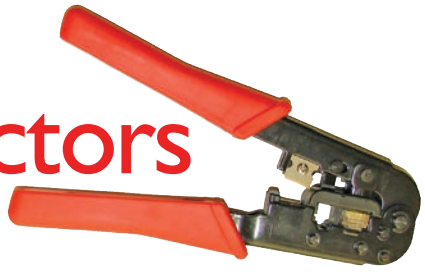
Installing Coax Crimp Connectors



Dino Papas, KLØS

I have never liked installing coax connectors. I think this was due to the fact that I did it so infrequently, each time seemed like the first time — and we all know what *that* is like. Finally, I broke down and bought some specialty tools and coax crimp connectors, and I haven't looked back since.

Tools

I find that a ratcheting crimping tool with a set of interchangeable dies is essential for this task. The ratcheting action is necessary to apply the proper crimping force, and a selection of die sizes ensures the proper amount of crimp for a chosen connector. The tool is also useful for Anderson Powerpole connectors and wire terminals. My ratcheting crimper is part of the Andy-Crimp Pro set sold by Quicksilver Radio. The set also includes cable cutters and strippers.

Rounding out my coax tool set is DX Engineering's Coaxial Cable Tool Kit that, while intended for preparing coax for solder connectors, also makes easy work of preparing coax for crimp connectors. They also sell a ratcheting crimp tool set (DXE-UT-KIT-CRMP2) for use with Amphenol Connex crimp-on connectors.

Crimping tool photo courtesy of Appaloosa, Wikimedia Commons.

The right tools make this task a cinch.

Step-by-Step Process

I'll illustrate the crimping process with two differently sized type N connectors (see Figure 1) and attach them to both the LMR-400 cables and the thinner LMR-240 cables.

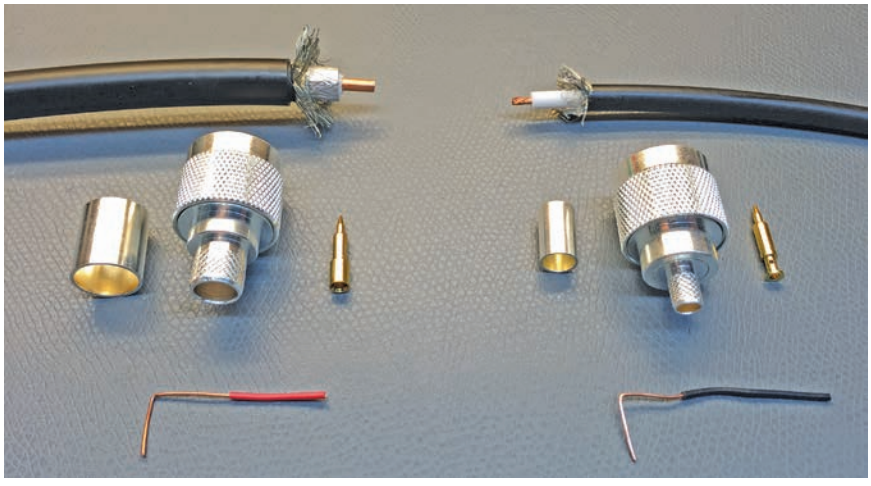


Figure 1 — On the left, a type N crimp connector for LMR-400 coax cable and, on the right, a type N crimp connector for the thinner LMR-240 coax cable. The two **L**-shaped wires at the bottom are homemade stripping gauges made by inserting a piece of wire into the connector body and bending it where it stops.

Step 1: Square the end. Cut a small piece from the cable end with a large, sharp cable cutter to get a straight, flush cut across the end. If the cutter is dull or too small, it will deform the end of the cable. Now, slip the ferrule and a length of heat-shrink tubing onto the cable (see Figure 2).

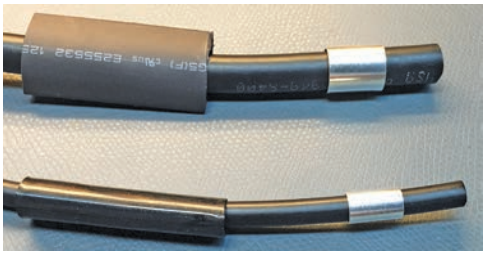


Figure 2 — Start with a square cut across the cable end and slide on the ferrule and a piece of heat-shrink tubing.

Step 2: Expose the braid. For LMR-240 cable, I use the DX Engineering green coax prep tool's **1ST CUT** opening to expose ⅝ inch of braid and aluminum shield. For LMR-400 cable, I use the similar red coax prep tool's **2ND CUT** opening to expose ¾ inch of braid and shield. Both tools make a spiral cut that proceeds until the wire end hits a stop (see Figure 3). A rubber jar-opening pad helps to grip the wire.

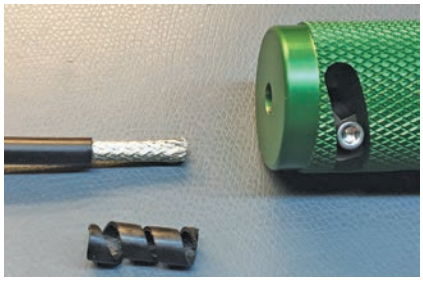


Figure 3 — The cable's outer covering is removed to expose the braid or shield.

Step 3: Prepare the braid. Slide the ferrule up to the braid and pull the braid back and down tight over it. Use a sharp pick to pull the braid outwards and perpendicular to the cable. Then, use a very sharp set of cutters to trim the exposed braid length by roughly half (see Figure 4). Before crimping, the ferrule must slip over and cover the braid, so it's best not to trim the braid too short at this point. With LMR-240 cable, I carefully slice the foil shield lengthwise along the dielectric on the opposite side of where the foil is split. Then, peel the cuts down to create two strips of foil and trim them to match the length of the trimmed braid. With the thicker LMR-400 cable, you can simply leave the foil in place around the dielectric.

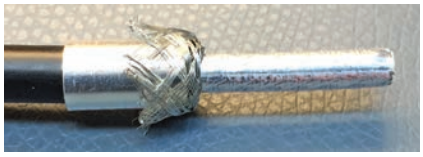


Figure 4 — The cable braid shown trimmed and folded back.

Step 4: Prepare the exposed dielectric. Once the center insulating dielectric has been exposed, use a purpose-made measuring gauge to mark how much dielectric to remove to expose the center conductor. Make a new gauge for each type of connector by inserting piece of scrap wire into the end of the connector body until it stops. Then, bend it over the edge of the connector into an **L** shape, with the bottom leg of the **L** representing the reference length. After marking the cut position, use a conventional "finger twirl" coax stripping tool to cut the dielectric (see Figure 5). Make sure the end of the dielectric is a clean square cut.

Figure 5 — The measured amount of dielectric is marked and then removed.

Step 5: Prepare the center pin. Use the center pin to mark the depth of the center conductor necessary to have the pin sit flush to the dielectric, and then clip the center conductor at this point (see Figure 6). Before crimping or soldering the pin to the center conductor, test fit the connection to ensure the center pin comes up flush with the end of the connector by dragging your fingertip across the top and feeling for the tip's sharp point.

Figure 6 — The center pin being fitted.

Step 6: Prepare the connector. First, make sure that there is no short from the braid or shield to the center conductor, and then firmly push the connector onto the coax (see Figure 7). Next, slide the ferrule over the braid or shield until it's flush with the connector body and trim off any protruding braid strands. The connector is now ready for crimping.

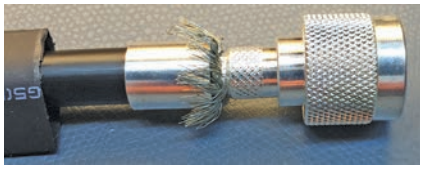


Figure 7 — The connector must be firmly pushed onto the coax.

Step 7: Crimp the connector. Select the proper die and place it over the ferrule, flush against the connector body, and then squeeze the ratcheting crimp tool handles until they automatically release, indicating the completion of the operation. Figure 8 shows an unmounted die positioned properly on a ferrule for an LMR-240 connector.

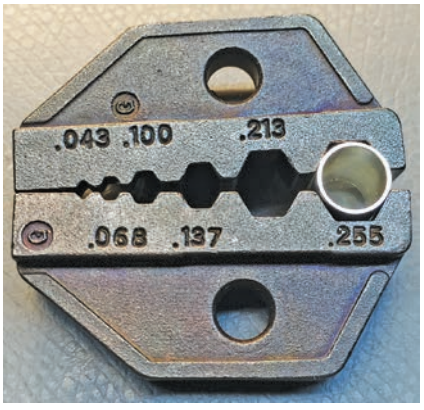


Figure 8 — An unmounted die, illustrating proper placement of ferrule for crimping.

Step 8: Finishing. Slide the heat-shrink tubing over the ferrule, flush with the connector body, and set it with a heat gun. Finally, add an ID label for a professional touch (see Figure 9).

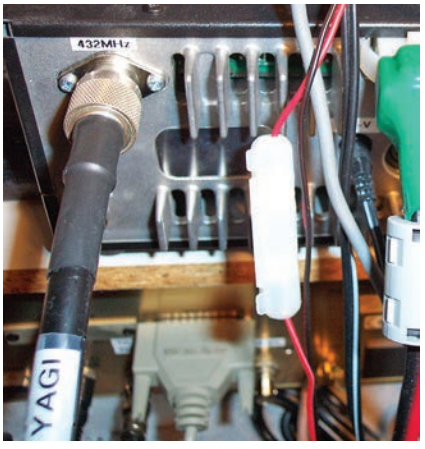


Figure 9 — LMR-400 cable with type N crimping connector, finished with heat-shrink tubing and an ID label.

Conclusion

Learning to crimp coax cable connectors will definitely take some practice. You can cut some scrap pieces of coax and prepare the ends for a crimp-on connector. As long as you don't solder or crimp the center conductor pin or crimp the ferrule, you can use the components over and over again until you get the hang of it. Alan Wolke, W2AEW, has an excellent YouTube instructional video about crimping that is worth watching.[1]

[1]A. Wolke, W2AEW, **www.youtube.com/watch?v=ktQVwfo-s9w**.

Photos by the author.

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