

Using the ICOM OPC-172 FO Connector Clone

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This document offers guidance on how to use the 3D-printed FO cable connectors described at https://github.com/ke0ff/OPC172_CONN. These connectors mate with the HFBR-RMD duplex cable offered by Broadcom. Once the connectors are properly attached to the cable, the result is a fiber-optic connection media that can be used with the EX-766, IC-900, or IC-M800. This document is limited to the preparation required to get the connectors ready to attach and some finishing steps.

Hot-off the Press

Depending on the 3D pre-prep, there may be support structure that needs to be removed once the connector comes off the printer. Once this is accomplished, you should have what is shown in Figure 1.

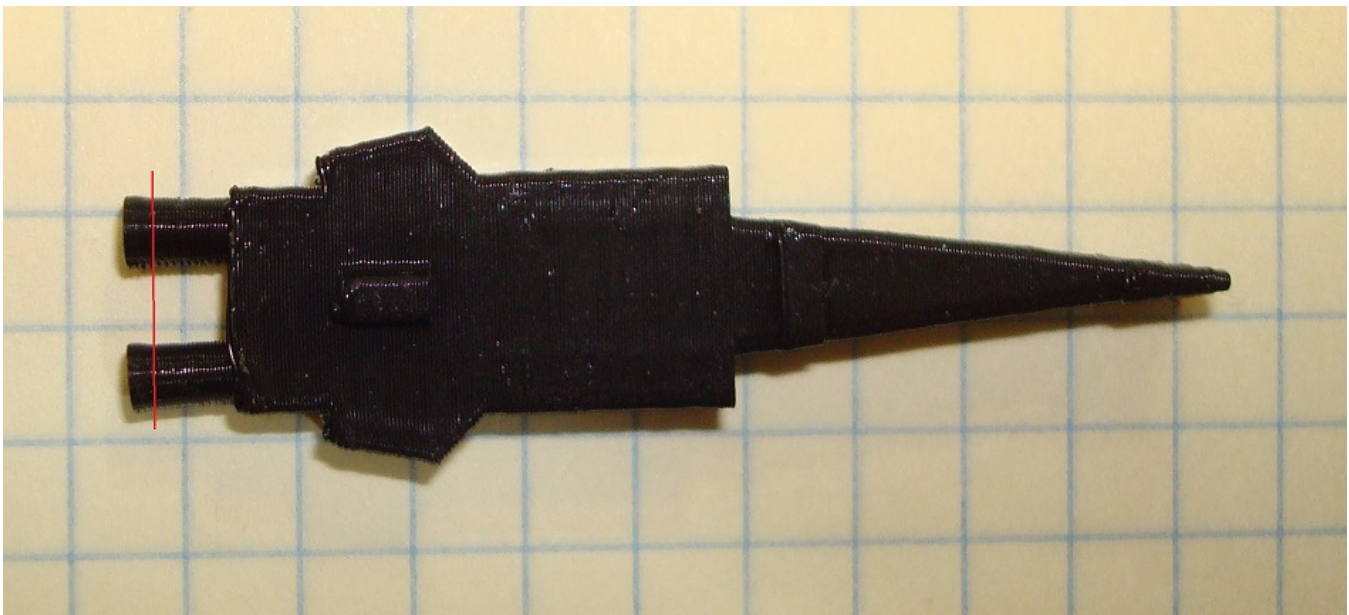


Figure 1. OPC-172 connector showing approximate location of the “cut-line”.

The next step is to “chase-out” the fiber holes. On the cable end, there are two holes that need to be chased to a diameter of 0.09”, +/- 0.01”, about 0.5” +/- 0.1” deep. A drill press with a depth-stop feature is the best choice. Use an X-Y vise to support the piece while drilling. Use proper clamping and other safety techniques and be sure to limit the clamping pressure so that the piece is not damaged.

The hole for the fiber needs to be chased to a diameter of 0.04” +/- 0.01/-0.0”, through. It would be best to also drill this from the cable side, but that requires a special (extra-long) drill bit. If this is not available, drill from the mating end being careful to keep the part true and center the drill on the small cylinders.

Cable Prep

The cable prep for FO is tricky since the “center conductor” is made of a similar material as that of the jacket. Removing the jacket without nicking the fibers is the primary challenge. Short of using a tool specific to the Broadcom cable, I can only say to use great care, and good luck.

As to the stripping dimensions, the duplex cable should be split to separate the two fiber jackets for a length of about 4 – 6 inches. This provides a stress relief zone for the cable. Strip each fiber to expose at least 3/4”. This should leave between 1/8” and 1/4” of fiber extending out the end of the connector.

Final Assembly

Once the cable is stripped, carefully thread each fiber into the connector. With the stress relief cut as described above, each fiber can be inserted individually. Wrap a couple of inches of Scotch-88 electrical tape tightly around the tapered end of the connector and secure with two small cable ties.

When finishing the second connector, make sure that the fibers “cross” from one connector to the other. The Broadcom cable has a stripe to identify the fibers. If you place the two connectors side-by-side, with the cable ends adjacent to each other, You want the striped fiber to be at the top (as viewed in Figure 1) of one of the connectors and at the bottom of the other. If the connectors are assembled so that they are identical, the cable won’t work.

Once the cable is secure to the connectors, use a sharp box-cutting razor knife to trim the cylinders at the mating end at the cut-line depicted in figure 1. The cylinders should extend no more than 0.125” from the main body of the connector.

It won’t hurt to sand the ends of the fibers with 2000 or 3000 grit wet/dry sand paper, but this should not generally be necessary except for very long (greater than 10m or so) cables.

References

ICOM OPC-172 Cable Clone, © 2021, Joseph Haas, https://ke0ff.github.io/MobileRadio/ICOM_OPC-172_Cable_Clone.pdf

OPC-172 3-printed Connector Clone source and STL files, https://github.com/ke0ff/OPC172_CONN

ICOM Instruction Manual, IC-901A/E, A-5078S-1EX, © 1989, ICOM Inc., 6-9-16 Kamihigashi, Hirano-ku, Osaka 547, Japan

ICOM Service Manual, IC-901A/E, A-5078S, © 1990, ICOM Inc., 6-9-16 Kamihigashi, Hirano-ku, Osaka 547, Japan

HFBR-RMD005Z: Cable, Duplex, Fiber-Optic, 5m, Avago (Broadcom) Technologies, <https://docs.broadcom.com/docs/AV02-1508EN>, (web site observed on 7/2/2017)