



CRT DATA

T5560

11-11-66

CRT Engineering

DESCRIPTION

The T5560 is a dual gun aluminized, five-inch, flat-faced cathode-ray tube designed for oscilloscope use. The T5560 has electrostatic focus and deflection, and a helical post accelerator. It is available with an internal graticule which can be illuminated.

ELECTRICAL DATA¹

Focusing method	Electrostatic
Deflecting method	Electrostatic
Heater voltage	6.3 volts RMS
Heater current at 6.3 volts (A & B guns together)	1.2 ±10% A
Direct interelectrode capacitance, approximate:	
Cathode to all other electrodes	5.9 pF
Grid no 1 to all other electrodes	9.6 pF
D1 to D2	2.4 pF
D3 to D4	1.3 pF
D1 to all other electrodes	6.9 pF
D2 to all other electrodes	6.9 pF
D3 to all other electrodes	4.6 pF
D4 to all other electrodes	4.6 pF
Post-accelerator helix resistance	200 MΩ min

MECHANICAL DATA

Overall length ²	20-13/16±3/16 in
Greatest bulb diameter ³	5-1/4±1/16 in
Minimum useful screen diameter	4-1/2 in
Bulb number	Special
Base	Special
Bulb contact	J121
Basing	Special
Base alignment:	
Base keyway aligns with D3D4 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 D1D2 and D3D4 trace	90°±1°
Gun to graticule alignment ²	±3°

RATINGS (design maximum values⁴)

Post-accelerator voltage	13,000 volts DC max
Lower helix and isolation shield voltage	2600 volts DC max
D3D4 shield voltage	2600 volts DC max

RATINGS, continued (design maximum values)

Intergun shield voltage	2600 volts DC max
Crosstalk shield voltage	2600 volts DC max
Average defl. plate voltage	2600 volts DC max
Ratio of post-accelerator voltage to average voltage of deflection plates ⁵	5 max
Astigmatism electrode voltage	2600 volts DC max
Focusing electrode voltage	900 volts DC max
Accelerator voltage	2600 volts DC max
Accelerator input	6 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 CONDITIONS⁴

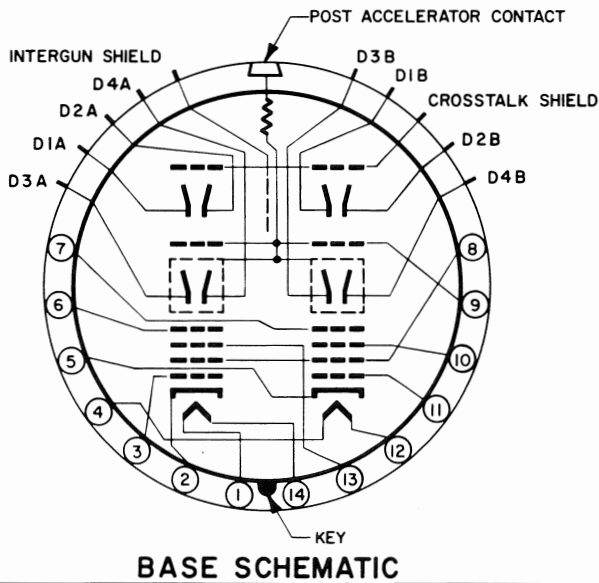
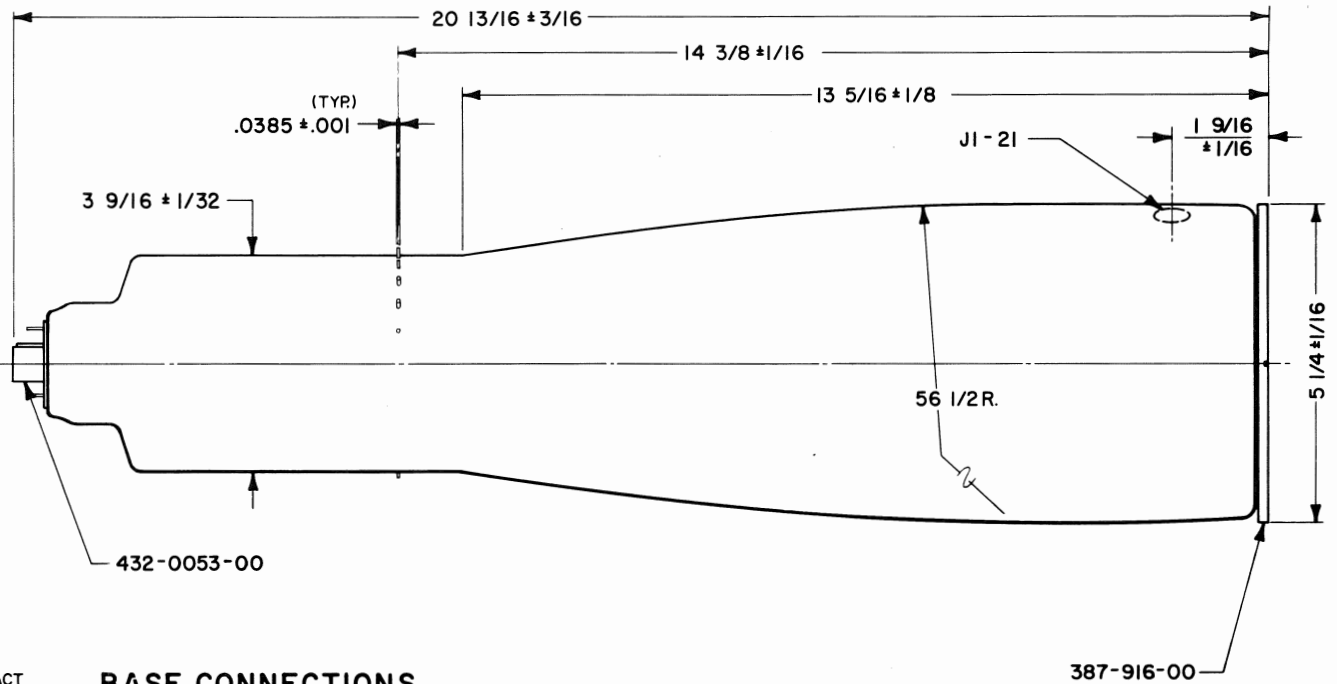
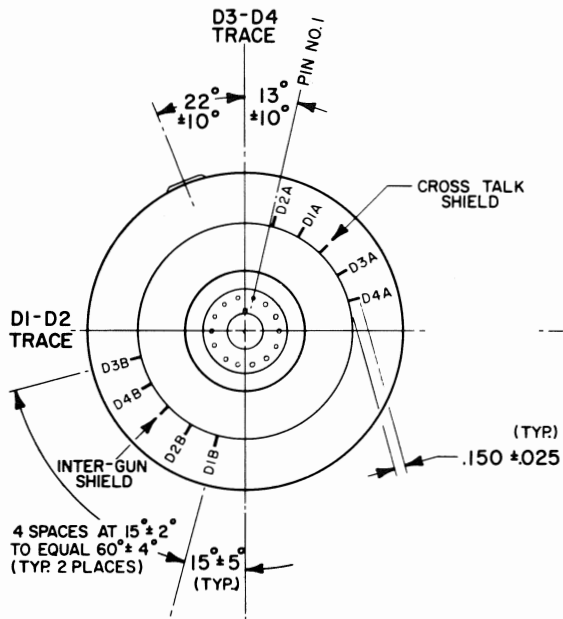
Post-accelerator voltage	10,000 volts DC
Lower helix and isolation shield voltage	2025 volts DC
D3-D4 shield voltage	2025 volts DC
Crosstalk shield voltage ⁶	1950 to 2150 volts DC
Intergun shield voltage ⁷	1950 to 2150 volts DC
Average D1-D2 plate voltage	2000 volts DC
Average D3-D4 plate voltage	2025 volts DC
Astigmatism electrode voltage ⁸	1955 to 2080 volts DC
Focusing electrode voltage ⁸	100 to 400 volts DC
Accelerator voltage	2080 volts DC
Grid no 1 voltage ⁹	-65 to -95 volts DC
Deflection factors:	
D1 and D2	18.5 to 22.2 volts DC/cm
D3 and D4	6.6 to 7.8 volts DC/cm
Useful scan D1-D2 ¹⁰	10 cm
Useful scan D3-D4 ¹⁰	6 cm
Focusing electrode current for any operating condition	-10 μ A to +10 μ A
Spot position (undeflected) ¹¹	
Horizontal	\pm 5 mm from graticule center
Vertical	\pm 6 mm from graticule center
Pattern distortion at 100% useful scan ¹²	1.5% max

MAXIMUM CIRCUIT VALUES

Grid no 1 circuit resistance	1.5 M Ω max
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NOTES

1. Data applies to A and B guns separately unless otherwise stated.
2. Internal graticule tubes only. See outline drawing.
3. Not including graticule lighting hardware. See outline drawing.
4. All voltages taken with respect to cathode.
5. This tube is designed for optimum performance when operating at ratio of 5. Operation at other ratios may result in changes in deflection linearity, pattern distortion and/or useful scan.
6. The crosstalk shield voltage is variable to provide for geometry control at outer edges of display.
7. The intergun shield voltage is variable to provide for geometry control at center of display.
8. Recommended range. Adjust for best overall focus.
9. Visual extinction of undeflected spot.
10. The deflection plates intercept part of the electron beam near the edge of scan; therefore, each deflection plate should be driven by a low-impedance source.
11. Connect free deflection electrodes to accelerator. Horizontal electrical center falls on vertical line bisecting tube face. Vertical electrical center of gun (A) falls one cm (above) horizontal line bisecting tube face, giving 2 cm separation between guns A and B.
12. With a 6 x 10 cm rectangular raster displayed about electrical center of gun A (or B), raster edges will not deviate from straight parallel lines by more than 1.0 mm total on left and right edges, nor by more than 1.0 mm total at top and bottom.



BASE CONNECTIONS

- 1, 14 HEATER - "A"
- 2 CATHODE - "A"
- 3 GRID NO. 1 - "A"
- 4 HEATER - "B"
- 5 CATHODE - "B"
- 6 ASTIGMATISM ELECTRODE - "A"
- 7 ASTIGMATISM ELECTRODE - "B"
- 8 ACCELERATOR
- 9 ISOLATION SHIELD
- 10 FOCUSING ELECTRODE - "B"
- 11 GRID NO. 1 - "B"
- 12 HEATER - "B"
- 13 FOCUSING ELECTRODE - "A"

MARK	DATE	DESCRIPTION	BY	APPR
		CATHODE-RAY TUBE DIVISION TEKTRONIX, INC. PORTLAND, OREGON, U.S.A.		
		TUBE TYPE: T5560--1	DATE:	
			MOD.	