SERVICE MANUAL

Model

DOUBLE-TWO

BATTERY MAINS PORTABLE

RADIO RECEIVER

REGENTONE
RADIO & TELEVISION LTD.

EASTERN AVENUE, WEST, MAWNEYS, ROMFORD, ESSEX
TELEPHONE : ROMFORD 5991-2-3-4

REGENTONE

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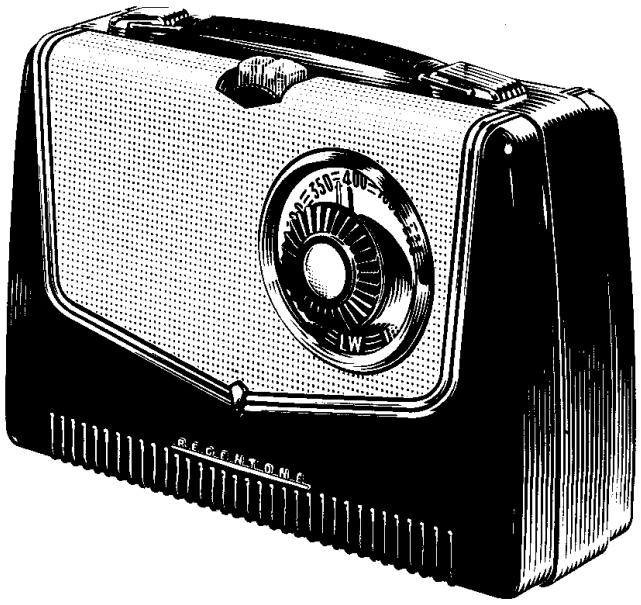


DESCRIPTION.

The receiver is a two waveband Mains/Battery Portable model, fitted with internal ferrite rod aerial for Medium and Long wavebands. Provision is also made for an external aerial, and mains lead storage in the rear of the cabinet. A battery economy switch is also fitted.

OPERATING VOLTAGES.

110–120V
190–210V
210–230V
230–250V
} D.C. or A.C. Mains (25–100 c.p.s.)

or internal battery supply 90V. H.T. 1.4V. L.T.

WAVEBANDS.

Long Wave	160–260 Kc/s	1875–1150 metres.
Medium Wave	525–1630 Kc/s	570– 187 ,,

VALVE COMPLEMENT. (MULLARD)

V1	DK 96	Heptode.	Frequency Changer.
V2	DF 96	Pentode.	I.F. Amplifier.
V3	DAF 96	Diode A.F. Pentode.	Det. A.V.C. and Audio Amplifier.
V4	DL 96	Output Pentode	Power Output.

CONTROLS.

Push button waveband switch.
Off/On, Volume Control.
Tuning.
Battery Economy Switch.

FITTED TERMINALS.

External aerial socket. Mains tap adjustment at the rear of chassis.

SPEAKER.

A 5″ 9,000 lines 3Ω Speaker is fitted.

BATTERY.

Ever Ready B.147. (90V. H.T., 1.4V. L.T.)
Expected life 100 hrs. under normal operating conditions. This will be considerably increased if the receiver is operated under economy condition.

CIRCUIT DESCRIPTION.

The aerial input circuits for M.W. and L.W. are wound on a high permeability ferro-ceramic rod providing a good signal from the local stations, without the use of an external aerial. When an external aerial is used it is " top capacity " coupled on both wavebands.

V1 (DK 96) operates as a heptode frequency changer (using G1 and G2 as oscillator grid and anode, and G3 as signal grid). The tuned grid oscillator operates at 470 Kc/s above signal frequency.

The I.F. signal (470 Kc/s) at the anode is amplified by a normal tuned transformer coupled I.F. amplifier V2 (DF 96) passing then to the detector, the diode of V3 (DAF 96).

The rectified output developed across the diode load resistor is then fed via an L.F. filter to the volume control in the grid circuit of the pentode (V3) which acts as " leaky grid " biased Audio frequency amplifier.

Audio output valve, V4 (DL 96), is driven from the anode of V3 via the usual R.C. coupling network.

When in use on mains inputs, the H.T. and L.T. supply is from a half wave rectifier (Westinghouse 18RA 1-1-16-1), an R.C. filter circuit smoothing the H.T. voltage (85V. approx.).

The voltages necessary for the H.T. and heater supplies (6.5V nominal) are, in the main, achieved by separate resistor chains, in order for the H.T. and Heater supplies to be rendered more independent of each other. The heater current can, therefore, be adjusted to the recommended 24 mA $\pm$ 2% on the nominal mains input to a given voltage tap, and remain stable despite variations of emission, replacement of valves etc.

A 12KΩ 1W. resistor connected between the H.T. dropper and the DL 96 heater shunt preset resistor, prevents the H.T. voltage rising above the maximum permitted 110V. It also stabilises the heater chain against variations in DL 96 and DK 96 emissions.

As the valve heaters are in series on mains operation, the centre tap of the output valve is at + 5.2V in relation to the chassis and its grid circuit, thus providing grid bias.

One end of the chain of 1.2MΩ resistors (i.e. A.G.C. line) is connected to output valve heater (Pin 5), so that the grid circuit of each valve is at the same potential as its filament. Therefore, under " no signal " conditions, the DK 96 and DF 96 are at the correct bias for maximum gain. With strong signal inputs, the higher negative voltage from the diode load end of this resistive chain reduces the gain of V1 and V2 as in a normal A.G.C. circuit.

For operation on battery supplies, the mains supply socket at the rear of chassis is removed. This operates switches which disconnect the mains power unit and automatically connect the battery. The heater chain is then earthed at two extra points and connected to the L.T. battery at two others, thus connecting all filaments in parallel, with an optional third connection (economy switch) allowing one of both the output valve heaters to be in circuit, so that L.T. and H.T. current economy (20%) can be affected if required at the cost of reduced power output.

Output valve bias when working from batteries is developed across a series resistor in the H.T. battery negative lead.

NOTE. ADJUSTMENT OF R8.

This variable resistor is pre-set at the factory and will not normally need readjustment with a change of output valve. If, however, for any reason it becomes necessary to readjust R8, the mains adjustment tap must be in the nominal position for the mains on which the receiver is being used. The voltage at pin 1 on V4 must be 3.9, the meter used being an Avo Model 8 or similar high resistance meter.

ALIGNMENT INSTRUCTIONS.

Alignment is more conveniently carried out on battery supply, but if mains supply is used it must be remembered that the chassis may be " live ".

INTERMEDIATE FREQUENCY.

Set receiver volume control at maximum. Apply 470 Kc/s from signal generator direct via .1μF condenser to the grid of the I.F. amplifier (V2) and adjust dust cores of 2nd I.F. Transformer T2 for maximum output, reducing the output from generator as far as possible (the audio output should not go above 50mW).

Transfer the generator output to the grid of V1, with set switched to M.W. gang open, adjust cores of 1st I.F. Transformer T.1. for maximum output, again reducing generator output as the circuits come into alignment.

R.F. ALIGNMENT. Close gang to check that pointer is set zero on scale. Check that Volume Control is at maximum. Connect the signal generator via dummy aerial to socket of receiver (with earth lead clipped on chassis).

(1) Set receiver to 575 Kc/s position on scale. Adjust osc. coil L5 slug for 2nd peak (nearest chassis) and slide M.W. coil L1 on rod for maximum output.

(2) Apply 1500 Kc/s. Re-set receiver to 1500 Kc/s (200m.) calibration mark, and adjust oscillator C14 and aerial C4 trimmers for maximum output.

(3) Repeat (1) and (2) until no improvement is possible.

LONG WAVE.

(1) Apply 225 Kc/s, set receiver to 225 Kc/s (1335 metres).

(2) Adjust L.W. osc. trimmer C15 and L.W. aerial coil L2 for maximum output.

(3) Repeat (2).

Aerial coils to be fixed to rod with Sellotape or lacquer. Trimmers to be sealed with lacquer in usual way.

ERRATA.

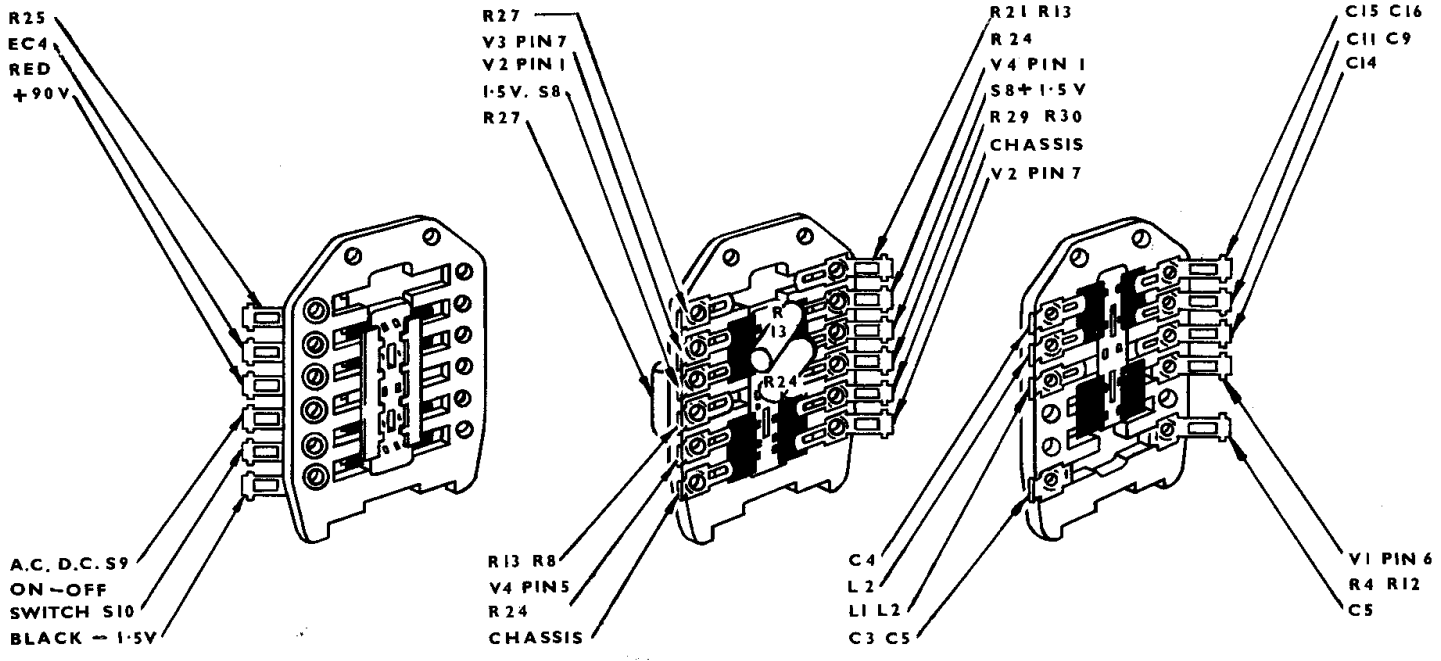
Condensers C8, 13, 21, 23 are shown as 100μF in the Circuit diagram. These should read 100 pF.

REPLACEMENT PARTS.

081/0002	Button M.W.
081/0003	,, L.W.
081/0004	,, Batt. Econ.
158/0001	Cabinet. Front Half.
158/0002	,, Rear ,,
197/0001	Clip. Gang spindle insulator.
197/0006	,, Knob.
199/0002	,, Cabinet rear mtg.
199/0003	,, Mains Connector.
204/0504	Coil. Oscillator Assy.
204/0505	,, L.W. Ae.
204/0506	,, M.W. Ae.
206/0007	,, I.F.T. 1st & 2nd.
780/0001	Connector. Mains input.
R.301508	Core Iron Dust.
230/0001	,, Rod Aerial.
497/0001	Insulator, Gang Spindle.
497/0003	,, Bat. Econ. Sw. Contact.
519/0002	Knob Tuning.
519/0001	,, Volume.
635/0001	Mains Dropper Retaining Plate.
620/0008	Panel. Mains Adj. Assy.
620/0011	,, Ae.
635/0003	,, Voltage Indicator.
640/0003	Plug. 4 pin Miniature.
645/0002	Pointer. Tuning.
649/0001/1	Pot. 1M. D.P.S.T.
714/0001	Rectifier.
717/0001	Resistor. Mains Dropping. 193.243.505.573Ω.
717/0002	Resistor. Mains Dropping. 3800, 2920, 3750Ω.
717/0004	Resistor. 300Ω W.W.
R10.10310	Resistor 10K 10% 1W.
R08.15210	Resistor 1.5K 10% ½W.
775/0001	Sleeve, Red. W/Ch. Indicator.
640/0001	Socket. Mains input on chassis.
787/0002	Speaker. 5″ p.m.
805/0002	Spring. W/Ch. Button.
806/0001	,, Mains dropper Mtg.
806/0002	,, Economy Switch Contact.
542/0002	,, Link–W/Ch. Switch.
805/0003	,, Battery to Mains Switch.
542/0001	Switch Bar. Battery Economy.
818/0001	Switch Wafer No. 1.
818/0002	,, ,, No. 3.
818/0003	,, ,, No. 2.
907/0001	Transformer O.P.T.
R.121522	Valveholder B7G.

CONDENSERS.

215/0003	40.40.8 μF Elec. 150/275 V.W.
213/0007	100μF Elec. 6V.W.
C035/104/25	.1μF 150V.W.
R.129746	.002μF 500V.W.
C754/472/05	4700 pF ± 5%.
223/0001/1	665 pF ± 1%.
223/0002/1	275 pF ± 5%.
C554/103/20	10,000 pF ± 20%.
R.130594	15 pF ± 1 pF.
R.130566	220 pF ± 20%.
R.130575	5 pF ± ½ pF.
217/0002	2 Gang Variable.
R.128530	3 Bank Trimmers.

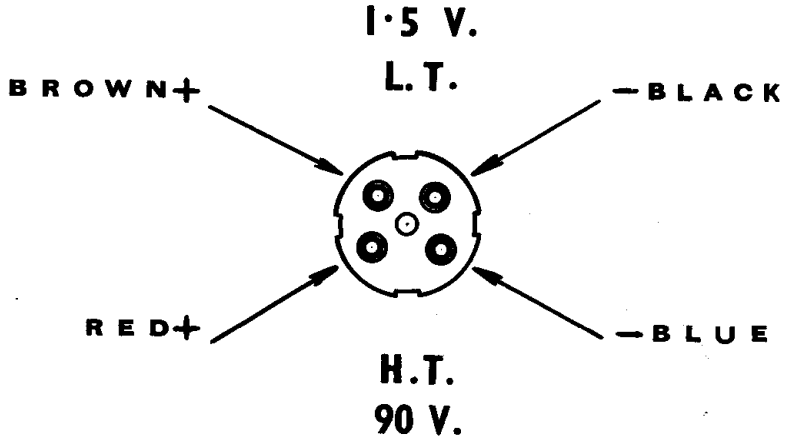


SWITCH WAFER NO. 1 SWITCH WAFER NO. 2 SWITCH WAFER NO. 3

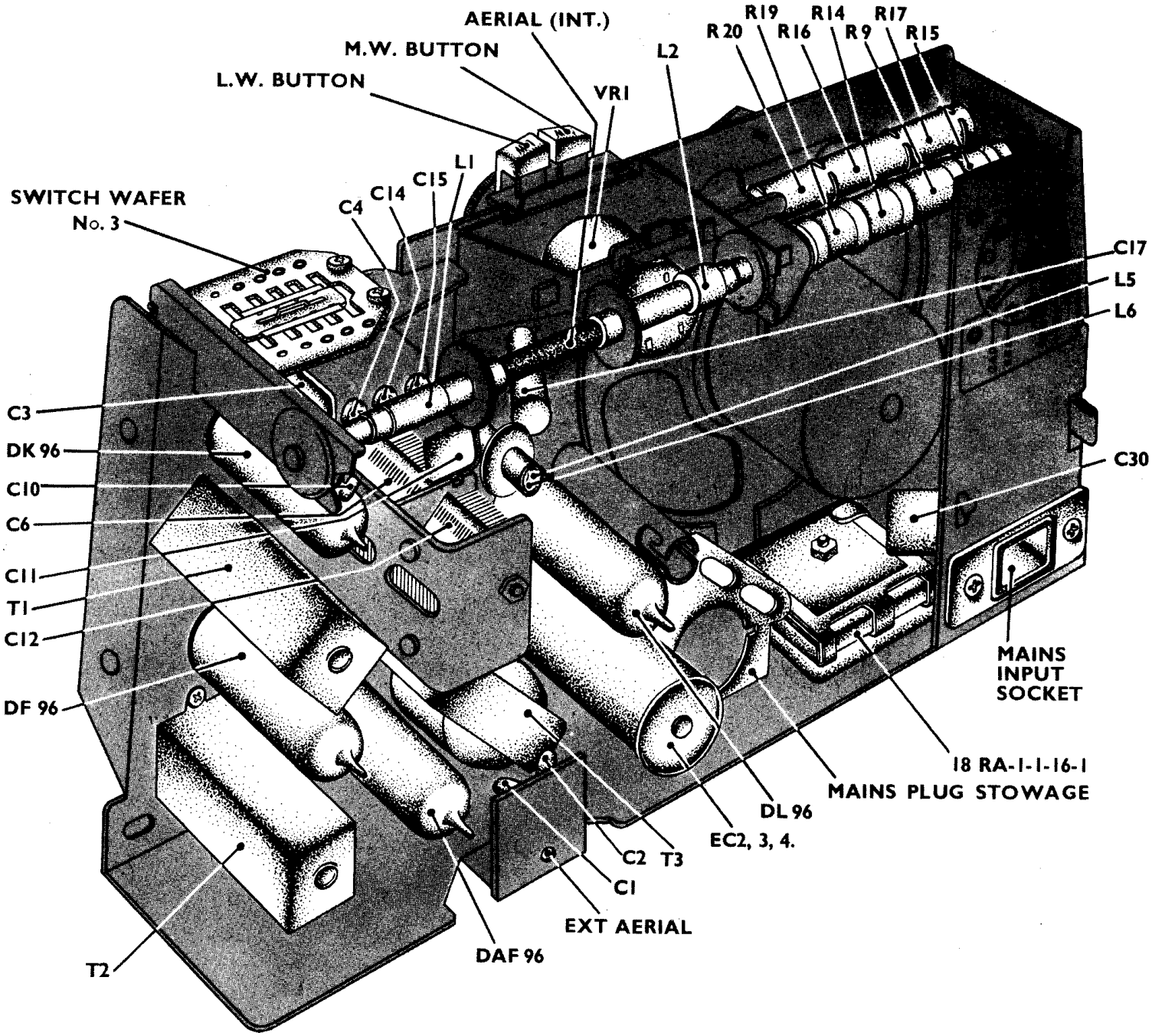
SWITCH WAFERS

VALVE OR CHECK POINT	ANODE			SCREEN			OSC. ANODE			OSC. GRID μA			HEATERS	BIAS	
	V.	M.A.	PIN	V.	M.A.	PIN	V.	M.A.	PIN.	MIN.	MAX.	PIN.	L.T. VOLTS.	V.	M.A.
1. DK 96	84	·42	2	68	·11	5	33	1·7	3	91	99	4			
							(OSCILLATING)			M.W.			1·3 AVERAGE ACROSS HTRS. 1 & 7. TOTAL = 6·5		
							35	1·6	3	103	106	4			
							(NOT OSC.)			L.W.					
2. DF 96	84	1·45	2	66	·48	3									
3. DAF 96	31	56	5	30	17	4									
		μA			μA										
4. DL 96	82	3·5	2	78	·66	3							3·9 (PIN 1.) TO CHASSIS		
H.T. (SMOOTHED)	84	8·6													
H.T. (SUB.)	78	·725													
H.T. NEG. TO CHASSIS														4 ECONOMY 4·6 FULL	8 10·5
R 21			CURRENT THROUGH H.T. SHUNT = 9·2 M.A.												

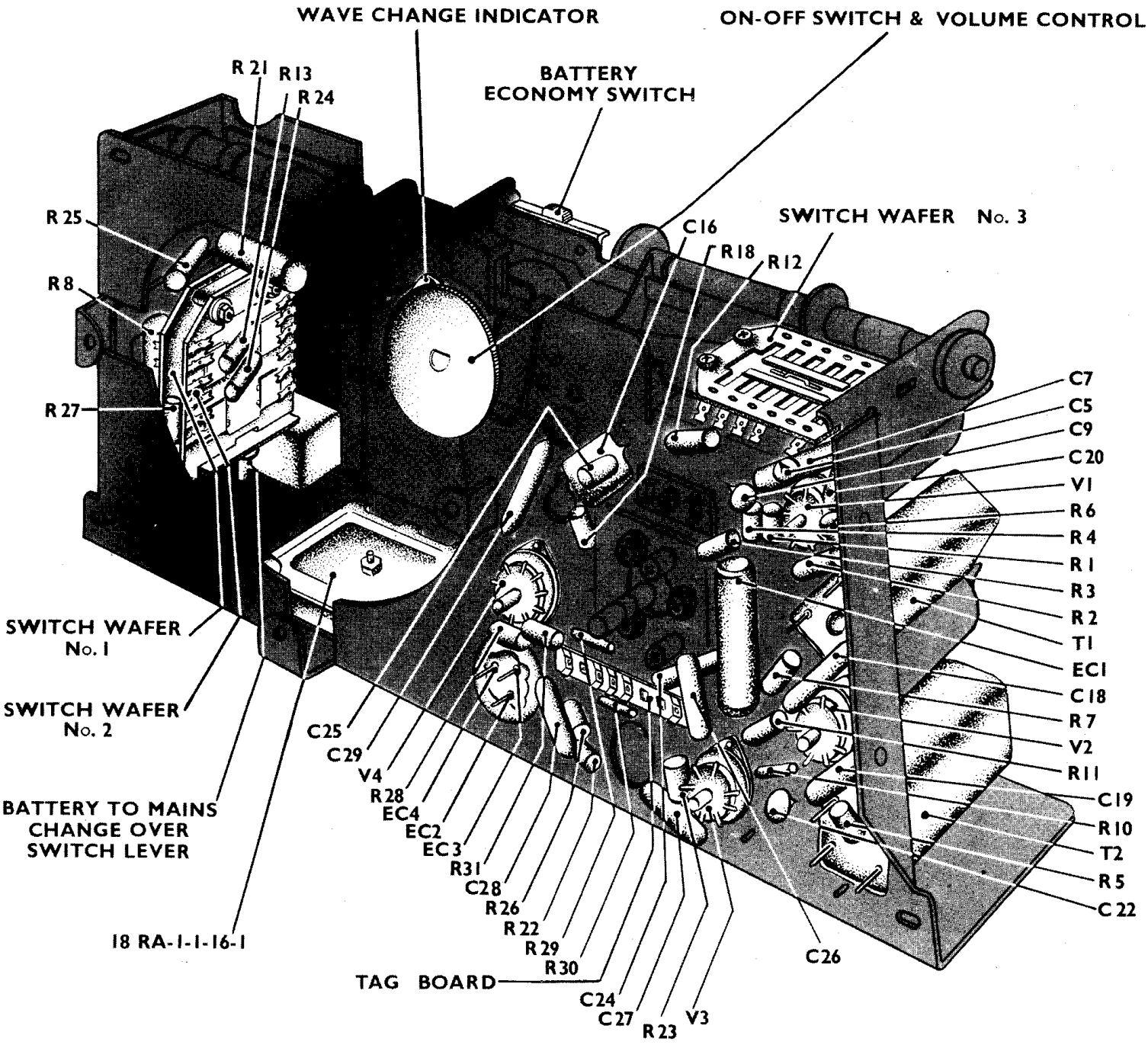
VALVE VOLTAGE & CURRENT READINGS.
METER USED – AVO MODEL 8.



BATTERY PLUG CONNECTIONS SEEN LOOKING AT PINS.



COMPONENT LAYOUT



VIEW WITH SPEAKER AND TUNING SCALE REMOVED

COMPONENT LAYOUT