

176A TEST SET

DESCRIPTION AND USE

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3. DESCRIPTION

3.01 The 176A (SICK-PIC) test set (Fig. 1) is battery powered and weighs approximately 4 pounds. It measures approximately 9-1/2 inches by 5 inches by 3-1/2 inches. A strap is provided for carrying or hanging the test set during use.

3.02 The test set uses a 1-kHz signal to compare the resistive length of one pair (shorted at the far end of the section being tested) with the capacitive length of another pair in the same section (opened at the far end). This comparison is indicated on the meter as dry or as an approximate percentage of water.

1. GENERAL

1.01 This section covers the description and use of the 176A (SICK-PIC) test set.

1.02 This section is reissued to change test leads to commercially available cords and make internal modifications to correct faulty percent moisture indications in cable lengths of less than 130 feet. Revision arrows are used to emphasize the more significant changes.

1.03 The 176A (SICK-PIC) test set is designed for use in testing of air core, PIC cable having a nominal capacitance of 0.083 μ F per mile. It will test 22- through 26-gauge cable 50 to 2500 feet and 19-gauge cable 100 to 2500 feet. The test set will indicate whether the cable is wet and what percentage of the cable section is wet.

2. PRECAUTIONS

2.01 Exercise care to protect the test set from water damage as it is *not* waterproof.



Fig. 1—176A Test Set

NOTICE

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

3.03 The 176A test set incorporates the following features:

- Direct meter reading of the percentage of water in a cable section—no computing, or special tables required
- Built-in calibration and self-test circuit
- Automatic battery testing during calibration
- Automatic out-of-range warning during testing
- Completely self-contained unit, including test leads
- Use of commercially available, long-life batteries
- Operation at wide range of temperature and humidity.

3.04 The following controls are located on the front panel (Fig. 2):

TITLE	FUNCTION
RUN Button	Activates set (a momentary push-button type switch)
CAL/TEST Switch	In CAL position, switch (1) internally disconnects set from test leads, (2) connects set to internal standards to calibrate meter, (3) activates battery test and (4) deactivates TEMP and GAUGE switches
CAL ADJ Knob	Calibrates meter to internal standard when CAL TEST switch is in CAL position
BATT OK	With CAL TEST switch in CAL position, indicator glows green if both batteries are satisfactory.
OUT OF RANGE	With CAL TEST switch in TEST position, indicator glows red if cable length is less than 100 or more than 2500 feet long. If indicator comes on when testing 22-, 24- or 26-gauge cable that is <i>known</i> to be 50 to 100 feet long, disregard signal.

TITLE	FUNCTION
GAUGE Switch	Adjusts set to gauge of <i> cable </i> being tested.
TEMP Switch	Adjusts set to approximate temperature of <i> cable </i> being tested.

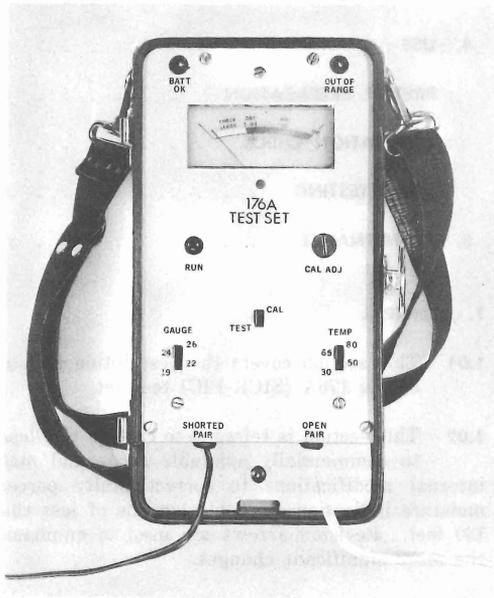


Fig. 2—Front Panel

4. USE

4.01 Testing must be performed at the nearest access points to the section of cable suspected of containing water. With this method, the test set will detect the smallest amount of water. In no case should the length of the cable section under test exceed 2500 feet because the results will be inaccurate.

PRETEST PREPARATION

4.02 Cable to be tested must be of one gauge (19 through 26), air core, PIC-type, capacitance of 0.083 $\mu\text{F}/\text{mile}$, 100 to 2500 feet long, except for 22- through 26-gauge cable **known** to be 50 to 100 feet long. Cable filled with reclamation compound cannot be tested.

(1) To identify individual problem sections and those with small amounts of water, test one cable section at a time.

(2) Select two cable pairs and cut them clear at each end of the section. Use KS-8455 meter or 145B test set to be sure that there are no shorts, ground faults, or foreign voltages on pairs to be tested.

Note: Fault resistance of less than 1 megohm results in inaccurate readings. If this happens, select another cable pair in the section and retest.

(3) At the far end of the section, short one pair by putting a strap between tip and ring conductors and leave other pair open and clear.

(4) Verify continuity of shorted pair at near end.

CALIBRATION CHECK

4.03 Before using test set, calibrate as follows:

(1) Move CAL TEST switch to CAL position.

(2) Depress and hold RUN button.

(3) BATT OK indicator will glow green if both batteries are good. If indicator does not come on, both batteries must be replaced before accurate readings can be taken.

(4) If BATT OK indicator comes on, turn CAL ADJ knob until meter needle lines up with CAL mark in meter window (Fig. 3). (Meter needle may occasionally be adjusted even if BATT OK indicator does not glow; however, readings will be inaccurate.)

(5) Release RUN button.

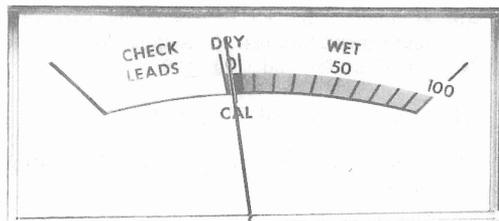


Fig. 3—Meter Face

CABLE TESTING

4.04 Connect and test cable as follows:

(1) Set CAL TEST switch to TEST position.

(2) Move GAUGE switch to gauge of cable being tested.

(3) Move TEMP switch to approximate temperature of cable.

(4) Connect OPEN PAIR (white wire with red insulator) test leads to cable pair that is open at far end (Fig. 4).

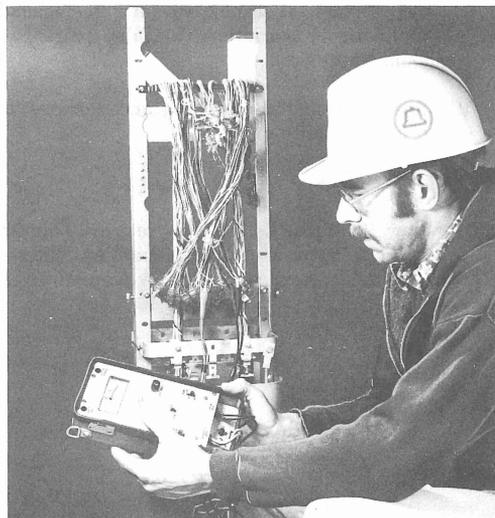


Fig. 4—Connecting to Pair to be Tested

- (5) Connect SHORTED PAIR (black wire with black insulator) test leads to cable pair that is shorted at far end (Fig. 4).
- (6) Depress and hold RUN button.
- (7) Read meter deflection, release RUN button and record result.

Note 1: If OUT OF RANGE indicator comes on when testing 19-gauge cable, meter reading is invalid. Recheck test leads and length of cable section.

If OUT OF RANGE indicator comes on when testing 22-, 24- or 26-gauge cable that is **known** to be 50 to 100 feet long, disregard signal.

Note 2: If meter indicator either stays in CHECK LEADS zone or deflects off-scale to the right, recheck test lead connections.

- (8) If cable pairs test WET, or if doubt exists about the validity of a test result for any reason, select, prepare, and test another open cable pair.

Note: Small differences in the indicated percentage of water on different pairs in the same section of cable are due to normal manufacturing variations in cable pairs and should be ignored.

- (9) Restore tested cable pairs and closures to original condition.

5. MAINTENANCE

5.01 New 176A (SICK-PIC) test sets are shipped without batteries. For maximum battery life and trouble-free operation at low temperatures,

use two alkaline 9-volt batteries (NEDA type 1604A), such as KS-21618 L2; Eveready* 522; Mallory MN 1604; or equivalent alkaline types.

- (1) Remove battery cover by pulling up on latch button in test lead compartment; gently lift nylon strip and disconnect spent batteries (see Fig. 5).
- (2) Connect snap fasteners of fresh batteries to test set terminals.
- (3) Place fresh batteries on nylon strip and gently reposition in battery compartment.
- (4) Replace battery cover and push down on latch button to secure.

*Registered trademark of Union Carbide Corp.

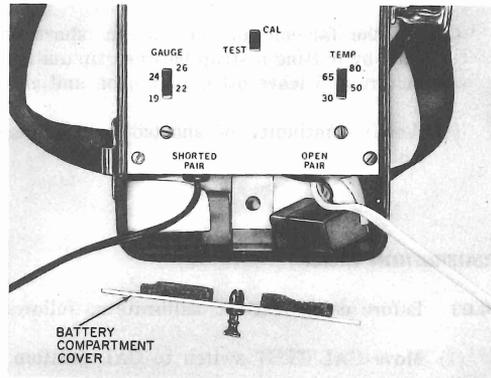


Fig. 5—Battery Replacement