The FISK
RADIOLETTE
MODEL 42V

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Four Valve, Medium Wave, Vibrator Power Operated Superheterodyne

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TECHNICAL INFORMATION
AND SERVICE DATA

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Amalgamated Wireless (Australasia) Ltd

THE FISK RADIOLETTE, MODEL 42V

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TECHNICAL INFORMATION

Electrical Specifications

TUNING RANGE

"Standard Medium Wave".....200-550 metres

Intermediate Frequency.....460 K.C.

ALIGNMENT FREQUENCIES

R.F. Alignment.....1400 K.C. (214M)

CURRENT CONSUMPTION

"A" Battery at 6 volts.....1.20 amps

"B" at 135 volts.....Supplied from Vibrator Power Unit

VALVE COMPLEMENT

(1) 1C6..... Detector-Oscillator

(2) 1C4.....I.F. Amplifier

(3) 1K6.I.F. Amp., 2nd Det., A.V.C. and A.F. Amp.

(4) ID4.....Output Pentode

Dial Lamp.....2.5 volts .06 amps.

Loudspeaker (Permanent magnet).....Type A.L.2

Loudspeaker Transformer.....T.G. 131

Replacement Fuse.....3 amp.

General Circuit Description

The Radiolette 42V is a four valve superheterodyne receiver designed for battery operation. The plate supply is obtained from a vibrator power unit, mounted within the console cabinet, which, in turn, is operated from two cells of a 6 volt accumulator. One cell of the accumulator (2 volts) is used to supply the filament voltage to the valves. The battery switch has a third position to illuminate the dial. After the Radiolette has been tuned, the switch may be turned to the second position to conserve battery current.

DETECTOR-OSCILLATOR.

The signal entering the aerial circuit is coupled to the control grid of the 1C6 through a tuned aerial coil T1. The local oscillator signal, 460 K.C. higher in frequency, is generated by the oscillator section of the 1C6. Within the 1C6 the signals combine to form the I.F. or beat frequency. No padding adjustment is required for the oscillator circuit since the padding condenser C6 is of the correct capacity and is matched to the oscillator coil at the factory. The oscillator and aerial coils are tuned by a two section variable condenser; each condenser is fitted with a compression type trimmer condenser for alignment purposes.

I.F. AMPLIFIER.

Two stages of I.F. amplification are used in which three transformers are employed. Excepting the secondary of the third transformer, which is untuned, the primaries and secondaries are tuned by compression type trimmer condensers. The first and second I.F. transformers are adjusted from beneath the chassis and the third from above the chassis. Amplification in the second I.F. stage is accomplished by the pentode section of the 1K6. The amplified signal is then coupled to the negative diode of the same valve by the third I.F. transformer for rectification across resistors R9 and R10. A signal is also fed to the positive diode by condenser C21, and proportionate to the incoming signal, a D.C. potential is produced across R7 to be fed to the control grids of the 1C6 and 1C4 valves for A.V.C.

AUDIO AMPLIFIER.

The volume control R9 selects the amount of audio signal to be transferred from the diode circuit to the control grid circuit of the 1K6, via C22, for audio amplification. Resistance capacity coupling is used to couple the plate circuit of the 1K6 to the control grid circuit of the 1D4 output pentode. The output of the 1D4 is transformer coupled to the permanent magnet dynamic loudspeaker.

Negative bias voltages are supplied by a 4½ volt bias "C" battery, which is mounted in a clip on the chassis.

A switch, located on the rear of the chassis, is used to control the sensitivity of the Radiolette. When the switch is in the local (L) position, R4

is connected in series with the screen feed resistor R3 to lower the screen grid voltage on the 1C6 and 1C4 valves. When the switch is in the distant (D) position, R4 is omitted to raise the screen grid voltage and thus increase the sensitivity.

The tone control circuit comprises a variable control connected in series with a .035 mfd. paper dielectric condenser between the plate of the 1D4 and earth.

Vibrator Power Unit

The Vibrator Power Unit supplies the correct socket voltages for the operation of the Radiolette. It contains a plug-in type vibrator, step-up transformer, and an efficient filter system.

Rectification of the high voltage is accomplished by means of the synchronous vibrator. The complete unit is acoustically housed in a soundproof case to prevent mechanical noise and has been carefully adjusted at the factory by special equipment to ensure quiet operation over an extensive period of life. No adjustments should be attempted on a vibrator suspected of being faulty. If a fault is suspected, the vibrator should be returned to the company for test or a renewal installed. The plug-in feature affords easy removal or replacement.

The case is lined with soundproofing material, and, in addition, the Vibrator Power Unit is suspended on sponge-rubber pads within the case.

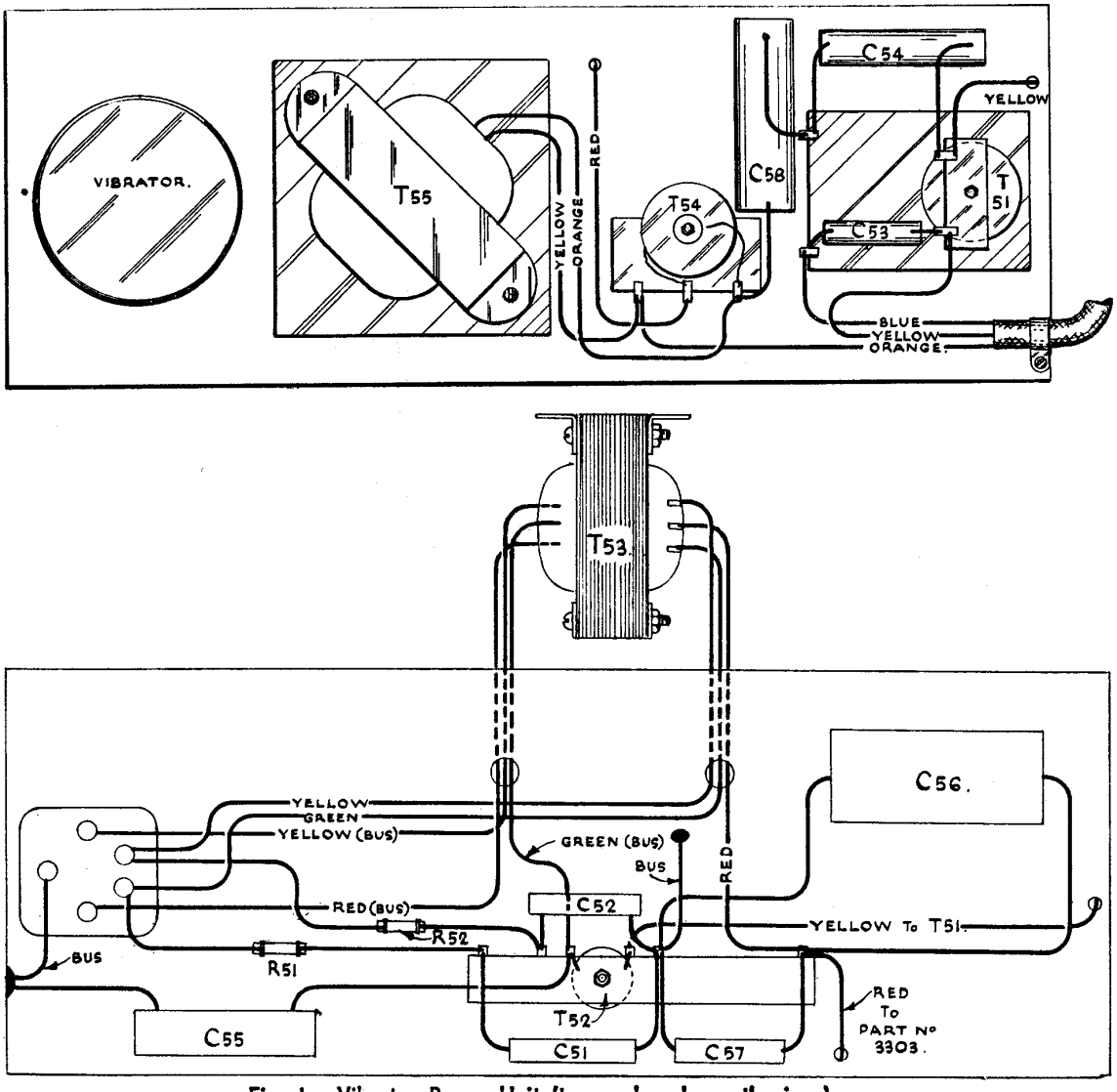

Fig. 1.—Vibrator Power Unit (top and underneath views).

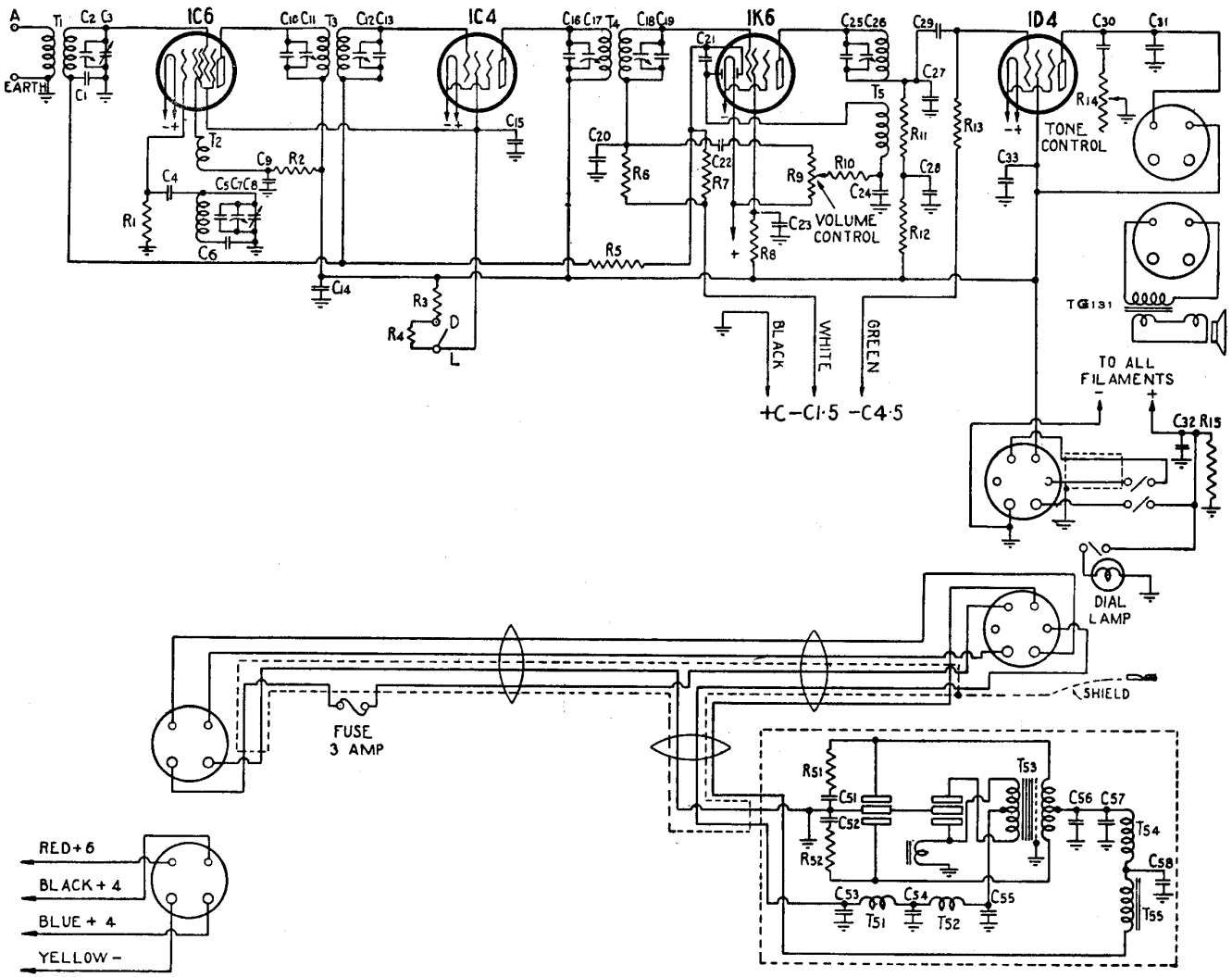

Fig. 2.—Circuit Diagram.

Code	Part No.	COILS — RECEIVER UNIT
T1	1560	Aerial Coil
T2	2893	Oscillator Coil
T3	1523C	First I.F. Transformer
T4	1523D	Second I.F. Transformer
T5	1530B	Third I.F. Transformer
		COILS — POWER UNIT
T51	3149	R.F. Choke
T52	3294	R.F. Choke
T53	3290	Vibrator Trans. (4 volt)
T54	3303	R.F. Choke
T55	3292	Smoothing Choke
		RESISTORS — RECEIVER UNIT
R1		60,000 ohms, ⅛ watt
R2		50,000 ohms, ⅛ watt
R3		75,000 ohms, ⅛ watt
R4		50,000 ohms, ⅛ watt
R5		1¾ Megohms, ⅛ watt
R6		1¾ Megohms, ⅛ watt
R7		1¾ Megohms, ⅛ watt
R8		250,000 ohms, 1 watt
R9	1507	500,000 ohms, Vol. Control
R10		300,000 ohms, ⅛ watt
R11		75,000 ohms, ⅛ watt

Code	Part No.	RESISTORS — RECEIVER UNIT
R12		20,000 ohms, ⅛ watt
R13		1 Megohm, ⅛ watt
R14	2762	100,000 ohms, Tone Control
R15	3367	4.5 ohms, wire wound
		RESISTORS — POWER UNIT
R51		50 ohms, ⅛ watt
R52		50 ohms, ⅛ watt
		CONDENSERS — RECEIVER UNIT
C1		.05 mfd. Paper
C2		10-50 mmfd. Mica Trimmer
C3	2891	Variable Condenser
C4		50 mmfd. Mica (D)
C5		15 mmfd. Mica (C)
C6		410 mmfd. Mica Padding
C7		10-50 mmfd. Mica Trimmer
C8	2891	Variable Condenser
C9		.05 mfd. Paper
C10		130 mmfd. Mica (H)
C11		10-50 mmfd. Mica Trimmer
C12		10-50 mmfd. Mica Trimmer
C13		130 mmfd. Mica (H)
C14		.5 mfd. Paper
C15		.1 mfd. Paper
C16		130 mmfd. Mica (H)

Code	Part No.	CONDENSERS — RECEIVER UNIT
C17		10-50 mmfd. Mica Trimmer
C18		10-50 mmfd. Mica Trimmer
C19		130 mmfd. Mica (H)
C20		200 mmfd. Mica (J)
C21		700 mmfd. Mica
C22		.05 mfd. Paper
C23		.1 mfd. Paper
C24		200 mmfd. Mica (J)
C25		130 mmfd. Mica (H)
C26		10-50 mmfd. Mica Trimmer
C27		700 mmfd. Mica
C28		.25 mfd. Paper
C29		.05 mfd. Paper
C30		.035 mfd. Paper
C31		.005 mfd. Paper
C32		.5 mfd. Paper
C33		8 mfd. Electrolytic
		CONDENSERS — POWER UNIT
C51		.02 mfd. Paper
C52		.02 mfd. Paper
C53		.1 mfd. Paper
C54		.25 mfd. Paper
C55		.25 mfd. Paper
C56		8 mfd. Electrolytic
C57		.02 mfd. Paper
C58		.5 mfd. Paper

Circuit Code.

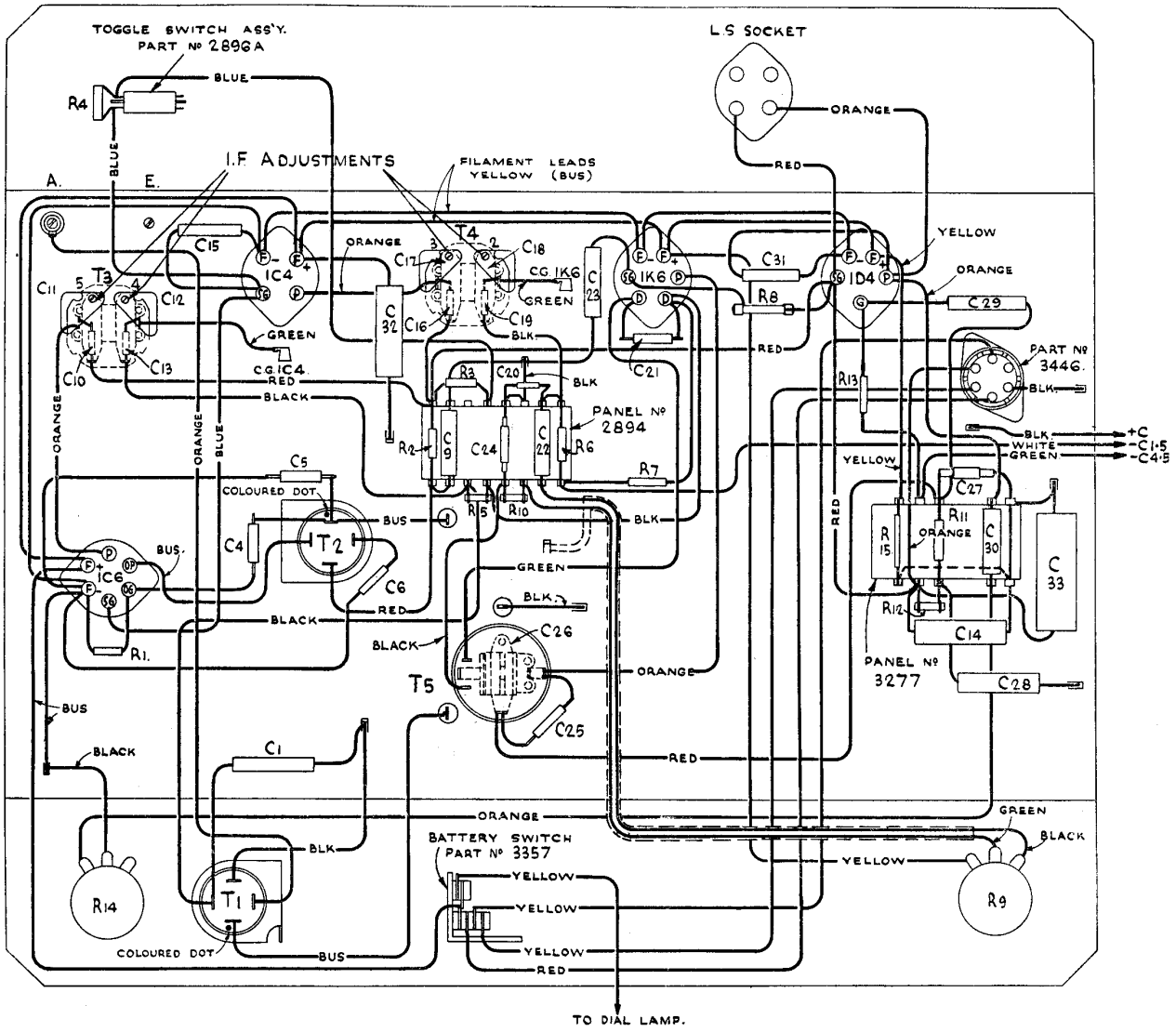

Fig. 3.—Lay-out Diagram (underneath view).

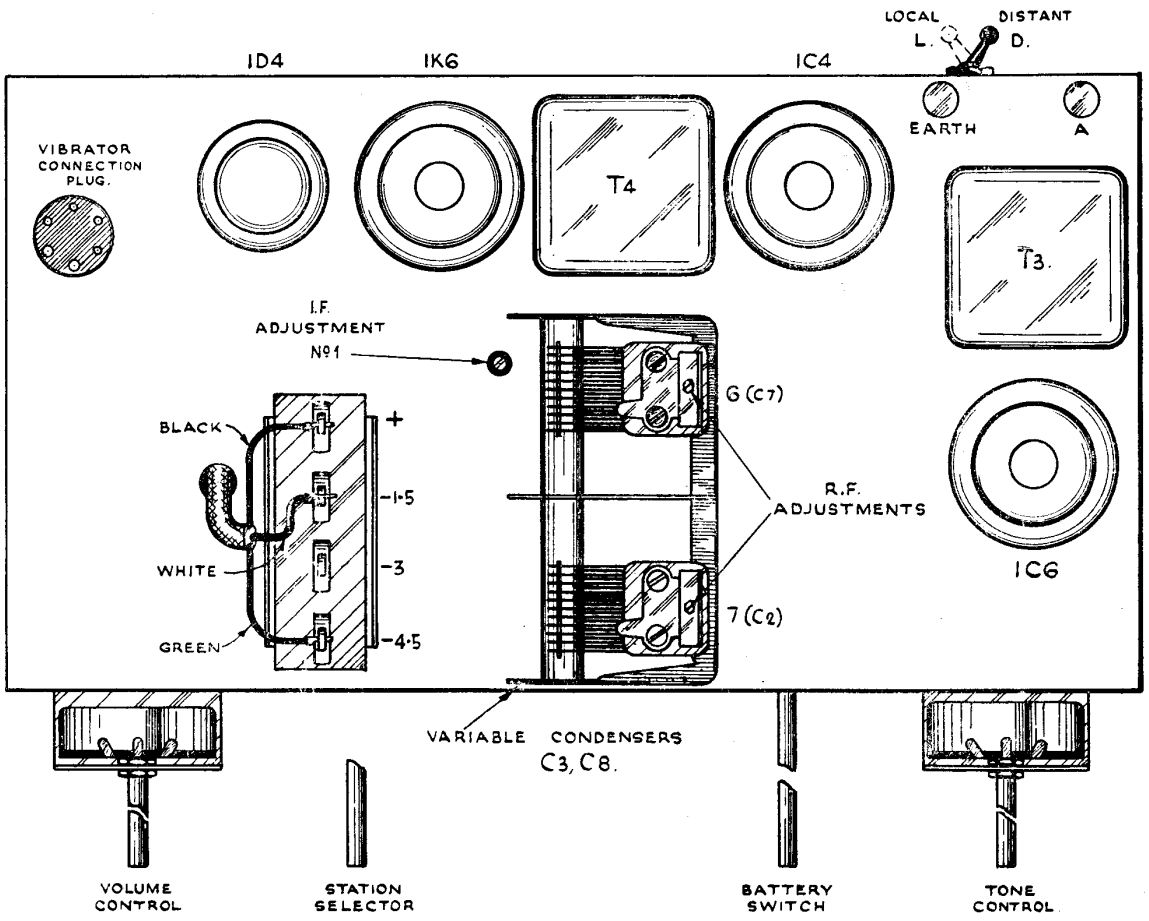

Fig. 4.—Lay-out Diagram (top view).

When fitting the unit in the case, first make certain that the Vibrator is firmly seated in its socket and is making good contact. Also, when fitting, see that the Vibrator is not moved out of place by side contact with the sponge rubber pad. The pad is placed in the correct position to provide a gentle downward pressure on the vibrator.

The installation is protected by a fuse, which is located in the Vibrator Power Unit cable. It is necessary when replacing the fuse to sheath it in the tubing provided before inserting in the fuse-holder. If the tubing is not used, the fuse is useless and the installation is deprived of protection. Before inserting a replacement fuse, always examine the installation to determine the fault which caused the fuse to "blow." Replacement fuse — 3 amp.

Proper connection of the power unit to the Receiver Unit is essential. In the event of noisy operation, see that the earth lug attached to the cable is firmly connected to the receiver chassis. A tapped hole and screw are provided on the receiver chassis, adjacent to the power unit socket, for the purpose. Do not connect an earth wire to the power unit other than this, as interference will result.

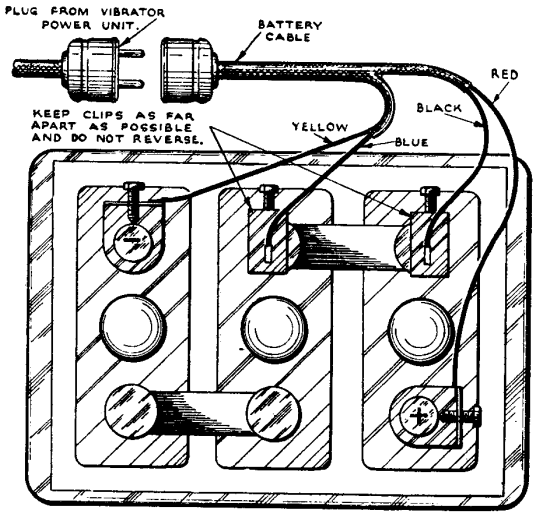

Fig. 5.—Accumulator Connections.

Fig. 5 shows the accumulator connections and it is important that the leads should always be arranged as shown. Do not reverse the blue and black leads and space them as far apart as possible on the connecting strap to avoid Vibrator buzz, which might otherwise result if these two leads are joined together or touch each other. As the cable is permanently connected to the accumulator, keep it smeared with light grease or vaseline to resist corrosion.

Alignment Procedure

Unless it is felt certain that the alignment of the Radiolette is incorrect, it is not desirable to alter the adjustments from the factory setting. However, when repairs have been made to R.F. or I.F. circuits or tampering is suspected, alignment becomes necessary.

In aligning the tuned circuits, it is important to apply a definite procedure, as tabulated below, and to use adequate and reliable test equipment. An A.W.A. Modulated Oscillator Type C1070 is ideal for the purpose. Visual indication of the output from the Radiolette is also necessary, any output meter of conventional design being suitable.

Connect the ground connection of the Modulated Oscillator to the Radiolette chassis, and for the I.F. alignment remove the grid clip from the 1C6 before connecting the oscillator. See that a 250,000 ohms resistor is connected between the output terminals of the modulated oscillator.

When aligning, set the volume control in the maximum clockwise position and the sensitivity switch (the switch at the rear of the chassis) in the distant (D) position. Regulate the output of the Modulated Oscillator so that a minimum signal is applied to the Radiolette to obtain an observable indication. This will avoid A.V.C. action and overloading.

All adjustments should be made with the use of a non-metallic screwdriver.

"Approx. 550 M. no signal" means that the Radiolette should be tuned to a point at or near 550 metres, where no signal or interference is received from a station or local (heterodyne) oscillator.

To check the calibration of the Radiolette connect an aerial and an earth wire and tune a broadcasting station of wavelength between 450 and 550 metres. If there is an error in the calibration, reset the pointer by loosening the mounting screws. Then, repeat instructions 4 and 5 of the chart.

Alignment Order	Oscillator Connection to R'iette	Oscillator Setting	Radiolette Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
1	1C6 Det.-Osc. Grid Cap	460 K.C.	Approx. 550M. No signal	3rd I.F. Trans. (T5)	C26	Max. (peak)
2–3	1C6 Det.-Osc. Grid Cap	460 K.C.	Approx. 550M. No signal	2nd I.F. Trans. (T4)	C18-C17	Max. (peak)
4–5	1C6 Det.-Osc. Grid Cap	460 K.C.	Approx. 550M. No signal	1st I.F. Trans. (T3)	C12-C11	Max. (peak)
6	Aerial Term.	1400 K.C.	214 metres	Oscillator	C7	Max. (peak)
7	Aerial Term.	1400 K.C.	214 metres	Detector	C2	Max. (peak)

RESISTANCE MEASUREMENTS.

The resistance values shown in fig. 6 have been carefully prepared so as to facilitate a rapid check of the circuit for irregularities. To obtain the full benefit from this diagram it is advisable to consult the circuit and lay-out diagrams while conducting the check. Each value should hold within ± 20%. Variations greater than this limit will usually be indicative of trouble in the basic circuits.

TUNING COILS.

Each coil is secured in its shield by a circular retaining spring which can be seen seated in a recess between the shield and the coil base. To remove the coil, disconnect the leads from the lugs and insert a small screwdriver between the spring and the shield, then ease the spring from the recess.

A coloured dot on the coil base denotes the grid connection, and fig. 3 shows the correct position for this dot when replacing a coil.

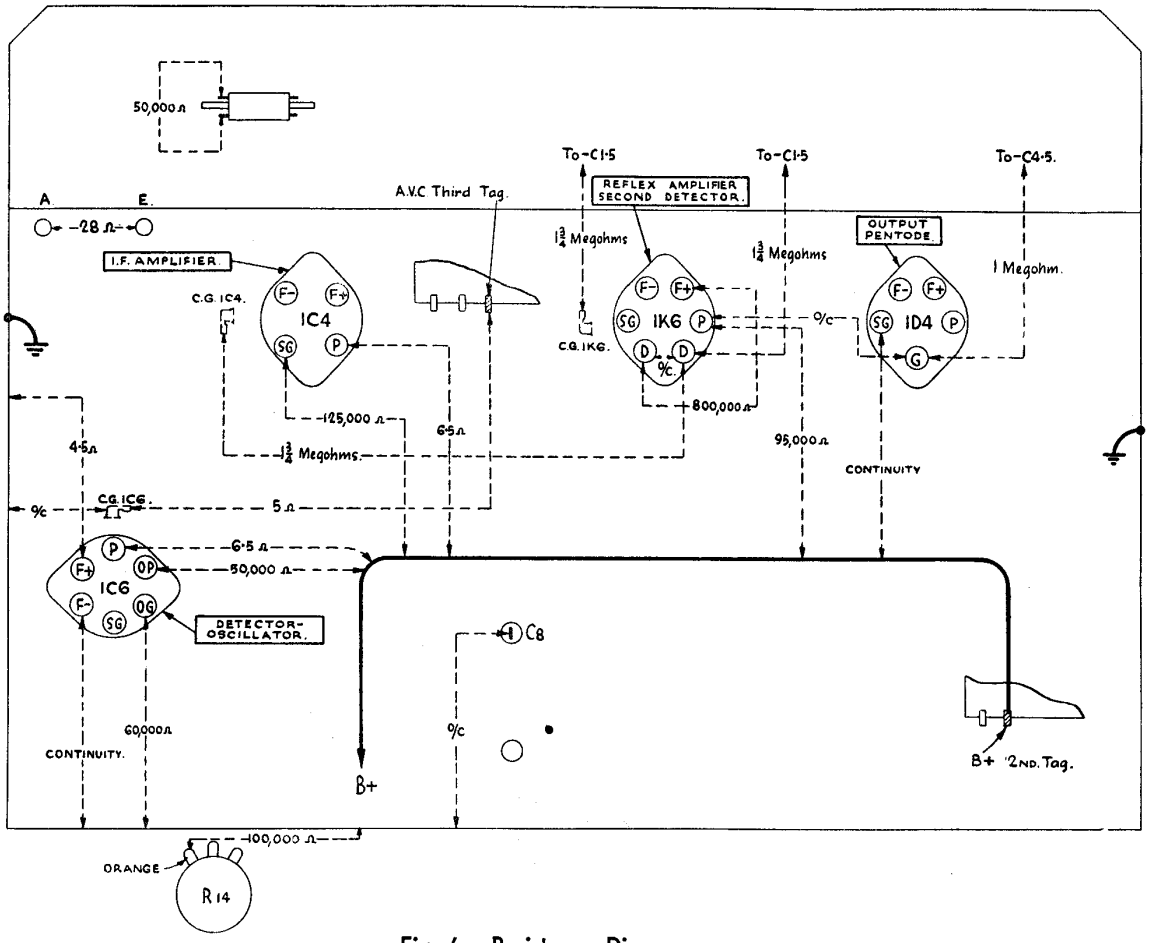

Fig. 6.—Resistance Diagram.

Resistance values were taken with the valves removed from sockets, variable condenser in full mesh, volume control in maximum clockwise position and sensitivity switch in local (L) position.

SOCKET VOLTAGES.

VALVE	Chassis to Control Grid Volts	Chassis to Screen Grid Volts	Chassis to Plate Volts	Plate Current M.A.	Filament Volts
1C6 Detector	*1.5	50	135	1.0	2.0
Oscillator	—	—	60	1.5	—
1C4 I.F. Amplifier	*1.5	50	135	1.5	2.0
1K6 Reflex Amplifier and Detector	*1.5	*50	*55	0.75	2.0
1D4 Output Pentode	*4.5	135	130	6.0	2.0

Measured with controls in maximum clockwise position and with sensitivity switch in distant (D) position. No signal input.

* Cannot be measured with ordinary voltmeter.


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