

AN226 Bridged Taps

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Abstract

This application note discusses the reflective events presented on a step TDR's trace or plot when the TDR encounters a bridged tap on a twisted pair cable.

General

Bridged Taps are a general accepted method of rerouting a communications pair. Their use by the telephone companies had been standard practice to route a dedicated pair's service to a secondary termination point. New, high performance practices require that bridged taps must be located and removed because they degrade all Digital Service Lines (HDSL, ADSL & VDSL). The open end of a bridged tap or its open main line reflects the xDSL signals and causes a secondary receive signal delayed by the length of the tap. For this same reason, a TDR's signals can reflect more than once and create a distorted event on the TDR's display.

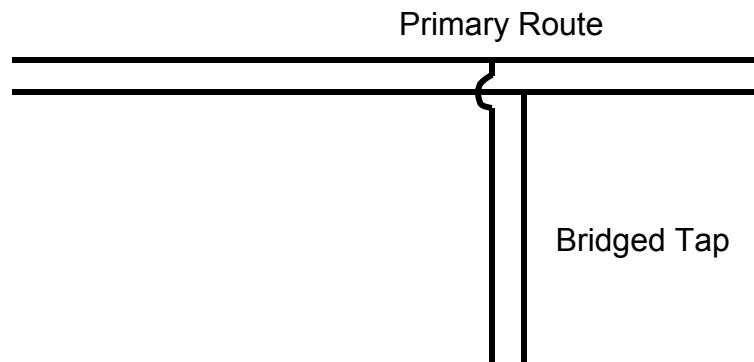


Figure 1

Bridge Tap's Affect on a Step TDR trace

Figure 2 is an example bridge tap trace shown on TDR PC Vision. It looks the same on the 20/20TDR's LCD. A 37 foot bridge tap has been spliced into a 400 foot cable pair at the 312 foot mark (Blue Cursor). The impedance of the cable is suddenly affected by having two 100 Ω pairs reflecting signals at the same time. The impedance is headed towards 50 Ω . If the bridged tap were long enough the trace would flatten out somewhere in that zone or above due to loop resistance.

In the example the bridge tap's start and length can be measured by placing the cursors at the start of the impedance dip and at the start of its return rise as shown (Red Cursor). The "Delta" or difference reading is the length of the tap. A short distance of nominal impedance returns just before the cable ends at 400 feet. The distance from the blue cursor to the end of the cable is the remaining primary or main pair in the cable.

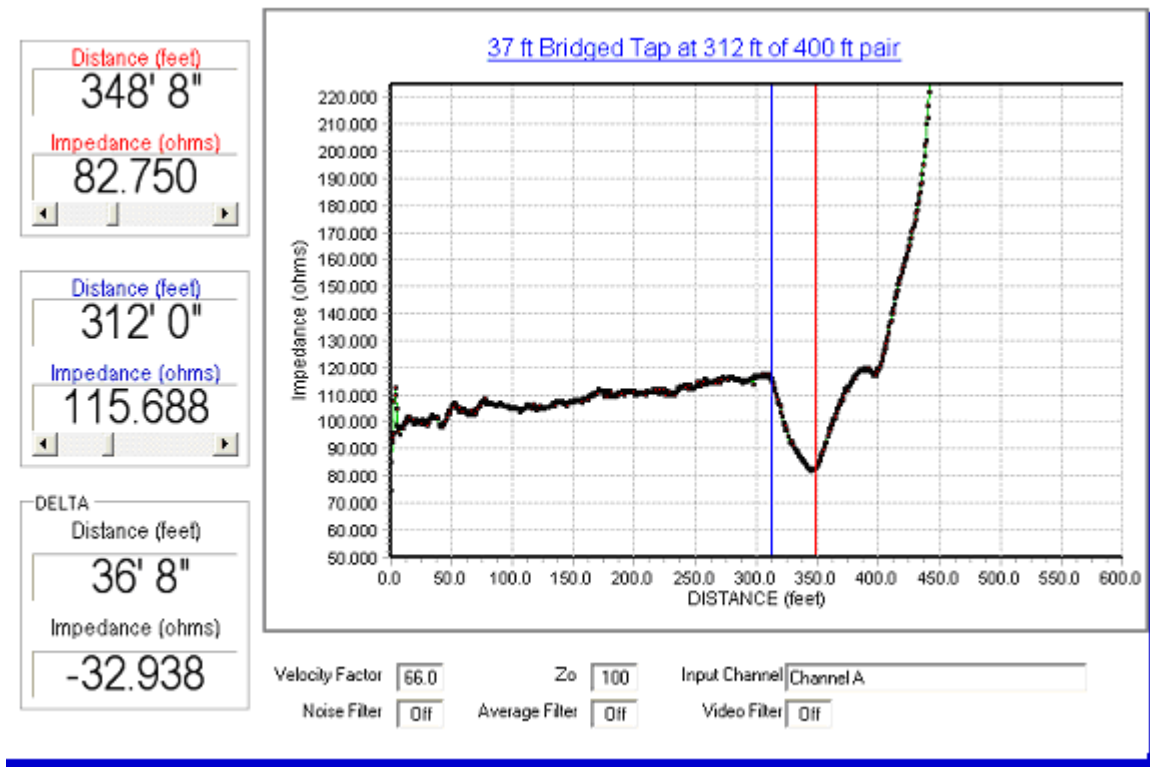


Figure 2

Distinguishing the difference between the tap's end and the primary cable's end can be confusing without a good cable diagram. The bridge tap can be longer than the primary's end section. There is no known way for a TDR to tell the difference when both ends are open.