

## 2-POINT AND MULTIPOINT PRIVATE LINE CIRCUIT TEST PROCEDURES DIGITAL DATA SYSTEM

CONTENTS	PAGE	CONTENTS	PAGE
1. GENERAL . . . . .	1	Q. Branch Select/Branch Block . . . . .	40
2. APPARATUS . . . . .	6	4. GLOSSARY . . . . .	41
3. PROCEDURES . . . . .	7	5. ISSUING ORGANIZATION . . . . .	42
A. DSU Loop-back Test . . . . .	7	<b>Figures</b>	
B. CHAN Loop-back Test . . . . .	9	1. Local Channel Loop-back Test Locations (Simplified) . . . . .	45
C. OCU or OCU-DP Loop-back Test . . . . .	10	2. Loop-back Locations on a Subrate Off-Net Extension Arrangement . . . . .	46
D. DSU Functional Test . . . . .	11	3. An Example of Card E-6527 . . . . .	47
E. DSU Straightaway Test . . . . .	17	<b>Tables</b>	
F. CSU Functional Test . . . . .	21	A. Secondary Channel Circuit Pack . . . . .	43
G. SRDM Test . . . . .	25	B. LSC Codes . . . . .	43
H. Inter-DLSA Straightaway Test . . . . .	27	C. MJU Answer-back Codes . . . . .	43
I. DDGT Loop-back Error Performance Test . . . . .	28	D. MJU Codes . . . . .	44
J. Subrate Off-Net Extension Loop-back Error Performance Test . . . . .	30	<b>1. GENERAL</b>	
K. 56-kb/s Repeater Loop-back Test . . . . .	31	1.01 This practice describes and provides proce- dures to be followed by AT&T Company per- sonnel at a hub office in conjunction with a CTC/ SSC-D (Centralized Test Center/Special Service Cen- ter-Digital). These procedures are for pre-service and maintenance tests on PL (private line) circuits and other common carrier facilities using the DDS (Digi- tal Data System).	
L. Inter-DLSA Loop-back Error Performance Test . . . . .	33	1.02 This practice is reissued for the following rea- sons:	
M. DS-0 DP Loop-back Test . . . . .	35	● To delete reference to SVB (serving bureau)	
N. Multipoint Circuit Test Using an MSU . . . . .	36		
O. MJU Remote Test . . . . .	37		
P. Circuit Pack Compatibility Test . . . . .	40		

- To replace STC (serving test center) terminology with hub
- To delete reference to switched DDS and to Practice AT&T 314-901-201
- To add glossary of acronyms and abbreviations (terms)
- To make changes in Fig. 2 and 3
- To delete Tables D, E and F
- To change Table A to Table B and make changes
- To change Table B to Table D
- To change Table G to Table A and make changes
- To delete secondary channel functional and MJU (multipoint junction unit) latching loop-back tests.

Revision arrows are used to emphasize the more significant changes.

**1.03** The CTCs are evolving to SSCs-D and will be referred to as CTC/SSCs-D throughout the remainder of the practice. Several DDS locations designated as POPs (points-of-presence) serve as cross-connect points for all inter-LATA (local access and transport area) and exchange access service. The cross-connect point within the POP is known as a POI (point-of-interface) and is physically located at the DSX-1 frame that terminates the inter-LATA digital facilities. The definitions and responsibilities of the hub office and CTC/SSC-D are found in Practice AT&T 660-230-100. Other offices making up a DLSA (digital LATA serving area) are also discussed in Practice AT&T 660-230-100.

**1.04** The test procedures in this practice are performed manually at an AT&T hub office by using portable test equipment. These procedures are time-consuming and are recommended for use in long-term testing, such as pre-service or installation testing, or trouble clearing an intermittent error problem. These manual test procedures have been superseded by more automatic test methods such as ABATS (Automated Bit Access Test System), BATS/LATS (Bit Access Test System/Line Access Test Sys-

tem), and SMAS/SARTS (Switched Maintenance Access Systems/Switched Access Remote Test System). The ABATS is dedicated to maintenance testing of DDS. Since the tests are automated, less time is needed to perform them (Practice AT&T 314-901-531).

**1.05** The OCU (office channel unit) loop-back test procedure (Test C) is used to test subrate OCU dataport (DP) channel units. The subrate data speeds are 2.4, 4.8, and 9.6 kb/s. This includes the new all rate OCU and OCU-DP (HL220 and J98726DJ). For 56 kb/s service, a 56 kb/s OCU-DP (code J98726DE) is used for testing along with the OCU loop-back code. A DS-0 DP (digital signal at the zero level dataport) channel unit requires an ED-3C793 connector to be physically plugged into the faceplate of the DS-0 DP for loop-back testing. This loop-back connector allows an error run test (Test M) to be made during the office busy hour for maintenance tests. The loop-back connector also allows plug-in capability for KS-20908 and KS-20909 DTSs (data test sets) which may test in either direction.

**1.06** To detect the presence of an old OCU or OCU-DP, a latching loop-back must be executed. The old OCU responds *only* to the nonlatching loop-back sequence currently used in the DDS network. The new all rate OCU and OCU-DP (HL220 and J98726DJ) will respond to both latching and nonlatching loop-back control sequences.

**1.07** The dataport channel units (DS-0 and OCU) may be used in a D3B or D4B channel bank and in a central office terminal and remote terminal of a *SLC*® 96 Carrier System. The dataport test procedures for the channel banks are documented in Practices AT&T 365-150-107 (D3 bank) and AT&T 365-170-000 (D4 bank). Test procedures for the *SLC* 96 system are documented in Practices AT&T 363-202-400, *SLC* 96 Carrier System—Central Office Terminal, and AT&T 363-202-401, *SLC* 96 Carrier System—Remote Terminal.

**1.08** The test procedures covered in this practice are as follows.

- (a) **DSU Loop-back Test:** This test checks the ability of a DSU (data service unit) to loop back an NE (near-end) or FE (far-end) channel at the customer interface (Fig. 1A). A 15-second block error run is performed for maintenance tests (trouble isolation), and a 15-minute block error

run is performed for installation and extensive maintenance tests. Assistance at the station (customer premises) is not required.

(b) **CHAN Loop-back Test:** This test checks the ability of a DSU to loop back an NE or FE channel at the customer interface (Fig. 1B). A 15-second block error run is performed for maintenance tests (trouble isolation), and a 15-minute block error run is performed for installation and extensive maintenance tests. Assistance at the station is not required to perform this test.

(c) **OCU or OCU-DP Loop-back Test:** This test checks the ability of an OCU or an OCU-DP to loop back an NE or FE channel at the OCU or OCU-DP local channel interface (Fig. 1A and 1B). A 15-second block error run is performed for maintenance tests (trouble isolation), and a 15-minute block error run is performed for installation and extensive maintenance tests. Assistance at the station, OCU, or OCU-DP is not required.

**Note:** An HL96 CP (circuit pack), or an HL220 CP for secondary channel operation, may be used in a DDS hybrid multiplex end office or collection hub to provide multiplexing of subrate dataport channels via an ISMX (integral subrate multiplexer). Test access is available between the HL96 and ISMX using a portable test set. The HL96 CP occupies the location normally occupied by an OCU.

(d) **DSU Functional Test:** This test checks the functions of a DSU and the customer interface leads. Assistance of and coordination with an AT&T employee at the station location are required (Practice AT&T 595-200-500).

(e) **DSU Straightaway Test:** This test checks the error performance of a channel terminated in a DSU on a testboard-to-station basis. A 15-minute bit error run is made simultaneously in both directions of transmission. The assistance of and coordination with an AT&T employee at the station location are required (Practice AT&T 595-200-500).

(f) **CSU (Channel Service Unit) Functional Test:** This test checks the functions of a 550A or equivalent type CSU and the customer interface leads. The assistance of and coordination with

an AT&T employee at the station location are required (Practice AT&T 595-100-500).

(g) **SRDM (Subrate Digital Multiplexer)**

**Test:** This test checks the error performance of a channel between the portable data test equipment and an SRDM. A 5-minute block error run is made simultaneously in both directions of transmission. In hub offices, the test is performed on a loop-back basis by use of a loop-back plug at the DSX-0B cross-connect bay. In local offices, the assistance of and coordination with an AT&T employee at the SRDM bay are required.

**Note:** This test requires that all channels of an SRDM be out of service.

(h) **Inter-DLSA Straightaway Test:** This test checks the error performance of a channel between DLSAs. A 5-minute block error run is made simultaneously in both directions of transmission.

(i) **DDGT (Digital Data Group Terminal)**

**Loop-back Error Performance Test:** This test checks the error performance of a channel between the portable data test equipment and a DDGT at a hub or serving office. A 5-minute block error run is made simultaneously in both directions of transmission with the manual loop-back switch on the HL85 CP of the DDGT in the LOC position if testing to a DDGT in a serving office. The assistance of an AT&T employee at the DDGT location is required.

(j) **Subrate Off-Net Extension Loop-back**

**Error Performance Test:** This test checks the error performance of a subrate off-net extension channel between the portable data test equipment and the DS (data set), or DAS (data auxiliary set) at the hub office, or at the station. A 5-minute block error run is made simultaneously in both directions of transmission with the DS (201C, 208A, or 209A) or DAS 831A in the loop-back test mode. When the data set at the station is customer-provided, DDS testing is performed only to the data set located in the hub office. Figure 2 shows the various loop-back points in a subrate off-net extension arrangement. The assistance of an AT&T employee at the DS or DAS location is required.

(k) **56-kb/s Repeater Loopback Test:** This test checks the ability of a 56-kb/s repeater to

loop back a line and checks the error performance of the repeater and the line between the portable data test equipment and the repeater. A 5-minute block error run is made from the portable data test equipment.

(l) **Inter-DLSA Loop-back Error Performance Test:** This test checks the error performance of an entire DDS circuit which contains two or more DLSAs. The hub offices at the end of the circuit under test make a 50-minute block error run simultaneously by transmitting the CHAN or DSU loop-back test code signal to the far-end station and checking for errors in the signal from the distant hub office as it is received from the near-end station.

(m) **DS-0 DP Loop-back Test:** This test checks the ability of a DS-0 DP to loop back an NE or FE channel (Fig. 1C). A 15-second block error run is performed for maintenance tests (trouble isolation), and a 15-minute block error run is performed for installation and extensive maintenance tests. The loop-back test should be repeated for each DS-0 DP on the circuit. The test rate depends on the error correction option in the DS-0 DP. A test rate of 56 kb/s is used when the error correction option is not installed. Assistance is required at the beginning and at the completion of the loop-back test.

(n) **Multipoint Circuit Test Using an MSU (Multipoint Signaling Unit):** The multipoint circuit test using an MSU checks the MJUs and the facilities in a multipoint circuit to ensure that a 2-point test connection can be established from the MSU to any desired station. Once a connection is accomplished, the applicable 2-point tests can be performed.

◆**Note:** The MSU will not operate on multipoint circuits employing DDB (digital data bank) MJUs or DDS HL223 and HL224 MJUs.◆

(o) **MJU Remote Test:** The MJU remote test checks the operation of an MJU from the ABATS of the channel and branch jacks at the testboard using the portable DTSs. This test verifies that an MJU can accept signals to its channel port and process the signals so that the signals appearing at all branch ports are identical to the signals at the channel port. This test also verifies that signals accepted by any one branch port on an

MJU from a downstream location will appear at the channel port of that MJU.

(p) **Circuit Pack Compatibility Test:** The circuit pack compatibility test verifies the presence of circuit packs that support secondary channel operation. Before the compatibility test can be run, it is necessary to set up the OCU latching loop-back. The test ensures that the OCU has been equipped for secondary channel service, because the OCU (HL220) will respond to the latching loop-back. This test must be run in the network-to-loop direction and may be of limited value in some end offices. The test will verify the presence of secondary channel circuit packs (Table A) in DS-1 multiplexers (T1DMs, T1WB4/5s, D4s, D5s, SLC Series 5) and subrate multiplexers (SRDMs and ISMXs). The test is performed by sending the new test word, 10000000, through the circuit. Unmodified multiplexing equipment will overwrite the test word with the UMC (unassigned multiplexer channel) code (00011000) or return all zeros. The properly modified equipment will pass the test word unchanged. In offices where few of these network components exist, visual verification of the presence of the circuit packs will be sufficient.

(q) **OCU Latching Loop-back Test:** The OCU latching loop-back test may be used to verify the presence of an OCU that is compatible with secondary channel operation and to prepare for secondary channel circuit pack compatibility tests. The old OCU responds only to the nonlatching loop-back sequence. The new OCU and OCU-DP (HL220 and J98726DJ) will respond to both latching and nonlatching loop-back control sequences. Therefore, if the OCU does not respond to a latching loop-back control sequence and successfully responds to the nonlatching loop-back, it is an old OCU. The latching loop-back sequence uses three control codes and one equipment specific data code. The control codes include the following: TIP (transition in progress), LBE (loop-back enable), and FEV (far-end voice). The LBE code is mapped in the forward direction to allow the loop-back of one of several identical plug-ins in tandem. MAP 0 or MAP 1 is also returned in the reverse direction in response to LBE codes sent during the looped state and may be used to differentiate between

loop-back locations. The latching loop-back bit patterns are:

TIP = 00111010

LBE = 01010110

FEV = 01011010

**Note:** The 0 is the do not care symbol.

The latching loop-back data codes are referred to as LSCs (loop-back select codes). One of the LSC bit patterns, given in Table B, must be transmitted as part of the latching loop-back sequence to select the loop-back location.

(r) **Branch Select/Branch Block Test:** These testing capabilities are incorporated into MJUs with secondary channel compatibility; i.e., those equipped with the HL223/224 circuit packs. When the branch select sequence is sent, the control leg of the MJU is connected directly to the selected branch, and a UMC code is sent to the unselected branches. In this mode, sending and receiving of further test code data is unaffected because the MJU is transparent to the circuit. One byte of RLS code or one byte of IDLE code will return the MJU to its normal transmission state. When the branch block sequence is sent, the branch identified in the sequence is disconnected from the control leg and looped back on itself. The other branches remain in the normal transmission state. Two bytes of RLS code will restore the blocked branch to its normal transmission state. The branch block and branch select code sequences are sent as necessary to achieve the proper testing configuration, and "selected" branches may be blocked or the "blocked" branches may be selected by transmitting the proper sequence. When MJU testing is initiated, the MJU responds by returning answer-back codes to the test position. The proper code must be returned to ensure that advancement to the proper state is occurring. These codes are given in Table C.

(s) **MJU Combining Function:** This test applies only to MJUs which have been modified for secondary channel capability (HL223/224). This test verifies that the redesigned MJU will recognize active and idle transitions in secondary channel data from all of its branches, and will combine this information with active and idle pri-

mary channel data from the same or different branches. This test can be accomplished only in hub offices equipped with ABATS.

**1.09** Any or all of these tests may be used for troubleshooting a DDS channel. However, the various tests are intended for use as described in paragraphs 1.10 and 1.11. The results of these tests should be recorded on the PL DDS initial test record card (E-6527). An example of the card is shown in Fig. 3.

**1.10 Maintenance Tests:** The maintenance tests are to be performed in the sequence and as directed in Practice AT&T 314-901-300. Additional maintenance tests include tests for secondary channel operation. These maintenance tests for secondary channel operation include the following:

- multipoint circuit test
- MJU latching loop-back test
- circuit pack compatibility test
- branch select/branch block test.

The procedures for testing the 2-point and multipoint circuits with secondary channel capability will not differ significantly from the existing procedures for DDS. However, new tests and testing capabilities can be executed because of modifications to the MJU. The maintenance tests and their purposes are as follows:

- (a) **Tests A, B, C, F, I, J, K, and M**—Isolation of troubles in the local channel (OCU/OCU-DP to DSU/CSU)
- (b) **Test H**—Isolation of troubles in the DDS backbone network on an inter-DLSA basis.

**1.11 Pre-Service Tests:** All of the tests in this practice are for use in testing equipment added to a DDS network following the initial installation. For multipoint circuits, Tests N and O must be performed first. The tests listed below are to be performed in the given sequence on multipoint circuits as well as 2-point circuits.

- (a) **DSU**
  - (1) Test A (DSU loop-back)

- (2) Test D (DSU functional)
- (3) Test E (DSU straightaway)
- (b) *CSU*
  - (1) Test B (CHAN loop-back)
  - (2) Test F (CSU functional)
- (c) *SRDM*—Test G
- (d) *OCU or OCU-DP*—Test C (OCU or OCU-DP loop-back)
- (e) *DDS Private Line Circuit—Inter-DLSA*
  - (1) Test H (Inter-DLSA straightaway)
  - (2) Test L (Inter-DLSA loop-back error performance)
- (f) *Off-Net Extension*
  - (1) Test I (DDGT loop-back error performance)
  - (2) Test J (substrate off-net extension loop-back error performance)
- (g) *56-kb/s Regenerative Repeater*—Test K (56-kb/s repeater loop-back)
- (h) *DS-0 DP Loop-back Test*—Test M (56 kb/s loop-back)

**1.12** The procedures given in Part 3 for Tests D, E, and F require the assistance of and the coordination with an AT&T employee at the station location. To aid in the coordination of these tests, the step numbers of these tests match those given in the station practices (Practices AT&T 595-200-500 and AT&T 595-100-500). Where no action is required at the testboard, the action being performed at the station and the verification for that action are given parenthetically in each step.

**1.13** The performance of Test G requires the assistance of and coordination with an AT&T employee at the DSX-0B cross-connect bay (hub offices) or SRDM bay (local offices). This test procedure is not provided in any other practice and is therefore performed entirely under the direction of the testboard operator.

**1.14** The performance of Test I requires the assistance of an AT&T employee at the DDGT shelf location. Test J requires the assistance of the customer or AT&T employee at the station location or assistance of an AT&T employee at the hub office.

**1.15** The performance of Test M requires the assistance of an AT&T employee at the DS-0 DP. The DS-0 DP plugs into either a D3 or a D4 channel bank. The AT&T employee must physically plug a loop-back connector into the DS-0 DP that is being tested.

**1.16 *Lettered Steps:*** A letter (a, b, c, etc.) added to a step number in Part 3 indicates a procedure which may or may not be required, depending on the circuit configuration. The condition under which a lettered step or series of lettered steps are to be performed is given in the ACTION column, and all steps within a test that are governed by the same conditions are assigned the same letter. When a condition does not apply, all steps governed by that letter are to be omitted.

## 2. APPARATUS

**2.01** The portable data test sets that are required for the performance of these tests, are provided as a part of the testboard. This manual testboard is used in the hub office.

**2.02** The MSU transmits multipoint signaling codes which, when received by the MJUs, are capable of isolating any leg of a multipoint circuit for test purposes. The MSU is also provided as part of the testboard.

**Note:** The MSU will not operate with the HL223 and HL224 or secondary channel all rate OCU and OCU-DPs.

**2.03** An automated version of the manual testboard is the KS-21899 Data Test System, commonly known as BATS. The BATS test access is remoted from a hub office to a CTC/SSC-D. The BATS is primarily used as a test tool for customer monitoring and/or testing by gaining access to either DS-0A (64 kb/s) or DS-1 (1.544 Mb/s) signals. The BATS also has an MSU for isolating legs on multipoint circuits. Complete details on description, installation, operation, and maintenance for the KS-21899 Data Test System is documented in the 107-605-ZZZ series of AT&T Practices.

### 3. PROCEDURES

3.01 This part includes the procedures for the pre-service and maintenance testing of 2-point and multipoint private line circuits on the DDS. This part also gives procedures for testing the secondary channel capability.

#### A. DSU Loop-back Test

STEP	ACTION	VERIFICATION
1	Verify that the portable DTS (data test set) receiver and transmitter are powered and receiving clock signals.	POWER ON lamps and CLOCK indicators lighted on both DTSs.
2	At the transmitter DTS— Set switches as follows:  OUTPUT to BIPOLAR  FUNCTION to LOOPBACK TEST  DATA RATE to the customer service rate of the channel to be tested (2.4, 4.8, 9.6 or 56 kbs).	
3	Momentarily operate the RESET key.	All LOOPBACK TEST and CONTROL CODES indicators extinguished.
4	At the receiver DTS— Set switches as follows:  INPUT to BIPOLAR  DATA RATE to the customer service rate of the channel to be tested (2.4, 4.8, 9.6 or 56 kbs)  COUNTER to BLOCK ERRORS  TEST WORD to LOOPED  SUBRATE CHANNEL to SINGLE.	
5	Insert the RCV (receive) cord reel plug into the MON (NEAR or FAR) jack of the channel to be tested.	Receiver DTS BYTE PATTERN indicator 8 extinguished (disregard other BYTE PATTERN indicators).

**Caution: If BYTE PATTERN indicator 8 is lighted, it indicates that data is present on the channel. DO NOT proceed to Step 6 until the channel is released for testing or service will be interrupted.**

STEP	ACTION	VERIFICATION
6	Disconnect the RCV cord reel plug from the MON (NEAR or FAR) jack, insert it into the FROM (NEAR or FAR) jack of the channel to be tested and, if the receiver DTS is equipped with a TERMINATE key, depress this key.	TERMINATED indicator lighted.
7	Insert the TRMT (transmit) cord reel plug into the TO (NEAR or FAR) jack of the channel to be tested.	
8	At the transmitter DTS— Momentarily operate the RESET key. Depress and hold the DSU LOOPBACK TEST key.	At the transmitter DTS— DSU LOOPBACK TEST indicator lighted.  At the receiver DTS— BYTE PATTERN indicator 8 and one other lighted. All others extinguished.
9	Release the DSU LOOPBACK TEST key (test pattern continues to be transmitted).	At the transmitter DTS— DSU LOOPBACK TEST indicator remains lighted.  At the receiver DTS— <b>56-kb/s service—</b> All BYTE PATTERN indicators flicker.  <b>Subrate service—</b> BYTE PATTERN indicators 2 through 8 flicker.
10a	If performing an installation test— At the receiver DTS— Momentarily operate the COUNTER MODE switch to RESET and start timing a 15-minute interval.	OVERFLOW indicator extinguished. Counter resets to 00.
11a	After 15 minutes— Operate the COUNTER MODE switch to HOLD.	Counter displays no more than two block errors.
12b	If performing a maintenance test— At the receiver DTS— Momentarily operate the COUNTER MODE switch to RESET and start timing a 15-second interval.	OVERFLOW indicator extinguished. Counter resets to 00.
13b	After 15 seconds— Operate the COUNTER MODE switch to HOLD.	Counter displays zero block errors.

STEP	ACTION	VERIFICATION
14	At the transmitter DTS— Momentarily operate the RESET key (test pattern stops).	All LOOPBACK TEST and CONTROL CODES indicators extinguished.
15c	If no further tests are to be made— Disconnect the TRMT and RCV cord reel plugs.	

#### B. CHAN Loop-back Test

STEP	ACTION	VERIFICATION
1	Perform Steps 1 through 7 of Test A.	
2	At the transmitter DTS— Operate and hold operated the CHAN LOOPBACK TEST key.	At the transmitter DTS— CHAN LOOPBACK TEST indicator lighted.  At the receiver DTS— BYTE PATTERN indicator 8 and two others lighted. All others extinguished.
3	At the transmitter DTS— Release the CHAN LOOPBACK TEST key.  <i>Note:</i> If the data rate of the line being tested is 56-kb/s and the line contains 56-kb/s repeaters, momentarily depress the transmitter DTS ALL 1s key once for each repeater in the line.	At the receiver DTS— <b>56-kb/s service</b> — All BYTE PATTERN indicators flicker.  <b>Subrate service</b> — BYTE PATTERN indicators 2 through 8 flicker.
4a	If performing an installation test— At the receiver DTS— Momentarily operate the COUNTER MODE switch to RESET and start timing a 15-minute interval.	OVERFLOW indicator extinguished. Counter resets to 00.
5a	After 15 minutes— Operate the COUNTER MODE switch to HOLD.	Counter displays no more than two block errors.
6b	If performing a maintenance test— At the receiver DTS— Momentarily operate the COUNTER MODE switch to RESET and start timing a 15-second interval.	OVERFLOW indicator extinguished. Counter resets to 00.

STEP	ACTION	VERIFICATION
7b	After 15 seconds— Operate the COUNTER MODE switch to HOLD.	Counter displays zero block errors.
8	At the transmitter DTS— Momentarily operate the RESET key.	All LOOPBACK TEST and CONTROL CODES indicators extinguished.
9c	If no further tests are to be made— Disconnect the TRMT and RCV cord reel plugs.	

### C. OCU or OCU-DP Loop-back Test

STEP	ACTION	VERIFICATION
1	Perform Steps 1 through 7 of Test A.	<b>Note:</b> When testing dataport facilities and a burst of errors occurs at a regular rate (from several per second to one every few seconds), the trouble is most likely synchronization timing at the D-type channel bank toward the hub office or the D-type bank at the end office is not optioned for loop timing.
2	At the transmitter DTS— Operate and hold operated the OCU LOOPBACK TEST key.	At the transmitter DTS— OCU LOOPBACK TEST indicator lighted.  At the receiver DTS— BYTE PATTERN indicator 8 and one other lighted. All others extinguished.
3	Release the OCU LOOPBACK TEST key.	At the receiver DTS— <b>56-kb/s service—</b> All BYTE PATTERN indicators flicker.  <b>Subrate service—</b> BYTE PATTERN indicators 2 through 8 flicker.
4a	If performing an installation test— At the receiver DTS— Momentarily operate the COUNTER MODE switch to RESET and start timing a 15-minute interval.	OVERFLOW indicator extinguished. Counter resets to 00.
5a	After 15 minutes— Operate the COUNTER MODE switch to HOLD.	Counter displays no more than two block errors. See Note in Step 1.

STEP	ACTION	VERIFICATION
6b	If performing a maintenance test— At the receiver DTS— Momentarily operate the COUNTER MODE switch to RESET and start timing a 15-second interval.	OVERFLOW indicator extinguished. Counter resets to 00.
7b	After 15 seconds— Operate the COUNTER MODE switch to HOLD.	Counter displays zero block errors. See Note in Step 1.
8	At the transmitter DTS— Momentarily operate the RESET key.	All LOOPBACK TEST and CONTROL CODES indicators extinguished.
9c	If no further tests are to be made— Disconnect the TRMT and RCV cord reel plugs.	

#### D. DSU Functional Test

STEP	ACTION	VERIFICATION
1	Verify that the portable DTS receiver and transmitter are powered and receiving clock signals.  ( <i>Subrate DSU:</i> Connect 914C DTS interface connector cable between DSU interface connector and connector A of 914C DTS.)	POWER ON lamps and CLOCK indicators lighted.  (None)
2	At the transmitter DTS— Operate switches as follows:  OUTPUT to BIPOLAR  FUNCTION to CONTROL CODES  DATA RATE to the customer service rate of the channel to be tested  MODE to REPEAT	None
	( <i>Subrate DSU:</i> Connect 914C DTS power cord to 117-volt, 60-Hz outlet.)	(None)
3	Release all the CONTROL CODES keys by depressing any one of them half way.	
4	Momentarily operate the RESET key.	All LOOPBACK TEST and CONTROL CODES indicators extinguished.

STEP	ACTION	VERIFICATION
	<i>(Subrate DSU: Program 914C DTS matrix and position controls per Practice AT&amp;T 595-200-500.)</i>	(None)
5	<p>At the receiver DTS— Set switches as follows:</p> <p>INPUT to BIPOLAR</p> <p>DATA RATE to the customer service rate of the channel to be tested</p> <p>SUBRATE CHANNEL to SINGLE</p> <p>COUNTER to BIT ERRORS</p> <p>TEST WORD to LOOPED.</p>	None
	<i>(Subrate DSU: Operate 914C DTS POWER switch.)</i>	(914C DTS POWER lamp lighted.)
6	Insert the RCV cord reel plug into the FROM (NEAR or FAR) jack of the channel to be tested.	If the receiver DTS is not equipped with a TERMINATE key, the TERMINATED indicator will light.
	<i>(56-kb/s DSU: Connect 912A WDTS [wideband data test set] interface cable between DSU interface connector and high-speed interface unit of 912A WDTS.)</i>	(None)
7a	If the receiver DTS is equipped with a TERMINATE key, operate this key.	TERMINATED indicator lighted.
	<i>(56-kb/s DSU: Connect 912A WDTS power cord to 117-volt, 60-Hz outlet.)</i>	(None)
8	Insert the TRMT cord reel plug into the TO (NEAR or FAR) jack of the channel to be tested.	None
	<p><i>(56-kb/s DSU: Position 912A WDTS controls per Practice AT&amp;T 595-200-500.)</i></p> <p><b>Note:</b> If testing a 56-kb/s DSU, proceed to Step 25.</p>	(None)
<b>Subrate DSU</b>		
9	<p>None</p> <p>(At the station location, apply power to the DSU.)</p>	<p>None</p> <p>(DSU PWR indicator lighted. NS, LL, and RT indicators extinguished.)</p>

STEP	ACTION	VERIFICATION
10	At the transmitter DTS— Operate the IDLE CODE CONTROL CODES key.  (None)	IDLE CODE CONTROL CODES indicator lighted.  (None)
11	None  (At 914C DTS, operate S1 key to ON.)	None  Lamps DS1 and DS2 lighted. Lamp DS3 extinguished.
12	Operate the MUX OUT OF SYNC CONTROL CODES key.	Transmitter MUX OUT OF SYNC CONTROL CODES indicator lighted and IDLE CODE CONTROL CODES indicator extinguished.
13	Operate the OCU LOOPBACK CONTROL CODES key.    (After one to two seconds— Observe NS indicator on DSU.)	At the transmitter DTS— OCU LOOPBACK CONTROL CODES indicator lighted and MUX OUT OF SYNC CONTROL CODES indicator extinguished.    At the receiver DTS— BYTE PATTERN indicator 8 and one other lighted. All others extinguished.  (NS lamp lighted.)
14	Set the transmitter DTS BYTE ENCODER switches to 0, 0, 0, 0, 0, 0, 1.  (None)	None  (None)
15	Set the transmitter DTS FUNCTION switch to BYTE ENCODER.  (At the 914C DTS matrix— Remove the SD programming pin and insert it in row S2, column 2.)	Transmitter OCU LOOPBACK CONTROL CODES indicator extinguished.  (None)
16	None  (At the 914C DTS, operate the S2 key to ON.)	Receiving 00000001 byte pattern.  (At DSU— NS lamp extinguished.  At 914C DTS— Lamps DS1 and DS3 lighted.)

STEP	ACTION	VERIFICATION
17	At the transmitter DTS— Operate the FUNCTION switch to TEST WORD 511.	None
	(None)	(None)
18	None  (Momentarily operate the RESET button on 914C DTS.)	None  (After 10 seconds— 914C DTS counter indicates 00.)
19	None  (Operate the DSU slide switch to RT.)	None  (At 914C DTS— Lamps DS1, DS2, and DS3 extinguished.
		At DSU— RT indicator lighted.)
20	At the receiver DTS— Operate the TEST WORD switch to 511 and then momentarily operate the COUNTER MODE switch to RESET.	After 10 seconds— Counter indicates zero bit errors.
	(None)	(None)
21	None  (Operate the DSU slide switch to the center position.)	None  (RT indicator extinguished.)
22	Operate the transmitter DTS FUNCTION switch to CONTROL CODES and then operate the DSU LOOPBACK CONTROL CODES key.	At the transmitter DTS— DSU LOOPBACK CONTROL CODES indicator lighted.
		At the receiver DTS— BYTE PATTERN indicator 8 and one other lighted. All others extinguished.
	(None)	(DSU RT indicator lighted.)
23	Operate the transmitter DTS CHAN LOOPBACK CONTROL CODES key.	At the transmitter DTS— CHAN LOOPBACK CONTROL CODES indicator lighted and DSU LOOPBACK CONTROL CODES indicator extinguished.
		At the receiver DTS— BYTE PATTERN indicator 8 and two others lighted. All others extinguished.

STEP	ACTION	VERIFICATION
	(None)	(At the 914C DTS— Lamps DS1 and DS3 lighted.  At the DSU— RT indicator extinguished and LL indicator lighted.)
24b	If no further tests are to be made— Disconnect the RCV and TRMT cord reel plugs.  (Disconnect 914C DTS and restore the DSU to normal operation.)	
<b>56-kb/s DSU</b>		
25	None  (At the station location, apply power to the DSU.)	None  (DSU PWR indicator lighted. NS, LL, and RT indicators extinguished.)
26	At the transmitter DTS— Operate the IDLE CODE CONTROL CODES key.  (None)	Transmitter DTS IDLE CODE CONTROL CODES indicator lighted.  (None)
27	None  (Operate the 912A WDTS REQ TO SEND switch to ON.)	None  (DATA SET READY and CLEAR TO SEND lamps lighted. RCVD LINE SIG DETR lamp extinguished.)
28	Operate the MUX OUT OF SYNC CONTROL CODES key.	Transmitter DTS MUX OUT OF SYNC CONTROL CODES indicator lighted and IDLE CODE CONTROL CODES indicator extinguished.
29	Operate the OCU LOOPBACK CONTROL CODES key.  (None)	At the transmitter DTS— OCU LOOPBACK CONTROL CODES indicator lighted and MUX OUT OF SYNC CONTROL CODES indicator extinguished.  At the receiver DTS— BYTE PATTERN indicator 8 and one other lighted. All others extinguished.  (After one to two seconds— NS indicator on DSU lighted.)

STEP	ACTION	VERIFICATION
30	Set the transmitter DTS BYTE ENCODER switches to 0, 0, 0, 0, 0, 0, 0, 1.  (None)	None  (None)
31	Set the transmitter DTS FUNCTION switch to BYTE ENCODER.  (Operate the 912A WDTS OUTPUT switch to SPACE.)	Transmitter OCU LOOPBACK CONTROL CODES indicator extinguished. Receiving 00000001 byte pattern.  (At DSU— NS indicator extinguished. 912A WDTS RCVD LINE SIG DETR lamp lighted.)
32	Operate the FUNCTION switch to TEST WORD 2047.  (None)	None  (None)
33	None  (Operate the 912A WDTS COUNTER switch to ON and then reset the counter.)	None  (After 10 seconds— 912A WDTS COUNTER indicates zero errors.)
34	None  (Operate the DSU slide switch to RT.)	None  (912A WDTS CLEAR TO SEND, DATA SET READY, and RCVD LINE SIG DETR lamps extinguished. DSU RT indicator lighted.)
35	At the receiver DTS— Operate the TEST WORD switch to 2047 and then momentarily operate the COUNTER MODE switch to RESET.  (None)	After 10 seconds— Counter indicates zero errors.  (None)
36	None  (Operate the DSU slide switch to the center position.)	None  (RT indicator extinguished.)
37	At the transmitter DTS— Operate the FUNCTION switch to CONTROL CODES and then operate the DSU LOOPBACK CONTROL CODES key.	At the transmitter DTS— DSU LOOPBACK CONTROL CODES indicator lighted.  At the receiver DTS— BYTE PATTERN indicator 8 and one other lighted. All others extinguished.

STEP	ACTION	VERIFICATION
	(None)	(DSU RT indicator lighted.)
38	Operate the CHAN LOOPBACK CONTROL CODES key.	At the transmitter DTS— DSU LOOPBACK CONTROL CODES indicator extinguished and CHAN LOOPBACK CONTROL CODES indicator lighted.  At the receiver DTS— BYTE PATTERN indicator 8 and two others lighted. All others extinguished.
	(None)	(912A WDTS CLEAR TO SEND and RCVD LINE SIG DETR lamps lighted.  DSU RT indicator extinguished and LL indicator lighted.)
39a	If no further tests are to be made— Disconnect the RCV and TRMT cord reel plugs.  (Disconnect the 912A WDTS and restore the DSU to normal operation.)	

#### E. DSU Straightaway Test

STEP	ACTION	VERIFICATION
1	Perform Steps 1 through 8 of Test D. If testing a 56-kb/s DSU, proceed to Step 12.	
<b>Subrate DSU</b>		
2	None  (Apply power to the DSU.)	None  (DSU PWR indicator lighted. NS, LL, and RT indicators extinguished.)
3	At the transmitter DTS— Operate the FUNCTION switch to TEST WORD 511.  (None)	None  (None)
4	At the receiver DTS— Operate the TEST WORD switch to 511.  (Operate the 914C DTS switch S1 to ON.)	None  (914C DTS lamps DS1, DS2, and DS3 lighted.)

STEP	ACTION	VERIFICATION
5	<p>Momentarily operate the receiver DTS COUNTER MODE switch to RESET.</p> <p>(Momentarily operate the 914C DTS RESET button.)</p>	<p>The receiver DTS counter resets to zero. OVERFLOW indicator extinguished.</p> <p>(914C DTS counter resets to zero. OVERFLOW lamp extinguished.)</p>
6	<p>Start timing a 15-minute interval.</p> <p>(Start timing a 15-minute interval.)</p>	<p>After 15 minutes— The receiver DTS counter indicates no more than three errors.</p> <p>(914C DTS counter indicates no more than three errors.)</p>
7a	<p>If more than three errors are counted by either the 914C DTS or the receiver DTS— Momentarily operate the receiver DTS COUNTER MODE switch to RESET and start timing another 15-minute interval.</p> <p>(Momentarily operate the 914C DTS RESET button and start timing another 15-minute interval.)</p>	<p>Same as Step 6.</p> <p>(Same as Step 6.)</p>
8b	<p>If more than three errors are counted by either the 914C DTS or the receiver DTS during the first 5 minutes of the second 15-minute interval— Wait 5 minutes and then repeat Step 7a.</p> <p>(Momentarily operate the 914C DTS RESET button and start timing another 15-minute interval.)</p> <p><i>An extraordinary condition, such as a severe electrical storm or an intermittent failure of customer-supplied ac power, may affect the performance of the DDS channel. The straightaway test cannot properly be performed until these conditions have cleared.</i></p>	<p>(Same as Step 6.)</p>
9c	<p>If three 15-minute error runs fail to meet the requirements— Troubleshoot the channel in accordance with Practice AT&amp;T 314-901-300 if this practice is not presently being used to isolate trouble on the channel.</p> <p>(None)</p>	<p>None</p> <p>(None)</p>

STEP	ACTION	VERIFICATION
10	Perform a 15-minute DSU and CHAN loop-back error run as follows:	
	(None)	(None)
	(1) Operate the receiver DTS TEST WORD switch to LOOPED and COUNTER switch to BLOCK ERRORS.	(1) None
	(2) Operate the transmitter DTS FUNCTION switch to LOOPBACK TEST.	(2) None
	(3) Momentarily operate the COUNTER MODE switch to RESET.	(3) Counter indicates zero and OVERFLOW indicator extinguished.
	(4) Momentarily operate the transmitter DTS DSU LOOPBACK TEST key and start timing a 15-minute interval.	(4) DSU LOOPBACK TEST indicator lighted.
	(5) After 15 minutes— Operate the receiver DTS COUNTER MODE switch to HOLD and record the counter indication on the appropriate record card (E-6527).	(5) Counter displays no more than two block errors.
	(6) Momentarily operate the receiver DTS COUNTER MODE switch to RESET.	(6) Counter indicates zero and OVERFLOW indicator extinguished.
	(7) Momentarily operate the transmitter DTS RESET switch.	(7) None
	(8) Momentarily operate the transmitter DTS CHAN LOOPBACK TEST key and start timing a 15-minute interval.	(8) CHAN LOOPBACK TEST indicator lighted.
	(9) After 15 minutes— Operate the receiver DTS COUNTER MODE switch to HOLD and record counter indication on the appropriate record card (E-6527).	(9) Counter indicates no more than two block errors.
11d	If no further tests are to be made— Disconnect the RCV and TRMT cord reel plugs.  (At the station location, disconnect the DTS and restore DSU to normal operation.)	
<b>56-kb/s DSU</b>		
12	None  (Apply power to the DSU.)	None  (DSU PWR indicator lighted. NS, LL, and RT indicators extinguished.)

STEP	ACTION	VERIFICATION
13	Operate the transmitter DTS FUNCTION switch to TEST WORD 2047.	None
	(None)	(None)
14	Operate the receiver DTS TEST WORD switch to 2047.	None
	(Operate 912A WDTS REQ TO SEND switch to ON.)	(CLEAR TO SEND, RCVD LINE SIG DETR, and DATA SET READY lamps lighted.)
15	None	None
	(Operate the 912A WDTS COUNTER switch to ON.)	(None)
16	Momentarily operate the receiver DTS COUNTER MODE switch to RESET.	Counter resets to zero and OVERFLOW indicator extinguished.
	(Momentarily operate the 912A WDTS COUNTER RESET button.)	(Counter resets to zero and OVERFLOW lamp extinguished.)
17	Start timing a 15-minute interval.	After 15 minutes— Counter indicates no more than three errors.
	(Start timing a 15-minute interval.)	(Counter indicates no more than three errors.)
18a	If more than three errors are counted by either the 912A WDTS or the receiver DTS— Momentarily operate the receiver DTS COUNTER MODE switch to RESET and start timing another 15-minute interval.	Same as Step 17.
	(Momentarily operate the 912A WDTS COUNTER RESET button and start timing another 15-minute interval.)	(Same as Step 17.)
19b	If more than three errors are counted by either the 912A WDTS or the receiver DTS during the first 5 minutes of the second 15-minute interval— Wait 5 minutes and then repeat Step 18a.	
	(Momentarily operate the 912A WDTS COUNTER RESET button and start timing another 15-minute interval.)	(Same as Step 17.)



STEP	ACTION	VERIFICATION
	<p>(4) Operate the receiver DTS switches as follows:</p> <p>INPUT to BIPOLAR</p> <p>SUBRATE CHANNEL to SINGLE</p> <p>COUNTER to BIT ERRORS</p> <p>TEST WORD to LOOPED</p> <p>DATA RATE to the customer service rate of the channel to be tested.</p>	(4) None.
2	<p>Insert the TRMT cord reel plug into the TO (NEAR or FAR) jack of the channel to be tested.</p> <p>(Disconnect the CPE (customer premises equipment) from the CSU.)</p>	None  (None)
3	<p>None</p> <p>(Insert the power plug of the 914C DTS into a 117-volt, 60-Hz ac outlet.)</p>	None  (None)
4	<p>None</p> <p>(Program the 914C DTS matrix per Practice AT&amp;T 595-100-500.)</p>	None  (None)
5	<p>Insert the RCV cord reel plug into the FROM (NEAR or FAR) jack and, if the receiver DTS is equipped with a TERMINATE key, operate this key.</p> <p>(None)</p>	The receiver DTS TERMINATED indicator lighted.  (None)
6	<p>None</p> <p>(Set the INTERFACE MODE switch on the DTS to the VOLTAGE position.)</p>	None  (None)
7	<p>None</p> <p>(Set the COUNTER switch on the DTS to BIT ERRORS.)</p>	None  (None)
8	<p>None</p> <p>(Set the OUTPUT [TP3] switch to OFF.)</p>	None  (None)

STEP	ACTION	VERIFICATION
9	None  (Set the RCV BIT RATE switch on the DTS to EXT +.)	None  (None)
10	None  (Set the TRANSMIT BIT RATE switch on the DTS to EXT +.)	None  (None)
11	None  (Set the TEST SET MODE switch on the DTS to SER.)	None  (None)
12	None  (Place the VOM function switch in the DCV 30 position.)	None  (None)
13	None  (Place the VOM polarity switch in the positive position.)	None  (None)
14	None  (On the DTS, connect the + test lead and - test lead of VOM to TP1 and GRD, respectively.)	None  (None)
15	None  (Construct an adapter cable per Practice AT&T 595-100-500.)	None  (None)
16	None  (Connect adapter cord end of the adapter cable to the customer interface connector on the CSU and the other end to connector A on the DTS.)	None  (None)
17	None  (Depress the POWER switch on the DTS.)	None  (POWER and DS1 lamps lighted. VOM indicates between 5 and 8 V dc.)
18	None  (Remove the matrix pin connecting DS1 and connector pin 2.)	None  (VOM indicates between 7 and 9 V dc.)

STEP	ACTION	VERIFICATION
19	None  (Disconnect the + test lead of the VOM from TP1.)	None  (None)
20	None  (Place the VOM polarity switch in the negative position.)	None  (None)
21	Depress the transmitter DTS CHAN LOOPBACK CONTROL CODES key.  (None)	The transmitter DTS CHAN LOOPBACK CONTROL CODES indicator lighted.  (TST indicator on CSU lighted. DS1 lamp on DTS extinguished.)
22	None  (Reconnect the + test lead of the VOM to TP1.)	None  (VOM indicates between -7 and -9 V dc.)
23	None  (Reinsert the matrix pin connecting DS1 and connector pin 2.)	None  (VOM indicates between -5 and -8 V dc.)
24	None  (Disconnect the VOM test leads.)	None  (None)
25	None  (Place the VOM function switch in the ACV 15 position.)	None  (None)
26	None  (Connect the VOM test leads across TP2 and TP3 of the DTS.)	None  (VOM indicates zero volts.)
27	Operate and hold the transmitter DTS ALL 1s key.  (None)	All the receiver DTS BYTE PATTERN indicators lighted.  (VOM indicates between 1 and 2 V ac. TST indicator on CSU extinguished and DS1 lamp on DTS lighted.)
28	Depress the transmitter DTS OCU LOOPBACK CONTROL CODES key.  (None)	The transmitter DTS OCU LOOPBACK CONTROL CODES indicator lighted.  (Meter indicates zero volts.)

STEP	ACTION	VERIFICATION
29	At the transmitter DTS— Operate the BYTE ENCODER switches to 0, 0, 0, 0, 0, 0, 1, and then operate the FUNCTION switch to BYTE ENCODER.  (None)	Receiver DTS BYTE PATTERN indicator 8 lighted. All others extinguished.  (None)
30	At the transmitter DTS— Operate the FUNCTION switch to CONTROL CODES and then momentarily operate the IDLE CODE CONTROL CODES key.  (None)	At the receiver DTS— <b>Subrate CSU:</b> BYTE PATTERN indicators 1 and 8 extinguished. All others lighted.  <b>56-kb/s CSU:</b> BYTE PATTERN indicator 8 extinguished. All others lighted.  (None)
31	Disconnect the TRMT cord reel plug.  (Remove the DTS adapter cable from the customer interface connector on the CSU.)	None  (None)
32	Disconnect the RCV cord reel plug.  (Restore the CSU to normal operation.)	None  (None)

#### G. SRDM Test

STEP	ACTION	VERIFICATION
1	<b>Caution: While this test is being performed, all channels of the SRDM being tested will be out of service.</b>  Verify that the portable DTSs are powered and receiving clock pulses.	PWR lamps and CLOCK indicators of both DTSs lighted.
2	Operate the transmitter DTS switches as follows:  FUNCTION to TEST WORD 511  OUTPUT to BIPOLAR  DATA RATE to the customer service rate of the channel to be tested  MODE to REPEAT.	

STEP	ACTION	VERIFICATION
3	<p>Operate the receiver DTS switches as follows:</p> <p>INPUT to BIPOLAR</p> <p>SUBRATE CHANNEL to SINGLE</p> <p>TEST WORD to 511</p> <p>COUNTER to BLOCK ERRORS</p> <p>DATA RATE to the customer service rate of the channel to be tested.</p>	
4a	<p>If testing an SRDM located in a local (end or intermediate) office—</p> <p>Operate the switches on the portable transmitter and receiver DTSs as given in Steps 2 and 3.</p>	
5a	<p>Plug the receiver and transmitter DTS power cords into 117-volt, 60-Hz outlets and operate the POWER ON switches on both DTSs.</p>	POWER ON lamps lighted on both DTSs.
6a	<p>Connect the clock cords of the transmitter and receiver DTSs to clock connectors of the BCPA (bay clock, power, and alarms) unit or LTS (local timing supply) shelf.</p>	CLOCK indicators on both DTSs lighted.
7a	<p>Plug the receiver DTS input cord into the SM-JCP (submultiplexer jack and connector panel) FROM (FAR) jack of the channel under test.</p>	
8a	<p>Plug the transmitter DTS output cord into the SM-JCP TO (FAR) jack of the channel under test.</p>	
9b	<p>If testing an SRDM located in a hub office—</p> <p>Have an AT&amp;T employee disconnect the multiplexed side of the SRDM DSX-0B cross-connection and then install a loop-back plug.</p>	
10b	<p>At the portable DTS—</p> <p>Insert the TRMT cord reel plug into the TO (NEAR or FAR) jack and the RCV cord reel plug into the FROM (NEAR or FAR) jack of the channel under test.</p>	If the receiver DTS is not equipped with a TERMINATE key, the TERMINATED indicator will light.
11	<p>If the receiver DTS is equipped with a TERMINATE key, depress this key and momentarily operate the COUNTER MODE switch to RESET and start timing a 5-minute interval.</p>	The receiver DTS TERMINATED indicator lighted.

STEP	ACTION	VERIFICATION
12	After five minutes— Operate the COUNTER MODE switch to HOLD.	Counter indicates less than two block errors.
13b	If testing an SRDM located in a hub office— Disconnect the TRMT and RCV cord reel plugs, remove loop-back plug from DSX-0B cross-connection, and restore original cross-connection.	
14a	Disconnect the portable receiver DTS and transmitter DTS input and output cords from the SM-JCP.	

#### H. Inter-DLSA Straightaway Test

STEP	ACTION	VERIFICATION
1	<i>The following procedures apply to the hubs at both ends of the network.</i>	
	Verify that the receiver and transmitter DTSs are powered and receiving clock signals.	POWER ON lamps and CLOCK indicators on both DTSs lighted.
2	Set the transmitter DTS switches as follows:  FUNCTION to TEST WORD 511 for subrate channels, or TEST WORD 2047 for 56-kb/s channels  OUTPUT to BIPOLAR  DATA RATE to the customer service rate of the channel to be tested  MODE to REPEAT.	
3	Set the switches on the receiver DTS as follows:  INPUT to BIPOLAR  DATA RATE to the customer service rate of the channel to be tested  SUBRATE CHANNEL to SINGLE  TEST WORD to 511 for subrate channels, or 2047 for 56-kb/s channels  COUNTER to BLOCK ERRORS.	

STEP	ACTION	VERIFICATION
4	Insert the TRMT cord reel plug into the TO (FAR) jack of the channel to be tested.	
5	Insert the RCV cord reel plug into the FROM (FAR) jack of the channel under test and, if the receiver DTS is equipped with a TERMINATE key, depress this key.	Receiver DTS TERMINATED indicator lighted.
6	Momentarily operate the receiver DTS COUNTER MODE switch to RESET and start timing a 5-minute interval.	
7	After five minutes— Operate the COUNTER MODE switch to HOLD.	Counter indicates less than two block errors.
8a	If no further tests are to be made— Disconnect the TRMT and RCV cord reel plugs.	

#### I. DDGT Loop-back Error Performance Test

STEP	ACTION	VERIFICATION
	<b>Note:</b> The manual loop-back switch at the DDGT must be in the REM position if the DDGT is in a serving office, or in the LOC position if the DDGT is in a hub office, before this test is performed.	
1	Verify that the portable DTSs are powered and receiving clock signals.	POWER ON lamps and CLOCK indicators lighted on both DTSs.
2	At the transmitter DTS— Set switches as follows:  OUTPUT to BIPOLAR  FUNCTION to TEST WORD 2047  DATA RATE to 56  MODE to REPEAT.	All LOOPACK TEST and CONTROL CODES indicators extinguished.

STEP	ACTION	VERIFICATION
3	<p>At the receiver DTS— Set switches as follows:</p> <p>INPUT to BIPOLAR</p> <p>DATA RATE to 56</p> <p>COUNTER to BLOCK ERRORS</p> <p>TEST WORD to 2047</p> <p>SUBRATE CHANNEL to SINGLE.</p>	
4	<p>Insert the RCV cord reel plug into the MON (NEAR or FAR) jack of the channel to be tested.</p>	<p>Receiver DTS BYTE PATTERN indicator 8 extinguished (disregard other BYTE PATTERN indicators).</p> <p><b>Caution: If BYTE PATTERN indicator 8 is lighted, it indicates that data is present on the channel. DO NOT proceed to Step 5 until the channel is released for testing or service will be interrupted.</b></p>
5	<p>Disconnect the RCV cord reel plug, insert it into the FROM (NEAR or FAR) jack of the channel to be tested, and, if the receiver DTS is equipped with a TERMINATE key, depress this key.</p>	<p>TERMINATED indicator lighted.</p>
6	<p>Insert the TRMT cord reel plug into the TO (NEAR or FAR) jack of the channel to be tested.</p>	
7	<p>Momentarily operate the receiver DTS COUNTER MODE switch to RESET.</p>	<p>The receiver DTS counter resets to zero. OVERFLOW indicator extinguished.</p>
8	<p>Start timing a 5-minute interval.</p>	<p>After 5 minutes— If testing a DDGT at a serving office— The receiver DTS counter indicates no more than two block errors.</p> <p>If testing a DDGT at a hub office— The receiver DTS counter indicates zero block errors.</p>
9a	<p>If no further tests are to be made— Disconnect the TRMT and RCV cord reel plugs.</p>	

J. Subrate Off-Net Extension Loop-back Error Performance Test

STEP	ACTION	VERIFICATION
	<p><b>Note:</b> When performing this test to the data set at the station or at the hub office, the data set must be in the DL (digital loop-back) mode or AL (analog loop-back) mode, respectively. If this test is performed to the DAS 831A, the loop-back switch on the DAS 831A must be in the operated position.</p>	
1	<p>Verify that the portable DTSs are powered and receiving clock signals.</p>	<p>POWER ON lamps and CLOCK indicators lighted on both DTSs.</p>
2	<p>At the transmitter DTS— Set switches as follows:</p> <p>OUTPUT to BIPOLAR</p> <p>FUNCTION to TEST WORD 511</p> <p>DATA RATE to the customer service rate of the channel to be tested</p> <p>MODE to REPEAT.</p>	<p>All LOOPBACK TEST and CONTROL CODES indicators extinguished.</p>
3	<p>At the receiver DTS— Set switches as follows:</p> <p>INPUT to BIPOLAR</p> <p>DATA RATE to the customer service rate of the channel to be tested</p> <p>COUNTER to BLOCK ERRORS</p> <p>TEST WORD to 511</p> <p>SUBRATE CHANNEL to SINGLE.</p>	
4	<p>Insert the RCV cord reel plug into the MON (NEAR or FAR) jack of the channel to be tested.</p>	<p>Receiver DTS BYTE PATTERN indicator 8 extinguished (disregard other BYTE PATTERN indicators).</p> <p><b>Caution: If BYTE PATTERN indicator 8 is lighted, it indicates that data is present on the channel. DO NOT proceed to Step 5 until the channel is released for testing or service will be interrupted.</b></p>

STEP	ACTION	VERIFICATION
5	Disconnect the RCV cord reel plug, insert it into the FROM (NEAR or FAR) jack of the channel to be tested, and, if the receiver DTS is equipped with a TERMINATE key, depress this key.	TERMINATED indicator lighted.
6	Insert the TRMT cord reel plug into the TO (NEAR or FAR) jack of the channel to be tested.	
7	Momentarily operate the receiver DTS COUNTER MODE switch to RESET.	The receiver DTS counter resets to zero. OVERFLOW indicator extinguished.
8	Start timing a 5-minute interval.	After 5 minutes— If testing a data set at the station— The receiver DTS counter indicates no more than two block errors.  If testing a data set at the hub office or a DAS 831A— The receiver DTS counter indicates zero block errors.
9a	If no further tests are to be made— Disconnect the TRMT and RCV cord reel plugs.	

**K. 56-kb/s Repeater Loop-back Test**

STEP	ACTION	VERIFICATION
1	Verify that the portable DTSs are powered and receiving clock signals.	POWER ON and CLOCK indicators lighted.
2	At the transmitter DTS— Set switches as follows:  OUTPUT to BIPOLAR  FUNCTION to LOOPBACK TEST  DATA RATE to 56  MODE to REPEAT.	
3	At the receiver DTS— Set switches as follows:  INPUT to BIPOLAR	

STEP	ACTION	VERIFICATION
	DATA RATE to 56	
	TEST WORD to LOOPED	
	COUNTER to BLOCK ERRORS.	
4	Insert the RCV cord reel plug into the MON (NEAR) jack of the line to be tested.	BYTE PATTERN indicator 8 extinguished (disregard other BYTE PATTERN indicators).
		<i>Caution: If BYTE PATTERN indicator 8 is lighted, it indicates that data is present on the line. DO NOT proceed to Step 5 until the line is released for testing or service will be interrupted.</i>
5	Disconnect the RCV cord reel plug and insert it into the FROM (NEAR) jack of the line to be tested. If the receiver DTS is equipped with a TERMINATE key, depress this key.	Receiver DTS TERMINATED indicator lighted.
6	Insert the TRMT cord reel plug into the TO (NEAR) jack of the line to be tested.	
7	Depress the transmitter DTS RESET key.	All transmitter DTS LOOPBACK TEST and CONTROL CODES indicators extinguished.
8	Operate and hold operated the transmitter DTS CHAN LOOPBACK TEST key.	At the transmitter DTS— CHAN LOOPBACK TEST indicator lighted.
		At the receiver DTS— BYTE PATTERN indicator 8 and two others lighted.
9	Release the CHAN LOOPBACK TEST key.	All receiver DTS BYTE PATTERN indicators flicker.
10a	If testing the second repeater beyond the hub, momentarily depress the ALL 1s key on the transmitter DTS.	None
	<i>Note:</i> This removes the loop-back condition from the first repeater and places the second repeater in the loop-back condition.	
11	Momentarily operate the receiver DTS COUNTER MODE switch to RESET and start timing a 5-minute interval.	Counter displays zero block errors.

STEP	ACTION	VERIFICATION
12a	If the line contains two repeaters and the second repeater beyond the hub is to be tested at this time, perform Steps 10a and 11.	
13b	If no further tests are to be made— Disconnect the TRMT and RCV cord reel plugs.	

#### L. Inter-DLSA Loop-back Error Performance Test

STEP	ACTION	VERIFICATION
	<b>Note:</b> The following procedures must be performed simultaneously by the hubs serving the near-end and far-end stations.	
1	Verify that the portable DTSs are powered and receiving clock signals.	POWER ON lamps and CLOCK indicators lighted on both DTSs.
2	At the transmitter DTS— Set switches as follows:  OUTPUT to BIPOLAR  FUNCTION to LOOPBACK TEST  DATA RATE to customer service rate of channel to be tested.	
3	Momentarily operate the RESET key.	All LOOPBACK TEST and CONTROL CODES indicators extinguished.
4	At the receiver DTS— Set switches as follows:  INPUT to BIPOLAR  DATA RATE to customer service rate of channel to be tested  COUNTER to BLOCK ERRORS  TEST WORD to LOOPED  SUBRATE CHANNEL to SINGLE.	

STEP	ACTION	VERIFICATION
5	Insert the RCV cord reel plug into the MON (NEAR or FAR) jack of the channel to be tested.	Receiver DTS BYTE PATTERN indicator 8 extinguished (disregard other BYTE PATTERN indicators).  <i>Caution: If BYTE PATTERN indicator 8 is lighted, it indicates that data is present on the channel. DO NOT proceed to Step 6 until the channel is released for testing or service will be interrupted.</i>
6	Disconnect the RCV cord reel plug, insert it into the FROM (NEAR) jack of channel to be tested and, if the receiver DTS is equipped with a TERMINATE key, depress this key.	TERMINATED indicator lighted.
7	Insert the TRMT cord reel plug into the TO (FAR) jack of the channel to be tested.	
8a	If the far-end station contains a CSU— At the transmitter DTS— Depress the RESET key, then the CHAN LOOPBACK TEST key.	At the receiver DTS— <b>56-kb/s service</b> — All BYTE PATTERN indicators flicker.  <b>Subrate service</b> — BYTE PATTERN indicators 2 through 8 flicker.
	<i>Note:</i> If the data rate of the line being tested is 56 kb/s and the line contains 56-kb/s repeaters, momentarily depress the transmitter DTS ALL 1s key once for each repeater in the line.	
9b	If the far-end station contains a DSU— At the transmitter DTS— Depress the RESET key, then the DSU LOOPBACK TEST key.	At the receiver DTS— <b>56-kb/s service</b> — All BYTE PATTERN indicators flicker.  <b>Subrate service</b> — BYTE PATTERN indicators 2 through 8 flicker.
10	At the receiver DTS— Momentarily operate the COUNTER MODE switch to RESET and start timing a 50-minute interval.	OVERFLOW indicator extinguished. Counter resets to 00.
11	After 50 minutes— Operate the COUNTER MODE switch to HOLD.	Counter displays no more than 14 block errors.
12c	If no further tests are to be made— Disconnect the TRMT and RCV cord reel plugs.	

---

**M. DS-0 DP Loop-back Test**


---

STEP	ACTION	VERIFICATION
1	Verify the channel has been released for testing or service will be interrupted.	
2	Notify D3 or D4 channel bank personnel to insert ED-3C793 loop-back connector with red jack up into DS-0 DP TST jack.  <i>Note:</i> This connector establishes channel loop-backs in both directions.	
3	Determine if DS-0 DP has been optioned for error correction in or error correction out. This information will be used later in Steps 5 and 7.	
4	Verify receiver and transmitter DTSs are powered and receiving clock signals.	POWER ON lamps and CLOCK indicators at both DTSs are lighted.
5	Set transmitter DTS switches as follows:  MODE to REPEAT  FUNCTION to TEST WORD 2047  DATA RATE to 9.6 kb/s when error correction is in, or to 56 kb/s when error correction is out.  OUTPUT to BIPOLAR.	
6	Momentarily depress RESET switch.	All LOOPBACK TEST and CONTROL CODES indicators are extinguished.
7	Set receiver DTS switches as follows:  INPUT to BIPOLAR  DATA RATE to 9.6 kb/s when error correction is in, or 56 kb/s when error correction is out.  CHANNEL to SINGLE  TEST WORD to 2047  COUNTER to BLOCK ERRORS.	
8	Insert TRMT cord reel plug into TO (NEAR or FAR) jack of channel being tested.	

STEP	ACTION	VERIFICATION
9	Insert RCV cord reel plug into FROM (NEAR or FAR) jack of channel being tested, and if receiver DTS is equipped with TERMINATE key, depress this key.	TERMINATED indicator lighted.
10a	If performing an installation test— At receiver DTS, momentarily operate COUNTER MODE switch to RESET and start timing a 15-minute interval.	OVERFLOW indicator extinguished. Counter resets to 00.
11a	After 15 minutes— Operate COUNTER MODE switch to HOLD.	Counter displays less than two block errors.
12b	If performing a maintenance test— At the receiver DTS, momentarily operate the COUNTER MODE switch to RESET and start timing a 15-second interval.	OVERFLOW indicator extinguished. Counter resets to 00.
13b	After 15 seconds— Operate COUNTER MODE switch to HOLD.	Counter displays zero block errors.
14	Notify D3 or D4 channel bank personnel to remove ED-3C793 loop-back connector from DS-0 DP TST jack.	
15	Repeat Steps 2 through 14 for remaining DS-0 DP(s) to be tested.	
16	If no further tests are to be made— Disconnect TRMT and RCV cord reel plugs from jacks.	

#### N. Multipoint Circuit Test Using an MSU

STEP	ACTION	VERIFICATION
1	Insert the TRMT cord reel plug into the TO (NEAR) or TO (FAR) channel jack toward the outlying station.	
2	Insert the RCV cord reel plug into the FROM (NEAR) or FROM (FAR) channel jack toward the outlying station.	
	<b>Note:</b> If a mistake is made while performing Steps 3 through 5, depress the CLR key on the MSU and start again.	

STEP	ACTION	VERIFICATION
3	Depress the SIG key on the MSU.	SIG lamp lights.
4	Depress the BRANCH keys necessary to reach the desired outlying station starting with the branch in the first downstream MJU and progressing in the downstream direction, selecting a branch at each MJU as it appears in the circuit.	The NEW section of the MSU display indicates the BR (branch) number and MJU HUBID code associated with the last branch selected. The OLD section of the MSU display indicates the BR number and MJU HUBID code associated with the next to last branch selected.
5	<b>Note:</b> The idle code byte (01111110 or 11111110) should not be transmitted over the circuit while performing the following steps.  Depress the TST key on the MSU.	TST lamp lights and SIG lamp extinguishes.
6	After performing all necessary tests, restore the MSU and circuit to their original state by performing Steps 7 and 8.	
7	After performing all necessary tests, depress the CLR key on the MSU.	CLR lamp lights for approximately one-half second. If the SIG or TST lamp was lighted when the CLR key was depressed, it will extinguish. If the SIG or TST lamp was lighted prior to the CLR key being depressed but was extinguished when the CLR key was depressed, it will remain extinguished.
8	Remove the TRMT and RCV cord reel plugs from the testboard jacks.	<b>Note:</b> If the TRMT and RCV cord reel plugs are removed from the jacks before the CLR key is depressed, the lamp under the CLR key will flash. The CLR lamp will extinguish after the TRMT and RCV cord reel plugs are reinserted into the jacks. Testing can then be continued or the channel can be returned to the normal state by performing Steps 7 and 8 above.

#### O. MJU Remote Test

STEP	ACTION	VERIFICATION
	<b>Note:</b> Before performing the following test, obtain customer release of the circuit or portion of the circuit downstream of the MJU being tested.	
1	Verify that the portable DTSs are powered and receiving clock signals.	POWER ON lamps and CLOCK indicators lighted on both DTSs.

STEP	ACTION	VERIFICATION
2	<p>Condition the portable DTS transmitter switches as follows:</p> <p>OUTPUT to BIPOLAR</p> <p>DATA RATE to 56</p> <p>FUNCTION to BYTE ENCODER</p> <p>MODE to REPEAT</p> <p>BYTE ENCODER to 11111110.</p>	
3	<p>Condition the portable DTS receiver switches as follows:</p> <p>INPUT to BIPOLAR</p> <p>DATA RATE to 56</p> <p>SUBRATE CHANNEL to SINGLE</p> <p>COUNTER MODE to HOLD</p> <p>COUNTER to BIT ERRORS</p> <p>TEST WORD to 511.</p> <p><b>Note 1:</b> If difficulty is encountered while performing the following steps, an attempt should be made to return the MJU to normal operation by transmitting the idle code to the MJU via the appropriate channel jack.</p> <p><b>Note 2:</b> While changing the settings of the BYTE ENCODER switches on the transmitter, depress the ALL 1s key until the desired byte is obtained.</p>	
4	<p>Insert dummy plugs into the appropriate TO and FROM <b>channel</b> jacks toward the upstream direction and insert the TRMT cord reel plug into the remaining TO <b>channel</b> jack toward the MJU.</p>	
5	<p>Insert dummy plugs into the appropriate TO and FROM <b>branch</b> jacks of each MJU branch toward the downstream direction.</p>	

STEP	ACTION	VERIFICATION
6	Insert the RCV cord reel plug into the remaining FROM <i>branch</i> jack of one of the branches toward the MJU. If the receiver DTS is equipped with a TERMINATE key, depress this key.	At the receiver DTS— TERMINATED and IDLE CODE indicators lighted. BYTE PATTERN indicators 1 through 7 <i>only</i> lighted.
7	At the transmitter DTS— Operate the FUNCTION switch to TEST WORD 511.	
8	At the receiver DTS— Momentarily operate the COUNTER MODE switch to RESET.	The receiver DTS counter resets to zero. OVERFLOW indicator extinguished.
9	Start timing a 15-second interval.	After 15 seconds— The receiver DTS counter registers zero bit errors.
10	Operate the transmitter DTS FUNCTION switch to BYTE ENCODER and repeat Steps 6 through 9 with the RCV cord reel plug inserted into the appropriate FROM jacks at each of the remaining branches.	
11	At the transmitter DTS— Operate the FUNCTION switch to BYTE ENCODER. Set BYTE ENCODER switches to 11000011.	
12	Insert the RCV cord reel plug into the appropriate FROM <i>channel</i> jack toward the MJU and, if the receiver DTS is equipped with a TERMINATE key, depress this key.	TERMINATED indicator lighted.
13	Insert the TRMT cord reel plug into the appropriate TO <i>branch</i> jack of branch 1 toward the MJU.	Receiver DTS BYTE PATTERN indicators 1, 2, 7, and 8 <i>only</i> lighted.
14	At the transmitter DTS— Operate the FUNCTION switch to TEST WORD 511.	
15	At the receiver DTS— Momentarily operate the COUNTER MODE switch to RESET.	The receiver DTS counter resets to zero. OVERFLOW indicator extinguished.
16	Start timing a 15-second interval.	After 15 seconds— The receiver DTS counter registers zero bit errors.

STEP	ACTION	VERIFICATION
17	Operate the transmitter DTS FUNCTION switch to BYTE ENCODER and repeat Steps 13 through 16 with the TRMT cord reel plug inserted into the appropriate TO jacks at each of the remaining branches.	
18	Remove the TRMT cord reel plug.	Receiver DTS BYTE PATTERN indicators 1 through 7 lighted.
19	After all tests have been performed, remove the RCV cord reel plug and the dummy plugs from the jacks associated with the channel and branches of the MJU just checked.	

**P. Circuit Pack Compatibility Test**

STEP	ACTION	VERIFICATION
1	Set up an OCU latching loop-back as described in the OCU latching loop-back test.	
2	Depress ALL 1s button on the KS-20909 DTS.	This will transmit all 1s while the byte encoder switches are reset.
3	Set BYTE ENCODER to 10000000.	
4	Release ALL 1s button to transmit the test word 10000000.	Test word 10000000 is displayed on the test set.  <i>Note:</i> If 10000000 is not displayed, verify the presence of the new secondary channel circuit packs listed in Table A.

**Q. Branch Select/Branch Block**

STEP	ACTION	VERIFICATION
------	--------	--------------

*Note:* Steps 1 through 4 apply to the branch select function and Steps 5 through 9 apply to the branch block function.

**MJU Branch Select**

1	Repeat Steps 1 through 3 of the MJU latching loop-back test.	DTS receiver displays HUBID code.
---	--	-----------------------------------

STEP	ACTION	VERIFICATION
2	Transmit BRn code, where "n" is the number of the selected branch. The BRn codes are given in Table D.	
3	Transmit UMC code.	MJU is transparent to the circuit. UMC code is sent to unselected branches.
4	Transmit IDLE code to restore previously selected branches to normal or RLS code to restore MJU to normal transmission state.	
<b>MJU Branch Block</b>		
5	Repeat Steps 1 through 3 of the MJU latching loop-back test.	DTS receiver displays HUBID code.
6	Transmit BRn code, where "n" is the number of the MJU channel to be blocked.	
7	Transmit UMC code.	
8	Transmit BLK code.	Selected branch is disconnected from control leg and looped back on itself; other MJU circuitry remains active.  <i>Note:</i> Transmitting IDLE code at this point will return all previously selected/blocked branches to the normal transmission state.
9	Transmit RLS code to return MJU to its normal transmission state.	

#### 4. GLOSSARY

4.01 Most of the acronyms and abbreviations (terms) are explained when they are first used in this practice. However, the following list is provided as a quick reference:

TERM	DEFINITION	TERM	DEFINITION
		CP	Circuit Pack
		CPE	Customer Premises Equipment
		CSU	Channel Service Unit
		CTC/SSC-D	Centralized Test Center/Special Service Center-Digital
ABATS	Automated Bit Access Test System	DAS	Data Auxiliary Set
AL	Analog Loop-back	DDB	Digital Data Bank
BATS/LATS	Bit Access Test System/Line Access Test System	DDGT	Digital Data Group Terminal
BCPA	Bay Clock, Power, and Alarm	DDS	Digital Data System

TERM	DEFINITION	TERM	DEFINITION
DL	Digital Loop-back	MSU	Multipoint Signaling Unit
DLSA	Digital LATA Serving Area	NE	Near-End
DP	Dataport	OCU	Office Channel Unit
DS	Data Set	PL	Private Line
DS-0	Digital Signal at the Zero Level Dataport	POI	Point-of-Interface
DSU	Data Service Unit	POP	Point-of-Presence
DTS	Data Test Set	RCV	Receive
FE	Far-End	SM-JCP	Submultiplexer Jack and Connector Panel
FEV	Far-End Voice	SMAS/SARTS	Switched Maintenance Access System/Switched Access Remote Test System
HUBID	Hub Identification Code	SRDM	Subrate Digital Multiplexer
ISMX	Integral Subrate Multiplexer	TIP	Transition in Progress
LATA	Local Access and Transport Area	TRMT	Transmit
LBE	Loop-back Enable	UMC	Unassigned Multiplexer Channel
LBID	Loop-back Identification Code	WDTS	Wideband Data Test Set
LED	Light Emitting Diode		
LSC	Loop-back Select Code		
LSI	Loop side Interface		
LTS	Local Timing Supply		
M-JCP	Multiplexer Jack and Connector Panel		
MJU	Multipoint Junction Unit		

#### 5. ISSUING ORGANIZATION

Published by  
The AT&T Documentation Management Organization

TABLE A SECONDARY CHANNEL COMPATIBLE CIRCUIT PACKS	
EQUIPMENT	CIRCUIT PACK
T1DM	HL216
T1DM-PM	HL29-series II
T1WB4/5	HL70C
D4-DS0-DP	J98726DH
D5-DS0-DP	AEK27
SRDM	HL37B
D4 OCU-DP	J98726DJ
ISMX	HL8B (5 Channel) or HL88B (10 Channel)
OCU	HL220
MJU	HL223/224
D5-OCU-DP	AEK26
SLC® Series 5 DS0-DP	AUA34
SLC® Series 5 OCU-DP	AUA52

TABLE B LSC CODES	
EQUIPMENT	LSCs (NOTES 1, 2)
DS-0 DP (drop)	Ø0000101
DS-0 DP (line)	Ø0000101
OCU	Ø1010101
CSU (channel)	Ø0110001
HL222	Ø1000111
Spare	Ø1110111
Spare	Ø1000001
Spare	Ø1110001

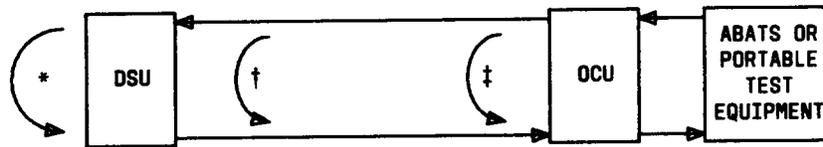
*Notes:*

- Ø is the do not care symbol.
- No LSC can equal 11111111.

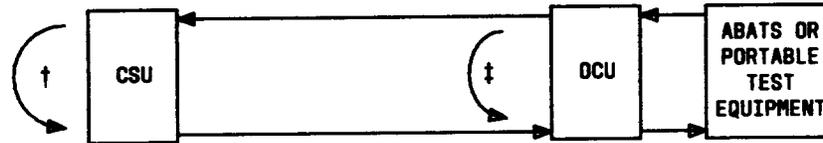
TABLE C MJU ANSWERBACK CODES	
RECEIVE FROM CONTROL	RETURN TO CONTROL
1st TA	No Change
2nd TA	TA
MA	HUBID
LBID	LBID

◆TABLE D◆		
MJU CODES		
CODE	ABBREVIATION	BIT PATTERN (NOTE 1)
Test Alert	TA	01101100
MJU Alert	MA	01110010
Branch 1	BR1	00101001
Branch 2	BR2	00101011
Branch 3	BR3	00101101
Branch 4	BR4	00101111
Unassigned Multiplexer Channel	UMC	00011000
Loopback Identification	LBID	01010001
Block	BLK	00001010
Control Mode Idle	IDLE	01111110
Data Mode Idle	DMI	01111111
Release	RLS	01111000
Multiplexer Out of Sync	MOS	00011010
Hub Identification	HUBID	0 A B C D E F 1

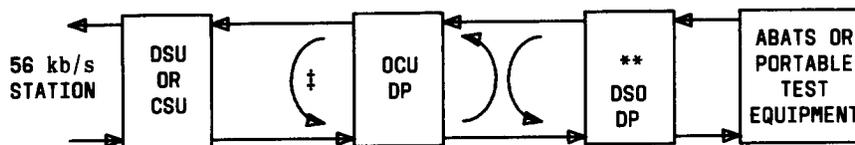
*Note 1: A, B, C, D, E, and F cannot be 000000, 111111, 110110, or 111000.*



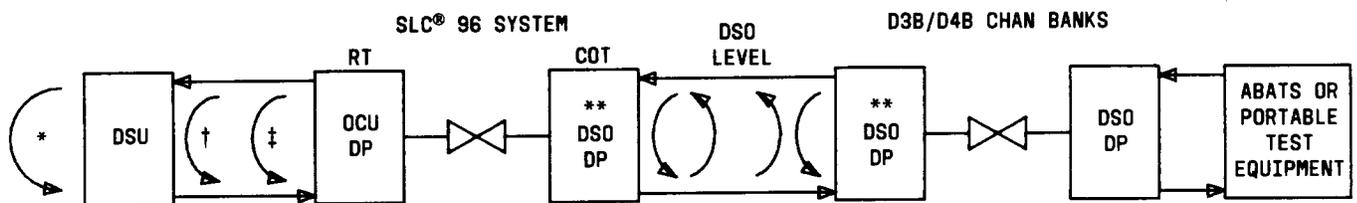
A. LOCAL CHANNEL WITH DSU



B. LOCAL CHANNEL WITH CSU



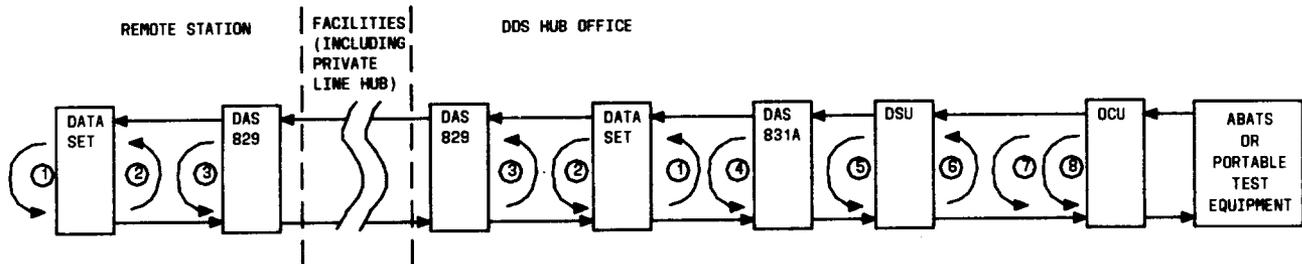
C. LOCAL 56 kb/s CHANNEL W/DSO DP



D. LOCAL CHANNEL W/DSO DPS AND SLC® 96

- \* DSU LOOP-BACK POINT
- † CHAN LOOP-BACK POINT
- ‡ OCU OR OCU DP LOOP-BACK POINT
- \*\* DSO DP LOOP-BACKS IN BOTH DIRECTIONS SIMULTANEOUSLY - MANUAL TEST ONLY

Fig. 1—Local Channel Loop-back Test Locations (Simplified)



- ① DIGITAL LOOP-BACK POINT
- ② ANALOG LOOP-BACK POINT
- ③ FACILITY LOOP-BACK POINT AT DAS 829
- ④ DAS 831A LOOP-BACK POINT
- ⑤ DSU LOOP-BACK POINT
- ⑥ LOCAL LINE LOOP-BACK POINT
- ⑦ CHAN LOOP-BACK POINT
- ⑧ OCU LOOP-BACK POINT

◆Fig. 2—Loop-back Locations on a Subrate Off-Net Extension Arrangement◆

CIRCUIT #		CIRCUIT		<input type="checkbox"/> PLT-TO-PT <input type="checkbox"/> MULT. PT		BIT RATE <input type="checkbox"/> 2.4 KB/S <input type="checkbox"/> 4.8 KB/S <input type="checkbox"/> 9.6 KB/S <input type="checkbox"/> 56.0 KB/S	
CUST. NAME		BILLING ADDRESS		TEL. #			
CONTROL HUB ADDRESS		TEL. #					
NEAR END		NAME		ADDRESS		TEL. #	INST. DATE
<input type="checkbox"/> CSU <input type="checkbox"/> DSU							
FAR END							
<input type="checkbox"/> CSU <input type="checkbox"/> DSU							
		<input type="checkbox"/> SINGLE LINE <input type="checkbox"/> HUNTING		ADDITIONAL NUMBERS _____ IN HUNTING GROUP _____			
REMARKS (OVER)							

◆Fig. 3—An Example of Card E-6527 (Sheet 1 of 2)◆

## PRESERVICE AND MAINTENANCE TESTS AT&amp;T 314-901-500

PRESRV.	MAINT.	NAME OF TEST	2-EMPLOYEE TEST	NUMBER OF ERRORS	INITIALS	DATE
A	A	DSU LOOP-BACK TO NEAR END STA	NO			
		DSU LOOP-BACK TO FAR END STA +	NO			
B	B	CHAN LOOP-BACK TO NEAR END STA *	NO			
		CHAN LOOP-BACK TO FAR END STA * +	NO			
C	C	OCU LOOP-BACK	NO			
D		DSU FUNCTIONAL	YES			
E	E	DSU STRAIGHTAWAY	YES			
F		CSU FUNCTIONAL	YES			
G		SRDM	YES			
H	H	HUB-TO-HUB STRAIGHTAWAY	NO			
<p>* FOR 56.0 KB/S SERVICE WITH REPEATERS IN LOCAL LOOP, BE SURE CHAN LOOP-BACK TEST IS MADE TO STATION (NOT TO REPEATERS)</p> <p>+ THESE TESTS MADE BY THE CONTROL HUB ONLY</p> <p>REMARKS</p>						

◆Fig. 3—An Example of Card E-6527 (Sheet 2 of 2)◆