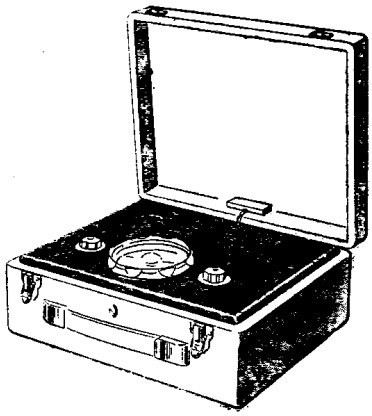
MARCONIPHONE SERVICE MANUAL

5-VALVE
TRANSPORTABLE RECEIVER
FOR A.C. MAINS OR
BATTERY OPERATION

★

MODEL T36AB



*** ERRATA**

Service Manual Models TARG39A, ARG40A, ARG41A (Part No. 93311). Page 9. Under Switches. S2 in each case should read S3. S3 should read S2. * Please correct your Service Manual now. Part No. 93311A.

NAME IN RADIO

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Part No. 93387

May, 1955

MODEL T36AB

SPECIFICATION

Physical

Height	4½ inches	Approx. Overall.
Length	12¼ inches	
Depth	10¼ inches	
Weight	8½ lbs. (including batteries) approx.	

Mains Supply and Consumption

195—255 volts, 50—100 cycles A.C. only.
Consumption—15 watts approx.

Battery Supply and Consumption

H.T.—90 volts (Ever Ready type B126).
L.T.—7·5 volt (Ever Ready type AD38).
Consumption—H.T.—12 mA.
L.T.—52 mA.

Wave Ranges

V1	X18	Frequency Changer.
V2	W17	I.F. Amplifier.
V3	ZD17	Detector A.G.C. and A.F. Amplifier.
V4	N19	Output Amplifier.
V5	U142	Rectifier.

Intermediate Frequency

470 kc/s.

Rated Output.

250 milliwatts max. approx.

Loudspeaker

5-inch permanent magnet type. The speech coil has a D.C. resistance of 2·5 ohms and an impedance of 3 ohms at 400 cycles.

BRIEF CIRCUIT DESCRIPTION

On mains operation the supply is fed via auto-transformer TR2 to the half wave rectifier V5. The rectified output from V5 is smoothed by C25, R19 and C23 and applied direct to the H.T. line and also via R18 to the series-connected filaments.

Each valve is biased by the voltage existing between its filament and chassis. On battery operation the voltage across R16 (between the H.T. negative line and chassis) is applied to the grid of the output valve (V4) as additional bias to economise H.T. consumption. Shunt resistors R6, R9, R14, connected between the negative side of the filament and chassis on valves V1, V2 and V4 limit the filament current to the rated value by by-passing the amount approximately equal to the anode and screen current, which would otherwise be superimposed on the filament current of the next valve down in the chain. As V3 is at the low potential end of the chain one side of the filament is connected directly to chassis and no shunt resistor is necessary.

INSTALLATION

The receiver is fitted with a built-in aerial and no external aerial is necessary.

Before operating the receiver, proceed as follows:—

1. Release the locking screw, adjacent to the centre of the carrying handle, and raise the control panel. Care should be taken not to damage the leads from the frame aerial (early models only).

2. Check that the 3-pin H.T. plug and the 2-pin L.T. plug are firmly inserted in their respective batteries.

3. For mains operation the Voltage Adjustment Panel (underside chassis illustration) should be inserted into the position marked with the voltage including that of your supply.

4. Fit a suitable 2-pin plug, preferably a flat type, to the mains lead, so that it can be easily stowed in the compartment under the control panel when not in use.

I.F. & R.F. ALIGNMENT

General

If the I.F. circuits have been disturbed complete I.F. and R.F. alignment must follow.

Whilst aligning, the input to the receiver must be progressively reduced as the circuits are brought into line so that the output does not exceed 20 mW (0·25 V. across the speech coil).

Intermediate Frequency

Set the Selector Switch to M.W., the Volume Control fully clockwise and the Gang Capacitor to maximum capacity (clockwise). A 0·1 μF capacitor should be inserted in each of the signal input leads.

1. Inject a modulated signal of 470 kc/s into the grid of V1 (pin 6).

2. Adjust coils L10, L9, L8, and L7 in that order for maximum output.

3. Repeat operations 1 and 2 until no further improvement can be obtained.

Radio Frequency

Connect a small loop aerial to the output leads of a signal generator and set up the loop at a distance of approximately 2 feet from the frame aerial or ferrite rod aerial.

Medium Wave

Set Selector Switch to M.W. and the Volume Control fully clockwise.

Op. No.	Scale Pointer Setting (Metres).	Tune Test Oscillator to Metres.	kc/s.	Operation.
1	500	500	600	Adjust L4 for maximum output.
2	200	200	1,500	Adjust TC4 for maximum output.
3	500	500	600	Adjust L2 or *L11 for maximum output.
4	200	200	1,500	Adjust TC3 for maximum output.
5	—	—	—	Repeat operations 1 to 4.

Long Wave

Set Selector Switch to L.W. Volume Control as before.

Op. No.	Scale Pointer Setting (metres).	Tune Test Oscillator to Metres.	kc/s.	Operation.
1	1,875	1,875	160	Adjust L6 for maximum output.
2	1,000	1,000	300	Adjust TC1 for maximum output.
3	1,875	1,875	160	Adjust L3 or *L12 for maximum output.
4	1,000	1,000	300	Adjust TC2 for maximum output.
5	—	—	—	Repeat operations 1 to 4.

** NOTE.—L11 and L12 are adjusted by sliding the coils along the ferrite rod. When the coils are adjusted they should be secured with tape.*

MODIFICATIONS

On later production models a ferrite rod aerial is fitted and the illustration on the right shows the circuit changes, which are as follows:—

Coils L11 and L12 are wound on the ferrite rod and replace coils L1, L2 and L3.

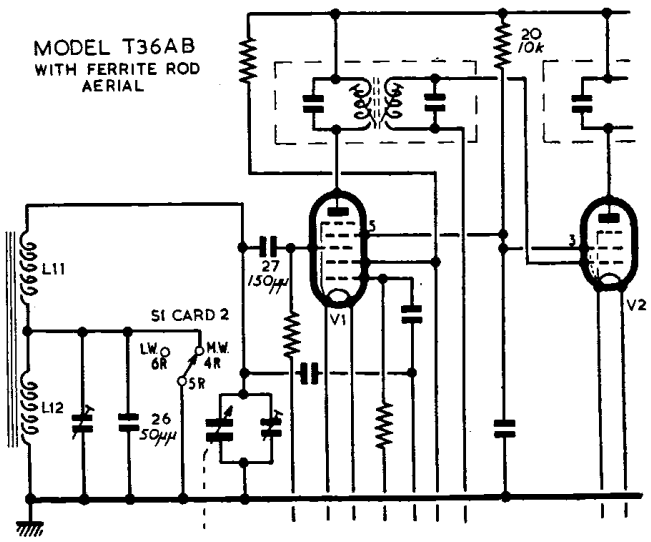
C26—50 μμF replaces C4, 35μμF and fitted between tags 4R and 5R of S1, card 2.

C27—150 μμF replaces C6, 75 μμF and remains in the same position.

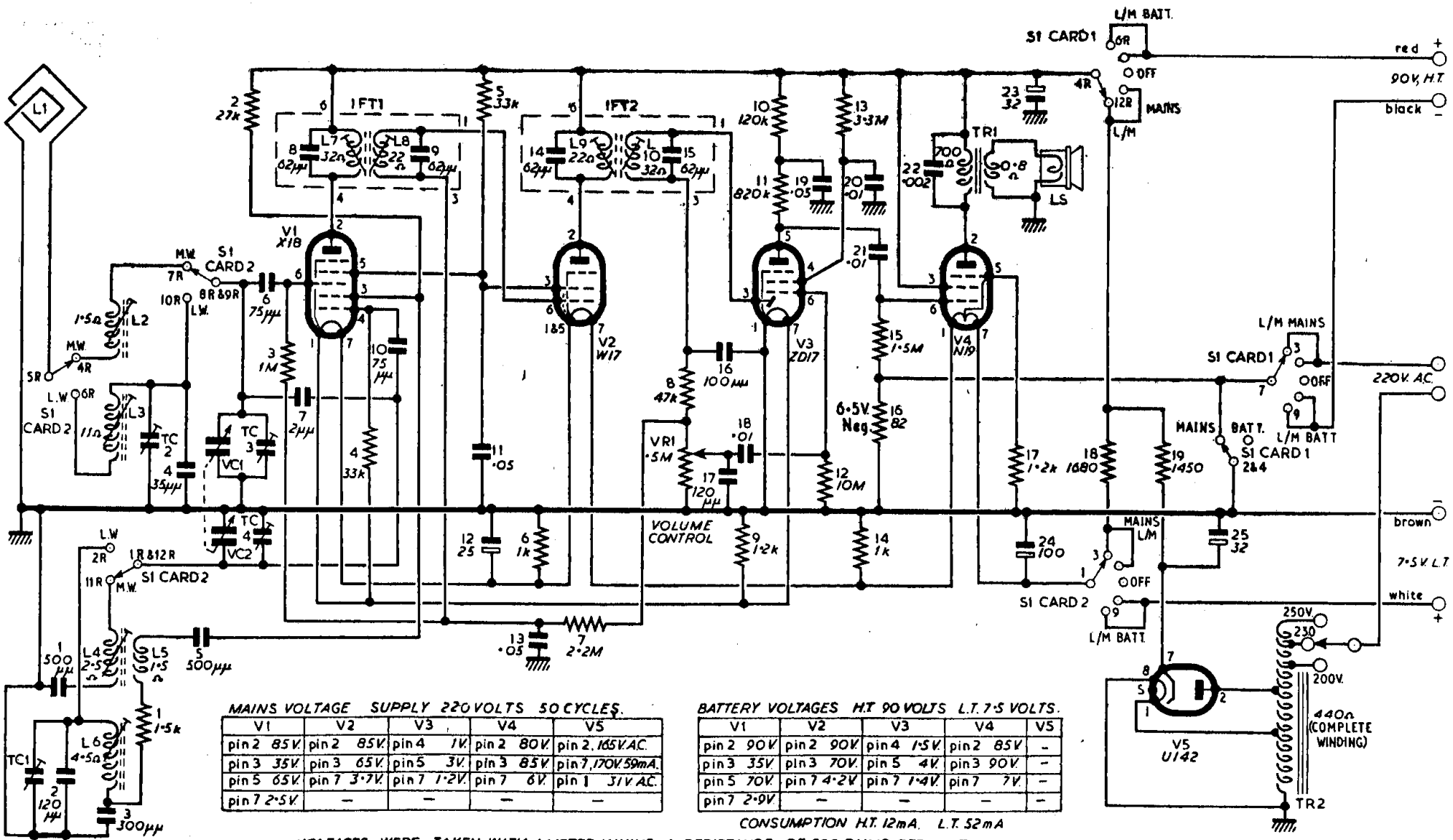
R20—10 K/ohms replaces R5, 33 K/ohms and remains in the same position as before.

The circuit diagram shown on page 4 will apply in all other respects.

The Underside Chassis View shows the position where the ferrite rod aerial is mounted on the chassis.



C	1,2	3	4	5	6	8,7	10	9	12	11	13	14	15	17	16	18	19	20,21	22	23	24	25								C
R			1		2	3	4			5	6	7	8		9,10,11			12, 13	14	15,16		17	18	19							R
L	1	4,6	2,3,5				7	8				9	10																		L
Misc.	TC1, S1 Card 2		TC2, S1 Card 2, VC1, VC2, TC3, TC4, V1				1FT1						V2, 1FT2		VR1		V3		V4		TR1	LS, S1 Cards 1&2		V5		S1 Card 1		TR2		Misc.



MAINS VOLTAGE SUPPLY 220 VOLTS 50 CYCLES.

V1	V2	V3	V4	V5
pin 2 85V.	pin 2 85V.	pin 4 1V.	pin 2 80V.	pin 2, 165V.A.C.
pin 3 35V.	pin 3 65V.	pin 5 3V.	pin 3 85V.	pin 7, 170V. 59mA.
pin 5 65V.	pin 7 3·7V.	pin 7 1·2V.	pin 7 6V.	pin 1 31V A.C.
pin 7 2·5V.	—	—	—	—

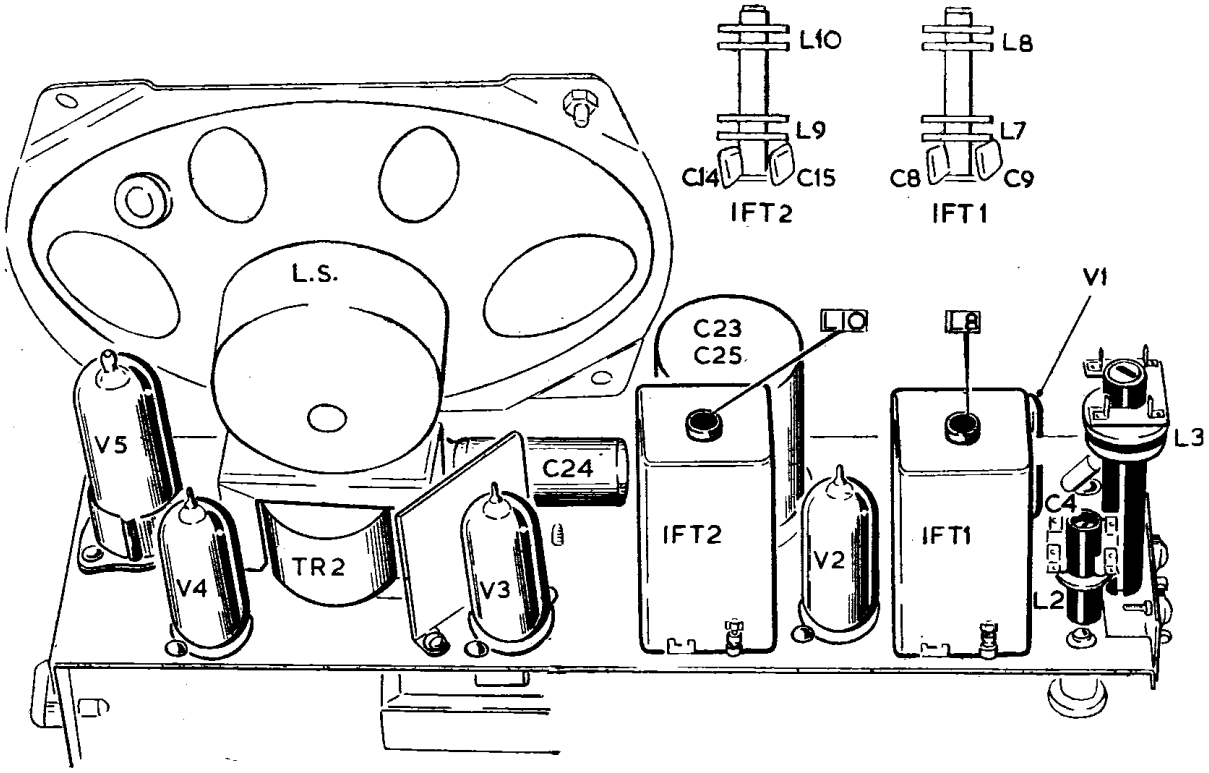
BATTERY VOLTAGES H.T. 90 VOLTS L.T. 7·5 VOLTS.

V1	V2	V3	V4	V5
pin 2 90V.	pin 2 90V.	pin 4 1·5V.	pin 2 85V.	—
pin 3 35V.	pin 3 70V.	pin 5 4V.	pin 3 90V.	—
pin 5 70V.	pin 7 4·2V.	pin 7 1·4V.	pin 7 7V.	—
pin 7 2·9V.	—	—	—	—

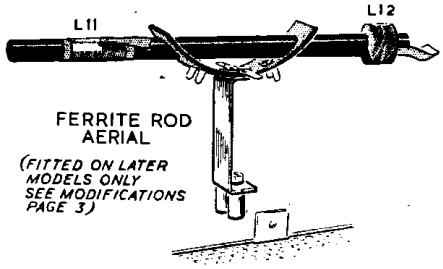
CONSUMPTION H.T. 12mA. L.T. 52mA

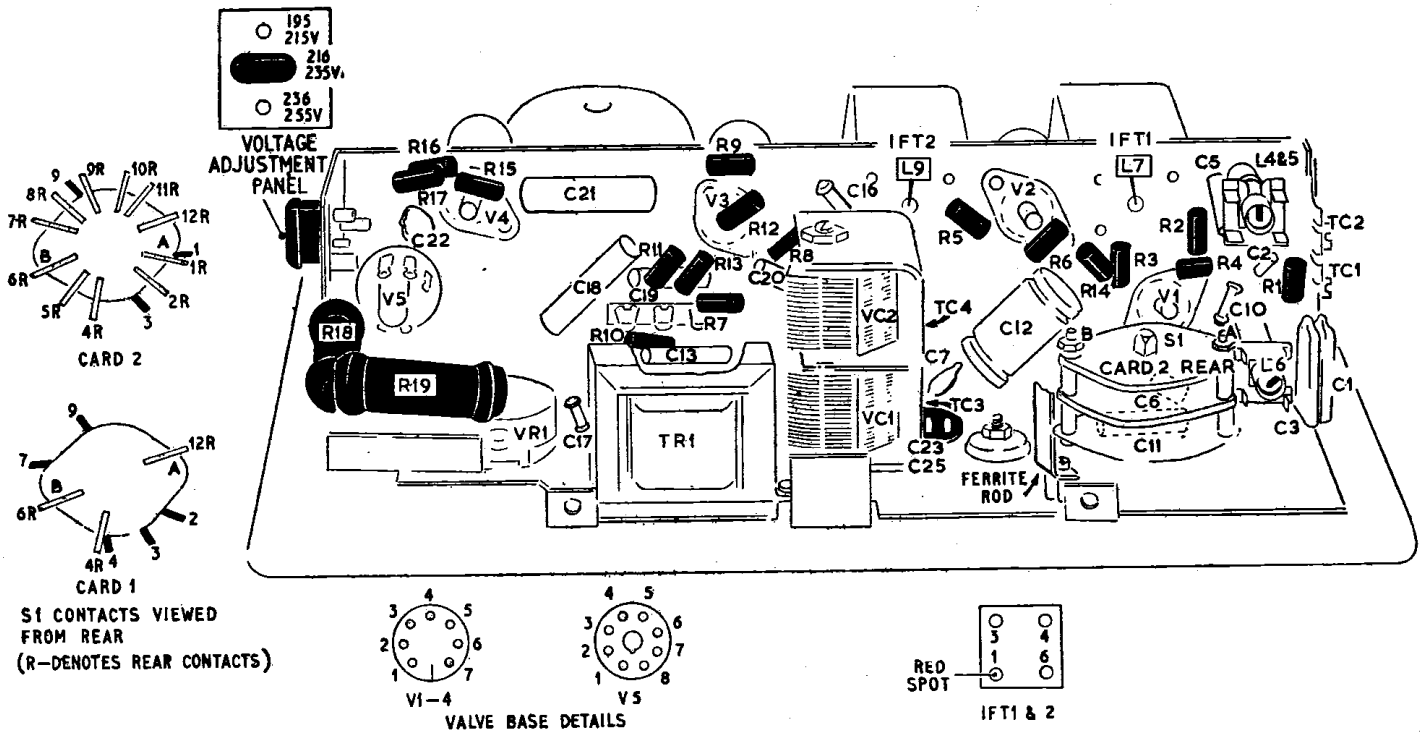
VOLTAGES WERE TAKEN WITH A METER HAVING A RESISTANCE OF 500 OHMS PER VOLT.

NOTE: POTENTIOMETER SHOWN WITH KNOB IN MAX. CLOCKWISE POSITION.
NUMBERS ADJACENT TO VALVE ELECTRODE CONNECTIONS REFER TO VALVE BASE PINS. (KEY GIVEN ON UNDERSIDE CHASSIS ILLUSTRATION.)



TOPSIDE CHASSIS VIEW





UNDERSIDE CHASSIS VIEW

SPARE PARTS LIST — MODEL T36AB

Part No.	Description	No. per Inst.
	INSTRUCTIONS	
93215	Instruction Card	1
P143802	Cabinet Label	1
P143797	Label "Warning—High Voltage"	1
P143796	Label "Voltage details, etc."	1
P143814	Panel for Warning and Voltage Labels	1
P86377	Fasteners—securing panel	2
	CABINET FITTINGS	
CP143798	Cabinet complete—early Models with Frame Aerial only	1
CP143798/1	Cabinet complete—later Models with Ferrite Rod Aerial	1
CP143798/7	Lid Hinges	2
8602	Chrome Screws—securing Hinges	8
CP143798/2	Lid Catches	2
8695	Chrome Screws—securing Catches	10
P143806	Screw—Coin Slotted (securing Baffle Board assy.)	1
P78266	Circlip—Retaining Screw (securing Baffle Board assy.)	1
P143807	Bush for above Screw (securing Baffle Board assy.)	1
CP143798/3	Baffle Board—Silked	1
T.S.5357	Silk for Baffle Board—in bulk, Red/Black	13″ by 11″
P143804	Spring Clips for Rear Edge of Baffle Board	2
CP143805	Bracket for Holding Front Edge Baffle Board	1
8695	Screws—securing Clips and Bracket	6
P86881	Solder Tags for Aerial Leads (Early Models only)	2
9772	Screws—securing Tags (Early Models only)	2
CP143798/4	Cover for Tags (Clothed) (Early Models only)	2
2418	Chrome Screws—securing Cover (Early Models only)	1
P98877	Stud Switch Stop	1
200062H	Screw (securing Stud)	1
200506	Nut (securing Stud)	1
CP143798/5	Handle Assy. (with Fixings)	1
41404	Emblem "G. Marconi"	1
3551	Pins—securing Emblem	2
44969	Transfer	1
CP143798/6	Lizard Skin Cloth	As reqd.
P143821	Indicator Pin for W/Change Knob	1
	CONTROL KNOBS	
P143793	Knob—"Volume" (with Spring Ring)	1
P143794	Knob—"Wavechange—Mains—Battery" (with Spring Ring)	1
P86896/1	Spring Rings for above knobs	2
35508	Spring Clips—securing above Knobs	2
CP143810	Knob—"Tuning"	1
P93431	Spring Clip—securing Tuning Knob	1

Part No.	Description	No. per Inst.
	CHASSIS ASSEMBLY	
CP143799/1	Chassis complete—early Models with Frame Aerial only	1
CP143799	Chassis complete—later Models with Ferrite Rod Aerial	1
200042M	Screws (securing Chassis)	2
P87474	Spring Nuts (securing Chassis)	2
201804	S.P. Washers (securing Chassis)	2
200404	Nuts (securing Chassis)	2
	VALVES AND VALVEHOLDERS	
X18	V1—Frequency Changer	1
W17	V2—I.F. Amplifier	1
ZD17	V3—A.F. Amplifier—A.G.C. and Detector Diode	1
N19	V4—Output	1
U142	V5—H.T. Rectifier	1
CP72769	Valveholders for V1, V2, V3, V4	4
59007AD	Rivets—securing Valveholders	8
P72646/1	Valveholder for V5	1
59007AE	Rivets—securing Valveholder	2
	INDUCTORS	
14/6222/0	*L1—Wire for Frame Aerial (Early Models only, see note below)	37′
CP139170	*L2—M.W. Aerial Coil (Early Models only, see note below)	1
CP73117	*L3—L.W. Aerial Coil (Early Models only, see note below)	1
CP139153	L4 & L5—M.W. Oscillator Coil	1
CP139154	L6—L.W. Oscillator Coil	1
200068F	Screws (securing L2-L4/5-L6)	3
201806	S.P. Washers (securing L2-L4/5-L6)	3
200048G	Screw (securing L3)	1
201804	S.P. Washer (securing L3)	1
	L7 & L8—See I.F.T.1	
	L9 & L10—See I.F.T.2	
CP139463/1	*L11 and L12—Ferrite Rod Aerial Coil Assy.	1
8777	P.K. Screws—securing Assy.	2
P36839/3	Spacers (alternative Facings for Assy.)	2
91903	P.K. Screws (alternative Facings for Assy.)	2

** NOTE.—The ferrite rod aerial assy. L11 and L12 replaces L1, L2 and L3 as used on early models with frame aerial.*

CP69743/13	I.F.T.1—1st I.F. Transformer, complete	1
CP69743/13	I.F.T.2—2nd I.F. Transformer, complete	1
11805	P.K. Screws—securing I.F.T.'s	4
CP139010/8	TR1—Output Transformer	1
10606	P.K. Screws—securing TR1	2
CP139169	TR2—Auto Mains Transformer	1
10606	P.K. Screws—securing TR2	2
	CAPACITORS	
P78806/11	C1—500 pfs., 350 v., 2%	1
P87436/2	C2—120 pfs., 750 v., 20%	1
P78806/33	C3—300 pfs., 350 v., 5%	1
P87437/1	*C4—35 pfs., 750 v., 20%	1
P87452/1	C5—500 pfs., 750 v., 20%	1

Part No.	Description	No. per Inst.
P87436/3	*C6—75 pfs., 750 v., 20%	1
P78803/10	C7—2 pfs., 350 v., 25%	1
	C8—62 pfs. } Part of I.F.T.1	1
	C9—62 pfs. } Part of I.F.T.1	1
P87436/3	C10—75 pfs., 750 v., 20%	1
38217DY	C11—0·047 mfs., 350 v., 20% ..	1
CE117	C12—25 mfd., 12 v., Electrolyte ..	1
38217DY	C13—0·047 mfd., 350 v., 20% ..	1
	C14—62 pfs. } Part of I.F.T.2	1
	C15—62 pfs. } Part of I.F.T.2	1
P87436/1	C16—100 pfs., 750 v., 20% ..	1
P87436/2	C17—120 pfs., 750 v., 20% ..	1
38214F	C18—0·01 mfd., 1,000 v., 20% ..	1
38217DY	C19—0·047 mfd., 350 v., 20% ..	1
38214F	C20—0·01 mfd., 1,000 v., 20% ..	1
38214F	C21—0·01 mfd., 1,000 v., 20% ..	1
CE57802	C22—0·002 mfd., 500 v., 20% ..	1
CE884/12	C23 & C25—32 + 32 mfd., 275 v., Electrolytic	1
CE467	C24—100 mfd., 25 v., Electrolytic ..	1
	C25—See C23 and C25 above	
P86559/10	*C26—50 pfs., 500 v., 20%	1
P78804/46	*C27—150 pfs., 350 v., 20% ..	1
CP70674/2	TC1 and TC2—Twin Trimmer Assy.	1
59007AB	Rivets—securing Assy.	2
	TC3 and TC4—Part of Gang Capacitor	
CP73520/T15	VC1 & VC2—Twin Gang Tuning Capacitor	1
200048D	Screws } securing Gang	3
201804	S.P. Washers } securing Gang	3

* *NOTE.—C26 and C27 replace C4 and C6 as used on early models with frame aerial.*

RESISTORS

33360DP	R1—1·5 K/Ohms., ¼ w., 20% ..	1
33360ND	R2—27 K/Ohms, ¼ w., 10% ..	1
33360EG	R3—1 M/Ohms, ¼ w., 20% ..	1
33360DX	R4—33 K/Ohms, ¼ w., 20% ..	1
33360DX	*R5—33 K/Ohms, ¼ w., 20% ..	1
33360DN	R6—1 K/Ohms, ¼ w., 20% ..	1
33360EJ	R7—2·2 M/Ohms, ¼ w., 20% ..	1
33360DY	R8—47 K/Ohms, ¼ w., 20% ..	1
33360FM	R9—1·2 K/Ohms, ¼ w., 5% ..	1
33360MW	R10—120 K/Ohms, ¼ w., 10% ..	1
33360NB	R11—820 K/Ohms, ¼ w., 10% ..	1
33360EN	R12—10 M/Ohms, ¼ w., 20% ..	1
33360EK	R13—3·3 M/Ohms, ¼ w., 20% ..	1
33360DN	R14—1 K/Ohms, ¼ w., 20% ..	1
33360EH	R15—1·5 M/Ohms, ¼ w., 20% ..	1
P86278/51	R16—82 Ohms, ¼ w., 5%	1
33360FM	R17—1·2 K/Ohms, ¼ w., 5% ..	1
P87370/3	R18—1,680 Ohms, 10w., 5% ..	1
P87370/4	R19—1,450 Ohms, 10 w., 5% ..	1
33360DU	R20—10 K/ohms, ¼ w., 20% ..	1
E5836	VR1—500 K/Ohms, Volume Control	1

* *NOTE.—R20 replaces R5 as used on early models with frame aerial.*

Part No.	Description	No. per Inst.
	SWITCH	
CP53792	S1—Wavechange and Master Switch	1
	TAGS, PANELS AND PLUGS	
P87471	5-Way Tag Strip	1
P87470	4-Way Tag Strip	1
201806	S.P. Washers } securing Strips	2
59007AB	Rivets } securing Strips	2
P86651	Voltage Selector Panel	1
59007AB	Rivets—securing Panel	2
P86444	Mains Selector Plug	1
P143814	Safety Panel	1
P86377	Fasteners—securing Panel	2
	NOTE.—For Battery Plugs—see under "Wires and Cables"	
	SCALE	
CP143812	Tuning Scale	1
P143821	Pins—securing Scale	3
	LOUDSPEAKER	
CP73001/8/3	Loudspeaker complete	1
200042M	Screws } securing Speaker	2
P87474	Spring Nuts } securing Speaker	2
201804	S.P. Washers } securing Speaker	2
200404	Nuts } securing Speaker	2
40764C	Cleat on above fixing (for Mains Lead)	1
	WIRES AND CABLES	
4201 x 2309	Mains Lead—in bulk	6ft.
40764C	Cleat—securing Mains Lead ..	1
P143820	Aerial Lead—Twin Flat (Early models only)	1
CP143819	Battery Lead and Plug Assy. ..	1
P86903	2-Pin Plug only	1
P86736	3-Pin Plug only	1
4020 x 2300 to 4020 x 2309	P.V.C. Covered Wire, 1/0·024 in. Change last figure for colour as per standard colour code	As reqd.
4120 x 1600 to 4120 x 1609	P.V.C. Covered Flex, 14/0·0076 in. Colours as wire above	As reqd.
	BATTERIES	
B126	H.T. Battery, 90 volts	1
AD38	L.T. Battery, 7·5 volt	1