The FISK
RADIOLETTE
MODELS 38 AND 41

•

Five 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 RADIOLETTE, MODELS 38 & 41

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

TECHNICAL INFORMATION

Electrical Specifications

TUNING RANGE	ALIGNMENT FREQUENCIES
"Standard Medium Wave" (a).....200-550 metres	"Standard Medium Wave".....1400 K.C. (214 M.) 600 K.C. (500 M.)
"Short Wave" (b).....19-50 metres	"Short Wave".....20 metres
Intermediate Frequency.....460 K.C.	
Power Supply Rating.....200-260V., 50-60C.	Power Consumption.....50 watts
VALVE COMPLEMENT	(3) 6B7..I.F. Amp., 2nd Det. A.V.C. and A.F. amp.
(1) 6A7.....Detector-Oscillator	(4) 42.....Output Pentode
(2) 6D6.....I.F. Amplifier	(5) 80.....Full wave Rectifier
Dial Lamps.....6.3 volts, .25 amps.	
Loudspeaker.....Type AEI (38) Type AJI (41)	Loudspeaker Transformer..TG52 (38), TG113 (41)
Loudspeaker Field Coil Resistance.....1600 ohms	

Identical in chassis design, these models differ only in respect to the cabinets in which they are housed.

The Model 38 is housed in a moulded cabinet of compact design and is fitted with a 6in. electro-dynamic loudspeaker mounted on the chassis.

The Model 41 is housed in a console cabinet and is supplied with an 8in. electro-dynamic loudspeaker which is connected to the chassis, at the rear, by a cable and plug.

General Circuit Description

DETECTOR-OSCILLATOR.

The first detector and oscillator functions are accomplished in a single valve, the 6A7. The R.F. input to this valve is coupled to the aerial by the aerial coils T1 or T2 which are tuned by the front section of the variable condenser C6. In the 6A7 the R.F. input is combined with a local oscillator signal, generated within the valve, which is 460 K.C. higher in frequency than the incoming signal. This frequency difference is constant throughout the tuning range of the receiver, owing to the inherent design of the oscillator coils in conjunction with the variable and padding condensers. As a result of the beating of the two signals within the 6A7, the I.F. or beat frequency is present in the plate circuit of the valve.

I.F. AMPLIFIER.

Two stages of I.F. amplification are used in which three tuned I.F. transformers are employed. Excepting the secondary of the third I.F. transformer, which is untuned, the primaries and secondaries are tuned to resonance by compression type trimmer condensers. The secondary of the third I.F. transformer applies the I.F. signal to the diodes of the 6B7 which are connected, for rectification across resistors R14 and R15 producing a D.C. voltage proportional to the strength of the signal being received which is applied to the control grid circuits of the 6A7 and 6D6 valves, via filter R16 and C4, to provide automatic volume control.

AUDIO AMPLIFIER.

The volume control, R14, selects the amount of audio signal in the diode circuit of the 6B7 to be applied via C29, to the control grid of the same 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. The output of the 42 is suitably matched to the loudspeaker by the transformer T.G.52 for the Model 38 and by T.G.113 for the Model 41.

POWER SUPPLY.

The power supply circuit consists of a transformer, T8, and an 80 rectifier, with the loudspeaker field utilised as a filter reactor in conjunction with two high capacity electrolytic condensers, C39 and C40.

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 6A7 and 6D6 valves to increase the bias voltage and thus reduce the sensitivity of the receiver, if desired.

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

7. 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 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, 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. adjustment screws are located beneath the tuning coils T1-T2, T3-T4. They are numbered in the correct alignment order — 6, 7, 8 and 9. See Fig. 2.

To align proceed as follows:—

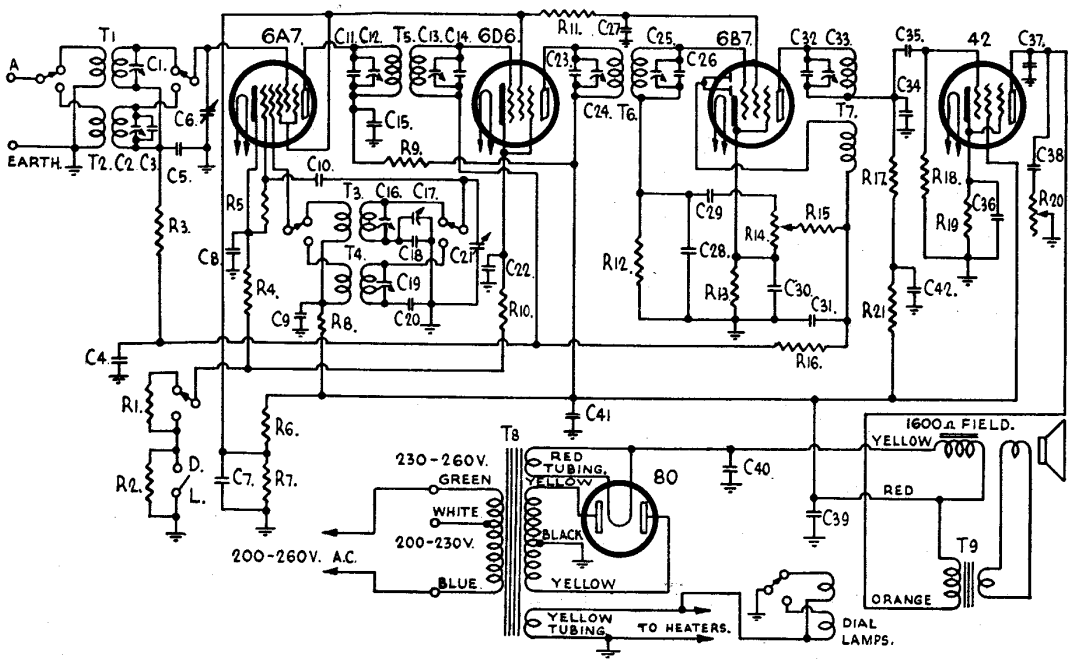
Band "A" (200-550M)

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 approx. 214 metres. See that the sensitivity switch at the rear of the Radiolette (see Fig. 3) 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: The output of the modulated oscillator should be maintained at the lowest level consistent with a good output indication.

5. Reset the Station Selector pointer to 214 metres 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 adjustment (No. 7) to give maximum output.
7. Set the modulated oscillator to 500 metres (600 K.C.).
8. Tune the Radiolette to the modulated signal.
9. Adjust the padding condenser (C17), which is approached from the front of the chassis with a suitable screwdriver, while tuning the Radiolette continuously through the signal. Adjust to the highest reading on the output meter.
10. Disconnect the modulated oscillator and connect an aerial and an earth wire to the Radiolette.

Tune a broadcasting station of wavelength between 450 and 500 metres. If the Radiolette is out of calibration reset the pointer by loosening the set screws. This will correct the calibration at the low frequency end of the scale. Repeat instructions 5 and 6 to correct the calibration at the high frequency end.



Code	Part No.	COILS
T1	2684A	Aerial Coil, 200-550 Metres
T2	2684A	Aerial Coil, 19-50 Metres
T3	1557A	Osc. Coil, 200-550 Metres
T4	1557A	Osc. Coil, 19-50 Metres
T5	1523A	First I.F. Transformer
T6	1523B	Second I.F. Transformer
T7	1530A	Third I.F. Transformer
T8	2950	Power Transformer 50~
T8	2951	Power Transformer 40~
T8	2952	Power Transformer 110 Volts
T9		TG52 (R38) TG113 (R41)
		RESISTORS
R1		200 ohms, ⅓ watt
R2		2,000 ohms, ⅓ watt
R3		100,000 ohms, ⅓ watt
R4		600 ohms, ⅓ watt
R5		60,000 ohms, ⅓ watt
R6		40,000 ohms, 1 watt
R7		30,000 ohms, 1 watt
R8		20,000 ohms, ⅓ watt
R9		300 ohms, ⅓ watt
R10		600 ohms, ⅓ watt
R11		100,000 ohms, ⅓ watt
R12		500,000 ohms, ⅓ watt
R13		2,000 ohms, ⅓ watt

Code	Part No.	RESISTORS
R14	1668	300,000 ohms, Vol. Cont.
R15		300,000 ohms, ⅓ watt
R16		1¾ Megohms, ⅓ watt
R17		100,000 ohms, 1 watt
R18		300,000 ohms, ⅓ watt
R19		400 ohms, 1 watt
R20	2762	100,000 ohms, Tone Cont.
R21		20,000 ohms, ⅓ watt
		CONDENSERS
C1		5-20 mmfd. Mica Trimmer
C2		5-20 mmfd. Mica Trimmer
C3		10 mmfd. Mica (B)
C4		.05 mfd. Paper
C5		.05 mfd. Paper
C6	2949	Variable Condenser
C7		.1 mfd. Paper
C8		.1 mfd. Paper
C9		.05 mfd. Paper
C10		50 mmfd. Mica (D)
C11		130 mmfd. Mica (H)
C12		10-50 mmfd. Mica Trimmer
C13		10-50 mmfd. Mica Trimmer
C14		130 mmfd. Mica (H)
C15		.05 mfd. Paper
C16		5-20 mmfd. Mica Trimmer

Code	Part No.	CONDENSERS
C17		10-50 mmfd. Mica Trimmer
C18		390 mmfd. Mica Padding
C19		5-20 mmfd. Mica Trimmer
C20		2800 mmfd. Mica Padding
C21	2949	Variable Condenser
C22		.1 mfd. Paper
C23		130 mmfd. Mica (H)
C24		10-50 mmfd. Mica Trimmer
C25		10-50 mmfd. Mica Trimmer
C26		130 mmfd. Mica (H)
C27		.1 mfd. Paper
C28		200 mmfd. Mica (J)
C29		.01 mfd. Paper
C30		25 mfd. 25 Volt Electrolytic
C31		200 mmfd. Mica (J)
C32		130 mmfd. Mica (H)
C33		10-50 mmfd. Mica Trimmer
C34		700 mmfd. Mica
C35		.01 mfd. Paper
C36		25mfd. 25 Volt Electrolytic
C37		.01 mfd. Paper
C38		.035 mfd. Paper
C39	2763A	8 mfd. 500 Volt Electrolytic
C40	2763A	8 mfd. 500 Volt Electrolytic
C41		.5 mfd. Paper
C42		.25 mfd. Paper

Fig. 1.—Circuit Diagram and Code.

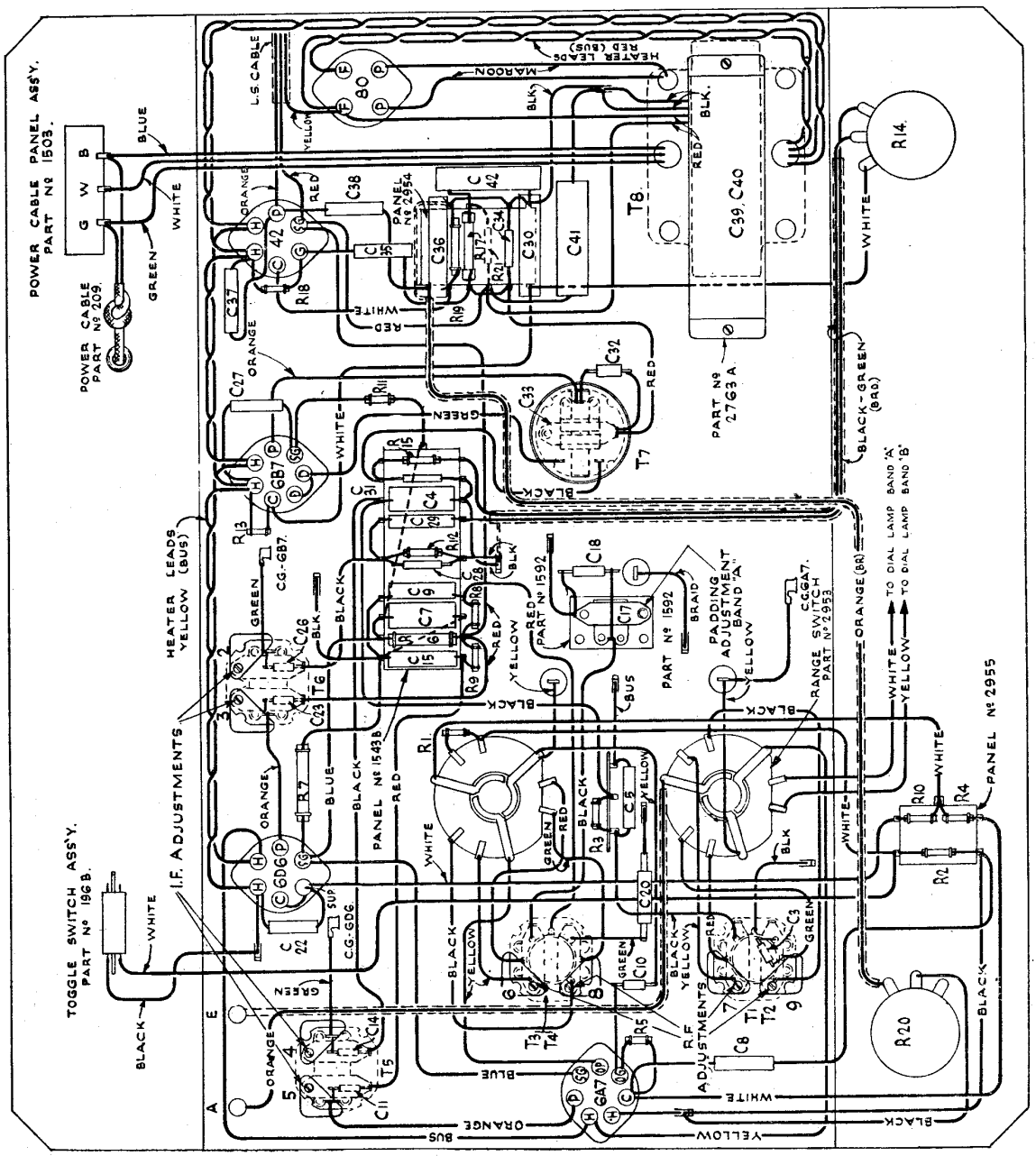


Fig. 2.—Layout Diagram (underneath view).

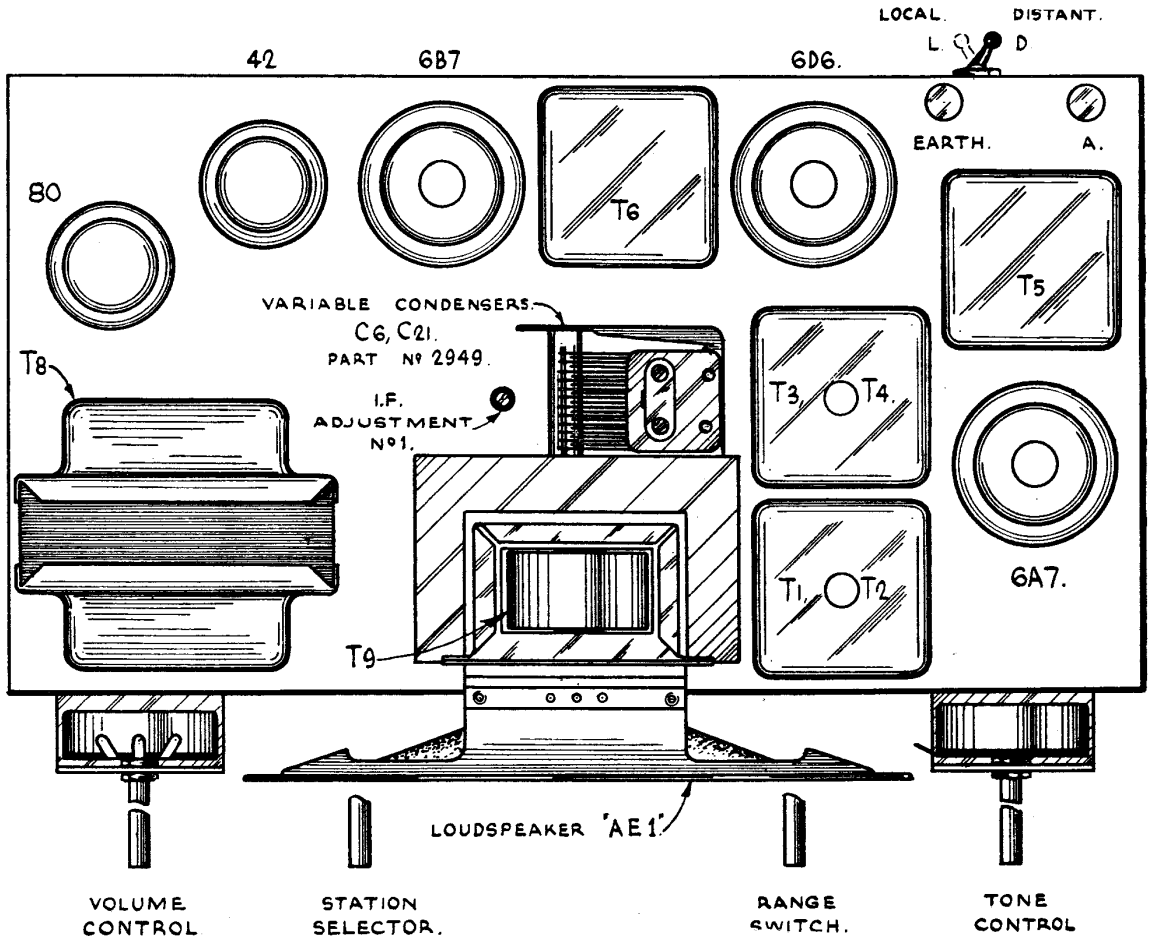


Fig. 3.—Layout Diagram (top view).

Band "B" (19-50M).

A 400 ohms non-inductive resistor should be connected between the output cable of the modulated oscillator and the aerial terminal for short wave alignment to simulate the characteristics of the average aerial.

1. Set the station selector pointer to 20 metres.
2. Set the modulated oscillator to 20 metres.
3. Reduce the capacitance of the oscillator (No. 8) trimmer and adjust by turning the screw in a clockwise direction to the first "peak" reading on the output meter. Check for the image signal which should be received at approximately 21.4 metres. It will probably be necessary to increase the output of the modulated oscillator for this check. Retune the Radiolette to 20 metres and reduce the output of the modulated oscillator to its previous value.
4. Increase the capacitance of the aerial trimmer (No. 9) and adjust in an anticlockwise direction to the first peak reading on the output meter while tuning the Radiolette continuously through the signal.

NOTE: It will be noticed on the short-wave band that the oscillator and aerial trimmers have two positions at which the signal will give maximum output. While the lower capacitance is correct for the oscillator trimmer the reverse is the case in respect to the aerial trimmer.

RESISTANCE MEASUREMENTS.

The resistance values shown 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 schematic 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.

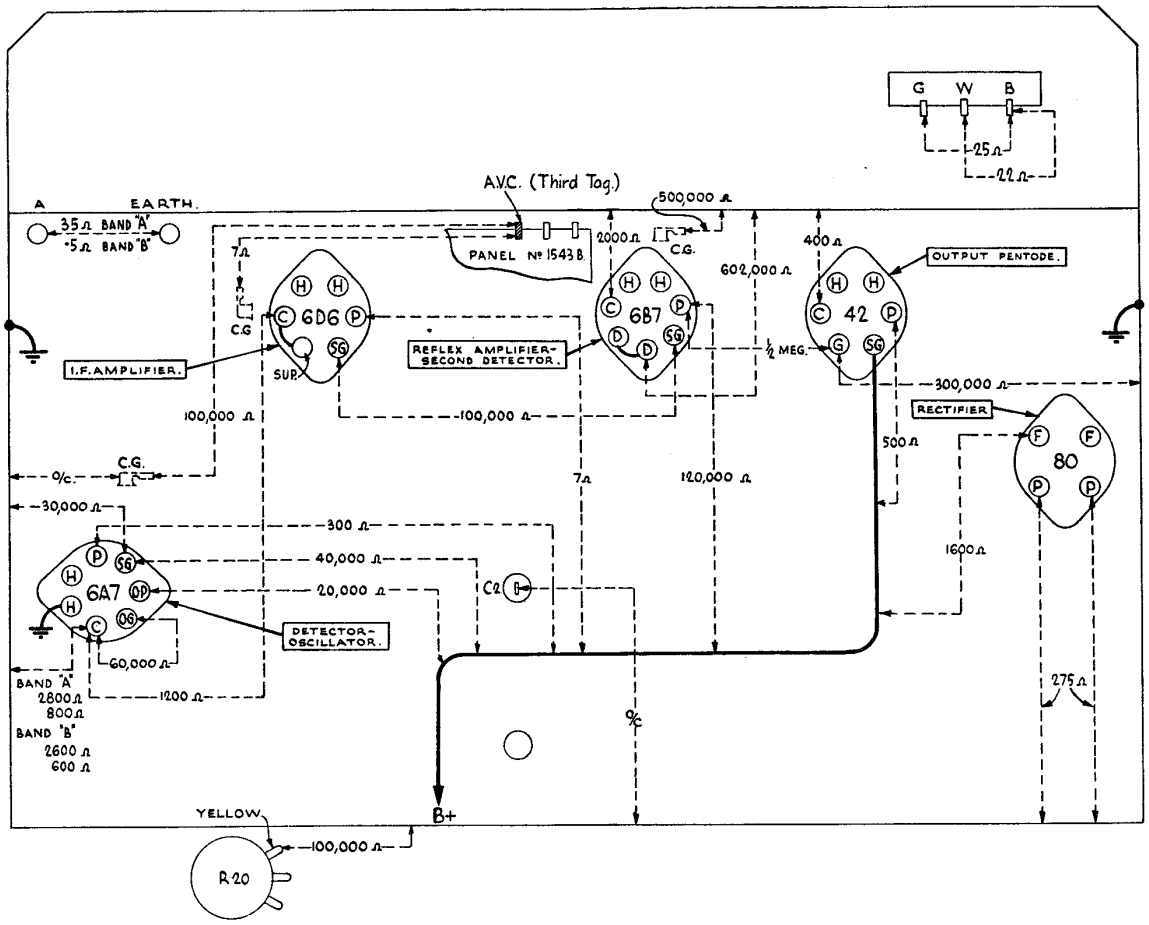


Fig. 4.—Resistance Diagram.

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

SOCKET VOLTAGES.

VALVE	Chassis to Cathode Volts	Chassis to Screen Grid Volts	Chassis to Plate Volts	Plate Current M.A.	Heater Volts
6A7 Detector M.W.	4.0	55	240	1.5	6.3
S.W.	3.0	52	240	3.0	—
6A7 Oscillator	—	—	170	3.0	—
6D6 I.F. Amplifier ...	3.0	55	240	3.0	6.3
6B7 Reflex Amplifier	1.5	30*	60*	1.0	6.3
42 Pentode	14.5	240	220	30.0	6.3
80 Rectifier . 600/300 volts 50 M.A. total current					5.0

Voltage across Loudspeaker field — 80 volts.

Measured at 240 volts A.C. supply. No signal input. Sensitivity switch in distant (D) position.

* Cannot be measured accurately with ordinary voltmeter.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