

DUAL TRACE OSCILLOSCOPE TUBE

55451

DEVELOPMENT SAMPLE DATA

QUICK REFERENCE DATA

13cm (5in) diameter flat faced dual trace oscilloscope tube with distributed p.d.a. and side connections to the y and common x plates. This tube incorporates deflection blanking and is intended for use in general purpose dual trace oscilloscopes.

Final anode voltage (p.d.a.)	3.5	kV
Display area (at $2V_{g7} = 7V_{g3}$) each beam	6×10	cm
S_y	11	V/cm
S_x	15.5	V/cm

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

HEATER

Suitable for series or parallel operation

V_h	6.3	V
I_h	300	mA

Note - (applies to series operation only): - The surge heater voltage must not exceed 9.5V r.m.s. when the supply is switched on.

When used in a series heater chain a.c. current limiting device may be necessary in the circuit to ensure that this voltage is not exceeded.

OPERATING CONDITIONS

BEAM FORMING

Final accelerator	V_{g7}	3.5	kV
Geometry control electrode	V_{g6}	1.0	kV
Astigmatism control electrode	V_{g5}	1.0	kV
Focusing electrode	V_{g4}	250 to 450	V
Beam blanking electrode (unblanked)	V_{g3}	1.0	kV
First accelerator	V_{g2}	1.0	kV
Control-grid voltage for visual extinction of focused spot	V_{g1}	-40 to -95	V

SCREEN

Face plate diameter	13	cm
Phosphor	GH	
Fluorescent colour	green	
Persistence	medium short	
Minimum useful scan (each beam)		
$y_1 - y_2$	6.0	cm
$x_1 - x_2$	10	cm
Minimum overlap (y-axis)	5.0	cm

The useful y-scan may be offset by 3mm max. with respect to the geometric centre of the face plate.

DEFLECTION

Double electrostatic				
Mean y-plate voltage	V_y mean	1.0	kV	
Mean x-plate voltage	V_x mean	1.0	kV	
Vertical deflection factor	S_y	9.5 to 12.5	V/cm	
Horizontal deflection factor	S_x	13.5 to 16.5	V/cm	
Angle between x and y deflection (each beam)		90±1	deg	
Angle between y-axes (beams superimposed)		±1.5	deg	

If use is made of the full deflection capabilities of the tube, the deflection plates will intercept part of the electron beam near the edge of the scan. Therefore a low impedance deflection plate drive is necessary. Both x and y plates are intended for symmetrical deflection.

Intermodulation

The y deflection on one trace caused by intermodulation from a signal of 200V peak-to-peak applied to the other y plates will not exceed 0.2mm.

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CORRECTION POTENTIAL RANGES

Astigmatism control range	V_{g5}	0.95 to 1.5	kV
Beam blanking control	V_{g3} w.r.t. V_{g2}	45	V

For visual extinction of a cathode current of $300\mu A$ the beam blanking electrode voltage will not exceed the stated value. With the tube running in the unblanked condition, $V_{g3} = V_{g2}$ and $I_k = 500\mu A$, the blanking plate current will not exceed $50\mu A$.

Raster distortion

A graticule, for each beam separately, consisting of concentric rectangles $8 \times 5\text{cm}$ and $7.65 \times 4.8\text{cm}$ is centred at the edge of the faceplate and aligned with the electrical x-axis of the tube. The edges of a raster will fall between these rectangles.

Line width (GH screen)

V_{g7}	3.5	kV
V_{g6}	1.0	kV
V_{g3}	1.0	kV
I_t	10	μA
*Line width	0.3	mm

*Measured by means of a shrinking raster at the geometric centre of the face plate.

RATINGS (ABSOLUTE MAXIMUM SYSTEM)

V_{g7} max. (p.d.a.)	4.0	kV
V_{g7} min.	3.0	kV
V_{g6} max.	1.2	kV
V_{g5} max.	1.2	kV
V_{g5} min.	900	V
V_{g4} max.	1.2	kV
V_{g3} max.	1.2	kV
V_{g2} max.	1.2	kV
V_{g2} min.	900	V
$-V_{g1}$ max.	200	V
$+V_{g1}$ max.	0	V
$+V_{g1}$ max.	2.0	V

V_{h-k}			
Cathode positive			
d.c. max.	200	V	
pk max.	200	V	
Cathode negative			
d.c. max.	125	V	
pk max.	250	V	
R_{g-k} max.	1.5	MΩ	
I_k max. (continuous)	300	μA	
I_k max. (intermittent short duration)	500	μA	
Maximum screen dissipation	3.0	mW/cm ²	

POST DEFLECTION HELIX RESISTANCE

r_{g7-g6} min.	33	MΩ
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CAPACITANCES (Measured on three terminal capacitance bridge)

High potential	Low potential	Earthed	Capacitance (pF) max.
k	all	-	3.5
g1	all	-	5.5
g3	all	-	6.0
x1	all	x2	3.0
x2	all	x1	3.0
y1'	all	y2'	3.0
y2'	all	y1'	4.5
y1''	all	y2''	4.5
y2''	all	y1''	3.0
x1	x2	all	2.0
y1'	y2'	all	0.6
y1''	y2''	all	0.6

MOUNTING POSITION

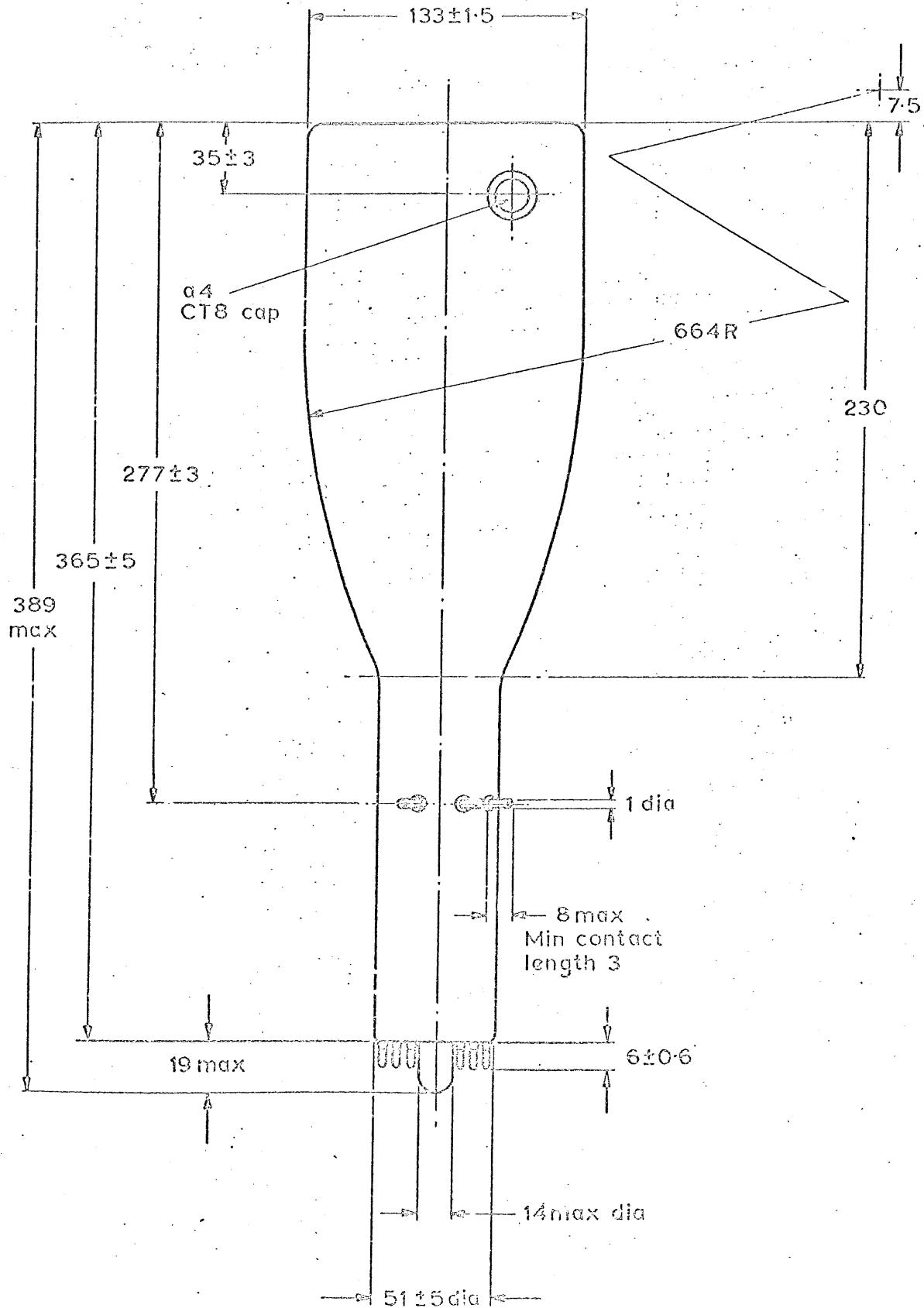
Any, except vertical with the screen downwards and the axis of the tube making an angle of less than 20° with the vertical. The tube socket should not be rigidly mounted but should have flexible leads and be allowed to move freely.

WEIGHT

Tube alone

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All dimensions in mm

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