RADIO TEST EQUIPMENT
MICROWAVE TEST SETS
J68392A TRANSMITTER-RECEIVER TEST SET
ROUTINE MAINTENANCE

This section contains the routine maintenance procedures for testing and adjusting the J68392A transmitter-receiver test set. If it is impossible to adjust the units tested to the required limits, refer to the applicable maintenance procedure as listed in Section 104-415-500.

This section is reissued to make changes in requirements and figures due to changes in the design of the J68392G IF reference detector and to include procedures for testing the KS-20383, L1 RF sweep oscillator. Since this is a major revision, change arrows ordinarily used have been omitted. This reissue does not affect the Equipment Test List.

Note: The requirements in Chart 1 must be met before proceeding to any other charts in this section.

CHART **PAGE**

CHART 1

POWER SUPPLY TEST AND ADJUSTMENT

APPARATUS:

1—KS-14510, List 1 Volt-Ohm-Milliammeter (VOM)

CHART 1 (Cont)

APPARATUS(Cont):

1—KS-14510, List 10 Probe Assembly

STEP	PROCEDURE
1	Connect the ac power cord between either receptacle, P55 or P56, at the top or bottom rear of the test set and a convenient 117-volt ac power source.
2	Observe the pilot lamp at the top front of the test set. If the pilot lamp is not lighted, operate the adjacent toggle switch to the opposite position.
3	If the pilot lamp does not light, check for a burned out bulb and replace the bulb if necessary. If the lamp still does not light, continue with Steps 4 and 5. If the lamp does light, proceed to Step 6.
4	Connect the ac power cord to the other test set receptacle. Observe the pilot lamp. If the pilot lamp is not lighted, operate the adjacent toggle switch to the opposite position.
5	If the pilot lamp still does not light, disconnect the ac power cord from the test set receptacle and measure the voltage at the cord. (a) If the voltage reading is zero, check the power cord for a possible break or for faulty connections to the plugs at each end of the cord. (b) If the voltage is above 105 volts, check the lamp socket, toggle switch, receptacles, and the associated wiring to each. ***Note:*** For the counter, oscilloscope, power meter, and RF sweep oscillator to operate properly, a minimum of 105 volts ac is required. If the VOM indicates a voltage less than 105 volts at the cord, another ac voltage source must be used for operating the test set.
6	Before setting the AC INPUT circuit breaker (CB1) on the J87296A power supply (located on the rear of the test set) to the ON position, make sure that the CP1-CP4 plug-in units are securely in position. Now, set the AC INPUT circuit breaker to the ON position.
7	Check that none of the fuse lamps on the top front of the test set are lighted. If any fuse lamp is lighted, set CB1 to OFF, replace the faulty fuse, and restore CB1 to ON. If the fuse lamp is extinguished, proceed to Step 10. If the lamp remains lighted, continue with Steps 8 and 9. ***Note:*** To prevent electrical damage to the CP2-CP4 regulator units always insert them into and remove them from the power supply ***after*** the AC INPUT circuit breaker (CB1) has been placed in the OFF position.

CHART 1 (Cont)

STEP	PROCEDURE

8 Set CB1 to OFF, and replace the faulty fuse. Disconnect all the loads to the power supply in question, as listed in the following table:

POWER SUPPLY	POWER SUPPLY LOADS
6.4 VCT	IF Sweep Oscillator (KS-19975, L1)
−24V	19V Regulator (SD-81783-01) RF and IF Sweep Control Ckt (SD-50566-01) IF Detector (SD-50568-01) IF Amplifier (SD-50565-01)
−40V	RF and IF Sweep Control Ckt (SD-50566-01)
−150V	IF Sweep Oscillator (KS-19975, L1)

9 Restore CB1 to the ON position. Reconnect each of the loads, one by one, to locate the cause of overload. Once the unit causing the overload has been determined, refer to the BSP maintenance section for that unit.

10 Using the KS-14510, L10 probe assembly, connect the VOM between the test points (located on the front of the power supply) listed in Table A.

Note 1: The loads for the power supply must be connected for the voltage measurements shown in Table A.

Note 2: If any of the indications in Step 10 are outside the required voltage range, do not adjust the ADJ VOLTS control located on the respective unit. The correct procedure for adjusting the output voltage is outlined in Steps 11 through 14.

Note 3: The voltage limits used herein are based on the nominal voltage of the output plus its variation, plus the tolerance of the KS-14510 meter. The KS-14510 meter tolerance is ± 2 percent of the full scale setting.

11 Check the calibration of the oscilloscope differential amplifier as outlined in Section 104-415-511. Refer to the procedure entitled SENSITIVITY CALIBRATION.

CHART 1 (Cont)

STEP	PROCEDURE

TABLE A

LOCATION	TEST POINTS	REQUIRED VOLTAGE	METER SCALE
CP2	NEG(—) (TP1) GRD (TP2)	—150 +7 Vdc	300
CP3	NEG(—) (TP1) GRD (TP2)	—40 ±1.5 Vdc	60
CP4	POS(+) (TP1) GRD (TP2)	+300 ±12 Vdc	600

12 Make the following control settings on the oscilloscope:

CONTROL	POSITION
AC-DC-OFF (+INPUT)	AC
SENSITIVITY	1 MV/CM
BANDWIDTH	4 KC

13 Using the P-48N310 cable assembly, connect the oscilloscope + INPUT jack to test points TP1 and TP2 in the respective plug-in unit. Observe the noise voltage.

Requirement: The noise voltage shall be no greater than 5 cm (5 mV) peak-to-peak for each CP unit (CP2, CP3, and CP4).

14 If the output noise and/or output voltage is not within the specified limits, adjust the ADJ VOLTS control on the CP unit in question until the output noise voltage is brought within its limits at a voltage that is within the required output voltage range. If the output noise and/or output voltage requirements still cannot be met, refer to Section 104-415-502.

Note: The ADJ VOLTS controls in the CP units are 10-turn potentiometers and may require many turns to adjust the regulator voltage.

CHART 1 (Cont)

STEP	PROCEDURE

15 Measure the dc voltages indicated in Table B.

Note 1: TP1, TP2, TP3, and TP9 are located on the top of the power supply chassis and are made accessible by removing the left side panel of the test set.

Note 2: If the above voltages do not fall within their indicated ranges, refer to Section 104-415-502.

16 With the VOM on the 300-Vac scale, measure the line voltage being delivered to the test console from the 117-volt ac power source.

17 With the VOM on the 12-Vac scale, measure the ac voltage between test points TP4 (A) and TP6 (GRD) and between TP5 (B) and TP6 (GRD) on the front panel of the power supply.

Requirement: The VOM shall indicate within the range shown in Fig. 1 for each measurement. If the requirement cannot be met, refer to Section 104-415-502.

18 Using the VOM, measure the voltage between the DC OUTPUT − and DC OUTPUT + jacks on the J87279A −19 volt regulator.

Requirement: −19 ±0.2 volts dc

If the requirement is not met, adjust the ADJ VOLTS control until the requirement is met. If the requirement still cannot be met, replace the defective unit with a spare −19 volt regulator and return the defective unit to the maintenance center.

Note: The −19 volt regulator used in the test set is identical to the −19 volt regulator used in the TD-3 transmitter-receiver bay. Troubleshooting information for the −19 volt regulator may be found in Section 411-726-500.

TABLE B

LOCATION	GROUND CONNECTION	VOLTAGE INDICATION	METER SCALE
TP1	TP9	42 to 50V	60
TP2	TP9	295 to 340V	600
TP3	TP9	−148 to −173V	300
TP8 (front panel of power supply)	TP7 (front panel of power supply)	−21.3 to −27.1V	60

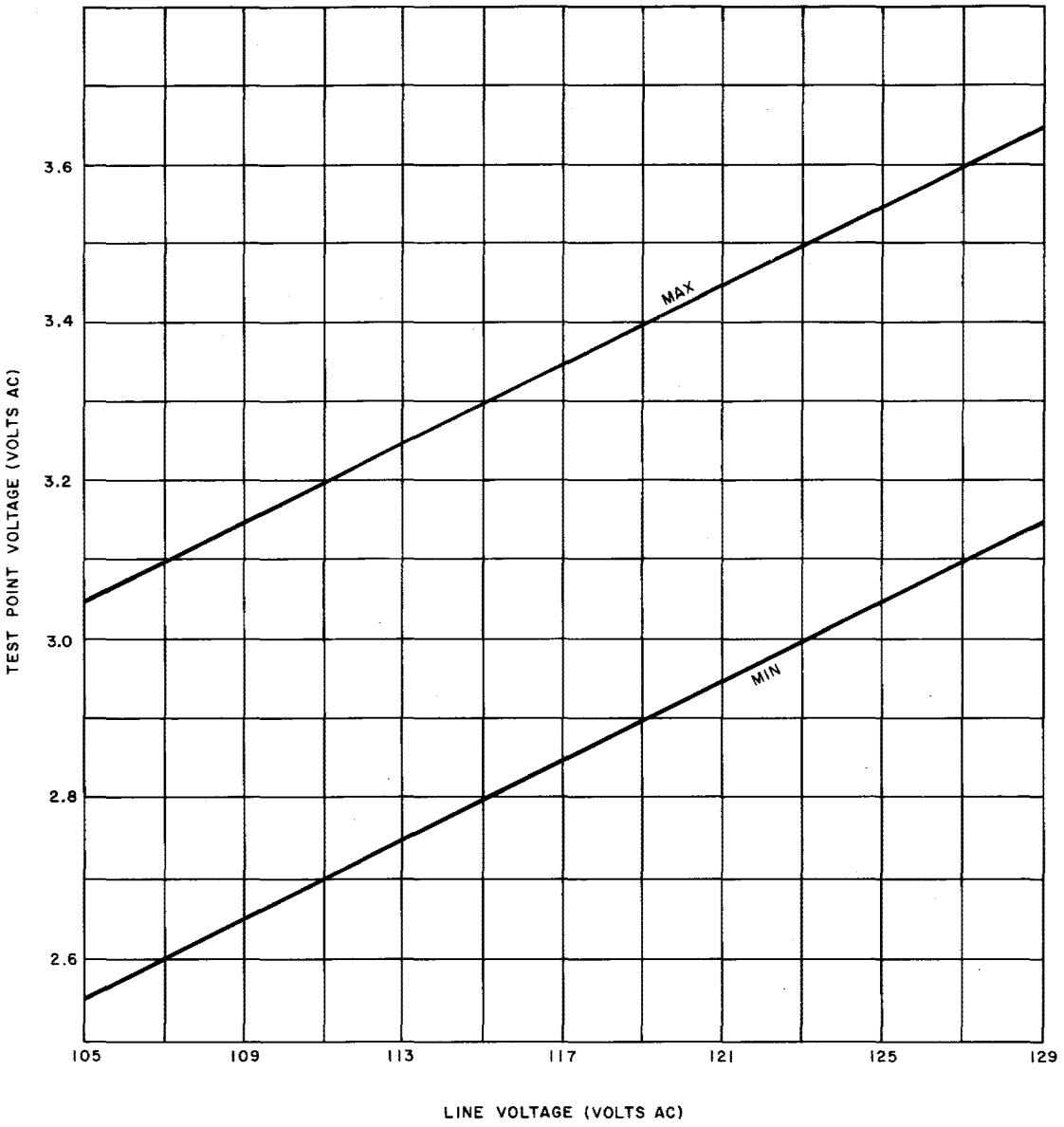


Fig. 1 Graph of Test Point Voltages vs Line Voltage

CHART 2

IF SWEEP OSCILLATOR—CHECKS AND ADJUSTMENTS

This chart checks the operation and adjustment of the 31-Hz oscillator, the IF trace start and stop control circuit, the IF trace linearity circuit, the IF sweep oscillator output power, and the frequency characteristic of the IF sweep oscillator output.

CHART 2 (Cont)

APPARATUS:

1—KS-14510, List 1 Volt-Ohm-Milliammeter (VOM)

1—J68392G IF Reference Detector

STEP	PROCEDURE

Adjustment of the 31-Hz Frequency, Gain, and Shape Characteristics

Note: If any problems are encountered in achieving the test setups or requirements outlined in the following steps, refer to Sections 104-415-505, −510, and −511.

1 Observe the sweep controls on the SWP CONT circuit (J68392E-1) located on the upper right front of the test set. The controls are located behind the small swing-out door. If a 31 CPS LEVEL control is provided, proceed to Step 5. If a 31 CPS SHAPE control is provided, continue with Step 2.

Note: If a 31 CPS SHAPE control is provided, the oscillator is in accordance with Fig. 2 of SD-50566-01, now rated MFR DISC. If a 31 CPS LEVEL control is provided, the oscillator is in accordance with Fig. 3 of SD-50566-01.

2 Prepare the test set in accordance with Fig. 2.

3 Observe the counter and oscilloscope.

Requirement: The counter shall indicate 31 $\pm$0.5 Hz. The waveform appearing on the oscilloscope shall be an undistorted sine wave having a minimum amplitude of 9 cm (18 volts) peak-to-peak.

If the requirement is not met, simultaneously adjust the 31 CPS SHAPE and 31 CPS FREQ controls until the requirement is met.

Note: If the unit will not oscillate, turn both the 31 CPS SHAPE and 31 CPS FREQ controls fully clockwise. Rotate the 31 CPS SHAPE control counterclockwise until oscillation occurs. Rotate the 31 CPS FREQ control counterclockwise until the counter indicates 31 $\pm$0.5 Hz. Adjust the 31 CPS SHAPE control for a maximum undistorted sine wave. If adjusting the 31 CPS FREQ control for 31 $\pm$0.5 Hz causes the unit to stop oscillating, readjust the 31 CPS SHAPE control until oscillation occurs. If the requirement still cannot be met, refer to Chart 1 of Section 104-415-505.

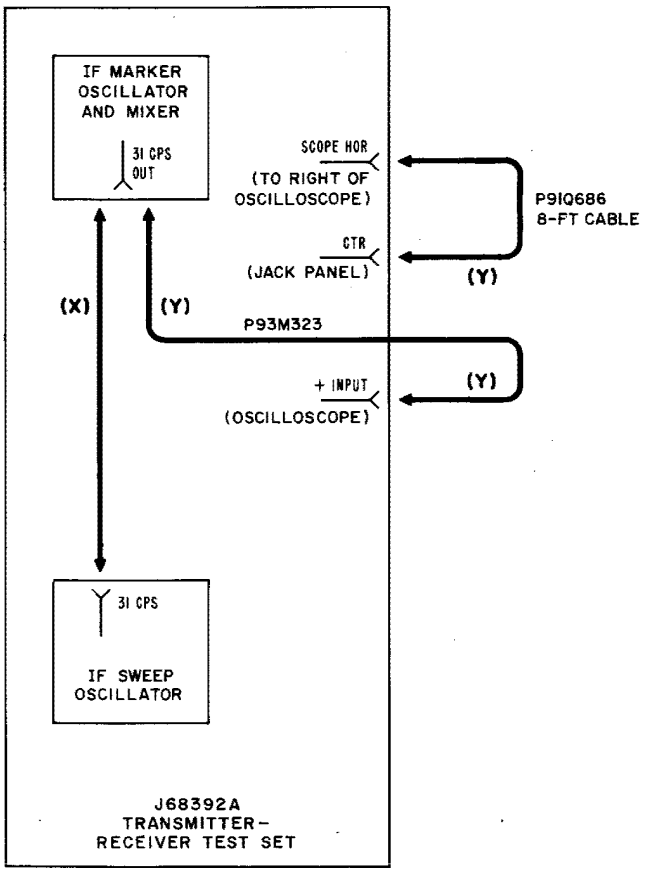
4 Proceed to Step 8.

5 Prepare the test set in accordance with Fig. 2.

6 Observe the counter and the oscilloscope.

CHART 2 (Cont)

STEP	PROCEDURE



PREPARATION FOR TEST

1. SET CONTROLS ON TEST SET AS FOLLOWS:

UNIT	CONTROL	POSITION
RF AND IF SWEEP CONTROL CIRCUIT	FUNCTION IF SWEEP WIDTH CTR	IF-IF MAX CW EXT
OSCILLOSCOPE TIME BASE UNIT	POSITION TRIGGER SOURCE LEVEL MAGNIFIER SWEEP TIME VERNIER SINGLE-NORMAL	MIDRANGE INT + AUTO X1 10 MSEC/CM CAL NORMAL
OSCILLOSCOPE DIFFERENTIAL AMPLIFIER	POSITION BANDWIDTH AMPLIFIER VERNIER SENSITIVITY AC-DC-OFF (+ INPUT) AC-DC-OFF (- INPUT)	MIDRANGE 4 DC CAL 2V/CM AC OFF

2. DISCONNECT CONNECTIONS SHOWN IN OPTION (X) AND CONNECT CABLES IN ACCORDANCE WITH OPTION (Y).

Fig. 2—Adjustment of 31-Hz Frequency, Gain, and Shape Characteristic

Requirement: The counter shall indicate 31 $\pm$0.5 Hz. The waveform appearing on the oscilloscope shall be an undistorted sine wave having a minimum amplitude of 9 cm (18 volts) peak-to-peak.

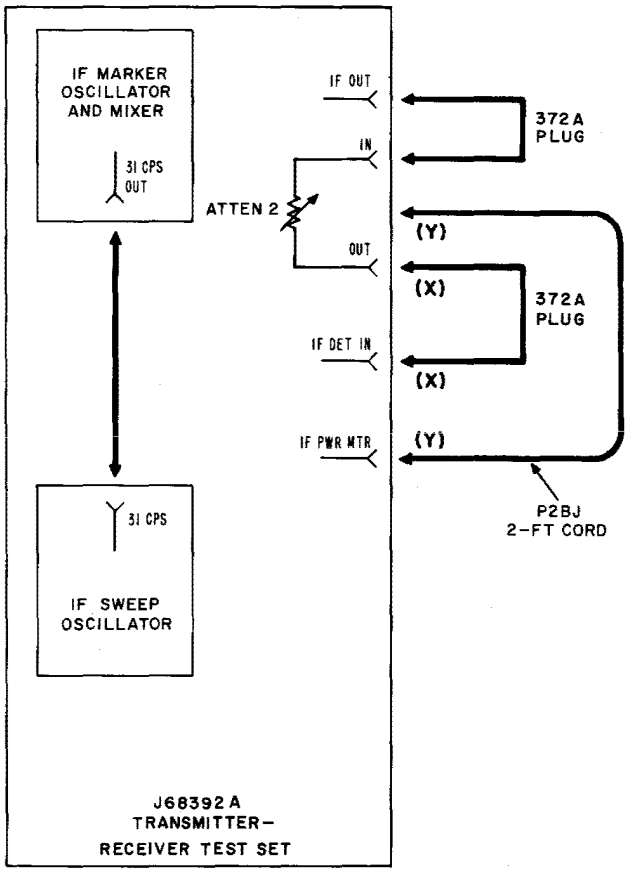
7 If the amplitude requirement is not met, adjust the 31 CPS LEVEL control. If the frequency requirement is not met, adjust the 31 CPS FREQ control. If either of the requirements still cannot be met, refer to Chart 2 of Section 104-415-505.

IF Trace Start and Trace Stop Control Adjustment

Note: If any problems are encountered in achieving the test setups or requirements outlined in the following steps, refer to Sections 104-415-505, -507, and -511.

CHART 2 (Cont)

STEP	PROCEDURE
8	Prepare the test set in accordance with Fig. 3, option (X).
9	Adjust the TEST TRACE and REF TRACE controls to display the two traces on the oscilloscope. Separate the two traces by approximately 1/2 cm.
10	Adjust the VERNIER control on the oscilloscope time base unit for a horizontal deflection of approximately 10 cm. ***Requirement:*** The test trace and reference trace shall be equal in length and positioned one above the other.
11	If the requirement is not met, adjust the IF TRACE START and IF TRACE STOP controls until the requirement is met. If the requirement still cannot be met, refer to Chart 3 of Section 104-415-505.



PREPARATION FOR TEST

1. SET ATTEN 2 TO 17 DB.
2. SET CONTROLS ON TEST SET AS FOLLOWS

UNIT	CONTROL	POSITION
RF AND IF SWEEP CONTROL CIRCUIT	FUNCTION IF SWEEP WIDTH IF CENTER FREQ IF MKR AM CTR	IF-IF MAX CCW MIDRANGE MAX CCW MKR FREQ
OSCILLOSCOPE TIME BASE UNIT	POSITION MAGNIFIER SWEEP TIME VERNIER SINGLE-NORMAL	MIDRANGE X10 EXT MIDRANGE NORMAL
OSCILLOSCOPE DIFFERENTIAL AMPLIFIER	POSITION BANDWIDTH AMPLIFIER VERNIER SENSITIVITY AC-DC-OFF (+INPUT) AC-DC-OFF (-INPUT)	MIDRANGE 4 DC MIDRANGE 2MV/CM DC OFF

3. CONNECT CABLES IN ACCORDANCE WITH REQUIRED OPTION.

Fig. 3—IF Trace Start and IF Trace Stop Adjustment—Test Setup

CHART 2 (Cont)

STEP	PROCEDURE

Note: The IF TRACE START control is used to align the left end of the traces and the IF TRACE STOP control is used to align the right end of the traces.

IF Trace Linearity Adjustment

Note: If any problems are encountered in achieving the test setups or requirements outlined in the following steps, refer to Sections 104-415-505, −507, and −511.

12 Turn the IF SWEEP WIDTH control on the test set control panel to midrange and adjust the IF MKR AMPLITUDE control for a convenient marker amplitude.

13 Adjust the IF MARKER FREQ control until the counter indicates 70 ±0.1 MHz.

Note: The markers appearing to the immediate left and right of the 70-MHz marker are the 64- and 76-MHz markers, respectively. An extraneous marker may appear at 89 MHz.

14 Center the 70-MHz marker by adjusting the IF CENTER FREQ control.

15 Adjust the VAR MKR AM control so that the 70-MHz marker is slightly higher in amplitude than the 64- and 76-MHz markers.

16 Adjust the IF SWEEP WIDTH and IF CENTER FREQ controls to set the 64-MHz marker 2 cm in from the left end of the 10-cm trace and the 76-MHz marker 2 cm in from the right end of the 10-cm test trace. Adjust the IF DET SLOPE control for a flat test trace, if necessary.

Requirement: The 70-MHz marker shall be equidistant from the 64- and 76-MHz markers.

If the requirement is not met, adjust the IF LIN control until the requirement is met. If the requirement still cannot be met, refer to Chart 4 of Section 104-415-505.

IF Sweep Oscillator Output Power Check

Note: If any problems are encountered in achieving the test setups or requirements outlined in the following steps, refer to Sections 104-415-504, −505, and −513.

17 On the power meter, set the INPUT CHANNEL control to IF and the POWER RANGE DBM switch to 0.

18 Prepare the test set in accordance with Fig. 3, option (Y).

19 Set ATTEN 2 to 12 dB and turn the IF SWEEP WIDTH control to the extreme counterclockwise position and observe the indication on the power meter.

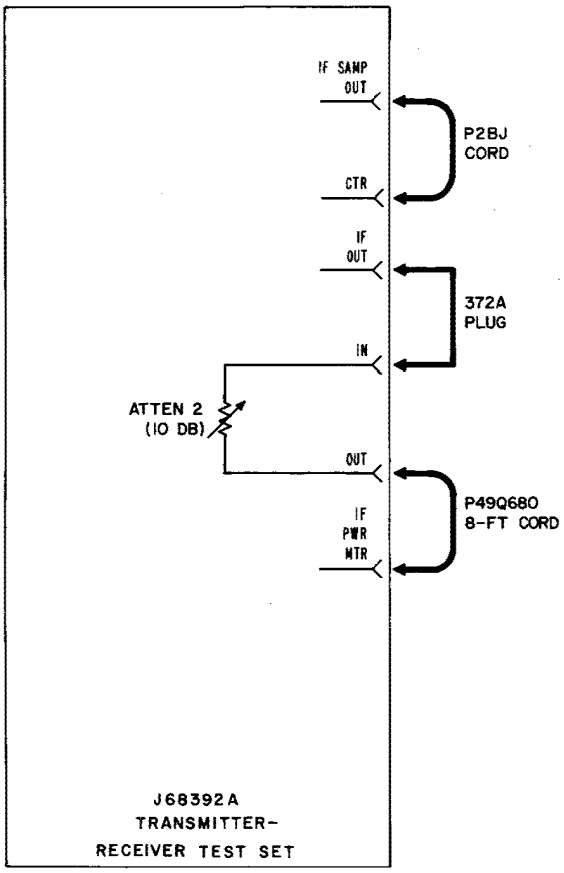
Requirement: −2.0 ±0.2 (This corresponds to +10.0 ±0.2 dBm at the IF OUT jack.)

CHART 2 (Cont)

STEP	PROCEDURE
	If the requirement is not met, adjust the output control on the IF sweep oscillator (located on the rear of the test set) until the requirement is met.
	IF Sweep Frequency Characteristic Test
	Note: If any problems are encountered in achieving the test setups or requirements outlined in the following steps, refer to Sections 104-415-504, -505, -507, -511, and -513.
20	Connect the ac power cord on the J68392G IF reference detector to a convenient 117-volt ac power source. Depress the PUSH ON button and allow 15 minutes for warm-up.
	Note: Steps 21 through 26 may be completed while awaiting warm-up of the J68392G IF reference detector.
21	Prepare the test set in accordance with Fig. 4.
22	Adjust the IF CENTER FREQ control for an indication of 70 $\pm$0.1 MHz on the counter.
23	Check the indication on the power meter.
	Requirement: 0 $\pm$0.2.
	If the requirement is not met, adjust ATTEN 2 until it is met.
24	Remove the P-49Q680 cord from the IF PWR MTR jack and connect it to the IF IN jack on the J68392G IF reference detector.
25	Remove the patch cord between the IF SAMP OUT jack and the CTR jack.
26	Set the CTR switch on the control panel to MKR FREQ.
27	On the J68392G IF reference detector, press the PUSH TO READ switch and adjust the MTR BAL control until the meter indicates exactly center scale. Release the PUSH TO READ switch.
28	Connect the VOM to the DC OUT jack on the J68392G IF reference detector.
29	Set the voltmeter to the .3 VOLT DC scale and adjust the DC BAL control for a voltmeter indication of 0 $\pm$0.05 volts.
	Note: The condition in Step 27 must be met before making this adjustment.
30	Disconnect the VOM from the DC OUT jack on the J68392G IF reference detector.
31	Using a second P-49Q680 cord, connect the DC OUT jack on the J68392G IF reference detector to the RF DET IN jack on the test set.

CHART 2 (Cont)

STEP	PROCEDURE



PREPARATION FOR TEST

1. SET ATTEN 2 TO 10 DB.
2. SET CONTROLS ON TEST SET AS FOLLOWS:

UNIT	CONTROL	POSITION
RF AND IF SWEEP CONTROL CIRCUIT	FUNCTION CTR IF SWEEP WIDTH	IF–RF * EXT MAX CCW
POWER METER	INPUT CHANNEL POWER RANGE DBM	IF 0

3. CONNECT CABLES AS SHOWN.

* THIS POSITION ENABLES A DC SIGNAL TO BE FED INTO THE RF DET IN JACK WHICH IS A DIRECT CONNECTION TO THE VERTICAL INPUT OF THE OSCILLOSCOPE.

Fig. 4—IF Sweep Frequency Characteristic Test Setup

32 Adjust the IF SWEEP WIDTH and IF CENTER FREQ controls to place the 64-MHz marker 2 cm in from the left end of the 10-cm trace and the 76-MHz marker 2 cm in from the right end of the 10-cm trace. The 10-cm display now corresponds to a swept frequency range between 60 and 80 MHz.

33 Run the variable marker across the test trace by varying the IF MARKER FREQ control. Check the frequency indicated on the counter when the frequency marker is at the two end points of the trace.

Requirement: The counter shall indicate 60 $\pm$0.5 MHz when the variable marker is at the left end of the trace and 80 $\pm$0.5 MHz when the variable marker is at the right end of the trace.

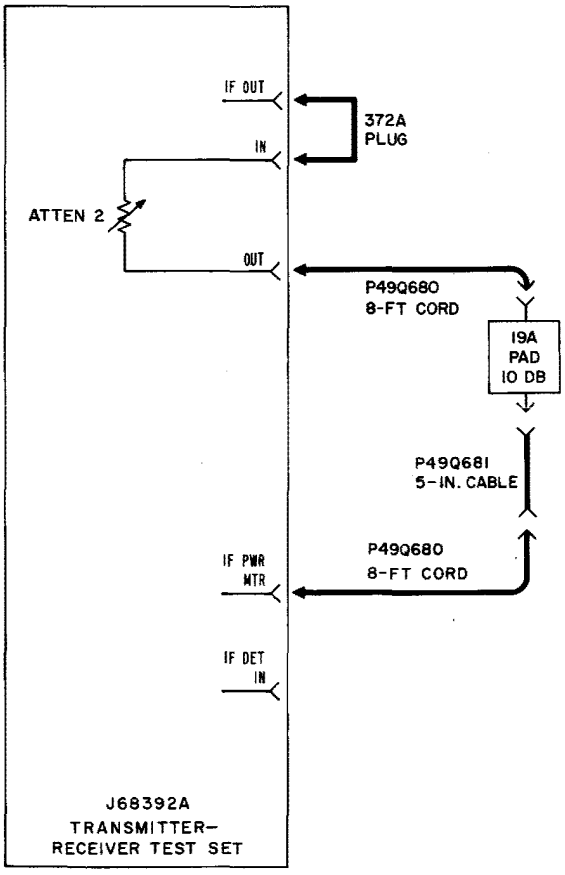
CHART 2 (Cont)

STEP	PROCEDURE
	If the requirement is not met, vary the IF SWEEP WIDTH and IF CENTER FREQ controls until the requirement is met.
34	Calibrate the oscilloscope for 0.01 dB per cm by adjusting the SENSITIVITY control on the oscilloscope until varying ATTEN 2 by 0.1 dB allows the test trace to move 10 cm vertically. The oscilloscope is now calibrated for .01 dB per cm.
35	Adjust the TEST TRACE and REF TRACE controls to center the traces on the oscilloscope. ***Requirement:*** The test trace shall be flat to within 0.01 dB between 60 and 80 MHz. If this requirement is not met, remove the outside shield cover of the oscillator. On the inside shield, remove the two screws holding down the small plate over C14 and C8. Using an insulated aligning tool, adjust C14 for slope and C8 for shape or bow. ***Note:*** Maintain the proper output power by adjusting the output control on the IF oscillator. If C14 reaches the end of its range and slope is still present, adjust C13 as follows. Adjust C14 to midrange and remove the inner shield cover. Through the hole in the side of the compartment, adjust C13 for minimum slope. ***Caution: Use an insulated screwdriver. Replace the inner shield and readjust C14 and C8 for a flat trace. Replace the outside shield cover.***
36	Adjust the IF SWEEP WIDTH and IF CENTER FREQ controls on the control panel for a 55- to 85-MHz sweep.
37	Adjust the TEST TRACE and REF TRACE controls to center the traces on the oscilloscope. ***Requirement:*** The test trace shall be flat to within 0.05 dB between 55 and 85 MHz.
38	If the requirements in Steps 35 and 37 are met, proceed to Chart 3. If the requirements are not met, continue with Step 39.
39	Connect the VOM to the CUR BAL TEST jacks on the IF sweep oscillator.
40	Set the VOM to its most sensitive current range and adjust the CUR BAL control for 0 current.
41	Repeat Steps 34 through 37. If the requirement still cannot be met, refer to Section 104-415-504.
42	Disconnect the J68392G IF reference detector.

CHART 3

IF DETECTOR TESTS

STEP	PROCEDURE
	Note: If any problems are encountered in achieving the test setups or requirements outlined in the following steps, refer to Sections 104-415-504, −505, −507, −511, and −513.
1	On the power meter, set the INPUT CHANNEL switch to IF and the POWER RANGE DBM switch to −5.
2	Prepare for the test in accordance with Fig. 5.
3	Adjust ATTEN 2 for a power meter indication of −2 (−7 dBm).
4	Remove the cord from the IF PWR MTR jack and connect it to the IF DET IN jack.



PREPARATION FOR TEST

1. SET CONTROLS ON TEST SET AS FOLLOWS:

UNIT	CONTROL	POSITION
OSCILLOSCOPE TIME BASE UNIT	POSITION MAGNIFIER SWEEP TIME VERNIER SINGLE-NORMAL	MIDRANGE X10 EXT MIDRANGE NORMAL
OSCILLOSCOPE DIFFERENTIAL AMPLIFIER	POSITION BANDWIDTH AMPLIFIER VERNIER SENSITIVITY AC-DC-OFF (+ INPUT) AC-DC-OFF (−INPUT)	MIDRANGE 4 DC MIDRANGE 2MV/CM DC OFF

2. CONNECT CABLES AS SHOWN.

Fig. 5—IF Detector Flatness Test Setup

CHART 3 (Cont)

STEP	PROCEDURE
5	Adjust the IF SWEEP WIDTH and IF CENTER FREQ controls for a 60- to 80-MHz sweep. Adjust the controls to place the 64-MHz marker 2 cm in from the left end of the 10-cm trace and the 76-MHz marker 2 cm in from the right end of the 10-cm trace. The 60- to 80-MHz sweep now appears over the 10-cm display.
6	Calibrate the oscilloscope for 0.01 dB per cm by adjusting the SENSITIVITY control on the oscilloscope until varying ATTEN 2 by .1 dB allows the test trace to move 10 cm vertically. ***Requirement:*** The test trace shall be flat to within 0.015 dB between 60 and 80 MHz. If the requirement is not met, adjust the IF DET SLOPE control on the front panel until the requirement is met.
7	If the test trace exhibits curvature in excess of the requirement in Step 6, adjust C21 in the IF detector for a flat test trace. To do this, the power meter must first be removed from the test set. The screws which hold the detector to the test set framework can now be removed. Capacitor C21 is located on the same side of the detector as the mounting screw holes. The use of the P93M321 power extender cable is very helpful. ***Note:*** If C21 must be adjusted, the IF DET SLOPE control on the front panel also must be adjusted to obtain a flat trace.

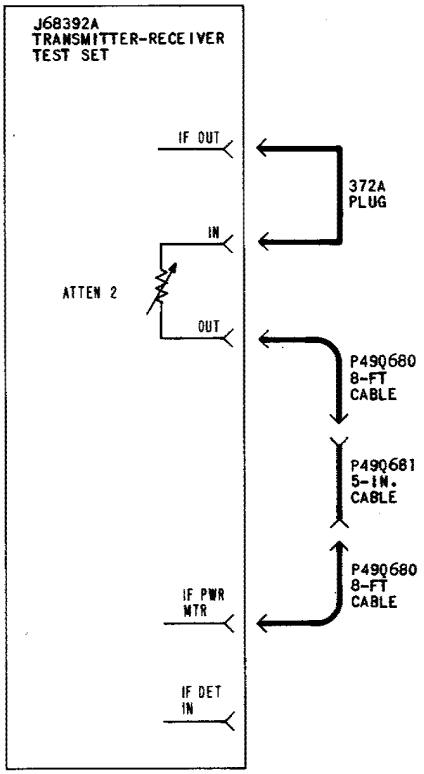
CHART 4

NOISE AND 60-HERTZ HUM TEST

STEP	PROCEDURE
	Note: If any problems are encountered in achieving the test setups or requirements outlined in the following steps, refer to Sections 104-415-504, −505, −507, −511, and −513.
1	Prepare for the test in accordance with Fig. 6.
2	Adjust ATTEN 2 for a power meter indication of −2 (−7 dBm).
3	Remove the cord from the IF PWR MTR jack and connect it to the IF DET IN jack.
4	Set the VERNIER control on the oscilloscope differential amplifier to CAL and the SENSITIVITY control to 0.1 MV/CM.

CHART 4 (Cont)

STEP	PROCEDURE



PREPARATION FOR TEST

1. SET ATTEN 2 TO 17 DB.
2. SET CONTROLS ON TEST SET AS FOLLOWS:

UNIT	CONTROL	POSITION
RF AND IF SWEEP CONTROL CIRCUIT	FUNCTION IF SWEEP WIDTH IF CENTER FREQ IF MKR AM CTR	IF-IF MIDRANGE MIDRANGE MIDRANGE MKR FREQ
OSCILLOSCOPE TIME BASE UNIT	POSITION MAGNIFIER SWEEP TIME VERNIER SINGLE-NORMAL	MIDRANGE X10 EXT MIDRANGE NORMAL
OSCILLOSCOPE DIFFERENTIAL AMPLIFIER	POSITION BANDWIDTH AMPLIFIER VERNIER SENSITIVITY AC-DC-OFF (+INPUT) AC-DC-OFF (-INPUT)	MIDRANGE 4 DC MIDRANGE 2MV/CM DC OFF
POWER METER	INPUT CHANNEL POWER RANGE DBM	IF -5

3. CONNECT CABLES AS SHOWN.

Fig. 6—Noise and 60-Hz Hum Test Setup

5 Turn the IF SWEEP WIDTH and IF MKR AMPLITUDE controls to the maximum counterclockwise position.

Requirement: The amplitude of the 60-Hz hum and the noise shall be less than 3 cm (0.3 mV) peak-to-peak.

CHART 5

IF RETURN-LOSS BRIDGE TEST

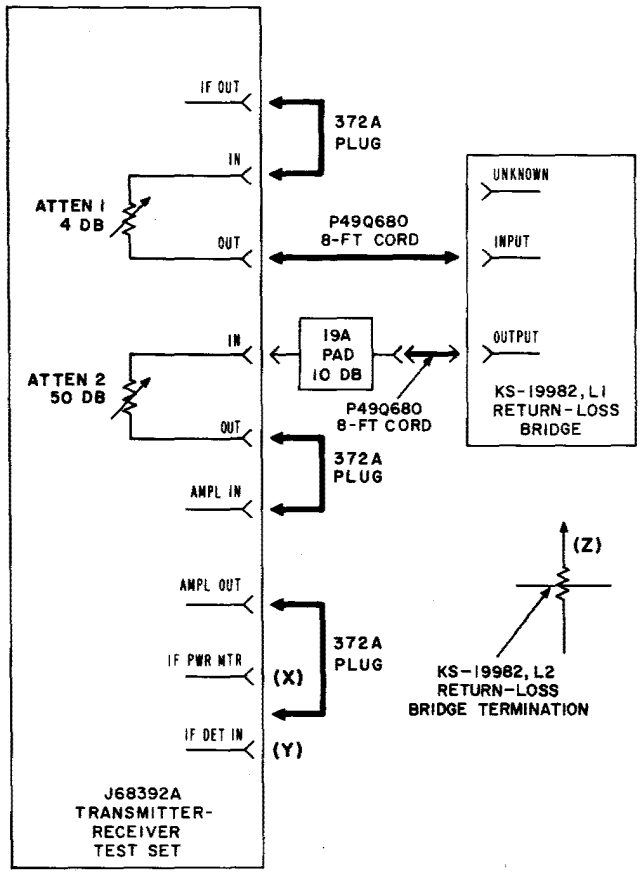
STEP	PROCEDURE

Note: If any problems are encountered in achieving the test setups or requirements outlined in the following steps, refer to Sections 104-415-503, −504, −505, −506, −507, −511, and −513.

1 Prepare for the test in accordance with Fig. 7, option (X).

2 Adjust the AMPL GAIN control on the front panel for a −2 indication on the power meter (−7 dBm).

3 Disconnect option (X) and connect option (Y).



PREPARATION FOR TEST

1. CONNECT CABLES AS SHOWN USING OPTION (X).
2. SET CONTROLS ON TEST SET AS FOLLOWS:

UNIT	CONTROL	POSITION
RF AND IF SWEEP CIRCUIT	FUNCTION IF SWEEP WIDTH IF CENTER FREQ IF MKR AM CTR	IF−IF MIDRANGE MIDRANGE MIDRANGE MKR FREQ
OSCILLOSCOPE TIME BASE UNIT	POSITION MAGNIFIER SWEEP TIME VERNIER SINGLE−NORMAL	MIDRANGE X10 EXT FOR APPROXIMATELY 10-CM DEFLECTION NORMAL
OSCILLOSCOPE DIFFERENTIAL AMPLIFIER	POSITION BANDWIDTH AMPLIFIER VERNIER SENSITIVITY AC−DC−OFF (+ INPUT) AC−DC−OFF (− INPUT)	MIDRANGE 4 DC MIDRANGE 10MV/CM DC OFF
ATTEN 2		50 DB
ATTEN 1		4 DB
POWER METER	INPUT CHANNEL POWER RANGE DBM	IF −5

Fig. 7—IF Return-Loss Bridge Test Setup

CHART 5 (Cont)

STEP	PROCEDURE
4	Using ATTEN 2 and the SENSITIVITY control on the oscilloscope, calibrate the oscilloscope for a sensitivity of 0.5 dB per cm by adjusting the SENSITIVITY control on the oscilloscope until varying ATTEN 2 by 5 dB allows the test trace to move 10 cm vertically.
5	Adjust the IF CENTER FREQ and IF SWEEP WIDTH controls to produce a swept output of from 50 to 90 MHz. Adjust the controls to place the 64-MHz marker 1.5 cm to the left of center and the 76-MHz marker 1.5 cm to the right of center. The 50- to 90-MHz sweep now appears over the 10-cm display.
6	Using the REF TRACE control, bring the reference trace into coincidence with the test trace.
7	Connect the KS-19982, L2 return-loss bridge termination to the UNKNOWN plug of the return-loss bridge as shown in option (Z) of Fig. 7.
8	Set ATTEN 2 to 0 dB and remove the 10-dB pad. ***Requirement:*** The test trace shall be below the reference trace between 50 and 90 MHz. ***Note:*** If the requirement is not met, remove the bottom cover of the return-loss bridge and adjust the screwdriver adjustments until the requirement is met. If the requirement still cannot be met, replace the return-loss bridge with a known good unit, and return the defective unit to the maintenance center.

CHART 6

RF SWEEP OSCILLATOR TEST AND ADJUSTMENTS

This chart provides the adjustment for the KS-19974, L1 or L4 or KS-20383, L1 RF sweep oscillator, the adjustment of the RF trace start and stop circuits, the calibration of the RF power monitor (if provided in the test set), and the test of the RF sweep frequency characteristics.

STEP	PROCEDURE
	RF Sweep Oscillator Sweep Waveform Test
	Note: If any problems are encountered in achieving the test setups or requirements outlined in the following steps, refer to Sections 104-415-505, -508, -511, and -514.

CHART 6 (Cont)

STEP	PROCEDURE
1	Prepare the test in accordance with Fig. 9. ***Requirement 1:*** Time A (Fig. 8) shall be 32.5 $\pm$2.5 ms (6.5 $\pm$0.5 cm). If the requirement is not met, adjust the 31 CPS ADJ control on the RF oscillator until the requirement is met. ***Requirement 2:*** B and D shall be 5 ms (1 cm) or less. ***Requirement 3:*** C shall be no more than 3 times E.
2	Measure voltage F at a point E/2 cm from the beginning of trace E. ***Requirement:*** Voltage F shall be no less than 1/4 the peak voltage.
3	Return all connections to normal configuration.

RF Trace Start, RF Trace Stop, and Trace Width Control Adjustments

Note: If any problems are encountered in achieving the test setups or requirements outlined in the following steps, refer to Sections 104-415-505, −508 or −514, and −511.

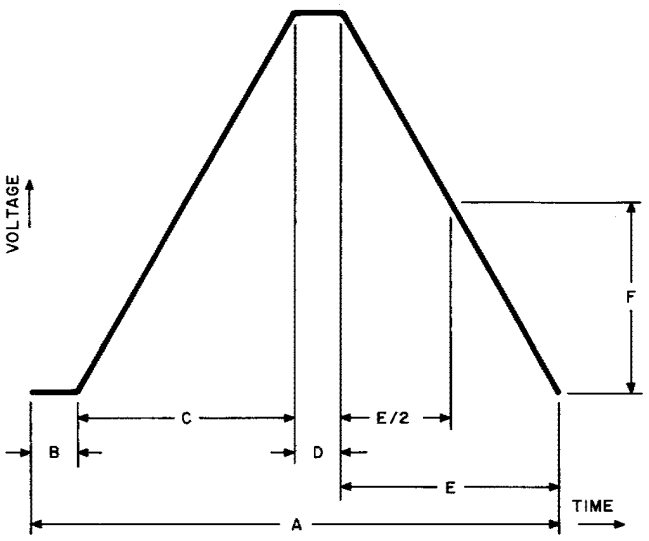
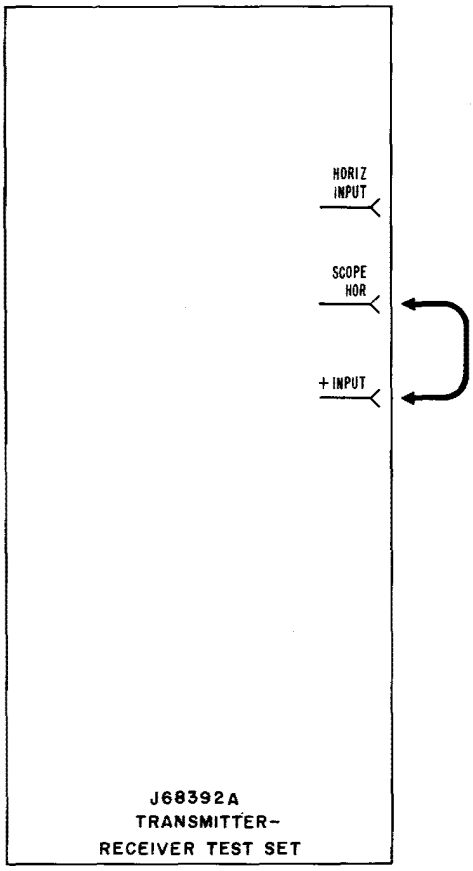


Fig. 8—RF Sweep Oscillator Sweep Waveform



PREPARATION FOR TEST

1. DISCONNECT THE PATCH PLUG FROM THE HORIZ INPUT JACK OF THE OSCILLOSCOPE AND CONNECT AS SHOWN.
2. SET CONTROLS AS FOLLOWS:

UNIT	CONTROL	POSITION
RF AND IF SWEEP CONTROL CIRCUIT	RF TRACE WIDTH FUNCTION	MAX CW RF-RF
OSCILLOSCOPE TIME BASE UNIT	POSITION TRIGGER SOURCE LEVEL MAGNIFIER SWEEP TIME VERNIER SINGLE-NORMAL	MIDRANGE INT + AUTO XI 5 MSEC/CM CAL NORMAL
OSCILLOSCOPE DIFFERENTIAL AMPLIFER	POSITION BANDWIDTH AMPLIFIER VERNIER SENSITIVITY AC-DC-OFF (+INPUT) AC-DC-OFF (-INPUT)	MIDRANGE 4 DC CAL 5V/CM DC OFF
KS-19974, L1 OR L4 ALFRED RF SWEEP OSCILLATOR	POWER LEVEL LINE FUNCTION-SWEEP SELECTOR	MAX CCW RF (RF INDICATOR GLOWS) START-STOP (AUTO)
KS-19974, L1 OR L4 HEWLETT-PACKARD RF SWEEP OSCILLATOR	POWER LEVEL LINE SWEEP-SELECTOR FUNCTION ALC	MAX CCW RF (RF INDICATOR GLOWS) AUTO START-STOP PRESS
KS-20383, L1 RF SWEEP OSCILLATOR	OUTPUT LINE MODE	MAX CCW RF(RF INDICATOR GLOWS) ΔF

Fig. 9—RF Sweep Oscillator Waveform Test Setup

CHART 6 (Cont)

STEP	PROCEDURE

4 Set the test set controls in accordance with the following table:

UNIT	CONTROL	POSITION
RF and IF Sweep Control Circuit	FUNCTION	RF-RF
	RF MRK AM (if provided)	MAX CCW
Oscilloscope Time Base Unit	VERNIER	Midrange
	POSITION	Midrange
	MAGNIFIER	X10
	SWEEP TIME	EXT
	SINGLE-NORMAL	NORMAL
Oscilloscope Differential Amplifier	POSITION	Midrange
	BANDWIDTH	4
	AMPLIFIER	DC
	VERNIER	Midrange
	SENSITIVITY	2 MV/CM
	AC-DC-OFF (+INPUT)	DC
	AC-DC-OFF (—INPUT)	OFF

5 Adjust the TEST TRACE and REF TRACE controls until the traces displayed on the oscilloscope are approximately 1/2 cm apart.

6 Set the FUNCTION switch on the control panel to IF-IF.

7 Adjust the VERNIER control on the time base unit until the horizontal deflection of the traces is exactly 10 cm.

8 Set the FUNCTION switch to RF-RF and adjust the RF TRACE WIDTH control until the horizontal deflection is exactly 10 cm.

Requirement: The reference and test traces shall be equal in length and shall lie exactly one above the other.

CHART 6 (Cont)

STEP	PROCEDURE

If the requirement is not met, adjust the RF TRACE START and RF TRACE STOP controls until the requirement is met. If the requirement still cannot be met, refer to Chart 5 of Section 104-415-505.

Note 1: The RF TRACE START control is used to align the left ends of the traces and the RF TRACE STOP control is used to align the right ends of the traces.

Note 2: For test sets equipped with a KS-20383, L1 RF sweep oscillator, proceed to Step 32.

RF Power Calibration—KS-19974, L1 or L4 Only

Note: If any problems are encountered in achieving the test setups or requirements outlined in the following steps, refer to Sections 104-415-508 and −513.

9 Prepare for the test in accordance with Fig. 10.

10 Adjust the POWER LEVEL control on the sweep oscillator until the power meter indicates 0 $\pm$0.1. If the indication cannot be obtained, adjust the ALC GAIN control until the power meter indicates 0 $\pm$0.1.

Note: Steps 11 through 13 provide information for checking and adjusting the RF monitor function, supplied in test sets equipped with option G of SD-50564-01.

11 Set the Weinschel Engineering 953-10 attenuator (located on the rear of the test set) to approximately 4 dB.

12 Set the INPUT control on the power meter to RF MON.

13 Adjust the Weinschel Engineering attenuator until the power meter indicates 0 $\pm$0.1.

RF Sweep Frequency Characteristic Test—KS-19974, L1 or L4 Only

Note: If any problems are encountered in achieving the test setups or requirements outlined in the following steps, refer to Sections 104-415-505, -508, -511, and -513.

14 Prepare for the test in accordance with Fig. 11.

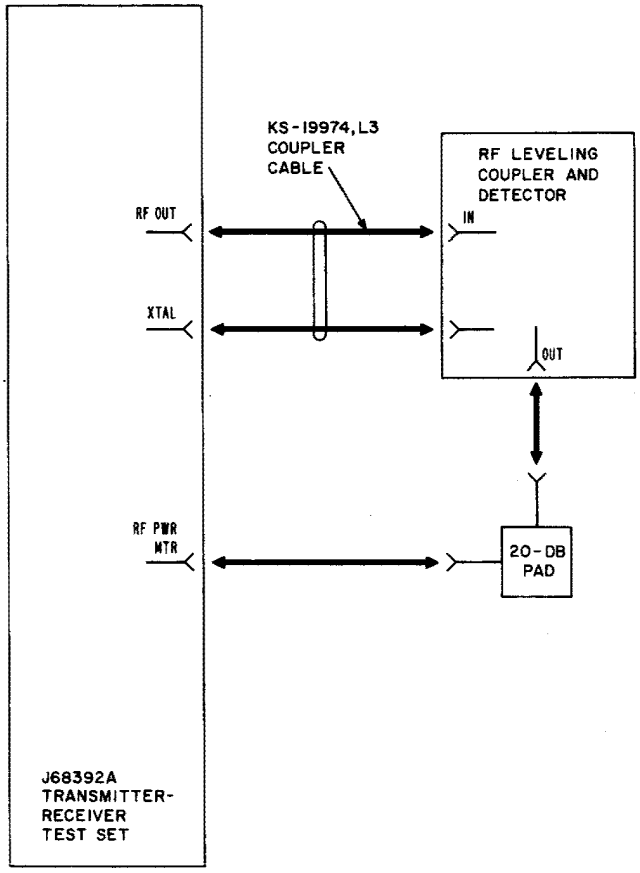
15 Adjust the START control on the RF oscillator to 3.70 GHz and the STOP control to 4.20 GHz.

16 Adjust the TEST TRACE and REF TRACE controls to display the traces on the oscilloscope.

17 Adjust the ALC GAIN control on the RF oscillator to obtain maximum output without causing oscillation within the leveling loop.

CHART 6 (Cont)

STEP	PROCEDURE



PREPARATION FOR TEST

1. SET CONTROLS ON TEST SET AS FOLLOWS:

UNIT	CONTROL	POSITION
POWER METER	INPUT CHANNEL	RF
	POWER RANGE DBM	0
ALFRED RF SWEEP OSCILLATOR	POWER LEVEL	MAX CCW
	LINE	RF (RF INDICATOR GLOWS)
	FUNCTION-SWEEP SELECTOR	START-STOP (AUTO)
HEWLETT-PACKARD RF SWEEP OSCILLATOR	POWER LEVEL	MAX CCW
	LINE	RF (RF INDICATOR GLOWS)
	SWEEP-SELECTOR	AUTO
	FUNCTION	START-STOP
	ALC	PRESS

2. ADJUST THE START CONTROL TO APPROXIMATELY 3.7 GHZ.
3. ADJUST THE STOP CONTROL TO APPROXIMATELY 4.2 GHZ.
4. CONNECT CABLES AS SHOWN.

Fig. 10—KS-19974 RF Power Adjustment Test Setup

Note: Oscillation in the leveling loop is characterized by sharp discontinuities in the test trace.

18 Connect the output of the 20-dB pad to the RF PWR MTR jack on the control panel.

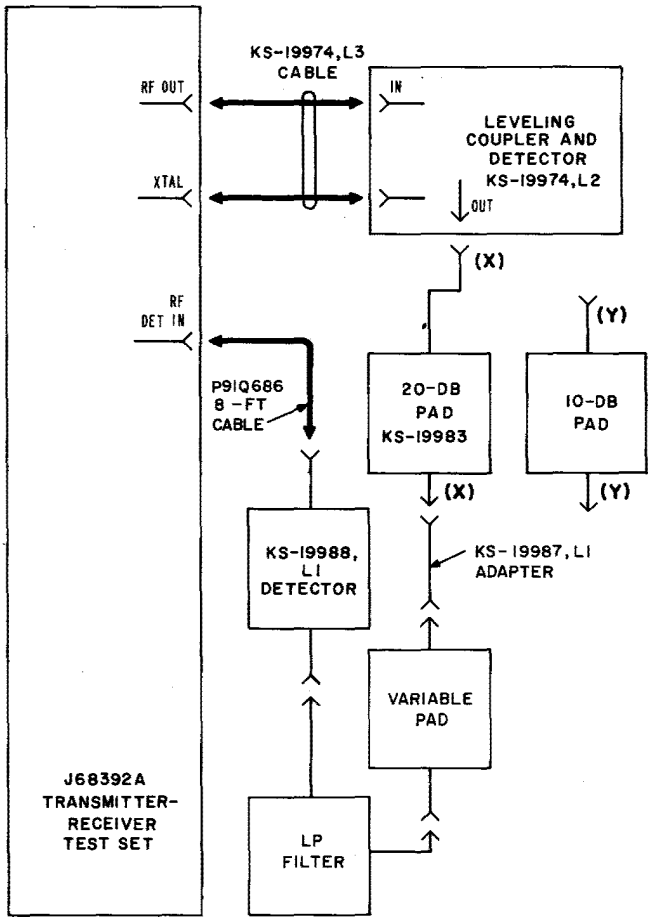
Note: Test sets equipped in accordance with option Q of SD-50564-01 enable connecting directly to the RF power head.

19 Set the POWER LEVEL control to maximum and adjust the COARSE screwdriver adjustment until the power meter indicates 0 $\pm$0.1.

20 Vary the POWER LEVEL control from the maximum setting to its minimum setting.

CHART 6 (Cont)

STEP	PROCEDURE



PREPARATION FOR TEST

1. SET CONTROLS ON TEST SET AS FOLLOWS:

UNIT	CONTROL	POSITION
RF AND IF SWEEP CONTROL CIRCUIT	FUNCTION RF MKR-AM (IF PROVIDED)	RF-RF MAX CCW
OSCILLOSCOPE TIME BASE UNIT	VERNIER POSITION MAGNIFIER SWEEP TIME SINGLE-NORMAL	MIDRANGE MIDRANGE X 10 EXT NORMAL
OSCILLOSCOPE DIFFERENTIAL AMPLIFIER	POSITION BANDWIDTH AMPLIFIER VERNIER SENSITIVITY AC-DC-OFF(+INPUT) AC-DC-OFF(-INPUT)	MIDRANGE 4 KC DC MIDRANGE 10MV/CM DC OFF
POWER METER	INPUT CHANNEL POWER RANGE DBM	RF 0
HEWLETT-PACKARD RF SWEEP OSCILLATOR	POWER LEVEL LINE SWEEP SELECTOR FUNCTION ALC	MAX CCW RF (RF INDICATOR GLOWS) AUTO START STOP ON ALC
ALFRED RF SWEEP OSCILLATOR	POWER LEVEL LINE FUNCTION-SWEEP SELECTOR	MAX CCW RF (RF INDICATOR GLOWS) START-STOP (AUTO)

2. MAKE CONNECTIONS AS SHOWN IN OPTION (X).

Fig. 11—Test Setup—KS-19974 RF Sweep Frequency Characteristic

Requirement: The power meter shall vary by a minimum of 10 dB (0 to −10 on the power meter).

21 Reconnect the circuit shown in Fig. 11.

22 Adjust the POWER LEVEL control from 0 to −10 and observe the test trace on the oscilloscope. If necessary, adjust the TEST TRACE control to keep the test trace on the oscilloscope screen.

CHART 6 (Cont)

STEP	PROCEDURE
	Requirement: There shall be no sharp discontinuities in the test trace between 3.7 and 4.2 GHz and there shall be no drastic changes in the shape of the test trace when the POWER LEVEL control is adjusted over its 10-dB range.
23	Connect the output of the 20-dB pad to the RF PWR MTR jack on the control panel.
	Note: On test sets equipped in accordance with option Q of SD-50564-01, connect directly to the RF power head.
24	Adjust the POWER LEVEL control until the power meter indicates 0.
25	Reconnect the circuit shown in Fig. 11.
26	Switch the RF oscillator to ΔF operation.
27	Adjust the ΔF control for an approximately 20-MHz sweep.
28	Calibrate the oscilloscope for 0.02 dB per cm sensitivity by adjusting the SENSITIVITY control on the oscilloscope until varying the variable pad from 2 to 2.4 dB causes the trace to move vertically by 10 cm. Adjust the SENSITIVITY control to double the oscilloscope sensitivity. The oscilloscope is now calibrated for .02 dB per cm.
29	Move the CW control over the range from 3.71 to 4.19 GHz.
	Requirement: The output power shall remain constant to within 0.03 dB (1.5 cm) for any 20-MHz sweep from 3.71 to 4.19 GHz.
30	Disconnect option (X) of Fig. 11 and connect option (Y).
31	Repeat the procedures in Steps 23 through 29.
	RF Power Calibration—KS-20383, L1 Only
	Note: If any problems are encountered in achieving the test setup or requirements outlined in the following steps, refer to Section 104-415-513 and -514.
32	Set the controls on the test set as shown below:

CHART 6 (Cont)

STEP	PROCEDURE

UNIT	CONTROL	POSITION
Power Meter	INPUT CHANNEL POWER RANGE DBM	RF −25
RF Sweep Oscillator	OUTPUT LINE MODE ΔF (MHz) BAND SELECTOR	10 ON CW 20 3.65—4.25 GHz

33 On the power meter, adjust the METER ZERO control for a ZERO indication on the meter. Set the POWER RANGE switch to +5.

34 Make the test connections in accordance with Fig. 12, option (Z).

Note: For RF sweep oscillators supplied by Alfred Electronics, perform Steps 35 through 44. For RF sweep oscillators supplied by Wiltron Company, proceed to Step 45.

Alfred RF Sweep Oscillator

35 With the OUTPUT control set to 10, observe the power meter indication for both positions of the BAND SELECTOR switch.

Requirement: The power meter shall indicate −1.0 (+4.0 dBm) or greater.

36 Adjust the OUTPUT control on the sweep oscillator to 1 and the POWER RANGE DBM control on the power meter to 0.

Requirement: The power meter shall indicate −2.0 (−2.0 dBm) or less for both positions of the BAND SELECTOR switch.

If the requirements of Steps 35 and 36 are met, proceed to Step 56.

If the requirement of Step 35 or 36 is ***not*** met, proceed with Step 37.

37 On the RF sweep oscillator, set the BAND SELECTOR switch to 3.65-4.25 GHz and the OUTPUT control to 1.

38 Adjust the ALC GAIN screwdriver control to 80 percent (4/5) of fully clockwise.

CHART 6 (Cont)

STEP	PROCEDURE
39	Adjust the COARSE screwdriver control for a power meter indication of −2.0. (This corresponds to a power of −2.0 dBm.)
40	Set the BAND SELECTOR switch to 5.9-6.5 GHz. ***Requirement:*** The power meter shall indicate −2.0 (−2.0 dBm) or less. If the requirement is not met, adjust the COARSE screwdriver control until the power meter indicates −2.0 dBm.
41	Set the power meter POWER RANGE DBM switch to +5 and the OUTPUT control on the oscillator to 10.
42	Adjust the ALC GAIN screwdriver control for a power meter indication of −1.0 (+4.0 dBm).
43	Set the BAND SELECTOR switch to the 3.65-4.25 GHz position. ***Requirement:*** The power meter shall indicate −1.0 (+4.0 dBm) or greater. If the requirement is not met, adjust the ALC GAIN screwdriver control until the meter indicates −1.0 (+4.0 dBm).
44	Repeat Steps 37 through 43 as necessary to correct for interaction effects so that the requirements of Steps 35 and 36 are met. When all requirements are met, proceed to Step 56.
	Wiltron RF Sweep Oscillator
45	With the OUTPUT control set to 10, observe the power meter indication for both positions of the BAND SELECTOR switch. ***Requirement:*** The power meter shall indicate −1.0 (+4.0 dBm) or greater.
46	Adjust the OUTPUT control on the sweep oscillator to 0 and the POWER RANGE control on the power meter to 0. ***Requirement:*** The power meter shall indicate −2.0 (−2.0 dBm) or less for both positions of the BAND SELECTOR switch. If the requirements of Steps 45 and 46 are met, proceed to Step 56. If the requirement of Step 45 or 46 is ***not*** met, proceed with Step 47.
47	Set the power meter POWER RANGE DBM switch to +5.

CHART 6 (Cont)

STEP	PROCEDURE
48	On the RF sweep oscillator, set the BAND SELECTOR switch to 5.9-6.5 GHz and the OUTPUT control to 10.
49	Adjust the ALC GAIN screwdriver control to midrange.
50	Adjust the COARSE screwdriver control for a power meter indication of −1.0 (+4.0 dBm).
51	Set the BAND SELECTOR switch to 3.65-4.25 GHz. ***Requirement:*** The power meter shall indicate −1.0 (+4.0 dBm) or greater. If the requirement is not met, adjust the COARSE screwdriver control for an indication of −1.0.
52	On the RF sweep oscillator, set the OUTPUT control to 0.
53	Set the power meter POWER RANGE DBM switch to 0. ***Requirement:*** The power meter shall indicate −2.0 (−2.0 dBm) or less. If the requirement is not met, remove the top cover of the RF sweep oscillator and adjust the minimum level potentiometer R141 on level control board 610WE-1 for a meter indication of −2.0.
54	Set the BAND SELECTOR switch to 5.9-6.5 GHz. ***Requirement:*** The power meter shall indicate −2.0 (−2.0 dBm) or less. If the requirement is ***not*** met, repeat the adjustment of Step 53.
55	Repeat Steps 45 through 54 as necessary to correct for interaction effects so the requirements of Steps 45 and 46 are met. When all requirements are met, proceed with Step 56.

RF Sweep Frequency Characteristic Test—KS-20383, L1 Only

Note: If any problems are encountered in achieving the test setup or requirements outlined in the following steps, refer to Sections 104-415-505, -511, -513, and -514.

CHART 6 (Cont)

STEP	PROCEDURE

4-GHz Band

56 Set the controls on the test set as shown below:

UNIT	CONTROL	POSITION
Power Meter	INPUT CHANNEL	RF
	POWER RANGE DBM	0 dBm
RF Sweep Oscillator	MODE	ΔF
	ΔF	20
	OUTPUT	MAX CCW
	BAND SELECTOR	3.65—4.25 GHz
IF and RF Sweep Control Circuit	FUNCTION	RF-RF
Oscilloscope Time Base Unit	VERNIER	Midrange
	POSITION	Midrange
	MAGNIFIER	X 10
	SWEEP TIME	EXT
	SINGLE — NORMAL	Normal
Oscilloscope Differential Amplifier	POSITION	Midrange
	BANDWIDTH	4
	AMPLIFIER	DC
	VERNIER	Midrange
	SENSITIVITY	10 MV/CM
	AC-DC-OFF (+INPUT)	DC
	AC-DC-OFF (—INPUT)	OFF

57 Make the test connections in accordance with Fig. 12, option (Y).

58 Adjust the OUTPUT control on the RF oscillator for a power meter indication of −2.0 (−2.0 dBm).

59 Connect the test circuit of Fig. 12, option (X).

60 Adjust the TEST TRACE and REF TRACE controls on the sweep control panel to display the traces on the oscilloscope.

CHART 6 (Cont)

STEP	PROCEDURE
61	Calibrate the oscilloscpe for 0.02 dB per cm sensitivity by adjusting the SENSITIVITY control on the oscilloscope until varying the variable attenuator 0.4 dB causes the trace to move vertically by 10 cm. Adjust the SENSITIVITY control to double the oscilloscope sensitivity. The oscilloscope is now calibrated for 0.02 dB per cm.
62	Bring the reference trace into coincidence with the test trace by means of the REF TRACE control.
63	Remove the RF variable attenuator and adjust the OUTPUT control on the RF oscillator to make the test trace coincide with the reference trace.
64	On the RF oscillator, vary the CW control slowly from 3.71 to 4.19 GHz. ***Requirement:*** The output power shall be flat to within 0.03 dB (1.5 cm) for any 20-MHz band located between 3.70 and 4.20 GHz without evidence of oscillation. ***Note:*** Oscillations in the leveling loop are characterized by sharp discontinuities in the test trace.
65	Set the OUTPUT control on the RF oscillator to 0.
66	Connect the circuit of Fig. 12, option (Y) with the 5-dB pad removed (restore the variable attenuator).
67	Adjust the OUTPUT control on the RF oscillator for a power meter indication of −2.0 (−2.0 dBm).
68	Connect the circuit of Fig. 12, option (X) with the 5-dB pad removed.
69	Repeat Steps 60 through 64; then proceed with Step 70.
	6-GHz Band
70	Repeat Step 56.
71	Set the BAND SELECTOR switch on the RF oscillator to 5.9-6.5 GHz and allow 30 minutes warm up.
72	Connect the circuit of Fig. 12, option (W).
73	Adjust the OUTPUT control on the RF oscillator for a power meter indication of −2.0 (−2.0 dBm).
74	Connect the circuit of Fig. 12, option (V).

CHART 6 (Cont)

STEP	PROCEDURE
75	Adjust the TEST TRACE and REF TRACE controls on the control panel to display the traces on the oscilloscope.
76	Calibrate the oscilloscope for 0.05 dB per cm sensitivity by adjusting the SENSITIVITY control on the oscilloscope until varying the step attenuator 0.5 dB causes the trace to move vertically by 10 cm. The oscilloscope is now calibrated for 0.05 dB per cm.
77	Bring the reference trace into coincidence with the test trace by means of the REF TRACE control.
78	Remove the 41A step attenuator and both 1B transducers and replace them with a KS-19987, L1 adapter.
79	Adjust the OUTPUT control to make the test trace coincide with the reference trace.
80	Vary the CW control on the RF oscillator slowly from 5.935 to 6.415 GHz. ***Requirement:*** The output power, as observed on the oscilloscope, shall be flat to within 0.03 dB for any 20-MHz band located between 5.925 and 6.425 GHz without evidence of oscillation. ***Note:*** Oscillations in the leveling loop are characterized by sharp discontinuities in the test trace.
81	Set the OUTPUT control on the oscillator to maximum counterclockwise.
82	Connect the circuit of Fig. 12, option (W), with the 5-dB pad removed and adjust the OUTPUT control on the RF oscillator for a power meter indication of −2.0 (−2.0 dBm).
83	Connect the circuit of Fig. 12, option (V), with the 5-dB pad removed and repeat Steps 75 through 80.
84	If all requirements are met, this concludes testing of the RF sweep oscillator.

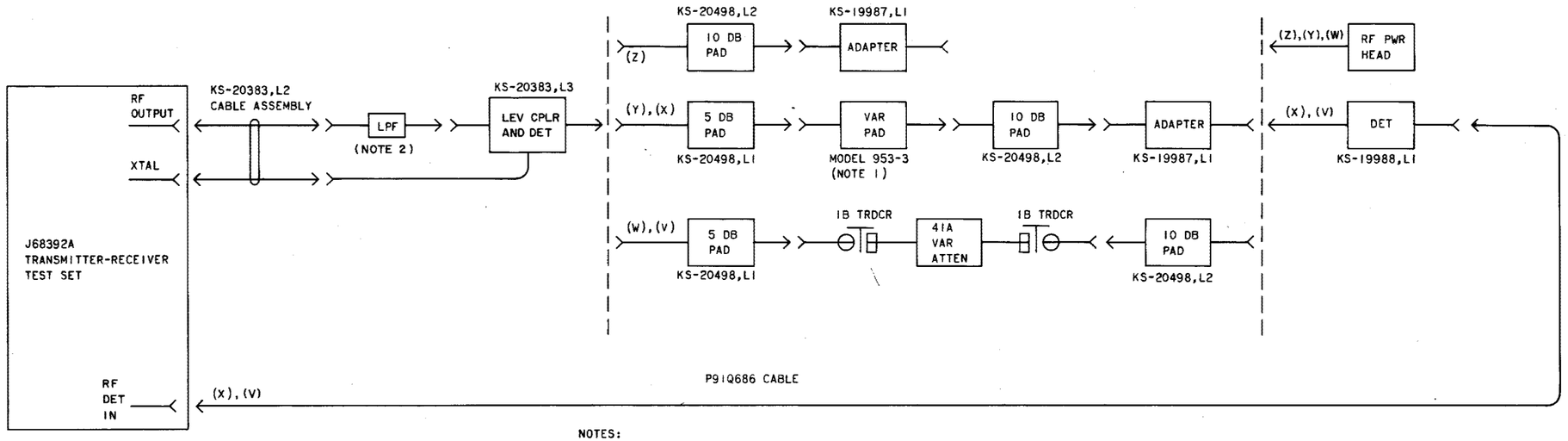
CHART 7

NOISE GENERATOR TEST

APPARATUS:

1—KS-14510, Volt-Ohm-Milliammeter (VOM)

STEP	PROCEDURE
	Note: This test applies only to those test sets equipped with a noise generator. If any problems are encountered in achieving the test setups or the requirements outlined in the following steps, refer to Section 104-415-512.
1	Press the NOISE LAMP pushbutton switch.
2	Connect the VOM to the test point jacks on the noise lamp power supply and adjust the ADJ VOLTS control for a meter reading of 1.50 volts.
3	Disconnect jack 103 from the noise source. ***Requirement:*** The noise lamp shall be extinguished and the voltmeter indication shall drop to zero.



NOTES:
1. SET VARIABLE ATTENUATOR AT MINIMUM.
2. FOR UNITS SUPPLIED BY WILTRON, THE LOW PASS FILTER IS BUILT INTO THE COUPLER AND FOR UNITS SUPPLIED BY ALFRED, AN EXTERNAL LOW PASS FILTER IS SUPPLIED.

Fig. 12—Test Setup for Testing the KS-20383, L1 RF Sweep Oscillator