5DNP- CATHODE RAY TUBE

The E.T.C. 5DNP- is a five inch diameter, flat face, single gun electrostatic deflection and focus cathode-ray tube. The tube features a post-accelerator and is designed to operate at high voltages with a resultant high brightness and small spot size. The deflection plate leads and Anode connections are brought out through the neck of the tube to minimize lead inductance and capacitance. The gun is designed to draw negligible focusing electrode current.

GENERAL CHARACTERISTICS

Electrical Data

Heater Voltage	6.3 ± 10% Volts
Heater Current	.6 ± 10% Amperes
Focusing Method	Electrostatic
Deflecting Method	Electrostatic

Phosphor	No. 1	No. 2	No. 7	No. 11	No. 19 (Note 1)
Fluorescence	Green	Green	Blue	Blue	Yellow-Orange
Phosphorescence	- - -	Green	Yellow	- - -	- - - -
Persistence	Medium	Long	Long	Short	Medium-Long

Direct Interelectrode Capacitances	Max.
Grid #1 to all other electrodes	7.9 uuf
Cathode to all other electrodes	5.8 uuf
D1 to D2	3.1 uuf
D3 to D4	1.3 uuf
D1 to all	5.1 uuf
D2 to all	5.1 uuf
D3 to all	4.0 uuf
D4 to all	4.0 uuf

Mechanical Data

Overall Length	16-3/4 ± 3/16 Inches
Greatest Bulb Diameter	5-1/4 ± 3/32 Inches
Minimum Useful Screen Diameter	4-1/2 Inches
Bulb Contacts	J1-25
Bulb Contact	J1-22
Base	B12-37
Basing	14Q

Base Alignment
- D3D4 trace aligns with Pin #2 and Tube Axis ±10 Degrees
- Positive voltage on D1 deflects the beam approx. towards Pin #5
- Positive voltage on D3 deflects the beam approx. towards Pin #2

Bulb Contact Alignment
- J1-22 contact aligns with 1D2 trace ±10 Degrees
- J1-22 contact on same side as No. Pin 5

Trace Alignment
- Angle between D1D2 and D3D4 trace 90 ± 1 Degrees

from JEDEC release #3356, July 31, 1961

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MAXIMUM RATINGS - Design Center Values

Post-Accelerator Voltage	16,000 Max. Volts D-C
Accelerator Voltage	8,000 Max. Volts D-C
Ratio-Post-Accelerator Voltage to Accelerator Voltage (Note 2)	2.0 Max.
Focusing Voltage	1,750 Max. Volts D-C
Grid #1 Voltage	
Negative Bias Value	200 Max. Volts D-C
Positive Bias Value	0 Max. Volts D-C
Positive Peak Value	2 Max. Volts D-C
Peak Heater to Cathode Voltage	
Heater Negative with respect to Cathode	180 Max. Volts
Heater Positive with respect to Cathode	180 Max. Volts
Peak Voltage between Accelerator and any Deflection Electrode	750 Max. Volts

TYPICAL OPERATING CONDITIONS

For Post-Accelerator Voltage of	10,000	Volts D-C
For Accelerator Voltage of	5,000	Volts D-C
Focusing Voltage	1250 to 1550	Volts D-C
Grid #1 Voltage (Note 3)	-53 to -87	Volts D-C
Modulation Factor (Note 4) (For P19)	18	Volts Max.
Line Width A (Note 5)	.3	MM
Line Width B (Note 5)	.35	MM
Deflection Factors		
D1 and D2	135 to 165	Volts D-C/Inch
D3 and D4	100 to 125	Volts D-C/Inch
Deflection Factor Uniformity (Note 6)	2%	Max.
Spot Position (Note 7) within 5/16 Inch Square		
Useful Scan		
1D2	4-1/2	Inches Min.
3D4	4-1/2	Inches Min.

CIRCUIT DESIGN VALUES

Focusing Current for any operating condition	-15 to +10 Microamperes
Grid #1 Circuit Resistance	1.5 Max. Megohms
Resistance in any deflecting-electrode circuit (Note 8)	1 Megohms

NOTES:

1 - The tube can be severely and permanently damaged if the current density on the P19 is allowed to rise too high in static tests. For this reason, the length of time during which the screen is bomarded should be kept as short as possible and I_{b3} limited to 5 uA max.

2. This tube is designed for optimum performances when operating at an Eb_3/Eb_2 ratio of 2.0. Operation at other ratios may result in changes in deflection uniformity, pattern distortion and useful scan.

3. Visual extinction of undeflected, focused spot.

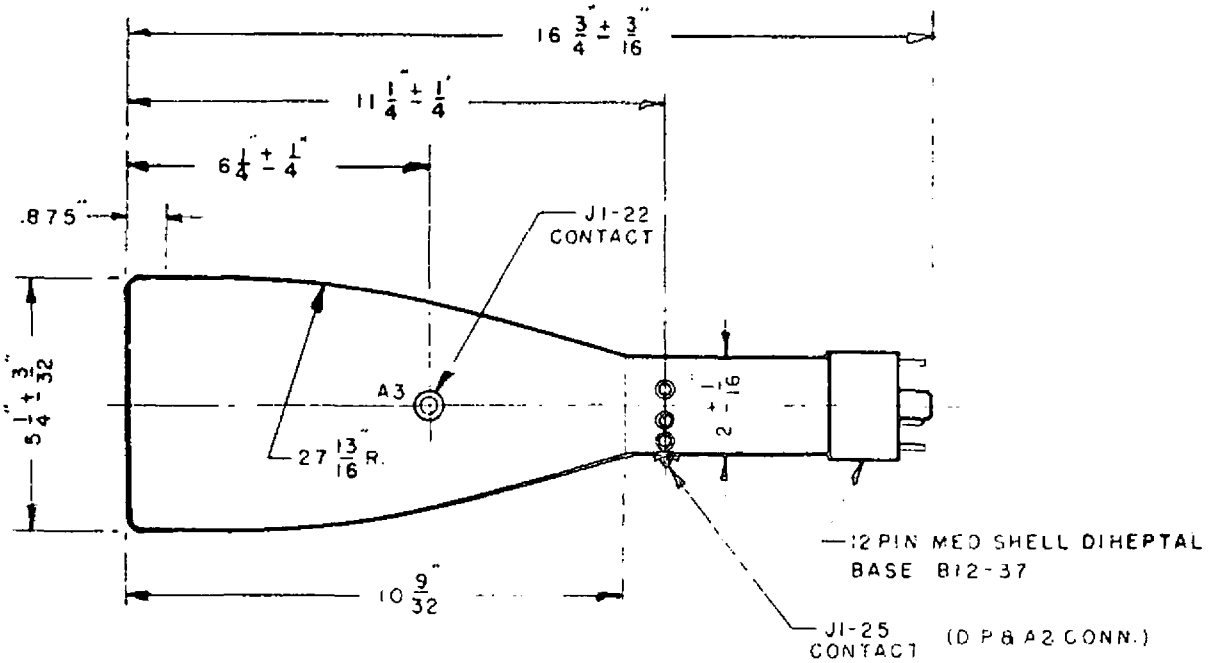
4 - The increase in Grid Voltage from cutoff to produce an I_{b3} of 5 uAdc for P19 screen.

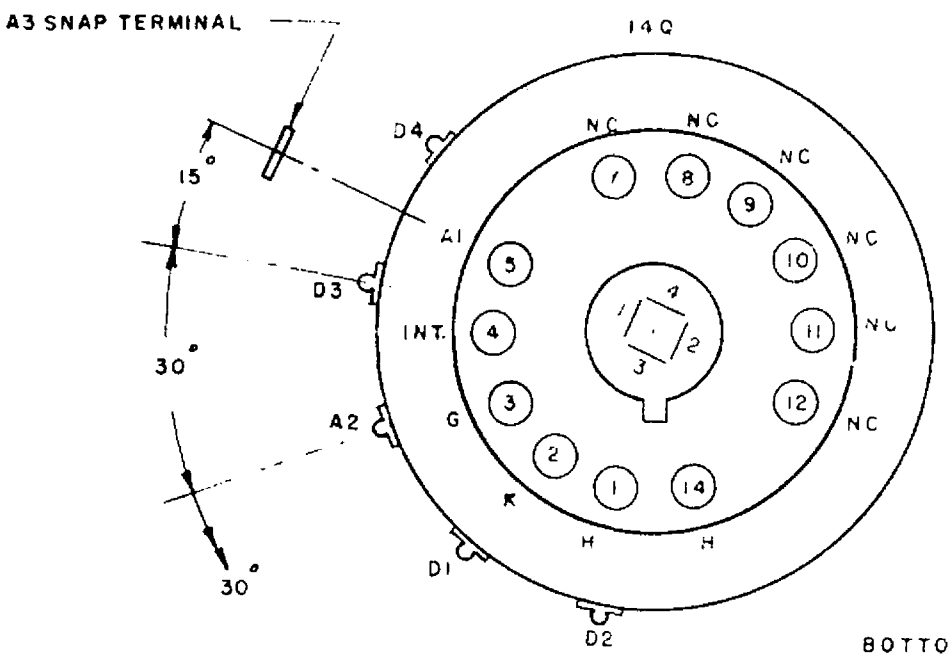
5 - Measured in accordance with MIL-E-1 specifications using an I_{b3} of 2 uAdc for P19 screen.

6 - The deflection (for both D1D2 and D3D4 plate pairs separately) for a deflection of less than 75% of the useful scan will not differ from the deflection factor for a deflection at 25% of the useful scan by more than the indicated value.

7 - Centered with respect to the tube face with the tube shielded.

8 - It is recommended that the deflecting electrode circuit resistance be approximately equal. Higher resistance values up to five megohms may be used for low current operation.





BOTTOM VIEW OF BASE AND NECK CONNECTIONS

NOTE:

1. + ID2 PIN 5
2. GRID NO.2 AND ANODE NO.2 ARE CONN. INTERNALLY AND REFERRED TO AS A2

ETC	ELECTRONIC TUBE CORPORATION PHILADELPHIA PA.		
TITLE	5DNP TUBE OUTLINE DRAWING		
TOLERANCES	DEC.	FRAC.	ANG.
ENG.		DATE 1-27-61	APP.
DR. H. WARREN		SCALE 1/4" = 1"	DRAWING NO. A-3648
CKD. H. Warren		REV. WAS 51TCP	