TELEVISION TUBE

A47-26W

TENTATIVE DATA

<table>
<thead>
<tr>
<th>QUICK REFERENCE DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>47cm (19in) direct viewing television tube with metal backed screen and reinforced envelope. A separate safety screen is not required. This tube is electrically identical to the A47-11W. Suitable for use in receivers with push-through presentation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Deflection</th>
<th>110 deg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focusing</td>
<td>Electrostatic</td>
</tr>
<tr>
<td>Light transmission (approx.)</td>
<td>50 %</td>
</tr>
<tr>
<td>Maximum overall length</td>
<td>30.9 cm</td>
</tr>
</tbody>
</table>

This data should be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS - CATHODE RAY TUBES

HEATER

Suitable for series or parallel operation

\[
\begin{align*}
V_h & = 6.3 \text{ V} \\
I_h & = 300 \text{ mA}
\end{align*}
\]

The limits of heater voltage and current are contained in 'General Operational Recommendations - Cathode Ray Tubes'.

Note—(applies to series operation only). The surge heater voltage must not exceed 9.5V r.m.s. when the supply is switched on. A current limiting device may be necessary in the circuit, to ensure that this voltage is not exceeded.

OPERATING CONDITIONS

\[
\begin{align*}
V_{a2+a4} & = 20 \text{ kV} \\
V_{a3} & \text{ (focus electrode control range)} \quad 0 \text{ to } 400 \quad 0 \text{ to } 400 \text{ V} \\
V_{a1} & = 400 \quad 500 \text{ V} \\
V_{g} & \text{ for visual extinction of focused raster} \quad -40 \text{ to } -77 \quad -50 \text{ to } -93 \text{ V} \\
V_{k} & \text{ for visual extinction of focused raster} \quad 36 \text{ to } 66 \quad 45 \text{ to } 80 \text{ V}
\end{align*}
\]

*For cathode modulation, all voltages are measured with respect to the grid.
SCREEN

Metal backed

Fluorescent colour White
Light transmission (approx.) 50 %
Useful screen area See page D6

FOCUSING

Electrostatic

The range of focus voltages shown in 'OPERATING CONDITIONS' results in optimum overall focus at a beam current of 250μA.

DEFLECTION

Magnetic

Diagonal deflection angle 110 deg
Horizontal deflection angle 99 deg
Vertical deflection angle 82 deg

The deflection coils should be designed to provide a pull-back of 4.0mm on a nominal tube.

CAPACITANCES

\[ \begin{align*}
\text{c} & \quad 6.0 \quad \text{pF} \\
\text{c}^{\text{k-all}} & \quad 4.0 \quad \text{pF} \\
\text{c}^{\text{a2+a4-M}} & \quad 1000 \text{ to } 1500 \quad \text{pF} \\
\text{c}^{\text{a2+a4-B}} & \quad 250 \quad \text{pF}
\end{align*} \]

EXTERNAL CONDUCTIVE COATING

This tube has an external conductive coating, M, which must be connected to chassis, and the capacitance of this coating to the final anode is used to provide smoothing for the c.h.t. supply. The electrical connection to this coating must be made within the area specified on the tube outline drawing.

RASTER CENTRING

See note under this heading in 'General Operational Recommendations - Cathode Ray Tubes'.

Centring magnet field intensity 0 to 10 Gs

Maximum distance of centre of centring field from reference line 57 mm

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

REFERENCE LINE GAUGE

J.E.D.E.C. 126. For details see 'General Operational Recommendations - Cathode Ray Tubes'.
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 diameter 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.

RATINGS (DESIGN CENTRE SYSTEM)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{a2+a4} \max.$ (at $I_{a2+a4} = 0$) (see note 1)</td>
<td>20 kV</td>
</tr>
<tr>
<td>$V_{a2+a4} \min.$</td>
<td>13 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>$V_{a3(pk)} \max.$ (see note 2)</td>
<td>2.5 kV</td>
</tr>
<tr>
<td>$V_{a1} \max.$</td>
<td>700 V</td>
</tr>
<tr>
<td>$V_{a1} \min.$</td>
<td>350 V</td>
</tr>
<tr>
<td>$V_{g(pk)} \max.$ (see note 2)</td>
<td>400 V</td>
</tr>
<tr>
<td>$V_{g} \max.$ (see note 3)</td>
<td>150 V</td>
</tr>
<tr>
<td>$I_{a3} \max.$</td>
<td>25 μA</td>
</tr>
<tr>
<td>$I_{a1} \max.$</td>
<td>5 μA</td>
</tr>
<tr>
<td>$V_{h-k}$ (see note 4)</td>
<td></td>
</tr>
<tr>
<td>Cathode positive d.c. max.</td>
<td>250 V</td>
</tr>
<tr>
<td>pk max.</td>
<td>300 V</td>
</tr>
<tr>
<td>Cathode negative d.c. max.</td>
<td>135 V</td>
</tr>
<tr>
<td>pk max.</td>
<td>180 V</td>
</tr>
<tr>
<td>$R_{h-k} \max.$</td>
<td>1.0 MΩ</td>
</tr>
<tr>
<td>$Z_{k-e} \max.$ ($f = 50Hz$)</td>
<td>100 kΩ</td>
</tr>
<tr>
<td>$R_{g-k} \max.$</td>
<td>1.5 MΩ</td>
</tr>
<tr>
<td>$Z_{g-k} \max.$ ($f = 50Hz$)</td>
<td>500 kΩ</td>
</tr>
</tbody>
</table>
1. Adequate precautions should be taken to ensure that the receiver is protected from damage which may be caused by a possible high voltage flash-over within the cathode ray tube.

2. Maximum pulse duration 22% of one cycle with a maximum of 1.5ms.

3. 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 +2V.

It is advisable to limit the positive excursion of the video signal to +5V(pk) max. This may be achieved automatically by the series connection of a 10kΩ resistor.

4. During an equipment warm-up period not exceeding 15 seconds $v_{h-k}(pk)$ max. (cathode positive) is allowed to rise to 410V. Between 15 and 45 seconds after switching on, a decrease in $v_{h-k}(pk)$ max. (cathode positive) proportional with time from 410V to 250V is permissible.

5. The metal band (B) should be connected directly to the chassis in an a.c. receiver operating from an isolating transformer, or via a suitable leakage path in an a.c./d.c. receiver, for example 2.0MΩ.

The mounting lugs will be in electrical contact with the metal band.

**WARNING**

X-ray shielding is advisable to give protection against possible danger of personal injury arising from prolonged exposure at close range to this tube when operated above 20kV.

**WEIGHT**

| Tube alone (approx.) | 8.0 | kg |
Determining the plane of the upper edge of the step on the reference line gauge J | E D | E C | 120 when the gauge is resting on the cone.

Recessed cavity connector C18

Neck dia. 26.6±0.0

All dimensions in mm
Bulb dimensions

Useful screen area shown shaded

Mould match line

External screen radii

166.6
(R=1219)

9.5R

1219R

533.5R

46.8
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The clip is located within these dimensions. Total thickness of rimbond tension band and clip = 8.0 max.

Nominal radii of the outside of the tension band = bulb radius + 2.5

All dimensions in mm

Bulb mould match line

The location of points X, Y, Z are shown on the bulb dimensions drawing

One of the four lugs may deviate 2mm max. from the plane through the three other lugs

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Mullard

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* Minimum space to be reserved for mounting lugs = 37mm.

Mounting lug

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Template for mounting bolts.

The bolts to be used for mounting the tubes must be within the circles of 8.5mm. diameter shown in the template drawing.

All dimensions in mm.
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Grid modulation

$V_{a2+a4} = 13$ to $20kV$

FINAL ANODE CURRENT PLOTTED AGAINST GRID VOLTAGE.
GRID MODULATION.
FINAL ANODE CURRENT PLOTTED AGAINST CATHODE-TO-GRID VOLTAGE. CATHODE MODULATION.
LIMITS OF CATHODE-TO-GRID CUT-OFF VOLTAGE PLOTTED AGAINST FIRST ANODE-TO-GRID VOLTAGE.
CATHODE MODULATION.
LIMITS OF GRID CUT-OFF VOLTAGE PLOTTED AGAINST FIRST ANODE VOLTAGE. GRID MODULATION.