

DATE 11/24/54  
SH. 1 OF 9

TMC SPECIFICATION NO. S - 208

COMPILED BY  
K.Z.

TITLE: PRODUCTION TESTING OF MODEL RSC-3

JOB 170

APPROVED VZ

Page Issue A B C D E

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COMPLETE INSTRUCTIONS

FOR THE PRODUCTION TESTING OF THE MODEL RSC-3 (A, B, C, D, E)

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1. PURPOSE

The Model RSC-3 Remote System Control Unit provides the audio frequencies which are used to perform the control functions within the RCR system. In addition, the unit also has an entirely separate audio amplifier chain which serves for monitoring of the remotely controlled receiver.

DESCRIPTION

Except for the circuit constants of the frequency determining networks, the design and operation of the 3 audio frequency oscillators of the model RSC-3 are exactly alike. All oscillators are of the high stability type, maintaining their set frequency under a variety of environmental conditions to very close tolerances. Frequency determination is accomplished by a Wien-Bridge network, while amplitude stabilization is provided by means of a current sensitive resistor. An output amplifier stage brings the signal level up to about +5 dbm. Provision is also made for adjustment of the output level to any value from +5 dbm on down.

The audio chain consists of a conventional 2 stage push-pull amplifier with an output level of 500 mw into a 68 ohm load. Special provision is made for an audio selective network at the input of the amplifier which permits on CW reception the attenuation of interfering signals.

2. TEST EQUIPMENT REQUIRED

- a) 1 Frequency Counter, Berkeley 5500 or equivalent.
- b) 1 VTVM (AC Type) Ballantine or equivalent.
- c) 1 VTVM (DC Type) Heathkit V6 or equivalent.
- d) 1 Oscilloscope, DuMont 304A or equivalent.
- e) 1 Audio Signal Generator, Heathkit or equivalent.

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3. TEST INSTRUCTIONS

- a) Proceed as outlined in Test Sequence and Procedure.  
(Part 4 to follow)
- b) Fill in blanks on Report Sheets, rejecting those units that do not meet the specifications.

4. TEST SEQUENCE AND PROCEDURE

Part I Mechanical Inspection

- a) Inspect the unit for obvious mechanical imperfections.
- b) Inspect the unit for obvious electrical errors.
- c) Carefully inspect the unit for loose screws on critical points. Most carefully inspect for loose screws on grounding points such as tube socket, nut straps and at ground lugs.
- d) Inspect and correct, if necessary, the alignment of the variable capacitors in regard to lateral and vertical positioning. Controls must rotate smoothly without binding or affecting the mounting bracket.
- e) Make certain that the two bottom terminals of the variable capacitors are well clear of the network can directly underneath.
- f) Adjust front panel controls carefully in following manner:  
See note below.
  - 1- BFO: Extension shaft, part no. PM-322, to extreme counter clockwise end; dial knob to position "5" left, capacitor fully meshed.
  - 2- HFO: Proceed exactly as indicated under BFO above.

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3- RF Gain: Extension shaft to extreme clockwise end; dial knob to position "10" right, capacitor fully meshed.

Note: Slightly more than the required 180 degrees of rotation is provided by the mechanical design. Dial knobs must be aligned in such a manner that rotation of dial knobs is possible for about the same amount to the left and to the right of the dial calibration which is engraved on the panel.

g) Verify the wiring of the Bandwidth control; in its extreme counter clockwise position, a minimum resistance must appear across the control.

## Part II Preliminary Test

- a) Connect Unit to power supply RSP-2 and energize the set.
- b) Observe: All filaments energized, VR tubes operating and pilot lamp illuminated.
- c) Measure B+ at terminals 8 and 9 of T 5. Voltage must fall within 285 V to 315 V.
- d) Measure regulated B+ at V9, V10 and V11, pin 5. Voltage must fall within 145 V to 155 V.
- e) Verify that regulated B+ drops out, measured on pin 5 of V9, V10 and V11, if the tubes are removed from their sockets.
- f) Verify, whether filaments of V1, V3 and V5 go out, if regulator R51 is removed from its socket.

WARNING: UNDER NO CIRCUMSTANCES MUST EITHER V1, V3 or V5 BE REMOVED FROM THEIR SOCKET WITHOUT FIRST EITHER REMOVING POWER FROM SET OR REMOVING R 51.

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THIS WILL SERVE TO PROTECT THE REGULATED FILAMENT  
CIRCUIT.

g) Observe whether B+ drops out at terminal 2 of T3 when  
AVC switch on front panel is set to "ON".

h) Observe whether B+ drops out at terminal 2 of T3, if AVC  
switch on front panel is on.

### Part III The BFO Section

a) Set Dial Knob marked BFO to exact center position.  
b) Connect AC VTVM and scope to pin 6 of V1B.  
c) Adjust degeneration control R1 for maximum output without  
waveform distortion. Meter reading between 2.0 and 5.0 volts (rms).

d) Now connect AC VTVM, counter and scope to the output jack  
J1; adjust output control R11 until a reading of 0.20 V (rms)  
is obtained. Terminate BFO output with a 600 ohm load first.

e) Adjust control on NF-104 until frequency specified by the  
suffix to NF-104 is obtained; accuracy:  $\pm 1$  cps.

f) Verify, whether total frequency range covered by BFO  
front panel control falls in the range of 80 cps to 85 cps;  
also verify whether the frequency difference between either  
extreme end of this control and its exact center position falls  
in the range of 37 cps to 45 cps. During this operation,  
observe whether the amplitude of the waveform remains essentially  
constant. Momentary cessation of oscillation points toward  
incorrect wiring of the capacitor network combination.

g) Reset dial knob to its center position.

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## Part IV The HFO Section

Repeat operations indicated in Part III, a) through h) also for the HFO section. Degeneration control is R13, output jack is J2 output control is R23. Front panel control is marked "Tuning."

## Part V The RF Gain Section

Repeat operations indicated in Part III, a) through h) also for the RF Gain section. Degeneration control is R25, output jack is J3, output control is R35. Front panel control is marked "RF Gain."

## Part VI The Audio Section

- a) Set audio filter to the "Off" position, audio gain to full clockwise position.
- b) Connect audio generator to terminals 3 and 4; adjust the generator output to about 1000 cps.
- c) Insert dummy plug into J4 and connect Ballantine VTVM and scope to R47.
- d) Adjust generator output control until meter reads 5.85 volts RMS. There shall be no distortion visible on the oscilloscope.
- e) Using the Ballantine VTVM, measure the input level at terminal 3 and 4. This level shall be -20 dbm (20 db below 1 milliwatt or .078 volts across 600 ohm load) or less. Reconnect VTVM across R-47.
- f) Set audio filter to "1000 cps" position, bandwidth control to "MINIMUM" and adjust frequency of the audio generator until a maximum output is obtained at R47. The output voltage shall not be less than 5.85 volts and the generator frequency shall fall between 950 and 1050 cps.

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- g) Remove dummy plug from J4 and insert low impedance headphones. With the speaker switch in the on-position, both speaker and phones must be operating. Place speaker switch in off-position; only headphones must be operating. Now remove headphone plug; speaker must be operating.
  - h) Jump terminal 1 on E1 to ground; upon rotation of R46, the muting control, the speaker volume must change in magnitude.

5. ACCEPTANCE PROCEDURE

If all sub tests specified under paragraph 4 are passed satisfactorily the unit should be stamped properly and accepted. The Test Report Sheet for the unit should be completed, signed and submitted to supervisor.



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## TEST DATA SHEET FOR MODEL RSC-3

Mfg. No. \_\_\_\_\_

Serial No. \_\_\_\_\_

Test I. Power Checks -----

BFO HFO RFG

Test II. Front Panel Control Settings \_\_\_\_\_

Test III. Oscillator Settings

Degeneration Adj. \_\_\_\_\_

Output Level \_\_\_\_\_ VAC \_\_\_\_\_ VAC \_\_\_\_\_ VAC

NF-104 Center Frequency \_\_\_\_\_ CPS \_\_\_\_\_ CPS \_\_\_\_\_ CPS

Test IV. Oscillator Tuning BFO \_\_\_\_\_ CPS to \_\_\_\_\_ CPS

HFO \_\_\_\_\_ CPS to \_\_\_\_\_ CPS

RFG \_\_\_\_\_ CPS to \_\_\_\_\_ CPS

Test V. Monitor Amplifier

Amplifier Output \_\_\_\_\_

Muting Circuit \_\_\_\_\_

Tester \_\_\_\_\_

Date \_\_\_\_\_

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11/29	A	All	All	Complete Revision	KZ	AJJ
12/6	B	7	Part 3	Step h) added.	} KZ A.J.J.	
"	B	9	All	Completely revised.		
9/7/55	B	6	Part 3(c)	Completed Revised.	KZ	A.J.J.
10/10/55	C	6	Part 3(f)	37 cps to 45 cps - was 40 cps to 43 cps	KZ	AJJ
1/5/65	D	6,7	13226	Revised shts. 6,7 per EMN		46
7/27/65	E	All	14547	Revised per EMN		