

G.E.C.
CATHODE RAY
TUBES

13 cm FLAT FACED OSCILLOSCOPE TUBE

D13-22

CV 9510 = 1374R

1300R
series

ISSUE 1

Equivalent to D13-22

*(5C2P1/DH13-10 1960 version)
with 2 stage PDA*

BRIEF DATA

A flat faced oscilloscope tube with a 13 cm diameter faceplate, mesh post deflection acceleration and aluminised screen. The tube has side connected deflection plates and is intended for use in precision wide band oscilloscopes.

Final anode voltage (p. d. a.)	15	kV
Display area at $V_{a4} = 10V_{a3}$	6 x 10	cm
Deflection factor (D_y)	3, 2 (max)	V/cm
Deflection factor (D_x)	12, 3 (max)	V/cm

HEATER

V_h	6, 3	V
I_h	300 (approx)	mA

RATINGS (Absolute) (Voltage ratings are to cathode unless otherwise shown)

	Max	Min	
V_{a4}	17, 3	6, 0	kV
V_{a3}	3, 3	1, 0	kV
Ratio (V_{a3}/V_{a4})	10	-	-
V_{a2}	1, 5	-	kV
V_{a1}	1, 7	0, 8	kV
*- V_{g1}	200	1	V
V_h -k cathode positive d. c.	200	-	V
pk	300	-	V
cathode negative d. c.	125	-	V
pk	250	-	V
V_y -a3	500	-	V
V_x -a3	500	-	V
R_h -k	100	-	k Ω
R_y -a3	0, 5	-	M Ω
R_x -a3	1, 0	-	M Ω
R_{g1} -k	1, 0	-	M Ω

*The d. c. value of grid voltage must never be allowed to become positive with respect to cathode.

1300R series

SCREEN (Aluminised)

Fluorescence	Green	White
Phosphorescence	Green	Yellowish - green
Persistence	1-5 ms	10 - 60 s
E. I. A. phosphor code	P31	P7
G. E. C. phosphor code	74	96

CAPACITANCES (Max.)

C_k - all	4,5	pF
C_{g1} - all	6,5	pF
C_{y1} - y2	2,5	pF
C_{y1} - all less y2	4,0	pF
C_{y2} - all less y1	4,0	pF
C_{x1} - x2	2,5	pF
C_{x1} - all less x2	6,5	pF
C_{x2} - all less x1	6,5	pF

EQUIPMENT DESIGN RANGE

	Max	Min	
V_{a2} (For focus)	333	167	V/kV $_{a3}$
- V_{g1} (For cut off)	56,5	30	V/kV $_{a1}$
D_y (at $V_{a4}/V_{a3} = 10$)	2,13	1,53	V/cm/kV $_{a3}$
D_x (at $V_{a4}/V_{a3} = 10$)	8,2	6,1	V/cm/kV $_{a3}$
p.d.a. spiral current	6	-	μ A/kV $_{a3-a4}$
V_{a3} (astigmatism correction)	± 50	-	V/kV $_{a3}$
V_{s2} (pattern correction)	± 50	-	V/kV $_{a3}$

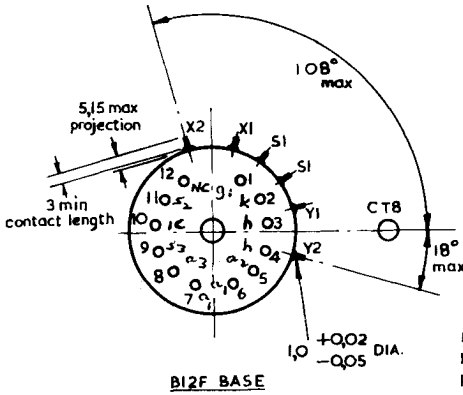
TYPICAL OPERATION

V_{a4}	15	kV
V_{a3}	1,5	kV
V_{a2} (For focus)	250 to 500	V
V_{a1}	1,5	kV
- V_{g1} (For cut off)	45 to 85	V
D_y (max)	3,2	V/cm
D_x (max)	12,3	V/cm
V_{s1} <i>ips</i>	1,5	kV
V_{s2} (nom)	1,5	kV
V_{s3} (nom)	1,475	kV
*Line width (typical for type 74 phosphor)	0,7	mm

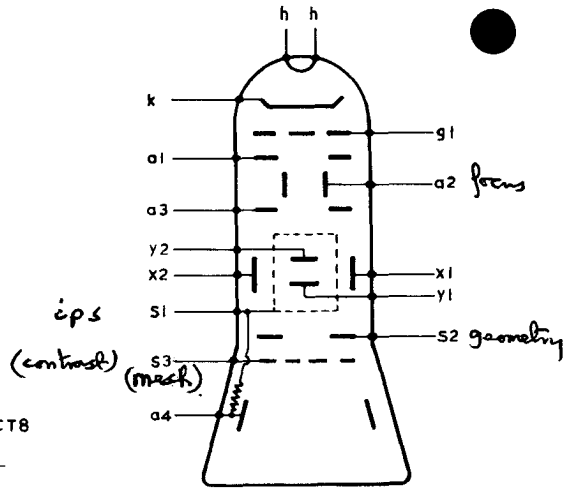
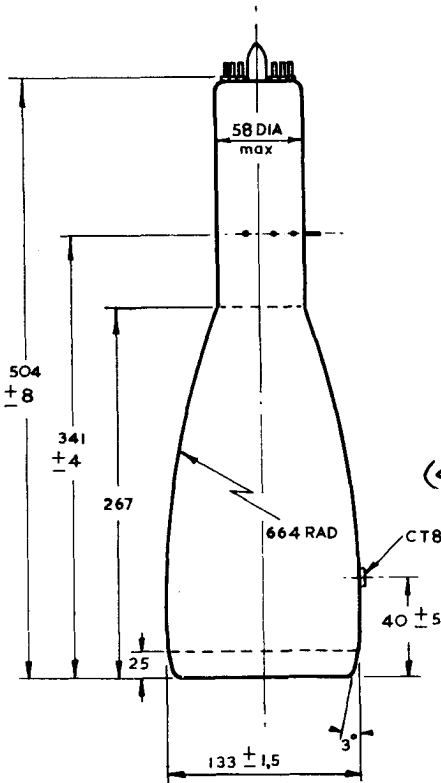
sen 0.3 by shrinking raster

*Measured by means of a microscope at the geometric centre of the face-plate for $I_b = 8\mu$ A.

1300R series



NOTE.
Minimum spacing between adjacent pins is 6mm.



All dimensions are in millimetres

OUTLINE DRAWING

1300R series

BASE CONNECTIONS

Base: B12F

Side Contact: CT8

Pin 1: g1

Pin 7: a1

2: k

8: a3

3: h

9: s3 (contrast)

4: h

10: IC

5: a2 (focus)

11: s2 (geometry)

6: a1

12: NC

Side pin connections as viewed from the base and reading clockwise from base pin 12.

x2 x1 s1 s1 y1 y2

WEIGHT

The weight of tube alone is 1,3 kgm.

ACCESSORIES

<u>Part</u>	<u>Manufacturer</u>	<u>Type No.</u>
Base socket	Carr Fastener Co. Ltd.	77/842
CT8 connector	" " " "	77/699
Side pin connector	Harwin	W3000
Magnetic shield	Magnetic Shields Ltd.	-
Screen mask	Standard Insulator Co.	SIC 5965

Provision of circuit information in this publication does not imply a right to use any invention which may be involved and which is the subject of patents by whomsoever owned.

Minimum Scanned Area

x	10	cm
y	6	cm

Astigmatism Correction

Adjustment of the potential on a3 relative to the y deflection plate mean potential may be used for the purpose of astigmatism correction. A range of adjustment of $\pm 33V/kV_{a3}$ should be allowed for this purpose.

Pattern Correction

Barrel or pincushion distortion may be minimised by the application of the appropriate potential to s2 relative to the x plate mean potential. A range of adjustment of $\pm 33V/kV_{a3}$ should be allowed for this purpose. Astigmatism and pattern correction potentials are quoted for the condition where the x plate mean potential is equal to the y plate mean potential. If, in any application, a difference between x and y plate mean potentials is unavoidable, it is recommended that this difference should be kept to a minimum.

Background Suppression

Background illumination of the phosphor may be reduced and contrast improved by applying a potential of -25V to s3 with respect to s2.

DISPLAY CHARACTERISTICS

Pattern Distortion

With pattern correction applied, the edges of a test raster will lie between two concentric rectangles of 100×60 mm and 98×58 mm.

Spot Position

The focused and undeflected spot will fall within a rectangle 12×20 mm centred at the geometric centre of the faceplate, the greater dimension being in the x axis.

Orientation

Looking at the screen with pins 1 and 12 of the base uppermost a positive potential applied to x1 will deflect the beam to the left and a positive potential applied to y1 will deflect the beam upwards.

MOUNTING

The tube may be mounted in any position but should not be supported by the base alone. It should preferably be held in a suitable rubber mask at the screen and by a clamp round the magnetic shield near the base. The socket should have sufficient freedom of movement to accommodate the maximum overall tube length and base orientation tolerances.