

1. YAA410—Unit Fullerphone Long Range (Aust)

(i) The Unit Fullerphone, Long Range (Aust.) has been produced for operation of a modified Fullerphone Mk. IV over long and noisy lines by improving the signal to noise ratio.

(ii) The principle of the method is to increase the signal current in the line by means of additional cells at each instrument, and to reduce the strength of the received signal to the normal value by means of a potentiometer across the telephones. The noise level is also reduced by the potentiometer to such an extent that it no longer gives rise to serious interference.

(iii) The Unit Fullerphone Long Range (Aust.) comprises a volume control and a line voltage selector switch. These components are connected to a standard 4 point plug which can be inserted in a standard 4 point socket fitted to a modified Fullerphone Mk. IV. The electrical circuit is shown in Fig. 11.

2. Modification to Fullerphone Mk. IV.

(i) Fullerphones Mk. IV are to be modified. In the field and future deliveries from production will be modified to provide normal operation until a Unit Fullerphone Long Range is plugged into the circuit. The modified Unit will be known as YAA419—Fullerphone Mk. IV^{*} Special (Aust.), the circuit of which is shown in Fig. 12.

(ii) The modifications involve fitting a 4 point jack on the body of the Fullerphone Mk. IV. The two outer contacts are connected in parallel with the Headphone Jacks. The two inner contacts are connected in series between the back contact of the key and the lead to that contact; until the Unit Fullerphone Long Range plug is inserted, operation of the Fullerphone Mk. IV^{*} Special (Aust.) is normal. When the plug is inserted the volume potentiometer is connected across the headphones and extra voltage up to 12 volts may be added to the CHOPPER circuit, and consequently the line circuit, by the voltage selector switch.

(iii) The addition of * to the nomenclature signifies that components have been fitted to suppress the buzzer sparking from causing local interference, and also to reduce the risk of interception by the enemy. This is a separate modification to that which converts the Fullerphone to a Mk. IV^{*} Special (Aust.), and does not affect the operation of the Long Range Unit.

3. Operating Instructions.

**Instructions for Using Fullerphone Mk IV^{*} Special (Aust.) with Unit,
Fullerphone Long Range (Aust.).**

(i) TEST AND ADJUST BUZZER as detailed in Sig. Trg., Vol. III, Pam. 21, Para. 3.

(ii) Connect terminals L1 and L2 to lines or line and earth. Plug in headphones and pull out "PULL ON" knob.

(iii) To eliminate as much as possible, any steady buzz heard in the headphones (not due to the distant station), throw key to position "A" or "B" and adjust the potentiometer until the buzz is minimised.

(iv) If the interference is found to be too great for satisfactory communication—

(a) Set Voltage Switch of the Unit, Fullerphone Long Range (Aust.) to "O".

(b) Plug the 4-point connector of the Unit Fullerphone Long Range (Aust.) into the socket provided on the Fullerphone Mk. IV^{*} Special (Aust.).

(c) Turn VOLUME to give maximum signal strength.

(v) Adjust voltage to 12 volts and establish communication. Reduce VOLTAGE and adjust VOLUME until a satisfactory signal to noise ration has been obtained. Keep voltage at a minimum.

(vi) Before disconnecting the Unit Fullerphone Long Range (Aust.), set the VOLTAGE to "O".

4. Interception.

(i) For very long quiet lines only sufficient extra voltage is necessary to bring the line current to a normal value over the higher resistance circuit.

(ii) When long noisy lines are in use, the line current will be increased in obtaining the required workable signal to noise ratio. Under these conditions signals are more easily intercepted and the circuit cannot be considered secure.

5. After Fig. 10 of Amendment No. 3, add new Figs 11 and 12 herewith.

FIG.11- YAA 410 - UNIT FULLERPHONE LONG RANGE (AUST)

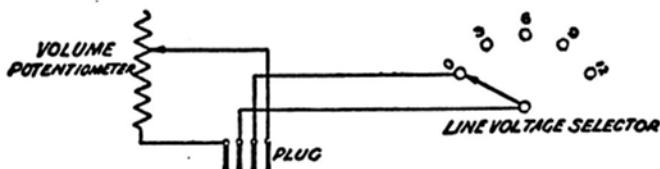


FIG.12- YAA 419 - FULLERPHONE MK II SPECIAL (AUST)*

CIRCUIT DIAGRAM

