TELEVISION TUBE

Direct viewing television tube with 8½ in. diagonal metal-backed rectangular grey glass screen, intended for use in portable transistor television receivers. This tube is electrostatically focused and has a 90° deflection angle. An ion trap magnet is not required.

PRELIMINARY DATA

This data should be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS—CATHODE RAY TUBES, which precede this section of the handbook.

HEATER

Suitable for parallel operation

$V_h$ 11.5 V
$I_h$ 60 mA

*The heater supply must be designed to provide a nominal 11.5V. The heater voltage must not rise above 13.8V and must not fall below 9.25V.

EXTERNAL CONDUCTIVE COATING

This tube has an external conductive coating, M, which must be earthed and the capacitance of this to the final anode is used to provide smoothing for the e.h.t. supply. The tube marking and warning labels are on the side of the cone opposite the final anode connector and this side should not be used for making contact to the external conductive coating.

CAPACITANCES

$C_{e-all}$ 7.0 pF
$C_{k-all}$ 4.0 pF
$C_{a2+a4-M}$ 250 pF

SCREEN

Metal backed
Fluorescent colour White
Useful screen area see drawing on page D4

FOCUSING

Electrostatic
The range of focus voltage shown in 'Operating conditions' results in optimum overall focus at a beam current of 50µA.

DEFLECTION

Double magnetic
The spread in the cone length can be obtained from the outline drawing. The deflection coils should be designed so that their internal contour is in accordance with the reference line gauge shown on page D3.
REFERENCE LINE GAUGE

See page D5

RASTER CENTRING
See notes under this heading in 'General operational recommendations – cathode ray tubes'.

Centring magnet field intensity 0 to 10 G

Adjustment of the centring magnet should not be such that a general reduction in brightness or shading of the raster occurs.

MOUNTING POSITION
Any

The tube socket should not be rigidly mounted but should have flexible leads and be allowed to move freely. The bottom circumference of the base shell will fall within a circle of 40mm which is centred upon the perpendicular from the centre of the face.

This tube is fitted with a pin protector in order to avoid damage to the glass base due to bending of the base pins whilst handling the tube.

It is advisable to keep this pin protector on the base until it can be replaced by the socket after installation of the tube in any equipment.

OPERATING CONDITIONS

\[ V_{a2+a4} \quad 12 \quad \text{kV} \]
\[ V_{a3} \text{ (focus electrode control range)} \quad 0 \text{ to } 400 \quad \text{V} \]
\[ V_{a3} \quad 400 \quad \text{V} \]
\[ \dagger V_k \text{ for visual extinction of focused raster} \quad -32 \text{ to } -69 \quad \text{V} \]
\[ \dagger V_k \text{ for visual extinction of focused raster} \quad 29 \text{ to } 62 \quad \text{V} \]

\dagger For grid modulation all voltages are measured with respect to the cathode; for cathode modulation, all voltages are measured with respect to the grid.
# ABSOLUTE MAXIMUM RATINGS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{a1+a4}$ max.</td>
<td>16 kV</td>
</tr>
<tr>
<td>$V_{a1+a4}$ min.</td>
<td>8.0 kV</td>
</tr>
<tr>
<td>$+V_{a3}$ max.</td>
<td>1.0 kV</td>
</tr>
<tr>
<td>$-V_{a3}$ max.</td>
<td>500 V</td>
</tr>
<tr>
<td>$V_{a1}$ max.</td>
<td>800 V</td>
</tr>
<tr>
<td>$V_{a1(pk)}$ min.</td>
<td>300 V</td>
</tr>
<tr>
<td><strong>$-V_{g(pk)}$ max.</strong></td>
<td>400 V</td>
</tr>
<tr>
<td><strong>$-V_{g}$ max.</strong></td>
<td>180 V</td>
</tr>
<tr>
<td>$+V_{g}$ max.</td>
<td>0 V</td>
</tr>
<tr>
<td>$+V_{g(pk)}$ max.</td>
<td>2.0 V</td>
</tr>
<tr>
<td>$\pm I_{a3}$ max.</td>
<td>25 µA</td>
</tr>
<tr>
<td>$\pm I_{a1}$ max.</td>
<td>15 µA</td>
</tr>
<tr>
<td>$R_{a1}$ max.</td>
<td>1.0 MΩ</td>
</tr>
<tr>
<td>$R_{a3}$ max.</td>
<td>3.0 MΩ</td>
</tr>
<tr>
<td>$V_{h-k}$</td>
<td></td>
</tr>
<tr>
<td>Cathode positive</td>
<td></td>
</tr>
<tr>
<td>d.c. max.</td>
<td>80 V</td>
</tr>
<tr>
<td>pk. max.</td>
<td>130 V</td>
</tr>
<tr>
<td>Cathode negative</td>
<td></td>
</tr>
<tr>
<td>d.c. max.</td>
<td>80 V</td>
</tr>
<tr>
<td>pk. max.</td>
<td>130 V</td>
</tr>
<tr>
<td>$R_{h-k}$ max.</td>
<td>1.0 MΩ</td>
</tr>
<tr>
<td>$Z_{k-g}$ max. (f=50c/s)</td>
<td>100 kΩ</td>
</tr>
<tr>
<td>$R_{g-k}$ max.</td>
<td>1.5 MΩ</td>
</tr>
<tr>
<td>$Z_{g-k}$ max. (f=50c/s)</td>
<td>500 kΩ</td>
</tr>
</tbody>
</table>

*The d.c. value of bias must not be such as to allow the grid to become positive with respect to the cathode, except during the period immediately after switching the receiver on or off when it may be allowed to rise to +1V. The maximum positive excursion of the video signal must not exceed +2V and at this voltage the grid current may be expected to be approximately 2mA.*

**Maximum pulse duration 22% of a cycle with a maximum of 1.5ms.**
AW2I-II
TELEVISION TUBE

All dimensions in mm

Mullard
SEPTEMBER 1962
Page D4
All dimensions in mm
TELEVISION TUBE

AW2I-II

Grid modulation

\[ V_g + a_4 = 10 \text{ to } 16 \text{ kV} \]

FINAL ANODE CURRENT PLOTTED AGAINST GRID VOLTAGE.
GRID MODULATION

Mullard

SEPTEMBER 1962
AW21-II TELEVISION TUBE

\[ I_{a2+a4} = 10 \text{ to } 15 \text{ kV} \]

**Cathode modulation**

**Final anode current plotted against cathode-to-grid voltage. Cathode modulation**
LIMITS OF GRID CUT-OFF VOLTAGE FOR FIRST ANODE VOLTAGES OF 350 TO 800V. GRID MODULATION
LIMITS OF CATHODE-TO-GRID VOLTAGE FOR FIRST ANODE VOLTAGES OF 350 TO 950V. CATHODE MODULATION