

**WIDEBAND DATA STATION USING DATA SET 303-TYPE  
50-KBPS GOVERNMENT SECURE SPEECH SERVICE  
TEST PROCEDURES**

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<b>1. GENERAL</b> . . . . .	1	<b>1.01</b> This section describes local test procedures for testing the wideband data station. A test of the remote test circuit is also described. These tests are to be made at the time of installation. They can also be used in clearing trouble conditions. These tests are arranged in a logical sequence and specify the steps necessary to determine that the data station is operating properly.
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TABLE A

TEST REFERENCE TABLE FOR DATA AUXILIARY SET 824A1

OPERATIONAL ARRANGEMENT OF DAS 824A1	PERFORM TEST						
	2.07	2.16	2.22	2.23	2.29	2.38	2.43
Option Z	X					X	
Option Z, T1WM-4	X					X	X
Option Y		X				X	
Option Y, T1WM-4		X				X	X
Option X			X				
Option W				X		X	
Option W, T1WM-4				X		X	X
Option V					X	X	
Option V, T1WM-4					X	X	X

**1.06** 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.

**1.07** 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.
- Strapping options agree with service order.
- All connections and connectors are properly made.

## 2. WIDEBAND DATA STATION TEST

**2.01** This 303-type wideband data station is usually operated synchronously with internal transmit clock and no scrambler. The tests of the station are essentially the same whether the station is operating restored polar or dc-coupled balanced line signal. The differences are noted in the following procedure.

**2.02** This is a local test of the wideband data station (WDS). The local test mode may be initiated only at the DAS 806.

**2.03** In the local test mode, data is sent from the 912A Wideband Data Test Set (WDTS) to DAS 824A1. The DAS 824A1 will recognize 50 kilobit per second (kbps) data and make the necessary switching to connect the Data Set (DS) 303-type to the line. From DS 303, the data is transmitted to the DAS 806. When the DAS 806 is in the local test (LT) mode, the data is looped back on the line side of DAS 806 and is returned to the 912A WDTS via DS 303 and DAS 824A1.

**2.04** If T1WM-4 is provided, it must be tested *only* after this local test has been completed.

**2.05** ♦The T1 carrier Line Terminating Unit (LTU) may be located in the wideband data station cabinet or remotely located from the T1WM-4 up to 750 cable feet. If the trouble indicates the LTU, refer to Section 365-122-503.♦

## OPERATIONAL ARRANGEMENT OF DATA AUXILIARY SET 824A1

**2.06** The wideband data station may be arranged for one of five different station arrangements. Each station is to be tested for only one of these arrangements. The test to be performed will be determined by the operational arrangement provided in DAS 824A1. Refer to Table A and determine the test steps to be performed. After completion of each test, return data station to normal.

**A. Four-Wire Voice Frequency—Wideband Circuit to Eight-Wire Line (Option Z)**

**2.07** This test is divided into two parts: wideband and voiceband. Perform the wideband test before performing the voiceband test.

**Wideband Test**

**2.08 General:** This station arrangement will be tested on a local loop-back basis by sending 50-kbps data from the 912A WDTS and verifying that data recognizers A and B properly switch from voice line facilities to wideband line facilities.

**2.09 Equipment Required:**

- 1—912A Wideband Data Test Set equipped with a J79912AA interface unit
- 1—ED-73248-20, group 2 balanced interface cord
- 1—Patch cord at least 2 feet long equipped with 310-type plugs
- 2—310-type plugs equipped with 135-ohm terminations
- 2—310-type plugs equipped with 600-ohm terminations.

**2.10 Preparation:**

- (a) Connect the balanced interface cord to the high-speed connector on the 912A interface.
- (b) Insert P1 of the balanced interface cable assembly ED-73248-20, group 2 into J2 of the DAS 824A1, also P2 into J1.
- (c) Verify that the LT key on DAS 806 is in the horizontal (off) position.
- (d) At the DAS 806, insert a 310-type plug equipped with a 135-ohm termination into the following jacks:

WB TRANSMITTING—LINE

WB RECEIVING—LINE.

- (e) At the DAS 806, insert a 310-type plug equipped with a 600-ohm termination into the following jacks:

VB TRANSMITTING—LINE

VB RECEIVING—LINE.

- (f) Operate the controls on the 912A WDTS as specified in Chart 1.

CHART 1

SWITCHES	SETTINGS
TRANSMIT—BIT RATE	50
TRANSMIT—TRIGGER	+
TRANSMIT—TEST SIGNAL	2087
TRANSMIT—OUTPUT	NORMAL
RECEIVE—BIT RATE	50
RECEIVE—TRIGGER	+
RECEIVE—TEST SIGNAL	2087
RECEIVE—INPUT	NORMAL
RECEIVE—WORD SYNC	AUTO
RECEIVE—TIMING	0
RECEIVE—COUNTER	OFF
INTERFACE UNIT—TEST MODE	BAL
INTERFACE UNIT—LOCAL TEST	OFF
POWER	ON

**2.11 Procedure:**

STEP	PROCEDURE
1	Verify that the NO DATA and NO SYNC lamps are lighted. Operate the COUNTER switch to ON and verify that errors are registered very rapidly.
2	At DAS 806, using patch cord provided, insert one end into WB TRANSMITTING—MON jack and the other end into WB RECEIVING—MON jack.
3	At the 912A WDTS, verify that the NO DATA and NO SYNC lamps are extinguished and the counter has stopped registering errors.
4	At DAS 806, remove the patch cord installed in Step 2 and verify indications of Step 1.
5	At DAS 806, operate the LT key to the vertical position and observe that the LT lamp lights.
6	At the 912A WDTS, observe that the NO DATA and NO SYNC lamps are extinguished and the counter has stopped registering errors.
7	At DAS 806, operate the LT key to the horizontal position and observe that the LT lamp is extinguished.
8	At the 912A WDTS, observe that the NO DATA and NO SYNC lamps are lighted and the counter registers errors. ♦This completes the test for the wideband portion.♦

**Voiceband Test**

**2.12 General:** This test will be performed by sending a 1-kHz signal from the 21A transmission measuring set (TMS) through the DAS 824A1 into DAS 806. Here the signal will be looped back on the line side of DAS 806 and monitored on the customer side of DAS 824A1. A test will also be made to determine if the voiceband lines are properly terminated while transmitting wideband data.

**2.13 Equipment Required:**

- 1—21A Transmission measuring set or equivalent 600-ohm measuring set
- 1—Shorting wire approximately 6 inches long equipped with alligator clips on each end
- 1—3W2A cord or equivalent
- 1—3P14A cord or equivalent

2—3P17A cords or equivalent

2—310-type plugs equipped with 135-ohm terminations

2—310-type plugs equipped with 600-ohm terminations

1—Patch cord approximately 2 feet long equipped with a 310-type plug on each end.

**2.14 Preparation:**

- (a) Calibrate the 21A TMS per instruction card attached to the TMS.
- (b) At the 21A TMS, adjust the oscillator output for 0 dBm at 1000 Hz.
- (c) At the 21A TMS, insert the double-plug end of a 3P17A cord into the OSC OUT jack, and insert the 310 plug end into J1 of the DAS 824A1.

(d) At the 21A TMS, insert the double-plug end of a 3P17A cord into the DET IN jack, and insert the 310 plug end into J2 of the DAS 824A1.

VB RECEIVING—LINE.

(e) Insert a 310-type plug equipped with a 600-ohm termination into the following jacks on DAS 806:

(f) Insert a 310-type plug equipped with a 135-ohm termination into the following jacks on DAS 806:

WB RECEIVING—LINE

WB TRANSMITTING—LINE.

VB TRANSMITTING—LINE

**2.15 Procedure:**

STEP	PROCEDURE								
9	◆At the 21A TMS, verify that the DB meter indicates a power not more than -30 dBm, eg, -40 dBm.◆								
10	At DAS 806, using a patch cord equipped with 310-type plugs, insert one end into VB TRANSMITTING—MON jack and the other end into VB RECEIVING—MON jack.								
11	◆At the 21A TMS, verify that the DB meter indicates a power between -1.2 and -1.8 dBm.◆								
12	At DAS 806, remove patch cord installed in Step 10.								
13	At DAS 806, operate the LT key to the vertical position and observe that the LT lamp lights.								
14	◆At the 21A TMS, verify that the DB meter indicates a power between -1.0 and -1.6 dBm.◆								
15	At DAS 806, operate the LT key to the horizontal position and observe that the LT lamp extinguishes.								
16	◆Verify that the DET IN received power is not more than -30 dBm.◆								
17	At DAS 824A1, remove cord plugs from J1 and J2.								
18	At the 21A TMS, insert the double-plug end of a 3P17A cord into the OSC OUT jack and insert the other end (310-type plug) into DAS 806 VB TRANSMITTING—MON jack.								
19	<p>Connect the 241A plug end of a 3W2A cord into the DET IN jack on the 21A TMS. Connect the spade-lug end of the cord at DAS 824A1, TB2 as follows:</p> <table border="0" data-bbox="730 1680 1136 1879"> <thead> <tr> <th data-bbox="730 1680 876 1732">SPADE LUG WIRE COLOR</th> <th data-bbox="990 1680 1136 1732">CONNECT TO TERMINAL</th> </tr> </thead> <tbody> <tr> <td data-bbox="763 1743 844 1774">WHITE</td> <td data-bbox="1047 1743 1079 1774">4</td> </tr> <tr> <td data-bbox="763 1795 844 1827">BLUE</td> <td data-bbox="1047 1795 1079 1827">3</td> </tr> <tr> <td data-bbox="771 1848 836 1879">RED</td> <td data-bbox="1047 1848 1079 1879">—</td> </tr> </tbody> </table>	SPADE LUG WIRE COLOR	CONNECT TO TERMINAL	WHITE	4	BLUE	3	RED	—
SPADE LUG WIRE COLOR	CONNECT TO TERMINAL								
WHITE	4								
BLUE	3								
RED	—								

STEP	PROCEDURE
20	Adjust the 21A TMS to indicate 0 dBm on the DB meter.
21	At DAS 824A1, circuit pack AR281, connect temporary strapping wire to TP14. Connect the other end of strapping wire to circuit pack AR280, TP14.
22	◆Verify that the 21A TMS DB meter indicates a power between -3.1 and -3.7 dBm.◆
23	At DAS 824A1, disconnect the spade lugs of the 3W2A cord from TB2, terminals 3 and 4, and connect between terminals 1 and 2.
24	At DAS 806, remove cord plug from VB TRANSMITTING—MON jack and insert into VB RECEIVING—MON jack.
25	Readjust, if necessary, the output of the 21A TMS for an indication of 0 dBm on the DB meter.
26	At DAS 824A1, circuit pack AR281, remove the strapping wire at TP14 and connect to TP12.
27	◆Verify that the 21A TMS DB meter indicates a power between -3.1 and -3.7 dBm.◆
28	At DAS 824A1, remove strapping wire installed in Step 26.
29	Remove the spade lugs of the 3W2A cord at TB2 of DAS 824A1.
30	Remove cord plug from DAS 806 that was installed in Step 24. This completes the test for the voiceband portion.

**B. Four-Wire Voice Frequency—Wideband Circuit to Eight-Wire Line With 50-KBPS Oscillator (Option Y)**

**2.16** This test is divided into two parts: wideband and voiceband. Perform the wideband test before performing the voiceband test.

**Wideband Test**

**2.17 General:** This test will be performed by sending data from the customer toward the line circuit. This data causes the fooler to turn on and supply an input back to the customer or 912A WDTS. When actual data is being received from the line, the fooler output will cease, thereby allowing the received data to be connected to the customer or 912A WDTS.

**2.18 Equipment Required:**

- 1—912A Wideband Data Test Set equipped with a J79912AA interface unit
- 1—ED-73248-20, group 2, balanced interface cord
- 1—Patch cord at least 2 feet long equipped with 310-type plugs
- 2—310-type plugs equipped with 135-ohm terminations
- 2—310-type plugs equipped with 600-ohm terminations.

**2.19 Preparation:**

- (a) Connect the balanced interface cord to the high-speed connector on the 912A interface.
- (b) Insert P1 of the balanced interface cord into J2 of the DAS 824A1, also P2 into J1.
- (c) Verify that the LT key on DAS 806 is in the horizontal (off) position.
- (d) At the DAS 806, insert a 310-type plug equipped with a 135-ohm termination into the following jacks:

WB TRANSMITTING—LINE

WB RECEIVING—LINE.

- (e) At the DAS 806, insert a 310-type plug equipped with a 600-ohm termination into the following jacks:

VB TRANSMITTING—LINE

VB RECEIVING—LINE.

- (f) Operate the controls on the 912A DTS as specified in Chart 1.

**2.20 Procedure:**

STEP	PROCEDURE
31	At the 912A WDTS, verify that the NO SYNC lamp is lighted and the NO DATA lamp is extinguished.
32	Operate the COUNTER switch to ON and verify that errors are registered very rapidly.
33	At DAS 806, using patch cord provided, insert one end into WB TRANSMITTING—MON jack and the other end into WB RECEIVING—MON jack.
34	At the 912A WDTS, verify that the NO DATA and NO SYNC lamps are extinguished and the counter has stopped registering errors.
35	At DAS 806, remove patch cord installed in Step 33.
36	At the 912A WDTS, observe that the NO DATA and NO SYNC lamps are lighted and the counter counts errors very rapidly.
37	At DAS 824A1, momentarily remove balanced interface cord plugs P1 and P2 and then reinstall.
38	At the 912A WDTS, observe that the NO SYNC lamp is lighted and the NO DATA lamp is extinguished.
39	At DAS 806, operate the LT key to the vertical position and observe that the LT lamp is lighted.
40	At the 912A WDTS, observe that the NO SYNC and NO DATA lamps are extinguished.
41	At the DAS 806, operate the LT key to the horizontal position and observe that the LT lamp is extinguished.
42	Observe at the 912A WDTS that the NO SYNC and NO DATA lamps are lighted. ♦This completes the test for the wideband portion.◀

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**Voiceband Test**

**2.21** The voiceband test for option Y is the same as the voiceband test for option Z. Perform voiceband test for option Z.

**C. Four-Wire Voice Frequency—Wideband Circuit to Four-Wire Voice Frequency—Wideband Circuit With Translator (Option X)**

**2.22** This optional arrangement of DAS 824A1 consists of the DAS 824A1 and associated translator. The test of this arrangement should be performed per Section 598-060-500.

**D. Four-Wire Voice Frequency—Wideband Circuit to Eight-Wire Line With Translator (Option W)**

**2.23** This test is divided into two parts: wideband and voiceband. Perform the wideband test before performing the voiceband test.

**Wideband Test**

**2.24 General:** A customer-owned translator is provided as part of this station arrangement; however, it will not be verified in this test. Data will be sent from the 912A WDTS through the DAS 824A1, DS 303, and into DAS 806. When this 50-kbps data is recognized in the DAS 824A1 transmit path, the logic sequence is such that recognizer A operates before recognizer B. This logic sequence in turn will operate the fooler circuit, thereby supplying a 50-kbps dotting wave back to the customer of 912A WDTS. When data is being received from the line, the fooler output will disconnect, thereby connecting the received data to the customer or 912A WDTS.

**2.25 Equipment Required:**

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

1—ED-73248-20, group 2, balanced interface cord

4—Patch cords at least 2 feet long equipped with 310-type plugs

2—310-type plugs equipped with 135-ohm terminations

2—310-type plugs equipped with 600-ohm terminations

2—Patch cords suitable for patching around the customer-owned translators.

**2.26 Preparation:**

(a) Connect the balanced interface cord to the high-speed connector on the 912A interface.

**THINK** *Do not transpose the transmit and receive pairs.*

(b) Bypass the customer-owned translators at the associated patch field by connecting T1 to T4, R1 to R4, T2 to T3, and R2 to R3.

(c) Verify that the LT key on DAS 806 is in the horizontal (off) position.

(d) At the DAS 806, insert a 310-type plug with a 135-ohm termination into the following jacks:

WB TRANSMITTING—LINE

WB RECEIVING—LINE.

(e) At the DAS 806, insert a 310-type plug equipped with a 600-ohm termination into the following jacks:

VB TRANSMITTING—LINE

VB RECEIVING—LINE.

(f) Insert P1 of the balanced interface cord into J2 of the DAS 824A1, also P2 into J1.

**2.27 Procedure:**

STEP	PROCEDURE
43	At the 912A WDTS, verify that the NO SYNC lamp is lighted and the NO DATA lamp is extinguished.
44	Operate the COUNTER switch to ON and verify that errors are registered very rapidly.

STEP	PROCEDURE
45	At DAS 806, using patch cord provided, insert one end into WB TRANSMITTING—MON jack and the other end into WB RECEIVING—MON jack.
46	At the 912A WDTS, verify that the NO DATA and NO SYNC lamps are extinguished and the counter has stopped registering errors.
47	At DAS 806, remove patch cord installed in Step 45.
48	At the 912A WDTS, observe that the NO DATA and NO SYNC lamps are lighted and the counter counts errors very rapidly.
49	At DAS 824A1, momentarily remove balanced interface cord plugs P1 and P2 and then reinstall.
50	At the 912A WDTS, observe that the NO SYNC lamp is lighted and the NO DATA lamp is extinguished.
51	At DAS 806, operate the LT key to the vertical position and observe that the LT lamp is lighted.
52	At the 912A WDTS, observe that the NO SYNC and NO DATA lamps are extinguished.
53	At the DAS 806, operate the LT key to the horizontal position and observe that the LT lamp extinguishes.
54	Observe at the 912A WDTS that the NO SYNC and NO DATA lamps are lighted. ♦This completes the test for the wideband portion.♦

### Voiceband Test

**2.28** The voiceband test for option W is the same as the test for option Z. Refer to paragraph 2.12 and perform option Z voiceband test.

### E. Eight-Wire Voice Frequency—Wideband Circuit to Eight-Wire Line (Option V)

**2.29** This test is divided into two parts: wideband and voiceband. Perform the wideband test before performing the voiceband test.

### Wideband Test

**2.30 General:** This station arrangement will be tested on a local loop-back basis by sending 50-kbps data from the 912A WDTS and verifying that data recognizers A and B properly switch from voice line facilities to wideband line facilities. When data recognizer A operates, a 10-ohm contact closure is supplied to customer (A). When data recognizer

B operates, a second 10-ohm contact closure is supplied to customer (A).

### 2.31 Equipment Required:

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

1—ED-73248-20, group 2, balanced interface cord

2—310-type plugs equipped with 135-ohm terminations

1—Patch cord at least 2 feet long equipped with 310-type plugs

1—KS-14510 volt-ohm-milliammeter.

### 2.32 Preparation:

(a) Connect the balanced interface cord to the high-speed connector on the 912A interface.

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- (b) Insert P1 of the balanced interface cord into J2 of the DAS 824A1.
- (c) Verify that the LT key on DAS 806 is in the horizontal (off) position.
- (d) At the DAS 806, insert a 310-type plug equipped with a 135-ohm termination into the following jacks:

WB TRANSMITTING—LINE

WB RECEIVING—LINE.

VB TRANSMITTING—LINE

VB RECEIVING—LINE.

- (f) At DAS 824A1, identify, tag, and remove for the duration of this test the wires connected to the following terminals on TB1:

**TERMINALS**

- 27
- 28
- 31
- 32

- (e) At the DAS 806, insert a 310-type plug equipped with a 600-ohm termination into the following jacks:

- (g) Operate the controls on the 912A WDTS as specified in Chart 1.

**2.33 Procedure:**

STEP	PROCEDURE
55	At the 912A WDTS, verify that the NO DATA and NO SYNC lamps are lighted. Operate the COUNTER switch to ON and verify that the counter registers errors very rapidly.
56	▶With the KS-14510 meter conditioned to measure resistance (ohms scale), connect the meter test leads between terminals 27 and 31 on TB1 of the DAS 824A1. Verify that the meter indicates an open circuit (infinite ohms).◀
57	With the KS-14510 meter conditioned to measure resistance, connect the meter test leads between terminals 28 and 32 on TB1 of DAS 824A1. Verify that the meter indicates an open circuit.
58	Insert P2 of the balanced interface cord into J1 of the DAS 824A1.
59	With the KS-14510 meter conditioned to measure 10 ohms, connect the meter test leads between terminals 27 and 31 on TB1 of DAS 824A1.
60	Verify that the meter indicates between 8 and 10 ohms.
61	At the 912A WDTS, verify that the NO DATA and NO SYNC lamps continue to be lighted.
62	At DAS 806, using patch cord provided, insert one end into WB TRANSMITTING—MON jack and the other end into WB RECEIVING—MON jack.
63	At the 912A WDTS, verify that the NO DATA and NO SYNC lamps are extinguished and the counter does not register errors.
64	With the KS-14510 meter conditioned to measure 10 ohms, connect the meter test leads between terminals 28 and 32 on TB1 of DAS 824A1.

STEP	PROCEDURE
65	Verify that the meter indicates between 8 and 10 ohms.
66	At the DAS 806, remove the patch cord installed in Step 62.
67	At the 912A WDTS, observe that the NO DATA and NO SYNC lamps are lighted and the counter counts errors very rapidly.
68	At DAS 806, operate the LT switch to vertical position and observe that the LT lamp lights.
69	At the 912A WDTS, observe that the NO DATA and NO SYNC lamps are extinguished and the counter does not register errors.
70	At DAS 806, operate the LT key to the horizontal position and observe that the LT lamp extinguishes.
71	At the 912A WDTS, observe that the NO DATA and NO SYNC lamps are lighted and the counter counts errors very rapidly.
72	At the DAS 824A1, reconnect the wires to terminals 27, 28, 31, and 32 that were disconnected at the beginning of this test. ♦This completes the test for the wideband portion.♦

**Voiceband Test**

**2.34 General:** This test will be performed by sending a 1-kHz signal from the 21A transmission measuring set (TMS), through the DAS 824A1 into DAS 806. Here the signal will be looped back and monitored on the customer side of DAS 824A1. This test will also determine if the voiceband lines are properly terminated while transmitting wideband data.

**2.35 Equipment Required:**

- 1—21A Transmission measuring set
- 1—Shorting wire approximately 6 inches long equipped with alligator clips on each end
- 1—KS-14510 Volt-ohm-milliammeter
- 1—3P14A Cord or equivalent
- 1—Patch cord equipped with 310-type plugs on each end
- 2—310-Type plugs equipped with 600-ohm terminations

4—310-Type plugs equipped with 135-ohm terminations

2—3W2A Cords or equivalent.

**2.36 Preparation:**

(a) At DAS 806, insert a 310-type plug equipped with a 600-ohm termination into the following jacks:

VB RECEIVING—LINE

VB TRANSMITTING—LINE.

(b) At DAS 806, insert a 310-type plug equipped with a 135-ohm termination into the following jacks:

WB RECEIVING—LINE

WB TRANSMITTING—LINE.

(c) At DAS 824A1, insert a 310-type plug equipped with a 135-ohm termination into J1 and J2.

(d) At DAS 806, verify that the LT key is in the horizontal position.

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(e) Calibrate the 21A TMS per instruction card attached.

SPADE TIP WIRE COLOR	CONNECT TO TERMINAL
WHITE	11
BLUE	12
RED	16

(f) At the 21A TMS, adjust the oscillator output for 0 dBm at 1000 Hz.

(g) At DAS 824A1, TB1, identify, tag, and remove for the duration of this test the leads to external equipment that are connected to terminals 11, 12, 24, and 25.

(i) At the 21A TMS, insert the double-plug end of a 3W2A cord into the DET IN jack. Connect the spade tip end of the cord at DAS 824A1, TB1, as follows:

SPADE TIP WIRE COLOR	CONNECT TO TERMINAL
WHITE	24
BLUE	25
RED	29

(h) At the 21A TMS, insert the double-plug end of a 3W2A cord into the OSC OUT jack. Connect the spade tip end of the cord at DAS 824A1, TB1, as follows:

**2.37 Procedure:**

STEP	PROCEDURE
73	▶At the 21A TMS, verify that the received power is not more than $-30$ dBm, eg, $-40$ dBm.◀
74	At DAS 806, insert the 310-type plug end of a patch cord into the VB RECEIVING—MON jack. Insert the other plug of the cord into the VB TRANSMITTING—MON jack.
75	Verify that the 21A TMS received power is between $-1.2$ and $-1.8$ dBm.
76	Remove the patch cord installed in Step 74.
77	▶Verify that the 21A TMS received power is not more than $-30$ dBm.◀
78	At DAS 806, operate the LT key to the vertical (on) position.
79	Verify that the 21A TMS received power is between $-1.0$ and $-1.6$ dBm.
80	At DAS 824A1, using shorting wire with alligator clips, connect one end to CP AR280—TP14. Connect the other end to CP AR281—TP14.
81	▶Verify that the 21A TMS received power is not more than $-30$ dBm.◀
82	Disconnect shorting wire from CP AR281—TP14 and connect to CP AR281—TP12.
83	▶Verify that the 21A TMS received power is not more than $-30$ dBm.◀
84	Disconnect shorting wire from CP AR281.
85	Verify that the 21A TMS received power is between $-1.0$ and $-1.6$ dBm.

STEP	PROCEDURE								
86	At DAS 806, operate the LT switch to the horizontal position.								
87	Disconnect the 3W2A cord from the 21A TMS, OSC OUT jack. Also, disconnect the spade tips that were connected in 2.36(h). Using a 3P17A cord, connect the 21A TMS, OSC OUT jack to the VB TRANSMITTING—MON jack on DAS 806.								
88	<p>Remove the spade tips that were connected in 2.36(i) and connect at DAS 824A1—TB2 as follows:</p> <table border="0" data-bbox="670 579 1065 768"> <thead> <tr> <th data-bbox="670 579 812 632">SPADE LUG WIRE COLOR</th> <th data-bbox="927 579 1065 632">CONNECT TO TERMINAL</th> </tr> </thead> <tbody> <tr> <td data-bbox="695 642 787 674">WHITE</td> <td data-bbox="987 642 1008 674">3</td> </tr> <tr> <td data-bbox="703 688 779 720">BLUE</td> <td data-bbox="987 688 1008 720">4</td> </tr> <tr> <td data-bbox="711 735 771 766">RED</td> <td data-bbox="987 735 1008 766">—</td> </tr> </tbody> </table>	SPADE LUG WIRE COLOR	CONNECT TO TERMINAL	WHITE	3	BLUE	4	RED	—
SPADE LUG WIRE COLOR	CONNECT TO TERMINAL								
WHITE	3								
BLUE	4								
RED	—								
89	Adjust the output of the 21A TMS for 0 dBm.								
90	At DAS 824A1, CP AR280, connect one end of a strapping wire to TP14. Connect the other end of the strapping wire to CP AR281—TP14.								
91	Verify that the 21A TMS DET IN power is between $-3.2$ and $-3.8$ dBm.								
92	At DAS 824A1, disconnect the spade lugs of 3W2A cable from terminals 3 and 4 and connect to terminals 1 and 2.								
93	Disconnect the 21A TMS OSC OUT from DAS 806 VB TRANSMITTING—MON jack and connect to VB RECEIVING—MON jack.								
94	Adjust the 21A TMS output for 0 dB on meter.								
95	At DAS 824A1, CP AR281, disconnect strap wire from TP14 and connect to CP AR281—TP12.								
96	Verify that the 21A TMS DET IN power is between $-3.2$ and $-3.8$ dBm.								
97	Disconnect strapping wire at CP AR280 and CP AR281 and remove plugs. Also, reconnect wires at DAS 824A1, TB1, that were disconnected in 2.36. ♦This completes the test for the voiceband portion.♦								

**REMOTE TEST**

**2.38** There are two remote tests: RT1 and RT2.

The combination of the two tests provides the serving central office or data test center with a means of testing the transmission facilities as well as the distant data station. The RT1 provides a turnaround connection at the line interface (DAS

806). The RT2 provides a turnaround connection at the customer interface.

**2.39** Steps 98 through 112 provide 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 operation sequence is proper. However, the complete remote test should be performed from a wideband data test bay.

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**2.40 Equipment Required:**

- 1—912A Wideband Data Test Set equipped with a J79912AA interface unit.
- 1—KS-14510 Volt-ohm-milliammeter.
- 2—310-Type plugs equipped with a 135-ohm termination resistor
- 2—Patch cords suitable for patching around the customer-owned translators will be needed if testing optional data station arrangement "W"
- 1—ED-73248-20, group 2, balanced interface cord.

**2.41 Preparation:**

- (a) Operate the controls on the 912A WDTS as specified in Chart 2.
- (b) Connect the balanced interface cord to the high-speed connector on the 912A WDTS.
- (c) At DAS 806, insert a 310-type plug equipped with a 135-ohm termination into the following jacks:  
  
 WB TRANSMITTING—LINE  
  
 WB RECEIVING—LINE.
- (d) If testing optional data station arrangement "W", it will be necessary for the craft employee to patch around or bypass the customer-owned translators as follows.

**THINK** *Do not transpose the transmit and receive pairs.*

Bypass the customer-owned translators at the associated patch field by connecting T1 to T4, R1 to R4, T2 to T3, and R2 to R3.

**2.42 Procedure:**



*Step 98 requires the craft employee to listen for verification. Read entire step before performing procedure.*

**CHART 2**

SWITCHES	SETTINGS
TRANSMIT—BIT RATE	50
TRANSMIT—TRIGGER	+
TRANSMIT—TEST SIGNAL	DOT
TRANSMIT—OUTPUT	NORMAL
RECEIVE—BIT RATE	50
RECEIVE—TRIGGER	+
RECEIVE—TEST SIGNAL	DOT
RECEIVE—INPUT	NORMAL
RECEIVE—WORD SYNC	AUTO
RECEIVE—TIMING	0
RECEIVE—COUNTER	OFF
INTERFACE UNIT—TEST MODE	BAL
INTERFACE UNIT—LOCAL TEST	OFF
POWER	ON

STEP	PROCEDURE
98	At the DAS 806, depress and hold the LRT key until 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.
99	◆Condition the KS-14510 meter to measure resistance (low scale). At DAS 806B7—TB3, connect meter leads between terminals 1 and 3. For DAS 806D1—TB1, connect meter leads between terminals 66 and 68.
100	Verify that meter indicates zero ohms.
101	Move KS-14510 meter leads to terminals 2 and 4 on TB3 for DAS 806B7 or to terminals 67 and 69 on TB1 for DAS 806D1.
102	Verify that the KS-14510 meter indicates zero ohms.
103	Move the KS-14510 meter leads to TB2 terminals 1 and 3 for DAS 806B7 or to terminals 59 and 61 on TB1 for DAS 806D1.
104	Verify that the KS-14510 meter indicates zero ohms.
105	Move the KS-14510 meter leads to TB2 terminals 2 and 4 for DAS 806B7 or to terminals 60 and 62 on TB1 for DAS 806D1.◆
106	Verify that KS-14510 meter indicates zero ohms.
107	At DAS 806, insert P2 of the balanced interface cord into the WB RECEIVING—MON jack and P1 into WB TRANSMITTING—MON jack.
108	At the 912A WDTS, observe that the NO DATA and NO SYNC lamps are lighted.
109	At DAS 806, depress LRT key again and hold (approximately 6 seconds) until both the LT and RT1 lamps are lighted.
110	At the 912A WDTS, observe that the NO DATA and NO SYNC lamps are extinguished.
111	At DAS 806, depress and hold (approximately 6 seconds) until RT1 lamp extinguishes. Release key and observe that the LT lamp extinguishes.
112	At the 912A WDTS, observe that the NO SYNC lamp is lighted. ◆This completes the test for remote tests 1 and 2 and provides back-to-normal operation.◆

#### T1WM-4 WIDEBAND MODEM

**Note:** This test should be performed only after it has been determined that the associated station equipment is functioning properly.

**2.43** This test will determine if the T1WM-4 is operating properly by allowing the tester to perform an error rate count. To perform an error

rate count, the transmitter output of the T1WM-4 must be looped back to the receiver input of the T1WM-4. In this loop-back condition, the 912A WDTS transmits a test signal through the data set into the T1WM-4. The transmitted output of the T1WM-4 is looped back to the receiver input of the T1WM-4 by placing the T1WM-4 in the local test (LT) mode. The 912A WDTS monitors the received test signal. Any variation between

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transmitted and received signals will be registered as an error count.

**2.44 Equipment Required:**

- 1—912A Wideband Data Test Set equipped with a J79912AA interface unit.
- 1—ED-73248-20, group 2, balanced interface cord.
- 2—Patch cords suitable for patching around the customer-owned translators will be needed if testing optional station arrangement "W".

**2.45 Preparation:**

- (a) Connect the ED-73248-20 balanced interface cord to the high-speed connector on the 912A WDTS.
- (b) At the DAS 824A1, insert P2 of the balanced interface cord into J1 and P1 into J2.

- (c) Operate the controls on the 912A WDTS as shown in Chart 1.
- (d) At DAS 806, verify that the LT and RT lamps are extinguished.
- (e) If the T1WM-4 is provided with optional data station arrangement "W", it will be necessary for the craft employee to patch around or bypass the customer-owned translators as follows.

**THINK** *Do not transpose the transmit and receive pairs.*

Bypass the customer-owned translators at the associated patch field by connecting T1 to T4, R1 to R4, T2 to T3, and R2 to R3.

**2.46 Procedure:**

STEP	PROCEDURE
113	At the T1WM-4 modem, remove the REC CONV SIG plug-in unit and observe that the MODEM ALM lamp lights. At the T1WM-4 ALM CONT board, observe that the AR lamp is lighted.
114	At the T1WM-4 ALM CONT board, turn the LT key to the vertical position.
115	Press and release the ACO button.
116	Replace the REC CONV SIG plug-in unit.
117	On the T1WM-4, observe that the AR and MODEM ALM lamps are extinguished.
118	Observe that the ACO and LT lamps are lighted.
119	At this point, the T1 lines should be terminated, and the T1WM-4 wideband data output should be looped back through the data set to the 912A WDTS. At the 912A WDTS, observe that the NO DATA and NO SYNC lamps are extinguished.
120	At the 912A WDTS, reset COUNTER by operating and releasing the RESET button. Operate the COUNTER switch to ON. Observe that the counter does not count.
121	Operate COUNTER switch to OFF.
122	At the T1WM-4 ALM CONT board, return the LT key to the horizontal position and observe that all T1WM-4 lights are extinguished. ♦This completes the test for the T1WM-4.♦

### 3. TROUBLESHOOTING

#### GENERAL

**3.01** 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.

**3.02** 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.

**3.03** There will not be a step in the Troubleshooting Chart for each step in the test procedures. Some of the steps in the test specify procedure and do not require an indication.

**3.04** **Equipment Required:** The 748A extraction tool (WECO) is gradually being replaced by the retaining bar of the data set and data auxiliary sets which have notches for the purpose of removing circuit packs.

**3.05 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.
- Verify correct power.
- Data set accidentally put in RT condition.

**3.06** 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 DEFECTIVE 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.

#### 3.07 Use of Remote Test Feature:

(a) Remote tests from a serving test center can be used to make certain checks of the customer's data 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 or a test center 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. 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.

#### 3.08 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.

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- (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 reinstalling an original circuit pack, the data set does not function properly, that circuit pack is obviously defective and should also be replaced.

**TROUBLE ISOLATING TEST**

**3.09** When the wideband data station does not satisfactorily meet the test step requirements, it may become necessary to isolate the trouble to DAS 824A1, DS 303, or DAS 806. This test will be performed by connecting the 912A WDTS directly to the DS 303. The test signal will be transmitted into DS 303 and will appear on the line side of DAS 806. Here the signal will be manually looped back through the DAS 806 to the DS 303. The received signal will be compared with the transmitted signal and differences will be registered on the 912A WDTS.

**3.10 Equipment Required:**

- 1—912A Wideband Data Test Set equipped with the J79912AA interface unit
- 1—Patch cord at least 2 feet long equipped with 310-type plugs on each end.

**3.11 Preparation:**

- (a) Disconnect the high-speed data cable (P-95M071) between DAS 824A1 and DS 303 from the SYNC connector (J11) on DS 303.
- (b) If patch cords have been installed at DAS 806, remove for the duration of this test and then reconnect.
- (c) Connect the high-speed cable between the 912A WDTS and DS 303 SYNC connector (J11).
- (d) Operate the 912A WDTS controls in accordance with the test being performed.

**3.12 Procedure:**

STEP	PROCEDURE
123	At the DAS 806, verify that the LT key is in the horizontal position.
124	At DAS 806, insert a patch cord between the WB TRANSMITTING—MON jack and WB RECEIVING—MON jack.
125	At the 912A WDTS, observe the status of the NO DATA and NO SYNC lamps. If both lamps are extinguished, proceed to Step 127. If only one lamp is extinguished, proceed to Step 126.
126	At this point, the trouble is most likely in DS 303. However, the trouble may be in DAS 806. Replace the DS 303 circuit packs per 3.08 until the NO DATA and NO SYNC lamps are extinguished and the COUNTER registers no errors. If trouble is suspected in DAS 806, replace the 10A-type Data Unit.
127	At this point, the trouble is most likely in DAS 824A1. To further isolate the trouble to data recognizer A or data recognizer B circuitry, restore the cable (P-95M071) connections between DAS 824A1 and DS 303.
128	At the 912A WDTS, remove the high-speed cable and connect the ED-73248-20 balanced interface cord. At the DAS 806, remove patch cord between WB TRANSMITTING—MON jack and WB RECEIVING—MON jack.

STEP	PROCEDURE										
129	At DAS 824A1, insert P2 of ED-73248-20 balanced interface cable into J1. Insert P1 into WB TRANSMITTING—MON jack on DAS 806.										
130	<p>If the NO DATA and NO SYNC lamps are extinguished and the COUNTER does not register errors, then data recognizer circuitry A is not causing the trouble; therefore, proceed to Step 131. If either the NO DATA or NO SYNC lamp is lighted or if the COUNTER registers errors, replace the following DAS 824A1 circuit packs in the order listed below:</p> <table data-bbox="649 577 1096 745"> <thead> <tr> <th>CIRCUIT PACK</th> <th>CIRCUIT PACK SLOT</th> </tr> </thead> <tbody> <tr> <td>AR283</td> <td>J1</td> </tr> <tr> <td>AR279</td> <td>J3</td> </tr> <tr> <td>AR281</td> <td>J4</td> </tr> </tbody> </table>	CIRCUIT PACK	CIRCUIT PACK SLOT	AR283	J1	AR279	J3	AR281	J4		
CIRCUIT PACK	CIRCUIT PACK SLOT										
AR283	J1										
AR279	J3										
AR281	J4										
131	At this point, the trouble has been isolated to DAS 824A1, most likely data recognizer B circuitry. Remove P1 of the ED-73248-20 balanced interface cable from DAS 806, WB TRANSMITTING—MON jack and install in DAS 824A1, jack J2.										
132	At the DAS 806, install a patch cord between WB TRANSMITTING—MON jack and WB RECEIVING—MON jack.										
133	<p>At the 912A WDTS, observe the status of the NO DATA and NO SYNC lamps. If either lamp is lighted or if the COUNTER registers errors, replace the following DAS 824A1 circuit packs in the order listed below:</p> <table data-bbox="649 1134 1096 1354"> <thead> <tr> <th>CIRCUIT PACK</th> <th>CIRCUIT PACK SLOT</th> </tr> </thead> <tbody> <tr> <td>AR283</td> <td>J2</td> </tr> <tr> <td>AR279</td> <td>J3</td> </tr> <tr> <td>AR281</td> <td>J4</td> </tr> <tr> <td>AR282</td> <td>J5</td> </tr> </tbody> </table>	CIRCUIT PACK	CIRCUIT PACK SLOT	AR283	J2	AR279	J3	AR281	J4	AR282	J5
CIRCUIT PACK	CIRCUIT PACK SLOT										
AR283	J2										
AR279	J3										
AR281	J4										
AR282	J5										
134	◆This completes the trouble isolating test between the DS 303, DAS 806, and DAS 824A1.◆										

## TROUBLESHOOTING CHART

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK	REMARKS
1	912A: NO DATA NO SYNC COUNTER	Lighted Lighted Registers errors.			Verify that the LT lamp on DAS 806 is not lighted.  Verify that the 912A WDTS is operating properly.
3	912A: NO DATA NO SYNC COUNTER	Extinguished Extinguished Does not register errors.	DS 303 DAS 806 DAS 824A1		Perform the Trouble Isolating Test.
5	DAS 806: LT Lamp	Lighted	DAS 806	10A-type Data Unit	
6	912A: NO DATA NO SYNC COUNTER	Extinguished Extinguished Does not register errors. }	DAS 806	10A-type Data Unit	Perform Trouble Isolating Test.
7	DAS 806: LT Lamp	Extinguished	DAS 806	10A-type Data Unit	
8	912A: NO DATA NO SYNC COUNTER	Lighted Lighted Registers errors. }	DAS 806	10A-type Data Unit	
9	21A TMS: DB Meter	Indicates a power not more than -30 dBm.			Verify that the DAS 806 LT lamp is extinguished.
11	21A TMS: DB Meter	Indicates a power between -1.2 and -1.8 dBm.	DAS 824A1	AR281 AR282	

## TROUBLESHOOTING CHART (Cont)

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK	REMARKS
13	DAS 806: LT Lamp	Lighted	DAS 806	10A-type Data Unit	
14	21A TMS: DB Meter	Indicates a power between $-1.0$ and $-1.6$ dBm.	DAS 806	10A-type Data Unit	
15	DAS 806: LT Lamp	Extinguished	DAS 806	10A-type Data Unit	
16	21A TMS: DB Meter	Indicates a power not more than than $-30$ dBm.	DAS 806	10A-type Data Unit	
22	21A TMS: DB Meter	Indicates a power between $-3.1$ and $-3.7$ dBm.	DAS 824A1	AR281 AR282	
27	21A TMS: DB Meter	Indicates a power between $-3.1$ and $-3.7$ dBm.	DAS 824A1	AR281 AR282	
31	912A: NO DATA  NO SYNC	Extinguished  Lighted	DAS 824A1	AR280 AR281 AR282 AR279	The data station may have been left in local test mode.  Verify that DAS 806 LT key is in the horizontal position.
32	912A: COUNTER	Counts errors very rapidly.			See remarks for Step 31.

## TROUBLESHOOTING CHART (Cont)

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK	REMARKS
34	912A: NO DATA NO SYNC COUNTER	Extinguished Extinguished Does not register.	DS 303 DAS 806 DAS 824A1		If either of these conditions are not met, perform the Trouble Isolating Test.
36	912A: NO DATA NO SYNC COUNTER	Lighted Lighted Counts errors very rapidly.	DAS 806	10A-type Data Unit	
38	912A: NO DATA  NO SYNC	Extinguished  Lighted	DAS 824A1  DAS 806	AR280 AR281 AR282 AR279	Verify that the LT key is in the horizontal position.
39	DAS 806: LT Lamp	Lighted	DAS 806	10A-type Data Unit	
40	912A: NO DATA NO SYNC	Extinguished Extinguished	DAS 806 DAS 806	10A-type Data Unit	Perform the Trouble Isolating Test.
41	DAS 806: LT Lamp	Extinguished	DAS 806	10A-type Data Unit	
42	912A: NO DATA NO SYNC	Lighted Lighted	DAS 806 DAS 806	10A-type Data Unit	

## TROUBLESHOOTING CHART (Cont)

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK	REMARKS
43	912A: NO DATA  NO SYNC	Extinguished  Lighted	DAS 824A1  DAS 806	AR280 AR282 AR281 AR279	Verify that DAS 806B7 is not in local test mode.  Verify that the translator has been properly patched out of the circuit.
44	912A: COUNTER	Registers errors very rapidly.			If counter doesn't count, verify that the 912A WDTS is operating properly.
46	912A: NO DATA NO SYNC COUNTER	Extinguished Extinguished Does not register errors.	DS 303 DAS 824A1 DAS 806		Perform the Trouble Isolating Test.
48	912A: NO DATA NO SYNC COUNTER	Lighted Lighted Registers errors very rapidly.	DAS 806	10A-type Data Unit	
50	912A: NO DATA  NO SYNC	Extinguished  Lighted	DAS 824A1	AR280 AR282 AR281 AR279	Verify that the translator has been properly patched out of the circuit.

## TROUBLESHOOTING CHART (Cont)

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK	REMARKS
51	DAS 806: LT Lamp	Lighted	DAS 806	10A-type Data Unit	
52	912A: NO DATA NO SYNC	Extinguished } Extinguished }	DS 303 DAS 824A1 DAS 806		Perform Trouble Isolating Test.
53	DAS 806: LT Lamp	Extinguished	DAS 806	10A-type Data Unit	
54	912A: NO DATA NO SYNC	Lighted } Lighted }	DAS 806	10A-type Data Unit	
55	912A: NO DATA NO SYNC COUNTER	Lighted } Lighted } Registers } errors very } rapidly. }	DAS 806	10A-type Data Unit	The DAS 806 was probably put in the local test mode. Verify that the LT lamp is extinguished. If not, operate LT key to horizontal position.
56	KS-14510 Meter	Meter should indicate open circuit.	DAS 824A1	AR281	
57	KS-14510 Meter	Meter should indicate open circuit.	DAS 824A1	AR281	
60	KS-14510 Meter	Meter indicates between 8 and 10 ohms.	DAS 824A1	AR281 AR283 AR279	There are two AR283 circuit packs. Replace the CP in slot J1.
61	912A: NO DATA NO SYNC	Lighted Lighted			Data Auxiliary Set 806 is probably in the local test mode.

## TROUBLESHOOTING CHART (Cont)

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK	REMARKS
63	912A: NO DATA NO SYNC COUNTER	Extinguished Extinguished Does not register errors.	DAS 824A1 DAS 806 DS 303		Perform Trouble Isolating Test.
65	KS-14510 Meter	Meter indicates between 8 and 10 ohms.	DAS 824A1		If the results of Step 63 are satisfactory, replace CP AR281.
67	912A: NO DATA NO SYNC COUNTER	Lighted Lighted Registers errors very rapidly.	DAS 806	10A-type Data Unit	The DAS 806 may be in local test mode. Operate the LT switch to the horizontal position.
68	DAS 806: LT Lamp	Lighted	DAS 806	10A-type Data Unit	
69	912A: NO DATA NO SYNC COUNTER	Extinguished Extinguished Does not register errors.	DAS 806	10A-type Data Unit	
70	DAS 806: LT Lamp	Extinguished	DAS 806	10A-type Data Unit	
71	912A: NO DATA NO SYNC COUNTER	Lighted Lighted Registers errors very rapidly.	DAS 806	10A-type Data Unit	
73	21A TMS: DB Meter	Indicates a power not more than -30 dBm.	DAS 806	10A-type Data Unit	

## TROUBLESHOOTING CHART (Cont)

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK	REMARKS
75	21A TMS: DB Meter	Indicates a power between $-1.2$ and $-1.8$ dBm.	DAS 824A1 DAS 806	AR281 AR282 10A-type Data Unit	
77	21A TMS: DB Meter	Indicates a power not more than $-30$ dBm.	DAS 806	10A-type Data Unit	
79	21A TMS: DB Meter	Indicates a power between $-1.0$ and $-1.6$ dBm.	DAS 806	10A-type Data Unit	
81	21A TMS: DB Meter	Indicates a power not more than $-30$ dBm.	DAS 824A1	AR281	If wideband tests have been performed, replace AR281 in DAS 824A1.
83	21A TMS: DB Meter	Indicates a power not more than $-30$ dBm.	DAS 824A1	AR281	If wideband tests have been performed, replace AR281 in DAS 824A1.
85	21A TMS: DB Meter	Indicates a power between $-1.0$ and $-1.6$ dBm.	DAS 824A1	AR281	
91	21A TMS: DB Meter	Indicates a power between $-3.2$ and $-3.8$ dBm.	DAS 824A1	AR281	
96	21A TMS: DB Meter	Indicates a power between $-3.2$ and $-3.8$ dBm.	DAS 824A1	AR281	

## TROUBLESHOOTING CHART (Cont)

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK	REMARKS
98	DAS 806: RT1 Relay RT1 Lamp	Heard to operate. Lighted	DAS 806	AR122 10A-type Data Unit	
100	KS-14510 Meter	Indicates zero ohms.	DAS 806	AR122 10A-type Data Unit	If Steps 100, 102, 104, and 106 do not meet their requirements, replace CP AR122. If at least one of these steps do not meet requirements, then replace the 10A-type Data Unit.
102	KS-14510 Meter	Indicates zero ohms.	DAS 806	AR122 10A-type Data Unit	
104	KS-14510 Meter	Indicates zero ohms.	DAS 806	AR122 10A-type Data Unit	
106	KS-14510 Meter	Indicates zero ohms.	DAS 806	AR122 10A-type Data Unit	
108	912A: NO DATA NO SYNC	Lighted Lighted	DAS 824A1 DAS 806	AR281 10A-type Data Unit	
109	DAS 806: LT RT1	Lighted Lighted	DAS 806	10A-type Data Unit	
110	912A: NO DATA NO SYNC	Extinguished Extinguished	DAS 824A1 DAS 806 DS 303	AR281 10A-type Data Unit	To verify DS 303, perform the wideband test applicable to the optional arrangement of DAS 824A1.
111	DAS 806: RT1 LT	Extinguished Extinguished	DAS 806	10A-type Data Unit	

## TROUBLESHOOTING CHART (Cont)

STEP	CONTROL OR INDICATOR	NORMAL CONDITION	DEFECTIVE DATA SET OR DATA AUXILIARY SET	REPLACE CIRCUIT PACK	REMARKS
112	912A: NO SYNC	Lighted	DAS 824A1 DAS 806	AR281 10A-type Data Unit	
113 thru 122					If Steps 113 through 122 are not as specified in the test, the trouble is probably in the T1WM-4 modem. Refer to Section 365-121-500.

## 4. REFERENCES

4.01 The circuit descriptions (CDs) and schematic drawings (SDs) for the apparatus included in the 4-wire point-to-point (Government Secure Speech Service) type data station are as follows:

- CD- and SD-1D100-01 Data Set 303-Type
- CD- and SD-1D097-01 Data Auxiliary Set 806B7
- CD- and SD-1D217-01 Data Auxiliary Set 806D-Type
- CD- and SD-1D218-01 Data Unit 32A-Type
- CD- and SD-1D134-01 Data Auxiliary Set 824-Type.

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

## SECTION

## TITLE

593-012-100	Data Set 303-Type, Description	103-221-100	J94021A (21A) Transmission Measuring Set (Range: 20 to 20,000 Cycles Sending and Receiving), Description.◀
598-042-100	Data Auxiliary Set 806B-Type, Description and Operation	598-077-100	Data Auxiliary Set 806D-Type, Identification
		590-100-106	10A-Type Data Unit, Identification and Operation
		598-060-100	Data Auxiliary Set 824A-Type, 50-Kilobit Data Recognizer, Description
		365-121-100	T1WM-4 Wideband Modem, Description
		365-122-100	T1 Carrier System Terminal, J98713F Line Terminating Unit, Description
		104-400-100	912A Wideband Data Test Set, Description and Operation
		590-100-122	32A-Type Data Unit, Description and Operation