DISC SEAL TRIODE

TD03-10

Indirectly-heated disc seal triode, without internal feedback, primarily intended for use as a common grid, earthed anode, concentric line oscillator. It may also be used as a power amplifier.

HEATER

Indirectly heated.

V_h	6.3	V
I_h (approx.	0.4	A

CAPACITANCES

c_{a-g}	1.1	μμF
c_{a-k}	0.02	μμF
c_{g-k}	2.2	μμF

CHARACTERISTICS

V_a	250	V
V_g	−3.5	V
I_a	20	mA
g_m	6.0	mA/V
μ	30	

LIMITING VALUES

V_a max.	350	V
p_a max.	10	W
I_a max.	50	mA
$i_{a(pk)}$ max.	150	mA
p_g max.	0.5	W
$T_{anode\ seal}$ max.	140	°C

In order to limit the anode seal temperature and also to limit the rate of change of anode seal temperature, it is necessary that the mass of metal in close thermal contact with the anode disc shall not be less than 60 grams (2 oz.) of brass or its thermal equivalent.

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OPERATING NOTES

A typical circuit arrangement is shown where the anode-to-grid and grid-to-cathode circuits are both coaxial lines, the grid line being common to both circuits.

Tuning is effected in both circuits by means of moveable bridges which should ideally be a quarter of a wavelength in length to ensure that the actual contact occurs at a current node. Over the wavelength range 10 to 60 cm a good compromise is obtained with a bridge of 2.5 cm in length.

It is essential that perfect contact is maintained between the lines and the bridges.

The heater-to-cathode circuit may be tuned by means of a capacity bridge. For the longer wavelengths tuning is not essential but must be employed for wavelengths around 10 cm. A bridge positioned 7.2 cm from the valve end of the cathode line will give satisfactory operation over the range 8-12 cm.

Feedback is obtained by means of an adjustable capacitive probe (6BA threaded rod) which makes contact with the anode line and passes through a $\frac{1}{4}$-in hole in the grid line. For wavelengths longer than 30 cm it is advisable to terminate the probe by a small circular disc. Below 30 cm this is unnecessary, and at approximately 10 cm the increased capacitance prohibits its use.

It is impossible to use a single probe position over each oscillator range and three positions A, B and C are given below for a typical circuit together with the range of wavelengths covered.

Probe Position	Distance from Anode Plane (mm)	Range of λ with Anode Line $\frac{3}{4}\lambda$ mode (cm)	Min. λ with Anode Line on $\frac{1}{4}\lambda$ mode (cm)
A	28.5	9 to 14	24
B	43.5	11 to 19	29
C	58.5	12 to 24	35

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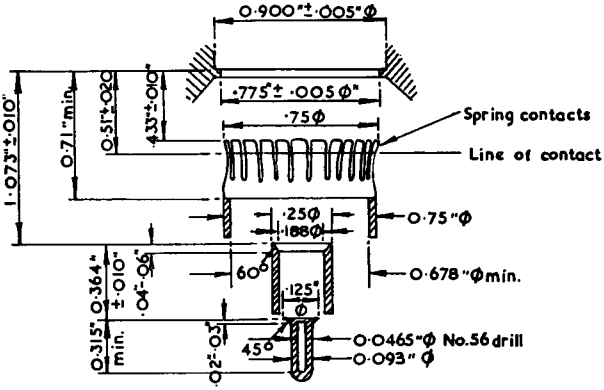

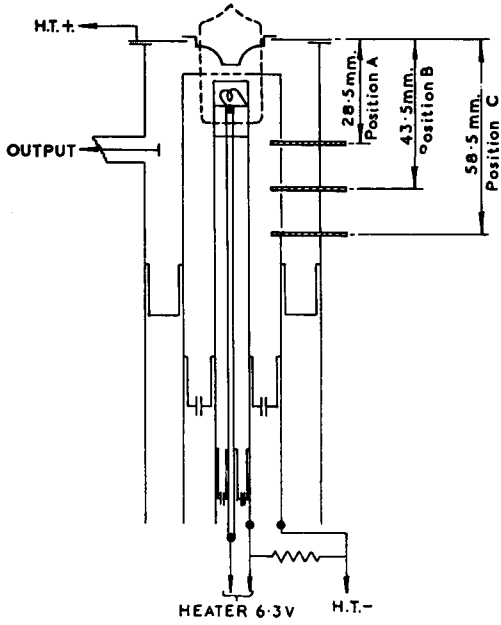

TYPICAL CIRCUIT ARRANGEMENT FOR OSCILLATOR

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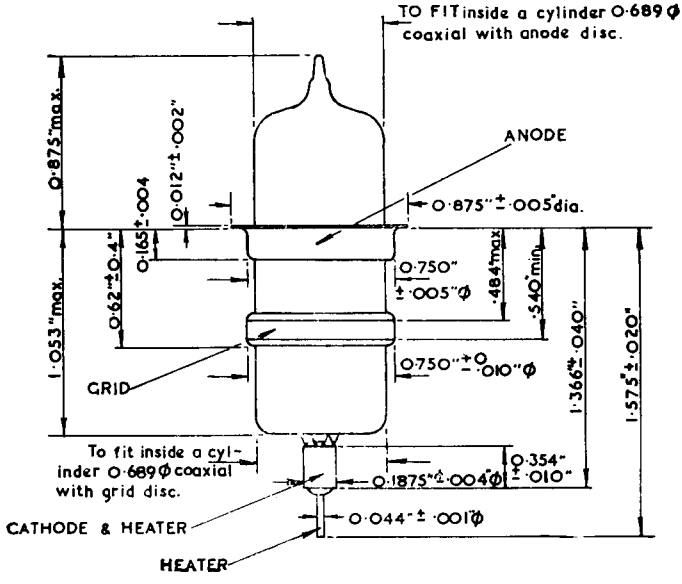
In order that bias may be used, a capacitor is incorporated in the grid-cathode bridge. The optimum value of bias varies with frequency and the following table gives the approximate values of cathode resistor for various wavelengths.

Operating Wavelength (cm)	Cathode Bias Resistor (Ω)
30	300 to 350
15	100
<12	0

Zero bias at a wavelength of 30 cm may cause a reduction in efficiency of 50%.

The output may be coupled into a 75 Ω line by means of a capacitive probe and this can be adjusted for optimum coupling by sliding the probe along the line, or by varying the depth of penetration towards the grid line.



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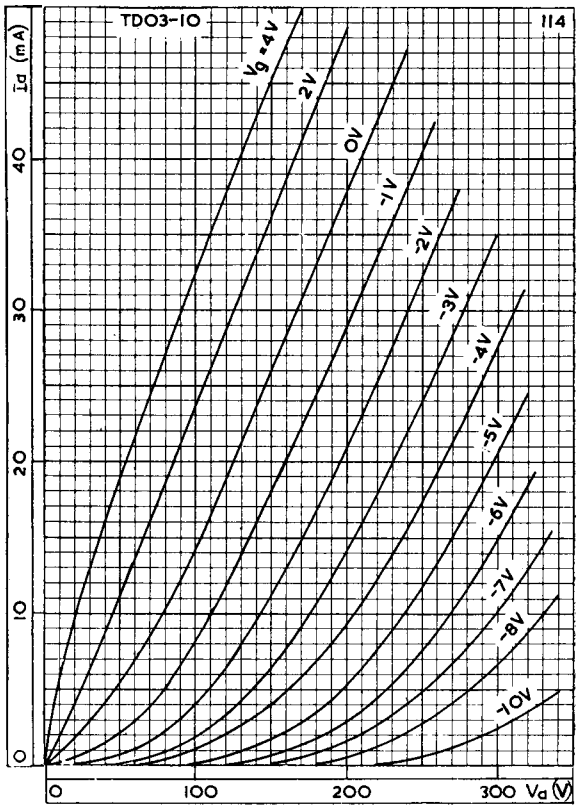

ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH GRID VOLTAGE AS PARAMETER

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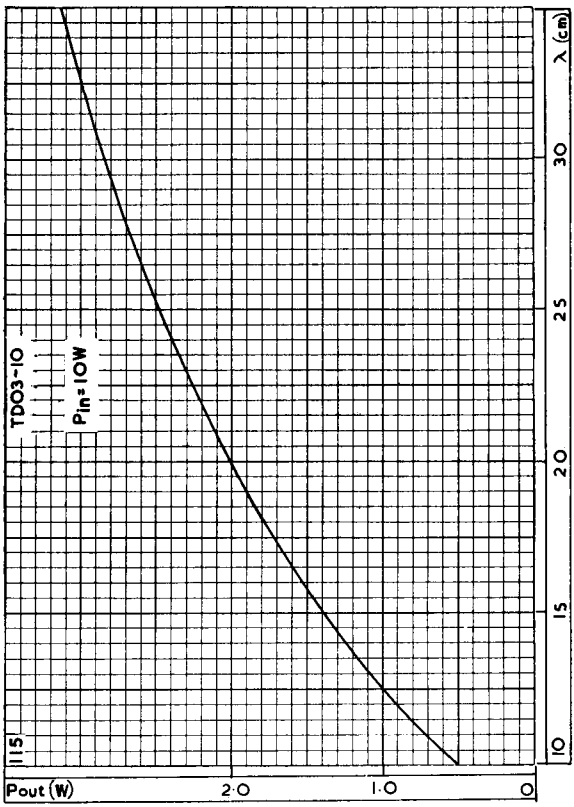

OUTPUT POWER PLOTTED AGAINST WAVELENGTH