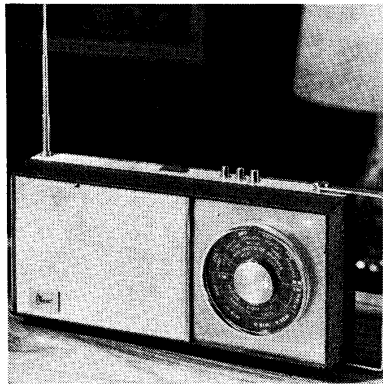


# E R T

SERVICE  
CHART  
1649



## MARGONIPHONE 4142 PORTABLE

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**SEVEN-TRANSISTOR** portable with three wavebands, incorporating transformerless power stage and temperature and battery voltage compensation.

**Battery.** 9V Drydex DT6, Ever Ready PP6, Vidor VT6 or equivalent.

**Consumption.** Quiescent 17mA, 50mW output 45mA, 300 mW output 90mA.

**Transistors.** TR1 AF115 oscillator-mixer, TR2 AF117 first IF amplifier, TR3 AF117 second IF amplifier, TR4 AC155 audio amplifier, TR5 AC113 audio driver, TR6 AC154 and TR7 AC157 output stage.

**Diodes.** D1 OA70 detector, D2 AA120 bias stabiliser.

**Wavebands.** Medium wave 185-565m (1620-530kc/s), long wave 1120-2050m (268-148kc/s), short wave 17.6-51m (17-5.9mc/s).

**IF.** 475kc/s.

**Aerials.** MW and LW ferrite rod, SW seven-section telescopic aerial. Car aerial socket provided.

**Outlets.** Earphone or tape recorder socket provided. Inserting plug mutes internal speaker.

**Output.** 300mW.

**Speaker.** 3 3/8 in. diameter, 15ohm impedance.

**Dimensions.** 5 3/8 x 2 3/8 x 9 in. excluding handle.

**Manufacturer.** British Radio Corporation Ltd.

**Service Departments.** London: Eley's Estate, Angel Road, N18. Tel: 01-807 3060. Ansafoone spares ordering service. Tel: 01-807 6332. Birmingham: 24 Sheepcote Street, 15. Tel: 021-643 9988. Glasgow: 160-162 Battlefield Road, S2. Tel: Langside 9251/4.

### DISMANTLING

Slide battery cover downwards to release and remove battery. Unscrew handle fixing studs to free back cover. For access to copper side of the printed board pull off turning knob and gently prise up lower end of board which is clipped into moulded lugs on the case.

### SERVICE NOTES

Output transistors TR6 and TR7 are series connected across the 9V battery supply and to ensure a balanced supply voltage to each, an adjustment R13 is incorporated in emitter circuit of TR4. Adjustment of R13 sets emitter potential and hence collector potential of TR4.

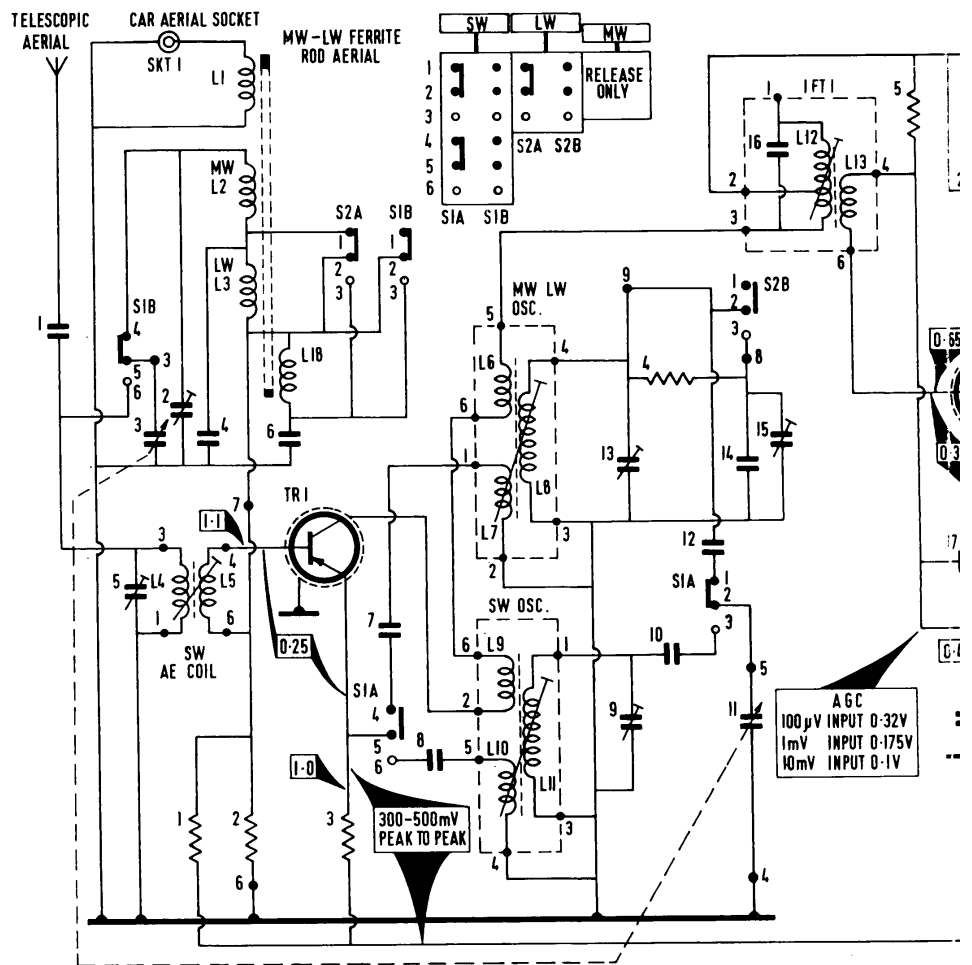
It determines, therefore, base potential of driver TR5 which is directly coupled to TR4. This bias determines collector potential of TR5 which in turn controls base voltages of TR6 and TR7.

Correct balance is obtained when potential of TR6/TR7 emitter junction is 5V with respect to positive line. Alternatively, output waveform at maximum output can be observed on oscilloscope and adjustment made for symmetry of waveform and clipping.

### CIRCUIT DESCRIPTION

Internal ferrite rod carries MW winding L2 and LW winding L3, both tuned by gang section C3. Switch S2A shorts out LW winding when in MW position. Signals from external car radio aerial are fed in via coupling coil L1.

R	1.	2.	3.	4.	5.
C	1.	2,3,4,5.	6.	7,8.	9,13,10. 12. 11. 14. 15,16.
L	1.	2.	3.	4.	5.
				6.	7.
				8.	9.
				10.	11.
					12.
					13.



**Circuit Diagram.** Figures in rectangles show volts where otherwise indicated. Circuit is shown

On SW, switch S1B connects tuning gang C3 across SW aerial coil L4. Signals are picked up on telescopic aerial and taken via series capacitor C1 into the tuned circuit.

SW coupling coil L5 applies signal to base of mixer stage TR1 (AF115). On MW and LW signal is developed across L18 and C6 respectively and fed into base circuit via secondary of SW aerial coil L5.

Separate oscillator coils for MW/LW and SW have their collector coils connected in series and emitter feedback coils switched by S1A. MW oscillator circuit comprises gang C11, trimmer C13 and coil L8. For LW operation switch S2B shorts out R4 to bring in additional capacitance C14 and C15.

When SW button is depressed, S1A connects gang C11, via series capacitor C10, across tuned circuit L11. Circuit is trimmed by C9.

Resultant IF signal at 475kc/s is selected by tuned primary of IFT1 and coupled via low impedance winding L13 to first IF amplifier TR2 (AF117). From collector of TR2 the signal is tuned by primary of IFT2 and then taken to base

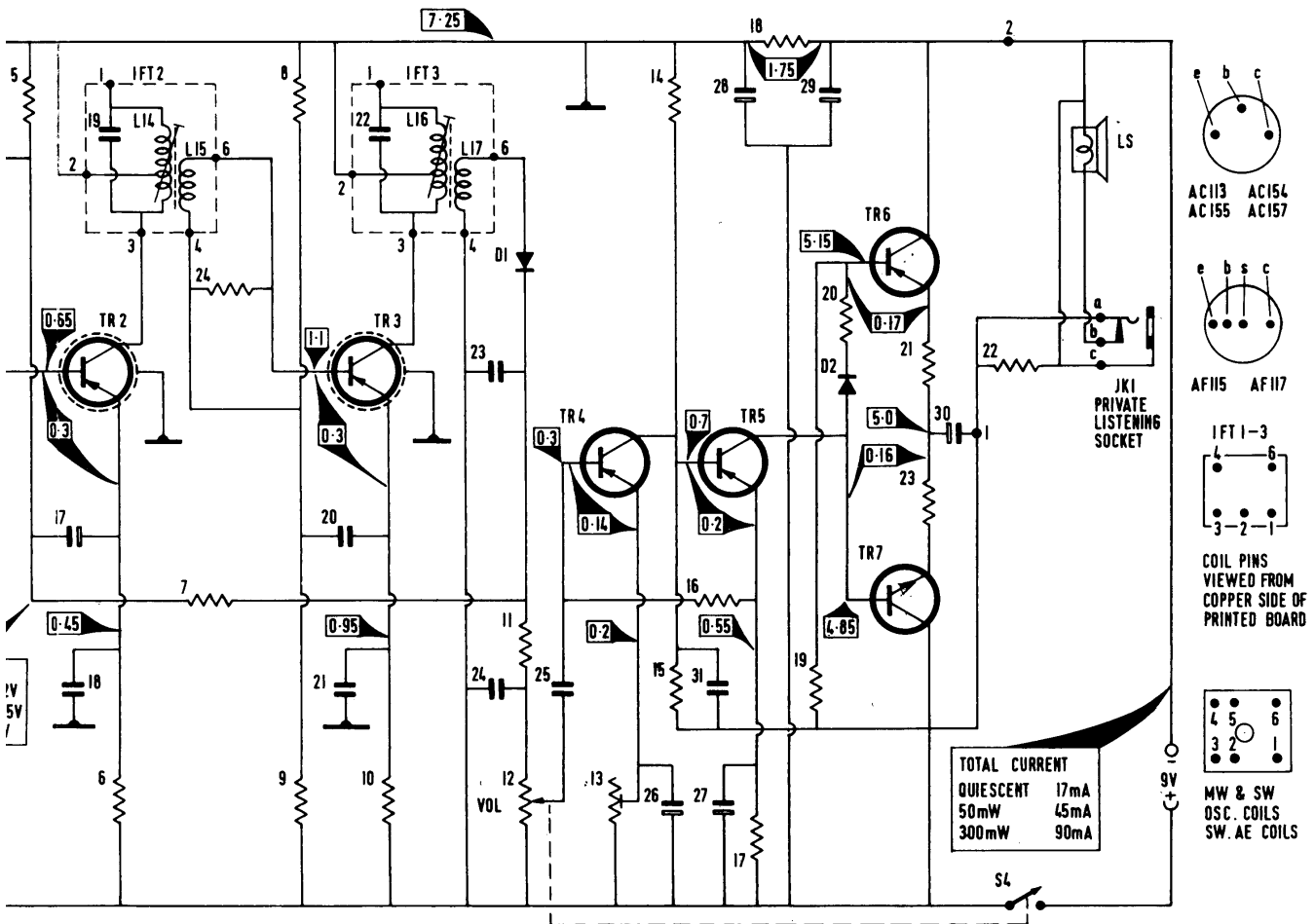
RESISTORS			CAPACITORS			TRANSISTOR VOLTAGES		
R1	5K6	A2	C1	20pF	B2	C16	175pF	B2
R2	27K	A2	C2	2-25pF	B2	C17	75mF	B2
R3	1K	B2	C3	255pF	B2	C18	20KpF	B2
R4	100K	B2	C4	60pF	A1	C19	175pF	B2
R5	100K	B2	C5	2-25	B2	C20	20KpF	B2
R6	680	B2	C6	1K3pF	B2	C21	20KpF	B2
R7	10K	B2	C7	10KpF	B2	C22	175pF	B2
R8	27K	B2	C8	5KpF	B2	C23	20KpF	B1
R9	5K6	B2	C9	2-25pF	A2	C24	10KpF	B1
R10	560	B2	C10	2KpF	A2	C25	470KpF	A1
R11	4K7	B1	C11	255pF	B2	C26	25mF	B1
R12	5K	A1	C12	250pF	A2	C27	75mF	B1
R13	1K	B1	C13	2-25pF	B2	C28	75mF	B1
R14	12K	B1	C14	230pF	B2	C29	75mF	B1
R15	47K	B1	C15	2-25pF	B2	C30	100mF	B1
R16	12K	B1				C31	1KpF	B1
R17	100	B1						
R18	390	B1						
R19	680	B1						
R20	5.6	B1						
R21	2.2	B1						
R22	100	B1						
R23	2.2	B1						
R24	390	B2						

of second IF amplifier TR3 (AF117). There follows a third single-tuned IF transformer before the signal is demodulated by detector D1. Detector load consists of R11 and R12 in series, with C23 and C24 providing RF by-pass.

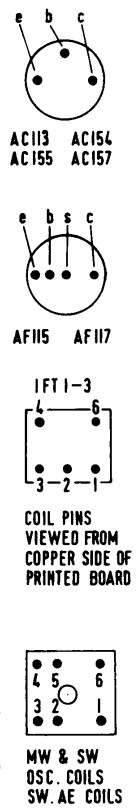
Positive voltage developed at top end of R11 is smoothed by R7 and C17 and fed back to base of IF amplifier TR2 to provide AGC.

*continued overleaf*

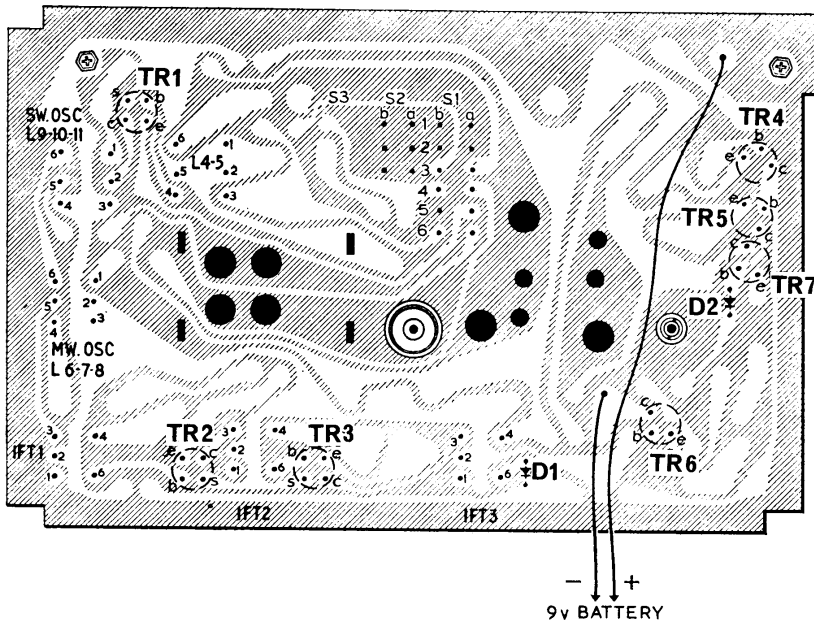
5.	6.	7. 24.	8. 9.	10.	11. 12.	13.	14. 15. 16.	17.	18. 19. 20.	21. 23.	22.
17. 18. 19.				20. 21. 22.	23. 24. 25.		26. 27. 31.	28.	29.		30.
		14. 15.			16. 17.						



TOTAL CURRENT	
QUIESCENT	17mA
50mW	45mA
300mW	90mA



v voltages measured with 20Kohm/volt meter between positive line and point shown, except shown with MW button depressed. R13 is adjusted to give 5.0V at junction R21/C30



From slider of volume control audio signal is fed via C25 to base of preamplifier TR4 (AC155). Direct coupling is

employed between TR4 collector and base of driver TR5 (AC113). Negative feedback is applied from emitter of TR5

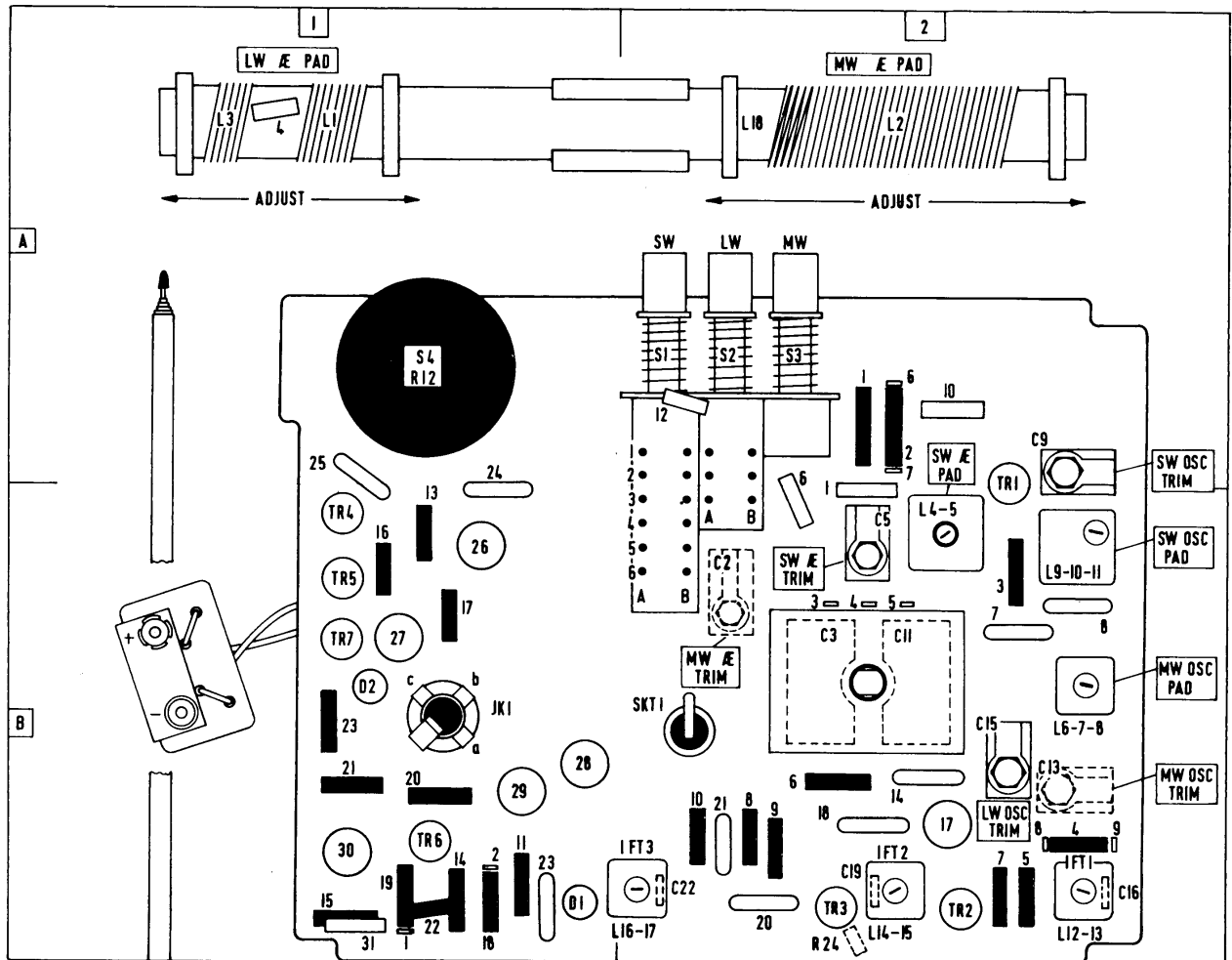
to base of first audio stage via R16 and there is a degree of selective feedback to the base of TR5 via C31/R15.

Output from TR5 drives simultaneously bases of both output transistors TR6 and TR7. During positive half cycles of the signal, NPN transistor TR7 conducts, resulting in a fall in collector/emitter voltage of TR7. During negative half cycles of the signal PNP transistor TR6 conducts, resulting in an increase in collector/emitter voltage of TR7.

The speaker is fed via C30 and J1. TR5 collector load R19 is returned to the live side of the speaker and, as this point is coupled to the emitters of TR6 and TR7 through C30, the input signal to output stage is virtually applied between base and emitter of both TR6 and TR7.

Diode D2 is biased by TR5 collector current and acts as a variable resistance which is sensitive to voltage and temperature variations. The resistance value of D2 is small compared with R19 and the voltage developed across D2 equals the sum of the nominal output transistor (TR6 and TR7) base/emitter voltages and so determines the correct quiescent operating conditions.

During low ambient temperature conditions the resistance of D2 increases thus compensating for falling output current of output transistors. This effect also takes place in the event of falling battery voltage. Diode D2 also assists thermal stability at high temperatures and opposes high current drain from the battery.



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AP 450A

### ALIGNMENT

**Equipment required.** Modulated signal generator covering IF, MW, LW and SW frequencies, 150hm output meter, aerial loop, 100KpF capacitor, polystyrene cement, trimming tools.

**IF.** Connect output meter in place of speaker (or AVO 8 on 10V AC range across speech coil). Set volume control to maximum but throughout alignment adjust signal generator level to maintain receiver output at 50mW.

Switch receiver to MW and fully close tuning gang. Apply a 30 per cent modulated 475kc/s signal via 100KpF capacitor across C3 (aerial section of gang).

Adjust IFT3, IFT2 and IFT1, in that order, for maximum output. Repeat until no further improvement results.

**MW.** Select MW and leave tuning gang fully closed. Inject 525kc/s signal to ferrite rod via aerial loop and adjust L8 for maximum output. Tune signal generator to 600kc/s and tune set to signal. Adjust position of L2 on ferrite rod to obtain maximum output.

Tune signal generator to 1500kc/s and tune set to signal. Adjust C2 for maximum output. Repeat adjustments at 600 and 1500kc/s in turn until no further improvement results. Reseal position of L2 on ferrite rod with polystyrene cement.

**LW.** Select LW and fully close tuning gang. Inject 148kc/s signal to ferrite aerial via transmitting loop and adjust C15 for maximum output. Tune signal generator to 220kc/s and tune set to signal. Adjust position of L3 on ferrite rod for maximum output.

Repeat adjustments at 148 and 220kc/s in turn until no further improvement results. Reseal L3 in new position on ferrite rod.

**SW.** Extend telescopic aerial and place signal generator lead nearby to provide loose coupling. Switch set to SW and fully close tuning gang. Set signal generator to 5.9mc/s and adjust L11 to obtain maximum output.

Set signal generator to 17mc/s, fully open tuning gang, and adjust C9 for maximum output. Repeat adjustments at 5.9mc/s and 17mc/s in turn until no further improvement results. Tune signal generator to 6.77mc/s and tune set to signal. Adjust L4 for maximum output.

Tune signal generator to 15.45mc/s and tune set to signal. Adjust C5 for maximum output. Repeat adjustments at 6.77 and 15.45mc/s in turn until no further improvement results.

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