TECHNICAL DATA

TEKTRONIX T5610

4/10/63

The Tektronix Type T5610 is a 4 x 5-inch ceramic rectangular flat-faced aluminized cathode ray tube with electrostatic focus and deflection. The T5610, which offers the internal-graticule option, is designed primarily for use in the Tektronix Type 561A General-Purpose Oscilloscope.

MECHANICAL SPECIFICATIONS:

Overall length	16½ ± ⅛ inches
Greatest width of bulb	5 5/16 inches
Greatest height of bulb	4 5/16 inches
Neck pin diameter	0.040 ± .002 inch
Base	JEDEC NO. B14-38
Bulb to gun alignment	± 3° [1]
Bulb and base alignment	See outline drawing

ELECTRICAL DATA:

Heater voltage	6.3 volts RMS
Heater current	0.6 ± 10% ampere RMS
Capacitance, interelectrode (typical values)	
Grid No. 1 to all other electrodes	8.3 μμf
Cathode to all other electrodes	4.9 μμf
DJ_1 to DJ_2	2.8 μμf
DJ_1 to all other electrodes except DJ_2	2.5 μμf
DJ_2 to all other electrodes except DJ_1	2.5 μμf
DJ_3 to DJ_4	1.4 μμf
DJ_3 to all other electrodes except DJ_4	2.1 μμf
DJ_4 to all other electrodes except DJ_3	1.9 μμf
BJ_2 to all other electrodes	8.4 μμf

Deflection polarity

Positive voltage on DJ_1 deflects beam toward pin No. 4

Positive voltage on DJ_3 deflects beam toward pin No. 8

Geometry (measured under typical operating conditions)

Minimum useful scan DJ_1-DJ_2	8 cm
Minimum useful scan DJ_3-DJ_4	10 cm
Minimum quality screen area	8 x 10 cm
Trace orthogonality	90° ± 1°
Centering of undeflected spot with respect to geometric center (deflection electrodes connected to grid No. 6)	8 mm Horiz. 3 mm Vert. [2]
Raster distortion	1.3% Max.

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

Accelerator and deflection system	
(screen, 1st anode, blanking plates, 2nd anode, deflection plates, isolation shield)	4000 volts Max.
Focus electrode	
Voltage range	0 to 4000 volts
Maximum current to focus electrode	± 10 μa
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 electrode power dissipation	
1st anode and blanking plates	3 watts Max.

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

Electrode designation	Symbol	
Screen voltage	Esc	3450 to 3550 volts DC[3]
Isolation shield voltage	Eg6	
Average of deflection plates	Edp	3500 volts DC
Accelerator voltage		
Grid No. 5 (astigmatism)	Eg5	3350 to 3650 volts DC[4]
Grid No. 2 and 3 (1st anode)	Eg2, 3	3500 volts DC
Blanking plate	BJ1	
Grid No. 4 voltage (focus)	Eg4	460 to 820 volts DC[4]
Grid No. 1 voltage (control)	Eg1	—53 to —88 volts DC (cutoff)

Deflection factors (nominal)

DJ_1-DJ_2	19.5 volts/cm
DJ_3-DJ_4	18.4 volts/cm

Useful scan[5]

DJ_1-DJ_2	8 cm
DJ_3-DJ_4	10 cm

Deflection blanking voltage (BJ_1-BJ_2)

For visual cutoff at $I_k = 200\ \mu a$	$\pm$ 88 volts

DESIGN RANGES:

Minimum scan[5]

DJ_1-DJ_2	8 cm
DJ_3-DJ_4	10 cm

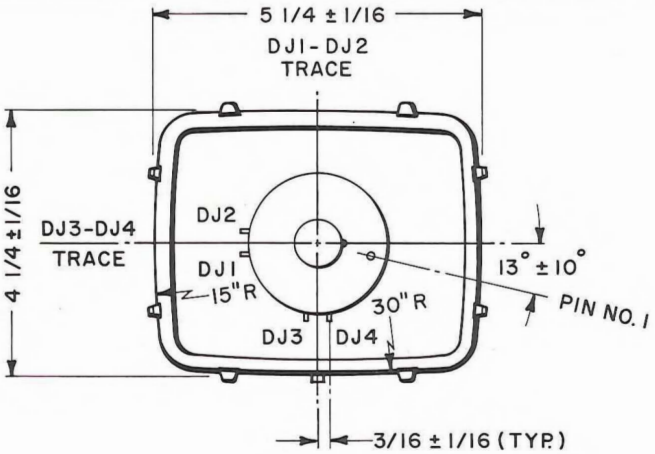
Deflection factors

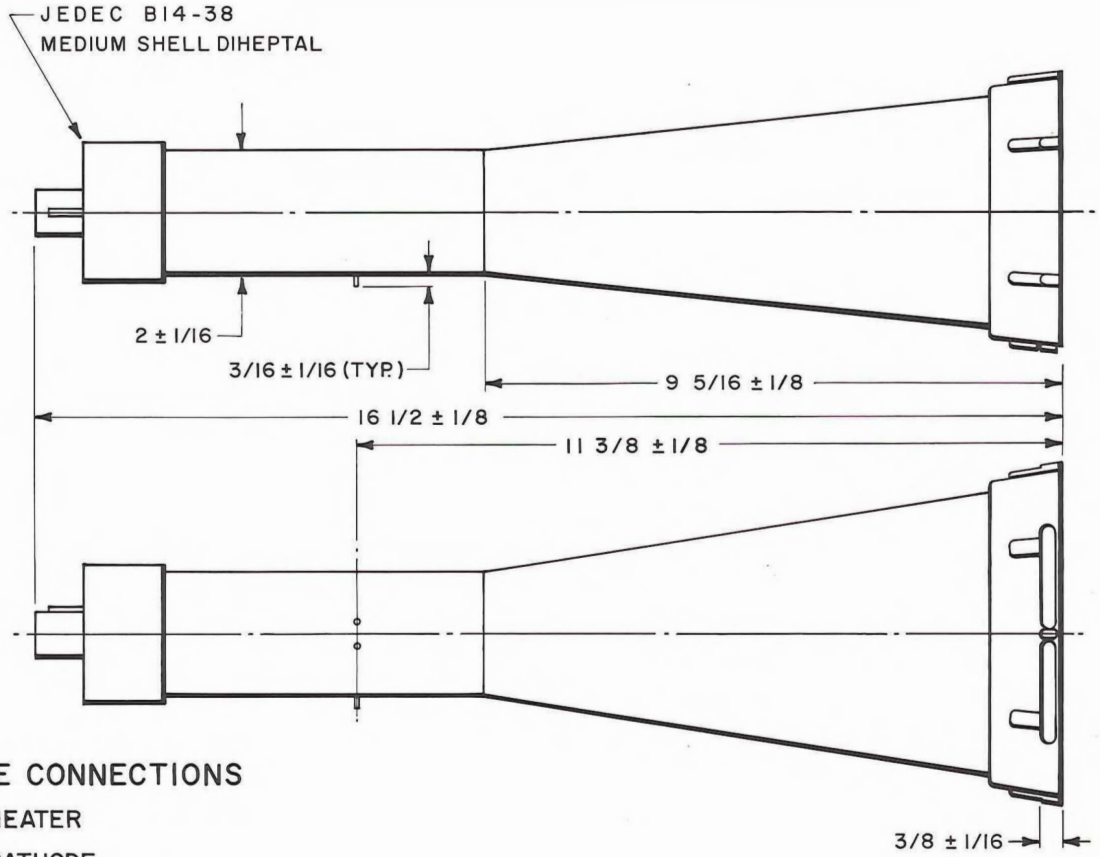
DJ_1-DJ_2	5.3 to 5.8 v/cm/kv of Edp
DJ_3-DJ_4	5.0 to 5.5 v/cm/kv of Edp

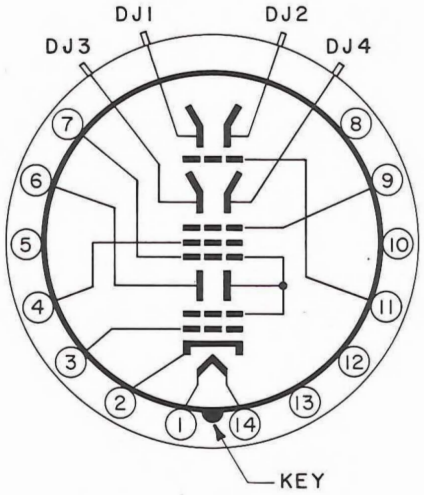
Grid No. 1 voltage for extinction of undeflected focused spot	3% of Edp
Focus electrode voltage (recommended range)	13% to 23% of Edp
Deflection blanking voltage (BJ_1-BJ_2) ($I_k = 200\ \mu a$)	2.5% of Edp

NOTES:

1. Where an internal graticule is used, it is the bulb reference.
2. For internal-graticule tubes only.
3. The isolation shield and conductive wall coatings are connected internally. Pattern distortion minimal with proper potential.
4. Recommended range. Adjust for optimum overall focus.
5. The deflection plates intercept part of the electron beam near the edge of scan; therefore, a low-impedance deflection drive is desirable.







BASE SCHEMATIC

BASE CONNECTIONS

1,14	HEATER
2	CATHODE
3	GRID NO.1 (CONTROL)
4	GRID NO.4 (FOCUS)
5,8,10 12,13	N.C.
6	BJ2 (BLANKING PLATE)
7	GRID NO.2,3 (FIRST ANODE) BJ1 (BLANKING PLATE RETURN)
9	GRID NO.5 (ASTIGMATISM)
11	GRID NO.6 (ISOLATION SHIELD)

MARK	DATE	DESCRIPTION	BY	APPR

CATHODE-RAY TUBE DIVISION
TEKTRONIX, INC.
PORTLAND, OREGON, U.S.A.

TUBE TYPE: T 5610

DATE: 1/18/63

MOD. A

T5610 PERFORMANCE CURVES are included in a combination T5032-T5610 publication.

Refer to T5032 section for further information.

TECHNICAL DATA

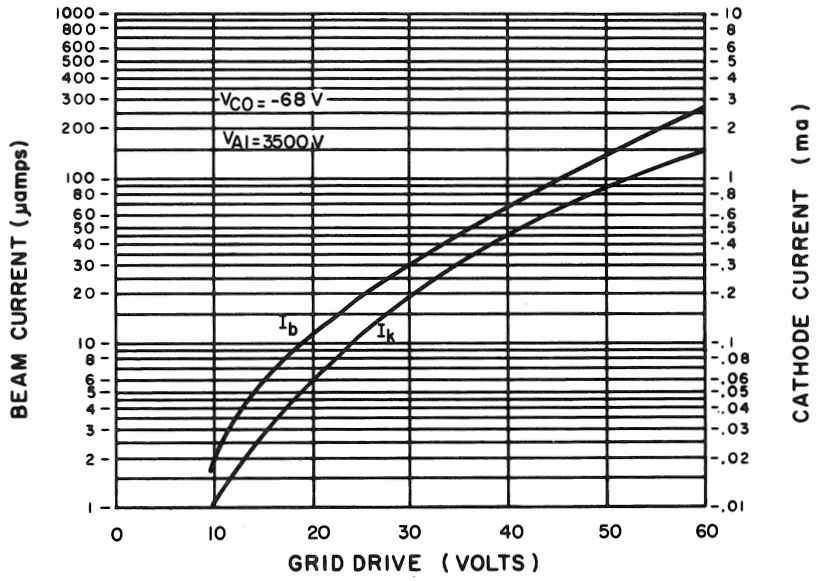
PERFORMANCE CURVES
T5032
T5610

LIMITED DISTRIBUTION 4/17/64

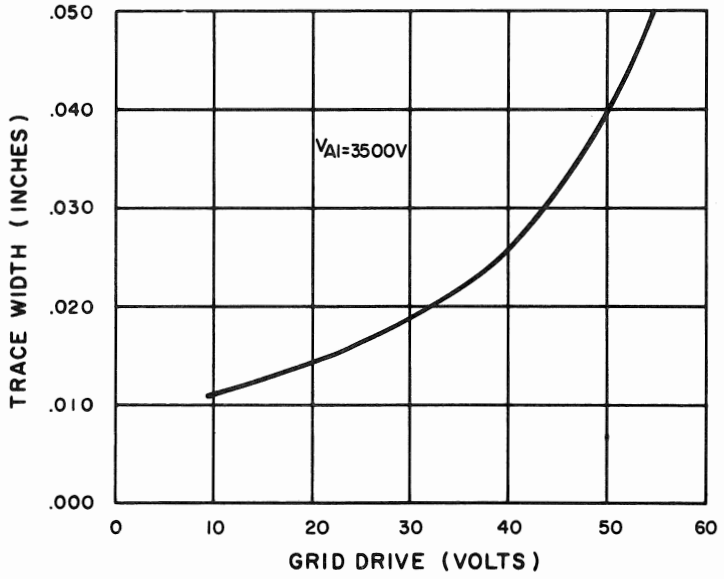
All measurements taken with voltages specified under Typical Operating Conditions on the T5032-T5610 Technical Data Sheet. This data is representative of the CRT alone dissociated from any operating circuitry.

AVERAGE GRID-DRIVE CHARACTERISTICS:

Grid drive measured as volts above cutoff.

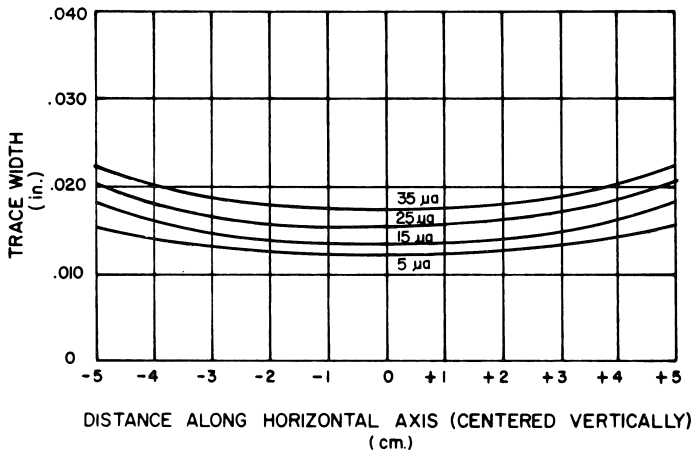


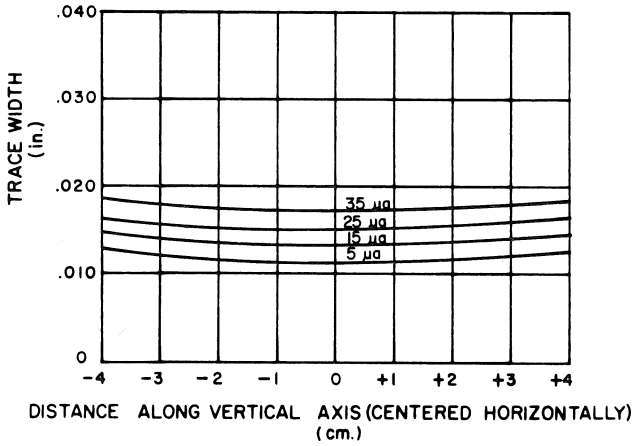
AVERAGE CENTER-SPOT-SIZE CHARACTERISTICS:



TRACE WIDTH VERSUS LOCATION ALONG AXIS:

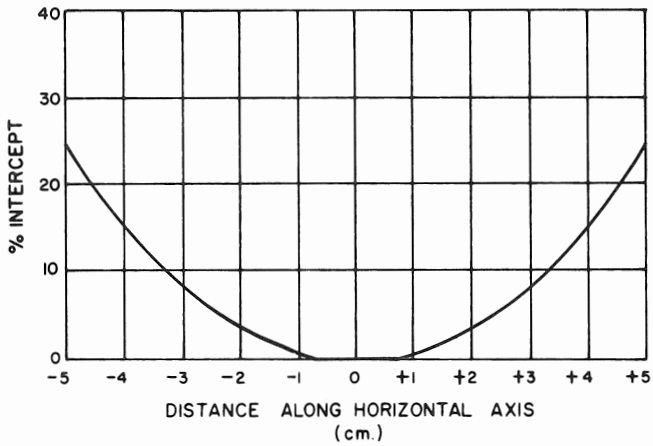
All trace width measurements taken using shrinking raster method with 11-line raster at 2 kc rep-rate.



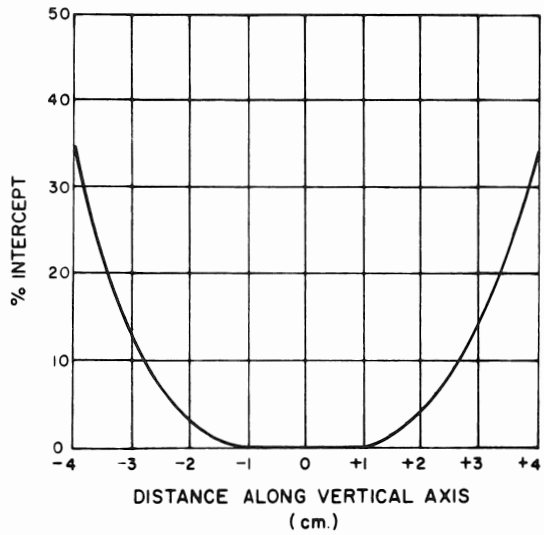


DEFLECTION PLATE I_b INTERCEPT:

Taken at normal viewing currents of 1-2 μamps.



(CENTERED VERTICALLY)



(CENTERED HORIZONTALLY)

LINEARITY CHARACTERISTICS:

Percent departure from the deflection factor measured at the axis.