

## AN225

# Split Pairs and Resplit Pairs

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### Abstract

Twisted pair cables with split pairs present a higher impedance path than normal. This application note explains what a split pair is, how to find it with a Step TDR and how to find any resplits.

### General

Whenever twisted pair cable is spliced, punched down or connectorized there is an opportunity for a common error called a “split pair” or “split” for short. A split occurs when one conductor of a twisted pair is spliced into a conductor from a different twisted pair, usually within the same binder group. See Figure 1 and note the white wires from the green and orange pairs are crossed. The split segment will exhibit higher impedance because the two conductors are farther apart when they are from different pairs. This results in increased attenuation of any signal traveling on the split pair. If the cable is resplit, then the split conductor is spliced back with the correct conductor, which restores the signal to the correct pair and restores the pair’s impedance. Figure 2 is the same cable’s split crossed again to form the resplit. Resplits are an example of two wrongs making a “right;” the split was repaired to bring the pairs together again, but the repair was made at the wrong splice. Resplits result in noisier channels and should be corrected when discovered. Once the original split is corrected, the old resplit (if still present) will now read like a split, so it must be changed as well to restore the impedance over the entire length of the pair.

**Split Pair**

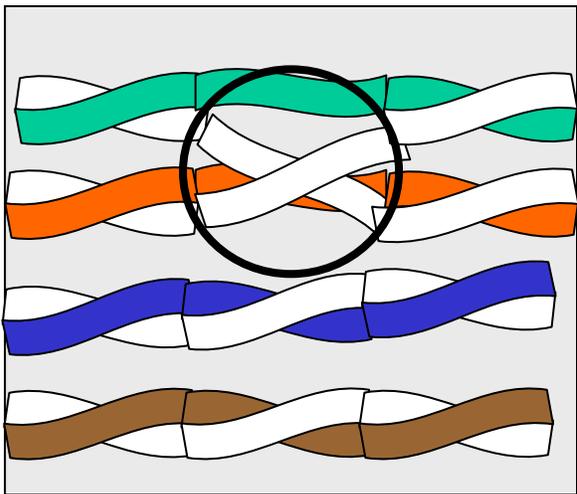


Figure 1

**Resplit Pair**

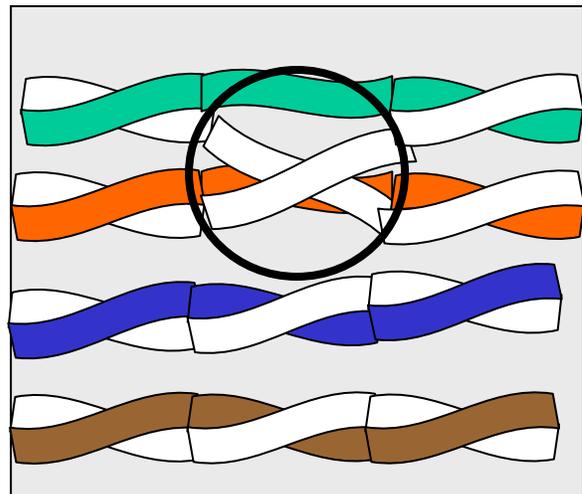


Figure 2

On the 20/20 TDR, a split will show a sudden increase in the impedance ( $Z$ ) of the pair and then a return to nominal impedance at the resplit. Figure 3 shows a split and resplit uploaded from the 20/20 TDR into the TDR PC Vision software. The initial split pair is marked by the red cursor at 24 feet and the resplit is marked by the blue cursor at 38 feet 11 inches.

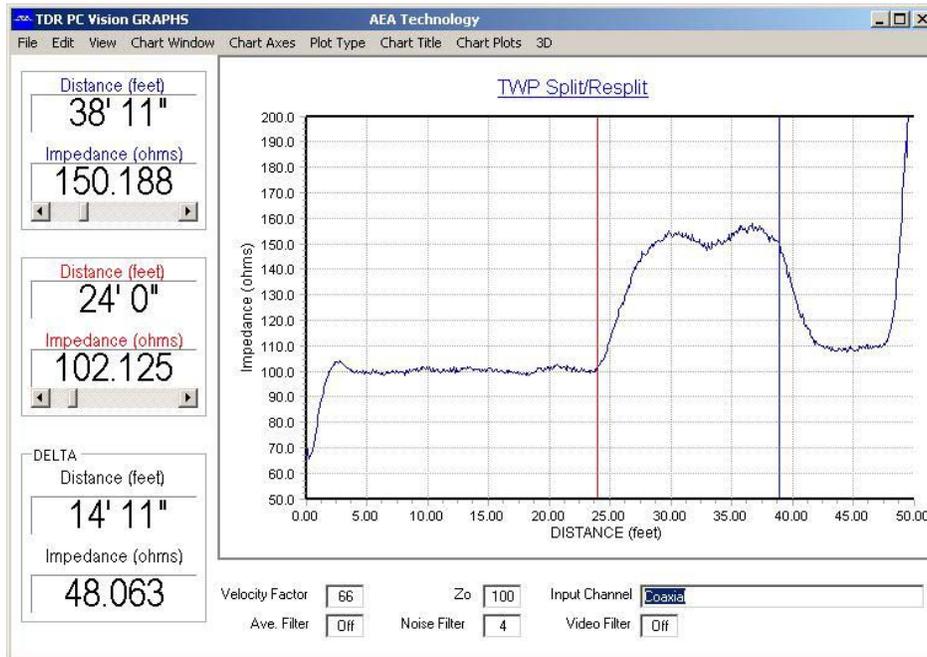


Figure 3