

# RADIO MANUFACTURERS ASSOCIATION

SUITE 701-4 AMERICAN BUILDING  
1317 F STREET, N.W.  
WASHINGTON, D. C.



R.M.A. DATA BUREAU  
90 West Street  
New York, N. Y.

Release No. 718

December 9, 1948

sponsor: Allen B. Dumont Laboratories

## 5XP1, 5XP2, 5XP11 CATHODE-RAY TUBES

The Type 5XP- is an electrostatic focus and deflection Cathode-ray Tube, with very high sensitivity D3D4 deflection plates, and with an intensifier subdivided into several steps for operation at high voltages and at high ratios of intensifier to second anode voltage.

The high D3D4 sensitivity is achieved by using long deflecting plates and limiting the D3D4 scan to a useful portion of the full screen diameter. Capacitances are low, being comparable to other types such as the 5JP-A and 5RP-A where deflection connections are made through the neck instead of the base.

The Type 5XP- is particularly useful for wide band oscillographs and for any application requiring high D3D4 deflection plate sensitivity, and the high writing rate capabilities of a multi-band cathode-ray tube.

### GENERAL CHARACTERISTICS

#### Electrical

Heater Voltage		6.3	Volts
Heater Current		0.6 ± 10%	Ampere
Focusing Method			Electrostatic
Deflecting Method			Electrostatic
Phosphor	P1	P2	P11
Fluorescence	Green	Green	Blue
Phosphorescence	--	Green	--
Persistence	Medium	Long	Short

#### Direct Interelectrode Capacitances, Approx.

Cathode to all other electrodes	5.0 uuf.
Grid No. 1 to all other electrodes	5.4 uuf.
D1 to D2	1.7 uuf.
D3 to D4	1.7 uuf.
D1 to all other electrodes except D2	2.5 uuf.
D2 to all other electrodes except D1	2.3 uuf.
D3 to all other electrodes except D4	1.9 uuf.
D4 to all other electrodes except D3	1.8 uuf.

#### Mechanical

Overall Length	17 5/8" ± 3/8"
Greatest Diameter of Bulb	5 1/4" ± 3/32"
Bulb Contacts	J1-22 (recessed small ball contact)
Neck Contacts	Special lateral contacts
Base	Medium 12-pin diheptal
Basing	14F
Base Alignment: 1D2 trace aligns with Pin No. 5 and tube axis	± 10 Degrees
Positive voltage on D1 deflects beam approximately toward Pin No. 5.	
Positive voltage on D3 deflects beam approximately toward Pin No. 2.	
Bulb contact alignment:	
J1-22 contacts align with 1D2 trace ± 10 degrees	
J1-22 contacts on same side as Pin No. 5.	

## 5XP1, 5XP2, 5XP11 CATHODE-RAY TUBES

### MAXIMUM RATINGS      Design Center Values

Anode No. 3 Voltage (Accelerator High Voltage Electrode)	25,500 Max. Volts D-C
Anode No. 2 Voltage	3,500 Max. Volts D-C
Ratio Anode No. 3 Voltage to Anode No. 2 Voltage	10 Max.
Anode No. 1 Voltage	1,550 Max. Volts D-C
Grid No. 1 Voltage	
Negative Bias Value	125 Max. Volts D-C
Positive Bias Value	0 Max. Volts D-C
Positive Peak Value	2 Max. Volts
Peak Heater Cathode Voltage <sup>1</sup>	
Heater Negative with respect to Cathode	125 Max. Volts D-C
Heater Positive with respect to Cathode	125 Max. Volts D-C
Peak Voltage between Anode No. 2 and any Deflection Electrode	1,200 Max. Volts

### TYPICAL OPERATING CONDITIONS

For Anode No. 3 Voltage <sup>2</sup> of	4,000	10,000	20,000 Volts
For Anode No. 2 Voltage of	2,000	2,000	2,000 Volts
Anode No. 1 Voltage for focus	362 to 695	362 to 695	362 to 695 Volts
Grid No. 1 Voltage <sup>3</sup>	-30 to -90	-30 to -90	-30 to -90 Volts
Deflection Factors:			
D1 and D2	72 to 108	102 to 154	140 to 210 Volts D-C per Inch
D3 and D4	24 to 36	34 to 52	46 to 68 Volts D-C per Inch
Useful Scan: <sup>4</sup>			
D1 and D2	4.25	4.25	3.5      Inches
D3 and D4	2.50	1.75	1.25      Inches
Frequency for 10% reduction in D3D4 deflection factor due to transit time <sup>5</sup>	200	200	200      mc.
Anode No. 1 Voltage for focus	18.1% to 34.8% of Eb2		Volts
Grid No. 1 Voltage <sup>3</sup>	1.5% to 4.5% of Eb2		Volts
Anode No. 1 Current for any operating condition	-50 to + 10      Microampere		
Deflection Factors:			
No 3rd Anode or Eb3 = Eb2			
D1 and D2	30 to 45 Volts D-C per inch per Kilovolt of Eb2		
D3 and D4	9.5 to 14.5 Volts D-C per inch per Kilovolt of Eb2		
Eb3 = Twice Eb2			
D1 and D2	36 to 54 Volts D-C per inch per Kilovolt of Eb2		
D3 and D4	12 to 18 Volts D-C per inch per Kilovolt of Eb2		
Spot Position (Undelected) <sup>6</sup>	Within 20 Millimeters square		

### MAXIMUM CIRCUIT VALUES

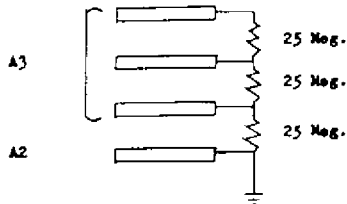
Grid No. 1 Circuit Resistance	1.5 Max. Megohms
Resistance in any Deflecting Electrode Circuit <sup>7</sup>	5      Max. Megohms

5XP1, 5XP2, 5XP11 CATHODE-RAY TUBES

NOTES

1. Cathode should be returned to one side or to the mid-tap of the heater transformer winding.
2. Anode No. 2 to final intensifier electrode voltage equally divided over the three intensifier electrodes.

Suggested method of connection:

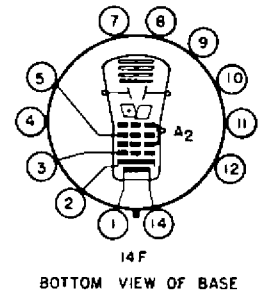
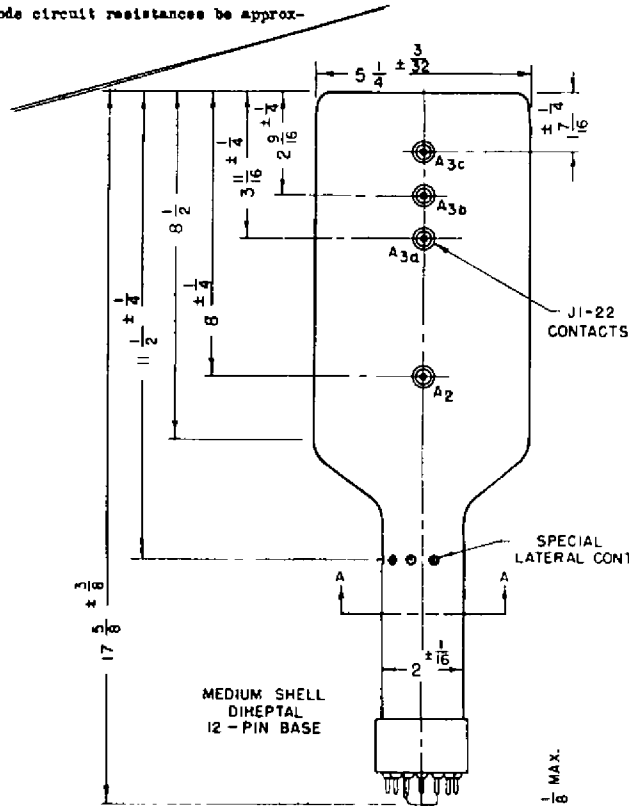


The two A2 terminals must be connected together.

3. Visual extinction of undeflected focused spot.
4. Reduction in useful scan when  $E_{b3}$  is greater than  $E_{b2}$  is determined by the ratio of  $E_{b3}$  to  $E_{b2}$  (note both voltages are with respect to cathode). Values shown are therefore applicable to any operating condition with  $E_{b3}$  to  $E_{b2}$  ratios of 2:1, 5:1, and 10:1.
5. Computed.
6. When the tube is operated at (1) normal heater voltage; (2)  $E_{b2}$  = 2000 volts; (3)  $E_{b3}$  = 10,000 volts; (4)  $E_{b1}$  adjusted for focus; (5)  $E_{b1}$  set at such a value as will avoid damage to the screen; (6) with each of the deflecting electrodes connected to Anode No. 2; and (7) with the tube shielded against external influences:

The spot will fall within a 20 mm. square, the center of which coincides with the geometric center of the tube face and the sides of which are parallel to the traces produced by deflecting electrodes D1 and D2 and by deflecting electrodes D3 and D4 respectively.

7. It is recommended that the deflecting electrode circuit resistances be approximately equal.



PIN NO.	ELEMENT
1	HEATER
2	CATHODE
3	GRID NO. 1
4	INTERNAL CONNECTION
5	ANODE NO. 1
7	NO CONNECTION
8	"
9	"
10	"
11	"
12	"
14	HEATER

