# Mullard
## MEDIUM IMPEDANCE TRIODE

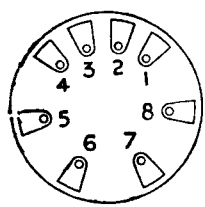
# HL13

The HL13 is an indirectly heated medium impedance Triode for use in D.C./A.C. mains receivers.

## DIMENSIONS

Overall length ... ... 101 mm. Overall diameter ... ... 44 mm.

## CONNECTIONS




Viewed from underside of Valve base.

Contact No. 1 Metallising
" 2 Heater
" 3 Heater
" 4 Cathode
" 5 —
" 6 —
" 7 —
" 8 Anode
Top Cap—Control Grid (G1)

## OPERATING DATA AND NOTES

For heater characteristics, operating data, and characteristic curves, see Type HL13C. Except for dimensions and base connections, Types HL13 and HL13C are identical.

# Mullard
## MEDIUM IMPEDANCE TRIODE HL13C

The HL13c is a medium impedance triode for use as detector or L.F. amplifier in D.C./A.C. mains receivers.

### HEATER CHARACTERISTICS

| | | | |
|---|---|---|---|
| Heater Volts | ... ... | Vf=13·0 volts. | |
| Heater Current | ... ... | If=0·2 amp. | |
| Heating Time—60 seconds | | | |

### DIMENSIONS

| | |
|---|---|
| Overall Length | ... =120 mm. |
| Overall Diameter | ... = 43 mm. |
| Bulb Finish—Metallised | |

### OPERATING CHARACTERISTICS

| | | | |
|---|---|---|---|
| Anode Voltage | ... ... ... ... ... | $Va_w$ | = 200 volts |
| Anode Current | ... ... ... ... ... | $Ia_w$ | = 5·0 mA |
| Grid Voltage | ... ... ... ... ... | $-Vg_w$ | = 3·7 volts |
| Mutual Conductance | ... ... ... ... | $S_w$ | = 3·3 mA/V |
| Amplification Factor | ... ... ... ... | $G_w$ | = 40 |
| Anode Impedance | ... ... ... ... | $Ri_w$ | = 12,000 ohms |
| Cathode Bias Resistor | ... ... ... ... | Rk | = 740 ohms |

### OPERATING CHARACTERISTICS AS R.C. AMPLIFIER

| | | | |
|---|---|---|---|
| Line Voltage | ... ... ... ... ... | Va | = 200 volts |
| Anode Current | ... ... ... ... ... | Ia | = 0·65 mA |
| Grid Voltage | ... ... ... ... ... | $-Vg$ | = 2·6 volts |
| Optimum Load | ... ... ... ... ... | Ra | =160,000 ohms |
| Cathode Bias Resistor | ... ... ... ... | Rk | = 4,000 ohms |
| Amplification Factor | ... ... ... ... | G | = 30·0 |
| Maximum Output Voltage (D=5% 2nd H.) | ... | Vo | = 36·0 volts |

### CAPACITIES

| | | | |
|---|---|---|---|
| Anode-Control Grid | ... ... ... ... ... | Cagl | = 3·1 $\mu\mu$F |
| Grid-Cathode | ... ... ... ... ... | Cgk | = 3·9 $\mu\mu$F |
| Anode-Cathode | ... ... ... ... ... | Cak | = 4·6 $\mu\mu$F |

### LIMITS

| | | | |
|---|---|---|---|
| Maximum Anode Voltage | ... ... ... | $Va_{max}$ | = 200 volts |
| Maximum Anode Dissipation | ... ... ... | $Wa_{max}$ | = 2·0 watts |
| Maximum Cathode Current | ... ... ... | $Ik_{max}$ | = 10 mA |
| Maximum Resistance in Grid Circuit | ... ... | $RglA_{max}$ | = 1·5 megohms |
| Maximum Voltage between Heater and Cathode | | $Vfk_{max}$ | = 125 volts |
| Maximum Resistance between Heater & Cathode | | $Rfk_{max}$ | = 20,000 ohms |
| Range of grid voltage for 1 $\mu$A grid current | ... | Vgl | =−0·5 to−1·0 v. |

# HL13C

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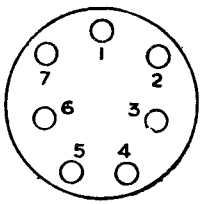
## MEDIUM IMPEDANCE TRIODE

### CONNECTIONS




Pin No. 1 Metallisation
" 2 —
" 3 —
" 4 Heater
" 5 Heater
" 6 Cathode
" 7 Anode
Top Cap—Control Grid.

Viewed from free end of pins.

# HL13C

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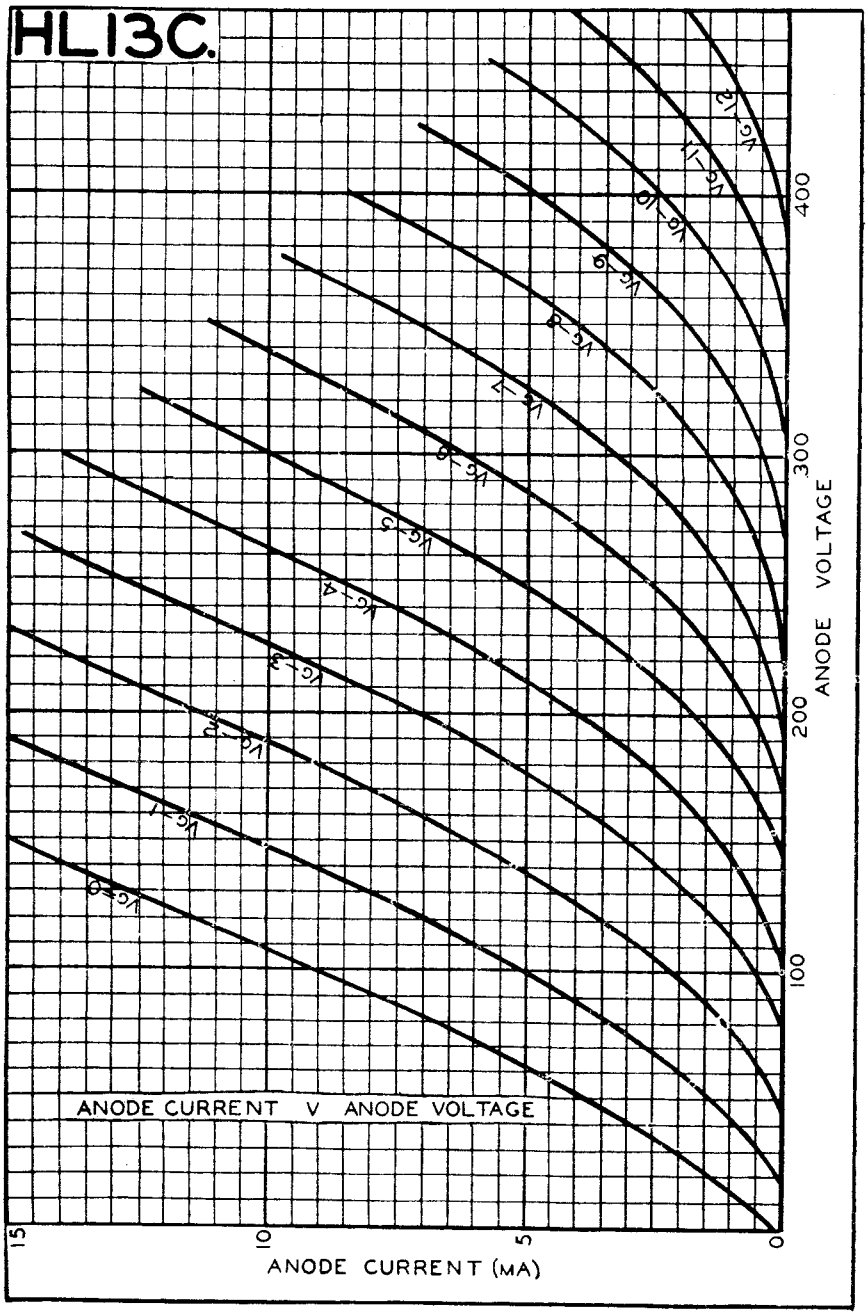

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