



# Thomas

23HP4  
Phototron  
Picture  
Tube

## ENGINEERING DATA

### CHARACTERISTICS

#### GENERAL DATA

Focusing Method..... Electrostatic  
 Deflecting Method..... Magnetic  
 Deflecting Angle-Diagonal (Approx.)..... 110 Degrees  
     Horizontal ..... 99 Degrees  
     Vertical ..... 82 Degrees  
 Phosphor ..... P4 Aluminized  
 Fluorescence ..... White  
 Persistence ..... Medium  
 Faceplate ..... Gray Filter Glass  
 Light Transmission (including twin panel)..... 40% (Approx.)

#### ELECTRICAL DATA

Heater Voltage ..... 6.3 Volts  
 Heater Current ..... .6 Ampere  $\pm$  5%  
 Direct Interelectrode Capacitances (Approx.)  
     Cathode to All Other Electrodes..... 5 uuf  
     Grid No. 1 to All Other Electrodes..... 6 uuf  
 Ion Trap Magnet..... None

#### MECHANICAL DATA

Minimum Useful Screen Dimensions..... 19 5/6" x 15 1/4 Inches  
 Minimum Useful Screen Area (Approx.)..... 282 Sq.In.  
 Bulb Contact (Recessed Small Cavity Cap)..... J1-21  
 Base (Small Wafer Eightar 7 Pin)..... B7-208 or B7-183  
 Basing..... 8 HR  
 J1-21 Contact Aligns with Pin Position No. 4  $\pm$  30 Degrees

### RATINGS

#### MAXIMUM RATINGS (Design Maximum Values)

Anode Voltage (Note 1)..... 20,000 Volts dc  
 Grid No. 4 Voltage (focusing electrode)..... -500 to + 2,000 Volts dc  
 Grid No. 2 Voltage..... 550 Volts dc  
 Grid No. 1 Voltage  
     Negative Bias Value..... 15 1/2 Volts dc  
     Positive Bias Value..... 0 Volts dc  
     Positive Peak Value ..... 2 Volts  
 Peak Heater-Cathode Voltage (Note 2)  
     Heater Negative with Respect to Cathode  
     During Warm-up Period Not to exceed.. 15 sec. 450 Volts dc  
     After Equipment Warm-up Period..... 200 Volts dc  
     Heater Positive with Respect to Cathode..... 200 Volts dc

#### RECOMMENDED OPERATING CONDITIONS

Anode Voltage ..... 16,000 Volts dc  
 Grid No. 4 Voltage (Note 3) ..... 0 to + 400 Volts dc  
 Grid No. 2 Voltage..... 300 Volts dc  
 Grid No. 1 Voltage (Note 4) ..... -35 To -72 Volts dc

#### CIRCUIT VALUES

Grid No. 1 Circuit Resistance..... 1.5 Max. Megohm  
 External Conductive Coating to Anode  
     Capacitance- ..... 2500 uuf. Max.  
     ..... 2000 uuf. Min.

THE 23HP4 IS A DIRECT-VIEW PICTURE TUBE FOR USE IN TELEVISION RECEIVERS AND INCLUDES SUCH FEATURES AS:

- o A short straight electron gun not requiring an ion trap.
- o A short neck.
- o Integral implosion panel.
- o A diagonal deflection angle of 110°
- o A gray tinted face
- o Rectangular Glass Type.
- o Spherical face.
- o Electrostatic Focus.
- o Metal Backed Screen.

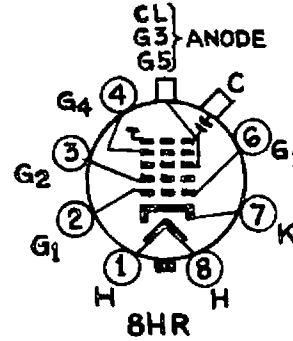
### NOTES

1. Grid No. 5, Grid No. 3, and the collector are connected together within the tube, and referred to herein as anode.
2. Cathode should be returned to one side or to the mid-tap of the heater transformer winding.
3. For focus with anode current of 100 ua and 19 5/16" x 15 1/4" raster.
4. Visual extinction of focused raster. Extinction of stationary focused spot will require that these values be about 5 volts more negative.

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from JEDEC release #2563, Aug. 24, 1959

SOCKET CONNECTIONS  
BOTTOM VIEW



- PIN 1 : HEATER  
 PIN 2 : GRID N<sup>o</sup> 1  
 PIN 3 : GRID N<sup>o</sup> 2  
 PIN 4 : GRID N<sup>o</sup> 4  
 PIN 6 : GRID N<sup>o</sup> 1  
 PIN 7 : CATHODE  
 PIN 8 : HEATER  
 CAP : ANODE (GRID N<sup>o</sup> 3,  
 GRID N<sup>o</sup> 5, COLLECTOR)  
 C : EXTERNAL CONDUCTIVE  
 COATING

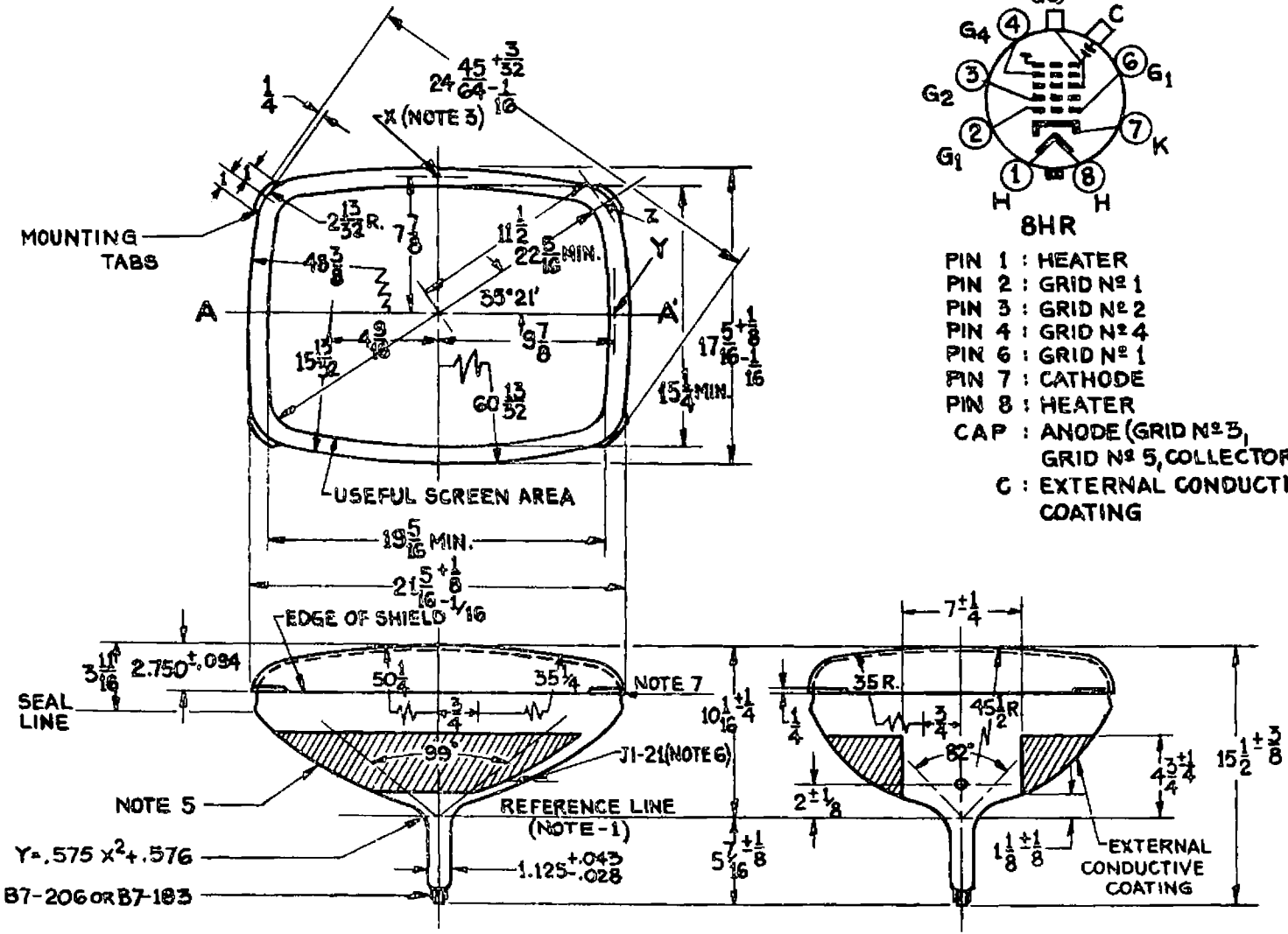


DIAGRAM NOTES :

1. Reference line is determined by plane C-C<sup>o</sup> of JEDEC No. 126 Reference Line Gauge, when the gauge is seated against the bulb.
2. Base Pin No. 4 aligns with horizontal centerline (A-A<sup>o</sup>) within 30<sup>o</sup> and is on same side as anode contact, J1-21.
3. Planes perpendicular to tube axis and passing through points X, Y, and Z are located as follows:

Plane tangent to crown of face to plane of X = .758" Nom.

Plane of X to plane of Y = .463"  $\pm$  .030"

Plane of X to plane of Z = .970"  $\pm$  .030"

Plane of X to the bottom of ear = 1.960"

4. Dimensions are in inches.
5. External Conductive Coating must be grounded.
6. Anti-corona coating around connector.
7. Panel edge flatness: .075" maximum out of plane.