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**TD-3 MICROWAVE RADIO
OVERALL SYSTEM
TESTS
RECEIVED CARRIER POWER
USING KRUSE 52011 IF/RF TEST SET**

This appendix provides a procedure for measuring the actual value of the received carrier power. The test is used primarily to check the loss of the radio hop from the output of the distant transmitter to the input of the radio receiver.

It is reissued to:

- Change the RF pad value.
- Revise option (X).
- Include options (Y) and (Z).

Note: Marginal arrows used to designate changes are omitted.

The theoretical received carrier power at the input to the radio receiver of a properly engineered TD-3 radio system, when no fading is present, depends upon the frequency, the transmitted power, the gain of the transmitting and receiving antennas, the filter and waveguide losses, and the length of the path. When the value of each of these variables is known, the theoretical received carrier power may be readily computed. The procedure for determining the theoretical value is outlined in Section 402-421-208.

The test should not be made during periods of fading since, when fading occurs, the received carrier power is generally below the normal value.

Caution 1: These tests are performed on an out-of-service basis. Check that the channel is not being used.

Caution 2: When removing and replacing waveguide units, care should be taken to prevent foreign matter from entering the waveguide. Handle waveguide sections with care to prevent damage to flange surfaces. All open waveguide sections should be capped.

CHART A

RECEIVING RADIO STATION

A valid comparison between the measured and theoretical received carrier powers can be made only after it is determined that the transmitter at the far station has the normal output power. This is accomplished by verifying that the meter on the transmitter control panel at the far station indicates the value which is handwritten in the space to the right of the TRMTR-OUT pushbutton. If personnel are not available at the far station and it is known that the transmitter is sending the proper power, continue with this test.

The radio receiver is normally adjusted so that with the theoretical received carrier power applied, the panel meter (in the RCVD SIG LEV position) should read a set value. That value is either 56 for a bay equipped with a J68387C receiver modulator-IF preamplifier or 70 for a bay equipped with a J68387P receiver modulator-IF preamplifier. When the radio receiver has been adjusted to 56 or 70, the meter indication will then change by 2 for each dB change in the received power. Therefore,

by knowing the theoretical power for which the bay was adjusted and noting any change from the 56- or 70-meter reading, the actual received carrier power can be determined.

If there is any doubt as to the meter calibration, the following procedure can be used to measure the actual received carrier power.

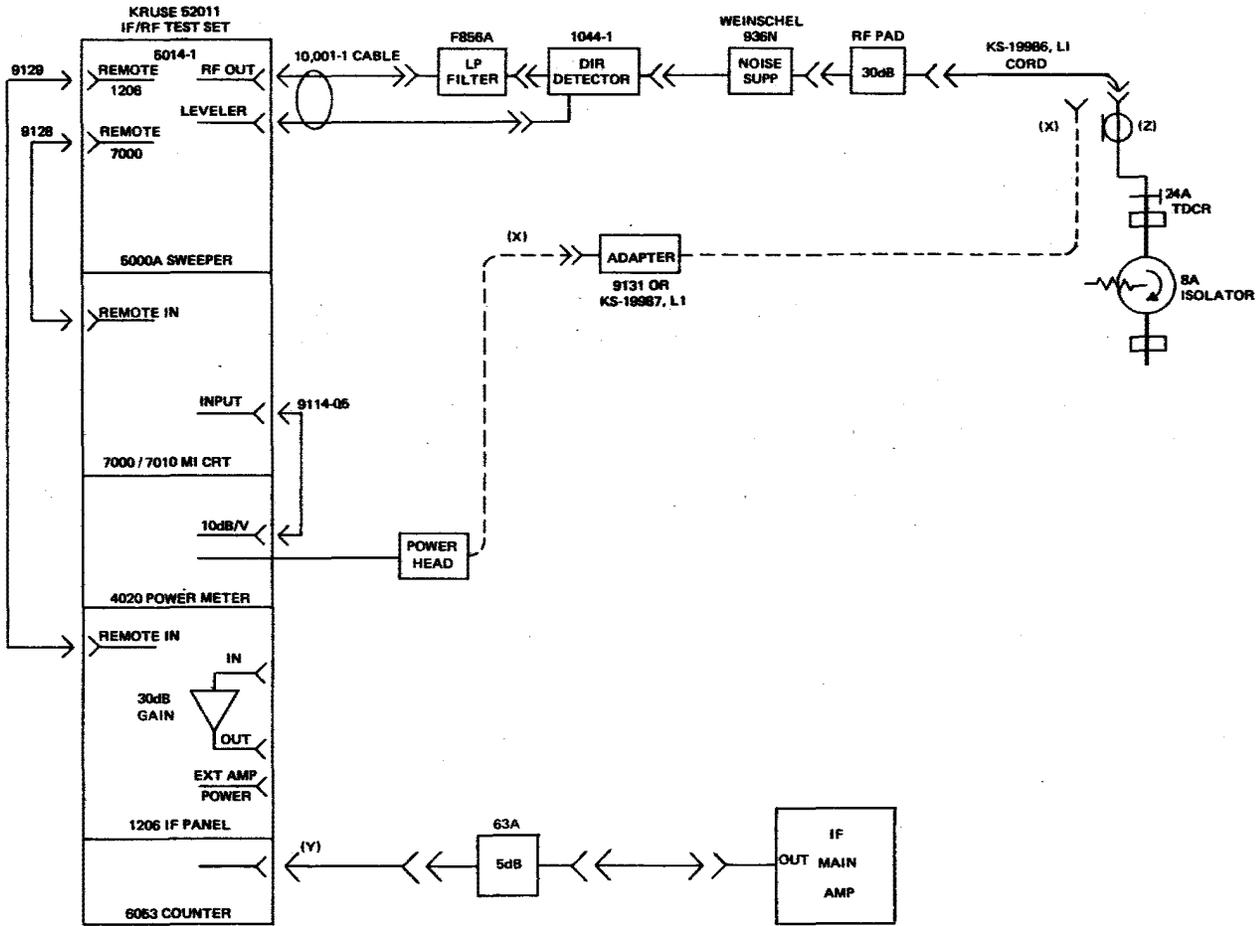
APPARATUS:

1—Kruse 52011 IF/RF Test Set

STEP	PROCEDURE
1	Press the RCVD SIG LEV pushbutton on the receiver control panel and record the value indicated on the meter. This value is a measure of the actual received carrier power.
2	Prepare the test set in accordance with Exhibit 1.
3	Connect option (X) and depress power meter DBM 50 OHM key.
4	Adjust the RF LEVEL control on the sweeper for a reading of approximately -30 dBm on the power meter.
5	Connect the 24A transducer to the 30 dB pad through a KS-19986, L1 cord.
6	Determine that the channel has been removed from service.
7	Remove bandpass filter FL1 located between channel dropping network Z1 and the 8A isolator A1 ahead of the receiver modulator unit.
8	Terminate the open end of the flexible waveguide with the shorting plate.
9	Disconnect option (X) and connect option (Z) to the 24A transducer to the 8A isolator. The power entering the 8A isolator is -30 dBm.
10	Connect option (Y) and touch up 5000A sweeper for 70 MHz on counter if required.
11	Adjust the RF LEVEL control on the SWEEPER until the value indicated on the receiver panel meter is the same as in Step 1.
	<i>Note:</i> During Steps 12 through 14, do not touch the level control on the RF SWEEPER.
12	Disconnect the KS-19986, L1 cord from the 24A transducer.
13	Reconnect option (X).
14	Measure and record the power.

STEP	PROCEDURE
15	<p>The level of the received carrier power at the drop arm of channel network Z1 can now be computed as follows:</p> <p><i>Example:</i></p> $\begin{aligned} \text{Received Carrier Power, dBm} &= \text{Power Meter Reading (Step 14)} - 30 + 0.5 \text{ dB} \\ &= \text{Power Meter Reading (Step 14)} - 39.5 \end{aligned}$ <p><i>Note:</i> The 0.5-dB factor takes into account the loss of filter FL1 which was not included in the circuit during the test.</p>
16	Remove the shorting plate from the flexible waveguide and the 24A transducer from the 8A isolator. Replace filter FL1.
17	Restore the channel to service.

**SECTION 411-100-508PT
APPENDIX 1**



PREPARATION FOR TEST

1. Insert RF Plug-In 5014-1 M-9 and attach proper scale.
2. Position test set controls.

3. 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 reading.

UNIT	CONTROL	POSITION
5800A SWEEPER	F-1 START	NOT USED
	MARKER 1	-15 MHz LOWER SCALE
	MARKER 2-Fc	DESIRED CENTER FREQUENCY
	MARKER 3	+15 MHz LOWER SCALE
	F-2 STOP	NOT USED
	VERNIER	MAX CCW
	RF LEVEL	+7 dBm
	1 KHz	OFF
	LEVELER	EXT
	RETRACE	ON
	MARKERS	OFF
	RECUR-TRIG-LINE	RECUR
	MODE	CW
	F _c ± ΔF VERNIER	MAX CW
	SWEEP SECONDS	.01
SWEEP SECONDS VERNIER	MAX CW	
EXT/INT'L SWEEP (REAR)	INT'L	
4020 POWER METER	LEVEL	10 DB/V
	GROUNDING	INT
	OFFSET	MIDSCALE

**Arrangement of Test Equipment
Exhibit 1**