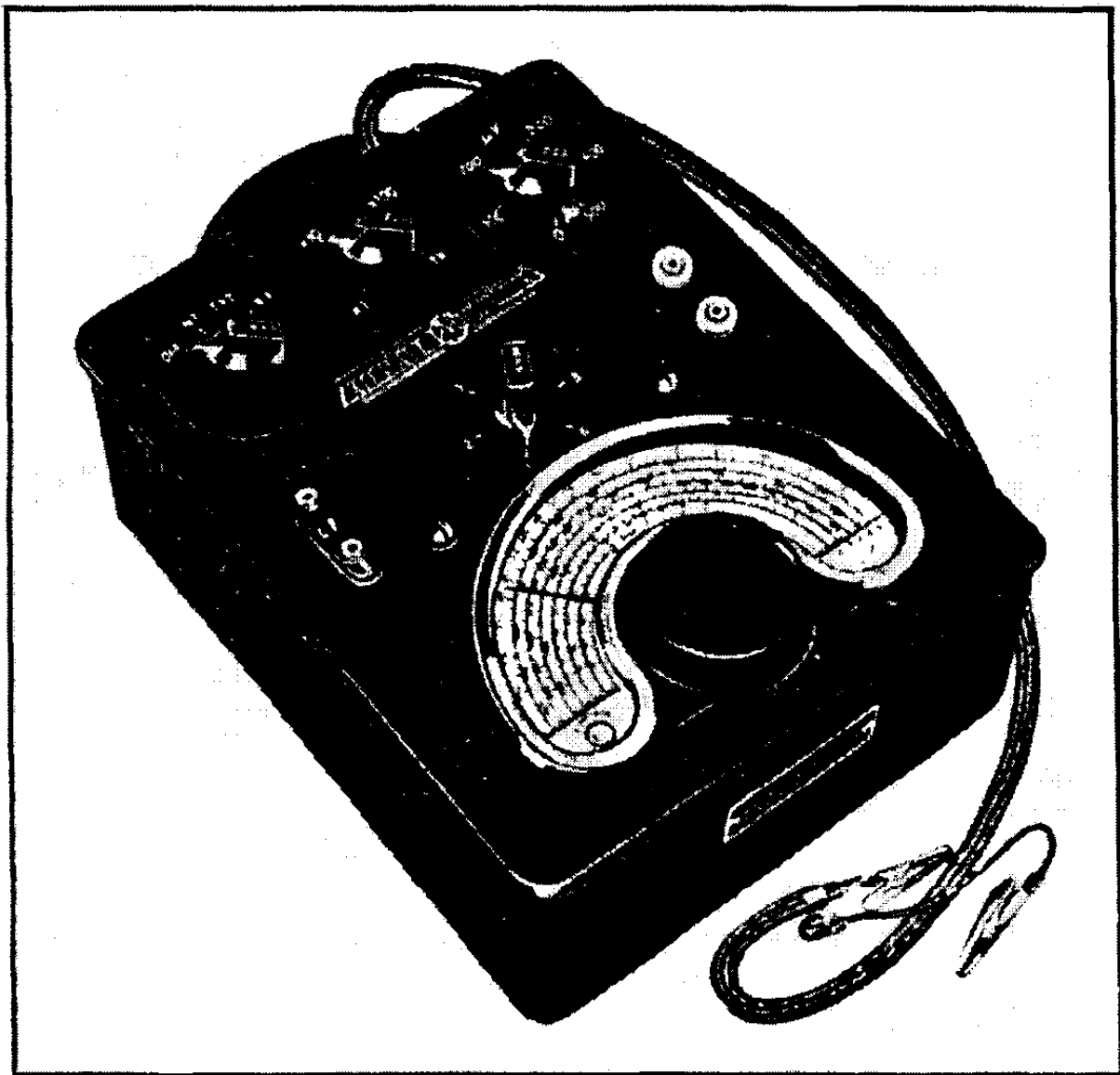


INSTRUCTIONS
FOR USING THE
ALL WAVE
AVO-OSCILLATOR



BRITISH MADE BY
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THE ALL WAVE AVO-OSCILLATOR

INSTRUCTIONS FOR USE

The ALL WAVE AVO-OSCILLATOR is an accurate modulated oscillator suitable for all radio service and general laboratory work.

It covers a fundamental range of 95 Kc.-40 megacycles in 6 ranges, the required range being selected by means of the wave range switch (numbered 1-6). Scale 1H is a harmonic calibration of range 1.

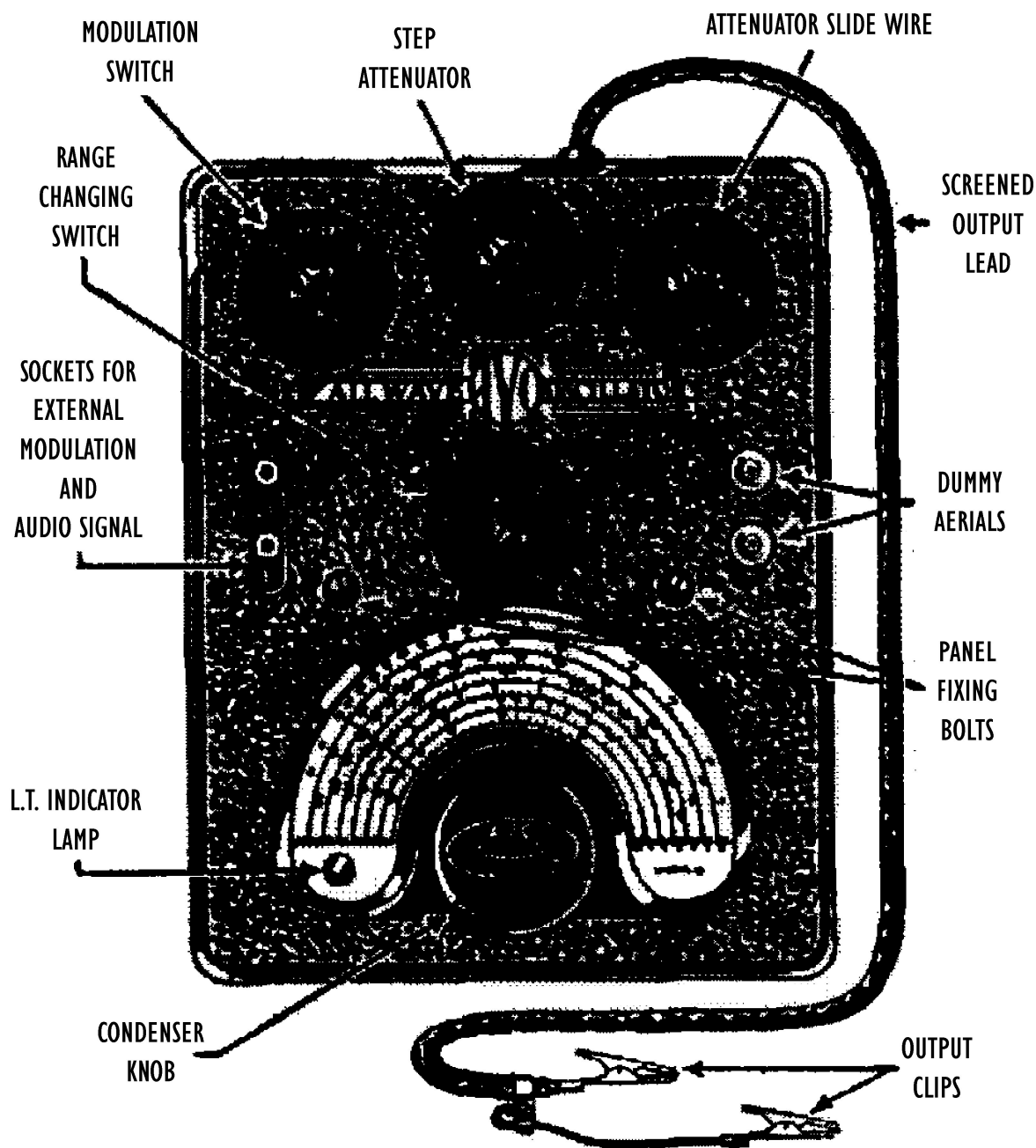
The ranges are as follows:-

- Range 6: 95Kc. – 300Kc.
Subdivisions of 1Kc. from 100Kc. to 110Kc.
2Kc. from 110Kc. to 200Kc.
5Kc. from 200Kc. to 250Kc.
- Range 5: 230Kc. - 800Kc.
Subdivisions of 10Kc. from 250Kc. to 600Kc.
20Kc. from 600Kc. to 700Kc.
50Kc. from 700Kc. to 800Kc.
- Range 4: 7000Kc. – 2,200Kc.
Subdivisions of 20Kc. from 700Kc. to 1,500Kc.
50Kc. from 1,500Kc. to 2,200Kc.
- Range 3: 1,800Kc. – 6,000Kc.
Subdivisions of 20Kc. from 1,800Kc. to 2,000Kc.
50Kc. from 2,000Kc. to 2,500Kc.
100Kc. from 2,500Kc. to 6,000Kc.
- Range 2: 5Mc. – 15Mc.
Subdivisions of 100Kc. from 5Mc. to 7Mc.
200Mc. from 7Mc. to 11Mc.
500Mc. from 11Mc. to 15Mc.
- Range 1: 14Mc. – 40Mc.
Subdivisions of 500Kc. from 14Mc. to 20Mc.
1Mc. from 20Mc. to 40Mc.
- Range 1H: 30Mc. – 80Mc.
Subdivisions of 1Mc. from 30Mc. to 40Mc.
2Mc. from 40Mc. to 80Mc.

The dial is directly calibrated in frequency on all ranges. In order to obtain a signal of any desired frequency, it is therefore only necessary to set the wave-change switch to the correct range and turn the pointer till the required frequency is indicated on the chosen scale. Wave-length readings can be obtained from the present frequency calibration, using the formula:

$$\text{Wave-length in meters} = \frac{300,000}{\text{Frequency in Kc.'s.}}$$

The signal can then be taken from the two clips of the special output lead provided. The clip which is connected to the metal screening being "Earthy".



DUMMY AERIALS.

For set alignment purposes, two dummy aerials are provided, one marked M.L. for frequencies up to about 2,500 Kc. and one marked "S" for higher frequencies than this.

The constants of these aerials are as follows:- M.L. – 20 Micro-henries; 25 Ohms; 200 Micro-Mfd.
S – 400 Ohms.

The required dummy aerial should be unscrewed from its tubular receptacle in the oscillator panel and screwed on to the end of the output lead in place of the removable spring clip. The spring clip can then be replaced at the end of the dummy aerial for connection to the set or other piece of apparatus. The earthy clip is connected as before.



When connecting the oscillator to a circuit which has a D.C. potential across it (such, as I.F. transformer primary) a condenser of about .01 mfd should be included in series with the oscillator lead to avoid damage to the attenuator. This precaution does not of course apply to cases where the M.L. dummy aerial is being used as this includes a condenser.

ATTENUATION OF SIGNAL.

The strength of the signal is varied by the two attenuator controls, one being a continuously variable slide wire and calibrated 0 -500 microvolts. The other attenuator sub-divides the output to the slide wire and thus acts as a multiplier.

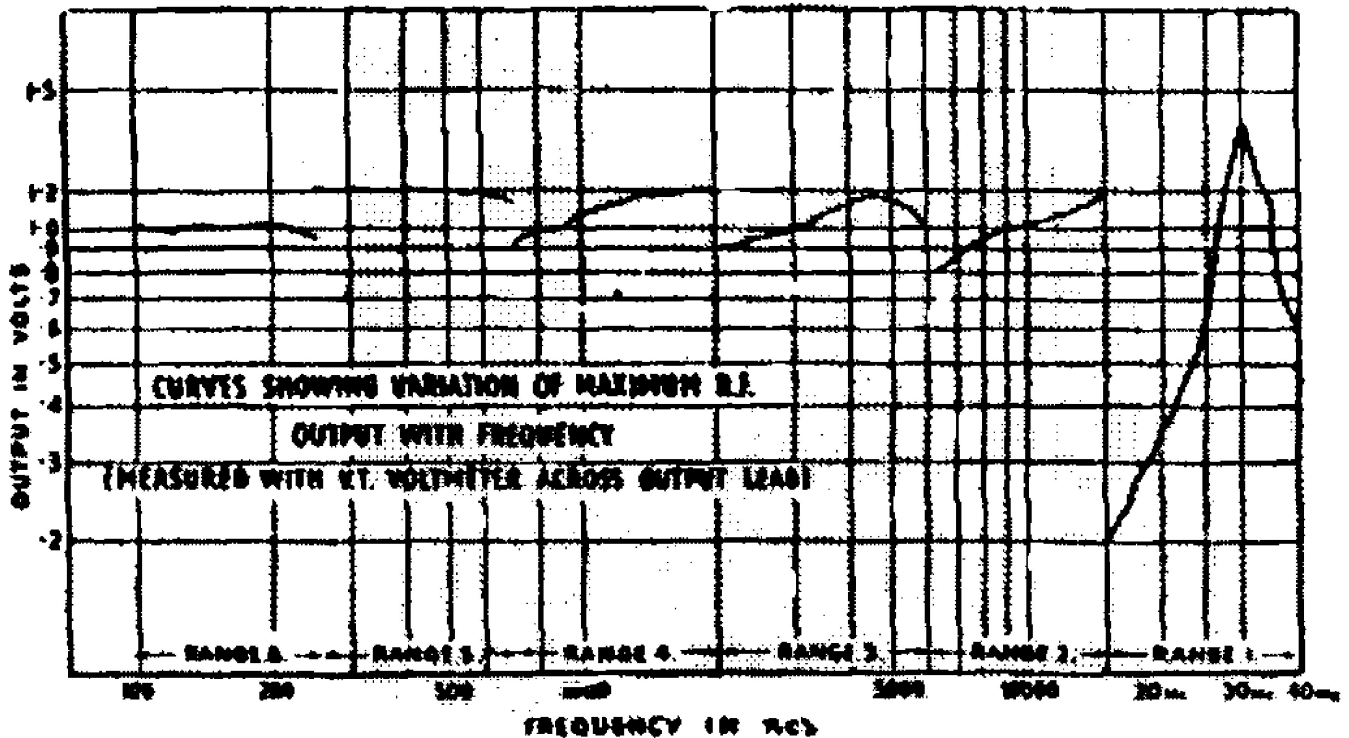
With this switch set to "X1" the maximum output from the attenuator is of the order of 500 micro volts. When set to "X10" the maximum output is multiplied by 10, giving approximately 5 millivolts, and at "X100" the output is approximately 50 millivolts. These outputs are varied down to a minimum by the rotation of the slide wire.

With the multiplier switch set to 1V, a force output of one volt is obtained which cannot be varied by the slide wire.

OUTPUT VOLTAGE ACCURACY.

Owing to the careful design of the oscillator circuits, the maximum output of one volt is extraordinarily well maintained over the full frequency range, as shown by the output curve given below.

This fact, combined with the negligible capacity and small inductance of the attenuator arrangement, results in the calibration of the attenuator being reasonably correct even at frequencies of the order of 10 or 15 megacycles. The instrument is thus suitable for determining sensitivity and selectivity characteristics.



The output does not vary appreciably With L.T. battery voltage but is, of course, dependent on the voltage of the H.T. battery.

MODULATION.

With the modulation switch set at "Off" – the instrument is switched off. When set at "INT.", the high frequency signal is internally modulated at a frequency of about 400 cycles, to a depth of approximately 30%. This audio signal is also available for external use at the sockets L.F. the socket marked F being earthy. The audio frequency voltage is about 12 volts into a high impedance load (5,000 ohms).

With the modulation switch set at "EXT", the instrument is suitable for external modulation with a suitable signal injected into the sockets "LF." Roughly 12 volts into an impedance of about 50,000 ohms is required for 30% modulation.

By setting the modulation switch at RF, an unmodulated radio frequency signal is obtained.

CHANGING THE BATTERIES.

In the left hand corner of the scale plate will be found a small indicator lamp which serves a threefold purpose. One of its functions is that of dropping resistance to enable two-volt valves to be operated from a standard $4\frac{1}{2}$ volt dry cell. Also, owing to the change in the resistance with temperature, it serves in some measure as a barettor to prevent the valve filament voltage changing too rapidly with fall of battery voltage. The efficiency of the device is such that it is not really necessary to change the $4\frac{1}{2}$ volt L.T. battery until it has of $2\frac{1}{2}$ volts under load.

The frequency drift with change of L.T. battery so small that it can be neglected even where the battery has fallen to $1\frac{1}{2}$ volts. When this condition has been attained the indicator lamp will show only the smallest red glow on the filament.

Owing to the small drain on the 75 volt H.T. battery, this component will have a long useful life, especially as a drop in the voltage of as much as 30-50 volts does not materially affect the calibration. When the HT battery has dropped to 40-volts, the frequency change at 100 Kc. is about 1% ; at 500 Kc, it is 0.8% ; above 1,000 Kc. it does not exceed 0.1%.

In the interests of stability of performance it is advisable to replace both batteries before their extreme limit of utility has been reached.

In order to gain access to the batteries, the two chromium plated screws on either side of the range-change switch should be carefully removed. When this is done, the panel can be lifted off, exposing the battery contacts and the wood L.T. battery container. This latter compartment is removed by loosening the two brass screws holding down the metal casting which forms the common negative battery contact.

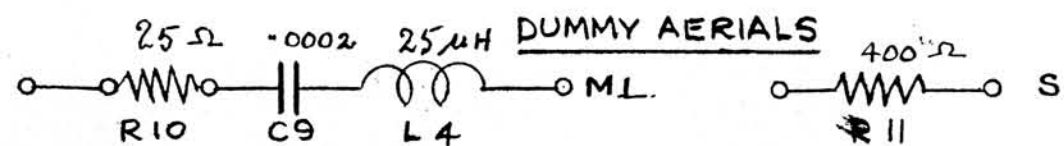
When replacing batteries take care that the connections are replaced exactly as in the original instance.

Should the indicator lamp fail for any reason, it may be removed by unscrewing the small brass screw which holds down the ebonite lamp holder. A new lamp (Type Ever-Ready 1908) may be screwed into the holder and the latter replaced.

Always switch off the instrument when not in use to preserve the life of the batteries and to prevent corrosion of the contacts due to seeping.

On no account should the lids of the coil or attenuator screening boxes be tampered with, otherwise calibration may be upset,

The above instructions also apply to the mains driven All-Wave Oscillator as this instrument is similar in all respects to the battery model with the exceptions that the supplies are obtained from A.C. mains and that IHC valves are used. Also on the mains model the on-off switch is a separate toggle switch on the case of the instrument. There is also a separate position on the modulation switch marked "L.F." to be used when the internal modulation voltage is taken from the sockets marked "L.F."



ACWEECO
(AVO)

DRAWN
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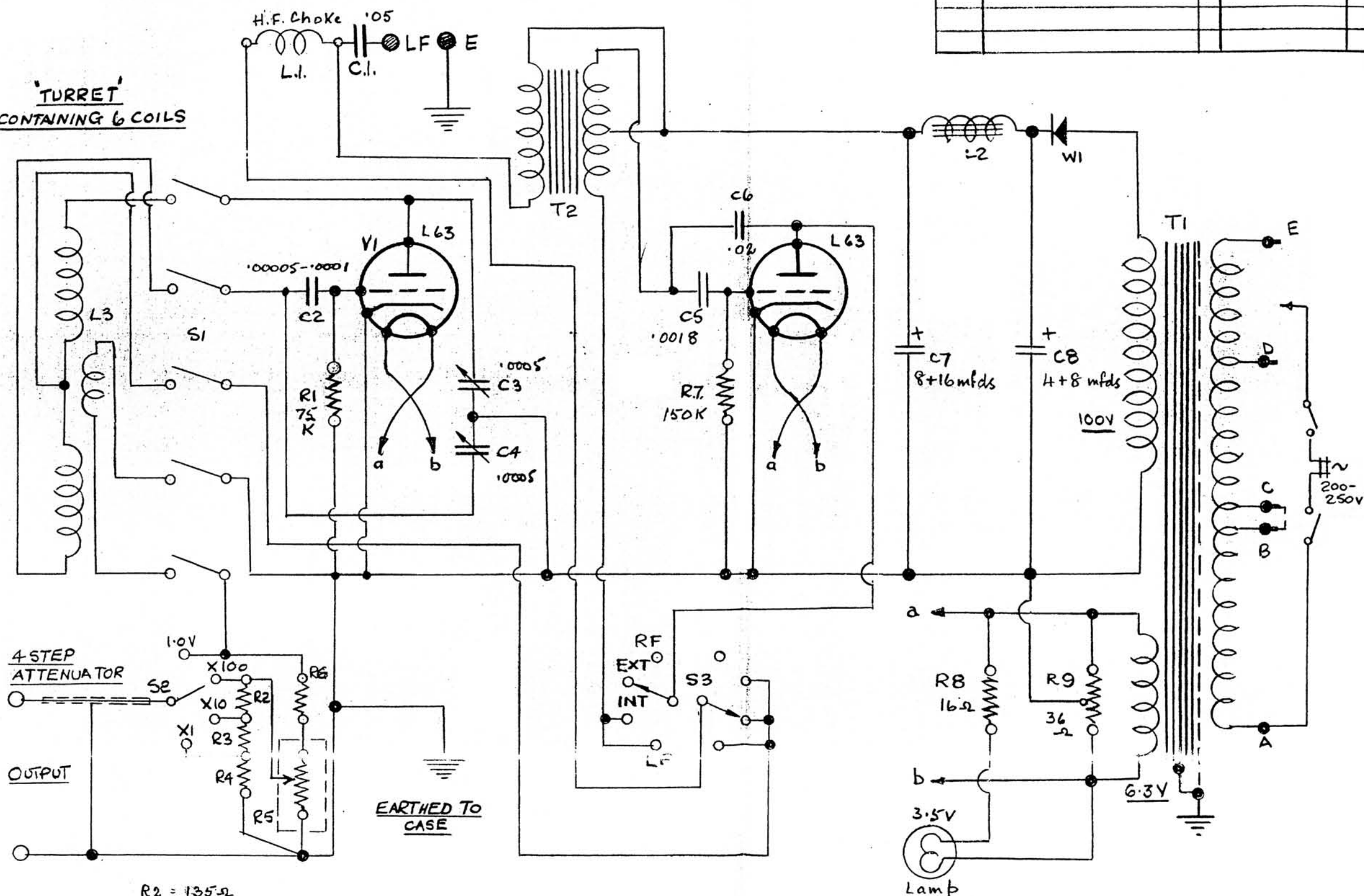
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MAINS TYPE ALL
WAVE OSCILLATOR.

20135

No	DESCRIPTION	DETAIL No	MATERIAL	MATERIAL	
				PATTERN No OR DIMENSIONS	
1	MAINS TYPE ALL WAVE OSCILLATOR	20,135-1			

'TURRET'
CONTAINING 6 COILS



R2 = 135 Ω
R3 13.5 Ω
R4 1.5 Ω
R5 4.5 Ω
R6 85 Ω