



# TECHNICAL DATA

TEKTRONIX  
T310P\_\_

T3100

9/6/62

The Tektronix Type T310P\_\_ is a 3-inch flat-faced cathode ray tube with electrostatic focus and deflection. The T310P\_\_ was designed primarily for use in the Tektronix Type 310 General-Purpose Oscilloscope and Type 360 Indicator Unit.

## MECHANICAL SPECIFICATIONS:

Overall length .....	11 <sup>7</sup> / <sub>16</sub> ± 1/8 inches
Greatest diameter of bulb .....	3 <sup>1</sup> / <sub>16</sub> inches
Base .....	JEDEC NO. B12-43
Bulb and base alignment .....	See outline drawing

## ELECTRICAL DATA:

Heater voltage .....	6.3 volts RMS
Heater current .....	0.3 ± 10% ampere RMS
Capacitance, interelectrode (typical values)	
Grid No. 1 to all other electrodes .....	5.5 μμf
Cathode to all other electrodes .....	4.3 μμf
DJ <sub>1</sub> to DJ <sub>2</sub> .....	2.4 μμf
DJ <sub>1</sub> to all other electrodes except DJ <sub>2</sub> .....	6.0 μμf
DJ <sub>2</sub> to all other electrodes except DJ <sub>1</sub> .....	6.3 μμf
DJ <sub>3</sub> to DJ <sub>4</sub> .....	1.5 μμf
DJ <sub>3</sub> to all other electrodes except DJ <sub>4</sub> .....	4.3 μμf
DJ <sub>4</sub> to all other electrodes except DJ <sub>3</sub> .....	4.9 μμf

## Deflection polarity

Positive voltage on DJ<sub>1</sub> deflects beam approximately toward pin No. 3

Positive voltage on DJ<sub>3</sub> deflects beam approximately toward pin No. 12

## Geometry (measured under typical operating conditions)

Minimum useful scan DJ <sub>1</sub> -DJ <sub>2</sub> .....	10 div <sup>1</sup>
Minimum useful scan DJ <sub>3</sub> -DJ <sub>4</sub> .....	8 div <sup>1</sup>
Minimum quality screen area .....	2 <sup>3</sup> / <sub>4</sub> -inch circle
Trace orthogonality .....	90° ± 1°
Centering of undeflected spot with respect to geometric center (deflection electrodes connected to grid No. 5) .....	0.125 inch
Raster distortion .....	1.9% Max.

**MAXIMUM RATINGS (all measurements taken with respect to cathode):**

Accelerator and deflection system

(screen, 1st anode, 2nd anode, deflection plates, isolation shield) ..... 2500 volts Max.

Focus electrode

Voltage range ..... 0 to 2500 volts

Maximum current to focus electrode .....  $\pm 10 \mu a$

Peak voltage between electrodes

Plate to plate ..... 500 volts Max.

Plate to all other electrodes in the accelerator and deflection system ..... 500 volts Max.

Between any two electrodes in the accelerator and deflection system ..... 500 volts Max.

Grid No. 1 voltage

Negative bias value ..... 150 volts Max.

Positive bias value ..... 0 volts Max.

Peak positive bias value ..... 2 volts Max.

Peak heater-cathode voltage

Heater negative with respect to cathode ..... 125 volts Max.

Heater positive with respect to cathode ..... 125 volts Max.

Maximum average electrode power dissipation

1st anode ..... 3 watts Max.

**TYPICAL OPERATING CONDITIONS (all measurements taken with respect to cathode):**

Electrode designation

Symbol

Screen voltage .....	Esc	} 1750 to 1950 volts DC <sup>2</sup>
Isolation shield voltage .....	Eg5	
Grid No. 4 (astigmatism) .....	Eg4	
Grid No. 2 (1st anode) .....	Eg2	
Average of deflection plates .....	Edp	1840 volts DC
Grid No. 3 voltage (focus) .....	Eg3	300 to 650 volts DC <sup>3</sup>
Grid No. 1 voltage (control) .....	Eg1	-55 to -95 volts DC (cutoff)

Deflection factors (nominal) <sup>1,4</sup>

DJ<sub>1</sub>-DJ<sub>2</sub> ..... 21.2 volts/div

DJ<sub>3</sub>-DJ<sub>4</sub> ..... 14.6 volts/div

Useful scan<sup>1</sup>

DJ<sub>1</sub>-DJ<sub>2</sub> ..... 10 div

DJ<sub>3</sub>-DJ<sub>4</sub> ..... 8 div

DESIGN RANGES:

Minimum scan<sup>1</sup>

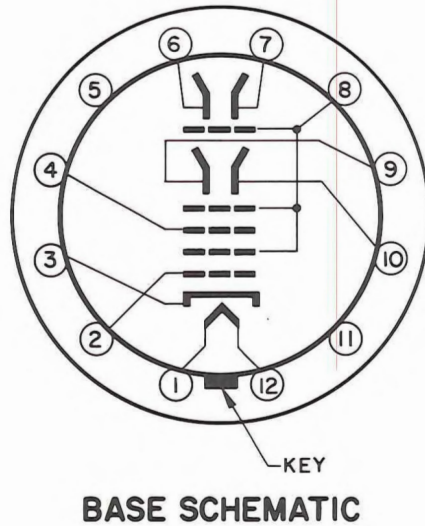
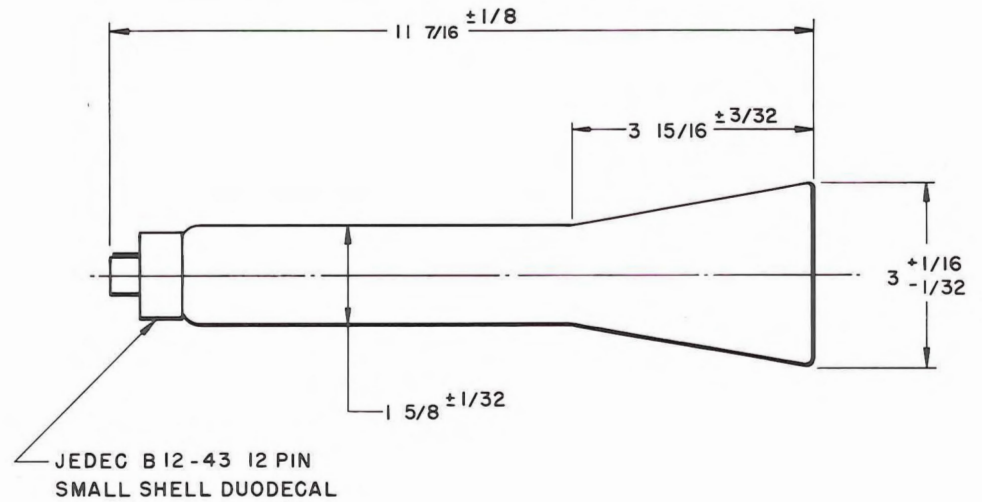
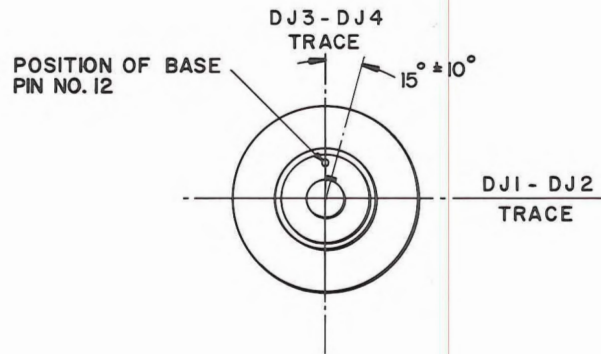
DJ <sub>1</sub> -DJ <sub>2</sub> .....	10 div
DJ <sub>3</sub> -DJ <sub>4</sub> .....	8 div

Deflection factors <sup>1,4</sup>

DJ <sub>1</sub> -DJ <sub>2</sub> .....	10.4 to 12.6 v/div/kv of Edp
DJ <sub>3</sub> -DJ <sub>4</sub> .....	7.1 to 8.8 v/div/kv of Edp
Grid No. 1 voltage for extinction of undeflected focused spot .....	5.2% of Edp
Focus electrode voltage (recommended range) .....	16% to 35% of Edp

NOTES:

1. Major graticule divisions are 0.25 inch.
2. The isolation shield, aquadag wall coating, Grid No. 4 (astigmatism), and Grid No. 2 (1st anode) are tied together internally. With the proper potential, pattern distortion is minimum and focus optimum.
3. Recommended range. Adjust for optimum focus.
4. The deflection plates intercept part of the electron beam near the edge of scan; therefore, a low-impedance deflection drive is desirable.



### BASE CONNECTIONS

- |      |  |
|------|--|
| 1,12 | HEATER   |
| 2    | GRID NO. 1   |
| 3    | CATHODE  |
| 4    | GRID NO. 3 (FOCUS)   |
| 5,11 | N.C.   |
| 6    | DJ1  |
| 7    | DJ2  |
| 8    | GRID NO. 2 (1 <sup>ST</sup> ANODE)<br>GRID NO. 4 (ASTIGMATISM)<br>ISOLATION SHIELD |
| 9    | DJ4  |
| 10   | DJ3  |

MARK	DATE	DESCRIPTION	BY	APPR
		CATHODE-RAY TUBE DIVISION <b>TEKTRONIX, INC.</b> PORTLAND, OREGON, U.S.A.		
		TUBE TYPE:	<b>T 310</b>	
			DATE:	8-3-62
			MOD.	<b>B</b>