BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

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PRESSURE TESTING
B LEAK LOCATOR—TESTING PROCEDURE

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1. GENERAL

1.01 This section covers the location of gas leaks in aerial cable by means of the B Leak Locator.

1.02 The instructions which follow assume that the cable under test has been charged with Freon 12 and that the apparatus is in satisfactory working condition.

2. SEQUENCE OF OPERATIONS

2.01 The sequence of operations in using the B locator for various purposes is outlined below.

2.02 **Full Gas Section:**

(1) Prepare the cable for charging.
(2) Charge cable with Freon.
(3) Test cable and mark defects.
(4) Clear the Freon from the section.
(5) Repair leaks in accordance with standard methods.

2.03 If successive gas sections are to be tested, it is important to schedule the charging well in advance of testing, due to the long period of time required to charge the cable with Freon.

2.04 **Short Sections:** In testing cable to locate multiple leaks or individual leaks in **less than a gas section,** proceed as follows:

(1) Prepare the cable for charging.

(2) Clear zero-pressure leaks or restrictions if any are evident.

(3) Charge approximately 10 spans of cable on each side of the suspected leak with Freon.

(4) Test the cable and mark the defects as covered in this section.

(5) Clear Freon from the test section.

(6) Repair leaks in accordance with standard methods.

2.05 **Preparing Existing Cable for Maintenance Under Pressure:** After the necessary pressure plugs have been constructed, proceed as follows:

(1) Charge the cable with nitrogen or connect to the compressor-dehydrator; then prepare an over-all gradient.

(2) Clear zero-pressure leaks or restrictions if any are present.

(3) Charge cable with Freon, using 1 cylinder at the center, if the section is under about 4 miles long. If longer, space the cylinders about 3 miles apart.

(4) Test cable and mark the defects.

(5) Clear Freon from the test section, using nitrogen cylinders or by connecting the cable to the compressor-dehydrator. In compressor operated systems, auxiliary nitrogen cylinders spaced about 3 miles apart should be used to clear the Freon, in order to reduce the waiting time.

(6) Repair leaks in accordance with standard methods.

3. TESTING CABLE ON STRAND

3.01 **Preliminary Warm-Up:** After placing the collector, detector and carrier assembly on the strand (or arranging the apparatus for carrying the power and control unit along the ground), proceed as follows:

(1) Connect the detector to the control unit and set the SENSITIVITY at the desired position—usually HIGH for locating leaks. (The HIGH position is ordinarily used for leak location purposes. However, when the detector is extra sensitive, as it may be when new, or if the alarm occurs at too great a distance from large leaks due to wind conditions, the MED or LOW sensitivity setting can be used if necessary, to avoid premature alarms.)

(2) Set the ON-OFF switch to ON and adjust the HEATER CURRENT control to give 3.1 amps., if practicable.

(3) After a 5 to 10 minute warm-up period, reset the heater current to 3.1 amps., if practicable.

(4) Turn the SIGNAL CURRENT control clockwise to give maximum current; then back off the control to give 1/2 ma. below maximum current.

(5) The apparatus is now ready for testing the cable.

3.02 **Testing Procedure:** Start with one end of the collector against the pole, where it should remain for 4 or 5 seconds. In this way the detector will respond to any leak in the pole area. Then proceed as follows:

(1) **Approximate Leak Location:** Pull the locator along the cable at walking speed to the next pole. At this rate, the apparatus can detect leaks as small as 1/100 cu. ft. of gas per day (1/4 in. diam. bubble in 10 to 15 seconds). If a leak exists, the alarm bell should ring when the collector is 1 to 10 feet beyond the leak, depending on the size of the leak and the strength and direction of the wind.

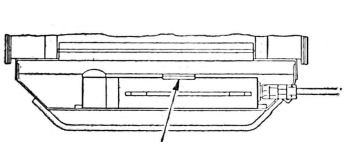
(2) If an alarm is heard, stop immediately and wait for the bell to stop ringing.

(3) Then pull the collector back one length at a time. When the bell again rings, the collector will usually be over or very close to the leak.

Note: Wind blowing along the cable may carry Freon toward the collector for several feet, especially near a sizeable leak.

(4) **Exact Leak Location:** Preferably with a ladder or ladder platform truck, or with a cable car if the cable can not be reached otherwise, go to the location of the collector and move the collector to one side.

(5) If the leak is not apparent, remove the detector from the collector as illustrated below, and inspect the cable by passing the air intake of the detector **VERY SLOWLY** along the cable (preferably with the wind) until the bell rings again.



(6) Inspect the area adjacent to the detector inlet, using solution if necessary, to spot the exact point of leak. The leak should be within a foot of the inlet.

(7) **Marking Defects:** When the defect is found, wrap friction tape around the cable, leaving a short hanging end to facilitate later observation from the ground. If the leak produces rapid bubbling, wrap with rubber and friction tape. **Do Not** make acetylene torch repairs until the Freon is removed from the cable.

3.03 **Effect of Wind:** If the collector is pulled into the wind, and particularly if the leak is large (10 or more cu. ft. per day), a bell signal may be received before the collector has passed over the sheath break. This condition will be recognized as experience is gained in using the locator.

3.04 **Effect of Fumes from Clothes Cleaners:** False indications have occasionally been noted in the vicinity of clothes cleaning plants, due to the escape of carbon tetrachloride fumes.

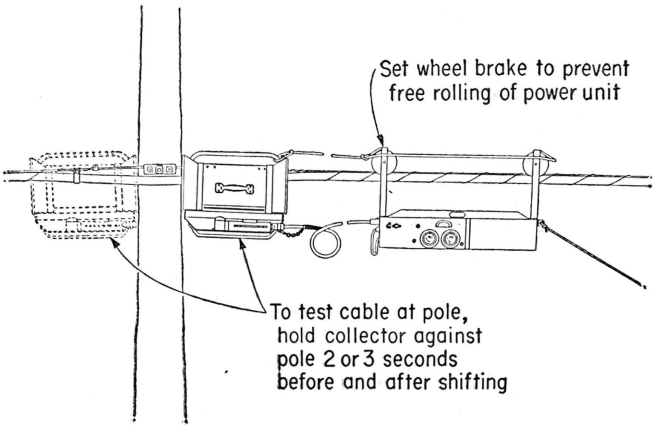
3.05 **Tobacco smoke** in any form contains a small amount of halogen gas that will affect the detector in the same manner as Freon. Care must, therefore, be taken to avoid trouble from the source, particularly when the detector is being used in hand to inspect cable.

4. TRANSFERRING B LOCATOR AT POLES

4.01 **Carrier:** After transferring the carrier, observe the reading of the heater current ammeter and the milliammeter. If the ammeter shows less than 3.1 amps., readjust the control to obtain the required current, if practicable. The detector should ordinarily not be operated at less than 2.9 amps.

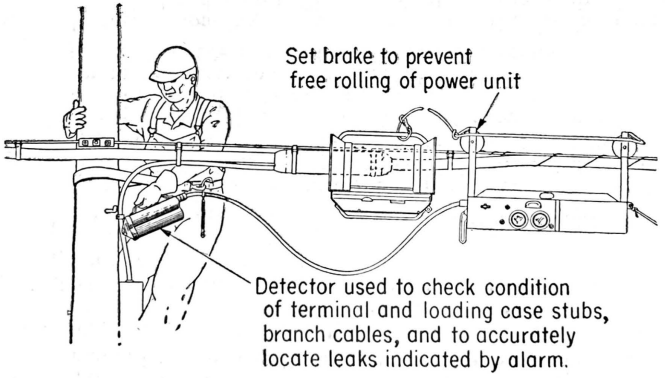
4.02 The signal current should be reset 1/2 ma. below maximum current, if any appreciable change from this setting is noted.

4.03 **Collector:** The following sketch shows how the collector should be used and transferred at poles to ensure that the section of cable in the pole area is given an adequate test.



5. TESTING CABLE ON POLES

5.01 The following sketch shows how the detector is used to test terminal or loading coil stubs, vertical sections of cable on poles, etc.



5.02 To insure normal operation in using the detector as indicated, be sure that the blower vents are not obstructed.

5.03 The heater in the detector element uses about 45 watts of power and the detector normally runs fairly hot, particularly during the summer. It can be handled safely by using gloves, when necessary.

6. TESTING TERMINALS, LOADING COIL CASES, ETC.

6.01 In testing distribution terminals, first pass the intake opening of the detector **SLOWLY** along the stub. Then open the cover and check the faceplate for leaks.

Note: Types F, C and No. 14 distribution terminals as well as B, BB, BD and similar sealed chamber cross-connecting terminals are not gastight unless suitably plugged in the stub or in the adjacent cable.

6.02 In testing loading coil cases, first pass the intake opening of the detector **SLOWLY** along the stub. Then check any suspected portion of the loading coil case.