

## Connecting an RJ45 Connector to Category 5 Cable

**Acknowledgements:** Developed by Jesus Casas, Faculty at Austin Community College, Austin, Texas.

**Lab Summary:** This lab demonstrates the connection of an RJ45 connector to Category (Cat) 5 cable.

**Lab Goal:** The goal of this lab is to introduce you to different Cat 5 wiring schemes and the application thereof, in the making of a straight cable or a cross-over cable.

### **Learning Objectives**

1. Connect a Cat 5 cross-over cable to an RJ45 connector.
2. Connect a Cat 5 straight cable to an RJ45 connector.

**Grading Criteria:** This is left up to the instructor.

**Time Required:** 1 hour

### **Lab Preparation**

- Read the WRE Wiring and Cabling Narrative Module.
- Read this document completely before you start on this experiment.
- Print out the laboratory experiment procedure that follows.

### **Equipment and Materials**

Each team of students will need the parts specified below.

Equipment	Quantity
Wire Strippers	1
Crimping Tool	1
Cat 5 Cable	As needed
RJ45 Connector	4



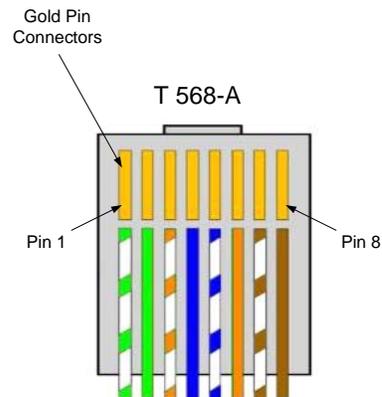
## Introduction

For wiring Cat 5 twisted-pair cable to RJ45 connectors, there are primarily two wiring schemes: T568-A and T568-B. In the wiring schemes, the pin numbers proceed from left to right with the position of the connector as shown in the diagrams.

### T 568-A

#### Pin #   Wire Base Color / Stripe Color

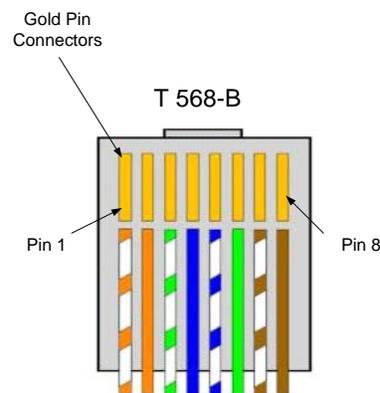
1	White / Green
2	Green / White
3	White / Orange
4	Blue / White
5	White / Blue
6	Orange / White
7	White / Brown
8	Brown / White



### T 568-B

#### Pin #   Wire Base Color / Stripe Color

1	White / Orange
2	Orange / White
3	White / Green
4	Blue / White
5	White / Blue
6	Green / White
7	White / Brown
8	Brown / White



## Building a Straight Cable

To build a straight-through cable such as the type used with hubs, switches, and routers; the cable can use either wiring scheme, but must use the same wiring scheme at both ends of the cable. This provides a pin-to-pin straight through orientation: pin 1 to pin 1, pin 2 to pin 2, etc.

## Building a Cross-Over Cable

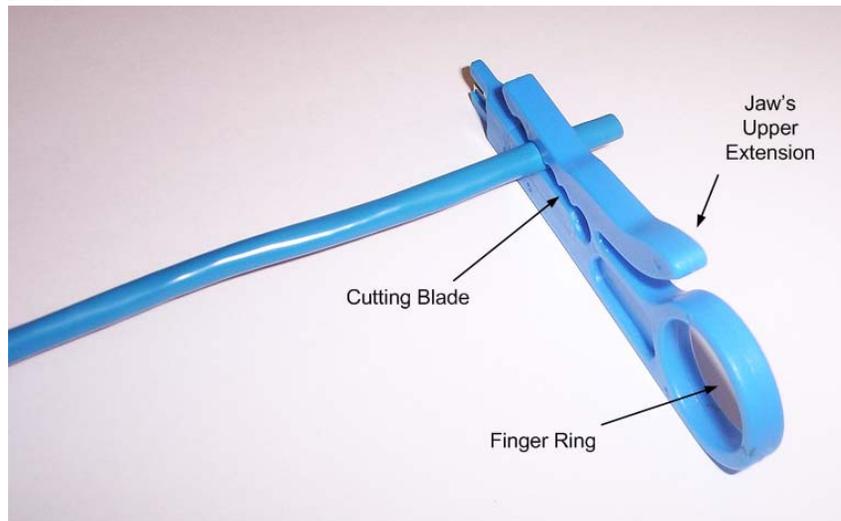
To build a cross-over cable for a direct link between two computers, the cable is built by using the T568-A wiring scheme on one end and the T568-B wiring scheme on the other end. This pin configuration crosses transmit and receive pairs.



<u>One End of the Cable</u>		<u>Other End of the Cable</u>
Pin 1 (TR+)	to	Pin 3 (RCV+)
Pin 2 (TR-)	to	Pin 6 (RCV-)
Pin 3 (RCV+)	to	Pin 1 (TR+)
Pin 6 (RCV-)	to	Pin 2 (TR-)

### Lab Procedure

1. To prepare the Cat 5 cable for an RJ45 connector, approximately one-half inch of the cable's outer insulation needs to be stripped from the end of the cable as shown in the picture below.
  - a. Open the jaw of the stripping tool by pressing down on the jaw's upper extension.
  - b. Place the Cat 5 cable in the second of four openings, starting from the end of the jaw.
  - c. Release the extension so the jaw grips the cable at approximately one-half inch from the cable's end See the following picture.



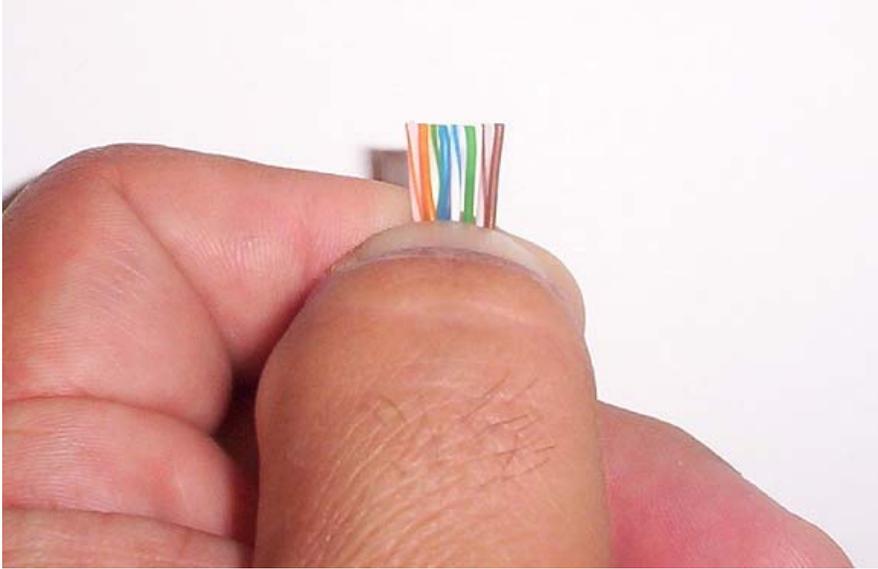
- d. With one of your fingers in the stripping tool's finger ring, rotate the stripping tool all the way around the cable one to two times.
- e. Remove the cable from the stripping tool and slide off the outer insulation that was cut; thereby, exposing the wire pairs as seen in the following picture.



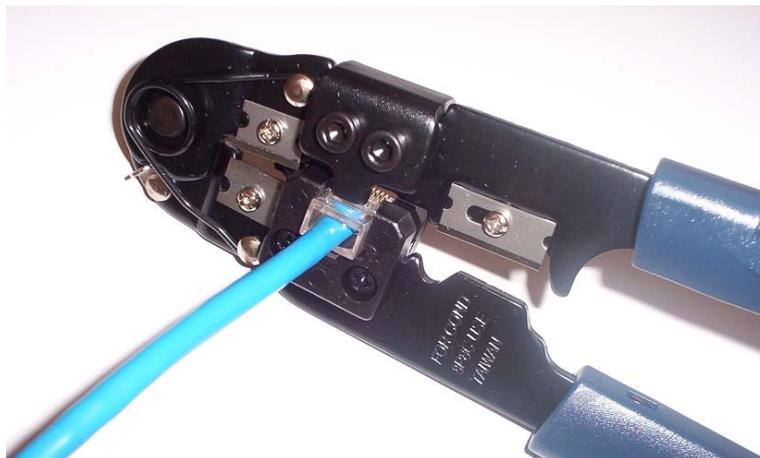
2. Cut off any of the exposed nylon threads and un-twist the conductor pairs.



3. Arrange the wires using a straight cable connection.
4. Trim the wires so as to have a perpendicular cut in respect to the cable. This will ensure that all the wires extend as far as possible into the RJ45 connector as shown below.

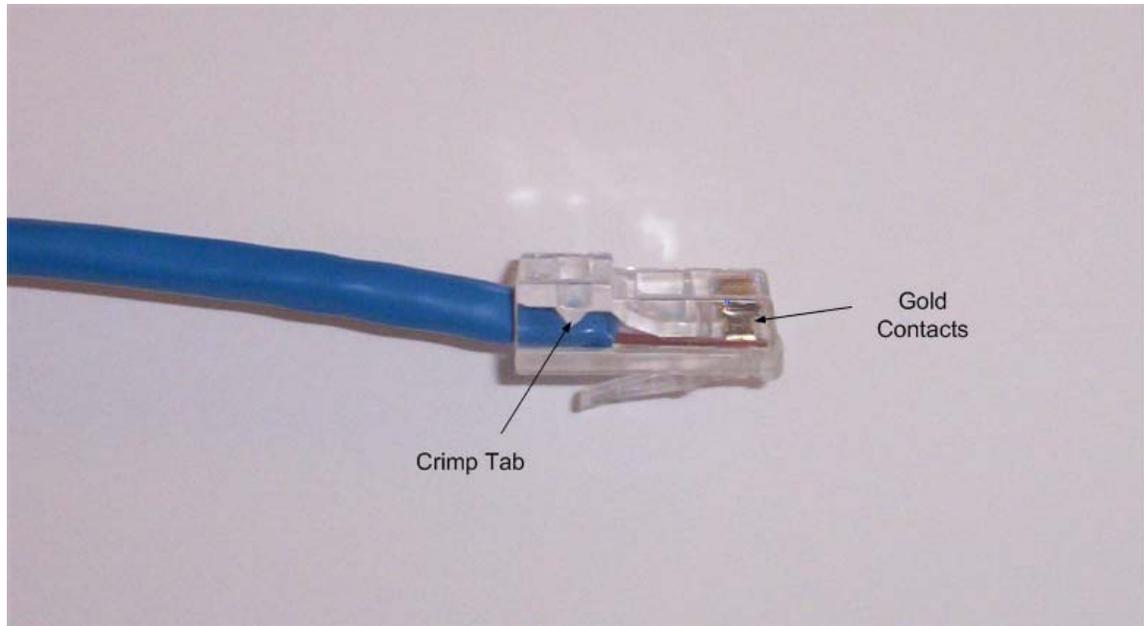


5. While holding the wires in place, as shown in the above picture, insert the wires into the RJ45 connector. Ensure that the gold contacts are facing you. All the wires should extend past the gold contacts to ensure a reliable connection. Slight trimming of the wires may be required to ensure this.
6. Use a crimping tool to crimp the RJ45 connector as shown in the figure below. This process makes an electrical connection between the wires and the gold contacts; and also provides a tight physical connection between the RJ45 connector and the cable.





7. Examine the RJ45 connection to ensure that the insulation of the cable is past the crimp tab. Also, ensure that all the wires are past the gold contacts. Use the picture below as an example.



8. Repeat the exercise using a cross-over connection.