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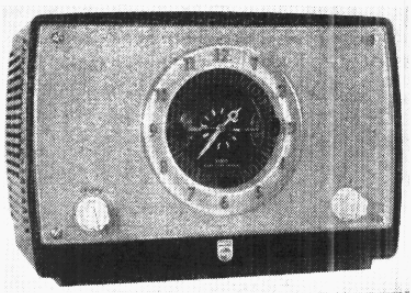
Radio Manuals

"TRADER" SERVICE SHEET
1192

PHILIPS 342A

Clock-controlled A.C. Superhet



GIVING a choice of four pre-tuned stations, one on L.W. and three on M.W., the Philips 342A "Music Maid" also has a choice of several combinations of automatic switching operations which are performed by a synchronous type electric clock. Details of this latter feature are given overleaf under "Clock Operations."

The receiver is a 4-valve (plus rectifier) table superhet designed for operation from A.C. mains of 200-250, 50 c/s.

Release date and original price: December, 1954, £17 9s 9d. Purchase tax extra.

CIRCUIT DESCRIPTION

Pre-tuned frame aerial inputs **L2**, **L1**, **C3** (L.W.), **L2**, **C24** (M.W.1), **L2**, **C25** (M.W.2) and **L2**, **C26** (M.W.3) precede first valve **(V1, Mullard UCH81)** which operates as frequency changer with external coupling between oscillator grid and injector grid.

Provision is made for the connection of an external aerial via **C1**, **S4**, **S5** to the junction of **L1**, **L2** (L.W.) and via **C1**, **S1** to a tapping on **L2** (M.W.). Pre-set oscillator coils **L5** (L.W.), **L6** (M.W.1), **L7** (M.W.2) and **L8** (M.W.3) are tuned by **C7**, **C8** in a Colpitts circuit.

Second valve **(V2, Mullard UBF80)** is a double diode R.F. pentode, its pentode section operating as intermediate frequency amplifier with tuned transformer couplings **C5, L3, L4, C6** and **C12, L9, L10, C13.**

Intermediate frequency 470 kc/s.

One diode section of **V2** operates as signal detector. The audio frequency component in its rectified output is developed across volume control **R9**, which acts as diode load, and is passed via **C17** to triode grid of double diode triode valve **(V3, Mullard UBC41).** The two diode sections of **V3** are not used and are strapped to its cathode. Tone correction at low level settings of the volume control by **R8, C16.** I.F. filtering by **C14, R7, C15** and **C20.**

Resistance-capacitance coupling by **R11, C18** and **R12** between **V3** and pentode output valve **(V4, Mullard UL41).** Fixed tone correction in **V4** anode circuit by **C22.** Two negative feedback tone correction circuits are used, one between winding **d** on **T1** and **V4** cathode circuit, and the other between winding **c** on **T1** and **V3** grid circuit.

	RESISTORS	Values	Locations
R1	Anti-static shunt	1MΩ	A1
R2	V1 C.G.	820kΩ	E2
R3	Osc. C.G.	47kΩ	F2
R4	Osc. anode feed	33kΩ	E2
R5	S.G. H.T. feed	18kΩ	E2
R6	A.G.C. decoupling	1·5MΩ	E2
R7	I.F. stopper	47kΩ	E2
R8	Tone correction	15kΩ	D2
R9*	Volume control	500kΩ	D2
R10	V3 C.G.	10MΩ	D2
R11	V3 anode load	220kΩ	D2
R12	V4 C.G.	470kΩ	D2
R13	H.T. smoothing	1·2kΩ	E2
R14	V4 C.G. stopper	1kΩ	D2
R15	V4 G.B.	220Ω	E2
R16	Thermistor	—	E2
R17	V5 surge limiter	240Ω	B1
R18	Thermistor	—	C1
R19, R20	Filament ballast	430Ω 250Ω	C1 B1

* Tapped at 450 kΩ + 50kΩ from R7.

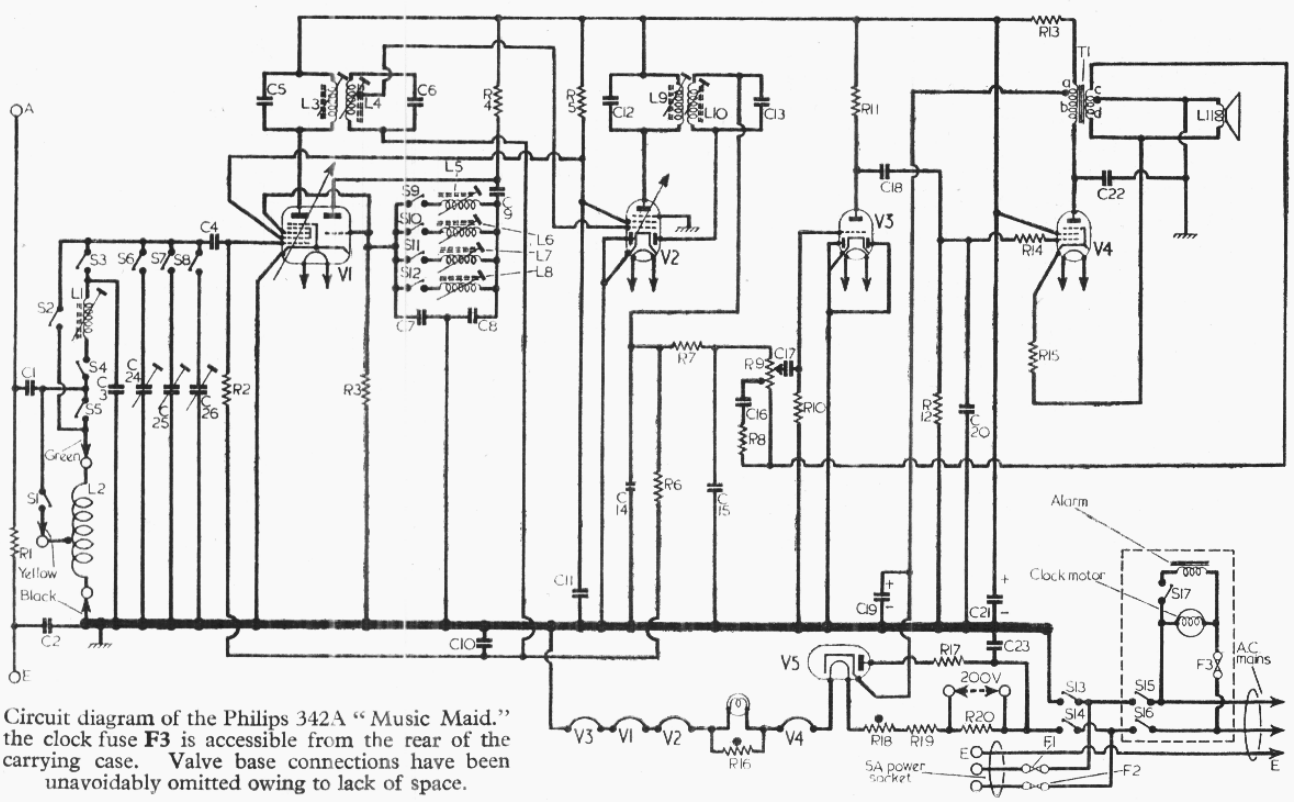
	CAPACITORS	Values	Locations
C1	Aerial and earth isolators	0·001μF	A1
C2		4,700pF	A1
C3	L.W. aerial trim.	150pF	F2
C4	V1 C.G.	100pF	F2
C5	1st I.F. trans. tuning	115pF	B1
C6		115pF	B1
C7	Osc. tuning	452pF	F2
C8		0·001μF	F2
C9	Osc. anode coup.	470pF	F2
C10	A.G.C. decoupling	0·047μF	E2
C11	S.G. decoupling	0·1μF	E2
C12	2nd I.F. trans. tuning	110pF	B1
C13		110pF	B1
C14	I.F. by-passes	82pF	E2
C15		100pF	D2
C16	Tone corrector	0·033μF	D2
C17	A.F. couplings	0·01μF	D2
C18		3,300pF	D2
C19*	H.T. smoothing	50μF	A1
C20	I.F. by-pass	390pF	D2
C21*	H.T. smoothing	50μF	A1
C22	Tone corrector	8,200pF	D2
C23	Mains R.F. by-pass	0·01μF	D2
C24‡	M.W. aerial pre-sets	400pF	A1
C25‡		250pF	A1
C26‡		250pF	A1

* Electrolytic. ‡ Pre-set.

GENERAL NOTES

Switches.—**S1-S12** are the pre-set station switches ganged in a single rotary unit beneath the chassis. The unit is indicated in the under chassis illustration and shown in detail in column 2 overleaf, drawn as seen from the front of an inverted chassis. The associated switch table shows the switch operations for the four control settings, starting from the fully anti-clockwise position. A dash indicates open, and **C**, closed.

Scale Lamp.—This is a 19 V, 0.09 A lamp with a clear tubular bulb and an M.E.S. base.



Circuit diagram of the Philips 342A "Music Maid." the clock fuse **F3** is accessible from the rear of the carrying case. Valve base connections have been unavoidably omitted owing to lack of space.

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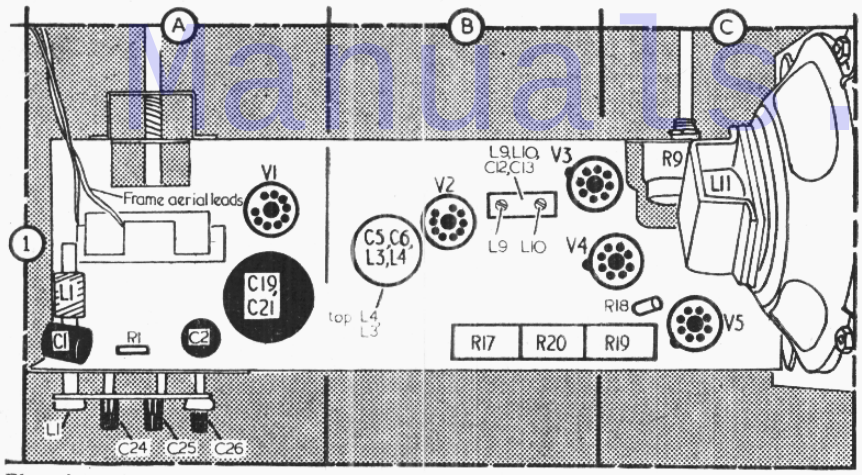


Plan view of the chassis showing the aerial pre-tuned station adjustments in location A1.

	OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	L.W. loading coil		37·0	A1
L2	Frame aerial		2·5	—
L3	1st I.F. trans.	Pri	7·2	B1
L4		Sec.	4·6*	B1
L5	L.W. osc. pre-set		14·0	F2
L6	M.W. osc. pre-sets		6·0	F2
L7			3·2	F2
L8			2·9	F2
L9	2nd I.F. trans.	Pri.	13·5	B1
L10		Sec.	13.5	B1
L11	Speech coil		3·5	C1
T1	O.P. trans.	a	20·0	E2
		b	320·0	
		c	—	
		d	0·8	
S1-S12	Waveband switches		—	F2
S13, S14	Mains sw.		—	D2
S15, S16	Time switches		—	—
S17	Alarm switch		—	—
F1, F2	5 amp fuses		—	—
F3	500mA Clock fuse		—	—

* Measured across lower section.

CLOCK OPERATIONS

Hand Setting.—The clock hands may be set by rotating the small white knob situated to the right of the **A** and **E** sockets at the rear of the receiver. This knob should only be turned in an anti-clockwise direction.

Slumber Switch.—This control, if turned clockwise, can be set to switch the receiver off after any period up to 60 minutes as indicated by its calibrated time scale. It should be used in conjunction with the "Radio" switch (see below).

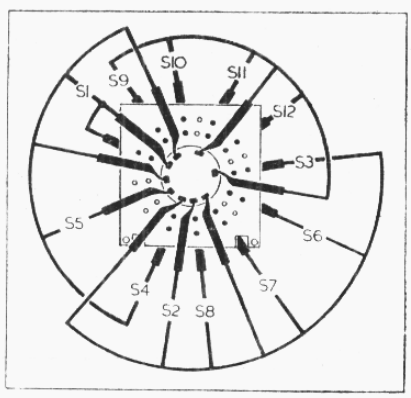
Alarm Setting.—The small dial in the centre of the clock face is read off against the rear end of the hour hand, and indicates the time at which the alarm will operate. It may be adjusted by pulling out the alarm setting knob and rotating it in an anti-clockwise direction. The alarm will only work when this knob is out. To stop the alarm, the knob should be pushed in. It should be used in conjunction with the "Radio" switch (see below).

Radio Switch.—This control is positioned at the bottom of the clock face and has the following three settings.

Alarm.—With the switch in this position, the slumber switch and alarm setting adjustments can be set up for operation. The receiver and 5 A power socket will be switched on at the time indicated by the alarm dial, and unless the alarm knob has been pushed in, the alarm will sound 10 minutes later.

Off.—Only the slumber switch will be in operation in this position to switch the receiver and 5 A power socket off at the selected time. The clock, in conjunction with the alarm setting,

(*Continued in column 3*)



Above : Diagram of the waveband switch unit. *Below :* Associated switch table.

Switches	L	1	2	3
S1	—	C	C	C
S2	—	C	C	C
S3	C	—	—	—
S4	C	—	—	—
S5	C	—	—	—
S6	—	C	—	—
S7	—	—	C	—
S8	—	—	—	C
S9	C	—	—	—
S10	—	C	—	—
S11	—	—	C	—
S12	—	—	—	C

Clock Operation—*continued*

operates as a normal alarm clock, but it must be set to ten minutes before time required.

Manual.—The receiver will operate normally irrespective of the clock control settings, and the 5 A power socket will be switched on all the time. The clock will still operate as an alarm clock in this position, but must still be set to ten minutes before time required.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from A.C. mains of 230 V, with the station selector control set to "L." There was no signal input.

Voltages were measured with an Avo Electronic TestMeter, and as this instrument has a high internal resistance, allowance should be made for the current drawn by other types of meter. Chassis was the negative connection in every case.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 UCH81	150·0	3·9	70·0	3·0	—
	Oscillator				
	33·0	3·6			
V2 UBF80	150·0	5·3	70·0	2·0	—
V3 UBC41	69·0	0·4	—	—	—
V4 UL41	165·0	37·5	150·0	6·6	8·6
V5 UY41	167·0*	—	—	—	176·0†

* A.C. reading. † Cathode current, 59·5 mA.

CIRCUIT ALIGNMENT

I.F. Stages.—The following adjustments can be made accessible by removing the cabinet back and base cover. Switch station selector switch to 3. Unscrew the cores of **L3, L4, L9** and **L10** (location reference B1) to their fullest extent. Connect signal generator output, via an 0.05 μF capacitor in each lead, to control grid (pin 2) of **V1** and chassis. Feed in a 470 kc/s (638.3 m) signal and adjust the cores of **L10, L9, L4** and **L3**, in that order, for maximum output. Repeat these adjustments until no further improvement results.

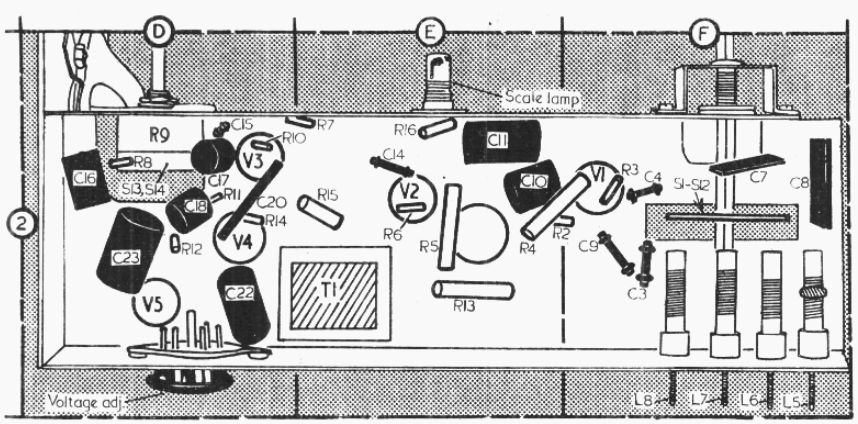
Pre-set Stations.—The following adjustments should be made with the chassis in its cabinet, and can be effected through the cabinet back cover, where they are labelled **L, 1, 2** and **3** to correspond with the settings of the station selector knob. A special trimming tool, secured by a clip to the back cover, is provided for the adjustment of the oscillator and L.W. aerial cores.

L (1,250-1,800 m).—Switch receiver to "L," tune in signal with **L5** core adjustment (F2), and then adjust the core of **L1** (A1) for maximum output.

1 (310-550 m).—Switch receiver to "1," tune in signal with **L6** core adjustment (F2), and then adjust **C24** (A1) for maximum output.

2 (245-435 m).—Switch receiver to "2," tune in signal with **L7** core adjustment (F2), and then adjust **C25** (A1) for maximum output.

3 (188-343 m).—Switch receiver to "3," tune in signal with **L8** core adjustment (F2), and then adjust **C26** (A1) for maximum output.



Underside view of the chassis showing the oscillator pre-tuned station adjustments in F2.

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