

**WIDEBAND DATA STATION USING DATA SET 303-TYPE  
TWO-WIRE SWITCHED SERVICE  
(460.8 Kbps DATA OVER PICTUREPHONE® FACILITIES)**

**TEST PROCEDURES**

CONTENTS	PAGE
<b>1. GENERAL . . . . .</b>	<b>1</b>
<b>2. WIDEBAND DATA STATION TESTS . . . . .</b>	<b>2</b>
<b>A. Wideband Data Station Using Data Set 303J26, Data Auxiliary Set 804A7, and Data Auxiliary Set 806D1—Local Test . . . . .</b>	<b>2</b>
<b>B. Wideband Data Station Using Data Set 303J26, Data Auxiliary Set 804A7, Data Auxiliary Set 806D1, and Data Auxiliary Set 801C4—Local Test . . . . .</b>	<b>6</b>
<b>C. Idle Line Loop-Back Test . . . . .</b>	<b>6</b>
<b>D. Local Test of Remote Test Feature . . . . .</b>	<b>9</b>
<b>E. Interlock Test . . . . .</b>	<b>10</b>
<b>F. Attendant Cooperation for Remote Test . . . . .</b>	<b>11</b>
<b>3. TROUBLESHOOTING . . . . .</b>	<b>12</b>
<b>4. REFERENCES . . . . .</b>	<b>23</b>

**1. GENERAL**

**1.01** This section describes local test procedures for testing the wideband data station (WDS). A local test of the remote test feature is also described. These are 2-wire switched service tests applicable to data on PICTUREPHONE facilities. These tests are to be performed at the time of installation; however, they may also be used in clearing trouble conditions.

**1.02** These tests are arranged in a logical sequence and specify the steps necessary to determine that the data station is operating properly.

**1.03** In this procedure, the indication resulting from switch operation occurs simultaneously with the operation of that switch unless otherwise specified. Controls or indicators not mentioned in the text have no bearing on the test being performed and should be ignored.

**1.04** The craft employee should become familiar with the options installed in the data station. The indications of certain tests are determined by which options are in the data station.

*Note:* The options wired into Data Set (DS) 303 and the other associated apparatus should be recorded on the label placed in the data station cabinet. If the coding of DS 303 is changed by the addition or removal of circuit packs, this should be noted on the label also. This label indication will prevent the problem of identifying the options and changes in apparatus on a subsequent repair visit.

**1.05** Tests are provided for the different features of the data station. The test title denotes the station feature for which the tests are intended.

**1.06** There are two WDS apparatus arrangements. The basic arrangement includes the DS 303J26, Data Auxiliary Set (DAS) 806D1, and DAS 804A7. The automatic calling capability may be provided by the addition of DAS 801C4. When DAS 801C4 is provided, it does not affect the basic station test. All tests in this section should be performed in addition to DAS 801C4 tests as outlined in Section 598-012-501.

**1.07** The WDS is connected to the 114A Interconnecting Unit. The 114A Interconnecting Unit is part of the PICTUREPHONE line facilities; however, it may be located in the WDS cabinet. The complete tests of the 114A Interconnecting Unit are not included in this section. However, test of video call connect (VCC) control logic and

## SECTION 593-800-511

idle loop-back will be performed. For information relative to test of the 114A Interconnecting Unit, refer to Section 463-390-100.

**1.08** Some business machines are capable of performing local tests. It is desirable to use the customer's equipment to determine if the business machine and/or station are operating properly.

**1.09** When the indication or action is as specified, proceed to the next step. If the indication is not as specified in the testing procedure, refer to the corresponding step number in the Troubleshooting Chart.

**Note:** If a trouble is isolated to a 16A1 Data Unit, check the 0.5 ampere fuse accessible from the rear of the unit.

**1.10** Before proceeding with any test of the data station, verify that:

- Wideband and voiceband loops have been tested and meet requirements as specified in appropriate BSPs.
- Telephone portion of installation meets standard dc talk, signaling, and supervision requirements.
- Strapping options agree with service order.
- All connections and connectors are properly made.

## 2. WIDEBAND DATA STATION TESTS

**2.01 General:** The test of a wideband data station is essentially the same whether the system is arranged as a single line or a key telephone station. When the station is provided in a key telephone system arrangement, access to the PICTUREPHONE facilities is provided via the 1P2 key telephone system.

**2.02** This section throughout refers to DAS 804A7; however, a DAS 804A3 may be provided. These tests are applicable to both models.

**2.03** When DAS 801C4 is provided, it does not affect the local test of the WDS. However, if DAS 801C4 is provided, it should be tested per Section 598-012-501.

### A. Wideband Data Station Using Data Set 303J26, Data Auxiliary Set 804A7, and Data Auxiliary Set 806D1—Local Test

**2.04 General:** This WDS arrangement is conditioned to operate synchronously with internal transmit clock and free-running scrambler. An unbalanced customer interface is provided.

**2.05** The local test of this station arrangement may be initiated at the DAS 804A7, DAS 806D1, or the 912A Wideband Data Test Set (WDTS). The local test results should be the same in each case.

**2.06** In the local test mode, data is sent from the 912A WDTS through the DS 303-type, looped on the line side of DAS 806D1, and returned through DS 303 to the 912A. The local test loop-back relays are provided in DAS 806D1. These relays are controlled by the 912A WDTS, business machine, DAS 804A7, or the LT key on DAS 806D1. The DAS 804A7 has control functions that control or condition the WDS for wideband data. This test will verify the following:

- Simultaneous TALK/DATA function.
- Control functions from DAS 804A7 function properly.
- Proper options are installed.
- DS 303-type can accept and react to business machine interface signals.
- Wideband data station can transmit and receive wideband data on a local loop-back within acceptable limits.
- DAS 806D1 functions properly and controls local test.

### 2.07 Equipment Required:

- 1—912A Wideband Data Test Set (WDTS) equipped with J79912AA interface unit.
- 2—310-type plugs equipped with 135-ohm terminations
- 1—Patch cord at least 4 feet long equipped with a 310-type plug on each end.

**2.08 Preparation:**

- (a) Disconnect the DS 303 transmitter and receiver from the 114A Interconnecting Unit as follows:
  - (1) Insert a 310-type plug equipped with a 135-ohm termination into the WB TRANSMITTING—LINE jack on DAS 806D1.
  - (2) Insert a 310-type plug equipped with a 135-ohm termination into the WB RECEIVING—LINE jack on DAS 806D1.
- (b) Connect the wideband data cable from the 912A WDTS to the SYNC connector on DS 303.
- (c) At DAS 806D1, verify that the LT key is in the horizontal position.
- (d) Set the switches on the 912A WDTS as shown in Chart 1.

**CHART 1**

SWITCHES	SETTINGS
TRANSMIT — BIT RATE	EXT
TRANSMIT — TEST SIGNAL	2087
TRANSMIT — TRIGGER	+
TRANSMIT — OUTPUT	NORMAL

**CHART 1 (Cont)**

RECEIVE — BIT RATE	EXT
RECEIVE — TIMING	0
RECEIVE — TEST SIGNAL	2087
RECEIVE — TRIGGER	+
RECEIVE — INPUT	NORMAL
RECEIVE — WORD SYNC	AUTO
RECEIVE — COUNTER	OFF
INTERFACE UNIT — TEST MODE	UNBAL
INTERFACE UNIT — SEND REQ	ON
INTERFACE UNIT — LOCAL TEST	OFF
INTERFACE UNIT — DATA TERM READY	ON
POWER	ON

- (e) Insert one patch cord between DAS 806D1 VB TRANSMITTER—MON jack and the 912A interface, TRMT jack.

**2.09 Procedure:**

STEP	PROCEDURE
1	At the DAS 804A7, lift the handset and depress the TALK button. Observe that the TALK lamp is lighted and all other DAS 804A7 lamps are extinguished.
2	At the DAS 804A7, depress the DATA button and observe that in approximately 5 seconds the WB CHAN lamp lights. Observe that the DATA and TALK lamps are extinguished. (The DATA lamp should have been removed for this station arrangement.)

**SECTION 593-800-511**

STEP	PROCEDURE
3	Return the handset to the cradle and observe that the WB CHAN lamp remains lighted. Verify that all other DAS 804A7 lamps are extinguished.
4	At DAS 804A7, remove handset from the cradle and depress the TALK button. Observe that the TALK and WB CHAN lamps are lighted. All other DAS 804A7 lamps should be extinguished.
5	At DAS 804A7, return the handset to the cradle and observe that all DAS 804A7 lamps are extinguished.
6	At DAS 804A7, remove the handset from the cradle, depress the DATA button, and observe that in approximately 5 seconds the WB CHAN lamp lights. Return the handset to the cradle.
7	At the 912A WDTS, operate the DATA TERM READY switch to OFF. Observe that the NO DATA and NO SYNC lamps are lighted. Observe that the CLEAR TO SEND, DATA SET READY, and AGC lamps are extinguished. Observe that all DAS 804A7 lamps are extinguished.
8	At the 912A WDTS, operate the DATA TERM READY switch to ON.
9	At the DAS 804A7, remove the handset from the cradle, depress the TALK button, observe that the TALK lamp lights, depress the DATA button, and observe that in approximately 5 seconds the WB CHAN lamp lights. Return the handset to the cradle.
10	At the 912A WDTS, observe that the CLEAR TO SEND, DATA SET READY, and NO SYNC lamps are lighted. Observe that the AGC and NO DATA lamps are extinguished.
11	At the 912A WDTS, operate the LOCAL TEST switch to ON. Observe that the NO DATA, NO SYNC, and DATA SET READY lamps are extinguished. Observe that the AGC and CLEAR TO SEND lamps are lighted. At DAS 806D1, observe that the LT lamp is lighted. At the DAS 804A7, observe that the TST lamp is lighted and the WB CHAN lamp is extinguished.
12	At the 912A WDTS, operate the SEND REQ switch to OFF. Observe that the CLEAR TO SEND lamp is extinguished. Observe that the NO SYNC and NO DATA lamps are lighted.
13	Observe that the AGC lamp is lighted.
14	At the 912A WDTS, operate the SEND REQ switch to ON. Observe that the lamp indications are the same as in Step 11.
15	At the 912A WDTS, reset the counter by depressing the RESET button.
16	Operate the COUNTER switch to ON. The counter should not count.
17	At the RECEIVER portion of the 912A WDTS, operate the INPUT switch to INVERTED. Observe that the NO SYNC lamp lights, and the counter counts errors very rapidly.

STEP	PROCEDURE
18	At the RECEIVER portion of the 912A WDTS, operate the INPUT switch to NORMAL, and observe that the counter does not count.
19	At the 912A WDTS, operate the COUNTER switch to OFF.
20	At the 912A WDTS, operate the LOCAL TEST switch to OFF. Observe that the LT lamp on DAS 806D1 is extinguished.
21	At DAS 804A7, observe that the WB CHAN lamp is lighted and all other DAS 804A7 lamps are extinguished.
22	<p>At DAS 804A7, depress the TST button and observe the following lamp indications:</p> <p>912A WDTS:</p> <p>NO DATA—Extinguished</p> <p>NO SYNC—Extinguished</p> <p>DATA SET READY—Extinguished.</p> <p>DAS 804A7:</p> <p>TST—Lighted</p> <p>WB CHAN—Extinguished.</p> <p>DAS 806D1:</p> <p>LT—Lighted.</p>
23	At DAS 804A7, remove handset from cradle and depress the TALK button. Observe that the TST lamp is extinguished and the TALK lamp is lighted. Observe that the WB CHAN lamp is lighted.
24	Depress the DATA button and observe that the WB CHAN lamp remains lighted. Return the handset to the cradle.
25	<p>At DAS 806D1, operate the LT key to the vertical position and observe the following lamp indications:</p> <p>912A WDTS:</p> <p>NO DATA—Extinguished</p> <p>NO SYNC—Extinguished</p> <p>DATA SET READY—Extinguished.</p>

**SECTION 593-800-511**

STEP	PROCEDURE
	<p>DAS 804A7: TST—Lighted WB CHAN—Extinguished. DAS 806D1: LT—Lighted.</p>
26	At DAS 806D1, operate the LT key to the horizontal position and observe that the LT lamp extinguishes.
27	At DAS 806D1, remove the 310-type plugs and patch cord between 912A and DAS 806D1 that were installed in preparation for this procedure.

**B. Wideband Data Station Using Data Set 303J26, Data Auxiliary Set 804A7, Data Auxiliary Set 806D1, and Data Auxiliary Set 801C4—Local Test**

**2.10 General:** The operation and tests of apparatus in this station arrangement are identical to that in part A. However, the addition of DAS 801C4 does provide the automatic calling capability.

**2.11 Equipment Required:**

- (a) No equipment other than that listed in part A is required.

**2.12 Preparation:**

- (a) No preparation is required other than that in part A.

**2.13 Procedure:**

- (a) The addition of DAS 801C4 does not alter the WDS tests. After performing the tests in this section, refer to Section 598-012-501 and perform the test of the DAS 801C4.

**C. Idle Line Loop-Back Test**

**2.14 General:** This test will verify that an idle line loop-back exists in the 114A Interconnecting

Unit. When this loop-back exists, control logic from the 114A Interconnecting Unit is applied to DS 303J26, thereby maintaining the received data in a mark-hold condition. This test will also verify that control logic may be applied to remove this mark-hold condition.

**2.15 Equipment Required:**

- 1—912A Wideband Data Test Set equipped with a J79912AA interface unit
- 1—Shorting wire (approximately 6 inches long) equipped with alligator clips on each end
- 1—Patch cord approximately 6 feet long equipped with 310-type plugs on each end.

**2.16 Preparation:**

- (a) Connect the wideband data cable to the SYNC connector on DS 303J26.
- (b) Operate the controls on the 912A WDTS as specified in Chart 2.
- (c) Insert one patch cord between DAS 806D1, VB TRANSMITTING—MON jack and the 912A WDTS interface, TRMT jack.

(d) Verify that the following conditions exist:

DAS 804A7:

DAS 806D1:

TST button—Released.

LT key—Horizontal position.

CHART 2

SWITCHES	SETTINGS
TRANSMIT — BIT RATE	EXT
TRANSMIT — TEST SIGNAL	2087
TRANSMIT — TRIGGER	+
TRANSMIT — OUTPUT	NORMAL
RECEIVE — BIT RATE	EXT
RECEIVE — TIMING	0
RECEIVE — TEST SIGNAL	2087
RECEIVE — TRIGGER	+
RECEIVE — INPUT	NORMAL
RECEIVE — WORD SYNC	AUTO
RECEIVE — COUNTER	OFF
INTERFACE UNIT — TEST MODE	UNBAL
INTERFACE UNIT — SEND REQ	ON
INTERFACE UNIT — LOCAL TEST	OFF
INTERFACE UNIT — DATA TERM READY	ON
POWER	ON

SECTION 593-800-511

2.17 Procedure:

STEP	PROCEDURE
28	At the DAS 804A7, remove the handset and depress the TALK button. Verify that the TALK lamp is lighted and all other DAS 804A7 lamps are extinguished.
29	At the DAS 804A7, depress the DATA button and verify that in approximately 5 seconds the WB CHAN lamp lights. Return the handset to the cradle and verify that the WB CHAN lamp remains lighted.
30	At the 912A WDTS, reset the COUNTER by depressing the RESET button.
31	Operate the COUNTER switch to ON. Verify that the counter registers errors very rapidly.
32	At the 912A WDTS, verify that the AGC and NO DATA lamps are extinguished and the NO SYNC lamp is lighted.
33	Using strap wire with alligator clips, connect one end to DS 303J26 circuit pack AR513, TP7. Connect the other end to AR513, TP1.
34	At the 912A WDTS, reset the COUNTER by depressing the RESET button.
35	Operate the COUNTER switch to ON. Verify that the counter does not count.
36	At the 912A WDTS, verify that the AGC lamp is lighted.
	<b><i>Read Steps 37, 38, and 39 before proceeding. These steps require the craft employee to simultaneously perform procedure and verification.</i></b>
37	At DS 303J26 circuit pack AR513, remove the shorting wire installed in Step 33.
38	At the 912A WDTS, verify that the counter registers errors.
39	Verify that the AGC and NO DATA lamps extinguish. Verify that the NO SYNC lamp lights.
40	Remove the patch cord between DAS 806D1 and the 912A WDTS that was installed in preparation for this procedure.

**D. Local Test of Remote Test Feature****CHART 3**

**2.18 General:** There are two remote tests: RT1 and RT2. The combination of the two tests provides the serving central office with a means of testing the transmission facilities as well as the data station. The RT1 provides a loop-back connection at the DAS 806D1. The RT2 provides a loop-back connection at the business machine interface.

**2.19** This test provides a means of performing a local test of the remote test feature and also of determining that the station's RT1, RT2, and back-to-normal operating sequence is proper.

**Note:** The idle line loop-back in the 114A Interconnecting Unit is not removed for this test. Therefore, the complete remote test should be performed from a wideband data test bay.

**2.20 Equipment Required:**

1—912A Wideband Data Test Set equipped with a J79912AA interface unit.

**2.21 Preparation:**

- (a) Connect the wideband data cable to the SYNC connector on DS 303J26.
- (b) Operate the controls on the 912A WDTS as specified in Chart 3.
- (c) Insert one patch cord between DAS 806D1, VB TRANSMITTING—MON jack, and the 912A WDTS interface, TRMT jack.
- (d) At DAS 804A7, remove the handset from the cradle. Depress the TALK button and observe that it lights. Depress the DATA button and observe that in approximately 5 seconds the WB CHAN lamp lights.

SWITCHES	SETTINGS
TRANSMIT — BIT RATE	EXT
TRANSMIT — TEST SIGNAL	2087
TRANSMIT — TRIGGER	+
TRANSMIT — OUTPUT	NORMAL
RECEIVE — BIT RATE	EXT
RECEIVE — TIMING	0
RECEIVE — TEST SIGNAL	2087
RECEIVE — TRIGGER	+
RECEIVE — INPUT	NORMAL
RECEIVE — WORD SYNC	AUTO
RECEIVE — COUNTER	OFF
INTERFACE UNIT — TEST MODE	UNBAL
INTERFACE UNIT — SEND REQ	ON
INTERFACE UNIT — LOCAL TEST	OFF
INTERFACE UNIT — DATA TERM READY	ON
POWER	ON

**SECTION 593-800-511**

**2.22 Procedure:**

STEP	PROCEDURE
41	At the 912A WDTS, observe that the CLEAR TO SEND, NO SYNC, and DATA SET READY lamps are lighted. Observe that the AGC and NO DATA lamps are extinguished.
42	At the DAS 806D1, depress and hold the LRT key until the RT1 relay is heard to operate (approximately 6 seconds). If the RT1 relay has operated, the RT1 lamp will light when the LRT key is released.
43	The wideband data station is now in the RT1 mode, and the line is looped in DAS 806D1 toward the 114A Interconnecting Unit. At DAS 804A7, observe that only the TST lamp is lighted.
44	Observe that the DATA SET READY, CLEAR TO SEND, NO DATA, and AGC lamps on the 912A WDTS are extinguished. Observe that the NO SYNC lamp is lighted.
45	At the DAS 806D1, depress the LRT key again and hold (approximately 6 seconds) until both the LT and RT1 lamps are lighted. The data station is now looped on the customer's side of DS 303J26. Observe that the NO DATA and NO SYNC lamps are lighted. Observe that the CLEAR TO SEND and DATA SET READY lamps are extinguished.
46	At the DAS 806D1, depress the LRT key and hold (approximately 6 seconds) until the RT1 lamp extinguishes. Release the LRT key and observe that the LT lamp extinguishes.
47	At the 912A WDTS, observe that the NO DATA and NO SYNC lamps are lighted. Observe that the DATA SET READY, CLEAR TO SEND, and AGC lamps are extinguished.
48	At the DAS 804A7, observe that all lamps are extinguished.

**E. Interlock Test**

**2.23 General:** The interlock test is provided in order to verify a connection between DAS 806D1 and the 114A Interconnecting Unit.

**2.24** This connection may be tested from the central office by placing a PICTUREPHONE call to the wideband data station. Call completion verifies that proper connection exists. The absence of a proper connection is indicated when the central office caller receives a reorder tone.

**2.25 Equipment Required:** There are no special tools or equipment required at the WDS for this test.

**2.26 Preparation:**

- (a) When the 114A Interconnecting Unit is installed in the KS-20018-L4 cabinet, gain access to the rear of the cabinet and disconnect the 840286454 cable plug from the mating connector at the 114A Interconnecting Unit.
- (b) When the 114A Interconnecting Unit is located outside the KS-20018-L4 cabinet, disconnect the plug of the B25A extender cable from the mating connector at the 114A Interconnecting Unit.
- (c) If other WDS or PICTUREPHONE facilities are associated with the same key telephone

system as the station being tested, it will be necessary to remove the power cord from each of these other stations for the duration of this test.



**Alert the responsible central office craft employee that this test may activate a major alarm.**

- (d) Establish voice contact between the WDS and the serving test center (STC) over a separate telephone if available.

**2.27 Procedure:**

STEP	PROCEDURE
49	At the STC, place a PICTUREPHONE call to the WDS that is to be tested.
50	At the STC, verify that reorder or busy back tone is heard, then hang up.
51	At the 114A Interconnecting Unit, re-establish the cable connection. The plug should be properly mated with the connector and pressed firmly into position.
52	At the STC, place a PICTUREPHONE call to the WDS that is to be tested.
53	At the STC, verify voice communication with the WDS and verify that no reorder or busy back tone is heard.
	<i>If power cords were removed in preparation for this procedure, the power cords should now be reinserted.</i>

**F. Attendant Cooperation for Remote Test**

**2.28 General:** This test is written to alert the attendant of action that may be required at the wideband data station (WDS). The remote tests are to be performed at, and under control of, the serving test center (STC).

**2.29** This is a test of the wideband and voiceband data channels from the STC to the WDS. The STC must place a PICTUREPHONE call to the data station under test. At the WDS, the attendant will depress the TALK button and answer the call. The STC will send a 2800-Hz tone for 10 seconds. The attendant must listen for reception of this tone and, upon tone ending, replace the handset on-hook. This procedure will remove the maintenance loop-back provided by the 114A Interconnecting Unit in idle line condition. No

further action is required by the attendant as the WDS will automatically return to idle condition when the test is terminated.

**2.30 Equipment Required:** No test equipment is required at the WDS. However, if the 912A WDTS is being used, it may remain connected for this test. At the STC, the 915 wideband data test bay (WDTB) provides the necessary rack-mounted equipment for performing the wideband test.

**2.31 Preparation:** Prepare the WDS for test as follows:

- (a) Establish voice contact between the WDS and the STC over a separate telephone. If a separate telephone is not available, use DAS 804A7 and, after establishing procedure, return handset to cradle.

**2.32 Procedure:**

STEP	PROCEDURE
54	At the STC, 915 WDTB, make preparations to perform remote test 1.
55	At the STC, place a PICTUREPHONE call to the WDS that is to be tested. If the automatic answer feature is provided, it should not be activated for this test.
56	At the WDS, depress the TALK button and answer the call.  <i>Next step requires the WDS attendant to listen for an indication.</i>
57	At the STC, send 2800-Hz tone to the WDS for 10 seconds.
58	At the wideband data station, listen for tone. When the tone ceases (when handset receiver goes dead), return the handset to the cradle.  <i>Analysis:</i> The wideband data station is now in the RT1 mode and the signal is looped at DAS 806D1. The appropriate test may now be performed from the STC. Following the release of RT1 mode, RT2 can be established. At the end of the remote test sequence, the station is automatically released from the test mode.

**3. TROUBLESHOOTING****3.01 General:**

- (a) The preceding tests are designed to determine if the data station is operating properly. If the data station does not meet the conditions specified in the tests, refer to the Troubleshooting Chart to determine the most probable cause of the trouble.
- (b) The step numbers in the Troubleshooting Chart correspond to the test step numbers. When performing a test and indications are not as specified, refer to the same step number in the Troubleshooting Chart.
- (c) There will not be a step in the Troubleshooting Chart for each step in the test charts. Some of the steps in the test charts specify procedure and do not require an indication.

**3.02 Equipment Required:**

- 1—748A extractor tool (WEC0)
- 1—KS-14510 meter (or equivalent).

**3.03 Troubleshooting Procedure:** Before performing any troubleshooting procedure, check the following for obvious causes of trouble:

- Loose cords, connectors, connections, etc
- Incorrect interconnections or options
- Broken wires
- Physical damage
- Correct power
- RT or LT.

**3.04** If the control or indicator does not pass the test as specified, refer to the Troubleshooting Chart for the correct condition of the control or indicator and the most probable cause of trouble as indicated in the "Data Set", "Circuit Pack", and "Remarks" columns. If the unit under the "Data Set" column is verified to be operating properly and the trouble still exists, a point-to-point check of the interconnecting wiring is necessary.

**3.05 Use of Remote Test Feature:**

(a) Remote tests can be used to make certain checks of the station as an aid in isolating trouble. Although the remote tests do not check the control functions, they do provide a means of checking the station and transmission facilities. In RT2, a signal can be sent from a distant station to the station under test. The signal is received, looped at the customer's interface, and transmitted back to the distant station. If the signals received at the distant station are the same as those transmitted, then the station under test can be assumed to be operating properly. If the signals received at the distant station are not the same as those transmitted, then the station under test or the facility is operating improperly.

(b) Make sure that the station is conditioned for the test being performed. If the RT1 lamp is lighted but should not be, the station may have been accidentally put in a remote test condition or baseband local test condition. To return the station to the normal operating condition, disconnect the power cord from the power receptacle. Reconnect the power cord and condition the system as specified in the test being performed.

**3.06 Replacing Circuit Packs:**

(a) When performing steps of a certain test and the data station fails, this may indicate

a specific circuit pack, in which case the circuit pack most likely to be bad will be indicated. When data station trouble has been isolated to a particular data set or data auxiliary set, the trouble may be corrected by replacing a circuit pack.

(b) When replacing a circuit pack, verify that the correct options, and no others, are installed on the new circuit pack for that particular data station arrangement.

(c) If the trouble cannot be isolated to a particular circuit pack within a data set or data auxiliary set, replace all circuit packs within the defective data set or data auxiliary set as follows:

(1) Replace circuit packs one at a time until the trouble is corrected.

(2) Reinstall all original circuit packs one at a time, except for the new one which corrected the trouble. It will, of course, remain in the data set.

(3) If, after replacing an original circuit pack, the data set does not function properly, that circuit pack is obviously defective and should also be replaced.

## TROUBLESHOOTING CHART

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK OR DATA UNIT	REMARKS
1	DAS 804A7: TALK  DATA  WB CHAN  TST  AUTO	Lighted  Extinguished  Extinguished  Extinguished  Extinguished	DAS 804A7  DAS 804A7  DAS 804A7  DAS 806D1 DAS 806D1  DAS 806D1 DAS 804A7	3A2 Data Unit   3A2 Data Unit  CP CS4  10A3 Data Unit  CP CS4	The DATA lamp is removed from DAS 804A7 for this station arrangement.
2	DAS 804A7: WB CHAN    TALK	Lighted    Extinguished	DAS 804A7  DAS 806D1  DAS 804A7	3A2 Data Unit  10A3 Data Unit CP CS4  3A2 Data Unit	Refer to Section 593-800-211 and verify DAS 806D1 options.
3	DAS 804A7: WB CHAN  TALK  AUTO  TST	Lighted  Extinguished  Extinguished  Extinguished	DAS 806D1 DAS 804A7  DAS 804A7  DAS 806D1  DAS 806D1	CP CS4  3A2 Data Unit  3A2 Data Unit  CP CS4  10A3 Data Unit	

## TROUBLESHOOTING CHART (Cont)

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK OR DATA UNIT	REMARKS
4	DAS 804A7: TALK	Lighted	DAS 804A7	3A2 Data Unit	
	WB CHAN	Lighted	DAS 804A7	3A2 Data Unit	
			DAS 806D1	CP CS4  10A3 Data Unit	
	TALK	Extinguished	DAS 804A7	3A2 Data Unit	
	AUTO TST	Extinguished Extinguished	DAS 806D1 DAS 806D1	CP CS4  10A3 Data Unit	
5	DAS 804A7: TALK	Extinguished	DAS 804A7	3A2 Data Unit	
	WB CHAN	Extinguished	DAS 806D1	CP CS4  10A3 Data Unit	
	AUTO	Extinguished	DAS 806D1	CP CS4	
	TST	Extinguished	DAS 806D1	10A3 Data Unit	
6	DAS 804A7: WB CHAN	Lighted	DAS 806D1	CP CS4  10A3 Data Unit	



## TROUBLESHOOTING CHART (Cont)

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK OR DATA UNIT	REMARKS
11	912A WDTS: NO DATA NO SYNC	Extinguished	DS 303J26 DAS 806D1	AR361 10A3 Data Unit	Remove the 16A1 Data Unit located in DS 303J26. Observe the NO DATA and NO SYNC lamps. If the lamps are as specified in the test, the 16A1 Data Unit is defective.
	DATA SET READY	Extinguished	DS 303J26	AR513 AR135 AR579 AR407	
	AGC	Lighted	DS 303J26	AR135	
	CLEAR TO SEND	Lighted	DS 303J26	AR513 AR361	
	DAS 806D1: LT	Lighted	DS 303J26	AR135	
			DAS 806D1	10A3 Data Unit	
			DS 303J26	AR135	
	DAS 804A7: TST	Lighted	DAS 806D1	10A3 Data Unit	
	WB CHAN	Extinguished	DAS 806D1	10A3 Data Unit	
12	912A WDTS: CLEAR TO SEND	Extinguished	DS 303J26	AR135	
	NO DATA	Lighted	DS 303J26	16A1 Data Unit AR135	
	NO SYNC	Lighted	DS 303J26	16A1 Data Unit	
13	912A WDTS: AGC	Lighted	DS 303J26	AR513 AR361	
14	Same as Step 11.	Same as Step 11.	Same as Step 11.	Same as Step 11.	

**SECTION 593-800-511**

**TROUBLESHOOTING CHART (Cont)**

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK OR DATA UNIT	REMARKS
16	912A WDTS: COUNTER	Does not register errors.	DS 303J26		Replace circuit packs per paragraph 3.06 (c).
17	912A WDTS: NO SYNC COUNTER	Lighted Registers errors very rapidly.			If indications are not as specified in the test, then replace the 912A WDTS.
18	912A WDTS: COUNTER	Does not register errors.	DS 303J26		Replace circuit packs per paragraph 3.06 (c).
20	DAS 806B7: LT	Extinguished	DAS 806D1 DS 303J26	10A3 Data Unit AR135	
21	DAS 804A7: WB CHAN  AUTO TST  TALK	Lighted  Extinguished Extinguished  Extinguished	DAS 806D1  DAS 806D1 DAS 806D1  DAS 804A7	CP CS4  10A3 Data Unit CP CS4 10A3 Data Unit 3A2 Data Unit	
22	912A WDTS:  Same as Step 11.  DAS 806D1: LT	Same as Step 11.  Lighted	Same as Step 11.  DAS 806D1	Same as Step 11.  10A3 Data Unit	If lamps are not as specified in Step 11, the trouble is most likely in DAS 804A7.

## TROUBLESHOOTING CHART (Cont)

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK OR DATA UNIT	REMARKS
23	DAS 804A7: TST  TALK  WB CHAN	Extinguished  Lighted  Lighted	DAS 806D1  DAS 804A7  DAS 806D1	10A3 Data Unit  3A2 Data Unit  10A3 Data Unit	
24	Same as Step 6.	Same as Step 6.	Same as Step 6.	Same as Step 6.	
25	Same as Step 11.	Same as Step 11.	Same as Step 11.	Same as Step 11.	If the lamp indications are not as specified in Step 11, then replace the 10A3 Data Unit located in DAS 806D1.
26	DAS 806D1: LT	Extinguished	DAS 806D1	10A3 Data Unit	
28	DAS 804A7: TALK  WB CHAN AUTO TST	Lighted  Extinguished Extinguished Extinguished	DAS 804A7  DAS 806D1 DAS 806D1 DAS 806D1	3A2 Data Unit  CP CS4 CP CS4  10A3 Data Unit	
29	DAS 804A7: WB CHAN	Lighted	DAS 806D1  DAS 804A7	10A3 Data Unit  CP CS4  3A2 Data Unit	
31	912A WDTS: COUNTER	Registers errors very rapidly.	DS 303J26	AR513	Verify that ground exists at DAS 806D1 on TB1-55. If ground does not exist, trouble is in the 114A Interconnecting Unit.

## TROUBLESHOOTING CHART (Cont)

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK OR DATA UNIT	REMARKS
32	912A WDTS: AGC  NO DATA NO SYNC	Extinguished  Extinguished Lighted	DS 303J26  DS 303J26 DS 303J26 DAS 806D1	AR513 AR361 16A1 Data Unit  AR135 AR407 10A3 Data Unit	
35	912A WDTS: COUNTER	Does not register errors.	DS 303J26	AR513	If counter registers errors after replacing AR513, perform a local test.
36	912A WDTS: AGC	Lighted	DS 303J26	AR361 AR135	
38	912A WDTS: COUNTER	Registers errors very rapidly.	DS 303J26	AR513	See Remarks for Step 31.
39	Same as Step 32.	Same as Step 32.	Same as Step 32.	Same as Step 32.	
41	912A WDTS: CLEAR TO SEND NO SYNC NO DATA DATA SET READY AGC	Lighted  Lighted Extinguished Lighted Extinguished	DS 303J26  DS 303J26 DS 303J26 DS 303J26 DS 303J26	AR135  AR135 AR135 AR135 AR513 AR361	

## TROUBLESHOOTING CHART (Cont)

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK OR DATA UNIT	REMARKS
42	DAS 806D1: RT1 Relay	Is heard to operate.	DAS 806D1	AR122 10A3 Data Unit	Depressing the LRT key simulates the effect of the 2800-Hz central office tone.
	RT1 Lamp	Lighted	DAS 806D1	10A3 Data Unit	
43	DAS 804A7: TST	Lighted	DAS 806D1	10A3 Data Unit	
	All other DAS 804A7 lamps	Extinguished			
44	912A WDTS: DATA SET READY	Extinguished	DS 303J26	AR135	
			DAS 806D1	10A3 Data Unit	
	CLEAR TO SEND	Extinguished	DS 303J26	AR135	
			DAS 806D1	10A3 Data Unit	
	AGC	Extinguished	DS 303J26	AR513	
		DAS 806D1	10A3 Data Unit		
	NO SYNC	Lighted	DS 303J26	AR513	
	NO DATA	Extinguished	DS 303J26	16A1 Data Unit	
45	DAS 806D1: LT	Lighted	DAS 806D1	AR122 10A3 Data Unit	
	RT1	Lighted			
	912A WDTS: NO DATA	Lighted	DS 303J26	AR135	
	NO SYNC	Lighted			
	CLEAR TO SEND	Extinguished			
	DATA SET READY	Extinguished			

## TROUBLESHOOTING CHART (Cont)

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK OR DATA UNIT	REMARKS
46	DAS 806D1: RT1 LT	Extinguished Extinguished	DAS 806D1	10A3 Data Unit AR122	
47	912A WDTS: NO DATA NO SYNC DATA SET READY CLEAR TO SEND AGC	Extinguished Lighted Extinguished Extinguished Extinguished	DS 303J26	AR135	
48	DAS 804A7: All lamps	Extinguished	DAS 806D1	10A3 Data Unit	
50	STC: Reorder tone	Reorder or busy back tone heard.	114A Interconnect- ing Unit		If tone is not heard, trouble may also be in PICTUREPHONE facilities.
53	STC: Reorder tone  Voice Communica- tion	No busy back or reorder tone heard.  Satisfactory	114A Interconnect- ing Unit  DAS 804A7	Telephone network	This indicates the absence of ground between DAS 806D1 and the 114A Interconnecting Unit.  Two-wire voice line may also be causing the trouble.

**4. REFERENCES**

**4.01** The circuit descriptions (CDs) and schematic drawings (SDs) for the apparatus included in the data over PICTUREPHONE facilities type wideband data station are as follows:

- SD-1D219-01 and CD-1D219-01—10A3 Data Unit
- SD-1D100-01 and CD-1D100-01—Data Set 303-Type
- SD-1D103-01 and CD-1D103-01—Data Auxiliary Set 801C4
- SD-1D050-01 and CD-1D050-01—3A-Type Data Unit
- SD-1D218-01 and CD-1D218-01—32A-Type Data Unit
- SD-1D217-01 and CD-1D217-01—Data Auxiliary Set 806D-Type
- SD-1D041-01 and CD-1D041-01—Data Auxiliary Set 804A
- SD-69904-01 and CD-69904-01—114A Interconnecting Unit.

**4.02** Bell System Practices covering the various equipment in the station are as follows:

SECTION	TITLE
593-012-100	Data Set 303-Type, Description
590-100-106	10A-Type Data Unit, Identification
590-100-113	16A1 Data Unit, Identification
598-030-100	Data Auxiliary Set 804A-Type, Identification and Connections
598-012-101	Data Auxiliary Sets 801C3 and 801C4, Description and Operation
463-390-100	"PICTUREPHONE®" Connecting Arrangement PVF, 114A Interconnecting Unit, Description
598-077-100	Data Auxiliary Set 806D1, Description
590-100-122	32A-Type Data Unit, Description and Operation