

similar Etel 3A2P31

G.E.C.

Mullard DHM9-11

**INSTRUMENT
CATHODE RAY TUBE**

used in Solartron CT436 & CD1014

BRIEF DATA

A 9cm (3½ inch) diameter flat faced double gun, oscilloscope tube.

Final anode voltage	1.5	kV
Useful scan (each beam)	5 x 7.7	cm
D _y (max)	18.3	V/cm
D _x (max)	27.3	V/cm

HEATER

V _h	6.3	V
I _h (approx. both guns)	0.6	A

PREFERRED TYPE

Tubes normally supplied with 24 phosphor as DHM9-11 (CV8108).	P31
Also available with 08 phosphor as DBM9-11 (CV5966)	P11
25 phosphor as DNM9-11 (CV5883)	P2
46 phosphor as DPM9-11 (CV8109)	P7

SCREEN (Preferred)

Fluorescence	Green
Phosphorescence	Green
Persistence	Medium-short
E.I.A. phosphor code	P31
GEC phosphor code	24

RATINGS (Absolute)(Each Gun)

	Max	Min	
V_{a1+a3}	1.8	1.0	kV
V_{a2}	600	—	V
$-V_g$	200	1.0	V
$V_{x-a1+a3}$	300	—	V
$V_{y-a1+a3}$	300	—	V
$R_{x-a1+a3}$	2.0	—	MΩ
$R_{y-a1+a3}$	2.0	—	MΩ
R_{g-k}	1.0	—	MΩ
v_{h-k} (pk)	+150	-150	V

CAPACITANCES

	Gun'		Gun''		
	Min	Max	Min	Max	
C_g -all	3.7	6.4	3.7	6.4	pF
C_k -all	2.1	4.2	2.1	4.2	pF
C_{x1} -all (x2 earthed)	4.0	6.5	4.0	6.5	pF
C_{x2} -all (x1 earthed)	4.0	7.0	4.0	7.0	pF
C_{y1} -all (y2 earthed)	1.0	3.0	2.0	4.0	pF
C_{y2} -all (y1 earthed)	2.0	4.0	1.0	3.0	pF
C_{x1-x2}	—	1.7	—	1.7	pF
C_{y1-y2}	1.6	2.6	1.6	2.6	pF
$C_{x1+x2-y1+y2}$	—	200	—	200	mpF
$C_{x1'+x2'-x1''+x2''}$ (max)				1.6	pF
$C_{y1'+y2'-y1''+y2''}$ (max)				600	mpF

EQUIPMENT DESIGN RANGE

	Max	Min	
V_{a2}	300	160	V/kV _{a3}
$-V_{g1}$	63	28	V/kV _{a1}
D_x	18.2	13.8	V/cm/kV _{a3}
D_y	12.2	9.1	V/cm/kV _{a3}

TYPICAL OPERATING CONDITIONS (Each Gun)

V_{a1+a3}	1.5	kV
V_{a2}	250 to 450	V
V_g for visual cut-off	-42 to -95	V
* I_{a2} max	150	μA
D_y	15	V/cm
D_x	23	V/cm

*With V_{a2} set for focus, and $V_g = -1.0V$.

D_y , D_x and V_g for visual cut-off are proportional to V_{a1+a3} .

LINE WIDTH (measured with 24 phosphor)

A value for line width under d.c. conditions is given below.

V_{a1+a3}	1.5	kV
V_{a2}	adjusted for focus	
I_t	1.0	μA
Raster — circle diameter	50	mm
Maximum line width.	0.7	mm

EQUALITY OF SENSITIVITIES

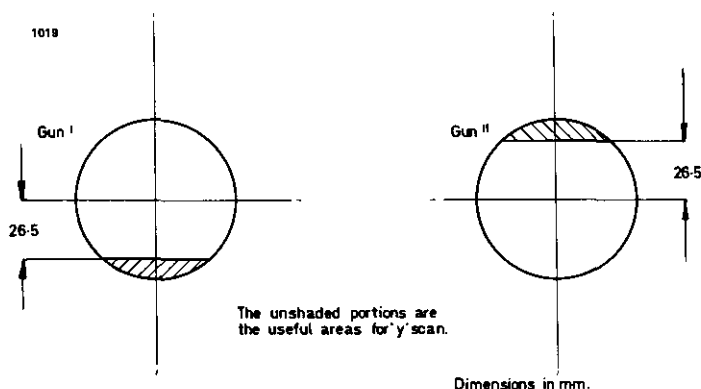
Sensitivity variations between the two guns will not differ by more than 5%, calculated as follows:

$$\text{Difference in sensitivities} = 100 - \frac{\text{lower x sensitivity}}{\text{higher x sensitivity}} \times 100$$

MINIMUM SCANNED AREA

x (Full screen)	7.7	cm
y	See Fig. 1	

FIGURE 1



DISPLAY CHARACTERISTICS

Both x and y plates are intended for symmetrical operation. The tube may be operated asymmetrically, but focus quality will deteriorate and trapezium distortion will be introduced.

The data for raster distortion and line-width will therefore not apply.

In general, the deflection plates should be at the same average potential as $a_1 + a_3$. However, it may be necessary to adjust the potential of the deflection plates to obtain optimum focus.

Pattern Distortion

Centred at the screen centre, a nominally square raster from either gun may be inserted into the frame bounded by the squares 48.75mm and 51.25mm.

Angle between x and y deflection (each gun) $90^\circ \pm 1.5^\circ$

Maximum angle between the two x deflections 1.5°

*Maximum angle between the two y deflections 2.5°

*The distance between the two electrical y axes at the geometric screen centre is 3.5mm max.

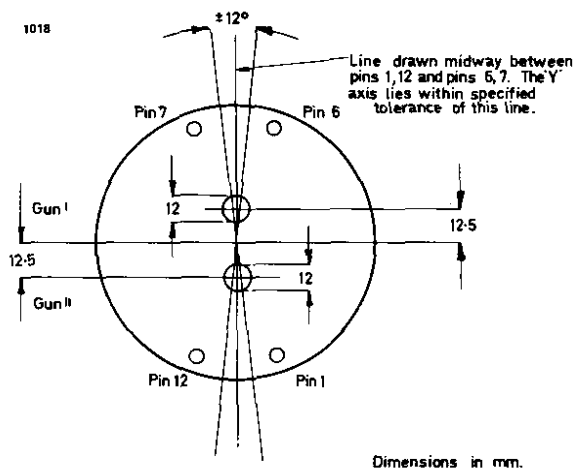
Pattern Alignment

When two nominally square rasters, whose edges coincide at their centres are superimposed at the screen centre, and when the rasters are simultaneously adjusted in size, the edges will fall within the frame bounded by the squares 48mm and 52mm, giving a total raster misalignment of $\pm 4\%$.

Spot Position

With the tube magnetically shielded, the undeflected spot of each gun will fall within the appropriate 12mm diameter circle shown in Fig. 2.

FIGURE 2



MOUNTING POSITION

The tube may be mounted in any position but under no circumstances should the socket be used to support the tube.

WEIGHT

510g.

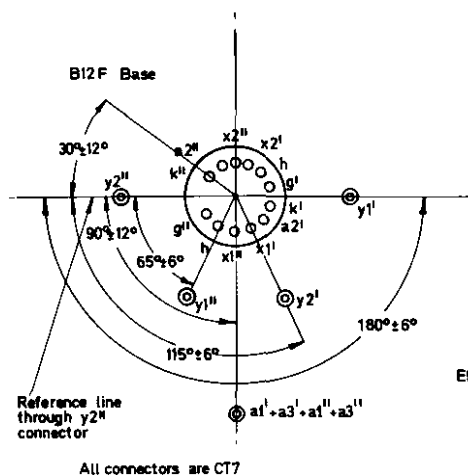
BASE CONNECTIONS

See drawing.

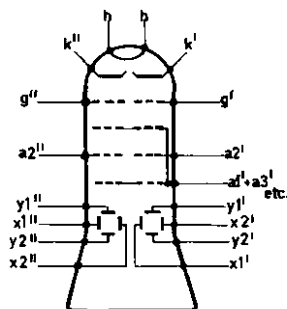
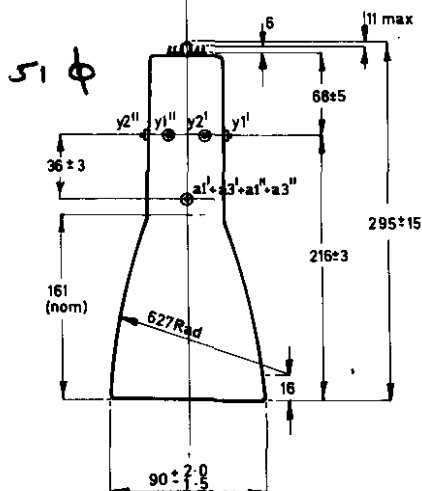
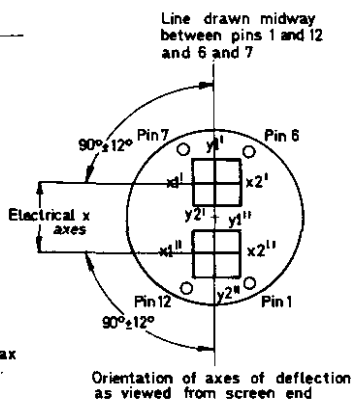
WARNING

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

OUTLINE



1017



Dimensions in mm.