

SIGNAL CORPS
REPAIR STANDARD

NO. REP-390
ISSUE NO. 1

REPAIRED EQUIPMENT STANDARD
FOR
RADIO RECEIVER R-100/URR

PROJECT 4422D

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SIGNAL CORPS ENGINEERING LABORATORIES

FORT MONMOUTH, N. J.

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REP-390

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PREFACE

Signal Corps Repair Standards (formerly Signal Corps Repaired Equipment Requirements) are prepared by the Maintenance Engineering Branch, Procurement-Maintenance Engineering Division, Signal Corps Engineering Laboratories, and cover various items of signal equipments which are subject to repair, test and inspection. These repair standards are documents which set forth the specific repair requirements and test standards to be applied to the individual equipments being repaired and tested.

Signal Corps Repair Standards are prepared for the specific use of the fifth echelon Signal Repair Shops in repairing and determining the quality and acceptability of repaired signal equipments covered by these standards. The use of Signal Corps Repair Standards is recommended as a guide and reference for any agency having occasion to repair, test or inspect an item of signal equipment for which a repair standard has been prepared.

Signal Corps Repair Standard No. REP-1001 is a general standard and is subsidiary to any individual standard prepared. No individual standard is to be considered complete in itself, but is to be used in conjunction with Signal Corps Repair Standard No. REP 1001, "General Standards for Repaired Signal Equipment."

Reports of any discrepancies or any constructive comments bearing upon this repair standard are invited. A series of Comments and/or Notes pages will be found in the back of this standard which are designed to facilitate reporting any inaccuracies noted. All such reports or comments as well as requests for additional copies, should be addressed to:

COMMANDING GENERAL
Signal Corps Engineering Laboratories, SIGEL-PMM-3
Fort Monmouth, New Jersey

REPAIRED EQUIPMENT STANDARD
FOR
RADIO RECEIVER R-100/URR

I. STATEMENT COVERING APPLICABILITY

This repair standard covers inspection requirements to be used in determining the quality and acceptability of repaired Radio Receiver R-100/URR. Its use is mandatory in the Maintenance Divisions of Signal Depots and the Signal Sections of General Depots. The use, insofar as limitations of test and calibration equipment permit, is highly recommended for all Signal Repair organizations.

A. Safety Precautions

1. Exercise Safety Precautions at all times.
2. Select and apply the proper tools.
3. Avoid makeshift methods.
4. Don't do damage to yourself or to the equipment.
5. BE CAREFUL

II. APPLICABLE REFERENCES

A. Repair Standards. Applicable paragraphs of the repair standards listed below form a part of this standard:

Title	Number
1. General Standards for Repaired Signal Equipment	REP-1001
2. Class "C" Receiver and Low Power Transmitter Vacuum Tubes	REP-242
3. Loudspeakers	REP-1002
4. Headset HS-33	REP-1005

B. Technical Publications. The following technical publication forms a part of this standard to the extent referenced herein:

Title	Number
Schematic Diagrams for Maintenance of Ground Radio Communications Sets	TM 11-310

NOTE: All applicable Modification Work Orders pertaining to this equipment shall be performed.

III. TEST AND ADDITIONAL EQUIPMENT

The following equipments, or suitable equivalents of known accuracy, will be employed in determining compliance with the requirements of this Signal Corps Repair Standard and will be capable of conforming to their respective Repair Standards:

A. Test Equipment

	Equipment	Stock Number	Number Used	REP
1.	Signal Generator TS-588/U	3F3820.7	1	-
2.	Electronic Multimeter ME-6/U	3F8100-3	1	-
3.	Frequency Meter SCR-211	2C1411	1	-

B. Additional Equipment

	Equipment	Stock Number	Number Used	REP
1.	Headset HS-33	2B333	1	1005
2.	Battery BA-203/U	3A275-203	2	-

	Equipment	Stock Number	Number Used	REP
3.	Battery BA-36	3A36	2	-
4.	Resistor, 3.1 ohm, 8 w	JAN type RW29G3R1	1	-
5.	Resistor, 390 ohms 1/4 w, non-inductive	3Z6039-21	2	-
6.	Capacitor, 220 mmf	JAN type CM20B221K	1	-
7.	Capacitor, 390 mmf	JAN type CM20B391K	1	-
8.	Inductor, RF; 20 microhenry	3C1084B-24	1	-

IV. REQUIREMENTS

A. General Test Conditions. Tests will be conducted under the following conditions, unless specified otherwise.

1. Tests will be made in a screened room at normal temperatures.

2. Supply voltages required are:

- a. 105-125 volts, 25-60 cycles, single phase.
- b. 220-230 volts, 25-60 cycles, single phase.
- c. 12 volts \pm 2 volts DC and 90 volts \pm 10 volts DC.

NOTE: Tests will be made at 105-125 volts AC unless specified otherwise.

3. The RF signal generator output, modulated 30% at 400 cycles, will be connected to the receiver input through a dummy antenna. The dummy antenna for the high frequency band will consist of a 390 ohm non-inductive resistor. The dummy antenna for the two low frequency bands

will consist of 220 mmfd capacitor in series with a 20 microhenry inductance which inductance is in parallel with a series consisting of a 390 mmfd capacitor and a 390 ohm resistor.

4. Electronic Multimeter MD-6/U, shunted with a 3.1 ohm non-inductive resistor, will be connected across the secondary winding of the output transformer.

5. The receiver shall be adjusted to produce a standard output of 0.4 volt (50 milliwatts) across the 3.1 ohm resistor.

6. Set the AC-DC BATT switch to AC-DC position.

7. The loudspeaker will be in the OFF position.

8. The equipment must have a warm up period of at least 15 minutes.

B. Detailed Tests. Tests will be made as follows and the requirements will be as indicated below and on the CHECK LIST:

1. Sensitivity and Signal-Plus-Noise-to-Noise-Ratio. Adjust the signal generator frequency until maximum output is indicated on output meter with modulation on. Turn modulation off and adjust receiver volume control to obtain 0.13 volt (1/3rd standard output voltage). With modulation on, adjust the signal generator output voltage until output meter reads 0.4 volt (50 milliwatts). Repeat the above procedure until the standard output is obtained with a signal-plus-noise-to-noise voltage ratio of 3 to 1. The receiver shall have a sensitivity of 10 microvolts or better on bands 1 and 2, and 15 microvolts sensitivity or better on band 3. Sensitivity measurements shall be made near the middle and both ends of each band. Repeat the above procedure of each test frequency.

2. Maximum Output. The maximum power output of the receiver, operating into a load of 3.1 ohms resistance, will be at least 1.5 watts (2.2 volts) when the receiver is operated from an AC power source, and at least 250 milliwatts (0.9 volt) when the receiver is operated from its battery source.

3. Automatic Volume Control. When operating the receiver with an input signal of 20 microvolts and an output of 50 milliwatts (0.4 volt), increasing the input signal to 10,000 microvolts shall not cause the output to increase two more than 600 milliwatts (1.4 volts). The receiver shall not block with an input signal of 0.1 volt.

4. Frequency Range. The receiver shall be capable of operating over the following frequency ranges:

band 1	540-1,550 kc
band 2	3,600-8,500 kc
band 3	3,400-19,000 kc

5. Calibration. The dial calibration accuracy shall be within plus or minus 1-1/2% of the measured frequency as measured near the middle and both ends of each band.

C. Operational Test. An operational test shall be made by tuning the receiver to a signal on each band. Voice signals, as heard on the loudspeaker and on the headphones, shall be clear and intelligible. Controls shall perform their functions properly and quietly. Extraneous noises, intermittent or microphonic conditions shall not be present when the receiver is operated on a vibration table for 30 seconds. This test will be repeated with an input voltage of 220-230 volts AC.

TO/fmh

Army - Ft. Monmouth, N. J.

CHECK LIST
FOR
RADIO RECEIVER R-100/URR

Test	Specified Value			Measured Value		
	High	Middle	Low	High	Middle	Low
1. Sensitivity (uv) (at a signal-plus-noise-to-noise voltage ratio of 3 to 1)	Band 1	10 uv	10 uv	10 uv	_____	_____
	Band 2	10 uv	10 uv	10 uv	_____	_____
	Band 3	15 uv	15 uv	15 uv	_____	_____
2. Maximum Power Output	Power Supply					
	AC	Batteries	AC	Batteries		
	1.5 watts	250 mw				
	or	or				
	(2.2 v)	(0.9 v)				
3. AVC	Input	Output	Output			
	20 uv	50 mw (0.4 v)	_____ v			
	10,000 uv	600 mw (1.4 v) max	_____ v			
4. Frequency Range	Band 1	540 kc to 1550 kc	_____ to _____			
	Band 2	3600 kc to 8500 kc	_____ to _____			
	Band 3	8400 kc to 19000 kc	_____ to _____			
5. Calibration (Limit within 1-1/2 percent of measured frequency)	Test Frequency	Maximum Deviation	Deviation			
	600 kc	±9.0 kc	kc			
	1000 kc	±15.0 kc	kc			
	1400 kc	±21.0 kc	kc			
	4 mc	±60.0 kc	kc			
	6 mc	±90.0 kc	kc			
	8 mc	±120.0 kc	kc			
	9 mc	±135.0 kc	kc			
	13 mc	±195.0 kc	kc			
	18 mc	±270.0 kc	kc			

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COMMENTS AND / OR NOTES