

INTRODUCTION

The T940 series comprises four five-inch diameter Projection Cathode Ray Tubes with magnetic focusing and magnetic deflection, designed for applications where high brightness displays of large area are required. The four tubes differ only in their screen properties; the fluorescent colours of the screens are given by the suffix letters B, G, R, and W, denoting blue, green, red and white respectively.

GENERAL DATA

Electrical

Cathode	Indirectly Heated, Oxide Coated
Heater Voltage (<i>See Note 1</i>)	6.3 V
Heater Current	0.66 A Max
Screen	Aluminised
Screen Fluorescent Colour:		
T940B	Blue
T940G	Green
T940R (<i>See Note 2</i>)	Red
T940W	White
Deflection Method	Magnetic
Deflection Angle	47 Degrees
Focusing Method	Magnetic
Raster Dimensions	72 × 96 mm Min
Highlight Brightness		
(at 4.5mA peak anode current) (<i>See Note 3</i>)	6500 mcd/cm ² 18 850 ft-lamberts
Inter-electrode Capacitances:		
Grid to all other electrodes	10 pF
Cathode to all other electrodes	9.0 pF

Mechanical

Overall Length	17.08 inches (434mm)	Max
Overall Diameter			
(excluding anode spigot)	5.34 inches (135.5mm)	Max
Neck Diameter	1.5 inches (38mm)	Max
Net Weight	2 pounds (910g)	Approx
Base (<i>See Note 4</i>)	B.S.448-B12A	
Anode Connector (Supplied separately. <i>See Note 5</i>)	MA151	
Mounting Position		<i>See Note 6</i>

Cooling

The screen requires forced-air cooling

PROJECTION CATHODE RAY TUBES

T940B T940R

T940G T940W

ENGLISH ELECTRIC

Page 2

MINIMUM AND MAXIMUM RATINGS (Absolute Values)

	<i>Min</i>	<i>Max</i>	
Anode Voltage (<i>See Note 7</i>)	40	55	kV
Grid Voltage (negative value, never positive) ..	—	250	V
Anode Current (Mean) (<i>See Notes 8 and 9</i>) ..	—	500	μ A
Grid to Cathode Resistance	—	1.5	M Ω
Grid to Cathode Impedance (at 50c/s)	—	500	k Ω
Heater to Cathode Voltage			<i>See Note 10</i>
Magnification	—	40	

TYPICAL OPERATING CONDITIONS

Anode Voltage	50	kV
Anode Current (Peak)	4.5	mA
Anode Current (Mean)	500	μ A
Grid Voltage for cut-off	-100 to -170	V
Spark Trap and External Conductive Coating (<i>See Note 11</i>)	Earth Potential	
Focus Power	<i>See Note 12</i>	
Line Width (<i>See Note 13</i>)	0.004	inch

INSULATION OF EXTERNAL COMPONENTS

The deflection and focus yokes should be insulated from the tube neck, and all corners on conducting surfaces should be rounded off. Earthed conductors should be kept away from the vicinity of the high potential end of the tube.

X-RAY WARNING

THE VOLTAGE AT WHICH THE TUBE OPERATES INVOLVES AN X-RAY HAZARD. The sheet steel casing of a typical projector in conjunction with the shielding provided by the optical and electrical components normally gives adequate protection but individual designs should be checked by measurement.

ENGLISH ELECTRIC VALVE CO. LTD.

Printed in England

**CHELMSFORD
ENGLAND**

Telephone:
Chelmsford 3491

PROJECTION CATHODE RAY TUBES

T940B **T940G**
T940R **T940W**

March 1965

ENGLISH ELECTRIC

Page 3

NOTES

1. The heater is suitable for parallel operation only.
2. The actual screen colour of the T940R is orange but gives red primary colour when used in conjunction with a Wratten 25 filter.
3. This highlight brightness relates to T940W.
4. The socket should not be rigidly mounted but should have flexible leads and be able to move freely. The bottom circumference of the base shell will fall within a circle having a diameter of 50mm which is centred on the perpendicular from the centre of the face plate.
5. It is recommended that the connection to the anode be made with connector type MA151, available from English Electric Valve Company Ltd. See page 7 for details.
6. The tube may be mounted in any position except with the screen downwards and the axis of the tube making an angle of less than 50° with the vertical.
7. A $50k\Omega$ resistor should be included in the anode lead in order to avoid damage to the tube by a momentary internal arc. Before removing the tube from an equipment the screen and cone should be discharged.
8. For normal television pictures. Stationary patterns, with high peak currents concentrated in one area of the tube face and the remaining area dark, impose harmful thermal stresses on the faceplate and must be avoided.
9. Means must be provided for the instantaneous removal of beam current in the event of a failure of either one or both of the time bases. Unless such a safety device is incorporated, a failure of this type will result in the immediate destruction of the screen of the tube.
10. The heater should preferably be connected to the cathode. Applications necessitating the application of a potential between the heater and cathode are subject to engineering approval.
11. The spark trap and external conductive coating should be connected by a low impedance path to the h.t. supply return. The purpose is to isolate from the grid and its associated circuits any occasional, non-destructive, discharges which sometimes occur when starting after prolonged shut down.
12. The focus power required is equivalent to approximately 1300 ampere-turns in a shrouded focus coil with $\frac{1}{4}$ -inch gap. The precise value depends on the gap position.
13. At $500\mu\text{A}$ anode current with a shrinking raster.

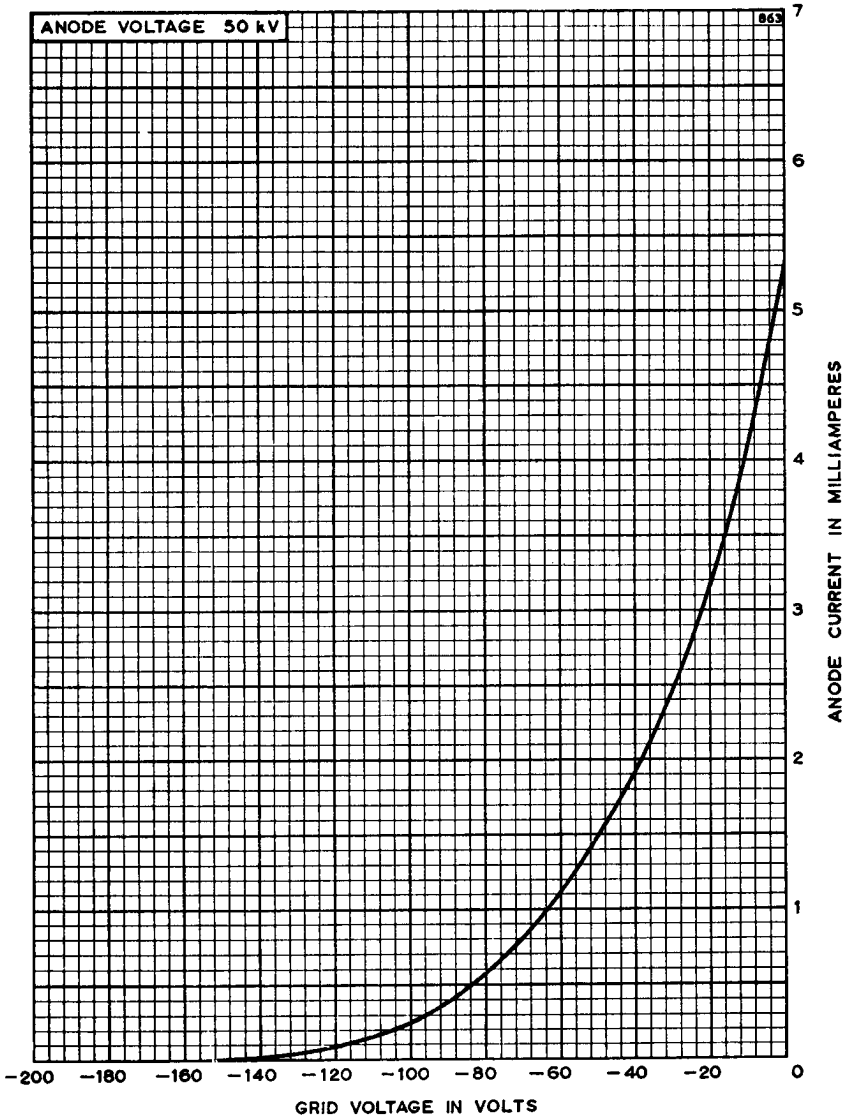
ENGLISH ELECTRIC VALVE CO. LTD.

**CHELMSFORD
ENGLAND**

Telephone:
Chelmsford 3491



GRID VOLTAGE CHARACTERISTIC



ENGLISH ELECTRIC VALVE CO. LTD.

**CHELMSFORD
ENGLAND**

Telephone:
Chelmsford 3491

PROJECTION CATHODE RAY TUBES

T940B T940R

T940G T940W

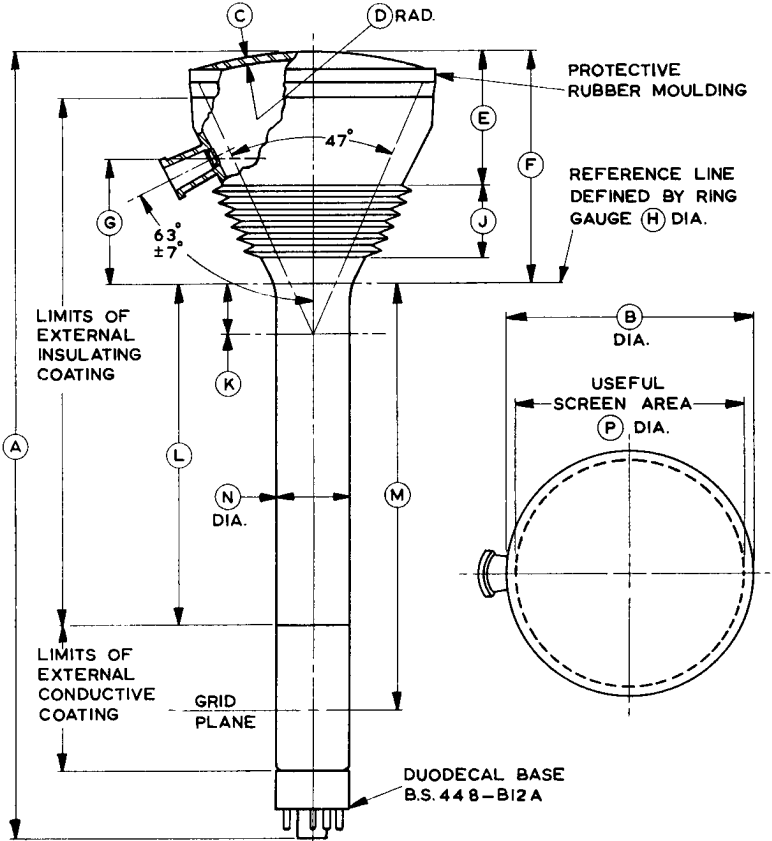
December 1966

ENGLISH ELECTRIC

Page 5

1261A

OUTLINE



Ref.	Inches	Millimetres	Ref.	Inches	Millimetres
A	16.693 ± 0.394	424.0 ± 10.0	J	1.496 ± 0.039	38.0 ± 1.0
B	5.275 ± 0.059	134.0 ± 1.5	K	1.083 Max	27.5 Max
C	0.118	3.0	L	7.480 + 0.000 - 0.197	190.0 + 0.0 - 5.0
D	8.150 ± 0.039	207.0 ± 1.0	M	9.114 ± 0.157	231.5 ± 4.0
E	2.795 ± 0.059	71.0 ± 1.5	N	1.437 ± 0.059	36.5 ± 1.5
F	4.862 ± 0.118	123.5 ± 3.0	P	4.725 Min	120.0 Min
G	2.736 ± 0.157	69.5 ± 4.0			
H	1.500	38.1			

Inch dimensions have been derived from millimetres.

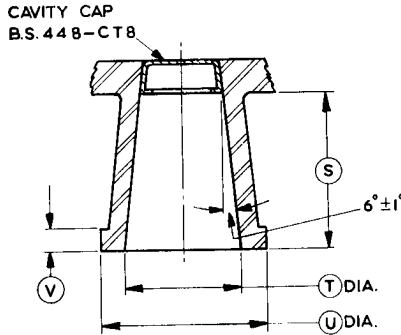
ENGLISH ELECTRIC VALVE CO. LTD.

CHELMSFORD
ENGLAND

ENGLISH ELECTRIC

ANODE SPIGOT DETAILS

877B

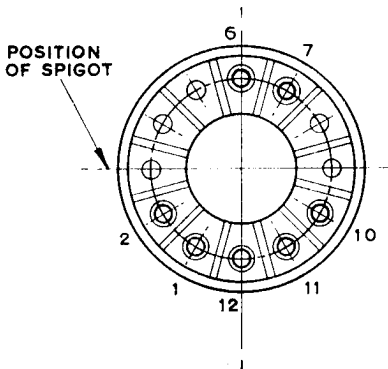


Ref.	Inches	Millimetres
S	0.925 ± 0.098	23.5 ± 2.5
T	0.717 ± 0.020	18.2 ± 0.5
U	0.984 ± 0.016	25.0 ± 0.4
V	0.118 Max	3.0 Max

Inch dimensions have been derived from millimetres.

BASE CONNECTIONS

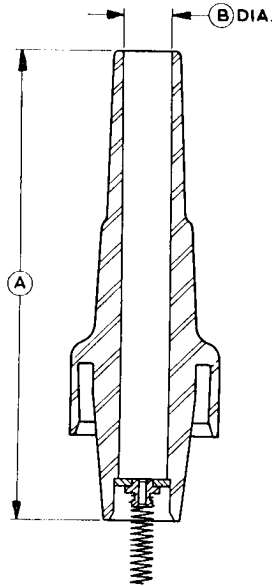
878



PIN	ELEMENT
1	HEATER
2	GRID
3	OMITTED
4	OMITTED
5	OMITTED
6	NO CONNECTION
7	NO CONNECTION
8	OMITTED
9	OMITTED
10	SPARK TRAP
11	CATHODE
12	HEATER
CAP	ANODE

ANODE CONNECTOR MA151

1284



Ref.	Inches	Millimetres
A	3.268	83.0
B	0.330 ± 0.005	8.38 ± 0.13