DATA SET 113DR-L1/2
TRANSMITTER-RECEIVER
SINGLE SET
TEST PROCEDURES USING 921A DATA TEST SET

CONTENTS PAGE

1. GENERAL

1.01 This section contains test procedures to be followed when using a 921A (version 2 or higher) data test set (DTS) to test a data set (DS) 113DR. These procedures are to be followed when needed on an initial installation or during a maintenance visit. Test procedures using the 914-type DTS are contained in Section 591-047-500.

1.02 When this section is reissued, the reason for reissue will be contained in this paragraph.

1.03 The DS 113DR provides asynchronous, full-duplex transmission and reception of serial binary data over the switched network at bit rates up to 300 bits per second (bps). The DS 113DR also provides a single mode of operation, answer only.

1.04 The 921A DTS (Fig. 1) is a portable, general purpose, data test set that provides the serial testing capabilities of the 914C DTS and is compatible with the 914C DTS for end-to-end testing. In addition, the 921A DTS is compatible with the 911A and 911NA DTSs for end-to-end start-stop distortion measurements. Additional information concerning the 921A DTS is contained in Section 107-402-100.

1.05 Input to the 921A DTS is made through a 20-button keyboard. A 32-character alphanumeric display provides operator prompting and test results.

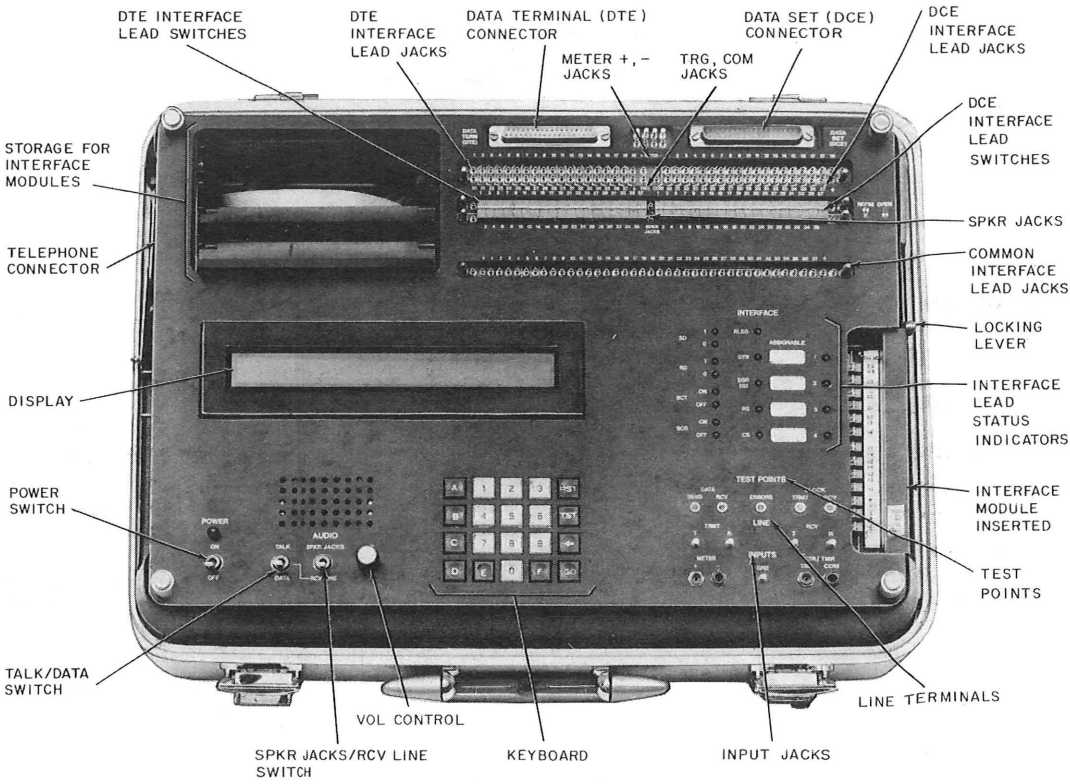

Fig. 1—921A Data Test Set—Front Panel

Test Capabilities

1.06 Test circuitry built into DS 113DR permits the following self tests to be performed: analog loopback, digital loopback, and end-to-end. The test circuitry also facilitates the remote test of the data set from a data test center (DTC).

1.07 If a 921A DTS is used, the analog loopback, digital loopback, and end-to-end tests can be performed using pseudorandom data. By use of the 921A DTS, the customer interface circuits are tested and a more precise indication of bit and block errors can be obtained. Start-stop distortion tests can be performed for asynchronous operation. The 921A DTS can also be used to test the data set automatic answer circuits.

2. INSTALLATION TESTS

2.01 This part provides the sequence in which tests are to be performed following installation of the data set. Before proceeding with the tests, verify that the local loop meets the requirements specified in Section 314-205-501.

2.02 Refer to Fig. 2 for the sequence of tests to be performed to verify proper installation. The 921A DTS is not required for installation testing, but may be used if desired.

3. MAINTENANCE TESTS

3.01 This part provides the sequence in which tests are to be performed when clearing a

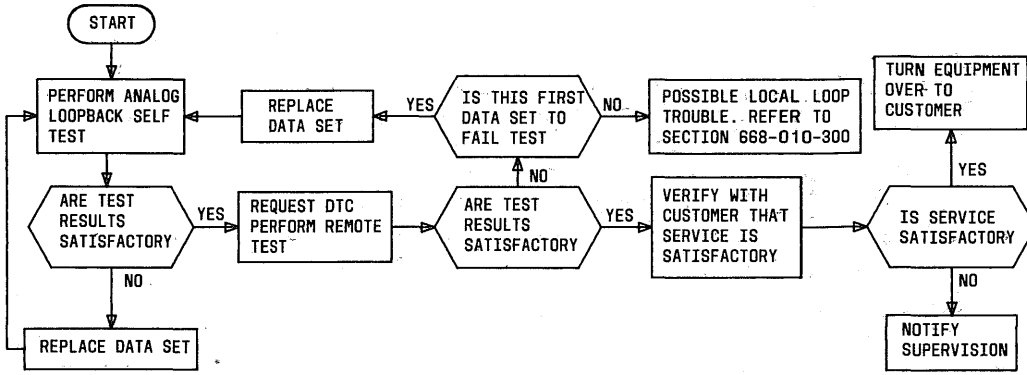

Fig. 2—Installation Test Sequence

trouble report and during a maintenance visit to the data station.

3.02 When a trouble report is received, a DTC is responsible for isolating the trouble to the data station or the transmission facility. The procedure for doing this is shown in Fig. 3.

3.03 If the trouble seems to be in the data station equipment, a telephone company (telco) employee must be dispatched to conduct more extensive tests at the data station. The following equipment should be taken on a trouble visit:

- Spare data set
- 921A DTS.

3.04 Refer to Fig. 4 for the sequence in which tests are to be performed by the telco employee at the data station. If the data set is replaced, the defective data set should be tagged with a description of the trouble, carefully packed, and returned to a service center for repair. Verify that the replacement data set is equipped with the proper options before placing the data set in service.

3.05 If the trouble persists after the tests have been completed, proceed as follows:

(a) Check that options installed in data set agree with those specified on service order.

(b) Verify that customer-provided equipment (CPE) has been tested and is operating properly.

(c) Check for physical damage to data station equipment.

(d) Verify that all cords and connectors are properly connected.

(e) Check for intermittent trouble in station wiring.

(f) Verify that data set and CPE are connected to a common ground.

(g) If trouble persists, request help from immediate supervisor.

4. TEST PROCEDURES

4.01 This part provides the procedures for the installation and maintenance tests.

A. Analog Loopback Self Test

4.02 This test checks the data set transmitter and receiver (Fig. 5). The customer interface is not checked. Test data generated by the data set is looped back internally from the transmitter output to the receiver input. The received data is compared to the transmitted data. If the distortion threshold (20 percent) is not exceeded, the MC lamp goes off after a short interval.

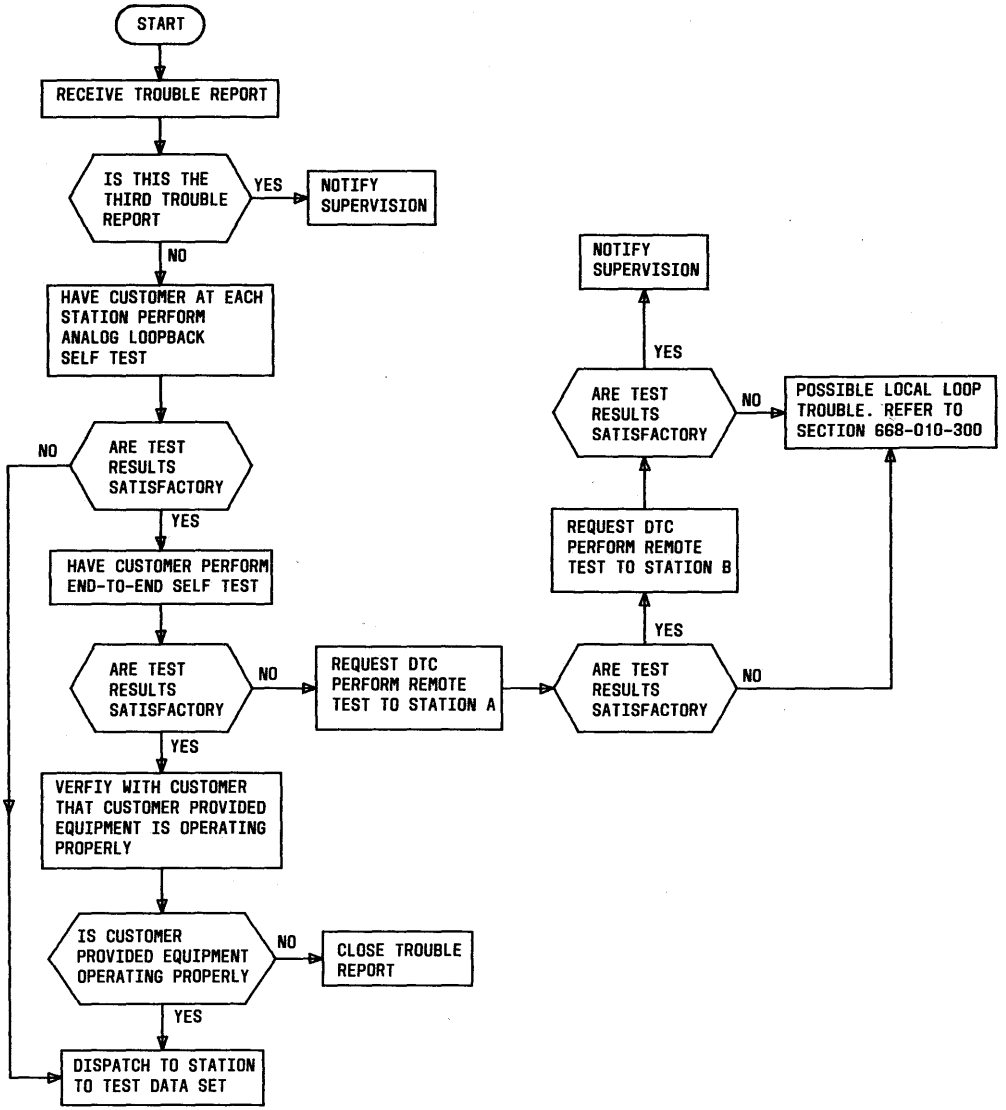

Fig. 3—Clearing Trouble Report

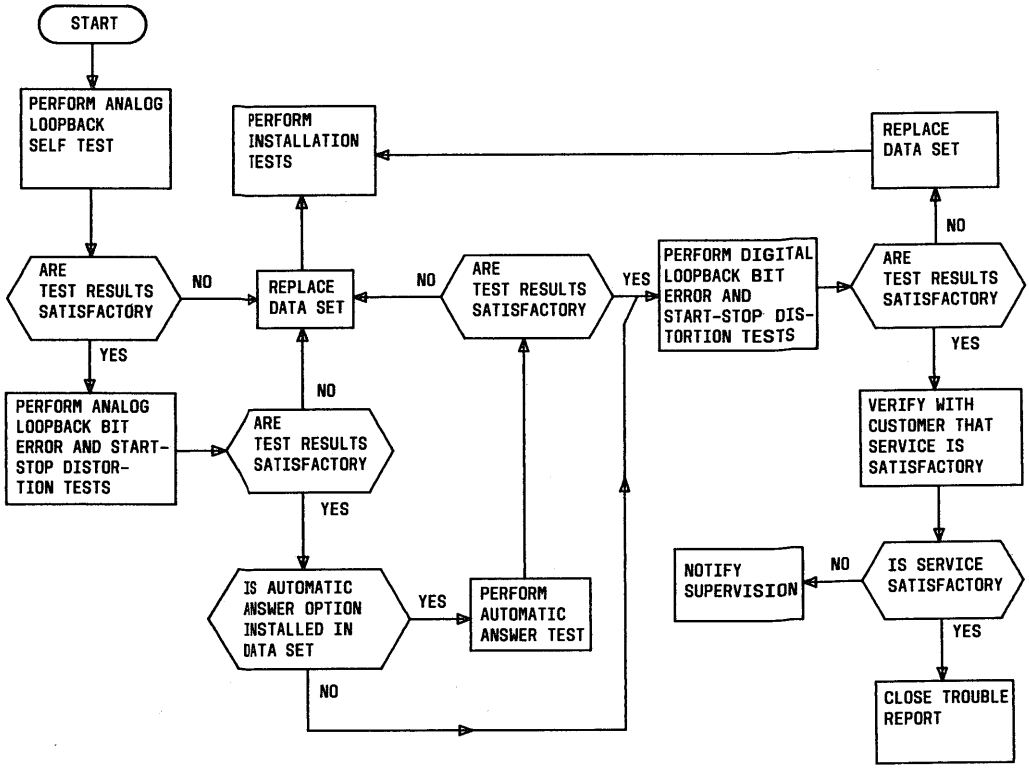

Fig. 4—Maintenance Test Sequence

4.03 Perform the test as follows:

(1) Depress AL and ST switches on data set.

Requirements: MB, MR, and TM lamps light and MC lamp goes off after SD and RD lamps light.

(2) Observe MC lamp for 1 minute.

Requirement: MC lamp remains off.

(3) Release AL and ST switches.

B. Digital Loopback Self Test

4.04 This test checks the transmitter and receiver of a local and a distant data set and the facilities connecting the data sets (Fig. 6). The customer interfaces are not checked. Test data generated and transmitted by the local data set is looped back internally from the receiver output to the transmitter input of the distant data set and retransmitted. This data is received by the local data set and compared to the original transmitted data. If the distortion threshold (35 percent) is not exceeded, the MC lamp goes off after a short interval.

Note: The distant data set can be a 103J, 103JR, 113C, 113CR, 113D, or 113DR.

4.05 Perform the test as follows:

(1) Place a call to distant station. If distant data set is already in DL mode, it will answer automatically.

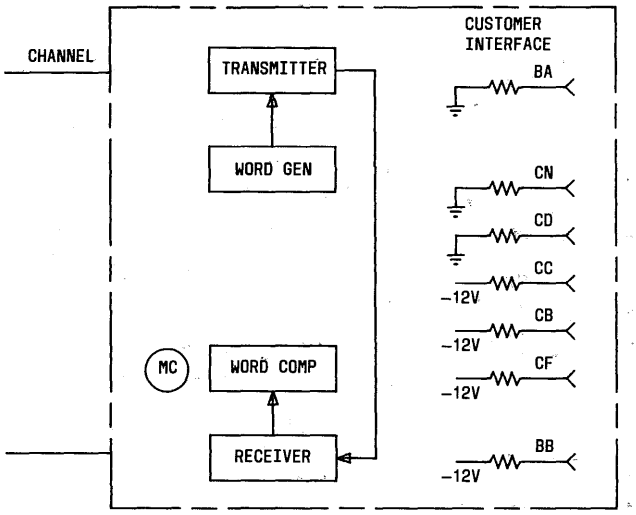

Fig. 5—Analog Loopback Self Test—Simplified Block Diagram

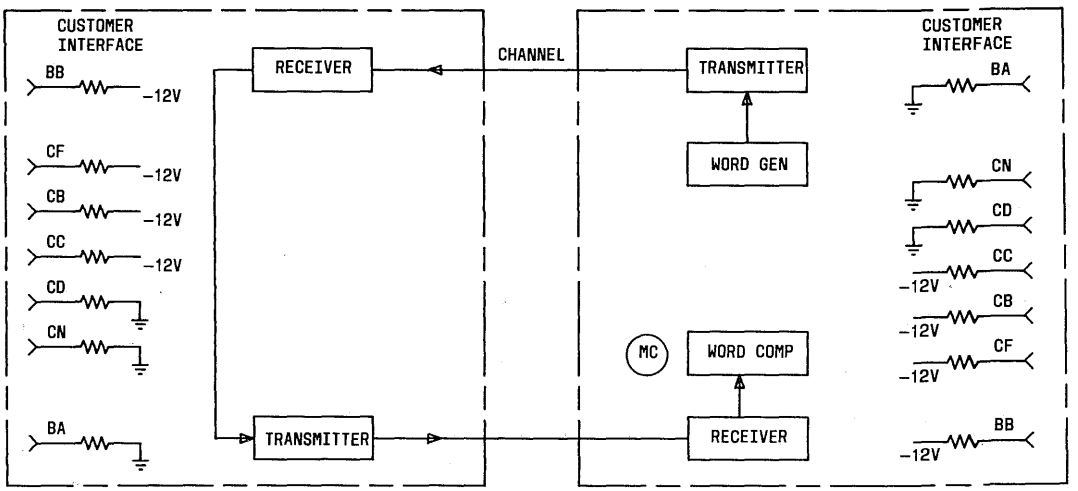

Fig. 6—Digital Loopback Self Test—Simplified Block Diagram

(2) If distant data set does not answer automatically, instruct attendant at distant station to depress DL switch on data set and go to data mode.

(3) On local data set, depress ST switch and go to data mode.

Requirements: On local data set, MR and TM lamps light and MC lamp goes off after SD and RD lamps light.

(4) Observe MC lamp on local data set for 2 minutes.

Requirements: If MC lamp remains off, both data sets and the line facilities are operating properly. If MC lamp remains lighted, the round-trip distortion exceeds 35 percent. Since the distortion in the two directions may be additive, no conclusion about the proper operability of the data sets and the line facilities may be drawn.

(5) Release ST switch on local data set. Call distant station and have DL switch released.

C. End-to-End Self Test

4.06 This test checks the transmitter and receiver of a local and a distant data set and the facilities connecting the data sets. The customer interfaces are not checked. Both data sets generate and transmit test data to each other. If the distortion threshold (35 percent) is not exceeded, the MC lamps on both data sets go off after a short interval.

Note: The distant data set can be a DS 103J, 103JR, 113C, 113CR, 113D, or 113DR.

4.07 Perform the test as follows:

(1) Call distant station and arrange to conduct an end-to-end self test.

(2) Depress ST switch on both data sets.

(3) Go to data mode at both stations.

Requirements: On both data sets, MR and TM lamps light and MC lamp goes off after SD and RD lamps light.

(4) Observe MC lamp on both data sets for 2 minutes.

Requirements: If MC lamps remain off, both data sets and the line facilities are operating properly. If MC lamps remain lighted, the distortion exceeds 35 percent.

(5) At end of test, go to talk mode and then release ST switch on both data sets.

D. Remote Test

4.08 This test allows a data test center (DTC) to check the data set transmitter and receiver and the facilities connecting the data set and the DTC. The customer interface is not checked.

4.09 Perform the test as follows:

(1) Contact DTC and request a remote test.

(2) When directed by DTC, depress DL switch on data set.

(3) DTC performs remote test.

(4) When directed by DTC, release DL switch.

E. Initial Test Setup for 921A DTS

4.10 Perform the initial test setup for the 921A DTS when used to test DS 113DR as follows:

STEP	ACTION	VERIFICATION
1	Connect data set to DTS using interface cable and Electronic Industries Association (EIA) adapter cord provided with DTS. ***Note:*** The interface cable is equipped with two 37-pin connectors. The 6-inch adapter	

STEP	ACTION	VERIFICATION
	cord is equipped with a 37-pin female connector and a 25-pin male connector. Connect interface cable from DATA SET (DCE) connector on DTS to 37-pin connector on adapter cord. Insert 25-pin connector on adapter cord into customer interface connector on data set.	
2	Connect DTS to a 105- to 129-Vac 60-Hz power source.	
3	Apply power to data set.	
4	On front of DTS, set POWER switch to ON.	POWER lamp lights.
5	Press RST on keyboard. ***Note:*** If RST is pressed during a test, the test is ended and the DTS recycles to this step.	Display reads (briefly) version number of DTS. DTS then performs self tests. If DTS is defective, display reads— TEST FAILED. If DTS is satisfactory, display reads— DATA SET:
6	Remove EIA interface module from storage and ensure that all 25 interface module switches are in TERM position.	
7	On right side of DTS, ensure that locking lever is in OPEN position.	
8	Insert interface module into slot.	
9	Move locking lever to CLOSE position.	
10	On front of DTS, ensure that all 37 DCE interface lead switches are in NORM position.	
11	Enter 20 on keyboard. ***Note:*** To delete a wrong entry on keyboard during any test, press back arrow (←).	Display reads— DATA SET: 20
12	Press GO.	Display reads— BIT RATE:
13	Enter 03.	Display reads— BIT RATE: 03

STEP	ACTION	VERIFICATION
14	Press GO. ***Note:*** If GO or TST is pressed at an unauthorized point in a test, the test is ended and the DTS recycles to this step.	Display reads— TEST SEQ:

F. Analog Loopback Bit Error Test

4.11 This test checks the data set transmitter and receiver and the customer interface. Test data is generated by the DTS and looped back internally from the data set transmitter output to the receiver input. The received data is compared to the transmitted data by the DTS. Data errors are indicated by the DTS display.

4.12 Perform the test as follows:

STEP	ACTION	VERIFICATION
1	Ensure that initial test setup described in paragraph 4.10 has been performed.	Display reads— TEST SEQ:
2	On data set, depress AL switch.	
3	On DTS, enter 55.	Display reads— TEST SEQ: 55
4	Press GO.	Display reads— TRANSMITTER=? 1=921 2=914 3=903
5	Enter 1.	Display reads (briefly)— TRANSMITTER=1 1=921 2=914 3=903 Display then reads— D=DT 0=SP 1=MK 2=2047 5=511 6=63
6	Enter 5.	Display reads (briefly)— 511 BIT ERROR TEST Display then reads— 1=BIT ERRORS 2=BLOCK ERRORS
7	Enter 1.	Display reads— ???? SECONDS
8	Enter 0060. ***Note:*** To perform functions listed below, press associated key. **KEY** **FUNCTION** A Repeat test. B Display time remaining in test. C Clear display. D End test.	Display reads (briefly)— 0060 SECONDS Display then reads— 0000 BITS IN ERROR From this point, display counts number of bits in error. If sync is lost during test, display flashes OSYN. If this occurs, test must be repeated by pressing A. At end of test, display reads TEST COMPLETE, total sync losses, and total bits in error.

STEP	ACTION	VERIFICATION
	E Inject 8 errors into data stream. F Force out-of-sync condition.	***Requirement:*** No bits in error.
9	On data set, release AL switch.	

G. Analog Loopback Start-Stop Distortion Test

4.13 This test uses the DTS to measure three types of start-stop distortion, as follows:

- Peak distortion
- Number of "hits" above a specified threshold
- Average bias distortion.

4.14 Perform the test as follows:

STEP	ACTION	VERIFICATION
1	Ensure that initial test setup described in paragraph 4.10 has been performed.	Display reads— TEST SEQ:
2	On data set, depress AL switch.	
3	On DTS, enter 52 79.	Display reads— TEST SEQ: 52 79
4	Press GO.	Display reads— PARITY=? (0=EVEN, 1=ODD)
5	Enter 0.	Display reads (briefly)— PARITY=0 (0=EVEN, 1=ODD) Display then reads— TRMT=? (1=MAN 2=CONT)
6	Enter 2. ***Note:*** Ignore display, PRESS A TO START.	Display reads (briefly)— TRMT=2 (1=MAN 2=CONT) Display then reads— PRESS A TO START
7	Press GO.	Display reads (briefly)— TEST INTERRUPTED Display then reads— MODE=? (1=RCV 2=RCV & TRMT)
8	Enter 2.	Display reads (briefly)— MODE=2 (1=RCV 2=RCV & TRMT) Display then reads— HITS OVER ??% (MAX=49%)

STEP	ACTION	VERIFICATION
9	Enter 08.	Display reads (briefly)— HITS OVER 08% (MAX=49%) Display then reads— ???? SECONDS
10	Enter 0060 and after about 2 seconds, press C. ***Note:*** To perform functions listed below, press associated key. **KEY — FUNCTION** A Repeat test. B Display time remaining in test. C Clear display. D End test.	Display reads (briefly)— 0060 SECONDS Display then reads— PEAK=00% HITS=00/08 AVG BIAS=00% At end of test, display reads TEST COMPLETE and test results. ***Requirements:*** 1. Less than 09% peak distortion. 2. Less than 01/08 hits. 3. Less than 03% average bias distortion.
11	On data set, release AL switch.	

H. Digital Loopback Bit Error Test

4.15 This test checks the transmitter and receiver of a local and a distant data set and the facilities connecting the data sets. The distant data set can be a 103J, 103JR, 113C, 113CR, 113D, or 113DR. The customer interface at the distant data set is not checked. Test data is generated by the DTS and transmitted by the local data set. This data is looped back internally from the receiver output to the transmitter input of the distant data set and retransmitted. The data is received by the local data set and compared to the original transmitted data by the DTS. Data errors are indicated by the DTS display.

4.16 Perform the test as follows:

STEP	ACTION	VERIFICATION
1	Ensure that initial test setup described in paragraph 4.10 has been performed.	Display reads— TEST SEQ:
2	On DTS, enter 55.	Display reads— TEST SEQ: 55
3	Press GO.	Display reads— TRANSMITTER=? 1=921 2=914 3=903
4	Enter 1.	Display reads briefly— TRANSMITTER=1 1=921 2=914 3=903

STEP	ACTION	VERIFICATION
		Display then reads— D=DT 0=SP 1=MK 2=2047 5=511 6=63 On DTS, DTR indicator lights.
5	Enter 5.	Display reads (briefly)— 511 BIT ERROR TEST Display then reads— 1=BIT ERRORS 2=BLOCK ERRORS
6	Place a call to distant end and request attendant to depress DL switch on data set; then go into data mode at both ends.	On DTS, DSR indicator lights.
7	Enter 1.	Display reads— ???? SECONDS
8	Enter 0300. ***Note:*** To perform functions listed below, press associated key. **KEY — FUNCTION** A Repeat test. B Display time remaining in test. C Clear display. D End test. E Inject 8 errors into data stream. F Force out-of-sync condition.	Display reads (briefly)— 0300 SECONDS Display then reads— 0000 BITS IN ERROR From this point, display counts number of bits in error. If sync is lost during test, display flashes OSYN. If this occurs, test must be repeated by pressing A. At end of test, display reads TEST COMPLETE, total sync losses, and total bits in error. ***Requirement:*** Total bits in error are less than 2.
9	Place a call to distant end and request attendant to release DL switch on data set.	

I. Digital Loopback Start-Stop Distortion Test

4.17 This test uses the DTS to measure three types of start-stop distortion of a local and a distant data set, as follows:

- Peak distortion
- Number of "hits" above a specified threshold
- Average bias distortion.

The distant data set can be a 103J, 103JR, 113C, 113CR, 113D, or 113DR.

4.18 Perform the test as follows:

STEP	ACTION	VERIFICATION
1	Ensure that initial test setup described in paragraph 4.10 has been performed.	Display reads— TEST SEQ:
2	On DTS, enter 52 79.	Display reads— TEST SEQ: 52 79
3	Press GO.	Display reads— PARITY=? (0=EVEN, 1=ODD) On DTS, DTR indicator lights.
4	Place a call to distant end and request attendant to depress DL switch on data set; then go into data mode at both ends.	On DTS, DSR indicator lights.
5	Enter 0.	Display reads (briefly)— PARITY=0 (0=EVEN, 1=ODD) Display then reads— TRMT=? (1=MAN 2=CONT)
6	Enter 2. ***Note:*** Ignore display, PRESS A TO START.	Display reads briefly— TRMT=2 (1=MAN 2=CONT) Display then reads— PRESS A TO START
7	Press GO.	Display reads (briefly)— TEST INTERRUPTED Display then reads— MODE=? (1=RCV 2=RCV & TRMT)
8	Enter 2.	Display reads (briefly)— MODE=2 (1=RCV 2=RCV & TRMT) Display then reads— HITS OVER ??% (MAX=49%)
9	Enter 15.	Display reads (briefly)— HITS OVER 15% (MAX=49%) Display then reads— ???? SECONDS

STEP	ACTION	VERIFICATION
10	Enter 0060 and after about 2 seconds, press C. ***Note:*** To perform functions listed below, press associated key. **KEY — FUNCTION** A Repeat test. B Display time remaining in test. C Clear display. D End test.	Display reads (briefly)— 0060 SECONDS Display then reads— PEAK=00% HITS=00/15 AVG BIAS=00% At end of test, display reads TEST COMPLETE and test results. ***Requirements:*** 1. Less than 15% peak distortion. 2. Less than 01/15 hits. 3. Less than 03% average bias distortion.
11	Place a call to distant end and request attendant to release DL switch on data set.	

J. End-to-End Bit Error Test

4.19 This test checks the transmitter and receiver of a local and a distant data set and the facilities connecting the data sets. The customer interface at both data sets is also checked. Identical test data is generated by DTSs at both data sets. This data is transmitted by one of the data sets and compared to the data generated by the DTS at the receiving data set. Data errors are indicated by the DTS display.

4.20 Perform the test as follows:

STEP	ACTION	VERIFICATION
1	Establish voice communication between the data stations and arrange to conduct an end-to-end bit error test.	
At both stations, perform Steps 2 through 9.		
2	Ensure that initial test setup described in paragraph 4.10 has been performed.	Display reads— TEST SEQ:
3	On DTS, enter 55.	Display reads— TEST SEQ: 55
4	Press GO.	Display reads— TRANSMITTER=? 1=921 2=914 3=903
5	Enter 1, 2, or 3 to correspond to the type of DTS being used at distant end.	Typical display reads (briefly)— TRANSMITTER=1 1=921 2=914 3=903 Display then reads— D=DT 0=SP 1=MK 2=2047 5=511 6=63

STEP	ACTION	VERIFICATION
6	Enter 5. ***Note:*** If distant end DTS is a 903, enter 6 instead of 5. Display reads (briefly)—63 BIT ERROR TEST.	Display reads (briefly)— 511 BIT ERROR TEST Display then reads— 1=BIT ERRORS 2=BLOCK ERRORS
7	Enter 1.	Display reads— ???? SECONDS
8	Place data set in data mode.	On DTS, DSR indicator lights.
9	Enter 0900. ***Note:*** To perform functions listed below, press associated key. **KEY — FUNCTION** A Repeat test. B Display time remaining in test. C Clear display. D End test. E Inject 8 errors into data stream. F Force out-of-sync condition.	Display reads (briefly)— 0900 SECONDS Display then reads— 0000 BITS IN ERROR From this point, display counts number of bits in error. If sync is lost during test, display flashes OSYN. If this occurs, test must be repeated by pressing A. At end of test, display reads TEST COMPLETE, total sync losses, and total bits in error. ***Requirement:*** Total bits in error are less than 6.

K. End-to-End Start-Stop Distortion Test

4.21 This test uses the 921A DTS to measure three types of start-stop distortion, as follows:

- Peak distortion
- Number of "hits" above a specified threshold
- Average bias distortion.

4.22 Perform the test as follows:

Note: A 911-type DTS can be used at the distant data station.

STEP	ACTION	VERIFICATION
1	Establish voice communication between the data stations and arrange to conduct an end-to-end start-stop distortion test.	
At both stations, perform Steps 2 through 11.		
2	Ensure that initial test setup described in paragraph 4.10 has been performed.	Display reads— TEST SEQ:

STEP	ACTION	VERIFICATION
3	Enter 52 79.	Display reads— TEST SEQ: 52 79
4	Press GO.	Display reads— PARITY=? (0=EVEN, 1=ODD)
5	Enter 0.	Display reads (briefly)— PARITY=0 (0=EVEN, 1=ODD) Display then reads— TRMT=? (1=MAN 2=CONT)
6	Enter 2. ***Note:*** Ignore display, PRESS A TO START.	Display reads (briefly)— TRMT=2 (1=MAN 2=CONT) Display then reads— PRESS A TO START
7	Press GO.	Display reads (briefly)— TEST INTERRUPTED Display then reads— MODE=? (1=RCV 2=RCV & TRMT)
8	Enter 2.	Display reads (briefly)— MODE=2 (1=RCV 2=RCV & TRMT) Display then reads— HITS OVER ??% (MAX=49%)
9	Enter 08.	Display reads (briefly)— HITS OVER 08% (MAX=49%) Display then reads— ???? SECONDS
10	Place data set in data mode.	On DTS, DSR indicator lights.
11	Enter 0060 and after about 2 seconds, press C. ***Note:*** To perform functions listed below, press associated key.	Display reads (briefly)— 0060 SECONDS Display then reads— PEAK=00% HITS=00/08 AVG BIAS=00% At end of test, display reads TEST COMPLETE and test results.

KEY	FUNCTION
A	Repeat test.
B	Display time remaining in test.
C	Clear display.
D	End test.

Requirements:

1. Less than 09% peak distortion.
2. Less than 01/08 hits.
3. Less than 03% average bias distortion.

L. Automatic Answer Test

4.23 This test uses the DTS to verify that the data set will automatically answer a call, go to the data mode, and end the call.

4.24 Perform the test as follows:

STEP	ACTION	VERIFICATION
1	Ensure that initial test setup described in paragraph 4.10 has been performed.	Display reads— TEST SEQ:
2	Enter 40.	Display reads— TEST SEQ: 40
3	Press GO.	Display reads— WAITING FOR RI
4	Place a call to data set from any convenient telephone set.	Display reads— RINGING (during ringing period—ring indicator lead ***on***). ASSIGNABLE 1 indicator follows ring indicator lead. After 3 complete ringing cycles, DTR indicator lights (data terminal ready lead ***on***). After several seconds, DSR indicator lights (data set ready lead ***on***). Display then reads— ANSWERED After several more seconds, DTR indicator goes off (data terminal ready lead ***off***). Then DSR indicator immediately goes off (data set ready lead ***off***). ***Requirement:*** Display reads (briefly)— TEST PASSED

M. Interface Test

4.25 This test checks the ability of the data set to respond to interface control and to provide indications through the interface. The signals that the data set will respond to and the indications given depend on the options installed. In this test, the DS 113DR interface is checked using a 921A

DTS. This test requires assistance from a data test center (DTC).

4.26 ***Test of Receive Space Disconnect—YES Option:*** This test checks the ability of the data set to disconnect (go on-hook) upon receiving a spacing signal from a distant data set.

4.27 Perform the test as follows:

STEP	ACTION	VERIFICATION
1	Verify that option V (receive space disconnect—YES) is installed in data set.	
2	Ensure that initial test setup described in paragraph 4.10 has been performed.	Display reads— TEST SEQ:
3	Enter 37.	Display reads— TEST SEQ: 37 DTR=? (0 OR 1)
4	Enter 1.	Display reads— TEST SEQ: 37 DTR=1 (0 OR 1)
5	Press GO.	Display reads (briefly)— TEST COMPLETE Display then reads— TEST SEQ:
6	Place a call to DTC and request DTC to place a call to data set and then send about 10 seconds of marking followed by at least 4 seconds of spacing.	
7	Data set automatically answers call. If option ZG (automatic answer—NO) is installed, manually answer call, go to data mode, and place handset on-hook.	***Requirements:*** On DTS, DSR indicator lights and shortly thereafter RLSD and CS indicators light.
8	When DTC sends spacing.	***Requirements:*** On DTS, RD-0 indicator lights and about 1-1/2 seconds later RLSD, DSR, and CS indicators go off (data set drops call).

4.28 ***Test of CB and CE Indications—COMMON Option:*** When option A (CB and CF indications—COMMON) is installed, the clear-to-send (CB) interface circuit is forced ***off*** whenever the received line signal detector (CF) interface circuit goes ***off.*** This test checks proper operation of this option.

4.29 Perform the test as follows:

STEP	ACTION	VERIFICATION
1	Verify that option A (CB and CF indications—COMMON) and option R (loss of carrier disconnect—NO) are installed in data set.	

STEP	ACTION	VERIFICATION
2	Ensure that initial test setup described in paragraph 4.10 has been performed.	Display reads— TEST SEQ:
3	Enter 37.	Display reads— TEST SEQ: 37 DTR=? (0 OR 1)
4	Enter 1.	Display reads— TEST SEQ: 37 DTR=1 (0 OR 1)
5	Press GO.	Display reads (briefly)— TEST COMPLETE Display then reads— TEST SEQ:
6	Place a call to DTC and request DTC to place a call to data set.	
7	Data set automatically answers call. If option ZG (automatic answer—NO) is installed, manually answer call, go to data mode, and place handset on-hook. ***Note:*** DTC should go to data mode after receiving answer tone.	***Requirements:*** On DTS, DSR indicator lights and shortly thereafter RLSD and CS indicators light.
8	Have DTC go from data mode to talk mode without dropping call (or go from TEST to TALK of 904 DTC)	***Requirements:*** On DTS, RLSD and CS indicators go off and DSR indicator remains lighted.

4.30 ***Test of Loss of Carrier Disconnect—YES Option:*** When option S (loss of carrier disconnect—YES) is installed, the data set terminates the call if carrier disappears from the line for approximately 250 ms. This test checks proper operation of this option.

4.31 Perform the test as follows:

STEP	ACTION	VERIFICATION
1	Verify that option S (loss of carrier disconnect—YES) is installed in data set.	
2	Ensure that initial test setup described in paragraph 4.10 has been performed.	Display reads— TEST SEQ:
3	Enter 37.	Display reads— TEST SEQ: 37 DTR=? (0 OR 1)
4	Enter 1.	Display reads— TEST SEQ: 37 DTR=1 (0 OR 1)
5	Press GO.	Display reads (briefly)— TEST COMPLETE

STEP	ACTION	VERIFICATION
		Display then reads— TEST SEQ:
6	Place a call to DTC and request DTC to place a call to data set.	
7	Data set automatically answers call. If option ZG (automatic answer—NO) is installed, manually answer call, go to data mode, and place handset on-hook. ***Note:*** DTC should go to data mode after receiving answer tone.	***Requirements:*** On DTS, DSR indicator lights and shortly thereafter RLSD and CS indicators light.
8	Have DTC go from data mode to talk mode without dropping call (or go from TEST to TALK at 904 DTC).	***Requirements:*** On DTS, RLSD and CS indicators go off immediately. DSR indicator goes off in about 250 ms or after about 3 seconds if option T is installed in data set.

5. REFERENCES

5.01 Additional information concerning the testing of DS 113DR is contained in the following publications:

SECTION	TITLE
107-402-100	921A Data Test Set—Description and Operation
314-205-501	Data Systems—DATAPHONE® Service and Data Access Arrangements Direct Distance Dialing Network—Test Requirements for Subscriber, Foreign Exchange, and Remote Exchange Lines
591-047-100	Data Set 113DR-L1/2—Transmitter-Receiver—Single Set—Description and Operation
591-047-200	Data Set 113DR-L1/2—Transmitter-Receiver—Single Set—Installation and Connections
591-047-500	Data Set 113DR-L1/2—Transmitter-Receiver—Single Set—Test Procedures
668-010-300	Data Systems—DATAPHONE® Service on Direct Distance Dialing Network—Data Test Center—Trouble Analysis Procedures