

# ANDERSON POWERPOLE

THE DESIGN AND USE  
OF THE ANDERSON POWERPOLE ELECTRICAL CONNECTOR

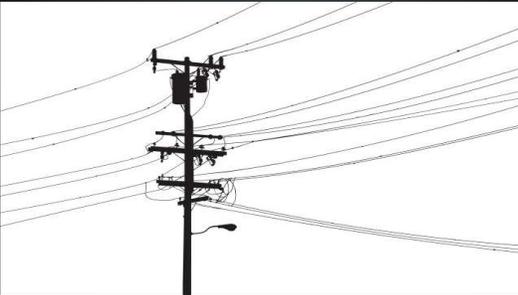
CLALLAM COUNTY AMATEUR RADIO CLUB

BILL PETERSON - K7WVP FEBRUARY 14, 2018

## ANDERSON POWERPOLES

- Designs
- Standards
- Advantages and Disadvantages
- How to Assemble and Use
- Examples

### POWERPOLES – EXAMPLE #1



### POWERPOLES – EXAMPLE #2



## POWERPOLES – EXAMPLE #3



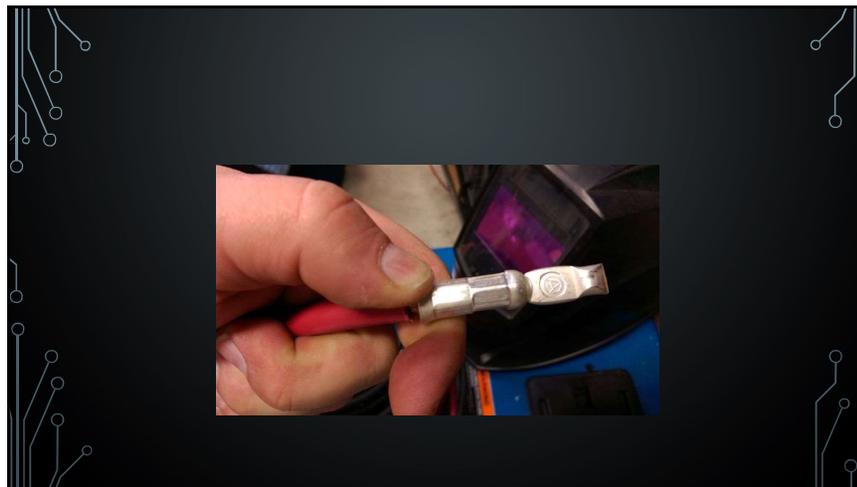
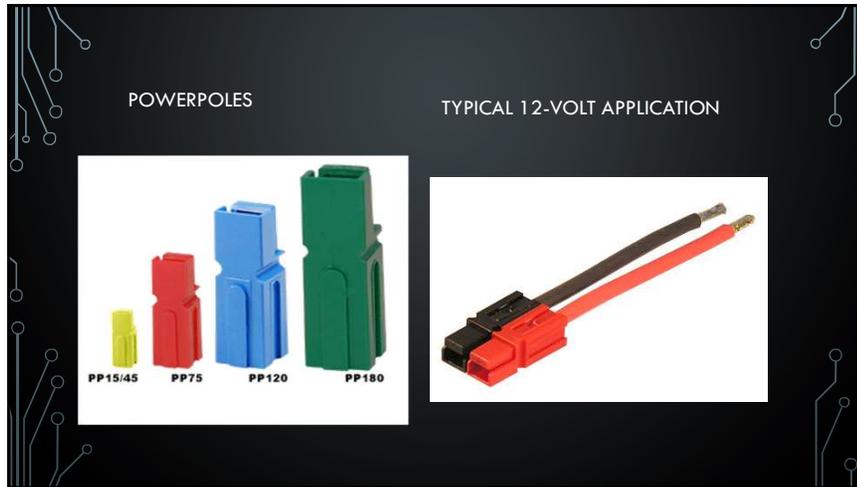
JUST 6 DAYS AGO I STARTED USING ANDERSON  
POWERPOLES FOR THE FIRST TIME

## A SECRET OF CONSULTING

- A couple of hours of research:
  - At a Library, looking at the latest "Industry" magazines
  - At the computer, Googling
- And you make yourself knowledgeable enough to talk about the latest issues on any subject.

## ANDERSON POWERPOLES

- Amateur radio de facto standard for 12 volt power connections
  - Adopted as Standard by:
    - ARES
    - RACES
  - This presentation will focus on the 12 volt applications

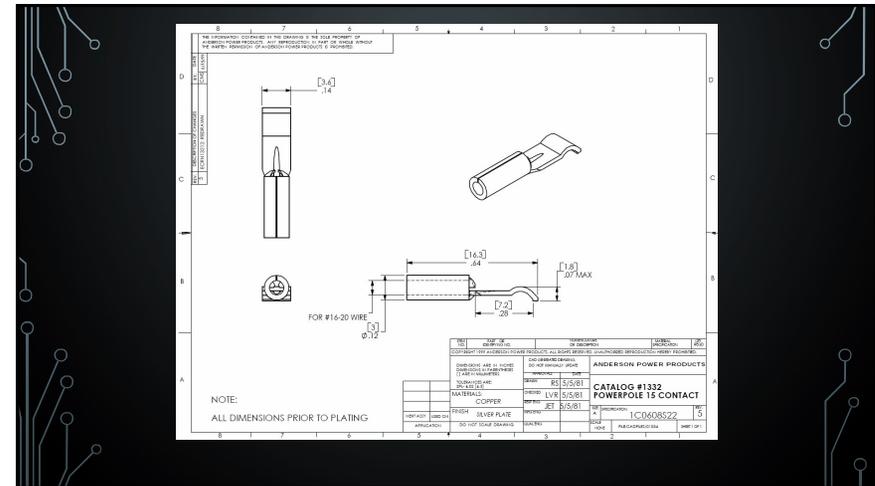


## POWERPOLES HAVE 7 PATENTS

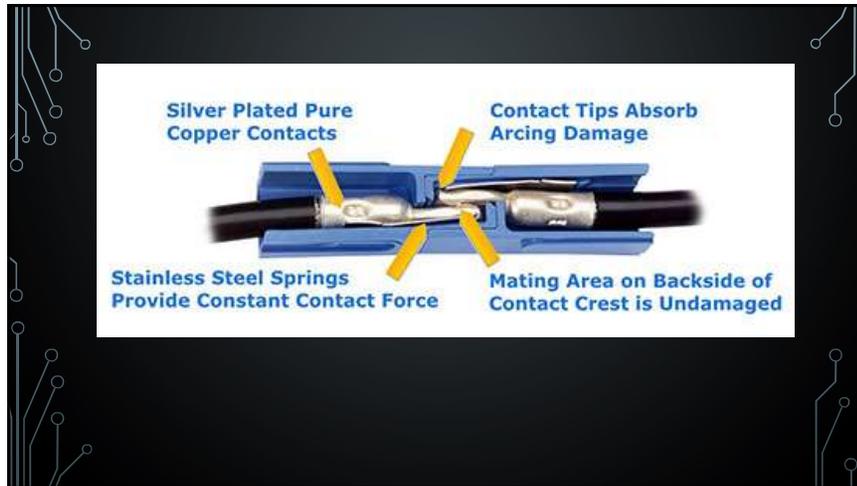
- First patent filed in 1953, and awarded in 1958
- Last patent awarded in 2008
- Some patents have run out allowing other companies to copy the design

## DESIGN CRITERIA

- All are rated for up to 600 volts
- Specific models covering from 15 to 350 Amps
- "Flat" Contacts with wiping action upon insertion to provide clean contact
- Stainless Steel clip spring behind contact:
  - Holds Contact in place
  - Assures solid electrical contact
  - Maintains electrical contact when cable is moved, or subject to vibrations
- Low Resistant silver plated copper connectors

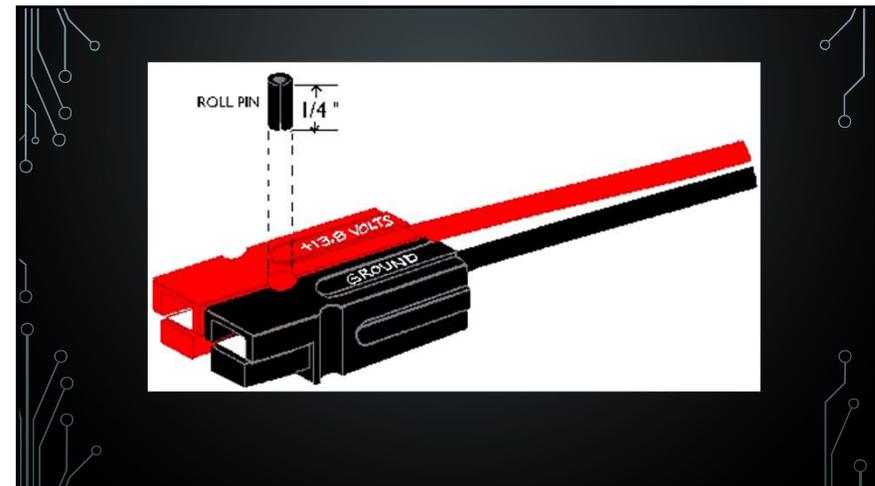
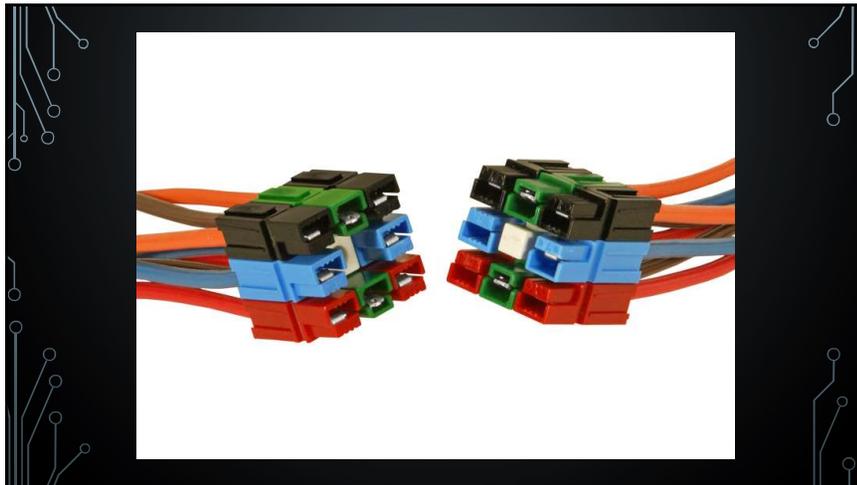


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- Molded-in dovetails lock modules into multipole units
  - If broken under load arcing is confined to tip, a non-conducting area
  - Detent keeps connectors mated and provides quick break snap action upon disconnect
  - Stainless steel leaf spring provides constant contact pressure
  - Rugged lightweight polycarbonate housing
  - Wiping action on make and break keeps conducting surfaces clear
  - Low resistance silver-plated copper contacts



## DESIGN CRITERIA (CONTINUED)

- Tin plated contacts rated at 1,500 mating cycles
- Silver plated contacts rated at 10,000 mating cycles
- Genderless
- Tongue and Groove design to join multiple connectors into single unit
- Pin for locking Tongue and Groove connections together
- The pin-hole can also be used to tie two connection "sets" so they don't come apart





## ADVANTAGES

- Contacts wipe clean on insertion
- Easy to connect and disconnect
- Generless
- Keeps connection insulated and contains sparks on connect/disconnect
- Stackable design
- Color coding



## DISADVANTAGES

- Generless
- Not "Keyed" to prevent improper connections
- Easy to become disconnected
- More expensive than other connectors
  - \$1.65 per set in small quantities

## SB SERIES CONNECTORS

- Keyed and Color Coded



## HOW TO USE

- Buy quality connectors
- Use contact that matches wire size
- Orient contacts before crimping
- Tug-test the connector after crimping
- Insert until it "clicks"

## MODEL NUMBERS

- PP-15 (15 Amp)
- PP-30 (30 Amp)
- PP-45 (45 Amp)

### 15, 30 & 45 AMP POWERPOLE CONNECTORS WILL MATE WITH EACH OTHER

The 15, 30 & 45 amp contacts all use the same housing. Therefore, they all connect to each other. The size of the flat contact area is actually the same for all contacts. The only difference between the 15, 30 & 45 amp contacts is the size of the receiving barrel that accepts the wire.

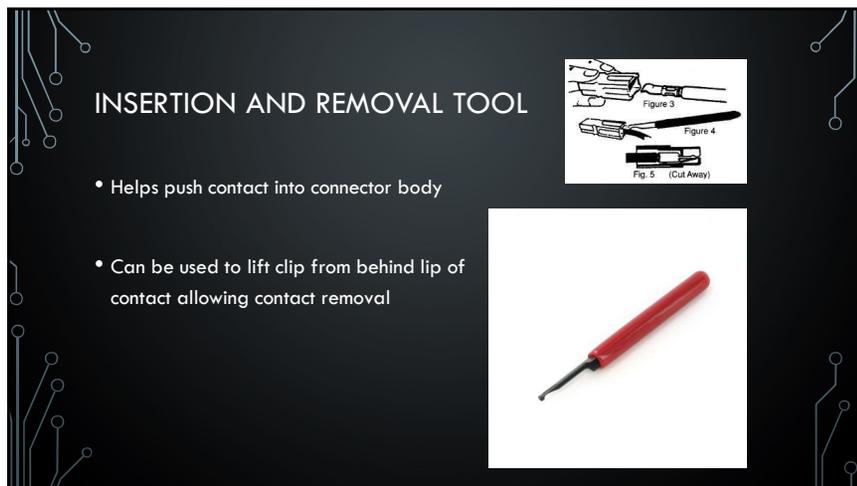
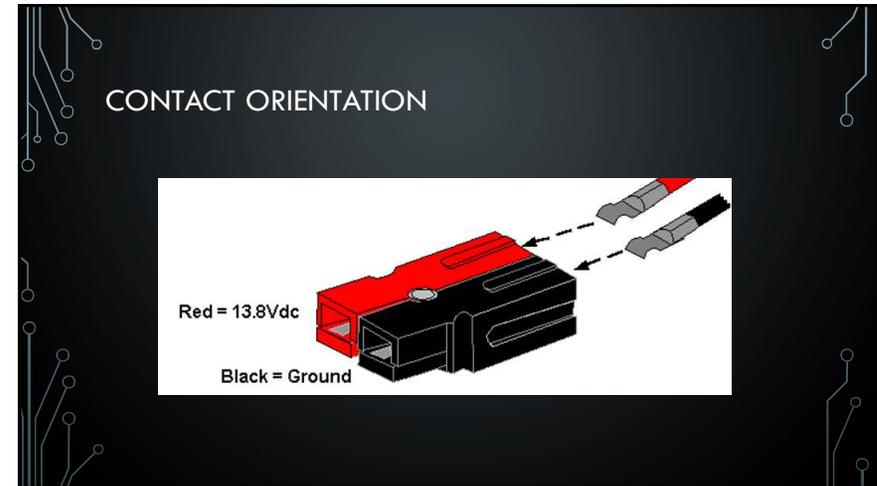
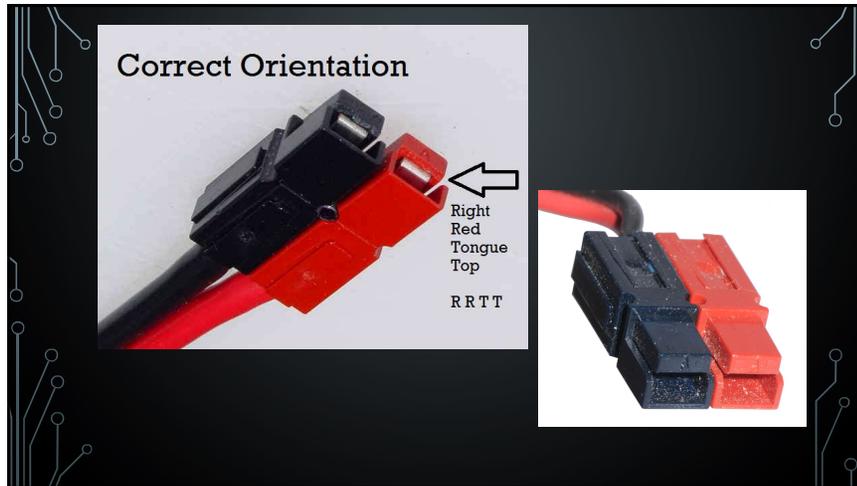
- 15 amp contacts are recommended for 20-16 gauge wire
- 30 amp contacts are recommended for 14-12 gauge wire
- 45 amp contacts are recommended for 10 gauge wire



"Click" – Lip of contact extends over stainless steel clip

Keeps contact from sliding backwards out of connector







## CRIMPING VS. SOLDERING

- Many manufactures recommend crimping over soldering
- Soldering causes the wires to become brittle
  - Soldering heat changes the properties of the wire?
  - Crimped connections allow a larger flex radius than a soldered connection
    - Flexing causes wire fatigue causes breakage
- Solder and wire will initially be clamped tightly, but will “flow” or creep under pressure and the connection will loosen?
- Constant vibrations are a form of constant flexing
- If you solder, make sure there is no excess solder to interfere with contact insertion

## EXAMPLES – BASIC POWER CONNECTIONS

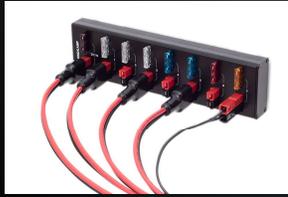
- Swap radios
- Swap power supplies
  - Power Supply
  - Battery
  - Cigarette Lighter
  - Workbench Test Power Supply

## EXAMPLES – PIG-TAILS OF ALL KINDS



## EXAMPLES – POWER DISTRIBUTION

WITH FUSES



WITHOUT FUSES



## EXAMPLE – IN-LINE TEST EQUIPMENT



## ANOTHER CONSULTING SECRET

- A lot of small things add up to make a SIGNIFICANT difference.

## I'D HAVE A Q&A

- But, I just told you everything I know.
- Links
  - <http://www.gsl.net/w2vtm/powerpole.html>
  - <http://powerwerx.com>
  - <http://www.andersonpower.com>