

Ham 151 - Repeater antenna hardware

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The tower has three different sub-systems to mount:

1) antenna, 2) hardline coax and 3) lightning rod with down-comer ground conductor.
CAUTION: the tower is aluminum. DO NOT allow copper to contact the aluminum. Use a CU/AL clamp.
When attaching hardware, make snug, but do not over torque. Avoid crimping the tower legs.
Aluminum V-groove clamps are Burndy GC18A or IlSCO AGC-2, for CU/AL.
Apply Burndy Penetrox A or equivalent to all aluminum connections and threads.
Scotch 33 tape should be cut, not stretched to tear. Cutting makes it seal better.

The antenna is mounted on a separate stainless-steel schedule 80 mast. Cut to length.
Mount mast to side of tower with three offset brackets from antenna vendor.
Mount mast near top of tower.
Arrange antenna tuning coax. Use Scotch 33 tape to hold in place.
Alternately tie in place with AWG14 insulated wire.

Hardline coax is 7/8" diameter and very stiff. Ends are installed.
Join antenna coax to hardline with a type-N barrel connector.
Wrap connection with Scotch 33 tape.
Cover tape with self-seal. It is permanent.
Route hardline inside a leg.
Hold in place often enough to keep from flopping. Use Scotch 33 tape or AWG14

Apply grounding kits near top, middle, and bottom of tower.
Strip jacket with box knife. Be careful. Avoid damage to the copper shield.
Ratchet the strap tight. Seal the joint.
Bond the strap to the tower using a CU/AL compatible connector.

Lightning rod is at the top of the tower.
Install 2" OD tubing in collar on top. Pin in place with 1/4" stainless hardware.
Make 3/4" aluminum rod length that will be 7' above top of antenna.
Round the top end to a hemisphere. Old tech used a point.
Attach 3/4" aluminum rod to tubing extension. Use two V-groove clamps.

Aluminum #2/0 basket-weave down-comer conductor is about .075" diameter.
Attach basket-weave to lightning rod with two lightning clamps.
Route down-comer conductor inside a different leg.
Clamp securely at top of tower, at 60', 40', 20', and base with V-groove.
Keep wire from flopping and rubbing.
Add clamps or use Scotch 33 tape.

The base of the tower is a Ufer ground with three ground rods around it.
Use three pigtails with crimp connector to bond each leg to its base.
Drill holes as needed.
Attach down-comer to one pigtail using two lightning clamps.
Use two V-groove clamps on the pigtail and on the basket weave and the leg.
Use at least one V-groove clamp for each of the other pigtails.

A metal junction box is mounted on the wall with a 2" hole penetrating into the radio room.
Drill a 2" hole in the enclosure side near the bottom.
Install a Myers-hub to keep water out.
Use a 2" PVC conduit male connector.
Use conduit fittings as needed to route and support conduit along wall toward tower.
Install a 90-degree elbow aimed at base of tower.

For protection, route hardline and ground wire through conduit.
Attach #4 ground wire to the ground rod protruding below tower with two connectors.

Inside junction box, create a common ground bus bar.
Terminate the #4 ground wire on the bus bar.
Run #6 ground wire to buried rod in front of box, south of tower. Attach.
Add Polyphaser between the hardline and the cable to the duplexer. Ground it.

Caution: Obtain professional assistance for design and installation.

Life is good. Enjoy!



AL V-groove clamp

