551A-TYPE CHANNEL SERVICE UNIT

TEST PROCEDURES

CONTENTS PAGE

1. GENERAL

1.01 This section describes the test procedures to be used when installing and troubleshooting the 551A-type channel service unit (CSU).

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 This procedure assumes that the T1 repeatered line has been installed and tested in accordance with Section 365-200-300.

1.04 There are no initial alignments or adjustments to be made in the CSU; however, visually verify that the proper 206-type repeater (equipped with the correct power options) and line build-out (LBO) network are installed in accordance with the service order.

1.05 This section describes three categories of testing: (1) CSU loop-back, (2) line loop-back, and (3) station to central office (CO). Either one or two or both of the first two test procedures should be used to verify an installation and all three may be used as an aid in trouble isolation.

2. CSU LOOP-BACK TEST

2.01 The CSU loop-back test checks the repeater and signal monitor circuitry by remotely looping the transmit pair to the receive pair at the customer interface and transmitting test signals. The loop-back test may be established by operating the remote test relay or by manually patching the SM-IN jack to the SM-OUT jack on the CSU (Fig. 1).

2.02 The actual test is performed at the CO; however, the proper operation of the remote test relay should be verified during installation.

2.03 The following equipment is required:

- One Bomar error rate test set, model 271B or equivalent
- One 3P7D cord
- Two 3P7C cords
- One KS-14510 volt-ohm-milliammeter or equivalent.

Note: For this test, the 3P7D cord and the KS-14510 meter are used at the customer premises. The error rate test set is used at the CO.

2.04 ***Procedure:*** Perform the tests outlined in Steps 1 through 18.

STEP	PROCEDURE
1	Establish voice contact with the CO that will be performing the test.
2	Request the CO to operate the remote test relay by applying the proper voltage to the associated remote test control pair (at least 15 Vdc at the CSU terminals).

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STEP	PROCEDURE

Requirement: Verify proper operation of the remote test relay by measuring the resistance between RTM and RTC of the CUSTOMER INTERFACE at the CSU (pins 5 and 13 of J3). This measurement should be less than 2 ohms.

Note: If the remote test feature is not provided, the CSU can be looped by patching the SM-IN jack to the SM-OUT jack using a 3P7D cord. (See Fig. 1.)

3 At the T1-type CO, set the controls on the error rate test set as follows:

- Set POWER switch to ON. Observe that the POWER lamp lights.
- Set MODE switch to ERRORS.
- Set INDIVIDUAL-ERROR SECONDS switch to ERROR SECONDS.
- Set SYNC MODE switch to AUTO.
- Disregard the SELF TEST switch.
- Set DISPLAY INTERVAL (SEC) switch to HOLD.
- Set COUNT INTERVAL (BITS) to timed (straight down).
- Set COUNT INTERVAL (MIN) to 15-minute position.

4 Patch one of the four DS1-OUTPUT jacks on the error rate test set to the L IN jack on the CO repeater. (See Fig. 1.)

5 Patch the R OUT jack on the CO repeater to the DS1-INPUT jack on the error rate test set. (See fig. 1.)

6 To start test, momentarily operate the RESET/RESYNC switch and reset COUNT INTERVAL (MIN) switch if necessary.

7 The duration of the test is 15 minutes.

8 At the completion of the test, observe the RECEIVE STATUS indicator lamps for the following indications:

- NO DATA — extinguished
- LOST DATA — extinguished
- NO SYNC — extinguished
- LOST SYNC — extinguished
- LOST POWER — extinguished

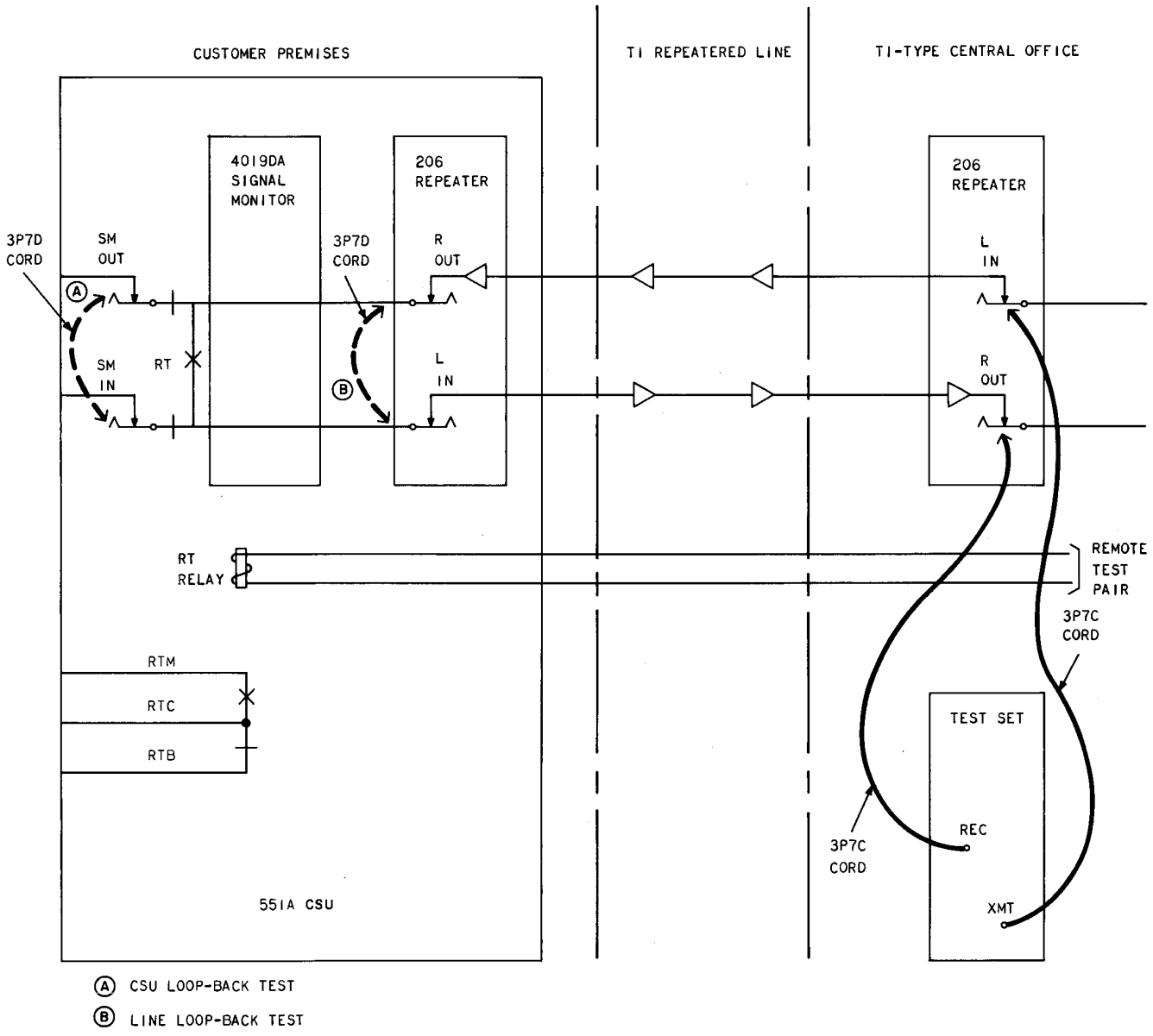

Fig. 1—Remote Loop-Back Test

STEP	PROCEDURE
	• OVERFLOW — extinguished • COUNT — lighted during test — extinguished at end of test.
9	Observe the display window. If the count exceeds 30 error seconds for the 15-minute test, the test fails.
10	On the CSU, observe that both the AVG DENS and the 16 ZERO indicators are extinguished.
11	Remove the 3P7D patching cord between SM-OUT and SM-IN (if installed).
12	Remove the customer interface cable from the CSU or insert dummy plug in SM-IN jack. ***Note:*** Removing the customer interface cable or inserting dummy plug conditions the CSU to send a dotting pattern.
13	On the test set at the CO, change the setting of the two MODE switches and the COUNT INTERVAL (BITS) switch: • Set VIOLATIONS-ERRORS switch to VIOLATIONS • Set INDIVIDUAL-ERROR SECONDS switch to INDIVIDUAL • Set COUNT INTERVAL (BITS) to 10^8.
14	To start test, momentarily operate the RESET/RESYNC switch.
15	The duration of the test is approximately 1 minute.
16	Observe the RECEIVE STATUS indicator lamps for the following indications: • NO DATA—extinguished • LOST DATA—extinguished • NO SYNC—on • LOST SYNC—on • LOST POWER—extinguished • OVERFLOW—extinguished • COUNT—lighted during test—extinguished at end of test.
17	Observe the display window on the test set. If the count exceeds 50 error seconds for the test period, or if NO DATA or LOST DATA indicators light, the test fails.

STEP	PROCEDURE
18	Observe that both the 16 ZERO and AVG DENS indicators on the CSU are lighted. If these indicators are not lighted, the test fails.

3. STATION TO T1-TYPE CENTRAL OFFICE

3.01 This test checks the CSU and the channel between the CSU and the CO. This procedure is used when the system under test receives a DS-1 test signal from an independent source at the far end, such as a second error rate test set or a quasi-random signal source, J98710R-1.

3.02 The following equipment is required:

- Two Bomar error rate test sets, model 271-B or equivalent (one at the customer premises and one at the CO)
- Four 3P7C cords (two at the CO and two at the customer premises).

3.03 ***Procedure:*** Perform Steps 1 through 8 simultaneously from the CO and the CSU. After the results of the test are noted, perform Steps 9 through 16. In Steps 14 and 15, observe only the test set at the CO. In Step 16, observe the 16 ZERO and AVG DENS indicators on the CSU.

STEP	PROCEDURE
1	Establish voice contact with the CO that will be performing the test.
2	Request the CO to connect the test set as shown in Fig. 2.
3	At the customer premises, connect the CSU to the test set as shown in Fig. 2.
4	Set the controls on both test sets as follows: • Set the POWER switch to ON. Observe that the POWER lamp lights. • Set MODE switch to ERRORS. • Set INDIVIDUAL-ERROR SECONDS switch to ERROR SECONDS. • Set SYNC MODE switch to AUTO. • Disregard the SELF TEST switch. • Set DISPLAY INTERVAL (SEC) switch to HOLD. • Set COUNT INTERVAL (BITS) to timed (straight down). • Set COUNT INTERVAL (MIN) to 15-minute position.

STEP	PROCEDURE
5	To start test, momentarily operate the RESET/RESYNC switch and reset COUNT INTERVAL (MIN) switch, if necessary.
6	The duration of the test is 15 minutes.
7	At the completion of the test, observe the RECEIVE STATUS indicator lamps for the following indications: • NO DATA—extinguished • LOST DATA—extinguished • NO SYNC—extinguished • LOST SYNC—extinguished • LOST POWER—extinguished • OVERFLOW—extinguished • COUNT—lighted during test—extinguished at end of test.
8	Observe the display window. If the count exceeds 30 error seconds for the 15-minute test, the test fails.
9	Remove the 3P7C cord from the test set DS1-OUTPUT to the SM-IN jack on the CSU.
10	Remove the customer interface cable from the CSU or insert dummy plug in SM-IN jack. ***Note:*** Removing the customer interface cable or inserting dummy plug conditions the CSU to send a dotting pattern.
11	On the test set at the CO, change the setting of the two MODE switches and the COUNT INTERVAL (BITS) switch: • Set VIOLATIONS-ERRORS switch to VIOLATIONS • Set INDIVIDUAL-ERROR SECONDS switch to INDIVIDUAL • Set COUNT INTERVAL (BITS) switch to 10^8.
12	To start test, momentarily operate the RESET/RESYNC switch.
13	The duration of the test is approximately 1 minute.
14	Observe the RECEIVE STATUS indicator lamps for the following indications: • NO DATA—extinguished

STEP	PROCEDURE
	• LOST DATA—extinguished • NO SYNC—on • LOST SYNC—on • LOST POWER—extinguished • OVERFLOW—extinguished • COUNT—lighted during test—extinguished at end of test.
15	Observe the display window on the test set. If the count exceeds 50 error seconds for the test period, or if NO DATA or LOST DATA indicators light, the test fails.
16	Observe that both the 16 ZERO and AVG DENS indicators on the CSU are lighted. If these indicators are not lighted, the test fails.

4. LINE LOOP-BACK TEST

4.01 The line loop-back test checks the repeater and T1 repeatered line by looping the transmit pair to the receive pair at the repeater in the CSU and transmitting test signals. This test provides a method of isolating a trouble to the T1 line or CSU. The actual test is performed at the CO. The loop-back is made manually by patching the R OUT jack to the L IN jack on the repeater (B Fig. 1).

4.02 The following equipment is required:

- One Bomar error rate test set, model 271B or equivalent
- One 3P7D cord.

Note: For this test, the 3P7D cord is used at the customer premises. The error rate test set is used at the CO.

4.03 ***Procedure:*** Perform the tests outlined in Steps 1 through 9.

STEP	PROCEDURE
1	Establish voice contact with the CO that will be performing the test.
2	On the CSU repeater, strap R-OUT jack to L IN jack using a 3P7D cord (B Fig. 1).
3	At the T1-type CO, set the controls on the error rate test set as follows: • Set POWER switch to ON. Observe that the POWER lamp lights.

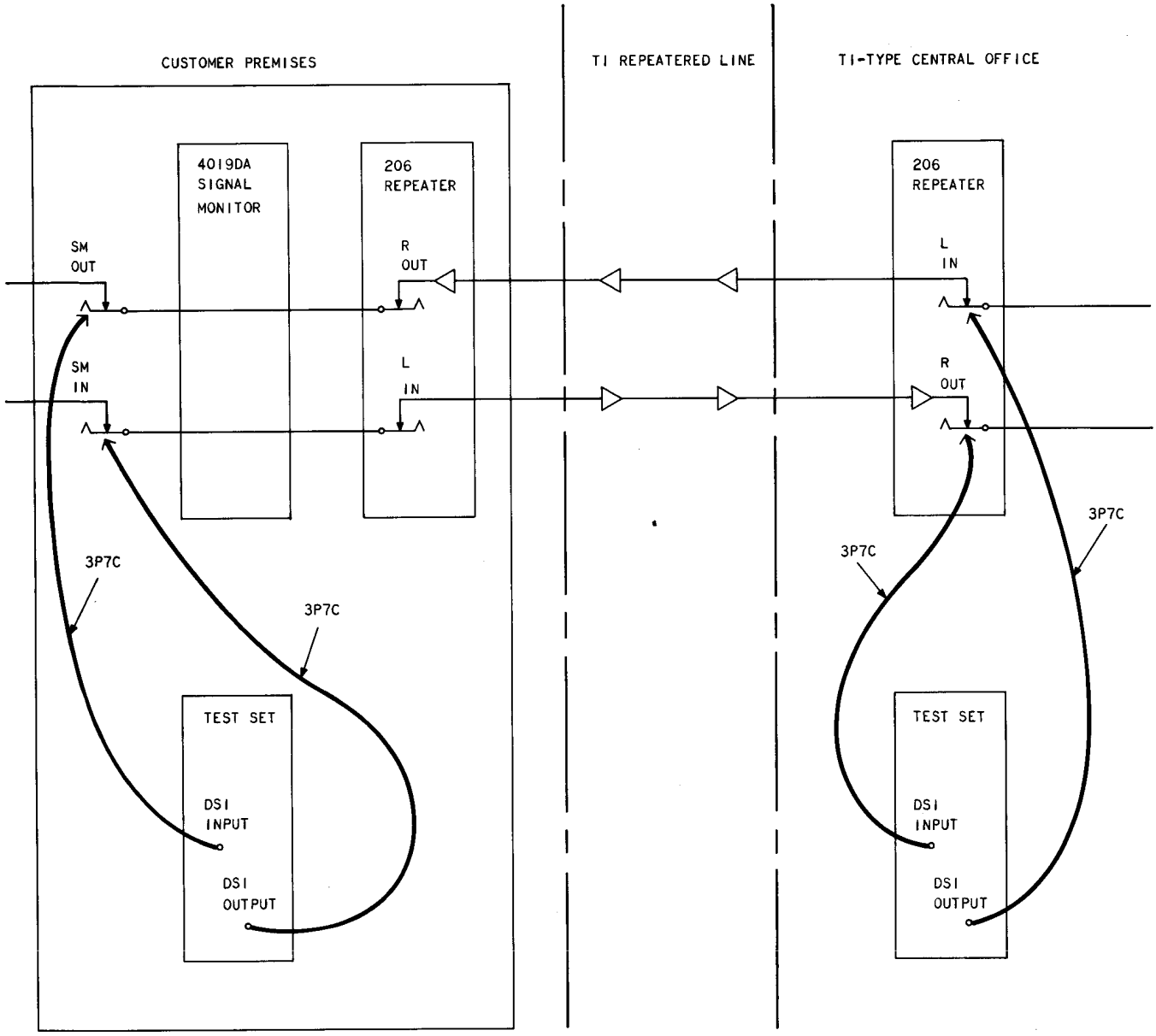

Fig. 2—Station to Central Office Testing

STEP	PROCEDURE
	• Set MODE switch to ERRORS. • Set INDIVIDUAL-ERROR SECONDS switch to ERROR SECONDS. • Set SYNC MODE switch to AUTO. • Disregard the SELF TEST switch. • Set DISPLAY INTERVAL (SEC) switch to HOLD. • Set COUNT INTERVAL (BITS) to timed (straight down). • Set COUNT INTERVAL (MIN) to 15-minute position.
4	Patch one of the four DS1-OUTPUT jacks on the error rate test set to the L IN jack on the CO repeater. (See Fig. 1.)
5	Patch the R OUT jack on the CO repeater to the DS1-INPUT jack on the error rate test set. (See Fig. 1.)
6	To start test, momentarily operate the RESET/RESYNC switch.
7	The duration of the test is 15 minutes.
8	At the completion of the test, observe the RECEIVE STATUS indicator lamps for the following indications: • NO DATA—extinguished • LOST DATA—extinguished • NO SYNC—extinguished • LOST SYNC—extinguished • LOST POWER—extinguished • OVERFLOW—extinguished • COUNT—lighted during test—extinguished at end of test.
9	Observe the display window. If the count exceeds 30 error seconds for the 15-minute test, the test fails.