K3DAV.com - Amateur Radio Operator

-----IN MIDDLETOWN, PENNSYLVANIA, USA Grid FN-10-----

PL-259 to Coax Installation Done Right.

By David - K3DAV (2/22/2012)

I installed my first PL-259 on to RG-8 coax at age 12. My family just got our first CB radio. A Courier 23+. We also got a CushCraft Ringo CR-1 1/2 wave antenna, and 50 feet of RG-8 coax. It was my job to put the connectors on the coax, so I talked to a CB friend (Joe) and he told me how to do it. I installed the connectors the way my friend told me to, and did a pretty good job. I hated the part about soldering the 4 little points of the shield through those 4 little holes. I wondered how good of a connection those 4 little solder points were, and how strong they are if the wire twists or turns while it is firmly connected to the antenna. But we put it all together and the SWR was about 1.6 on channel 9.

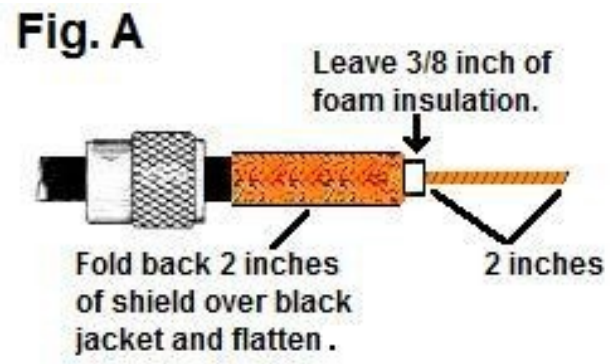
We noticed the SWR go higher after just a few days. My experienced friend Joe came over and we pulled the antenna down and checked it out. Everything looked OK, then Joe noticed how easy it was to twists the coax in the PL-259. So he re-soldered the connector and we put it all back up. The SWR was still 1.6 so we adjusted the matching bar on the antenna and got it down to a 1.4. That was the best it would get, so we used the radio that way.

A few months later, the SWR went up to 1.9, and I knew something was not right. So we pulled the Ringo down again, and it was still OK, but that damn connector was loose again. This time I studied the connector and noticed threads inside the open end. I found out later that they were for adaptors for smaller coax. But after looking at the connector and the coax, I decided to try something a little different. And it brought the SWR down to 1.2, and lasted for 8 years before I took the antenna down.

Now I am not claiming that I invented this method of installing a PL-259 onto RG-8 coax, but at the time I thought of it by myself and I have done it this way ever since. After using the method I am about to describe for 45 years, I have never had one single connection go bad, and SWR has always been very good.

How To Install A PL-259 on RG-8 Coax,

The Better Way.

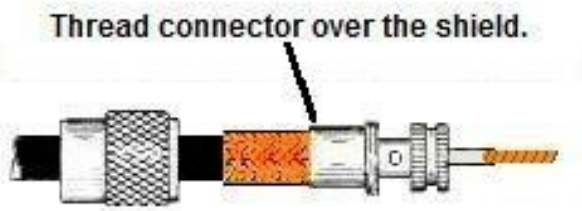


I remove about 2 inches of the black jacket from the end of the coax. Then I fold the braided shield back over the remaining black jacket so the white foam insulation is all showing. Then I remove the foam insulation except for 3/8 inch of it. **Figure A** at left shows the coax preperation.

Now you are ready to install the PL-259. First remember to remove the outer threaded case of the connector,

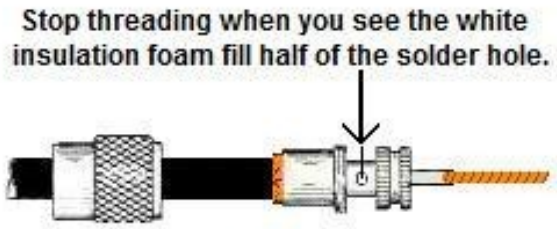
and slide it onto the coax FACING THE RIGHT DIRECTION. I have made that mistake a couple of times after finishing the connector installation, and my reaction was not pretty.

Fig B



Now slide the PL-259 onto the coax right up to the shield wire. Start threading the connector over the shield wire. Just like screwing a nut onto a bolt. If it becomes too tight to do by hand, then use 2 pair of pliars to hold the coax and thread the connector. See **Figure B** at left.

Fig. C



Trim back braided shield wire, but leave about an 1/8 inch. Then continue threading the connector onto the coax until the remaining shield is just inside the connector. Then STOP!

Continue to thread the connector onto the coax. Keep looking into the little solder holes on the connector. You will see the copper center conductor in the middle. When you begin to see the edge of the white foam insulator cover about half of the solder hole, STOP THREADING. Trim off the excess braided shield wire so that only about 1/8 inch of it is still showing. See **Figure C** at left.

Fig. D

Cut off excess center conductor and solder the tip of the wire in the center shaft of the connector.

Now continue threading the connector onto the coax until the remaining shield wire just disappears into the connector then stop. Don't go any further.

Now cut the excess center conductor wire flush to the end of the center conductor shaft of the connector. Solder the tip well, and try to allow a little of the solder to roll down inside the shaft just a little for a good solder joint. And you are finished. See Figure D below.

Cons Of The Old way.

The old way used 4 little solder points of the copper braid to the connector. The rest of the braid inside the connector was touching air. Only those 4 tiny points made your entire ground connection. Ground connections are the most important for a good SWR. The coax usually was not very tight in the connector and could turn or twist, breaking the 4 tiny little solder points, and you wouldn't even know it until you physically inspected it.

Pros of this better way.

Using the method that I just described here, ensures that the entire 360 degrees of the copper braid is firmly and quite tightly touching 360 degrees of the inside of the connector. This adds strength to the connection from the coax twisting or being pulled out of the connector. Soldering is not needed for the shield. The connector is twisted onto the coax so tightly, that the ground connection is solid and will not work loose. You could hang from the coax with this connection. The center conductor is soldered firmly so it also has a solid connection.

As I said, I have installed hundreds of PL-259 connectors onto RG-8 coax for many of my friends and myself for over 45 years. Every single one of them were still working perfectly until the antenna system was removed or changed or blown up from lightning. Not one of them has ever failed, and always provided a great SWR.

For Use On LMR-400 Type Coax.

For many years now, I have only used Times Microwave LMR-400 for all of my antennas. It is a little harder to install a PL-259 onto LMR-400, but I have done dozens of them and they work great. The trick is to unbraid the shield wire, and fold back the now straigntened shield wires very tightly over the black jacket. The connector is harder to thread over the shield, but with 2 pair of pliars you can do it. Just remember to make sure the foil that is molded around the foam insulation is trimmed back just enough so it doesn't come in contact with the center conductor inside the connector. That could be a whole new problem.

My good friend Mike (KD0WTE) in Iowa has made a very good instructional video on YouTube, on how to install a PL-259 on to LMR-400. His instructions can also be used for basic copper RG-8 type coax. **CLICK HERE** to see Mike's great video

By the way.... There have been a few guys who asked me if using this install method, would the threads in the PL-259 connector cut into and break off the short braided shield wires leaving a poor ground connection? The answer is no if it was installed correctly.

Mike installed a PL-259 onto LMR-400. He later needed the connector to use on a much longer piece of coax. So he heated the tip of the connector enough to melt the solder and unscrewed the connector off from the coax. The following photo shows the piece of LMR-400 after Mike removed the connector.

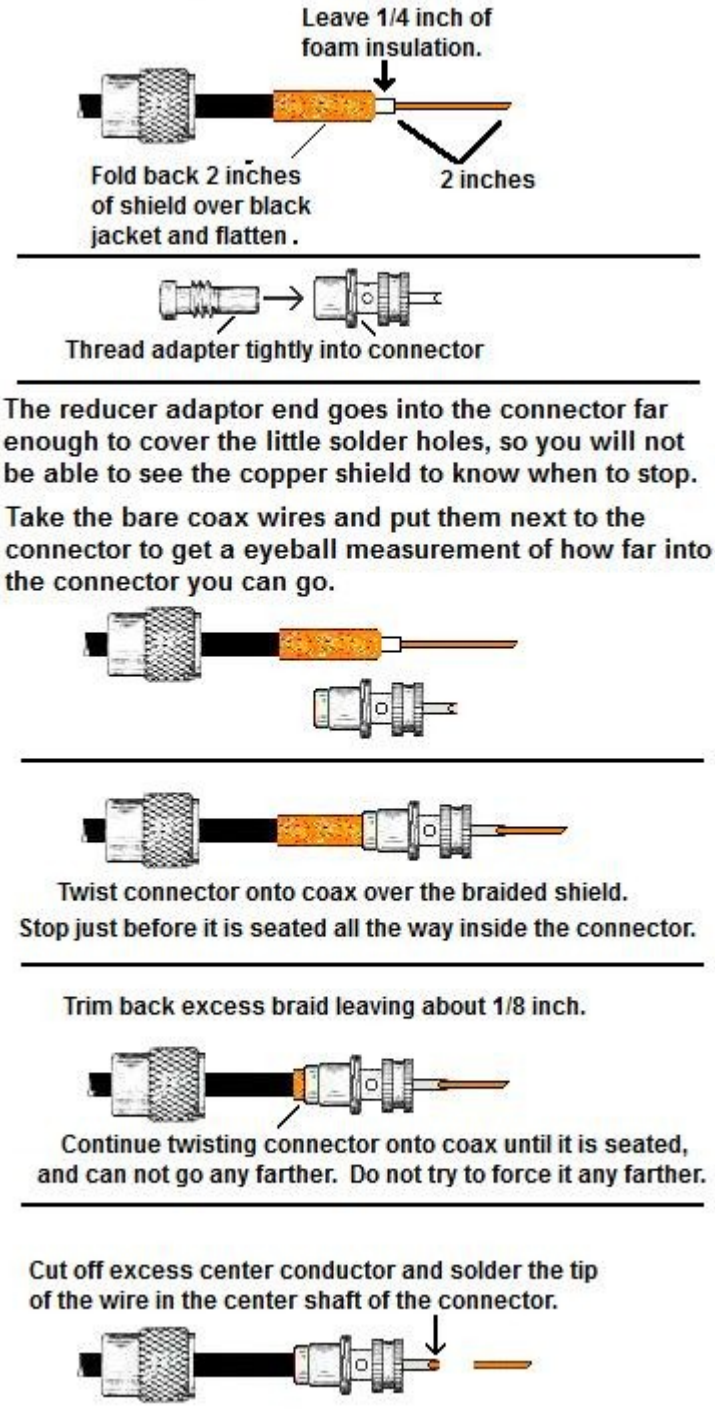
As you can clearly see, all of the shield wires are still in tact and none of them are broken or mangled. You can even see the crinkles in the wires where the threads of the connector gripped into the shield wire strong and firm enough to make a solid contact over the full 360 degrees of the inside of the connector. You can also notice that the connector threads gripped the wires hard enough to scrape the tin coating from the copper shield, exposing the copper color of the wire. But not so hard that it damaged the wire.

RG-58 and RG-8X coax.

You may be wondering how this method works for smaller diameter coax. If done right, it works very well. But it is an option if you still prefer your way. When removing the black jacket and folding back the braided shield wire, do not sleeve it back so tightly. Just push it back lightly and it will be thicker to slide the connector over it firmly. The smaller coax adaptor does not have threads inside to grip the wire. If it still feels a little lose, put a piece of electrical tape on the jacket, then bring the braid back over it. This will add thickness to it for a firmer connection. You can use more tape if necessary. I have done this for all of my indoor jumpers of RG-8X, and once again, they have never failed me for good performance.

Figure E below is pretty self explanitory after seeing how it was done for the RG-8 type coax.

RG-58 & RG-8X



Some Very GOOD Advice To Follow

Two small pieces of advice to all newer radio operators that experienced hams SHOULD already know.

1. **NEVER NEVER NEVER use crimp connectors!!!!** They are not good connections and they will fail. Crimp connectors are why cables you buy with pre-installed connectors provide poor SWR, less

power to the antenna, and why they always fail. Come on people, wise up. You are not making a simple cable TV jumper connection here. You are putting connectors on coaxial cable that will carry high power raw RF going through these bad boys to your big expensive quality antenna. Use a real connector that has to be soldered. Unless you don't care about quality.

2. **NEVER NEVER NEVER buy coax with pre-installed connectors already on it.**

They use those crappy crimped-on connectors I just talked about, and they will fail. They let water in to arch and burn out the center conductor wire. Most of the time, the coax they use is not a good grade of quality either. Learn how to install the connector yourself even if it is a royal pain in the butt. You will have a better connector and a better connection that will last for many years if you do it yourself. It's not rocket science. It's just a connector, and it's YOUR expensive radio at stake.

If you have any questions or comments about this article, please feel free to contact me at

k3dav@msn.com