



CRT DATA

T5033

1-4-65

DESCRIPTION

The T5033 is an aluminized, 4 x 5 inch rectangular, flat-faced cathode-ray tube designed for oscilloscope use. The T5033 has electrostatic focus and deflection. It is available either with or without a lighted internal graticule.

ELECTRICAL DATA

Focusing method	Electrostatic
Deflecting method	Electrostatic
Direct interelectrode capacitance, approximate:	
Cathode to all other electrodes	4.5 pf
Grid no. 1 to all other electrodes	8.3 pf
D1 to D2	2.9 pf
D3 to D4	1.9 pf
D1 to all other electrodes	5.8 pf
D2 to all other electrodes	5.8 pf
D3 to all other electrodes	3.8 pf
D4 to all other electrodes	3.9 pf
B2 to all other electrodes	8.3 pf

MECHANICAL DATA

Overall length ¹	16-3/8 ±1/8 inches
Greatest bulb dimensions ² :	
Width	5 ±1/16 inches
Height	4 ±1/16 inches
Minimum useful screen dimensions:	
Width	4 inches
Height	2-3/8 inches
Bulb number	Special
Base	B14-38
Basing	Special
Base alignment:	
Base keyway aligns with D1-D2 trace	±10°
Positive voltage on D1 deflects beam approximately toward pin no. 8	
Positive voltage on D3 deflects beam approximately toward pin no. 4	
Angle between D1-D2 and D3-D4 trace	90° ±1°
Gun to graticule alignment ¹	±3°

RATINGS (absolute maximum values)³

Heater voltage	6.3 volts ac
Heater current at 6.3 volts	0.6 ±10% amp
Screen voltage	4000 volts dc max
Isolation shield voltage	4000 volts dc max
Average deflection plate voltage	4000 volts dc max
Astigmatism electrode voltage	4000 volts dc max
Focusing electrode voltage	950 volts dc max
Accelerator voltage	4000 volts dc max
Blanking plate voltage	4000 volts dc max
Accelerator input	6 watts max
Grid no. 1 voltage:	
Negative-bias value	150 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 CONDITIONS³

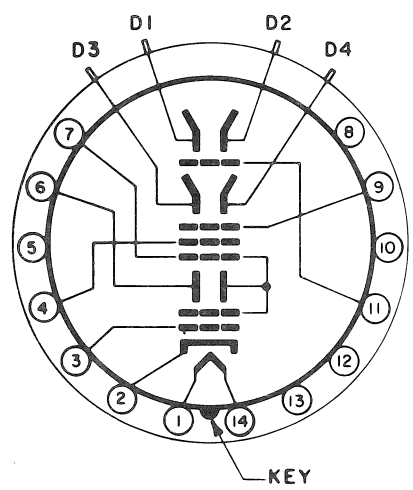
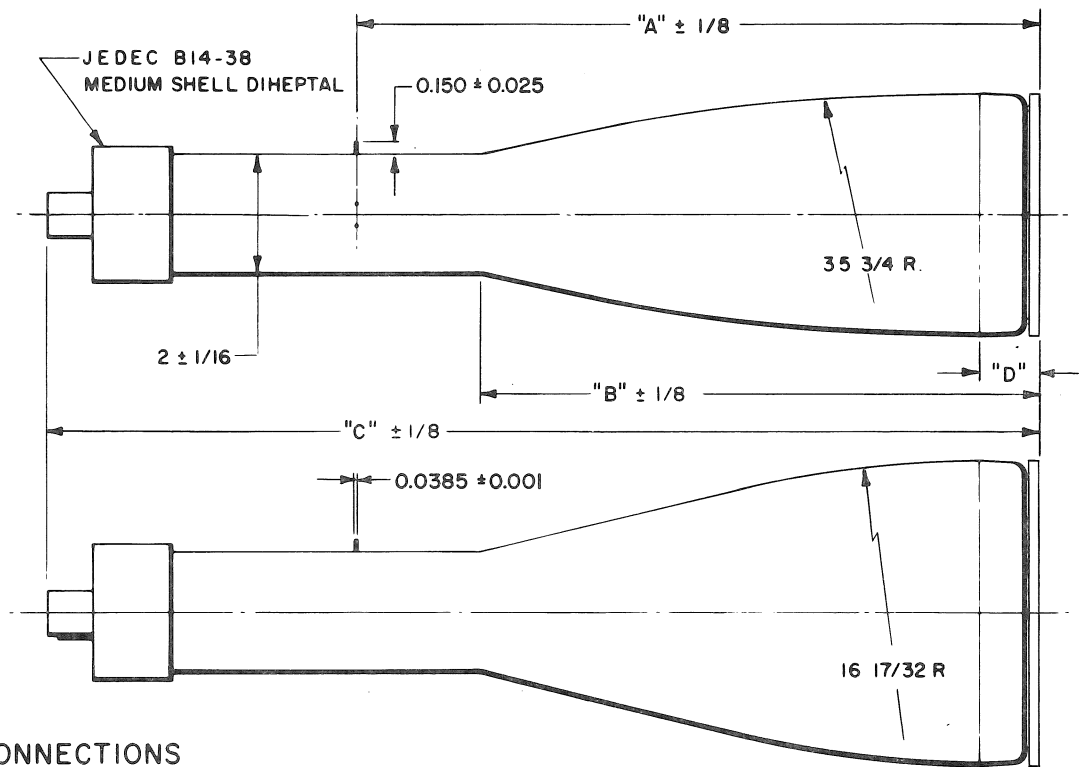
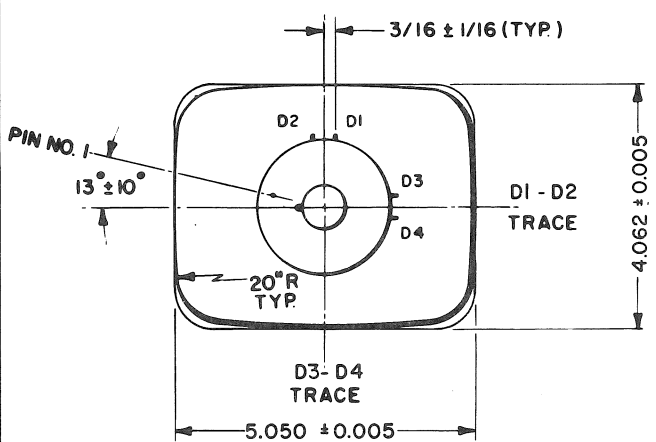
Screen voltage	3450 to 3550 volts dc
Isolation shield voltage ⁴	3450 to 3550 volts dc
Average deflection plate voltage	3500 volts dc
Astigmatism electrode voltage ⁵	3350 to 3650 volts dc
Focusing electrode voltage ⁵	460 to 820 volts dc
Accelerator and B1 blanking plate voltage	3500 volts dc
Grid no. 1 voltage ⁶	-53 to -88 volts dc
Deflection factors:	
D1 and D2	19.4 to 21.4 volts dc/cm
D3 and D4	11.1 to 12.3 volts dc/cm
Useful scan D1-D2 ⁷	10 cm
Useful scan D3-D4 ⁷	6 cm
Deflection blanking voltage (B1 to B2)	
For visual cut-off at $I_k = 200 \mu\text{a}$	±88 volts dc max
Focusing electrode current for any operating condition	-10 μa to +10 μa
Spot position (undeflected) ⁸	
Horizontal	±8.0 mm from geometric center
Vertical	±5.0 mm from geometric center
Pattern distortion at 100% useful scan ⁹	1.5% max

MAXIMUM CIRCUIT VALUES

Grid no. 1 circuit resistance 1.5 M Ω max

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. The isolation shield and conductive wall coating are connected internally. Pattern distortion is minimized by proper adjustment of this potential.
5. Recommended range. Adjust for best overall focus.
6. Visual extinction of undeflected spot.
7. The deflection plates intercept part of the electron beam near the edge of scan; therefore, a low-impedance deflection drive is desirable.
8. Connect free deflection electrodes to accelerator.
9. 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.



TUBE SCHEMATIC

BASE CONNECTIONS

- 1,14 HEATER
- 2 CATHODE
- 3 GRID NO.1
- 4 FOCUSING ELECTRODE
- 5,8,10 N.C.
- 12,13
- 6 (B2) BLANKING PLATE
- 7 ACCELERATOR
(B1) BLANKING PLATE RETURN
- 9 ASTIGMATISM ELECTRODE
- 11 ISOLATION SHIELD

TYPE	"A"	"B"	"C"	"D"
T5033-1 INT. GRATICULE	11 1/4	9 3/16	16 3/8	15/16
T5033 NON INT. GRAT.	11 1/16	9	16 3/16	3/4

MARK	DATE	DESCRIPTION	BY	APPR
	CATHODE-RAY TUBE DIVISION TEKTRONIX, INC. PORTLAND, OREGON, U.S.A.			
	TUBE TYPE: T5033, T5033-1		DATE: 7-16-64	MOD. A