

DATA SET 401M-TYPE TRANSMITTER TEST PROCEDURES

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1. GENERAL

1.01 This section describes test procedures for data set 401M-type. These tests are to be made at the time of installation and as a part of the trouble-clearing procedures.

1.02 This section is reissued to add information on data set 401M-L1B. Data set 401M-L1B replaces data sets 401M-L1/4, -L1/2/3, and -L1/2/4, which are rated Manufacture Discontinued (MD). Data sets 401M-L1A/2/3 and -L1A/2/4 are also rated MD, but no replacement is provided. Information on the MD data sets has been retained since these sets are still in service. Since this is a general revision, arrows ordinarily used to indicate changes have been omitted.

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

1.04 Before proceeding with any test, make sure the following conditions have been met.

- Verify that the overall facilities have been tested and meet the transmission requirements specified in the section entitled Data Systems—DATA-PHONE® Service and Data Access Arrangements on Direct Distance Dialing Network—Test Requirements for Subscriber, Foreign Exchange, and Remote Exchange Lines (314-205-501).
- Verify that the data set strapping options agree with the service order or circuit layout record card. Refer to the section entitled Data Set 401M-Type Transmitter—Installation and Connections (594-028-200).

1.05 Data sets failing to pass test requirements should be replaced. The data set used for replacement should be tested by the data test center (DTC) before being placed in service.

1.06 Data sets found to be defective should be returned to the Western Electric Company distributing houses for repair. Sets should be tagged to indicate the nature of the trouble.

2. INSTALLATION TEST PROCEDURE

2.01 The following test is to be performed to ensure proper installation of data set 401M-type. This test is also performed during a maintenance visit to verify data set operation.

2.02 The data set is tested remotely by the DTC. This test requires that the data set be placed in the test mode by either the customer or Telco employee. The test checks the frequencies produced by the data set when TEST A and TEST B buttons are operated.

STEP	PROCEDURE
1	Lift handset of data set 401M-type and depress TALK button.
2	Place a call to the DTC and request that the transmitter be tested as outlined in the section entitled Data Test Center—904A and 904C Types—Test Procedures—Data Set 401M-Type (668-104-508).
3	After it has been agreed to begin the test, depress DATA button.
4	<p data-bbox="253 611 1390 663">Depress and hold TEST A button. The data set will transmit the following frequencies to the DTC.</p> <ul data-bbox="318 705 919 863" style="list-style-type: none"><li data-bbox="318 705 537 726">● 941 Hz \pm10 Hz<li data-bbox="318 768 537 789">● 1633 Hz \pm10 Hz<li data-bbox="318 831 919 863">● 1950 Hz \pm10 Hz (if C group oscillator is used).
	<p data-bbox="253 894 1390 989"><i>Note:</i> The above frequencies may be monitored through the handset for data set 401M-L1B, with option X, -L1/2/3, or -L1A/2/3 or through a loudspeaker in the business machine for data set 401M-L1/2/4 or -L1A/2/4 and -L1B with option W.</p>
5	After the prearranged time, release TEST A.
6	<p data-bbox="253 1083 1390 1136">Depress and hold TEST B button. The data set will transmit the following frequencies to the DTC.</p> <ul data-bbox="318 1178 1422 1367" style="list-style-type: none"><li data-bbox="318 1178 537 1199">● 600 Hz \pm10 Hz<li data-bbox="318 1241 537 1262">● 1098 Hz \pm10 Hz<li data-bbox="318 1304 1422 1367">● 2250 Hz \pm10 Hz (if C group oscillator is used, data set 401M-L1B, -L1/2/3, -L1/2/4, -L1A/2/3, or -L1A/2/4).
	<p data-bbox="253 1398 1008 1430"><i>Note:</i> The above frequencies may be monitored as in Step 4.</p>
7	After the prearranged time, release TEST B.
8	Depress TALK button and discuss results of the test with the DTC. Arrange to repeat the test if any of the frequencies were missed.
9	Replace handset to terminate the call.
10	End of test.

3. MAINTENANCE TEST PROCEDURES

3.01 The following test procedure is to be performed if data set 401M-type does not meet the requirements of the DTC test and a Telco employee has been dispatched to the station.

3.02 The test procedure to be followed should depend on the type of test equipment available.

A. Interface Test Using the 901B Data Test Set (DTS)

3.03 This test procedure checks the frequencies and levels generated by data set 401M-type.

3.04 The only test equipment required for this test is a 901B DTS and a 1013-type handset (required if data set under test is a List 4).

3.05 Perform the following procedure.

STEP	PROCEDURE
1	Remove the business machine cord from the data set interface connector and connect the interface test adapter in its place.
2	Connect the 901B DTS to the interface test adapter.
3	Set the controls of the 901B DTS as follows: <ul style="list-style-type: none"> <li data-bbox="423 957 737 982">● SELECTOR—Position 6 <li data-bbox="423 1020 626 1045">● A TEST—OFF <li data-bbox="423 1083 626 1108">● B TEST—OFF <li data-bbox="423 1146 691 1171">● UNATT-ATT—ATT.
4	Strap terminals 24 and 25 together on the interface test adapter.
5	Lift handset, depress TALK button and call the DTC.
6	Request a test of the transmitter as outlined in the section entitled Data Test Center—904A and 904C-Types—Test Procedures—Data Set 401M-Type (668-104-508).
7	After arrangements have been made to begin the test, depress DATA button.
8	In cooperation with the DTC, operate the A TEST switch of the 901B DTS to each position shown in Table A. The DTC should receive and check the various frequencies. If the data set under test is a L1B <i>without</i> option V or a L1/4 (no C group oscillator), omit 11 through 14 of Table A.
	Note: The above frequencies may be monitored locally as follows: <ul style="list-style-type: none"> <li data-bbox="423 1713 854 1738">● Data set 401M-L1B with handset. <li data-bbox="423 1776 1040 1801">● Data set 401M-L1/2/3 or -L1A/2/3 with handset. <li data-bbox="423 1839 1523 1896">● Data set 401M-L1/4, -L1/2/4, or -L1A/2/4 with 1013-type handset connected between terminals C and D of the 901B DTS.

STEP	PROCEDURE
9	At the end of the test, depress TALK button and discuss results of the test with the DTC. Arrange to repeat the test if any of the frequencies were missed.
10	Replace handset to terminate the call and reconnect business machine.
11	End of test.

TABLE A
TRANSMITTING FREQUENCIES

A TEST SWITCH ON 901B DATA TEST SET TO POSITION	LISTEN FOR FREQUENCY	CYCLES PER SECONDS (Hz)
OFF	REST	*
1	A0	600
2	A1	697
3	A2	770
4	A3	852
5	A4	941
6	B0	1098
7	B1	1209
8	B2	1336
9	B3	1477
10	B4	1633
11	C0	1950
12	C1	2050
13	C2	2150
14	C3	2250

* 600, 1098, and 1950 Hz in a composite signal.

B. Interface Test Using the 914-Type DTS

3.06 The purpose of this test is to check the frequencies and levels generated by data set 401M-type.

3.07 The only test equipment required for this test is a 914-type DTS.

3.08 Before making test connections, ensure that all programming pins are removed from the 914-type DTS matrix.

3.09 For information on the 914-type DTS, refer to the section entitled 914-Type Data Test Set—Description and Operation (107-101-100).

3.10 *Lettered Steps:* A letter a, b, c, etc, added to a step number of this section

indicates an action which may or may not be required, depending on local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the PROCEDURE column, and all steps governed by the same condition are designated by the same

letter within the test. Where a condition does not apply, all steps designated by that letter should be omitted.

3.11 Perform the following procedure:

STEP	PROCEDURE
1	<p>Operate the controls on the 914-type DTS as follows:</p> <ul style="list-style-type: none"> ● Depress all A interface selector switches. ● Operate INTERFACE MODE switch to CONTACT. ● Operate FUNCTION switch to SPKR. ● Operate RANGE switch to -30. ● Operate OUTPUT switch to OFF. ● Operate S1 through S8 to OFF. ● Verify that all programming pins are removed from the matrix.
2	Connect a jumper wire from interface selector switch 19A to the black INPUT jack on the 914-type DTS.
3	Connect a jumper wire from interface selector switch 20A to the red INPUT jack on the DTS.
4	Remove the customer interface connector from data set to be tested.
5	Connect the test cable supplied with the 914-type DTS from the A connector on the DTS to the customer interface connector on the data set.
6	Turn 914-type DTS on.
7	Lift handset, depress TALK button, and call the DTC.
8	Request a test of the transmitter as outlined in the section entitled Data Test Center—904A and 904-Types—Test Procedures—Data Set 401M-Type (668-104-508).
9	After arranging to begin the test, depress DATA button.
10	<p>Insert a red programming pin into the following crossover points on the 914-type DTS matrix:</p> <ul style="list-style-type: none"> ● 24 and TP1 ● 25 and TP1.

STEP

PROCEDURE

Requirement: Data set will transmit AO; BO; and, if installed, CO (600, 1098, and 1950 Hz, respectively).

Note: These frequencies can be monitored either through the handset for data set 401M-L1B, -L1/2/3, or -L1A/2/3 or through the loudspeaker of the 914-type DTS for data set 401M-L1/4, -L1/2/4, or -L1A/2/4.

- 11 Place a red programming pin into each of the following crossover points on the 914-type DTS matrix:

- 3 and TP2
- 7 and TP2.

Requirement: The data set will transmit A1 (697 Hz).

- 12 Remove programming pin from the 3 and TP2 crossover point and insert it into the following crossover points one at a time. The time interval should be such that the DTC can make its measurements.

CROSSOVER POINTS	DESIGNATION	FREQUENCY
4 and TP2	A2	770 Hz
5 and TP2	A3	852 Hz
6 and TP2	A4	941 Hz
9 and TP2	B1	1209 Hz
10 and TP2	B2	1336 Hz
11 and TP2	B3	1477 Hz
12 and TP2	B4	1633 Hz

- 13a If option V in data set 401M-L1B or C group oscillator for data set 401M-L1/2/3, -L1/2/4, -L1A/2/3, or -L1A/2/4 is not installed—
Proceed to Step 15.

- 14b If option V or C group oscillator is installed—
Resume the procedures of Step 12 with the following crossover points:

CROSSOVER POINTS	DESIGNATION	FREQUENCY
14 and TP2	C1	2050 Hz
15 and TP2	C2	2150 Hz
16 and TP2	C3	2250 Hz

STEP	PROCEDURE
15	Remove all programming pins from the 914-type DTS matrix.
16	Depress the TALK button and discuss the results of the test with the DTC. Arrange to repeat the test if any of the frequencies were missed.
17	Hang up handset and return to pretest conditions.
18	End of test.
