The FISK
RADIOLETTE
MODEL 37

•

Five Valve, Medium Wave, A.C. Operated
Superheterodyne

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TECHNICAL INFORMATION
AND SERVICE DATA

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Amalgamated Wireless (Australasia) Ltd

THE FISK RADIOLETTE, MODEL 37

Five Valve, Medium Wave, A.C. Operated, Superheterodyne

TECHNICAL INFORMATION

Electrical Specifications

TUNING RANGE "Standard Medium Wave".....200-550 metres	ALIGNMENT FREQUENCIES R.F. Alignment.....1400 k.c. (214 m.)
Intermediate Frequency.....	.....175 k.c.
Power Supply Rating.....190-260 v., 50-60 c.	Power Consumption.....50 watts
VALVE COMPLEMENT (1) 6D6.....R.F. Amplifier (2) 6A7.....Detector-Oscillator	(3) 6B7. I.F. Amp., 2nd Det., A.V.C. and A.F. Amp (4) 42.....Output Pentode (5) 80.....Full Wave Rectifier
Dial Lamp.....	.....6.3 Volts .25 Amps.
Loudspeaker.....Type AA1	Loudspeaker Transformer.....T.G. 51
Loudspeaker Field Coil Resistance.....	.....1600 ohms.

General Circuit Description

The Radiolette 37 uses the Superheterodyne type of circuit, consisting of an R.F. stage — a combined first detector-oscillator stage — a combined I.F. amplifier, second detector, A.V.C. and audio amplifier stage — and a power output stage. Socket voltages are supplied by a power supply system employing a full-wave rectifier.

R.F. AMPLIFIER.

The R.F. signal is amplified by the 6D6 R.F. amplifier, the control grid of which is coupled to the aerial through a tuned aerial coil (T1.). Coupled to the plate circuit of the 6D6 by a tuned R.F. coil (T2), the 6A7 combines the functions of first detector and oscillator. In this valve the incoming R.F. signal is combined with a local oscillator signal, which is 175 K.C. different in frequency, and as a result of the beating of the two signals, the intermediate frequency of 175 K.C. is present in the plate circuit of the 6A7. The three section variable condenser, which tunes the aerial, R.F. and oscillator coils, has adjustable trimmer condensers for accurate alignment.

I.F. AMPLIFIER.

One stage of I.F. amplification is employed, using the 6B7 valve as an amplifier. The primary and secondary of the first I.F. transformer and the primary of the second I.F. transformer are all tuned by compression type trimmer condensers. The secondary of the second I.F. transformer is untuned. The I.F. signal is applied by the second I.F. transformer to the diode plates of the 6B7 valve for rectification, which produces a D.C. potential across resistors R10 and R11. This potential is applied, via R12, to the control grid circuit of the 6A7 detector-oscillator and 6D6 R.F. amplifier to provide automatic volume control.

AUDIO AMPLIFIER.

The volume control (R10) selects the amount of audio signal in the diode circuit of the 6B7 to be applied to the control grid of this valve for amplification. Resistance capacity coupling is used between the plate circuit of the 6B7 and the control grid circuit of the 42 output pentode. Transformer TG-51 provides suitable matching between the output valve and the loudspeaker.

POWER SUPPLY.

The power supply circuit consists of a transformer (T6) and an 80 rectifier, with the loudspeaker field utilised as a filter reactor in conjunction with two high capacity condensers (C26 and C27).

LOCAL-DISTANT SWITCH.

Sensitivity of the Radiolette is controlled by a switch at the rear of the chassis, which connects a resistor in series with the normal cathode bias resistor on the 6D6 and 6A7 valves to increase the bias voltage.

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 three adjustment screws, located in the left hand chassis-end, are shown in fig. 3 numbered in the correct alignment order. Each circuit must be aligned to a basic frequency of 175 K.C.

To do this proceed as follows:—

1. Remove the grid clip from the control grid of the 6A7 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 42 output pentode.

3. Switch the Radiolette ON and allow a space of 30 seconds before making adjustments to enable the valves to assume their normal operating characteristics.

4. Set the Station Selector pointer of the Radiolette to 550 metres on the dial scale and turn the Volume Control to the maximum clockwise position.

5. Set the modulated oscillator to 175 K.C. and switch it ON.

6. Adjust the output of the modulated oscillator so that a slight indication is apparent on the output meter.

NOTE: When aligning the I.F. transformers the output of the modulated oscillator should be maintained at the lowest level that will give a good output indication.

7. Reference to fig. 3 will show the adjustments numbered in the order in which they should be treated. Beginning with No. 1, 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 reading 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 and 3 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.

Before proceeding with the R.F. alignment, first check the Station Selector pointer setting. Turn the Station Selector control to the extreme clockwise position, which should place the pointer at 545 metres. If such is not the case, loosen the set screw and reset the pointer to this wavelength.

The R.F. trimmer adjustment screws Nos. 4, 5 and 6 are located on the variable condenser. See fig. 2.

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 earth terminal marked "EARTH".

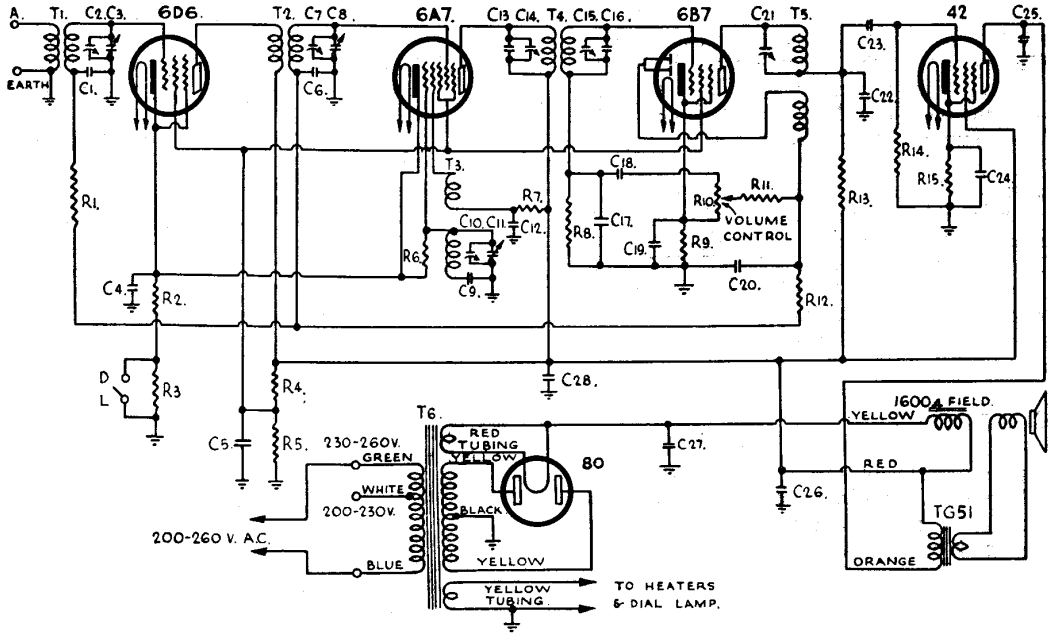
2. Set the Station Selector pointer to 214 metres. See that the sensitivity switch at the rear of the Radiolette is set to Distant (D).

3. Set the modulated oscillator to 214 metres (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. When aligning the R.F. circuits the output of the modulated oscillator should be maintained at the lowest level that will give a good output indication.

5. Reset the Station Selector pointer to 214 metres and adjust the oscillator trimmer adjustment (No. 4) with a non-metallic screw-



Code	Part No.	COILS
T1	29	Aerial Coil
T2	2327	R.F. Coil
T3	2329	Osc. Coil
T4	2771	1st I.F. Transformer
T5	23	2nd I.F. Transformer
T6	15	Power Transformer 50~
T6	17	Power Transformer 40~
T6	1162	Power Transformer 110 V.

Code	Part No.	RESISTORS
R1		100,000 ohms, $\frac{1}{8}$ watt
R2		1,200 ohms, $\frac{1}{2}$ watt
R3		2,000 ohms, $\frac{1}{8}$ watt
R4		40,000 ohms, 1 watt
R5		20,000 ohms, 1 watt
R6		60,000 ohms, $\frac{1}{8}$ watt
R7		20,000 ohms, $\frac{1}{8}$ watt
R8		500,000 ohms, $\frac{1}{8}$ watt
R9		2,000 ohms, $\frac{1}{8}$ watt
R10	588	250,000 ohms, Volume Cont.
R11		300,000 ohms, $\frac{1}{8}$ watt
R12		$1\frac{3}{4}$ Megohms, $\frac{1}{8}$ watt
R13		100,000 ohms, $\frac{1}{8}$ watt
R14		300,000 ohms, $\frac{1}{8}$ watt
R15		400 ohms, 1 watt

Code	Part No.	CONDENSERS
C1		.05 mfd. Paper
C2		10-50 mmfd. Mica Trimmer
C3	2A	Variable Condenser
C4		.1 mfd. Paper
C5		.1 mfd. Paper
C6		.05 mfd. Paper
C7		10-50 mmfd. Mica Trimmer
C8	2A	Variable Condenser
C9		900 mmfd. Mica Padding
C10		10-50 mmfd. Mica Trimmer
C11	2A	Variable Condenser
C12		.05 mfd. Paper
C13		85 mmfd. Mica (E)
C14		10-50 mmfd. Mica Trimmer
C15		10-50 mmfd. Mica Trimmer
C16		85 mmfd. Mica (E)
C17		200 mmfd. Mica (J)
C18		.01 mfd. Paper
C19		25 mfd. 25 Volt Electrolytic
C20		200 mmfd. Mica (J)
C21		10-50 mmfd. Mica Trimmer
C22		700 mmfd. Mica
C23		.01 mfd. Paper
C24		25 mfd. 25 Volt Electrolytic
C25		.02 mfd. Paper
C26	2763A	8 mfd. 500 Volt Electrolytic
C27	2763A	8 mfd. 500 Volt Electrolytic
C28		.1 mfd. Paper

Fig. 1.—Circuit Diagram and Code.

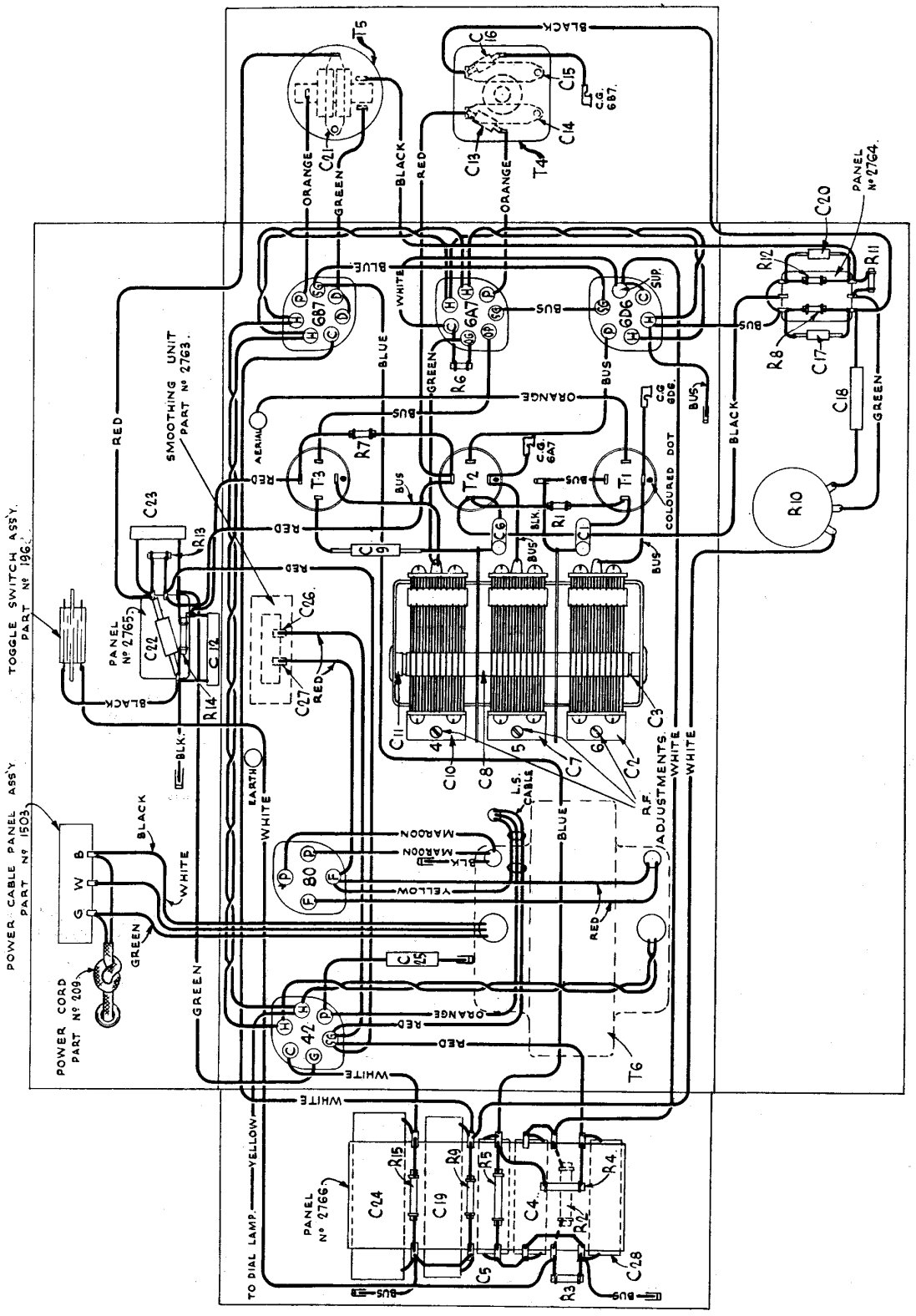


Fig. 2.—Layout Diagram (underneath view).

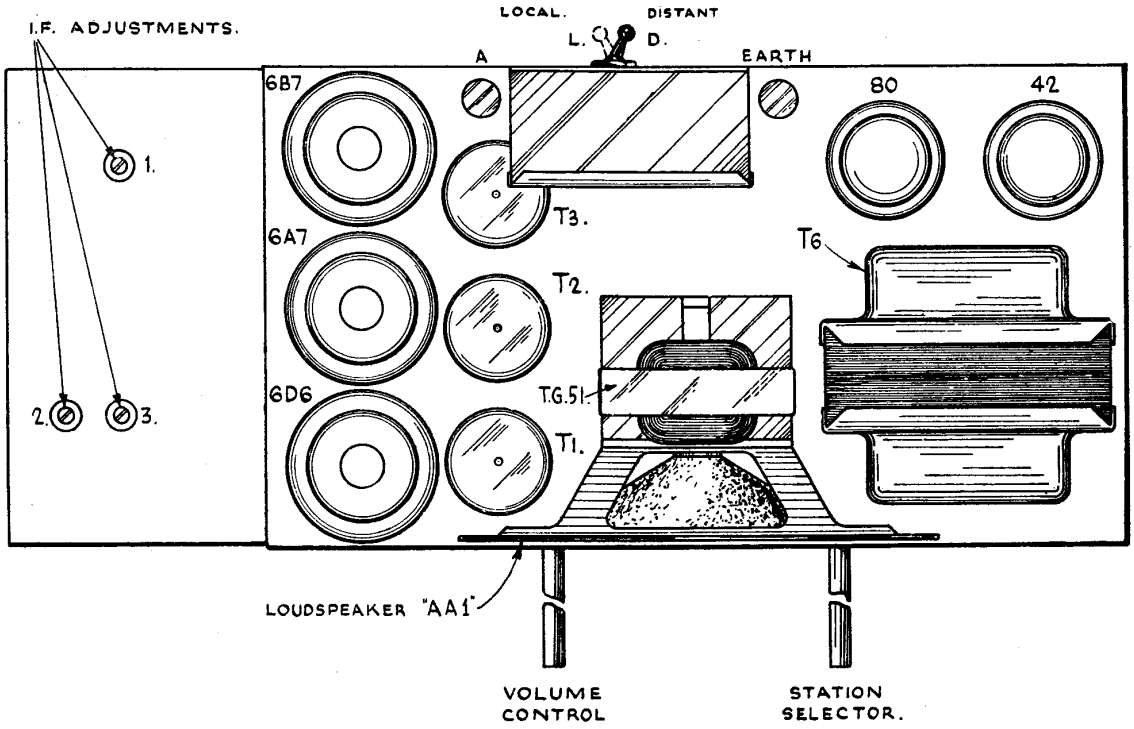


Fig. 3.—Layout Diagram (top view).

driver to a point where the maximum reading is shown on the output meter.

6. Adjust the R.F. and aerial trimmer adjustments (No. 5 and 6) to give maximum output.

7. Tune the Station Selector carefully to the highest reading on the output meter and readjust the R.F. and aerial trimmer adjustments.

8. Disconnect the modulated oscillator and connect an aerial and an earth wire to the Radiolette. Tune a broadcasting station of wavelength between 450 and 550 metres. If there is an error in the calibration of the Radiolette, reset the pointer by loosening the set screw. Next, repeat instructions 5, 6 and 7 to complete the calibration.

NOTE. This model employs a fixed padding condenser (C9) which is matched to the oscillator coil, thus eliminating a padding adjustment.

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 layout diagrams when conducting the check. Each value should hold within ± 20%. Variations greater than this limit will usually be a pointer to trouble in the circuit.

CHASSIS-END ASSEMBLIES.

In servicing this model, advantage should be taken of the hinging feature of the chassis-end assemblies. By removing the two lower screws the end-assemblies may be hinged outwards to make all the components easily accessible.

TUNING COILS (T1, T2, T3).

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 a 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.

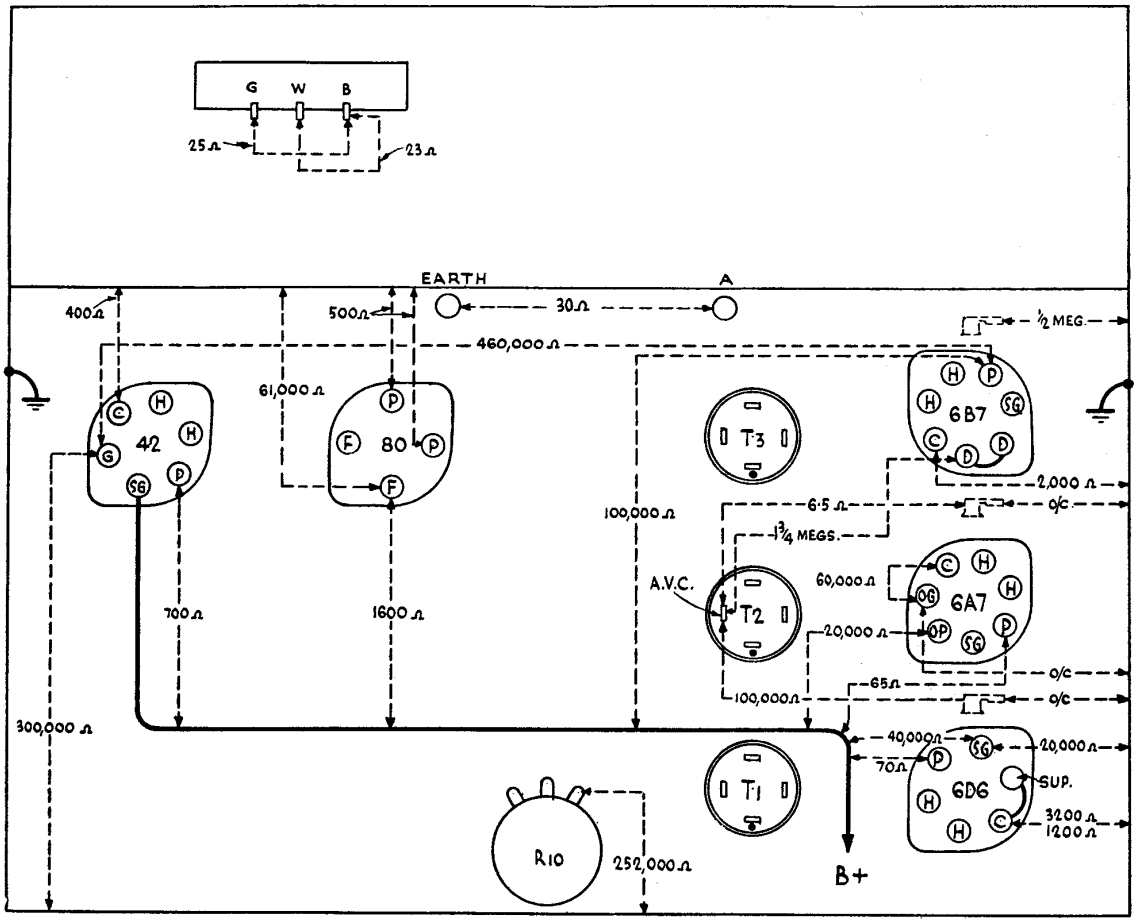


Fig. 4.—Resistance Diagram.

Resistance values were taken with the valves removed from sockets, power supply disconnected, variable condensers in full-mesh and volume control set in maximum clockwise position, unless otherwise stated.

OSCILLATOR COIL (T3).

When removing the Oscillator Coil, do not detach the padding condenser (C9), as each coil is adjusted during production for use with the particular condenser supplied.

SOCKET VOLTAGES.

VALVE		Chassis to Cathode Volts	Chassis to Screen Grid Volts	Chassis to Plate Volts	Plate Current M.A.	Heater Volts
6D6	R.F. Amplifier	6.0	55	245	1.0	6.3
6A7	Detector	6.0	55	245	0.5	6.3
	Oscillator	—	—	170	3.0	—
6B7	Reflex Amplifier	2.5	55	100*	1.2	6.3
42	Pentode	14.0	245	230	30.0	6.3
80	Rectifier	600/300 volts, 45 M.A. total current.				5.0

Voltage across loudspeaker field — 72 volts.

Measured at 240 volts A.C. supply. No signal input. Controls in maximum clockwise position.

* Cannot be measured with an ordinary voltmeter.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