



CATHODE-RAY TUBE

TYPE 5BWP-

The Type 5BWP- is a high voltage, 5-inch, flat face, electrostatic focus and deflection cathode-ray tube. The tube features a linear post accelerator - a spiral resistance winding - which extends from the tube face to the deflection plate region, allowing for a gradual voltage gradient. Other features of the 5BWP- are high deflection sensitivity coupled with high writing rate, astigmatism and pattern adjustment controls to insure distortionless displays.

An aluminized screen is provided for maximum light output and stability.

The 5BWP- is similar to the 5BHP- except for increased voltage rating, and utilization of a molded, high voltage lead.

GENERAL CHARACTERISTICS

Electrical Data

Focusing Method	Electrostatic	
Deflecting Method	Electrostatic	
Direct Interelectrode Capacitances, Approximate		
Cathode to all other electrodes	4.6	μuf
Grid No. 1 to all other electrodes	6.4	μuf
D1 to D2	1.9	μuf
D3 to D4	1.5	μuf
D1 to all other electrodes except D2	3.5	μuf
D2 to all other electrodes except D1	3.5	μuf
D3 to all other electrodes except D4	2.8	μuf
D4 to all other electrodes except D3	2.8	μuf
Post Accelerator Helix Resistance (Spiral)	200 to 600	Megohms

Optical Data

Phosphor Number	1	2	5	7	11	15
Fluorescent Color	Green	Blue-Green	Blue	Blue-White	Blue	Blue-Green
Phosphorescent Color	-----	Green	----	Yellow	----	-----
Persistence	Medium	Long	Very short	Long	Short	Extremely short

Faceplate Clear

Mechanical Data

Overall Length	18 $\frac{1}{4} \pm \frac{3}{16}$	Inches
Greatest Diameter of Bulb	5 $\frac{1}{4} \pm \frac{3}{32}$	Inches
Minimum Useful Screen Diameter	4 $\frac{1}{2}$	Inches

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GENERAL CHARACTERISTICS (Mechanical Data) (Continued)

Bulb Number	J42K	
Bulb Contact	Molded Lead	
Base	B12-37	
Basing	14AG	
Base Alignment:		
D3D4 trace aligns with Pin No. 1 and Tube Axis	± 10	Degrees
Positive voltage on D1 deflects beam approximately toward Pin No. 4		
Positive voltage on D3 deflects beam approximately toward Pin No. 1		
Angle between D1D2 and D3D4 traces	90 ± 1	Degrees
Bulb Contact Alignment:		
Centerline of molded lead aligns with trace of D1D2	± 10	Degrees
Centerline of molded lead on same side as Pin No. 4		

RATINGS (Design Maximum Values)

Heater Voltage	6.3	Volts
Heater Current at 6.3 Volts	$0.6 \pm 10\%$	Ampere
Post Accelerator Voltage	24,000	Max. Volts DC
Isolation Shield Voltage	4,240	Max. Volts DC
Deflection Plate Shield Voltage	4,180	Max. Volts DC
Accelerator Voltage	4,000	Max. Volts DC
Ratio Post Accelerator Voltage to Accelerator Voltage	6	Max.
Accelerator Input	6	Max. Watts
Focusing Electrode Voltage	2,000	Max. Volts DC
Grid No. 1 Voltage		
Negative Bias Value	200	Max. Volts DC
Positive Bias Value	0	Max. Volts DC
Positive Peak Value	2	Max. Volts
Peak Heater-Cathode Voltage		
Heater negative with respect to cathode		
During warm-up period not to exceed 15 seconds	410	Max. Volts
After equipment warm-up period	180	Max. Volts
Heater positive with respect to cathode	180	Max. Volts
Peak Voltage between Accelerator and any		
Deflection Electrode	1,100	Max. Volts



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TYPICAL OPERATING CONDITIONS

Post Accelerator Voltage	24,000	Volts
Isolation Shield Voltage ¹	3,760 to 4,240	Volts
Deflection Plate Shield Voltage ²	3,760 to 4,180	Volts
Accelerator Voltage ³	4,000	Volts
Focusing Electrode Voltage	435 to 1,250	Volts
Grid No. 1 Voltage ⁴	-128 to -200	Volts
Modulation ⁵	80	Max. Volts
Line Width "A" ⁵	.025	Max. Inch
Deflection Factors: ⁶		
D1D2	160 to 189	Volts DC/Inch
D3D4	34 to 49	Volts DC/Inch
Useful Scan:		
D1D2	3.9	Inches (100 mm)*
D3D4	1.6	Inches (40 mm)*
Focusing Electrode Current for any operating condition	-15 to +10	Microamperes
Spot Position (Undelected) ⁷	Within a 3/16-Inch radius circle *	
Pattern Distortion ⁸		
Post Accelerator Current	100	Max. μ A

* Centered with respect to the tube face

MAXIMUM CIRCUIT VALUES

Grid No. 1 Circuit Resistance	1.5	Max. Megohms
Resistance in any Deflecting-Electrode Circuit ⁹	1.0	Max. Megohms

NOTES

1. The isolation shield and the lower end of the post accelerator helix are connected together within the tube. With the proper potentials on this electrode combination, barrel and pincushion distortions are minimized.
2. Adjustment of deflection plate shield voltage provides improved linearity of D3D4 deflection by controlling the edge effect of the D3D4 plate field. In many applications the deflection plate shield may be connected externally to the isolation shield.



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N O T E S
(Continued)

3. Under the typical operating conditions listed, the accelerator voltage may be varied to provide for astigmatism control.
4. Visual extinction of undeflected, focused spot.
5. For an Ib3 of 25 μ ADC measured in accordance with MIL-E-1 specifications. All readings of beam current shall be in addition to the reading obtained for post accelerator current with the beam cut-off.
6. If use is made of the full deflection capabilities of the tube, the deflection plates will intercept part of the electron beam near the edge of scan; hence a low impedance deflection plate drive is desirable.
7. When the tube is operated at typical operating conditions, with Ec1 adjusted to avoid damage to the screen, with each of the deflecting electrodes connected to the accelerator, and with the tube shielded against external influences, the spot will fall within a 3/16-inch (5 mm) radius circle centered on the tube face.
8. With a 1.6 x 3.9-inch (40 x 100 mm) raster centered on the face of the tube, the raster edges will not deviate from straight parallel lines by more than .039 inch (1 mm) total on the left and right edges, nor by more than .020 inch (.5 mm) total on the top and bottom.
9. It is recommended that the deflecting-electrode circuit resistances be approximately equal. Higher resistance values up to 5 megohms may be used for low beam current operation.

A diagram of a circular DNA molecule with 14 numbered sites (1-14) around its perimeter. The molecule is represented by a circle with internal lines indicating the helical structure. A label 'HELIX' points to the top of the circle. A label 'KEY' points to a specific site (14) at the bottom. The diagram is labeled 'D)' in the bottom left corner.

<u>PIN NO.</u>	<u>ELEMENT</u>
1 —	HEATER
2 —	CATHODE
3 —	GRID NO. 1
5 —	FOCUSING ELECTRODE
9 —	ACCELERATOR
12 —	DEFLECTION PLATE SHIELD
14 —	HEATER
CAP —	POST-ACCELERATOR

