

Fault Locating

1. EQUIPMENT AVAILABLE

- (a) 500 volt megger.
- (b) Capacitance Bridge (battery operated) and Capacitance Meter (110 Volts A.C.)
- (c) Tinsley Fault Locator (battery operated, also requires 6 volt storage battery).
- (d) Search Coil Equipment which includes head phones (battery operated)
- (e) Ohmmeter and Wheatstone Bridge (both battery operated)
- (f) Time delay reflectometer (TDR)

2. TYPE OF FAULTS

- (a) Low resistance short between conductor or conductors and sheath (a few ohms) and conductor continuity.
- (b) High resistance short between conductors or conductor and sheath and conductor continuity.
- (c) Open circuit of conductor(s) with high resistance to sheath or other conductor and across open ends of conductor.
- (d) Open circuit of conductor(s) with low resistance to sheath or other conductor and across open ends of conductor.

3. PROCEDURE

The first step is to disconnect the conductors from all equipment if possible, then using the 500 volt megger, take the insulation value between all conductors and between conductor(s) and sheath, from both ends of cable. Also the continuity of each conductor and of the sheath should be checked. From these tests the type of fault may be determined.

(A) Low Resistance Short

The Tinsley Fault Locator may be used on this type of fault to find the percentage of the distance the

fault is from one end.

An ohmmeter or Wheatstone Bridge may also be used on this type of fault, although it will not give as accurate results. The following formula may be used for this method:

(B) High Resistance Short: The Tinsley Fault Locator is the only instrument available for finding this type of fault. A fault up to 200 megohms may be located with this instrument.

(C) Open Circuit With High Resistance Short: The Capacitance Meter may be used if 110 volts AC is conveniently available and the resistance to sheath or other conductor is above one megohm. The Capacitance Bridge is a better and more convenient instrument to use for this type of fault. It may be used with a resistance to sheath or to other conductor down to 50,000 ohms, but not below.

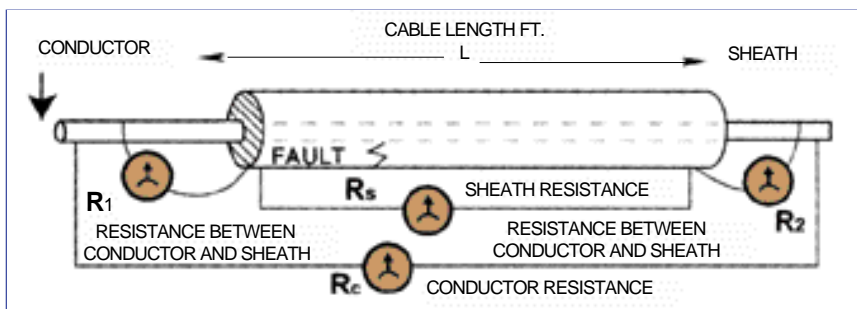
(D) Open Circuit With Low Resistance Short: Tektronix Model1503 metallic cable TDR tester.

Location of Cable: The Search Coil equipment may be used to determine the location of cable but not to locate faults. The main difficulty of tracing a fault with this equipment is that there is no large reduction in sound when the coil passes the fault.

However, once the distance from the fault has been determined by one of the above methods, the search coil may be very useful in determining where the cable runs.

Equipment Operating instructions: Each piece of equipment has complete operating instructions with it. If these are lost, copies may be obtained from Korea EHT.

Location of Cables and Cable Faults



- R_1 = Resistance across shorted conductor and sheath from one end (ohms).
- R_2 = Resistance across shorted conductor and sheath from the other end (ohms).
- R_C = Resistance of conductor (ohms), measured across ends of cables.
- R_S = Resistance of sheaths (ohms), measured across ends of cables.
- L = Total length of cable (feet).
- D = Distance from first end of fault (feet).