

RESTRICTED

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SCHOOL OF SIGNALS

RADIO SET A510

OPERATION

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Preliminary

1. Check that the station list is complete for the particular role in which the set is to be employed and that the batteries are serviceable.

Crystals

2. Plug crystals of the required frequencies into sockets in the transmitter unit and mark, in the spaces provided on the crystal cover, the crystal frequencies. Replace crystal cover, ensuring correct seating, and screw down firmly.

Batteries

3. Turn the set over and rotate the locking wheels in the direction indicated to unlock battery compartments. Insert batteries - LT in the receiver unit, HT/Bias in the transmitter unit. Connect batteries by means of the plugs provided, replace covers and lock the compartments.

Battery Test

4. Connect transmitter and receiver by screwing the interconnecting plug and socket firmly together. Set A-B-NET Switch to NET.
 - a. LT Battery. Set function switch to 'CW'. The aerial tuning meter in the transmitter should read within the Red Band on the 'AER TUNE' scale.
 - b. HT Battery. Hold function switch on 'VOICE'. The aerial tuning meter in the transmitter should read within the Red Band on the 'AER TUNE' scale.
 - c. Switch off by setting function switch to 'OFF'.

Aerial Erection

5. Rod Aerial.
 - a. In daylight conditions, the rod aerial should be assembled by hand, then fitted into the rod tuner, which is connected to the transmitter unit by a bayonet plug and socket.
 - b. To assemble the rod aerial at night, hold the bottom end of the aerial in the right hand and allow the remaining sections to hang loosely. Hold the button attached to the nylon cord in hand, maintain a steady tension on the cord and jiggle the right hand in order to guide

the section together. Complete mating of the sections by hand and pull the slack cord through to hang from the top of the aerial. THIS METHOD SHOULD BE USED AS LITTLE AS POSSIBLE IN ORDER TO PRESERVE THE LIFE OF THE NYLON CORD WHICH IS PRIMARILY INTENDED TO PREVENT THE LOSS OF ROD SECTIONS.

6. End Fed Aerial. The end fed aerial consists of eight different lengths of wire and an aerial lead, wound on a bobbin which displays a chart indicating the number of links of the aerial to be used for each frequency. The frequency ranges mentioned (A and B) correspond to the A and B positions of the A-B switch on the transmitter unit.

- a. Locate a suitable tree.
- b. Unwind the aerial cord, and, holding the free end, throw the bobbin over the highest possible branch.
- c. Connect the free end of the cord to the insulator on the aerial.
- d. Unwind as much of the aerial as required in the direction which is approximately at right angles to the line of the distant station.
- e. Haul on the aerial cord to raise the aerial to the required height, and make fast the cord to the tree. DO NOT EXERT UNDUE STRAIN ON THE AERIAL WHEN HOISTING.
- f. Attach the last link of the selected aerial to one end of the orange lead on the aerial bobbin, and other end of the orange lead to the aerial terminal on the transmitter. KEEP THE ORANGE LEAD OFF THE GROUND.
- g. Drive the counterpoise spike through the hole in the aerial bobbin into the earth in such a position that the aerial is kept off the ground as much as possible.
- h. Spread out the four black wires of the counterpoise in roughly the shape of a cross and connect the green lead to the earth terminal of the transmitter.

7. Dipole Aerial (Horizontal). Information regarding the lengths of aerial to be used for given frequencies, is contained in a chart on the inside of one flap of the dipole aerial holder. The preferred arrangements for sky wave communication is to have the dipole strung between two masts; however, trees may be used where masts are unavailable, provided that the aerial is kept free of foliage.

- a. Select the aerial site - aerial should preferably be broadside to the line of communication.

- b. Set up masts or locate suitable trees approximately 140-ft apart to allow for frequency changes necessitating change of aerial length.
- c. Unwind both spools until the length corresponding to the desired frequency is obtained and lay the wire along the ground approximately beneath the intended aerial position. THE RED PLASTIC MARKERS ON THE AERIAL WIRE ARE AT ONE FOOT INTERVALS. UNWIND TO EXACT LENGTH WHICH WILL INCLUDE THE LENGTH OF EACH DIPOLE CASE.
- d. If setting up between trees, unwind aerial cord and, using bobbin as a throwing device, throw it over the highest possible branch of the LOWER tree. Attach cord to dipole case.
- e. Move to other tree and select a branch at about the same level as that of the lower tree to ensure that the aerial is as near horizontal as possible. Repeat the drill with the other bobbin.
- f. Attach the end of the aerial wires to the feeder terminals.
- g. Hoist the aerials by means of the aerial cords. IN THE MAST ERECTION, DO NOT HOIST THE FEEDER POINT HIGHER THAN 3/4 HEIGHT OF THE SUPPORTING POINTS OF THE AERIAL.
- h. Insert one side of the dipole feeder wire in the aerial terminal and the other side in the earthing hole of the transmitter unit. THE COUNTERPOISE IS NOT USED WITH THE HORIZONTAL DIPOLE.

Dipole Aerial (Inclined).

- a. Select aerial site and locate suitable tree - aerial should be broadside to the line of communication.
- b. Unwind both spools until the length corresponding to the desired frequency is obtained and lay the wire along the ground approximately in the aerial position.
- c. Unwind aerial cord and throw bobbin over highest possible branch. Attach cord to dipole case.
- d. Move to distant end of second aerial and drive counterpoise spike into the earth.
- e. Attach second dipole case to counterpoise by means of other bobbin.
- f. Attach the ends of the aerial wires to the feeder terminals.
- g. Hoist the aerial by means of the aerial cord at tree end ensuring that the dipole case at the lower end is not making contact with the ground. DO NOT SPREAD OUT COUNTERPOISE WIRES.

h. Insert one end of the dipole feeder wire in the aerial terminal and the other side in the earthing hole of the transmitter unit. WHEN DISMANTLING STATION, LOWER AERIAL, DISCONNECT THE CORD, THEN PULL THE CORD FROM THE BOBBIN END.

Operation of Set Using Rod Aerial

9. Voice.

- a. Ensure interconnecting plug firmly joined.
- b. Plug either or both the handset/headset into receiver.
- c. Transmitter - select crystal of ordered frequency by means of crystal switch.
- d. Transmitter - turn frequency control knob to set transmitter to ordered frequency.
- e. Receiver - set to appropriate band - BLUE 2-4.5mHz
ORANGE 4.5-10mHz
- f. Transmitter - matching switch to 'O', A-B-NET switch to 'B'.
 - (1) Function switch - hold on VOICE.
 - (2) Rod tuner tuning knob - adjust to give maximum reading in aerial tuning meter.
 - (3) Rod tuner locking switch - turn clockwise to lock.
 - (4) Function switch - allow to return to 'R'.
- g. Tune receiver to zero beat as follows:
 - (1) Transmitter function to 'R'.
 - (2) Transmitter 'A-B-NET' switch to NET.
 - (3) Receiver volume control knob fully clockwise.
 - (4) Turn receiver frequency control knob carefully about required frequency on dial scale until signal is heard.
 - (5) Tune to zero beat.
 - (6) Receiver frequency lock - turn anti-clockwise carefully to lock.
 - (7) Transmitter 'A-B-NET' switch to 'B'.

- (8) Receiver volume control knob to comfortable hearing point.
- h. To transmit on VOICE - hold transmitter function switch on VOICE and speak in normal manner. If using handset, press pressel switch.
- i. To receive - allow transmitter function switch to return to 'R'.
10. CW. For CW working, after drill contained in sub-paras 9.a. to g. has been carried out, proceed as follows:
- a. Plug in key.
- b. Transmitter function switch to 'CW'.
- c. Send. UNTIL KEY IS PLUGGED IN, DISTANT STATION WILL NOT BE HEARD. REMOVE KEY PLUG FROM TRANSMITTER BEFORE RETURNING TO VOICE OPERATION.

Operation of Set Using End Fed Aerial

11. Voice.
- a. Ensure inter-connecting plug firmly joined.
- b. Plug either or both the handset/headset into receiver.
- c. Transmitter - select crystal of ordered frequency by means of crystal switch. Turn frequency control knob to set transmitter to ordered frequency.
- d. Receiver - set to appropriate band - BLUE 2-4.5 MHz, ORANGE 4.5-10 MHz.
- e. (1) Transmitter - matching switch to '0'.
- (2) A-B-Net switch to A or B according to aerial bobbin chart.
- (3) Function switch - hold on VOICE.
- (4) Matching switch - turn until maximum reading obtained on aerial tuning meter.
- (5) Frequency control knob - slightly re-adjust for maximum reading on aerial tuning meter.
- (6) Function switch - allow to return to 'R'.
- f. Tune Receiver to zero beat.
- g. To transmit on Voice - as for para 9.h.

12. CW. Proceed as for para 10.

Operation of Set Using Dipole Aerial

13. Voice.

- a. Ensure inter-connecting plug firmly joined.
- b. Plug either or both the headset/handset into receiver.
- c. Transmitter - select crystal of ordered frequency by means of crystal switch. Turn frequency control knob to set transmitter to ordered frequency.
- d. Receiver - set to appropriate band - BLUE 2-4.5 MHz, ORANGE 4.5-10 MHz.
- e. (1) Transmitter - matching switch to 'O'.
(2) A-B-Net switch to 'B'.
(3) Function switch - hold on VOICE.
(4) Matching switch - turn until maximum reading obtained on aerial tuning meter, ('O' is invariably the best position with DIPOLE aerial).
(5) Frequency control knob - slightly re-adjust for maximum reading on aerial tuning meter.
- f. Function switch - allow to return to 'R'.
- g. Tune receiver to zero beat.
- h. To transmit on VOICE - as per para 9.h.

14. CW. Proceed as for para 10.

User Maintenance

15. a. Keep all parts of station clean and dry, paying particular attention to plug holes and plugs.
- b. Keep fixing screws tight.
- c. Watch the humidity indicators. Should they turn PINK, moisture has entered the units which must be exchanged as soon as conditions permit.
- d. Take special care of aerial gear. Keep it as clean as possible and replace damaged items as soon as possible.

- e. Rewind aerial wires side by side and neatly.
- f. Report at once any faults or losses.

FAULT FINDING CHART

Symptom	Possible Fault	Action
1. Humidity indicators appear pink.	Interior of set is moist.	Return set to base at earliest opportunity.
2. Set appears dead.	Batteries.	Carry out battery test as per para 3. If confirmed faulty, change batteries.
	Switches in wrong positions.	Re-set and check.
	Plugs not making contact.	Ensure plugs not damaged. Then clean pins and sockets and re-connect.
	Headset or handset faulty.	Change.
	Internal fault.	Report.
3. Receiver noise heard, but no signals sent or received.	Switch in wrong position.	Double check.
	Faulty aerial connection.	Check aerial connection. Clean socket.
	Internal fault.	Report
4. Set not sending on any channel but OK on receive.	Faulty microphone (VOICE) if aerial meter gives tuning indication.	Change handset or headset.
	Faulty pressel switch (VOICE) if aerial meter gives tuning indication.	Replace handset.

Symptom	Possible Fault	Action
	Faulty plug connection to transmitter from key (CW).	Change key if adjustment not possible.
	Internal fault.	Report.
5. Set defective on certain frequencies but OK on others.	Faulty crystal.	Replace.
	Internal fault.	Report.