

911NA DATA TEST SET MAINTENANCE AND TESTS

CONTENTS	PAGE
1. GENERAL	1
2. MAINTENANCE	2
3. TEST PROCEDURES	2
911NA DTS Self Test	2

1. GENERAL

1.01 The purpose of this section is to provide maintenance information and test procedures for identifying trouble that may occur in the 911NA data test set (DTS). The tests provided in this section should be performed whenever test indications show equipment performance to be questionable.

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

1.03 The 911NA DTS transmits and receives serial data test signals to test teletypewriters (TTYs), data equipment, and transmission facilities.

1.04 The 911NA DTS is referred to in this section as "the DTS". The DTS is comprised of a test sentence generator (TSG) and a distortion measuring set (DMS). Additionally, all light-emitting diodes (LEDs) on the DTS are referred to as status indicators.

1.05 The TSG is capable of transmitting the following four fox test messages.

- (a) The 5-element Baudot code 80-character test message is:

THE QUICK BROWN FOX JUMPED OVER
A LAZY DOGS BACK 1234567890 A1A
TESTING

The Baudot test message is preceded by the following four nonprint characters:

LETTERS, CARRIAGE RETURN, LINE
FEED, LETTERS.

- (b) Three 8-element American Standard Code for Information Interchange (ASCII) test messages can be transmitted, depending upon the setting of the LINE LENGTH switch.



The fox test messages printed by a Model 37 TTY are shown. When the fox test message is printed by a Model 33 or 35 TTY, it will be in all capital letters.

- (1) The short (S) 38-character ASCII test message is:

The Quick Brown Fox Jumped Over A

- (2) The normal (N) 77-character ASCII test message is:

The Quick Brown Fox Jumped Over A
Lazy Dog's Back 1234567890 Testing 0123

- (3) The long (L) 137-character ASCII test message is:

The Quick Brown Fox Jumped Over A
Lazy Dog's Back 1234567890 Testing 0123
The Quick Brown Fox Jumped Over A
Lazy Dog's Back Test 0123

The three ASCII test messages are preceded by the following four nonprint characters:

DELETE, CARRIAGE RETURN, LINE
FEED, DELETE.

- 1.06** The 3-character selectable message can be arranged to transmit 1, 2, or 3 characters

NOTICE

Not for use or disclosure outside the
Bell System except under written agreement

of either the Baudot or ASCII code as desired. An information plate showing the 5- and 8-level code charts is attached to the DTS inside cover.

Note: When using the 3-character selectable message to transmit the Baudot code, switches 6, 7, and 8 **must** be set to mark.

1.07 Using the TYPE DIST, DIST 10%, and DIST 1% controls, the TSG generates a signal of predetermined type and amount of distortion. The types of distortion that may be generated are marking bias (MB), spacing bias (SB), switched bias (SWB), marking end (ME), spacing end (SE), switched end (SWE), and switched combination (SWC).

1.08 The CODE switch conditions the 911NA DTS to generate, transmit, and receive serial data signals with five or eight information elements, a start element, and a stop pulse of one or more element lengths.

1.09 The BAUDS switch allows for the selection of 13 different crystal-controlled speeds ranging from 45.5 to 1800 baud.

1.10 The type of equipment to be tested determines the settings of the CODE and BAUDS switches. These switches are common to both the TSG and the DMS; therefore, the generating and measuring sections are always set to the same code and speed.

2. MAINTENANCE

2.01 Maintenance of the 911NA DTS is limited to the 1/2-amp fuse located in the lower

left corner (directly behind the power cord input) of the DTS.

2.02 To gain access to the fuse, perform the following.

- (1) Remove the front cover.
- (2) Turn the four 1/4-turn fasteners counterclockwise (CCW) (Fig. 1) to release the chassis from the rear cover.
- (3) Place the DTS on its back and, using the two faceplate handles, raise the chassis until it is clear of the rear cover.
- (4) Replace fuse located in fuse holder (Fig. 2) as required.

Note: Two spare fuses are mounted on the rear of the unit.

3. TEST PROCEDURES

911NA DTS Self Test



Incorrect indications on DISPLAY may be observed when switch positions are changed. If this occurs, operate the DMS RESET button before continuing with tests. If this does not clear the problem, set the STEP/STOP/START switch to STOP, operate both RESET buttons, then return the STEP/STOP/START switch to START.

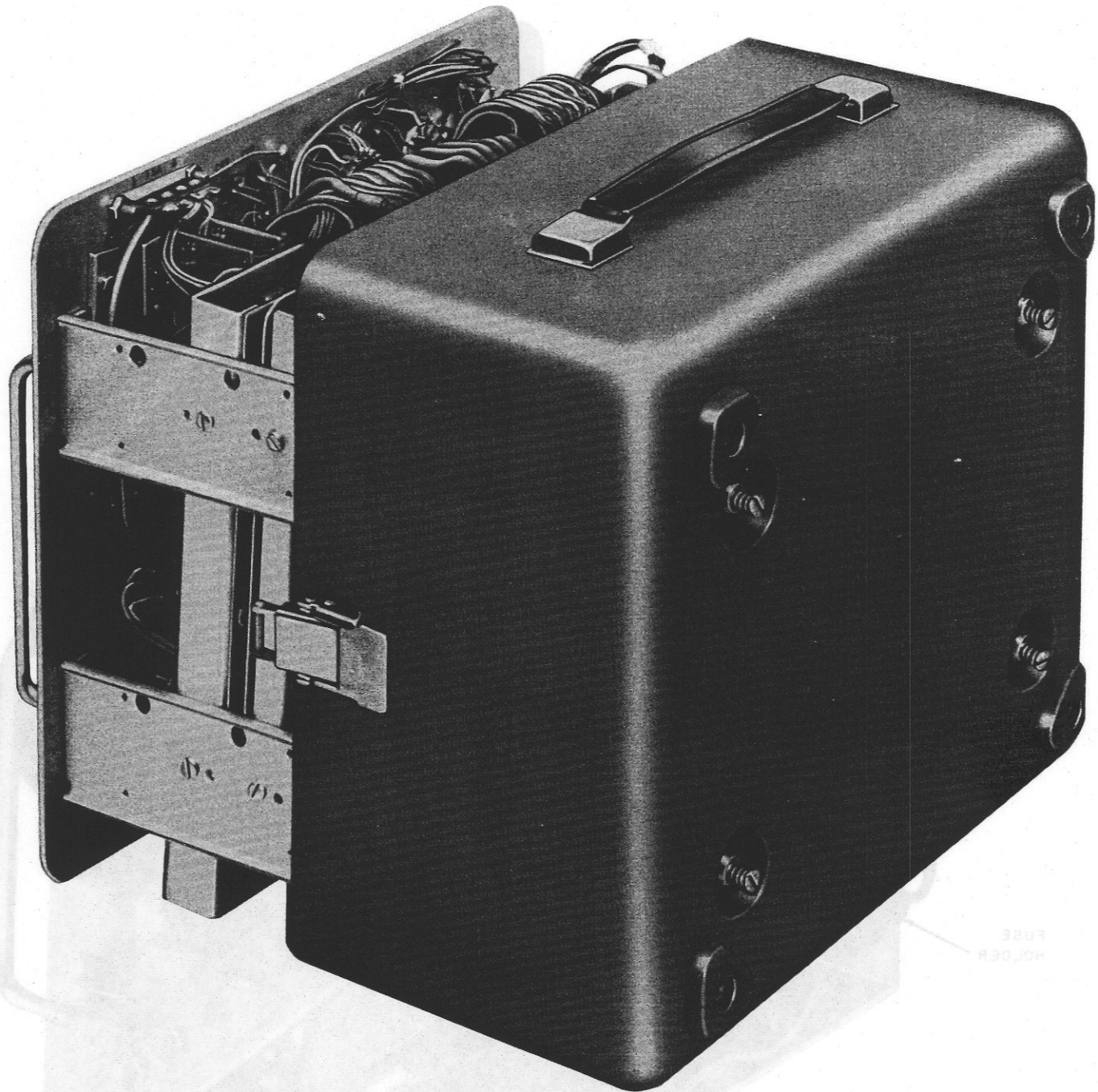


Fig. 1—911NA DTS—Rear Cover Removal

FUSE
HOLDER

Fig. 2—911NA DTS—Rear Cover Removed

STEP

ACTION

VERIFICATION

- 1 Ensure that the DTS power switch is OFF.
- 2 Set controls and switches of the DTS to the following positions:



When generating undistorted signals, always operate the DIST 10% and DIST 1% switches to the zero position and the TYPE DIST switch to the SB position. Do not attempt to transmit zero distortion when the TYPE DIST switch is in any position other than SB.

SWITCH	POSITION
DIST 10%	0
DIST 1%	0
BAUDS	1
LINE LENGTH	N
TYPE DIST	SB
CODE	5/7.0
REPEAT	OFF
STEP/STOP/START	STOP
FOX/CHAR	FOX
PARITY ON/OFF	OFF
PARITY ODD/EVEN	EVEN
FILTER	OUT
DISPLAY CHAR	OFF
DISCR %	3
DISTORTION PEAKS	0
DISPLAY	PK
INPUT	TST
ASYN/C/SYN/C	ASYN/C
3-char. selectable message matrix	All to S
ON/SKIP	Both to SKIP

- 3 Operate DTS POWER switch to ON, then momentarily operate both RESET buttons. POWER status indicator lighted for the remainder of test.
Both SIGS status indicators lighted.
- 4 Operate the STEP/STOP/START switch to START. Both SIGS indicators flashing.
DISPLAY indicates 00 to 01% distortion.
All other status indicators off.
- 5 Set DIST 1% switch to 1. Same as Step 4 except DISPLAY indicates 00 to 02% distortion.

STEP	ACTION	VERIFICATION
6	Set DIST 1% switch to 2.	Same as Step 4 except DISPLAY indicates 01 to 03% distortion.
7	Set DIST 1% switch to 3.	Both SIGS and SB indicators flashing. DISPLAY indicates 02 to 04% distortion.
8	Increase the DIST 1% switch setting in 1%-increments from 4 to 9.	Same as Step 7 except DISPLAY indicates 04 $\pm 1\%$ to 09 $\pm 1\%$ distortion in 1%-increments.
9	Increase the DIST 10% switch setting in 10%-increments from 10 to 40.	Same as Step 7 except DISPLAY indicates 19 $\pm 1\%$ to 49 $\pm 1\%$ distortion in 10%-increments.
10	Operate the STEP/STOP/START switch to STOP, then set DIST 1% to 5, DIST 10% to 20, CODE to 5/7.42, and momentarily operate the DMS RESET button.	Both SIGS indicators lighted. All other status indicators off. DISPLAY indicates 00% distortion.
11	Operate the STEP/STOP/START switch to START.	SB and both SIGS indicators flashing. All other status indicators off. DISPLAY indicates 25 $\pm 1\%$ distortion.
12	Set CODE switch to 5/7.5, then 8/10, then 8/11.	Same as Step 11 for each setting of CODE switch.
13	Operate the STEP/STOP/START switch to STOP, CODE switch to 8/11M, PARITY ON/OFF to ON, and momentarily operate both RESET buttons.	Same as Step 10.
14	Operate the STEP/STOP/START switch to START.	SB and both SIGS indicators flashing. PARITY indicator lighted. All other indicators off. DISPLAY indicates 25 $\pm 1\%$ distortion.
15	Operate the STEP/STOP/START switch to STOP, set CODE switch to 5/7.0, TYPE DIST switch to MB, PARITY ON/OFF to OFF, and momentarily operate both RESET buttons.	Same as Step 10.
16	Operate the STEP/STOP/START switch to START.	MB and both SIGS indicators flashing. All other indicators off. DISPLAY indicates 25 $\pm 1\%$ distortion.
17	Set TYPE DIST switch to SWB.	Both SIGS indicators flashing. MB and SB indicators flash alternately. DISPLAY indicates 25 $\pm 1\%$ distortion. All other indicators off.
18	Set TYPE DIST switch to ME.	ME and both SIGS indicators flashing. All other indicators off. DISPLAY indicates 25 $\pm 1\%$ distortion.

STEP	ACTION	VERIFICATION
19	Set TYPE DIST switch to SE.	SE and both SIGS indicators flashing. All other indicators off. DISPLAY indicates $25 \pm 1\%$ distortion.
20	Set TYPE DIST switch to SWE.	Both SIGS indicators flashing. ME and SE indicators flash alternately. DISPLAY indicates $25 \pm 1\%$ distortion. All other indicators off.
21	Set TYPE DIST switch to SWC.	Both SIGS indicators flashing. MB, SB, ME, and SE indicators flash consecutively. DISPLAY indicates $25 \pm 1\%$ distortion. All other indicators off.
22	Increase the BAUDS setting in 1-position increments from 2 through 5.	Same as Step 21 except the indicators blink faster with each higher switch setting.
23	Operate STEP/STOP/START switch to STOP, set the REPEAT switch to ON, TYPE DIST to MB, then momentarily operate both RESET buttons.	Same as Step 10.
24	Operate STEP/STOP/START switch to START, then set DISPLAY CHAR to 5.	MB and both SIGS indicators flashing. DISPLAY indicates $25 \pm 1\%$ distortion. RECEIVED CHARACTERS 2-1, 2-2, 2-3, 2-4, and 2-5 flashing. All other indicators off.
25	Set switches as follows: <ul style="list-style-type: none"> • STEP/STOP/START to STOP • FOX/CHAR to CHAR • First character switches 2, 4, 6, 7, and 8 to M • Second character switches 1, 3, 5, 6, 7, and 8 to M • Second character ON/SKIP to ON • Then momentarily operate both RESET buttons. 	Same as Step 10 except RECEIVED CHARACTERS 2-1, 2-2, 2-3, 2-4, and 2-5 lighted.
26	Momentarily operate STEP/STOP/START to STEP.	MB and both SIGS indicators lighted. RECEIVED CHARACTERS 2-2 and 2-4 lighted. All other indicators off. DISPLAY indicates $25 \pm 1\%$ distortion.
27	Momentarily operate STEP/STOP/START to STEP.	MB and both SIGS indicators lighted. RECEIVED CHARACTERS 2-1, 2-3, and 2-5 lighted. All other indicators off. DISPLAY indicates $25 \pm 1\%$ distortion.
28	Momentarily operate STEP/STOP/START to STEP.	Same as Step 26.

SECTION 103-813-510

STEP	ACTION	VERIFICATION
29	Set the second character ON/SKIP switch to SKIP, then momentarily operate the STEP/STOP/START switch to STEP.	Same as Step 26.
30	Set switches as follows: <ul style="list-style-type: none"> • CODE to 8/10 • REPEAT to OFF • First character switches 2, 4, 6, and 8 to M • Second character switches 1, 3, 5, and 7 to M • Third character switches 3, 4, 7, and 8 to M • All other character switches to S • Second and third character ON/SKIP to ON • DISPLAY CHAR to OFF • Then momentarily operate both RESET buttons. 	Same as Step 10.
31	Set DISPLAY CHAR to 8, then momentarily operate STEP/STOP/START to STEP.	MB and both SIGS indicators lighted. RECEIVED CHARACTERS 1-2, 1-4, 1-6, and 1-8 lighted. Disregard indicators of second RECEIVED CHARACTER. All other indicators off. DISPLAY indicates 25 \pm 1% distortion.
32	Momentarily operate STEP/STOP/START to STEP.	MB and both SIGS indicators lighted. RECEIVED CHARACTERS 1-1, 1-3, 1-5, 1-7, 2-2, 2-4, 2-6, and 2-8 lighted. All other indicators off. DISPLAY indicates 25 \pm 1% distortion.
33	Momentarily operate STEP/STOP/START to STEP.	MB and SIGS indicators lighted. RECEIVED CHARACTERS 1-3, 1-4, 1-7, 1-8, 2-1, 2-3, 2-5, and 2-7 lighted. All other indicators off. DISPLAY indicates 25 \pm 1% distortion.
34	Set switches as follows: <ul style="list-style-type: none"> • FOX/CHAR to FOX • DIST 10% to 0 • DIST 1% to 1 • DISPLAY CHAR to OFF • DISPLAY to AUTO PK • Momentarily operate both RESET buttons. 	Same as Step 10.
35	Operate STEP/STOP/START switch to START.	Both SIGS indicators flashing. All other indicators off. DISPLAY indicates 01 \pm 1% distortion.
36	Set switches as follows: <ul style="list-style-type: none"> • DIST 1% to 2 	Both SIGS indicators flashing. All other indicators off.

STEP	ACTION	VERIFICATION
	<ul style="list-style-type: none"> Then momentarily operate the DMS RESET button. 	DISPLAY indicates $2 \pm 1\%$ distortion.
37	Set switches as follows: <ul style="list-style-type: none"> DIST 1% to 3 DISTORTION PEAKS to 5 DISPLAY to COUNT PK Then momentarily operate DMS RESET button. 	MB and both SIGS indicators flashing. All other indicators off. DISPLAY indicates 00 distortion peaks above 5%.
38	Set DISCR % to 5, then momentarily operate DMS RESET button.	Both SIGS indicators flashing. All other indicators off. DISPLAY indicates 00 distortion peaks above 5%.
39	Set DIST 1% to 6, then momentarily operate DMS RESET button.	MB and both SIGS indicators flashing. All other indicators off. DISPLAY counts to 99 and remains at 99 until reset.
40	Set DISCR % to 7, DISTORTION PEAKS to 10, then momentarily operate the DMS RESET button.	Both SIGS indicators flashing. All other indicators off. DISPLAY indicates 00 distortion peaks above 10%.
41	Set DIST 1% to 8, then momentarily operate the DMS RESET button.	MB and both SIGS indicators flashing. All other indicators off. DISPLAY indicates 00 distortion peaks above 10%.
42	Set DIST 1% to 9, DISCR % to 10, then momentarily operate DMS RESET button.	Same as Step 40.
43	Set DIST 1% to 1, DIST 10% to 10, then momentarily operate DMS RESET button.	Same as Step 39.
44	Set DIST 1% to 4, DISCR % to 15, DISTORTION PEAKS to 15, then momentarily operate DMS RESET button.	Both SIGS indicators flashing. All other indicators off. DISPLAY indicates 00 distortion peaks above 15%.
45	Set DIST 1% to 6, then momentarily operate DMS RESET button.	Same as Step 39.
46	Set DIST 1% to 8, DISTORTION PEAKS to 20, then momentarily operate the DMS RESET button.	MB and both SIGS indicators flashing. All other indicators off. DISPLAY indicates 00 distortion peaks above 20%.
47	Set DIST 1% to 3, DIST 10% to 20, then momentarily operate the DMS RESET button.	Same as Step 39.

SECTION 103-813-510

STEP	ACTION	VERIFICATION
48	Set DISPLAY to COUNT END, then momentarily operate the DMS RESET button.	MB and both SIGS indicators flashing. All other indicators off. DISPLAY indicates 00 end distortion peaks above 20%.
49	Set TYPE DIST to ME, then momentarily operate both RESET buttons.	ME and both SIGS indicators flashing. All other indicators off. DISPLAY counts to 99 and remains at 99 until reset.
50	Set DISTORTION PEAKS to 25, then momentarily operate DMS RESET button.	ME and both SIGS indicators flashing. All other indicators off. DISPLAY indicates 00 end distortion peaks above 25%.
51	Set DIST 1% to 7, then momentarily operate the DMS RESET button.	Same as Step 49.
52	Set DISTORTION PEAKS to 30, then momentarily operate DMS RESET button.	ME and both SIGS indicators flashing. All other indicators off. DISPLAY indicates 00 end distortion peaks above 30%.
53	Set DIST 1% to 2, DIST 10% to 30, then momentarily operate DMS RESET button.	Same as Step 49.
54	Set DISTORTION PEAKS to 35, then momentarily operate DMS RESET button.	ME and both SIGS indicators flashing. All other indicators off. DISPLAY indicates 00 end distortion peaks above 35%.
55	Set DIST 1% to 7, then momentarily operate DMS RESET button.	Same as Step 49.
56	Set DISTORTION PEAKS to 40, then momentarily operate DMS RESET button.	ME and both SIGS indicators flashing. All other indicators off. DISPLAY indicates 00 end distortion peaks above 40%.
57	Set DIST 1% to 2, DIST 10% to 40, then momentarily operate DMS RESET button.	Same as Step 49.
58	Set switches as follows: <ul style="list-style-type: none"> ● STEP/STOP/START to STOP ● TYPE DIST to SB ● DIST 1% to 0 ● DIST 10% to 0 ● FOX/CHAR to CHAR ● First, second, and third character switches—1, 3, 5, 7, and 8 to S 2, 4, and 6 to M ● Second and third ON/SKIP switches to ON 	Both SIGS indicators lighted. All other indicators off. DISPLAY indicates 00.

STEP	ACTION	VERIFICATION
	<ul style="list-style-type: none"> ● PARITY ON/OFF to ON ● PARITY ODD/EVEN to ODD, then return to EVEN ● DISPLAY to COUNT PAR ● DISTORTION PEAKS to 0 ● Then momentarily operate both RESET buttons. 	
59	Operate the STEP/STOP/START switch to START.	SB, PARITY, and both SIGS indicators flashing. All other indicators off. DISPLAY indicates 3 parity errors received.
60	Operate the STEP/STOP/START switch to STOP, REPEAT to ON, then momentarily operate both RESET buttons.	Same as Step 58.
61	Operate the STEP/STOP/START switch to START.	PARITY indicator lighted. SB and both SIGS indicators flashing. All other indicators off. DISPLAY begins counting.
62	Operate PARITY ON/OFF switch to OFF.	SB and both SIGS indicators lighted. DISPLAY stops counting. PARITY indicator off.
63	Operate PARITY ON/OFF switch to ON.	PARITY indicator lighted. SB and both SIGS indicators flashing. All other indicators off. DISPLAY resumes counting.
64	When DISPLAY reaches 99, operate DMS RESET button.	SB and both SIGS indicators flashing. PARITY indicator turns off while RESET button is depressed and relights when RESET button is released. All other indicators off. DISPLAY resets to 00 and then resumes counting.
65	Operate PARITY ON/OFF switch to OFF, momentarily operate DMS RESET button, then depress and hold depressed the SPACE button.	Both SIGS indicators off. Disregard all other indications.
66	Release the SPACE button.	SB and both SIGS indicators flashing.
67	End of test. Operate the STEP/STOP/START switch to STOP, then operate the DTS POWER switch to OFF.	All indicators turn off.