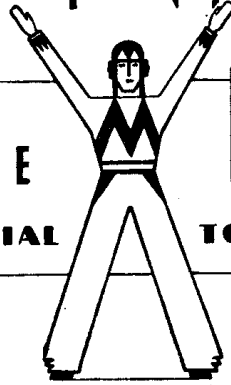


MARCONI PHONE

SERVICE MANUAL

PRIVATE AND CONFIDENTIAL TO THE TRADE ONLY



MODEL 273—5-VALVE BATTERY SUPERHET

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SEPT.
1934
1935 SERIES
NUMBER THREE
PART No. 18843

GENERAL DESCRIPTION.

WAVELENGTH RANGE.

ACTUAL.—Medium waves : 200 to 560 metres.

Long waves : 1,010 to 2,000 metres.

INDICATED.—Medium waves : 220 to 560 metres.

Long waves : 1,100 to 2,000 metres.

PHYSICAL DETAILS.

Size :—Height : $18\frac{1}{4}$ inches.

Width : $15\frac{3}{8}$ inches.

Depth : $8\frac{1}{4}$ inches.

Weight : 44 lb. complete nett ; 54 lb. nett (home packing).

BATTERIES.

High tension : Marconiphone type B550, 166 volts, plus 9 volts for grid bias.

Accumulator : Unspillable jelly accumulator, 2 volts 30 amp. hours capacity.

It is essential that the accumulator be correctly connected, i.e., positive (+) lead to red terminal ; otherwise the life of the H.T. battery will be shortened and distortion will be introduced.

BATTERY CONSUMPTION.

Total average consumption from H.T. battery : 7.5 m/A. This figure, which is based on voltmeter tests, will depend on nature of programme.

Total consumption from accumulator (including pilot lamp) : 0.96 amps.

CIRCUIT DESCRIPTION.

Signals are fed to the grid of the H.F. amplifier valve VS24 through a high impedance aerial coupling transformer, one half of which functions as a second channel suppressor.

The grids of the H.F. and the I.F. amplifiers are controlled (giving delayed A.V.C.) by negative bias supplied by one half of a double diode rectifier incorporated in the second detector (the delay is in the diode itself).

The H.F. amplifier is tuned anode coupled to a screen grid S23 valve, and the leaky grid detector oscillator to the I.F. amplifier VS2, the output of which is rectified by the diode portion of the new double diode triode valve (HD21).

The triode portion of the HD21 is used as a first L.F. amplifier and feeds, via a condenser and transformer, the QP21, a combination of two push-pull pentodes which are in turn coupled to the moving coil speaker by a matching transformer.

SPEAKER.

Type 16000R : Permanent magnet moving coil speaker.

D.C. resistance of coil : 4 ohms.

EXTRA SPEAKERS.

An extra speaker may be connected to this instrument without appreciably reducing volume. Moving iron or moving coil types may be used providing that their impedances are adjusted to suit pentode output conditions. Connect the extra speaker across terminals 3 and 5 on the parent speaker transformer panel.

Use only wire which is adequately insulated with rubber for extension speaker leads, otherwise the H.T. battery may be run down and/or volume reduced.

DISMANTLING.

TO REMOVE CHASSIS.

(1) Remove batteries. H.T. battery plugs should always be detached **before** accumulator tags are disturbed.

(2) Remove the three screws which fix the speaker terminal strip to the right hand (underside) of chassis, and detach speaker earthing tag from extreme right of chassis.

Do not forget to replace the black lead earthing speaker at right hand side of chassis.

(3) Loosen the battery leads by partly withdrawing the wood screws fixing cable cleats.

(4) Remove four knobs from front of cabinet.

(5) Take out the four screws fixing chassis (heads are on underside of cabinet). The chassis may now be withdrawn.

Before replacing the chassis fixing screws see that the plain and locking washers are present.

TO REMOVE SPEAKER.

To remove the speaker it is not necessary to disturb the chassis or the accumulator housing.

Using a wide-bladed screwdriver in order not to damage finish, remove the four ornamental screws from front of cabinet. There are no nuts.

When replacing, screw up firmly.

REPLACEMENT OF COILS.

Separate coils (such as L9) cannot be supplied.

In the event of coil damage, the complete unit (L9 and L10) should be replaced.

When tuning coils are replaced, or the H.F. wiring of the instrument has been disarranged, the tuned circuits of instrument must be re-ganged (see under H.F. Tests and Adjustments).

PICK-UP.

A pick-up having a D.C. resistance of not less than 1,000 ohms may be connected to the sockets provided.

Connect the pick-up screening to the earth socket of chassis or to the pick-up socket *not* marked G.

PRELIMINARY TESTS.

If radio signals are unobtainable, switch on receiver and test in the following manner :—

1. **Test Battery, Speaker and Accumulator.**—If on making and breaking H.T. — plug at battery socket a rustling sound is heard, the speaker and batteries can be assumed O.K.

2. **Test for L.F. Amplifier HD21, Pentodes QP21 and Loudspeaker.**—Place wet finger on pick-up terminal marked "G." If valves are functioning, a faint click will be heard.

The employment of a pick-up will definitely prove whether V4 and V5 and their associated components are working correctly.

If speaker responds to contact at P.U. grid socket, but does not respond on radio, the fault must be associated with valves V1, 2, 3, or their associated components.

Before testing emission of valves individually, it is advisable to check the total H.T. consumption. Measure by inserting meter between H.T. — and battery.

If total H.T. feed exceeds 14 m/A, suspect "short" to chassis.

COMPONENT CONTINUITY TESTS.

The tests shown in bold type may be made whilst chassis remains in position.

Remove all valves, lamp, and batteries and set the wavechange switch to L.W. position before testing.

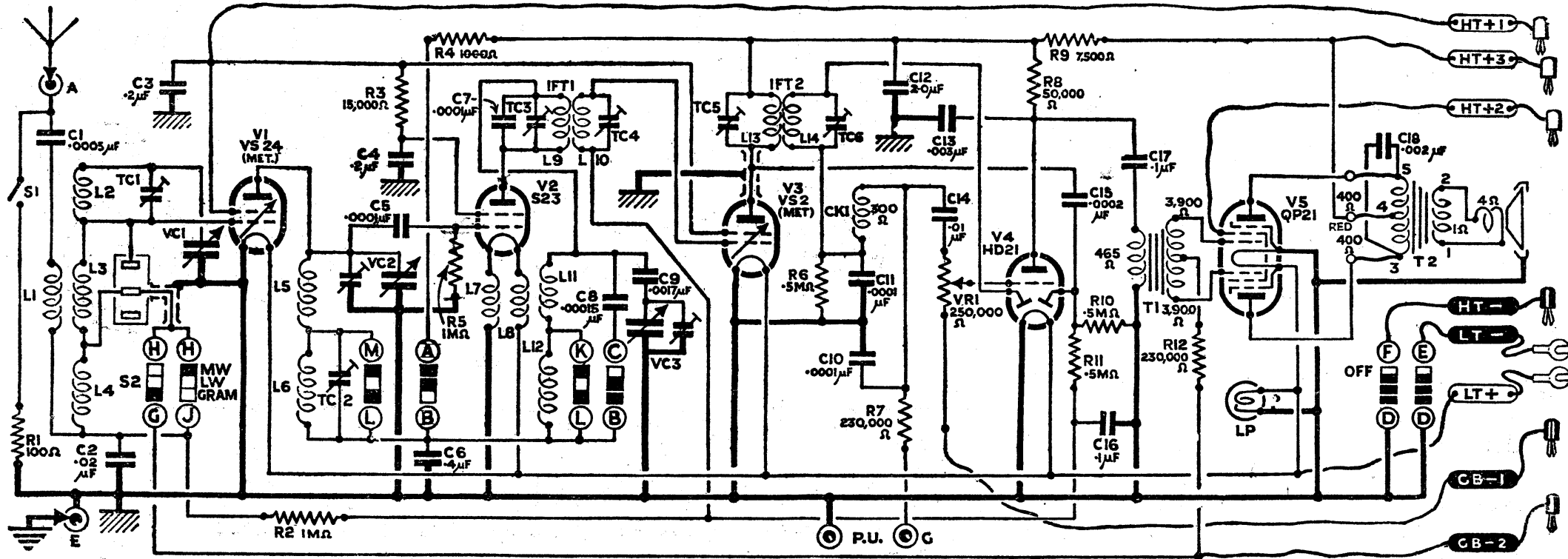
Test No.	Coil to be Tested.	Test across :—	D.C. Resistance.	Approximate Resistance to Chassis.
1	L1	Ends of coil	10.5 ohms ...	Infinite.
2	L2	Trimmer T.C.1	5.5 ohms ...	Infinite.
3	L3	Inside terminals at base of VS24 valve...	6.0 ohms ...	Infinite.
4	L4	Centre terminal at base of VS24, and contact J of switch	27.0 ohms ...	Infinite.
5	L5 + L6 + L11 + L12 + L9	Anodes of VS24 (V1) and S23 (V2)	95 ohms ...	Infinite.
6	L5	Fixed vanes of VC2 and contact M	4.2 ohms ...	Infinite.
7	L6	Contacts M and L of wavechange switch (S2) ...	13.7 ohms ...	Infinite.
8	L7	Filament (—) socket of S23 and earth (chassis)	1.3 ohms ...	1.3 ohms (max.).
9	L8	Filament socket (+) of S23 and LT + spade	1.3 ohms ...	Infinite.
10	L11	Yellow lead at top of coil and contact K on wavechange switch	3.7 ohms ...	Infinite.
11	L12	Contacts K and L of switch S2	6.75 ohms ...	Infinite.
12	L9	Trimmer TC3	70 ohms ...	Infinite.
13	L10	Trimmer TC4	90 ohms ...	Infinite.
14	L13	Trimmer TC5	70 ohms ...	Infinite.
15	L14	Trimmer TC6	90 ohms ...	Infinite.

VALVE TABLE.

	V1, VS24	V2, S21 or S23	V3, VS2	V4, HD21	V5, QP21	REMARKS.
TEST VOLTAGES... ..	100* (130) Gram. : Nil	33.0 Gram. : 29	100* (140) Gram. : 145	65 (80)* Gram. : 80	See anode and screen feed	Values marked * must be taken with a voltmeter having a full scale deflection of at least 10 times the reading shown. ‡ These values will fluctuate accord- ing to the type and strength of the signal re- ceived. A voltmeter having a resistance of 200 ohms per volt was used for all readings given Tolerances— ± 10 per cent.
MEASURED BETWEEN	Anode and frame	Screen and frame	Anode and frame	Anode and frame	—	
CHECK COMPONENTS	L5, L6, R4, R9, S2, contacts AB, A.V.C.	L7, L8, L9, L11, L12, R3 and R4, R9, S2, contacts AB	L13, R9, and anode screening, A.V.C.	R8, R9, VR1	T1, T2, R12	
ANODE TO FRAME VOLTS	100* (130) Gram. : Nil	100* Gram. : Nil	100* (140) Gram. : 145	65 (80)* Gram. : 80	Each anode 160	
SCREEN TO FRAME VOLTS	60	33 Gram. : 29	60	—	As letter on the valve 132—162	
ANODE FEED mA	2.8 (0.2) Gram. : Nil	1.0 Gram. : Nil	3.4 (0.7) Gram. : 0.7	0.5 (0.9) Gram. : 1.0	Each anode 0.8‡	
SCREEN FEED mA		TOTAL FEED 3.0 (0.6) Gram. : 1.7		—	0.4‡	

Where two readings are given, the first is for no signal (carrier), whilst that in brackets shows the effect of the A.V.C. action on a powerful nearby station. If variation does not occur when tuned to a powerful station, check the following:—

A.V.C. components : R2, R10, R11, C2, C15, V16.



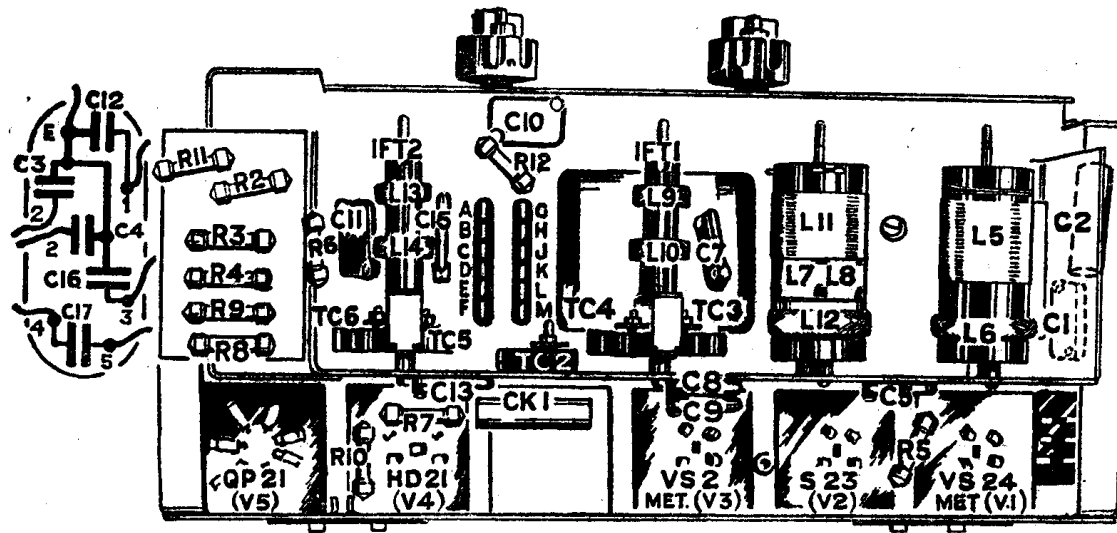


Fig. 2.

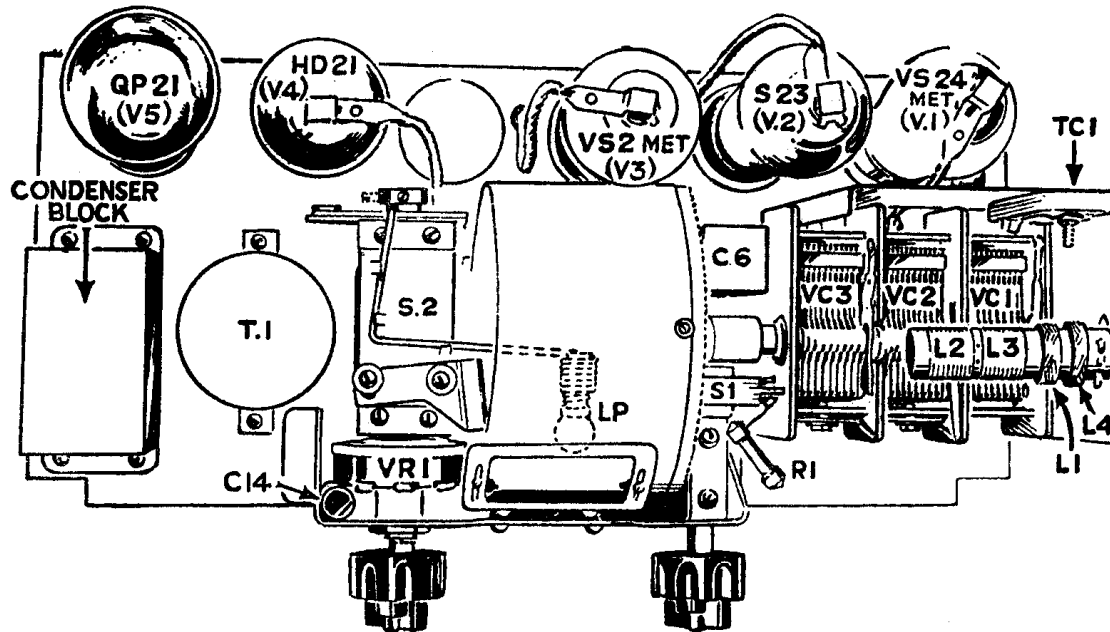


Fig. 3.

RESISTANCE COLOUR CODE.

Resistances are coded with three colours :—

BODY colour indicates 1st figure.

END colour indicates 2nd figure.

SPOT colour indicates additional 0's.

BODY and END
Colours.
(1st and 2nd figures.)

- 0 Black.
- 1 Brown.
- 2 Red.
- 3 Orange.
- 4 Yellow.
- 5 Green.
- 6 Blue.
- 7 Violet.
- 8 Grey.
- 9 White.

SPOT colours.
(Additional 0's.)

- 0 Black.
- 0. Brown.
- 00. Red.
- 000. Orange.
- 0,000. Yellow.
- 00,000. Green

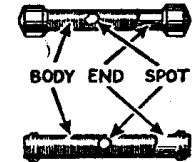


Fig. 4.

WIRING COLOUR CODE.

- | | | | |
|-------------------------|-----|-----|--|
| Black | ... | ... | Earth. |
| Red | ... | ... | H.T. positive. |
| Green | ... | ... | Grid. |
| Blue | ... | ... | Pick-up. |
| Brown | ... | ... | Heaters. |
| Pink | ... | ... | Loudspeaker. |
| Purple | ... | ... | Aerial. |
| Yellow | ... | ... | Anode. |
| Yellow with red tracer | ... | ... | Screen of S.G. valve. |
| Green with black tracer | ... | ... | Bottom of grid circuit
not direct to earth. |
| Green with white tracer | ... | ... | Mid position of coil. |

For part numbers of electrical components, see Spare Part List on pages 9 and 10.

H.F. TESTS AND ADJUSTMENTS.

INSTABILITY.

If instability is encountered, causing instrument to oscillate and set up a whistle in the speaker, this may be due to stray coupling.

Carefully note position of wiring before attempting to renew components.

Whenever wiring associated with the H.F. side of the instrument is disturbed the circuits must be reganged.

Unless adequate test equipment is available the replacement of coil units should not be attempted, as this work demands a considerable knowledge of the instrument.

TRIMMING OF I.F. TRANSFORMERS.

If new units (such as coils L9 and L10) are replaced or the wiring thereto has been disturbed, the circuits must be re-trimmed.

An accurately calibrated modulated oscillator, which supplies a signal of constant frequency and magnitude, must be employed.

NOTE.—When making adjustments to trimming condensers, see that the screwdriver has an insulated handle and that blade does not touch the chassis. A piece of insulating tape wrapped round the blade will prevent this. The cans must be in place when trimming.

Keep testing leads as short as possible.

Set the wavechange switch of Model 273 to M.W. position and turn tuning condenser to minimum.

Measurement of signal may be made by connecting an 0.3 A.C. voltmeter across secondary of T2.

Proceed as follows :—

- (1) Set oscillator to 125 K.C. and loosely couple output coil by placing near the trimmer TC4.
- (2) Switch on the oscillator and trim TC4 for maximum deflection of meter needle.
More than one peak will be obtained when adjusting trimmers. In all cases the peak nearest to maximum capacity (home position of trimmer screw) is the one which must be chosen.
- (3) Trim TC6, TC3 and TC5 in the order given. The adjustment of TC6 is not critical.

Go over operations (2) and (3) again in the same order.

Re-seal the trimmers by applying a hot soldering iron.

REGANGING OF TUNING CONDENSERS.

If tuning or oscillator coils have been replaced or the associated wiring disarranged, the trimmers on sections VC2 and VC3 of ganged condensers must be re-adjusted. The re-trimming of I.F. transformers will also call for the readjustment of the ganged condensers.

Employ an 0.3 A.C. voltmeter (connected across output side of T2) as an output meter.

To check the position of the scale and pointer the ganged condenser vanes must be set to maximum capacity—the pointer should then register 560 metres.

NOTE.—It is important that some form of aerial and earth be coupled to the radio instrument in order to preserve correct operating conditions. Loosely couple oscillator to aerial lead.

Proceed to regang as follows :—

MEDIUM WAVES.

- (1) Switch on the oscillator and adjust to 220 metres.
- (2) With tuning scale set to 220 metres adjust trimmers on VC3 and VC2 in the order given.
Adjust for maximum deflection of output meter.
Check the adjustments by rotating screw of each trimmer first clockwise and then anti-clockwise.
If a correct setting has been made the meter reading should fall on either side of the critical point.

LONG WAVES.

- (3) Switch on the oscillator and adjust to 1,400 metres.
- (4) With tuning scale set to 1,400 metres adjust trimmer TC2 for maximum deflection of output meter.

ELECTRICAL INTERFERENCE.

Electrical machinery or flashing signs will invariably give rise to the type of interference known as "H.F." and will cause crackling or "frying" noises in the speaker. Attention is drawn to the activities of H.M. Post Office and the British Broadcasting Corporation in investigating this type of interference.

WHAT TO DO.

1. Make absolutely certain that the interference is not within the instrument by disconnecting the aerial and earth leads.
2. Obtain from a Post Office (or the B.B.C.) a copy of the special questionnaire form issued by them.
3. Fill in the form accurately, giving in addition to the answers required :—
 - (a) Name of the manufacturer of the receiver.
 - (b) The Manufacturer's Catalogue No. of the receiver.
4. Send the questionnaire back as directed, together with *brief* notes as to possible source of interference which your local knowledge may suggest.
5. **Do not** assure your customer that a cure will be effected.
6. The P.O./B.B.C. organization is one for investigating the *cause* of complaint with a view to ascertaining whether or not a cure can be effected. Such investigations may be both delicate and lengthy and require both goodwill and tact to bring to a successful conclusion. **Do not** suggest to the owner (if known) of the interfering apparatus that your application is in any way a measure of retaliation.
7. It is of the utmost importance that this valuable channel of co-operation with H.M. Post Office and the B.B.C. should not be employed until every possible test has been made to ensure that the interference complained of comes definitely from a source *exterior* to the instrument.

WARNING.

Marconi valves have been selected for this instrument because of their high performance and special electrical characteristics. Inferior performance or actual damage may result if valves other than the specified Marconi types are employed.

SPARE PART LIST

Part No.	Description.	Retail List Price.	Per
CABINET PARTS AND FITTINGS.			
		£ s. d.	
—	Cabinet, Polished	3 10 0	Each.
10475	Cabinet feet (felt)	0 0 6	Doz.
17138	Back for cabinet	0 1 3	Each.
12754	Screw for back	0 0 1	"
13268	Bracket for back	0 0 1	"
8602	Screw, securing brackets	0 0 2	Doz.
—	Battery shelf	0 2 9	Each.
16737	Accumulator shield	0 0 6	"
8602	Screw securing shield	0 0 2	Doz.
—	Baffle, with silk	0 2 3	Each.
17382	Silk only	0 1 0	"
8602	Screw, R.H. } securing baffle	0 0 2	Doz.
9539	Screw, F.H. }	0 0 1½	"
16046	Loudspeaker fret	0 2 6	Each.
—	Button } securing fret	0 0 1	"
9548	Screw }	0 0 3	Doz.
17213A	Tuning escutcheon, with transfers	0 2 0	Each.
17510	Transfer—M-L-O-G	0 0 1	"
17511	Transfer—L-D	0 0 1	"
8718	Screw, securing escutcheon	0 0 4	Doz.

SPARE PART LIST—continued.

Part No.	Description.	Retail List Price.	Per	
LOUDSPEAKER.				
16000R	Loudspeaker, complete with T2, output transformer	£ 2 6 0	Each.	
16020	Ornamental screw } securing loudspeaker	0 0 1	"	
14761	Ornamental washer }	0 0 7	Doz.	
16763A	Magnet	1 5 0	Each.	
11627	Nut } securing magnet to studs on cone chassis	0 0 6	Doz.	
3167	Washer, S.P. }	0 0 2	"	
16000Q	Cone chassis	0 3 0	Each.	
16401B	Speech coil and cone	0 5 0	"	
16007	Cardboard washer }	0 0 1	Doz.	
6314	Washer } securing spider of cone to studs on cone chassis	0 0 2	"	
1883	Spring washer }	0 0 3	"	
11636	Nut }	0 0 4	"	
16012	Felt	0 0 2	Each.	
10616D	T2—Output transformer	0 10 6	"	
12619	Screw securing T2 to base plate on cone chassis	0 0 6	Doz.	
16013A	Terminal panel on transformer with terminal tags and screws	0 1 6	Each.	
11228	Terminal screw on panel	0 0 4	Doz.	
8777	Screw, P.K., securing panel	0 0 6	"	
15719G	C18—0.002 mfd.	0 1 1	Each.	
16024	Dust bag	0 1 0	"	
RADIO UNIT.				
14940E	Radio Unit	7 0 0	Each.	
16725	Bolt } securing radio unit	0 0 1	"	
14997	Washer }	0 0 2	Doz.	
3167	Washer, S.P. }	0 0 2	"	
Marconi Valves.				
—	V1—VS24 Metallised—H.F. valve	—	—	
—	V2—S23 Plain—Detector Oscillator	—	—	
—	V3—VS2 Metallised—I.F. valve	—	—	
—	V4—HD21 Plain—2nd Detector	—	—	
—	V5—QP21—Plain Output valve	—	—	
17446	Valve Nut	0 0 6	Doz.	
ELECTRICAL COMPONENTS.				
Inductances.				
17215A	L1—Aerial coil—primary	} Aerial coil assembly	0 4 0	Each.
	L2—Suppressor coil—M.W.			
	L3—Aerial coil secondary—M.W.			
	L4—Aerial coil secondary—L.W.			
17217	Coil clamp	0 0 1	"	
11220	Screw } securing aerial coil assembly to screen	0 0 2	Doz.	
3166	Washer }	0 0 2	"	
17214	Screen	0 0 5	Each.	
17207	Tapped plate—one hole	0 0 1	"	
17208	Tapped plate—two holes	0 0 1	"	
11219	Screw } securing screen to condenser gang	0 0 3	Doz.	
3166	Washer, S.P. }	0 0 2	"	
8777	Screw, P.K. }	0 0 6	"	
1048	Washer }	0 0 2	"	
14966A	L5—H.F. anode coil—M.W.	}	0 2 6	Each.
	L6—H.F. anode coil—L.W.			
14967A	L 7—Oscillator coil, reaction	}	0 3 3	"
	L 8—Oscillator coil, reaction			
	L11—Oscillator coil, M.W.			
	L12—Oscillator coil, L.W.			
7601	Distance collar }	0 0 4	Doz.	
11230	Screw } securing anode coil and oscillator coil assemblies to sub- }	0 0 3	"	
3165	Washer, S.P. } chassis	0 0 2	"	
14553F	L9—1st I.F. bandpass primary } yellow spot	}	0 2 6	Each.
	L10—1st I.F. bandpass secondary }			
14553E	L13—2nd I.F. bandpass primary } red spot	}	0 2 6	"
	L14—2nd I.F. bandpass secondary }			
12917	Nut } securing I.F. coil former to stud	0 0 4	Doz.	
3166	Washer, S.P. }	0 0 2	"	
14961	Coil screen	0 0 5	Each.	
12917	Nut } securing coil screens	0 0 4	Doz.	
3166	Washer, S.P. }	0 0 2	"	

SPARE PART LIST—continued.

Part No.	Description.	Retail List Price.	Per
Choke and Transformers.			
16772A	CK1—I.F. choke	£ 0 2 0	Each.
16076F	T1—interval transformer	0 12 0	"
1048	Washer } securing T1	0 0 2	Doz.
12619	Screw, PK }	0 0 6	"
10616D	T2—output transformer (on loudspeaker)	0 10 6	Each.
14553H	I.F.T.1—complete with L9, L10, TC3 and TC4	0 5 3	"
14553G	I.F.T.2—complete with L13, L14, TC5 and TC6	0 5 3	"
7601	Distance collar } securing I.F.T.1 and I.F.T.2	0 0 4	Doz.
11629	Nut }	0 0 6	"
3165	Washer, S.P. }	0 0 2	"
Resistances.			
17541AC or 5787AC	R1—100 ohms	0 0 9	Each.
5787G or 17140G	R2—1 megohm	0 0 9	"
5787AG or 17140AG	R3—15,000 ohms	0 0 9	"
5787K or 17140K	R4—1,000 ohms	0 0 9	"
17541G or 5787G	R5—1 megohm	0 0 9	"
17541C or 5787C	R6— $\frac{1}{2}$ megohm	0 0 9	"
17541Z or 5787Z	R7—230,000 ohms	0 0 9	"
5787P or 17140P	R8—50,000 ohms	0 0 9	"
10450M or 5787AM	R9—7,500 ohms	0 0 9	"
17541C or 5787C	R10— $\frac{1}{2}$ megohm	0 0 9	"
5787C or 17140C	R11— $\frac{1}{2}$ megohm	0 0 9	"
17541Z or 5787Z	R12—230,000 ohms	0 0 9	"
6000AS	VR1—250,000 ohms volume control	0 4 2	"
15806	Distance collar } securing VR1	0 0 3	"
4400	Nut }	0 0 2	"
Condensers.			
15719E	C1—0.0005 mfd....	0 1 3	"
or 15193A	C1—0.0005 mfd....	0 0 9	"
1062	Washer } securing C1	0 0 3	Doz.
13806	Rivet }	0 0 4	"
16316B	C2—0.02 mfd.	0 0 9	Each.
16688B	C3—0.2 mfd. } condenser block	0 5 3	"
	C4—0.2 mfd. }		
	C12—2.0 mfd. }		
	C16—0.1 mfd. }		
12619	C17—0.1 mfd. }	0 0 6	Doz.
15719B	Screw, P.K., securing condenser block	0 0 9	Each.
or 2308A	C5—0.0001 mfd....	0 0 9	Each.
1062	Washer } securing C5	0 0 3	Doz.
13806	Rivet }	0 0 4	"
16691B	C6—0.4 mfd.	0 1 8	Each.
12619	Screw, P.K., securing C6	0 0 6	Doz.
15719B	C7—0.0001 mfd.	0 0 9	Each.
or 2308A	C8—0.00015 mfd.	0 0 9	"
15719Z	Rivet securing C8	0 0 4	Doz.
13806	C9—0.0017 mfd....	0 1 3	Each.
15719L	C10—0.0001 mfd.	0 0 9	"
15719B	Rivet securing C10	0 0 4	Doz.
or 2308A	C11—0.0001 mfd.	0 0 9	Each.
13806	C13—0.003 mfd....	0 1 4	"

SPARE PART LIST—continued.

Part No.	Description.	Retail List Price.	Per
	Condensers—continued.	£ s. d.	
16316A	C14—0.01 mfd. ...	0 0 9	Each.
15719C	C15—0.0002 mfd. ...	0 0 9	"
or 10012A	C15—0.0002 mfd. ...	0 0 8	"
15719G	C18—0.002 mfd....	0 1 1	"
16240D	TC1—0.00014 mfd. ...	0 1 2	Doz.
11328	Screw	0 0 2	Doz.
3165	Washer, S.P. } securing TC1 to screen on condenser gang ...	0 0 2	"
11629	Nut	0 0 6	"
16240C	TC2—0.00007 mfd. ...	0 1 2	Each.
or 11737C	TC2—0.00007 mfd. ...	0 1 3	"
10845	Screw	0 0 2	Doz.
3165	Washer, S.P. } securing TC2 to sub-chassis ...	0 0 2	"
11629	Nut	0 0 6	"
12640B	TC3 and TC4—twin 0.0001 pre-set condensers ...	0 2 1	Each.
12640B	TC5 and TC6—twin 0.0001 pre-set condensers ...		
14963A	Bracket, supporting pre-set condensers, with stud supporting L9, L10, L13 and L14 ...	0 0 4½	"
11381	Screw	0 0 4	Doz.
1062	Washer	0 0 3	"
7601	Distance collar } securing pre-set condensers to brackets and brackets to sub-chassis ...	0 0 4	"
3165	Washer, S.P. }	0 0 2	"
11629	Nut	0 0 6	"
14957A	VC1, VC2 and VC3—three-gang variable condenser with two trimmers ...	0 11 0	Each.
16025	Distance-piece	0 0 6	Doz.
3167	Washer, S.P. } securing gang condenser ...	0 0 2	"
17058	Screw	0 0 2	"
17211A	Scale drum ...	0 1 4	Each.
11773	Grub screw securing scale drum to spindle of gang condenser ...	0 0 5	Doz.
14976D	Scale ...	0 0 8	Each.
211	Screw, P.K. }	0 0 6	Doz.
1048	Washer	0 0 2	"
11227	Screw } securing scale to scale drum ...	0 0 6	"
3165	Washer, S.P. }	0 0 2	"
17218A	Scale guide bracket with rollers ...	0 0 3	Each.
4396	Washer } securing bracket to lamp bracket on top of S2... ...	0 0 2	Doz.
12619	Screw	0 0 6	"
17212A	Lampholder ...	0 0 4	Each.
16296A	PILOT LAMP—2-volt 0.06-amp., continuous burning ...	0 0 6	"
14945	Cursor ...	0 0 2	"
12968	Pointer ...	0 0 1	"
11235	Screw, securing pointers to cursor ...	0 0 3	Doz.
17210	Bracket, supporting cursor ...	0 0 2	Each.
11248	Screw	0 0 7	Doz.
1048	Washer } securing cursor to bracket and bracket to cursor mounting }	0 0 2	"
3165	Washer, S.P. } bracket (17209A) ...	0 0 2	"
17209A	Cursor mounting bracket, complete with bracket for condenser drive shaft and L.D. switch spindle ...	0 0 8	Each.
12619	Screw, P.K., securing cursor mounting bracket ...	0 0 6	Doz.
11676	Condenser drive shaft ...	0 0 2	Each.
16702A	Condenser drive shaft bush with friction sleeve ...	0 0 7	"
10674	Grub screw securing drive bush to drive shaft ...	0 0 4	Doz.
	Switches.		
14530B	S1—Local-distant switch ...	0 1 9	Each.
14697	Nut, securing S1 to bracket ...	0 0 11	Doz.
17204	Bracket, supporting S1 ...	0 0 1	Each.
8777	Screw, P.K. } securing bracket ...	0 0 6	Doz.
3166	Washer, S.P. }	0 0 2	"
17201A	Spindle, with crank and pin, operating S1 ...	0 0 3	Each.
17202	Washer } securing spindle ...	0 0 2	Doz.
17203	Bush	0 0 1	Each.
10674	Grub screw securing bush to spindle ...	0 0 4	Doz.
14950C	S2—On—Off and change-over switch ...	0 6 3	Each.
14954	Guard panel, marked A to M ...	0 0 2	"
8777	Screw, P.K. } securing S2 and guard panel ...	0 0 6	Doz.
1048	Washer	0 0 2	"
14952	Lamp bracket ...	0 0 1	Each.
14951	Top plate, bakelite ...	0 0 1	"
8777	Screw, P.K., securing top plate and lamp bracket ...	0 0 2	Doz.
11696A	Strip with six spring contacts ...	0 2 8	Each.
1062	Washer } securing contact strips ...	0 0 3	Doz.
8777	Screw, P.K. }	0 0 2	"

SPARE PART LIST—continued.

Part No.	Description.	Retail List Price.	Per
	Switches:—continued.	£ s. d.	
11051F	Rotor, with six contacts	0 0 10	Each.
11063	Collar, at rear end of rotor	0 0 2	"
10674	Grub screw, securing collar	0 0 4	Doz.
1039	Washer } at front end of rotor	0 0 2	"
12567	Spring }	0 0 6	"
12541A	Locating collar, with four pins	0 0 4	Each.
10674	Grub screw, securing locating collar	0 0 4	Doz.
12013	Tension spring for locating lever	0 0 9	"
14950B	Switch frame, rear, with locating lever and roller	0 0 8	Each.
14950	Switch frame, front	0 0 2	"
14953	Spindle	0 0 5	"
	Valveholders, Panels, Straps.		
10545	Valve panel (5-pin)	0 0 2	"
13703	Valve panel cover	0 0 2	"
10547	Valve panel cover, upper, with red spot	0 0 2	"
10546	Valve leg clip	0 0 7	Doz.
13804	Rivet securing above	0 0 3	"
17502	Valve panel (7-pin)	0 0 2	Each.
17501	Valve panel cover	0 0 4	"
17503	Valve leg clip	0 0 1	"
13813	Rivet securing 7-pin valve holder	0 0 1	Doz.
3152A	A. & E. panel, with two sockets and tags	0 0 4	Each.
16073A	P.U. panel, with two sockets and tags	0 0 4	"
11733A	Aerial coil connecting panel, with 3 tags	0 0 8	"
13803	Rivet securing above three panels	0 0 3	Doz.
14948A	Loudspeaker connection panel on mounting plate	0 0 6	Each.
8777	Screw, P.K., securing plate to sub-chassis	0 0 6	Doz.
14956A	Resistance panel, with 13 tags	0 2 3	Each.
14955	Insulating piece	0 0 6	Doz.
8777	Screw, P.K. } securing resistance panel to sub-chassis	0 0 6	"
1048	Washer }	0 0 2	"
14946	Strap	0 0 4	Each.
13246	Screw } securing straps at end of chassis	0 0 3	Doz.
3166	Washer, S.P. }	0 0 2	"
	Leads, insulating bushes, cleats.		
12757A	Set of battery leads, complete	0 7 0	Each.
8519	L.T. tags	0 0 1	"
16288A	Plug—red	0 0 2	"
16288B	Plug—black	0 0 2	"
	Lead labels—		
15453A	L.T.+	0 0 1	"
15453B	L.T.—	0 0 1	"
15453C	H.T.—	0 0 1	"
15453D	H.T.+1	0 0 1	"
15453E	H.T.+2	0 0 1	"
15453F	H.T.+3	0 0 1	"
15453G	G.B.C.+	0 0 1	"
15453H	G.B.—1	0 0 1	"
15453J	G.B.—2	0 0 1	"
3153	Cleat securing leads to sub-chassis	0 0 3	Doz.
3338	Tag for anode leads	0 0 6	"
17445	Clip	0 0 1½	Each.
12761A	Loudspeaker lead, with tags	0 3 0	"
15159	Tag	0 0 3	Doz.
3338	Tag	0 0 6	"
11376	Screw } securing L.S. lead to L.S. panel of sub-chassis... ..	0 0 6	"
1048	Washer }	0 0 2	"
4714	Rubber bush	0 0 1	Each.
or 16756	Insulation bush	0 0 1	"
10086	Rubber bush	0 0 1	"
or 16755	Insulation bush	0 0 1	"
7155	Cleat, securing L.S. leads to cabinet	0 0 1	"
12613	Cleat, securing battery leads to cabinet	0 0 1	"
8502	Screw securing cleats	0 0 2	Doz.
351790100	Rubber covered flex for LT leads	0 2 0	Doz. yds.
352/30144	Braided flex—		
	Yellow	0 2 0	"
352/30155	Green	0 2 0	"
352/30111	Brown	0 2 0	"
352/30122	Red	0 2 0	"

SPARE PART LIST—continued.

Part No.	Description.	Retail List Price.	Per
Leads, insulating bushes, cleats—continued.			
Braided flex—contd.			
352 30100	Black	£ s. d. 0 2 0	Doz. yds.
352/30109	Black/white	0 2 0	"
352/30120	Red/black	0 2 0	"
352/30154	Green/yellow	0 2 0	"
352/30129	Red/white	0 2 0	"
352/30112	Brown/red	0 2 0	"
Varnished cotton sleeving—			
223/14440	Yellow, 10 mm.	0 1 0	Yard.
223/12440	Yellow, 8 mm.	0 0 10	"
223/07440	Yellow, 3 mm.	0 0 3 $\frac{1}{2}$	"
223/03440	Yellow, 1 mm.	0 0 2 $\frac{1}{2}$	"
223/03770	Violet, 1 mm.	0 0 2 $\frac{1}{2}$	"
223/03550	Green, 1 mm.	0 0 2 $\frac{1}{2}$	"
223/03501	Green/black, 1 mm.	0 0 2 $\frac{1}{2}$	"
223/03000	Black, 1 mm.	0 0 2 $\frac{1}{2}$	"
223/03220	Red, 1 mm.	0 0 2 $\frac{1}{2}$	"
223/03110	Brown, 1 mm.	0 0 2 $\frac{1}{2}$	"
223/03421	Yellow/red, 1 mm.	0 0 2 $\frac{1}{2}$	"
223/03880	State, 1 mm.	0 0 2 $\frac{1}{2}$	"
223/03660	Blue, 1 mm.	0 0 2 $\frac{1}{2}$	"
350/00200	Copper flex	0 0 1	"
398/20340	Metal braid	0 0 4	"
301/02220	No. 22 S.W.G. tinned copper wire	0 2 6	Lb.
222/00040	Black thread—four cord	0 0 2	Doz. yds.
16758A	Knob—outer	0 0 8	Each.
11773	Grub screw—cupped	0 0 5	Doz.
16759A	Knob—inner	0 0 7	Each.
10674	Grub screw—pointed	0 0 4	Doz.
16289E	Aerial plug—mauve	0 0 2	Each.
16289B	Earth plug—black	0 0 2	"
16289D	P.U. plug—Blue	0 0 2	"
17205	Instruction card	0 0 6	"
17384	Model, Warning and Patents label	0 0 1 $\frac{1}{2}$	"
—	H.T. battery—175v.—Cat. No. B550	—	—
—	Accumulator—2v. 30A.H.—2NAN7/4... ..	—	—

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