911J DATA SIGNAL DISTORTING SET—TESTS

1. GENERAL

1.01 The purpose of this section is to assure that the 911J Data Signal Distorting Set is operating properly. The tests outlined in this section should be performed periodically and when test indications cause equipment performance to be in question. Local procedures should be followed concerning the disposition of equipment that requires repair.

1.02 The 911J is one of a series of serial data test sets that has been developed to provide a more flexible testing capability in multiposition No. 2 and No. 9B telegraph serviceboards and Data Observing and Test Centers (DOTCs).

1.03 The 911J consists of a control panel in the serviceboard and an electronic unit that is rack mounted. By using a 911K exclusion circuit, each electronic unit may be arranged to serve from one to five control panels located in the serviceboard positions. The 911K controls switching to prevent electronic unit access by more than one control panel at a time.

1.04 Complementary test sets that will usually appear in test installations with the 911J are as follows:

(a) 911G Test Sentence Generator

(b) 911F Distortion Measuring Set.

1.05 For more details concerning equipment that is discussed in this section, refer to the following circuit descriptions (CDs), schematic drawings (SDs), and sections:

(a) 911F Distortion Measuring Set: Section 103-813-103; CD- and SD-70952-01

(b) 911G Test Sentence Generator: Section 103-813-104; CD- and SD-70953-01

(c) 911J Data Signal Distorting Set: Section 103-813-105; CD- and SD-70954-01

(d) 911K Exclusion Unit: Section 103-813-106; CD- and SD-70957-01

1.06 The 911J Data Signal Distorting Set will accept a variety of input signals from mechanical or electronic multiple senders, hub drive or hub, 20- or 60-mA neutral signals, and Electronic Industries Association (EIA) signals. The 911J will completely regenerate input signals before distortion is applied to them. The input signals may contain a maximum of 20 percent distortion. The output signals are maintained at any desired level of distortion between 0 and 49 percent.

1.07 The controls for operation of the 911J and their functions are outlined below.

(a) CONN—Illuminated locking pushbutton for obtaining access to the electronic unit in installations where more than one control panel is installed. When the electronic unit is busy, the CONN switch at the nonusing position(s) will be illuminated. If an illuminated switch is operated, the CONN switch at the using position will flash at a 60-ipm rate.

(b) INPUT—A 7-position switch which conditions the 911J to accept the following input signals:

(1) HD—Hub drive signals for hub potentiometer internal to the 911J

(2) 20R—20-mA neutral signals (reversed); ie, 0.0 mA mark and 20-mA space

(3) 20N—20-mA neutral signals (normal); ie, 20-mA mark and 0.0 mA space

(4) 60R—62.5 mA neutral signals (reversed); ie, 0.0 mA mark and 60-mA space

(5) 60N—62.5 mA neutral signals (normal); ie, 60-mA mark and 0.0 mA space

(6) HUB--Hub signals—hub potentiometer external to the 911J; ie, +60 V mark, -30 V space

(7) EIA—-3 to -25 V mark and +3 to +25 V space.

(c) OUTPUT—A 3-position switch for selecting the type of output:

(1) REL R and N—Relay contact closures (normal and reversed) for neutral operation

(2) HD—Hub Drive (hub potentiometer external to the 911J).

(d) CODE—A 9-position switch with the positions designated 5 through 13. The switch should be set to the position that indicates the number of information elements in each character of the incoming signal.

(e) BIAS—An 8-position switch used to select the type of distortion to be applied to the generated signal:

(1) 0—No Distortion

(2) MB—Marking Bias

(3) SB—Spacing Bias

(4) SWB—Switched Bias

(5) SWE—Switched End Distortion

(6) SWC—Switched Combination

(7) SWN 10—Switched Narrow 10%

(8) SWN 15—Switched Narrow 15%.

(f) DISTORTION—Two switches designated DIST 1% and DIST 5% will allow variation of the distortion in 1 percent steps from 0 to 49 percent except for the 0, SWN10, and SWN15 positions of the BIAS switch where the amount of distortion is fixed.

(g) BAUDS—A 23-position switch for selection of a maximum of 22 baud rates. Position 23 of the switch is reserved for selection of the baud rate by the class-of-service lead from the diode matrix (to be developed). The baud rates may be determined by externally connected common clocks or by internal crystal-controlled clock circuits.

2. PREPARATION

2.01 The validity of tests outlined in this section will depend upon the operability of the 911G Test Sentence Generator and the 911F Distortion Measuring Set used to perform the tests. The 911G and 911F should therefore be previously tested according to Sections 103-813-503 and 103-813-504.

2.02 Connect the test circuit as shown in Fig. 1.

2.03 Set control switches on the 911G as follows:

CONTROL	POSITION
BAUDS	1
BIAS	MB
CODE	5/7
DIST 1%	0
DIST 5%	20
OUTPUT	HD
AUTO-STEP	AUTO
RY or U*	OFF
REPEAT	OFF

2.04 Set control switches on the 911J as follows:

CONTROL	POSITION
BAUDS	1
BIAS	MB
CODE	5
DIST 1%	0
DIST 5%	0
INPUT	HUB
OUTPUT	HD

2.05 Set control switches on the 911F as follows:

CONTROL	POSITION
BAUDS	1
CODE	5
INPUT	HUB
PARITY	OFF
FILTER	OUT
DISPLAY	PK

2.06 If a 911K exclusion circuit is provided, depress the CONN switch on the 911G, 911J, and 911F. Observe that the SIGS lamp is flashing on all these units. Observe that the 911F distortion nixies indicate 00 to 03, and the BIAS/ED nixies read 00 to 02.

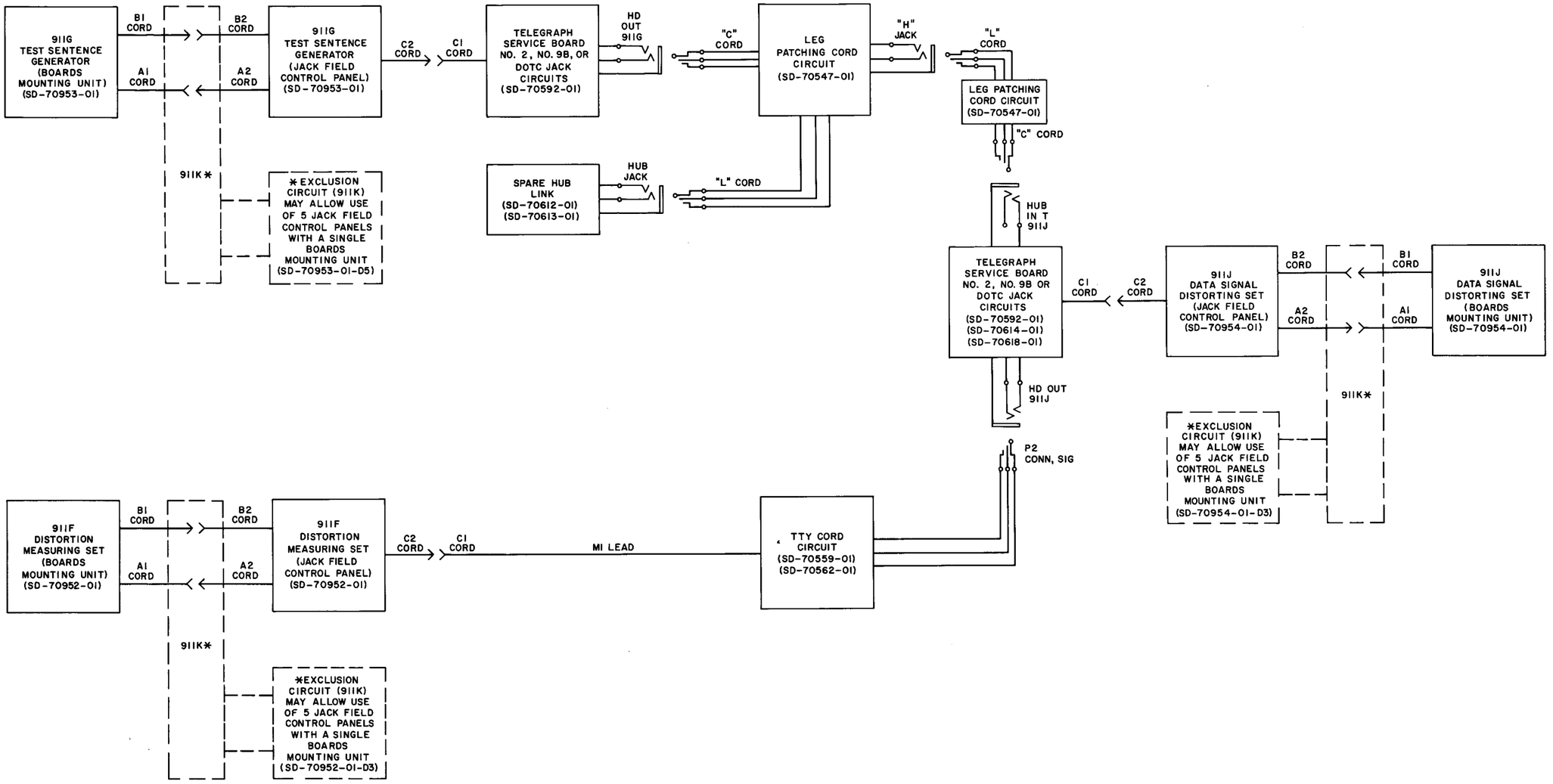

Fig. 1—911J Data Signal Distorting Set—Test Connections

3. TESTS

3.01 Perform the following test.

STEP	ACTION	VERIFICATION
1	***911J:*** Set DIST 5% switch to 5.	***911F:*** Observe that distortion nixies indicate 5; M/S nixie indicates M.
2	***911J:*** Rotate DIST 1% switch from 0 to 4.	***911F:*** Observe that distortion nixie readings make corresponding change for each step that DIST 1% switch is advanced.
3	***911J:*** Rotate DIST 5% switch from 5 to 45.	***911F:*** Observe that distortion nixie readings make corresponding change for each step that DIST 5% switch is advanced.
4	***911J:*** Repeat Steps 1 through 3 for each code and speed provided with the 911J. ***Note:*** The CODE and BAUDS switches on the 911G and 911F must be set to correspond with the 911J.	***911F:*** Distortion nixie tubes should indicate 911J distortion switch setting within +1, –2 percent.

3.02 Perform the following test.

STEP	ACTION	VERIFICATION
1	***911G:*** Set BAUDS switch to 1, BIAS switch to SWB, CODE switch to 5/7, DIST 1% switch to 0, DIST 5% switch to 20, OUTPUT switch to HD, AUTO-STEP switch to AUTO, RY OR U* switch to OFF, and REPEAT switch to OFF. ***911J:*** Set BAUDS switch to 1, BIAS switch to SWB, CODE switch to 5, DIST 1% switch to 0, DIST 5% switch to 0, INPUT switch to HUB, and OUTPUT switch to H. ***911F:*** Set BAUDS switch to 1, CODE switch to 5, INPUT switch to HUB, PARITY switch to OFF, FILTER switch to OUT, DISPLAY switch to PK.	***911F, 911G, 911J:*** Observe that SIGS lamp is flashing. ***911F:*** Observe that distortion nixies read 18 to 21.
2	Repeat 3.01 Steps 1 through 4.	***911F:*** Observations should be the same.

3.03 Perform the following test.

STEP	ACTION	VERIFICATION
1	Repeat 3.02, Step 1.	
2	***911J:*** Set BIAS switch to SWE.	***911F:*** M/S nixie extinguished.
3	***911J:*** Depress ED switch.	***911F:*** M/S nixie flashing both M and S.

STEP	ACTION	VERIFICATION
4	***911J:*** Set BIAS switch to SWC.	***911F:*** M/S nixie flashing both M and S.
5	***911J:*** Depress and hold ED switch.	***911F:*** M/S nixie flashing both M and S.
6	***911J:*** Set BIAS switch to SWN 10.	***911F:*** Distortion nixies display 20 ±2, M/S nixie flashing both M and S.
7	***911J:*** Depress ED switch.	***911F:*** M/S nixie flashing both M and S.

3.04 Disconnect test connections and restore equipment for normal use.