TYPE 7502: HEPTODE FREQUENCY CHANGER.

The 7502 is a seven pin all glass construction heptode for use as a frequency changer up to 60 Mc/s.

The use of a special rugged electrode construction manufactured by means of semi-automatic assembly techniques contributes to a low catastrophic failure rate.

The cathode sleeve is made of a special alloy to inhibit the growth of cathode interface resistance during long periods of operation under cut-off conditions and the pure tungsten heater has been designed to withstand frequent heater switching (see note) In addition the heater-cathode construction and materials ensure very low levels of leakage throughout life.

The glass base and envelope strain patterns are tightly controlled during manufacture to prevent glass failures during life. Special attention is also given to the control of materials and processes to minimise variation of characteristics during life. A particular feature is the very low change in inter-electrode capacitances during life.

**Note:** A sample from each production lot is tested under the following elevated conditions to assess heater quality:- heater voltage 120% of nominal value: heater-cathode voltage 240V r.m.s: applied voltages cycled 1 minute on, 3 minutes off for 100 hours.

**MECHANICAL DATA**

Coated unipotential cathode.

Outline drawing .................. 5-2 Bulb ...................... T-5'1/2
Base ............................. E7-1 Small button ............ 7 pin
Maximum diameter .................. 4"
Maximum overall length ................ 17/8"
Maximum seated height ............ 21/8"
Pin connections ............... Basing ..................... 7CH

Pin 1 - Grid No. 1 (Osc.)  Pin 5 - Anode
Pin 2 - Cathode & Grid No. 5  Pin 6 - Grids No. 2 & No. 4
Pin 3 - Heater  Pin 7 - Grid No. 3 (sig.)
Pin 4 - Heater

Mounting position .................. any
Maximum shock (intermittent service) .............. 500g
ELECTRICAL DATA

Interelectrode capacitances (Measured with external shield)

C in .............................................................. 7.5 pF
C out ............................................................. 13.5 pF
Ca-g3 ............................................................ 0.35 pF max.

Heater:

Voltage (ac or dc) 6.3 volts
Current 0.3 amps

Ratings - Absolute maximum values.

Maximum heater voltage variation .......... ± 5% of nominal value.
Maximum heater-cathode voltage
   Heater negative with respect to cathode .............. 100 volts
   Heater positive with respect to cathode .............. 100 volts
Maximum cathode current ............................. 15.5 mA
Maximum anode voltage ................................ 330 volts
Maximum anode dissipation ......................... 1.1 watts
Maximum screen voltage ................................ 110 volts
Maximum screen dissipation ....................... 1.1 watts
Maximum bulb temperature (hottest spot on bulb surface) .... 150°C

RANGE OF CHARACTERISTIC VALUES FOR EQUIPMENT DESIGN. (At Zero hours)

Test conditions:- \( V_a = 250V, V_{g3} = -15V, V_{g2+4} = 100V, \)
\( I_{gl} = 0.5 \text{ mA r.m.s.}, R_{gl} = 20k\Omega \)

<table>
<thead>
<tr>
<th></th>
<th>Min.</th>
<th>Bogey</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anode current</td>
<td>1.9</td>
<td>3.0</td>
<td>4.1</td>
</tr>
<tr>
<td>Screen current</td>
<td>5.2</td>
<td>7.5</td>
<td>9.8</td>
</tr>
<tr>
<td>Mutual conductance ( gm ) (osc.)</td>
<td>5.5</td>
<td>7.25</td>
<td>9.0 \text{ mA/V}</td>
</tr>
<tr>
<td>Inner amplification factor</td>
<td>17</td>
<td>21</td>
<td>25</td>
</tr>
<tr>
<td>Anode impedance</td>
<td></td>
<td>1.0</td>
<td>\text{MΩ}</td>
</tr>
</tbody>
</table>

Maximum value of cathode interface resistance throughout life under cut-off conditions ..................... 10Ω