TD-3 MICROWAVE RADIO

J68386G AND J68386H TRANSMITTER-RECEIVER BAYS

TRANSMITTER TESTS USING ED-50996-10 PORTABLE TEST EQUIPMENT

TRANSMISSION

This appendix supplements Section 411-506-501.

It is reissued to:

- Correct test levels to comply with the latest AT&T requirements for Chart A, Step 15 and Chart E, Step 16.
- Include the appropriate legend on Page 1 in accordance with AT&Ts "Guideline and Procedure for Safeguarding Information" and Pacific Company's System Instruction (SI) 178.

Note: Marginal arrows are used to denote changes.

It describes procedures for measuring and adjusting the gain and amplitude response of the radio transmitter in the J68386G and J68386H radio bays using ED-50996-10 Portable Test Equipment. Procedures for checking and adjusting the IF limiter — carrier resupply and for setting up transmitter alarms are also included.

Section 411-500-501, In-Service Checks, should be performed prior to this appendix, and the results used as a guide to any source of trouble. The preliminary checks in Section 411-502-500 must be completed before performing the tests in this appendix. The IF return loss test in Section 411-506-502, when required by the Equipment Test List, must be completed prior to these tests or after replacement of any transmitter unit.

For the location of components in the transmitter section, refer to Fig. 1.

The charts must be performed in the order listed, unless otherwise specified. The recommended maintenance interval is given in the Equipment Test List.

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

Caution 2: ***When removing and replacing waveguide units, care should be exercised to prevent foreign matter from entering the waveguide. Handle all types of waveguide carefully in order to prevent damage to flange mating surfaces and/or flexible waveguide segments. When connecting waveguide units, flange mating surfaces must be carefully aligned and all screws tightened securely to avoid RF leakage.***

Warning 1: ***DO NOT leave energized waveguides unterminated. The RF power density which may be encountered at output waveguide is potentially hazardous to the eyes and body tissue.***

Warning 2: ***Voltages inside the TWT power supply are much higher than those usually found in telephone power plants. Under no circumstances should the built-in interlock feature be defeated.***

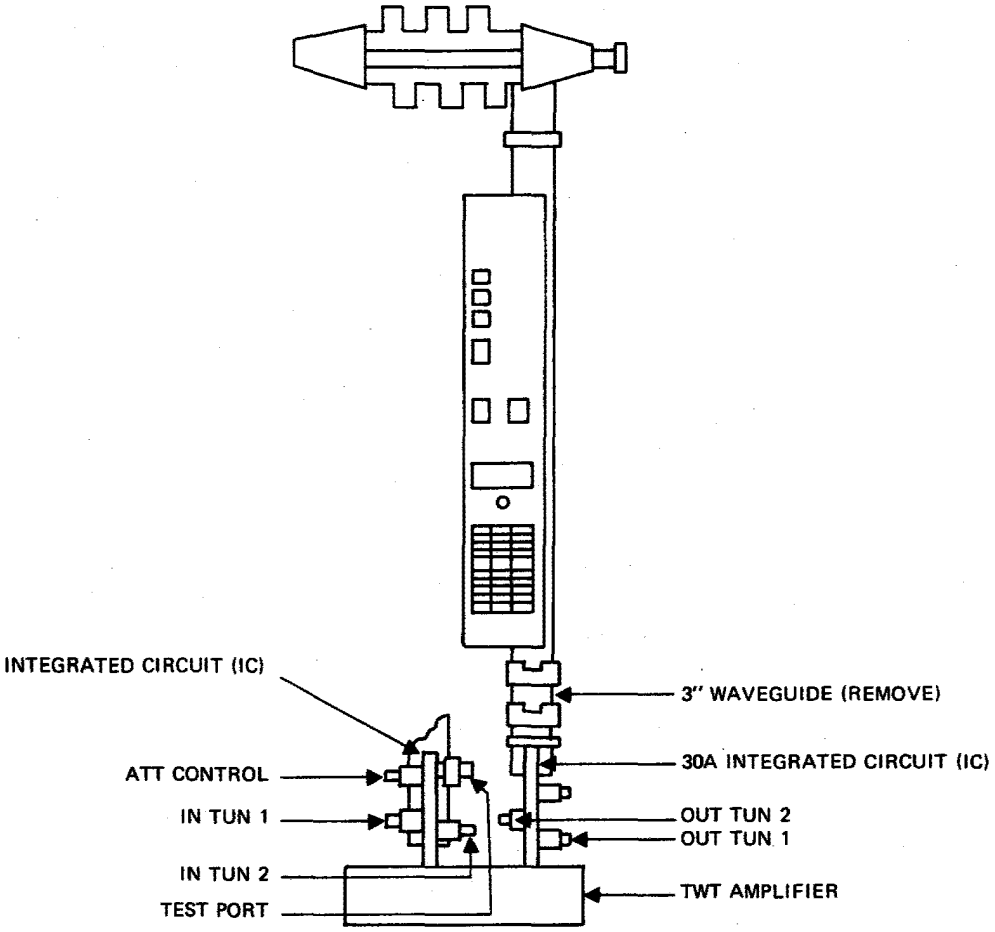
CHART A

OVERALL TRANSMISSION TEST

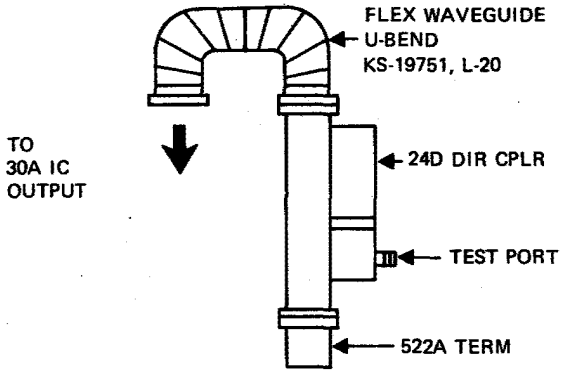
APPARATUS:

1-ED-50996-10 Portable Test Arrangement

STEP	PROCEDURE
1	When performing the main station or Hot Standby/Space Diversity (HS/SD) repeater station transmitter test, 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. HS or HS/SD bays must be switched off on the channel to be tested. *Note:* 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 or in the radio transmitter carrying service for HS/SD arrangement.
2	Disconnect P14 plug from IF IN jack of IF driver amplifier. *Caution: Step 2 should be performed prior to connecting or disconnecting the test apparatus to the 30A integrated circuit output. This prevents hazardous RF power radiation from the unterminated port.*
3	Connect the P-48N309 cable assembly from TP1 to TP5 on the IF limiter — carrier resupply. (This disables the IF carrier resupply.) *Note:* Delete this step on HS or HS/SD bays.
4	Remove the 3-inch flexible waveguide from the transmitter and connect a shorting plate to the exposed port leading to the 1432 ( ) transmitter channel combining network.
5	Prepare transmitter for test as shown in Fig. 1.
6	Connect test set in accordance with Fig. 2, Preparation for Test, Part 1 and 2.
7	Terminate the coaxial TEST port on the 29A integrated circuit.
8	Reconnect the P14 plug to the IF IN jack of IF driver amplifier.
9	Select COLL CURR on the meter panel. *Requirement:* 70±4 If the requirement is not met, perform Step 3 of Chart D.
10	Connect test set in accordance with Fig. 3, option (A). Do not perform oscilloscope calibration at this time.
11	Set power meter RANGE control to 0 dBm.
12	Measure transmitter output power using the power meter. *Requirement:* Not less +35.0 dBm minus the calibrated loss of the 24D directional coupler, and RF pad.

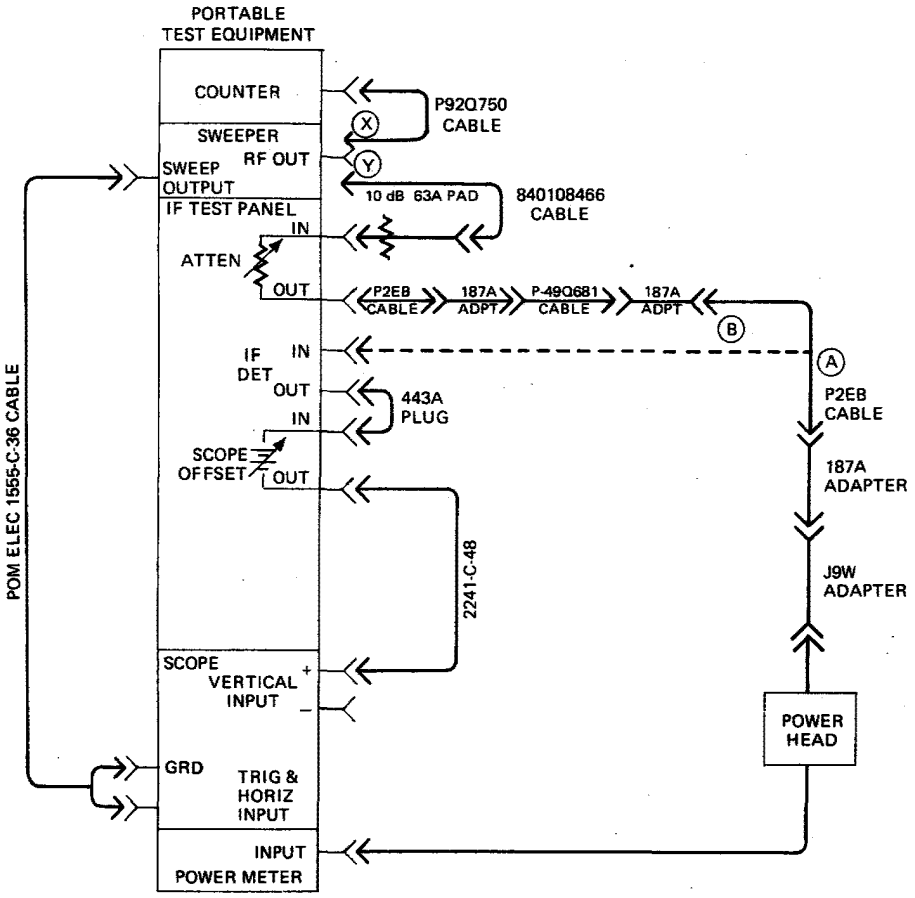


Location of Transmitter Components



Note: The TEST PORT must be near to 522A TERM.

Transmitter Test Arrangement
Preparing Transmitter For Test
Fig. 1



PREPARATION FOR TEST

PART 1

1. Insert 5007-1, IF plug-in, and associated scale into Kruse 5000A sweeper.
2. Position sweeper and counter controls.

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

3. Connect option (X).
4. Adjust sweeper Marker 2-FC control for counter reading of 70 MHz, ±0.5 MHz.
5. Connect options (Y) and (A) and position power meter and power head controls. Set IF test panel ATTEN to 7.

UNIT	CONTROL	POSITION
POWER METER	LINE	ON
	SCALE ILLUM	MID-RANGE
	RANGE	-5 dBm
POWER HEAD	% EFF	100

6. Adjust sweeper plug-in RF LEVEL control for a power meter measurement of –7 dBm, ±0.2 dBm.

PART 2

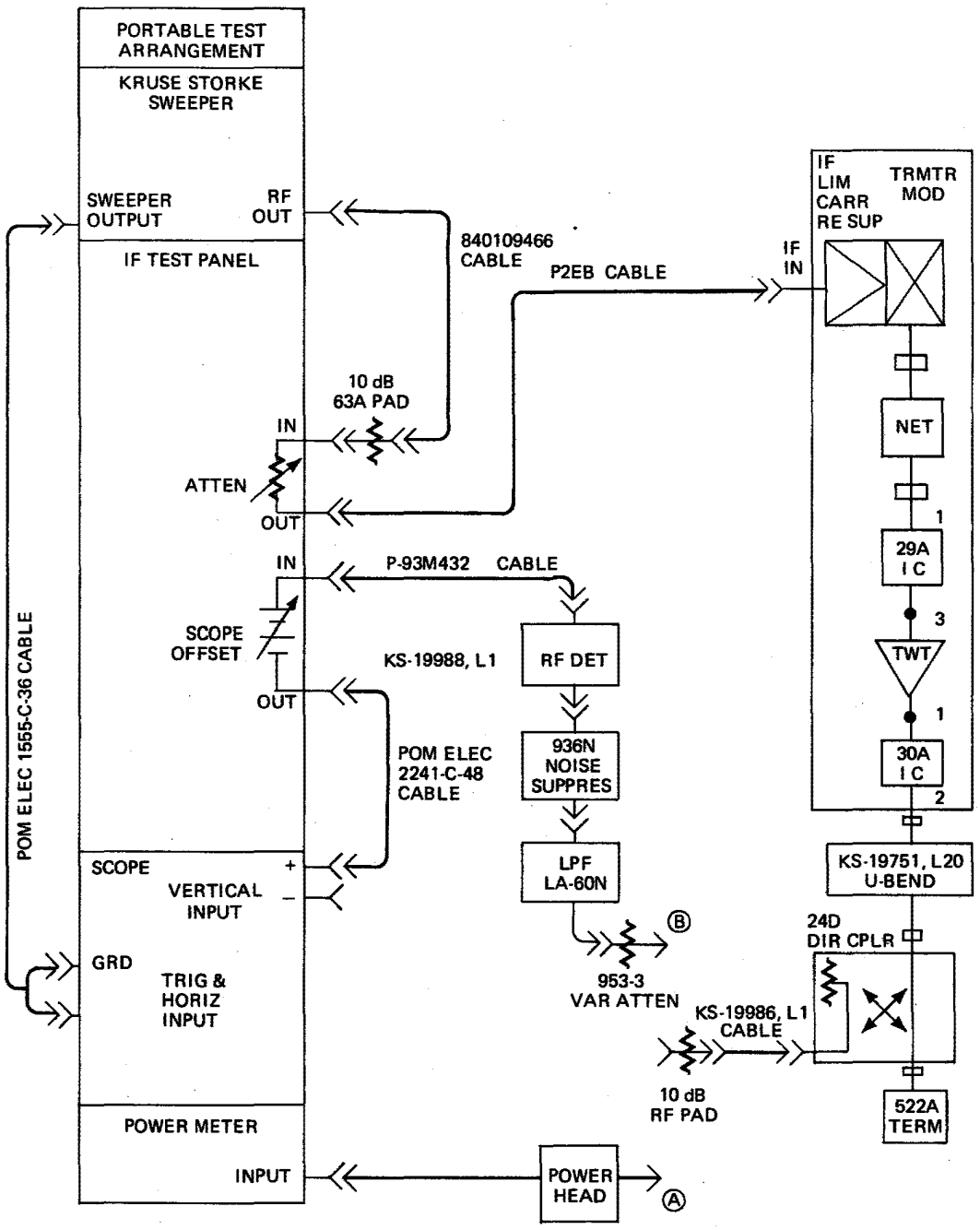
1. Position oscilloscope controls.

UNIT	CONTROL	POSITION
OSCILLOSCOPE	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

2. Set sweeper MODE control to WIDE F1-F2 and connect options (Y) (B).
3. Center trace on scope with IF test panel SCOPE OFFSET ADJ control.
4. Adjust scope HORIZONTAL POSITION and EXT HORIZ controls such that the two end markers coincide with full scale deflection. (10 divisions.)
5. While switching IF test panel ATTEN control to 8 and back to 7, adjust scope VERTICAL POSITION and SENSITIVITY controls or IF test panel SCOPE OFFSET ADJ control for a 10 division deflection. Adjust scope VERTICAL POSITION control at IF test panel ATTEN control setting of 8 and scope sensitivity control at ATTEN control setting of 7. This calibrates scope for 0.1 dB per division.
6. Change scope VERTICAL SENSITIVITY control to 1MV/DIV. This calibrates scope for 0.05 dB per division.

   Requirement: Test trace shall be flat to within .01 dB between 60 and 80 MHz. If requirement is not met, adjust IF test panel IF DET SLOPE control for a flat test trace.

Preparation and Calibration of Test Equipment
Fig. 2



OSCILLOSCOPE CALIBRATION

1. Set sweeper MODE control to WIDE F1-F2 position.
2. Scope control settings remain same as Fig. 2.
3. Position trace on scope display with IF test panel SCOPE OFFSET control.
4. Adjust scope HORIZONTAL POSITION and EXT HORIZ controls such that the two end markers coincide with full horizontal deflection. (10 divisions)
5. While setting 953-3 VAR ATTEN pad loss to 1 dB and back to 2 dB position, adjust scope VERTICAL POSITION (or SCOPE OFFSET) and SENSITIVITY controls for a deflection of 10 divisions. (Adjust VERTICAL POSITION at 1 dB and SENSITIVITY control at 2 dB of VAR ATTEN.) This calibrates scope for 0.1 dB per division.
6. Set scope VERTICAL SENSITIVITY to 1MV/DIV. The scope is now calibrated for 0.05 dB per division.
7. Set trace such that the 70 MHz (center marker) point on test trace is located on middle horizontal line with scope VERTICAL POSITION control.
8. Adjust sweeper MARKER 1 to 62 MHz and MARKER 3 to 78 MHz.

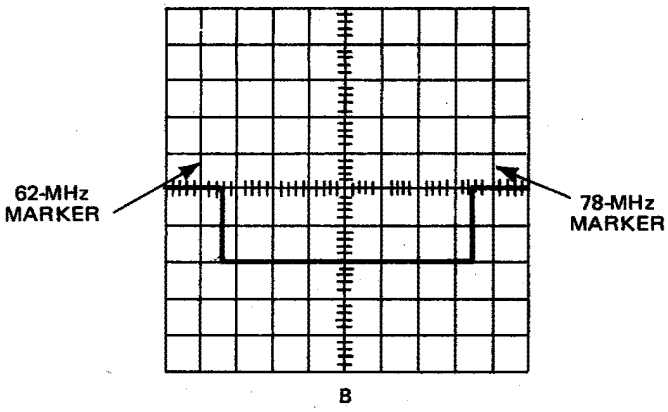
Overall Transmitter IF to RF Test Setup
Fig. 3

CHART A (Contd)

STEP	PROCEDURE
	If the requirement is not met, complete Charts B, C, and D and repeat Chart A. If requirement is met, proceed to Step 13.
13	Adjust the ATT control on the 29A integrated circuit while observing the power meter. Meet Requirement 1 or 2 as applicable to the transmitter under test. *Requirement 1:* +37.0 dBm if (a) the channel is carrying 1200 message circuits or (b) this power is specified for the transmitter. Required power meter indication equals +37.0 dBm — calibrated loss of (24D directional coupler + RF attenuator). *Requirement 2:* Maximum available power between +37.0 and +38.5 dBm if (a) the channel is carrying 1500 message circuits and/or (b) this power is specified for the transmitter. The minimum required power meter indication equals the required power meter indication specified for Requirement 1. The desired power meter indication equals up to 1.5 dB greater than the minimum power meter indication. *Example:* Calibrated 24D coupler loss = −28.0 dB Calibrated RF pad loss = −10.0 dB −38.0 dB Requirement +37.0 dBm Calibrated Loss −38.0 dBm Power Meter Indication −1.0 dBm This is the power meter indication for Requirement 1. For Requirement 2, this is the minimum power meter indication; the desired power meter indication is the maximum obtainable between −1.0 dBm and −1.0 dBm +1.5 dB = +0.5 dBm. *Note 1:* If the ATT control is set to deliver maximum power to the TWT (maximum counterclockwise), the TWT IN meter indication should be approximately 90. If the maximum output power that can be obtained from the transmitter is less than +37 dBm and the TWT IN meter indication is less than 90 (ATT maximum counterclockwise), the output power from the IF driver amplifier-transmitter modulator is too low. Perform Charts B and C, and repeat Chart A. If the maximum output power is less than +37 dBm and the TWT IN meter indication is approximately 90 (ATT maximum counterclockwise), the TWT gain is too low. Perform Charts C and D, and repeat Chart A.

CHART A (Contd)

STEP	PROCEDURE
	Note 2: If the TWT IN meter indication is approximately 90 (ATT maximum counterclockwise) and the maximum output power from the transmitter is just +37.0 dBm, the TWT gain is low. This could occur if the input, output, and/or voltage adjustments associated with the TWT were significantly misadjusted or if the TWT were near its end of life.
14	Connect test set in accordance with Fig. 3, option (B). Perform oscilloscope calibration of Fig. 3.
15	Measure amplitude response of transmitter.
	Requirement: The amplitude response shall be flat to within 0.30 dB between ±8 MHz of center frequency and within 0.45 dB between ±10 MHz of center frequency. ← ←
	If the requirement is not met, check the IF limiter — carrier resupply gain and amplitude response in accordance with Chart B, the driver amplifier and transmitter modulator gain and amplitude response in accordance with Chart C, and the TWT amplifier gain and amplitude response in accordance with Chart D; then repeat Chart A. When the requirement is met in frequency diversity bays proceed with Step 16. When the requirement is met in HS or HS/SD bays proceed with Step 17.
16	Disconnect the P-48N309 cable assembly connected in Step 3.
	Requirement: No evidence of IF limiter — carrier resupply switching from 10 MHz below to 10 MHz above the center frequency should be evident. (See Fig. 4 for an example of this condition.)



Trouble Condition Showing
Inband Switching due to Carrier Resupply
Fig. 4

	If the requirement is not met, perform Chart E; if the requirement is still not met, replace the IF limiter — carrier resupply unit and perform Charts B and E.
17	After the requirements are met, perform Charts E and F.

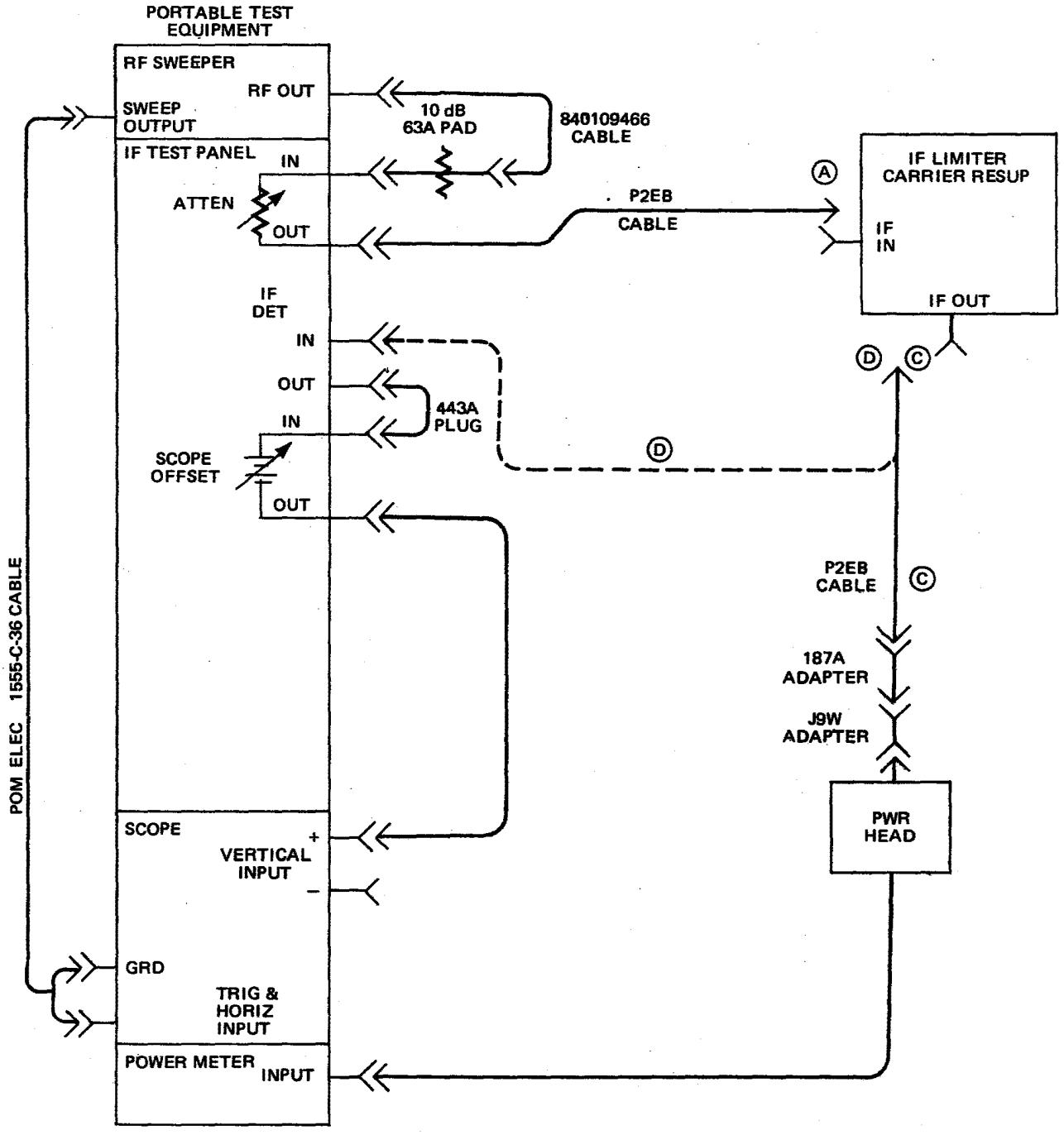
CHART B

IF LIMITER — CARRIER RESUPPLY TRANSMISSION ADJUSTMENT

APPARATUS:

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

STEP	PROCEDURE
	Notes: *1.* HS or HS/SD bays *must* be switched *off* of the channel to be tested. *2.* If the requirements in this chart are not met, replace the IF limiter-carrier resupply unit.
1	Connect test set in accordance with Fig. 5 and perform Preparation for Test. *Note:* For easy alignment, remove the unit and brackets by loosening the two screws which fasten the brackets to the bay. Hang the unit above its present location onto the bay frame post provided (use bracket hole to hang unit).
2	Observe test trace on oscilloscope. *Requirement:* The test trace and reference trace should coincide at 70 MHz, and shall be flat to within 0.05 dB between 60 and 80 MHz. If the requirement is not met, adjust the GAIN and SLOPE controls until the requirement is met. If the requirement still cannot be met, replace the IF limiter-carrier resupply unit.
3	Connect options (A) and (C).
4	Set sweeper MODE control to CW.
5	Read and record power meter indication.
6	Increase IF test panel ATTEN control setting by 5 dB (less signal). *Requirement:* The power meter indication should be within 1 dB of that recorded in Step 5.



PREPARATION FOR TEST

1. Perform test set preparation as shown in Fig. 2, Part 1 and 2.
2. Connect options (A) and (D).
3. Set sweeper MODE control to WIDE F1-F2 position.
4. Set trace such that the 70 MHz (center marker) point on test trace is located on middle horizontal line with scope VERTICAL POSITION control.

IF Limiter Carrier Resupply Unit Transmission Tests
Fig. 5

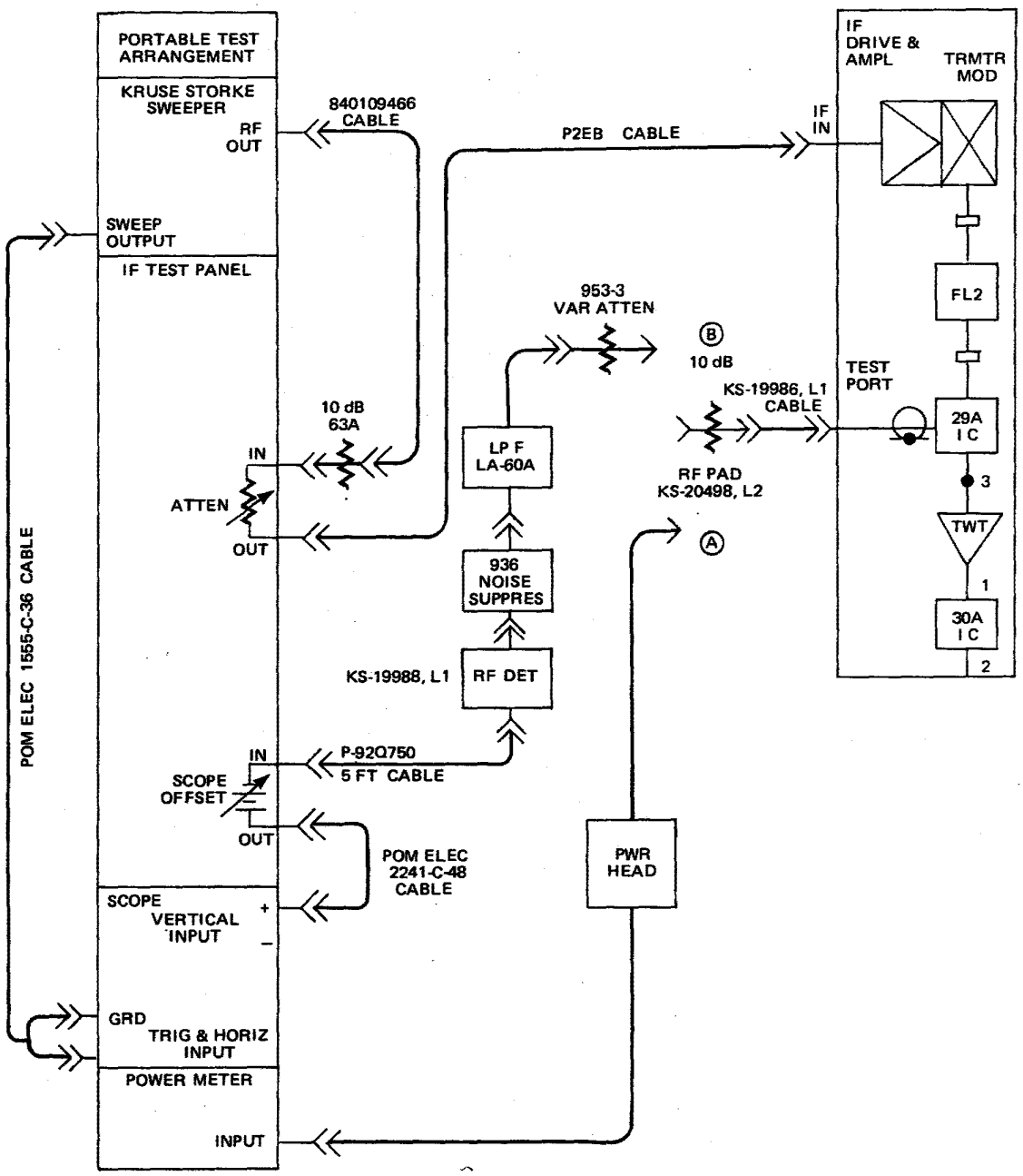
CHART C

IF DRIVER AMPLIFIER — TRANSMITTER MODULATOR ADJUSTMENT

APPARATUS:

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

STEP	PROCEDURE
	Notes: *1.* HS or HS/SD bays *must* be switched *off* of the channel to be tested. *2.* If the requirements in this chart are not met, refer to Section 411-506-503 for troubleshooting procedures.
1	Remove the termination from the TEST port of the 29A integrated circuit and insert 10 dB RF pad as shown in Fig. 6.
2	Connect the test set in accordance with Fig. 6, option (A) and Preparation for Test.
3	Adjust ATT control on the 29A integrated circuit for maximum power output at the TEST port. (Maximum power is obtained by turning the attenuator counterclockwise.) *Requirement:* +9 dB. If the requirement is not met, adjust the DIODE BIAS control on the IF driver amplifier for maximum output; then adjust the GAIN control. *Note:* If the GAIN control has insufficient adjustment range to obtain the required power, readjust the DIODE BIAS control to meet the requirement.
4	Connect the test set in accordance with Fig. 6, option (B) Preparation for Test. Measure the amplitude response of the IF driver amplifier — transmitter modulator. *Requirement:* The amplitude response shall be flat to within 0.15 dB between ±8 MHz of center frequency, and 0.23 dB between ±10 MHz of center frequency. If the requirement is not met, adjust the SLOPE control (coarse adjustment) and the DIODE BIAS control (fine adjustment) until the requirement is met. If necessary, adjust the GAIN control to keep the traces coincident.
5	Select, in turn, TRMTR MOD BIAS and DR AMPL OUT, and record the indication for each on the meter panel.
6	Remove the connection from the TEST port on the 29A integrated circuit and replace the termination on the 29A integrated circuit.
7	Readjust ATT control on the 29A integrated circuit for TWT IN meter indication recorded on the meter panel.



PREPARATION FOR TEST

1. Prepare test setup in accordance with Fig. 2, Part 1.

Option A

1. Set power meter RANGE control to 0 dBm.

Option B

1. Set sweeper MODE control to WIDE F1-F2 position.
2. Scope control settings as shown in Fig. 2, Part 2.
3. Set RF variable pad for exactly 2.0 dBm.
4. Position trace on scope display with IF test panel SCOPE OFFSET control.
5. Adjust scope HORIZONTAL POSITION and EXT HORIZ controls such that the two end markers coincide with full horizontal deflection. (10 divisions)
6. While setting 953-3 VAR ATTEN pad loss to 1 dB and back to 2 dB position, adjust scope VERTICAL POSITION (or SCOPE OFFSET) and SENSITIVITY controls for a deflection of 10 divisions. (Adjust VERTICAL POSITION at 1 dB and SENSITIVITY control at 2 dB of VAR ATTEN.) This calibrates scope for 0.1 dB per division.
7. Set scope VERTICAL SENSITIVITY to 1 MV/DIV. The scope is now calibrated for 0.05 dB per division.
8. Set trace such that the 70 MHz (center marker) point on test trace is located on middle horizontal line with scope VERTICAL POSITION control.

IF Driver Amplifier Transmitter Modulator Test Setup
Fig. 6

CHART D

TWT AMPLIFIER ADJUSTMENT

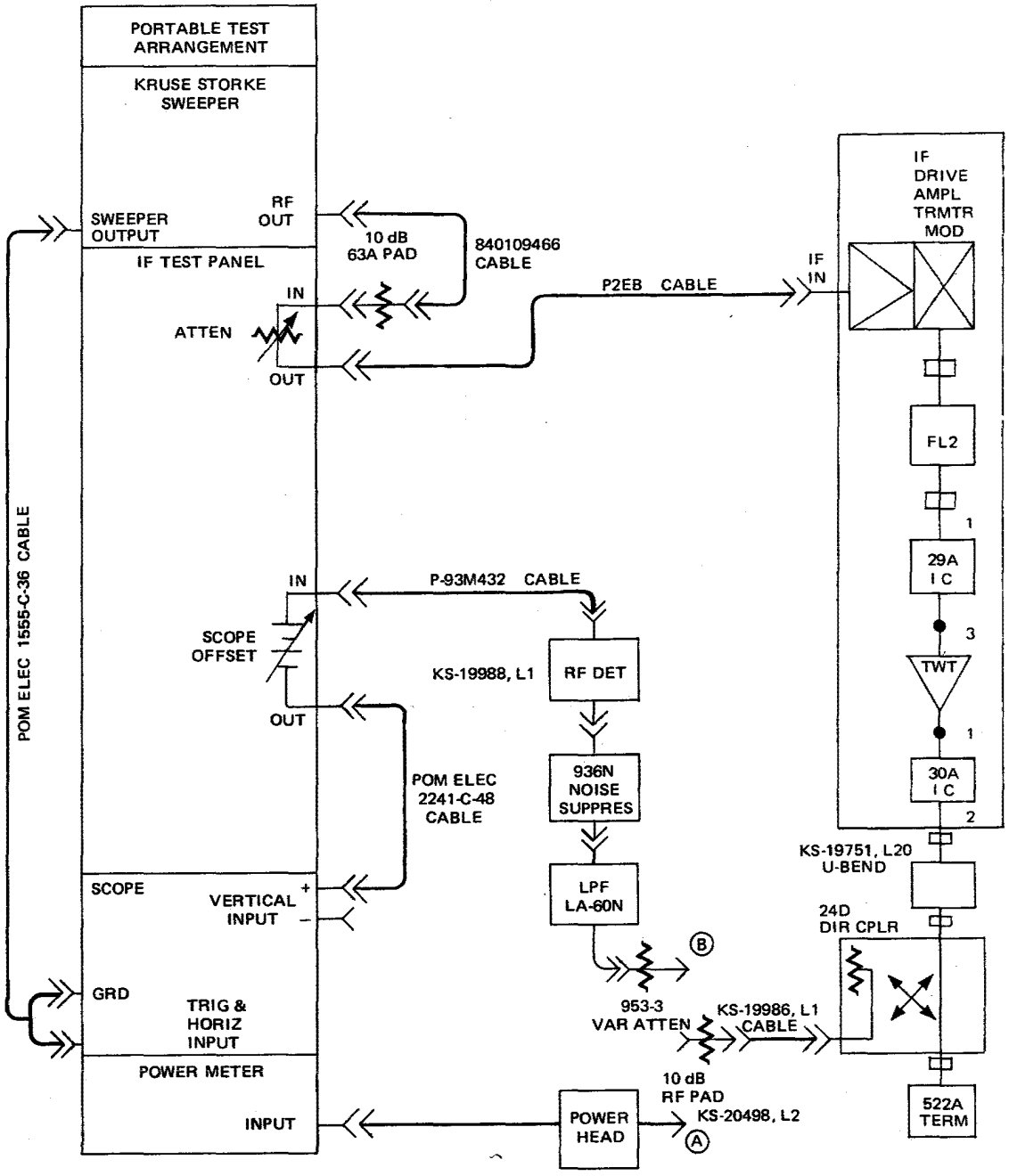
APPARATUS:

1—ED-50996-10 Portable Test Arrangement

STEP	PROCEDURE
	Notes: *1.* The TWT should have been energized for at least 20 minutes so that it is at normal operating temperature, and the IF driver amplifier — transmitter modulator should have been checked in accordance with Chart C before performing any test in this chart. *2.* If the requirements are not met in this chart, refer to Section 411-506-504 for troubleshooting procedures. *3.* HS or HS/SD bays must be switched off of the channel to be tested.
1	Remove 3-inch flexible waveguide from transmitter and connect a shorting plate to exposed port leading to 1432 ( ) transmitter channel combining network. Prepare transmitter for test in accordance with Fig. 1.
2	Connect test set in accordance with Fig. 7, option (A) and Preparation for Test.
3	Select COLL CUR on the meter panel and adjust the HELIX ADJ control on the power supply for a maximum power meter indication, while maintaining the panel meter indication at 70 with the ANODE ADJUST control. *Requirement:* 70 ±1 (panel meter) *Note:* If a COLL CUR indication of 70 cannot be obtained by adjusting the ANODE ADJUST control, leave the ANODE ADJUST control in the counterclockwise position and adjust the HELIX ADJUST control for an indication of 70.
4	Adjust TUN 1 and TUN 2 controls on the 29A and 30A integrated circuits for maximum transmitter power output as indicated on the power meter.
5	Adjust ATT control on the 29A integrated circuit to meet the following requirement. *Requirement:* +37.0 dBm minus the calibrated loss of the 24D directional coupler and RF pad.

CHART D (Contd)

STEP	PROCEDURE
	Example: Calibrated 24D coupler loss = −28.0 dB Calibrated RF pad loss = −10.0 dB = −38.0 dB Requirement = +37.0 dBm Calibrated Loss = −38.0 dBm Power Meter Indication = − 1.0 dBm
6	Connect test set in accordance with Fig. 7, option (B) and Preparation for Test.
7	Adjust TUN 1 and TUN 2 controls on the 30A integrated circuit to meet the following requirement. *Requirement:* The amplitude response shall be flat to within 0.20 dB between ±8 MHz of center frequency, and 0.35 dB between ±10 MHz of center frequency. *Note:* The test trace displays the combined amplitude response of the IF driver amplifier — transmitter modulator and TWT amplifier.
8	Connect test set in accordance with Fig. 7, option (A) and check transmitter output power. *Requirement:* Greater than +36.0 dBm minus the calibrated loss of the 24D directional coupler, RF attenuator, and the RF cable, if used.
9	With the ATT control on the 29A integrated circuit, adjust the transmitter output power. Meet Requirement 1 or 2 as applicable to the transmitter under test. *Requirement 1:* +37.0 dBm. For 1200 message circuit channels, the power meter indication is equal to +37.0 dBm minus the calibrated loss of the 24D directional coupler and the RF attenuator. *Requirement 2:* For 1500 message circuit channels, the maximum available between +37.0 and +38.5 dBm (minimum power meter indication same as for Requirement 1; up to 1.5 dB greater whenever possible).
10	Select TWT IN and COLL CUR on the meter panel and record each meter indication.



PREPARATION FOR TEST

1. Prepare test setup in accordance with Fig. 2, Part 1.

Option A

1. Set power meter RANGE control to 0 dBm.

Option B

1. Set sweeper MODE control to WIDE F1-F2 position.
2. Scope settings as shown in Fig. 2.
3. Set RF variable pad for exactly 2.0 dBm.
4. Position trace on scope display with IF test panel SCOPE OFFSET control.
5. Adjust scope HORIZONTAL POSITION and EXT HORIZ controls such that the two end markers coincide with full horizontal deflection. (10 divisions)
6. While setting 953-3 VAR ATTEN pad loss to 1 dB and back to 2 dB position, adjust scope VERTICAL POSITION (or SCOPE OFFSET) and SENSITIVITY controls for a deflection of 10 divisions. (Adjust VERTICAL POSITION at 1 dB and SENSITIVITY control at 2 dB of VAR ATTEN.) This calibrates scope for 0.1 dB per division.
7. Set scope VERTICAL SENSITIVITY to 1 MV/DIV. The scope is now calibrated for 0.05 dB per division.
8. Set trace such that the 70 MHz (center marker) point on test trace is located on middle horizontal line with scope VERTICAL POSITION control.

Test Setup for TWT Amplifier Adjustment
Fig. 7

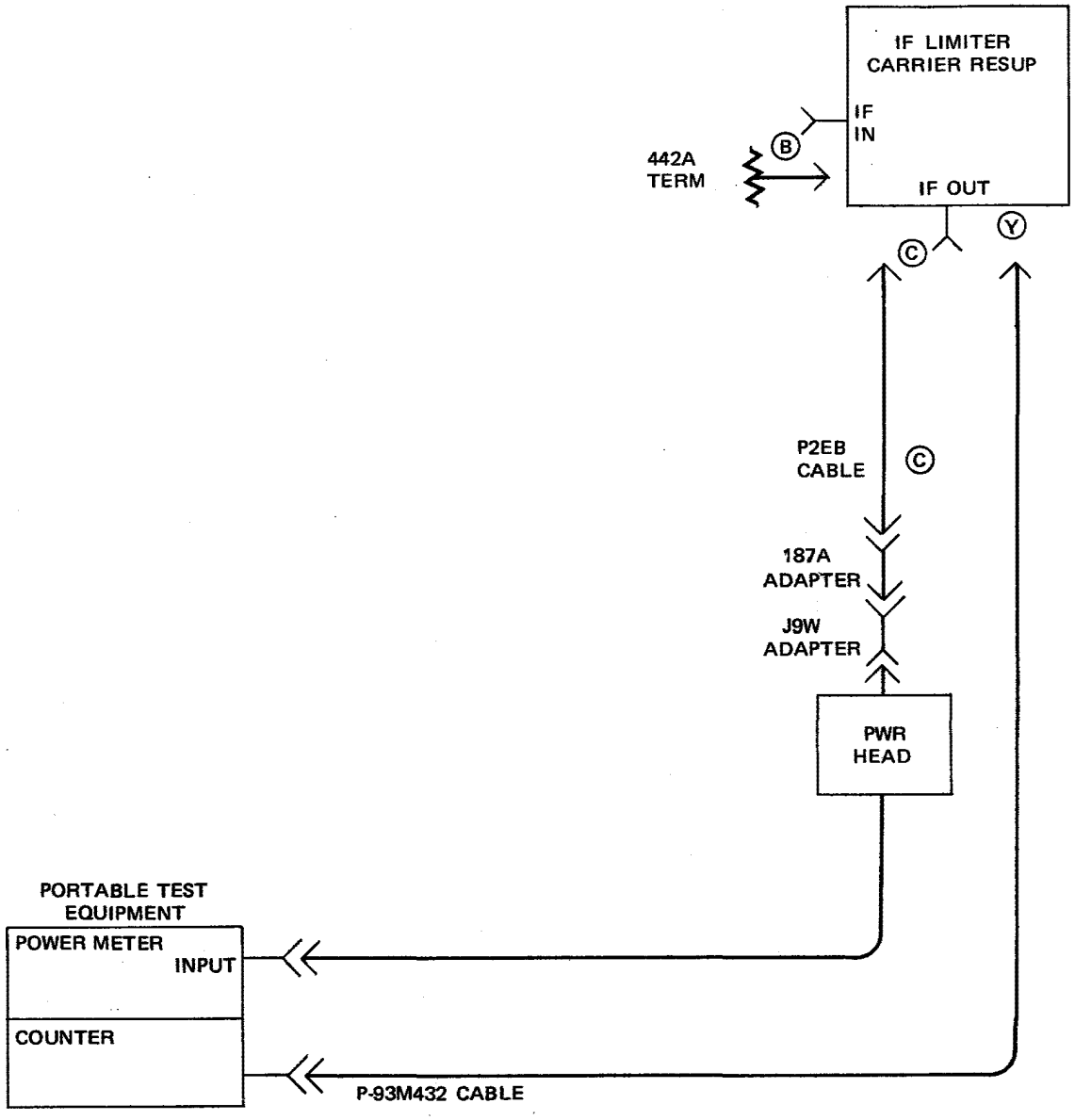
CHART E

IF LIMITER — CARRIER RESUPPLY OPERATION CHECKS

APPARATUS:

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

STEP	PROCEDURE
	Note: If the requirrements are not in this chart, replace the IF limiter — carrier resupply unit.
	Carrier Resupply 70 MHz Frequency and Output Power Checks
1	Connect test set in accordance with Fig. 8, Step 1.
2	Measure the 70 MHz output power.
	Requirement: −7.0 dBm ±1 dB
3	Connect option (Y), and Fig. 8, Step 2 and measure and record output frequency.
	Requirement: 70 ±0.006 MHz
	Carrier Resupply 61 MHz Frequency and Output Power Checks
4	Connect test set in accordance with Fig. 9A and perform the Preparation for Test procedures to calibrate the test setup.
5	Connect test set in accordance with Fig. 9B, option (X).
6	Adjust the 9 MHz LEV control of the IF limiter — carrier resupply to meet the following requirement.
	Requirement: −10 dBm ±0.5 dB
	Note: The requirement corresponds to −42 dBm ±0.5 dB at the IF limiter — carrier resupply output.
7	Select CRS 9 MHz on the panel meter and adjust the 9 MHz ALM V control to meet the following requirement.
	Requirement: 59 ±5
8	Connect option (Y) and measure the frequency. Subtract this frequency from that recorded in Step 3.



PREPARATION FOR TEST

1. Connect options (B) and (C). Set power meter controls.

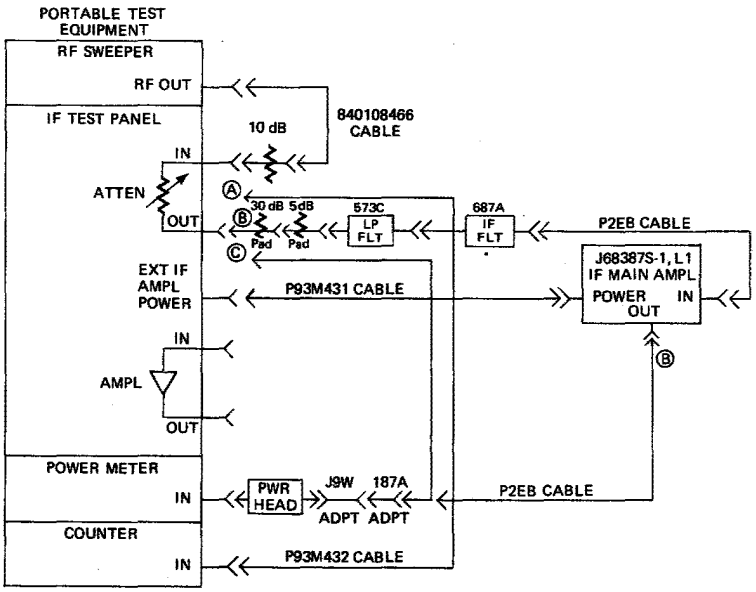
UNIT	CONTROL	POSITION
POWER METER	LINE	ON
	SCALE ILLUM	MID-RANGE
	RANGE	-5 dBm
POWER HEAD	% EFF	100

2. Set counter controls.

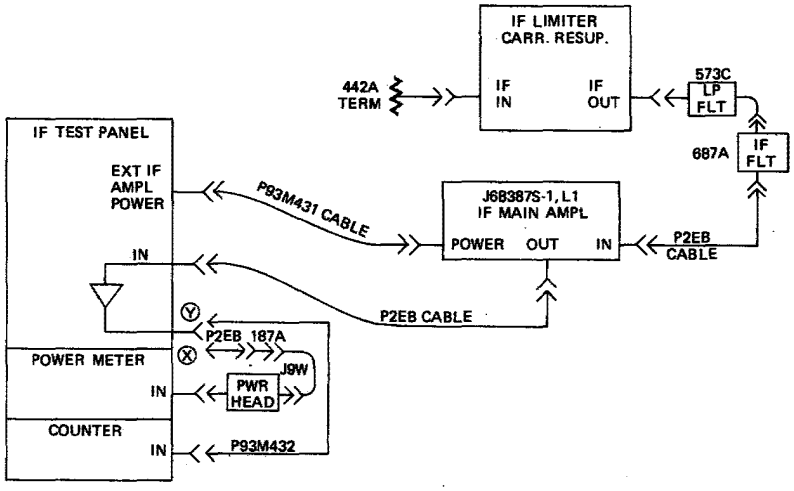
CONTROL	POSITION
FREQ A (kHz)	10 ms
DISPLAY TIME	MINIMUM
INPUT B INT OSC	INT OSC
GAIN	MAX
NORM-TEST (OR AC TEST DC)	NORM (OR AC)

IF Limiter Carrier Resupply
70 MHz Output Power and Frequency Test Setup
Fig. 8

A



B



PREPARATION FOR TEST

1. Insert 5007-1, IF plug-in and associated scale into Kruse 5000A sweeper.
2. Position sweeper, power meter, and counter controls.

UNIT	CONTROL	POSITION
SWEEPER	PUSH ON-OFF	ON
	SWEEP SECONDS	.01
	SWEEP SECONDS VERNIER	FULLY 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
	MARKER 1	60 MHz
	MARKER 2-FC	70 MHz
	MARKER 3	80 MHz
IF PLUG-IN	MARKER ADJ	MID-RANGE
	MARKERS	MARKERS
	RETRACE	OFF
	LEVELER	LEVELER
	1 kHz	OFF
	RF LEVEL	FULLY CCW

UNIT	CONTROL	POSITION
COUNTER	FREQ A (kHz)	10 ms
	DISPLAY TIME	MINIMUM
	INP B INT OSC	INT OSC
	GAIN	MAX
	NORM-TEST (OR AC TEST DC)	NORM (OR AC)
POWER METER	LINE	ON
	SCALE ILLUM	MID-RANGE
	RANGE	-5 dBm
POWER HEAD	% EFF	100

3. Set IF test panel ATTEN control to 7 dB.
4. Connect option (A) and adjust sweeper MARKER 2-FC control for a 61.0 ±0.5 MHz counter reading.
5. Connect option (C) and adjust sweeper RF LEVEL control for a power measurement of -7 dBm.
6. Connect option (B) and adjust EXT AMPL GAIN control for a power measurement of -10 dBm.

IF Limiter — Carrier Resupply
61 MHz Output Power and Frequency Test Setup
Fig. 9

CHART E (Contd)

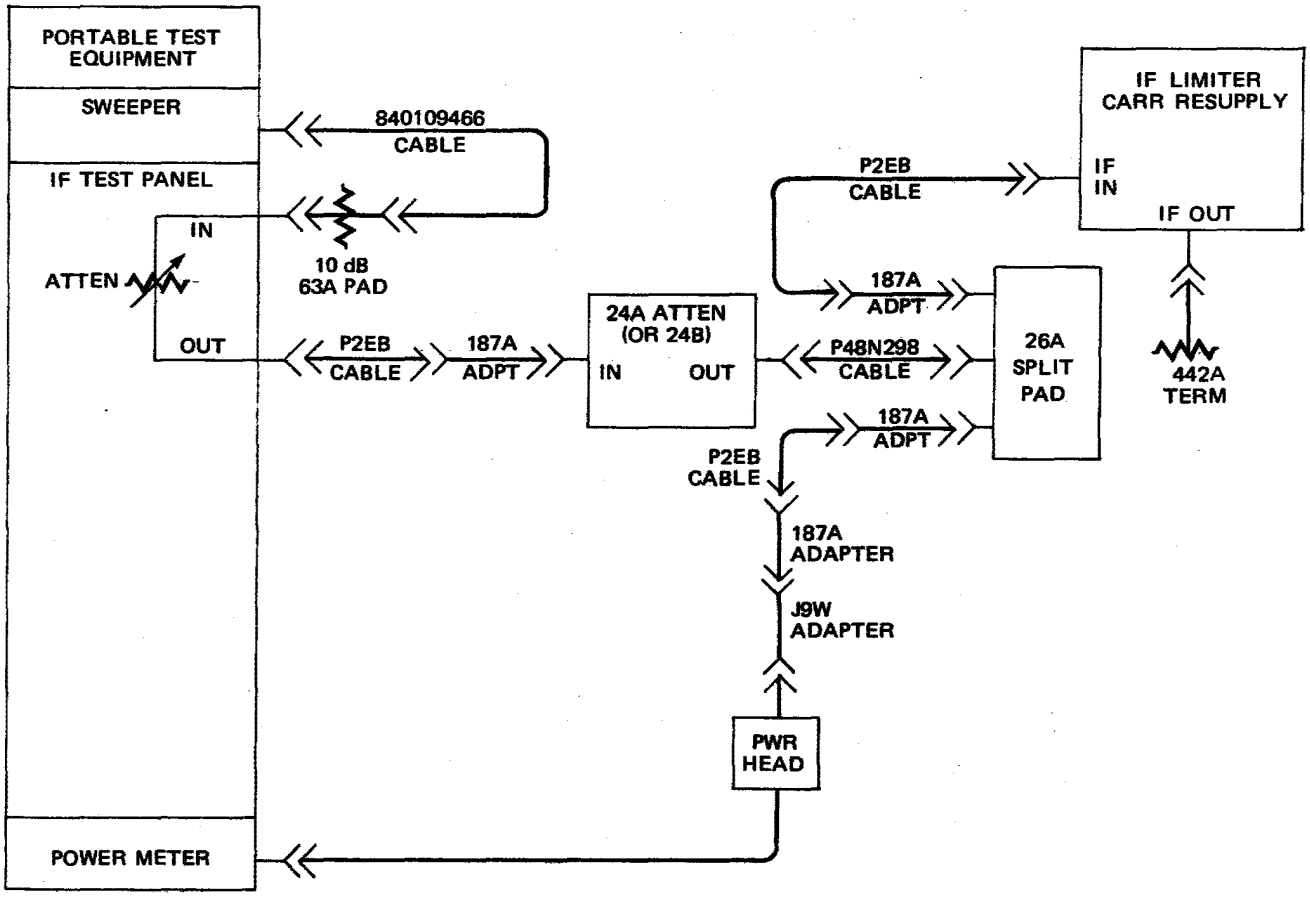
STEP	PROCEDURE
	Requirement: 9 ±0.0015 MHz
	Carrier Resupply Trip and Restore Checks
9	Connect test set in accordance with Fig. 10.
10	Select CRS SW V on the meter panel and record the meter indication.
11	Slowly increase 24A or 24B ATTEN until the CRS SW V meter indication just drops to zero. Set power meter RANGE control to −16 dBm and measure power.
	Requirement: −16.0 dBm ±0.5 dB
	If the requirement is not met, proceed to following Steps 12 to 16.
12	Set TRIP control fully clockwise. Set power meter RANGE control to −15 dBm.
13	Adjust 24A or 24B ATTEN for a −16 dBm power measurement.
14	Slowly rotate TRIP control counterclockwise until CRS SW V indication on the meter panel drops to zero.
15	Set power meter RANGE control to −10 dBm.
16	Slowly increase input power to unit by decreasing ATTEN until meter reading jumps up scale.
→	*Requirement:* Between −15.0 dBm and −12.5 dBm
	If requirement is not met, replace IF limiter-carrier resupply unit and repeat Charts B and F.
17	Record meter panel directions for LIM CUR, LIM IN, CRS 70 MHz, CRS 9 MHz, and CRS SW V.

CHART F

ALARM CHECKS AND ADJUSTMENTS

APPARATUS:

1—ED-50996-10 Portable Test Arrangement



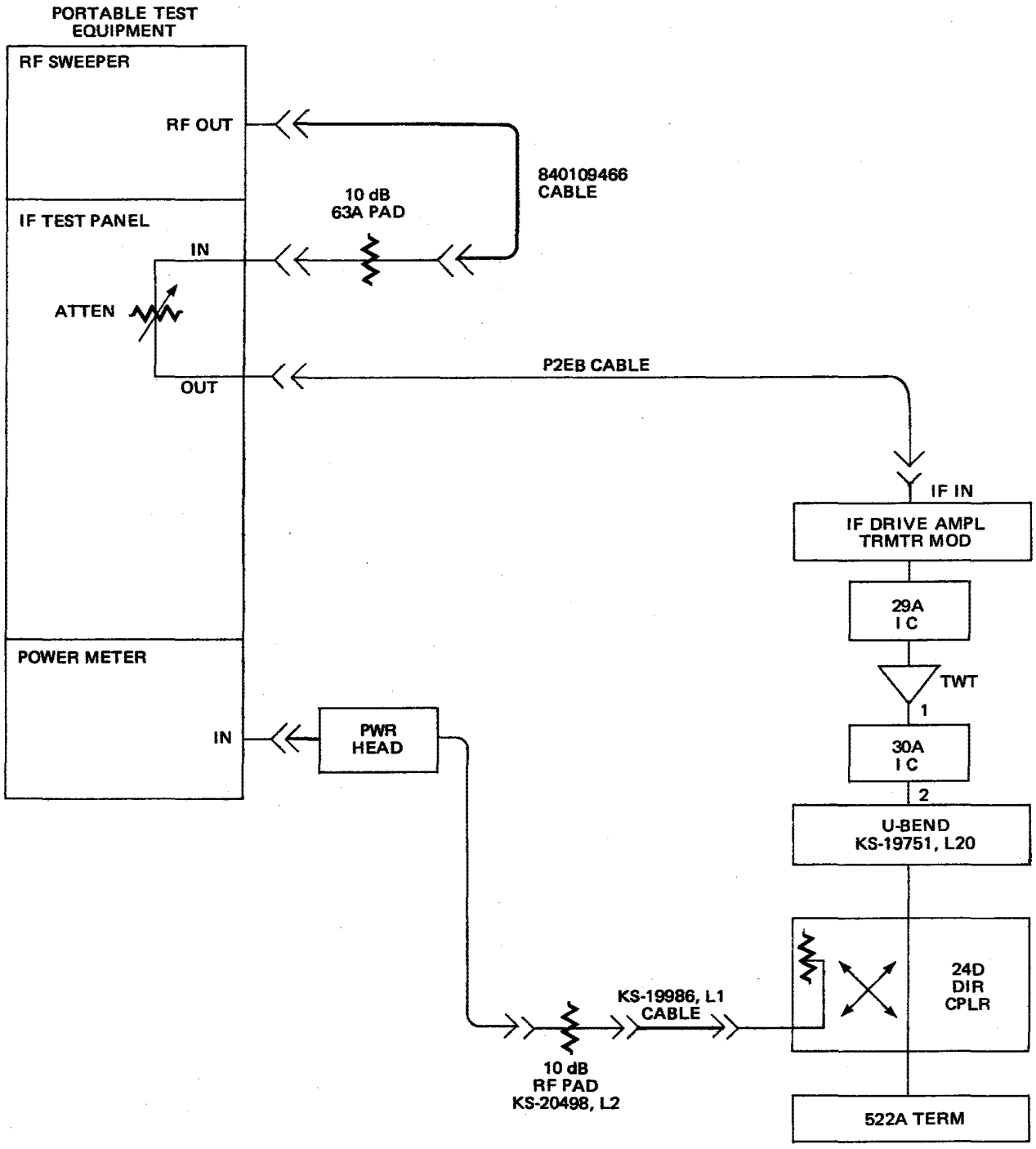
Preparation For Test

1. Prepare test set in accordance with Fig. 2, Part 1.
2. Set IF test panel ATTEN to 0 dB.
3. Set 24A or 24B ATTEN for minimum atten (fully counterclockwise).
4. Set power meter RANGE control to – 10 dBm.

IF Limiter — Carrier Resupply
Trip and Restore Point Test Setup
Fig. 10

CHART F (Contd)

STEP	PROCEDURE
	Carrier Resupply 9 MHz Alarm Checks (frequency diversity only)
1	Adjust the 9 MHz LEV control counterclockwise until the CRS 9 MHz alarm lamp on the alarm panel just lights.
2	Select CRS 9 MHz on the meter panel.
	Requirement: Between 18 and 42.
3	Readjust the 9 MHz LEV for a CRS 9 MHz indication equal to the value recorded on the meter panel.
	Transmitter Output Power Alarm Checks and Adjustments
	Note: HS or HS/SD bays must be switched off of the channel which is to be tested.
4	Connect test set in accordance with Fig. 11.
5	Record power meter indication.
6	Increase IF test panel ATTEN control until the TRMTR OUT alarm lamp just lights on the alarm panel.
7	Record power meter indication.
	Requirement: The difference in this indication and that of Step 5 shall be between 2 and 4 dB.
	If the requirement is not met, perform only Steps 8 through 10.
8	Readjust IF test panel ATTEN control for the same power meter indication recorded in Step 5.
9	Increase IF test panel ATTEN control until the power meter indication drops by 3 dB.
10	Adjust MON ADJ control on the 30A integrated circuit until TRMTR OUT alarm lamp just lights.
	Note: If TRMTR OUT lamp is lit, adjust MON ADJ control to extinguish the lamp.
11	Readjust IF test panel ATTEN control for the same power meter indication as recorded in Step 5.
12	Record TRMTR OUT meter indication.
	Caution: Prior to disconnecting the test appartus from the transmitter as directed in Step 13, temporarily remove the P14 plug from the IF input jack of the IF driver amplifier.
13	Disconnect all test connections and apparatus from the transmitter.
14	Reconnect the normal transmitter connections, connecting the P14 plug to the IF input jack of the IF driver amplifier last.
	Caution: To avoid potential RF power radiation, the P14 plug should be connected last.



Preparation for Test

1. Prepare transmitter for test as shown in Fig. 1.
2. Prepare test setup in accordance with Fig. 2, Part 1.
3. Connect test setup.

Test Setup for Checking and Adjusting Transmitter Output Power Alarm
Fig. 11