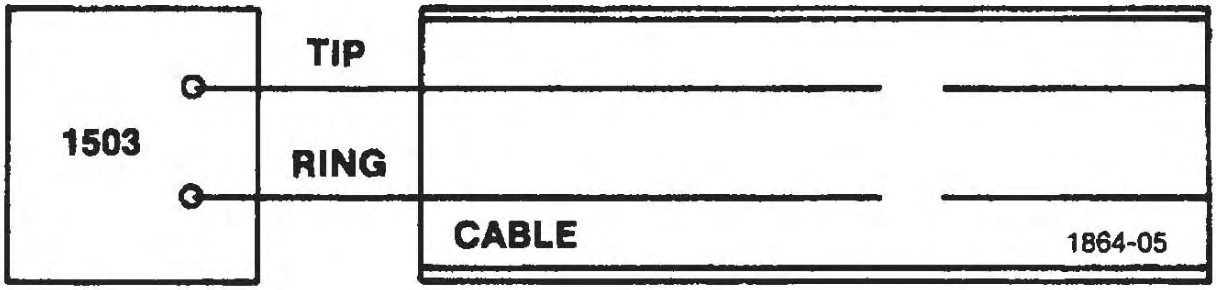

Fig. 4-1. Open tip and ring.

An open tip and ring is shown as a positive return pulse (Fig. 4-2). If only one (tip or ring) is open, the return pulse will be of lesser amplitude than if both are open. Twisted pair lines generally use wire in gauge range from 19 to 26. Line attenuation increases rapidly with the gauge number, so the range is reduced and the display on the 1503 is more "smeared" when testing fine gauge wire.

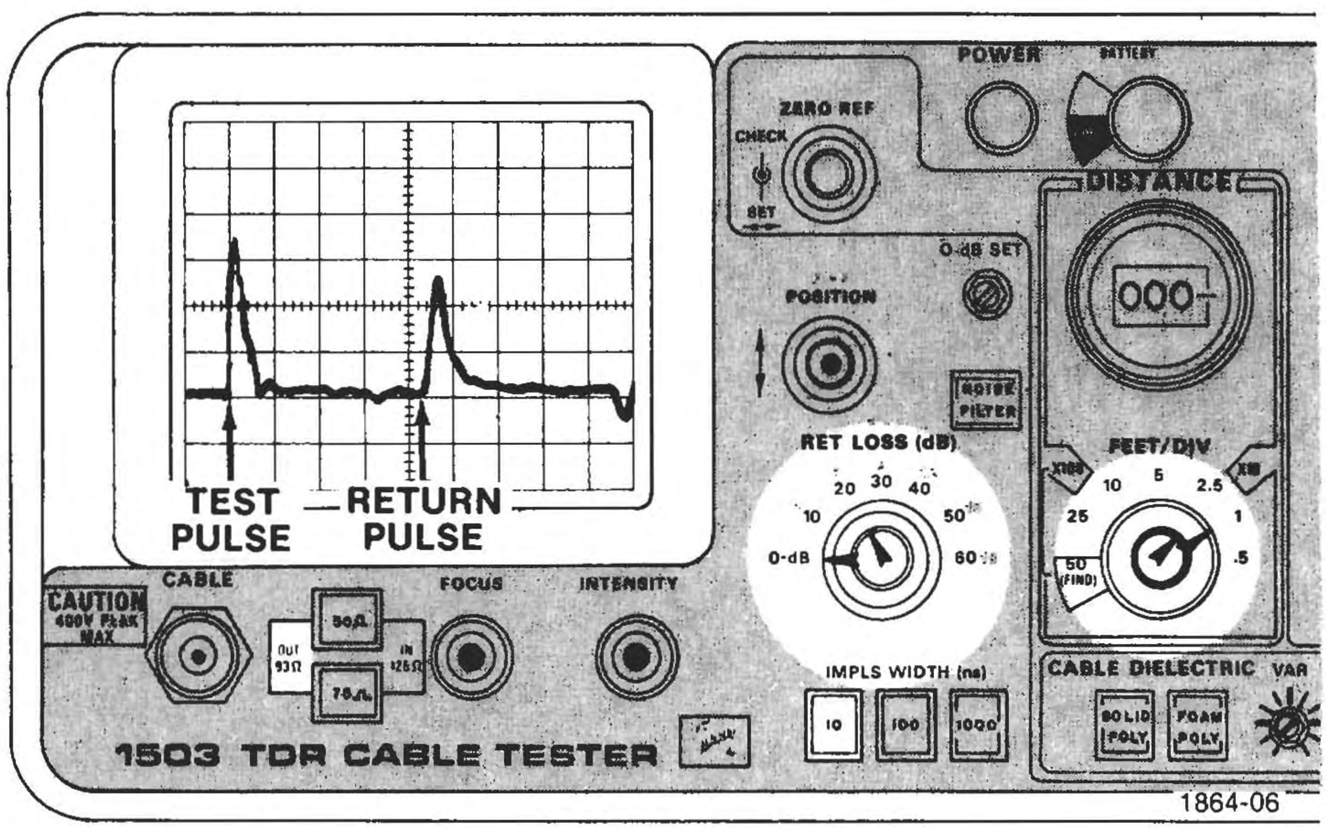

Fig. 4-2. Open pair or loading coil at 46 feet.

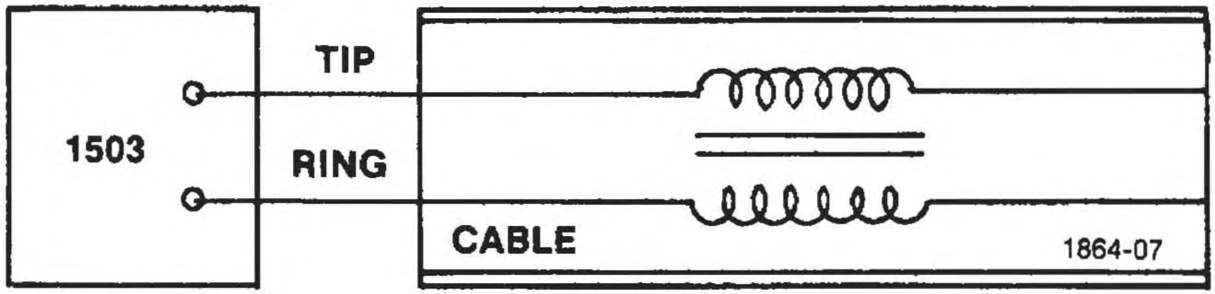

Fig. 4-3. Loading coil.

The function of a loading coil is to increase line inductance to improve transmission characteristics. The tip and ring conductors connect to separate windings on a donut-shaped core. The two coils are wound in a direction to produce an aiding magnetic field. The value of the coil is determined by the cable characteristics which run between two points. The 1503 cannot look through loading coils because of the large impedance mis-match.

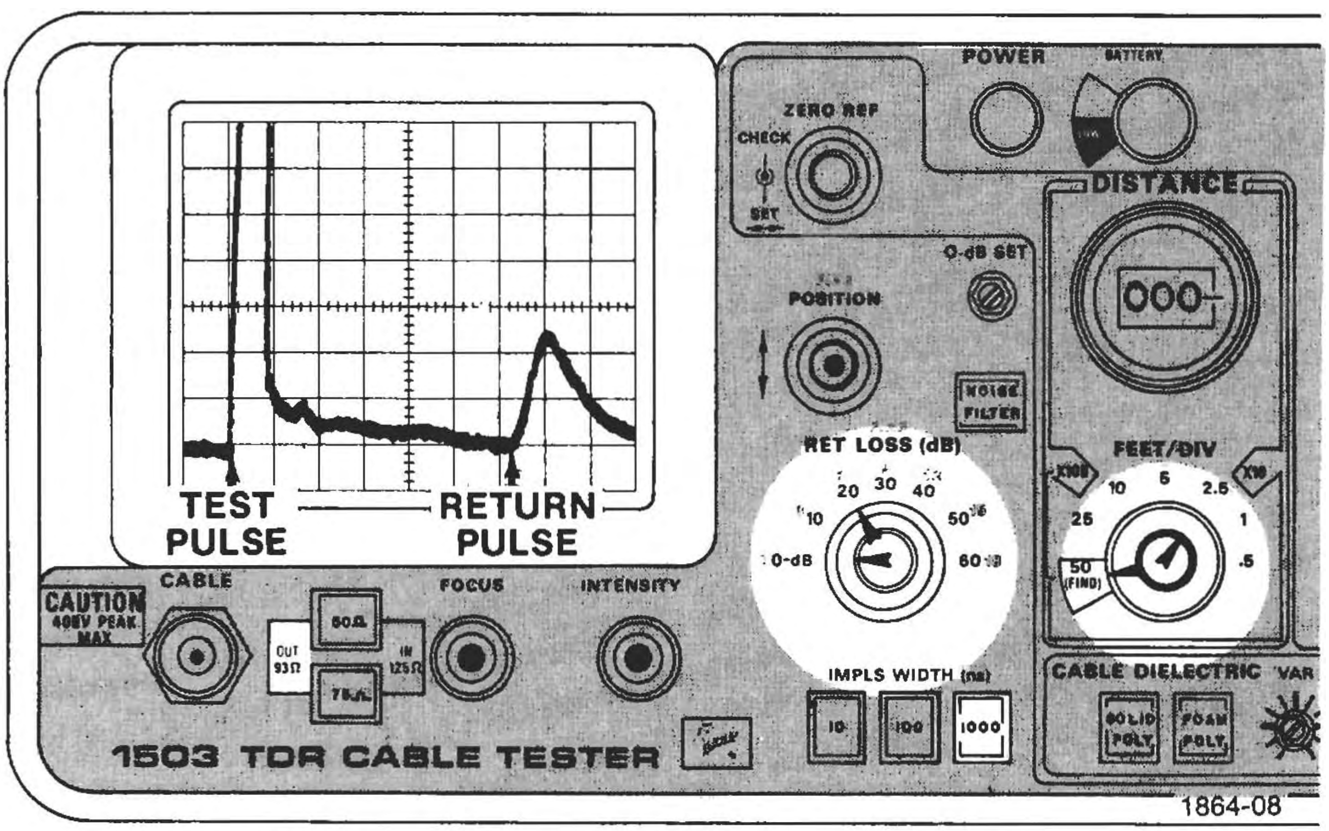

Fig. 4-4. Open pair or loading coil at 3175 feet.

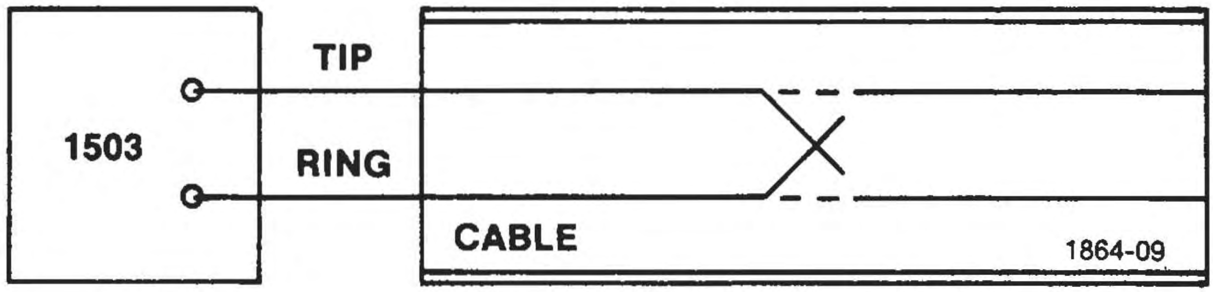

Fig. 4-5. Shorted tip and ring.

Shorts between pairs is shown on the 1503 as a negative return pulse. A short, called a metallic cross, may be detected using a standard battery or earphone test. However, the 1503 will indicate the exact distance to the fault.

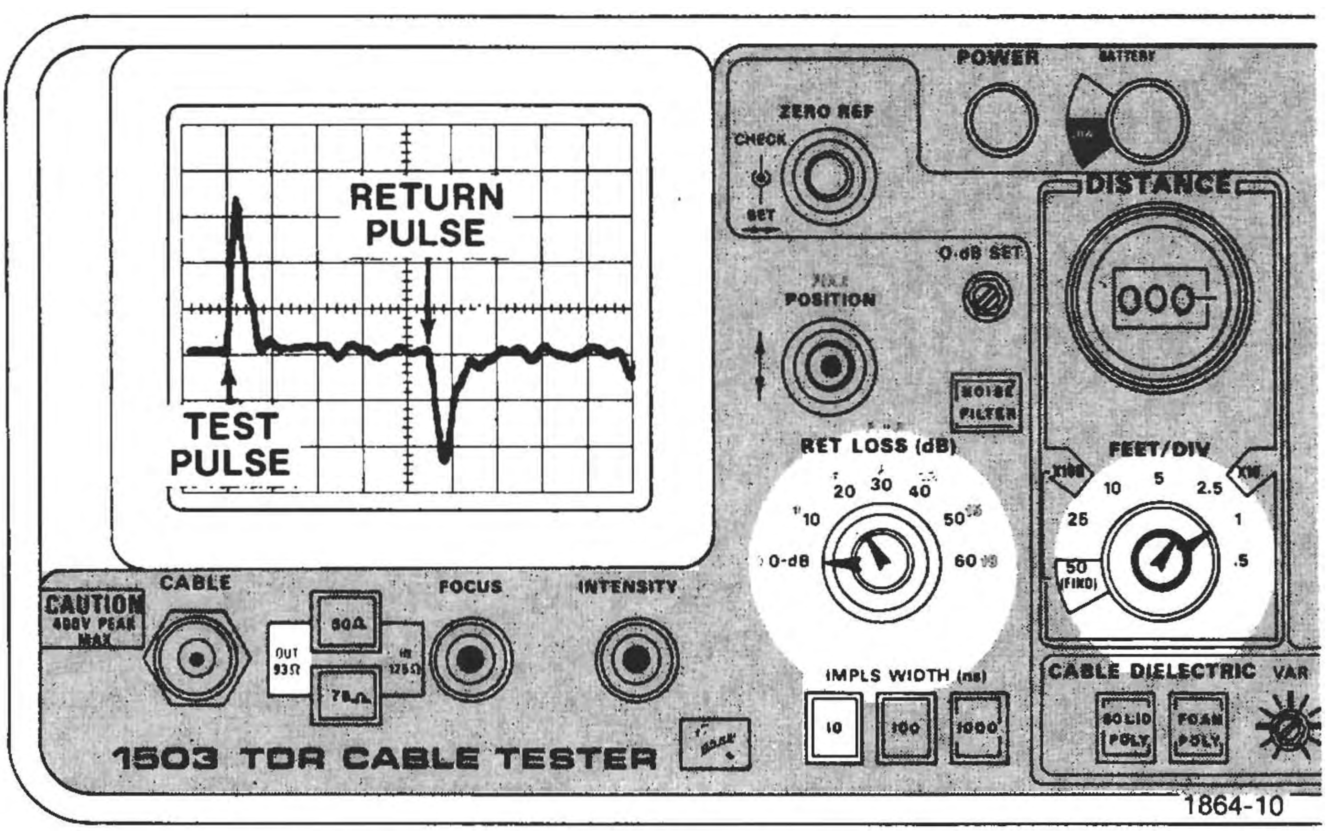

Fig. 4-6. Shorted tip and ring or building-out network at 44 feet.

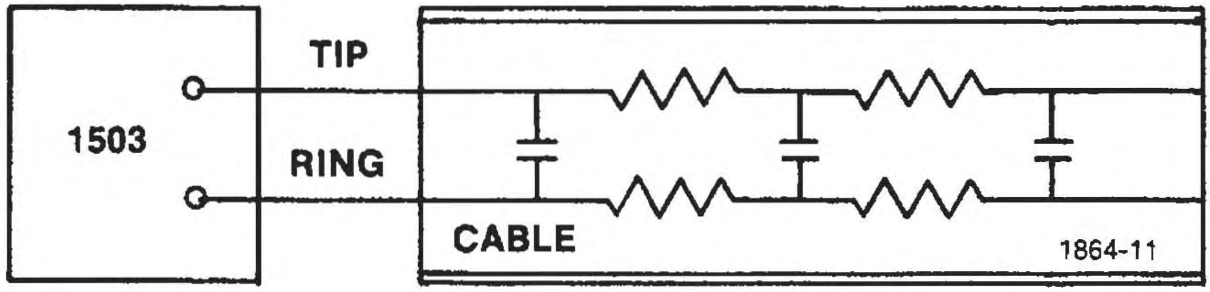

Fig. 4-7. Building-out network.

A building-out network will appear on the 1503 as a short circuit (the capacitors in the network short out the test pulse). A building-out network is used with loading coils to artificially make up the required distance of the coil. The 1503 cannot look through building-out networks because of the large impedance mis-match.

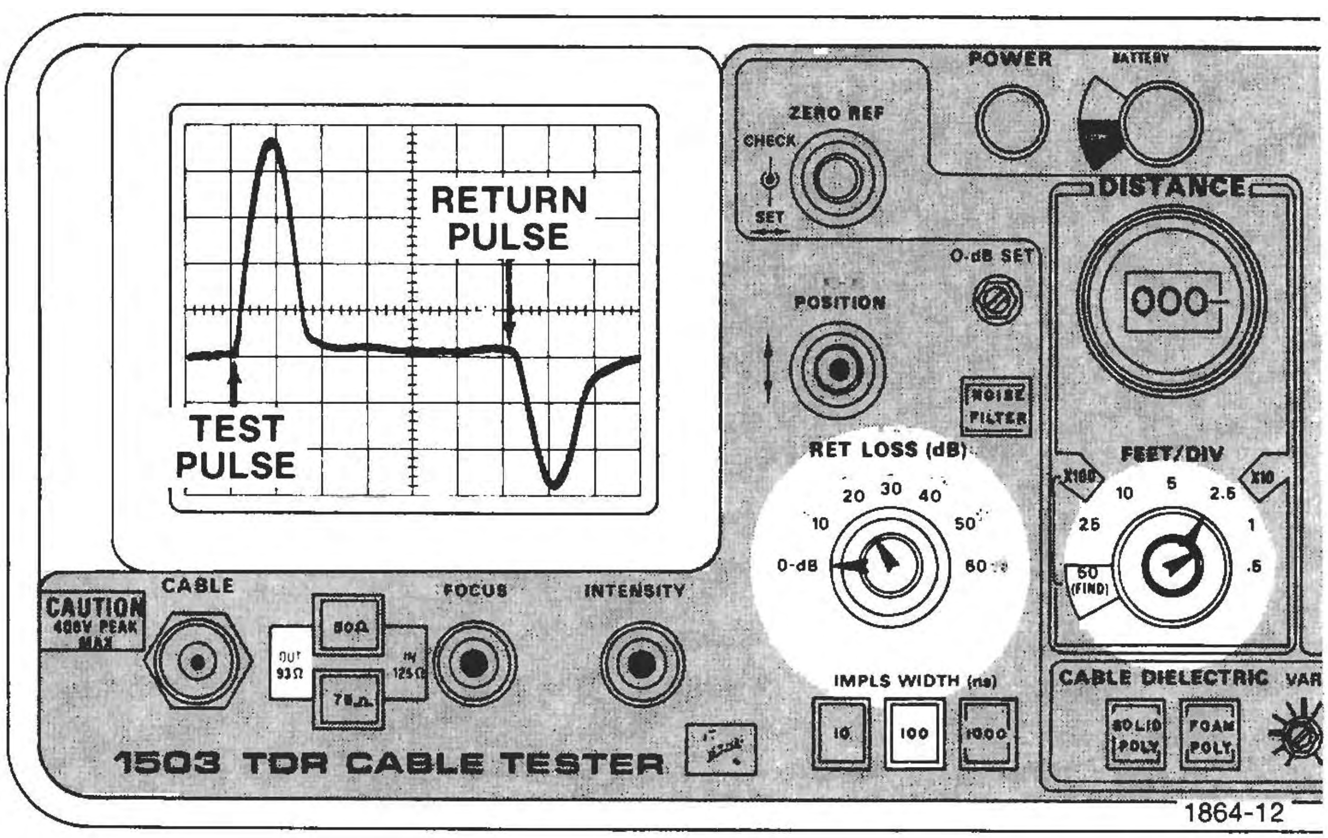

Fig. 4-8. Shorted tip and ring or building-out network at 157 feet.

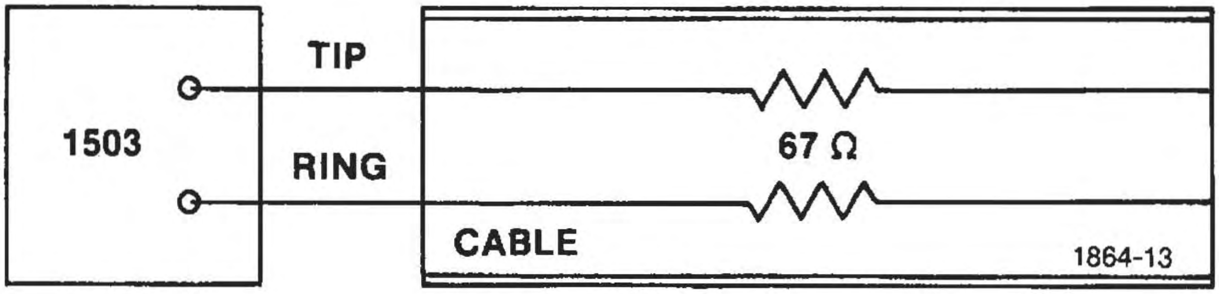

Fig. 4-9. High-impedance splice.

A splice may have any impedance depending upon its quality. The illustration here is for a splice having 67 ohms. This shows up as a positive return on the 1503. A known fault location such as a splice may be used as a reference point for calibration prior to performing measurements in a cable of unknown dielectric constant.

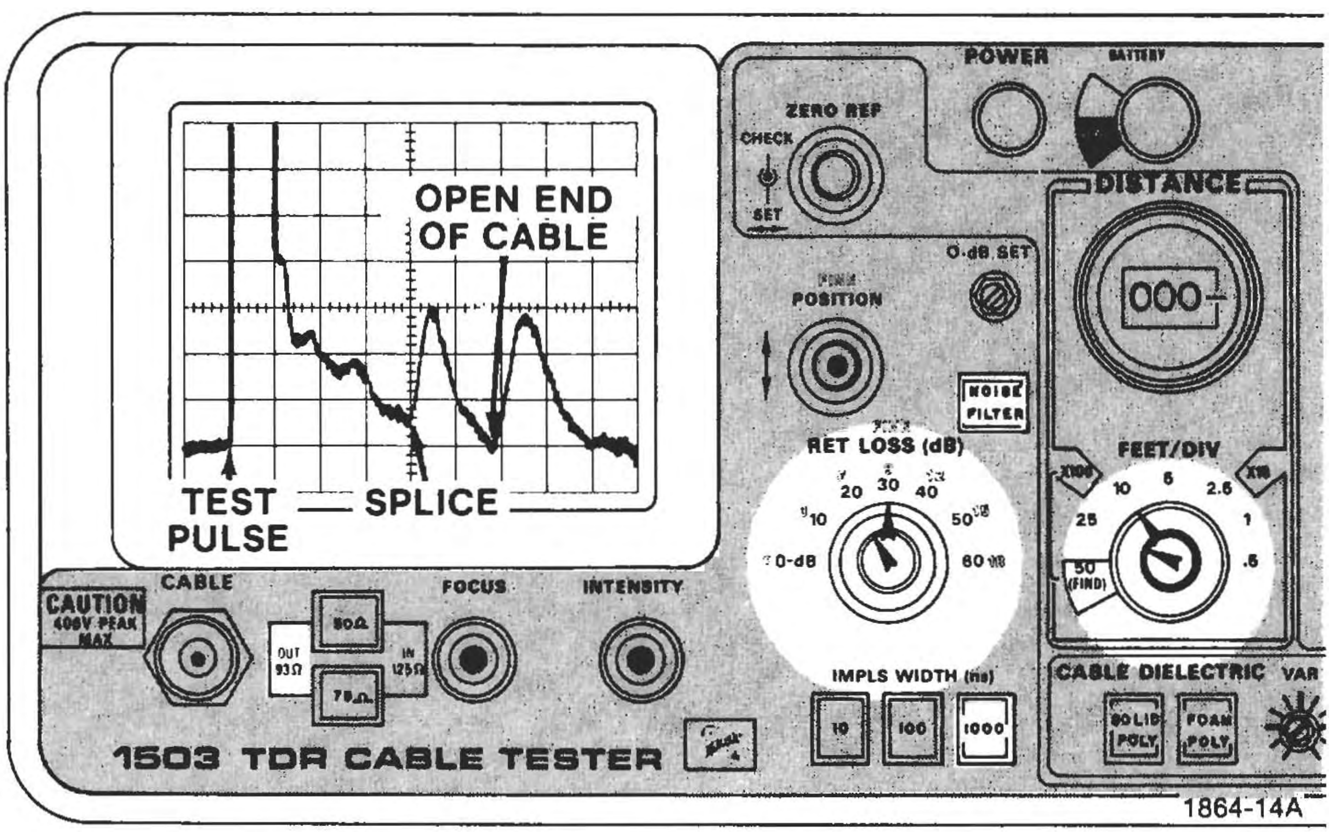

Fig. 4-10. High impedance splice at 4000 feet.

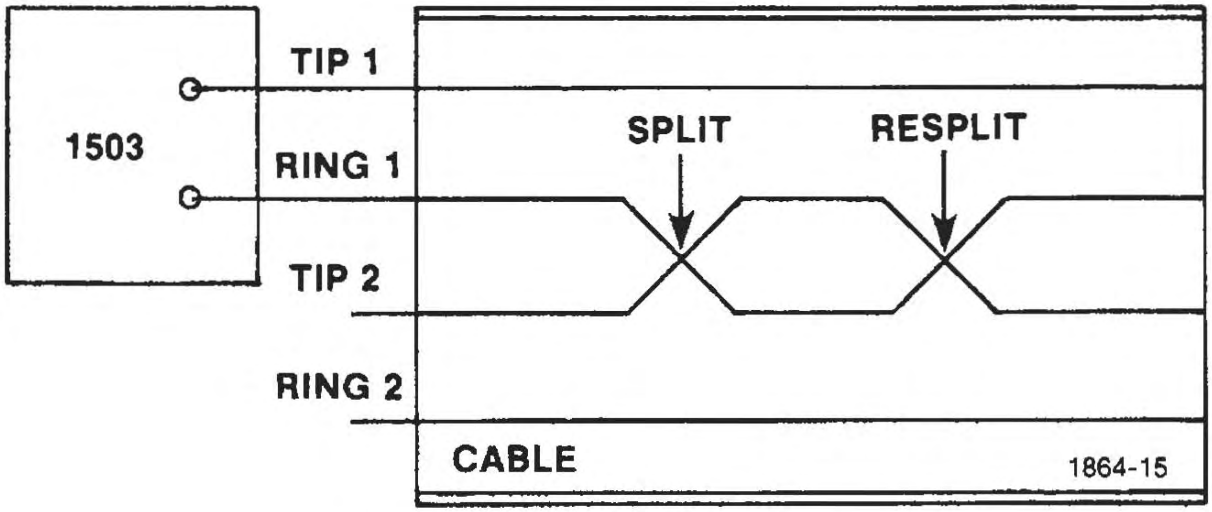

Fig. 4-11. Split and re-split pair.

A split occurs at a splice when the tip or ring of one cable is accidently spliced to the tip or ring of another cable pair. The 1503 crt will show a discontinuity similiar to that of a splice at the point where the conductors are separated. A decrease in capacitance will be

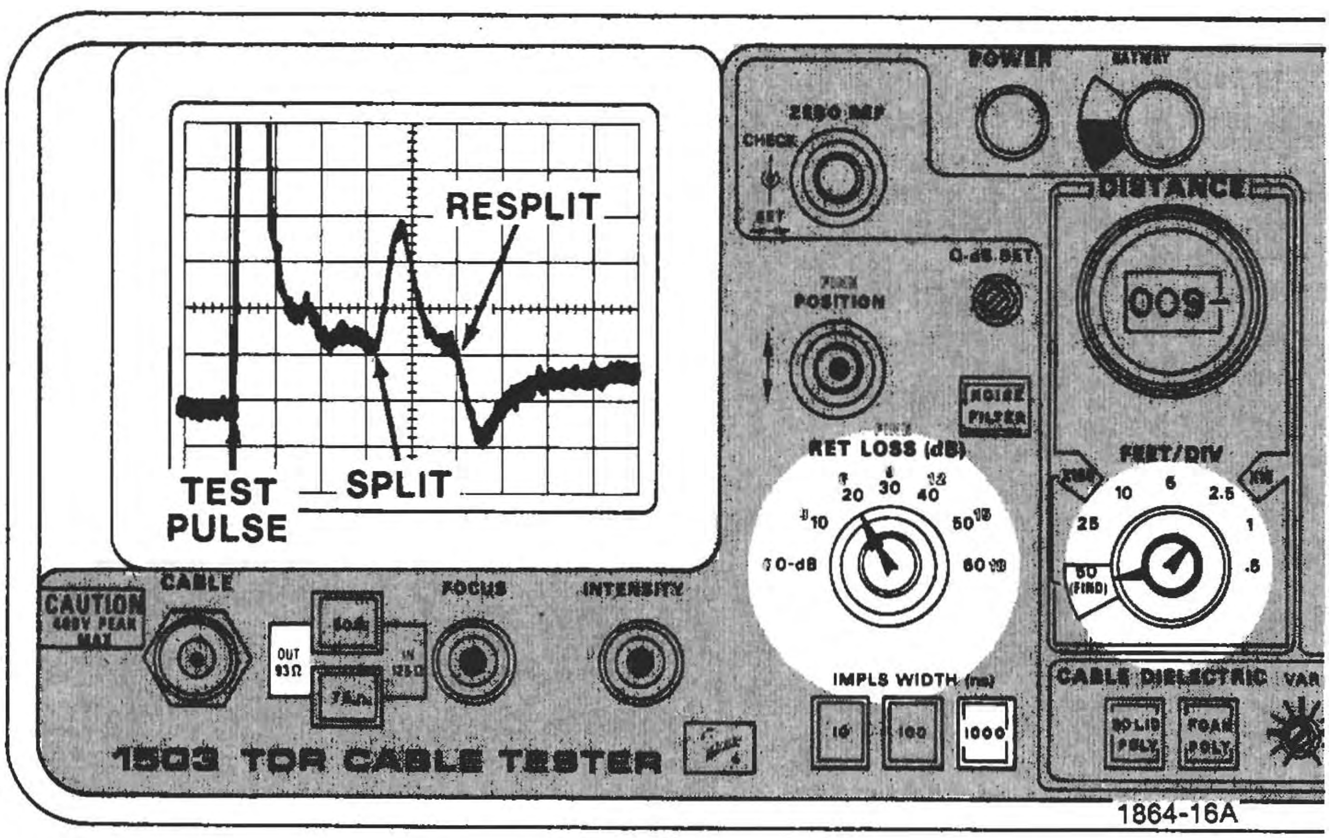

Fig. 4-12. Split and re-split pair at 1600 and 2500 feet.

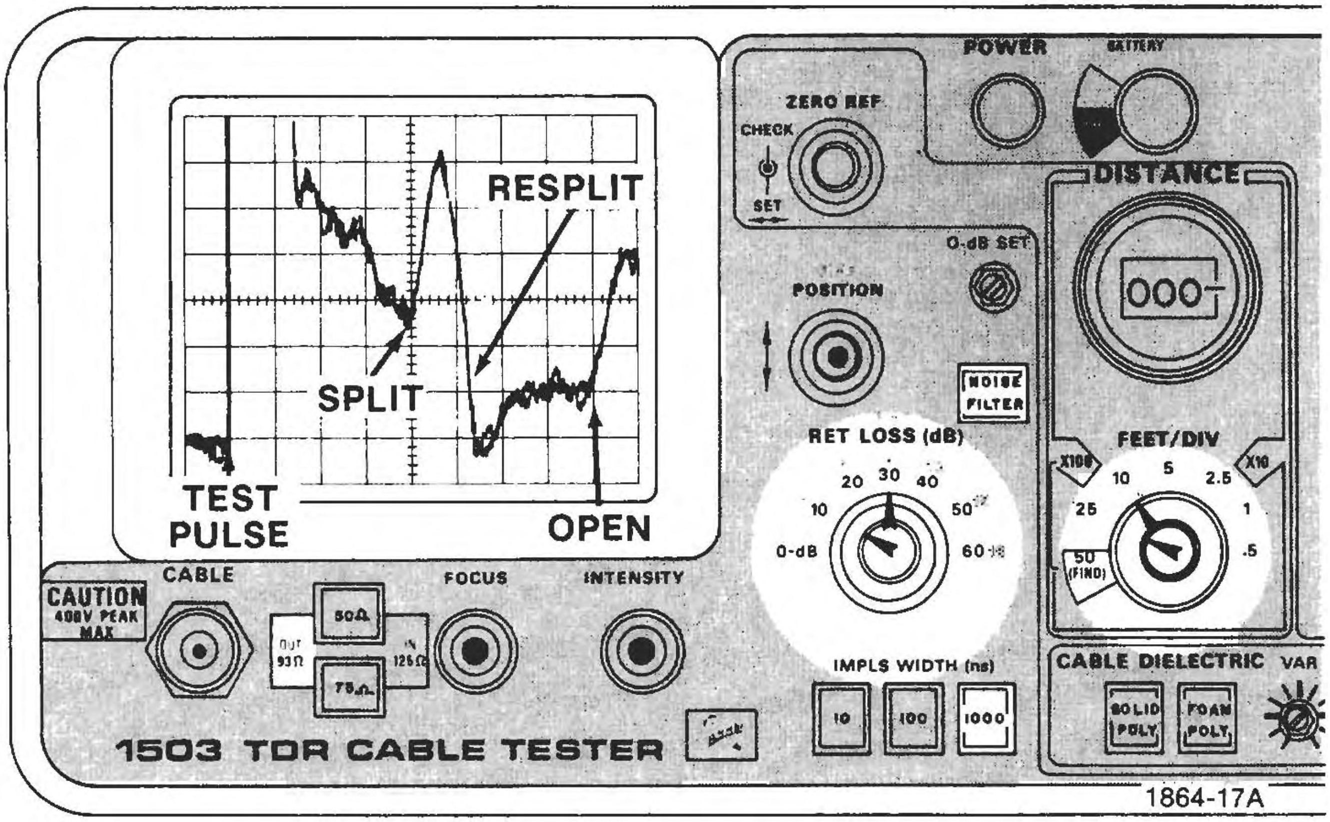

Fig. 4-13. Split and re-split pair at 4000 and 5250 feet.

indicated by a positive return pulse. If a re-split (restoration to normal condition) occurs in a subsequent splice, the return pulse will appear with the opposite polarity of that shown for the split.

Bridge Taps (see Figs. 4-14 and 4-15 on the next two pages)

The 1503 will look through Bridge Taps; since they represent a large capacitance the Bridge Tap will appear as a negative return pulse. A large number of taps could be difficult to evaluate.

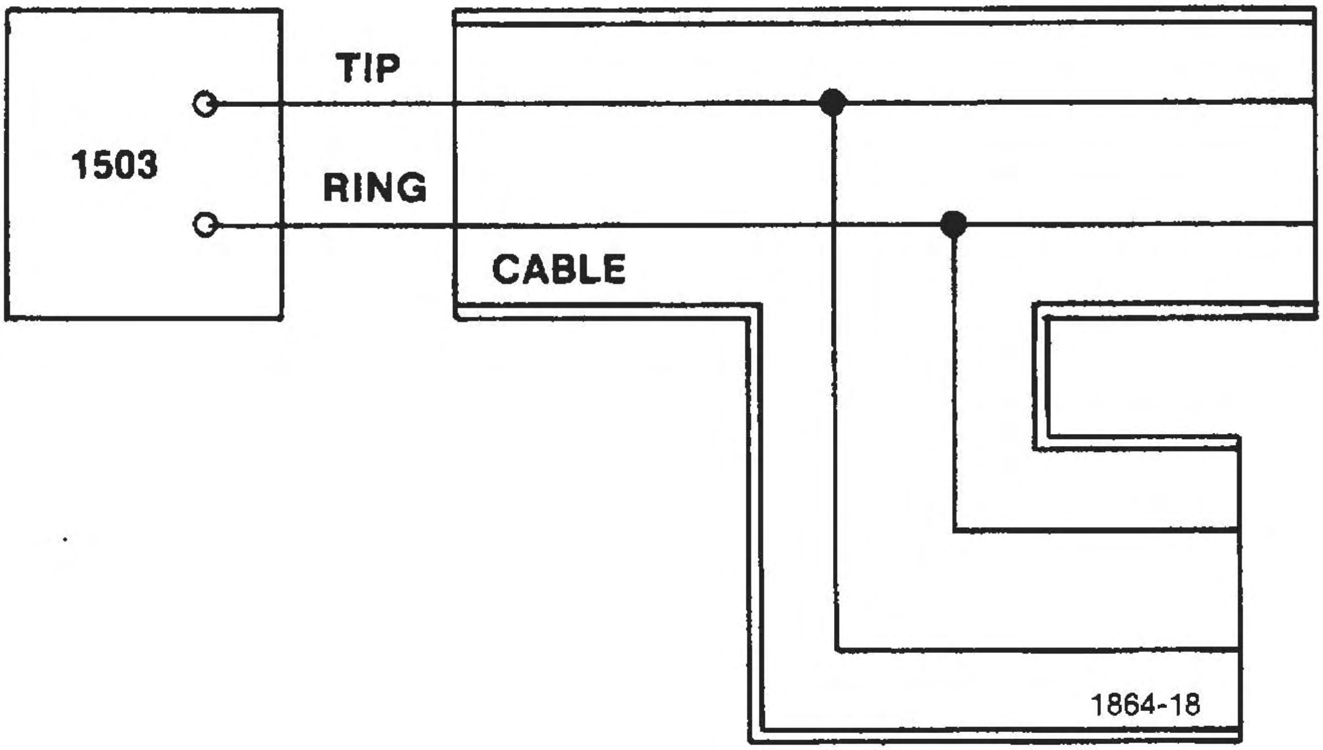

Fig. 4-14. Bridge tap.

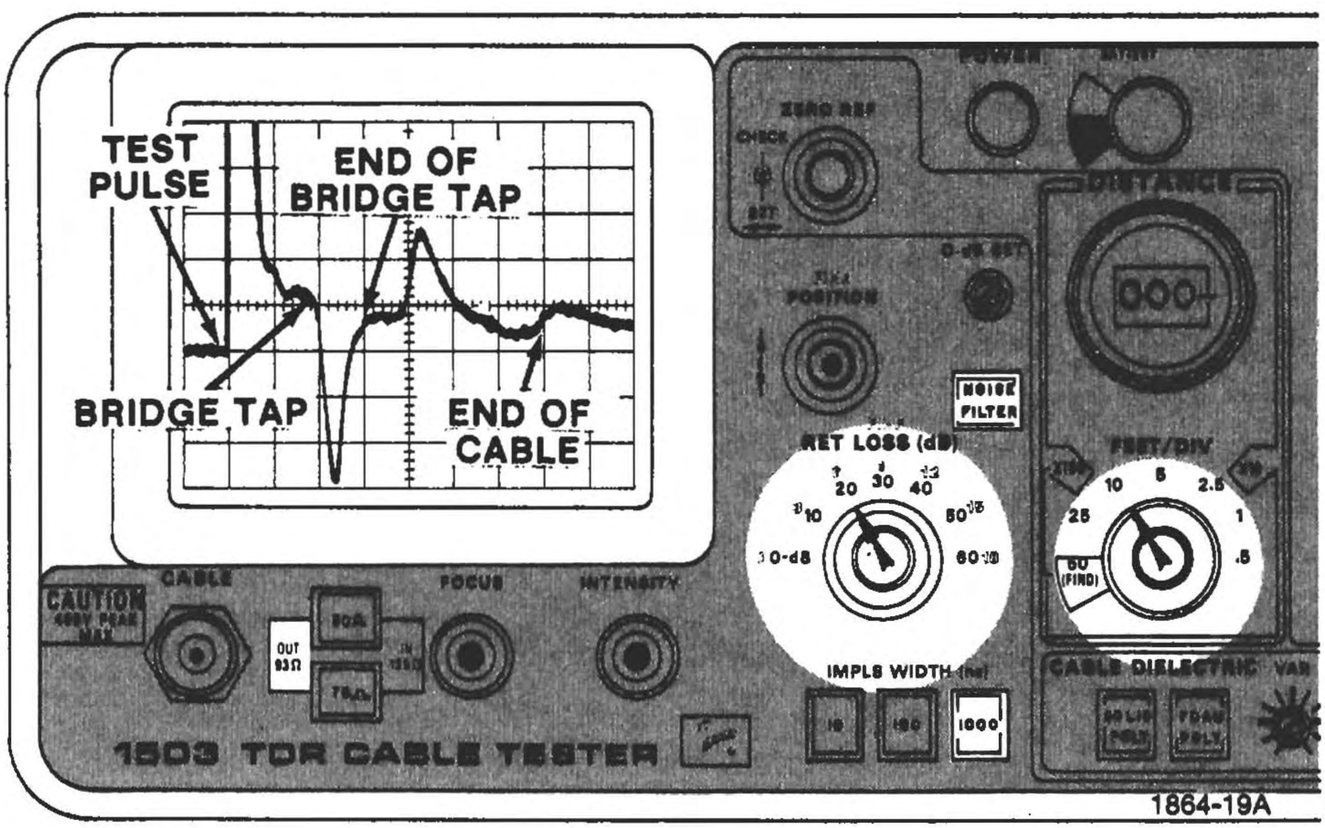

Fig. 4-15. Bridge tap at 2000 feet.