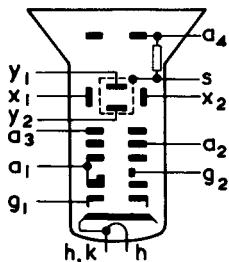


## GENERAL

This short 10 cm x 8 cm rectangular tube with electrostatic focusing and deflection is designed for general purpose applications and is capable of being deflected by transistor circuits. It incorporates a means of beam blanking at anode potential which avoids d.c. coupling to the grid.

Heater voltage	$V_h$	6.3	V
Heater current	$I_h$	0.3	A



## ABSOLUTE RATINGS

		Max	Min	
Fourth anode voltage	$V_{a4}$	4.0	1.5	kV
Third anode voltage	$V_{a3}$	1.75	0.6	kV
Second anode voltage	$V_{a2}$	1.0	0	kV
First anode voltage	$V_{a1}$	1.75	0.6	kV
Negative grid voltage	$-V_{g1}$	200	1.0	V
Beam blanking voltage	$V_{g2}$	2.0	0.5	kV
Peak x plate to third anode voltage	$v_{x-a3(pk)}$	500	-	V
Peak y plate to third anode voltage	$v_{y-a3(pk)}$	500	-	V
x plate to third anode resistance	$R_{x-a3}$	5.0	-	M $\Omega$
y plate to third anode resistance	$R_{y-a3}$	100	-	k $\Omega$
Control grid to cathode resistance	$R_{g1-k}$	1.5	-	M $\Omega$
Second anode current	$I_{a2}$	10	-	$\mu$ A
P.D.A. ratio ( $V_{a4}/V_{a3}$ )		2.2: 1		
Helix resistance		-	15	M $\Omega$

All voltages referred to cathode unless otherwise stated.

## PHOSPHOR SCREEN

This type is usually supplied with GH phosphor (D14-172GH) giving a green trace of medium short persistence. Other phosphor screens can be made available to special order.

This data should be read in conjunction with Brimar Operational and Safety Recommendations for Industrial Cathode Ray Tubes.

**INTER-ELECTRODE CAPACITANCES**

Grid 1 to all	$C_{g1}$ -all	10	pF
Grid 2 to all	$C_{g2}$ -all	10	pF
Heater and cathode to all	$C_{h, k}$ -all	4.0	pF
$x_1$ plate to $x_2$ plate	$C_{x1-x2}$	2.1	pF
$y_1$ plate to $y_2$ plate	$C_{y1-y2}$	1.4	pF
$x_1$ plate to all, less $x_2$ plate	$C_{x1}$ -all, less $x_2$	6.9	pF
$x_2$ plate to all, less $x_1$ plate	$C_{x2}$ -all, less $x_1$	6.6	pF
$y_1$ plate to all, less $y_2$ plate	$C_{y1}$ -all, less $y_2$	5.1	pF
$y_2$ plate to all, less $y_1$ plate	$C_{y2}$ -all, less $y_1$	5.1	pF
$x_1, x_2$ plates to $y_1, y_2$ plates	$C_{x1, x2-y1, y2}$	0.8	pF
Grid 1 to $x_1, x_2, y_1, y_2$ plates	$C_{g1-x1, x2, y1, y2}$	1.4	pF
Grid 1 to grid 2	$C_{g1-g2}$	0.7	pF

**TYPICAL OPERATION** - voltages with respect to cathode.

Fourth anode voltage	$V_{a4}$	2.0	3.0	kV
Mean deflector plate potential		1000	1500	V
Third anode voltage for optimum astigmatism correction	$V_{a3}$	1000*	1500*	V
Second anode voltage for optimum focus	$V_{a2}$	180 to 380	270 to 570	V
First anode voltage	$V_{a1}$	1000	1500	V
Shield voltage for optimum raster shape	$V_s$	1000*	1500*	V
Beam blanking voltage for cut-off	$V_{g2}$	935†	1405†	V
Control grid voltage for cut-off	$V_{g1}$	-35 to -65	-50 to -95	V
x deflection coefficient	$D_x$	15.7 to 18.7	23.5 to 28	V/cm
y deflection coefficient	$D_y$	7.4 to 9.7	11 to 14.3	V/cm
Line width at centre-using microscope	] at 10μA beam current	0.55	0.49	mm
Line width at edge-using microscope		0.90	0.88	mm
Line width at centre measured by shrinking raster		0.28	0.25	mm

\* The required voltage will not differ from the quoted value by more than ± 50V.

† The beam is unblanked when  $V_{g2} = V_{a1}$ . This grid 2 electrode should not be used as a brilliance control.

## **RASTER DISTORTION AND ALIGNMENT**

The undeflected spot will fall in a circle of 5 mm radius about the centre of the tube face.

Raster distortion: the edges of a test raster will fall between two concentric rectangles 10 cm x 8 cm and 9.75 cm x 7.8 cm.

Rectangularity of x and y axes is  $90^\circ \pm 1^\circ$ . The horizontal trace will be parallel with the axis of the rectangular face-plate to within  $\pm 5^\circ$ . A twist coil will be required to effect accurate alignment. This should be mounted inside the magnetic shield approximately 90 mm from the face and should not extend more than 165 mm from the face. 26 ampere turns will suffice, with provision for reversing the current if necessary.

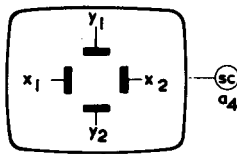
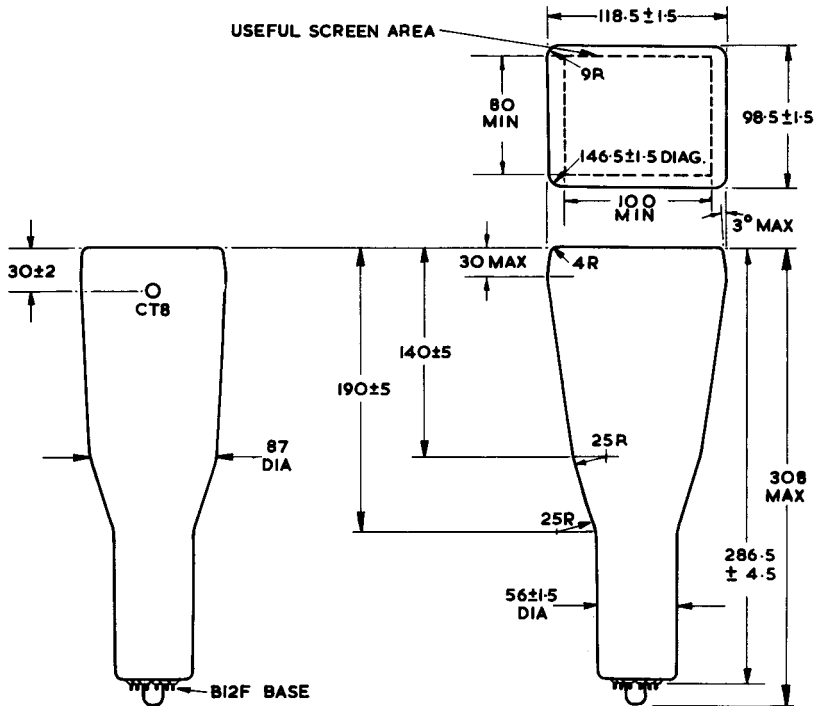
It is preferable that the mean x and y plate potentials are equal otherwise some deterioration in performance will occur. Under any circumstances the mean y plate potential should never differ from the mean x plate potential by more than 50V when the tube is operated at 3 kV.

## **MAGNETIC SHIELDING**

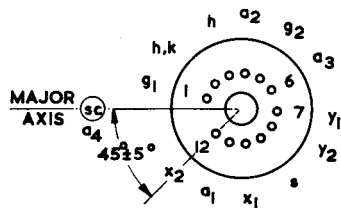
Adequate magnetic shielding is required. In addition due attention should be paid to the position of the tube relative to transformers and chokes.

**TUBE WEIGHT** (approximate) 1.0 kg

**MOUNTING POSITION** - unrestricted.



VIEWS FROM SCREEN END  
(CT8 AT RIGHT)



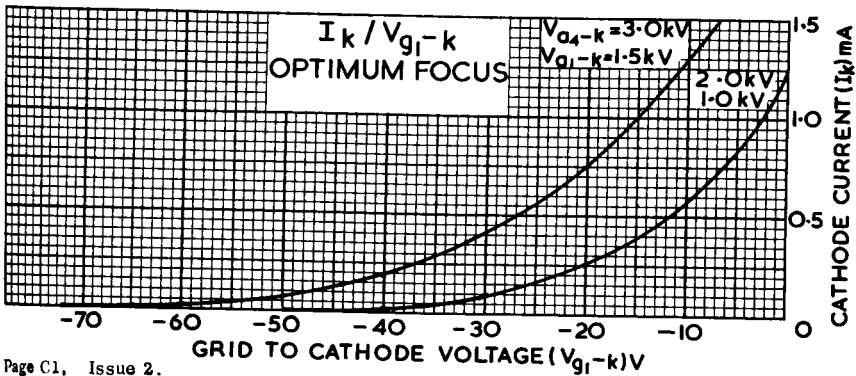
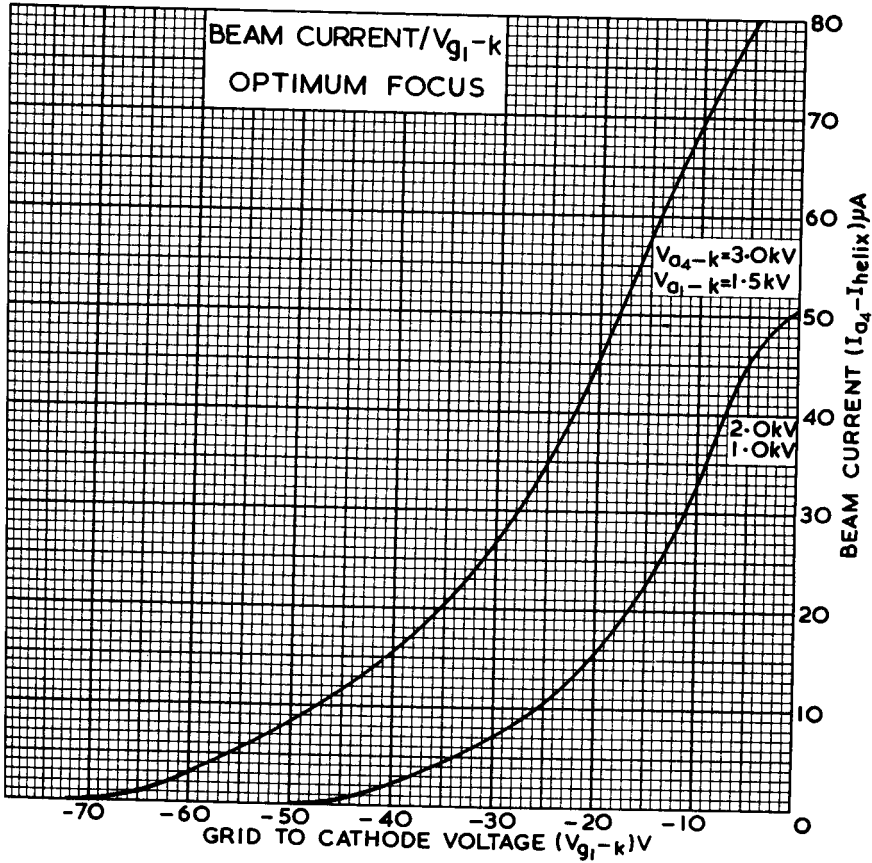
VIEW FROM PINS FREE END  
(CT8 AT LEFT)

All dimensions in mm

Third angle projection

Not to be scaled

It is advisable to support the tube near the screen, and at a second point on the parallel neck near the base. The tube should not be subjected to any stress from the use of clamps and should not be suspended by the base. Connecting leads should not be soldered directly to the tube pins.

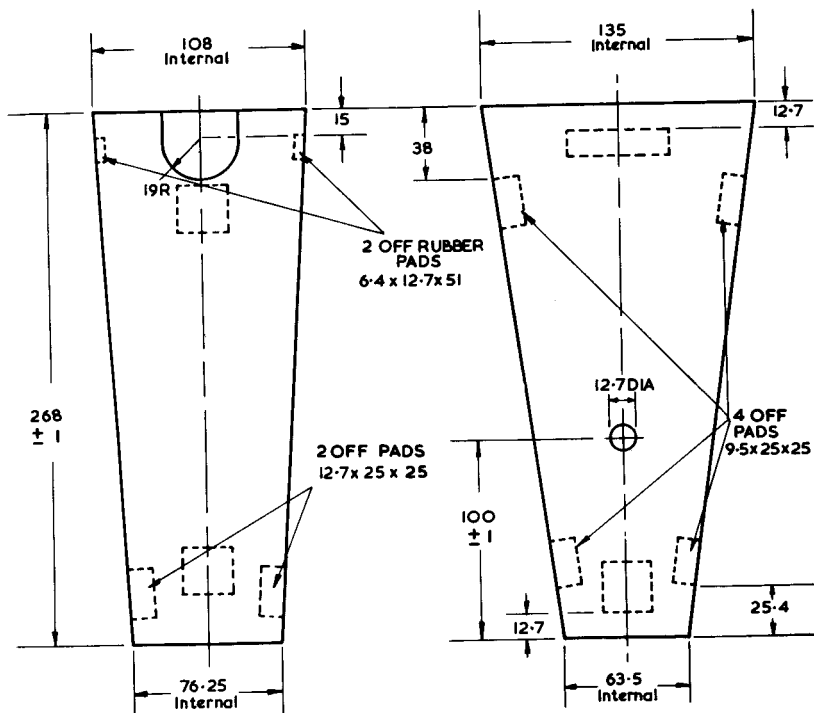
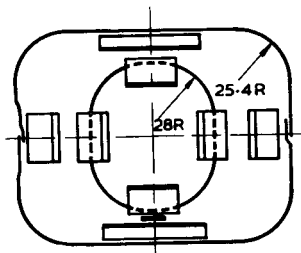


D14-172 ..

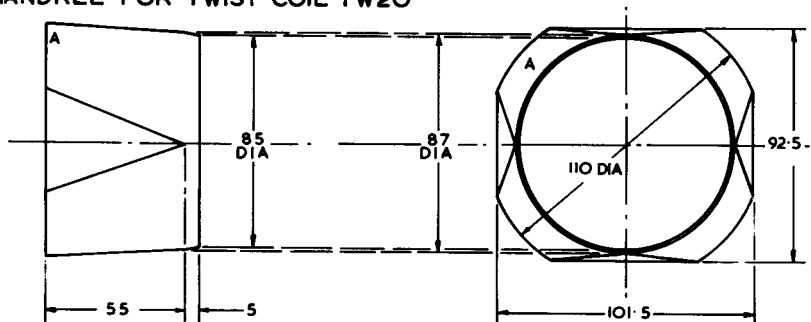
# Magnetic Shield MS15

**MATERIAL** 0.35 ± 0.05 Mumetal  
**FINISH** Silver hammer outside  
**PADS** Soft sponge closed cell neoprene  
**METAL TOLERANCES** ± 0.5 Unless otherwise stated

Third angle projection  
All dimensions in mm  
Not to be scaled



**MANDREL FOR TWIST COIL TW20**



All dimensions in mm

Not to be scaled

**MANDREL**

Shaped from wood in the form of a shaped truncated circular cone, dimensions as above.

**SHIELD**

This twist coil is designed to be used in conjunction with magnetic shield MS15 for D14-172..

**WINDING**

575 turns of 0.28 mm Lewmex Grade 1 or 2 wire, or approved alternative, layer wound on the adhesive side of adhesive backed crepe paper to give 5 mm margins between the coil and each edge of the mandrel.

Start and finish of winding to be brought out on 450 mm long thin flexible lead wires at position A on drawing.

Varnish, if necessary, cover with adhesive backed crepe paper and ensure that the edges of the coil are sealed in place.

**ELECTRICAL CHARACTERISTICS**

Resistance approx. 50  $\Omega$ . Current required for  $\pm 5^\circ$  twist is  $\pm 42$  mA measured on typical D14-172.. with  $V_{a4} = 3$  kV and  $V_{a1} = 1.5$  kV.

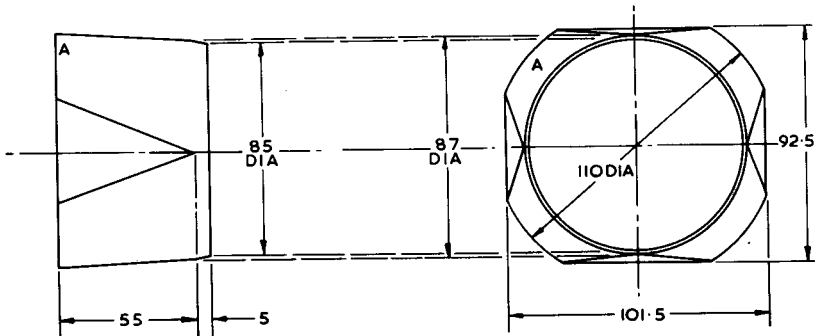
**FITTING**

The completed twist coil should be pushed onto the tube from the base end as far as it will travel and locked in position with adhesive tape.

D14-172..

Tube Coil TW 26

MANDREL FOR TWIST COIL TW26



All dimensions in mm

Not to be scaled

#### MANDREL

Shaped from wood in the form of a shaped truncated circular cone, dimensions as above.

#### SHIELD

This twist coil is designed to be used in conjunction with magnetic shield MS15 for D14-172..

#### WINDING

2500 turns of 0.125 mm Lewmex Grade 1 or 2 wire, or approved alternative, layer wound on the adhesive side of adhesive backed crepe paper to give 5 mm margins between the coil and each edge of the mandrel.  
Start and finish of winding to be brought out on 450 mm long thin flexible lead wires from smaller end of winding.  
Varnish, if necessary, cover with adhesive backed crepe paper and ensure that the edges of the coil are sealed in place.

#### ELECTRICAL CHARACTERISTICS

Resistance approx. 1060  $\Omega$ . Current required for  $\pm 5^\circ$  twist is  $\pm 10$  mA measured on typical D14-172.. with  $V_{a4} = 3$  kV and  $V_{a1} = 1.5$  kV.

#### FITTING

The completed twist coil should be pushed onto the tube from the base end as far as it will travel and locked in position with adhesive tape.

Thorn Radio Valves and Tubes Limited

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