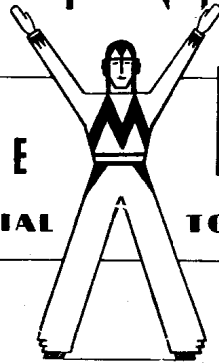


MARCONI PHONE

SERVICE MANUAL

PRIVATE AND CONFIDENTIAL

TO THE TRADE ONLY



MODELS 240 & 245 — 4 VALVE T.R.F. A.C. MAINS CONSOLE AND RADIOGRAM

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NOV.
1935
1936 SERIES
NUMBER THREE
PART NO. 22367
ISSUE 1.

BRIEF SPECIFICATION.

VOLTAGE RANGE.

200 to 250 volts (A.C.).

Model 240—

50 to 100 cycles.

Model 245—

50 to 60 cycles.

POWER CONSUMPTION.

Radio—76 watts.

Gramophone—90 watts (Model 245 only).

SPEECH OUTPUT.

Approximately 3 watts (undistorted).

Anode dissipation, 7.5 watts.

WAVELENGTH RANGE.

Medium waves—200 to 550 metres.

Long waves—1,000 to 2,000 metres.

MARCONI VALVES.

VMS4B—MH4I—N4I—UI2.

DIMENSIONS.

			Height.	Width.	Depth.
Model 240	...	...	34 inches.	16½ inches.	10 inches.
Model 245	...	...	34 "	16 "	14 "

WEIGHT.

Model 240—46 lb. net. 58 lb. gross.

Model 245—61 lb. net. 75 lb. gross.

LOUDSPEAKER. Part No. 21880 C.

The loudspeaker unit includes electrolytic smoothing condensers C17 and C18, and the output transformer T2.

D.C. resistance coil speech, 1.75 ohms approx.

Impedance at 800 cycles, 2.5 ohms approx.

D.C. resistance of field, 2,000 ohms approx.

The field of the speaker is in the positive H.T. lead and functions as smoothing in conjunction with the electrolytic condensers. A hum neutralizing coil (which is trimmed by a resistance) is fitted. For connections, see circuit diagram, Fig. 1, page 4.

PICK-UP. Part No. 17670L. (Model 245 only).

D.C. resistance—4,000 ohms.

This pick-up incorporates a special type of damping rubber, and therefore should only be interchanged with one of exactly similar type.

MOTOR. Part No. 21902A or 22900A Squirrel Cage Types. (Model 245 only).

Service particulars of these motors will be supplied by the Service Department on request.

These motors must be regularly lubricated with a good quality light machine oil. The oil holes will be found underneath the turntable.

CIRCUIT DESCRIPTION.

AERIAL COUPLING.

Aperiodic transformer coupling to the first tuned circuit with a resistance fed aerial tapping AE2 for localities close to a powerful station.

H.F. AMPLIFIER.

Marconi VMS4B has a variable bias control VRI, which operates as a volume control, and tuned anode-capacity coupling to the detector.

DETECTOR.

Marconi MH4I—a high slope triode operating as a grid detector with reaction coils L6 and L7, controlled by the variable condenser VC3, which acts as a sensitivity control. Adequate H.F. filtration is provided by L8, C5. The detector is resistance capacity (R5, C7) coupled to the pentode output valve.

OUTPUT.

Marconi N4I, a high efficiency pentode which feeds the moving coil speaker via the output transformer T2.

RECTIFIER.

Marconi UI2 supplies H.T. current to all valves.

GRAMOPHONE.

In Model 245 the pick-up output is fed direct to the grid of the output pentode via the gramophone volume control VR3.

SERVICE DATA.

MODEL 240.

For circuit and component diagrams, Preliminary Tests, Continuity Checks and H.F. Tests, etc., see Service Manual for Model 235, Part No. 21222.

MODEL 245.

Circuit and component diagrams are given on pages 4 and 5. For Preliminary Tests, Continuity Checks, H.F. Tests, etc., see Service Manual for Model 235, Part No. 21222.

DISMANTLING.

The motor board on this Model must be removed to obtain access to the chassis and loudspeaker. Do not attempt to remove the back panel.

1. Lift motor board and disconnect pick-up and motor.
2. Remove switch lead and mains lead from transformer panel.
3. Remove four screws holding chassis mounting board and remove the control knobs.
4. The chassis, mounting board, **and loudspeaker**, can now be removed in one unit by sliding back and lifting out of the cabinet.

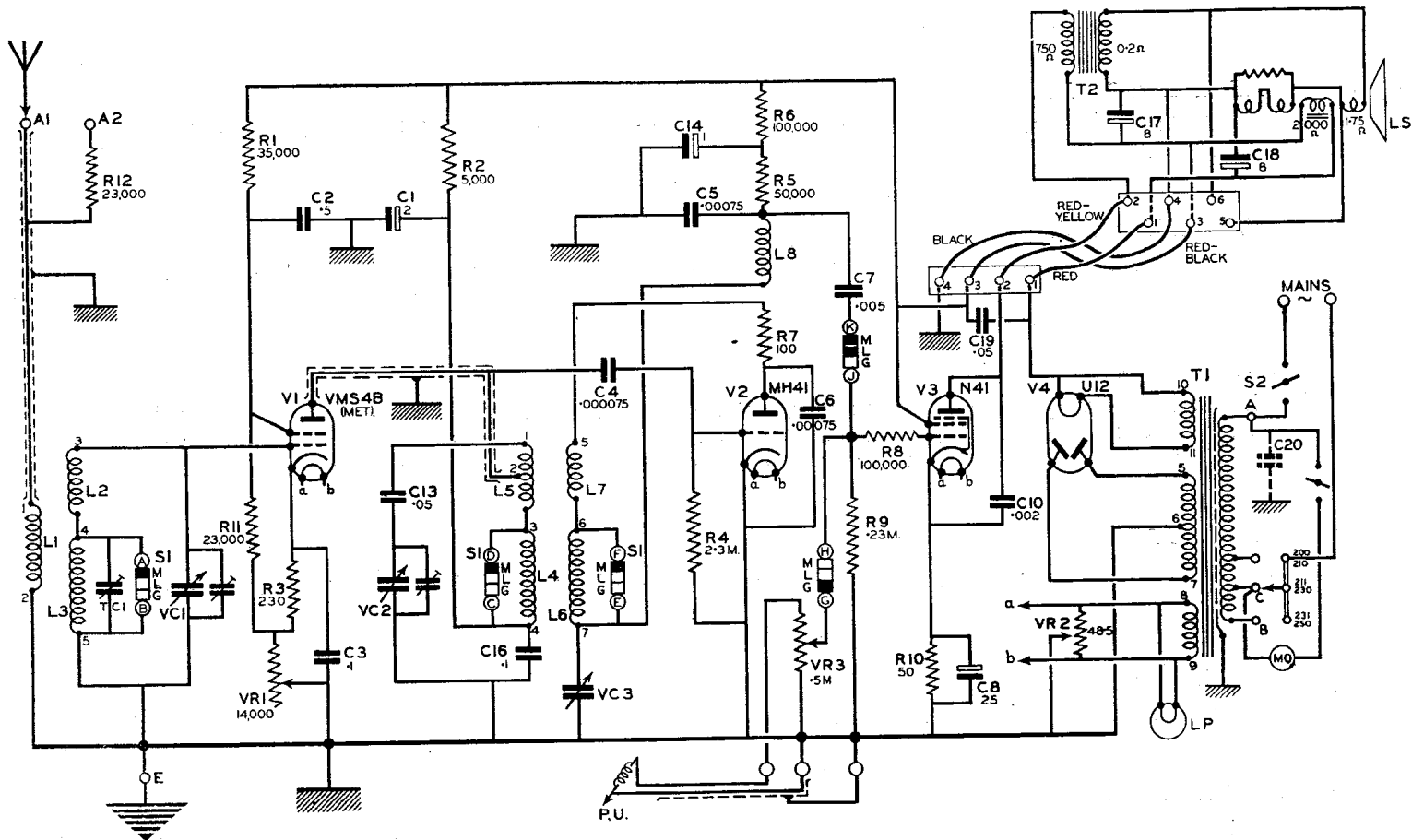


Fig. 1.

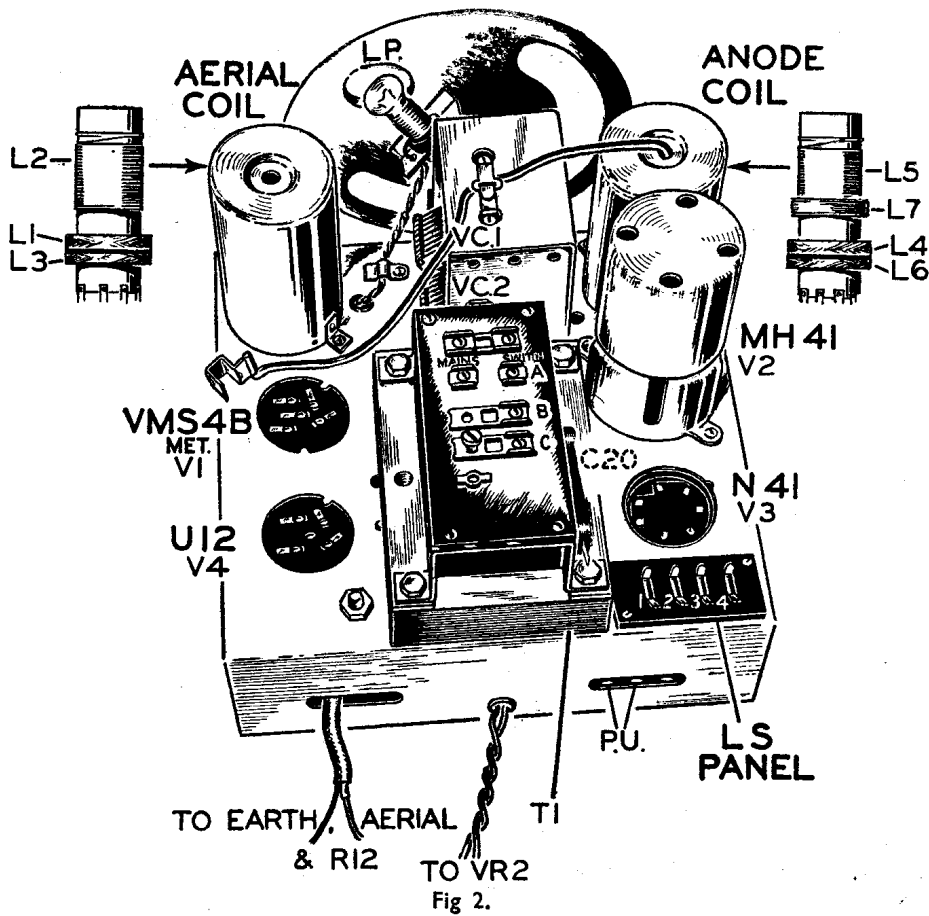
VALVE TABLE.

This Table was taken with the Volume Control set to maximum (except where otherwise stated) and reaction at minimum. Readings ± 20 per cent.

	V1 VMS4B	V2 MH4I	V3 N4I	V5 UI2
ANODE FRAME VOLTS	190—170*	65	170	A.C.
ANODE FEED mA	0—4.0*	1.0	42	—
SCREEN FRAME VOLTS	100—70*	—	200	—
SCREEN FEED mA	0.6*	—	1.0	—
CATHODE FRAME VOLTS	26—1.5*	—	2.5	330

* According to position of volume control—first reading for minimum.
 Total H.T. current measured at terminal 1 60 mA.
 Current through potentiometers R1, R11 and VR1 3 mA.

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 Valves are employed.



NEW WIRE COLOUR CODE.

H.T. positive (+)	...	...	...	Red.
Anodes of valves when not direct to H.T.	...	...	...	Red/Yellow.
Screening grids when not direct to H.T.	...	...	...	Red/Black.
Grid circuits	...	...	...	Green.
Mains	...	...	...	Orange.
Heaters, filaments and cathodes	...	...	...	Brown.
General purpose colour	...	...	...	Yellow.

Yellow will be used for leads not falling in the general code, and when stocks of any colour are temporarily exhausted in the factory.

RESISTANCE COLOUR CODE.

BODY and END Colours.

SPOT Colours.

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

SPOT Colours. (Additional 0's.)

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

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

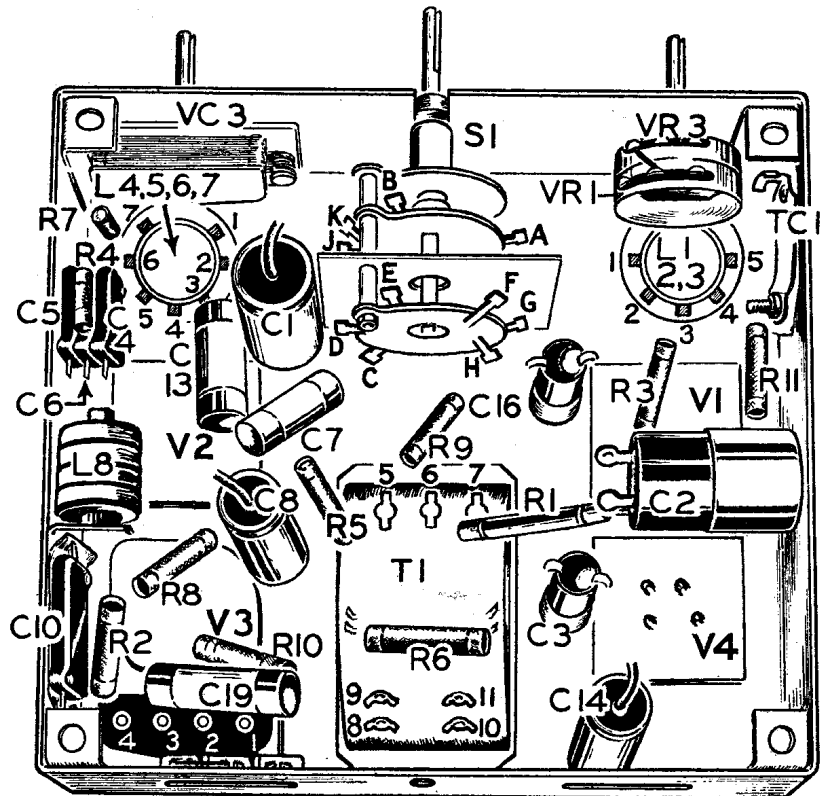
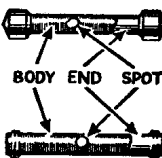


Fig. 3.

ELECTRICAL INTERFERENCE.

Before attributing disturbing noises to a fault within the instrument the following simple tests should be made :—

Switch on the receiver and, having tuned to a point where signals are not being received, make and break the aerial lead. If the aerial is picking up disturbances a decrease in noise will be noticed when aerial is disconnected. On the other hand, the interference may be due to high frequency (H.F.) brought to the instrument via the current supply, or to a fault in the receiver. Carefully check the whole receiver for loose or dirty contacts or joints.

In districts where severe interference is experienced, due to man-made static being picked up by the aerial downlead, the fitting of ANTI-STATIC AERIAL EQUIPMENT may be of great benefit. This equipment is obtainable from :—

E.M.I. SERVICE, LTD.,

SHERATON WORKS,

HAYES, MIDDLESEX.

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 the Post Office and the British Broadcasting Corporation in investigating this type of interference.

If it is quite certain after the tests previously described that the interference is not within the instrument, obtain from a Post Office (or the B.B.C.) a copy of the special questionnaire form issued on Electrical Interference, fill this up accurately and return it as directed.

The P.O./B.B.C. organisation is one for investigating the **cause** of complaint to ascertain whether a cure can be effected. Such investigations may be delicate and lengthy, and require both goodwill and tact to bring to a successful conclusion. On no account should it be suggested to the owner (if known) of the interfering apparatus that your application to the B.B.C. is in any way a measure of retaliation.

It is of the utmost importance that this valuable channel of co-operation with the 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.

THE INTERFERENCE MANUAL.

You are advised, in your own interests, to obtain the Marconiphone Manual "Electrical Interference with Broadcast Reception." This is a most comprehensive treatment of the subject, extending over 32 pages and dealing fully with the symptoms, cause and remedy of all types of interference. In conjunction with the Manual, four special 12-inch Records have been made of the various interference noises, each fully cross-indexed for rapid identification.

The net price of the Manual and Records in an album is 7s. 6d. Orders should be sent to the Marconiphone Company, Ltd., Radio House, Tottenham Court Road, London, W.1.

SPARE PART LIST.

MODEL 240.

Part No.	Description.	Parts per Inst.	Finish.	Retail List Price.	Per
	Instructions.			£ s. d.	
21936	Instruction card	1	—	0 0 6	Each.
21934	Model, warning and patents label	1	—	0 0 6	Doz.
	CABINET PARTS AND FITTINGS.				
	Cabinet	1			
—	Baffle board, with silk	1	Pol Std	4 7 6	Each.
21931	Silk	1	—	0 1 6	"
9539	Screw, securing baffle board	8	—	0 0 9	"
21898	Dome, for bottom	4	—	0 1 0 ¹ / ₂	Doz.
21897A	Tuning escutcheon	1	BzP	0 3 6	Each.
21889	Window	2	—	0 0 4	"
21913A	Scale	1	—	0 2 6	"
21810	Screw	3	BzP	0 0 7	Doz.
21811	Clip	3	—	0 0 6	"
1011	Washer } Securing tuning escutcheon	3	—	0 0 2	"
21825	Nut, slotted }	3	WN	0 0 6	"
21917A	Cabinet back—upper (printed)	1	—	0 1 3	Each.
21916A	Cabinet back—lower (printed)	1	—	0 2 6	"
8602	Screw, securing cabinet backs	10	ParB	0 0 2	Doz.
19214E	Mains On/Off switch	1	BzSP local	0 1 9	Each.
14697	Nut, securing switch	1	—	0 0 11	Doz.
19875	Switch escutcheon	1	BzSP	0 0 6	Each.
21238	Switch plate, with cleat for lead	1	CdP-	0 0 1	"
	LEADS, PLUGS, ETC.				
21818A	Switch lead with two tags	1	—	0 0 6	Each.
21945A	Mains lead, with two tags	1	—	0 1 6	"
11882	Tag, on above leads	4	SP	0 0 4	Doz.
21942A	Loudspeaker lead	1	—	0 1 9	Each.
16578	Cleat, for L.S. lead	3	CdP	0 0 6	Doz.
8692	Screw, securing cleat... ..	3	—	0 0 3	"
21903A	Mains plug	1	—	0 0 9	Each.
16289J	Aerial plug—Yellow	1	—	0 0 2	"
16289B	Earth plug—Black	1	—	0 0 2	"
18888A	Carton for mains lead, etc.	1	—	0 0 1	"
	CONTROLS.				
10691B	Knob—Tune	—	—	0 0 7	Each.
10691E	Knob—Sensitivity	—	—	0 0 7	"
10691F	Knob—Wave change	—	—	0 0 7	"
10691C	Knob—Volume	—	—	0 0 7	"
16546	Screw, PK, securing knobs	—	—	0 0 7	Doz.
	RADIO UNIT.				
21800B	Radio Unit —For spares, see Model 235 S.P.L.	1	—	4 18 0	Each.
22007	Screw, O BA × 7/8-in., hexagonal head } securing radio unit	4	WN	0 0 6	Doz.
3531	Washer }	4	WN	0 0 2	"
3168	Washer, SP }	4	—	0 0 2	"
	LOUDSPEAKER.				
21880C	Loudspeaker —For spares, see Model 235 S.P.L.	1	—	1 12 9	Each.
21855	Screw, 2BA × 7/8-in., hexagonal head } securing loudspeaker	4	WN	0 0 6	Doz.
12094	Washer }	4	WN	0 0 4	"
3167	Washer, SP }	4	—	0 0 2	"
11627	Nut }	4	WN	0 0 6	"

MODEL 245.

Part No.	Description.	Parts per Inst.	Finish.	Retail List Price.	Per
	Instructions.			£ s. d.	
22188	Warning label	1	—	0 0 6	Doz.
21937	Instruction card	1	—	0 0 6	Each.
21915	Transfer A, E, and HC	1	—	0 0 9	Doz.
	CABINET PARTS AND FITTINGS.				
F9108C	Cabinet	1	Pol	5 0 0	Each.
—	Lid for cabinet	1	Pol	1 4 0	"
22110A	Lid Hinge	2	BzP	0 0 3	"
9559	Lid hinge—Screw	8	—	0 0 4	Doz.
21923	Felt for top of body—Side	2	—	0 0 1	Each.
21924	Felt for top of body—Back or front	2	—	0 0 1½	"
21925	Felt for motor board bearer—Front	1	—	0 0 1	"
21926	Felt for motor board bearer—Side, front	2	—	0 0 6	Doz.
21927	Felt for motor board bearer—Side, back	2	—	0 0 4	"
—	Motor board	1	Pol	0 7 0	Each.
8684	Motor board—Screw	4	BzP	0 0 6	Doz.
14670	Motor board—Lifting knob	1	BzP	0 0 6	Each.
11411	Motor board—Lifting knob screw	1	WN	0 0 2	Doz.
12775	Insert nut in shelf	8	ParB	0 0 1	Each.
—	Baffle board with silk	1	—	0 2 6	"
21943	Silk only	1	—	0 0 9	"
9539	Baffle board screw	8	—	0 0 1½	Doz.
22337	Baffle board felt—Top or bottom	2	—	0 0 4	"
22338	Baffle board felt—Side	2	—	0 0 3	"
6526	Dome for base	4	Pol	0 0 6	"
21897A	Tuning escutcheon	1	BzP	0 3 6	Each.
21889	Window	2	—	0 0 4	"
21913A	Scale	1	—	0 2 6	"
21811	Clip	3	—	0 0 6	Doz.
21810	Screw } Securing tuning escutcheon	3	BzP	0 0 7	"
21825	Nut }	3	WN	0 0 6	"
18899	Needle box clip	1	BzP	0 0 6	Each.
8602	Screw, securing clip in cabinet lid	2	BzP	0 0 2	Doz.
19214E	Mains on/off switch	1	BzP	0 1 9	Each.
21238	Switch plate	1	CdP	0 0 1	"
14697	Nut, securing switch	1	WN	0 0 11	Doz.
19875	Switch escutcheon	1	BzP	0 0 6	Each.
21910	Metal panel for VR2 and A.E. panel	1	BzP	0 0 9	Each.
11805	Screw, P.K. } Securing metal panel to back of cabinet	4	"	0 0 6	Doz.
4396	Washer }	4	"	0 0 2	"
14567D	VR2 hum control	1	"	0 1 0	Each.
11017	Spacer } Securing VR2 to metal panel	2	"	0 0 3	Doz.
18305	Rivet }	2	"	0 0 3	"
21852A	A. and E. panel with three socket tags	1	—	0 0 7	Each.
21853	A. and E. socket tag	3	SP	0 0 6	Doz.
14566	Rivet, securing A. and E. panel to metal panel	2	—	0 0 2	"
	MOTOR BOARD FITTINGS.				
21902A	Motor, including fixing screws	1	—	1 15 0	Each.
21940B	Turntable	1	BzP	0 5 6	"
3569	Felt	1	—	0 0 6	"
282	Spring clip	1	—	0 0 2	"
13869	Spring ring	1	—	0 0 6	Doz.
1002	Turntable clip	1	NG	0 0 6	"
21911A	Regulator	1	BzP	0 0 6	Each.
13387	Screw, securing regulator to motor	1	WN	0 0 3	Doz.
6255	Regulator plate	1	BzP	0 0 4	Each.
2418	Screw, securing regulator plate	2	"	0 0 3	Doz.
230E	Auto brake	1	"	0 7 3	Each.
2418	Screw, securing auto brake	3	WN	0 0 3	Doz.
246	Indicator plate	1	BzP	0 0 4	Each.
8602	Screw, securing indicator plate	2	"	0 0 2	Doz.
9430	Waste needle bowl	1	AcD	0 0 4	Each.
4369	Waste needle bowl lid	1	"	0 0 9	"
3484	Waste needle bowl support	1	CdP	0 0 2	"
9932	Waste needle bowl support screw	3	WN	0 0 2	Doz.
21904B	Pick up rest	1	BzP	0 1 0	Each.
21906	Pick up rest felt	1	—	0 0 2	Doz.
2418	Screw, securing rest	2	BzP	0 0 3	"

MODEL 245—continued.

Part No.	Description.	Parts per Inst.	Finish.	Retail List Price.	Per
PICK-UP.					
				£ s. d.	
17670L	Pick-up ...	1	—	} 1 12 0	Each.
17494	Trade mark transfer ...	1	—		
17670	Pick-up arm ...	1	—	0 1 6	"
21920A	Pick-up head assembly ...	1	—	0 10 0	"
21920	Pick-up head moulding ...	1	—	0 0 9	"
16101	Pole piece ...	2	WN	0 1 9	"
16113	Pole piece screw ...	4	"	0 0 8	Doz.
16111C	Coil ...	1	—	0 2 0	Each.
16109	Armature ...	1	CdP	0 0 6	"
16103	Armature pivot ...	2	—	0 0 6	Doz.
21921	Damping rubber ...	1	—	0 0 1	Each.
16104	Damping rubber clamp ...	1	—	0 0 5	Doz.
16126	Damping rubber clamp screw ...	2	WN	0 0 4	"
19132	Needle screw ...	1	{ BzSp local	0 0 1½	Each.
21907	Magnet ...	1		0 3 0	"
21908	Clip ...	1	—	0 0 4	Doz.
16118	Bracket for lead cover ...	1	CB	0 0 1	Each.
11238	Screw	1	BzP	0 0 2	Doz.
21036	Washer } Securing clip and bracket ...	1	—	0 0 2	"
11630	Nut }	1	WN	0 0 6	"
16119	Sleeve, covering coil connections to lead ...	2	—	0 0 10	"
16112	Screw	2	WN	0 0 1	Each.
21909	Retaining rubber } Securing head assembly to P.U. arm	2	—	0 0 4	Doz.
3820	Washer }	2	WN	0 0 2	"
19156A	P.U. lead ...	1	—	0 1 3	Each.
16700	Lead cover ...	1	—	0 0 3	Doz.
18769	Bracket } Securing lead cover to P.U. arm	1	BME n	0 0 1½	Each.
11237-	Screw }	1	BzP	0 0 5	Doz.
16121	Fixing base ...	1	—	0 0 8	Each.
16122	Support pillar ...	1	—	0 0 11	"
16114	Pivot screw, securing P.U. arm to support pillar ...	1	BzP	0 0 1½	"
16107A	Spring, with anchor rings ...	1	OB	0 0 2	"
16108	Spring anchor ...	1	WN	0 0 6	Doz.
17001	Spacer for balls ...	1	"	0 0 3	Each.
3519	Ball ...	8	—	0 0 1½	Doz.
16128	Locking screw ...	1	BzP	0 0 8	Each.
16127A	Brake arm and pin ...	1	"	0 0 11	"
11228	Screw, securing brake arm ...	3	"	0 0 4	Doz.
17611	Dust washer ...	1	—	0 0 1	"
17693	Pin ...	1	—	0 0 2	Gross.
9547	Screw, securing pick-up ...	3	BzP	0 0 4	Doz.
LEADS, PLUGS, CLEATS, ETC.					
21818A	Switch lead, with two tags ...	1	—	0 0 6	Each.
21947A	Motor lead, with three tags ...	1	—	0 0 7	"
21945A	Mains lead, with two tags ...	1	—	0 1 6	"
11802	Tag, on above leads ...	7	SP	0 0 4	Doz.
21816A	Loudspeaker lead ...	1	—	0 1 0	Each.
	P.U. lead—see under Pick-up.				
21903A	Mains plug ...	1	—	0 0 9	"
16289J	Plug, yellow } For P.U. lead, aerial and earth ...	2	—	0 0 2	"
16289B	Plug, black }	3	—	0 0 2	"
18888A	Carton for mains lead ...	1	—	0 0 1	"
7155	Cleat, for leads and for securing valve packing ...	4	CdP	0 0 1	"
8602	Screw, for cleats ...	4	WN	0 0 2	Doz.
LOUDSPEAKER.					
21880C	Loudspeaker ...	1	—	1 12 9	Each.
21854	Screw } Securing loudspeaker to insert nuts (12775) }	4	WN	0 0 6	Doz.
3618	Washer, SP }	4	—	0 0 2	"

MODEL 245—continued.

Part No.	Description.	Parts per Inst.	Finish.-	Retail List Price.	Per
RADIO UNIT.					
				£ s. d.	
21800C	Radio unit	1	—	4 18 0	Each.
11303	Screw	4	WN	0 0 2	Doz.
2005	Washer	4	CdP	0 0 1½	"
3460	Spring washer	4	—	0 0 3	"
11303	Screw	4	—	0 0 2	"
1038	Washer	4	—	0 0 6	"
3168	Washer, SP	4	—	0 0 2	"
All spares for radio unit as for 21800B (radio unit used on table model) with the following exceptions :—					
18300CC	VRI and VR3—volume control, with nut and washer	1	—	0 5 0	Each.
21919	Indicator plate	1	—	0 0 7	Doz.
13802	Rivet, securing indicator plate to chassis	2	—	0 0 2	Doz.
21918A	Indicator and bush	1	—	0 0 3	Each.
16564	Screw, PK, securing bush to spindle of volume control	1	—	0 0 7	Doz.
16316H	C7 0·005 mfd.	1	—	0 0 9	Each.
16316C	C19 0·05 mfd.	1	—	0 0 9	"
21866A	SI. Change over switch, with nut and washer	1	—	0 9 0	"
CONTROLS.					
10691B	Knob—Tune	1	ChF	0 0 7	Each.
10691E	Knob—Sensitivity	1	"	0 0 7	"
10691D	Knob—Switch	1	"	0 0 7	"
10691C	Knob—Volume	1	"	0 0 7	"
16564	Screw, PK, securing knobs	4	"	0 0 7	Doz.
VALVES.					
V1—VMS4B—Met.		V3—N41—Clear.			
V2—MH41—Clear.		V4—U12—Clear.			

" FINISH " CODE.

AcD	Acid Dip	ParB	Parkerised Black
BME n	Black Matt Enamel	OB	Oil Black
BzP	Bronze Polish	ParBEn	Parkerised Black Enamel
CB	Camera Black	Pol	Polished
CdP	Cadmium Plate	SP	Silver Plate
ChF	Chrome Filled	Std	Standard
NG	Nickel Gloss	WN	White Nickel

In order to expedite delivery of spare part orders, please quote :—

1. Model number and serial number.
2. Spare part number, description, and " finish " as given in the above list.
3. Quantity required.

Unless full particulars are quoted, delay in execution of orders must inevitably result.

Order spare parts from :—

E.M.I. SERVICE, LTD.,
SHERATON WORKS,
HAYES, MIDDLESEX.

Telephone : Southall 2468.

Telegraphic Address : Service, Hayes, Middlesex.

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