The FISK
RADIOLETTE
MODELS 39 and 42B

•

Four Valve, Medium Wave, Battery Operated

Superheterodyne

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TECHNICAL INFORMATION

AND SERVICE DATA

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Amalgamated Wireless (Australasia) Ltd

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TECHNICAL INFORMATION

Electrical Specifications

TUNING RANGE

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

ALIGNMENT FREQUENCIES

R.F. Alignment.....1400 k.c. (214 m.)

Intermediate Frequency.....460 k.c.

CURRENT CONSUMPTION

"A" Battery at 2 volts.....60 amps. (dial lamp off)

"A" Battery at 2 volts.....66 amps. (dial lamp on)

"B" Battery at 120 volts.....12 M.A.

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) 1D4.....Output Pentode

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

Loudspeaker (Permanent Magnet) Types A.G.1 (39), A.L.2 (42B).

Loudspeaker Transformer T.G. 51 (39), T.G.131 (42B).

General Circuit Description

The Radiolette is a four valve superheterodyne designed for battery operation. The plate supply is from "B" batteries and the filament supply from a 2 volt storage battery. The circuit description per stage is as follows:—

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 section 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. 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 automatic volume control.

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 $4\frac{1}{2}$ 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.

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 with these circuits is suspected, complete alignment becomes necessary.

In aligning the tuned circuits it is important to apply a definite procedure, as described 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 during alignment is also necessary, any output meter of conventional design being suitable.

I.F. ALIGNMENT.

The I.F. adjustments 1, 2, 3, 4 and 5 are shown in Figs. 2 and 3. Each circuit must be aligned to a basic frequency of 460 kilocycles.

To align, proceed as follows:—

1. Remove the grid clip from the control grid of the 1C6 and connect the output of the Modulated Oscillator, the ground connection of the oscillator being connected to the Radiolette chassis. See that a 250,000 ohms resistor is connected between the output terminals of the modulated oscillator.
2. Connect an output meter in the plate circuit of the 1D4 output pentode.
3. Set the Station Selector pointer of the Radiolette to 550 meters on the dial scale, and turn the Volume Control to the maximum clockwise position. Set the Local-Distant switch at the rear of the Radiolette chassis to the Distant (D) position.
4. Set the Modulated Oscillator to 460 K.C. and switch it ON.
5. Adjust the output of the modulated oscillator so that a slight indication is apparent on the output meter.

NOTE.—The output of the modulated oscillator should be maintained at the lowest level consistent with a good output indication.

6. Beginning with adjustment No. 1 (see fig. 3) a non-metallic screwdriver is used to adjust the trimmer screw to a point where the maximum output reading is obtained. When the output meter becomes excessive, it should be reduced by adjusting the output of the modulated oscillator.

IMPORTANT.

The Volume Control must not be used for this purpose, as inaccurate alignment will result if it is altered from the maximum clockwise position.

Proceed with adjustments 2, 3, 4 and 5 in the same manner. It is advisable to repeat the adjustments in the same sequence to assure that the maximum output is obtained.

R.F. ALIGNMENT.

The R.F. adjustments are located on the variable condenser—see fig. 3. They are numbered in the correct alignment order continuing from the I.F. procedure, that is, 6 and 7.

To align, proceed as follows:—

1. Connect the output of the modulated oscillator to the aerial terminal marked "A," the ground connection of the oscillator being connected to the Radiolette chassis.
2. Set the Station Selector pointer at approximately 214 meters. See that the Sensitivity Switch is still in the distant (D) position.
3. Set the modulated oscillator to 214 meters (1400 K.C.).
4. Tune the Radiolette to the modulated signal and adjust the output of the modulated oscillator so that a slight indication is produced on the output meter.

NOTE.—The output of the modulated oscillator should be maintained at the lowest level consistent with a good output indication.
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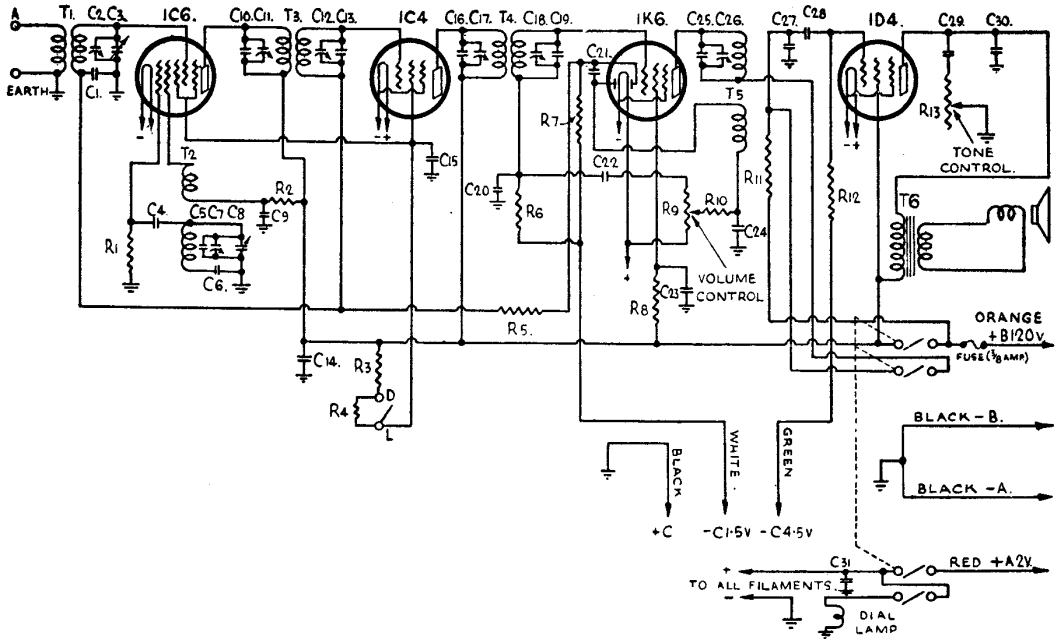
5. Reset the Station Selector pointer to 214 meters and adjust the oscillator trimmer (No. 6) with a non-metallic screwdriver to a point where the maximum reading is obtained on the output meter.
6. Adjust the aerial trimmer (No. 7) to give maximum output.
7. Tune the Station Selector carefully to the highest reading on the output meter and re-adjust the aerial trimmer.



Code	Part No.	COILS
T1	1560	Aerial Coil
T2	2893	Osc. Coil
T3	1523A	First I.F. Transformer
T4	1523B	Second I.F. Transformer
T5	1530A	Third I.F. Transformer
T6		TG53 (R39), TG131 (R42B)
		RESISTORS
R1		60,0000 ohms, ⅓ watt
R2		50,000 ohms, ⅓ watt
R3		75,000 ohms, ⅓ watt
R4		50,000 ohms, ⅓ watt
R5		1¾ Megohms, ⅓ watt
R6		1¾ Megohms, ⅓ watt
R7		1¾ Megohms, ⅓ watt
R8		250,000 ohms, 1 watt
R9	1507	500,000 ohms, Vol. Control
R10		300,000 ohms, ⅓ watt
R11		75,000 ohms, 1 watt
R12		1 Megohm, ⅓ watt
R13	2762	100,000 ohms, Tone Control

Code	Part No.	CONDENSERS
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)
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		.05 mfd. Paper

Code	Part No.	CONDENSERS
C29		.035 mfd. Paper
C30		.005 mfd. Paper
C31		.5 mfd. Paper

Fig. 1.—Circuit Diagram and Code

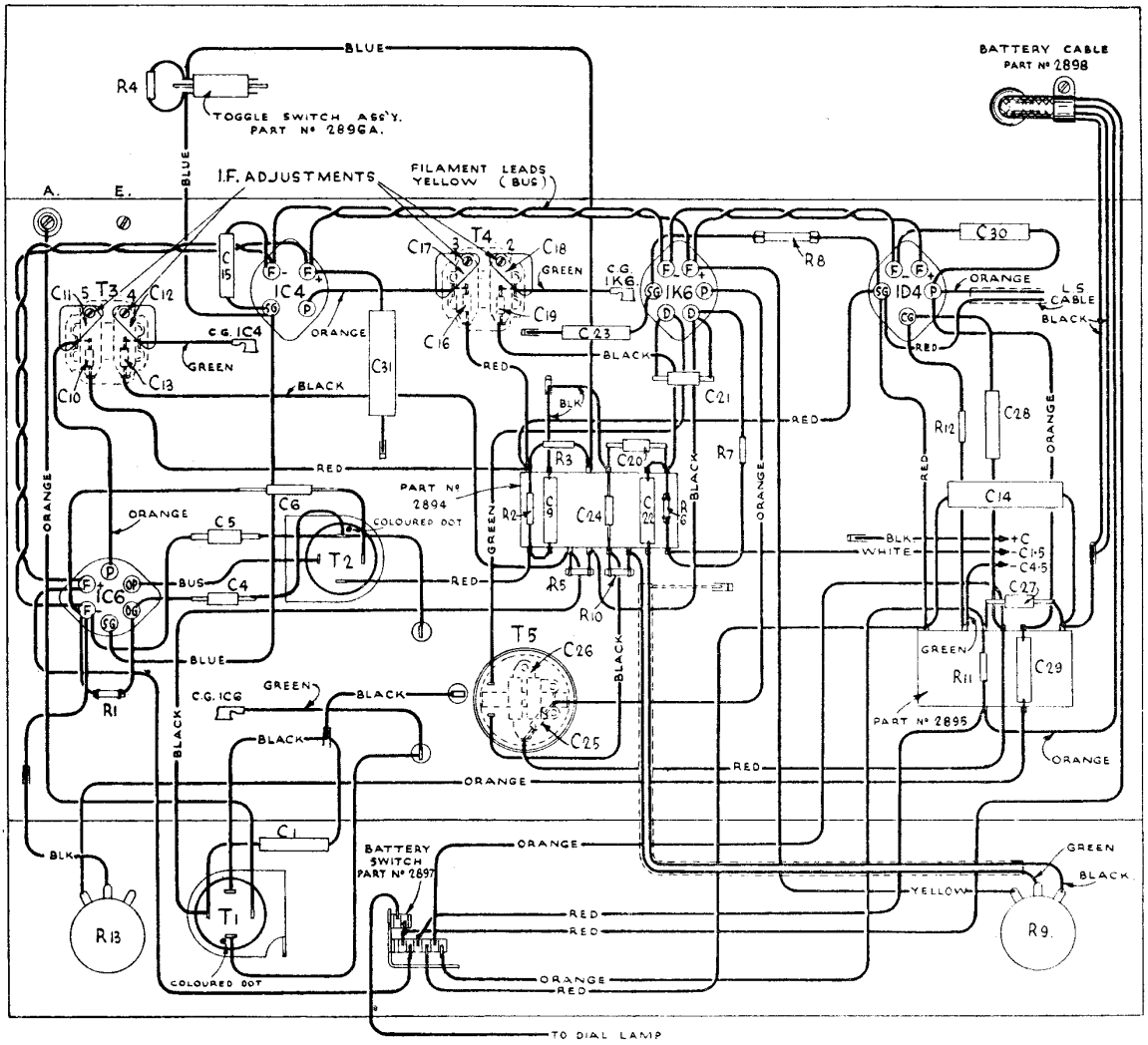


Fig. 2.—Layout Diagram (underneath view).

8. Disconnect the modulated oscillator and connect an aerial and an earth wire to the Radiolette. Tune a broadcasting station of wave length between 450 and 550 meters. If there is an error in the calibration of the Radiolette, re-set the pointer by loosening the mounting screws. Next, repeat instructions 5, 6 and 7 to complete the calibration.

   These models employ a fixed padding condenser (C6) which is matched to the oscillator coil, thus eliminating a padding adjustment. Do not, at any time, separate the padding condenser from the coil to which it is fitted.

RESISTANCE MEASUREMENTS.

The resistance values shown in fig. 4 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 valve should hold within ± 20% Variations greater than this limit will usually be indicative of trouble in the basic circuits.

TUNING COILS (T1-T2).

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. 2 shows the correct position for this dot when replacing a coil.

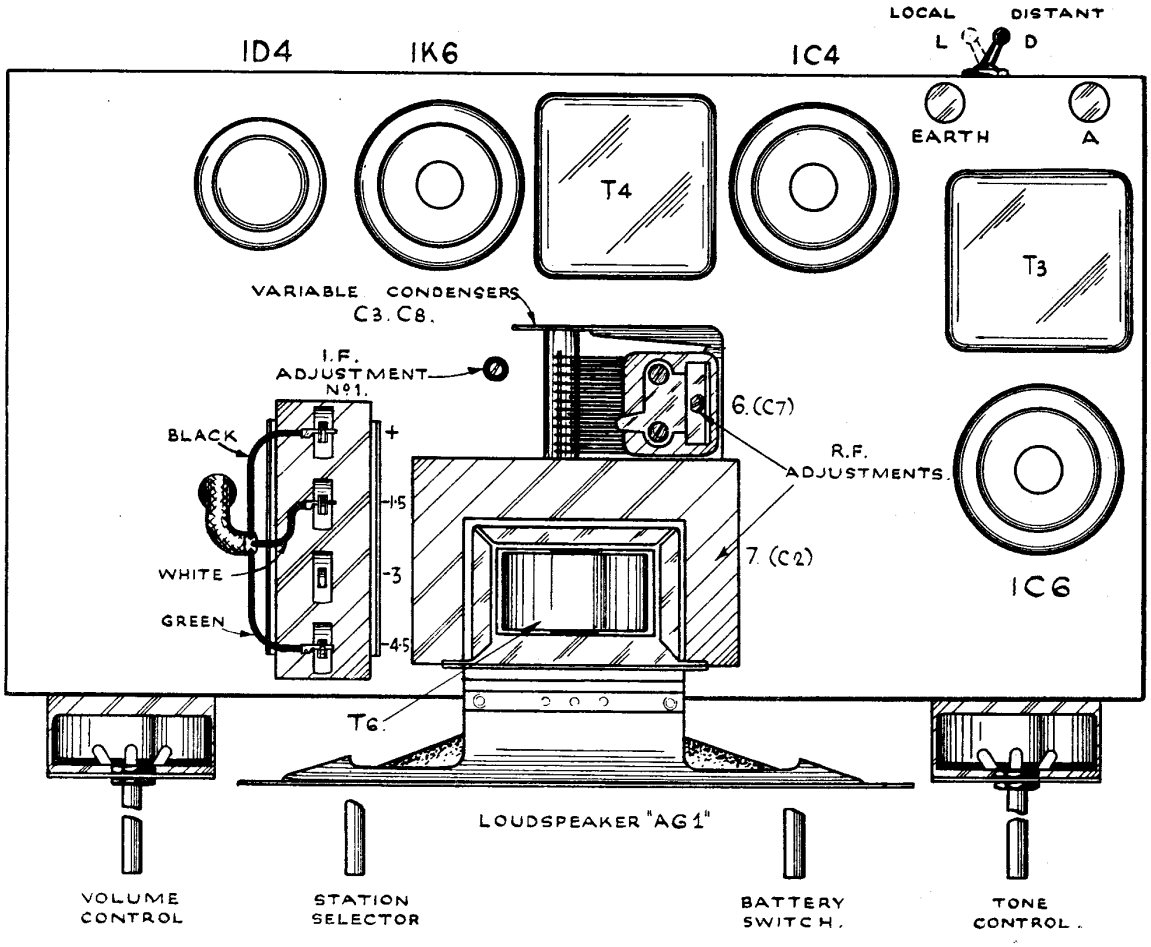


Fig. 3.—Layout Diagram (top view).

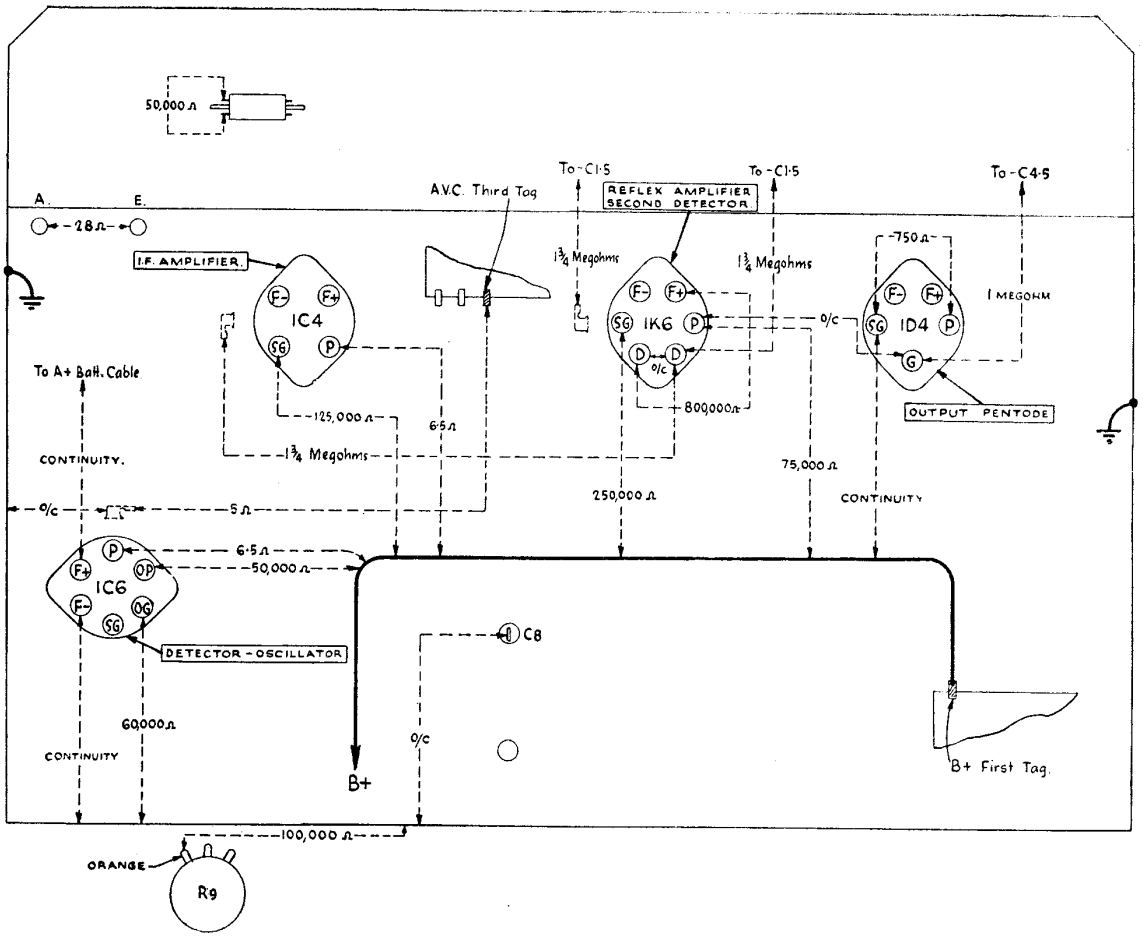


Fig. 4.—Resistance Diagram.

Resistance values were taken with the valves removed from sockets, variable condensers 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	45	120	1.0	2.0
Oscillator	—	—	55	1.5	—
1C4 I.F. Amplifier ...	*1.5	45	120	1.5	2.0
1K6 Reflex Amplifier and Detector	*1.5	*50	*55	0.75	2.0
1D4 Output Pentode	*4.5	120	115	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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