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**NOTES FOR
OPERATORS**

**Regimental
Radio
Equipments**

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CHAPTER 5

The W.S. A510

Introduction

121. The A510 wireless set is a crystal controlled, low power light-weight transmitter-receiver, designed primarily for use by long range infantry patrols. It can be used as a man packed station on the move, in a vehicle, or as a ground station. For the ground station role, improved aerial systems are provided to achieve greater range.

122. Carried in two special pouches on the standard webbing equipment, its operation can be either voice or CW in the frequency range 2 - 10 mcs. Thus it is an HF wireless equipment (see Chapter 1).

123. Operated by dry batteries giving 24 hours working, it provides efficient transmission on either ground wave (rod) or sky wave (horizontal aeriels). See Chapter 1.

Components

124. Figure 22 shows all the components required for a complete station A510.

Setting Up

125. The WS A 510 consists of two units, a transmitter and receiver both housed in a light, hermetically sealed, cast aluminium alloy case. The setting up is carried out as follows:—

(a) Transmitter Battery (HT Battery — 90 Volts)

- (i) Remove the transmitter from its pouch.
- (ii) Turn the transmitter upside down. Note the two large locking wheels, one on each side of the case. Turn each locking wheel in the direction of the arrow marked on it. This allows the cover of the battery compartment to be removed.
- (iii) Remove the large battery from its wrapping. Take the sealing from the socket on the battery top in such a manner as to insure no sealing remains in the socket holes.
- (iv) Noting the position of the holes in the battery socket and the position of the pins on the three pin battery plug attached to the battery lead coming from the base of the set, fit the plug into the battery socket. Ensure that the small removing clip attached to the battery



Figure 22 -- Complete Wireless Station A 170

plug is not between the battery lead and the top of the battery. Push the battery into the battery compartment. The plug must be down inside the walls of the compartment.

- (v) Turn the locking wheels on the battery compartment cover so that their open segments are facing up. Place the battery cover on the transmitter body so that the projection on each side of the body passes through the open segment. Exert pressure downwards firmly on the cover. Turn the locking wheels in the direction of the arrows until the cover is locked to the transmitter body. (Turn in the direction of the arrow).
- (vi) Replace the transmitter in its pouch, in such a manner that the silver covered aerial base on top of the transmitter appears under the hole in the lid of the pouch.

(b) LT Battery

- (i) Remove the receiver from its pouch, turn it upside down and remove the battery compartment cover.
- (ii) Unwrap the smaller battery and remove the sealing from the pocket at its top, insuring that no sealing remains in the holes.
- (iii) Insert the battery plug into the battery socket in such a way that the large and small hole in the socket correspond to the large and small pin on the plug. Make sure the removing clip is not between the battery cable and the top of the battery. Place the battery into the battery compartment.
- (iv) Replace the battery compartment cover and return the receiver to its pouch.

(c) Connecting Transmitter and Receiver Together

The transmitter, carried on the left, and the receiver on the right of the man, appear to be separate units but neither will operate until the inter-connecting plug and socket are securely joined. Matching the thick black lead coming from the right side of the transmitter and the shorter black lead from the left side of the receiver, so that the key on the outer rim of the receiver lead plug fits into the key way in the rim of the transmitter lead socket, push plug and socket together and secure by screwing the largest knurled ring until it is tight.

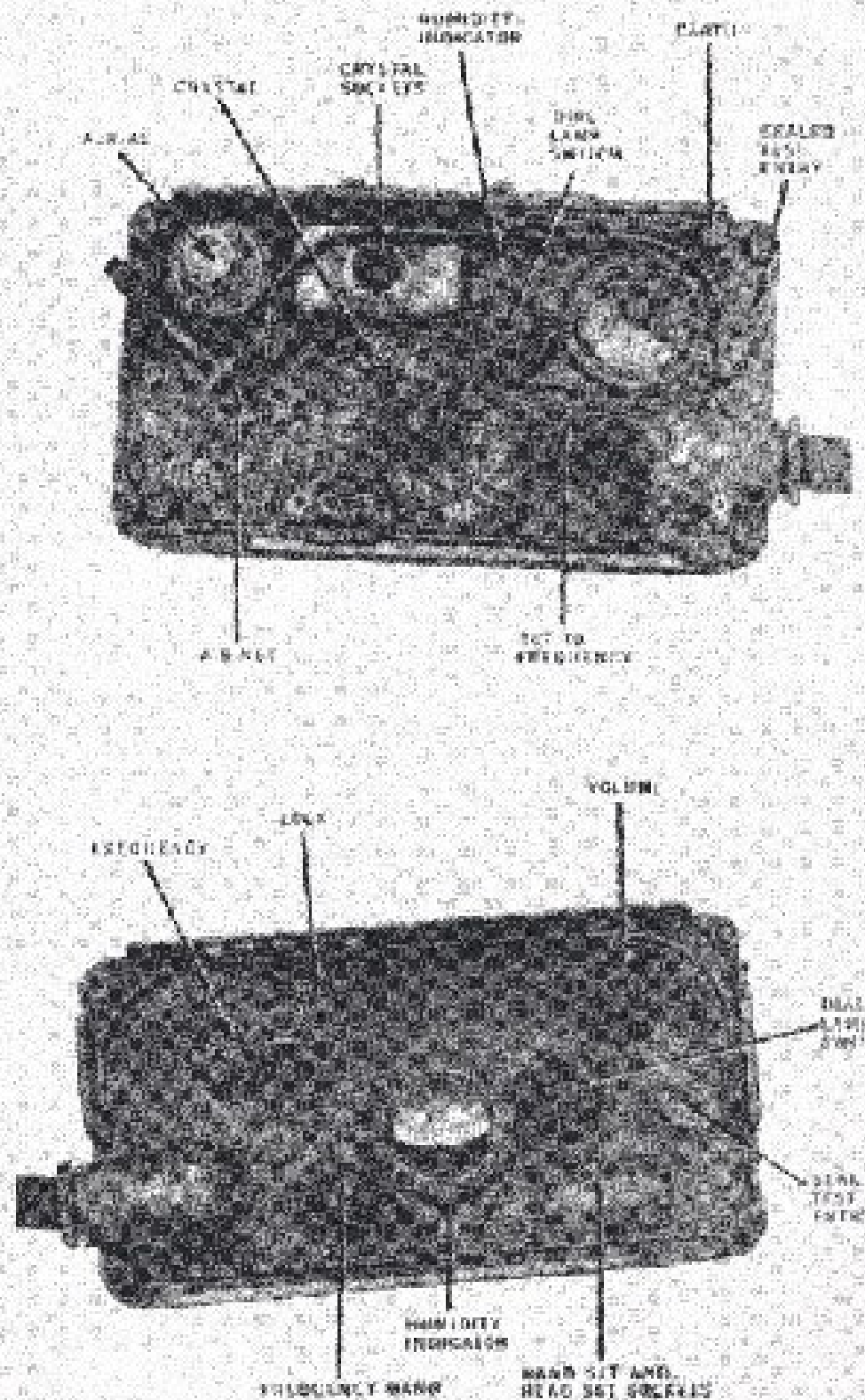


Figure 27 - Transmitter and Receiver Control Panel, Panels TFS & TR

- (d) **Hand Set and Head Set.** Remove these items from their carrying pouch. On examination, it will be seen that the plugs on each of these units are identical. Each has four pins set close together with the fifth pin spaced away. These plugs fit into the double socket at the bottom right of the receiver control panel. It does not matter which unit goes into which socket.

Receiver Controls

126. The receiver controls as marked on the panel (shown here in capitals), and other items on the receiver are explained below and illustrated in figure 23.

- (a) **Frequency Band.** This switch selects the blue band (2 - 4.5 mcs), or the orange band (4.5 - 10 mcs). The colours are clearly marked, and correspond with the colours on the frequency dial scale. The switch has a wide arc of travel.
- (b) **Frequency.** This is the frequency control knob, the position of which can be fixed by rotating the LOCK lever anti-clockwise through 90 degrees. The frequency is indicated on the dial scale which is located in the centre of the panel. The dial scale shows the blue band (2 - 4.5 mcs) and the orange band (4.5 - 10 mcs).
- (c) **Humidity Indicator.** Immediately below the frequency dial scale is a humidity indicator which is normally a blue colour, but turns pink when moisture has leaked in to the receiver, in which case the set should be replaced and repaired when possible.
- (d) **Dial Lamp Switch.** The rubber cap near the frequency dial scale, marked press, covers a press switch which, when pressed, actuates the pilot lamp when the function switch on the transmitter is set at R.
- (e) **Volume.** This control is situated in a corner of the panel opposite the frequency control knob. It increases and decreases the sound to the ear.
- (f) **Five-pin Sockets.** These accept the handset or the head gear assembly plugs, or one of each, as required.
- (g) **Seal test entry.** The hexagonal bolt on the right of the dial lamp switch seals the entry for leak testing (by R.Aust. Sigs. or RAEME personnel).

Transmitter Controls

127. The transmitter controls as marked on the panel (shown here in capitals), and other items on the transmitter are explained below and illustrated in figure 23.

- (a) **Aerial.** The position of this terminal was chosen in order to keep the rod aerial as far away as possible from the operator's body when the set is carried on the man. The three radial pins at the top of the terminal form a plug on which the bayonet type socket in the base of the aerial tuning inductor, ("rod tuner") is mounted when a rod aerial is used. In the centre of this plug is a spring loaded button which when depressed, clears holes in the aerial terminal for insertion of dipole or end-fed aerial leads. (With these aerials the rod tuner is not used.)
- (b) **Off-CW - R - Voice.** This function switch, operated by a lever knob exercises complete control of the station when on the air. When switching from R to voice, pressure on the knob must be maintained until speech is finished, its return spring returning the lever knob to R when pressure is relaxed. When holding the lever knob to voice, the operator's hand must be kept as far as possible from the aerial terminal.
- (c) **A-B-Net.** This control is mounted on the same spindle as the function switch. The three positions are:—
 - (i) **A** — long wire end-fed aerial
 - (ii) **B** — long wire aerial, rod aerial, and dipole
 - (iii) **Net** — To net receiver to transmitter
- (d) **Crystal Sockets** To the right of the aerial terminal is the sealed multiple socket, protected by an easily removed cover, for four miniature crystals.
- (e) **Crystal.** This switch is mounted on the same spindle as the **matching switch**, and selects the required crystal.
- (f) **Matching.** This switch is used, in the main, only for long wire aerials.
- (g) **Set to Frequency.** This control sets the transmitter to the ordered frequency.
- (h) **Humidity Indicator** } As for receiver para 126
- (j) **Sealed Test Entry** } (c) and (g).
- (k) **Dial Lamp Switch.** This is identical with the switch (marked **press**) on the receiver but operates under different conditions. The switch functions when

the transmitter function switch is on **CW** or **voice**, and the **AB - net** switch is in any one of the three positions. To enable the transmitter to be tuned at night under conditions of wireless silence, the dial lamp switch will also function when the function switch is on **R** and the **A-B-Net** switch is on **net**.

- (l) **Aerial Tuning Meter.** The frequency dial scale, and meter scale (marked **Aer Tune**) are seen through the one window, the frequency dial scale being off-set to enable the meter to be more easily read.
- (m) **Earth.** On the outer flange near the aerial tuning meter is an earth terminal to which connection is made by **depressing** the leaf spring, inserting the earth wire through the counter-sunk hole in the outer flange, and then releasing the leaf spring.

Testing the Batteries

128. (a) Set the **A-B-Net** switch to **Net**.

(b) **To check low tension.**

(i) Move **voice-R-CW-Off** switch to **CW**.

(ii) Look down into meter well on transmitter and press dial lamp switch (marked **press**) on the transmitter.

(iii) Meter should read within the limits of the short thick red band on the meter scale. If the reading is below the short mark, replace the battery.

(iv) Turn **voice R-CW-Off** switch back to **R**.

(c) **To check high tension**

(i) Hold **voice-R-CW-off** switch on **Voice**.

(ii) Look down into meter well on transmitter and press dial lamp switch (marked **Press**) on the transmitter.

(iii) Needle should be within limits of long thin red mark. If the reading is below the long mark replace the battery.

(iv) Allow the **voice - R - CW - Off** switch to return to **R**.

Crystals

129. (a) Remove crystal socket cover by unscrewing the black knob.

(b) Insert the issued crystals in the crystal holders (numbered 1 to 4 on crystal socket cover). Ensure that the pins on the individual crystal holders are pushed between the two metal holding strips, which

constitute the socket, not between one of the strips and the rubber housing. **Failure to avoid this will push the two strips together and render that particular socket inoperative.**

- (c) Replace the crystal socket cover and screw it down.

Hand Set and Head Gear Assembly Test

- 130. (a) Push the **voice-R-CW-off** switch (hereafter referred to as the function switch) to **voice** and speak into microphone. If these assemblies are operating satisfactorily, the operator will hear sidetone.
- (b) Allow the switch to return to **R**. Background noise should be heard in the ear pieces.

Man Pack Rod Working

131. Fitting Rod

- (a) Take the rod tuner from the pouch, and place in a vertical position on the aerial terminal. Turn the rod tuner till it drops over the three radial pins. Push down and turn anti-clockwise to lock.
- (b) Take the eight foot rod from the pouch. Holding its thick end throw the aerial out along the ground. Pull on the button and shake the aerial. The nylon cord will pull the aerial sections together.
- (c) Place the rod aerial in the hole in the top of the tuner.

132. Switch Positions

- (a) Unlock the tuning knob on the rod tuner by moving the locking arm, situated under the rod tuner knob, to the right.
- (b) Put the function switch to **R**.
- (c) Put the **A-B-Net** switch to **B**.
- (d) Switch the **crystal** switch to the desired frequency by selecting positions 1 to 4.
- (e) Place the **matching** switch to **0**.
- (f) By means of the **set frequency knob**, set the transmitter at the approximately ordered frequency.
- (g) Set the **receiver frequency band** switch to the frequency band in which the ordered frequency is. (blue and orange bands).
- (h) Ensuring that the receiver frequency lock is in the twelve o'clock position, set the ordered frequency on the frequency dial.
- (j) Set the **volume control** fully clockwise.