

Cable Building Lab

Straight-Thru Cable

In this lab you will learn how to build a Category 5 (CAT 5) Unshielded Twisted Pair (UTP) straight-through Ethernet patch cable to T568-B standard and test it for good connections (continuity).

The following resources will be required:

- Two to three foot length of Cat 5 cabling
- Two RJ45 connectors
- Wire cutter
- Wire Stripper
- RJ45 crimping tools to attach the RJ45 connectors to the cable ends
- Ethernet cabling continuity tester which can test straight-thru cables

Step 1 - Cabling Information

A straight through patch cable (T568-B) can be used to connect a PC workstation to a wall plate in a work area or it can be used to connect from a patch panel in a wiring closet to a hub or a switch. A PC can also be connected directly to a port on a hub or switch with this cable. If a cable will be used to connect from an "uplink" port on one hub to a "crossover" front port on another hub then a straight through cable should be used. The correct wiring scheme for a 568-B is:

Orange/White, Orange, Green/White, Blue, Blue/White, Green, Brown/White, Brown

Step 2 -Create a T568-B straight-thru cable

- Determine the length of the cable, and then add at least 10% to it.
- Cut a piece of stranded Cat 5 unshielded twisted-pair cable to the determined length. You will use stranded cable for patch cables because it is more durable when bent repeatedly. Solid wire is fine for cable runs that are punched down into jacks. For this practice use the supplied cable.
- Strip 1" of jacket off of one end of the cable.
- Hold the 4 pairs of twisted cables tightly where jacket was cut away, then untwist the wires and reorganize the cable pairs into the order of the 568-B wiring standard. Take care to maintain the twists since this provides noise cancellation.
- Flatten, straighten, and line up the wires, then trim them in a straight line to within 1/2" - 3/8" from the edge of the jacket. Be sure not to let go of the jacket and the wires, which are now in order!
- Place an RJ-45 plug on the end of the cable, with the prong on the underside and the orange pair to the left side of the connector.
- Gently push the plug onto wires until you can see the copper ends of the wires through the end of the plug. Make sure the end of the jacket is inside the plug and all wires are in the correct order. If the jacket is not inside the plug, it will not be properly strain relieved and will eventually cause problems.
- If everything is correct, crimp the plug hard enough to force the contacts through the insulation on the wires, thus completing the conducting path.
- Repeat steps 3-8 to terminate the other end of the cable, using the same scheme to finish the straight through cable.
- Test the finished cable and have the instructor check it. How can you tell if your cable is functioning properly?

Cable Building Lab

Rollover Cable

In this lab you will learn how to build a Category 5 (CAT 5) Unshielded Twisted Pair (UTP) Rollover Ethernet patch cable to T568-B standard and test it for good connections (continuity).

The following resources will be required:

- Two to three foot length of Cat 5 cabling
- Two RJ45 connectors
- Wire cutter
- Wire Stripper
- RJ45 crimping tools to attach the RJ45 connectors to the cable ends
- Ethernet cabling continuity tester which can test rollover cables

Step 1 - Cabling Information

It can be used to connect a workstation or dumb terminal to the console port on the back of a router or Ethernet switch in order to be able to configure the router or switch. This cable uses an asynchronous serial interface to the router or switch (8 data bits, No parity and 2 Stop bits). Both ends of the cable you build will have RJ45 connectors on them. One end plugs directly into the RJ45 console management port on the back of the router or switch and the other end plugs into an RJ45-to-DB9 terminal adapter. This adapter converts the RJ 45 to a 9-pin female D connector that plugs into the DB9 serial port male adapter on the back of a PC running terminal emulation software such as HyperTerminal. The correct wiring scheme for a 568-B is:

Orange/White, Orange, Green/White, Blue, Blue/White, Green, Brown/White, Brown
To
Brown, Brown/White, Green, Blue/White, Blue, Green/White, Orange, Orange/White

Step 2 -Create a T568-B rollover console cable.

- Determine the length of the cable, and then add at least 10% to it.
- Cut a piece of stranded Cat 5 unshielded twisted-pair cable to the determined length. You will use stranded cable for patch cables because it is more durable when bent repeatedly. Solid wire is fine for cable runs that are punched down into jacks. For this practice use the supplied cable.
- Strip 1" of jacket off of one end of the cable.
- Hold the 4 pairs of twisted cables tightly where jacket was cut away, then untwist the wires and reorganize the cable pairs into the order of the 568-B wiring standard. Take care to maintain the twists since this provides noise cancellation.
- Flatten, straighten, and line up the wires, then trim them in a straight line to within 1/2" - 3/8" from the edge of the jacket. Be sure not to let go of the jacket and the wires, which are now in order!
- Place an RJ-45 plug on the end of the cable, with the prong on the underside and the orange pair to the left side of the connector.
- Gently push the plug onto wires until you can see the copper ends of the wires through the end of the plug. Make sure the end of the jacket is inside the plug and all wires are in the correct order. If the jacket is not inside the plug, it will not be properly strain relieved and will eventually cause problems.
- If everything is correct, crimp the plug hard enough to force the contacts through the insulation on the wires, thus completing the conducting path.
- Repeat steps 3-8 to terminate the other end of the cable, using the reverse scheme to finish the rollover cable.
- Test the finished cable and have the instructor check it. How can you tell if your cable is functioning properly?

Cable Building Lab

Crossover Cable

In this lab you will learn how to build a Category 5 (CAT 5) Unshielded Twisted Pair (UTP) Crossover Ethernet patch cable to T568-B/A standard and test it for good connections (continuity).

The following resources will be required:

- Two to three foot length of Cat 5 cabling
- Two RJ45 connectors
- Wire cutter
- Wire Stripper
- RJ45 crimping tools to attach the RJ45 connectors to the cable ends
- Ethernet cabling continuity tester which can test Crossover cables

Step 1 - Cabling Information

This cable will conform to the structured cabling standards and, if it is used between hubs or switches, is considered to be part of the "vertical" cabling also known as backbone cable. A crossover cable can be used as a backbone cable to connect two or more hubs or switches in a LAN or to connect 2 isolated workstations to create a mini-LAN. This will allow you to connect two workstations together or a server and a workstation without the need for a hub between them.

The correct wiring scheme for a 568-B is:

Orange/White, Orange, Green/White, Blue, Blue/White, Green, Brown/White, Brown

The correct wiring scheme for a 568-A is:

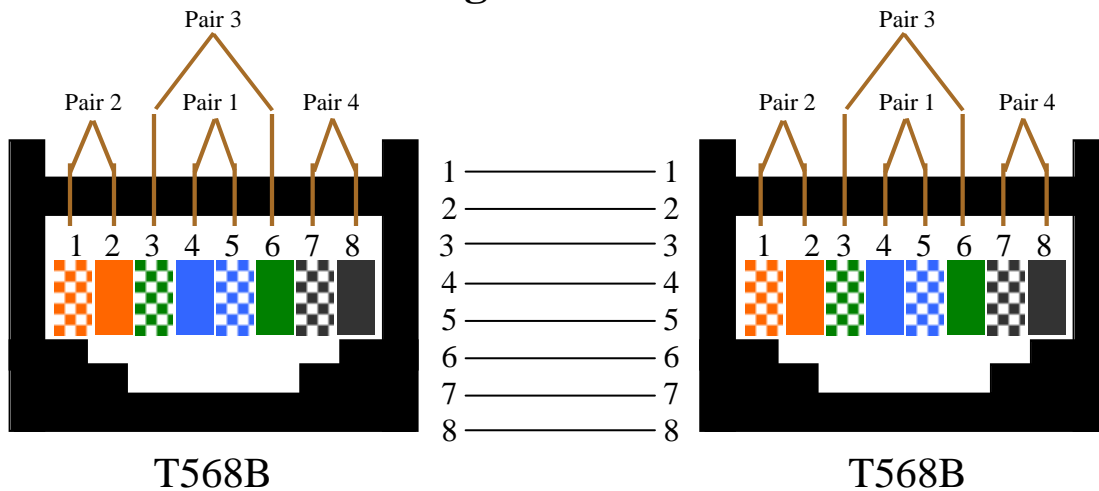
Green/White, Green, Orange/White, Blue, Blue/White, Orange, Brown/White, Brown

Step 2 - Create a T568-B/A Crossover cable.

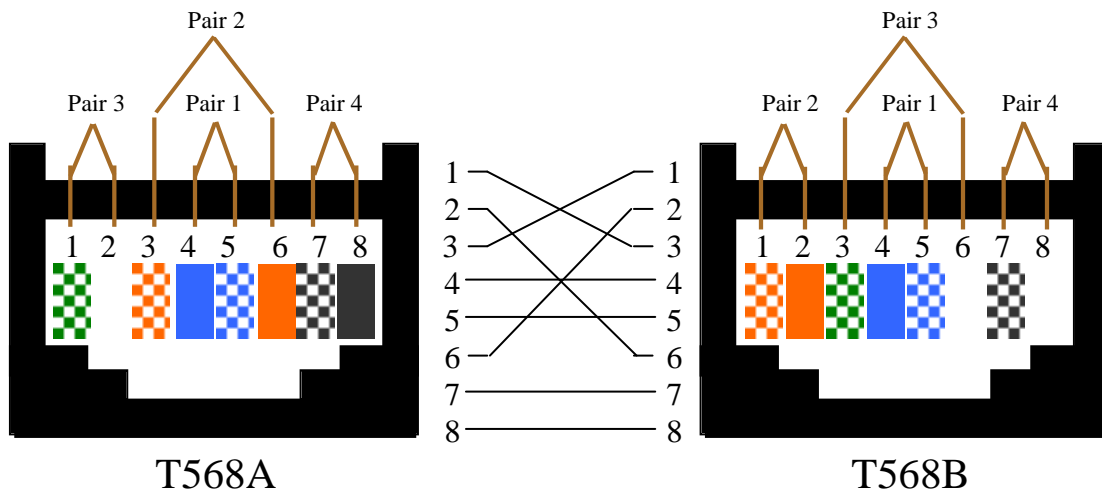
- Determine the length of the cable, and then add at least 10% to it.
- Cut a piece of stranded Cat 5 unshielded twisted-pair cable to the determined length. You will use stranded cable for patch cables because it is more durable when bent repeatedly. Solid wire is fine for cable runs that are punched down into jacks. For this practice use the supplied cable.
- Strip 1" of jacket off of one end of the cable.
- Hold the 4 pairs of twisted cables tightly where jacket was cut away, then untwist the wires and reorganize the cable pairs into the order of the 568-B wiring standard. Take care to maintain the twists since this provides noise cancellation.
- Flatten, straighten, and line up the wires, then trim them in a straight line to within 1/2" - 3/8" from the edge of the jacket. Be sure not to let go of the jacket and the wires, which are now in order!
- Place an RJ-45 plug on the end of the cable, with the prong on the underside and the orange pair to the left side of the connector.
- Gently push the plug onto wires until you can see the copper ends of the wires through the end of the plug. Make sure the end of the jacket is inside the plug and all wires are in the correct order. If the jacket is not inside the plug, it will not be properly strain relieved and will eventually cause problems.
- If everything is correct, crimp the plug hard enough to force the contacts through the insulation on the wires, thus completing the conducting path.
- Repeat steps 3-8 to terminate the other end of the cable, using the 568-A scheme for the opposite end of the cable.
- Test the finished cable and have the instructor check it. How can you tell if your cable is functioning properly?

RJ45 Pinouts

Straight Thru Cable



Cross-Over Cable or Cross Connect Cable



Roll-Over Cable or Console Cable

