



# CRT DATA

T6470

Revision A

4-19-68

*CRT Engineering*

## DESCRIPTION

The T6470 is an aluminized, 3 x 5 inch, flat-faced cathode-ray tube designed for oscilloscope use. The T6470 has electrostatic focus and deflection, a mesh-shielded helical post accelerator, and a lighted internal graticule.

## ELECTRICAL DATA

Focusing method .....	Electrostatic
Deflecting method .....	Electrostatic
Direct interelectrode capacitance, approximate:	
Cathode to all other electrodes .....	4.4 pF
Grid no. 1 to all other electrodes .....	7.7 pF
D1 to D2 .....	1.9 pF
D3 to D4 .....	1.4 pF
D1 to all other electrodes .....	6.9 pF
D2 to all other electrodes .....	6.9 pF
D3 to all other electrodes .....	4.2 pF
D4 to all other electrodes .....	4.2 pF
Post-accelerator helix resistance .....	200 M $\Omega$ min

## MECHANICAL DATA

Overall length <sup>1</sup> .....	18-3/16 $\pm$ 3/16 inches
Greatest bulb dimensions: <sup>2</sup>	
Width .....	4-13/16 $\pm$ 1/16 inches
Height .....	3-1/4 $\pm$ 1/16 inches
Minimum useful screen dimensions:	
Width .....	4 inches
Height .....	2-3/8 inches
Bulb number .....	Special
Bulb contact .....	J1-21
Base .....	B14-38
Basing .....	Special
Bulb contact alignment:	
J1-21 contact aligns with trace of D1-D2 .....	$\pm$ 5 $^{\circ}$
J1-21 contact on same side as pin no. 4	
Base alignment:	
Base keyway aligns with D3-D4 trace .....	$\pm$ 10 $^{\circ}$
Positive voltage on D1 deflects beam approximately toward pin no. 4	
Positive voltage on D3 deflects beam approximately toward pin no. 1	
Angle between D1-D2 and D3-D4 trace .....	90 $^{\circ}$ $\pm$ 1 $^{\circ}$
Gun to graticule alignment <sup>1</sup> .....	$\pm$ 3 $^{\circ}$

RATINGS (absolute maximum values)<sup>3</sup>

Heater voltage .....	6.3 volts AC
Heater current at 6.3 volts .....	0.6 ±10% A
Post-accelerator voltage .....	18500 volts DC max
Post-accelerator grid voltage .....	3000 volts DC max
Lower helix and isolation shield voltage .....	3000 volts DC max
D1-D2 shield voltage .....	3000 volts DC max
D3-D4 shield voltage .....	3000 volts DC max
Average deflection plate voltage .....	3000 volts DC max
Ratio of post-accelerator voltage to average voltage of deflection plates <sup>4</sup> .....	6.2 max
Astigmatism electrode voltage .....	3000 volts DC max
Focusing electrode voltage .....	1000 volts DC max
Accelerator voltage .....	3000 volts DC max
Accelerator input .....	10 watts max
Grid no. 1 voltage:	
Negative-bias value .....	200 volts DC max
Positive-bias value .....	0 volts DC max
Positive-peak value .....	2 volts DC max
Peak heater-cathode voltage:	
Heater negative to cathode:	
During warm-up period not to exceed 15 seconds ...	180 volts DC max
After equipment warm-up period .....	125 volts DC max
Heater positive to cathode .....	125 volts DC max
Peak voltage between astigmatism and/or any deflection electrode .....	500 volts DC max

TYPICAL OPERATING CONDITIONS<sup>3</sup>

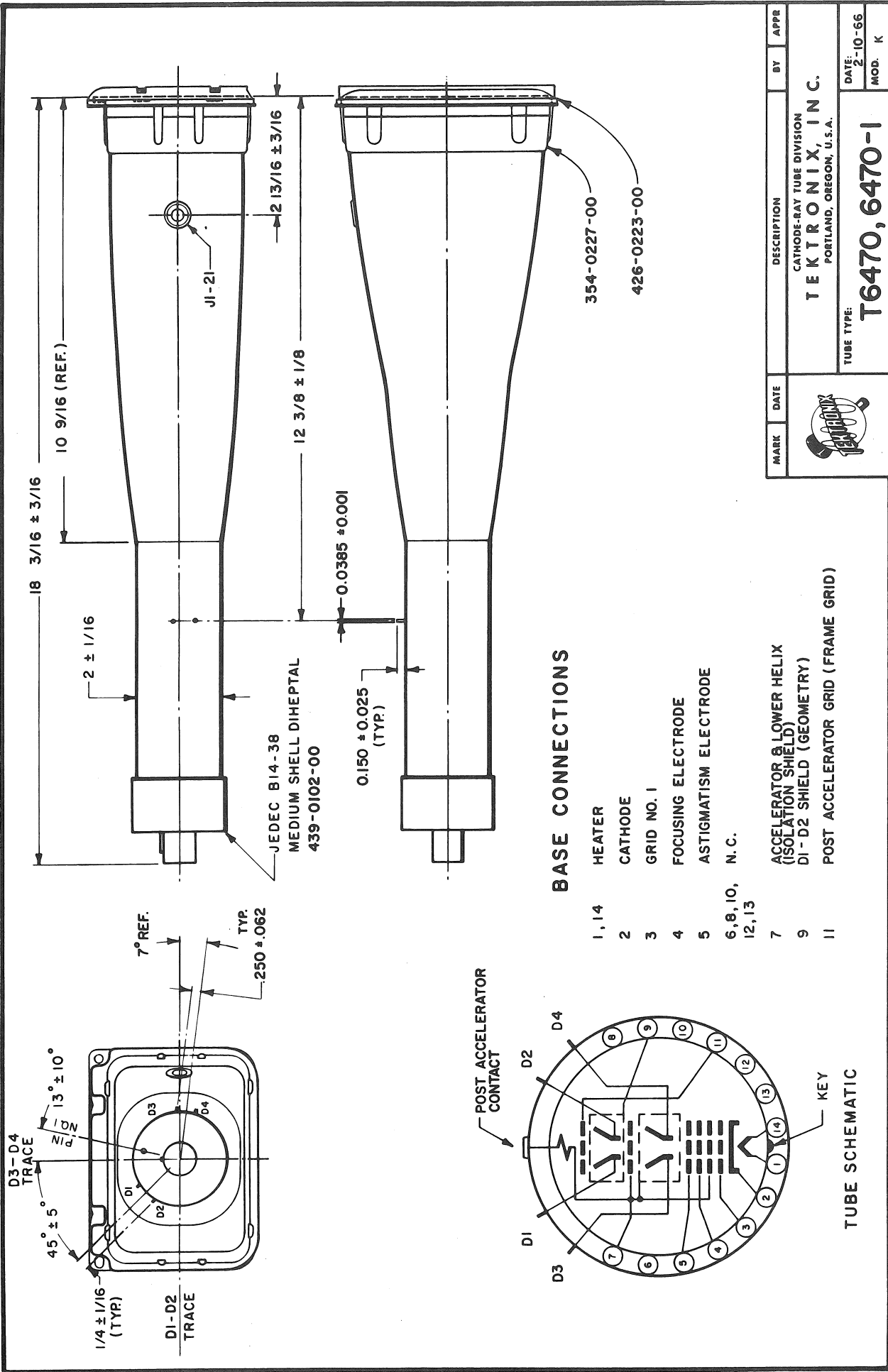
Post-accelerator voltage .....	14000 volts DC
Post-accelerator grid voltage .....	2200 volts DC
Lower helix and isolation shield voltage .....	2238 volts DC
D1-D2 shield voltage <sup>5</sup> .....	2185 to 2300 volts DC
Average D1-D2 deflection plate voltage .....	2264 volts DC
Average D3-D4 deflection plate voltage .....	2238 volts DC
Astigmatism electrode voltage <sup>6</sup> .....	2200 to 2300 volts DC
Focusing electrode voltage <sup>6</sup> .....	300 to 600 volts DC
Accelerator voltage .....	2250 volts DC
Grid no. 1 voltage <sup>7</sup> .....	-75 to -105 volts DC
Deflection factors:	
D1 and D2 .....	13.2 to 15.4 volts DC/cm
D3 and D4 .....	4.9 to 5.7 volts DC/cm
Useful scan D1-D2 <sup>8</sup> .....	10 cm
Useful scan D3-D4 <sup>8</sup> .....	6 cm
Focusing electrode current for any operating condition .....	-10 µA to +10 µA
Spot position (undeflected) <sup>9</sup>	
Horizontal .....	±5 mm from geometric center
Vertical .....	±7.5 mm from geometric center
Pattern distortion at 100% useful scan <sup>10</sup> .....	1.5% max

## MAXIMUM CIRCUIT VALUES

Grid no. 1 circuit resistance ..... 1.5 M $\Omega$  max

## NOTES

1. Internal graticule tubes only. See outline drawing.
2. Not including graticule lighting and mounting hardware. See outline drawing.
3. All voltages taken with respect to cathode.
4. This tube is designed for optimum performance when operating at a ratio of 6. Operation at other ratios may result in changes in deflection uniformity, pattern distortion, and/or useful scan.
5. Pattern distortion is minimized by proper adjustment of this potential.
6. Recommended range. Adjust for best overall focus.
7. Visual extinction of undeflected spot.
8. The deflection plates intercept part of the electron beam near the edge of scan; therefore, a low-impedance deflection drive is desirable.
9. Connect free deflection electrodes to accelerator.
10. With a 6 x 10 cm rectangular raster centered on the face of the tube, the raster edges will not deviate from straight parallel lines by more than 1.0 mm total on the left and right edges, nor by more than 1.0 mm total at the top and bottom.



MARK	DATE	DESCRIPTION	BY	APPR
		CATHODE-RAY TUBE DIVISION <b>TEKTRONIX, INC.</b> PORTLAND, OREGON, U.S.A.		
TUBE TYPE:		<b>T6470, 6470-1</b>	DATE: 2-10-66 MOD. K	