A better way to install PL-259 connectors on RG-8X type coax

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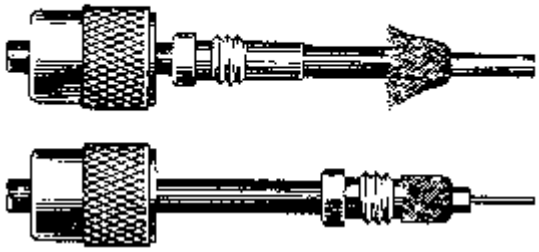
When installing small coax such as RG-8X in a PL-259 using an reducer have you ever wondered if you were really going to get a good solid connection to the outer braid when you looked the holes in the PL-259 and saw only one or two flimsy little strands of the shield? Well, here is an unauthorized solution to that problem.

Installing RG-58, 8X and their kin to PL-259 connectors can be a bit of a challenge. No matter how nice a book's assembly diagram (Figure 1) looks and how easy the installation instructions sound my results using those methods never seem to come out the same.

Figure 1 - A typical example illustrating how a reducer is to be installed. Looks easy enough doesn't it?



The problem for me is getting the shield portion folded back over the reducer. The shield loses its form very quickly when folded back over the larger diameter of the reducer. I tried several approaches to solve this problem such as combing, trimming and arranging the braid very carefully, but when screwed into the PL-259 body the results many times are that only a few strands of shield is visible through the holes of the connector body to solder.

A GOOD THING TO KNOW

Several years ago I observed an amateur installing PL-259 connectors on RG-8X coax using a unique method that made me wonder why I hadn't thought of it myself. I have been using this procedure ever since obtaining good sound mechanical and electrical connections without ever experiencing a failure of any kind. A good thing should be passed along so here's how it's done.

To begin, let me state that I normally always use silver plated connectors and reducers. They are so much easier to solider to than the slightly less expensive nickel-plated connectors. However, if you are using a reducer that is not silver-plated you will need to tin the end of the reducer prior to installing the cable. To do this use a fine cut file or on a piece of fine emery paper to remove the plating on the end of the reducer (Figure 2)

until you can see the bright brass exposed. Next using a large soldering iron tin the end of the reducer where the plating had been removed (Figure 3). Apply just a light flash of solider on this surface. Don't pile it on as it may run down the inside of the reducer and make a mess of things.

Figure 2 - Removing the nickel plating from the end of a reducer. This step should not be used for silver plated reducers.

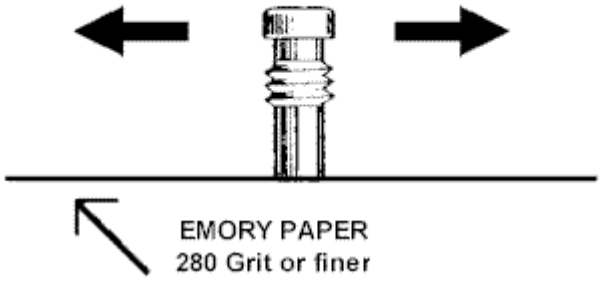
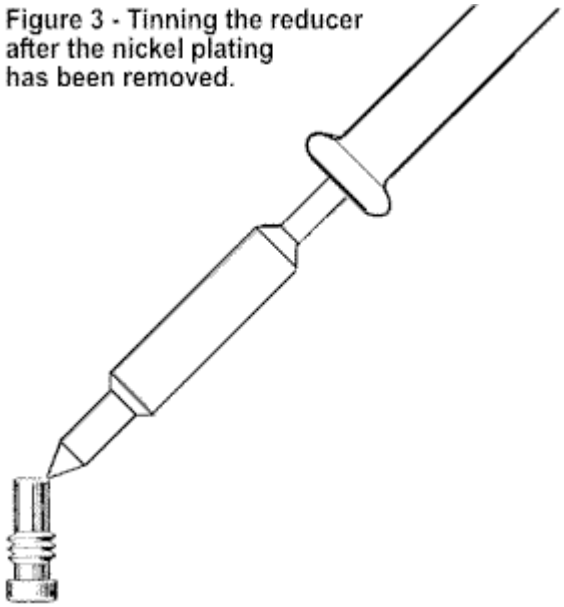


Figure 3 - Tinning the reducer after the nickel plating has been removed.



Prepare the cable by removing the outer jacket and shield as shown in (Figure 4). (Note: The ¼" dimension shown for the shield's length is approximate. It can be longer as it will be trimmed later during the installation.)

Slip the prepared cable into the reducer so that the end of the outer jacket is even with the reducer's end. Next, fold the braid over the end of the reducer so that the strands are at a right angle (90º) or more (Figure 5).

Figure 4 - Coax cable preparation. The ¼" braid length is approximate and can be longer - it will be trimmed later.

Figure 5 - Folding the shield braid strands over the end of the reducer.

AN ASIDE:
Note it is very important when soldering connectors onto coaxial cables to use a LARGE SOLDERING IRON - at least 100 -150 watts or better. If you use a small pencil type soldering iron or a soldering gun - even a high wattage type - there simply is not enough mass in the soldering tip to do the job correctly. The idea is to make the solder joint as fast as possible and get away from the connector quickly before the whole thing gets too hot and ruins the cable. You should not allow the soldering iron contact with the connector for more than 2-4 seconds. If your soldering iron is of sufficient size the short time will not be a problem. If you can not get the solder to flow in that length of time then that's an indication that the iron is not big enough for the job.

NOW BACK TO THE INSTALLATION
At this point I place the coax/reducer assembly into a small tabletop vise so that they are held firmly in a vertical position. Carefully place the tip of soldering iron on the braid (Figure 6). Be careful that you do not allow the tip of the soldering iron to touch and damage the cable's plastic dielectric. The trick is to keep the tip of the soldering iron about 1/8" away from the dielectric and let the solder wick up the braid and fuse to the reducer. Don't pile the solder on. It takes very little solder to make a sound connection. Also, don't try to solder the entire surface at once. I solder about 20-30% of the area, let things cool a bit and then solder another section repeating this until I have the completely bonded the braid to the reducer all the way around.

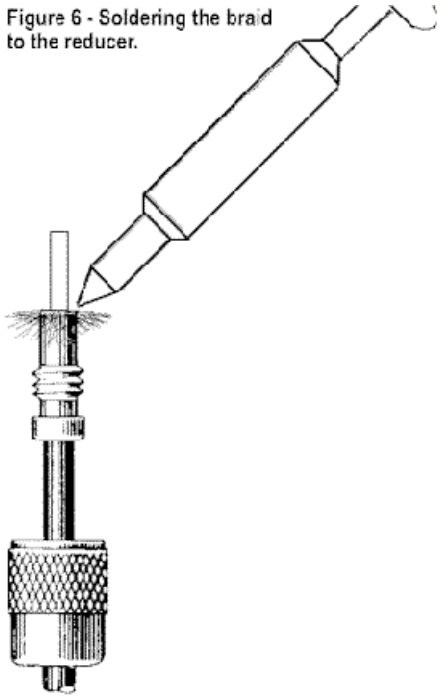


Figure 6 - Soldering the braid to the reducer.

Allow the assembly to cool and then inspect the dielectric to be sure there isn't any visible damage. If you see that you have accidentally melted or damaged the dielectric just stop at that point; remove the reducer and start over.

Using a sharp flush-cutting diagonal cutter (or heavy-duty cuticle scissors) cut off the remaining excess braid around the reducer (Figure 7). After removing the excess braid I use a small fine cut file to do a final touch-up removing any jagged rough spots.

Next cut and remove the dielectric insulation leaving a portion that extends about 1/32" to 1/16" beyond the end of the reducer as shown in Figure 8. If the coax has a stranded center conductor it should be tinned at this time. Screw the reducer and cable assembly into the PL-259 and tighten well.

Continue by soldering the center conductor to the PL-259's pin in the conventional manner, trimming off the excess conductor and cleaning any flux residue from the pin.

Finally, solder one of the holes in the connector body to assure that the reducer will stay put. I have found that without this important last step, in time, the reducer will loosen.

Conclusion

Using this technique I have no doubt that I have a good electrical and mechanical connection as 100% of the braid is now soldered and bonded rather that just a few strands.

There is concern by some that soldering the braid to the reducer in this manner may damage the cable. While that possibility exists, this method allows you to visually inspect the dielectric for any possible damage prior to installing the reducer/coax assembly into the connector body - something you can't do using the conventional method. I have been using this method for a number of years and I have never had a problem or failure.

Figure 7 - Trimming off excess braid after soldering.

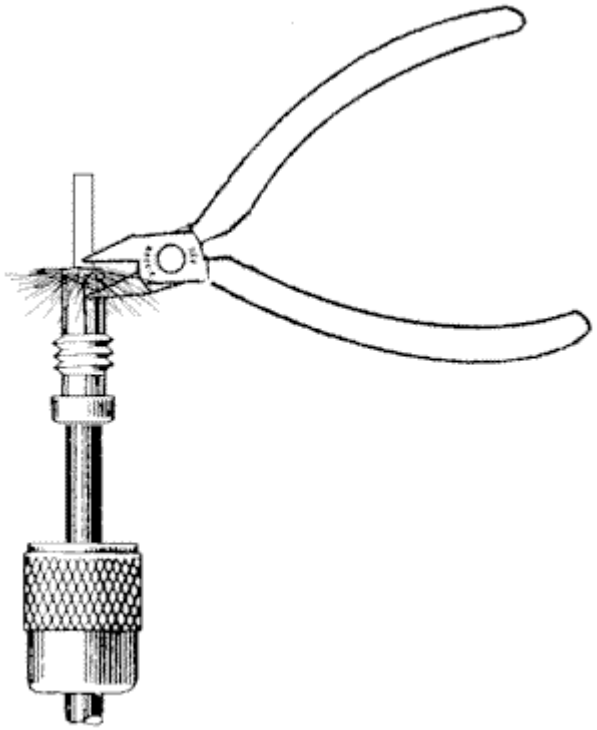
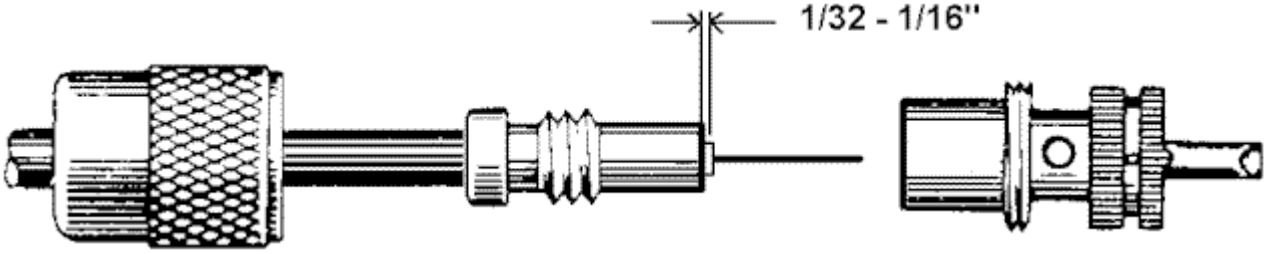


Figure 8 - Coax and reducer ready for final assembly.



Professional installers who have access to specialized tools such as industrial resistance-soldering stations may have better methods utilizing those tools, but for the average Joe Ham (me) who is using a knife, diagonal cutters and soldering iron (of the proper size) this procedure works very well. Try it yourself and see what you think.