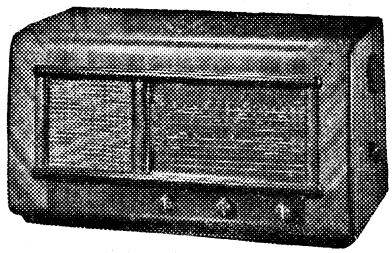
TECHNICAL INFORMATION AND SERVICE DATA

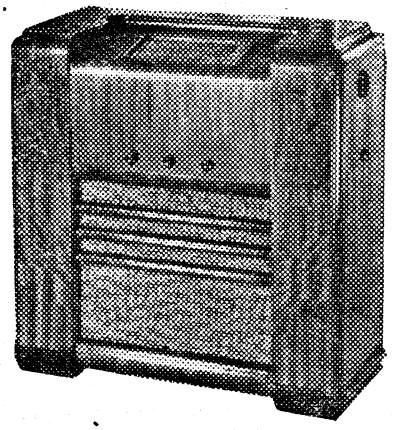
AWA RADIOLA

Models 614-T & 711-C

FIVE VALVE, FIVE BAND, A.C. OPERATED SUPERHETERODYNES

ISSUED BY
AMALGAMATED WIRELESS (A/SIA.) LTD.





ELECTRICAL SPECIFICATIONS.

FREQUENCY RANGES:

1600-540 Kc/s	(187.5-555 M.)
4-1.5 Mc/s	(75-200 M.)
10-3.7 Mc/s	(30-81 M.)
15-9.5 Mc/s	(20-31.5 M.)
23-14.7 Mc/s	(13-20.4 M.)

INTERMEDIATE FREQUENCY ..... 455 Kc/s

POWER SUPPLY RATING ..... 200-260 volts, 50-60 C.P.S.
(Models are produced with other voltage and frequency ratings.)

POWER CONSUMPTION ..... 60 watts

DIAL LAMPS (3) ..... 6.3 volt, 0.25 amp. M.E.S.

VALVE COMPLEMENT:

(1) 6J8G Converter.
(2) 6SK7GT I.F. Amplifier.
(3) 6SQ7GT Detector, A.V.C., and A.F. Amplifier.
(4) 6V6GT/G Output.
(5) 5Y3GT/G Rectifier.

LOUDSPEAKER:

Model 614-T.

7 inch—Code No. AW4.
Transformer—XA1.
V.C. Impedance—3 ohms at 400 C.P.S.
Field—1500 ohms.

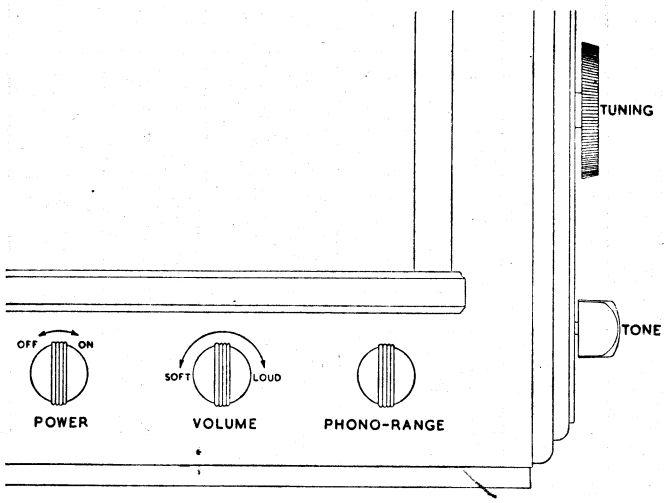
12E2

Model 711-C.

12 inch—Code No. AS8 or AS13
Transformer—TX20.
V.C. Impedance—2.2 ohms at 400 C.P.S.
Field—1500 ohms.

UNDISTORTED POWER OUTPUT: 4.5 watts.

CONTROLS:



MECHANICAL SPECIFICATIONS.

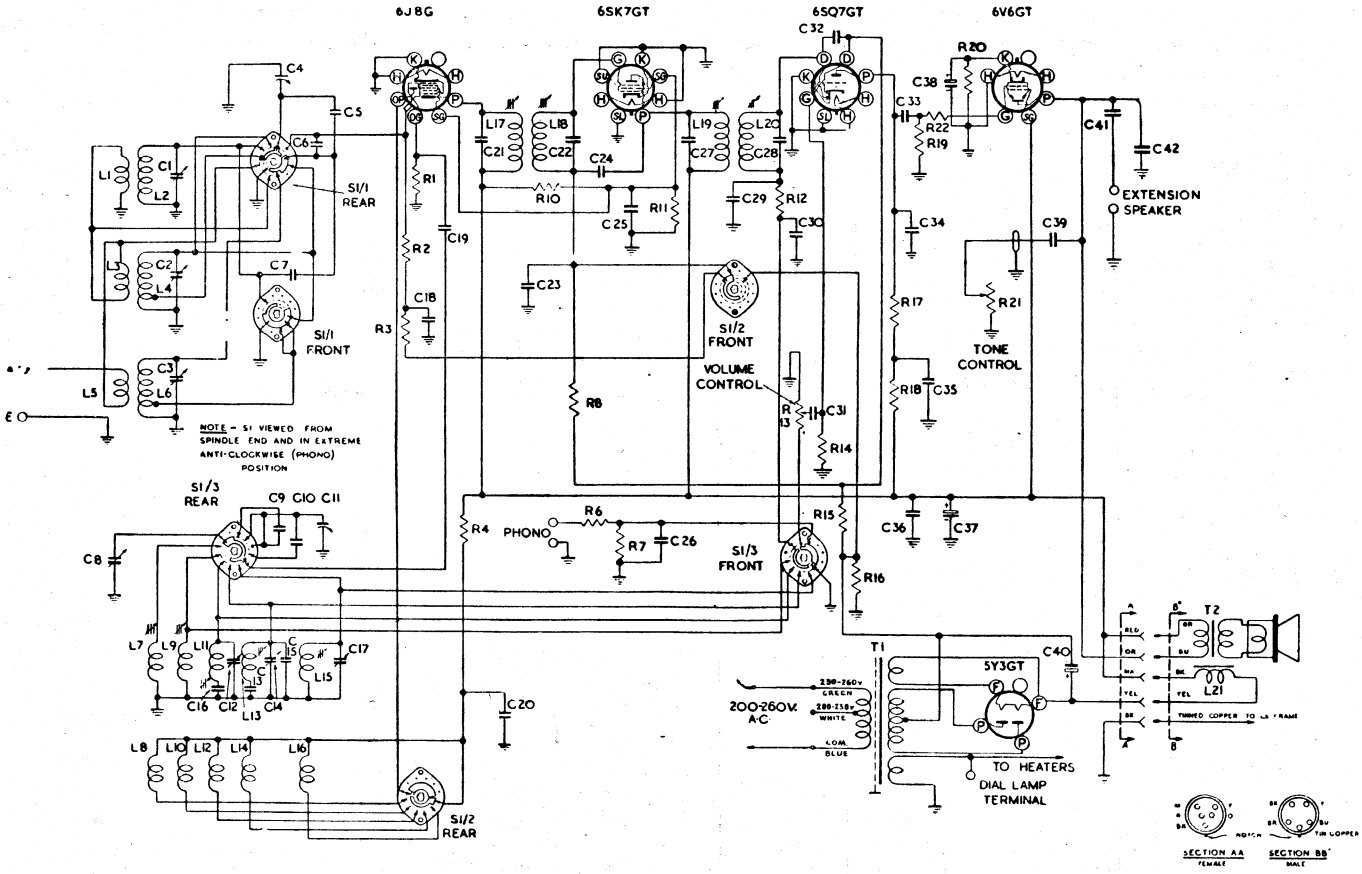
	Height.	Width.	Depth.
Cabinet Dimensions (inches)—			
614-T	12	23	10 5/16
711-C	32½	32¾	13
Carton Dimensions (inches)—			
614-T	13½	24	12
711-C	33½	34	14½

	Height.	Width.	Depth.
Chassis Base Dimensions (inches)	2⅞	12⅞	6⅞

Weight (nett lbs.)—
614-T 35
711-C 85

Cabinet Finish ..... Walnut Veneer

CIRCUIT DIAGRAM AND CODE



Circuit Code No.	Description.	Stock Code or Part No.
	INDUCTORS.	
L1, 2	Aerial Coil, 1600-540 kc.	9748
L3, 4	Aerial Coil, 4-1.5 Mc. and 10-3.7 Mc.	9854
L5, 6	Aerial Coil, 15-9.5 Mc. and 23-14.7 Mc.	20442
L7, 8	Oscillator Coil, 23-14.7 Mc.	20441
L9, 10	Oscillator Coil, 15-9.5 Mc.	20440
L11, 12	Oscillator Coil, 10-3.7 Mc.	9743
L13, 14	Oscillator Coil, 4-1.5 Mc.	9742
L15, 16	Oscillator Coil, 1600-540 kc.	9741
L17, 18	1st I.F. Transformer	20443
L19, 20	2nd I.F. Transformer	8287Z
L21	Speaker field, 1500 ohms	
	RESISTORS.	
R1	32,000 ohms, ½ watt	
R2	1 megohm, ½ watt	
R3	1 megohm, ½ watt	
R4	20,000 ohms, 1 watt	
R5	Not used	
R6	20,000 ohms, ½ watt	
R7	50,000 ohms, ½ watt	
R8	1.6 megohms, ½ watt	
R9	Not used	
R12	50,000 ohms, ½ watt	
R10	25,000 ohms, 2 watt	
R11	20,000 ohms, 1 watt	
R13	0.5 megohm, Volume Control	
R14	10 megohms, 1 watt	
R15	2.5 megohms, ½ watt	
R16	40 ohms, 3 watt	
R17	0.25 megohm, 1 watt	
R18	20,000 ohms, 1 watt	
R19	0.5 megohm, ½ watt	
R20	250 ohms, 3 watt	
R21	0.1 megohm, Tone Control	
R22	50,000 ohms, ½ watt	
	CAPACITORS.	
C1	2-25 uuF air trimmer	
C2	2-25 uuF air trimmer	
C3	2-25 uuF air trimmer	
C4	12-430 uuF variable (ganged)	
C5	120 uuF N750 Temp. Comp. ±2½%	
C6	200 uuF mica	
C7	14 uuF mica	
C8	2-25 uuF air trimmer	
C9	490 uuF mica padder (1600-540 kc.) ± 2½%	
C10	120 uuF N750 Temp. Comp. ± 2½%	
C11	12-430 uuF variable (ganged)	
C12	2-25 uuF air trimmer	
C13	1350 uuF mica padder (4-1.5 Mc.) ± 2½%	
C14	2-25 uuF air trimmer	
C15	12 uuF mica	
C16	2550 uuF mica padder (10.3.7 Mc.) ± 2½%	
C17	2-25 uuF air trimmer	
C18	.05 uF paper, 200 v. working	
C19	50 uuF mica	
C20	.01 uF paper, 600 v. working	
C21	70 uuF mica	
C22	70 uuF mica	
C23	.02 uF paper, 600 v. working	
C24	12 uuF mica	
C25	.1 uF paper, 400 v. working	
C26	.01 uF paper, 600 v. working	
C27	70 uuF mica	
C28	70 uuF mica	
C29	100 uuF mica	
C30	100 uuF mica	
C31	.02 uF paper	
C32	50 uuF mica	
C33	.01 uF paper	
C34	200 uuF mica	
C35	.5 uF paper, 400 v. working	
C36	.1 uF paper, 400 v. working	
C37	16 uF, 525 P.V. Electrolytic	
C38	25 uF, 40 P.V. Electrolytic	
C39	0.05 uF paper, 400 v. working	
C40	8 uF, 525 P.V. Electrolytic	
C41	0.5 uF paper, 400 v. working	
C42	0.005 uF paper, 600 v. working	
	TRANSFORMERS.	
T1	Power Transformer, 50-60 C.P.S.	11344
T1	Power Transformer, 40 C.P.S.	11346
	LOUDSPEAKER.	
7 inch	Electro Magnet	AW4
12 inch	Electro Magnet	AS13

D.C. RESISTANCE OF WINDINGS

Winding.	D.C. Resistance in ohms.
Aerial Coils—	
Primary (L1)	13
Secondary (L2)	4
Primary (L3)	3.5
Secondary (L4)	2
Primary (L5)	2.5
Secondary (L6)	.5
Oscillator Coils—	
Primary (L7)	.5
Secondary (L8)	*
Primary (L9)	.5
Secondary (L10)	*
Primary (L11)	.5
Secondary (L12)	*
Primary (L13)	.5
Secondary (L14)	1.5
Primary (L15)	1.75
Secondary (L16)	7
I.F. Transformer Windings	8
Power Transformer T2—	
Primary	16
Secondary	520
Loudspeaker Input	
Transformer—	
Primary, XA1	500
Secondary, XA1	*
Primary, TX20	420
Secondary, TX20	*

The above readings were taken on a standard chassis, but substitution of materials during manufacture may cause variations, and it should not be assumed that a component is faulty if a slightly different reading is obtained.

* Less than 1 ohm.

SOCKET VOLTAGES

Valves.	Control Grid to Chassis Volts.	Cathode to Chassis Volts.	Screen Grid to Chassis Volts.	Plate to Chassis Volts.	Plate Current mA.	Heater Volts.
6J8G Converter	−2.6	0	85	260	1.3	6.3
Oscillator	—	—	—	150	5.0	—
6SK7GT I.F. Amplifier	−2.6	0	85	260	6.5	6.3
6SQ7GT Detector, A.V.C. and A.F. Amplifier	0	0	—	100*	0.6	6.3
6V6GT/G Output	0	12.5	260	240	45	6.3
5Y3GT/G Rectifier	770/385 volts, 70 mA total current.					

* This reading may vary depending on the resistance of the voltmeter used.

Measurements taken with the receiver connected to 240 volts A.C. supply. Range switch at "Broadcast" and no signal input. Volume control maximum clockwise. Voltmeter, 1000 ohms per volt; measurements taken on highest scale giving accurate readable deflection.

MECHANICAL REPLACEMENT PARTS.

Item.	Part No.
Cabinet, console	C69Z
Cabinet, table	C77
Cable, loudspeaker—	
Table	17822
Console	6465
Cable, power	209
Cable, tone control—	
Table	20432
Console	20431
Clip, grid	7459
Cone, assembly, loudspeaker—	
Type AW4	9356
Type AS8	7071
Type AS13	7071
Dial frame assembly	20501A
Dial Scale	20500A
Drum, band indicator	20544

Item.	Part No.
Dust Cover, loudspeaker—	
AW4	9843
AS8	10306
AS13	10306
Knob	4589
Knob, tuning	9407
Screen, I.F. transformer	3351
Cap	8372
Socket, valve	4704
Socket, valve, cushion	20142
Spindle, tuning control extension—	
Table	19066
Console	19583
Spring, drive tension	1741
Strip, tag, 1 way	7628
5 way	8239
7 way	9879
Washer, felt	4935

ALIGNMENT PROCEDURE.

Alignment should be necessary only when adjustments have been altered from the factory setting or when repairs have been made to the tuned circuits. Climatic conditions should not seriously affect the receiver.

It is important to apply a definite procedure, as given in this booklet, and to use adequate and reliable test equipment. Instruments ideally suited to the requirements are either the A.W.A. Junior Signal Generator type 2R3911, or the A.W.A. Modulated Oscillators type J6726 and C1070*. An output meter is necessary with both these instruments, the recommended type having an output impedance of 5000 ohms and a range of 5-3000 milliwatts. The meter should be connected across the primary of the loudspeaker transformer. If the output meter used is one which impresses a load on the anode circuit of the output valve, it will be necessary to open the voice coil if true power indications are required.

As the calibration of the band-spread bands requires great accuracy, it is recommended that an A.W.A. Crystal Calibrator, type 6795, be used to check the accuracy of the signal generator. The crystal calibrator emits a modulated signal at intervals of either 100 or 1000 Kc/s, throughout the radio frequency spectrum, thus providing a series of fixed and equally spaced calibration points of known accuracy. When using this instrument care should be taken to select the correct signal. With the crystal set at the 1000 Kc. position a spurious image signal can generally be obtained by turning the tuning control of the receiver to a point approximately 100 Kc/s higher in frequency. This is a useful check as to whether a harmonic or spurious image is being tuned. If a crystal calibrator is not available, broadcasting stations of known frequency may be used as an alternative.

When using a signal generator or modulated oscillator with the tuning of the receiver fixed, two frequencies can be tuned from the test instrument, one 0.92 Mc/s higher in frequency than the other. In all cases the desired frequency is the lower of the two.

A convenient alignment jig designed to hold the receiver chassis and fitted with a dial scale and pointer may be obtained from the Service Department of the company. With this jig, alignment may be carried out with the chassis coupled to an actual scale, thus ensuring that the calibration will be correct when the chassis is placed in the cabinet, otherwise, use the 0-180° calibration scale on the drum. (See alignment table.)

For all alignment purposes connect the "low" side of the signal generator to the receiver chassis.

Perform alignment in the proper order as shown in the chart, starting from No. 1 and following all operations across, then No. 2, etc.

Keep the volume control in the maximum clockwise position and regulate the output of the test instrument so that a minimum signal is introduced to the receiver to give a standard indication on the output meter. This will avoid A.V.C. action and overloading.

When the receiver has been satisfactorily aligned, seal the adjusting screws with a small quantity of cellulose cement.

* If a type J6726 or C1070 instrument is used, see that a 0.25 megohm resistor is connected between the output terminals, and for short wave alignment a 400 ohm non-inductive receiver in series with the active output lead.

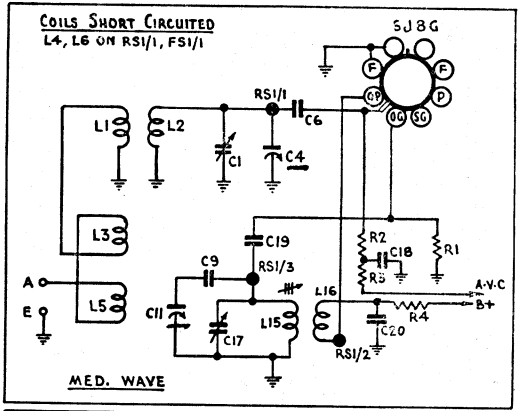
ALIGNMENT TABLE.

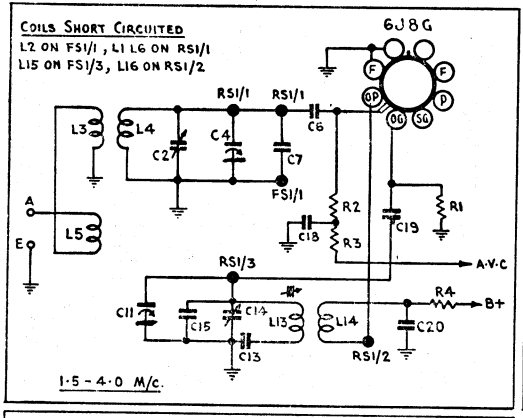
Alignment Order.	Test Inst. Connect to Receiver.	Frequency Setting.	Band Setting.	Calibration Scale Setting.	Circuit to Adjust.	Adjustment Symbol.	Adjust to Obtain.
1	6J8G Cap.*	455 Kc/s	Broadcast	0°	2nd I.F. Transformer	Core L20	Max. Peak
2	6J8G Cap.*	455 Kc/s	Broadcast	0°	2nd I.F. Transformer	Core L19	Max. Peak
3	6J8G Cap.*	455 Kc/s	Broadcast	0°	1st I.F. Transformer	Core L18	Max. Peak
4	6J8G Cap.*	455 Kc/s	Broadcast	0°	1st I.F. Transformer	Core L17	Max. Peak
			Recheck 1, 2, 3 and 4.				
5	Aerial	600 Kc/s	Broadcast	20°	Oscillator†	Core L15	Max. Peak
6	Aerial	1500 Kc/s	Broadcast	155°	Oscillator	C17	Calibration
7	Aerial	1500 Kc/s	Broadcast	155°	Aerial	C1	Max. Peak
			Recheck 5, 6, 7.				
8	Aerial	1.6 Mc/s	4-1.5 Mc/s	16°	Oscillator†	Core L13	Max. Peak
9	Aerial	3.6 Mc/s	4-1.5 Mc/s	147°	Oscillator	C14	Calibration
10	Aerial	3.6 Mc/s	4-1.5 Mc/s	147°	Aerial	C2	Max. Peak
11	Aerial	4.0 Mc/s	10-3.7 Mc/s	18°	Oscillator†	Core L11	Max. Peak
12	Aerial	9.5 Mc/s	10-3.7 Mc/s	160°	Oscillator	C12	Calibration
13	Aerial	9.7 Mc/s	15-9.5 Mc/s	21°	Oscillator	Core L9	Calibration
14	Aerial	14.0 Mc/s	15-9.5 Mc/s	153°	Oscillator	C8	Calibration
15	Aerial	14.0 Mc/s	15-9.5 Mc/s	153°	Aerial	C3	Max. Peak
16	Aerial	15.0 Mc/s	23-14.7 Mc/s	19°	Oscillator	Core L7	Calibration
			Recheck 8-16. A compromise in adjustments between 13, 14, 15 and 16 may be made for best results on both bands.				

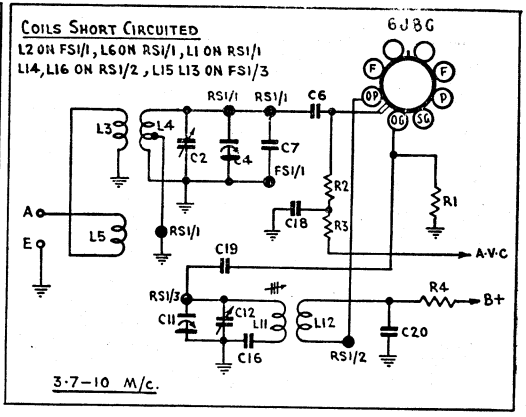
* With Grid Clip connected. A 0.001 uF capacitor should be connected in series with the "High" side of the test instrument.

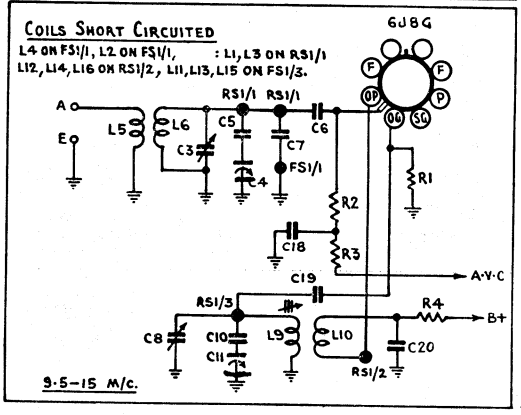
† Rock the tuning control back and forth through the signal.

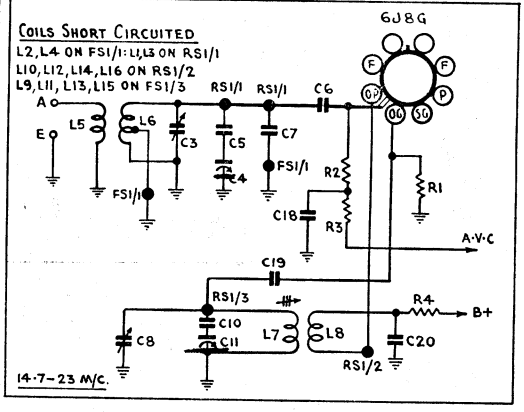
The column headed "Calibration Scale Setting" refers to the 180° scale on the ganged tuning capacitor drum drive. Check the setting of the drum before taking readings. The zero mark should be opposite the pointer with the tuning capacitor fully closed.









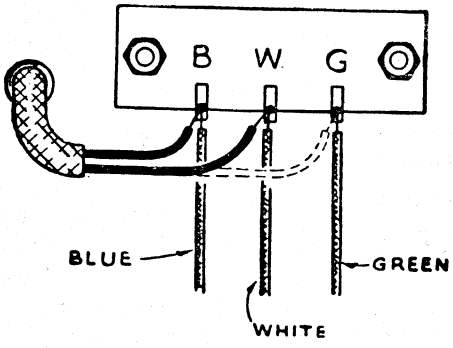


NOTE ● INDICATES TWO OR MORE CONNECTIONS THROUGH SWITCH
E.G. "RS1/1" REAR OF SECTION 1
"FS1/3" FRONT OF SECTION 3

TUNING CIRCUIT DIAGRAM.

CONNECTION TO POWER SUPPLY.

The receiver should not be connected to any circuit supplying other than alternating current from 200 to 260 volts and at the frequency stated on the label within the cabinet. The power supply connection panel is shown in the accompanying diagram, and for 230 to 260 volt operation the input leads from the power switch (S2) should be connected to tags B and G. For operation on voltages below 230, connection should be made to tags B and W.

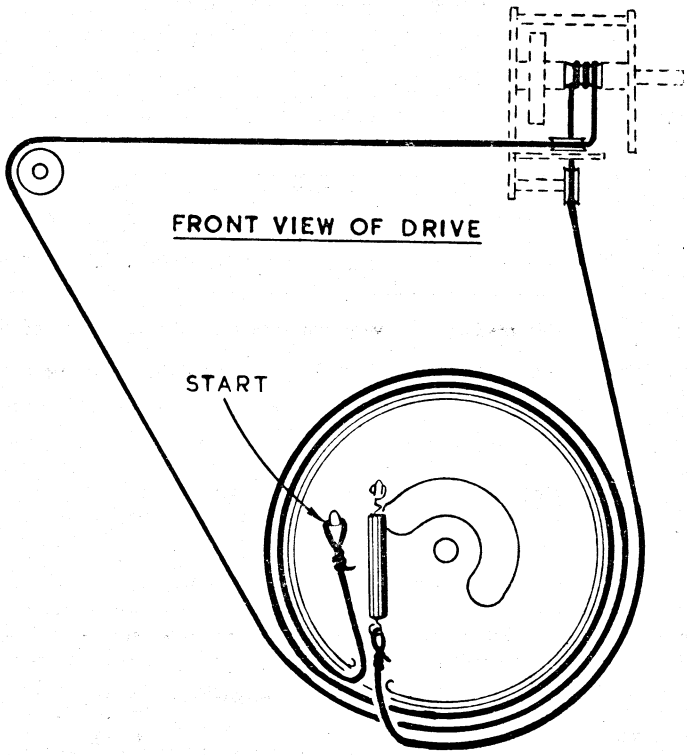


SERVICE WINDOW.

A "Service Window" is provided in the base of the table model cabinet. The window is covered by a perforated grille fastened by four knurled nuts. With the grille removed, it is possible to perform most service operations without removing the chassis from the cabinet.

TUNING DRIVE CORD REPLACEMENT.

The accompanying diagram shows the route of the cord and the method of attachment. Whilst fitting the cord, keep it taut and adjust the length so that the tension spring measures approximately 2 inches long when fitted. The spring should be sheathed to prevent it rattling against the drum.



DESCRIPTION OF TUNING CIRCUIT ADJUSTMENTS

BROADCAST BAND.

The broadcast band adjustments follows usual practice with two trimming capacitors—C1 aerial, C17 oscillator and a variable magnetite core for L.F. adjustment of the oscillator coil L15, L16.

4-1.5 Mc/s Band.

Adjustments are similar to those used on the broadcast band, that is, with two trimming capacitors, C2 aerial, C14 oscillator and a variable magnetite core for L.F. adjustment of the oscillator coil L13, L14.

10-3.7 Mc/s Band.

The capacitor in the aerial section is common with that in the 4-1.5 Mc/s band, the change of band being accomplished by switching tapped coils. The oscillator section, however, is provided with a separate capacitor, C12, for tracking with the signal circuits at the H.F. end and a variable magnetite core for L.F. adjustment of the oscillator coil L11, L12.

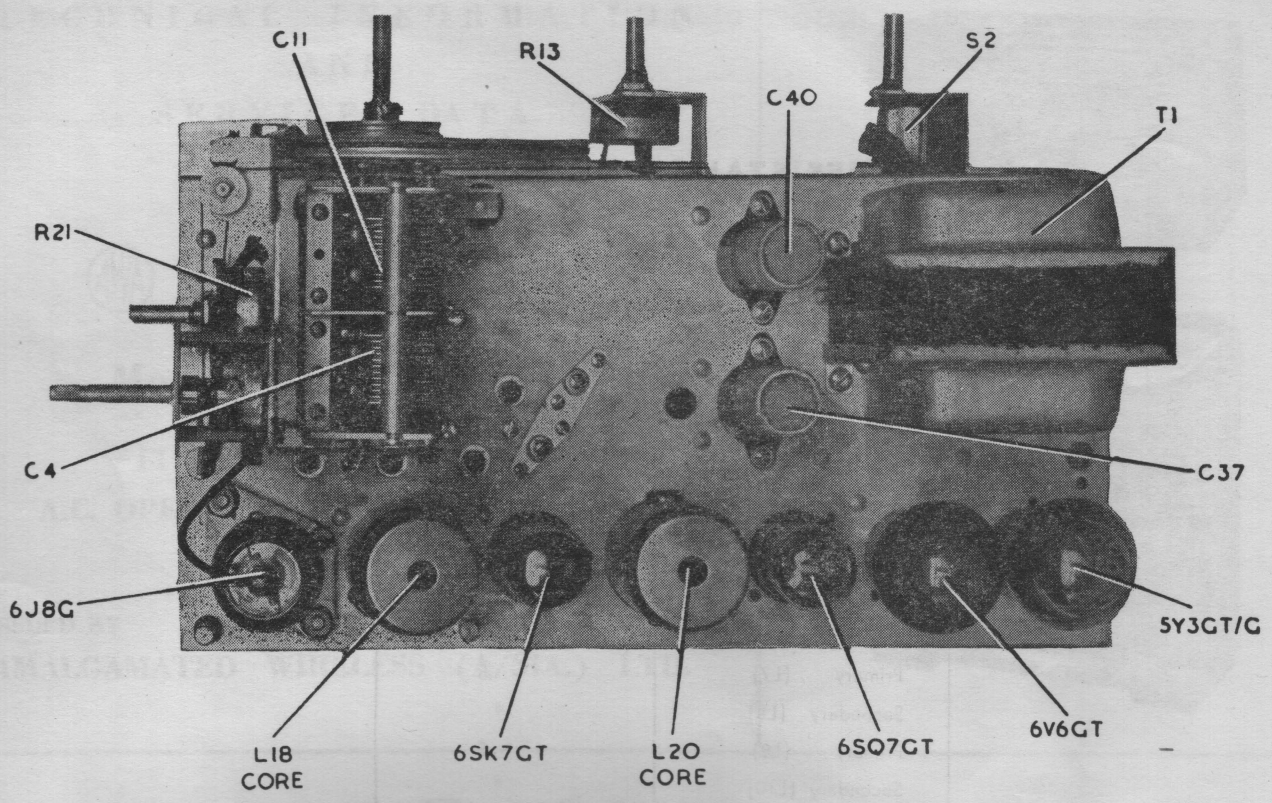
15-9.5 Mc/s Band.

Adjustments are the same as used on 4-1.5 Mc/s band, that is, with two trimming capacitors, C3 aerial, C8 oscillator and a variable magnetite core for L.F. adjustment of the oscillator coil L9, L10.

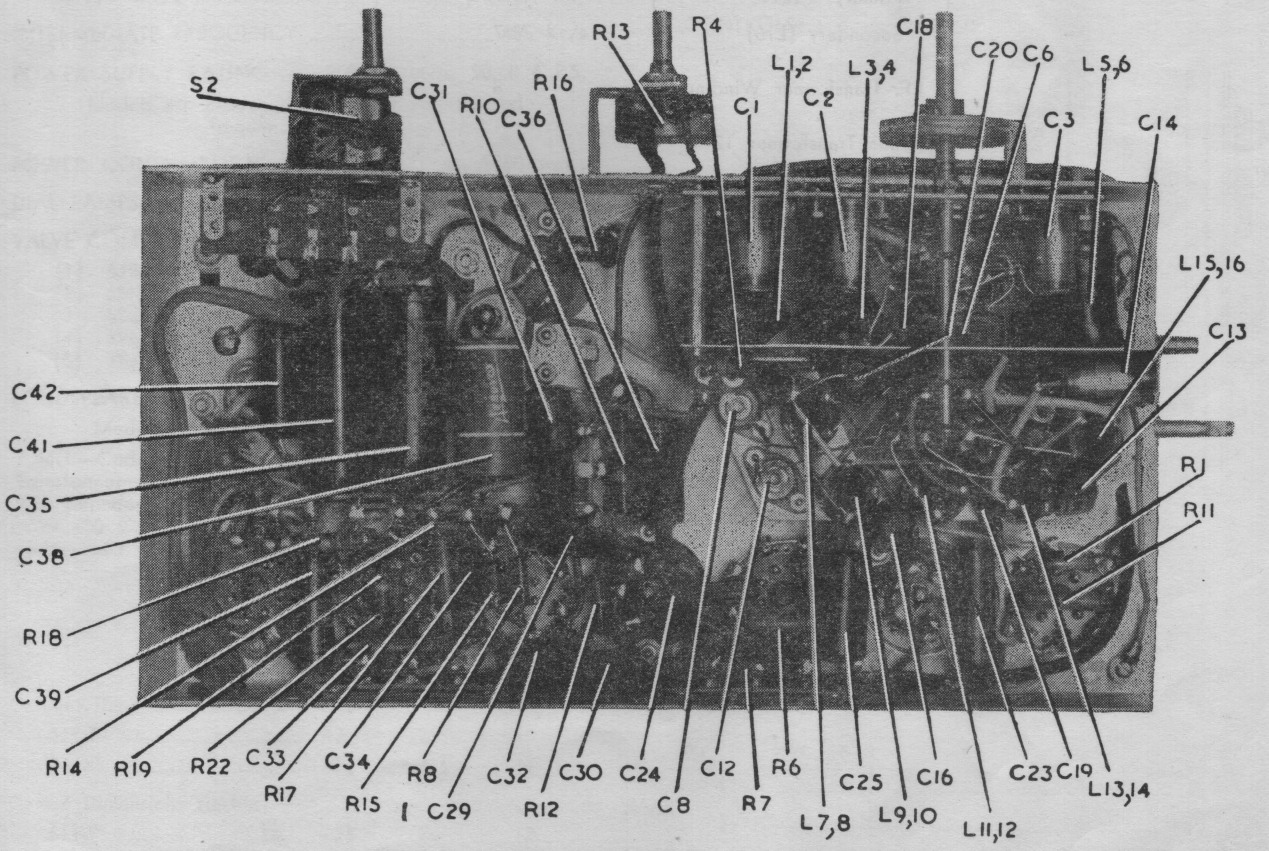
23-14.7 Mc/s Band.

One adjustment only is provided, a variable magnetite core in the oscillator coil L7, L8.

It will be noted that the ratio $\frac{\text{max. frequency}}{\text{min. frequency}}$ is the same on the 2 bands, 15-9.5 Mc/s, 23-14.7 Mc/s, and the tracking is correct using the same series capacitor for both bands. The ratio $\frac{\text{max. frequency}}{\text{min. frequency}}$ is also the same on the 4.0-1.5 Mc/s and 10-3.7 Mc/s bands, but, due to the greatly different frequency spectrum of the oscillator, the series capacitors in the two oscillator circuits are different.



CHASSIS (TOP VIEW).



CHASSIS (UNDERNEATH VIEW).