Two 100Mbit Ethernet connections over a single Cat6 cable

Our new home has an Ethernet cable connection from the router to the office, which I used to connect a computer in the office back to the router. But I couldn't get the printer in the office to connect to the remote router via WiFi as the signal would not reliably penetrate the walls.

Rather than installing a switch or router in the office, I decided that I wanted to run two Ethernet connections from the office back to the router. The computer and printer are both 100BASE-T 100Mbit/s Ethernet devices, meaning that they only use two of the four twisted pairs in a Cat6 cable. The house wiring uses gigabit-capable 1000Mbit/s four-pair cable, as is common these days.

I therefore made two cable splitters, one for each end. This allows the computer and printer to run independently over the Ethernet cable wired into the house. Note that gigabit Ethernet requires all four pairs, so using this technique with gigabit devices will force them to revert to 100Mbit mode.

I know that commercial splitters are available (eg, see Jaycar Cat YT6090 and RS 443-9165) but I already had RJ45 connectors, Cat5 cable and a crimping tool so I figured I'd make my own. Plus my splitters incorporate a cable, whereas the commercial splitters needs two extra regular Cat5 cables at each end.

The wiring required is shown in the diagram. Connecting only four wires to the 8-pin RJ45 connector can be a bit of fun. Pins 1, 2 and 3 are easy but pin 6 can be a bit tricky.

First, straighten the wires so that pins 1, 2 and 3 are parallel and close to each other, with a gap between pin 3 and 6. Slide the wires for pins 1, 2 and 3 so they just go into the wire guide slots, then wriggle the wire for pin 6 so it goes into pin 6 wire guide slot. Push all wires into the connecter and crimp it.

I used long nose pliers to expand the connector hoods/boots to allow two thin Cat5 cables to fit. Wet the cables so that the hoods can slide over the two wires, as it is a tight fit. Be careful or you will split the hoods.

**Roderick Wall,
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1 White / Brown
2 Brown
3 White / Blue
6 Blue

1 White / Orange
2 Orange
3 White / Green
6 Green

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