the contact.

To proceed with soldering, do the following

- Use the proper soldering iron (40 to 125 watts with a 1/8-inch tip) and good electronics grade resin core solder. Never use acid core solder. The iron should be hot enough to cause the solder to flow nicely into the joint within a few seconds. It is very important to have the iron tip clean and shiny and tinned with a fresh coating of solder.
- If possible, clamp the wire in a small bench vise with the stripped end up.
- Tin the bare wire.
- Slip the contact strip into place on the wire, as shown below left. Put the iron tip on the contact at the end of the wire and flow just enough solder between the iron tip and the contact to “wet” this junction. Once solder starts to flow, add only enough additional solder so that it flows into the inside of the contact barrel and the core of the wire. Too much solder can begin to flow down into the wire’s insulation, reducing flexibility, which may cause the wire to break with repeated flexing. Inspect the completed joint — there should not be any solder on the outside of the contact. If there is, file or scrape it off. If there is solder on the contact-mating surface, re-do the connection with a new contact.



YouTube Videos

You can watch the correct assembly of Powerpole connectors on YouTube at

<https://www.youtube.com/watch?v=X1Al6kmru6Y> or <https://www.youtube.com/watch?v=QzLvdR6X81k>

Materials

Where to Purchase 12-Gauge Wire

12-gauge stranded copper zip wire is available at Lowe’s and The Home Depot, plus most electronics supply stores and some hardware stores. Outdoor low-voltage lighting wire is the most readily available. The electronic suppliers listed below also offer 12-gauge two-color zip wire (red/black). 12-gauge stranded speaker wire can also be used. 12-gauge non-zip stranded copper wire is allowable, but not recommended due to its stiffness. 12-gauge red/black zip wire is also available from the sources listed below for PP connectors.

Where to Purchase Powerpole Connectors

The standard connector for NTRAK is the Anderson Power Products PP30 series 30 Amp Powerpole. This connector is genderless and exhibits lower voltage drop at the higher currents common in DCC applications

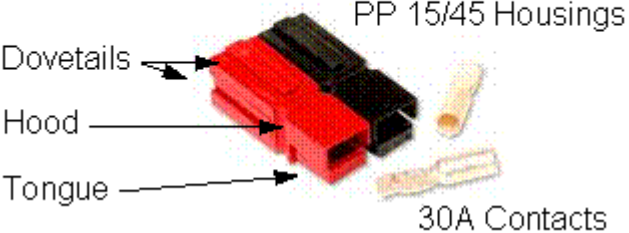
The Anderson part numbers for the PP30 series 30A Powerpole are provided in the table on the next page.

For NTRAK and T-TRAK purposes you may choose to purchase red and black connectors only, and then apply colored tape or you may purchase housing colors matched to the track colors.

Powerpole connector pairs in various colors are available through the NTRAK Model Railroading Society's business office at [http:// http://www.ntrak.org/ntrak_store/default.html](http://http://www.ntrak.org/ntrak_store/default.html). An online Order Form and pricing is available at. All sets include an instruction sheet.

NTRAK pricing includes the shipping cost and there is no minimum order amount.

Anderson Part Numbers for the PP30 Series 30A Powerpole Copnnectors

Anderson Powerpole® PP30 Connector	Housing Color	Complete PP30 Connector (Housing & Contact)	15-45A Housing Only
		Black	1330G4
Orange		1330G13	1327G17
Red		1330	1327
Yellow		1330G11	1327G16
Blue		1330G12	1327G8
Green		1330G2	1327G5
White		1330G5	1327G7
Purple		1330G17	1327G23
Gray		1330G14	1327G18
Brown		1330G15	1327G21
Pink		1330G16	1327G22
All connectors use #1331 30 Amp contacts.			

Some other sources are the following mail-order electronic supply firms:

- Powerwerx at www.powerwerx.com
- Cablexperts at www.cablexperts.com/cfdocs/cat.cfm?ItemGroup=9&itmsub=0&bskt=0&USA_ship=1&c=0
- Quicksilver Radio Products at www.qsradio.com/DCpower.htm
- Hometek at www.cheapam.com/page10.html
- Connex Electronics at www.connex-electronics.com/?url=/html/products/anderson/powerpole/pp_main.html
- Rosspar Ltd. (Canada) at www.rosspar.com

Powerpole connectors are also carried by major industrial electronics distributors, including Newark InOne (www.newark.com) and Allied Electronics (www.alliedelec.com).

Since the 30A Powerpoles are also standard in the R/C model aircraft hobby these connectors are available at many hobby shops that carry R/C model aircraft. They may be known as SB connectors or Sermos connectors in these shops.

Powerpole Crimping Tool

Powerpole crimping tools are available from a number of sources, but highly recommended is the West Mountain Radio PWRcrimp Tool, shown below: Order from http://www.westmountainradio.com/dc_power.php



Custom Manufactured Track Bus Cables

Custom manufactured track bus cables of any length and connector colors are available from Joshua Murrah. Contact Joshua at joshmurrah@outlook.com.

References

- Documentation from T-TRAK official web site at <http://www.t-trak.org> and NTRAK Newsletters.
- Email communications with several people.
- Glenn McLain & Steve Jackson, Northern Virginia NTRAK, “T-TRAK Powerpole Bus Wires”
- Paul Musselman, “The Unofficial T-TRAK Handbook”, at <http://T-TrakHandbook.com>
- Kato Unitrack information from Kato official web site at <http://www.katousa.com> .
- Wiring for DCC, Alan Gartner at <http://wiringfordcc.com>.
- T-TRAK Email list at Yahoo Groups
- Digitrax Users Email list at groups.io
- JMRI Users Email list at Yahoo Groups
- Kato Unitrack Email list at Yahoo Groups
- Bob Wilson, W3BIG
- Wake County, NC AUXCOMM
- Powerwerx at www.powerwerx.com
- NTRAK “How-To” Book, NTRAK, Inc.