407-TYPE MULTIPLE DATA STATION
TEST PROCEDURES

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1. GENERAL

1.01 This section describes the test procedures and associated test requirements to be met at the time of installation or when investigating trouble conditions associated with the 407-type multiple data station.

1.02 This section is reissued to include coverage of data set (DS) 407B.

1.03 Before proceeding with any test, verify that the data loops have been tested and meet requirements specified in the section entitled Data Systems—Dataphone® Service on Direct Distance Dialing Network—Test Requirements for Subscriber, Foreign Exchange, and Remote Exchange Lines (314-205-501) or Voiceband Private Line Data Circuits—Tests and Requirements (314-410-500).

1.04 When test or demonstration calls are made, refer to the section entitled Crediting Charges on Test Calls (010-250-001) for the proper procedure for crediting charges.

1.05 The 407-type multiple data station contains a test unit, consisting of the 46A1 and 47A1 data units, which is provided with the 41A1 ▶or 41A2◀ data mounting. The test unit provides both local and remote testing capabilities for any data set 407-type mounted in the cabinet. The test unit also provides a lamp testing feature for all the light emitting diodes (LEDs) in the station.

1.06 When a data set is placed in the remote test mode, the data set is connected to a service line and then tested by the data test center. The local test may be conducted by the customer or telephone company (telco) employee using the test unit. A typical test arrangement is shown in Fig. 1.

1.07 The test procedures given in this section are for one data set and must be repeated for each additional data set.

1.08 A KS-20538-L1 volt-ohm-milliammeter (VOM), or equivalent, is needed to perform the power unit test. A 1013-type handset, or equivalent, is required for the verification test.

2. LOCAL TEST

2.01 This test checks the operation of a data set 407-type under normal input conditions via the 47A1 data unit (modified 16-button Touch-Tone® dial). The local test does ***not*** check the line control circuit. When a character is transmitted from the dial and received by the data set, the LEDs representing the horizontal and vertical coordinates of the character key will flash at a steady rate if the data set is functioning properly. Perform the local test as follows:

STEP	PROCEDURE
1	Operate LOCAL-REMOTE TEST switch to REMOTE.
2	Depress LAMP TEST switch.

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STEP	PROCEDURE
	Requirement: All LEDs light on all data sets in the cabinet and on the 46A1 and 47A1 data units.
3	Remove customer interface cable from data set to be tested.
4	Plug the test connector into data set by operating the catch located on the extension. (The extension provides a means of depressing the TEST button located on the front of the data set.)
	Requirement: ON and OS LEDs light (disregard TR LED).
5	Operate LOCAL-REMOTE switch on test unit (46A1 data unit) to LOCAL position.
	Requirement: After a delay, the MR and LOCAL TEST LEDs light.
6	Depress and hold pushbutton 1 on the 47A1 data unit.
	Requirement: Associated row and column LEDs (on the 47A1 data unit) and DP LED (on the data set) flash at a steady rate (10 pulses per second). Refer to Fig. 1 for an example of which LEDs are flashing on the 47A1 data unit when pushbutton 1 is depressed.
7	Repeat Step 6 for all other pushbuttons.
	Note 1: When testing DS 407B with option K installed, the AR lamp will light when the * (star) key is depressed on the 47A1 data unit. If option K is not installed, test of DS 407B is identical to the test of DS 407A.
	Note 2: If some LEDs do not flash properly, replace the associated data set. Verify that the replacement data set has proper options installed per Section 594-800-200.
8	Remove test connector from data set by operating the catch on the extension.
9	Plug customer interface connector into data set and tighten screws.
10	Repeat test as required for each data set.
11	Return station to pretest condition.

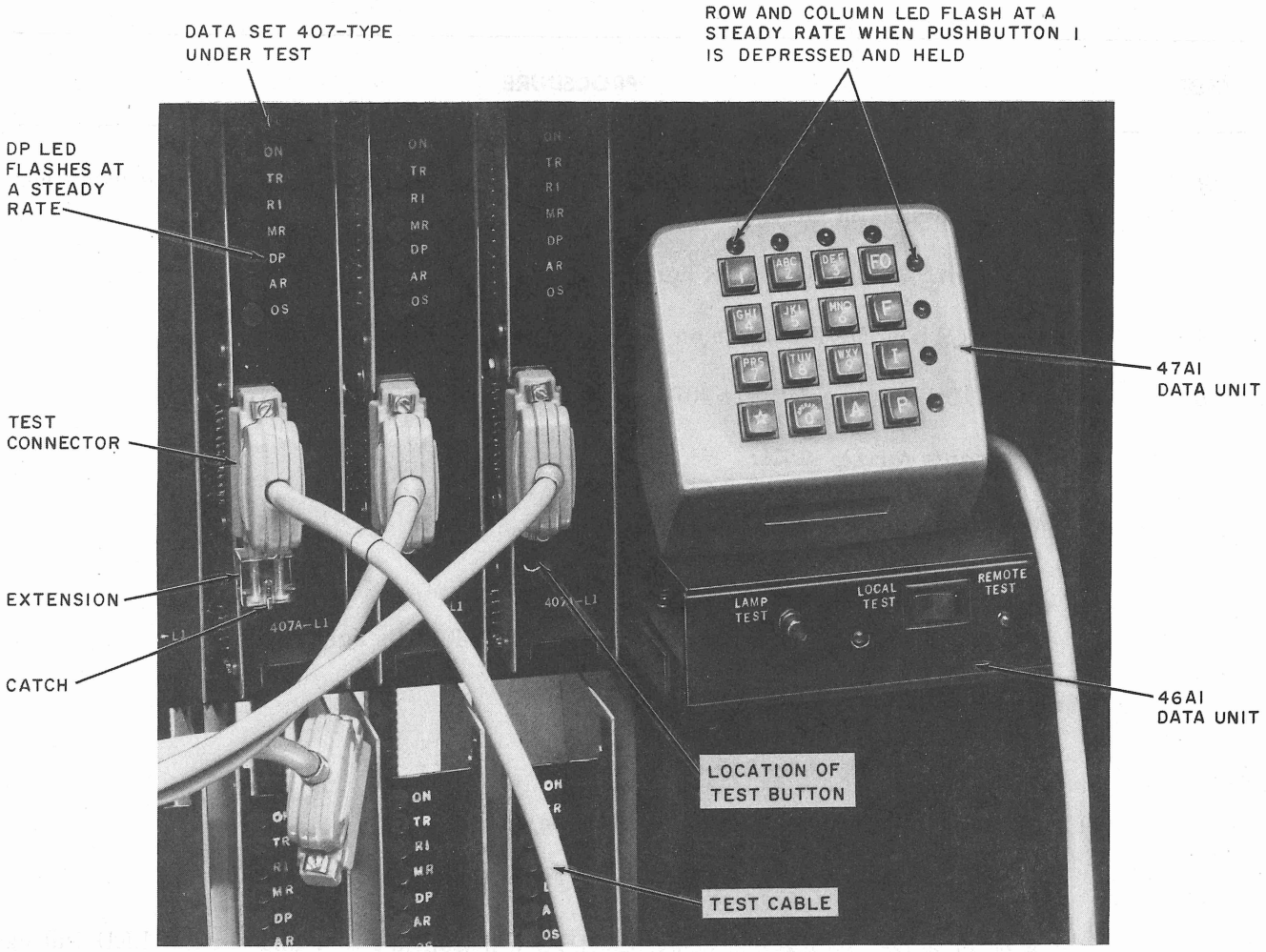

Fig. 1—Data Set 407-Type Test Arrangement—Typical

3. REMOTE TEST

3.01 This test provides a thorough check of the data set. The line control circuitry is checked along with parameters such as sensitivity and bandwidths. In the remote test mode, the data set under test is connected to a service line associated with the installation and called by the data test center (DTC). Since the 407-type multiple data station is normally on a hunting group, the service line provides a means of accessing a particular data set.

Note: "Computer down" is optionally detected by means of a switch or by detecting all DTRs off in a station. If the switch is used, it should be in the "computer up" position. When the switch is in the "computer down" position, all TR lights in the station will be ON. If the "all DTRs off" method is used, all TR lights in the station will be ON.

Perform the remote test as follows:

STEP	PROCEDURE
1	Call the DTC and arrange for a remote test in accordance with DTC procedures.
2	Remove customer interface cable from the data set to be tested.

STEP	PROCEDURE
3	Plug the test connector into the data set by operating the catch located on the extension (placing the data set in the test mode). ***Requirement:*** ON and OS LEDs light (disregard TR LED).
4	Operate LOCAL-REMOTE switch on the test unit to REMOTE position.
5	When the DTC calls the data set 407-type under test, observe the following: ***Requirements for DS 407A:*** • RI LED flashes one or two times. • TR LED lights (TR LED may already be on). • After a 3-second delay, MR and REMOTE TEST LEDs light. ***Requirements for DS 407B:*** • RI LED flashes one or two times. • TR LED lights (TR LED may already be on). • After a 3-second delay, MR and REMOTE TEST LEDs light. • After a 12- to 15-second delay, the DTC will transmit * * and the AR LED will light or flash. • If the "all DTRs off" method of detection of computer down is used, all of the TR lights in the cabinet will go OFF.
6	When the DTC transmits a valid Touch-Tone character, observe the following: ***Requirements:*** • The DP LED flashes at a steady rate (10 pulses per second). • On the 47A1 data unit, the row and column LEDs associated with the character being transmitted by the DTC will also flash at a steady rate (10 pulses per second). • When * is transmitted, the AR LED may light or flash.
7	When all the remote test is completed, the DTC transmits a ***hang-up*** character sequence (* # *) which terminates the call. ***Requirement:*** ON and OS LEDs (on data set) are lighted and REMOTE TEST LED extinguishes (on 46A1 data unit).

STEP	PROCEDURE
	Note: If data set fails the above test, replace the data set. Verify that replacement data set has proper options installed per Section 594-800-200.
8	Remove test cable from data set by operating the catch on the extension.
9	Plug customer interface connector into data set.
10	Repeat Steps 2 through 9, as required, for each data set.
11	Return station to pretest condition.

4. POWER UNIT TEST

4.01 The following procedure is used to measure the voltages of the 101A power unit. Since each data set operates from a separate regulator in the power unit, one data set could be out of service due to trouble within a particular regulator. In this case, the power unit may have to be replaced. A data set may also have power unit trouble even if the ON lamp on the data set under test is lighted. A KS-20538-L1 VOM is required for this test.

STEP	PROCEDURE
1	Gain access to the rear of the 41-type data mounting(s).
2	Set VOM FUNCTION switch to 30 Vdc.
3	Connect VOM leads as follows: • Negative lead to terminal 9 of J terminal interface (J5-J12) as required for data set under test. • Positive lead to terminal 7 of J terminal interface (J5-J12) as required for data set under test. ***Requirement:*** VOM reads 10 to 14 volts.
4	Disconnect both VOM leads and reconnect as follows: • Negative lead to terminal 7 of J terminal interface (J5-J12) as required for data set under test. • Positive lead to terminal 21 of J terminal interface (J5-J12) as required for data set under test. ***Requirement:*** VOM reads 10 to 14 volts.
5	Disconnect both VOM leads.

STEP	PROCEDURE
6	Set VOM FUNCTION switch to 10 Vdc.
7	Connect VOM leads as follows: • Negative lead to terminal 7 of J terminal interface (J5-J12) as required for data set under test. • Positive lead to terminal 31 of J terminal interface (J5-J12) as required for data set under test. ***Requirement:*** VOM reads 4.8 to 5.2 volts.
8	Remove test leads and return station to pretest condition.

5. VERIFICATION TEST

5.01 This test is performed during the installation procedure prior to connecting the customer interface cables to the data sets mounted in the 41-type data mounting. The test verifies that the data set is functioning properly prior to connecting the customer-provided computer to the data set. A 1013-type handset is required for this test. The verification test is as follows:

STEP	PROCEDURE
1	Operate LOCAL-REMOTE TEST switch to REMOTE.
2	Depress LAMP TEST switch. ***Requirement:*** All LEDs light.
3	Plug the test connector into data set by operating the catch located on the extension. (The extension provides a means of depressing the TEST button located on the front of the data set.)
4	Operate LOCAL-REMOTE switch on test unit (46A1 data unit) to LOCAL position. ***Requirement:*** After a delay, the MR and LOCAL test LEDs light.
5	Depress and hold pushbutton 1 on the 47A1 data unit. ***Requirement:*** Associated row and column LEDs and DP LED flash at a steady rate (10 pulses per second).
6	Repeat Step 5 for all other pushbuttons on the 47A1 data unit. ▶***Note 1:*** With DS 407B with option K, the AR LED will light or flash when * (A_4 B_1) is depressed.◀

STEP	PROCEDURE
	Note 2: If some LEDs do not flash properly, replace the associated data set. Verify that replacement data set has proper options installed.
7	Connect a 1013-type handset across the service line tip and ring (pins 2 of J8 and 2 of J9, respectively.
8	Operate the TALK-MON switch on the handset to TALK.
9	Operate LOCAL-REMOTE switch to REMOTE position.
10	Call the ring-back number using the 1013-type handset.
11	Operate TALK-MON switch on the handset to MON.
	Requirement: After ringing is tripped, monitor the following: • 2025-Hz answer tone is heard in handset • REMOTE TEST LED lighted • MR LED lighted.
12	Remove test connector from data set by operating the catch on the extension.
13	Plug customer interface connector into data set.
14	Repeat test as required for each data set mounted in the 41-type data mounting(s).
15	Remove 1013-type handset leads from service line.
16	Perform remote test per Part 3 of this section on any one data set.
	Note: This verifies the ability to perform a remote test.
17	End of verification test.