NO. 1 ELECTRONIC SWITCHING SYSTEM ADF
FULL-DUPLEX – 100 WORD PER MINUTE DATA STATION
USING 4-ROW TELETYPEWRITERS
TEST PROCEDURES

1. GENERAL

1.01 This section describes the test procedures and test requirements for a full-duplex, 100 word per minute data station incorporating Model 33- and 35-type Teletypewriters (TTY) and used with No. 1 Electronic Switching System Arranged with Data Features (No. 1 ESS ADF).

1.02 The testing of the data station depends on a specific format. Any deviation from specific format may condition the data station for false indications or operations. If such a condition occurs, momentarily disconnect the power cord to the data station. This will return the data station to the idle condition.

Test procedures of the data station are controlled by the Serving Test Center (STC) or the Control Serving Test Center (CSTC).

1.03 Both installation and maintenance test procedures are given. Since some of the tests are identical for installation and maintenance, each test is presented only once. For best results, final range finder adjustments should be made with the STC or CSTC.

1.04 The installation test sequence consists of the following tests:

- Local Test
- Remote Test of Data Auxiliary Set (DAS) 820A1 or 820A2
- Message Reception
- Message Transmission
- Customer Verification

1.05 The maintenance test sequence will be determined by the nature of the trouble being investigated. In general, the station will have been remotely tested by the STC or CSTC to determine the nature of trouble. Any or all of the following tests may be used in investigating the trouble:

- Local Test
- Remote Test of DAS 820A1 or 820A2 With Specified Conditions
- Remote Test of Data Set 108A-Type
- Message Reception
- Message Transmission
- Continuity Test of DAS 804N1, 804N2, or 804R3

2. INSTALLATION TESTS

2.01 The installation tests are designed to verify that the data station has been assembled properly and is operative with the No. 1 ESS ADF system.

2.02 The test procedure (Part 4) should be performed in the sequence described in 1.04.

Transmission from the data station to the STC or CSTC will require the preparation of special test tapes. Fig. 1 and 2 show the test tapes and keys to be used for the control codes. The same tapes are used for the installation test and maintenance test.

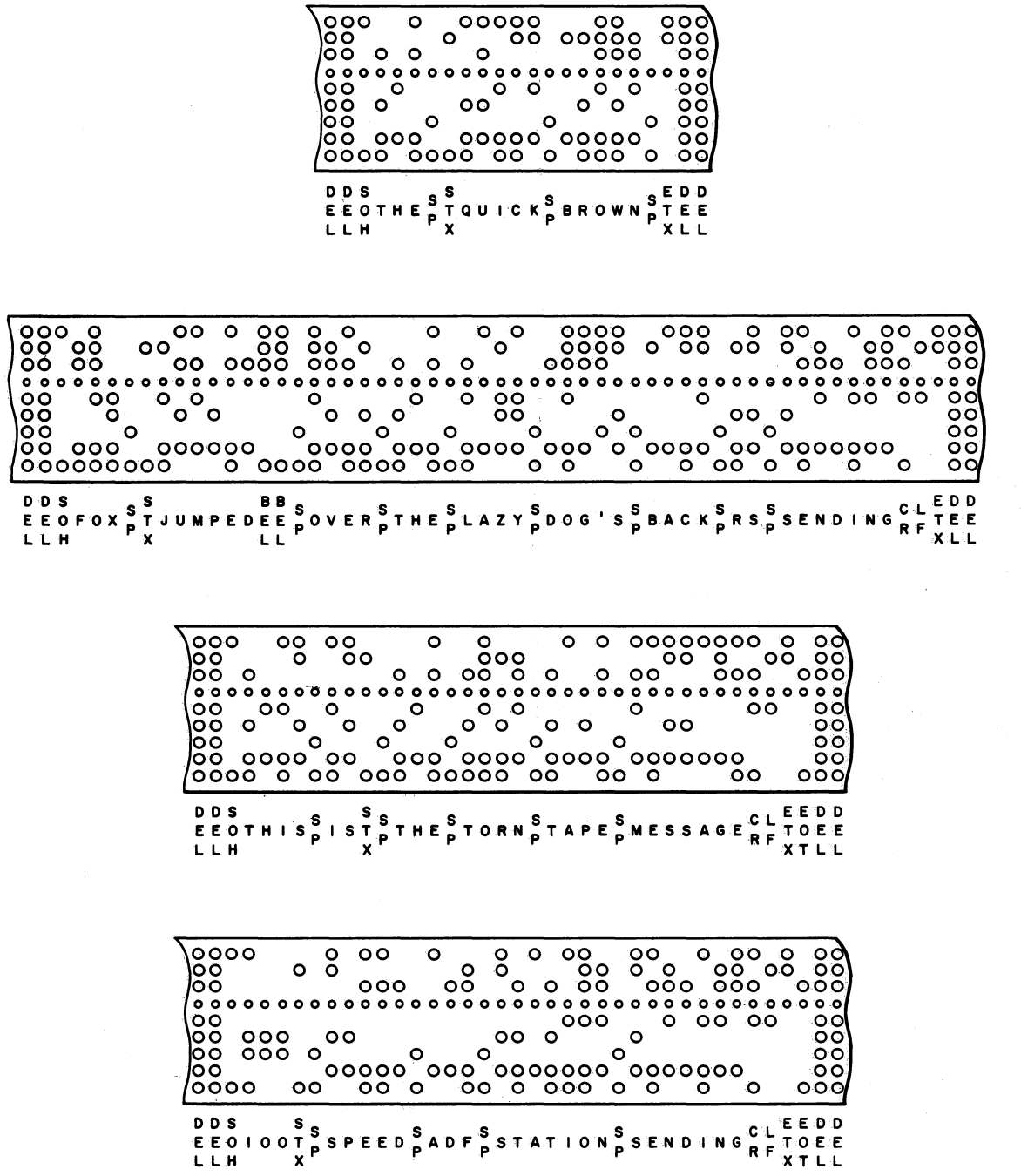
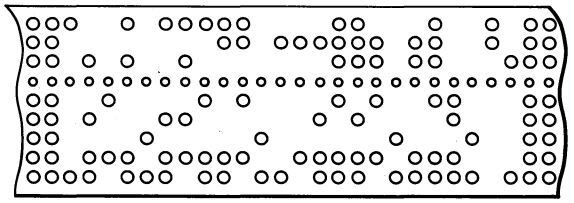
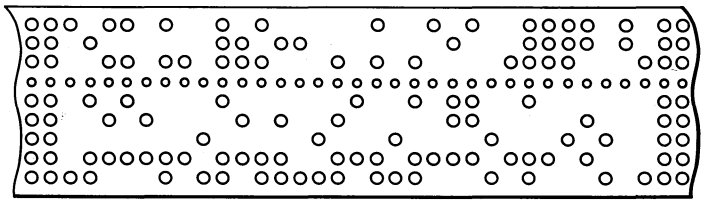
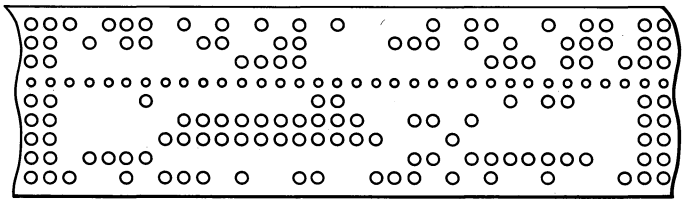
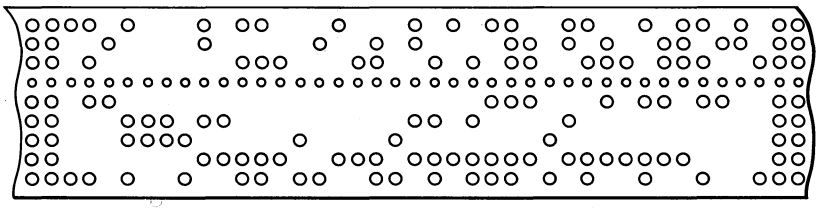


Fig. 1 — Test Tape Number 1 For Testing No. 1 ESS ADF ASR Station









D
E=DELETE
L

S
O=CTRL A
H

S
T=CTRL B
X

E
T=CTRL C
X

E
O=CTRL D
T

S
P=SPACE

C
R=CARR RET

L
F=LINE FEED

Fig. 2 — Test Tape Number 2 For Testing No. 1 ESS ADF ASR Station

3. MAINTENANCE TESTS

3.01 The maintenance test procedure should be in accordance with the maintenance philosophy given in the section entitled No. 1 Electronic Switching System ADF, Full-Duplex — 100 Word Per Minute Data Station Using 4-Row Teletypewriters, Maintenance (580-301-301).

3.02 Maintenance procedures for the TTY's should be in accordance with the following sections, whichever is applicable.

- Model 33 Teletypewriters, Field Maintenance Practice (FMP), (579-200-350)
- Model 35 Teletypewriters, Field Maintenance Practice (FMP), (579-300-350)

4. TEST PROCEDURE

Tape Format — ASR TTY Only

4.01 Two test tapes should be prepared before beginning the test procedure. To prepare the test tapes:

(1) Condition TTY for off-line operation (MODE switch to LOCAL or OFF LINE, whichever is appropriate).

(2) Starting with approximately three inches of delete (E), proceed to type the test tape as shown in Fig. 1.

Note: Between each message, insert approximately two inches of E in order to identify each of the messages. Insert approximately four inches of E between the multimessage transmission and the single transmission at the end. A message begins with O and ends with an T. A transmission begins with O and ends with an O.

(3) Tear off this tape and designate it ***tape 1.***

(4) Starting with approximately three inches of E, proceed to type the test tape as shown in Fig. 2.

(5) Tear off this tape and designate it ***tape 2.***

Local Test

4.02 The following test should be performed to verify that the data station functions properly. Tests with the STC or CSTC should not be attempted unless the data station TTY is operative.

4.03 To perform the local test:

(1) Momentarily disconnect the power cord to the data station. This will initialize the circuits in DAS 820A1 or 820A2.

(2) Verify that the AUD OFF lamp is extinguished. (To extinguish, operate the AUD OFF key.)

(3) Using a nearby telephone, call the STC or CSTC and request that the data station leg be connected to a test hub.

Take proper steps to insure that the customer is not billed for test calls. See the section entitled Crediting Charges On Test Calls (010-250-001).

(4) If the data station TTY is an ASR, condition the TTY for on-line mode of operation.

(5) Remove the paper supply. PAPER LOW lamp should light and the alarm should sound.

Note: If the primary station is a 35 ROTR TTY, remove tape supply. TAPE LOW lamp should light and the alarm should sound.

(6) Operate the AUD OFF key. AUD OFF lamp should light and the alarm should be silenced.

(7) Replace the paper (tape) supply. PAPER LOW (TAPE LOW) lamp should remain lit.

(8) Operate the PAPER LOW (TAPE LOW) key. PAPER LOW (TAPE LOW) lamp should extinguish.

(9) Operate the AUD OFF key. AUD OFF lamp should extinguish.

Note: In the following steps, the alarm will sound each time an alarm condition occurs. It can be silenced by operating the AUD OFF key.

(10) Operate the OUT OF SVC key. OUT OF SVC lamp should light. If the data station TTY is a 35 ASR, the motor should stop.

(11) Operate the OUT OF SVC key. OUT OF SVC lamp should extinguish. If the data station TTY is a 35 ASR, the motor should start.

ASR Stations Only

(12) Condition the TTY for off-line mode of operation.

(13) Check the general operation of the TTY (typing, end-of-line counter and lamp, tabulation, etc.).

Remote Test of DAS 820A1 or 820A2

(1) Place ***tape 1*** (Fig. 1) into the gate of the 33 ASR Reader or 35 ASR Transmitter Distributor (TD), whichever is appropriate, and close the gate.

(2) Operate the bat handle to RUN.

(3) Operate BID key.

Note: Reader or TD will start and run until S O H is detected. Reader will stop on S O H and the BID lamp should light.

(4) Call STC or CSTC and request a remote test of the data station.

Note: Furnish the ***station polling code*** (SPC), ***call enquiry code*** (CEC), and ***station identity code*** (SIC) to the STC or CSTC. The codes should be stamped on the faceplates of CP AR18 and AR25.

(5) Test of the data station is now under control of the STC or CSTC. When the data station is placed in the test mode, the OUT OF SVC lamp should light. During the test, the TRANS lamp should light. When all lamps except the BID lamp are extinguished, the test is complete.

Message Reception

4.04 This test permits a check of the range finder adjustment of the TTY, the parity circuits, and the ability of an auxiliary receiving TTY to function properly (if an auxiliary receiving TTY is provided).

(1) Using a nearby telephone, call the STC or CSTC and request a message reception test.

(2) The STC or CSTC will select the data station as a receiver and send the test message.

(3) While receiving the test message (The quick brown fox . . .), take a range on the TTY and, if provided, on the auxiliary TTY.

Note: Range should meet the requirements specified in the section entitled Teletypewriter Station Tests, Orientation and Distortion Tests (570-006-500).

(4) The STC or CSTC will roll call the data station. The MSG REC lamp may light due to a lost character being detected during the range adjustment.

Note: If the MSG REC lamp is lighted, momentarily operate the MSG REC key. The MSG REC lamp should extinguish.

(5) Request STC or CSTC to transmit a nonparity test sentence.

(6) The STC or CSTC will select the data station as a receiver and send the test message with the exception that the test message will ***not*** contain even parity.

(7) The test message will be received as follows:

_H__U__K_B__N___UMP_D__V___H

_AZY_D_G'S_BA_K___3_56__90

__S_ND_NG

(8) The ERROR lamp should light.

(9) Operate the ERROR key. ERROR lamp should extinguish.

(10) The STC or CSTC will send the following message on the TTY:

Place ***tape 1*** in gate.

Operate bat handle to RUN and operate BID key.

(11) If an auxiliary TTY is provided, the above message sent by the STC or CSTC will be copied by the primary station TTY, and the auxiliary TTY will copy only the first line of the message. (Place ***tape 1*** in gate.)

Note: If the primary station is a 35 ASR or RO TTY and it uses $\frac{E}{X}$T disconnect option, the auxiliary TTY will copy the entire message. When the auxiliary TTY is a 35 ROTR and is furnished with the tape feed-out option, tape feed-out should occur when the auxiliary TTY is disconnected (either manually or automatically).

Message Transmission

4.05 This test checks the transmitting capability of the data station, the HOLD key circuitry, and, if provided, the ***end-of-transmission*** ($\frac{E}{T}$O) counter circuitry.

(1) Place ***tape 1*** in the gate, operate the bat handle to RUN, and operate BID key. The STC or CSTC will poll and then select the data station as a sender.

(2) The tape will start and the messages will be printed on the station TTY.

When the bell sounds during transmission of the second message, operate the HOLD key on DAS 804N1.

(3) At the end of the second message, the HOLD lamp should light, tape stops, and the alarm sounds.

(4) Open the gate of the reader (or TD). The BID lamp should extinguish.

(5) Close the gate of the reader (or TD). Place bat handle to RUN, operate the HOLD key (HOLD lamp should extinguish), and operate the BID key (BID lamp should light). The STC or CSTC will proceed to pick up the torn tape message.

Note: The above operation simulates the introduction of a torn tape message. The third message on ***tape 1*** is used for the inserted message.

(6) At end of torn tape message, BID lamp should remain lit, but the data station will be unselected (TRANS lamp will extinguish).

(7) Tape will advance to $\frac{S}{H}$O of the second transmission and stop.

(8) The STC or CSTC will select the data station as a sender again and the tape will start.

(9) The second transmission will be sent and also printed on the station TTY. After the second transmission, the reader (or TD) will continue to run until the tape runs out. When the tape runs out, the reader (or TD) will stop and the BID lamp will extinguish.

(10) At the end of ***tape 1,*** open the gate and reposition the tape to the beginning.

(11) Close the gate, place bat handle to RUN, and operate the BID key.

(12) The tape should start and run until S O is H detected. Tape will stop on S O. H

(13) The STC or CSTC will pick up the tape.

(14) When the TRANS lamp lights on DAS 804N1, momentarily operate the taut tape contact. The TAPE lamp should light, the BID lamp should extinguish, and the reader (or TD) should stop.

(15) Operate the TAPE key. The TAPE lamp should extinguish.

(16) Remove ***tape 1*** from the gate.

End-of-Transmission Counter Test — 35 ASR Only

(17) Insert ***tape 2*** into the gate, close the gate, place bat handle to RUN, ***but do not operate BID key.***

(18) Operate the E O T (CTRL D) key ***four*** times on the keyboard.

(19) The tape should start and run to S O H and stop.

(20) The STC or CSTC will now control the test and pick up the four transmissions.

Note: At the end of the fourth transmission, but before the tape runs out, the BID lamp should extinguish and the data station should return to the idle mode. At the end of the fourth transmission, the TD should be stopped with the sensing bars D aligned opposite the first E L following the last E O. T

Remote Test of Data Set 108A-Type

4.06 The remote test of the data set requires gaining access to DAS 820A1 or 820A2. To gain access, refer to the section referenced in 3.01.

(1) Using a nearby telephone, call STC or CSTC and request a remote test of Data Set 108A-type.

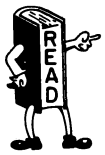
(2) When requested, operate the R switch on DAS 820A1 or 820A2 to the MTCE position.

(3) The STC or CSTC will perform the remote test of the data set.

(4) When the remote test is completed, restore the R switch to the NORM position.

Continuity Test of DAS 804N2 or 804R3

4.07 This test checks the continuity of the keys and cabling associated with DAS 804N2 or 804R3.



Remove the power cord to the customer-provided ac receptacle before performing this test.

(1) Gain access to DAS 820A1 or 820A2. Refer to Part 2 of Section 580-301-301.

(2) Disconnect the N plug from DAS 820A1 or 820A2.

(3) Connect a KS-16786 L3 connector (to be ordered separately) to the N plug.

(4) Using a KS-14510 L1 volt-ohm-milliammeter, perform continuity test shown in Table A by using the pins of the KS-16786 L3 connector to make the connections.

Continuity Test of DAS 804N1

4.08 This test checks the continuity of the keys, lamps, and cabling associated with DAS 804N1.

Remove the power cord to the customer-provided ac receptacle before performing this test.

(1) Gain access to DAS 820A1 or 820A2. Refer to 4.06 (1).

(2) Disconnect the N plug from DAS 820A1 or 820A2.

(3) Connect a KS-16786 L3 connector (to be ordered separately) to the N plug.

(4) Using a KS-14510 L1 volt-ohm-milliammeter, perform continuity test shown in Table B by using the pins of the KS-16786 L3 connector to make the connections.

5. CUSTOMER VERIFICATION

5.01 When the preceding tests have been completed and the test requirements have been met, suggest to the customer that he verify that the service is satisfactory. If the customer has messages to transmit, verify that the service is satisfactory. If the customer has no messages to transmit, consider the data station satisfactory for service.

TABLE A

CONTINUITY TEST OF DAS 804N2 OR 804R3

STEP	KEY	POSITION	VOLT-OHM-MILLIAMMETER			
			SCALE	CONNECT PROBE		READING OHMS
				+	−	
1			R X 10	3	9	55 ± 15
2				3	6	55 ± 15
3				3	2	55 ± 15
4				3	14	55 ± 15
5				3	13	55 ± 15
6				3	12	55 ± 15
7	AUD OFF	RLS		3	8	∞
8		OPR		3	8	0 to 2
9	AUD OFF	OPR		3	11	∞
10		RLS		3	11	0 to 2
11	OUT OF SVC	RLS		8	15	0 to 2
12		OPR		8	15	∞
13	MSG REC	RLS		5	4	0 to 2
14		OPR		5	4	∞
15	ERROR	RLS		5	7	0 to 2
16		OPR		5	7	∞
17	*PAPER LOW	RLS		5	10	0 to 2
18		OPR		5	10	∞
19				36	FRAME VIO-SL	0 to 2
20				16	LDSPKR YEL-BL	0 to 2

*TAPE LOW designation substituted for PAPER LOW on DAS 804R3

TABLE B

CONTINUITY TEST OF DAS 804N1

STEP	KEY	POSITION	VOLT-OHM-MILLIAMMETER			
			SCALE	CONNECT PROBE		READING OHMS
				+	−	
1			R X 10	3	18	55 ± 15
2				3	2	55 ± 15
3				3	15	55 ± 15
4				3	13	55 ± 15
5				3	11	55 ± 15
6				3	9	55 ± 15
7				3	7	55 ± 15
8				LDSPKR BL-VIO	8	0 to 2
9	AUD	RLS		3	8	∞
10	OFF	OPR		3	8	0 to 2
11	AUD	OPR		17	8	∞
12	OFF	RLS		17	8	0 to 2
13	OUT	RLS		16	8	0 to 2
14	OF SVC	OPR		16	8	∞
15	OUT	OPR		21	8	0 to 2
16	OF SVC	RLS		21	8	∞
17	HOLD	RLS		14	8	∞
18		OPR		14	8	0 to 2
19	PRIOR	RLS		12	8	0 to 2
20		OPR		12	8	∞
21	BID	RLS		10	8	0 to 2
22		OPR		10	8	∞
23	TAPE	RLS		5	4	0 to 2
24		OPR		5	4	∞
25	EMG	RLS		5	6	0 to 2
26	STOP	OPR		5	6	∞
27				19	LDSPKR YEL-SL	0 to 2
28				24	FRAME VIO-SL	0 to 2