

**MODEL A222** is a four-valve ' Radiotime ' receiver offering switch-controlled selection of three M.W. and one L.W. station, a self-starting electric clock, with automatic switching and alarm facilities. The receiver has built-in frame aerials for operation on both M.W. and L.W. bands, and to cater for areas of low-signal strength, sockets are provided for the connection of an external aerial and earth.

The radio chassis and clock assembly are housed in a plastic cabinet and operation is from A.C. mains only.

**MAINS SUPPLY :** 200-250V, 50 c.p.s. A.C.

**MAINS CONSUMPTION :** 160 mA at 240 V, 50 c.p.s.

### **CONTROLS :**

**Radio :** Upper ' VOLUME,' Lower ' SELECTOR ' switch.

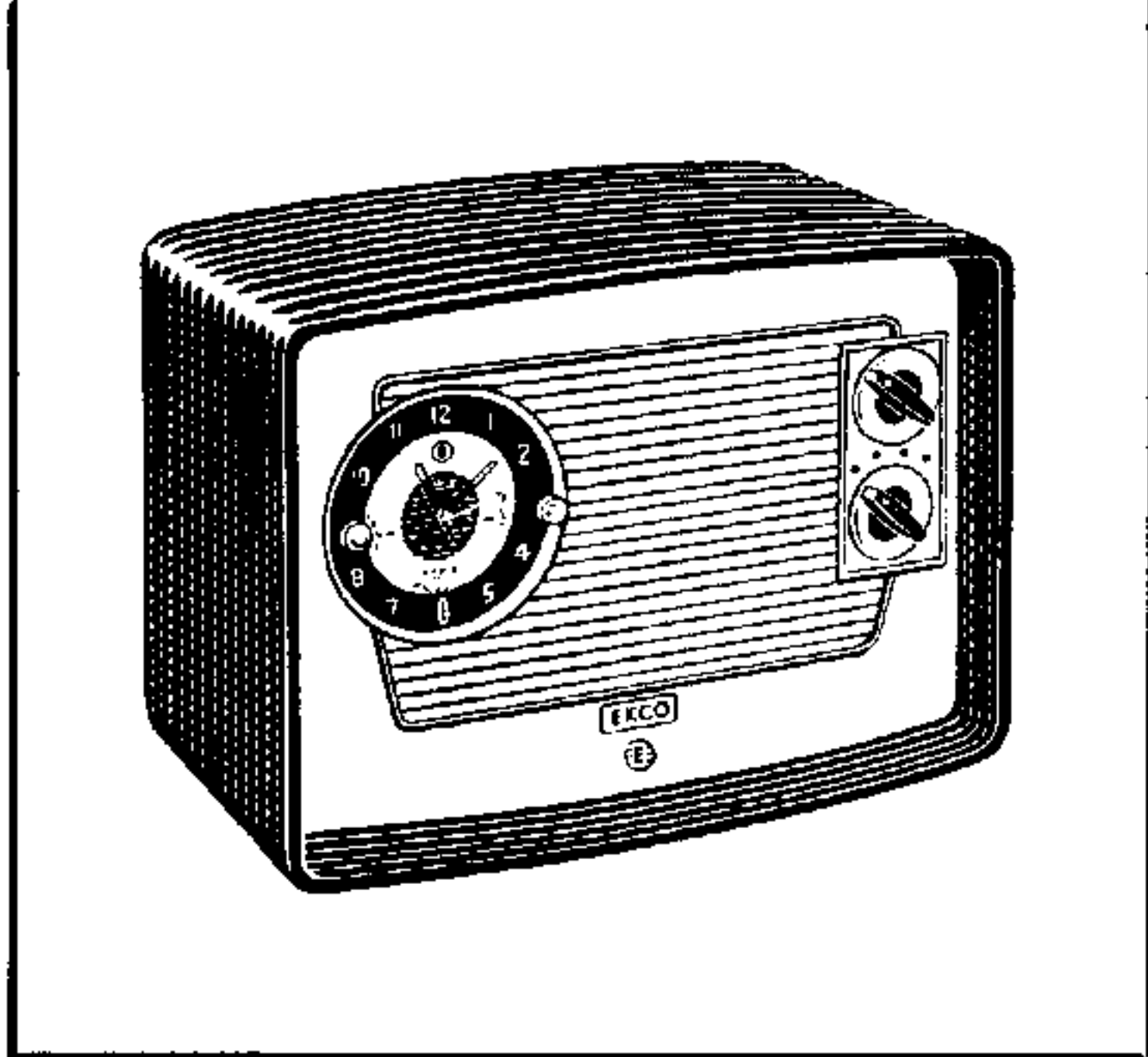
**Clock :** Left ' SLEEP,' Centre ' MASTER,' Right ' ALARM,' and at the rear is the Hand position control.

### **VALVES :**

V1	UCH42	Frequency Changer.
V2	UBF80	I.F. Amplifier, Detector and A.V.C.
V3	UL41	A.F. Output.
V4	UY41	H.T. Rectifier.

All valves are Mullard and have B8A bases, except V2 which has a B9A type.

**PILOT LAMP :** 12 volts, 2.2 watts.



### WAVEBAND COVERAGE :

Position 1. M.W.	188 to 343 metres,	1600—875 Kc/s.
Position 2. M.W.	245 to 435 metres,	1230—685 Kc/s.
Position 3. M.W.	310 to 550 metres,	965—540 Kc/s.
Position 4. L.W.	1200 to 1800 metres,	250—160 Kc/s.

**INTERMEDIATE FREQUENCY :** 470 Kc/s.

**LOUDSPEAKER IMPEDANCE :** 3 ohms at 400 c.p.s. Sockets are provided for the connection of a 3 ohms external loud-speaker.

**OUTPUT :** 2.5 watts.

**CIRCUIT DETAILS:** In the aerial and earth circuits are protective capacitors C1 and C3, and a static leak R1 is provided for use with external aerials. Both frame aerials are in series for L.W. operation with L1 short circuited on M.W., the loop in use being shunted by the appropriate trimmer for the range selected. Signals from the tuned circuit are fed via C9 and an I.F. filter to the control grid of V1. A Colpitts oscillator circuit is used with the triode section of V1, being completed by connection of an appropriate coil, via the selector switch S3. Each coil is tuned by an iron dust core.

The I.F. output at V1 anode is transformer coupled to the pentode section of V2, amplified, and finally transformer coupled to one diode of V2 for demodulation. Most of the A.F. developed across R13 is fed via C21, R14, R15 and R18 to the grid of the output valve V3. The two latter components also form the path for negative feedback which is derived from the speaker circuit.

A.V.C. which is delayed by a set potential from the divider formed by R8, R12 and R13, is developed by the second diode of V2 and fed to V1 and V2 control grid circuits.

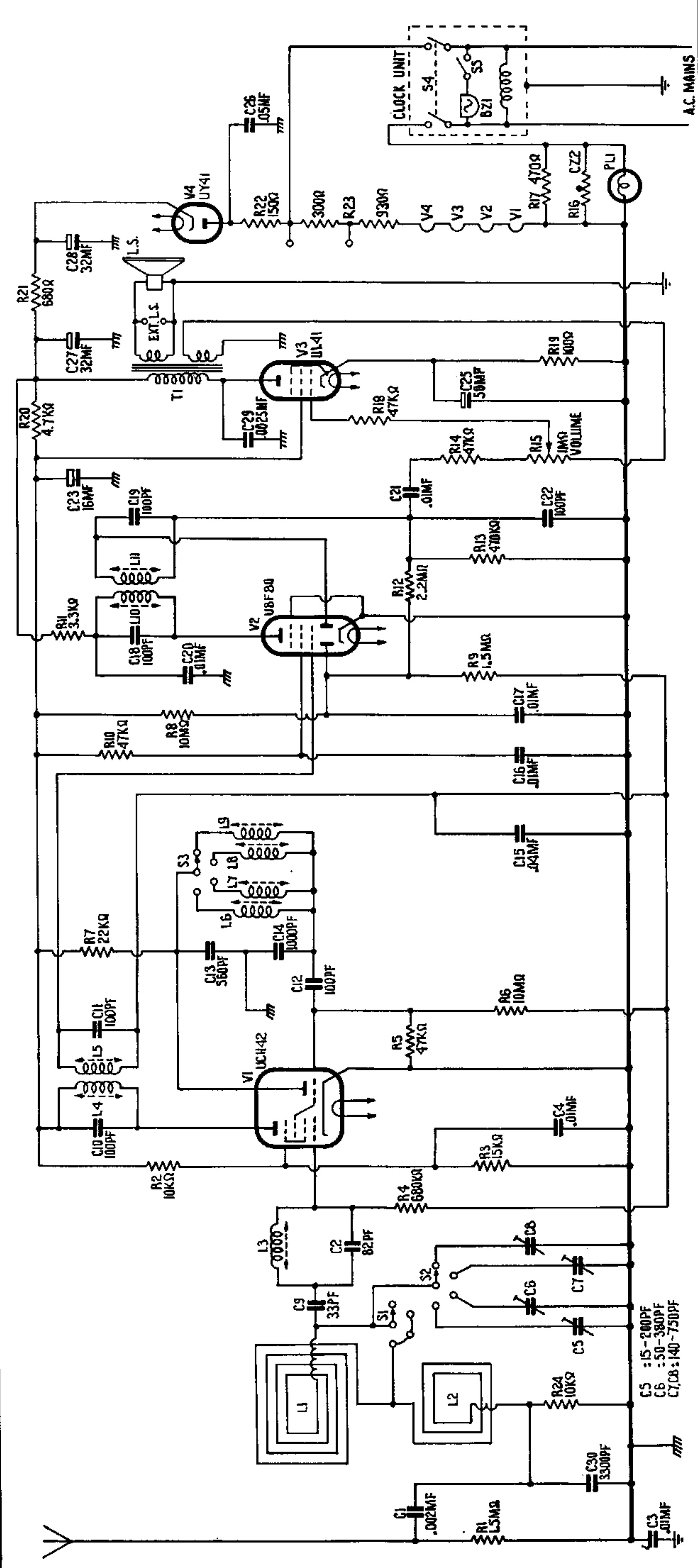
The power circuits are fairly conventional, H.T. being derived from the mains via a half-wave rectifier V4. The valve heaters are in series with a ballast resistor R23 across the mains input. A Brimistor R16 has been included, connected across the Pilot lamp circuit to maintain the heater circuit in the event of lamp failure.

The clock unit is connected directly across the mains input, and the following is a detailed description of its function in relation to the receiver.

**CLOCK FUNCTION :** As soon as the receiver is connected to the supply the clock will start. The clock and alarm facilities are of the twelve-hour type.

The centre control is the 'MASTER' switch and in its middle position the receiver is 'OFF.' When it is turned clockwise to 'MANUAL' the receiver is switched on and when turned to the anti-clockwise position 'ALARM' the radio will be switched on at the time indicated on the centre scale. When the radio has been switched on automatically it will stay on indefinitely or until the centre control is switched to 'OFF.'

C 3. 1. 30. 2. 9. 5. 6. 7. 8. 10. 4. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30.



CIRCUIT DIAGRAM

The left-hand control marked ' SLEEP ' can be rotated in a clockwise direction so that the pointer indicates any one of the graduations 0-60. This operation will automatically switch the receiver on, providing the ' MASTER ' control is set at either ' ALARM ' or ' OFF.' The receiver will stay switched on until the number of minutes shown on the ' SLEEP ' indicator scale elapses. The receiver will then be switched off, but will switch on again later if set to ' ALARM.'

An alarm buzzer is incorporated in the clock and operates at approx. 8 minutes later than the radio alarm switch. The buzzer will operate if the right-hand control is left in the out position, and is silenced by pushing the control in. The position of the ' MASTER ' control does not affect the buzzer operation.

**ALIGNMENT :** Turn the selector switch to range 3. Connect an output meter across the secondary of the output transformer. Set the Volume Control to maximum output. Inject a modulated 470 Kc/s. signal via an 0.1 mfd. capacitor to pin 6 of V1, adjust the four I.F. cores in the following order for maximum output. I.F.T.2 upper and lower, then the I.F.T.1 upper and lower. Inject the 470 Kc/s. into the aerial socket and adjust L3 core for minimum output.

**STATION SETTING :** A weak signal should be used in order to obtain a correct setting of the aerial trimmer, and an external aerial should, therefore, be disconnected. The receiver should be rotated slightly to reduce signal pickup as the oscillator adjustment nears the correct setting.

Turn the selector switch to the required range. Adjust the appropriate oscillator core for maximum output (see above) and the adjacent aerial trimmer for resonance.

**CHASSIS REMOVAL :** Remove five screws holding the back cover and pull the hand setting knob which comes away with the back cover and extension spindle.

**Note.**—The back cover will not be completely freed due to the frame aerial connections and care must be taken to avoid undue strain on these connections when dismantling the receiver.

Remove the two front control knobs.

Remove the two bakelite plinths on the cabinet base, and unscrew the four chassis retaining bolts, thus exposed.

For complete removal of the chassis from the cabinet it is necessary first to remove the mains lead cleat held by a 4BA screw, and then disconnect two leads from the clock unit, one to the mains resistor, the other to chassis. The clock is left mounted in the cabinet.

## D.C. RESISTANCE OF WINDINGS

WINDING	OHMS	PART NO.
L1		DP21277
L2		DP21276
L3	1.0	DP13936/1
L4	15.0	SA1704
L5	15.0	
L6	1.5	DPI4674
L7	1.8	DPI4675

WINDING	OHMS	PART NO.
L8	2.0	DPI4676
L9	2.3	DPI4673
L10	15.0	SA1704
L11	15.0	
Pri.	275	SA5284
T1 Sec.	*	
Tertiary	8.9	
* Less than 1 ohm		

**CLOCK UNIT SERVICE FACILITIES :** If the clock unit becomes faulty, telephone or write to the nearest depot of Smiths English Clocks Ltd. (list below) and quote receiver type and serial number to which the clock belongs.

When the replacement unit is received, return the defective clock, in the same packing to the depot. As the replacement unit is charged for, it is important that early return of the faulty unit is required, otherwise difficulty may be experienced in receiving the necessary credit. If the clock has been subject to misuse or has been tampered with, the makers reserve the right to refuse acceptance or to charge for work involved in putting the clock in full working order.

Always ensure that all necessary particulars are enclosed on an advice note.

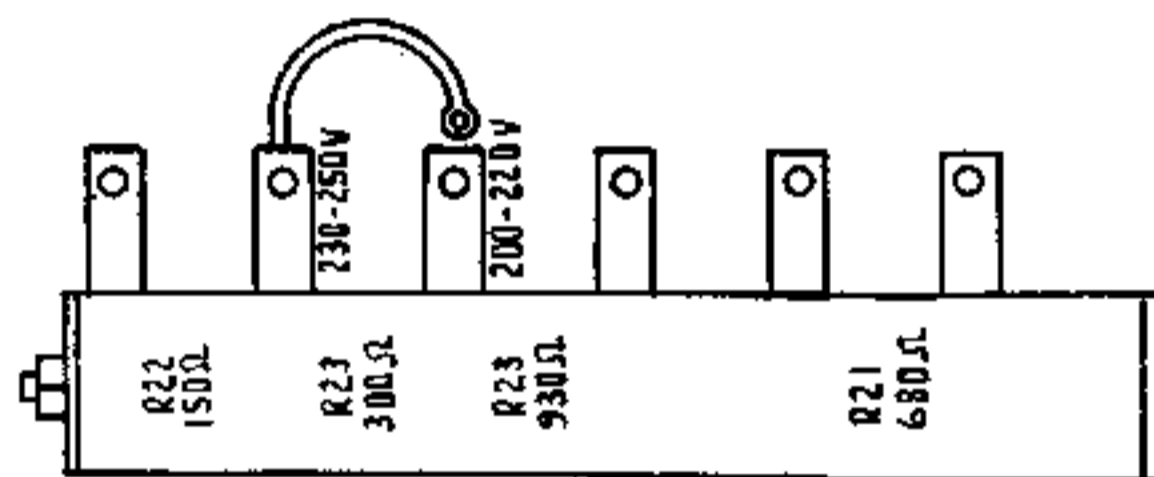
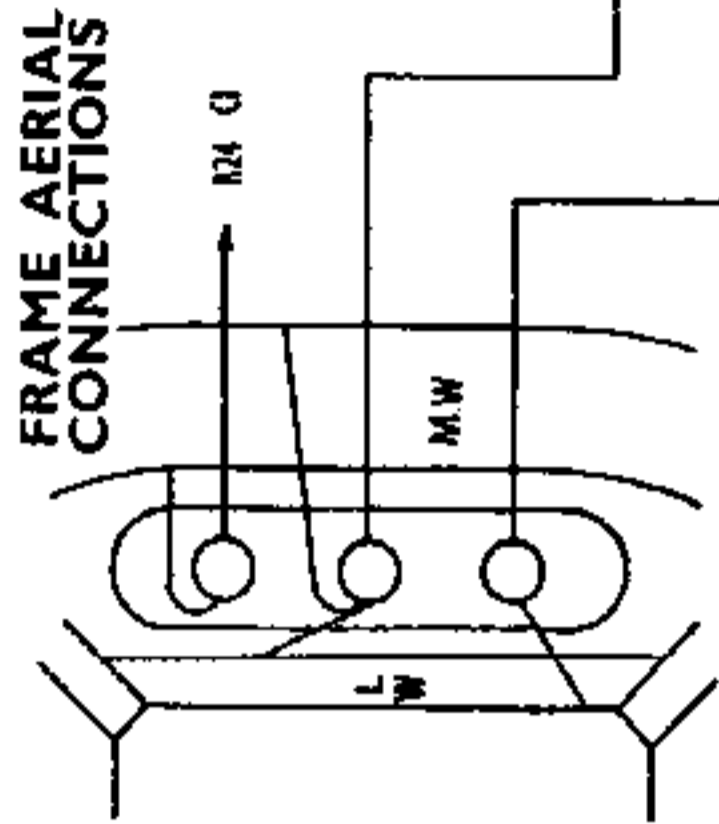
The makers' guarantee covers a period of 12 months from the date of purchase by user.

**SMITHS ENGLISH CLOCKS LTD.,**  
**Service Dept.**  
**Waterloo Road, Cricklewood, London, N.W.2.**  
**Gladstone 6464.**

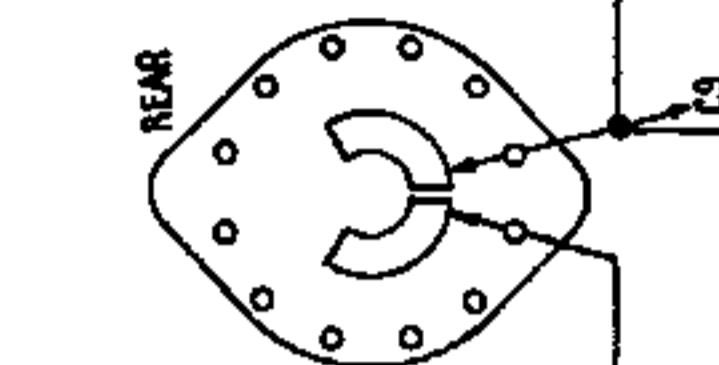
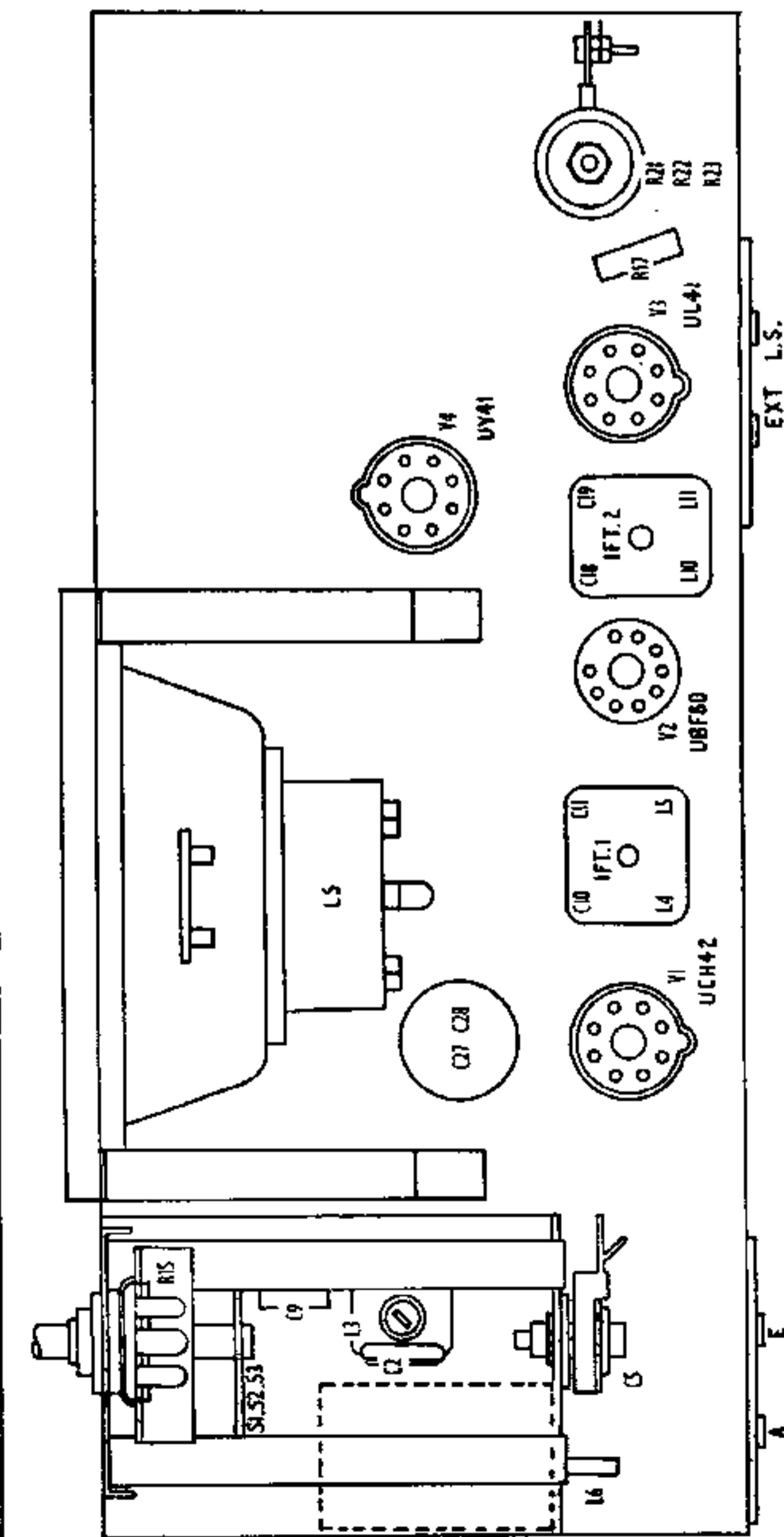
**SMITHS ENGLISH CLOCKS Ltd.,**  
**153-155 Bothwell Street, Glasgow.**  
**Glasgow Central 3972/4.**

**SMITHS ENGLISH CLOCKS Ltd.,**  
**19 Ormeau Avenue, Belfast, N. Ireland.**  
**Belfast 29471.**

**FRAME AERIAL CONNECTIONS**

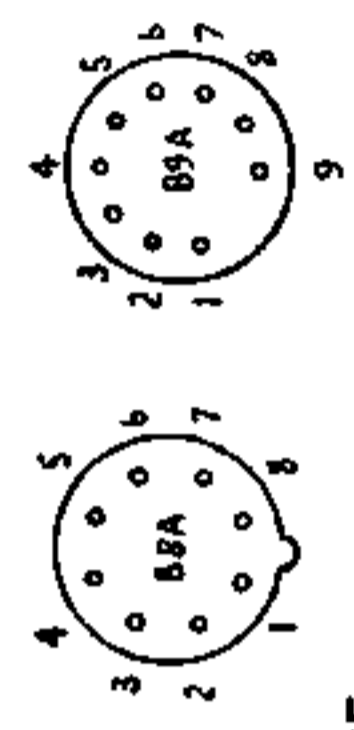


**MAINS RESISTANCE**



**SELECTOR SWITCH WIRING**  
VIEWED FROM REAR

**VALVE BASE DATA**



**VOLTAGE AND CURRENT DATA**

VALVE	ANODE		SCREEN		CATHODE		GRID
	V	mA	V	mA	V	A	
UCH42	102	2.0	51	2.0	—	6.0	-1.0
UBF80	169	2.9	48	1.1	—	4.0	-1.0
UL41	171	40.0	102	5.5	4.5	45.5	—
UY41	218 (A.C.)	—	—	—	—	59	—

**Other voltages :**

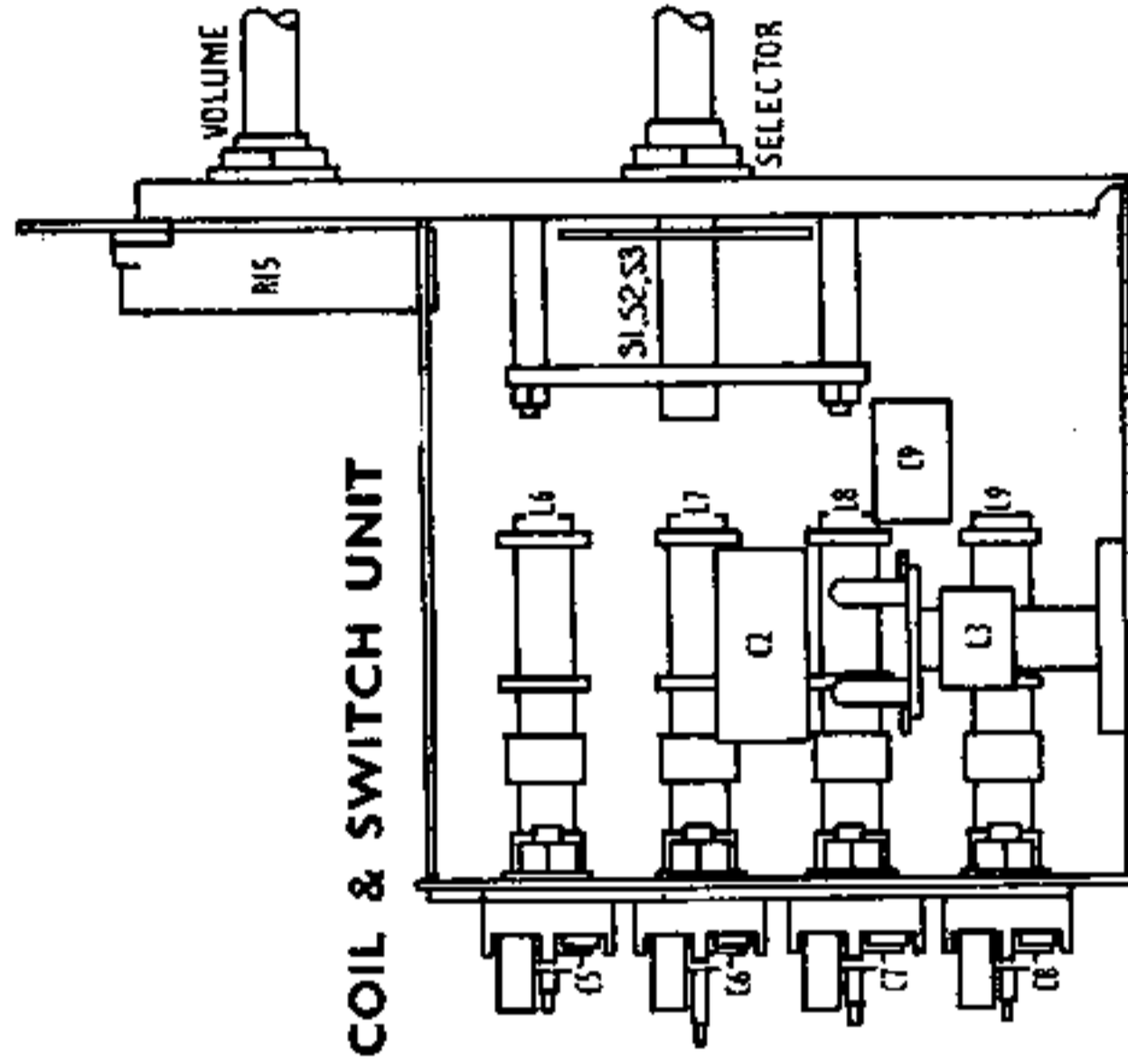
- Voltage across heater chain 107V. A.C.
- UCH42 triode anode current 1.9 mA.
- H.T. voltage at C28 220V.
- H.T. voltage at C27 180V.
- H.T. voltage at C23 102V.

**Conditions :** Station selector switch set to position 2 with no signal input. D.C. voltages taken with a 20,000 ohms/volt meter. A.C. volts with 1,000 ohms/volt meter. The two grid voltages must be taken on a D.C. valve voltmeter. Input 240V. at 50 c.p.s. All voltages are relative to chassis.

**VALVE BASE DATA**

VALVE	1	2	3	4	5	6	7	8	9	BASE
UCH42	H	A	OA	OG	G2	G1	K	H	—	B8A
UBF80	G2	G1	K.S	H	H	A	D1	D2	G3	B9A
UL41	H	A	—	—	G2	G1	K.G3	H	—	B8A
UY41	H	A	—	—	—	—	K	H	—	B8A

**COIL & SWITCH UNIT**



**SERVICE DEPT., E. K. COLE Ltd.,**  
Somerton Works, Arterial Road,  
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Head Office: Ekco Works, Southend-on-Sea

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Glasgow, C.2.  
'Phone: Central 2012

**NORTHERN SERVICE DEPOT:**  
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Manchester, 1  
'Phone: Central 6711/2

**MIDLAND SERVICE DEPOT:**  
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Birmingham, 3  
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