



# CRT DATA

T5810

REVISION B

12-7-66

## DESCRIPTION

The T5810 is an aluminized, 5-inch, flat-faced cathode-ray tube designed for oscilloscope use. The T5810 has electrostatic focus and deflection, a helical post accelerator, and a distributed vertical deflection structure. It is available either with or without a lighted internal graticule.

## ELECTRICAL DATA

Focusing method .....	Electrostatic
Deflecting method .....	Electrostatic
Heater voltage .....	6.3 volts RMS
Heater current at 6.3 volts .....	0.6 ±10% A
Direct interelectrode capacitance, approximate:	
Cathode to all other electrodes .....	4.8 pF
Grid no. 1 to all other electrodes .....	8.4 pF
D1 to D2 .....	2.4 pF
D1 to all other electrodes .....	3.5 pF
D2 to all other electrodes .....	3.5 pF
Deflection plates:	
D3 to D4 nominal characteristic impedance .....	900 ohms p to p
Post-accelerator helix resistance .....	200 MΩ min

## MECHANICAL DATA

Overall length <sup>1</sup> .....	21-1/16 ± 3/16 inches
Greatest bulb diameter <sup>2</sup> .....	5-1/4 ± 1/16 inches
Neck pin diameter .....	0.040 ± 0.002 inches
Minimum useful screen diameter .....	4-1/2 inches
Bulb number .....	J42ZLIA
Bulb contact .....	J1-21
Base .....	B14-38
Basing .....	Special
Bulb contact alignment:	
J1-21 contact aligns with trace of D1-D2 .....	± 5°
J1-21 contact on same side as pin no. 4	
Base alignment:	
Pin no. 1 aligns with D3-D4 trace .....	± 10°
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° ± 1°
Gun to graticule alignment <sup>1</sup> .....	± 3°

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

Post-accelerator volage .....	12,000 volts DC max
Lower helix and isolation shield voltage.....	2,000 volts DC max

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

D3-D4 shield voltage .....	2000 volts DC max
Average deflection plate voltage .....	2000 volts DC max
Ratio of post-accelerator voltage to average voltage of deflection plates <sup>4</sup> .....	6 max
Astigmatism electrode voltage .....	2000 volts DC max
Focusing electrode voltage .....	650 volts DC max
Accelerator voltage .....	2000 volts DC max
Accelerator input .....	4 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>

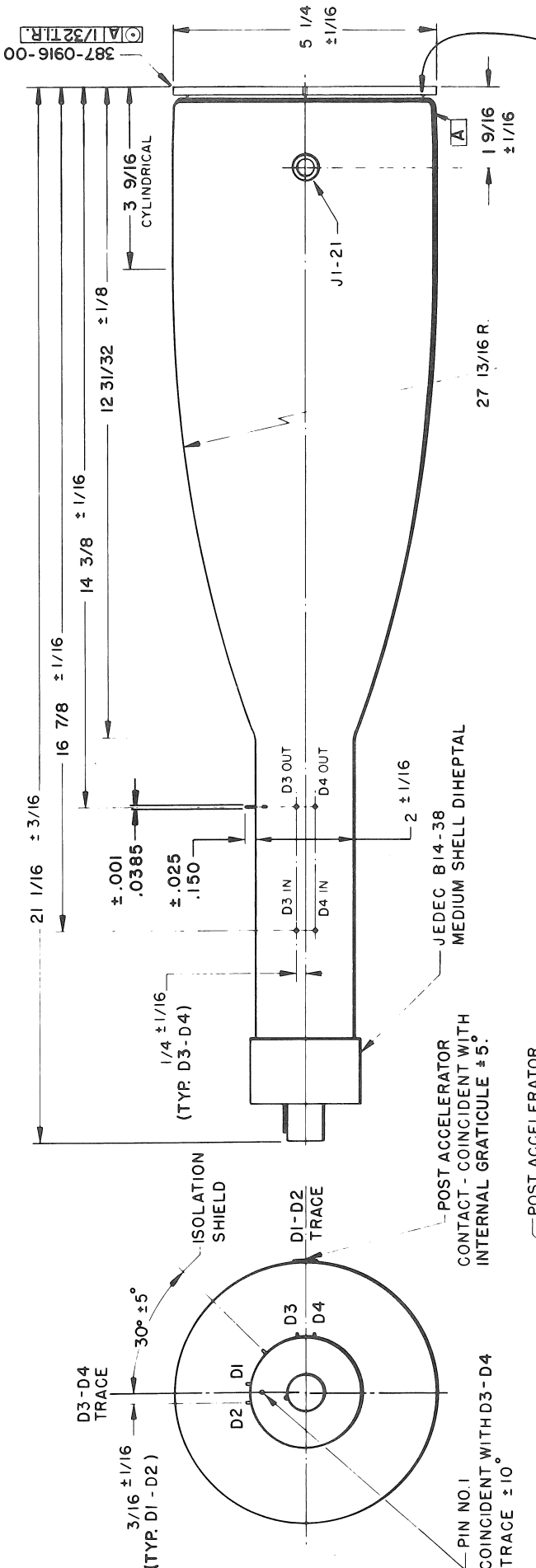
Post-accelerator voltage .....	10,000 volts DC
Lower helix and isolation shield voltage <sup>5</sup> .....	1575 to 1700 volts DC
D3-D4 shield voltage <sup>6</sup> .....	1650 volts DC
Average deflection plate voltage .....	1650 volts DC
Astigmatism electrode voltage <sup>7</sup> .....	1575 to 1850 volts DC
Focusing electrode voltage <sup>7</sup> .....	180 to 590 volts DC
Accelerator voltage .....	1700 volts DC
Grid no. 1 voltage <sup>8</sup> .....	-55 to -85 volts DC
Deflection factors:	
D1 and D2 .....	18.0 to 21.0 volts DC/cm
D3 and D4 .....	4.6 to 5.6 volts DC/cm
Useful scan D1-D2 <sup>9</sup> .....	10 cm
Useful scan D3-D4 <sup>9</sup> .....	4 cm
Focusing electrode current for any operating condition .....	-10 $\mu$ A to +10 $\mu$ A
Spot position (undeflected) <sup>10</sup> .....	$\pm$ 5 mm from geometric center
Pattern distortion at 100% useful scan <sup>11</sup> .....	1.65% max

MAXIMUM CIRCUIT VALUES

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

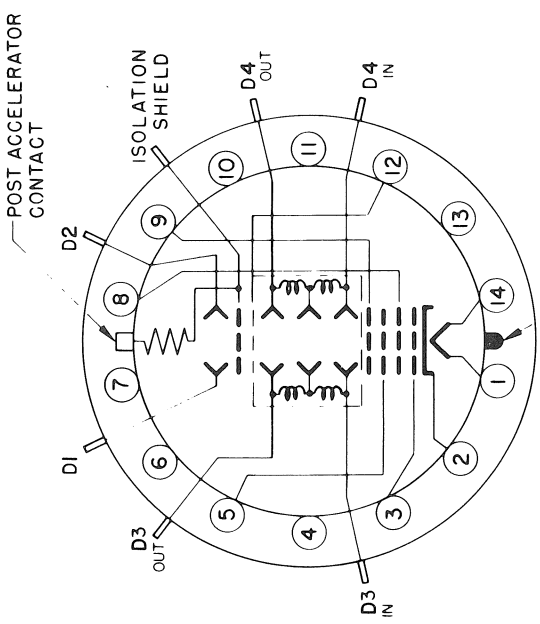
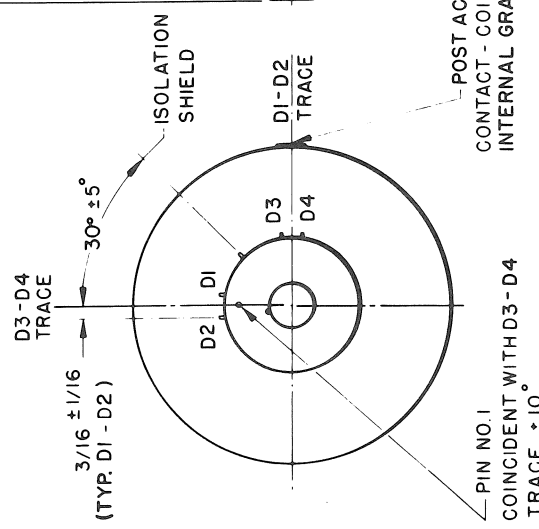
1. Internal graticule tubes only. See outline drawing.
2. Not including graticule lighting hardware. See outline drawing.
3. All voltages taken with respect to cathode.
4. This tube is designed for optimum performance when operating at a ratio of 6. Operation at other ratios may result in changes in deflection uniformity, pattern distortion, and/or useful scan.
5. The isolation shield and the lower end of the post-accelerator helix are connected internally. Pattern distortion is minimized by proper adjustment of this potential.
6. Adjustment of D3-D4 deflection shield voltage controls linearity and scan of the D3-D4 deflection system.
7. Recommended range. Adjust for best overall focus.
8. Visual extinction of undeflected spot.
9. The deflection plates intercept part of the electron beam near the edge of scan; therefore, a low-impedance deflection drive is desirable.
10. Connect free deflection electrodes to accelerator.
11. With a 4 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 2/3 mm total on the left and right edges, nor by more than 2/3 mm total at the top and bottom.



POINTS ON 387-0916-00  
TO BE OUTSIDE  
GRATICULE AREA

**BASE CONNECTIONS**

- 1, 14 HEATER
- 2 CATHODE
- 3 GRID NO. 1
- 4, 6, 7, 10, 11, 13 N. C.
- 5 FOCUSING ELECTRODE
- 8 ACCELERATOR
- 9 ASTIGMATISM ELECTRODE
- 12 D3-D4 SHIELD



**BASE SCHEMATIC**

MARK	DATE	DESCRIPTION	BY	APPR
		CATHODE-RAY TUBE DIVISION		
		<b>TEKTRONIX, INC.</b>		
		PORTLAND, OREGON, U.S.A.		
		TUBE TYPE:	<b>T5810-1</b>	
		DATE:	11/17/66	
		MOD.		