REPLACING PAGE ADDENDUM
Filing Instructions:

1. REMOVE FROM THE SECTION THE PAGES NUMBERED THE SAME AS THOSE ATTACHED TO THIS PINK SHEET.
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DATA SET 108-TYPE
SINGLE PRIVATE LINE STATION
USING DATA AUXILIARY SET 820D-TYPE
TEST PROCEDURES

1. GENERAL

1.001 This addendum supplements Section 591-023-501, Issue 3. The attached pages must be inserted in the section in accordance with the filing instructions.

1.002 This addendum is issued to provide additional information on connecting test equipment to the data set for distortion testing. This addendum also corrects an error in step numbering of the carrier shift test.

4. CARRIER SHIFT TEST

The following changes apply to Part 4 of the section.

(a) 4.03 Step 7—renumbered Step 6.

(b) 4.04 subtitle changed to read Carrier Shift Test Measurement.

5. LOOP-BACK TEST

The following changes apply to Part 5 of the section.

(a) 5.04—revised

(b) Fig. 1—revised

(c) 5.09—revised

Attached:

Pages 5, 6, 7, and 8 dated January 1973, revised
Page 8.1 dated January 1973, added

DATA SET 108-TYPE
SINGLE PRIVATE LINE STATION
USING DATA AUXILIARY SET 820D-TYPE
TEST PROCEDURES

CONTENTS PAGE

1. GENERAL

1.01 This section describes the test procedures to be performed and test requirements to be met at the time of installation or when investigating trouble conditions associated with Data Sets 108A- and 108C-type Single Private Line Station using Data Auxiliary Set (DAS) 820D-type.

1.02 This section is reissued to include Addendum 591-023-501, Issue 1 and to include information pertaining to DAS 820D-L1 and DAS 820D-L1A which replace DAS 820D1 and 820D2, respectively. DAS 820D1 and DAS 820D2 are rated manufacture discontinued (MD). All references to DAS 820D-L1 and DAS 820D-L1A also apply to DAS 820D1 and DAS 820D2, respectively, except where noted. Due to extensive revision, arrows ordinarily used to denote changes have been omitted.

1.03 This section is to be used in conjunction with the sections entitled Data Set 108-Type Private Line System Station Application—Maintenance (591-023-300), Data Set 108-Type Single Private Line Station Using Data Auxiliary Set 820D-Type—Installation and Connections (591-023-201), and Data Set 108-Type Single Private Line Station Using Data Auxiliary Set 820D-Type—Maintenance (591-023-301).

1.04 Data Set 108A-type is intended to work with Data Set 108B- or 108D- type for hub operation or with Data Set 108C- or 108D- type for station-to-station service. Data Set 108C-type is intended to work with Data Set 108A-type for station-to-station service only.

1.05 The following is a complete list of test equipment necessary to perform the tests outlined in this section:

- 901B Data Test Set
- Portable station test set TTS-28, or equivalent
- 1011-type handset (dial hand test set) or portable Telegraph Carrier Test Set (TCTS) (KS-19935-L7)

Note: The TCTS includes the Auxiliary Power Supply (APS).

- 911A Data Test Set
- 902-type Data Test Set
- 903-type Data Test Sets (two required)
- W2DW cords (three required)
- W1AD cords, or equivalent (three required)
- 1W2A cords, or equivalent (two required)
- One 3000Ω 1-watt resistor
- 2W42A cord, or equivalent.

1.06 A letter a, b, c, etc, is added to a step number in Parts 3 and 4 of this section indicating an action which may or may not be required, depending on local conditions. The condition under which a lettered step should be made is given in the PROCEDURE 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.

2. DATA CARRIER DETECTOR (CF) LEAD TEST

2.01 This test determines the condition of the CF lead. The condition of the lead is indicated by the three states listed in Table A. The lamp or buzzer must be provided by and located on the terminal equipment. This test assumes that the carrier squelch on carrier fail option has been removed.

A. EIA Interface

2.02 The following equipment is required at the station:

- 901B Data Test Set
- Portable station test set TTS-28, or equivalent.

2.03 The following procedure should be used to perform the CF lead indication test on sets utilizing an EIA interface.

(1) At the DAS 820D-type, remove the interface cord from J3.

(2) Interconnect DAS 820D-type and 901B Data Test Set cover (interface test adapter) using W25A cord supplied with interface test adapter.

(3) Set FUNCTION switch on TTS-28 to 30 VDC.

(4) Connect + (positive) lead of TTS-28 to terminal 8 (CF) of the interface test adapter.

(5) Connect – (negative) lead of TTS-28 to terminal 7 (AB) of the interface test adapter.

(6) Meter should indicate between 5 and 25 volts, indicating that data carrier lead is on and that carrier is being received.

(7) Remove leads from terminals 8 and 7 of interface test adapter. Remove W25A cord from DAS 820D-type, and reconnect business machine cord to J3.

TABLE A

CARRIER BEING RECEIVED	CARRIER NOT BEING RECEIVED
Lamp or buzzer — Off	Lamp or buzzer — On
EIA interface CF lead — On (+5 to +25V)	EIA interface CF lead — Off (–5 to –25V)
Current interface CF lead — On (small voltage)	Current interface CF lead — Off (approx +24V)

B. Current Interface

2.04 The following equipment is required at the station:

- 901B Data Test Set
- Portable station test set TTS-28, or equivalent
- One 3000Ω 1-watt resistor.

2.05 The following procedure should be used to perform the CF lead indication test on sets utilizing current interface.

(1) At DAS 820D-type, remove interface cord from J3.

(2) Interconnect DAS 820D-type and interface test adapter using W25A cord supplied with the interface test adapter.

(3) Remove power to the DAS, and connect a 3000Ω 1-watt resistor between terminals 8 (CF lead) and 9 (+24 volts) of the interface test adapter.

(4) Restore power to the DAS and place TTS-28 FUNCTION switch to 30 VDC position.

(5) Place black lead of meter on pin 7 (signal ground) and red lead on pin 8 (CF lead). If the CF lead is on, a small voltage will be read on the meter. If the CF lead is off, approximately 24 volts will be read on the meter. Refer to Table A.

(6) Remove power from DAS, remove meter and resistor from interface test adapter, and return to normal operation.

3. CARRIER MONITORING TEST

3.01 This test determines the presence of both near- and far-end carriers.

3.02 Equipment necessary for this test consists of the following.

- 1011- type handset, or
- Telegraph Carrier Test Set and two W1AD cords.

Note: In this section all reference to TB 1 on DAS 820D-L1 and DAS 820D-L1A are also applicable to terminal strip (TS A) on DAS 820D1 and DAS 820D2 except that TS A provides for 2-wire facilities ***only*** on terminals 1 and 2. Other terminals on TS A are referenced in the section entitled Data Set 108-Type—Single Private Line Station—Using Data Auxiliary Set 820D-Type—Installation and Connection (591-023-201).

A. Far-End Carrier

3.03 The following procedure should be used to determine the presence of far-end carrier at the station when using the 1011-type handset. This test assumes the carrier squelch on carrier fail option has been removed.

(1) Remove power from DAS 820D-type.

Note: This will disable near-end carrier and allow monitoring of weak far-end carrier.

(2) Remove plastic housing of DAS 820D-L1 or gain access to DAS 820D-L1A.

(3) Operate 1011 handset TALK MON switch to MON.

(4) Connect leads of 1011 handset to terminals 1 and 2 of terminal board TB 1 of DAS 820D-type (2-wire), or to terminals 1 and 2, 3 and 4 of TB 1 (4-wire).

(5) Monitor for incoming carrier (F1 or F2).

(6) Remove 1011 handset, replace cover, if supplied, and restore power to the DAS.

3.04 The following procedure measures the frequency of the far-end carrier using the TCTS and two W1AD cords. Greater accuracy can be obtained when measuring the far-end carrier by using the TCTS.

(1) Using a nearby telephone, instruct far-end station not to send data until instructed to return the station to normal operation.

(2) Remove plastic housing of DAS 820D-L1 or gain access to DAS 820D-L1A.

Warning: To avoid shock hazards make certain the power sources are turned off before making power connections between units.

(3) Connect one end of the APS interconnection power cord (stored in the CABLES AND SPARE FUSES section of the APS) to the PWR jack of the APS.

(4) Connect the other end of the interconnection power cord to the PWR jack of the TCTS.

(5) Operate the controls on the TCTS in accordance with Table B.

TABLE B

CONTROL	POSITION
AM/FM	FM
SW/DW/F	F
CHANNEL SELECT	F1 or F2 as required
SPKR switch	ON
HI-M/LO-M	HI-M
LEVEL dBm	−17

(6) Connect spade-tip ends of the two W1AD cords to terminals 1 and 2 (2-wire) or terminals 3 and 4 (4-wire) of TB 1 or DAS 820D-type.

(7) Connect alligator clip ends of the two W1AD cords to VF-1 and VF-2 screws of TB 1 on the back of the TCTS.

(8) Connect the power cord of the APS to an available 120V, 60-Hz ac power source.

(9) Operate the PWR switch of APS to ON.

(10) Monitor the incoming carrier (F1 or F2).

Note: If the far-end station is arranged for mark hold when carrier fails, the SIGSM-ON lamp of the TCTS will be lighted. If the far-end station is arranged for space hold when carrier fails, the SIGSM-ON lamp will not be lighted.

(11) ***Requirement:*** FREQUENCY DEVIATION meter indicates not less than −6 and not more than +6 Hz.

(12) Operate PWR switch of APS to OFF.

(13) Disconnect all power cords and test cords.

(14) Replace cover (if supplied) and restore normal station operation to the near- and far-end stations.

B. Near-End Carrier

3.05 The following procedure should be used to determine the presence of near-end carrier using the 1011-type handset.

(1) Remove cover of DAS 820D-L1 or gain access to DAS 820D-L1A.

(2) Operate 1011 handset TALK MON switch to MON.

(3) Connect leads of 1011 handset to terminals 1 and 2 of TB 1 of DAS 820D-type.

(4) Monitor for carrier (F1 or F2) opposite far-end carrier.

Note: Near-end carrier will be the louder tone of two tones heard in 2-wire arrangements. In 4-wire operation only near-end carrier is present.

(5) Remove 1011 handset and replace cover, if supplied.

3.06 The following procedure measures the frequency of the near-end carrier using the TCTS and two W1AD cords. Greater accuracy can be obtained when using the TCTS.

(1) Remove cover of DAS 820D-L1 or gain access to DAS 820D-L1A.

(2) Using a nearby telephone, instruct the far-end station not to send data until instructed to return station to normal operation.

Warning: To avoid shock hazards, make certain the power sources are turned off before making power connections between units.

(3) Connect one end of the APS interconnection power cord (stored in the CABLES AND SPARE FUSES section of the APS) to the PWR jack of the APS.

(4) Connect the other end of the interconnection power cord to the PWR jack of the TCTS.

(5) Operate the controls of the TCTS in accordance with Table C.

(6) Connect the spade-tip ends of the two W1AD cords to terminals 1 and 2 of TB 1 on DAS 820D-type.

(7) Connect the alligator clip ends of the two W1AD cords to VF-1 and VF-2 screws of TB 1 on the back of the TCTS.

(8) Connect the power cord of the APS to an available 120V 60-Hz ac power source.

(9) Operate the PWR switch of APS to ON.

(10) Monitor the near-end carrier (F1 or F2).

Note: If the near-end station is arranged for mark hold when carrier fails, the SIGSM-ON lamp of the TCTS will be lighted. If the near-end station is arranged for space hold when carrier fails, the SIGSM-ON lamp will not be lighted.

(11) ***Requirement:*** The FREQUENCY DEVIATION meter indicates not less than −6 and not more than +6 Hz.

(12) Operate the PWR switch of the APS to OFF.

(13) Disconnect all test cords.

(14) Replace cover (if supplied) and return the near-end station and the far-end station to normal operation.

4. CARRIER SHIFT TEST

4.01 This test determines if the near-end carrier can be shifted down.

4.02 The following test equipment is required at the station:

- 901B Data Test Set
- W1AD cords, or equivalent (3 required)
- 1011-type handset or portable TCTS.

4.03 The following procedure using the 1011-type handset should be used to determine if the near-end carrier can be shifted down.

(1) Remove cover of DAS 820D-L1, or gain access to DAS 820D-L1A.

(2) Remove customer interface cord from J3 of the DAS, and plug cord from the interface test adapter in its place.

(3) Operate 1011 handset TALK MON switch to MON, and connect leads to terminals 1 and 2 of TB 1 (2-wire) or to terminals 1 and 2, 3 and 4 of TB 1 (4-wire).

(4) Clip one end of W1AD cord to terminal 2 (BA lead) of interface test adapter.

(5) Using free end of WIAD cord, momentarily touch terminal 9 (+24V) of the interface test adapter while monitoring with 1011 handset.

Note: For sets utilizing a current interface, the carrier can be shifted by depressing a key on the associated teletypewriter. Carrier shift can be monitored by a 1011 handset on either terminals 1 and 2 (2-wire) or terminals 1, 2, 3, and 4 (4-wire) of TB 1.

(6) ▶Remove handset and interface test adapter and replace cover, if supplied.◀

4.04 The following procedure is used to measure the frequency of the near-end carrier when it is shifted down.

Carrier Shift Test Measurement

(1) Remove cover of DAS 820D-L1 or gain access to DAS 820D-L1A.

(2) Remove customer interface cord from J3 of DAS, and plug cord from the interface test adapter in its place.

Warning: To avoid shock hazards, make certain the power sources are turned off before making power connections between units.

(3) Connect one end of APS interconnection power cord (stored in the CABLES AND SPARE FUSES section of the APS) to the PWR jack of the APS.

(4) Connect the other end of the power cord to the PWR jack of the TCTS.

(5) Operate the controls of the TCTS in accordance with Table C.

(6) Connect the spade-tip end of two of the W1AD cords to terminals 1 and 2 of TB 1 on the DAS.

(7) Connect the alligator clip ends of the two W1AD cords to VF-1 and VF-2 screws on the back of the TCTS.

(8) Clip the alligator clip end of the third W1AD cord to terminal 9 of the interface test adapter.

(9) Operate the PWR switch of the APS to ON.

(10a) ***Requirement:*** If the near-end station is arranged for mark hold in the idle condition, the meter will indicate not less than −6 and not more than +6 Hz and the SIGSM-ON lamp will be lighted.

(11a) Momentarily connect the third W1AD cord to terminal 9 of the interface test adapter.

(12a) ***Requirement:*** A continuous tone on the speaker will be lower than in Step 10a, FREQUENCY DEVIATION meter indicates not less than −6 and not more than +6 Hz, and SIGSM-ON lamp will not be lighted.

(13b) ***Requirement:*** If the near-end station is arranged for space hold in the idle condition, the FREQUENCY DEVIATION meter will indicate not less than −6 and not more than +6 Hz and the SIGSM-ON lamp will not be lighted.

(14b) Momentarily connect the spade-tip end of the third W1AD cord to terminal 10 of the interface test adapter.

(15b) ***Requirement:*** A continuous tone on the speaker will be higher than in Step 13b, FREQUENCY DEVIATION meter indicates not less than −6 and not more than +6 Hz, and SIGSM-ON lamp will be lighted.

(16) Operate the PWR switch of the APS to OFF.

(17) Disconnect the interconnection power cord and test cords.

(18) End of test.

5. LOOP-BACK TEST

5.01 The loop-back test is required when investigating trouble reports or, at the time of installation, to ensure proper operation of the data station. If the service offering is a voiceband data circuit, the 904-type Data Test Center (DTC) will perform the test; if it is a telegraph channel, the private line telegraph testboard will perform the test.

5.02 Usually, the loop-back test will have been performed prior to dispatching a telephone company employee in response to a trouble report.

5.03 The data station is conditioned for loop-back testing by depressing the TEST key on the front of the DAS or the remote TEST key when remote facilities are installed. The DAS TEST key is a push-push type. It is pressed once to condition the data station for testing and pressed again to release the data station for test mode. The TEST lamp lights when the data station is in the test mode.

5.04 The following test procedures will describe loop-back testing on a station-to-station arrangement. In order to perform a valid loop-back test, the carrier squelch on carrier fail option and the local copy option must be disabled. Refer to

the installation section (591-023-201) for information on removing these options.

A. Distortion Measurement Test Using 911A Data Test Set

5.05 This test measures the loop-back distortion of the data system. The transmit lead is driven by the test sentence generator (TSG). At the receive lead, the data set feeds the data signals to the distortion measuring set (DMS), which measures the distortion introduced by the loop-back mode.

5.06 The block diagram (Fig. 1) shows the equipment set up at the terminal for testing both directions of transmission. This checks the transmitter and receiver of both data sets and the two directions of transmission of the connecting facilities.

5.07 Verify that the test equipment is in good operating condition. Refer to the section entitled 911-Type Data Test Sets (J79911A, B, and C), (103-813-100).

5.08 The following equipment is required at the near-end station:

- 901B Data Test Set
- W1AD cords, or equivalent (two required)
- 911A Data Test Set
- 1W2A cords, or equivalent (two required)
- 2W42A cord, or equivalent
- 2W20A cord, or equivalent.

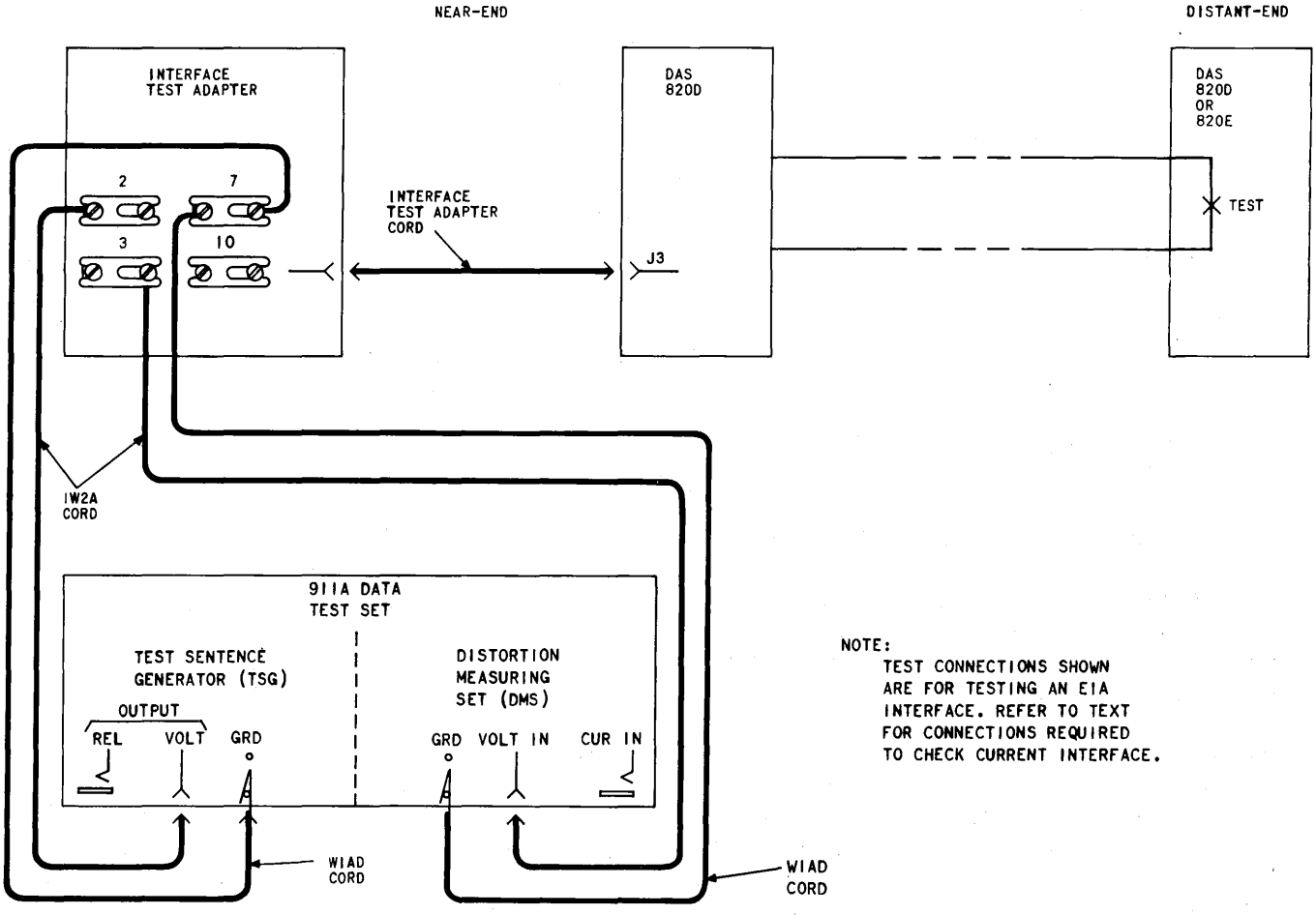

Fig. 1—Distortion Test Using 911A Data Test Set

Note: If 2W42A cord is not available, the equivalent cord must be equipped with a 310-type plug on one end to be compatible with the REL jack on TSG. If the 2W20A cord is not available, the equivalent cord must be equipped with a 347-type plug on one end to be compatible with the CUR. IN. jack on DMS.

5.09 The following procedure should be used to measure distortion using the 911A Data Test Set.

(1) Remove customer interface cord from J3 of DAS 820D-type, and connect interface test adapter in its place.

(2) Set controls of TSG as follows:

AUTO. MAN. STEP to AUTO.

BAUDS to speed desired

BIAS to 0

CODE to code desired

DIST 1% to 0

DIST 5% to 0

REPEAT to OFF

RY OR U* to OFF

OUTPUT to EIA for EIA interface; OUTPUT to REL for current interface.

(3) ▶For EIA interface: use a 1W2A cord to connect from the OUTPUT VOLT jack on the TSG to terminal 2 (BA lead) of the interface test adapter. Connect a W1AD cord from GRD on the TSG to terminal 7 (AB lead) of the interface test adapter. (See Fig. 1).

(4) For current interface: use a 2W42A cord to connect from the REL jack of the TSG to the interface test adapter. The black wire of the 2W42A cord connects to terminal 2 (BA lead) and the white wire to terminal 10 (−24 volts) of the interface test adapter.◀

(5) Set controls of the DMS as follows:

BAUDS to speed desired

CODE to code desired

DISCR% to 5

FILTER to OUT

INPUT to EIA for EIA interface; INPUT to REV 20 for current interface

PARITY to OFF

AUTO PK-PIP to PIP.

(6) ▶For EIA interface: use a 1W2A cord to connect from the VOLT IN jack on the DMS to terminal 3 (BB lead) on the interface test adapter. Connect a W1AD cord from GRD on the DMS to terminal 7 (AB lead) of the interface test adapter.

(7) For current interface: use a 2W20A cord to connect from the CUR IN jack of the DMS to the interface test adapter. The red wire of the 2W20A cord connects to terminal 3 (BB lead) and the white wire to terminal 10 (−24 volts) of the interface test adapter.◀

(8) Connect power cord of 911A Data Test Set to 117-volt ac outlet. Turn power switch ON.

(9) ▶Request the far-end station be placed in the test mode.◀

(10) Momentarily operate AUTO PK-PIP switch to PK and then back to PIP.

(11) Operate RESET switch on DMS to prepare set to receive incoming signals.

(12) ***Requirements:*** Distortion displayed on pixie tubes should be 15 percent or less.

(13) Set DIST 5% switch on TSG to 25.

(14) Set BIAS switch to SWC.

(15) Set DISCR% switch on DMS to 0.

(16) ***Requirements:*** Distortion displayed on pixie tubes should be less than 40 percent.

Note: This checks the ability of the system to operate at a high distortion rate.

(17) Remove test equipment; return to pretest conditions.

B. Distortion Measurement Test Using 902- and 903-Type Data Test Sets

5.10 This test measures the distortion and error rate of the data system. The transmit lead is driven by 903-type Data Test Set (63-bit word generator). At the receive lead, the data set feeds the data signals to the 902-type Data Test Set (distortion measuring and error checking set). Also at the receive lead, a 903-type Data Test Set is used to deliver to 902-type Data Test Set a signal identical to the signal sent from the transmitting end. The 902-type Data Test Set synchronizes these two signals, measures the peak distortion, and counts the number of errors in the received data. This test can only be made on sets utilizing an EIA interface.

5.11 The block diagram (Fig. 2) shows the equipment set up at the terminal for testing both directions of transmission. This checks the transmitter and receiver of both data sets and the two directions of transmission of the connecting facilities.

Caution: Do not connect the 903-type Data Test Set until all other equipment is connected and all of their switches have been placed to proper settings.

5.12 Verify that test equipment is in good operating condition. Refer to the appropriate sections covering operational and calibration tests. Sections covering data test sets specified in these tests are as follows:

SECTION	TITLE
107-100-100	901A and 901B Data Test Sets—Identification and Operation
107-300-100	902A and 902B Data Test Sets—Identification and Operation
107-200-100	903A and 903B Data Test Sets—Description and Operation

5.13 The following equipment is required at the near-end station:

- Interface Test Adapter J79901B
- 903-type Data Test Sets (two required)
- 902-type Data Test Set
- W2DW cords, or equivalent (three required).

5.14 The following procedure should be used to measure distortion.

Transmit Lead

- ***903-type Data Test Set:***

  RANDOM-DOT to RANDOM

  TRIGGER to +

  BIT RATE to 150.

Note: Set BIT RATE on 903C to 180°. For compatible bit rate, use a 903B and a 902B at the receive lead.

(1) Remove business machine cord from J3 of DAS 820D-type and replace with cord from interface test adapter.

(2) Using W2DW cord, connect from red SIGNAL OUT jack to terminal 2, and from black SIGNAL OUT jack to terminal 7 of the interface test adapter.

(3) Connect the power cord of 903-type Data Test Set to 117-volt ac outlet. Turn power switch ON.

Receive Lead

- ***902-type Data Test Set:***

  BIT RATE to 150

Note: On 902B Data Test Set, set

BIT RATE to 180

Meter selection switch to DIST ADJ

TRIGGER—not required.

- ***903-type Data Test Set:***

  BIT RATE to EXT CLOCK

  RANDOM-DOT to RANDOM

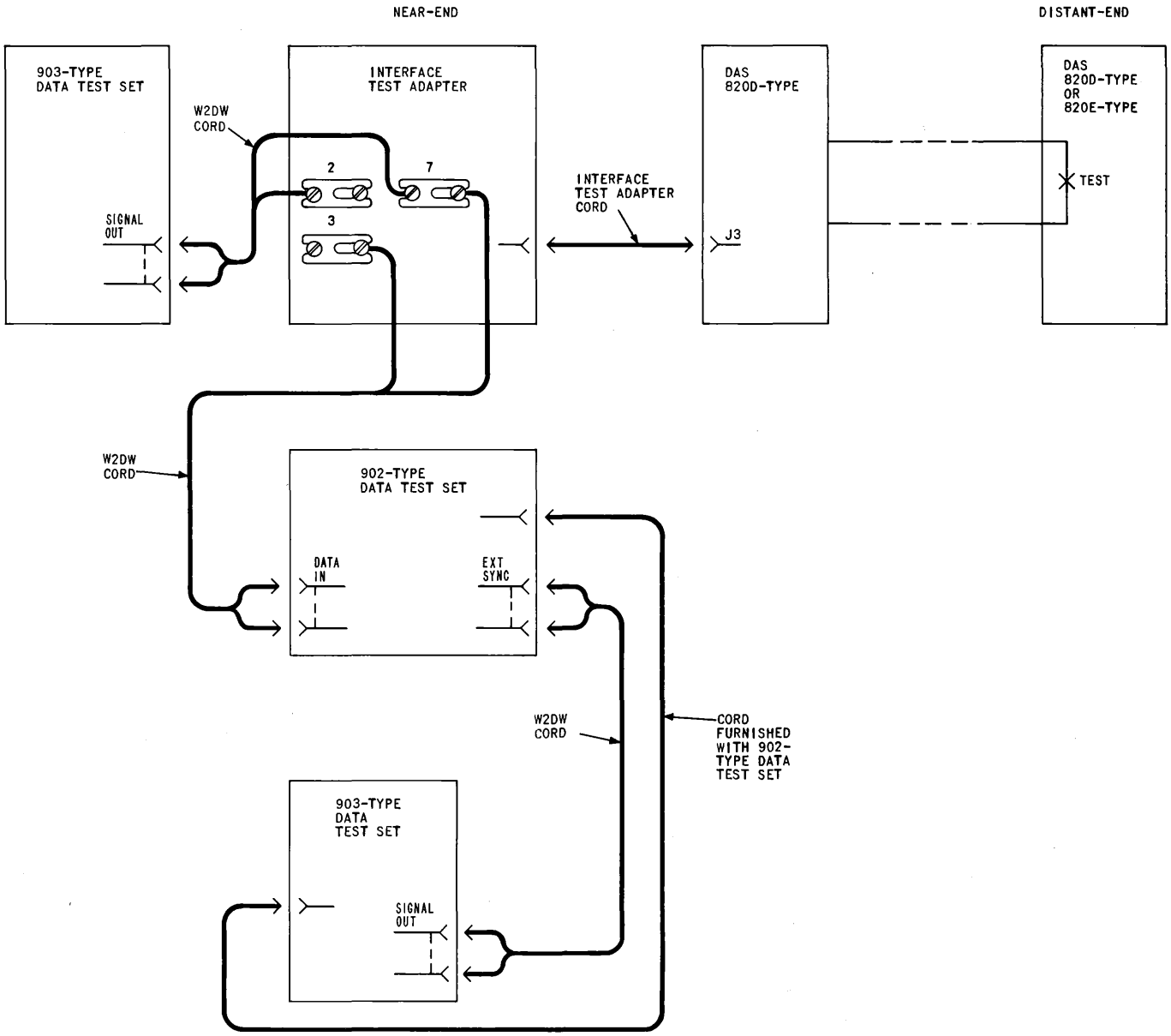

Fig. 2—Distortion Measurement Using 901-, 902-, and 903-Type Data Test Sets

TRIGGER to +.

(4) Using W2DW cord, connect from red DATA IN jack of 902-type Data Test Set to terminal 3, and from black DATA IN jack to terminal 7 of the interface test adapter.

(5) Connect the 903-type set to the 902-type set with the cord provided.

(6) Connect power cord of 903-type set to 117-volt ac outlet. Turn power switch ON.

(7) Request that far end be placed in test mode.

(8) Momentarily depress START button on transmitting 903-type Data Test Set. The transmitting station has no further duties until end of test period.

(9) Allow the 902-type Data Test Set meter selection switch to remain in the DIST ADJ position for several seconds before making distortion calibration adjustment. Zero the meter by means of the DISTORTION adjustment control.

(10) Move the meter selection switch to VOLT ADJ position, and again zero the meter by means of the VOLTS adjustment control.

Note: The BIAS ADJ position on the 902-type Data Test Set is not used in this test.

(11) Move the meter selection switch to PHASE ADJ position, and again zero the meter by means of the PHASE adjustment control.

(12) Move the meter selection switch to DIST MEAS. Depress the WORD SYNC & RESET switch momentarily, and record the time.

(13) The microammeter should settle down to some relatively stable value that indicates peak distortion. One microamp is equal to one percent distortion. For example, a meter indication of 8 microamps would be 8 percent peak distortion.

(14) The TOTAL ERRORS lamps lighted on the 902-type Data Test Set indicate the number of errors in received data from the time the WORD SYNC & RESET switch was released. For example, should the 8, 4, and 1 lamps be lighted, this would be an indication of a total of 13 errors.

(15) ***Requirements:*** 10 percent or less distortion; 2 or less errors in a 5-minute test.

Note: For marginal cases of trouble (ie, customer complains of random errors), 15- to 30-minute tests should be made; same limits should be used.

(16) Disconnect test equipment; return to pretest conditions.

C. Loop-Back Test Using TTS-28 Test Set, or Equivalent

5.15 The following test equipment is required at the near-end station:

- Interface Test Adapter J79901B
- Portable station test set TTS-28, or equivalent
- W1AD cord, or equivalent.

5.16 The following procedure should be used to perform the loop-back test using a TTS-28, or equivalent.

(1) At DAS 820D-type, remove customer interface cord from J3.

(2) Connect interface test adapter to J3 of DAS 820D-type.

(3) Request that far end be placed in the test mode.

(4) Set FUNCTION switch on TTS-28 to 30 VDC.

(5) Connect + (positive) terminal of TTS-28 to interface test adapter, terminal 7 (signal ground).

(6) Connect – (negative) terminal of TTS-28 to interface test adapter, terminal 3 (BB lead).

(7) Meter should read between 5 and 25 volts.

(8) Remove meter leads from interface test adapter.

(9) Clip one end of W1AD cord to terminal 2 (BA) lead of the interface test adapter, and clip other end to terminal 9 (+24V).

(10) Connect – (negative) terminal of TTS-28 to interface test adapter, terminal 7 (signal ground).

(11) Connect + (positive) terminal of TTS-28 to interface test adapter, terminal 3 (BB lead).

(12) Meter should indicate between 5 and 25 volts.

(13) Remove test equipment; return to pretest conditions.

6. POWER SUPPLY MEASUREMENT

6.01 The only equipment required at the station to perform the power unit voltage test is a TTS-28 portable station test set, or equivalent, and a 901B Data Test Set.

6.02 The following procedure should be used to measure the voltage of the 18A power unit.

(1) At the DAS 820D-type, remove the customer business machine cord from J3.

(2) Connect the interface test adapter to J3 on the DAS 820D-type.

(3) Set FUNCTION switch on TTS-28 to 30 VDC.

(4) Connect – (negative) terminal of TTS-28 to interface test adapter, terminal 7.

(5) Connect + (positive) terminal of TTS-28 to interface test adapter, terminal 9.

(6) Meter should indicate 24 ±3 volts.

(7) Remove test lead that was connected in Step (5) from terminal 9.

(8) Exchange test lead from – terminal to + terminal on TTS-28.

(9) Connect – terminal of TTS-28 to interface test adapter, terminal 10.

(10) Meter should indicate 24 ±3 volts.

(11) Remove test leads, remove interface test adapter, and reconnect customer business machine cord disconnected in (1).

7. TRANS-HYBRID LOSS MEASUREMENT

This measurement requires that a 900-ohm termination (quiet line) be placed on the line at either the far end or the near end.

7.01 The following procedure should be used to perform the trans-hybrid loss measurement test.

(1) Request the 900-ohm termination to be placed on the line.

(2) Check the send level of the data set by using TTS-28.

(a) Set FUNCTION switch of TTS-28 to DBM BRDG 0 position.

(b) Connect + and – terminals of TTS-28 to TP1 and TP2 of data set.

(c) Read the meter and record reading.

(3) Set FUNCTION switch of TTS-28 to DBM BRDG –10 position.

(4) Connect + and – terminals of TTS-28 to a good ground and TP3 of data set, respectively.

(5) Meter indication should not be more positive then reading in Step (2)(c).

Note: Meter actually reads at least a 10-dB difference due to the FUNCTION switch being set to –10.

7.02 To meet the requirements of 7.01 and/or reduce crosstalk from the transmitter into the receiver for incoming carrier below –30 dBm, an optimum trans-hybrid balance must be achieved. To verify proper trans-hybrid balance of data set under test, refer to Section 591-023-201 for details of screw switch and strapping arrangements.

8. LOOP-LOSS MEASUREMENT

8.01 This measurement requires the use of the TTS-28 and an oscillator capable of furnishing 1000 Hz and 2300 Hz. The measurement is made as follows.

(1) Remove power from DAS 820D-type and remove cover, or gain access to the DAS.

(2) Disconnect the telephone line from TB 1 terminals 1 and 2 (2-wire) or terminals 1, 2, 3, and 4 (4-wire).

(3) Set FUNCTION switch of TTS-28 to DBM 900Ω TERM 0 position.

(3) Connect + and – terminals of TTS-28 to the telephone line.

(4) Request distant station or STC to send 1000 Hz at 0 dBm.

(5) Read TTS-28 meter.

Note: It may be necessary to set FUNCTION switch of TTS-28 to DBM 900Ω TERM –10 position to obtain reading.

(6) Request distant station or STC to send 2300 Hz at 0 dBm.

(7) Read TTS-28 meter.

(8) Meter readings are the actual measured loss (AML) of the telephone facilities. These readings should be the same as the readings taken during installation of the data station. The station layout card shows the expected measured loss (EML) when the facilities were designed. The readings taken in Steps (5) and (7) should not deviate from the limits shown in Table B. If the AML is not within limits, the loop should be turned back for repair.

Note: The maximum AML possible for station-to-hub configurations should be −16 dB. The maximum AML for station-to-station configurations should be −24 dB.

(9) If AML is within limits, remove connections from TTS-28, replace cover, and restore power to the station.

TABLE C

LOOP LIMITS

TYPE OF LOOP	AML LIMITS
Without repeaters or carriers	EML ±1 dB
With E7 repeaters only	EML ±1 dB
With all other repeaters and/or carriers	EML ±2 dB