



**ABRIDGED DATA**

8½-Inch Diagonal, Rectangular Display Tubes for monitor and radar applications. They feature long necks, enabling two sets of scan coils to be fitted for display of alpha-numeric characters in computer read-out or radar systems. The narrow scan angle permits the use of valve or transistor scan amplifiers.

Focus Method ( <i>See Note 3</i> )	.. .. .	..	Magnetic
Deflection Method	.. .. .	..	Magnetic
Deflection Angle	.. .. .	40	Degrees
E.H.T. Voltage	.. .. .	15	kV

**GENERAL DATA**

**Electrical and General**

Cathode	.. .. .	Indirectly Heated, Oxide Coated
Heater Voltage ( <i>See Note 1</i> )	.. .. .	6.3 V
Heater Current	.. .. .	0.3 ± 10% A
Screen ( <i>See Note 2</i> )	.. .. .	Aluminised
Inter-electrode Capacitances:		
Grid to all other electrodes, less than	.. .. .	8.0 pF
Cathode to all other electrodes, less than	.. .. .	8.0 pF
Final anode to external coating* (this capacitance may be used for E.H.T. smoothing)	.. .. .	750 pF Approx

**Mechanical**

Overall Length	.. .. .	22.25 inches (565 mm)	Max
Faceplate Diagonal	.. .. .	8.510 inches (216 mm)	Max
Neck Diameter	.. .. .	1.40 inches (35.5 mm)	Max
Net Weight	.. .. .	4.6 pounds (2.1 kg)	Approx
Base	.. .. .	.. .. .	B.S.448-B12A
Anode 2 Cavity Cap	.. .. .	.. .. .	B.S.448-CT8
Mounting Position	.. .. .	.. .. .	<i>See Note 4</i>

\*Versions are available without the external coating, but otherwise identical (T969 series).

## ENGLISH ELECTRIC

### MAXIMUM AND MINIMUM RATINGS

(Absolute Values)

(All voltages with respect to cathode)

	<i>Min</i>	<i>Max</i>	
Anode 2 Voltage .. .. .	9.0	16.5	kV
Anode 1 Voltage .. .. .	250	600	V
Grid Voltage, negative value ( <i>See Note 5</i> ) ..	0	250	V
Heater to Cathode Voltage:			
Cathode negative .. .. .	—	150	V
Cathode positive ( <i>See Note 6</i> ) .. .. .	—	200	V
Peak Heater to Cathode Voltage:			
Cathode positive ( <i>See Note 7</i> ) .. .. .	—	410	V
Grid to Cathode Resistance .. .. .	—	1.5	MΩ
Grid to Cathode Impedance (at 50c/s).. .. .	—	0.5	MΩ
Heater to Cathode Resistance .. .. .	—	<i>See Note 8</i>	
Anode 1 Supply Source Impedance .. .. .	—	1.5	MΩ

### TYPICAL OPERATING CONDITIONS

Anode 2 Voltage .. .. .	15	kV
Anode 1 Voltage .. .. .	300	V
Grid Voltage for cut-off .. .. .	-30 to -90	V
Grid Drive for 50μA beam current .. .. .	20 to 30	V

### BEAM CENTRING

In order to obtain maximum brightness and the best focus spot size, stray magnetic fields must be minimised over the length of the gun structure. This may be achieved by using a tubular mumetal shield over the neck.

Where optimum performance is required, a small magnet should be used for centring the beam in the defining aperture. (Elac type BC11 is suitable). The magnet should be located in the region of the grid and its position and strength adjusted to give maximum brightness.

### X-RAY WARNING

X-Rays are produced when types in the T954 series are operated with anode voltages above 16kV (absolute value). These rays can constitute a health hazard unless the tubes are adequately shielded for X-ray radiation. This is entirely a function of high voltage devices and does not reflect on the design of the tubes.

### NOTES

1. The heater is suitable for series or parallel operation. In series operation the surge heater voltage must not exceed  $9.5V_{r.m.s.}$  when the supply is switched on and a current limiting device may be necessary in the circuit to ensure that this voltage is not exceeded.
2. Tubes in the T954 series have screens with the following characteristics.

Type	EEV Screen	Equivalent	Fluorescent Colour	Persistence
T954S	S*	—	Yellowish-orange	Long
T954T	T	—	Yellow-orange	Medium
T954Y	Y*	P33	Orange	Long

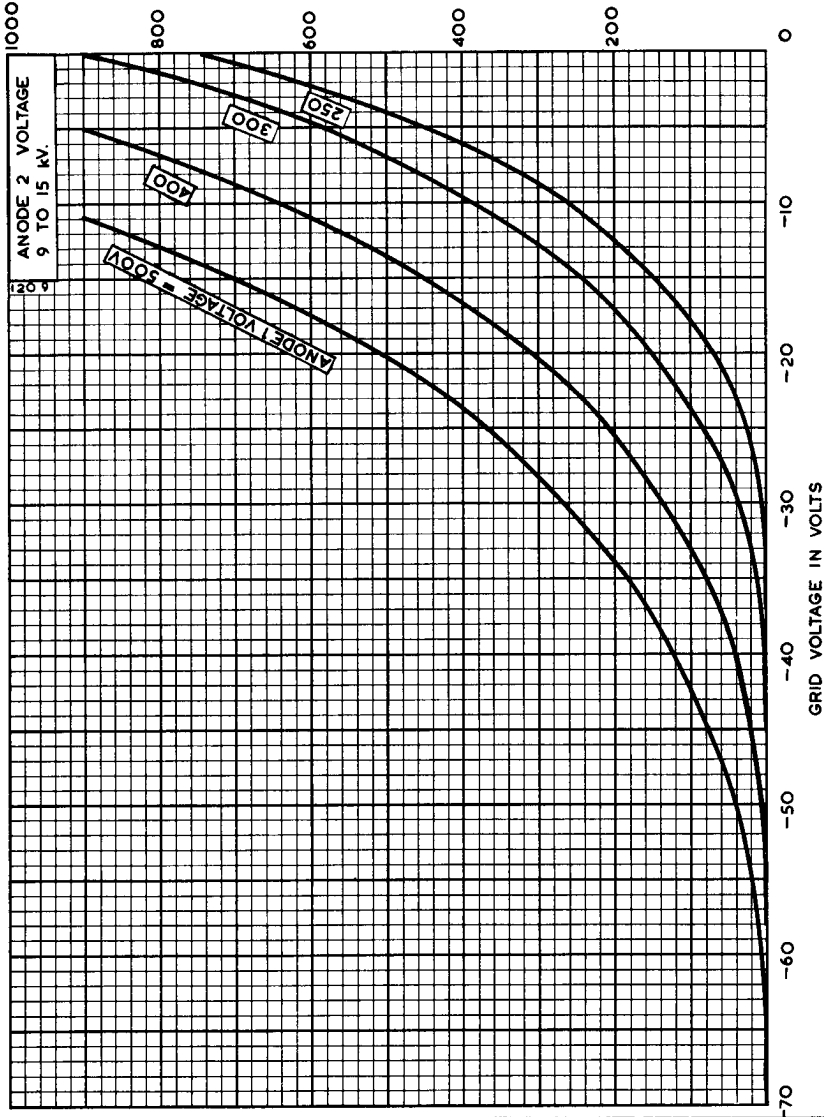
The tube can be manufactured with alternative screens, and customers' enquiries are invited.

\*This is a fluoride screen which is sensitive to burn and should not be operated with slow moving spots.

3. The focus coil should be positioned so that the focusing field is entirely on the screen side of the beam defining aperture. When using a focus coil having a short air gap, the centre of the air gap should be approximately 2.75 inches (70mm) from the grid plane.
4. The tube may be mounted in any position except vertically with the screen downwards and the axis of the tube making an angle of less than  $20^\circ$  with the vertical.
5. The d.c. value of grid bias must not be allowed to become positive with respect to the cathode except during the periods immediately after switching the equipment on or off, when it may be allowed to rise to +1V. The maximum positive grid excursion may reach 2V and at this voltage the grid current may be expected to be approximately 2mA.
6. To avoid excessive hum, the a.c. component of the heater to cathode voltage should be as low as possible, preferably less than  $20V_{r.m.s.}$
7. During a warming-up period not exceeding 45 seconds.
8. When the heater is in a series chain or earthed, the impedance between the cathode and earth at 50c/s must not exceed  $100k\Omega$ . When the heater is supplied from a separate transformer, the heater to cathode resistance must not exceed  $1M\Omega$ .

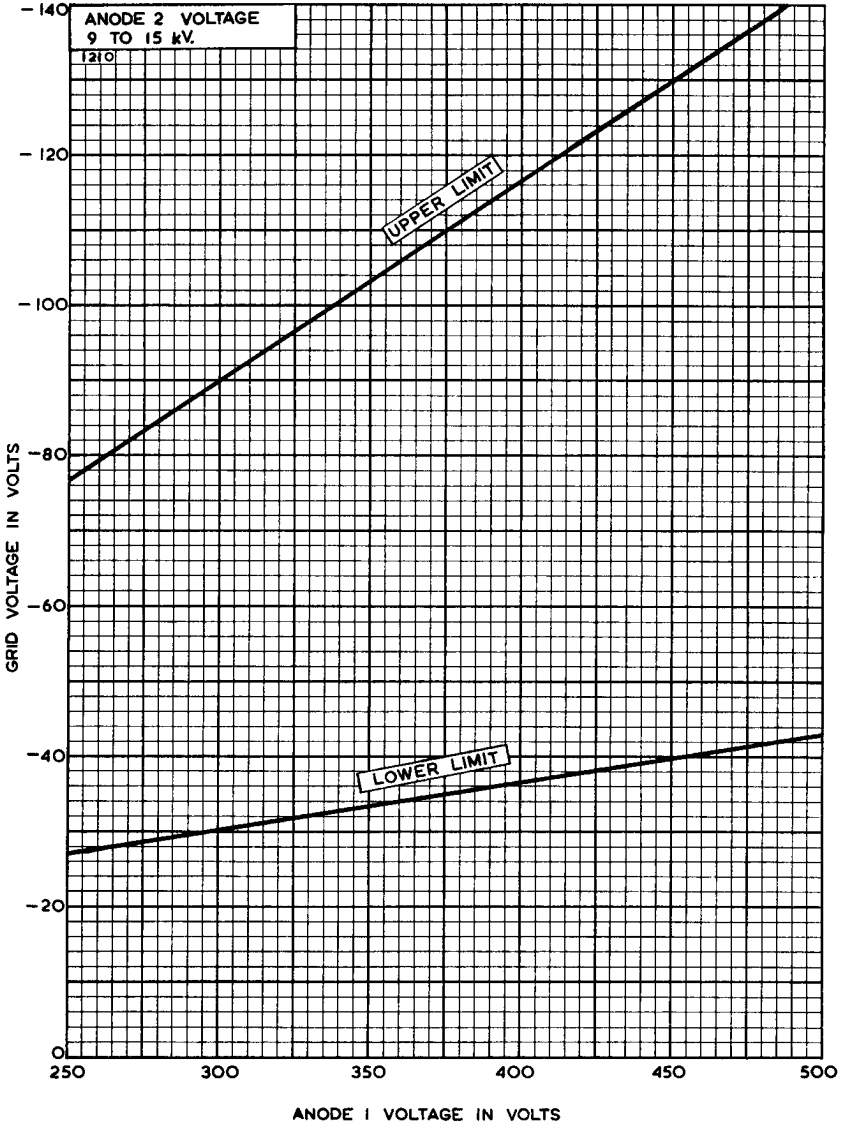
ENGLISH ELECTRIC

GRID VOLTAGE CHARACTERISTICS  
ANODE 2 CURRENT IN MICROAMPERES





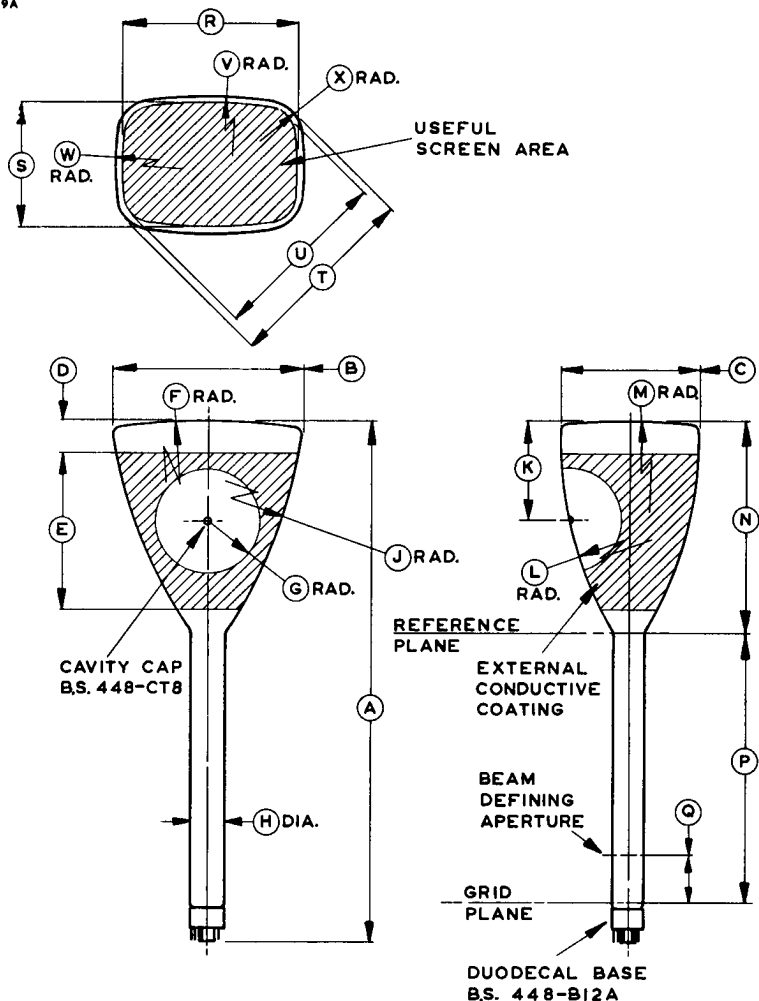
GRID VOLTAGE CUT-OFF LIMITS



ENGLISH ELECTRIC

OUTLINE

1119A



Note—A ring gauge 1.417 inches (36.0mm) diameter by 3.937 inches (100mm) long will pass over base and neck to reference plane.



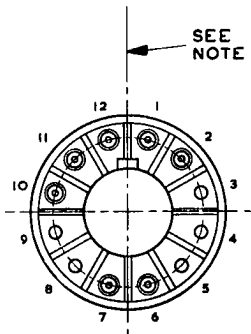
**OUTLINE DIMENSIONS**

Ref.	Inches	Millimetres	Ref.	Inches	Millimetres
A	21.970 ± 0.276	558.0 ± 7.0	M	27.00	686.0
B	7.874 ± 0.059	200.0 ± 1.5	N	8.661 ± 0.118	220.0 ± 3.0
C	6.063 ± 0.059	154.0 ± 1.5	P	11.22	285.0
D	1.299	33.0	Q	1.968 ± 0.197	50.0 ± 5.0
E	6.693	170.0	R	7.283	185.0
F	27.00	686.0	S	5.433	138.0
G	2.165	55.0	T	8.445	214.5
H	1.378 +0.020 -0.039	35.0 +0.5 -1.0	U	7.677	195.0
J	19.69	500.0	V	18.504	470.0
K	3.937 ± 0.197	100.0 ± 5.0	W	12.244	311.0
L	15.75	400.0	X	1.496	38.0

Inch dimensions have been derived from millimetres.

**OUTLINE DETAIL**

1198A



Pin	Element
1	Heater
2	Grid
3	No Pin
4	No Pin
5	No Pin
6	No Connection
7	No Connection
8	No Pin
9	No Pin
10	Anode 1
11	Cathode
12	Heater
Cavity Cap	Anode 2

Note—The anode cavity cap will be in line with the base key to within 10°.