

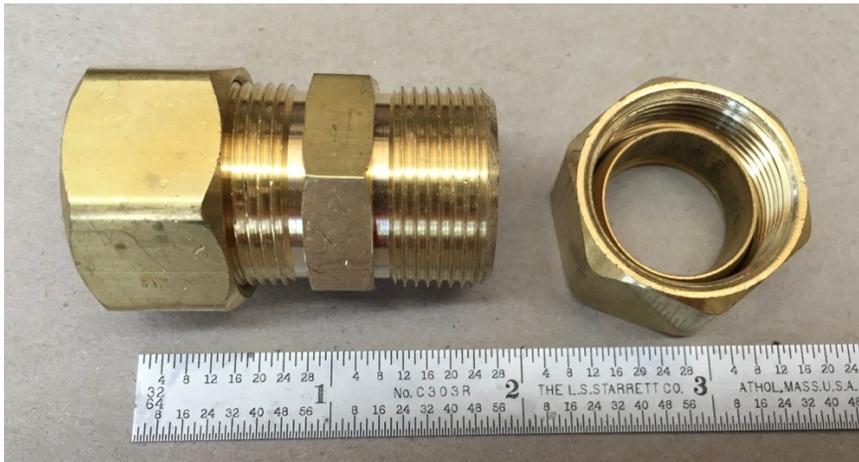
UHF Female Connector for 3/4-inch CATV Hardline

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CATV hardline is often cheap or even free, making it popular for ham radio use even though it's 75 ohms. It comes in several diameters; this article addresses the 3/4-inch OD version. The challenge is installing connectors. Since most of us use UHF (PL-259) types, here is one way of making that termination from common hardware. Since I have a machine shop with a lathe, life is easier, but you could do this with simpler tools.

The aluminum shield is exactly 3/4 inch diameter, so we start with a 3/4-inch brass compression union. Half of it, just beyond the hexagonal center section, will be cut off in the lathe. You could do this with a hacksaw, then clean it up with a file. Keep the spare nut and compression ring, just in case.

FYI, there is some confusion about tubing sizes and fittings. Refrigerator tubing—the soft, flexible kind—has an outside diameter that is exactly equal to the nominal diameter: 3/4 inch tubing is in fact exactly 0.750" diameter. Meanwhile, rigid copper pipe (type L or M) follows a different size schedule and its OD is larger than the nominal diameter by exactly 1/8 inch. Compression fittings are available for both systems. The particular fitting I bought was an **Anderson Metals 50062-12**, available at Amazon.



A generic PL-258 double-female UHF connector with PTFE center insulator is chosen because that Teflon won't melt during soldering. It will have a tight fit when pressed onto the cable's center conductor, which is about 6 to 10 mils oversized compared to a standard PL-259 pin.

The threads on one end must be reduced in diameter to fit the bore of the compression fitting. Alternatively, the fitting could be bored out. The objective is a close fit suitable for soldering. Bore diameter was 0.564 in while the threads were 0.620. So the bore could have been carefully drilled 5/8" and the fit would likely be acceptable. Instead, I chose to turn the threads down on the lathe, holding the connector with a 5/8 collet.



Here are the parts, ready for soldering.



A torch is required for soldering. Be sure that the parts are squeaky-clean. Fine steel wool works great to remove any oxidation. Apply flux to the parts before slipping them together. I use the paste flux sold for soldering copper pipe; it washes off with water. Balance the parts on the end of a steel rod or maybe a large socket to keep the end of the connector flush with the end of the bore in the fitting. Wrap a piece of 1/16" solder around the joint and heat from the bottom. It'll flow into the joint real nice. Don't overheat. When cool, scrub everything off with water and alcohol as needed.



Prepare the CATV cable as follows. Be sure the end you're working on is undamaged and has no kinks.

1. Remove the outer insulation, if present, at least 1.25 inches from the end.
2. Use a tubing cutter to make a clean cut thru the aluminum shield 1/4 inch from the end.
3. Remove all the foam insulation with a knife. The objective is to have a clean 1/4-inch long center conductor exposed.

4. Clean any contamination off of the center conductor, leaving only shiny copper. I use 400-grit silicon carbide paper. Don't get carried away and cut all the way through to the aluminum core. If you do, start over. Use a fine file to create a very slight chamfer on the end of the conductor, making it easier to insert into the connector.
5. Apply dielectric grease to the center conductor and the exposed dielectric. I recommend Dow Corning 4 compound. This will repel any moisture that enters.
6. Since we are mating brass to aluminum, it is mandatory that you apply an anti-corrosion compound to the aluminum jacket. Noalox or Penetrox (both zinc-based) are recommended.
7. Slide the connector assembly onto the cable. The connector will be a tight press fit. Make sure it is fully seated and don't let it escape.
8. Using two wrenches, tighten the compression fitting until it has a very firm grip. If disaster strikes, or you need to reuse the whole thing, you can start over because there is another compression collar left over.

After assembly in the field, you should waterproof your connectors in the usual way. This assembly is intrinsically waterproof but water can still leak into your PL-259.