PERFORMANCE REQUIREMENTS FOR THE J68386G AND H TRANSMITTER-RECEIVER BAYS USED IN THE TD-3 RADIO SYSTEM TOLL SYSTEMS

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1. GENERAL

1.01 This section covers the performance requirements which the J68386G repeater station and J68386H main station transmitter-receiver bays installed by the Western Electric Company and tested with the J68392A test set shall meet before turnover to the customer.

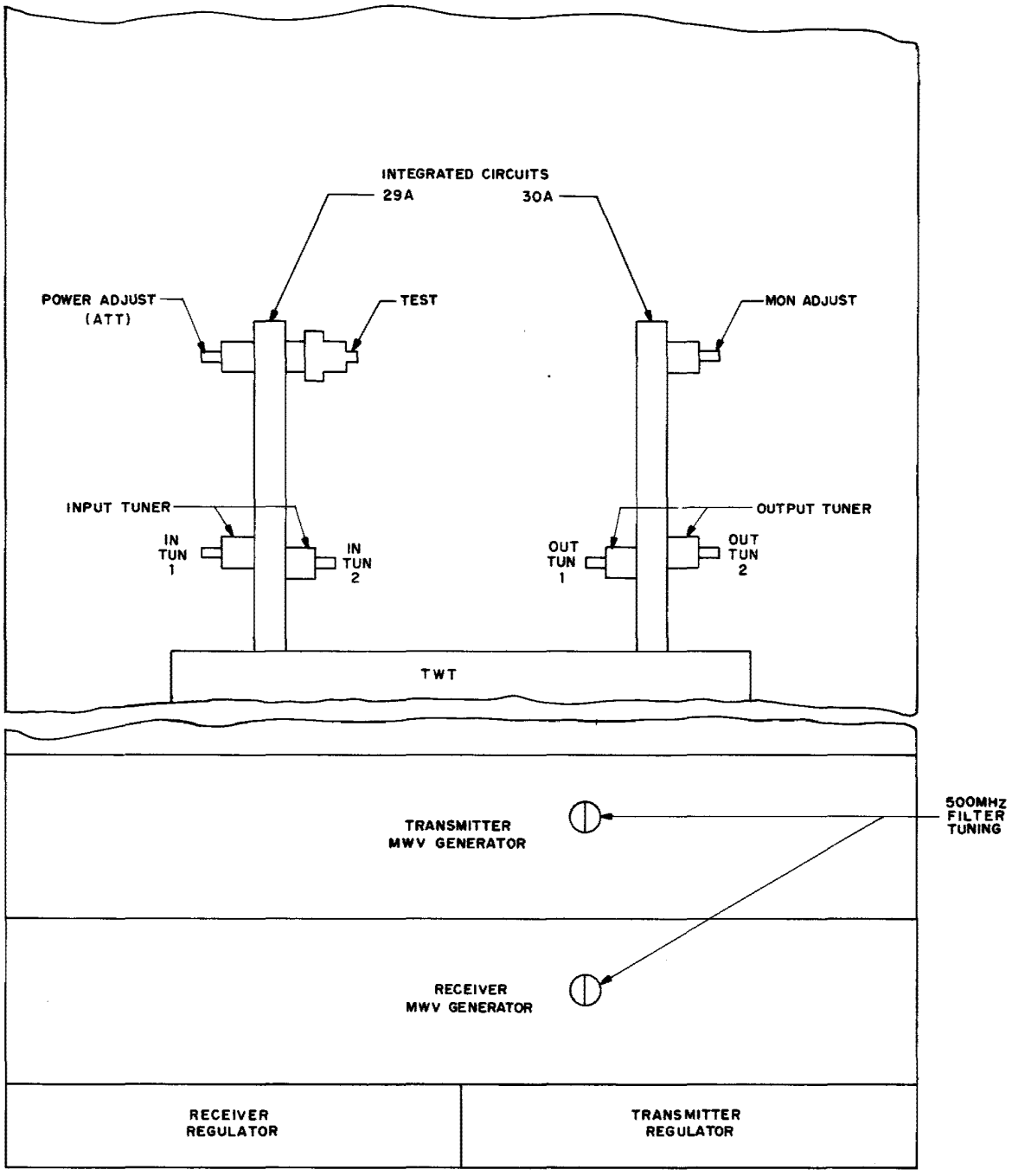

Fig. 1—Bottom Front of Main Station Bay

1.02 Refer to BSP Section 800-630-180 covering general requirements and definitions for additional information necessary for the proper application of the requirements.

1.03 The tests shall be performed in the order prescribed.

1.04 The requirements are based upon the use of the following testing equipment:

1—J68392A Test Set (any version that includes List 8). Use is made of the following accessories that are furnished with the test set.

1—J68835D Traveling-Wave-Tube (TWT) Power Supply Test Load

1—24A Transducer

1—24D Directional Coupler

1—522A Waveguide Termination

1—KS-14510, List 1 Volt-ohm-milliammeter (VOM)

1—KS-19751, List 20 Flexible Waveguide U Bend

1—KS-19986, List 4 Cable

1—KS-20498, List 2 RF Pad, 10 dB

1—P-48N180 Cable (6-foot miniature coaxial cable which connects FREQ test points to frequency counter)

2—P-49Q680 IF Cables (8 foot)

1—P-49Q681 IF Cable (6-inch)

–190A Adapters, as required

Note: The line engineer or operating personnel will provide the value of the normal received carrier power at the drop arm of the receiver channel separation network for any given transmitter-receiver bay. This value of received carrier power is used when aligning the radio receiver.

2. COMMON EQUIPMENT TESTS

A. Preliminary Adjustments

Caution: Before opening any transmitter waveguide joints, check that all circuit breakers on the bay are turned off.

Note: Where tolerances are not specifically indicated on numerical values, which occur throughout this section, the following shall apply:

(a) Bay panel meter: $\pm 1/2$ division

(b) Power indication, dBm or dB: ± 0.1

(c) Frequency: ± 1 MHz

2.01 On the transmitter, remove the piece of 3-inch flexible waveguide following the 30A integrated network (see Fig. 1) and on the receiver, the piece of 3-inch flexible waveguide ahead of isolator AT1.

2.02 Assemble the KS-19751, List 20 flexible waveguide U bend, the 24D directional coupler, and 522A termination in that order and connect this test assembly to Port 2 of the 30A integrated network in the transmitter. Connect a 24A transducer to isolator AT1 in the receiver.

2.03 Before operating the circuit breakers on the bay, check the power connections at the bay terminal strip for the proper polarity with a KS-14510, List 1 VOM.

TERM. STRIP	TERMINAL IDENTIFICATION		VOLTAGE
	REPEATER STATION BAY	MAIN STATION BAY	
TS1	1	1	−24*
	2	2	Ground
	5	3 5	−24*
	6	4 6	Ground
	7	7	−24*
	8	8	Ground

*This is the nominal voltage, the range is −21 to −26 volts.

B. Turning On Radio Equipment

2.04 Turn on the following circuit breakers:

RCVR PWR

TRMTR PWR (if equipped)

ALM PWR (the ABS light shall extinguish)

INPUT (located on TWT power supply. This also causes a red indicator lamp to light during the period of TWT warm up.)

2.05 Measure the voltage at the bay terminal strip and verify that the voltages are within limits, as follows:

TERM. STRIP	TERMINAL IDENTIFICATION		VOLTAGE LIMITS
	REPEATER STATION BAY	MAIN STATION BAY	
TS1	1	1	−21 to −26
	2	2	Ground
		3	−21 to −26
		4	Ground
	7	7	−21 to −26
	8	8	Ground

2.06 After the TWT power supply warm-up period has completed, the red indicator lamp will extinguish. Check that the COLL CUR reads 70 ±5 on the meter. Vary the ANODE VOLTAGE ADJUST, if necessary. If the ANODE VOLTAGE ADJUST is at the end of its range, vary the HELIX ADJUST control. Measure the voltage at the INPUT VOLTAGE test jacks and take the action indicated as follows:

IF READING AT INPUT VOLTAGE	ACTION
23 to 26 Volts	No change on power supply (leave circuit breaker in ON position)
Greater than 26 Volts	Voltage too high, not acceptable
Less than 21 Volts	Voltage too low, not acceptable
21 to 23 Volts	Turn INPUT circuit breaker off. Remove the two plug-in units from the TWT power supply. Locate transformer T5 in the converter circuit (right-hand unit). Disconnect the B lead from tap 10 of T5 and connect to tap 11 of T5. Replace the units in the power supply and turn the INPUT circuit breaker to the ON position.

2.07 Operate the −19V pushbutton(s) on the meter panel for the receiver and/or transmitter and note the meter reading(s).

Requirement: The meter shall read on the red line (70).

If this requirement is not met, remove the cover panel and vary the ADJ VOLTS control on the appropriate regulator (See Fig. 1).

3. MICROWAVE GENERATOR CHECKS

3.01 Using the frequency counter in the test set, measure the frequency at the microwave generator(s) FREQ MON jack with the 6-foot minature coaxial cable.

Requirement: The frequency shall be as specified in one of the Tables A, B, and C.

If this requirement is not met, adjust the FREQ ADJ control. This control is first set to an extreme clockwise (CW) position and then backed off counterclockwise (CCW).

Note: The requirement must be met with the tuning tool removed.

3.02 Operate the MWV GEN OUT pushbutton(s).

Requirement: The meter shall read 70.

If this requirement is not met, but is within the range 70±5, adjust the LEV ADJ control on the appropriate generator, located on the 125- to 500-MHz multiplier unit, for a meter reading of 70.

Note: If the meter reading was found to be outside the range 70±5, refer to BSP 411-502-504 for trouble shooting tests and retuning.

4. RECEIVER TESTS

A. Shift Modulator Check (Repeater Station Bays Only)

4.01 With the frequency counter in the test set, measure the frequency at the OSC MON jack. Use the 6-foot miniature coaxial cable to connect to the counter.

Requirement: The frequency shall be 40 MHz ±50 Hz.

If this requirement is not met adjust the FREQ control.

4.02 Remove the cable from the OSC MON jack.

4.03 Operate the SHIFT MOD OUT push button.

Requirement: The meter shall read 70.

If this requirement is not met adjust the PWR ADJ control.

B. Receiver Modulator IF Preamplifier Check

4.04 Prepare the test set for an RF to IF swept measurement. Adjust the test set to obtain a signal swept ±10 MHz about the received carrier frequency at a power equal to the normal received carrier power expected at the output of the channel separating network Z1. Apply this signal to the

TABLE A

REPEATER STATION TRANSMITTER-RECEIVER BAY

CHANNEL FREQUENCY		MICROWAVE GENERATOR LOW-FREQUENCY OSCILLATOR	
RECEIVER	TRANSMITTER		
MHz		MHz	±Hz
3730	3770	120.0000	±120
3770	3730	118.7500	±119
3810	3850	122.5000	±122
3850	3810	121.2500	±121
3890	3930	120.6250	±121
3930	3890	119.3750	±119
3970	4010	123.1250	±123
4010	3970	121.8750	±122
4050	4090	125.6250	±126
4090	4050	124.3750	±124
4130	4170	128.1250	±128
4170	4130	126.8750	±127
3710	3750	119.3750	±119
3750	3710	118.1250	±118
3790	3830	121.8750	±122
3830	3790	120.6250	±121
3870	3910	120.0000	±120
3910	3870	118.7500	±119
3950	3990	122.5000	±122
3990	3950	121.2500	±121
4030	4070	125.0000	±125
4070	4030	123.7500	±124
4110	4150	127.5000	±128
4150	4110	126.2500	±126

24A transducer previously connected to AT1. Remove the cable from the IF PREAMPLIFIER IF OUT jack.

4.05 Operate the RCVD MOD BIAS pushbutton. Insure that the meter reading is in accordance with that specified for the receiving filter of the receiver under test by noting the value of the REF BIAS stamped on the modulator and applying the correction listed in Table D. Make any adjustment with the DIODE BIAS control.

TABLE B

MAIN STATION BAY TRANSMITTER

TRANSMITTER CHANNEL FREQUENCY	MICROWAVE GENERATOR LOW-FREQUENCY OSCILLATOR	
MHz	MHz	±Hz
3770 3730	120.0000 118.7500	±120 ±119
3850 3810	122.5000 121.2500	±122 ±121
3930 3890	120.6250 119.3750	±121 ±119
4010 3970	123.1250 121.8750	±123 ±122
4090 4050	125.6250 124.3750	±126 ±124
4170 4130	128.1250 126.8750	±128 ±127
3750 3710	119.3750 118.1250	±119 ±118
3830 3790	121.8750 120.6250	±122 ±121
3910 3870	120.0000 118.7500	±120 ±119
3990 3950	122.5000 121.2500	±122 ±121
4070 4030	125.0000 123.7500	±125 ±124
4150 4110	127.5000 126.2500	±128 ±126

TABLE C

MAIN STATION BAY RECEIVER

RECEIVER CHANNEL FREQUENCY	MICROWAVE GENERATOR LOW-FREQUENCY OSCILLATOR	
MHz	MHz	±Hz
3730	118.7500	±119
3770	120.0000	±120
3810	121.2500	±121
3850	122.5000	±122
3890	119.3750	±119
3930	120.6250	±121
3970	121.8750	±122
4010	123.1250	±123
4050	124.3750	±124
4090	125.6250	±126
4130	126.8750	±127
4170	128.1250	±128
3710	118.1250	±118
3750	119.3750	±119
3790	120.6250	±121
3830	121.8750	±122
3870	118.7500	±119
3910	120.0000	±120
3950	121.2500	±121
3990	122.5000	±122
4030	123.7500	±124
4070	125.0000	±125
4110	126.2500	±126
4150	127.5000	±128

TABLE D

BIAS READING

RECEIVER FREQUENCY MHz	RECEIVER FILTER FL1	BIAS READING
3710	1348A	REF BIAS +7.0
3730	1348B	REF BIAS +6.0
3870		
3750	1348C	REF BIAS +5.0
3890		
3770	1348D	REF BIAS +4.0
3910		
3790	1348E	REF BIAS +3.0
3930		
3810	1348F	REF BIAS +2.0
3950		
3830	1348G	REF BIAS +1.5
3970		
3850	1348H	REF BIAS +0.5
3990		
4010	1348J	REF BIAS +0
4030	1348K	REF BIAS −1.0
4050	1348L	REF BIAS −2.0
4070	1348M	REF BIAS −3.0
4090	1348N	REF BIAS −4.0
4110	1348P	REF BIAS −5.0
4130	1348R	REF BIAS −6.0
4150	1348S	REF BIAS −7.0
4170	1348T	REF BIAS −8.0

4.06 Observe the amplitude response at the IF OUT jack on the IF preamplifier unit. Maintain an output power of −1.0 dBm with the LEVEL control.

Requirement: The amplitude response shall be flat to within 0.09 dB over the 70 ±10 MHz band.

If this requirement is not met, adjust the SHAPE, SLOPE, and LEVEL controls for the proper amplitude response while keeping the output power at −1.0 dBm.

C. Overall Receiver and IF Main Amplifier Check

4.07 Replace the cable to the IF OUT jack on the preamplifier. Operate the AGC-MAN switch on the IF main amplifier to MAN.

4.08 While maintaining the RF sweep at the input to AT1, observe the amplitude response at the IF OUT jack of the IF main amplifier. Adjust the MAN GAIN control for an output power of +1.0 dBm.

Requirement: The amplitude response shall be flat to within 0.26 dB over the 70 ±10 MHz band.

If this requirement is not met, adjust the SLOPE 1 and SLOPE 2 controls on the IF main amplifier while maintaining +1.0 dBm output power.

4.09 Reduce the RF sweep width to zero to obtain a single frequency signal at the received carrier frequency. Operate the AGC-MAN switch to AGC. Adjust the IF LEV control to obtain +1.0 dBm output power. If necessary, adjust the M SENS control on the IF main amplifier for a RCVD CARR PWR meter reading of 80 and record this reading on the meter pushbutton.

4.10 Reduce the RF input power by 40 dB.

Requirement: The IF output power at 70 MHz shall drop by not more than 2.0 dB.

5. TRANSMITTER TESTS

A. Overall Transmitter Check

5.01 Prepare the test set for an IF to RF test. Insert an IF signal swept from 60 to 80 MHz at a power of −7 dBm into the IF IN jack of the IF limiter-carrier resupply. Observe the RF amplitude response at the test connection at the output of the 30A integrated circuit. Adjust the HELIX ADJUST control on the TWT power supply for maximum power output while maintaining a COLL CURR meter reading of 70 with the ANODE VOLTAGE ADJUST control.

Note: If the ANODE VOLTAGE ADJUST control reaches the end of its range during this adjustment it may be left in that position. The COLL CURR meter reading is then set to 70 with the HELIX ADJUST control.

Requirement 1: The amplitude response shall be within 0.15 dB from 6 MHz below to 6 MHz above the transmitter frequency.

Requirement 2: Requirement 1 shall be met with an output power of +37.0 dBm referred to port 2 of the 30A integrated circuit. The ATT control on the 29A integrated circuit (see Fig. 1) may be adjusted to obtain the required output power.

5.02 Record the new TWT IN meter reading on the pushbutton if a change in the setting of the ATT control was made in Step 5.01.

5.03 If the requirements in Step 5.01 are met, proceed to check the carrier resupply trip point in Steps 5.09 and 5.10, then proceed to 6. Transmitter and Receiver Alarm Checks.

5.04 If requirement 1 of Step 5.01 is not met, prepare to test the individual units by referring to Parts B, C, and D.

5.05 If requirement 2 of Step 5.01 is not met, or if a COLL CURR meter reading of 70 cannot be obtained, it will be necessary to install the TWT power supply test load to test the operation of the TWT power supply. Refer to 7. Traveling-Wave-Tube Power Supply Tests with Test Load for this test. If the TWT power supply meets these requirements, install a spare TWT and recheck Step 5.01.

B. IF Limiter—Carrier Resupply

5.06 ***IF Amplitude Response:*** Prepare the test set for an IF to IF response measurement. Adjust the test set IF DET SLOPE control for a flat response from 60 to 80 MHz at an input power of −7 dBm. Include the patch cables in this adjustment. Two 8-foot IF cables joined with the 6-inch IF cable may be used. Connect the swept IF output to the IF IN jack. Set the power at the IF OUT jack to −7 dBm with the GAIN control. Observe the amplitude response at the IF OUT jack.

Requirement: The amplitude response shall be flat to within 0.03 dB over the 60- to 80-MHz band with an output power of −7.0 dBm ±0.15 dB at 70 MHz.

If this requirement is not met, adjust the SLOPE and GAIN controls.

5.07 Reset the IF sweep oscillator to obtain a single frequency output of 70 MHz. Decrease the input power to the unit to −12 dBm.

Requirement: The output power at 70 MHz shall be greater than −7.5 dBm.

5.08 Terminate the IF IN jack on the unit with a 368A plug and measure the frequency at the IF OUT jack.

Requirement: The frequency shall be 70 ±0.004 MHz.

5.09 ***IF Carrier Resupply Trip Point Check:*** Prepare the test set for a 70-MHz single frequency output so that the output power can be reduced in a smooth manner. This can be accomplished by patching the IF OUT through ATT 1 and ATT 3. Set ATT 1 to 13 dB and ATT 3 to MIN. Patch from the output of ATT 3 to the IF IN jack on the unit. Operate the CRS SW V meter switch. Slowly decrease the input power by means of ATT 3 until the meter reading drops to zero.

Requirement: The input power shall be −16 ±0.2 dBm.

5.10 Slowly increase the input power to the unit until the meter reading jumps up scale.

Requirement: The input power shall be between −14.5 and −13 dBm.

If these requirements are not met proceed as follows:

(a) Set the TRIP control for full clockwise rotation and apply a power of −16 dBm to the unit.

(b) Slowly adjust the TRIP control in the counterclockwise direction until the CRS SW V meter reading drops to zero.

(c) Recheck that the requirements are met by slowly decreasing and increasing the input power to the unit.

C. IF Driver Amplifier — Transmitter Modulator

5.11 Prepare the test set for an IF to RF measurement. Remove the coaxial termination from the test port on the 29A integrated circuit. (See Fig. 1.) Connect the power meter in the test set through a 10-dB pad to the test port. Adjust the ATT control counterclockwise for maximum power.

5.12 Insert a swept IF signal of 70 ±10 MHz at a power of −7 dBm at the IF IN jack of the IF limiter-carrier resupply unit.

5.13 Adjust the DIODE BIAS control on the IF driver amplifier for maximum power.

5.14 Adjust the GAIN control on the IF driver amplifier for a power of +9.0 dBm.

5.15 Replace the power meter by an RF detector. Adjust the SLOPE (for course adjustment), DIODE BIAS (for fine adjustment) and GAIN controls on the IF driver amplifier to meet the following requirement while maintaining an output power of +9.0 dBm.

Requirement: The amplitude response shall be flat to within 0.21 dB for 10 MHz below to 10 MHz above the transmitter channel frequency.

5.16 Record the meter readings for TRMTR MOD BIAS and DR AMPL OUT.

5.17 Replace the coaxial termination on the test port.

5.18 Adjust the ATT control on the 29A integrated circuit clockwise to obtain a meter reading of 50 in the TWT IN metering position.

D. Traveling-Wave-Tube Check

5.19 Monitor the output power at the test connection made in Step 2.02 while maintaining the IF swept signal applied in Step 5.12.

5.20 Adjust the input tuner IN TUN 1 and IN TUN 2 controls on the 29A integrated circcuit and the output tuner OUT TUN 1 and OUT TUN 2 controls on the 30A integrated circuit for maximum power output. (See Fig. 1.)

5.21 Adjust the HELIX ADJUST control on the TWT power supply for maximum power output while maintaining a COLL CURR meter reading of 70 with the ANODE VOLTAGE ADJUST control. (See Note in Step 5.01.)

5.22 Adjust the ATT control on the 29A integrated circuit to obtain a power of +37 dBm at the output, Port 2, of the 30A integrated circuit.

5.23 Remove the power meter from the test connection and connect an RF detector. Observe the amplitude response and obtain the requirement below by adjusting the output tuner OUT TUN 1 and OUT TUN 2 controls on the 30A integrated circuit, without dropping the output power more than 1 dB.

Requirement: The amplitude response shall be flat within 0.15 dB from 6 MHz below to 6 MHz above the transmitter channel frequency.

5.24 Reset the output power at port 2 of the 30A integrated circuit to +37.0 dBm with the ATT control on the 29A integrated circuit.

Requirement: The TWT IN meter shall read less than 90.

5.25 Record the TWT IN, COLL CUR and TRMTR OUT meter readings.

5.26 Recheck the requirements for the overall transmitter in Step 5.01.

6. TRANSMITTER AND RECEIVER ALARM CHECKS

Note: In the following alarm checks, the alarm lamp indication refers to the appropriate repeater or main station bay. For a repeater bay the alarm indication is RPTR. For a main station bay the alarm indication is either TRMTR or RCVR. For each alarm indication check that operating the ACO pushbutton clears the audible alarm.

6.01 Maintain a 70-MHz signal at −7.0 dBm to the IF limiter-carrier resupply IF IN jack. Set the AGC-MAN switch on the IF main amplifier to AGC.

Requirement: The alarm lamp(s) shall be extinguished.

A −19 Volt Regulator Alarm Check

6.02 Perform Step 6.02 for each −19 volt regulator. (See Fig. 1.)

(a) Operate the −19 volt meter pushbutton for the appropriate regulator. Turn the ADJ VOLTS control on this regulator clockwise until the alarm lamp just lights.

Requirement: The meter shall read 74 ±1.

If this requirement is not met, obtain a meter reading of 74 with the ADJ VOLTS control and adjust the HV ALM ADJ control until the alarm lamp just lights.

(b) Turn the ADJ VOLTS control counterclockwise until the alarm lamp just lights.

Requirement: The meter shall read 66 ±1.0.

If this requirement is not met, obtain a meter reading of 66 with the ADJ VOLTS control. Adjust the LV ALM ADJ control until the alarm lamp just lights.

(c) Restore the meter reading to 70 with the ADJ control. The alarm lamp shall be extinguished.

B. IF Carrier Resupply Delayed Alarm Check

6.03 Remove the IF input signal at the IF IN jack of the IF limiter-carrier resupply.

Requirement: The alarm lamp shall light after 45 ±15 seconds.

(a) Restore the signal to the IF IN jack.

Requirement: The alarm lamp shall extinguish.

C. IF Carrier Resupply 9-MHz Oscillator Alarm Check

6.04 Adjust the 9-MHz LEV control in the IF carrier resupply limiter until the alarm lamp just lights.

Requirement: The CRS 9-MHz meter shall read 30 ±15.

(a) Adjust the 9-MHz LEV control to restore the meter reading recorded for the CRS 9 MHz position.

Requirement: The alarm lamp shall extinguish.

D. Transmitter Output Power Alarm Check

6.05 Maintain the IF input signal to the IF limiter-carrier resupply.

(a) Monitor and record the RF output power at the test connection.

(b) Reduce the IF power at the input to the IF driver amplifier transmitter modulator in a smooth manner. This can be accomplished by patching from the IF OUT jack of the IF-limiter carrier resupply through ATT 1 and ATT 3 on the test set to the IF IN jack of the IF driver amplifier-transmitter modulator. Set ATT 1 to 13 dB and ATT 3 to MIN.

(c) Decrease the input power to the IF limiter amplifier-transmitter modulator by means of ATT 3 until the alarm lamp just lights.

Requirement: The RF output power at the test connection shall be 3.0 ±0.5 dB less than that recorded in (a).

If this requirement is not met, obtain an RF power at the test connection which will be 3 dB lower than that recorded in (a). Adjust the MON ADJ control on the 30A integrated circuit (see Fig. 1) until the alarm lamp just lights. Recheck the requirement by repeating Step 6.05(c).

(d) Restore the normal connection between the IF limiter-carrier resupply and the IF driver amplifier-transmitter modulator.

Requirement: The alarm lamp shall be extinguished. If it was necessary to change the setting of the MON ADJ control in Step 6.05(c), record the new TRMTR OUT reading on the meter pushbutton.

E. Automatic Gain Control (AGC)—Manual Switch Alarm Check

6.06 Operate the AGC-MAN switch on the IF main amplifier to MAN.

Requirement: The alarm lamp shall light.

(a) Restore the switch to the AGC position.

Requirement: The alarm lamp shall extinguish.

6.07 Operate the RCVR PWR, TRMTR PWR, and INPUT (on the TWT power supply) switches to OFF. Remove the test pieces installed in Par. 2.02 and restore all connections to normal.

7. TRAVELING-WAVE-TUBE POWER SUPPLY TESTS WITH TEST LOAD

Note: This part is to be used only if indicated by tests specified in 5. Transmitter Tests, A. Overall Transmitter Check.

7.01 Operate the INPUT circuit breaker to OFF. Remove the oscillator (left-hand unit) from the TWT power supply, and unplug the power connector from the TWT. Place the test load in the slots provided on top of the power supply case. Move the sliding cover to the extreme right position. Plug the power connector into the test load socket. Replace the oscillator unit in the normal position. Turn the VOLTAGE SELECTOR switch on the test load to OFF.

7.02 Operate the INPUT circuit breaker on the front of the TWT power supply to ON.

Requirement 1: The HEATER VOLTAGE meter on the test load shall read 9.1 ±0.3 volts.

Requirement 2: After 180 ±22 seconds, the HEATER VOLTAGE meter reading shall

drop to 7.55 ±0.05 volts. Adjust the HEATER ADJUST control, if necessary.

7.03 Operate the VOLTAGE SELECTOR switch to the COLLECTOR position.

Requirement: The VOLTAGE MONITOR meter shall read between 132 and 150 volts.

7.04 Operate the VOLTAGE SELECTOR switch to the HELIX 0.6 MA position. Rotate the HELIX ADJ control on the converter unit over its range and note the reading on the VOLTAGE MONITOR meter on the test load.

Requirement: The reading shall include the range between 122 volts and 148 volts.

Note: Earlier models of this test load may be designated HELIX 1 for the HELIX 0.6 MA position and HELIX 2 for the HELIX 6 MA position.

7.05 Operate the VOLTAGE SELECTOR switch on the test load to the HELIX 6 MA position and again rotate the HELIX ADJ on the converter unit and note the reading on the VOLTAGE MONITOR meter on the test load.

Requirement: The reading shall include the range between 122 volts and 148 volts. Failure to meet the requirements in Steps 7.04 and 7.05 is an indication of converter failure.

7.06 Operate the VOLTAGE SELECTOR switch on the test load to the HELIX 0.6 MA position and adjust the HELIX ADJ control on the converter unit to read 135 ±5 volts on the VOLTAGE MONITOR meter.

Requirement: The HELIX CURRENT meter shall read 0.6 ±0.03 mA.

7.07 Operate the VOLTAGE SELECTOR switch to the HELIX 6 MA position.

Requirement: The VOLTAGE MONITOR meter shall read 135 ±5 volts.

7.08 Operate the VOLTAGE SELECTOR switch to the ANODE position. Rotate the ANODE ADJ control on the oscillator unit over its range and note the reading on the VOLTAGE MONITOR meter.

Requirement: The reading shall include the range between 136 and 162 volts. Failure to meet this requirement is an indication of converter failure.

7.09 Rotate the ANODE VOLTAGE ADJUST control on the oscillator unit to read 150 volts on the VOLTAGE MONITOR meter.

Requirement: The CATHODE CURRENT meter on the test load shall read 42.3 ±4.1 mA.

7.10 Operate the VOLTAGE SELECTOR switch to the OFF position. Turn the INPUT circuit breaker to OFF. Remove the oscillator plug-in unit. Disconnect the power plug from the test load. Remove the test load. Move the sliding cover to the extreme left position. Connect the power plug to the traveling wave tube. Insert the oscillator plug-in unit. Operate the INPUT switch to ON. Wait until the warmup indicator lamp turns off and return to 5. Transmitter Tests, A. Overall Transmitter Check.