
DATA SERVICE QUALIFICATION TESTS
T1 DIGITAL LINE
DIGITAL TRANSMISSION SYSTEMS

This section contains the tests for initially qualifying T1 digital lines that are to be used in the Digital Data System (DDS). These tests may also be used for qualifying T1 lines for voiceband data, wideband data, program service, and 1.544-Mb/s data services.

This section is being reissued to change its title and scope to cover a broader spectrum of data service. Since this is a general reissue, change arrows are not used. This reissue does not affect Equipment Test List.

After the T1 line has been selected or constructed, line performance must be evaluated before the line can be used for data service when the preparation (Chart 1) is complete. The purpose of the line qualification tests given in this section is to ensure that both directions of line transmission meet the performance objective for the customer channel.

The various data services and T1 carrier are intended to provide full-duplex service; therefore, all of its parts must be capable of satisfactory 2-way transmission. Evaluating the T1 line on a looped basis (Chart 2) allows estimating the 2-way performance of the overall facility with little craft time and effort. Two one-way tests (Chart 3) can also be used. This method is useful if in-service lines must be tested, since the test can be made on a monitoring basis and does not require that the system under test be removed from service.

Depending on the system layout, T1 lines may consist of a single span or of several spans connected through intermediate offices. However, the line qualification test must be performed on the overall T1 line between DDS, data bank, or channel bank terminal locations.

Some lines may exhibit poorer than normal performance during certain periods of the day. On most of these lines, these periods occur during the business hours. Therefore, the line qualification test should be performed during the business day, preferably spanning the busiest hour.

For locations that exhibit busy periods outside the normal business day, the 2-hour line qualification test should span those busy periods.

CHART	PAGE
1 — Preparation	2
2 — Looped-Line Qualification Test	4
3 — End-To-End Qualification Test	6

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

APPARATUS:

- 1 —J98725AF Quasi-Random Signal Source (QRSS) or J98710R Quasi-Random Signal Source (QRSS)
- 1 —J98725AC T1C/T1 Office Bipolar Violation Detector (T1C/T1 OBVD) or either the Bowmar 271B or Northeast Electronics 7031
- 1 —P3BH Cord

Note 1: If the lines to be tested are being supplied with a good bipolar signal, the QRSS is not required.

Note 2: If using the Bowmar 271B test set the QRSS is not required.

CHART 1

PREPARATION

STEP	PROCEDURE						
1	Ensure that the initial line tests in Section 365-800-002 (TOP) have been completed.						
2	Determine whether a 1.544-Mb/s signal is being supplied to the line to be tested. If a signal is being supplied, proceed to Step 4; if not, proceed to Step 3.						
3	Connect the output of a QRSS to the line to be tested as follows: <ul style="list-style-type: none">● If at a DSX-1, connect to IN jack associated with line to be tested.● If at a T1C/T1 ORB, connect to L IN jack on jack field.● If at a 206 ORB, connect to L IN jack on repeater.● If at a 201 ORB, connect to IN jack on STA.						
4	Connect the power cord of the test set to -48V TST jack (115 VAC if using 271B) on the DSX-1 maintenance panel or the jack mounting panel on the ORB.						
5	Connect one end of a P3BH cord to the test set as follows:						
	<table><tr><td>T1C/T1 OBVD</td><td>271B</td><td>7031</td></tr><tr><td>To SIG IN jack</td><td>To DSI INPUT jack</td><td>To 310 INPUT jack</td></tr></table>	T1C/T1 OBVD	271B	7031	To SIG IN jack	To DSI INPUT jack	To 310 INPUT jack
T1C/T1 OBVD	271B	7031					
To SIG IN jack	To DSI INPUT jack	To 310 INPUT jack					

CHART 1 (Contd)

STEP	PROCEDURE
6	<p>Connect the free end of the P3BH cord to the line to be tested as follows:</p> <ul style="list-style-type: none"> ● If at a DSX-1, connect to MON jack associated with OUT jack of line to be tested. ● If at a T1C/T1 ORB, connect to MON jack below the appropriate X IN jack on the jack field. ● If at a 206 ORB, connect to MON jack below the X IN jack on the repeater. ● If at a 201 ORB, connect to MON jack on side of STA associated with receiving direction. <p>Note: The receiving side of the office repeater should be terminated with a 386B plug if the line is to be looped for testing.</p>
7	Set the switches on the test set per Table A.

TABLE A

SWITCHES	TEST SET BEING USED		
	T1C/T1 OBVD	7031	271B
	SET SWITCH AS FOLLOWS		
Mode	BV sec	—	Violations
Timer	2 Hr	2 Hr	—
Individual errors /error seconds	—	Error seconds	Error seconds
Pulses/errors	—	Errors	—
Power	—	—	On
SYNC mode	—	—	Auto
Self test	—	—	Normal
Display interval	—	—	Midrange
Count interval (bits)	—	—	Count
Count interval (min)	—	—	120

CHART 1 (Contd)

STEP	PROCEDURE
8	Proceed to Chart 2 for looped-line test or to Chart 3 for end-to-end line test.

APPARATUS:

- 1 — J98725AC T1C/T1 Office Bipolar Violation Detector (T1C/T1 OBVD) or either the Bowmar 271B or Northeast Electronics 7031
 - 1 — 386B Plug
-

CHART 2

LOOPED-LINE QUALIFICATION TEST

STEP	PROCEDURE
------	-----------

Caution: *If the T1 line to be tested is in service, patch traffic off to an available alternate line (see Section 365-226-500).*

- 1 Ensure that Chart 1 has been completed.
- 2 Have the line under test looped at the office repeater bay at the far end.
- 3 Ensure that the receiving side of the repeater is terminated by a 386B plug.
- 4 Depress START/RESET (T1C/T1 OBVD), RESET (7031), or RESET/RESYNC (271B).

Requirement 1: Count display is all zeros.

Requirement 2: Lamp indicators lighted as follows, all other indicators extinguished.

T1C/T1 OBVD	271B	7031
Under test	Power count	None

CHART 2 (Contd)

STEP	PROCEDURE
5	Count the number of bit error-seconds for a 2-hour period during the business day, preferably spanning the busiest hour. Requirement 1: The error-seconds count is 50 or less. Requirement 2: All lamp indicators on the test set (except POWER on 271B) are extinguished.
6	If the requirement of Step 5 is met, remove all test equipment and have the loop removed at the far end.
7	Ensure that a bipolar signal is being supplied to the line.
8	If the requirement of Step 5 is not met, isolate the malfunctioning span by repeating Steps 4 and 5 with the line looped at the receiving end of each span. Note: If it is suspected that the requirement of Step 5 was not met because of an unusual, nonrecurring event such as maintenance activity, the line should be retested the next business day.
9	Locate the trouble within the malfunctioning span according to Section 365-800-002 (TOP).

APPARATUS:

- 1 — J98725AC T1C/T1 Office Bipolar Violation Detector (T1C/T1 OBVD) or either the Bowmar 271B or Northeast Electronics 7031

CHART 3

END-TO-END QUALIFICATION TEST

STEP

PROCEDURE

Note 1: This test may be performed in one direction of transmission at a time or in both directions of transmission simultaneously. If both directions of transmission are to be tested simultaneously, omit Step 9.

Note 2: For this test, designate one end of the line under test as the transmitting end and the other as the receiving end.

Both Ends

- 1 Ensure that Chart 1 has been completed.

Transmitting End

- 2 Notify the receiving end to proceed with Step 3.

Receiving End

- 3 Depress START/RESET (T1C/T1 OBVD), RESET (7031), or RESET/RESYNC (271B).

Requirement 1: Count display is all zeros.

Requirement 2: Lamp indicators lighted as follows, all other indicators extinguished.

T1C/T1 OBVD	271B	7031
Under test	Power count	None

CHART 3 (Contd)

STEP	PROCEDURE
4	Count the number of bit error seconds or bipolar violation (BPV) seconds for a 2-hour period during the business day, preferably spanning the busiest hour. Requirement 1: The error-seconds count is 30 or less. Requirement 2: All lamps on test set (except POWER on 271B) are extinguished.
5	If the requirement of Step 4 is not met, isolate the malfunctioning span by repeating Steps 1 through 4 at the receiving end of each span.
6	Locate the trouble within the malfunctioning span according to Section 365-800-002 (TOP).
7	If the requirement of Step 4 is met, remove all test equipment.
8	Ensure that a bipolar signal is being supplied to the line. Note: If both directions of transmission have been tested, omit Step 9.
9	Repeat Steps 1 through 8 for the other direction of transmission.
