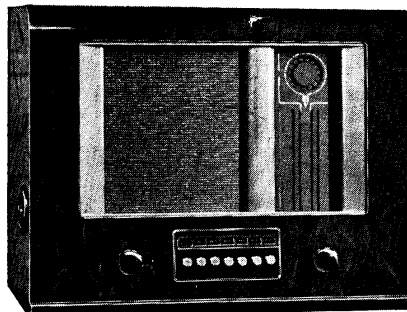


BUSH RADIO

Service Instructions

A.C. MAINS MODEL P.B.83



Front View of P.B.83 Receiver

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SPECIFICATION

BASIC DESIGN—

A five valve (including rectifier) three waveband superheterodyne, with six tuned circuits.

Seven Press Buttons: three as waveband switches for manual tuning and the remaining four as pre-tuned station selectors.

Permeability tuning employed for the oscillator circuit of the pre-tuned stations and in the intermediate frequency transformers.

VALVES—

Mullard ECH35	(Heater 6.3 v. 0.3 a.)	Octal base.
EF39	(Heater 6.3 v. 0.2 a.)	Octal base.
EBC33	(Heater 6.3 v. 0.2 a.)	Octal base.
EL33	(Heater 6.3 v. 0.9 a.)	Octal base.
IW4/350	(Heater 4.0 v. 2.0 a.)	4-pin base.

SCALE LAMPS—

- Three for manual tuning scale
- Two for identification windows on escutcheon plate.
- One for "Teleflie" short waveband logging.
- Type 6.2 v. 0.3 a. each.

VOLTAGE RANGE—

200-250 volts A.C., 40-100 cycles.

MAINS CONSUMPTION—

Approximately 40 watts.

AUDIO OUTPUT—

1.5 watts to the speaker.

WAVEBAND RANGES—

- Manual tuning:—
- S.W. 16.5 — 51 metres (18.18 — 5.88 Mc/s.).
- M.W. 200 — 560 metres (1500 — 535.7 Kc/s.).
- L.W. 850 — 2000 metres (352.9 — 150 Kc/s.).

Tuning scale calibrated in station names and wavelengths in metres.

Preselected Stations:—Four buttons provided to cover a waveband of 200—550 metres, 1100—2000 metres.

INTERMEDIATE FREQUENCY—

465 Kc/s.

CONTROLS—

1. Recessed knob on left-hand side of cabinet—mains switch and tone control.
2. Left-hand knob—volume control;
3. Right-hand knob—manual tuning control.
4. Seven Press Buttons:—From left to right the buttons are arranged as follows:—
 - Button No. 1. Pre-selected tuning covering 1100-2000 metres.
 - Button No. 2. Pre-selected tuning covering 350-550 metres.
 - Button No. 3. Pre-selected tuning covering 350-550 metres.
 - Button No. 4. Pre-selected tuning covering 200-350 metres.
 - Button No. 5. Manual tuning wavechange L.W.
 - Button No. 6. Manual tuning wavechange S.W.
 - Button No. 7. Manual tuning wavechange M.W.

AERIAL AND EARTH—

- Two alternative aerial sockets are provided:—
- (Facing back of chassis.)
- Top left-hand socket—Maximum Sensitivity.
- Centre socket—Maximum Selectivity.
- Bottom socket—Earth.

GRAMOPHONE PICK-UP—

Sockets are provided for a pick-up of medium impedance of any reputable make.

When using a pick-up, the set should be tuned off a powerful station to prevent radio "break-through."

EXTERNAL SPEAKER—

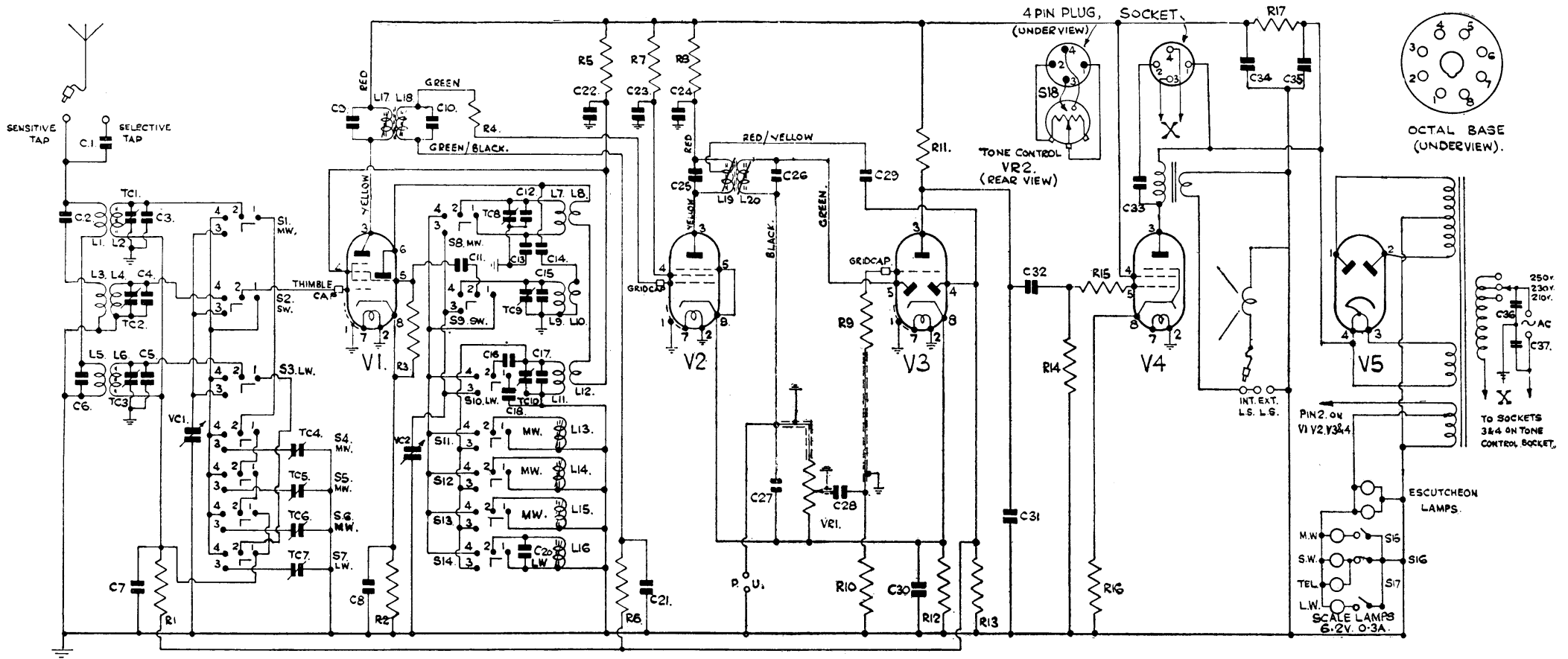
Two sockets are provided for a low impedance external speaker. A plug is also fitted to disconnect the internal speaker. **This plug should always be inserted in the top socket unless an extension speaker is in use.**

CABINET DIMENSIONS—

- 21 ins. long. 21½ ins. long including knob.
- 16¾ ins. high.
- 11½ ins. wide. 12 ins. wide including knobs and press button switches.
- Weight 29 lbs. approximately.

CIRCUIT DIAGRAM P.B.83

P.B.83



VALVES

- V.1. Mullard ECH.35.
- V.2. Mullard EF.39.
- V.3. Mullard EBC.33.
- V.4. Mullard EL.33.
- V.5. Mullard IW4/350

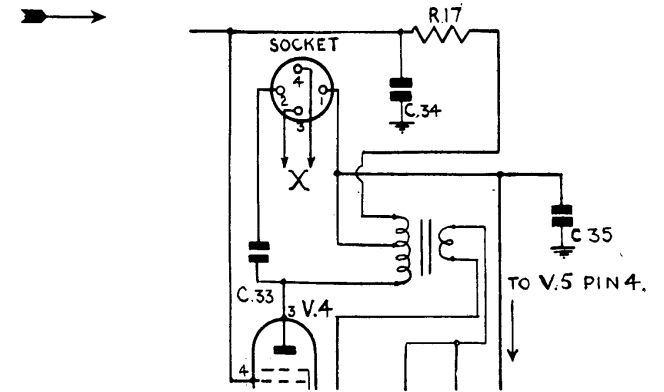
OUTPUT TRANSFORMER MODIFICATION

Later models of the P.B.83 receiver will be fitted with a modified output transformer which has a tapped primary. The unsmoothed H.T. from the rectifier cathode is introduced at the tapping, and fed via the transformer primary to the anode of the output valve; it is also fed to the remainder of the circuit, but from the opposite end of the primary.

Part No. S.12870.

Ratio—80 : 1.

Specification as for S.9543.



CAPACITORS.

Reference	Value mmfd.	Tolerance ± %	Type	Working Voltage Rating D.C.	Part No.	Description
C.1	50	20	Silver mica ...	350	P.8991 or P.3779	Aerial series capacity.
C.2	50	20	" " ...	350	P.8991 or P.3779	Aerial S.W. coupling.
C.3	5	—	Clip assembly ...	—	} S.9240 ...	{ M.W. aerial tuning, fixed capacity.
C.4	5	—	" " ...	—		
C.5	30	10	Silver mica ...	350	P.8992 or P.2230	L.W. aerial tuning, fixed capacity.
C.6	800	20	Mica ...	350	P.3776 ...	L.W. aerial shunt.
C.7	.05 mfd.	20	Tubular ...	350	P.3770 ...	V.1 control grid decoupling, A.V.C. line.
C.8	.05 mfd.	20	" " ...	350	P.3770 ...	V.1 cathode by-pass.
C.9	110	2	Silver mica ...	350	P.3729 ...	1st I.F.T. primary fixed capacity.
C.10	110	2	" " ...	350	P.3729 ...	1st I.F.T. secondary fixed capacity.
C.11	30	20	" " ...	350	P.8992 or P.2230	V.1 oscillator control grid capacity.
C.12	15	10	" " ...	350	P.2228 ...	M.W. oscillator tuning fixed capacity.
C.13	556	1	" " ...	350	P.2034 ...	M.W. oscillator padder.
C.14	50	10	" " ...	350	P.3779 ...	S.W. oscillator anode coupling.
C.15	15	10	" " ...	350	P.3777 ...	S.W. oscillator tuning fixed capacity.
C.16	316	1	" " ...	350	P.2035 ...	L.W. oscillator padder (part of P.B. station osc. tuning).
C.17	130	1	" " ...	350	P.2336 ...	L.W. oscillator tuning, fixed capacity.
C.18	340	1	" " ...	350	P.2266 ...	Additional oscillator tuning capacity on P.B. stations with C.16.
C.19	Not used	—	—	350	—	—
C.20	316	1	Silver mica ...	350	P.2035 ...	Fixed capacity for L.W. oscillator coil, preselected station.
C.21	.05 mfd.	20	Tubular ...	350	P.3770 ...	V.2. control grid decoupling A.V.C. line.
C.22	.05 mfd.	20	" " ...	350	P.3770 ...	V.1 screen decoupling.
C.23	.05 mfd.	20	" " ...	350	P.3770 ...	V.2 screen decoupling.
C.24	.05 mfd.	20	" " ...	350	P.3770 ...	V.2 anode decoupling.
C.25	110	2	Silver mica ...	350	P.3729 ...	2nd I.F.T. primary fixed capacity.
C.26	110	2	" " ...	350	P.3729 ...	2nd I.F.T. secondary fixed capacity.
C.27	100	20	Mica ...	350	P.3775 ...	I.F. filter.
C.28	.01 mfd.	25	Tubular ...	350	P.8988 or P.3769	Coupling to V.3 triode section.
C.29	50	20	Mica ...	350	P.3774 ...	A.V.C. diode coupling.
C.30	.05 mfd.	20	Tubular ...	350	P.3770 ...	V.2 and V.3 cathodes by-pass.
C.31	1000	25	" " ...	350	P.8989 or P.3768	Fixed tone correction.
C.32	.01 mfd.	25	" " ...	350	P.8988 or P.3769	Coupling to V.4 control grid.
C.33	.03 mfd.	25	" " ...	350	P.8987 or P.8986	Part of variable tone corrector.
C.34	16 mfd.	+50	} Electrolytic ...	350	P.3766 ...	H.T. line smoothing.
C.35	16 mfd.	-20				
C.36	.01 mfd.	25	Tubular ...	500	P.3769 ...	Mains filter.
C.37	.01 mfd.	25	" " ...	500	P.3769 ...	Mains filter.
T.C.1	10	—	Special assembly	—	S.10006 ...	M.W. aerial tuning circuit trimmer.
T.C.2	10	—	" " ...	—	S.10004 ...	S.W. aerial tuning circuit trimmer.
T.C.3	10	—	" " ...	—	S.10008 ...	L.W. aerial tuning circuit trimmer.
T.C.4	15-150	—	" " ...	—	P.2224 ...	No. 4 button, preselected station, M.W. aerial tuning.
T.C.5	100-450	—	" " ...	—	P.2224 ...	No. 3 button, preselected station, M.W. aerial tuning.
T.C.6	100-450	—	" " ...	—	P.1938 ...	No. 2 button, preselected station, M.W. aerial tuning.
T.C.7	100-450	—	" " ...	—	P.1938 ...	No. 1 button, preselected station, L.W. aerial tuning.
T.C.8*	10	—	" " ...	—	S.10013 ...	L.W. oscillator circuit trimmer.
T.C.9*	10	—	" " ...	—	S.10018 ...	S.W. oscillator circuit trimmer.
T.C.10*	10	—	" " ...	—	S.10007 ...	M.W. oscillator circuit trimmer.
V.C.1	—	—	} Gang condenser	—	} P.3018/1 ...	Aerial circuit, variable tuning.
V.C.2	—	—				

*T.C.8, T.C.9 and T.C.10 are part of the individual coil assembly ; the Part Numbers quoted are in each case for the complete assembly.

RESISTORS.

Reference	Value (Ohms)	Rating (Watts)	Part No.	Description
R.1	1 meg.	1/4	P.7115 or P.9855 ...	V.1 A.V.C. decoupling.
R.2	100	1/4	P.6107 or P.9687 ...	V.1 cathode bias.
R.3	33,000	1/4	P.6737 or P.9792 ...	V.1 oscillator grid return (insulated).
R.4	4,700	1/4	P.6527 ...	V.2 grid stopper.
R.5	22,000	1	P.6693 ...	V.1 hex. screen and oscillator anode feed.
R.6	1 meg.	1/4	P.7115 or P.9855 ...	V.2 A.V.C. decoupling.
R.7	47,000	1/4	P.6778 or P.12154 ...	V.2 screen feed (insulated).
R.8	10,000	1/4	P.6610 or P.12126 ...	V.2 anode feed.
R.9	100,000	1/4	P.9389A ...	V.3 grid stopper.
R.10	2.2 meg.	1/4	P.7199 or P.9869 ...	V.3 grid return.
R.11	68,000	1/4	P.6820 or P.12161 ...	V.3 anode load.
R.12	220	1/4	P.6191 or P.9701 ...	V.2, V.3 common cathode bias.
R.13	1 meg.	1/4	P.7115 or P.9855 ...	A.V.C. diode load.
R.14	470,000	1/4	P.7031 or P.9841 ...	V.4 grid return.
R.15	47,000	1/4	P.6779 or P.9799 ...	V.4 grid stopper.
R.16	150	1/4	P.6154 or P.12050 ...	V.4 cathode bias.
R.17	10,000	2	P.6608 ...	H.T. line smoothing.
V.R.1	.05 meg.	—	P.2201 ...	Manual volume control.
V.R.2	50,000	—	P.2522 ...	Variable tone control with S.18 ganged.

A resistance value tolerance of ±20% is permissible on all fixed resistors with the exception of R.16, which is ±10%.

VALVE OPERATING DATA.

INPUT—230 volts, 50 cycles. Mains transformer tap in 230 volts. Receiver set to Medium Waveband. NO SIGNAL INPUT. Voltage measurements as shown on the Avometer Model 7; chassis negative for H.T. line. 1,000 volt range for H.T. and 10 volt range for cathode measurements.

Valve	Electrode	Pin No.	Voltage	Current (m.a.)
V.1	Hexode anode ...	3	140	1.5
	Oscillator anode ...	6	60	2.5
	Screens ...	4	60	2.0
	Cathode ...	8	6	6.0
V.2	Anode ...	3	95	4.5
	Screen ...	4	75	1.5
	Cathode ...	8	1.4	6.0
V.3	Triode anode ...	3	60	1.0
	Cathode ...	8	1.4	1.0
V.4	Anode ...	3	290	20
	Screen ...	4	140	2.0
	Cathode ...	8	3.3	22
V.5	Anodes ...	1 and 2	245 A.C.	—
	Cathode ...	4	300	35

Voltage drop across Output Transformer primary=10.
 " " " R.17=120.

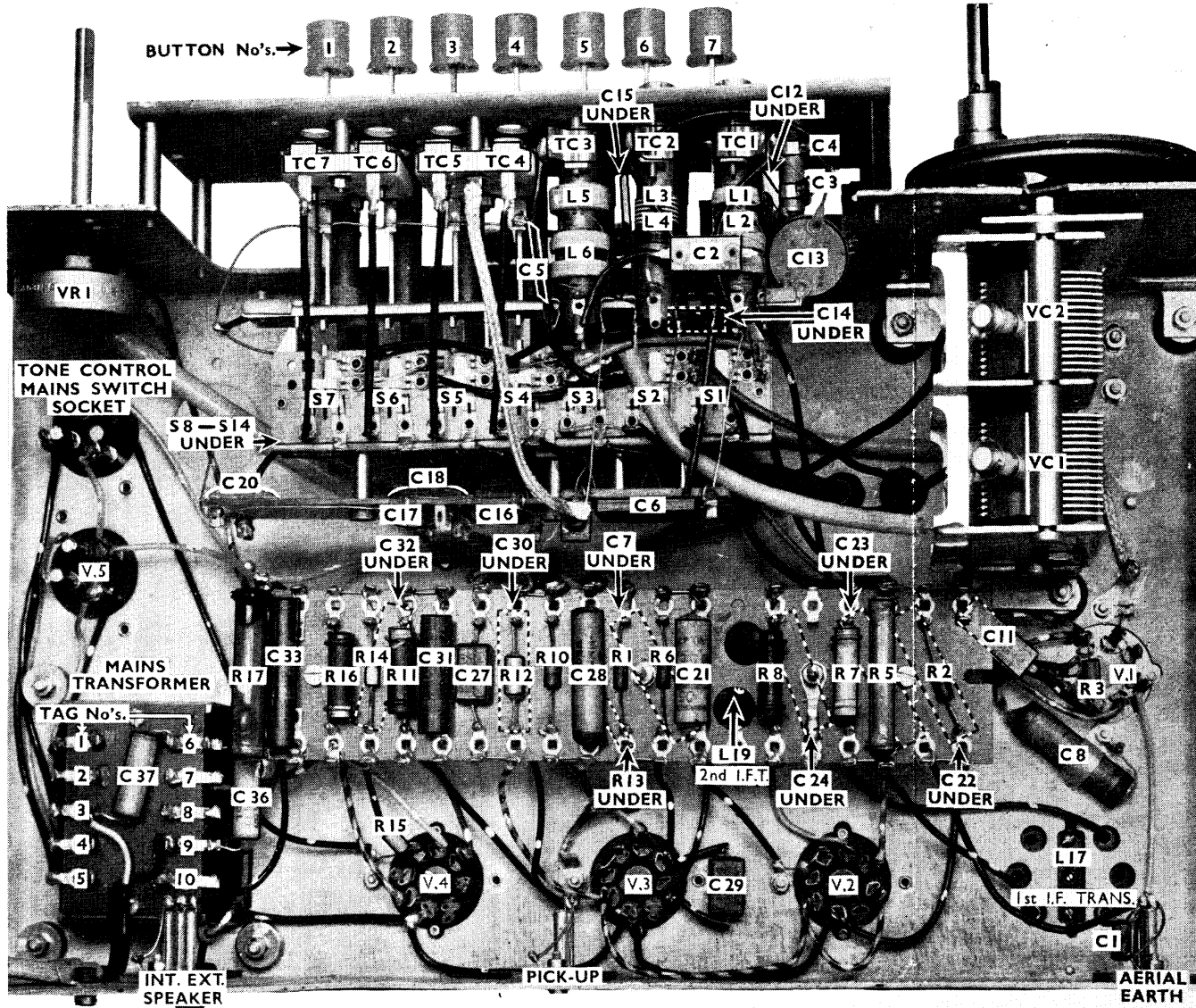
REPLACEMENT OF LAMPS.

Viewed from the back of the chassis, access to the lamps is as follows:—

SCALE LAMPS for S.W., M.W. and L.W.—Unscrew the two terminals behind the scale assembly and withdraw panel containing the three lamps.

ESCUTCHEON LAMPS.—Slacken terminals fixing the lamp brackets to the chassis—they can then be lifted off the screws and the lamps replaced. Two lamps on separate brackets are provided.

TYPE.—6.2 v. 0.3 a. each.



UNDER CHASSIS VIEW OF P.B.83 RECEIVER

COIL DECK CONNECTIONS TO CHASSIS

Complete Coil Deck including condenser panel and lamp switch assembly—Part No. S.9551.

After removing the three bolts, distance pieces, nut and washer on insulated pillar securing the Press Button plate to the front of the chassis, the complete Coil Deck can be withdrawn from the chassis by unsoldering the following wires:—

1. Earth braid from the S.W. aerial coils L.3., L.4. (tag nearest L.W. aerial coils).
2. V.C.1. fixed vanes to S.1. contact 3.
3. M.W. Aerial coil L.1. (tag nearest to Gang Condenser) to aerial socket sensitive tap.
4. M.W. Aerial coil L.2. (tag nearest to S.W. Aerial coils) to R.1. (tag nearest Coil Deck).
5. Remove cap from the lead going to the control grid of V.1. and pull lead through chassis.
6. M.W. Oscillator coil L.8. (tag farthest away from press button switch) to V.1. pin 6.
7. C.11. (tag on resistance panel) to S.9. contact 2.
8. L.W. Oscillator coil L.12. (tag farthest away from press button switch) to R.5. (tag nearest press button deck).
9. Earth braid from junction of S.W. and L.W. Oscillator coils to Gang Condenser earthing contacts.
10. Yellow, Red and Black leads from scale lamp holders—pull the leads through the grommet in chassis.

IMPORTANT—

When replacing the Aerial and Oscillator coils, note carefully the direction of the trimmer clip (at the base of each coil) in relation to the Press Button unit. Replace the new coil in exactly the same position as the one taken out. If this is not done, the wrong connections will be made to the coil tags.

Earth or chassis connections required to be taken off for servicing should always be replaced on to the tags from which they were taken. This is most important for the successful working of the short waveband section.

COIL DATA.

Reference	Approx. D.C. Resistance	Part No.	Coil Description
L.1	0.5	} S.10006	M.W. aerial coupling.
L.2	1.0		M.W. aerial tuning.
L.3	Very small ,, ,,	} S.10004	S.W. aerial coupling.
L.4			S.W. aerial tuning.
L.5	30	} S.10008	L.W. aerial coupling.
L.6	14		L.W. aerial tuning.
L.7	1.5	} S.10007	M.W. oscillator, tuning.
L.8	1.0		M.W. oscillator, reaction.
L.9	Very small 1.0	} S.10018	S.W. oscillator, tuning.
L.10			S.W. oscillator, reaction.
L.11	2.7	} S.10013	L.W. and P.B. master oscil- lator tuning.
L.12	2.3		L.W. and P.B. master oscil- lator reaction.
L.13	2.0	S.10010	M.W. P.B. No. 4 oscillator, tuning, 200-350 m.
L.14	2.3	S.10011	M.W. P.B. No. 3 oscillator, tuning, 350-550 m.
L.15	2.3	S.10011	M.W. P.B. No. 2 oscillator, tuning, 350-550 m.
L.16	4.0	S.10012	L.W. P.B. No. 1 oscillator, tuning, 1,100-2,000 m.
L.17*	5.0	} S.9522	1st I.F.T. primary tuning.
L.18*	5.0		1st I.F.T. secondary tuning.
L.19*	5.0	} S.9523	2nd I.F.T. primary tuning.
L.20*	5.0		2nd I.F.T. secondary tuning.

*On early serial numbers of the P.B.83 receiver, the 1st I.F.T. (L.17 and L.18) and the 2nd I.F.T. (L.19 and L.20) are *fixed iron core type*. The primary of the 2nd I.F.T. is not tapped. Specification of the fixed iron core type as follows:—

L.17, L.18 : D.C. Resistance, 3.8 ohms. Part No. S.10057F.
L.19, L.20 : D.C. Resistance, 3.8 ohms. Part No. S.9508.

SPEAKER

Type—Rola 8-Z.

Part No. P.3292.

Speech Coil D.C. Resistance—2.5 ohms.

Leads from Speech Coil taken direct to terminals on

Output Transformer Nos. 3 and 4.

MAINS TRANSFORMER.

PART No. : 200-250 volt, 40-100 cycles, type S.9541.

100-120, 200-250 volt, 40-100 cycles, type S.10197.

Details shown below for the 200-250 volt type.

Input 230 volts, 50 cycles. Mains Tapping Screw in 230 volt position.

Tag numbers shown on illustration of the "Under Chassis view of P.B.83 Receiver" on the opposite page.

Winding	Tag No.	Approx. D.C. Resistance (Ohms)	A.C. Voltage No Load	A.C. Voltage Full Load
PRIMARY				
Start of winding ...	9	—	} Measured from the start of winding.	
210 v. tap ...	—	40		
230 v. tap ...	—	45		
250 v. tap (finish)	8	49		
RECTIFIER				
SECONDARY				
Start of winding ...	4	} 425 total winding	} 255 each half	} 245 each half
Centre tap ...	6			
Finish of winding...	2			
VALVE HEATER				
Start of winding ...	6	} 0.22 total winding	} 4.5 } 6.9	} 3.9 } 6.2
Tap ...	7			
Finish of winding...	10			

PRIMARY MAGNETISING CURRENT.

NO LOAD at 230 volts, 50 cycles input—approx. 70 m.a.

FULL LOAD at 230 volts, 50 cycles input—approx. 190 m.a.

TYPE S.10197—100-120, 200-250 volts. Specification as above.

D.C. resistance between start of primary winding and the 110 volt tap is 19 ohms.

OUTPUT TRANSFORMER

Part No. S.9543.

Primary— D.C. Resistance— 480 ohms.

Secondary—D.C. Resistance—0.37 ohm.

Ratio—86 : 1.

Primary Inductance—At 400 cycles, 5 volts, with 26 ma.

D.C. flowing, no load on secondary—approx. 10 Hs.

CONNECTIONS TO OUTPUT TRANSFORMER—

Tag numbers shown on illustration on page 6.

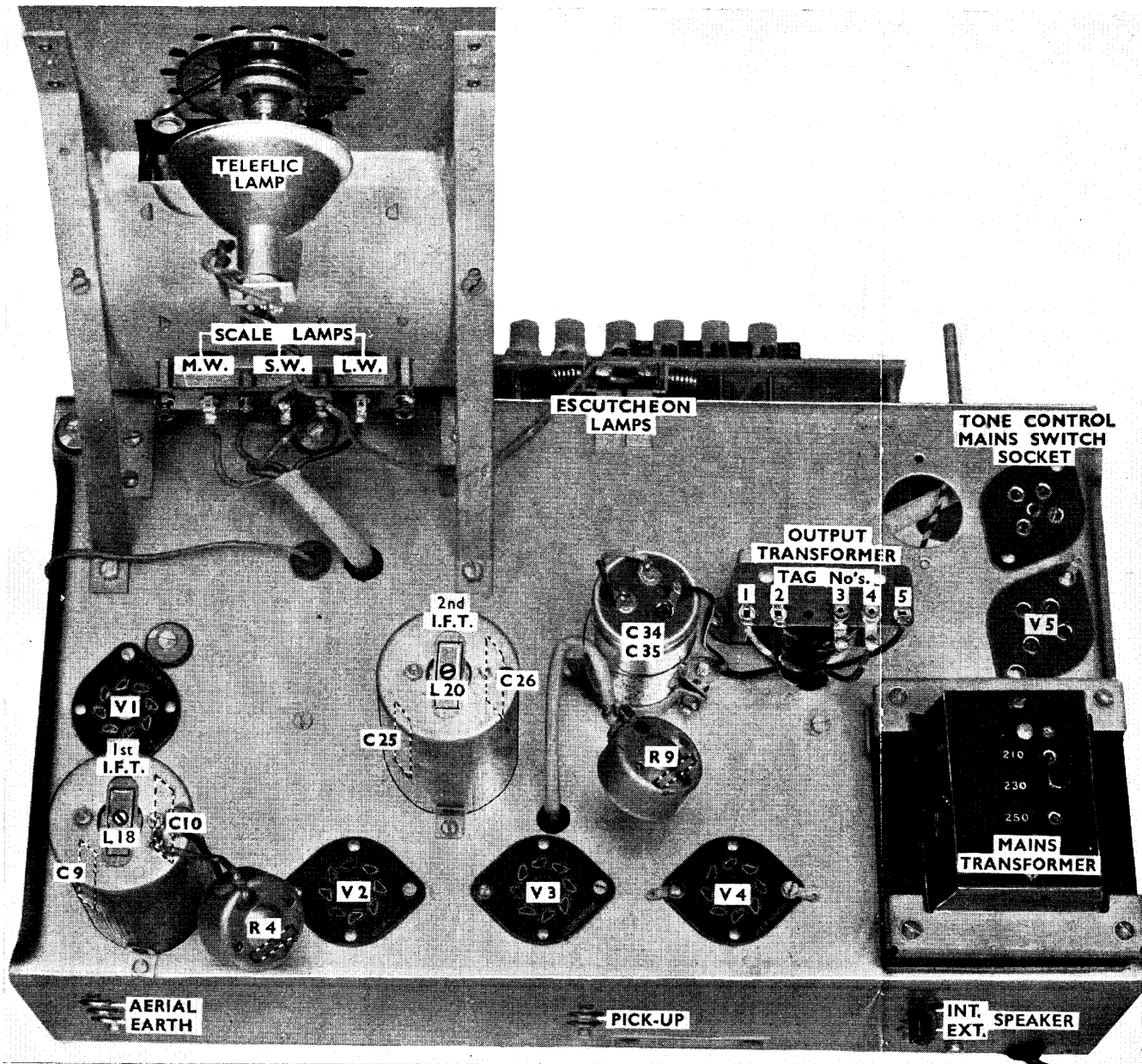
Tag No. 1. Primary—Connection to V.4. pin 3 (anode).

Tag No. 2. Secondary—Connection to Int. Speaker cut-out socket (top).

Tag No. 3. Secondary—Connection to chassis and to speech coil.

Tag No. 4. To Int. Speaker cut-out plug and to speech coil.

Tag No. 5. Primary—Connection to R.17. (tag nearest coil deck).



TOP VIEW OF P.B.83 CHASSIS

FITTING CORD DRIVE

Part Nos.	Scale Frame Assembly	S.10029
	Reflector Bracket Assembly	S.9252
	Scale Lamp holder Assembly	S.9152
	Reverse Vernier Drive	P.2553
	Drive Cord, Clip and Spring	S.9554
	Length of cord between knots approx. 48 ins.	
	Pointer	S.9555
	Glass scale	P.2564

1. First remove the glass scale by unscrewing the four fixing screws holding the scale clamps.
2. Turn the Drive Wheel into the position shown in the adjacent illustration, bringing the tuning condenser to minimum capacity.
3. Take the longest part of the cord B round the Drive Wheel in an anti-clockwise direction (front view) for approximately one turn, anchor to chassis temporarily.
4. Pass cord A round wheel clockwise in front of cord B, passing to the right of pulley 2 and 1, and across to the left side of the "Teleflic" drum (front view).
5. Noting that the slots are at the top of the drum, pass this cord in through the first slot, out of the second, and complete $2\frac{1}{2}$ turns round the drum clockwise (front view), down to the right side of wheel and slip on to the groove.
6. Turn the Drive until the Pointer is at the top of its travel; replace the tuning scale so that the centre line of the Pointer coincides with the top of the Medium and Long wavelength lines.

The Pointer is detachable, and may be placed in position on the cord by gently easing over two small clips on the back.

DISMANTLING

REMOVING CHASSIS FROM CABINET—

Remove the two screws securing the top of the scale assembly to the cabinet.

Disconnect speaker leads from the Output Transformer. Unplug the Tone Control cable from the chassis. Remove the two control knobs from the front of the cabinet. When replacing, remember to put the felt washers on the control spindles, between the cabinet and the knobs.

Remove the four chassis bolts from under the cabinet; the chassis should then be carefully withdrawn from the back.

For servicing the chassis the combined Tone Control and ON/OFF switch need not be removed from the cabinet, but to complete the mains circuit a shorting bar can be placed in pins 3 and 4 (filament pins) of the tone control socket on the chassis.

REMOVING SPEAKER FROM CABINET—

Disconnect the speaker leads from the Output Transformer. Remove the nuts and washers from the four bolts holding the speaker to the sub-baffle board.

CIRCUIT ALIGNMENT

The use of a reputable Modulated Signal Generator with a variable output is essential for accurate line-up of the R.F. and I.F. circuits.

A suitable dummy aerial should be connected in series with the output from the Signal Generator for each waveband. This may consist of a 400-ohm non-inductive resistor for the Short waveband and a fixed capacitor of 200 mmf. for the Medium and Long wavebands.

A sensitive output meter should be used as a visual indicator.

To obtain the most accurate adjustment of the tuned circuits, always use the lowest possible input to the Receiver from the Signal Generator.

Set the Volume Control to maximum and the Tone Control to low.

Check the position of the tuning pointer in relation to the gang condenser, the vanes fully meshed, the centre of the pointer should coincide with the top of the Medium and Long waveband lines on the scale.

INTERMEDIATE FREQUENCY CIRCUITS—465 Kcs.—

Set the receiver to Medium waveband and tune to about 300 metres. From the Signal Generator feed in a signal of 465 kcs. to V.2. control grid (top cap). ADJUST L.20 and L.19. Transfer the Signal Generator to V.1. hexode control grid (top cap). ADJUST L.18. and L.17. A final adjustment should then be made to L.19. and L.20.

RADIO FREQUENCY CIRCUITS—MANUAL TUNING—

Short Waveband: 16.5—51 metres—

1. Connect Signal Generator to the sensitive aerial socket (via dummy aerial) and chassis; set to 18 metres (16.67 mcs.).
2. Press S.W. Button (No. 6) and set pointer to 18 metres.
3. Adjust Oscillator T.C.9. and aerial T.C.2. for maximum output.
4. Check calibration on 50 metres (6.00 mcs.).

Medium Waveband: 198—565 metres—

1. Press M.W. Button (No. 7), set pointer to 300 metres.
2. Set Signal Generator to 300 metres (1,000 kcs.).
3. Adjust Oscillator T.C.8. and aerial T.C.1. for maximum output.
4. Check calibration on 500 metres (600 kcs.).

Long Waveband: 850—2,000 metres—

1. Press L.W. Button (No. 5), set pointer to 1,500 metres.
2. Set Signal Generator to 1,500 metres (200 kcs.).
3. Adjust Oscillator T.C.10. and aerial T.C.3. for maximum output.
4. Check calibration on 1,900 metres (157.6 kcs.).

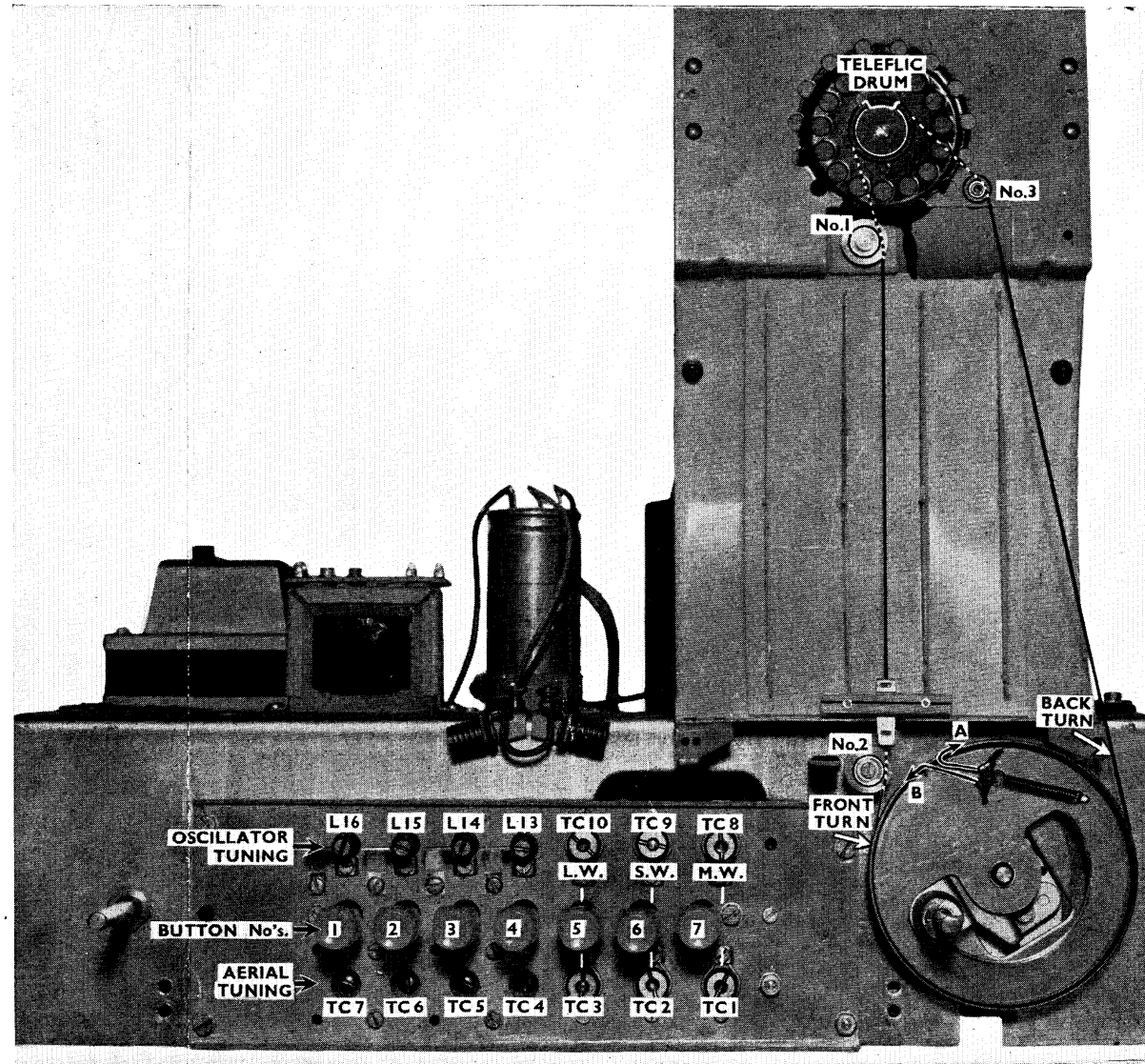
IMPORTANT—

1. Adjustment of the L.W. Oscillator T.C.10. will affect the tuning of the pre-selected stations. After the L.W. manual circuit adjustment, recheck L.13., L.14., L.15. and L.16.
2. Adjustment of the M.W. Manual Aerial T.C.1. will necessitate re-adjustment of the M.W. pre-selected station trimmers T.C.4., T.C.5., and T.C.6.

PRE-SELECTED STATION ADJUSTMENT, BUTTONS 1 TO 4—

1. Connect the Aerial and Earth to the sockets.
2. Tune to the station required on the Manual Tuner to ascertain the nature of the programme.
3. Press the Button allocated to that particular station. Turn the core adjustment (clockwise for increase in wavelength) above the Button, so that the Index mark coincides approximately with the wavelength required. Then carefully rotate the core for the loudest output from the station.
4. Adjust the Aerial tuning trimmer below the Button (clockwise for increase in wavelength) for loudest output. Unless the aerial trimmer is tuned fairly near the wavelength of the desired station, it may not be possible to make the necessary adjustment to the oscillator circuit, so as far as possible the aerial and oscillator adjustments should be aligned together.

Finally, make a careful re-adjustment of each tuned circuit. The remainder of the circuits associated with each Button should be adjusted in the same manner as outlined above.



FRONT VIEW OF P.B.83 CHASSIS SHOWING PRESS BUTTON UNIT AND TUNING DRIVE

SERVICING NOTES

Before trying to locate a fault in the Receiver, it is important to see that all valves are up to standard, and making good contact in their holders.

Voltage readings should be checked on all valves, also Speaker and Output Transformer windings checked.

If the above checks are found to be in order, apply an A.F. Signal from a Generator to the control grid of V.3. to check the sensitivity of V.3. and V. 4.; if there is no output or it is low, a component associated with V.3 and V.4. would appear to be at fault.

To check the R.F. side of the Receiver, commence with the Intermediate Frequency stage V.2.; inject a 465 kc. signal into the control grid of V.2. (top cap) and check the output against another receiver of the same type; this procedure will check the operation of V.2. and the 2nd I.F. Transformer.

To check the 1st I.F. Transformer, feed in the 465 kc. signal to the hexode anode of V.1. (pin 3). If these tests prove the sensitivity to be up to standard it should be possible to trace the fault to the Aerial or Oscillator circuits.

The Oscillator circuits can be checked by connecting a Signal Generator to the hexode control grid V.1. (top cap) and inserting an R.F. Signal within the limits covered by each waveband or pre-selected station band. If these circuits are oscillating, transfer the output from the Generator to the aerial input and check the components associated with the aerial circuits, by feeding in a similar signal as that used for the oscillator circuits on each waveband.

Provided one carefully studies the circuit diagram on page 2, together with the information given in this Service Manual, there should be no difficulty in locating the most obscure fault, should it arise.

It is essential that the source of supply from the Mains should be checked first, and then work back from V.5. to V.1.

COMPONENTS AFFECTING CALIBRATION—

Short Waveband —L.9., L.10., T.C.9., C.15.
 Medium Waveband—L.7., L.8., T.C.8., C.12., C.13.
 Long Waveband —L.11., L.12., T.C.10., C.16., C.17., C.18.

Pre-selected stations—

Button No. 1. M.W.—L.13.
 Button No. 2. M.W.—L.14.
 Button No. 3. M.W.—L.15.
 Button No. 4. L.W.—L.16., C.20.

The components of the Oscillator circuit L.11., T.C.10., C.16., C.17. and C.18. are common to the Pre-selected station circuits, therefore, any one of these being faulty will affect Buttons 1 to 4. The Oscillator grid condenser C.11. is connected to the Medium, Long wavebands and Pre-selected circuits via S.W. switch S.9. contacts 1 and 2 when the S.W. Button is out, bad contact on these two points will upset the function of the oscillator circuits.

COMPONENTS ASSOCIATED WITH THE AERIAL CIRCUITS—

Short Waveband —L.3., L.4., T.C.2., C.2., C.4., S.2.
 Medium Waveband—L.1., L.2., T.C.1., C.3., S.1.
 Long Waveband —L.5., L.6., T.C.3., C.5., C.6., S.3.

Pre-selected stations—

Button No. 1. M.W.—L.1., L.2., T.C.4., S.4.
 Button No. 2. M.W.—L.1., L.2., T.C.5., S.5.
 Button No. 3. M.W.—L.1., L.2., T.C.6., S.6.
 Button No. 4. L.W.—L.5., L.6., T.C.7., S.7.

A.V.C. LINE COMPONENTS—

A.V.C. is applied to V.1. on Medium and Long Wavebands only, and V.2. on all wavebands. R.1., C.7., R.6., C.21., R.13., C.29.

DECOUPLING AND BIAS CIRCUITS—

V.1. Bias—R.2., C.8. Screen and Oscillator anode decoupling—R.5., C.22.

V.2. Bias (common to V.3.)—R.12., C.30. Decoupling—Screen R.7., C.23. Anode R.8., C.24.

V.3. Bias as V.2. Common H.T. line decoupling—R.17.

OUTPUT CIRCUIT ARRANGEMENT—

Negative feed back is applied to the output valve. R.16, the cathode resistor, is used to apply the correct amount of feedback, carrying the D.C. component of the anode current and also the signal current, producing a voltage in opposition to the grid input. The potential applied to the screen of V.4. is lower than the anode as it is taken from the smoothed side of R.17. On a strong signal, the voltage drop along the H.T. line is reduced, as the A.V.C. produces an increased negative bias to V.1. and V.2., thus reducing the total H.T. current taken by these valves, with the result that the screen potential of V.4. rises, enabling the valve to handle a large output.

LIST OF PART NUMBERS

These Part Numbers not previously shown against the items in this Manual.

WHEN ORDERING REPLACEMENT OR SPARE PARTS PLEASE QUOTE:—

- (a) Type and serial number of receiver.
- (b) Part number and description of item.
- (c) Quantity required.

Buttons for Press Button Unit	P.2476
Cabinet	P.3723
Fibre back for cabinet	P.3722
Clip for electrolytic condenser	P.3287
Escutcheon lamp holder (left hand)	S.9238
Escutcheon lamp holder (right hand)	S.9239
Escutcheon plate for Press Button Unit	S.9244
Escutcheon for Tone Control	P.2128
Insulated distance piece for Press Button Plate	P.2335
Knob (small)	P.2216

Knob (large)	P.2020
Lamp switch assembly for Press Button Unit	S.9187
Lamp holder for tuning scale	S.9152
Mains lead with 5-amp. plug	S.9547
Panel (Aerial and Earth)	S.10196
Panel (Ext. Speaker)	S.10195
Panel (Pick-up)	S.10194
Plug, 4-pin for Tone Control	P.8225
Reflector bracket assembly for Telefluc	S.9252
Screened grid cap assembly for V.2.	S.9389A
Screened grid cap assembly for V.3.	S.9389B
Station names for Escutcheon plate	P.2445

Valves—

Type EBC.33	P.3797
Type ECH.35	P.8215
Type EF.39	P.3796
Type EL.33	P.12311
Type IW4/350	P.8224
Valve holder, 4-pin	P.3903
Valve holder, 8-pin octal	P.3900

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