Temporary Leaflet.

TUNGSRAM

ECH11

12

VALVE.

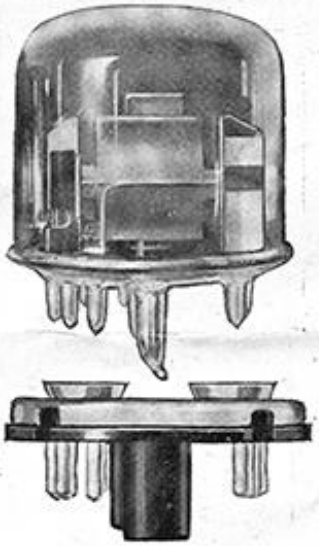
Triode Hexode Frequency Changer
IN "FOOTLESS" CONSTRUCTION.

LIMIT CHARACTERISTICS.

Heater Potential	6.3±10% volts
Heater Current	0.2 amps
Maximum Cathode Current	15 mA
Maximum Heater-Cathode Potential	100 volts
Maximum Heater-Cathode External Resistance	20,000 ohms
Maximum Signal Grid Circuit Resistance	3 megohms
Hexode :	
Maximum Anode Potential (Valve cold)	550 volts
" " " (Valve heated)	300 volts
Maximum Anode Dissipation	1.5 watts
Maximum Accelerator Grid Potential (Valve cold)	550 volts
" " " " " (Valve heated)	125 volts
" " " " Dissipation	0.5 watts
Triode:	
Maximum Anode Potential (Valve cold)	550 volts
" " " (Valve heated)	150 volts
Maximum Anode Dissipation	1 watt
Mutual Conductance @ $E_G=0$	2.8 mA/V
Magnification Factor @ $E_G=0$	20

General :—

The low-loss design of this valve enables easy reception of signals down to 3 metres and with special care even lower. With a fixed screen voltage the A.V.C. potential required for full control is small, on the other hand, with larger A.V.C. potential the cross modulation can be reduced by using the well-known principle of floating screen grid voltage (fed by means of dropping resistance.)



This valve is constructed on the so-called footless principle, which eliminates the previous conventional re-entrant tube and pinch, in which very long lead lengths from the electrodes to the external circuit caused excessive lead inductance and excessive inter-electrode and inter-lead capacitances as well as tendencies to inter-electrode leakage in the pinch.

All these disadvantages are eliminated by the footless construction in which the entire electrode structure is mounted horizontally on a glass disc, as shown in the illustration, all leads passing directly to the pins with the shortest possible length ; the input leads as shown in the base connection diagram on page 4 going directly to one group of pins, whilst the output leads are connected to the other group, each group

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being individually screened from the other by a metal screening plate on the base. An important feature is that the internal screen can be connected to the chassis by the shortest possible lead, (about $\frac{1}{2}$") consequently the screening is effective even at very high frequencies.

These are the reasons why the footless range of valves will function at 5 metre wave length just as satisfactorily as ordinary valves will function at 50 metres.

Functional Characteristics :—

Internal Anode Impedance greater than 1.5 megohms.

Slope with Fixed Screen Voltage

@	Eg_1 = −2 v	Conversion Conductance	=	650 μA/V
	Eg_1 ,, −12 v	,,	,,	6.5 ,,
	Eg_1 ,, −13 v	,,	,,	3.25 ,,

Slope with Floating Screen Voltage Rg_{2+4} ,, 50,000 ohms

@	Eg_1 = −2 v	Conversion Conductance	,,	650 μA/V
	Eg_1 ,, −16.5 v	,,	,,	6.5 ,,
	Eg_1 ,, −21 v	,,	,,	1.6 ,,

Capacitances :

Input	5.3 $\mu\mu$F.	G_1–Anode	0.001 $\mu\mu$F.
Output	9.1 ,,	G_1–Heater	0.001 ,,
Gt and G_3–Cathode	4.3 ,,	G_1–G_3 and Gt	0.2 ,,
Triode-Anode-Cathode	2.5 ,,	Gt and G_3–Triode Anode	1.5 ,,

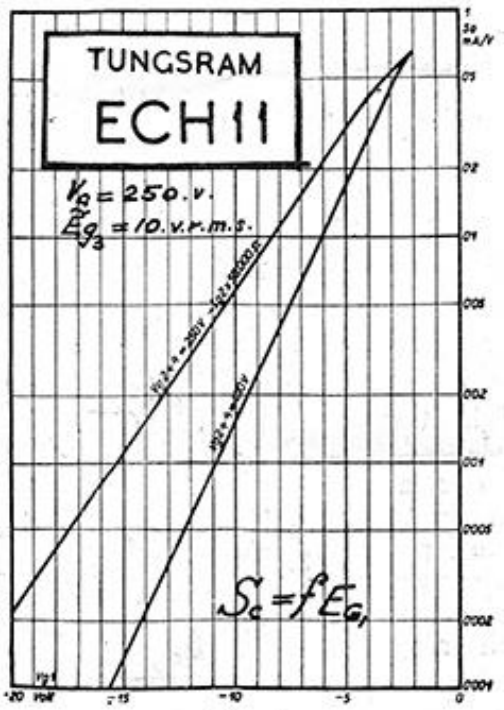

Fig. 2

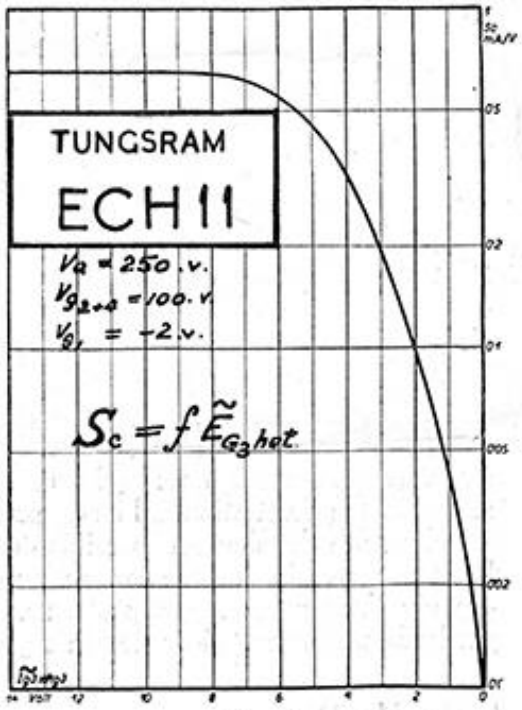

Fig. 3

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Typical Operating Conditions :—

Anode Potential	250 volts
Anode Current	2.3 mA
Accelerator Grids (G_2, G_4) Potential	100 volts
Accelerator Grids Current	3 mA
Signal Grid Potential	−2 volts
Cathode Resistor	250 ohms
Triode Anode Supply Voltage (Fed through 30,000 ohms)	250 volts
Triode Anode Current	3.3 mA
Triode Grid Leak	50,000 ohms
Triode Grid Current	200 μA

Fig. 1 shows a picture of the internal structure of the glass valve which is enclosed in a copper can (not shown) having external dimensions as shown in Fig. 6 overleaf.

Fig. 2 gives the conversion conductance Sc. as a function of the signal grid bias.

Fig. 3 shows the conversion conductance Sc. as a function of the heterodyne voltage on the injector grid, whilst,

Fig. 4 is the triode grid volts–anode current characteristic.

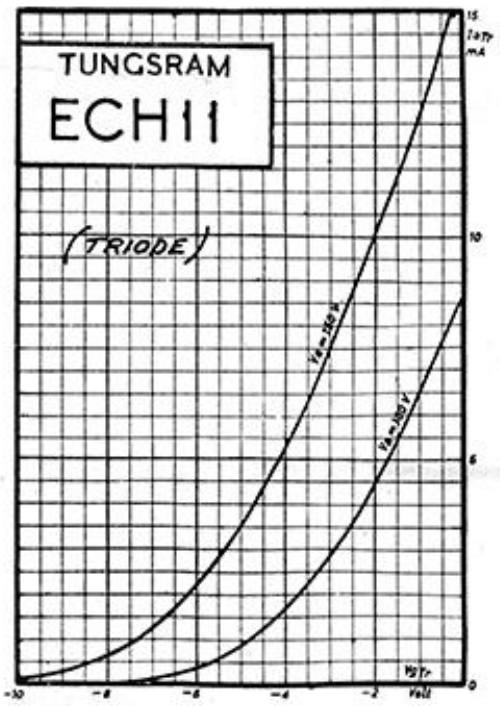

Fig. 4

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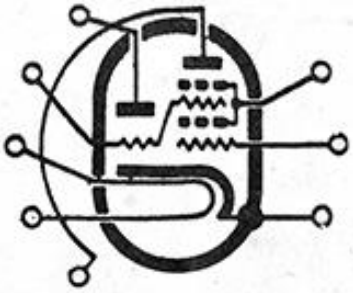

Fig. 5

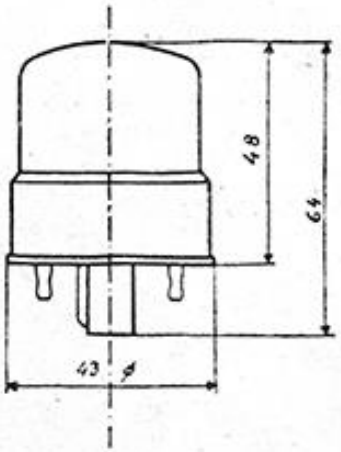

Fig. 6

The Base of this valve is a new type of octal base, the pin centres of which are on a much larger pitch circle so as to increase the distance between input and output pins. The connections to the pins are shown in Fig. 5 which is viewed from under chassis. (Whilst from this diagram it would appear that the hexode anode lead goes via a roundabout way, it really goes directly by a lead only half inch long.)

The pins on this valve base are so shaped that they fit into the holder with a 'click' action, thus combining the advantages of the ordinary octal base with that of the side contact base.

The dimensions of type ECH11 are shown in Fig. 6 above in millimetres, and, as will be seen, these are exceedingly small. Whilst the deck space is somewhat larger than ordinary octal valves, it is no larger than that of side contact type of valves.

NOTICE.

In the event of this valve being returned, the manufacturers are under no obligation to return or replace it, should there be any necessity to break it for the purpose of a thorough examination.

Further Technical Information can be obtained from :—

BRITISH TUNGSRAM RADIO WORKS Ltd.,
WEST ROAD, TOTTENHAM, LONDON, N.17.
Telephone Tottenham 4884-5-6.
Tungsram factories in England, France, Hungary, Poland and Italy.