



RF GROUNDING AND BONDING IN THE HAM SHACK

A Layman's Attempt

K2AL

IMPROVEMENT NEEDED



Current shack had inadequate grounding and bonding. Noise on bands and my laptop would also crash due to RFI in shack during a contest.

GOALS

- 1. Bond equipment together to make voltage and current differences low to minimize RFI and noise.**
- 2. Devise a “ground plane” to “short circuit” RF fields.**
- 3. Make an “earth connection” – Grounding.**

DO SOME RESEARCH



Grounding and Bonding for the Radio Amateur

Good Practices for Electrical Safety,
Lightning Protection, and RF Management

H. Ward Silver, N0AX

Good reference book from ARRL by N0AX. I also emailed him with questions and he kindly responded.

**GROUNDING MEANS “TO MAKE A CONNECTION TO EARTH”
WHILE BONDING MEANS CONNECTING
EQUIPMENT TOGETHER TO MINIMIZE VOLTAGE BETWEEN THEM**

WHY GROUNDING AND BONDING IMPORTANT

**AC SAFETY-PROTECT AGAINST SHOCK HAZARDS FROM EQUIPMENT
CONNECTED TO AC OUTLETS**

**LIGHTNING PROTECTION-KEEP ALL EQUIPMENT AT SAME VOLTAGE
AND DISSIPATE CHARGES TO EARTH**

MANAGE RF- PREVENT RFI

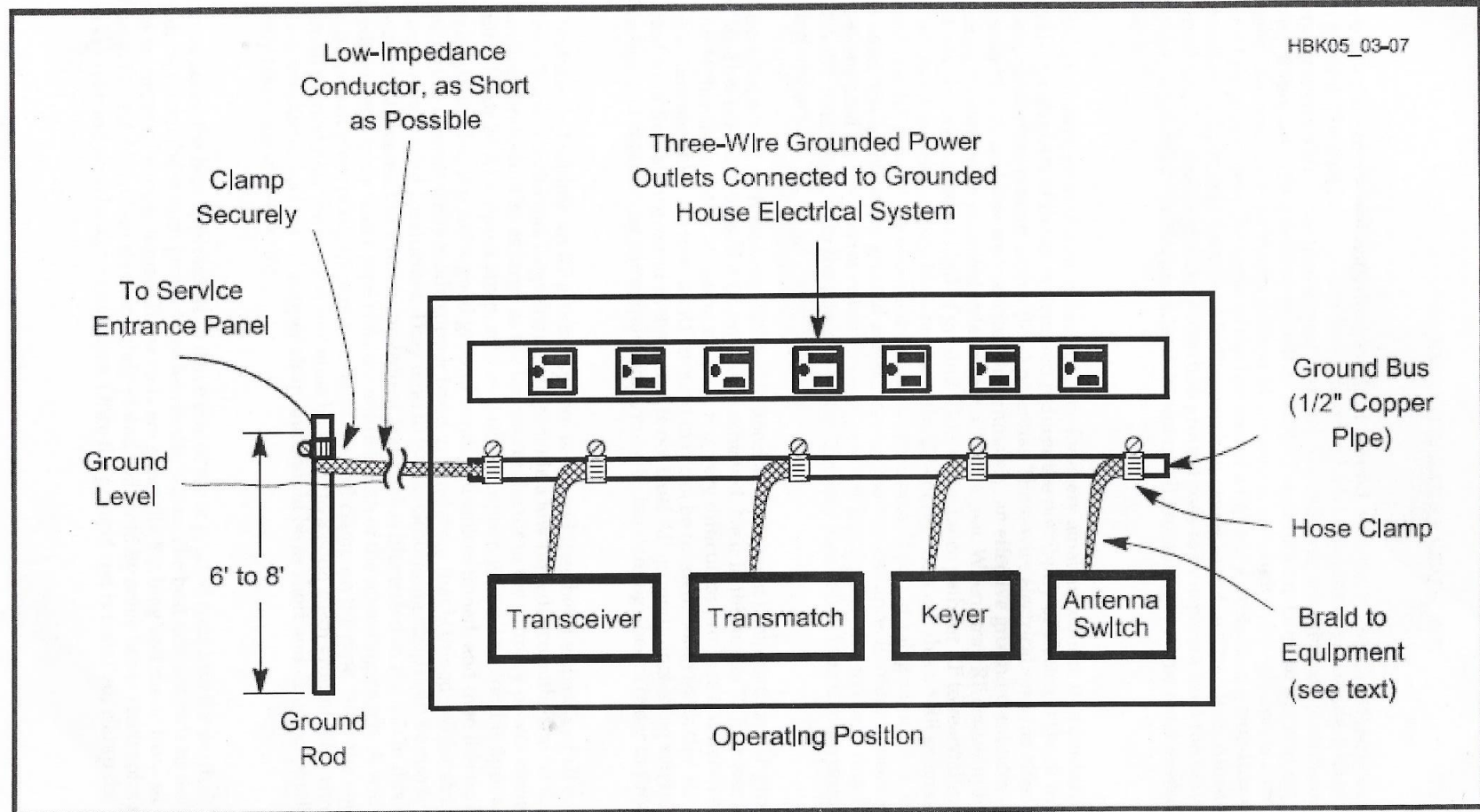


Fig 3.7 — An effective station ground bonds the chassis of all equipment together with low-impedance conductors and ties into a good earth ground. Note that the ground bus is in turn bonded to the service entrance panel. This connection should be made by a licensed electrician with #6 AWG (minimum size) copper wire.

COMMON GROUNDING BUS



5/8" Copper conduit.

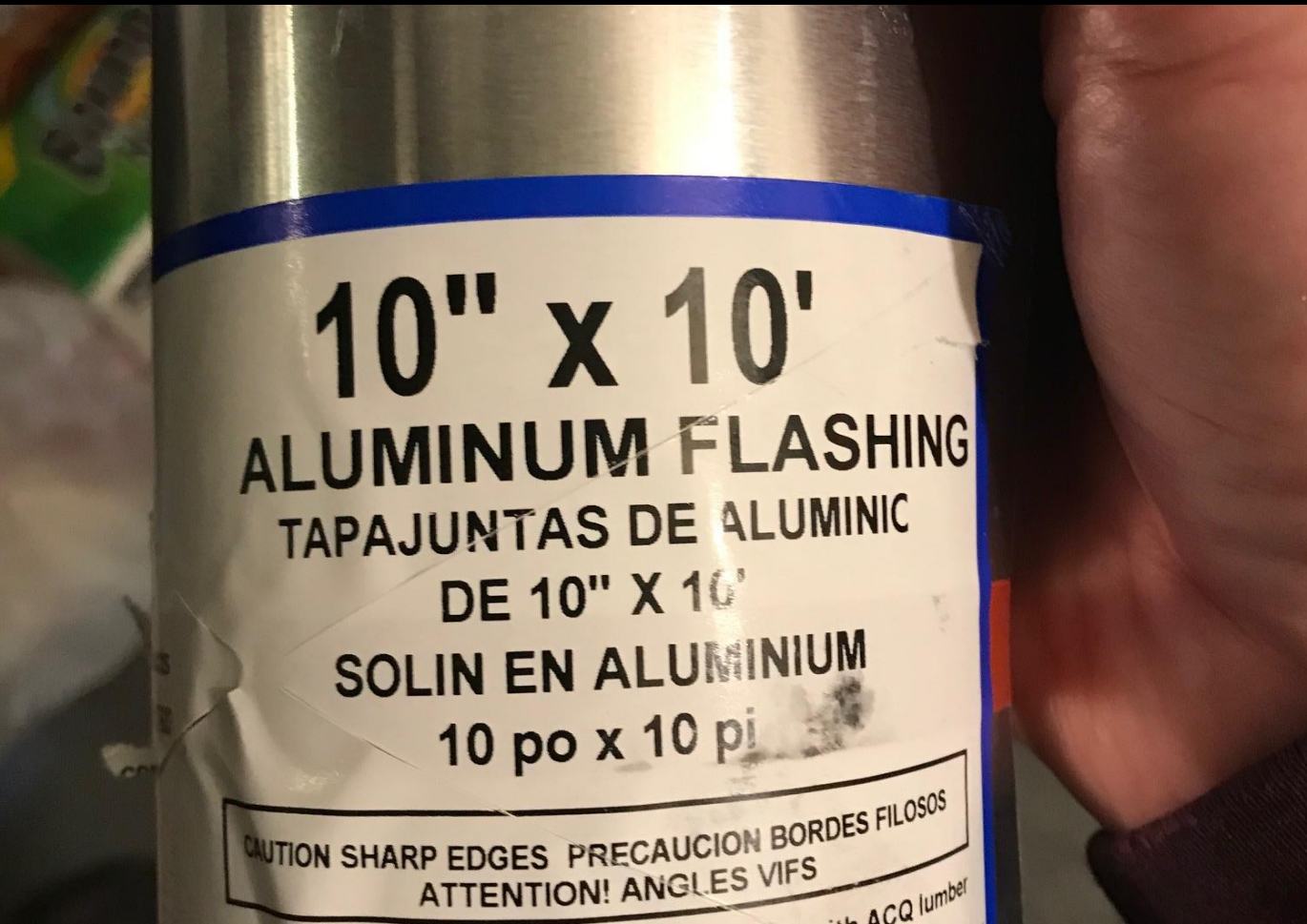
Drilled a series of 3/32" holes 2" CC for machine screws to attach 14ga copper wire for the gear and for braids for connecting to the ground plane.

RF GROUND PLANE

**FLAT SHEET METAL
UNDER EQUIPMENT
PROVIDES LOTS OF
CONDUCTIVE SURFACE
AREA TO “SHORT CIRCUIT”
RF FIELDS.**



RF GROUND PLANE



Aluminum roof flashing.

Cost: \$10 at Home Depot.

POWER POLE CONNECTORS



Used green Power Pole connectors for quick disconnect of equipment.

POWER POLES ON GROUND WIRES



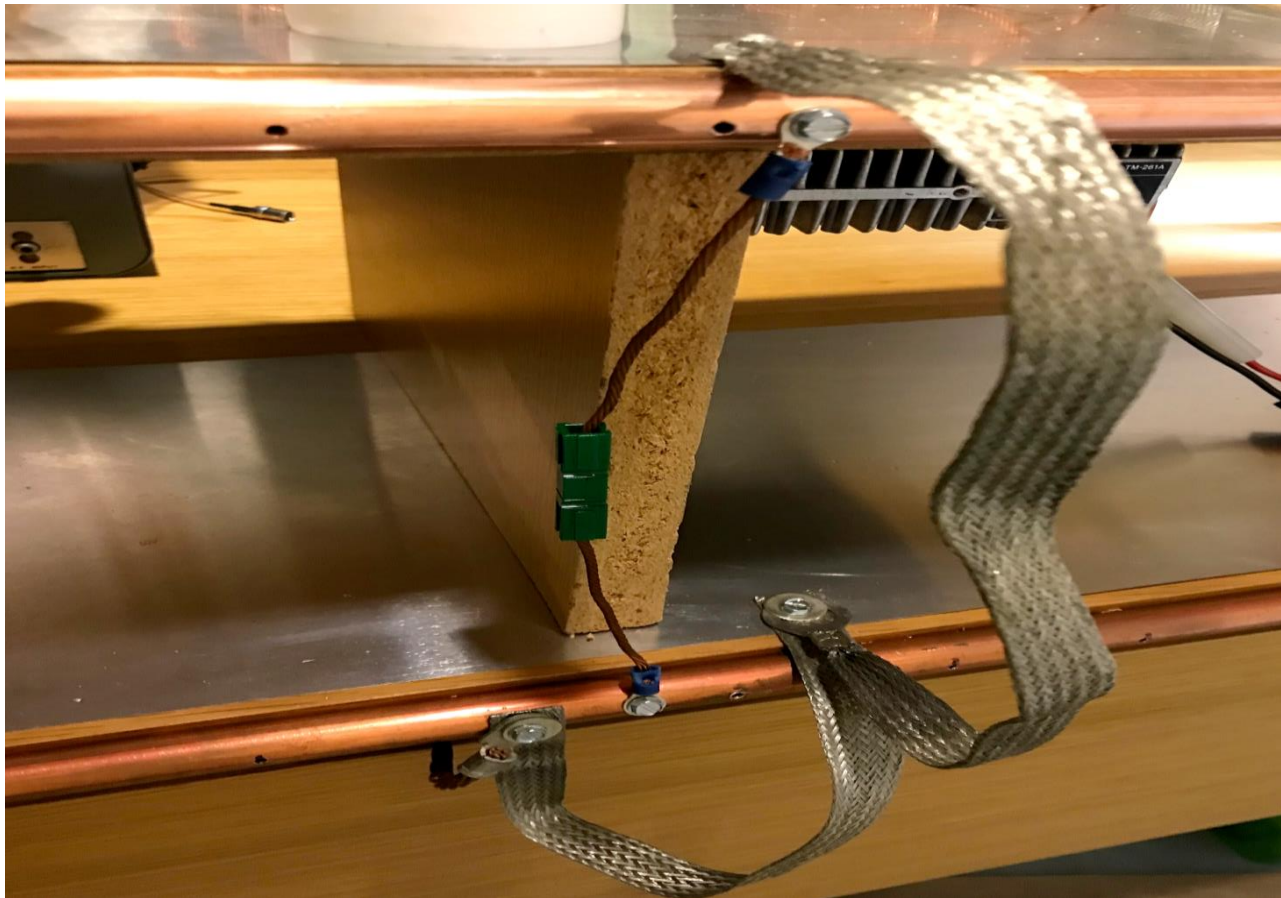
For easy disconnect to
move equipment.

SCREW FLASHING ONTO SHELF AND DESK



Per NOAX, OK to have two levels but bond the two levels together in several places.

BONDED FLASHING EACH OTHER AND TO BOTH BUSSES.

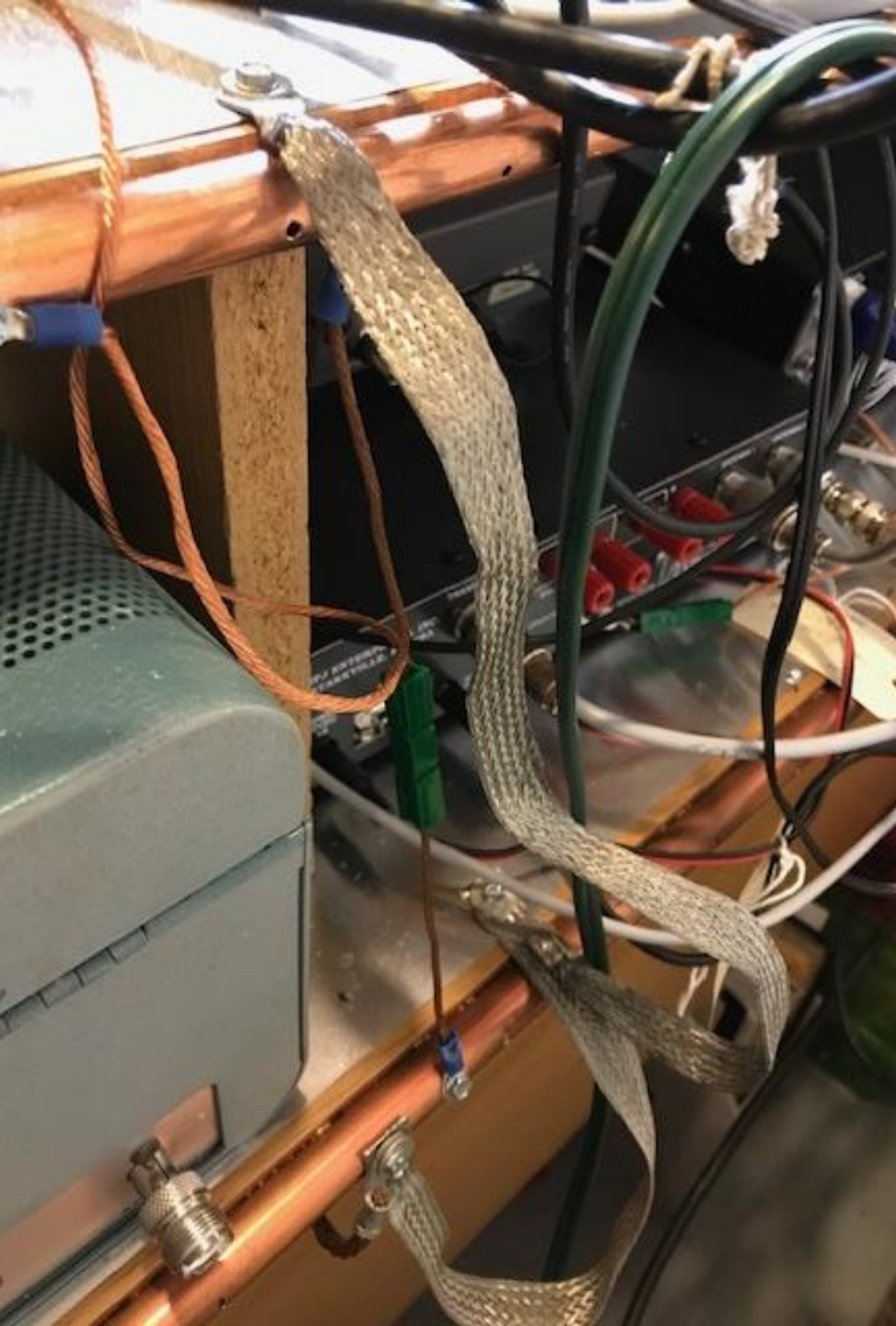


Used power pole connectors on most of the grounding straps so can easily disconnect. OK to do.

FINISHING



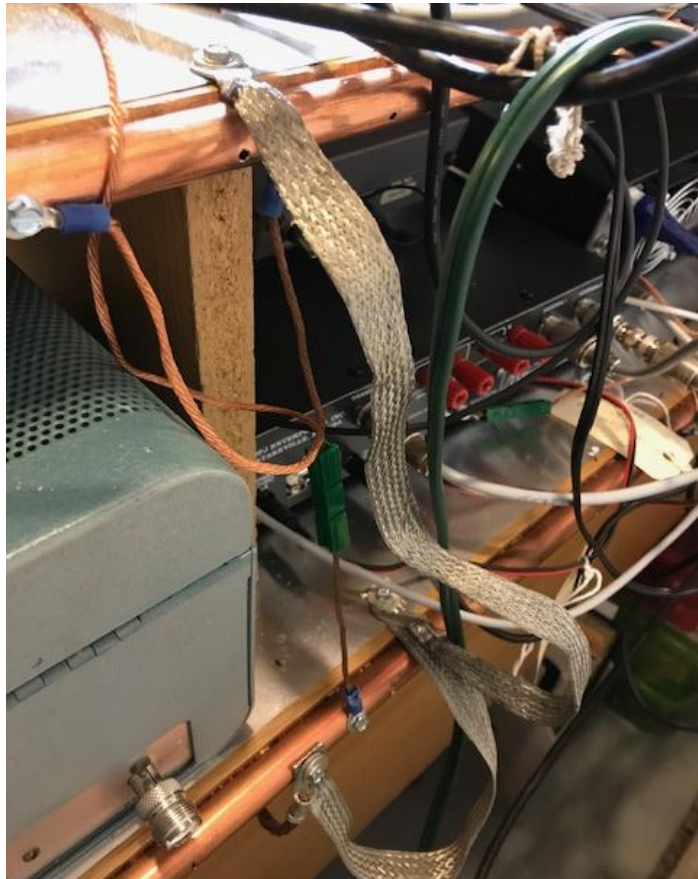
Used aluminum tape to seal edges.



BOND LEVELS TO OUTSIDE GROUND

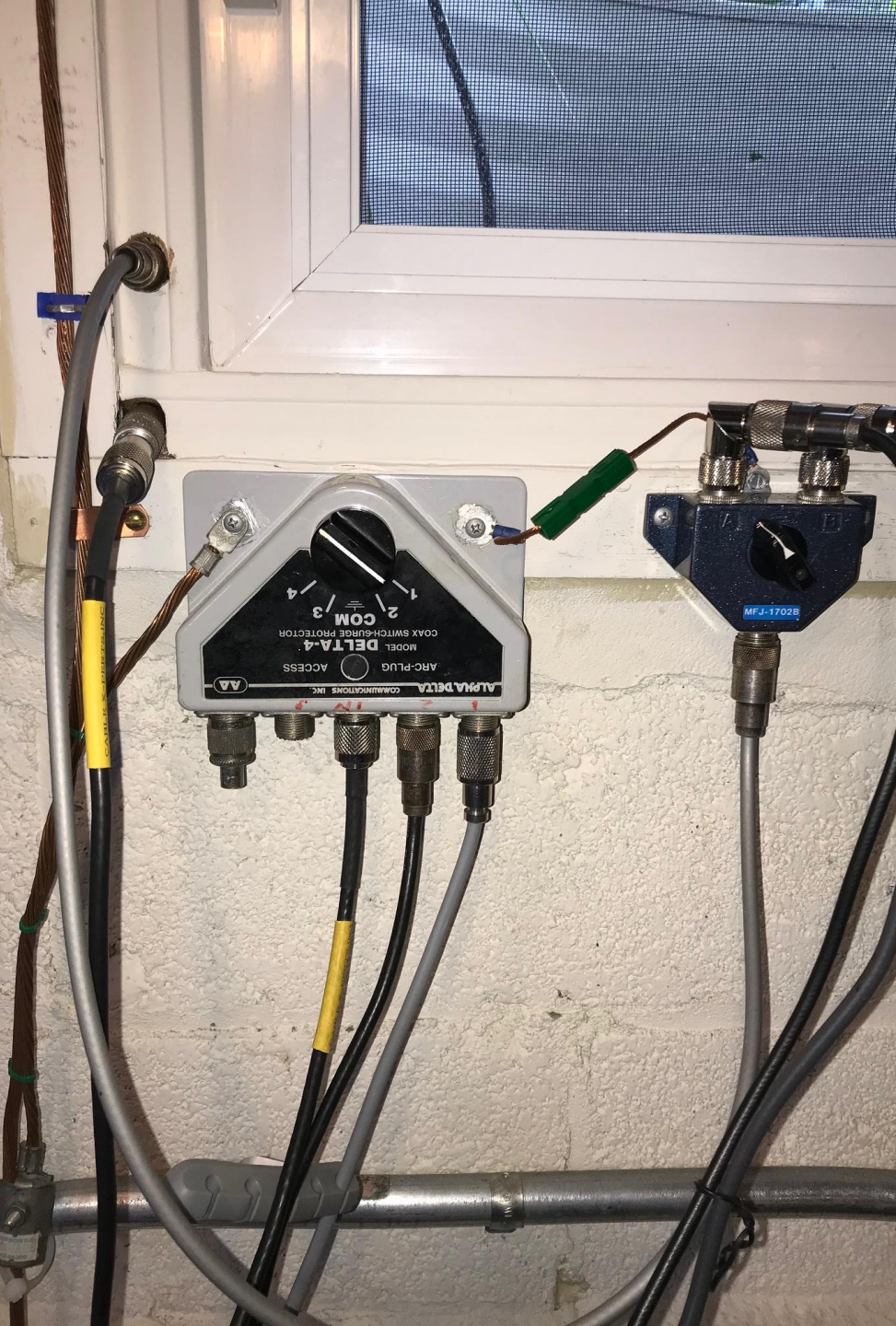
**BRAID BONDS TWO SHELVES TOGETHER
AND THEN CONNECTED TO BRAIDED
WIRE WHICH RUNS OUT TO GROUND ROD
IN YARD.**

TWO LEVELS BONDED TOGETHER AND TO BRAIDED WIRE TO OUTSIDE GROUND ROD



ANTENNA SWITCHES

WIRE TO GROUND ROD ALSO CONNECTED TO ANTENNA SWITCHES.



IMPROVED GROUNDING

BEFORE



AFTER



OUTSIDE EARTH GROUND

Heavy braid to 8' copper
ground rod.

