



*mono-accelerator*

DOUBLE GUN  
CATHODE RAY TUBE

**BRIEF DATA**

A double gun oscilloscope tube with a 13 cm (5¼ inch) flat screen. Deflector plates and final anode connections are brought out to side pins. The screen is fully scanned by both guns. This tube is a shortened version of the 1300A which is now obsolete.

**HEATER**

Heater voltage . . . . .	6.3	V
Heater current (each gun) . . . . .	0.3	A

**SCREEN**

	1324A/2	1346A/2
Fluorescence . . . . .	Green	White
Phosphorescence . . . . .	Green	Yellowish-green
Persistence . . . . .	1 - 5 ms	10 - 60 s
EIA phosphor code . . . . .	P31	P7
GEC phosphor code . . . . .	24	46
Pro Electron phosphor code . . . . .	GH	GM

**RATINGS (Absolute)**

		Max	Min	
Third anode and wall coating voltage . . . . .	$V_{a3}, V_m$	5.0	2.0	kV
Focus voltage . . . . .	$V_{a2}$	1.5	—	kV
First anode voltage . . . . .	$V_{a1}$	2.0	1.0	kV
Control grid voltage . . . . .	$-V_g$	200	0	V
Y plates to third anode voltage . . . . .	$V_{y1, y2-a3}$	300	—	V
X plates to third anode voltage . . . . .	$V_{x1, x2-a3}$	300	—	V
Heater-cathode voltage . . . . .	$V_{h-k}$	150	—	V
Y deflector plate circuit resistance . . . . .	$R_{y-a3}$	2.0	—	MΩ
X deflector plate circuit resistance . . . . .	$R_{x-a3}$	2.0	—	MΩ
Grid to cathode circuit resistance . . . . .	$R_{g-k}$	1.0	—	MΩ
*Peak grid voltage . . . . .	$+v_g$ (pk)	2.0	—	V

\*The dc value of the modulator voltage must never become positive with respect to cathode.

## CAPACITANCES

Cathode to all other electrodes . . . . .	5.0	pF
Grid to all other electrodes . . . . .	7.0	pF
Deflector plates y1 to y2 . . . . .	2.0	pF
Deflector plates y1 to all electrodes except y2 . . . . .	3.0	pF
Deflector plates y2 to all electrodes except y1 . . . . .	3.0	pF
Deflector plates x1 to x2 . . . . .	2.0	pF
Deflector plates x1 to all electrodes except x2 . . . . .	4.0	pF
Deflector plates x2 to all electrodes except x1 . . . . .	4.0	pF

## EQUIPMENT DESIGN RANGE

		Max	Min	
Focus voltage . . . . .	$V_{a2}$	990	600	V
Control grid voltage for spot cut-off . . . . .	$-V_g$	50	25	V/k $V_{a1}$
Y deflection factor . . . . .	$D_y$	6.7	5.0	V/cm/k $V_{a3}$
X deflection factor . . . . .	$D_x$	10	8.0	V/cm/k $V_{a3}$
Astigmatism correction . . . . .	$V_{a3-y}$	+33	-33	V/k $V_{a3}$

## TYPICAL OPERATION (All operating potentials are with respect to cathode)

Third anode and wall coating voltage . . . . .	$V_{a3}, V_m$	3	kV
Focus voltage . . . . .	$V_{a2}$	600 - 990	V
First anode voltage . . . . .	$V_{a1}$	1.5	kV
Control grid voltage for spot cut-off . . . . .	$-V_g$	58	V
Maximum y deflection factor . . . . .	$D_y$	20	V/cm
Maximum x deflection factor . . . . .	$D_x$	30	V/cm
*Line width typical . . . . .		0.6	mm

\*Measured by means of a microscope at the centre of x and y axes for each gun, at a beam current of 1.0  $\mu$ A.

†The wall coating, m, and the mean potential of the deflector plates are normally held constant at a<sub>3</sub> potential. Adjustment of the a'3 and a''3 potentials relative to the mean potential of the deflector plates may be used as an astigmatism control.

## **DISPLAY CHARACTERISTICS (Typical operation)**

### **Spot Position**

The undeflected spots will lie within two 10 mm dia. circles whose centres lie on the y axis  $\pm 12.5$  mm from the geometric centre of the tube face.

### **Minimum Scanned Area**

Minimum useful scanned area is  $\pm 57$  mm along the axes intersecting at the centre of the tube face.

### **Deflection Linearity**

The difference between the deflection sensitivity for 25 % and 75 % of the useful scanned area will not be greater than 2 % for each gun.

### **Pattern Distortion**

The edges of a test raster 72 mm x 72 mm will lie between two concentric squares of 68 mm and 72 mm sides.

Angle between deflection axes of each gun is  $90^\circ \pm 1^\circ$ . Angle between the x deflection axes of the two guns is not greater than  $1^\circ$ .

### **Orientation**

Looking at the screen with pin 10 uppermost, a positive potential applied to x1 will deflect the spot to the left and a positive potential applied to y1 will deflect the spot upwards.

## **MOUNTING**

The tube may be mounted in any position but must 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 overall length and base orientation tolerances.

## **WEIGHT**

The weight of the tube alone is approximately 1.1 kg (2½ lb).

## BASE CONNECTIONS

Base : B12F

Pin 1 : g''

2 : k''

3 : h''

4 : h''

5 : a2''

6 : a1''

Pin 7 : a1'

8 : a2'

9 : h'

10 : h'

11 : k'

12 : g'

Pins 6 and 7 are internally connected.

## MAGNETIC SHIELD

A suitable magnetic shield may be obtained from Magnetic Shields Ltd., Headcorn Road, Staplehurst, Tonbridge, Kent.

## WARNING

Care should be taken not to expose the tube to strong magnetic fields either in use or during storage.

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# OUTLINE

