

Fabricating Your Own Ethernet Cable

Note: This guide assumes that you wish to create a cable that includes Power-over-Ethernet (PoE) by a means other than the use of a power injector. Power injectors are available to allow you to connect a voltage source to an Ethernet cable. They will only inject the power in one direction. If using power injectors on a BAD BOY series installation, one injector will be required for each device.

Bitstorm recommends that you purchase your cable from Bitstorm. The cables are pre-tested with 3 ft (1m) red and black power leads and fuse holder and are available in convenient lengths of 40, 80, 120, 160 and 200 ft (12, 24, 37, 50, 60 meters) and come complete with a splicing junction box for deck or wall transits. However, making your own cable provides you with the ability to customize an installation to suit your specific needs.

Step 1 Acquire the Length and Type of Cable

Depending on where the cable will be used will determine the type of cable, with many colours and types being available. Bitstorm recommends outdoor rated, UV protected, PVC jacket, 26 awg solid or stranded cable.

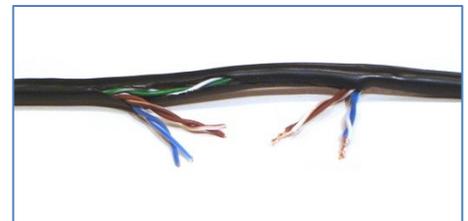
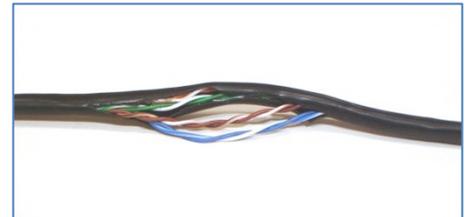
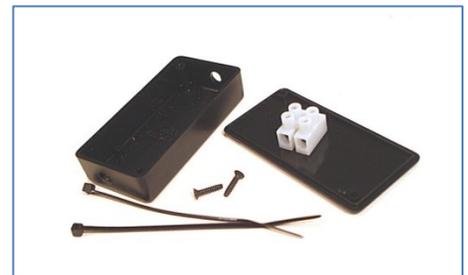
Step 2 Creating a Power Splice

Determine which end of the cable is to receive power. If your cable will include the optional BAD BOY Unleashed, both ends of the cable will require power. There are a number of methods to create a power splice, but the two described following use **Junction Box** or **Splicing** method. It is also recommended that the circuit be protected by a fuse of no more than 5A. Please read all instructions.

NOTE: Power splices are not weatherproof and should never be left exposed to the elements.

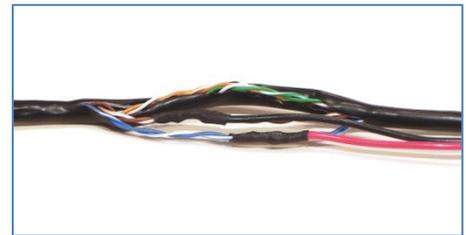
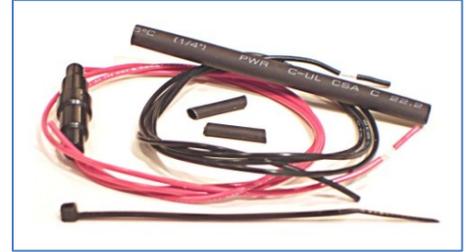
Method 1 Junction Box (Preferred Method)

- Parts required: small plastic junction box, a 2 position screw terminal strip, red and black power wire, 2 tie wraps and an inline fuse holder with fuse. These are relatively inexpensive and can be found at most electronic supply stores.
- Drill 2 holes adequate for the size of the wire, usually at either ends of the box.
- Being carefully to not cut any of the wires in the cable, cut through the cable jacket and slit the jacket open to provide access to the wires.
- Feed the cable into one of the holes of the junction box and out the other and position the box so that the removed jacket is now inside the box. Pull through extra cable as necessary to make working easier.
- Locate the Blue, Blue/White, Brown and Brown/White wires. Cut these at about the middle of the exposed wires and strip about 1/4 to 3/8 inch (5-10mm) of insulation from each of the four cut wires that go to the end requiring power. Do all wires if power is required at both ends.
- Electrically connect the Blue and Blue/White wire pair to each other. Do the same for the Brown and Brown/White wire pair. See photo.
- Connect the wires to the terminal block. If not required, leave the Blue and Brown pairs for the unpowered end disconnected from the terminal strip. Attach the Red power wire (+ Pos) to the Blue pair and the Black wire (- Neg) to the Brown pair. The fuse holder can be put inside the box as well. **Tip:** Dielectric grease can be applied to prevent corrosion.
- Fit everything into the junction box and attach small tie wraps to the cable inside the box at both holes to act as a strain reliefs.
- With CAT5 cable ends unplugged and no power applied, use an ohm meter to verify that the power leads show infinite resistance to each other. Any conductance between wires should be corrected before continuing. Attach box cover.



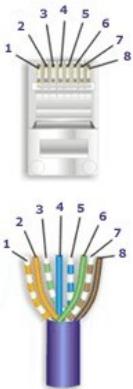
Method 2 Splicing

- Parts required: 3/8" and 1/4" shrink wrap, red and black power wire, small tie wrap and an inline fuse holder with fuse.
- At the location best suited to your needs, cut through the outer jacket of the cable being careful to not cut any of the wire pairs. Cut a slit through the jacket of the cable to a length of about 4" (10cm).
- Locate the Blue and Blue/White wire pair and extract them from the cable so that they can be worked with. Cut this pair and strip back the insulation and electrically join the two wires. If power is required at both ends, join both pairs together. Otherwise use only the pair going to the cable end to be powered. **Tip:** Make this cut about 1/3 from one end of the slit.
- Slip on lengths of 1/4" heat shrink wrap for the connections about to be made.
- Electrically connect the Red power wire to the Blue and Blue/White pair(s) and solder. Slide the heat shrink wrap over the joint and shrink into place.
- Locate the Brown and Brown/White wire pair and extract them. As with the Blue pair, cut and strip back the insulation and electrically join the two wires going to the end that requires power. If power is required at both ends, join both pairs together. **Tip:** Make this cut about 1/3 from the other end of the slit. This will stagger the power wire splices. Refer to photo.
- Electrically connect the Black power wire to the Brown and Brown/White pair(s) and solder. Slide the heat shrink wrap over the joint and shrink into place.
- Work all wire pairs and the power splices back inside the jacket as much as possible. This will provide added protection for the wires.
- Slip a length of 3/8" heat shrink over the slit until covered and shrink into position. The Red and Black power wires can come out from either end.
- Put a small tie wrap over the shrink wrap at the end where the power wires come out. This will act as a strain relief should the power wires be pulled.



Step 3 Crimp on CAT5 Connectors

Ensure that the wires are organized in the following order (EIA-568-B spec):



Pin	Wire Colour	Name
1	White /Orange	TX+
2	Orange	TX-
3	White /Green	RX+
4	Blue	VDC+
5	White /Blue	VDC+
6	Green	RX-
7	White /Brown	VDC-
8	Brown	VDC-

Step 4 Testing the Cable

Use your fabricated cable for a computer connection. This will ensure that the connectors are properly crimped and connections are being made. Doing this now can save troubleshooting time later.