The FISK

RADIOLA

MODEL 255

•

Six Valve, Two Band, A.C. Operated

Superheterodyne

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TECHNICAL INFORMATION

AND SERVICE DATA

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Amalgamated Wireless (Australasia) Ltd

THE FISK RADIOLA, MODEL 255

Six Valve, Two Band, A.C. Operated, Superheterodyne

TECHNICAL INFORMATION

Electrical Specifications

TUNING RANGE	ALIGNMENT FREQUENCIES.
"Standard Medium Wave" (a).....1500-550 K.C.	"Standard Medium Wave" (a) ....1400-600 K.C.
"Short Wave" (b).....16-50 Metres	"Short Wave" (b).....18 metres

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

Power Supply Rating.....190-260V., 50-60C.

(Special instruments made for other voltage and frequency ratings.)

Power Consumption.....75 watts

VALVE COMPLEMENT

(1) 6D6 R.F. Amplifier.....	(4) 6B7.....Det. A.V.C. and A.F. Amp
(2) 6A7 Detector-Oscillator.....	(5) 42.....Output Pentode
(3) 6D6 I.F. Amplifier.....	(6) 80.....Rectifier

Dial Lamps.....6.3 volts, .25 amps.

Loudspeaker.....10 inch, Type A.N.2 Loudspeaker Transformer.....T.A.3200Y

Loudspeaker Field Coil Resistance.....2000 ohms

General Circuit Description

The Radiola 255 is a six valve, two band, A.C. operated, superheterodyne. Outstanding features are the use of magnetite cores in I.F. transformers and in the medium wave oscillator coil, and air trimmers for the alignment of the R.F., 1st detector and oscillator stages. These features provide greater selectivity and sensitivity in addition to ensuring practically permanent alignment under all conditions of humidity, temperature and vibration.

TUNED CIRCUITS.

The Medium Wave and Short Wave coils for each stage are wound on a single former and are tuned by a three section variable condenser. The selection of the range it is desired to tune is accomplished by a multiple contact, three section range switch, controlled from the front of the cabinet. A section of this switch is also used to illuminate the proper tuning dial scale for the band in operation. Air trimmer condensers are used to balance the aerial, R.F. and oscillator coils, and when aligned they may be locked to make the adjustment permanent. A magnetite core is inserted in the oscillator coil for padding the oscillator circuit at 600 K.C. The adjustment screw protrudes from the top of the oscillator shield. See fig. 3.

The intermediate frequency amplifier system consists of a 6D6 valve in a transformer coupled circuit. The stage operates at a basic frequency of 460 K.C. Adjustable magnetite cores are provided for adjusting the inductance of the primary and secondary windings in both the I.F. transformers.

DETECTOR AND A.V.C.

The modulated signal, as obtained from the output of the I.F stage, is detected by one of the diodes in the 6B7 valve. The audio frequency component, secured by this process, is transferred from the movable arm of the volume control R15 through coupling condenser C34 to the control grid of the 6B7 for amplification.

A signal is also fed from the I.F. amplifier to the remaining diode of the 6B7, via C35, and the D.C. voltage produced across R16 is used for automatic volume control, being applied as automatic control grid bias to the R.F. amplifier, detector-oscillator and I.F. amplifier valves.

AUDIO SYSTEM.

The audio frequency component, mentioned under "Detector and A.V.C." transferred to the control grid of the 6B7, is amplified in the valve and then coupled through a resistance — capacity network to the control grid of the 42 output pentode. The output of the power amplifier is transformer coupled to the electro-dynamic loudspeaker.

POWER SUPPLY.

Socket voltages are supplied from a circuit comprising a power transformer and an 80 full-wave rectifier, with the loudspeaker field (2,000 ohms) utilised as a filter reactor in conjunction with two high capacity electrolytic condensers C44 and C45.

Alignment Procedure

It is important to use adequate and reliable test equipment to perform the following operations. An A.W.A. Modulated Oscillator, type C.1070, is ideal for the purpose. Visible indication of the output from the Radiola is also essential, any output meter of conventional design being suitable. All adjustments should be made with a non-metallic screwdriver, as the self-capacity of a metallic driver makes accurate alignment most difficult.

The alignment procedure is arranged in the form of a chart. Perform alignment in the proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown in figs. 2 and 3.

Keep the volume and sensitivity controls of the Radiola in the maximum clockwise position, during alignment, and regulate the output of the modulated oscillator so that a minimum signal is applied to the Radiola to obtain an observable output indication. This will avoid A.V.C. action and overloading.

The term "Dummy Aerial" means the device which must be connected between the output cable of the modulated oscillator and the aerial terminal, when stated, to simulate the characteristics of the average aerial. The "Dummy Aerial" in this case should be non-inductive resistance of 400 ohms.

Connect the ground connection of the modulated oscillator to the Radiola chassis and for I.F. alignment remove the grid clip from the 6A7 before connecting the oscillator. See that a 250,000 ohms resistor is connected between the output terminals of the modulated oscillator.

"Approx. 550 K.C., No Signal" means that the Radiola should be tuned to a point at approximately 550 K.C. where no signal or interference is received from a station or local (heterodyne) oscillator.

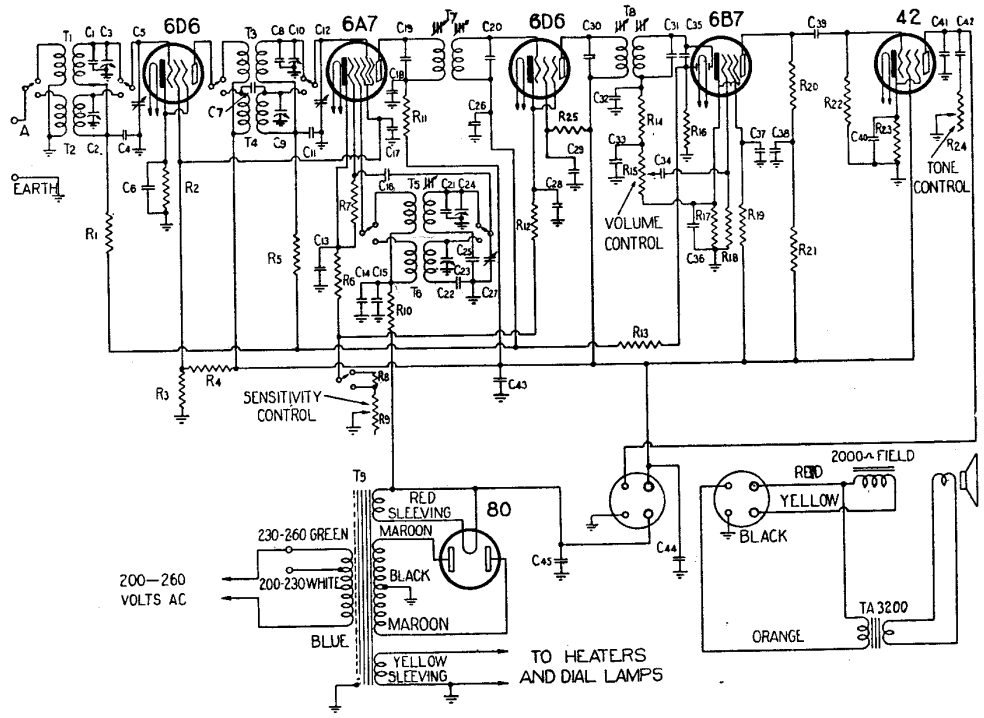
To check the calibration of the Radiola, connect an aerial and an earth wire and tune a broadcasting station of wavelength between 450 and 550 metres. If there is an error in the calibration, reset the pointer by loosening the mounting screws. Then, repeat instructions 8, 9 and 10 of the chart.

Alignment Order	Oscillator Connection to Radiola	Oscillator Setting	Dummy Aerial	Radiola Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
1	6A7 Det.-Osc. Grid Cap	460 K.C.	—	Approx. 550 K.C. No signal	2nd I.F. Trans. (T8)	Secondary and Primary	Max. (peak)
2	6A7 Det.-Osc. Grid Cap	460 K.C.	—	Approx. 550 K.C. No signal	1st I.F. Trans. (T7)	Secondary and Primary	Max. (peak)
3	Aerial Term.	600 K.C.	—	600 K.C.	Oscillator	Padding Adjustment	Max. (peak)
4	Aerial Term.	1400 K.C.	—	1400 K.C.	Oscillator	C24	Max. (peak)
5	Aerial Term.	1400 K.C.	—	1400 K.C.	Detector	C10	Max. (peak)
6	Aerial Term.	1400 K.C.	—	1400 K.C.	R.F.	C3	Max. (peak)
7	Aerial Term.	600 K.C.	—	Rock through 600 K.C.	Oscillator	Padding Adjustment	Max. (peak)
8	Aerial Term.	1400 K.C.	—	1400 K.C.	Oscillator	C24	Max. (peak)
9	Aerial Term.	1400 K.C.	—	1400 K.C.	Detector	C10	Max. (peak)
10	Aerial Term.	1400 K.C.	—	1400 K.C.	R.F.	C3	Max. (peak)
11	Aerial Term.	18 metres	400 ohms	18 metres	Oscillator	C22	Max. (peak) *
12	Aerial Term.	18 metres	400 ohms	18 metres	Detector	C9	Max. (peak) **
13	Aerial Term.	18 metres	400 ohms	18 metres	R.F.	C2	Max. (peak) ***

* Use minimum capacity peak if two peaks can be obtained.

** Use maximum capacity peak if two peaks can be obtained.

*** After this adjustment check for the image signal by tuning the Radiola dial to approx. 19 M. It may be necessary to advance the output from the modulated oscillator to receive the signal.



Code	Part No.	COILS
T1	3402	Aerial Coil, 1500-550 K.C.
T2	3402	Aerial Coil, 16-50 Metres
T3	3404	R.F. Coil, 1500-550 K.C.
T4	3404	R.F. Coil, 16-50 Metres
T5	3407	Oscil. Coil, 1500-550 K.C.
T6	3407	Oscil. Coil, 16-50 Metres
T7	3243	First I.F. Transformer
T8	3244	Second I.F. Transformer
T9	1805A	Power Transformer, 50 Cycle
T9	1806A	Power Transformer, 40 Cycle
T9	1807A	Power Transformer, 110 Volt
		RESISTORS
R1		100,000 ohms, ½ watt
R2		300 ohms, ½ watt
R3		11,000 ohms, 3 watt
R4		11,000 ohms, 3 watt
R5		100,000 ohms, ½ watt
R6	3410	400 ohms, ½ watt
R7		60,000 ohms, ½ watt
R8		300 ohms, ½ watt
R9	3266	3,000 ohms, Sens. Control
R10		50,000 ohms, 1 watt
R11		300 ohms, ½ watt
R12		600 ohms, ½ watt
R13		1¾ Megohms, ½ watt
R14		100,000 ohms, ½ watt
R15	1668	300,000 ohms, Volume Control

Code	Part No.	RESISTORS
R16		1¾ Megohms, ½ watt
R17		3,000 ohms, ½ watt
R18		500,000 ohms, ½ watt
R19		1 Megohm, 1 watt
R20		200,000 ohms, ½ watt
R21		50,000 ohms, ½ watt
R22		300,000 ohms, ½ watt
R23		400 ohms, 1 watt
R24	2762	100,000 ohms, Tone Control
R25		100,000 ohms, 1 watt
		CONDENSERS
C1		6 mmfd. Mica (F)
C2		2-20 mmfd. Air Trimmer
C3		2-20 mmfd. Air Trimmer
C4		.05 mfd. Paper
C5	3399	Variable Condenser
C6		.1 mfd. Paper
C7		10 mmfd. Mica (B)
C8		6 mmfd. Mica (F)
C9		2-20 mmfd. Air Trimmer
C10		2-20 mmfd. Air Trimmer
C11		.05 mfd. Paper
C12	3399	Variable Condenser
C13		.1 mfd. Paper
C14		.05 mfd. Paper
C15		8 mfd. 500 Volt Electrolytic
C16		50 mmfd. Mica (D)

Code	Part No.	CONDENSERS
C17		.1 mfd. Paper
C18		.05 mfd. Paper
C19		115 mmfd. Mica (A)
C20		115 mmfd. Mica (A)
C21		15 mmfd. Mica (C)
C22		2-10 mmfd. Air Trimmer
C23		2800 mmfd. Mica Padding
C24		2-20 mmfd. Air Trimmer
C25		440 mmfd. Mica Padding
C26		.05 mfd. Paper
C27	3399	Variable Condenser
C28		.1 mfd. Paper
C29		.1 mfd. Paper
C30		115 mmfd. Mica (A)
C31		115 mmfd. Mica (A)
C32		100 mmfd. Mica (G)
C33		100 mmfd. Mica (G)
C34		.05 mfd. Paper
C35		700 mmfd. Mica
C36		5 mfd. 25V Electrolytic
C37		.1 mfd. Paper
C38		.5 mfd. Paper
C39		.05 mfd. Paper
C40		25 mfd. 25V Electrolytic
C41		.005 mfd. Paper
C42		.035 mfd. Paper
C43		.5 mfd. Paper
C44		8 mfd. 500V Electrolytic
C45		8 mfd. 500V Electrolytic

Fig. 1.—Circuit Diagram and Code.

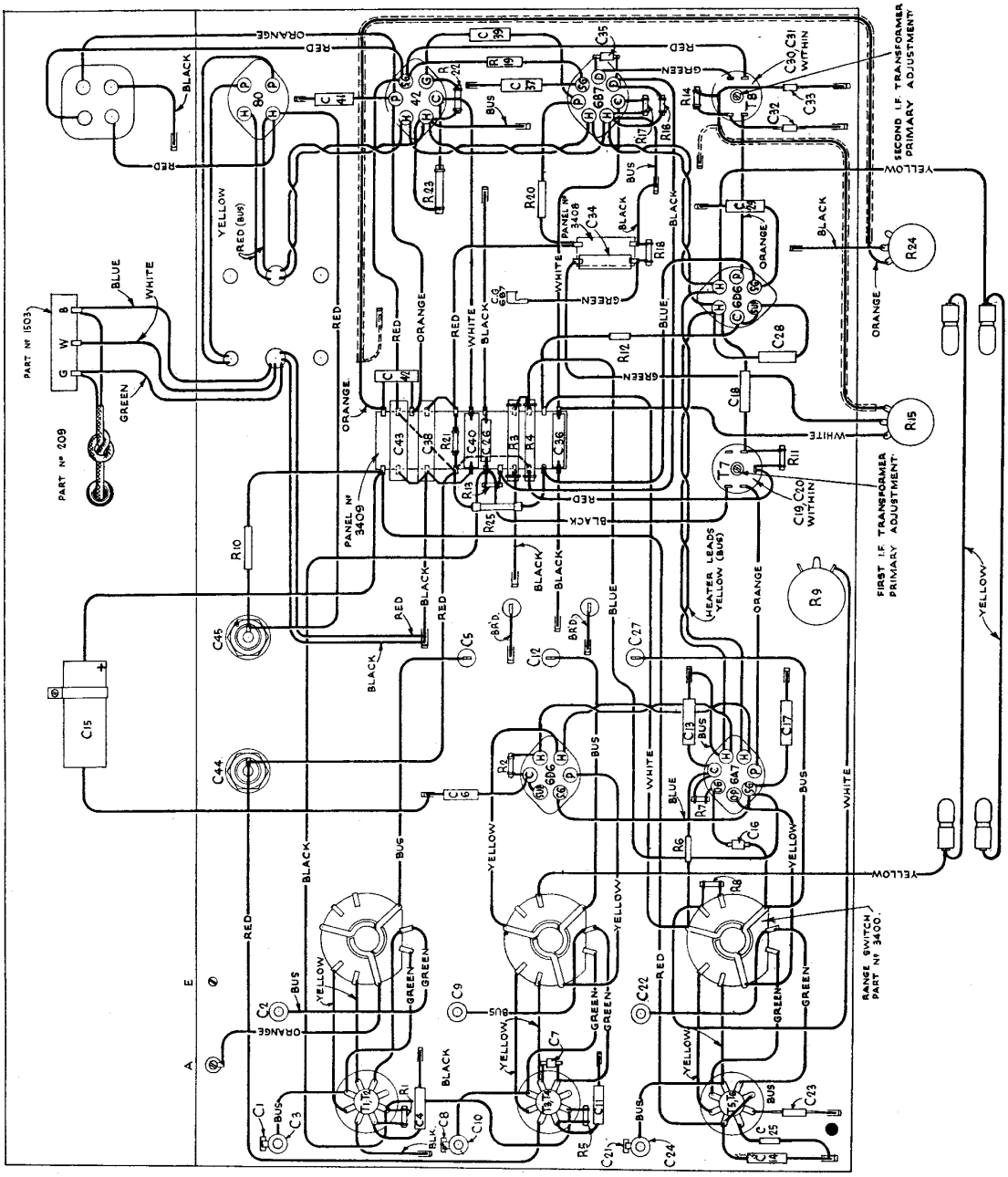


Fig. 2.—Lay-out Diagram (underneath view).

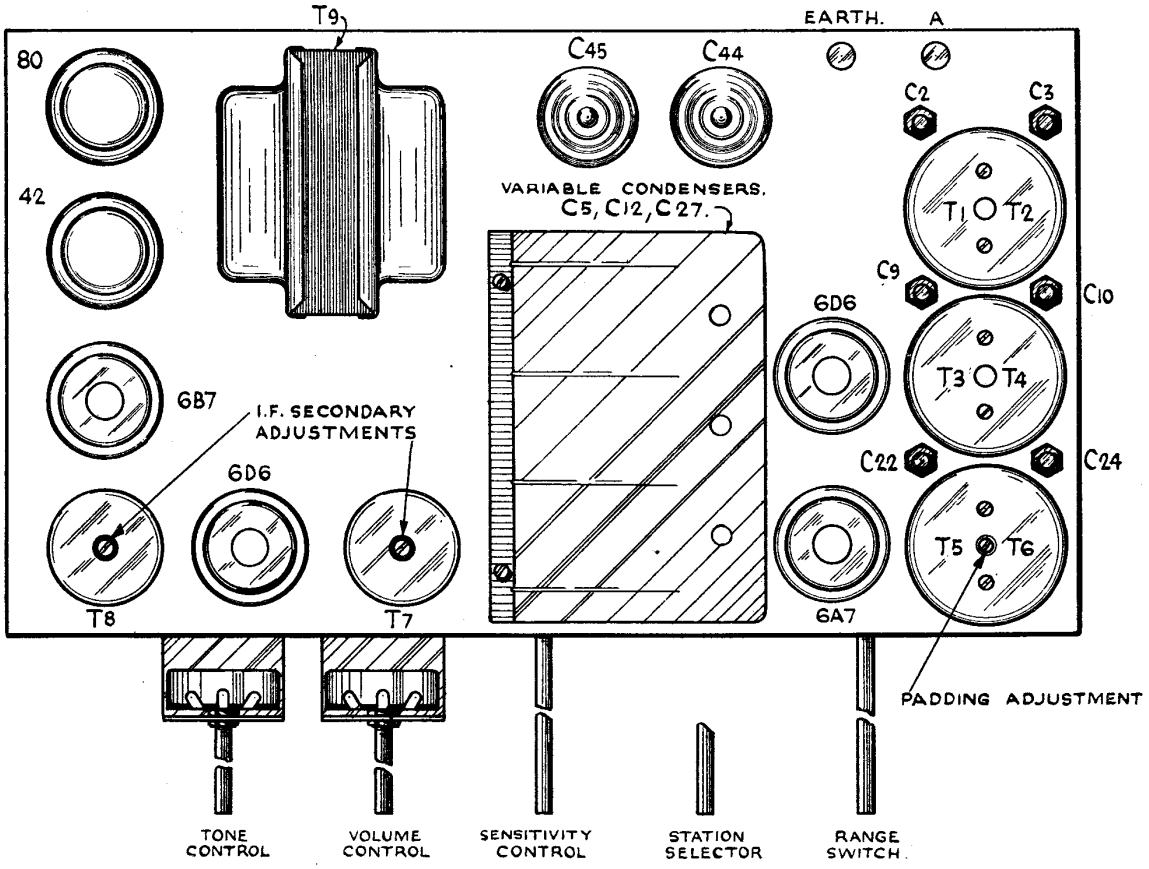


Fig. 3.—Lay-out Diagram (top view).

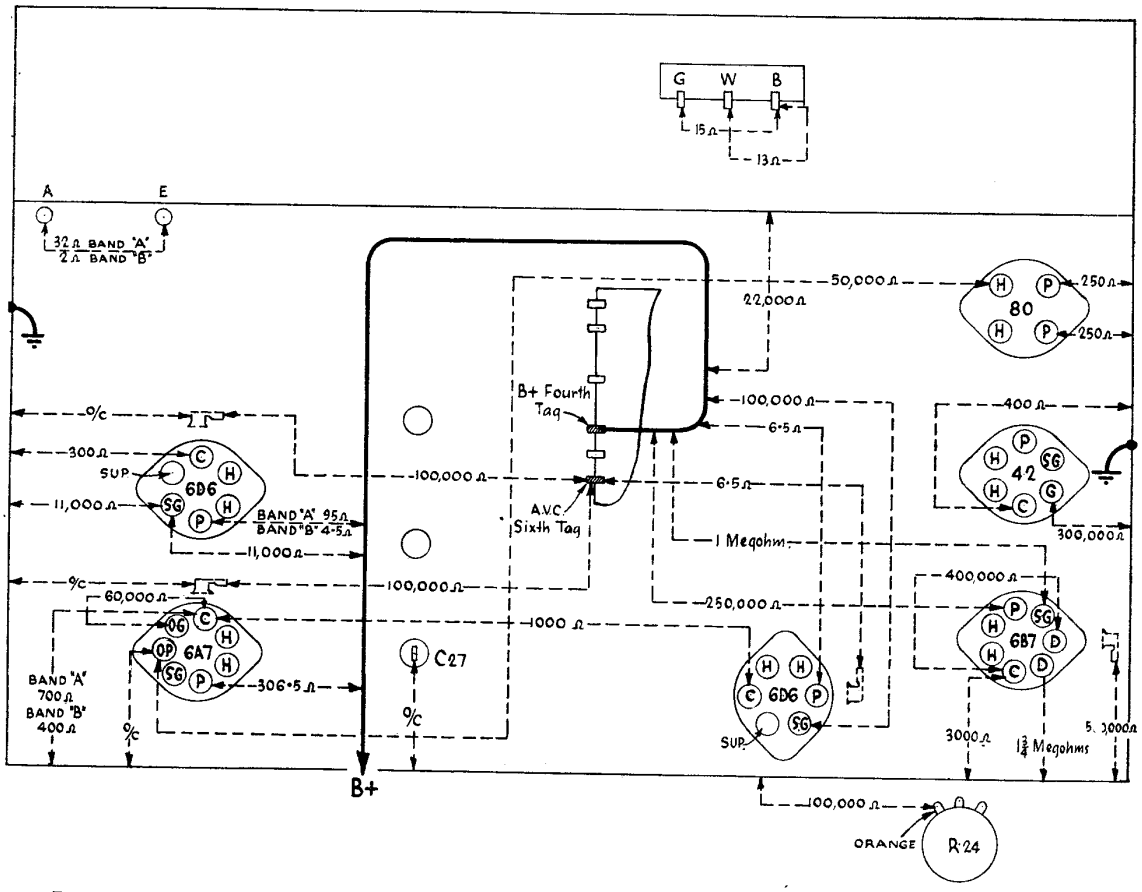
AIR TRIMMER ADJUSTMENTS.

As well as using steady pressure in the adjustment of the air trimmer plunger, if the plunger is rotated, accurate alignment is less difficult. Immediately the correct capacity is selected, lock the trimmer to make the adjustment permanent. Do not loosen the locking nut to such an extent as to allow the plunger to move too freely.

WIRING COLOUR CODE.

Circuit	Colour
B+	Red
Plate	Orange
Screen Grid	Blue
Cathode	White
Earth, negative and A.V.C.	Black

Owing to a printing error in the General Service Information booklet, the B+ and plate circuit colours were reversed. The corrected code is shown above.



Resistance values were taken with the valves removed from sockets, power supply disconnected, variable condenser in full mesh and sensitivity control and volume control in maximum clockwise position.

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	3.0	100	250	6.0	6.3
6A7 Detector M.W.	6.5	100	250	2.0	6.3
S.W.	3.0	100	250	4.0	—
,, Oscillator	—	—	150	4.0	—
6D6 I.F. Amplifier M.W.	6.5	105	250	2.5	6.3
S.W.	3.0	85	250	6.0	—
6B7 Detector	2.0	*25	*60	0.75	6.3
42 Pentode	14.5	250	235	30.0	6.3
80 Rectifier	680/340 volts, 65 M.A. Total current				5.0

Voltage across loudspeaker field — 130 volts

Measured at 240 volts A.C. supply. No signal input. Controls in maximum clockwise position excepting range switch which is set as desired.

* Cannot be measured with ordinary voltmeter.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