



7BJF2 CATHODE RAY TUBE

The ETC Type 7BJF2 is a 7" diagonal square face, five beam electrostatic deflection and focus cathode ray tube. Each beam is independently controllable, utilizes limited available scan with increased deflection sensitivity in the D3D4 direction and is so positioned that they scan separate areas of the screen. The deflection electrode and acceleration electrode connections are brought out through the bulb wall to minimize lead inductance and capacity and to improve insulation. A collar or ring base provides ease of connection to these leads.

GENERAL CHARACTERISTICS

Electrical Data

Heater Voltage 6.3 Volts  
 Heater Current 0.3 ± 10% Amperes

Focusing Method Electrostatic  
 Deflecting Method Electrostatic

Phosphor	P1	P2	P7	P11
Fluorescence	Green	Green	Blue	Blue
Phosphorescence	Green	Green	Yellow	Blue
Persistence	Medium	Long	Long	Short

Direct Interelectrode Capacitances		Max.
Cathode to all other electrodes	4.9	6.5 uuf
Grid #1 to all other electrodes	4.8	7.0 uuf
D1 to D2		2.7 uuf
D3 to D4		3.2 uuf
D1 to all other electrodes except D2		8.1 uuf
D2 to all other electrodes except D1		8.0 uuf
D3 to all other electrodes except D4		7.8 uuf
D4 to all other electrodes except D3		7.8 uuf

Mechanical Data

Overall Length 18-1/2 ± 3/8 Inches  
 Greatest Bulb Diameter 7-1/32 Inches  
 Minimum Useful Screen Diameter 4.5 Inches  
 Bulb Contact J1-22  
 Base Special  
 Base Alignment  
 D3D4 trace aligns with Pin #8 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 #1  
 Bulb Contact Alignment  
 J1-22 contact aligns with D3D4 trace ±10 Degrees  
 J1-22 contact on same side as Pin #1  
 Trace Alignment  
 Angle between D3D4 and D1D2 trace 90 ± 2 Degrees

MAXIMUM RATINGS Design Center Values

Post-Accelerator Voltage 7700 Max. Volts D=C  
 Accelerator Voltage (Note 1) 3850 Max. Volts D=C

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MAXIMUM RATINGS (CONT'D)

Ratio Post-Accelerator Voltage to Accelerator Voltage	2.0 Max.
Focusing Voltage	1650 Max. Volts D-C
Grid No. 1 Voltage	
Negative Bias Value	200 Max. Volts D-C
Positive Bias Value	0 Max. Volts D-C
Positive Peak Value	0 Max. Volts D-C
Peak Heater to Cathode Voltage	
Heater Negative with respect to Cathode	180 Max. Volts D-C
Heater Positive with respect to Cathode	180 Max. Volts D-C
Peak Voltage between Accelerator and any Deflection Electrode	1250 Max. Volts D-C

TYPICAL OPERATING CONDITIONS

For Post-Accelerator Voltage of	4000 Volts D-C
Accelerator Voltage of	2000 Volts D-C
Focusing Voltage	450 to 650 Volts D-C
Grid #1 Voltage (Note 2)	-50 to -90 Volts D-C
Modulation Factor (Note 3)	.55 Volts D-C
Line Width "A" (Note 4)	.65 mm
Deflection Factors	
D1 and D2	68 to 84 Volts D-C/Inch
D3 and D4 (Note 8)	27 to 37 Volts D-C/Inch
Deflection Factor Uniformity (Note 5)	2% Maximum
Useful Scan (Note 6)	
D1D2	4.5 Inches
D3D4	1.5 Inches
Interaction Factor	.00001 Max. Inches/Volts D-C

CIRCUIT DESIGN VALUES

Focusing Voltage	225 to 350 Volts per KV of Accelerator Voltage
Focusing Current for any operating condition	-15 to +10 Microamperes
Grid #1 Voltage (Note 2)	-25 to -45 Volts per KV of Accelerator Voltage
Deflection Factors:	
Post-Accelerator Voltage = Accelerator Voltage	
D1 and D2	25 to 37.5 Volts D-C/Inch/KV of Accelerator Voltage
D3 and D4	11.5 to 19 Volts D-C/Inch/KV of Accelerator Voltage
Resistance in any Deflecting-Electrode Circuit (Note 7)	1.0 Max. Megohms

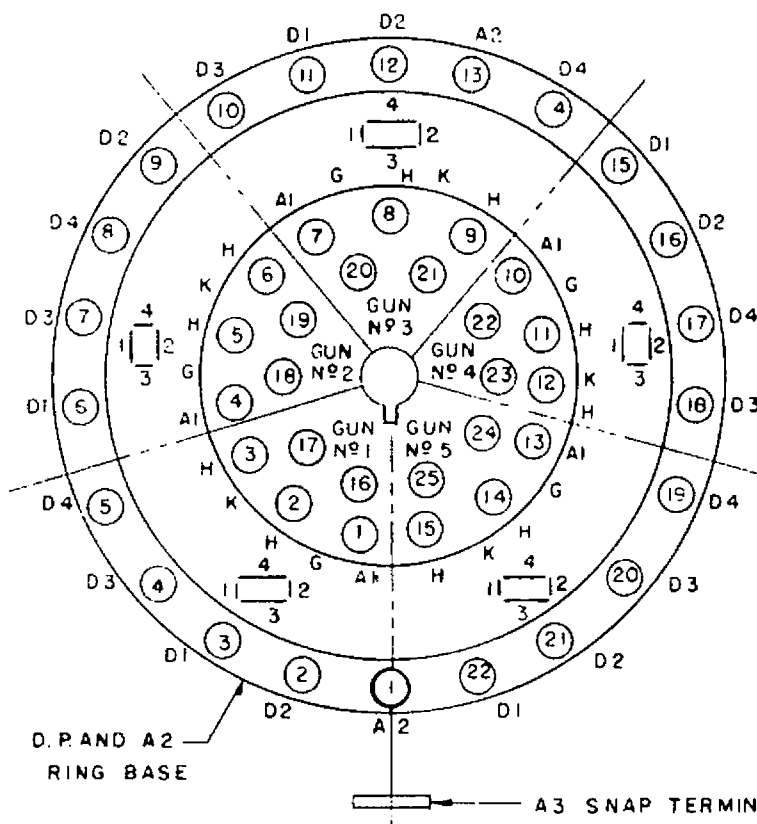
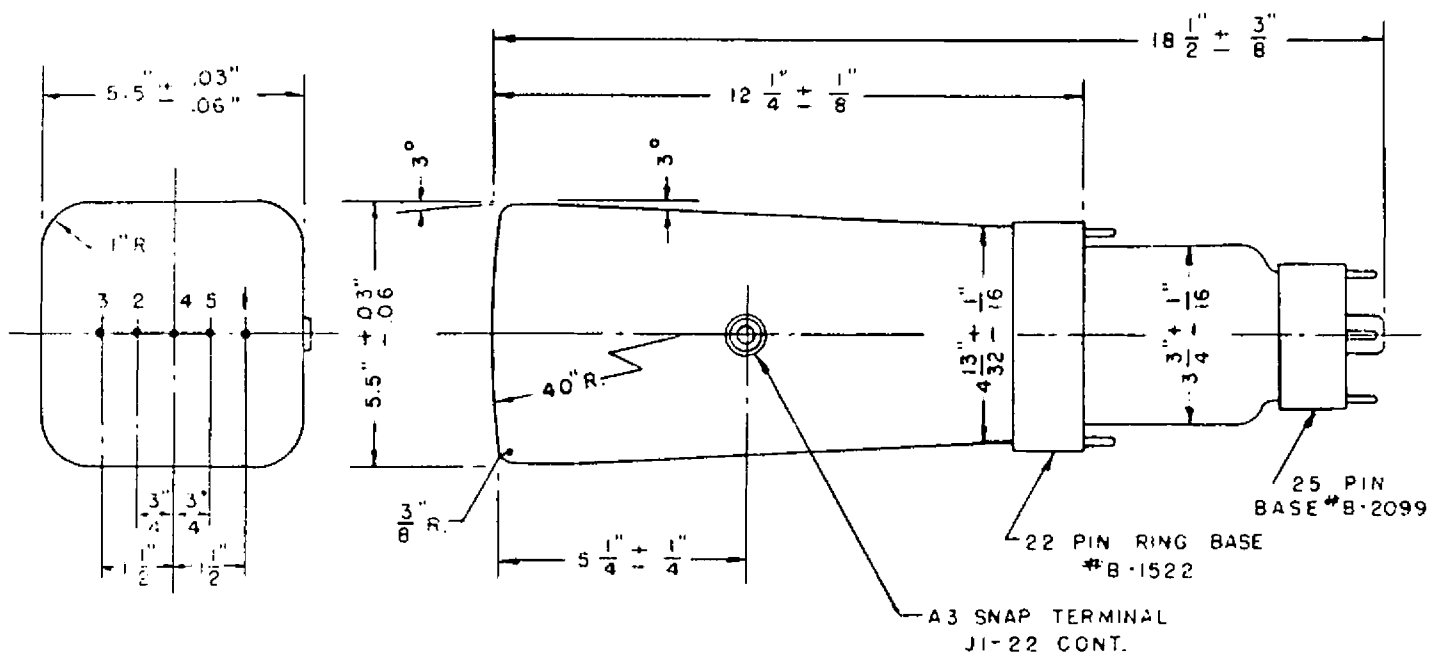
7BJ NOTES:

- 1 - Accelerator Power Input (Avg.) should be limited to 6 watts.
- 2 - Visual extinction of the undeflected, focused spot.
- 3 - Increase in Grid Voltage from cutoff to produce an  $I_{b3}$  of 50  $\mu$ Adc.
- 4 - Measured in accordance with JAN-1A Specifications dated 29 May, 1949 with an  $I_{b3}$  of 25  $\mu$ Adc.
- 5 - The deflection factor (for both D1D2 and D3D4 plate pairs, separately) for deflections of less than 75% of the useful scan will not differ from the deflection factor for a deflection of 25% of the useful scan by more than the indicated value.
- 6 - Centered about normal undeflected spot position.
- 7 - It is recommended that the deflecting electrode circuit resistances be approximately equal, otherwise beam shift at high drives can be expected - Higher

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7BJP2 NOTES (CONT'D):

- 7 - resistance values up to five megohms may be used for low beam current operation.
- 8 - The Deflection in the direction is limited to  $\pm .75$  inches minimum from the undeflected spot position.



BOTTOM VIEW OF  
BASE CONNECTIONS

NOTE:  
THE UNDEFLECTED SPOT FROM  
ANY GUN FALLS WITHIN A CIRCLE  
OF  $\frac{5}{16}$ " RADIUS WHOSE CENTER IS  
AT THE NUMBER CORRESPONDING TO  
THE GUN NUMBER.

		<b>ELECTRONIC TUBE CORPORATION</b>	
PHILADELPHIA, PA.			
TITLE <b>7BJP TUBE OUTLINE DRAWING</b>			
TOLERANCES		DEC.	FRAC.
ENG.		DATE	APP. <i>H. Warren</i>
DR. J. E. G. JR.		SCALE $\frac{1}{4}" = 1"$	DRAWING NO.
CKD. <i>H. Warren</i>		REV. REDRAWN	<b>A-3797</b>