Marconiphone

SERVICE MANUAL

Price One Shilling

SPECIFICATION

BATTERY

9V Drydex DT9, Ever Ready PP9, Siemens TR9, Vidor VT9 or equivalent

WAVERANGES

Medium:	193-571 metres (1550-525 Kc/s)
Long:	1154-2000 metres (260-150 Kc/s)
Bandspread Lux:	187.5-214 metres (1600-1400 Kc/s)

INTERNAL AERIAL

7in. × $\frac{3}{8}$in. ferrite rod

LOUDSPEAKER

7in. × $3\frac{5}{8}$in. elliptical, PM, moving coil, 25 ohms impedance

POWER OUTPUT

1W—Push-pull

CASE DIMENSIONS

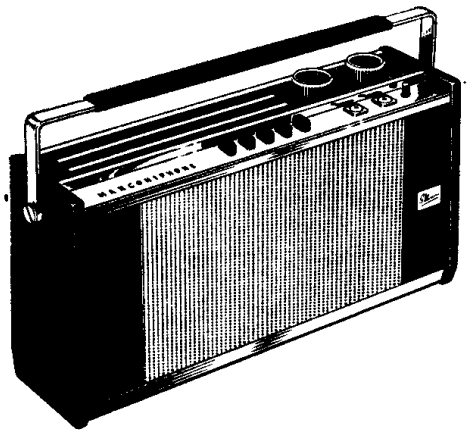
$6\frac{3}{4}$in. high (excluding handle) × $3\frac{1}{4}$in. deep × $13\frac{5}{8}$in. wide

SOCKET FACILITIES

Private listening socket with muting of internal loudspeaker : min. impedance not less than 30Ω. Tape socket for recording from radio : min. load impedance 50KΩ. Car aerial socket for standard type car aerial. *A permeability tuned input coil is switched into circuit in place of ferrite rod when CAR button is depressed.*

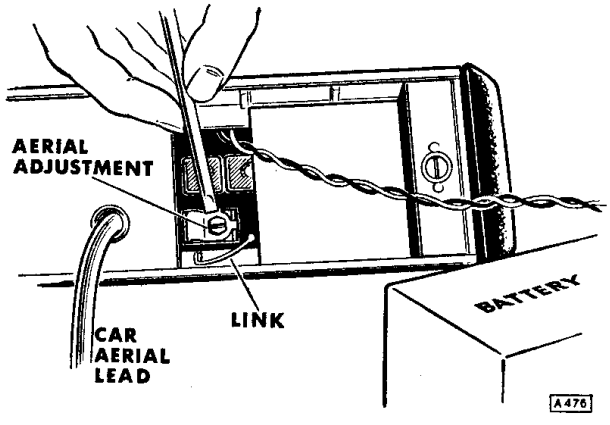
TRANSISTORS

	Mullard	Mazda	
VT1	AF117		Mixer
VT2	AF117		Oscillator
VT3	AF117		1st IF amplifier
VT4	AF117		2nd IF amplifier
VT5		AC155	AF amplifier
VT6		AC113	AF driver
VT7	matched	AC154	Push-pull output
VT8	pair	AC154	
VT9		AC169	Bias stabilizer



CAR AERIAL ADJUSTMENT

This adjustment is accessible after withdrawing the battery from the battery compartment within the limits of the connecting leads. Plug in car aerial feeder, select MW and depress CAR button. Tune receiver to any weak station around the high frequency end of the range and peak **C1.** Check that peak occurs within four turns of maximum capacitance. If a peak cannot be obtained within four turns, the shorting link across **C2** should be removed. This will generally only be necessary for cars fitted with aerial feeders over 8ft. long.



Location of car aerial trimmer C1 and shorting link across C2

ALIGNMENT DATA

A signal from a suitable generator, 30% amplitude modulated by an AF signal, is required for circuit alignment. Tuning indication is best obtained either with an output meter having an impedance of 20-30Ω and connected across the LS winding of T2 (with the loudspeaker disconnected) or a Model 8 Avometer, set to the 2·5V 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.

IF CIRCUITS

Depress ON & MW buttons and turn gang to maximum. Apply a 475 Kc/s modulated signal through a 0.1μF capacitor between tag 13 and chassis. Adjust L14, L13, L12, L11 and L10 in that order for maximum output. Repeat in the same order until no further improvement is obtainable.

RF CIRCUITS

With gang at maximum, check that cursor coincides with set zero pips at left-hand end of scale window. Slide cursor along drive cord to correct any error in calibration. MW must be aligned first. Signals should be injected via a loop loosely coupled to the ferrite rod aerial with the CAR button in the off position.

Range	Inject	Cursor Position	Adjust
MW	600 Kc/s	500 metres	L7, L5*
LUX	1500 Kc/s	200 metres	C19
MW	1500 Kc/s	200 metres	C6
LUX	1500 Kc/s	200 metres	C7
LW	200 Kc/s	1500 metres	C20, L4*

* Adjust by sliding coil along ferrite rod .

Repeat RF alignment as necessary to obtain maximum output and accurate calibration. Note : When cabinet back cover is refitted, MW aerial coil L5 and LW aerial coil L4 will lose inductance due to detuning effect of metal trims. Readjust as follows :

Switch to MW, slide L5 slightly inwards along ferrite rod then recheck output level. Repeat until output level returns to maximum with back cover in position. Switch to LW and use similar procedure for L4.

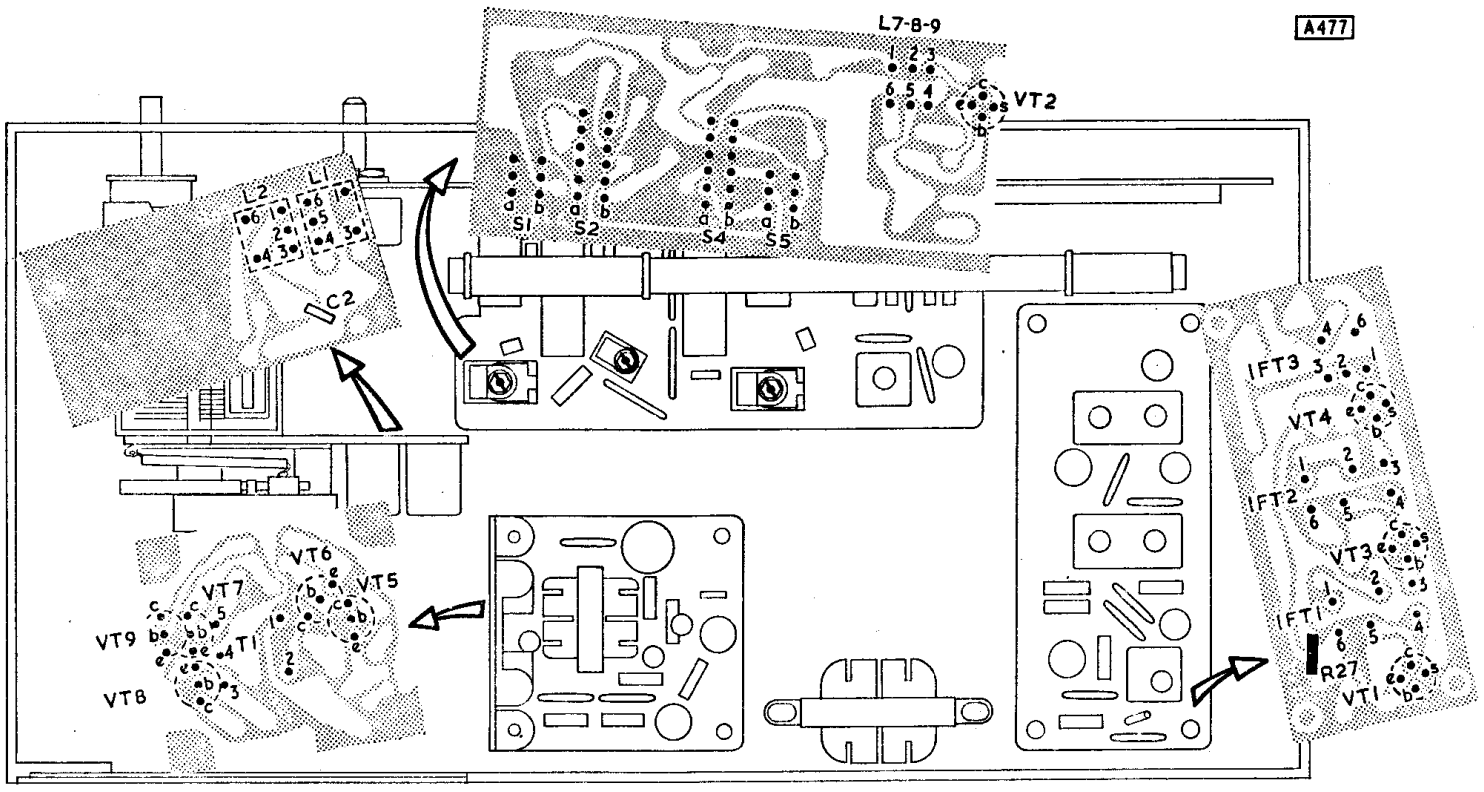
CAR AERIAL TUNER

MW : Depress MW and CAR buttons and set MW car aerial pad (L3) adjusting screw (cam follower) so that an equal amount of thread appears at each end of its black moulded support. With gang fully closed, check that slot in rear face of drive cam is in line with cam follower. Set receiver to 500 metre calibration marker on scale and inject 600 Kc/s signal into car aerial socket via dummy load comprising an 18pF capacitor in series with signal generator output, followed by a 60pF shunt capacitor. Adjust C1 for maximum output.

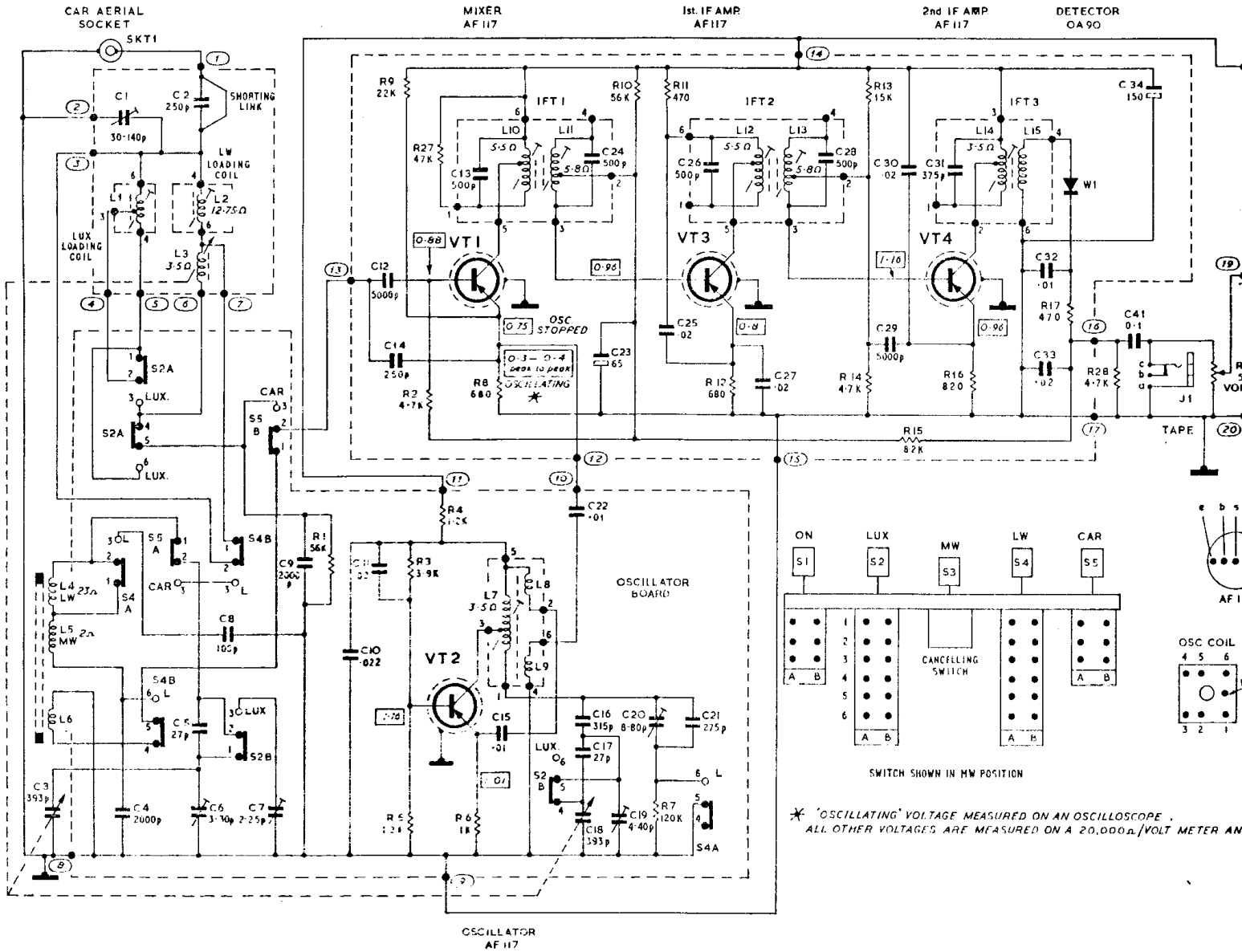
Set receiver to 214 metre calibration marker on scale, inject 1400 Kc/s signal and adjust MW car aerial pad adjusting screw for maximum output. Repeat until no further improvement results.

Depress LUX and CAR buttons, set receiver to 200 metres on LUX scale, inject a 1500 Kc/s signal and adjust L1 for maximum output.

LW : Depress LW and CAR buttons and set receiver to 1500 metres. Inject 200 Kc/s signal and adjust L2 for maximum output.



Copper Side of Printed Boards showing transistor and coil connections



CIRCUIT DIAGRAM NOTES

DC resistance readings are shown against inductors where these are 1 ohm or greater. Ringed figures indicate printed board tag connection points.

Operation of stabilizing transistor VT9

The bias voltage applied to the push-pull output transistors VT7 and VT8, is determined by the collector/emitter voltage of VT9. This voltage is in turn, dependent upon the base/emitter voltage of VT9, and is derived from the voltage across R25, which with R24 forms part of a potentiometer in the emitter circuit of VT6. Thus a voltage change in the emitter circuit of VT6 will produce a corresponding change in the controlling voltage applied to the base of VT9.

Temperature variations are compensated by a change occurring in the base/emitter voltage of VT9 and any supply voltage variations are compensated by the change in bias on VT9 caused by alteration of emitter current of VT6.

SERVI

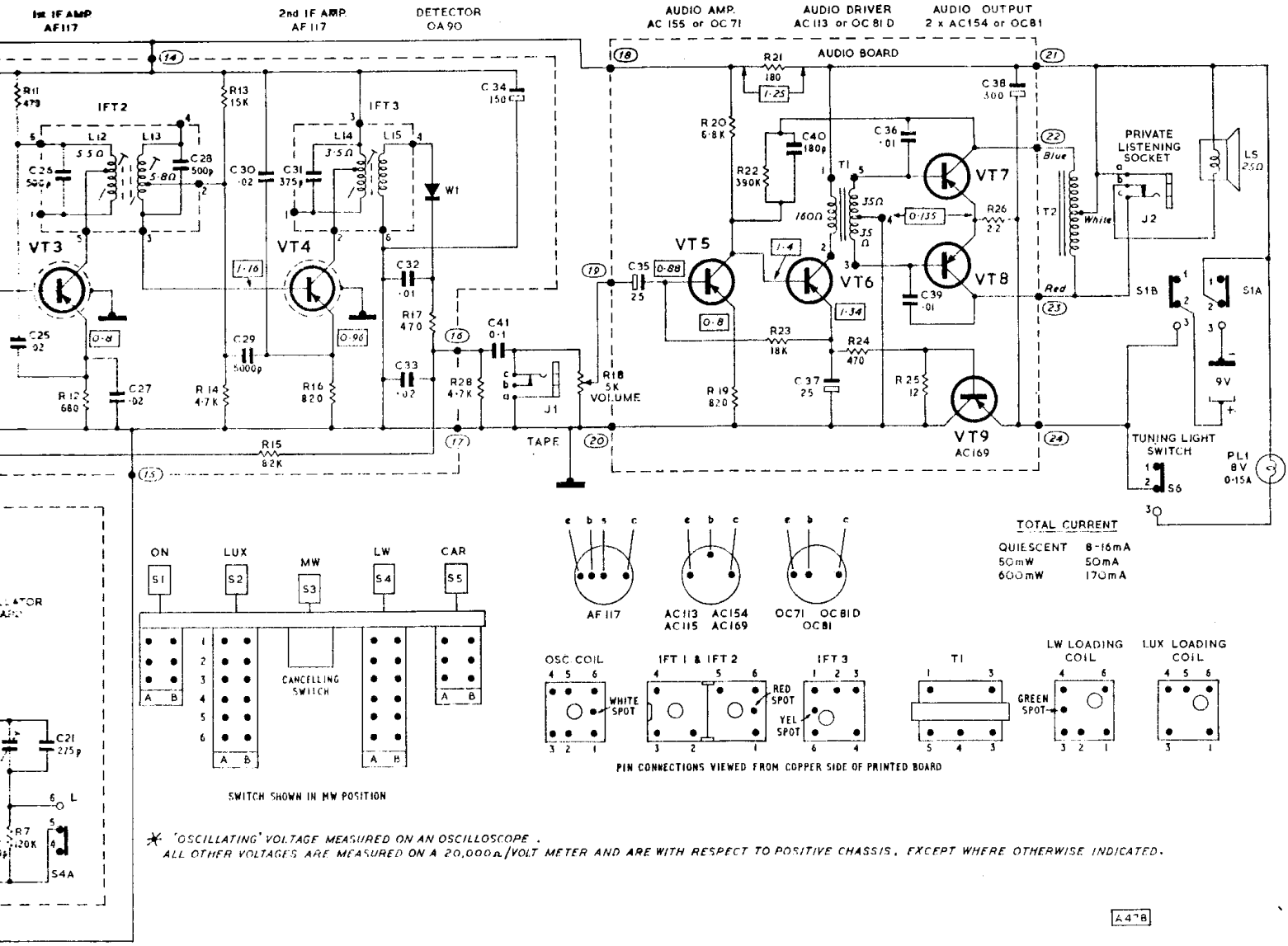
ACCESS FOR SERVICE

Release battery cover and take out battery. Remove countersunk screws from bottom of cabinet, pull out lower edge of speaker baffle and withdraw it down and out from behind rear scale trim within limit of speaker leads.

To gain access to drive cord assembly, pull off volume and tuning knobs then lay receiver face down on a protective surface. Remove screws and washers securing wavechange switch board (including screw and pillar supporting MW aerial trimmer C6) and also screws and washers securing tuning assembly. Disconnect tape leads from volume control and withdraw tuning assembly within limit of leads.

Three screws and four screws respectively, secure the Audio and IF boards.

When refitting wavechange switch board, position MW aerial trimmer C6 so that it can be adjusted through aperture in battery compartment. In addition, prise off speaker fasteners and unsolder car aerial and private listening socket leads if receiver assembly is to be completely removed from the case.



SERVICE NOTES

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Scale Lamp

One leg of scale lamp support bracket is bent up to prevent the lamp accidentally falling off. This leg must be straightened before the lamp can be withdrawn.

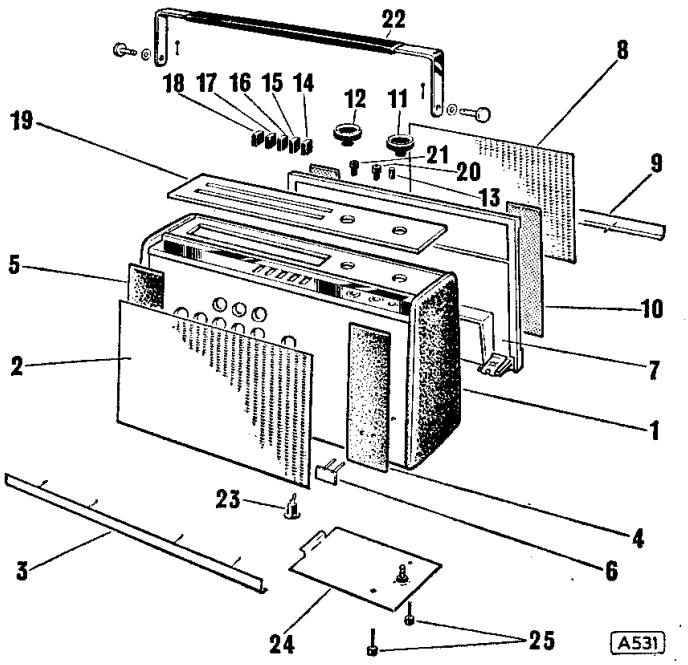
Scale Diffuser

The scale diffuser is held in place by the drive cord support frame. Remove scale lamp and pull off diffuser for access to ferrite rod aerial, etc.

To check oscillator operation, use an oscilloscope to measure the peak-to-peak voltage across R8, and compare with the voltage indicated in the circuit diagram for a correctly functioning oscillator. An alternative method is to connect a DC voltmeter across R8. If the oscillator is working properly, the voltage should drop slightly when the oscillator section of the tuning gang is short-circuited.

Transistors should not be replaced unless voltage checks, etc., indicate that replacement is necessary. The complementary power output transistors are a matched pair; if one becomes faulty, both must be replaced by a new matched pair. Thorn replacement types are available from our Service Depots.

REPLACEMENT PARTS LIST



Cabinet Parts

1.	Cabinet front assembly	3M4-170
2.	Grille (front)	3A4-022
3.	Bottom trim (front)	3A2-036
4.	Padding (front R.H.)	3B4-038/1
5.	Padding (front L.H.)	3B4-038
6.	Emblem	3A6-005
7.	Cabinet back assembly (clip 3L4-163; chrome screw SZ8KP08/C; screw SZ8KP08)	3M4-171
8.	Grille (back)	3A4-022/1
9.	Bottom trim (back)	3A2-036
10.	Padding (back)—2	3B4-065
11.	Tuning knob (clip 3L3-091)	3C0-014/4
12.	Volume knob (clip 3L3-091)	3C0-014/4
13.	Button (scale lamp)	3C0-033
14.	Button (ON)	3C0-029/6
15.	Button (LUX)	3C0-029/4
16.	Button (MW)	3C0-029/3
17.	Button (LW)	3C0-029/2
18.	Button (CAR)	3C0-029/1
19.	Scale (twin stick ¼in. 3P8-014; twin stick 5/16in. 3P0-015)	3A7-060/2
20.	Personal listening socket (push-on fix 3L2-091)	3F6-037
21.	Tape input socket (push-on fix 3L2-091)	3F6-037
22.	Handle assembly (pivot pin 3B3-036; washer 3L6-003; split pin 3L5-003)	3M4-169
23.	Car aerial socket (clip 3L2-089)	3F6-025/1
24.	Battery flap (fastener 3B3-026; rubber washer 3L6-027)	3B1-079
25.	Foot—4	3A8-003

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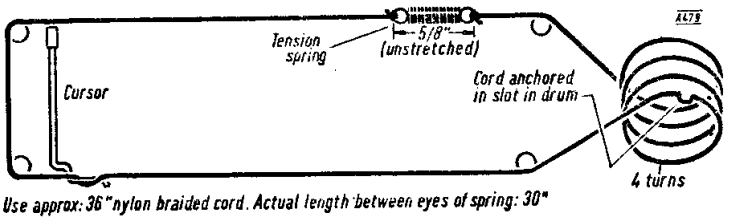
DRIVE CORD ARRANGEMENT



Use approx: 36" nylon braided cord. Actual length between eyes of spring: 30"

PRINTED BOARD TAG CONNECTIONS

Car Aerial Tuner Board

1. To C2 shorting link, C2, and SKT1 inner
2. To SKT1 outer and tag 8 on Wavechange Switch Board
3. To C2 shorting link, C2, and S4B, contact 2
4. To S2A, contact 2
5. To S2A, contact 1
6. To L3 and S2A, contact 3
7. To L3 and S4B, contact 1

Wavechange Switch Board

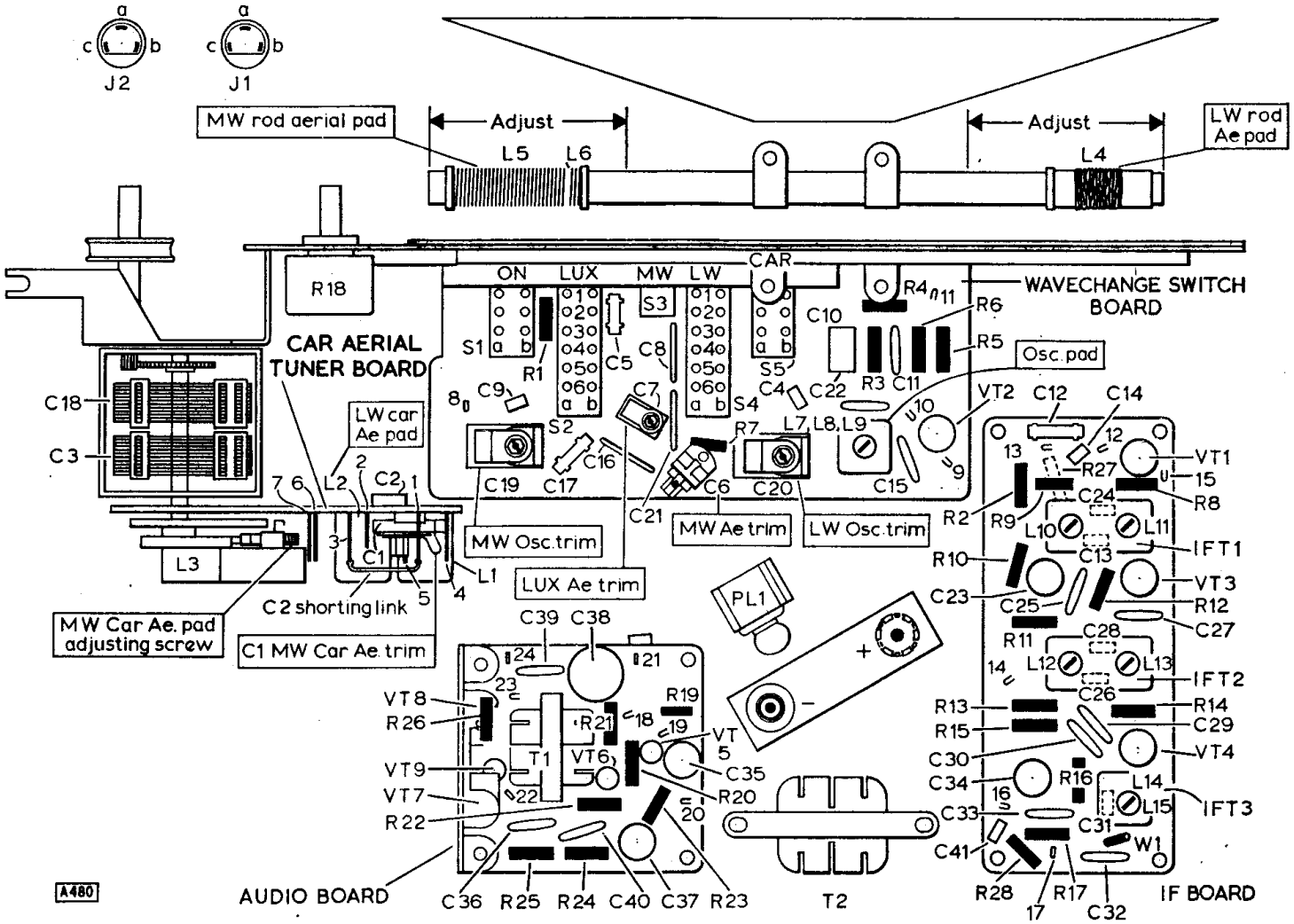
8. To gang frame, switch frame and tag 2 on Car Aerial Tuner Board
9. To tag 15 on IF Board
10. To tag 12 on IF Board
11. To tag 14 on IF Board

IF Board

12. To tag 10 on Wavechange Switch Board
13. To S5B, contact 2
14. To tag 11 on Wavechange Switch Board and tag 18 on Audio Board
15. To tag 9 on Wavechange Switch Board
16. To C41 & R28
17. To tag 20 on Audio Board

Audio Board

18. To tag 14 on IF Board
19. To slider of volume control
20. To tag 17 on IF Board and "earthy" end of volume control
21. To T2 (white or yellow lead), J2 contact 'a', scale lamp, upper loudspeaker tag and S1A, contact 2
22. To T2 (blue lead)
23. To T2 (red lead) and J2, contact 'c'
24. To S1B, contact 3, and S6, contact 2



Component Locations and Alignment Adjustments

COMPONENT DETAILS

CAPACITORS

Ref.	Value	Tol.	Volts	Function	Part No.
C1	30-140pF	Preset		Car aerial trimmer	3E4-019
C2	250pF	10%		Car aerial series fixed trimmer	3M97
C3	393pF	Variable		Rod aerial tuning	3E4-017
C4	2000pF	5%	30V	Rod aerial bottom end coupling	1M93
C5	27pF	5%	750V	Lux. fixed aerial trimmer	3M98
C6	3-30pF	Preset		Rod aerial trimmer	3E4-006
C7	2-25pF	Preset		Lux. aerial trimmer	3E4-015
C8	100pF	5%	350V	LW aerial tracking	3M99
C9	2000pF	5%	30V	Car aerial bottom end coupling	1M93
C10	.022μF	20%	250V	VT2 base bias	3M19
C11	.02μF	—20+50%	200V	decoupling	3M66
C12	5000pF	20%	500V	VT1 signal coupling	2M27
C13	500pF	2½%	30V	L10 tuning	
C14	250pF	10%	125V	Car ignition noise suppression	3M97
C15	.01μF	25%	300V	Oscillator coupling	4M01
C16	315pF	1%		MW oscillator padder	3E4-022
C17	27pF	5%	750V	Lux. oscillator padder	3M98
C18	393pF	Variable		Oscillator tuning	3E4-017
C19	4-40pF	Preset		MW oscillator trimmer	3E4—004
C20	8-80pF	Preset		LW oscillator trimmer	3E4-019/1
C21	275pF	5%		LW fixed oscillator trimmer	3E4-021
C22	.01μF	+50—20%	200V	Oscillator/mixer coupling	4M04
C23	75μF	Elec.	9/10V	AGC decoupling	3E0-001/4
C24	500pF	2½%	30V	L11 tuning	
C25	.02μF	—20+50%	200V	VT3 collector decoupling	1M91
C26	500pF	2½%	30V	L12 tuning	
C27	.02μF	—20+50%	200V	VT3 emitter bypass	1M91
C28	500pF	2½%	30V	L13 tuning	
C29	5000pF	—20+80%	300V	VT4 base bias decoupling	3M92
C30	.02μF	—20+50%	200V	VT4 emitter bypass	1M91
C31	375pF	2½%	30V	L14 tuning	
C32	.01μF	25%	300V	Part IF filter	4M03
C33	.02μF	+50—20%	200V		1M91
C34	150μF	Elec.	9/10V	IF board supply decoupling	3E0-005/2
C35	25μF	Elec.	25V	Audio coupling	3E0-001/2
C36	.01μF	25%	300V	NFB tone correction	3M94
C37	25μF	Elec.	25V	VT6 emitter bypass	3E0-001/2
C38	300μF	Elec.	10V	Supply decoupling	3E0-003/4
C39	.01μF	25%	300V	NFB tone correction	3M94
C40	180pF	10%	500V	Part audio feedback	4M02
C41	0.1μF	—25+50%		Part bass attenuator	4M22

INDUCTORS AND TRANSFORMERS

Ref.	Description	Part No.
L1	MW bandspread loading coil assembly	3D1-051
L2	LW loading coil assembly	3D1-050
L3	Permeability tuned coil assembly	3D1-076
L4-L5-L6	Ferrite rod aerial assembly	3F0-036
L7-L8-L9	MW osc. coil assembly	3D1-053
L10-L11	IFT1	92764
L12-L13	IFT2	92764/1
L14-L15	IFT3	91511
T1	Audio driver transformer	3D3-008
T2	Output transformer	3D3-001

RESISTORS

All ¼ watt carbon, 10% tolerance, unless otherwise stated

Ref.	Value	Tol.	Function	Part No.
R1	56KΩ		Car aerial damping	8A14
R2	4.7KΩ		VT1 AGC feed	1A32
R3	3.9KΩ		Part VT2 base bias potential divider	7A36
R4	1.2KΩ		VT2 collector load	7A54
R5	1.2KΩ		Part VT2 base bias potential divider	7A54
R6	1KΩ		VT2 emitter stabilizing	2A25
R7	120KΩ		MW oscillator damping	8A15
R8	680Ω		VT1 emitter stabilizing	2A30
R9	22KΩ			1A56
R10	56KΩ		VT3 base bias	8A16
R11	470Ω		VT3 collector load	7A37
R12	680Ω		VT3 emitter stabilizing	2A30
R13	15KΩ		VT4 base bias	1A18
R14	4.7KΩ		potential divider	1A32
R15	8.2KΩ		AGC decoupling	7A42
R16	820Ω		VT4 emitter stabilizing	7A40
R17	470Ω		Part IF filter	7A37
R18	5KΩ	Log pot	Volume control	3E1-022/3
R19	820Ω		VT5 emitter stabilizing	8A17
R20	6.8KΩ		VT5/VT6 coupling	6A90
R21	180Ω		DC dropper and decoupler	8A04
R22	390KΩ		Part audio feedback	7A73
R23	18KΩ		VT5 base bias	8A07
R24	470Ω		Bias stabilizing load	7A49
R25	12Ω			6A42
R26	2.2Ω	±½Ω	VT7/VT8 emitter stabilizing	8A18
R27	47KΩ		L10 damping	8A19
R28	4.7KΩ		Part bass attenuator	8A67

MISCELLANEOUS

Ref.	Description	Part No.
J1	Tape socket (clip 3L2-091)	3F6-037
J2	Private listening socket (clip 3L2-091)	3F6-037
LS	Loudspeaker—25Ω impedance (clip 3L2-073; washer 3L6-017)	3E3-016
PL1	8V 0.15A lamp	3E6-009
S1-5	Push-button switch	3E2-013
S6	Scale lamp switch (screw SA4HP06)	3E2-016
SKT1	Car aerial socket (clip 3L2-089)	3F6-025

Replacement Parts List—continued

Chassis Parts

Description	Part No.
Audio board	PC72
Car aerial tuner board	PC69/2
IF board (screw SB4HP04; SP washer WS4)	PC57/1
Wavechange switch board	PC71/1
Tuner bracket	3B1-072
Ball-bearing 3/32in. dia.	3C5-003
Cam (grub-screw SB6GP02)	3B6-021
Spring	3B5-029
Diffuser	3A7-039
Drive drum (clip 3L3-066)	3F5-010
Cursor	3B5-046
Drive cord tensioning spring	3B5-015
Lampholder bracket	3B1-081
Lampholder	3F6-004
Reflector	3B4-034
Wavechange switch bush	3B3-051
Jack plug	3F6-050/1
Chassis assembly less printed boards (screw SB4HP04; washer WS4)	3M1-035
Heat sink	3C5-002
Heat sink mounting bracket (screw SZ6HP04)	3B1-082
Tuner assembly (rubber grommet 3C3-007; screw 3L6-019/1)	3M4-144
Tuner coil fixing screw	SB8C02
Core assembly	3E7-013
Adjusting screw	3L6-035
Output transformer fixing screw	SB4HP04
Battery connector	3F6-031
Aerial retaining clip (screw SZ6HP05)	3L3-084
Printed board fixing screw (washer WS4)	SB4HP04
Trimming tool	3B6-020