

<p>TD-3 MICROWAVE RADIO</p> <p>J68386G AND J68386H TRANSMITTER-RECEIVER BAYS</p> <p>TRANSMITTER TESTS USING KRUSE 52011 IF/RF TEST SET</p> <p>IF RETURN LOSS MEASUREMENTS</p>	
<p>This appendix describes the procedures for using the Kruse 52011 IF/RF Test Set to measure the return loss of the various IF units in the transmitter portion of the radio bay.</p> <p>It is reissued to add a caution to be observed when working on a system equipped with Hot Standby/Space Diversity Switching.</p> <p>The preliminary checks in Section 411-502-500 should be completed before performing the tests in this appendix.</p> <p>The recommended maintenance interval for these tests is given in the Equipment Test List.</p> <p><i>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.</i></p> <p><i>Caution 2: On Hot Standby/Space Diversity equipped bays, consult Section 411-600-500 for forced switching procedures to remove service from the desired transmitter. Exercise extra caution during tests since the receiver in this bay may be carrying service.</i></p>	
<p>CHART A</p> <p>IF LIMITER-CARRIER RESUPPLY</p>	
<p>APPARATUS:</p> <p>1—Kruse 52011 IF/RF Test Set 1—KS-20114, L2 Adjusting Tool</p>	
STEP	PROCEDURE
1	<p>When performing the main station transmitter tests, disconnect the cable at the IF IN jack of the IF limiter-carrier resupply and terminate the end of the cable with a 188A adapter and a 20 dB, 19A pad. Also perform this step when testing any transmitter equipped for hot standby operations.</p>

CHART A (Cont)

STEP	PROCEDURE
	<p><i>Note:</i> Terminating the cable is necessary to prevent reflections that might otherwise impair transmission in the signal (service-carrying) path back at the 100A transmitting IF switch bay (frequency diversity systems) or in the service-carrying transmitter (Hot Standby/Space Diversity Systems).</p>
2	Connect the P-48N309 cable assembly between test points TP1 and TP5 on the IF limiter-carrier resupply. (This disables the carrier resupply.)
3	Remove the normal connection from the IF OUT jack and insert a 442A plug.
4	Perform preparation for test in Exhibit 1.
5	<p>Measure return loss at the IF IN jack.</p> <p><i>Requirement:</i> Greater than 30 dB between 60 and 80 MHz.</p> <p>If the requirement is not met, adjust the IN RL1 and IN RL2 controls for the best return loss.</p> <p>If the requirement still is not met, replace the IF limiter-carrier resupply with a spare unit and repeat Steps 2 through 5.</p>
6	Remove the 442A plug from the IF OUT jack and insert it into the IF IN jack.
7	<p>Measure the return loss at the IF OUT jack.</p> <p><i>Requirement:</i> Greater than 28 dB between 60 and 80 MHz.</p> <p>If the requirement is not met, adjust the OUT RL1 and OUT RL2 controls.</p> <p>If the requirement still is not met, replace the IF limiter-carrier resupply and repeat Steps 2 through 7.</p>
8	Remove the P-48N309 cable assembly from between TP1 and TP5 and restore normal bay connections.

CHART B

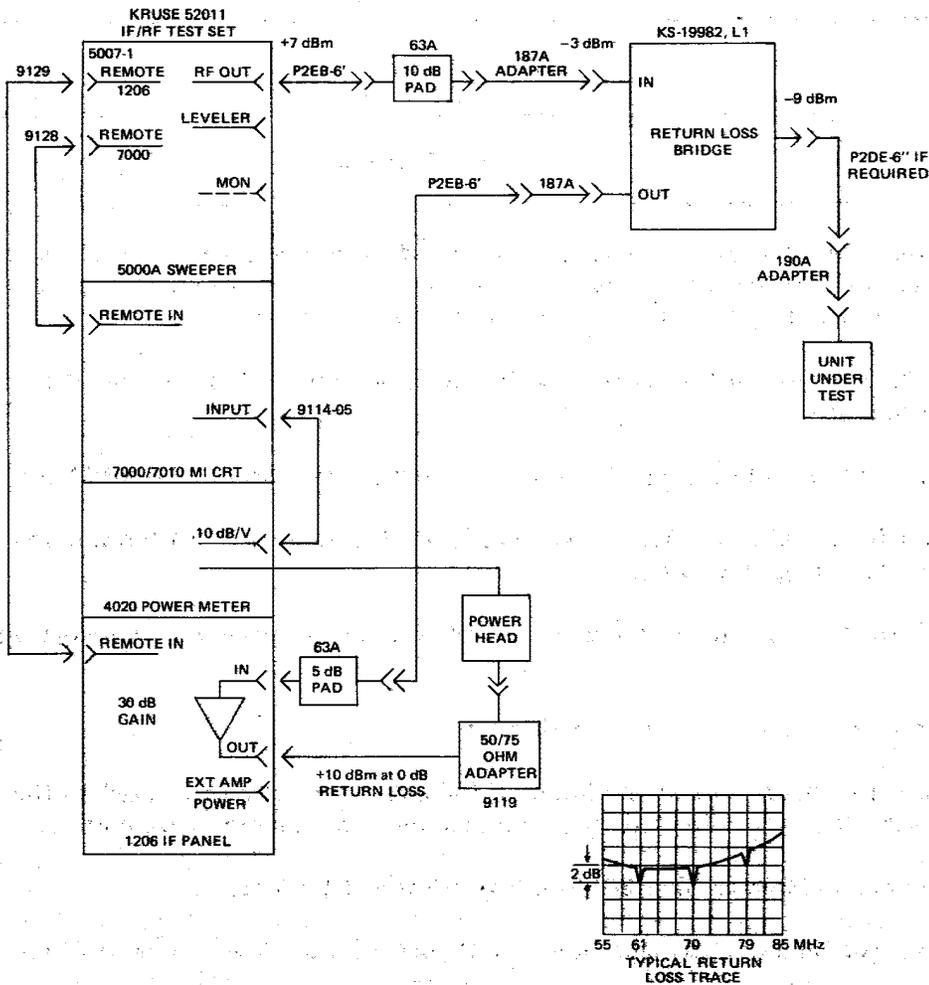
IF DRIVER AMPLIFIER

APPARATUS:

- 1—Kruse 52011 IF/RF Test Set
- 1—KS-20114, L2 Adjusting Tool

CHART B (Cont)	
STEP	PROCEDURE
	<p><i>Caution: Step 1 should always be performed before connecting or disconnecting test apparatus to the output of the 30A integrated circuit in order to prevent potentially hazardous RF power radiating from that port while it is unterminated.</i></p>
1	Remove drive to the transmitter by disconnecting plug P14 from the IF IN jack of the IF driver amplifier.
2	Remove the flexible waveguide section located at the output of the 30A integrated circuit.
3	Using a KS-19751, L20 flexible waveguide bend, connect a 552A termination to the output of the 30A integrated circuit.
4	Terminate the waveguide going to the 1432 transmitter channel network with a shorting plate.
5	Perform preparation for test in Exhibit 1.
6	<p>Measure the return loss at the input to the cable normally connected to the IF driver amplifier IF IN jack as directed in the measurement procedure in Exhibit 1.</p> <p><i>Requirement: Greater than 30 dB between 60 and 80 MHz.</i></p> <p>If the requirement is not met, adjust RL1 and RL2 for the best return loss.</p> <p>If the requirement still is not met, replace the IF driver amplifier with a spare as directed in Section 411-506-503.</p>
7	Restore all normal connections. Connect plug P14 to the IF IN jack of the IF driver amplifier only after the flexible waveguide section has been replaced.

SECTION 411-506-502PT
APPENDIX 2



PREPARATION FOR TEST

1. Insert IF plug-in 5007-1 into sweeper and operate controls on test set.

UNIT	CONTROL	POSITION
5000A SWEEPER	F-1 START	55 MHz
	MARKER 1	61 MHz
	MARKER 2-Fc	70 MHz
	MARKER 3	79 MHz
	F-2 STOP	85 MHz
	VERNIER	MAX CW
	RF LEVEL	+7 dBm
	1 kHz	OFF
	LEVELER	INT
	RETRACE	ON
	MARKERS	OFF
	RECUR-TRIG-LINE	RECUR
	MODE	CW
	Fc ± Δ F VERNIER	MAX CW
SWEEP SECONDS	.01	
SWEEP SECONDS VERNIER	MAX CW	
EXT/INT'L SWEEP (REAR)	INT'L	
7000-M1/ 7010-M1 CRT DISPLAY SCOPE	OFFSET	MIDSCALE (DO NOT READJUST)
	GAIN	X1
	POLARITY	+UP
	BW	30 kHz
	INPUT	DC
4020 POWER METER	LEVEL	10 DB/V
	GROUNDING	INT
	OFFSET	MIDSCALE

2. Connect power meter head to CAL OUT jack. Depress DBM CAL key and adjust its control for +10.00 dBm reading. Depress ZERO key and adjust its control for 00.00±.01 reading. Depress DBM 75 ohm key. Establish the connections shown.
3. Disconnect UNKNOWN on return loss bridge. Adjust sweeper RF level control for power meter reading of +10.0 dBm. This is 0 dB return loss.
4. Connect unit under test. Read 70 MHz return loss on power meter. Actual return loss is 10 dB greater than power meter reading. (Example: if power meter reading is -17 dBm, actual return loss is 27 dB.)
5. Set sweeper MODE switch to WIDE F1-F2 and center trace on scope using power meter OFFSET control and scope HORIZ and GAIN controls. Swept return loss between 55 and 85 MHz is now displayed with 2 dB/div calibration with markers at 61, 70, and 79 MHz.
6. Reference return loss at 70 MHz is the value read in 4 above. Reset power meter OFFSET to bring reference to center of scope. A display above reference indicates a return loss with a lower value than the 70 MHz reference.
7. The power meter reading during sweep is the average value across the band.
8. Return loss is measured at a level of -9 dBm into the unit under test.

Test Setup – IF Return Loss
Exhibit 1