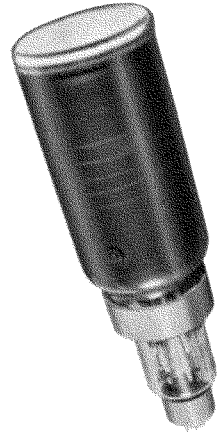


5 ARP - CATHODE-RAY TUBE

The Type 5ARP- is a two-gun electrostatic deflection and focus monoaccelerator cathode-ray tube, with each gun having similar electrical characteristics to the Type 5AQP-. The two guns are independent of each other with the exception of the accelerators and pattern adjustment electrodes. Both accelerators and the internal shielding are connected together.



The deflection plates, astigmatism control, accelerator, and pattern adjustment electrode connections for each gun are brought out to a special ring base located at the upper end of the bulb neck. This allows for minimum deflection plate capacitance and maximum voltage insulation without resorting to individual bulb contacts.

GENERAL CHARACTERISTICS

Electrical Data

Focusing Method	Electrostatic
Deflecting Method	Electrostatic
Direct Interelectrode Capacitances, Approx. (for each unit)	
Cathode to all other electrodes	3.6 μ f.
Grid #1 to all other electrodes	4.4 μ f.
D1 to D2	2.0 μ f.
D3 to D4	1.4 μ f.
D1 to all other electrodes	4.2 μ f.
D2 to all other electrodes	4.2 μ f.
D3 to all other electrodes	3.5 μ f.
D4 to all other electrodes	3.5 μ f.

Optical Data

Phosphor Number	No. 1	No. 2	No. 7	No. 11
Fluorescent Color	Green	Green	Blue	Blue
Phosphorescent Color	—	Green	Yellow	—
Persistence	Medium	Long	Long	Short

Mechanical Data

Overall Length	18½ ± ¼ Inches
Greatest Diameter of Bulb	5¼ ± 3/32 Inches
Minimum Useful Screen Diameter	4½ Inches
Bases	B12-37
Basing	Special Ring Base

B12-37 Base Alignment (for each unit):

D1D2 trace aligns with Pin #4 and tube axis	± 10 Degrees
Positive voltage on D1 deflects beam approximately toward Pin #11	
Positive voltage on D3 deflects beam approximately toward Pin #8	
Angle between D3D4 and D1D2 traces	90 ± 1 Degrees

Trace Alignment.

Corresponding traces of each gun are within 1.0 degree of each other, in center of tube

MAXIMUM RATINGS (Design Center Values) (Values are for each unit)

Heater Voltage	6.3 Volts
Heater Current at 6.3 Volts	0.6 ± 10% Ampere
Accelerator Voltage	6000 Max. Volts D-C
Astigmatism Control Electrode Voltage	6000 Max. Volts D-C
Accelerator Input	6 Max. Watts
Astigmatism Control Electrode Input	6 Max. Watts
Focusing Electrode Voltage	1500 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	0 Max. Volts
Peak Heater-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	1100 Max. Volts
Peak Voltage between Accelerator and Pattern Adjustment Electrode	280 Max. Volts

TYPICAL OPERATING CONDITIONS (Values are for each unit unless otherwise indicated)

Accelerator Voltage ²	2500 Volts D-C
Astigmatism Control Voltage ²	2500 Volts D-C
Focusing Electrode Voltage	0 to 300 Volts D-C
Grid #1 Voltage ³	-34 to -56 Volts D-C
P1 Light Output ⁴	15 Ft. L. Min.
Modulation ⁴	40 Max. Volts D-C
Line Width A'	0.030 Inch Max.
Deflection Factors:	
D1D2	45 to 55 Volts D-C per Inch
D3D4	31.5 to 38.5 Volts D-C per Inch
Deflection Factor Uniformity ⁷	1.5% Max.
Useful Scan:	
D1D2	4 Inches*
D3D4	3.3 Inches*
Pattern Distortion ⁶	
Tracking Error ⁷	0.050 Inch Max.
Spot Position ⁸	Within a 5/16-inch radius circle

CIRCUIT DESIGN VALUES (For each unit)

Focusing Electrode Current for any operating condition	-15 to +15 μ a.
Grid #1 Voltage ³	-13.6 to -22.4 Volts/Kilovolt of Accelerator Voltage
Grid #1 Circuit Resistance	1.5 Max. Megohms
Deflection Factors:	
D1D2	18 to 22 Volts D-C per Inch per Kilovolt of Accelerator
D3D4	12.6 to 15.4 Volts D-C per Inch per Kilovolt of Accelerator
Resistance in any Deflecting-Electrode Circuit ⁹	1 Max. Megohm

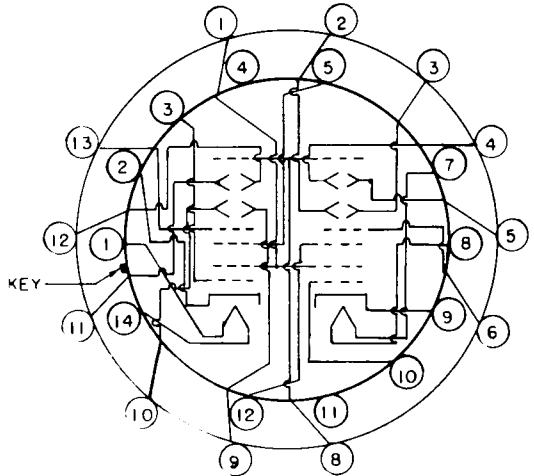
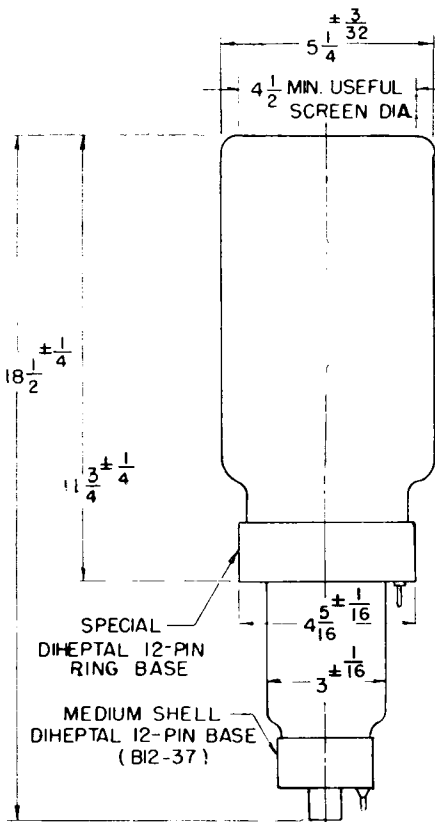
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NOTES

1. Values given are for balanced deflection voltages. These values are measured with the accelerator, astigmatism control, and pattern adjustment electrodes connected together.
2. Deflection uniformity, tracking error, or pattern distortion may be improved by the use of a difference potential applied between accelerator and pattern adjustment electrodes.
When this difference potential is used, slight changes may be noted in deflection factors, grid cut-off voltage, light output and line width.
The astigmatism control electrode voltage should be adjusted to obtain optimum spot shape.
3. Visual extinction of undeflected focused spot.
4. Measured in accordance with MIL-E-1 specifications.
5. The deflection factor (for both D1D2 and D3D4 plate pairs, separately) for any deflection of less than 90% of the useful scan will not differ from the deflection factor for a deflection at 30% of the useful scan by more than the indicated value.
6. All portions of a raster pattern, adjusted so its widest points just touch the sides of a 3.672 x 3.060-inch rectangle, will fall within the area bounded by the 3.672 x 3.060-inch rectangle and an inscribed 3.528 x 2.940-inch rectangle.

7. The positions of the spot of each beam, when deflected from the center by applied voltages proportional to the deflection factor, will not deviate from each other by more than the indicated value within 90% of the useful scan dimensions.
 8. When the tube is operated at typical operating conditions ($E_h = 6.3$ V., $E_{b2} = 2500$ V., E_{b1} at focus); E_{c1} 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, both spots will fall within a $5/16$ -inch radius circle centered on the tube face.
 9. The distance between each spot will be no greater than $5/16$ inch.
- It is recommended that the deflecting electrode circuit resistances be approximately equal.

TYPE 5ARP-



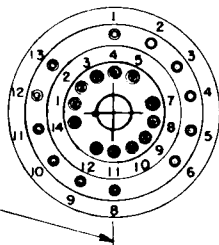
BASING

RING BASE

PIN NO.	ELEMENT
1	ACCELERATOR, SHIELD
8	PATTERN ADJUSTMENT ELECTRODE
GUN "B"	
2	DEFLECTING ELECTRODE D_4
3	DEFLECTING ELECTRODE D_3
4	DEFLECTING ELECTRODE D_2
5	DEFLECTING ELECTRODE D_1
6	ASTIGMATISM CONTROL ELECTRODE
GUN "A"	
9	DEFLECTING ELECTRODE D_3
10	DEFLECTING ELECTRODE D_4
11	DEFLECTING ELECTRODE D_1
12	DEFLECTING ELECTRODE D_2
13	ASTIGMATISM CONTROL ELECTRODE

BI2-37 BASE

GUN "A"		GUN "B"	
PIN NO.	ELEMENT	PIN NO.	ELEMENT
1	HEATER	7	HEATER
2	CATHODE	8	HEATER
3	GRID NO. 1	9	CATHODE
5	FOCUSING ELECTRODE	10	GRID NO. 1
14	HEATER	12	FOCUSING ELECTRODE



BOTTOM VIEW OF TUBE