

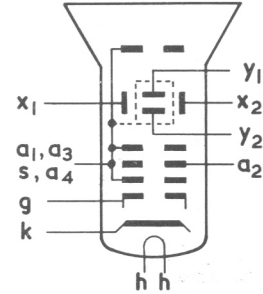
# Oscilloscope Tube

D7-200..

## GENERAL

This 3 inch diagonal rectangular oscilloscope tube is primarily intended for use in inexpensive oscilloscopes and monitoring devices. The tube has sufficient deflector sensitivity to permit transistor driven deflection.

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



## ABSOLUTE RATINGS

		Max	Min	V	
First, third and fourth anode voltage	$V_{a1+a3+a4}$	2000		V	←
Second anode voltage	$V_{a2}$	600	-	V	
Negative grid voltage	$-V_g$	200	0	V	
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	$R_{x-a3}$	2.0	-	MΩ	
y-plate to third anode resistance	$R_{y-a3}$	2.0	-	MΩ	
Grid to cathode resistance	$R_{g-k}$	1.5	-	MΩ	
Average cathode current	$I_{k(av)}$	200	-	μA	
Heater to cathode voltage	$V_{h-k}$	± 125	-	V	

All voltages referred to cathode unless otherwise stated.

**TUBE WEIGHT** (approximate) - 100 g

## PHOSPHOR SCREEN

This type is usually supplied with GH phosphor (D7-200GH) giving a green trace of medium short persistence. Other phosphors can be made available to special order. For optimum performance with W phosphor, the tube should be used as near the maximum final anode voltage as possible. ←

**Thorn Radio Valves and Tubes Limited**

Dec. 1969, Issue 3, Page 1

### INTER-ELECTRODE CAPACITANCES

Cathode and heater to all	$c_{k, h-all}$	3.0	pF
Grid to all	$c_{g-all}$	6.5	pF
Grid to $x_1, x_2, y_1, y_2$ plates	$c_{g-x1, x2, y1, y2}$	1.0	pF
$x_1$ plate to $x_2$ plate	$c_{x1-x2}$	0.5	pF
$y_1$ plate to $y_2$ plate	$c_{y1-y2}$	1.3	pF
$x_1$ plate to all, less $x_2$ plate	$c_{x1-all, less x2}$	3.0	pF
$x_2$ plate to all, less $x_1$ plate	$c_{x2-all, less x1}$	3.0	pF
$y_1$ plate to all, less $y_2$ plate	$c_{y1-all, less y2}$	3.0	pF
$y_2$ plate to all, less $y_1$ plate	$c_{y2-all, less y1}$	3.0	pF
$x_1, x_2$ to $y_1, y_2$ plates	$c_{x1, x2-y1, y2}$	0.3	pF

### TYPICAL OPERATION - voltages with respect to cathode

First, third and fourth anode voltage	$V_{a1+a3+a4}$	1000	1800	V
Mean deflector plate potential*		1000	1800	V
Second anode voltage for focus	$V_{a2}$	65 to 200	115 to 355	V
Grid voltage for spot cut-off (approx)	$V_g$	-25 to -50	-45 to -90	V
x plate deflection coefficient	$D_x$	21 to 29	37 to 52	V/cm
y plate deflection coefficient	$D_y$	25 to 35	45 to 63	V/cm
Minimum useful screen area		5 by 4	5 by 4	cm <sup>2</sup>
Line width at centre, measured by shrinking raster, at 25 $\mu$ A cathode current		0.3	0.25	mm

\* This tube is designed for symmetrical operation.

† Recommended for W phosphor.

### NOTES

Rectangularity of x and y traces  $90^\circ \pm 3^\circ$ .

The horizontal trace will be parallel with the axis of the rectangular face - plate to within  $\pm 3^\circ$ .

The undeflected focused spot will lie within an 8 mm diameter circle central to the tube face.

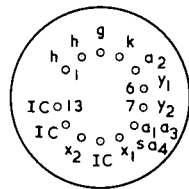
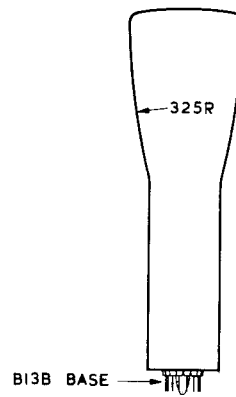
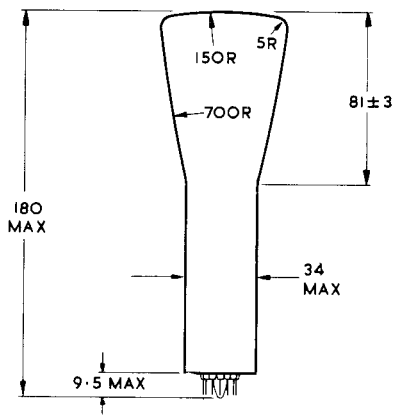
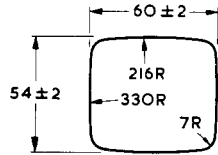
Adequate magnetic shielding is required and to avoid screen charging and hand effects it is recommended that the tube is operated with the final anodes at earthy potential.

For critical requirements any residual astigmatism may be corrected by adjustment of the final anode to mean x-plate potential within the range  $\pm 30V$ .

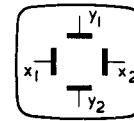
# Oscilloscope Tube

D7-200..

Q453A



VIEW FROM PINS FREE END  
(PIN 3 AT TOP)



VIEW FROM SCREEN END  
(PIN 3 AT TOP)

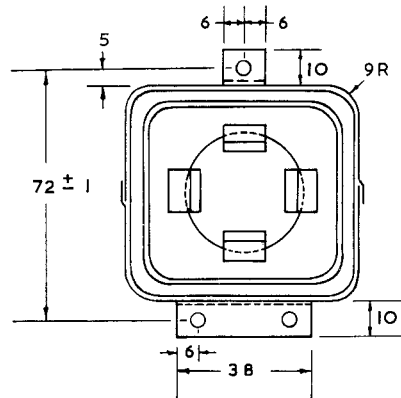
All dimensions in mm

Not to be scaled

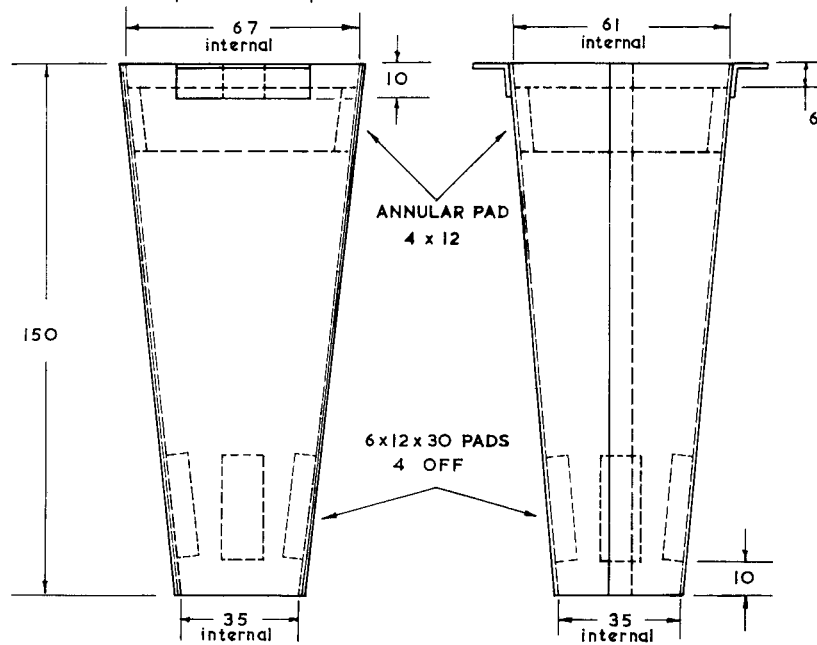
It is advisable to support the tube near the screen, and at a second point on the parallel neck near the base. The tube should not be subjected to any stress from the use of clamps and should not be suspended by the base. Connecting leads should not be soldered directly to the tube pins.

# Magnetic Shield MS3

D7-200..



SHIELD 0.4 thick Mumetal  
 BRACKETS 0.8 thick Mumetal  
 drilled 4BA clearance  
 FINISH Matt black paint (except  
 face of mounting brackets)  
 TOLERANCES ± 0.4 on metalwork  
 dimensions  
 PADS Soft Sponge Neoprene  
 All dimensions in mm

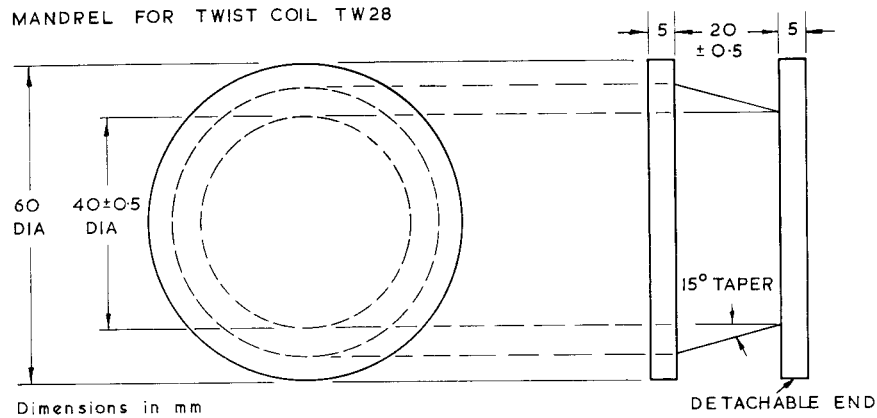


Thorn Radio Valves and Tubes Limited  
 Oct. 1971, Issue 1, Page E1



## Tube Coil TW28

D7-200..



### SHIELD

This twist coil is designed to be used in conjunction with magnetic shield MS3 for D7-200..

### WINDING

1200 turns of 44 S.W.G. acetone self bonding wire.  
Start and finish of winding to be brought out in flexible lead wires from narrow end of winding. Secure and insulate with 0.05 mm Melinex tape. Coil wound in uniform layers.

### ELECTRICAL CHARACTERISTICS

Resistance approximately 580  $\Omega$   
Twist coefficient approximately 4mA/degree measured on a typical D7-200.. tube with  $V_{a1} = 2kV$ .

### FITTING

The completed twist coil should be pushed hard onto the tube, with the lead out wires at one corner. Secure to tube in two places with suitable adhesive tape.

**Thorn Radio Valves and Tubes Limited**

Dec. 1971, Issue 1, Page F1

