The Radio Hotel– Working with Aluminum

……using an element to build elements

By Rick Hiller – W5RH

Aluminum – ***Al*** *-- Atomic Number 13 on the Periodic Table* – a lightweight, silvery-white metal that is the most abundant metallic element in the Earth's crust and the most widely used nonferrous metal. Plus, for our Ham Radio benefit, it is electrically conductive.

If you have never worked with aluminum, you are in for a treat. It is easy to cut, drill and shape. You can work with it with just simple hand tools, a vice, a hack saw, a power drill, bits and files. Of course, having access to a band saw (with the proper blade), a drill press, a table saw, disc sander, a break, and a sheer will ease and speed your work a bit. But leave most of those tools to the big boys. Hand tools will do you just fine.

Most of the work with aluminum in Ham Radio will come in the form of the popular telescopic tubing. This T-6061 (a number denoting the makeup and characteristics of the aluminum) tubing is an extruded part with varying, stepped ODs (outer diameter), but with a constant wall thickness (.0625") to give it a telescopic property. One Ham Radio supplier, **DX Engineering, (www.DXengineering.com)** has a wide assortment tubing with solid or split ends. **Home Depot** or **Loews** have some aluminum stock (solid rod, angles, etc.). Check **Amazon** too.

Cutting aluminum tubing leaves a burred edge, so deburring must be accomplished by a deburring tool, a file (flat or round, depending) or sand paper. Use a small, round file on the ID (inside diameter) edge of the telescopic tubing, as the ID edges must be smooth and of the same diameter as the remainder of the tubing, so that the smaller tubing will slide in easily.

Before assembling the tubing, clean up the OD surface of smaller tubing using Scotch Brite pad (non- ferrous), or steel wool (0000). Apply, to the inserted tube portion, some Ox-Gard or Nonalox. These are corrosion inhibiting, conductive pastes that ensure proper conduction between tubing sections. Ox-Gard or Nonalox are available in the electrical department of your DIY stores.

Fastening of the adjoining tubing sections can be accomplished with stainless steel hose clamps, rivets (with aluminum mandrels) or sheet metal screws. The method depends on the tubing end purchased – solid or split. (See N6BT's book, referenced below). Easy peasey, have fun!

For building larger aluminum antenna arrays (Yagi-Uda's and LPDA's, etc.), it might be best to have a read of either of these books: **Physical Design of Yagi Antennas** (ARRL) by David Leeson --W6QHS or **Array of Light** (self-publish) by Tom Schiller – N6BT.

Enjoy your hobby 73…Rick

Next time…. Wire – Simply Wire