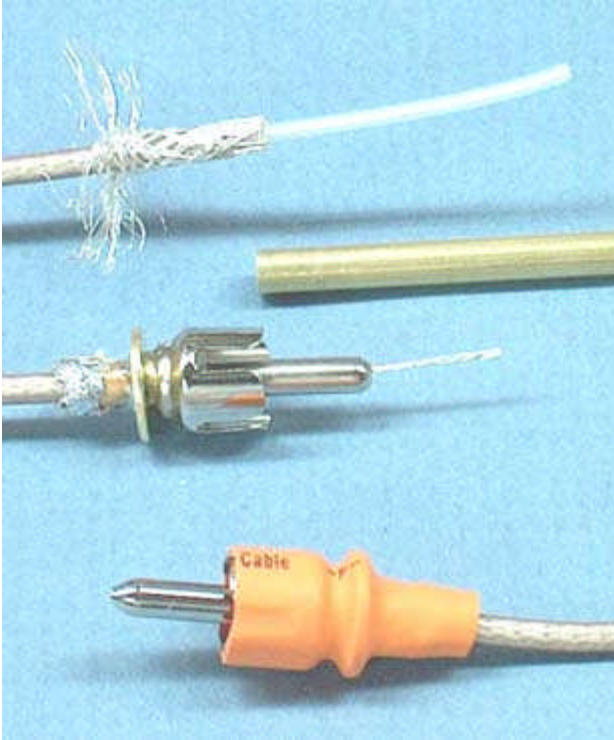


Using Phono Plugs for VHF Measurement Applications

Bob Kopski, K3NHI, has come up with a very clean way of assembling RCA plugs with RG-188 coax cable. These cables are used throughout Bob's version of the QST spectrum analyzer, which he built exclusively with "ugly" methods. He begins with an inexpensive phono plug, Mouser type 17PP050. He then inserts a piece of hobby shop brass tubing into the plug back. The tubing is 5/32 inch OD and has an approximate length of 5/16 inch. The tubing is carefully deburred before use. It's inserted only about 1/16 inch, taking care to avoid the center pin inside. The plug is sweat soldered to the tubing shell. Then a #8 brass washer is slipped onto the tubing and soldered in place. The washer serves as a "gripper" during handling. Details are shown in the photograph.



Another piece of the brass tubing is used to dress the RG-188 braid back over the outer cable insulation. Bob notes that this takes a bit of practice, but works well when the skill is mastered. About 1/4 inch of foldback is adequate, creating two layers of braid with cable insulation between. Now remove some insulation from the center conductor. Insert the prepared cable so the folded back braid is about 1/4" into the plug/tubing, bend the exposed braid back up over the tubing, trim strands, and solder the braid to the tubing. Now solder the inner conductor. One or two layers of heat shrink finish the job, shown in the photo.



There are some complications to this method that add some challenge. For one, RG-188 coaxial cable is harder to find and more expensive than many other types. This is the result of the Teflon dielectric. But it is this material that allows easy soldering. The cable is available on the web at <http://www.cablexperts.com/> with prices starting at \$1.80/foot in small amounts. Bob has also used this method with RG-174. While it works fine, one must use short soldering times to prevent excess melting of the cable dielectric. Experimentation is clearly in order.

Bob normally uses these cables with Mouser 161-2052 phono female connectors. These become solderable parts if you remove the bright shiny plating, which requires considerable effort. A photo shows Bob's version of the spectrum analyzer second mixer. He used SBL-1 mixers in his design. The board assembly fits inside an inexpensive aluminum box.



Incidentally, the above photo includes an added 5th order low pass filter in the path coming from the first IF bandpass filter. Bob reports that this was effective in eliminating the spurious responses related to compromised stopband attenuation in the IF filter.

Many thanks to Bob for sharing his methods with us.