

## Lightning & Static Protection, Better Grounding Your Equipment

### WA6ED

1. Safety
  - a. Safety is the main reason we ground our equipment. We want to prevent RF and electrical exposure
  - b. A good RF ground can help lower your noise floor
2. Ground Rod(s) (Home Depot)
  - a. Use 8-10 foot ground rod
  - b. Several ground rods can be better, but the first one is the most important!
3. RF Ground strap or braid
  - a. Not an AC ground
  - b. RF travels on the surface of the conductor
  - c. 2 inch wide copper strap is very good
  - d. Wire braid is good but may not hold up outside very well
  - e. Romex round wire not so good
4. PolyPhaser (HRO)
  - a. *Please note: this item replaces the Is-50UX-C1 arrestor* The Polyphaser IS-50UX-C0 is a coaxial surge protector. It assures surge voltages and currents are prevented from being passed to other equipment. DC blocked, low loss, wide frequency range, low VSWR, aluminum enclosure, multiple strike capability. Mount Type - Flange
  - b. Frequency Range - 1.5 MHz to 700 MHz, Protected Side Connector UHF Female, Surge Side Connector UHF Female
  - c. Turn On Voltage 600 VDC  $\pm$  20 %, VSWR =1.2:1 1.5 to 700 MHz, Insertion Loss = 0.1 dB,
  - d. RF Power HF 2 kW, VHF 375 W, UHF 125 W
5. Alpha Delta (HRO)
  - a. No DC Block, Replaceable cartridge
  - b. Transi-Trap Surge Protectors are gas surge arresters designed to protect sensitive electronic equipment from damage due to excess voltage or currents generated by transient phenomena (lightning or static buildup). The elements in the Arc-Plug™ Cartridge consist of two metal electrodes hermetically sealed in a rugged gas filled, ceramic cylinder. They perform as voltage dependent switches which can reliably and repeatedly carry large currents for brief periods of time. In operation, a sufficient voltage across the element cause an arc to form between the electrodes, changing its impedance from greater than 10,000 meg-Ohms to a few milli-Ohms in less than 100 nanoseconds time. While conducting in the arc mode, the voltage across the surge arrester is less than 30 Volts.
6. Mechanical Contacts
  - a. Use nuts, bolts, and washers
7. Burndy Pentetrox A (HRO)
  - a. Electrical joint compound for proper connection between metal parts
  - b. Oxide-inhibiting compound for preventing galvanic corrosion and enhancing connection in electrical joints
  - c. For aluminum to aluminum, aluminum to copper, and aluminum to conduit applications
  - d. Remains workable when stored in dry environment under 100 degrees F
  - e. UL listed to 600 V, CSA certified, and RoHS compliant
  - f. 8 oz. Container Size Squeeze Bottle
8. Georgia copper
  - a. Source for copper strap and ground buss bars
9. Single ground point
10. Ground loops
11. References, further reading:
  - a. Grounding
    - i. <http://www.radioworks.com/nbgnd.html>
    - ii. <https://helpdesk.flexradio.com/hc/en-us/articles/204779159-Grounding-Systems-in-the-Ham-Shack-Paradigms-Facts-and-Fallacies>
    - iii. <https://www.youtube.com/watch?v=-8dUTg8jaN8>
  - b. Sources
    - i. <https://www.hamradio.com>
    - ii. <https://www.dxengineering.com/search/department/grounding-and-lightning-protection>
    - iii. <https://abrind.com/product-category/grounding-braid-tinned-copper-flat/>
    - iv. <https://www.alphadeltaradio.com/>
    - v. <https://www.polyphaser.com/>
    - vi. [www.gacopper.com](http://www.gacopper.com)