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**RECEPTION SET
R209**

Working Instructions

ZA 28691

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Reception Set R209

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RECEPTION SET R209

General Description and Working Instructions

CHAPTER I.—GENERAL DESCRIPTION

1. Purpose and facilities

The R209 is a general purpose receiver suitable for tropical use. In performance it is similar to the R107 and better than the R109 receivers, and it may be used in place of either of them. Facilities are also provided for the reception of F.M. signals as well as A.M., CW and MCW. The receiver can be incorporated in a man-pack, animal, or vehicle station and it can also be used as a receiver for high power senders such as the Wireless Set No. 53.

The sealed construction of the receiver renders it waterproof and almost completely airtight. Its breathing rate is only a few ccs a day, and moisture entering is absorbed by the built-in silica gel desiccator. A spare desiccator is fitted.

2. Frequency range

The receiver covers a frequency band of 1.0 to 20.0 Mc/s in four ranges :—

Range 4	1.0 to 2.2. Mc/s
" 3	2.2 to 5.2 Mc/s
" 2	5.2 to 12.0 Mc/s
" 1	12.0 to 20.0 Mc/s

The receiver has an I.F. of 460 kc/s and an F.M. deviation of 3.5 kc/s.

3. Connections and controls

The receiver connections and controls are all situated on the front panel and are as follows :—

OFF-ON-ON- & LIGHT	Three position switch for switching power supply OFF or ON. In ON & LIGHT position, in addition to power being switched ON the tuning scale is illuminated.
AE ROD WIRE	Push terminal connection for rod or single wire high impedance aerial.
AE 80 OHM	Push terminal connection for 80 ohm dipole feeder aerial connection.
EARTH	Push terminal for earthing chassis or for connection of one end of dipole feeder aerial connection.
B.F.O.	Knob for adjusting frequency of note on C.W. working.
AE TRIMMER	Knob for final tuning adjustment of aerial circuit.
6V D.C.	3-pt. plug for connection to 6V D.C. power supply source.
F.M.-C.W.-A.M.	Three position system switch.
VOLUME	Gain control knob.

TUNING	Main tuning knob having a finger hole for rapid turning.
PHONES	Two 2-pt. sockets for low impedance, 150 ohm, phones.
RANGE	Waverange switch. The frequency coverage of the range in use is indicated on the main dial mask.

4. Power supply

A 6-volt 1.65 amps D.C. supply source is required. H.T. is provided by an internal vibrator and rectifier.

5. Weights and dimensions

The set in its case weighs 21 lbs. approx.

Its approx. dimensions are :—

Height— $8\frac{1}{2}$ ins.

Width— $12\frac{1}{4}$ ins.

Depth— 9 ins.

6. Silica gel desiccator

A silica gel desiccator is screwed into the front panel of the receiver. Slots in the cylindrical body of the desiccator enable the air inside the receiver to contact the gel whereby the air is dried, excess internal moisture causing the gel to change colour from blue to pink. The gel is viewed through the glass front. A spare desiccator is screwed into a blind hole in the front panel alongside the desiccator being used.

CHAPTER II.—OPERATION

7. Preliminary

Before proceeding to operate the receiver make a general mechanical inspection to see that it appears to be in sound condition.

If mounted in any way as man-pack, ground station or vehicle station see that the receiver is held securely in its mounting.

Inspect silica gel indicator and see that it is not pink. If gel is pink, replace indicator with spare, making sure that the rubber sealing washer is in good order. If this other indicator also soon turns pink, interior of set is wet or the case is not properly sealed and set should be returned to workshops for drying out and resealing.

8. Setting up

(1) Connect receiver aerial to left-hand or right-hand AERIAL terminal respectively according as to whether it is a rod or single wire high impedance aerial or dipole feeder or 80 ohm aerial.

(2) Connect EARTH terminal to earth connection, if available ; if dipole feeder aerial is being used connect one end of feeder to EARTH terminal.

(3) See that OFF-ON-ON & LIGHT switch is at OFF.

(4) If loudspeaker working is required, open loudspeaker cover. If loudspeaker working is not required screw loudspeaker cover down to front panel.

(5) If phone working is required, plug phones into PHONES socket.

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(6) Set B.F.O. tuning knob so that projection from knob lies against raised piece on front panel.

(7) Connect 6V three-pt. plug to D.C. supply source. Looking at the front of the panel, the two pins towards the left are to be connected to the 6V source. The bottom left-hand pin is connected to chassis potential. The third pin is not used.

9. To operate

(1) Set RANGE switch to required frequency band.

(2) Set F.M.-C.W.-A.M. system switch to required system of operation.

(3) Switch on power supply source.

(4) Set OFF-ON-ON & LIGHT switch to ON (or to ON & LIGHT if illumination of dial is also required).

(5) Turn VOLUME control fully clockwise.

(6) Rotate the main TUNING knob until the calibrated dial indicates approximately the frequency required.

(7) Search for the required signal by turning the TUNING knob slowly in both directions. Make final tuning adjustment by turning AE TRIMMER knob. If a dial resetting log for various stations has been made for the receiver, to tune in to a required station turn TUNING knob until MAIN and VERNIER scales give the resetting log readings of the required station.

(8) Turn VOLUME control knob anticlockwise until signal is received on loudspeaker or in phones at required strength.

(9) For C.W. operation set the system switch to C.W. and search for the required signal. When the signal has been located turn the main TUNING dial until the beat frequency falls to zero. Then adjust the B.F.O. control until the pitch of the beat frequency rises to a convenient level. Make final adjustment by turning AE TRIMMER knob.

CHAPTER III.—

OPERATORS' ROUTINE MAINTENANCE

10. General

(1) Keep the set clean.

(2) Examine all leads for fraying, paying special attention to the points where they enter plugs or sockets.

(3) See that all plugs and sockets are clean.

11. Batteries

(1) The condition of batteries should be watched carefully. See that topping-up and charging are carried out regularly.

(2) Examine the terminals and clean them if necessary, keeping them smeared lightly with vaseline.

(3) Test the battery voltage with the set switched to ON & LIGHT; the voltage reading should not be allowed to fall below 5.75 volts. If voltage reading is low, recharge battery.

12. The receiver

- (1) Check receiver controls to see that they work smoothly and firmly throughout their range of movement.
- (2) Check that the dial lamps switch on when switch is in ON & LIGHT position.
- (3) Ensure that desiccator has not turned pink. The desiccator is to be replaced by the spare at monthly intervals.
- (4) Check reception is normal as judged by signals and background noise.

13. Warning

If the set does not work when switched on, SWITCH OFF IMMEDIATELY. Make sure that battery, aerial and earth and phones, if used, are properly connected. After making any necessary corrections, check again by switching ON. SWITCH OFF IMMEDIATELY if the set still does not work.

14. Sealing

The receiver is hermetically sealed and the operator should not loosen off any fixing screws or in any way attempt to remove the set from its case. Further, none of the control knobs should be tampered with as the spindle sealing glands might be damaged thereby.

15. Changing valves, vibrators etc.

Where maintenance has to be done which involves opening the set, the equipment should be placed in the care of an Electrician Signals or radio mechanic.

If such personnel are not available however, the operator may try to get the set working himself. In such a case the procedure is as follows :—

- (1) *Remove the set from its case.* Remove the securing nuts and bolts from around the edge of the case and gently ease the set out. Count the nuts and bolts (20) and store them safely.
- (2) *Vibrator.* This may require changing if the set goes "dead" while switched on.
- (3) *Pilot lamps.* If the pilot lamps fail to light while the rest of the set is working try replacing them with spares. The main dial lamp can be changed after taking out the lamp holder which is held by two screws S1 and S2. The VERNIER dial lamp and holder are attached to a bracket, and to change this lamp the screws S3 and S4 must be removed, when the lamp, holder and bracket can be removed. Do not disconnect or put any undue strain upon the leads to the lamp holders.
- (4) *Valves.* With the set switched on try replacing the valves one by one by new valves until the set functions. Mark the faulty valve or valves and return to stores at the earliest opportunity.

If the local oscillator valve has to be changed the calibration of the tuning and vernier scales may be slightly affected. This may cause inconvenience in re-setting since a frequency logged with one oscillator valve cannot generally be re-set on the vernier dial when this valve has been changed. A new log of the frequencies commonly employed has therefore to be made.

The H.T. supply to the local oscillator is stabilised by a neon lamp. This should be renewed if it does not glow pink when the set is working. If this lamp is not working the oscillator drifts and it will be found that logging and re-setting frequencies is extremely difficult.

The positions of the valves are indicated in Fig. 3. To change the R.F., local oscillator, mixer valves or H.T. stabiliser remove the two fixing screws marked at the left of Fig. 3 and take off the cover. To change an I.F. valve or B.F.O. or discriminator valves, remove the two screws shown in Fig. 3 which clamp the units in position. Then unplug the unit concerned. Take the screening can off the unit after first removing the fixing screws, one on each of the narrow sides of the can. The valve may now be renewed. A.F. valves and vibrator are directly accessible.

- (5) *Desiccator sealing rings.* These should be replaced by spares if they show signs of perishing.
- (6) *Returning the set to its case.* Carefully fit the set in the case and secure with the 20 nuts and bolts around the edge. Failure to insert or properly tighten up any of these screws will result in moisture getting in the set and subsequently a fault in its working.

NOTE : The interior of the set should be exposed for as short a period as possible. In countries where high humidities are experienced it is best to open the set in the morning while the temperature is rising rather than in the evening when the temperature is falling and when condensation of water vapour may take place on the interior of the set.

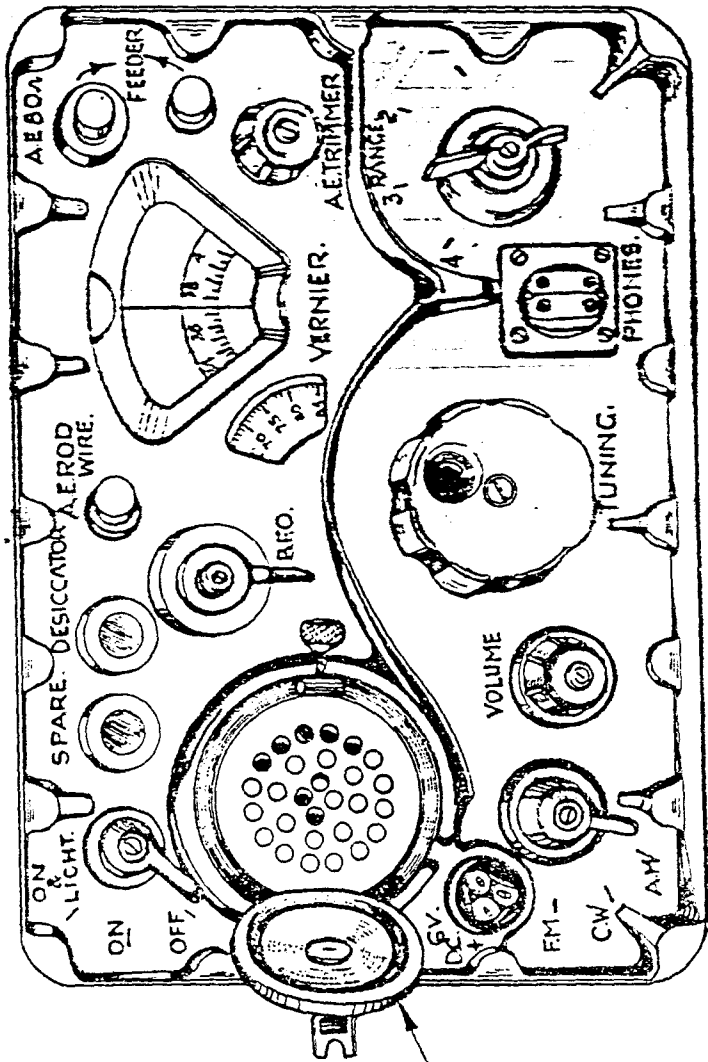
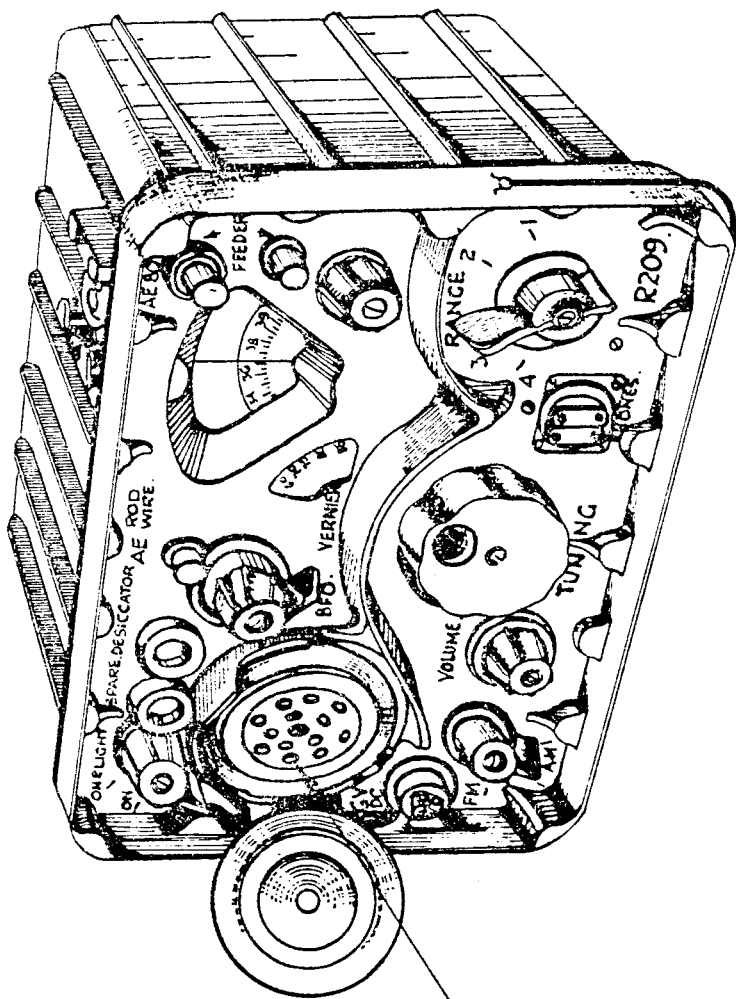


FIG. 1. RECEPTION SET R209—FRONT PANEL

LOUD SPEAKER.



LOUD SPEAKER.

FIG. 2. RECEPTION SET R209—GENERAL VIEW

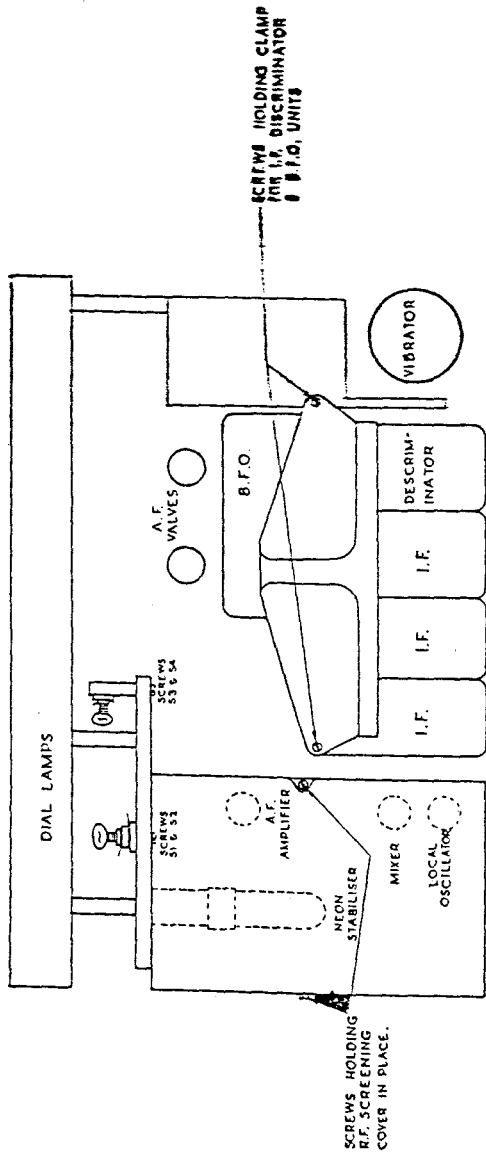


FIG. 3. RECEPTION SET R209—PLAN VIEW SHOWING VALVE PORTIONS