



Steve Sant Andrea, AG1YK, hk@arri.org

## Splicing, Reeling, and Tubing

### Wire Joining Techniques

If you have ever needed to solder tinsel wire, then you know it's not an easy task. Tinsel wire is formed of spiral conductors made of foil (like copper) wrapped around fibers. These conductors are extremely flimsy and sometimes melt when soldering. You are likely to find tinsel in self-coiled cords (like microphone and telephone handset cords), modular telephone set cords, headphone cords, wires with cloth insulation, switchboard cords, and some musical instrument cords.

The secret to soldering these wires is to wrap the flimsy conductor with a stiffer conductor before soldering. The best wire for this splinting job is 24 AWG solid bare copper.

Start with a 10 inch piece of solid wire and strip about 6 inches. Carefully strip about an inch of the tinsel wire. Next, wrap the solid wire in a tight coil around the tinsel wire (see Figure 1). You will find that the bare copper



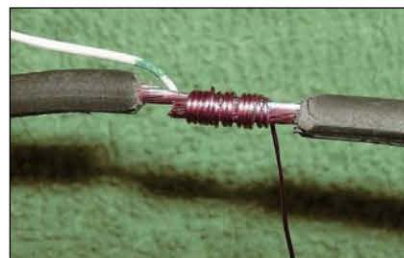
**Figure 1** — Coil solid copper wire around the tinsel (red lead) then trim and tin the coil (black lead). The remaining solid wire pigtail can be trimmed off or used to make connections. [Frank Ingle, KG4CQK, photo]

coil supports and stiffens the tinsel so the coil looks a little like a segment of heavier solid copper when it is finished. When you have about ¼ inch of coil in place, you can trim the ends of the solid wire, leaving only the coil. When you tin the coil, it will bond with the tinsel and will become stiffer. Now you can solder the coil to a solder terminal, secure it with a screw terminal or even add a crimp on connector.

Sometimes I find I need to solder a stranded conductor to a terminal that is too small or too



**Figure 2** — To prepare a parallel splice, strip the ends of the wire and position them alongside each other. [Frank Ingle, KG4CQK, photo]



**Figure 3** — Wrap both exposed wires with #24 AWG solid copper, then solder. [Frank Ingle, KG4CQK, photo]

full to fit all the strands. Using the same wrapping technique, I can wrap the stranded wire for ¼ inch and then leave a short pigtail of 24 AWG wire (see Figure 1). This little pigtail will fit though all but the tiniest holes and can be soldered. Unless you are talking about high currents, the reduction in diameter for ¼ inch will not be an issue.

In none of these cases will the wrapping provide a very strong mechanical connection. The boundary between the end of the solder and the start of the insulation will be a bit weak and you may need to improvise a mechanical support above the solder joint. A small zip-tie around the tinsel insulation and a nearby anchor will often work.

Another application for this technique is in parallel splices. This is similar in concept to the Western Union splice, but much neater. Expose about a half inch of conductor on two wires to be joined, then lie the clean, exposed parts next to each other (see Figure 2) and join them with the 24 AWG solid wire (see Figure 3). Tin the coil and you have a neat joint that is stronger than the original wire. When finished, cover the joint with a piece of heat-shrink tubing for a nearly invisible splice (see Figure 4).<sup>1</sup> — 73, Frank Ingle, KG4CQK, 2580 Park St, Jacksonville, FL 32204, kg4cqk@comcast.net

### Chalk Reel Antenna

I do a lot of portable operating from hotels or while backpacking. I have found that a reasonably effective antenna for 40 meters and above is a simple long-wire antenna of approximately 50 feet in length. It tunes well with a simple L network or with the internal tuner in



**Figure 4** — Finish the splice with a piece of heat-shrink tubing for a neat and sturdy splice. [Frank Ingle, KG4CQK, photo]

<sup>1</sup>For more on splicing and terminating techniques, see the following NASA Standard, Section 19: [www.hq.nasa.gov/office/codeq/doctree/87394.pdf](http://www.hq.nasa.gov/office/codeq/doctree/87394.pdf).





**Figure 5** — An inexpensive chalk reel is a convenient way to carry an end-fed long wire. [Alan Amos Jr, KN1O, photo]

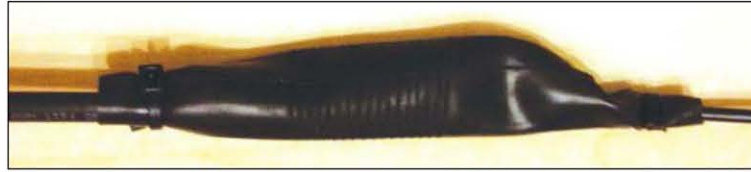
my K1. When operating from a hotel, I typically try to get a second or third floor room and use a tree or my car to support the antenna. Generally, I use the air conditioner to provide a ground reference. When backpacking I feed the antenna from the low end and get the other end as high up a tree as I can and simply lay another wire on the ground (where no one will trip over it) as the ground reference.

The biggest problem has always been keeping the wire from becoming a tangled mess. I have tried a variety of methods, some of which were more successful than others. While walking through the tool section of our local hardware store, an item caught my attention; a chalk line reel. The intended use is to hold 100 feet of string along with powdered chalk and the string is used to mark a straight line. I had just acquired a reel of Teflon-coated fine wire (#26 I believe) for portable antennas and the diameter isn't much greater than the string in the chalk reel. The reel is quite compact and is light enough to be practical even for backpacking.

I opened the reel and removed all but about a foot of the string and also removed the end cap that the string feeds through. I simply tied the remaining piece of string to the wire as shown in Figure 5. I fed the wire through the internal felt ring, which provides a little bit of drag on the wire to help it wind evenly on the spool. To connect the transmitter, I simply stripped off a short section of the insulation a few inches from the spool end of the wire to provide a place where I could use a small alligator clip to attach the transmitter. This solution has truly made me a "happy camper" when operating portable; no more tangled wires! — 73, Alan Amos Jr, KN1O, 30 Bromfield St, Newburyport, MA 01950, radiokn1o@gmail.com

### Inner Tube Weatherproofing

I've successfully used this method for a few years during the course of antenna installations to protect coax connections from the elements. Rather than using electrical tape, coax seal or some of the more traditional methods of sealing coax connectors and splices, I cut up a bicycle inner tube and use it as a sleeve over the connection. A generic 26 inch bicycle tube can be purchased for about \$3 at the local bike



**Figure 6** — A short piece of bicycle inner tube makes an inexpensive weatherproof seal for coax connections. [Stephen Burns, N5VTU, photo]

shop or discount store and will yield enough material for about a dozen connections.

I cut the sleeve to extend about 2 inches beyond each side of the joint then slip it over the connection, completely covering the joint. Then I secure it tightly to the coax on each end with a tie-wrap (see Figure 6). I always treat the sleeve with a protective coating such as Armor All or a similar product to prevent UV damage. The best part is that the connection remains flexible and watertight and the sleeve is easily removed and may be reused multiple times. — 73, Stephen Burns, N5VTU, 10208 S Summerlin, Conroe, TX 77302, n5vtu@arrl.net

### RFI from Electronic Lighting Ballast

I use F96 T12 lamps in my shack that required the older Advance Transformer Company # SM-2E75-S-1-TP light fixture ballasts. I decided to replace the old ballasts with the newer Philips Advance Model ICN-2P60-SC electronic ballasts. When I turned on the lights I was confronted with an S9+ signal on several 2 meter radios, which appeared to cover the entire band. The "electronic ballasts" also interfered with X10 modules used to control other lighting in the house.

I was able to eliminate the interference by installing a single Fair-Rite ([www.fair-rite.com](http://www.fair-rite.com)), type 43 split core material ferrite snap-on filter (p/n 0443164151) on the power cable to the lamps. — 73, Dwight Holtzen, N3ARU, 795 N McComas St, Wichita, KS 67203-4832, n3aru@cox.net

### EchoLink on Linux

My radio desk computer uses the *Ubuntu* operating system (currently ver.13.04). It works very well and I decided to install EchoLink. Here are a few setup tips that may help in experimenting with EchoLink or other *Windows* programs, on *Linux* computers.

1. Download *EchoLinkSetup\_2\_0\_908.exe* (or other version) from [www.echolink.org](http://www.echolink.org).
2. Check to see that *Wine* (a compatibility layer that allows *Windows* programs to run on *Linux*) is installed. If not, download the current version from [www.winehq.org](http://www.winehq.org) and install it by opening a terminal window and entering the command: "wine control [ENTER]." Select the install file and follow the program's installation instructions.

3. An EchoLink startup icon will be installed on the desktop; click it to start the program and complete the normal setup. After that, you will be hard pressed to tell if you are using EchoLink on a *Windows* or *Linux* platform. — 73, Tom Hart, AD1B, 54 Hermaine Ave, Dedham, MA 02026, tom.hart@verizon.net

### Off the Shelf Expander

Belkin's RockStar, marketed to "connect up to five pairs of headphones," functions well for connecting bugs, keys, and paddles to the transceiver. I have a Begali Sculpture paddle ([www.i2rtf.com](http://www.i2rtf.com)), which I use most of the time, a Vibroplex Original Standard ([www.vibroplex.com](http://www.vibroplex.com)) and a Begali Blade straight key, which are in place and ready to immediately be put in the game. An extra 3.5 mm plug to 3.5 mm plug cable is included in the package (see Figure 7). — 73, Bob Mayo, W2TAC, 113 Taconic Lake Way, Petersburg, NY 12138, bobmayo@outlook.com



**Figure 7** — The Belkin RockStar splitter is an inexpensive and neat method for connecting multiple accessories in your shack. [Bob Mayo, W2TAC, photo]

"Hints and Kinks" items have not been tested by *QST* or the ARRL unless otherwise stated. Although we can't guarantee that a given hint will work for your situation, we make every effort to screen out harmful information. Send technical questions directly to the hint's author.

*QST* invites you to share your hints with fellow hams. Send them to "Attn: Hints and Kinks" at ARRL Headquarters, 225 Main St, Newington, CT 06111, or via e-mail to [hk@arrl.org](mailto:hk@arrl.org). Please include your name, call sign, complete mailing address, daytime telephone number and e-mail address on all correspondence. Whether you are praising or criticizing an item, please send the author(s) a copy of your comments.