

SERVICING NOTES

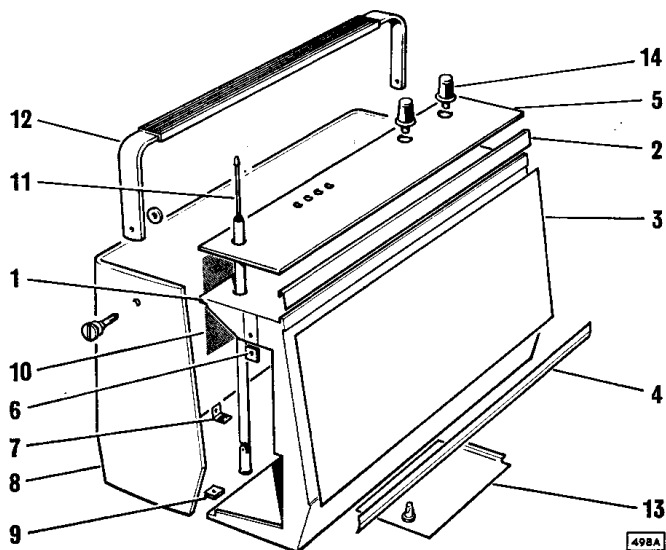
Access for Service. Take out and disconnect battery. Remove coin-slotted studs to release carrying handle, taking note of position of spacers and spring washers.

From top centre of the wrap-round cabinet back, take out the 4BA countersunk screw and also take out three countersunk screws from bottom of cabinet. The cabinet back can now be separated from the chassis and cabinet front to reveal the component side of the printed board.

For access to the copper side and the drive cord assembly, withdraw the telescopic aerial, pull off volume and tuning knobs, unsolder the telescopic aerial lead and remove two screws from lower edge of printed board: also remove three 4BA screws, two from top left-hand side of printed board and tuning drive assembly, and one from top right-hand side of printed board to release printed board and tuning drive assembly from cabinet.

Loudspeaker. If the loudspeaker requires replacement, lever up one claw of each fixing clip to loosen and use new clips to secure the replacement loudspeaker.

REPLACEMENT PARTS



Cabinet Assembly

	Model 4168	Model 6168
(1) Cabinet front assembly (including items 2-7)	03M3-111	03M3-100
Foam pad	3P9-024	3P9-024
(2) Top trim	3A2-216/003	3A2-216/004
(3) Grille	03A4-162	03A4-160
Scrim	03B4-238	03B4-238
(4) Front trim	03A2-219	03A2-219
(5) Scale	03A7-577	03A7-573
Twinstick	03B4-239	03B4-239
(6) 'U' clip securing handle	03L4-031	03L4-031
(7) Clip securing printed board... ..	03L4-169	03L4-169
(8) Cabinet back assembly (including items 9-10)	03M3-110	03M3-114
Screw (3 off)	SZ06KP08/N	SZ06KP08/N
Screw	SB06KP09/C	SB06KP09/C
(9) 'U' clip securing cabinet back	03L4-167	03L4-167
(10) Scrim on cabinet back	03B4-237	03B4-237
(11) Telescopic aerial	03F0-092/001	03F0-092/001
(12) Handle	03A9-058/001	03A9-058/003
Stud	03B3-119	03B3-119
Spacer	03L7-037	03L7-037
Washer	03L6-068	03L6-068
(13) Battery compartment cover	03B1-280/002	03B1-280/004
(14) Off/Volume or Tuning knob	03C0-222	03C0-222
Clip	03L3-111	03L3-111

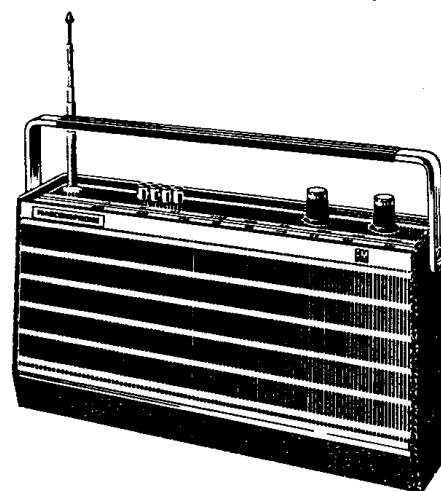
BRC service manual

Price: One Shilling and Sixpence

MARCONIPHONE **4168**

ULTRA **6168**

(Sch. A & B)



4168
(6168 is similar)

Both models are electrically identical and provide reception in the Long, Medium and VHF/FM wavebands. Each receiver is powered by a 9V battery, Type PP9 or equivalents. Personal listening and car aerial sockets are fitted.

"Marconiphone" products are made to a standard of design and quality approved by The Marconiphone Co.Ltd., registered proprietor of the name and signature trade-marks.

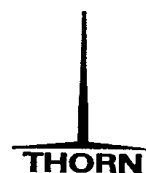
BRITISH RADIO CORPORATION LIMITED

SERVICE DEPOTS

LONDON:
P.O. Box No. 121, Lea Valley Trading Estate, Angel Road,
Edmonton, London, N.18. Tel. 01-807 3060
Spare Parts Tel. 01-807 0791; Ansafone Spares Tel. 01-807 6332

MANCHESTER:
Thorn House, Derby Street, Cheetham,
Manchester 8. Tel. 061-832 2499

GLASGOW:
155 Shieldhall Road, Glasgow, S.W.1.
Tel. 041-882 4512



British Radio Corporation Ltd. is a member
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Replacement Parts—continued

Chassis Assembly—(both models)

Printed board assembly ...	00V6-246
4BA screw securing printed board	SY06HP04
PK screw securing printed board	SZ06HP04
SP washer	WSPB04
Ferrite rod cleat	3L3-084
'U' clip	03L4-167
Screw	SA06HH06
Tuning drive support moulding assembly	03M3-095
Scale backing	(Model 4168) 03A7-616/002
	(Model 6168) 03B5-083/002
Cursor	03M4-096
Tuning drive pulley assembly	03L6-037
Special nut	03C8-112
SP washer	03C8-121
Small pulley (black)	03L3-039
Large pulley	03F5-031
Circlip	03L6-110/002
Drive drum	03L6-110/001
Screw	03C0-226
Screw securing tuning gang	00B5-068
Push-button	03B1-282
Drive cord tension spring	3F6-031
J1/SKT1 bracket	
Battery connector	

COMPONENT DETAILS

When ordering replacement capacitors and resistors for which no part number is given, please quote Model number and component details as stated below.

References in the location column refer to the illustration on back page.

RESISTORS

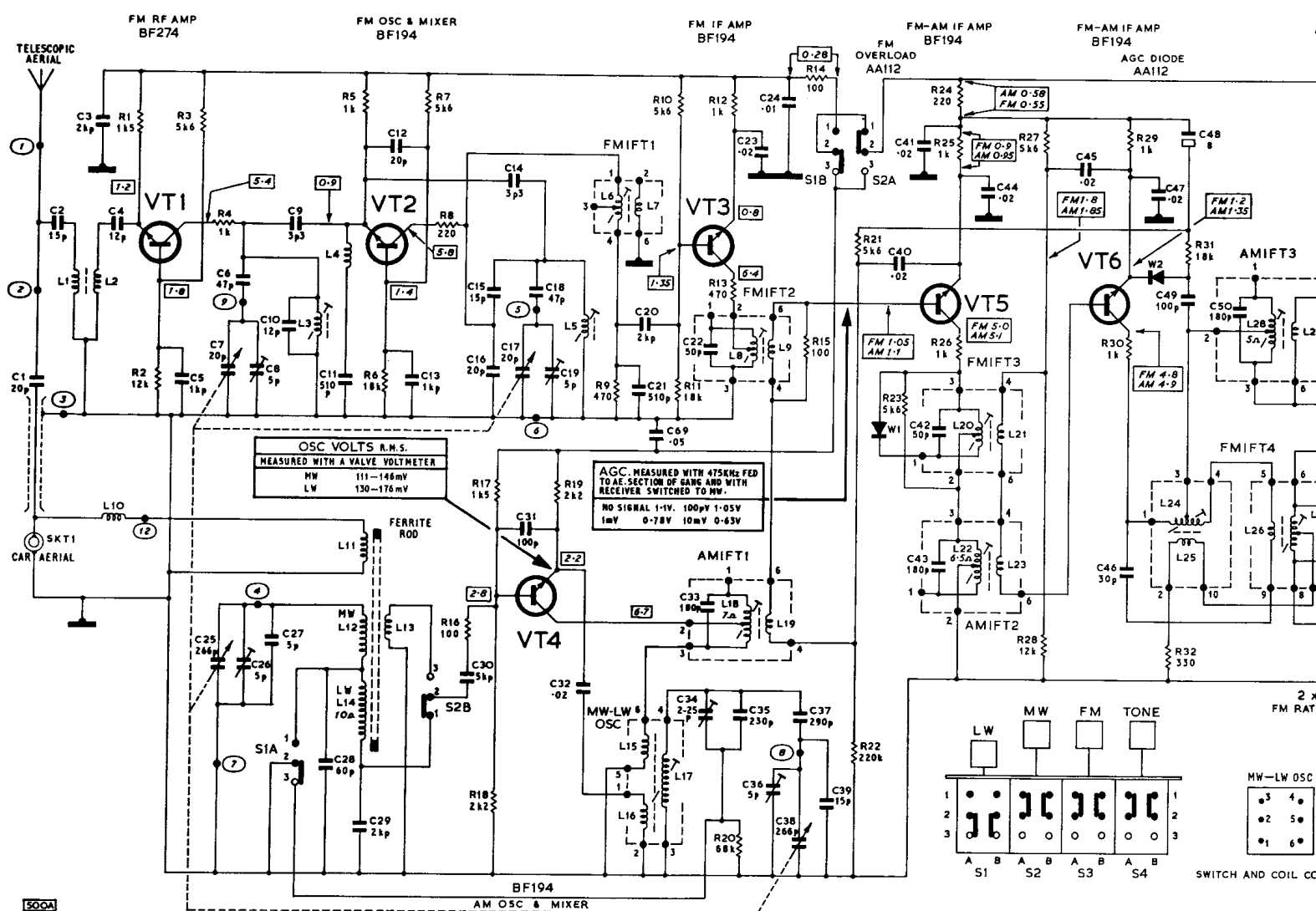
REF	DESCRIPTION & PART NO.	LOC
R1	1.5kΩ, 10%, 1/4W, VT1 emitter stabilizing	EF3
R2	12kΩ, 10%, 1/4W, Part VT1 base bias pot. divider	E4
R3	5.6kΩ, 10%, 1/4W, Part VT1 base bias pot. divider	E4
R4	1kΩ, 10%, 1/4W, FM RF stopper	E4
R5	1kΩ, 10%, 1/4W, VT2 emitter stabilizing	F2
R6	18kΩ, 10%, 1/4W, Part VT2 base bias pot. divider	F3
R7	5.6kΩ, 10%, 1/4W, Part VT2 base bias pot. divider	F2
R8	220Ω, 10%, 1/4W, FM RF stopper	EF3
R9	470Ω, 10%, 1/4W, VT2 collector load	E2
R10	5.6kΩ, 10%, 1/4W, Part VT3 base bias pot. divider	E3
R11	18kΩ, 10%, 1/4W, Part VT3 base bias pot. divider	E3
R12	1kΩ, 10%, 1/4W, VT3 emitter stabilizing	E3
R13	470Ω, 10%, 1/4W, AM limiting	E3
R14	100Ω, 10%, 1/4W, Part FM supply line decoupling	E2
R15	100Ω, 10%, 1/4W, FM IFT2 damping	E3
R16	100Ω, 10%, 1/4W, AM RF stopper	D3
R17	1.5kΩ, 10%, 1/4W, Part VT4 base bias pot. divider	D3
R18	2.2kΩ, 10%, 1/4W, Part VT4 base bias pot. divider	DE3
R19	2.2kΩ, 10%, 1/4W, VT4 emitter stabilizing	DE3
R20	68kΩ, 5%, 1/4W, MW oscillator damping	E3
R21	5.6kΩ, 10%, 1/4W, Part VT5 base bias pot. divider	D4
R22	220kΩ, 10%, 1/4W, Part VT5 base bias pot. divider	D3,4
R23	5.6kΩ, 10%, 1/4W, FM IFT3 damping	E4
R24	220Ω, 10%, 1/4W, VT5 supply line dropper	CD3
R25	1kΩ, 10%, 1/4W, VT5 emitter stabilizing	DE4
R26	1kΩ, 10%, 1/4W, VT5 AM limiting	E3,4
R27	5.6kΩ, 10%, 1/4W, Part VT6 base bias pot. divider	DE4
R28	12kΩ, 10%, 1/4W, Part VT6 base bias pot. divider	DE4
R29	1kΩ, 10%, 1/4W, VT6 emitter stabilizing	DE4
R30	1kΩ, 10%, 1/4W, AM limiting	D4
R31	18kΩ, 10%, 1/4W, AGC feed	DE4
R32	330Ω, 10%, 1/4W, Ratio detector tertiary series	D4
R33	5.6kΩ, 10%, 1/4W, AM detector load	CD4
R34	22kΩ, 10%, 1/4W, Part IF filter	C3,4
R35	68Ω, 10%, 1/4W, DC dropper and decoupler	D2
R36	5.6kΩ, 10%, 1/4W, Ratio detector load	C4
R37	5.6kΩ, 10%, 1/4W, Ratio detector load	C4
R38	1kΩ, 10%, 1/4W, Part de-emphasis	C4
R39	20kΩ, Log. pot., Volume control and switch S5, 03E1-077/002	B2
R40	100kΩ, 10%, 1/4W, Part VT7 base bias pot. divider	B3
R41	22kΩ, 10%, 1/4W, Part VT7 base bias pot. divider	A2,3
R42	330Ω, 10%, 1/4W, DC dropper and decoupler	A2
R43	5.6kΩ, 10%, 1/4W, VT7 collector load	AB2
R44	680Ω, 10%, 1/4W, VT7 emitter stabilizing	AB3
R45	33kΩ, 10%, 1/4W, VT7 base bias feed	B3
R46	68kΩ, 10%, 1/4W, Part VT8 base bias pot. divider	A2,3
R47	39kΩ, 5%, 1/4W, Part VT8 base bias pot. divider	AB3
R48	10Ω, 10%, 1/4W, NFB current limiting	B2,3
R49	1.5kΩ, 10%, 1/4W, VT8 collector load	B3
R50	680Ω, 10%, 1/4W, VT8 emitter stabilizing	BC3
R51	680Ω, 10%, 1/4W, VT9 collector load	CD2
R52	330Ω, 10%, 1/4W, Output transistors protective load	C2

CAPACITORS

REF	DESCRIPTION & PART NO.	LOC
C1	20pF, 5%, 500V, AM aerial coupling	F4
C2	15pF, 5%, 500V, FM aerial coupling	F3,4
C3	2000pF, 20%, 500V, FM supply line decoupling	EF2
C4	12pF, 5%, 500V, VT1 signal coupling	EF4
C5	1000pF, 20%, 500V, VT1 base bias decoupling	E4
C6	47pF, 5%, 500V, FM RF amp. fixed padder	E3,4
C7	20pF, FM RF amp. tuning; Part tuning gang, 03E4-041	F7
C8	5pF, FM RF amp. trimmer; Part tuning gang, 03E4-041	FG3
C9	3.3pF, ±1pF, 500V, VT2 emitter coupling	F3,4
C10	12pF, 5%, 500V, FM RF amp. fixed trimmer	E4
C11	510pF, 10%, 500V, Part 10.7 MHz rejector	EF3
C12	20pF, 5%, 500V, VT2 emitter bypass	F2,3
C13	1000pF, 20%, 500V, VT2 base decoupling	F3
C14	3.3pF, ±1pF, 500V, FM oscillator emitter coupling	F3
C15	15pF, 5%, 500V, Part FM mixer coupling	EF3
C16	20pF, 5%, 500V, Part FM mixer coupling	E3
C17	20pF, FM oscillator tuning; Part tuning gang, 03E4-041	F7
C18	47pF, 5%, 500V, FM oscillator fixed padder	F3
C19	5pF, FM oscillator trimmer; Part tuning gang, 03E4-041	FG3
C20	2000pF, 20%, 500V, VT3 base coupling	E2,3
C21	510pF, 10%, 500V, VT2 collector decoupling	E2,3
C22	50pF, L8 tuning, Part FM IFT2	E3
C23	.02μF, —20 + 80%, 50V, VT3 emitter bypass	E3
C24	.01μF, —20 + 80%, 50V, Part FM supply line decoupling	F4
C25	266pF, AM aerial tuning; Part tuning gang, 03E4-041	F7
C26	5pF, AM aerial trimmer; Part tuning gang, 03E4-041	FG4
C27	5pF, 5%, 500V, AM aerial fixed trimmer	F3
C28	60pF, 2 1/2%, 20V, LW aerial fixed trimmer	E1
C29	2000pF, 20%, 500V, LW aerial bottom end coupling	D3
C30	5000pF, 20%, 500V, VT4 signal coupling	D3
C31	100pF, 10%, 500V, VT4 stabilizing	DE3
C32	.02μF, —20 + 80%, 50V, AM oscillator emitter coupling	D3
C33	180pF, L18 tuning; Part AM IFT1	D3,4
C34	2.25pF, Preset, LW oscillator trimmer, 03E4-015	D3
C35	230pF, 2%, 350V, LW oscillator fixed trimmer	DE3
C36	5pF, MW oscillator trimmer; Part tuning gang, 03E4-041	FG3
C37	290pF, 2%, 350V, MW oscillator fixed padder	E3
C38	266pF, AM oscillator tuning; Part tuning gang, 03E4-041	F7
C39	15pF, 5%, 500V, MW oscillator fixed trimmer	E3
C40	.02μF, —20 + 80%, 50V, VT5 base bias decoupling	DE3
C41	.02μF, —20 + 80%, 50V, VT5/6 emitter supply line decoupling	D4
C42	50pF, L20 tuning; Part AM IFT3	E4
C43	180pF, L22 tuning; Part AM IFT2	E4
C44	.02μF, —20 + 80%, 50V, VT5 emitter bypass	E3,4
C45	.02μF, —20 + 80%, 50V, VT6 base bias decoupling	DE4
C46	30pF, 5%, 500V, FM IFT4 primary tuning	D4
C47	.02μF, —20 + 80%, 50V, VT6 emitter bypass	D4
C48	8μF, Elec., 18V, AGC decoupling, 00E0-222/13	D4
C49	100pF, 10%, 500V, AGC diode signal coupling	D4
C50	180pF, L28 tuning; Part AM IFT3	D4
C51	5000pF, 20%, 500V, Part AM IF filter	D4
C52	90pF, L27 tuning; Part FM IFT4	CD4
C53	.02μF, —20 + 80%, 50V, RF IF supply line decoupling	D3
C54	510pF, 10%, 500V, Part ratio detector decoupling	C4
C55	510pF, 10%, 500V, Part ratio detector decoupling	C4
C56	5000pF, 20%, 500V, Part AM IF filter	C4
C57	8μF, Elec., 18V, Ratio detector stabilizing, 00E0-222/13	C4
C58	150μF Elec., 9V, Supply line decoupling, 00E0-229/59	CD3
C59	.01μF, —20 + 80%, 50V, Part de-emphasis	C4
C60	0.22μF, 10%, 250V, Part FM and AM detector output coupling	D2,3
C61	.05μF, —20 + 80%, 50V, Tone control	D2
C62	0.22μF, 10%, 250V, VT7 audio coupling	A3
C63	8μF, Elec., 18V, VT8 base bias decoupling, 00E0-222/13	AB2
C64	8μF, Elec., 18V, VT7 output coupling, 00E0-222/13	B3
C65	300μF, Elec., 9V, NFB and DC blocking, 00E0-229/85	B2
C66	2000pF, 20%, 500V, Tone correction	BC3
C67	300μF, Elec., 9V, Supply decoupling, 00E0-229/85	C2,3
C68	300μF, Elec., 9V, Audio output coupling, 00E0-229/64	C3
C69	.05μF, —20 + 80%, 50V, VT4 supply line decoupling (AM)	DE7

MISCELLANEOUS

REF	DESCRIPTION & PART NO.	LOC
J1	Personal listening socket (push-on-fix 03L2-103), 03F6-037	C3
LS	Loudspeaker (10 ohms impedance), 03E3-044/003	—
S1-4	Push-button wavechange switch, 03E2-080	DE2
S5	Off-On switch (with R39)	B2
SKT1	Car aerial socket (clip 03L2-089), 03F6-025/002	C3
W1	AA112, FM overload diode	E4
W2	AA112, AGC diode	D4
W3	AA112, AM detector	D4
W4	AA112, Ratio detector diode	C4
W5	AA112, Ratio detector diode	C4
W6	D3, Stabilizing diode (Part output pack LP42—00V1-216)	C2,3



INDUCTORS

REF	DESCRIPTION & PART NO.	LOC
L1-2	FM aerial coupling, 03D1-149	F4
L3	FM RF tuning, 03D0-081	E4
L4	FM RF choke, 03D8-002	EF2
L5	FM oscillator tuning, 03D1-192	E3
L6-7	FM IFT1, 03D0-055...	E2
L8-9	FM IFT2, 03D0-055...	FG4
L10	RF choke, 03D8-003	C7
L11	AM aerial coupling coil,	EF1
L12	MW aerial coil	D1
L13	VT4 base coupling coil,	DE1
L14	LW aerial coil,	F1
L15-17	AM oscillator coil, 03D1-070	CD3
L18-19	AM IFT1, 03D0-036	D4,5
L20-21	FM IFT3, 03D0-055...	EF4
L22-23	AM IFT2, 03D0-037	E4,5
L24-25	FM IFT4 primary, 03D0-050	D4,5
L26-27	FM IFT4 secondary, 03D0-051	C4,5
L28-29	AM IFT3, 03D0-038	B3,4
L30	RF choke, 03D8-003	C4

CIRCUIT DIAGRAM (Sch. B)

All voltages were measured with a 20,000 Ω /volt meter and are with respect to the emitter line of each transistor, except where otherwise shown. Ringed figures indicate printed board tag connection points. DC resistances of inductors are shown where these exceed 1 Ω . Transistor types which are similar to those shown in the circuit diagram may be fitted during manufacture or supplied as replacements. In some receivers R46 is 82k Ω , and C35 is 240pF. In Sch.A receivers R34 is 5.6k Ω and C56 is .01 μ F.

The manufacturers reserve the right to vary specifications or use alternative materials as may be deemed necessary or desirable at any time.

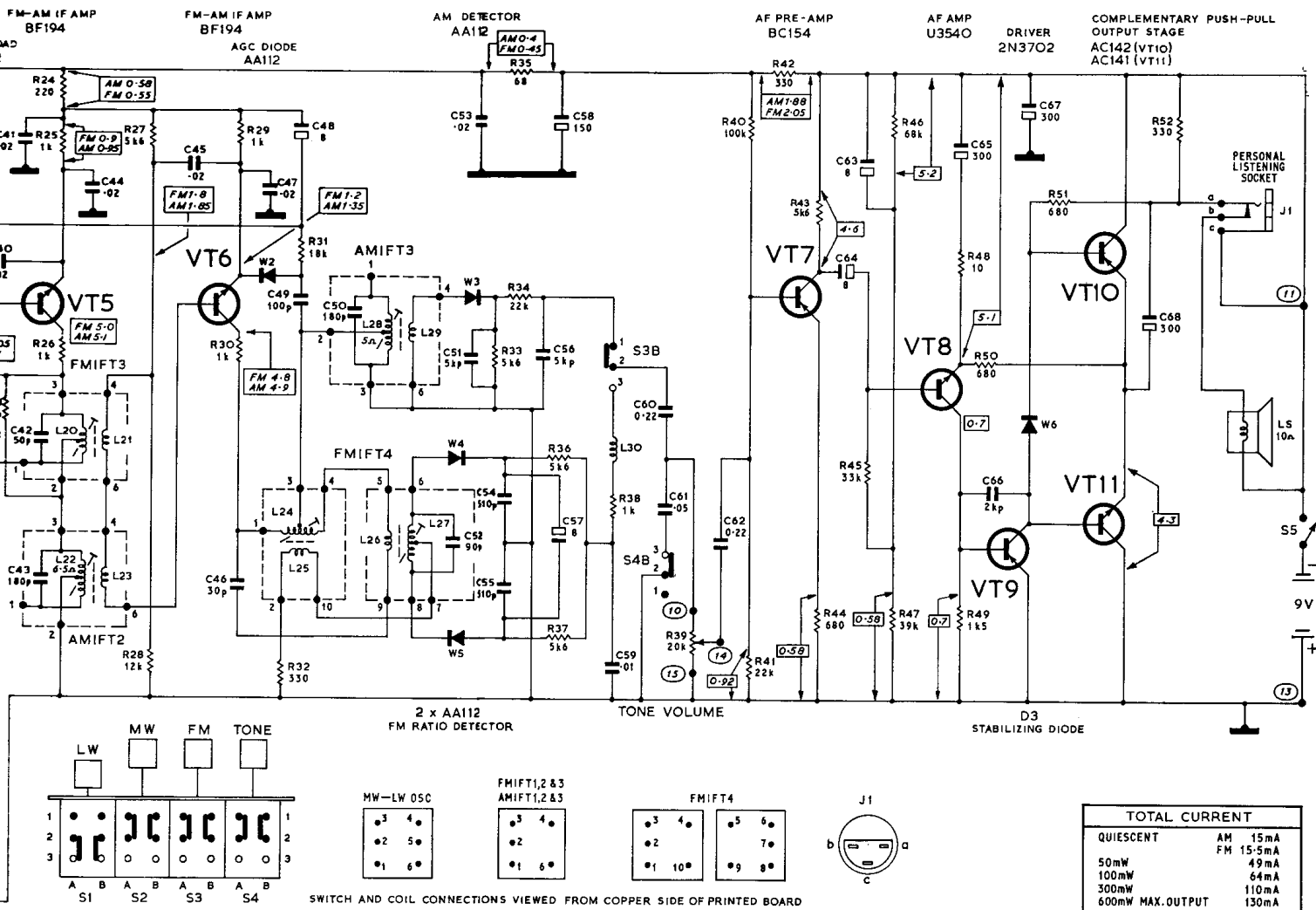


DIAGRAM (Sch. B)

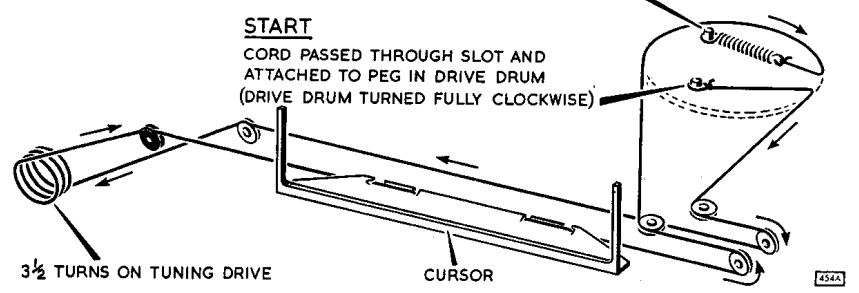
measured with a 20,000 Ω/volt meter and are printed on the center line of each transistor, except where indicated by circled figures indicate printed board tag resistances of inductors are shown where inductors are similar to those shown in the diagram may be fitted during manufacture or otherwise. In some receivers R46 is 82kΩ, and in some receivers R34 is 5.6kΩ and C56 is .01μF.

It is recommended that you vary specifications or use alternative materials as long as they are desirable at any time.

DRIVE CORD ARRANGEMENT

USE APPROXIMATELY 40" OF NYLON BRAIDED CORD. (ACTUAL LENGTH BETWEEN KNOTS - 35 1/4")

FINISH
CORD PASSED THROUGH SLOT AND SPRING ATTACHED TO PEG IN DRIVE DRUM



ALIGNMENT DATA

A signal from a suitable AM-FM generator is required. Tuning indication is best obtained either with an output meter having an impedance of 10Ω and connected in place of the loudspeaker or a Model 8 Avometer, set to the 10V AC range, connected in parallel with the loudspeaker.

Throughout alignment the signal input level to the receiver should be adjusted to maintain the audio output at approximately 50mW with the volume control set at maximum in order to avoid alignment error due to AGC action.

Appropriate alignment markers are provided by notches in the scale backing plate but as these are not annotated they should be identified by comparison with the tuning scale.

AM IF Circuits

Select MW and turn gang to maximum capacitance. Apply a 475 kHz modulated signal through a $0.1\mu\text{F}$ capacitor between tag 4 and frame of tuning gang. Adjust L28, L22 and L18 in that order for maximum output.

Repeat in the same order until no further improvement is obtainable.

AM RF Circuits

With gang fully closed, check and if necessary, adjust cursor to coincide with zero marker pips on right-hand end of scale or appropriate notch in scale backing plate. MW must be aligned first. Medium and Long wave signals should be injected via a loop loosely coupled to the ferrite rod aerial. Set signal generator and cursor as indicated in the table and make all adjustments for maximum output.

Range	Inject	Cursor Position	Adjust
MW	600 kHz 1500 kHz	PAD marker notch or centre of 500 metres TRIM marker notch or centre of 200 metres	L17, L12* C36, C26
LW	220 kHz 200 kHz	LW calibration notch or centre of 1400 metres	C34, L14†

*Adjust by sliding ring along ferrite rod

†Adjust by sliding coil former along ferrite rod

Repeat adjustments as necessary to obtain maximum output.

FM IF Circuits

Select FM. Inject 10.7 MHz (25 kHz deviation) signal, via a $0.1\mu\text{F}$ blocking capacitor, between tag 9 and frame of tuning gang and peak L27, L24, L20, L8 and L6 for maximum output. Switch signal generator to AM (30% modulation) and adjust L27 for minimum output (AM rejection).

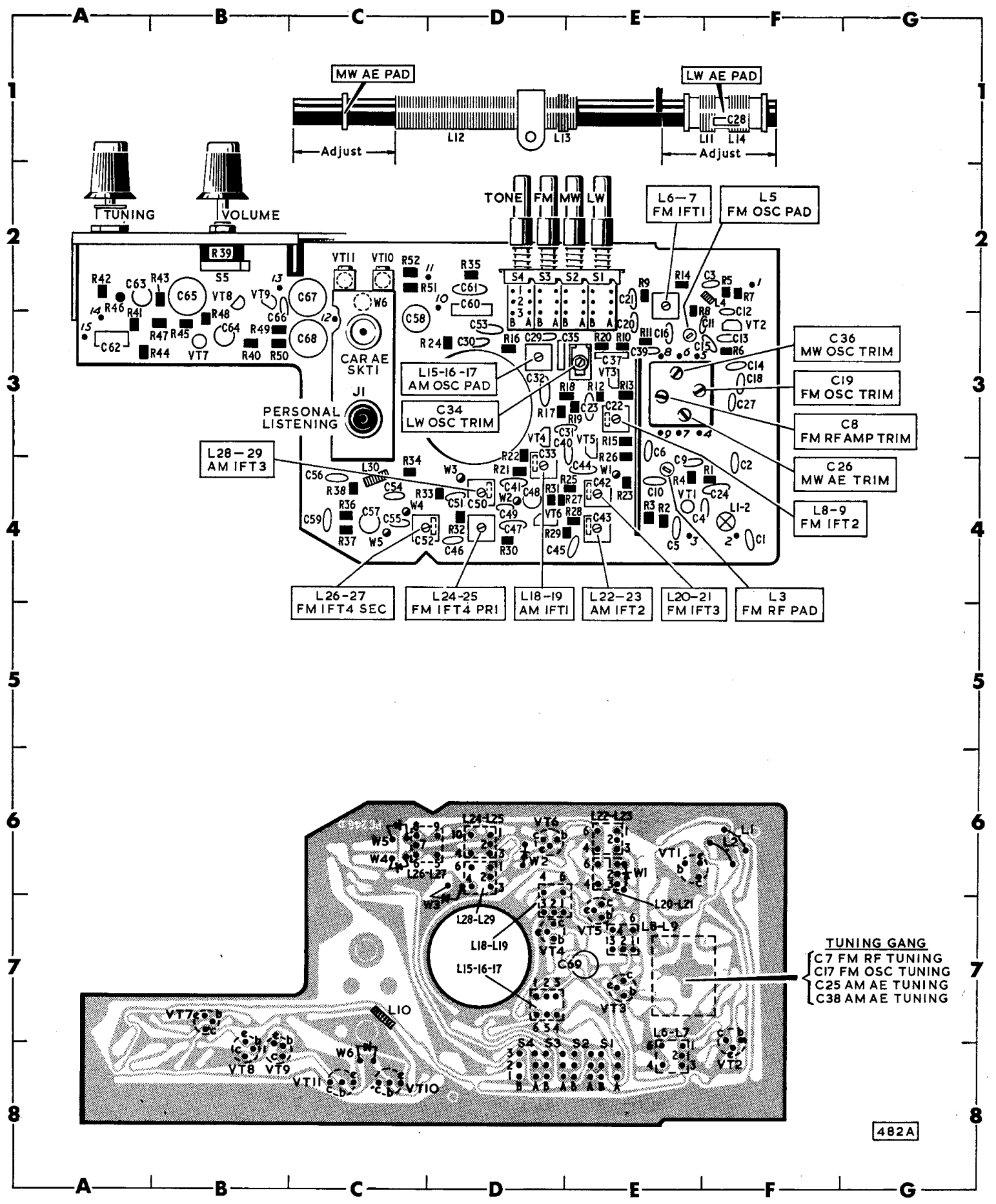
Repeat as necessary for maximum FM output and minimum AM output.

FM RF Circuits

Inject FM RF signals into telescopic aerial lead with aerial disconnected and make adjustments for maximum output.

Range	Inject	Cursor Position	Adjust
FM	88 MHz 96 MHz	88 MHz notch or scale calibration 96 MHz notch or scale calibration	L5, L3 C19, C8

Repeat in the same order until no further improvement results.



Component and copper sides of printed board showing alignment adjustments and base connections of coils, diodes and transistors.