CRT DATA

T5470

10-14-64

DESCRIPTION

The T5470 is an aluminized, 5-inch, flat-faced cathode-ray tube designed for oscilloscope use. The T5470 has electrostatic focus and deflection, and a helical post accelerator. 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	4.8 pf
Grid no. 1 to all other electrodes	8.4 pf
D1 to D2	2.4 pf
D3 to D4	1.3 pf
D1 to all other electrodes	5.8 pf
D2 to all other electrodes	5.9 pf
D3 to all other electrodes	4.3 pf
D4 to all other electrodes	4.3 pf
Post-accelerator helix resistance	200 MΩ min

OPTICAL DATA

Phosphor Number	P1	P2	P7	P11	P31
Fluorescent color	Green	Blue-green	Blue-white	Blue	Green
Phosphorescent color	Green	Green	Yellow	Blue	Green
Persistence	Medium	Medium-short	Long	Medium-short	Medium

Faceplate ..... clear, flat

MECHANICAL DATA

Overall length[1]	20-7/16 ±3/16 inches
Greatest diameter of bulb[2]	5-1/4 ±1/16 inches
Minimum useful screen diameter	4-1/2 inches
Bulb number	J42ZL1A
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[1]	±3°

RATINGS (absolute maximum values)[3]

Heater voltage	6.3 volts ac
Heater current at 6.3 volts	0.6 ±10% amp
Post-accelerator voltage	13000 volts dc max
Lower helix and isolation shield voltage	2600 volts dc max
D3-D4 shield voltage	2600 volts dc max
Average deflection plate voltage	2600 volts dc max
Ratio of post-accelerator voltage to average voltage of deflection plates[4]	5 max
Astigmatism electrode voltage	2600 volts dc max
Focusing electrode voltage	880 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	550 volts dc max

TYPICAL OPERATING CONDITIONS[3]

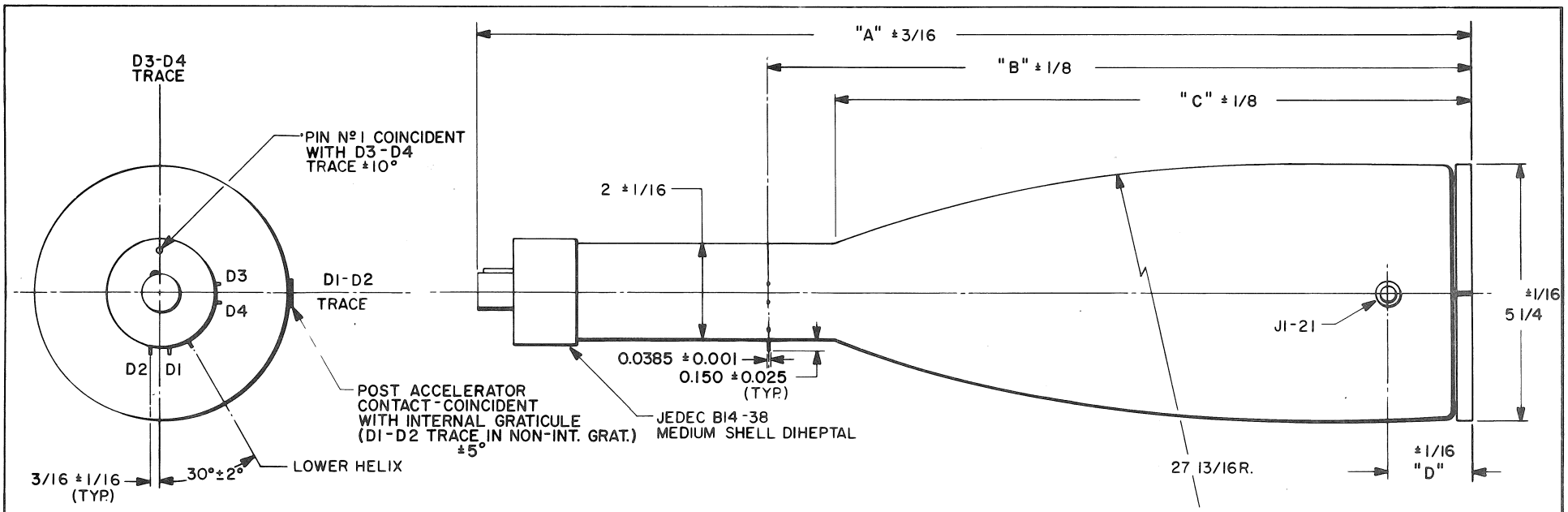
Post-accelerator voltage	10000 volts dc
Lower helix and isolation shield voltage[5]	1945 to 2080 volts dc
D3-D4 shield voltage[6]	1990 volts dc
Average deflection plate voltage	2000 volts dc
Astigmatism electrode voltage[7]	1945 to 2080 volts dc
Focusing electrode voltage[7]	100 to 400 volts dc
Accelerator voltage	2000 volts dc
Grid no. 1 voltage[8]	-65 to -95 volts dc
Deflection factors:	
D1 and D2	18 to 22 volts dc/cm
D3 and D4	6.6 to 7.8 volts dc/cm
Useful scan D1-D2[9]	10 cm
Useful scan D3-D4[9]	6 cm
Focusing electrode current for any operating condition	-10 μa to +10 μa
Spot position (undeflected)[10]	5 mm from geometric center
Pattern distortion at 100% useful scan[11]	1.5% max

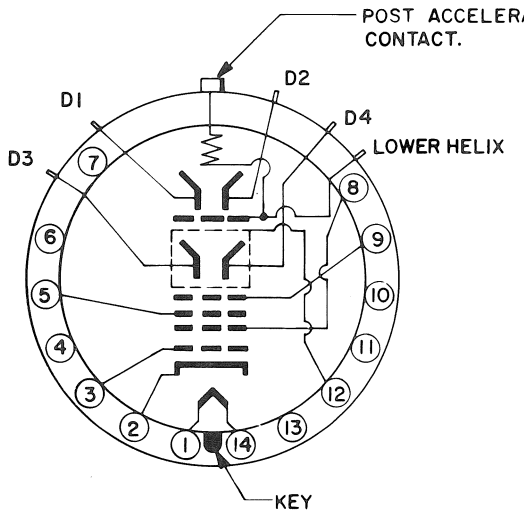
MAXIMUM CIRCUIT VALUES

Grid no. 1 circuit resistance ..... 1.5 MΩ 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. This tube is designed for optimum performance when operating at a ratio of 5. 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 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
4,6,7, 10,11,13	N.C.
5	FOCUSING ELECTRODE
8	ACCELERATOR
9	ASTIGMATISM ELECTRODE
12	D3 – D4 SHIELD

TYPE	"A"	"B"	"C"	"D"
INT. GRATICULE	20 7/16	14 3/8	12 31/32	1 9/16
NON INT. GRAT.	20 1/4	14 3/16	12 25/32	1 3/8

MARK	DATE	DESCRIPTION	BY	APPR

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

TUBE TYPE: T5470

DATE: 9-29-64

MOD. D