

TELETYPEWRITER FACILITY
LOOP TESTS
NO. 1 ELECTRONIC SWITCHING SYSTEM

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1. GENERAL

1.01 This section describes test procedures to maintain the teletypewriter (TTY) loops used in the 2-wire No. 1 Electronic Switching System (ESS), 4-wire No. 1 ESS, and No. 1 ESS Arranged with Data Features (ADF). The TTY loops covered are those loops that communicate with the ESS programs and that are used for the administration of the system.

1.02 This section is reissued to:

- (a) Add the J79911NA (911NA) data set in Paragraph 2.01.
- (b) Change the member number for the remote maintenance teletypewriter from 08 to 12 as required for CTX-8 and later generics. This number is used in TTY-DGN and TTY-MAINT messages.
- (c) Change the MCC-BEGIN-4. message to RT-MSGs-REM.
- (d) Change Steps 10 and 12 to show that they apply when testing maintenance TTYs or maintenance monitor loop TTYs associated with SD-1A121-01 or SD-1A121-02 TR units. This change affects almost all of the optional condition letters that follow the step numbers.

Since this is a general revision, arrows ordinarily used to indicate changes have been omitted.

This reissue does not affect the equipment test list (ETL).

1.03 The TTY communicates with the ESS through TR units (SD-1A121-01, SD-1A121-02, SD-1A147-01, or SD-1A147-02.) A loop jack (Fig. 1) per channel is provided for connecting test apparatus.

1.04 The 35-type TTYs are designed to print correctly with 38 percent bias and 35 percent end distortion. The TR units accommodate 45 percent bias and 45 percent end distortion.

1.05 Normal TTY and loop routine maintenance would be adequate for the ESS TTY loops under normal power conditions; however, when the TTYs are switched to emergency ac power supply, significant impairment can occur. A frequency shift of 2 Hz can cause as much as 26.6 percent distortion; therefore, the loop **must** be maintained within tolerances to assure trouble free operation under emergency conditions.

1.06 **Lettered Steps:** A letter a, b, c, etc, added to a step number in Part 4 of this section, indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

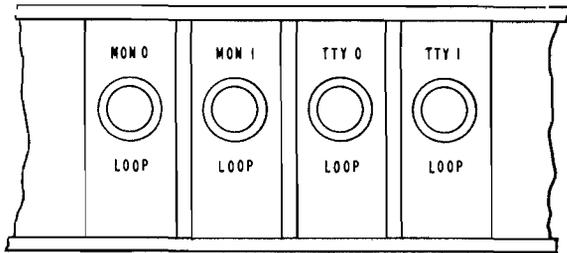
1.07 The following abbreviations are used in this section:

ADF Arranged with Data Features

NOTICE

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SD-1A121-01

LEGEND:



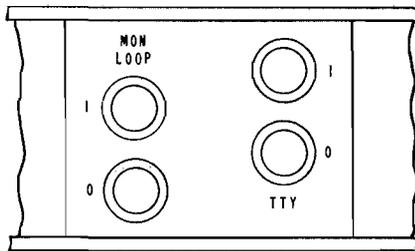
JACK



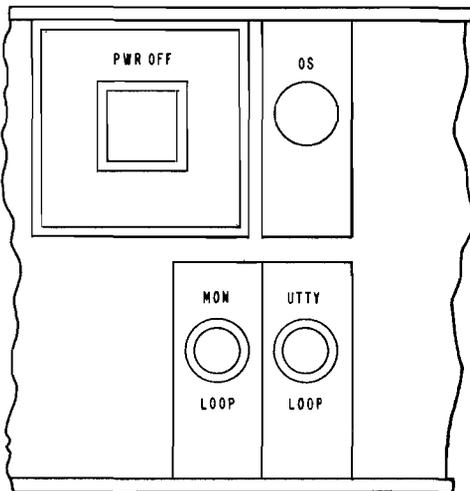
LAMP



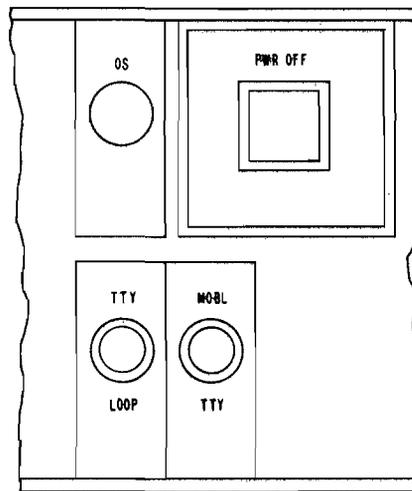
LAMP/KEY



SD-1A121-02



SD-1A147-01



SD-1A147-02

Fig. 1—Teletypewriter Transmit-Receive Unit Loop Jacks

DTS	Data Set	generator and a distortion measuring set. (Calibration of the test set may be found in Section 103-813-100 and 103-813-110, respectively.
ESS	Electronic Switching System	
Hz	Hertz	2.02 Patching cord 2P4C, P2B cord, 6 feet long, equipped with two 310 plugs.
MCC	Master Control Center	
TR	Transmit Receive	2.03 Patching cord 2P30B, P2CP cord, 6 feet long, equipped with one 347B plug and one 310 plug.
TTY	Teletypewriter	

2. APPARATUS

2.01 J79911A (911A) or J79911NA (911NA) data set (DTS) which contains a test sentence

2.04 Five patching cords 1W13A, 3 feet long, each equipped with two 360A tools and two KS-6278 connecting clips.

3. PREPARATION

STEP	ACTION	VERIFICATION
1	Place 911A DTS near TR unit of loop to be tested.	
2	At DTS— Insert 8-11 matrix card J79911BF L1.	
3	Set following switches: On Test Sentence Generator—	

SWITCH	SET TO FUNCTION
AUTO-MAN-STEP	AUTO
BAUD	110
BIAS	SWC
CODE	8/11 M
DIST 1%	0
DIST 5%	0
REPEAT	OFF
RY or U	OFF
OUTPUT	REL

On Distortion Measuring Set—

STEP	ACTION	VERIFICATION																
	<table border="1"> <thead> <tr> <th>SWITCH</th> <th>SET TO FUNCTION</th> </tr> </thead> <tbody> <tr> <td>BAUD</td> <td>110</td> </tr> <tr> <td>CODE</td> <td>8/11</td> </tr> <tr> <td>FILTER</td> <td>OUT</td> </tr> <tr> <td>PARITY</td> <td>OFF</td> </tr> <tr> <td>PIP-PK</td> <td>PK</td> </tr> <tr> <td>POLARITY</td> <td>—</td> </tr> <tr> <td>INPUT</td> <td>NORM 20</td> </tr> </tbody> </table>	SWITCH	SET TO FUNCTION	BAUD	110	CODE	8/11	FILTER	OUT	PARITY	OFF	PIP-PK	PK	POLARITY	—	INPUT	NORM 20	
SWITCH	SET TO FUNCTION																	
BAUD	110																	
CODE	8/11																	
FILTER	OUT																	
PARITY	OFF																	
PIP-PK	PK																	
POLARITY	—																	
INPUT	NORM 20																	

- 4 Connect ac power and turn DTS on.
- 5 Momentarily operate RESET keys on both test sentence generator and distortion measuring set.

4. METHOD

STEP	ACTION	VERIFICATION
6a	<p>If testing first (local) maintenance TTY or first (local) maintenance monitor loop TTY— Notify attendant at second maintenance TTY that maintenance messages are to be transferred.</p> <p>Note: Second maintenance TTY could be located at the Switching Control Center (SCC).</p>	
7a	<p>At local maintenance TTY— Type input message TTY-DGN-12.</p> <p>Note: Do not proceed unless ATP appears.</p>	<p>Following output message printed: DR02 RAW TTY 08 PH1 ATP</p>
8a	Type input message RT-MSGs-REM.	<p>Maintenance messages transferred to second maintenance TTY. AR02 output message printed.</p>
9a	Contact attendant at second maintenance TTY and verify that second TTY is functioning.	
10b	If testing first maintenance TTY or first maintenance monitor loop TTY that is associated with a SD1A121-01 or SD-IA121-02 TR unit—	

STEP	ACTION	VERIFICATION
	At second maintenance TTY— Type input message TTY-MAINT-00 S. to suspend local TTY.	
11b	At master control center (MCC) AMA-TTY frame control panel— Operate TTY CONTROL OFF-0 key.	OS-0, OFF NOR, and POWER OFF lamps lighted. Note: POWER OFF and OFF NOR lamps also reflect the condition of the AMA portion of this frame. For example, if power is off in one AMA part, the POWER OFF and OFF NOR lamps will be lighted.
12c	If testing second maintenance TTY or second maintenance monitor loop TTY— Notify attendant at second maintenance TTY that loop tests are to be performed.	
13c	At local maintenance TTY— Type input message TTY-MAINT-08 S. to suspend second TTY.	
14c	At MCC AMA-TTY frame control panel— Operate TTY CONTROL OFF-1 key.	OS-1, OFF NOR, and POWER OFF lamps lighted. (See Note after Step 11b).
15d	If testing TTY or monitor loop TTY associated with SD-1A147-01, -02— Notify appropriate attendant that loop tests are to be performed.	
16d	At local maintenance TTY— Type input message TTY-MAINT-aa S. (aa = member number) to suspend loop to be tested.	
17d	At TR unit (SD-1A147-01, -02)— Operate PWR OFF key.	PWR OFF lamp lighted.
18	At TR unit under test— Remove A-45 circuit pack (bipolar flip-flop) from its location (Table A).	
19	At TR unit under test— Strap pins 27 and 11 on circuit pack connector of A140 to ground (Table A).	
20e	If TR unit is SD-1A147-02— Strap as shown in Table B.	
	Note: If TR unit is equipped with option S and two or more TTYs, all 5 ports will repeat the QUICK BROWN FOX message generated by the 911A test set.	

TABLE A
CIRCUIT PACK LOCATIONS FOR
LOOP SIGNALER AND BIPOLAR FLIP-FLOP

CIRCUIT	LOCATION OF A-140 CIRCUIT PACK	LOCATION OF A-45 CIRCUIT PACK	LOCATION OF A-976 CIRCUIT PACK
SD-1A121-01 Circuit 0 — Local Maintenance TTY	110-20	134-18	—
SD-1A121-01 Circuit 0 — Local Maintenance Monitor TTY	106-14	134-18	—
SD-1A121-01 Circuit 1 — Second Maintenance TTY	108-30	134-38	—
SD-1A121-01 Circuit 1 — Second Maintenance Monitor TTY	106-16	134-38	—
SD-1A121-02 Circuit 0 — Local Maintenance TTY	110-14	134-18	—
SD-1A121-02 Circuit 0 — Local Maintenance Monitor TTY	110-24	134-18	—
SD-1A121-02 Circuit 1 — Second Maintenance TTY	110-36	134-38	—
SD-1A121-01 Circuit 1 — Second Maintenance Monitor TTY	110-26	134-38	—
SD-1A147-01 Universal TTY Circuit	038	222	—
SD-1A147-01 Universal TTY Monitor Circuit	036	222	—
SD-1A147-02 Universal Input/Output Circuit	—	2-31	0-32
	—	2-31	0-30

Table A—CIRCUIT PACK LOCATIONS FOR LOOP SIGNALER AND BIPOLAR FLIP-FLOP

SECTION 231-003-501

STEP	ACTION	VERIFICATION
24	Using 2P4C patching cord, patch OUTPUT REL jack of test sentence generator to TTY jack on TR unit (Fig. 1).	
25f	If channel being tested is equipped with 105A data sets— At office data set mounting panel— Operate R relay.	
26	At TTY under test— Verify that QUICK BROWN FOX message is being received.	
27	At DTS— Turn DIST 5% switch one step at a time to increase distortion, allowing at least two lines of print between each increase until copy garbles.	Final error-free setting of DIST 5% switch indicates amount of distortion on loop signal that TTY machine will tolerate.
28	Record setting of DIST 5% switch.	
29	Remove patch between test sentence generator and TR unit.	
30g	If TTY being tested is receive-only or receive-only typing reperforator set— Omit Steps 31 through 38f.	
31	Using 2P30B patching cord, insert 347B plug in CUR IN jack of distortion measuring set and 310 plug in TTY test jack on TR unit.	
32f	If channel being tested is equipped with 105A data sets— At TR unit— Block operated MT(1) relay (for second maintenance TTY) or M relay (other than maintenance TTY)	
33f	Using 1W13A patching cord, connect MT1-3B relay to MT1-3 relay (second maintenance TTY) or M3B relay to M3 relay (other than maintenance TTY).	
34	At distortion measuring set— Momentarily operate RESET switch.	Nixie tubes indicate 0.
35	At TTY being tested— Have at least two lines typed (QUICK BROWN FOX, RUs, etc).	At distortion measuring set— Nixie tubes indicate peak distortion.
36	Record reading on nixie tubes.	

STEP	ACTION	VERIFICATION
37	Remove patch between distortion measuring set and TR unit.	
38f	If channel being tested is equipped with 105A data sets— Release operated relay MT(1) and remove connection made in Step 33f.	
39h	If reading in Step 28 is less than 35 percent or reading in Step 36 is greater than 18 percent— Request that TTY maintenance force locate and correct trouble.	
40a	If testing local maintenance TTY is local maintenance monitor loop TTY— At MCC AMA-TTY frame control panel— Operate TTY CONTROL OFF-0 key.	OFF NOR, OS-0, and POWER OFF lamps lighted. (See Note after Step 11b.)
41c	If testing second maintenance TTY or second maintenance monitor loop TTY— At MCC AMA-TTY frame control panel— Operate TTY CONTROL OFF-1 key.	OFF NOR, OS-1, and POWER OFF lamps lighted. (See Note after Step 11b.)
42d	If testing TTY or monitor loop TTY associated with SD-1A147-01, -02— At TR unit— Operate PWR OFF key.	PWR OFF lamp lighted.
43	At TR unit — Remove temporary straps and replace A-45 (bipolar flip-flop) circuit pack. (See Table A.)	
44a	If testing local maintenance TTY or local maintenance monitor loop TTY— At MCC AMA-TTY frame control panel— Operate TTY CONTROL NOR key.	POWER OFF, OFF NOR, and OS-0 lamps extinguished. (See Note after Step 11b.)
45a	At second maintenance TTY— Type input message TTY-MAINT-00 R. to restore local TTY.	
46a	At local maintenance TTY— Type input message TTY-DGN-a bb. (See input message manual.)	DR01 message printed. (See output message manual.)
47a	At second maintenance TTY— Type input message RT-MSGs-REM. to return maintenance messages to local maintenance TTY.	AR02 message printed. (See output message manual.)

STEP	ACTION	VERIFICATION
48c	If testing second maintenance TTY or second maintenance monitor loop TTY— At MCC AMA-TTY frame control panel— Operate TTY CONTROL NOR key.	POWER OFF, OFF NOR, and OS-1 lamps extinguished. (See Note after Step 11b.)
49c	At local maintenance TTY— Type input message TTY-MAINT-12 R. to restore TTY to service.	
50c	Type input message TTY-DGN-a bb. (See input message manual.)	DR01 message printed. (See output message manual.)
51d	If testing TTY or monitor loop TTY associated with SD-1A147-01, -02— At TR unit— Release PWR OFF key.	PWR OFF lamp extinguished.
52	At local maintenance TTY— Type input message TTY-MAINT-aa R. (aa = member number) to restore the TTY under test.	
53d	Type input message TTY-DGN-a bb. (See input message manual.)	DR01 message printed. (See output message manual.)