25X1

A SUMMARY OF SPECIFIED TESTS OF THE RS/C-11 RADIO SET

DATE: 30 July 1957

1. INTRODUCTION

The RS/C-11 Radio Set prototype model developed by the [redacted] 25X1

[redacted] has been received 25X1

by the R&D Laboratory for preliminary tests of receiver sensitivity, selectivity, calibration, and over-all drift characteristics.

The radio set is comparable to the RS/A-11 and RS/B-11 prototype models in size, weight, printed circuitry, and electrical and mechanical characteristics. The exception being that the RS/C-11 units operate in the 4 - 16 mc frequency range.

During initial tests, the receiver failed to function due to an intermittent short in the audio section board and to the HFO board being cut too short so that it did not line up with the correct pin receptacles on the main printed board.

In the following summary of the test results, the RS/B-11 Specifications No. 54-A-1029-A are cited for ease of comparison.

2. SUMMARY OF RECEIVER TEST DATA

2.1. AM and CW Sensitivity and Raw Noise Output

	Sensitivity:	Raw Noise Output:
	AM	
Minimum	19.0 microvolts at 16 mc	0.525 microwatt at 12 mc
Maximum	4.2 microvolts at 4 mc	3.6 microwatts at 4 mc
Average	11.0 microvolts	1.265 microwatts
	CW	
Minimum	11.0 microvolts at 16 mc	15.5 microwatts at 10 mc
Maximum	1.3 microvolts at 4 mc	36.0 microwatts at 4 mc
Average	4.6 microvolts	21.7 microwatts

Specifications: AM sensitivity to be 15 microvolts into 300 ohms for 0.5 milliwatt audio output. CW sensitivity to be 5 microvolts into 300 ohms for 0.5 milliwatt audio output. The raw noise output not to exceed 20 microwatts under any conditions.

2.2. Range and Calibration

Range: 3.917000 to 16.444500 mc

Calibration:

Minimum error - 0.12625% at 6 mc

Maximum error - 0.4935% at 12 mc

Average error - 0.208%

Specifications: The dial calibration shall be within 0.1% of the tuned frequency.

2.3. Receiver Over-all Drift

Average Drift:

Minimum - 10.9 cycles per minute (0.000091%) after 2½ hours

Maximum - 95.5 cycles per minute (0.00079%) during first 20 minutes

Over-all - 62.2 cycles per minute (0.00052%) during 3 hour test

The drift curve appears on page 6.

Specifications: The rate of frequency change shall not exceed 0.0004% at any point of the curve.

2.4. Selectivity

Receiver bandwidth - 4535 cycles at the 6 db points

Shape factor - 5.0

The selectivity curve appears on page 7.

Specifications: Bandwidth 5.4 kcs at the 6 db points

Shape factor - 3

3. CONCLUSIONS AND RECOMMENDATIONS

3.1. Conclusions

The RS/C-11 receiver performed satisfactorily in two of the specified tests. The unit meets the specifications regarding sensitivity except at the high end of band 2 (16 mc). The receiver bandwidth was found to be 4230 cycles, rather than 5400 cycles as required in the test specifications. The receiver calibration and over-all drift characteristics are not satisfactory.

Future acceptance of the receiver as a prototype model is considered, primarily, to be based on specific improvement of the RS/11 dial mechanism. The receiver fails to meet Section 4.3.1. of Specifications No. 54-A-1029-A (dial).

3.2. Recommendations

(1) The receiver drift should be reduced by improvement of the HFO circuit and its operating parameters.

(2) The calibration of the receiver should be improved. This defect is considered to be a function of the dial mechanism reliability. It is requested that consideration be given to the possibility of using a counter to select frequency. An alternate solution, which may be considered, is the initiation of a new development to produce a reliable dial mechanism.

(3) The receiver bandwidth is narrow and is not considered to be representative of other RS/11 receivers tested. No recommendation is given.

3.3. Malfunctions

The following malfunctions occurred during testing of the RS/C-11 Receiver:

(1) Earset receptacle broke.

(2) Audio printed board shorted to the tape roller lip on the receiver case inner wall.

(3) The HFO printed board was cut too short so that it is possible to mismatch the board pins and pin receptacles on the main printed board.

(4) BFO tube (1AK4) defective.

(5) IF tube (1AD4) defective.

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