B GROUND PROBE, AT-8681

DESCRIPTION AND USE

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1. GENERAL

1.01 This section covers the description and use of the B ground probe, AT-8681, (Fig. 1). This probe provides an easy method for pinpointing shield openings in a section of buried cable where continuity has been lost. The probe may also be used to locate the path of buried cable.

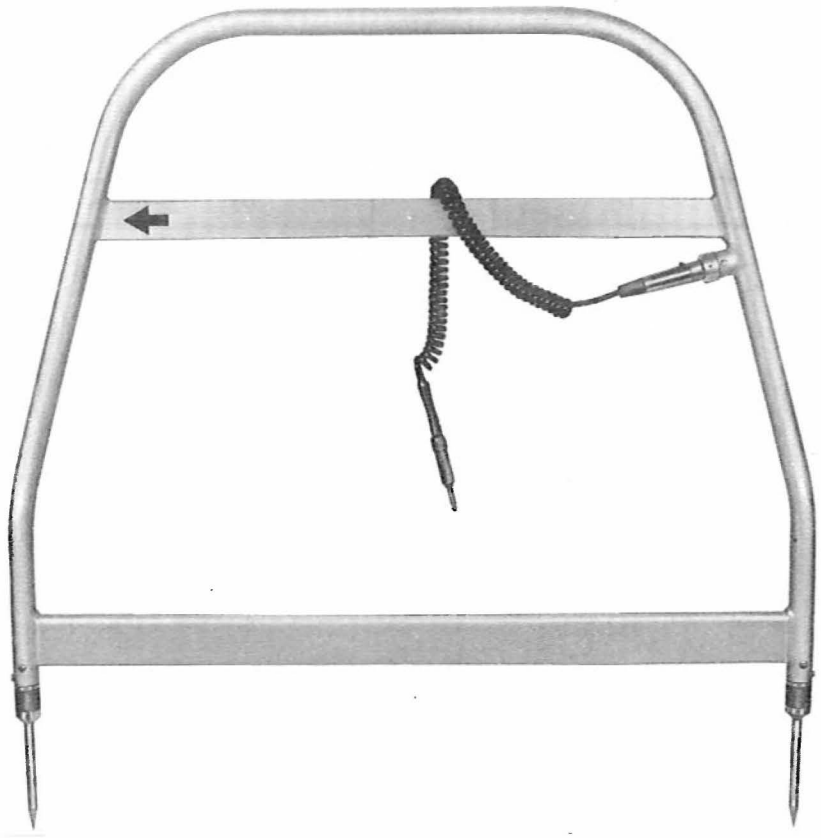

Fig. 1—◆B Ground Probe, AT-8681◆

NOTICE
Not for use or disclosure outside the
Bell System except under written agreement

1.02 This section is reissued to:

- Update Fig. 1, 2, 3, and 10 and add Fig. 4 and 5
- Add NOISY ENVIRONMENT, Part 6

1.03 A signal source, supplied by a 76C test set or equivalent, is applied to the cable and detection of this signal is accomplished with the components of the 91A test set and a 147C amplifier (Fig. 2). The earth ground for the signal source shall be established with a separate ground rod (eg, a long screwdriver).

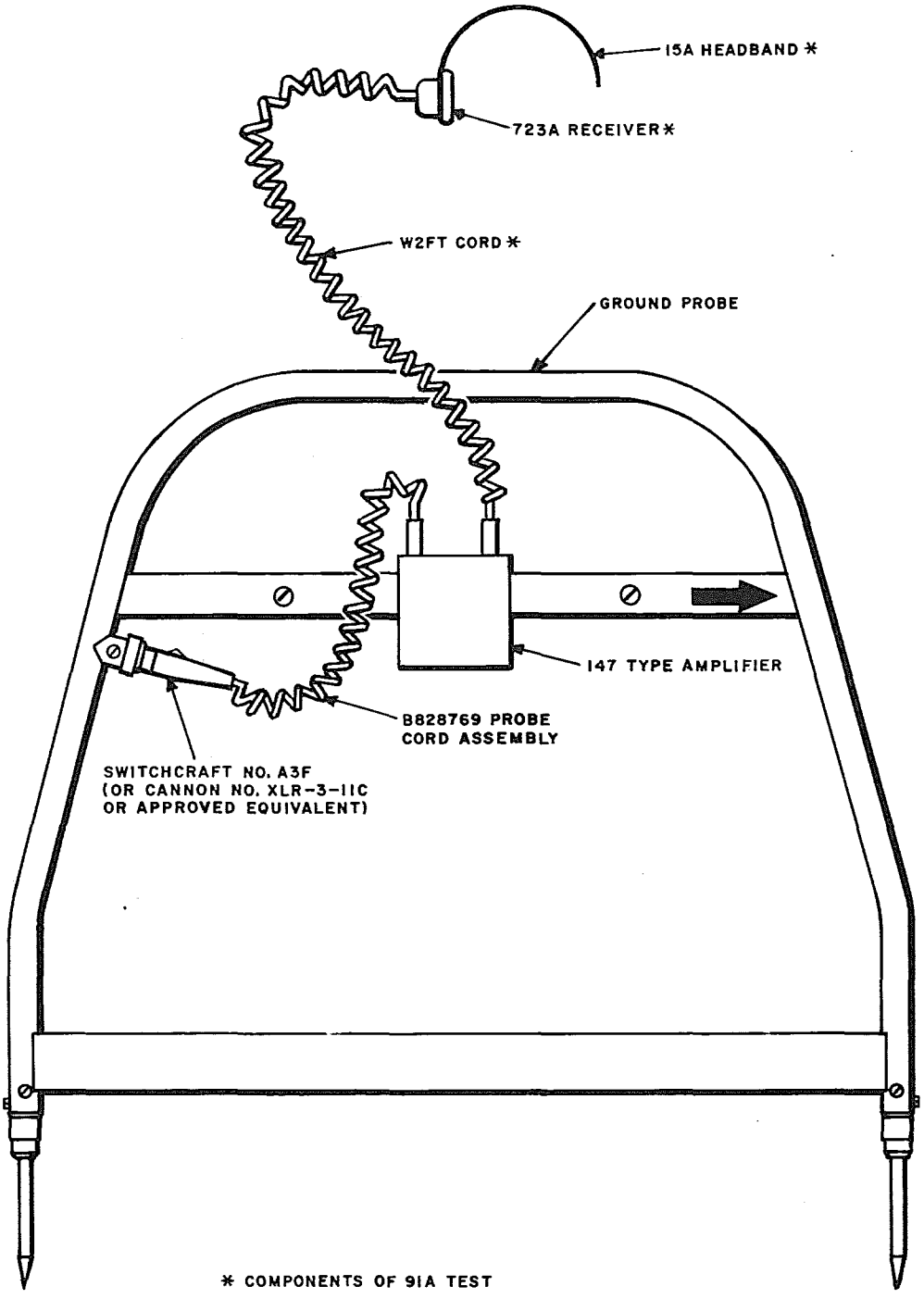

Fig. 2—Components Used With B Ground Probe

1.04 ***This instruction is not intended for use in locating shield grounds where the shield is in contact with the ground and the shield continuity has not been broken. (See Sections 634-315-500 and 644-104-102.)***

2. PRECAUTION

2.01 Although the B ground probe, AT-8681, is water resistant, it should not be used in water or exposed to the elements for long periods of time.

2.02 Do not use the probe when the electrodes are not completely insulated from the frame. (See Part 7.) Such use will cause signal loss and make interpretation of signals difficult if not impossible.

2.03 When the B ground probe is not in use, care shall be taken to keep electrode tips covered with the rubber protectors provided. (See Fig. 3.)

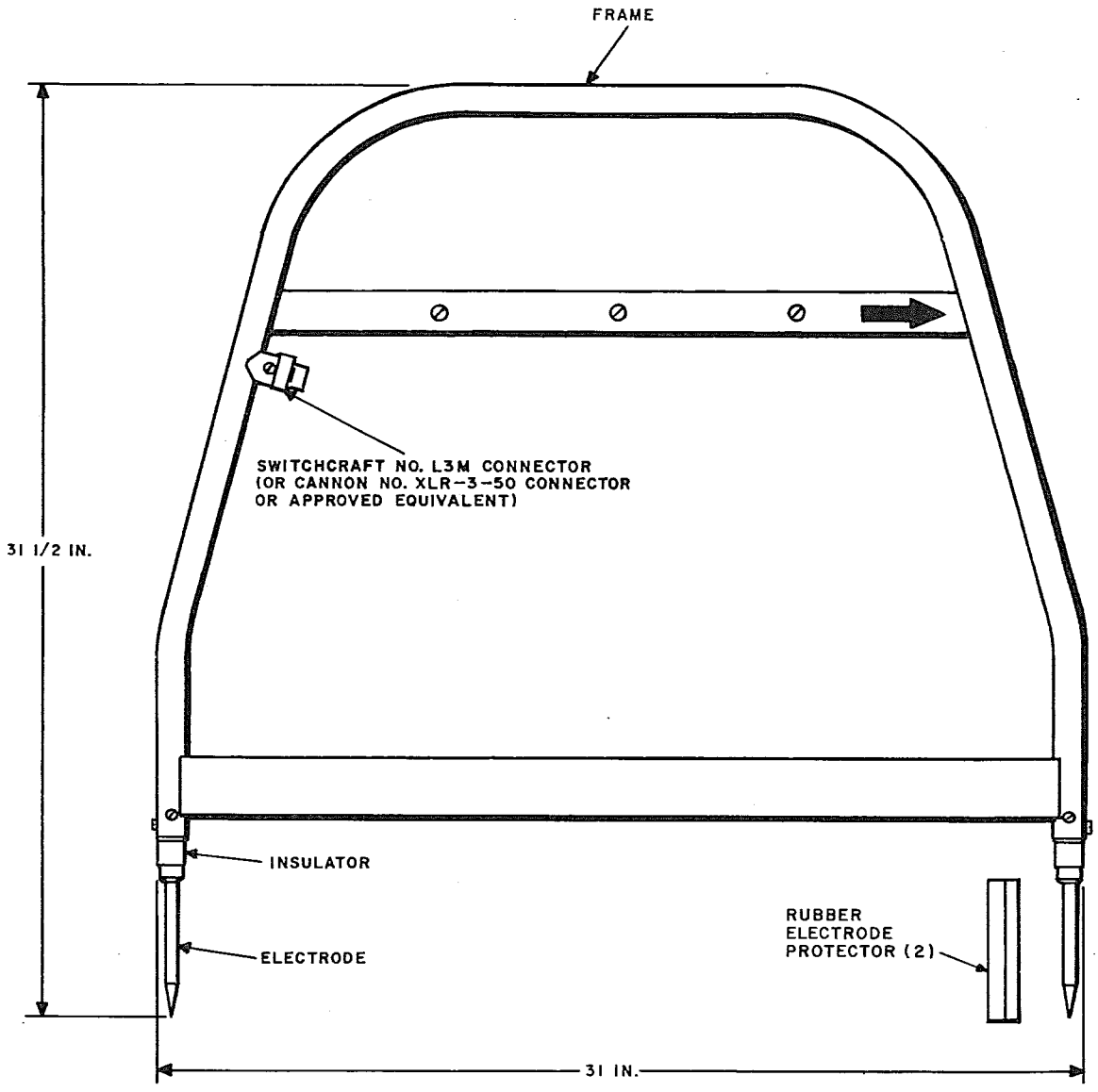

Fig. 3—Probe Assembly

3. DESCRIPTION

3.01 The frame of the probe is made of aluminum plate and tubing (Fig. 3). The open ends of the tubing provide the support for two stainless steel electrodes, insulated from the frame by phenol fiber insulators. Each electrode is connected to the Switchcraft No. A3F connector by internal wiring. The lower cross member provides the employee a means for driving the electrodes into the ground. The upper member provides a support for the associated test equipment. A B-828769 probe cord assembly is provided to connect the probe to the input of the 147-type amplifiers.

4. LOCATING OPEN SHIELD FAULTS

Warning: Test the shield for voltage before and after opening it, in joint buried plant or in plant where the power company grounds are bonded together with telco plant. The B voltage tester (Sections 620-105-010 and 081-705-101) and insulating gloves should be used.

4.01 The necessary tests shall be made (use KS-8455 test set or equivalent) to determine that:

(1) The open shield fault measures 10,000 ohms or more and that there is no leakage of the shield to ground, or

(2) The shield fault is completely open and at least one end of the cable shield does not contain leakage to ground.

These conditions are illustrated in Fig. 4 and 5.

4.02 In the case of a shield fault as defined in Fig. 4, the low frequency test signal may be applied from either end with the shield at the opposite end of the section grounded.

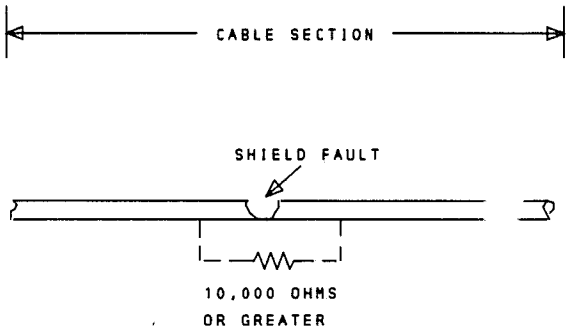

Fig. 4—Shield Fault—No Leakage to Ground

4.03 For the case where one end of the section has leakage to ground and the opposite end does not (Fig. 5), the low frequency test signal shall be applied at the end that contains no leakage and the shield grounded at the other end.

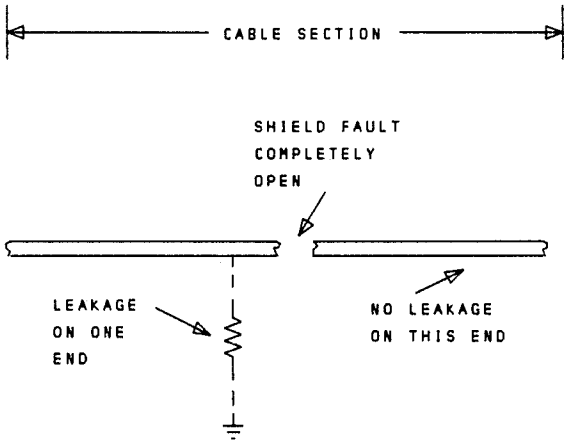

Fig. 5—Shield Fault—Leakage to Ground at One End

4.04 Proceed as follows:

(1) Connect a 76C test set or equivalent between the cable shield (Fig. 6) and ground.

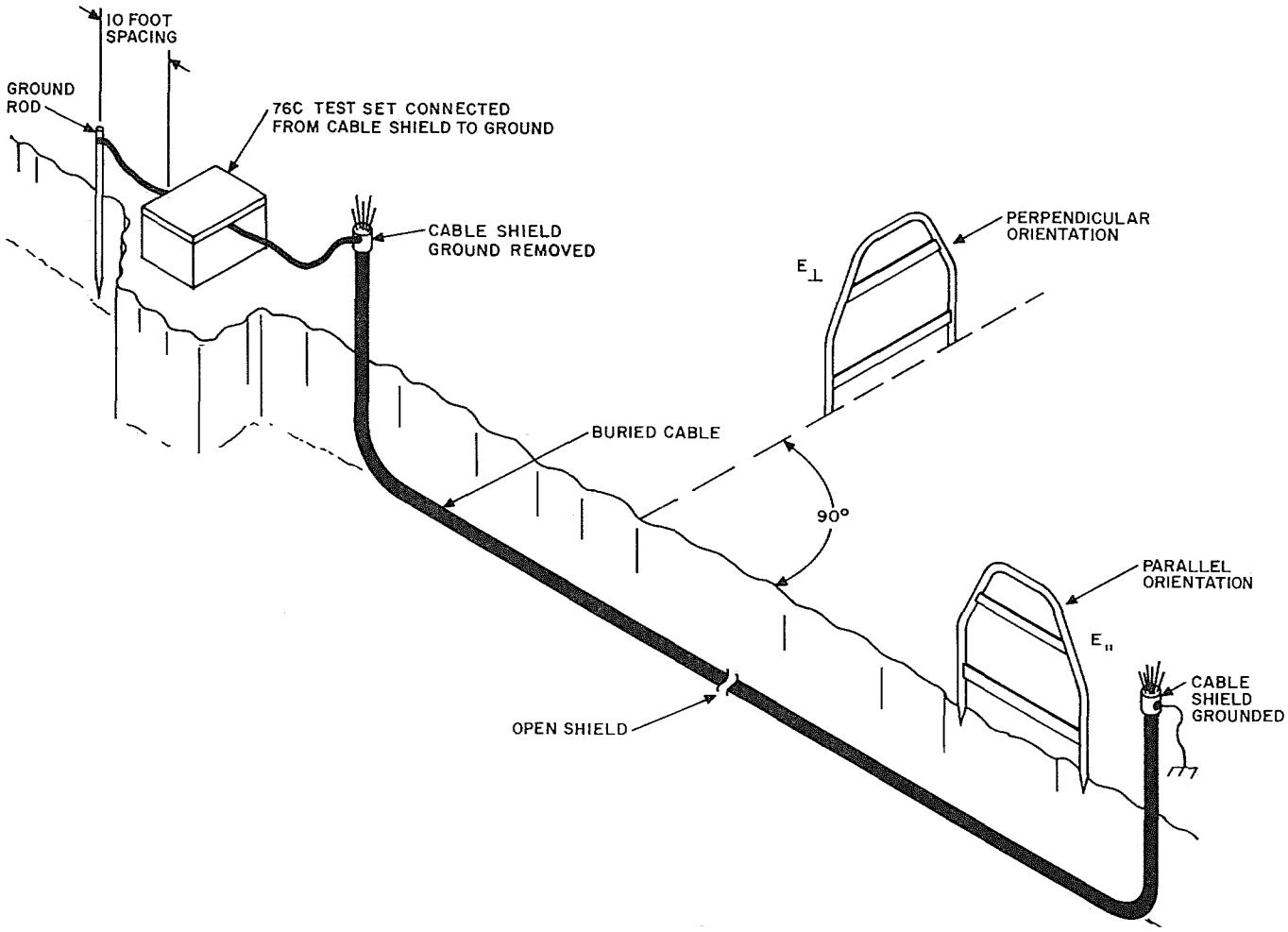

Fig. 6—Locating Open Shield Faults

(2) As shown in Fig. 6, the ground for the signal source should be placed 10 feet from the end of the cable and in line with the cable in order to minimize distortion in the field pattern.

(3) Connect a headset to the REC jack and the probe cord to the INPUT jack of the 147-type amplifier.

(4) Place the AMPLIFIER SWITCH to the PROBE position.

(5) The headset is preferred over an open speaker since it allows the employee to detect lower level signals.

(6) The probe should be used in a PERPENDICULAR orientation along the cable path ***away*** from the signal source and slightly to the ***side*** as shown in Fig. 6.

(7) To minimize the amount of probing, an occasional sample should be made to determine

if the fault has been passed. The signal is noticeably weaker beyond the fault.

(8) By retracing steps, establish the ***zone*** where the signal is stronger (Fig. 7).

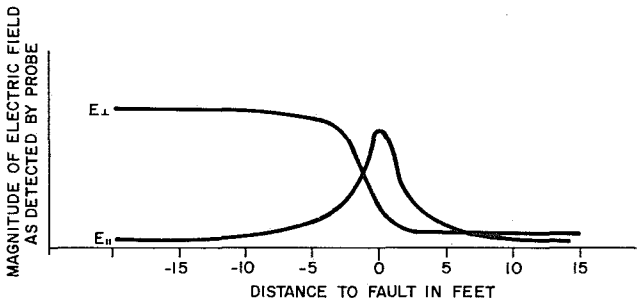

Fig. 7—Signal Levels

(9) During this sampling, it is important that the probe does NOT straddle the buried cable. If this happens, the signal level will decrease and as the probe is centered over the cable, a null will occur.

4.05 When the zone has been established, sampling must be over shorter increments. Position the probe PARALLEL to the cable and if possible directly above as shown in Fig. 6. The location of the open shield fault is pinpointed when the signal is at its ***maximum peak*** as shown in Fig. 7.

5. LOCATING BURIED CABLE

Warning: Test the shield for voltage, before and after opening it, in joint buried plant or in plant where the power company grounds are bonded together with telco plant. The B voltage tester (Sections 620-105-010 and 081-705-101) and insulating gloves should be used.

5.01 Attach the test equipment to the cable as outlined in 4.01 through 4.04(5). The shield of the buried cable to be located shall be ***isolated from the ground at both ends of the span*** (Fig. 8).

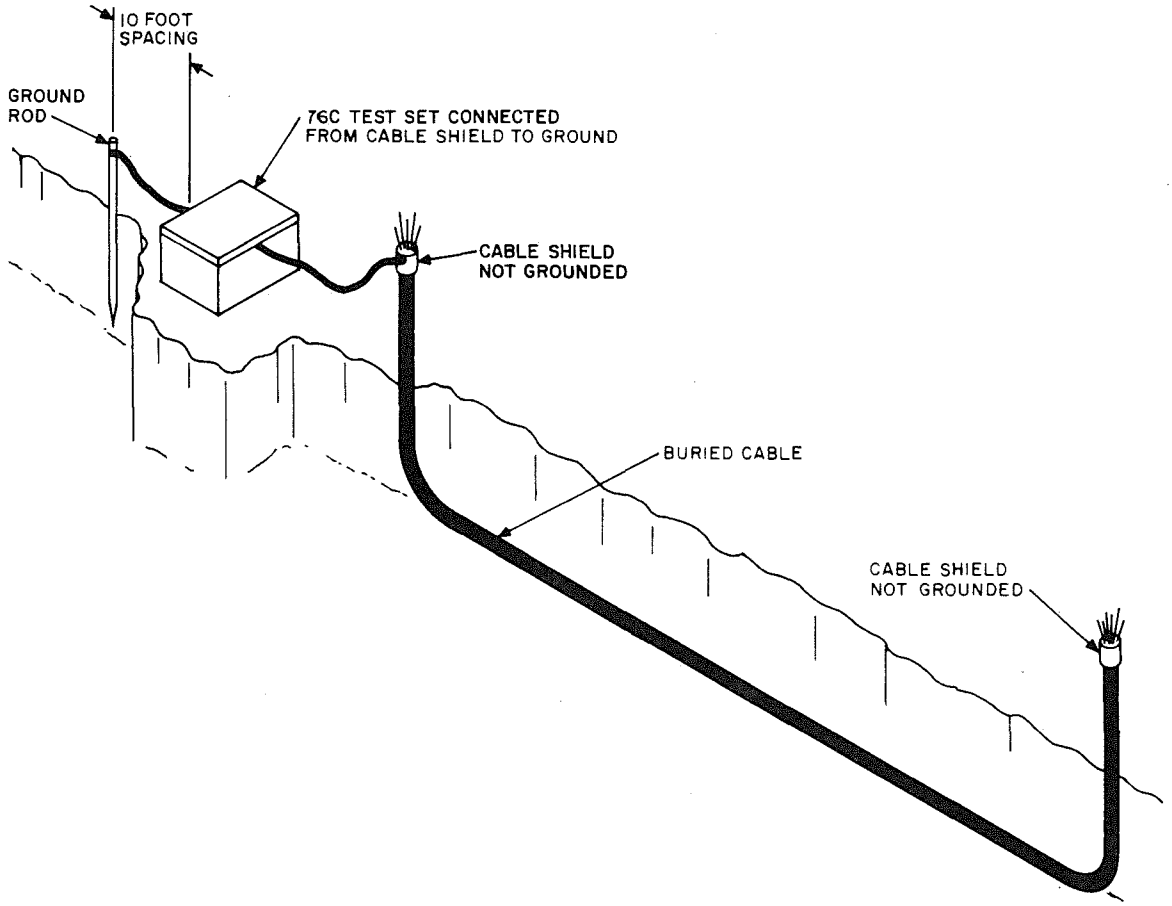

Fig. 8—Isolating Shield of Cable From Ground

5.02 With the probe positioned PERPENDICULAR to the cable as shown in Fig. 9, a means of locating the buried cable is provided. As the probe is moved closer to the cable, the signal will rise until the probe is located directly over the buried cable, then a null occurs. ***This null indicates that the probe is directly over the cable.***

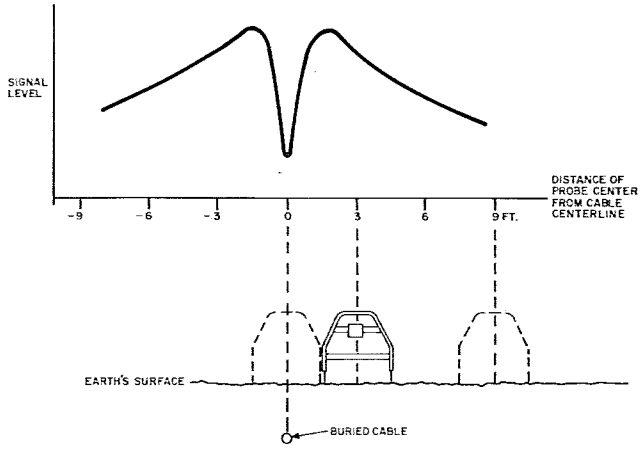

Fig. 9—Locating Buried Cable

6. NOISY ENVIRONMENT

6.01 In noisy environment fault and locating procedures may be difficult to perform. If noise is a problem in detecting a tone, the procedures can be made more effective by using the tone sources and detectors as defined in Section 644-104-100 in place of those specified in this practice.

7. MAINTENANCE

7.01 The probe can be disassembled as shown in Fig. 10 for part replacement. Binding head machine screws and hex nut are assembled with loctite No. 83 grade CV on the threads. Each electrode is insulated from the frame with fiber bushings. The wiring continuity can be checked from each electrode to the connector and the insulation of each probe from the frame. This should be done prior to use with an ohmmeter to assure satisfactory operation of the probe.

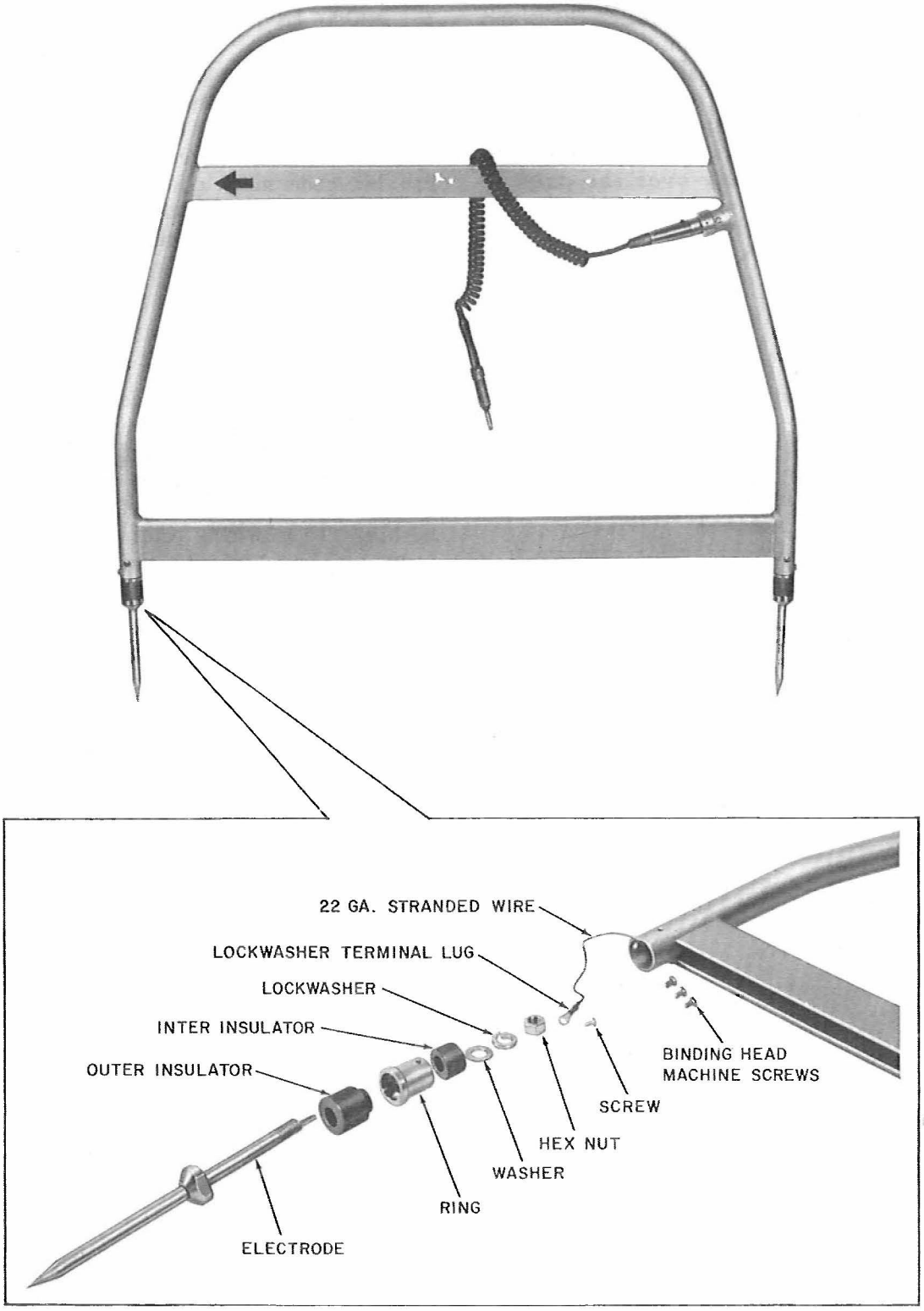

Fig. 10—◗B Ground Probe Disassembled◖