

J68331A TRANSMITTER-RECEIVER BAY

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1. GENERAL

1.01 This section covers the procedures to be followed in putting the radio transmitter-receiver equipment in and out of service for testing and maintenance purposes.

2. PLACEMENT OF RADIO EQUIPMENT IN SERVICE -
AUXILIARY REPEATER STATION

2.01 Procedure:

- (1) Insert fuses of the capacity specified in the fuse mountings on the receiver control panel, transmitter control panel, 40 mc shifter, and the microwave generator.
- (2) Operate the FIL circuit breakers on these units to the ON position.
- (3) Operate the FIL ACT switches on the receiver control unit, microwave generator and the 40 mc shifter to NOR.
- (4) Using a Weston 779 Analyzer (or equivalent), insert the test pick in the FIL V V6 jack of the microwave generator and adjust the FIL ADJ V6 potentiometer until the voltmeter reads 6.3 volts.
- (5) Repeat with the V7 stage.
- (6) Operating the meter switch on the microwave generator, make a rough

check of the various meter readings. The requirements after a 30-minute warmup period are given below:

<u>Switch Position</u>	<u>Meter Reading*</u>
V1-IP1	10 ± 2 ma
V1-IG1	0.3 ma min
V1-IP2	5 ± 2 ma
V2-IP	3.5 ± 1 ma
V3-IG	0.8 ± 0.25 ma
V3-IP	6.5 ± 2 ma
V4-IG	3.0 ± 2 ma
V4-IP	17 ± 2 ma
V5-IP	13 ± 3 ma
V6-IP	19 ± 2 ma
V7-IP	20 ma max

*Note: Where no meter scale is indicated on the meter switch, use 50 ma full scale.

(7) Operating the selecting switch on the 40 mc shifter, make a rough check of the various meter readings. The requirements after a 5-minute warmup period are given below:

<u>Switch Position</u>	<u>Meter Reading</u>
V1-Ep	150 ± 3 volts
V1-IP1	13 ± 3 ma
V1-IG2	0.3 ± 0.15 ma
V1-IP2	8 ± 3 ma
V2-IP+S	30 ma max
CR1	50 ±12 ma)*
CR2	50 ±12 ma)*

*Note: Average of these two should be 50 ± 2 ma.

- (8) Operate the CONT key on the receiver control unit to AUTO.
- (9) Operate meter switch to 130 V position. The full scale of the meter in this test position is 250 volts; the voltage should be 135 ± 5 volts.
- (10) Operate meter switch to +BIAS. The full scale of the meter in this test position is 10 volts; the voltage reading should be 9 volts. If not, remove the panel cover and with a screwdriver adjust the +BIAS potentiometer until this value is obtained. Replace cover.

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(11) Operate the meter switch first to CR1 and then to CR2 and observe the crystal currents. The full scale of the meter in these test positions is 2.5 ma; the average of the two readings should be 1.5 ma. If not, adjust the RCVR CONVR potentiometer on the 40 mc shifter with a screwdriver.

(12) Using a Weston 779 Analyzer (or equivalent), measure the voltage on the FIL V MOD jack on the transmitter control unit. This should be 6.3 volts. If not, adjust FIL ADJ MOD potentiometer with a screwdriver.

(13) Operate the meter switch on the transmitter control unit to MOD and note the modulator plate current. This should be 15 ma. If not, adjust BIAS ADJ MOD with a screwdriver.

(14) With the Weston 779 Analyzer, measure the FIL V AMP 1 filament voltage. If this is not 6.3 volts, adjust the FIL ADJ AMP 1 potentiometer.

(15) Operate the meter switch on the transmitter control panel to MOD and the key to -BIAS; if the bias voltage is not - 1.0 volt, adjust the XMTR MOD potentiometer on the 40 mc shifter.

(16) Operate the meter switch to AMP 1 and note the plate current. Adjust the BIAS ADJ AMP 1 potentiometer, if necessary, to make the plate current reading 25 ma.

(17) Similarly for AMP 2.

(18) Similarly for AMP 3 with the plate current requirement 30 ma.

(19) With an incoming signal present, operate the RESET key momentarily and read the PWR OUT meter. If this does not read 0 DB, adjust the AUTO CONT potentiometer on the receiver control unit.

(20) Operate the meter switch on the receiver control unit to RCVR OUTPUT and record reading. This value may be used to set the output power until maintenance work is done on the repeater after which a new value should be obtained.

(21) After a 30-minute warmup period, check all the above readings.

3. PLACEMENT OF RADIO EQUIPMENT IN SERVICE - TERMINAL OR MAIN STATION

(A) Receiver

3.01 Procedure:

(1) Insert fuses of the capacity specified in the fuse mountings of the receiver control unit and the receiver microwave generator.

(2) Operate the FIL circuit breakers on these units to the ON position.

(3) Operate the FIL ACT switches on these units to NOR.

(4) Using a Weston 779 Analyzer (or equivalent), measure the voltage on the FIL V V7 jack of the receiver microwave generator; if necessary, adjust the FIL ADJ V7 potentiometer with a screwdriver until this voltage is 6.3 volts.

(5) Operating the meter switch on the microwave generator, make a rough check of the various meter readings. The requirements after a 30-minute warmup period are given below.

<u>Switch Position</u>	<u>Meter Reading*</u>
V1-IP1	10 ± 2 ma
V1-IG1	0.3 ma min
V1-IP2	5 ± 2 ma
V2-IP	3.5 ± 1 ma
V3-IG	0.8 ± 0.25ma
V3-IP	6.5 ± 2 ma
V4-IG	3.0 ± 2 ma
V4-IP	17 ± 2 ma
V5-IP	13 ± 3 ma
V6-IP	0
V7-IP	12 ma max

*Note: Where no meter scale is indicated on the meter switch, use 50 ma full scale.

(6) Operate the CONT key on the receiver control unit to AUTO.

(7) Operate the meter switch on the receiver control unit to the 130 V position. The full scale of the meter in this test position is 250 volts; the voltage should be 135 ± 5 volts.

(8) Operate meter switch to +BIAS. The full scale of the meter in this test position is 10 volts; the voltage reading should be 9 volts. If not, remove the panel cover and with a screwdriver adjust the +BIAS potentiometer until this value is obtained. Replace the cover.

(9) Operate the meter switch first to CR1 and then to CR2 and observe the crystal currents. The full scale of the meter in these test positions is 2.5 ma; the average of two readings should be 1.5 ma. If not, adjust the OUTPUT potentiometer on the receiver microwave generator with a screwdriver. If 1.5 ma can not be obtained, the microwave generator should be retuned in accordance with Part 12 of Section R90.314.

(10) With an incoming signal present, adjust the AUTO CONT potentiometer on the receiver control unit so that the power at the OUT jack of the IF main amplifier is +8 dbm, using AT11 and the IF power meter.

(11) Operate the meter switch on the receiver control unit to RCVR OUTPUT and record reading. This value may be used to set the output power until maintenance work is done on the receiver portion of the repeater after which a new value should be obtained.

(12) After a 30-minute warmup period, check all the above readings.

(B) Transmitter

3.02 Procedure:

(1) Insert fuses of the capacity specified in the fuse mountings on the transmitter control unit, transmitter microwave generator, and the IF buffer amplifier.

(2) Operate the FIL circuit breakers on these units to ON.

(3) Operate the FIL ACT switches on the transmitter microwave generator and the IF buffer amplifier to NOR.

(4) Using a Weston 779 Analyzer (or equivalent) measure the voltage on the FIL V V6 jack of the microwave generator; if necessary, adjust the FIL ADJ V6 potentiometer with a screwdriver until this voltage is 6.3 volts.

(5) Repeat with the V7 stage.

(6) Operating the meter switch on the microwave generator, make a rough check of the various meter readings. The requirements after a 30-minute warmup period are given below:

<u>Switch Position</u>	<u>Meter Reading*</u>
V1-IP1	10 ± 2 ma
V1-IG1	0.3 ma min
V1-IP2	5 ± 2 ma
V2-IP	3.5 ± 1 ma
V3-IG	0.8 ± 0.25ma
V3-IP	6.5 ± 2 ma
V4-IG	3.0 ± 2 ma
V4-IP	17 ± 2 ma
V5-IP	13 ± 3 ma
V6-IP	19 ± 2 ma
V7-IP	20 ma max

*Note: Where no meter scale is indicated on the meter switch, use 50 ma full scale.

(7) Using a Weston 779 Analyzer (or equivalent), measure the voltage on the FIL V MOD jack on the transmitter control unit. This should be 6.3 volts. If not, adjust FIL ADJ MOD potentiometer with a screwdriver.

(8) Operate the meter switch on the transmitter control unit to MOD and note the modulator plate current. This should be 15 ma. If not, adjust BIAS ADJ MOD with a screwdriver.

(9) Operate the key to -BIAS; if the bias voltage is not -1.0 volt adjust the OUTPUT potentiometer on the transmitter microwave generator.

(10) With the Weston 779 Analyzer measure the FIL V AMP 1 filament voltage. If this is not 6.3 volts, adjust the FIL ADJ AMP 1 potentiometer.

(11) Operate the meter switch to AMP and note the plate current. Adjust the BIAS ADJ AMP 1 potentiometer to make the plate current 25 ma.

(12) Similarly for AMP 2.

(13) Similarly for AMP 3 with the plate current requirement 30 ma. (This should be repeated with normal power output from transmitter.)

(14) With a signal from the FM transmitter to the input of the radio transmitter, operate the RESET key on the transmitter control unit momentarily and then read the PWR OUT meter. If this does not read 0 DB, adjust the GAIN potentiometer on the buffer amplifier with a screwdriver.

(15) After a 30-minute warmup period, recheck the above readings.

4. REMOVAL OF RADIO EQUIPMENT FROM SERVICE

(A) Auxiliary Repeater Station

4.01 Procedure:

(1) Operate the FIL circuit breakers on the receiver control unit, the transmitter control unit, the 40 mc shifter and the microwave generator to OFF.

(B) Terminal or Main Station

4.02 Procedure:

(1) To remove the receiver from service, operate the FIL circuit breakers on the receiver control unit and the receiver microwave generator to OFF.

(2) To remove the transmitter from service, operate the FIL circuit breakers on the transmitter control unit, the transmitter microwave generator and the IF buffer amplifier to OFF.