

## Applications Note: Making CTI Network Cables

This Applications Note describes how to make your own modular cables for use in connecting modules in the CTI network.

### Overview:

The CTI network employs the same familiar 4-conductor cables widely used to connect modular telephones. These can be purchased in a variety of lengths directly from CTI, or from virtually any electronics or home supply store.

However, making your own modular cables is remarkably easy, and is a great way to save money when construction your CTI network. The tools and raw materials required are very inexpensive, and can be found at any electronics store. And making your own cables lets you customize their length to match you layout's needs, keeping your wiring neat and clean.

### Materials Needed:

The following tools and materials are all you'll need. Part numbers and advertised prices for various suppliers (accurate at the time this app note was written) are also shown.



Combination modular strip and crimp tool



4-conductor modular phone cable



6 position/4 conductor "RJ11" modular crimp plug (2 per cable)

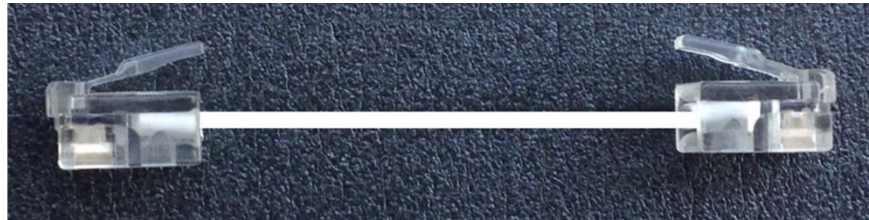
	Home Depot	DigiKey	Mouser
Modular Strip/Crimp Tool	538443 (\$28.98)	TEL-6030 (\$27.49)	382-2196 (\$16.43)
4-Conductor Cable	186249 (\$17.98/50')	AT-K-26-4-W/100 (\$12.23/100')	172-UL4210 (\$52.55/1000')
6P4C RJ11 Crimp Plug	324778 (\$0.44)	A-MO 6/4-F50 (\$0.22)	530-940-SP-3046 (\$0.17)

## Making Cables:

In general, making cables is self-explanatory. After cutting a section of bulk 4-conductor cable to the desired length, use the stripper portion of the tool to remove a small amount of the outer plastic sheath from each end of the cable. (Most tools provide a physical “stop” to ensure the optimal amount of insulation is removed.) Then fully insert each stripped end of the cable into an RJ11 modular plug, and using the crimp section of the tool, squeeze it permanently in place.

The only aspect of the cable making process that requires some clarification is the relative orientation of the RJ11 plugs at each end of the cable. There are two styles of modular cables: commonly termed “*phone*” cables and “*data*” cables. The CTI network was designed to use “*phone*” style cables, since these are universally available in the U.S as a result of their use in modular telephones. If you buy a modular cable in the U.S. you can usually rest assured it will be the correct “*phone*” style cable. However, users living in countries that do not employ the modular telephone wiring standard should use caution. If you buy a ready-made cable in those countries, there’s a good chance it may be a *data* cable, which will not work with CTI.

Telling the difference between the two types of cables is easy, as shown in the illustrations below. Lay the cable out perfectly flat end-to-end, with no twists. If the spring clips on the crimp plugs are both on the same side of the cable, you have a “*phone*” cable. If the clips are on opposite sides of the cable, the cable is a “*data*” cable.



A Modular “*Phone*” Cable (side view)  
(The **correct** cable orientation for use with the CTI network)



A Modular “*Data*” Cable (side view)  
(The **incorrect** cable orientation for use with the CTI network)

For convenience, manufacturers of modular cable provide a visible and tactile marker on the outer cable sheath (usually a raised ridge running the length of the cable). Using this marker as a guide, align the modular plugs so that the spring clips are on the same side at both ends (which side of the cable you choose doesn’t matter).