

**TD-3 MICROWAVE RADIO**  
**J68386G AND J68386H TRANSMITTER-RECEIVER BAYS**  
**RECEIVER TESTS USING ED-50996-10 PORTABLE TEST EQUIPMENT**  
**IF RETURN LOSS MEASUREMENT**

This appendix supplements Section 411-504-502.

It is reissued to add:

- A caution to be observed when working on a system equipped with Hot Standby/Space Diversity Switching.
- Chart D to correct the former measurement procedure which permitted measuring through IF cables.

The preliminary checks in Section 411-502-500 should be completed before performing the tests in this appendix.

The recommended maintenance interval for these tests is given in the Equipment Test List.

*Caution 1: These tests are performed on an out-of-service basis. Obtain a release from the designated control office and remove the channel from service as directed by local practice.*

*Caution 2: Before working on Hot Standby/Space Diversity equipped bays, consult Section 411-600-500 for forced switching procedures to be followed to remove service from the desired receiver. Exercise extra caution during tests since the transmitter in this bay may be carrying service.*

**CHART A**  
**IF MAIN AMPLIFIER**

**APPARATUS:**

- 1—ED-50996-10 Portable Test Arrangement
- 1—KS-20114, L2 Adjusting Tool

STEP	PROCEDURE
1	Prepare test set in accordance with Exhibit 1.

CHART A (Cont)	
STEP	PROCEDURE
2	Operate the MAN-AGC switch on the IF main amplifier to the MAN position.
3	Press the RCVD CARR PWR pushbutton on the meter panel.  <i>Requirement: Between 70 and 90.</i>  If this requirement is not met, adjust the MAN GAIN control until the meter indicates 80.
4	Perform preparation for test and check of test setup in Exhibit 2.
5	Connect the unit under test to the UNKNOWN terminal of the return loss bridge in accordance with Exhibit 2, option (B).
6	Measure the return loss at the IF IN and IF OUT jacks as directed in the measurement procedure in Exhibit 2.  <i>Requirement: Input return loss at the IF IN jack: greater than 30 dB between 60 and 80 MHz. Output return loss at the IF OUT jack: greater than 30 dB between 60 and 80 MHz.</i>  If the requirement is not met for input return loss, adjust RL1 until the requirement is met.  If the requirement is not met for output return loss, adjust RL2 until the requirement is met. It may be necessary to terminate the IF IN jack with a 442A plug when measuring the output return loss.  If either requirement cannot be met, replace the IF main amplifier.
CHART B  IF PREAMPLIFIER	
<b>APPARATUS:</b>  1—ED-50996-10 Portable Test Arrangement 1—KS-20481, L1 Adjusting Tool	
STEP	PROCEDURE
1	Remove the flexible waveguide section from between the 1433 receiver channel network and the 19A isolator.

<b>CHART B (Cont)</b>	
<b>STEP</b>	<b>PROCEDURE</b>
2	Connect a shorting plate ahead of the 19A isolator and terminate the 1433 receiver channel network with a shorting plate.
3	Prepare test set in accordance with Exhibit 1.
4	Perform preparation for tests and check of test setup in Exhibit 2.
5	Remove the cable from the IF OUT jack on the IF preamplifier and connect the UNKNOWN plug of the return loss bridge to the IF OUT jack.
6	Measure the output return loss as directed in the measurement procedure in Exhibit 2.  <i>Requirement: 33 dB minimum between 60 and 80 MHz.</i>  <i>Caution: Use the proper adjusting tool to avoid damaging the RL control.</i>  If the requirement is not met, adjust the RL control. If the requirement still is not met, replace the defective unit in accordance with Section 411-504-503 and return the defective unit to a maintenance center.
7	Reconnect the cable to the IF OUT jack on the IF preamplifier.
8	Remove the shorting plates and replace the flexible waveguide section.
<b>CHART C</b>	
<b>IF NETWORKS</b>	
<b>APPARATUS:</b>	
1—ED-50996-10 Portable Test Arrangement	
<b>STEP</b>	<b>PROCEDURE</b>
1	Prepare test set in accordance with Exhibit 1.
2	Perform preparation for test and check of test setup in Exhibit 2.
3	Terminate the other jack of the network with a 368A plug except when testing the 1042A network. Terminate the other jack of the 1042A network with a 442A plug.
4	Using the measurement procedure in Exhibit 2, measure the return loss and check for conformance with the requirements listed in Table A.

CHART C (Cont)

STEP	PROCEDURE
5	<p>If any of the requirements are not met, measure the return loss directly at the port in question. It may be necessary to remove the network for access. If the requirement still is not met, replace the network. If the network now meets requirements, check the cable and connectors for damage. Replace any damaged cables.</p> <p>Restore all cable connections</p>

TABLE A  
 IF NETWORK – RETURN LOSS REQUIREMENTS

NETWORK	FREQUENCY	MINIMUM REQUIREMENT – dB	
		INPUT	OUTPUT
918A	BETWEEN 62 AND 78 MHz BETWEEN 60 AND 80 MHz	30 27	30 27
918B	BETWEEN 62 AND 78 MHz BETWEEN 60 AND 80 MHz	30 27	30 27
918C	BETWEEN 60 AND 80 MHz	30	30
919A	BETWEEN 62 AND 78 MHz BETWEEN 60 AND 80 MHz	30 27	30 27
919B	BETWEEN 62 AND 78 MHz BETWEEN 60 AND 80 MHz	30 27	30 27
920A	BETWEEN 62 AND 78 MHz BETWEEN 60 AND 80 MHz	30 27	30 27
1042A	BETWEEN 62 AND 78 MHz BETWEEN 60 AND 80 MHz	25 23	25 23

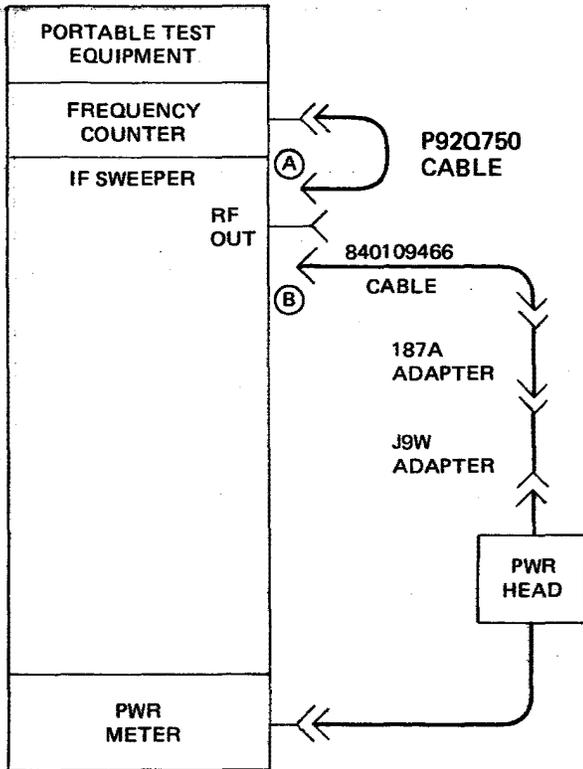
CHART D  
INTERCONNECTING BAY CABLES

APPARATUS:

1—ED-50996-10 Portable Test Arrangement

STEP	PROCEDURE
1	Prepare test set in accordance with Exhibit 1.
2	Connect cable to the UNKNOWN plug on the return loss bridge in accordance with Exhibit 2, Option (B).
3	Terminate the other end in a 368A or 442A plug using the appropriate adapter.
4	Using measurement procedure in Exhibit 2, measure return loss.  <i>Requirement:</i> Greater than 32 dB between 60 and 80 MHz.
5	Repeat Steps 2 through 4 for the other end of the cable. If the requirement in Step 4 cannot be met, replace the cable.
6	Restore all cable connections.

**SECTION 411-504-502PT**  
**APPENDIX 1**

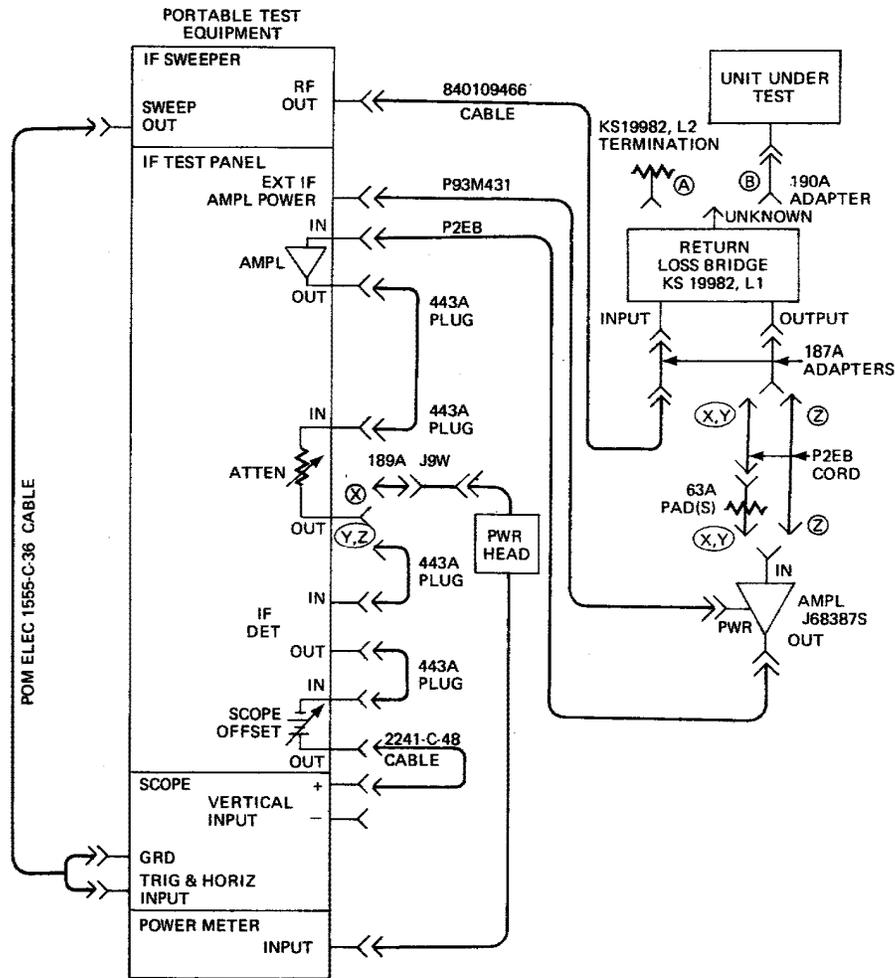


UNIT	CONTROL	POSITION
SWEEPER	PUSH ON-OFF	ON
	SWEEP SECONDS	.01
	SWEEP SECONDS VERNIER	CLOCKWISE
	RECUR-TRIG-LINE	RECUR
	VERNIER	0
	MODE	CW
	MODE VERNIER	CALIB
	EXT'L/INT'L SWEEP (REAR)	INT'L
	F1-START	60 MHz
	F2-STOP	80 MHz
IF PLUG-IN	MARKER 1	60 MHz
	MARKER 2-FC	70 MHz
	MARKER 3	80 MHz
	MARKERS ADJ	MID-RANGE
	MARKERS	MARKERS
	RETRACE	RETRACE
PWR METER	LEVELER	LEVELER
	1 kHz	OFF
	RF LEVEL	1 mw
PWR HEAD	LINE	ON
	SCALE ILLUM RANGE	MID-RANGE 0 dBm
COUNTER	% EFF	100
	FREQ A (kHz)	10 ms
	DISPLAY TIME	MINIMUM
	INPUT B/INT OSC	INT OSC
	GAIN	MAX
	NORM-TEST (AC TEST DC)	NORM (AC)

**PREPARATION FOR TEST**

1. Insert Kruse 5007-1 IF plug-in and associated scale into 5000A sweeper.
2. Connect test setup option (A) for measuring sweeper frequency.
3. Position test equipment controls. (See above table.)
4. Adjust sweeper MARKER 2-FC control until counter reads  $70 \pm 0.1$  MHz.
5. Connect option (B).
6. Adjust sweeper RF LEVEL control for a power meter measurement of 0 dBm,  $\pm 0.2$  dBm.

**Preparation of Test Equipment to Send IF**  
**Exhibit 1**



**PREPARATION FOR TEST**

1. Set IF test panel ATTN to 8 dB and power meter RANGE control to -5 dBm.
2. Connect option (X). Use 20 dB and 30 dB 63A pads in series between return loss bridge and test panel amplifier.
3. Adjust EXT AMPL GAIN control on IF test panel for a power meter reading of -7.0 dBm, ±0.1 dBm. (Meter scale reading of -2.0 dBm, ±0.1 dBm.)
4. Set sweeper MODE control to WIDE F1-F2.
5. Set scope controls.

CONTROL	POSITION
VERTICAL POSITION	MIDRANGE
SENSITIVITY	2MV/DIV
+ INPUT	DC
- INPUT	OFF
BW LIMIT	IN
HORIZONTAL POSITION	MIDRANGE
EXT. HORIZ. V/DIV	0.5
COUPLING	DC
OFFSET	
INPUT SELECT	OFF

6. Connect option (Y).
7. On IF test panel, adjust SCOPE OFFSET control until trace appears on scope center horizontal line.
8. Adjust scope HORIZONTAL POSITION and EXT HORIZ controls so that the two end markers coincide with full horizontal deflection.

9. While switching IF test panel ATTN control to 9 dB and back to 8 dB, adjust scope VERTICAL POSITION and SENSITIVITY controls for one division deflection. This calibrates scope for 1 dB/DIV.
10. Set ATTN control for 8 dB.

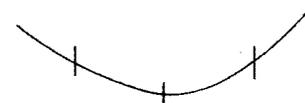
**CHECK OF TEST SETUP**

1. Connect options (A) and (Z).
2. The trace shall be below scope center horizontal line. If this requirement is not met, recheck test setup and preparation for test.
3. Remove option (A).

**MEASUREMENT PROCEDURE**

1. Connect option (B) and (Y).
2. Option (Y) pad combinations.  
 IF MAIN AMPLIFIER 20 dB  
 IF PREAMPLIFIER 10 dB and 7 dB  
 IF NETWORKS (SEE TABLE A.)
3. To meet requirements, the trace shall be entirely below scope horizontal center line with 70 MHz point at lowest point on trace. (See example.)

Example:



**IF Return Loss Measurement  
Exhibit 2**