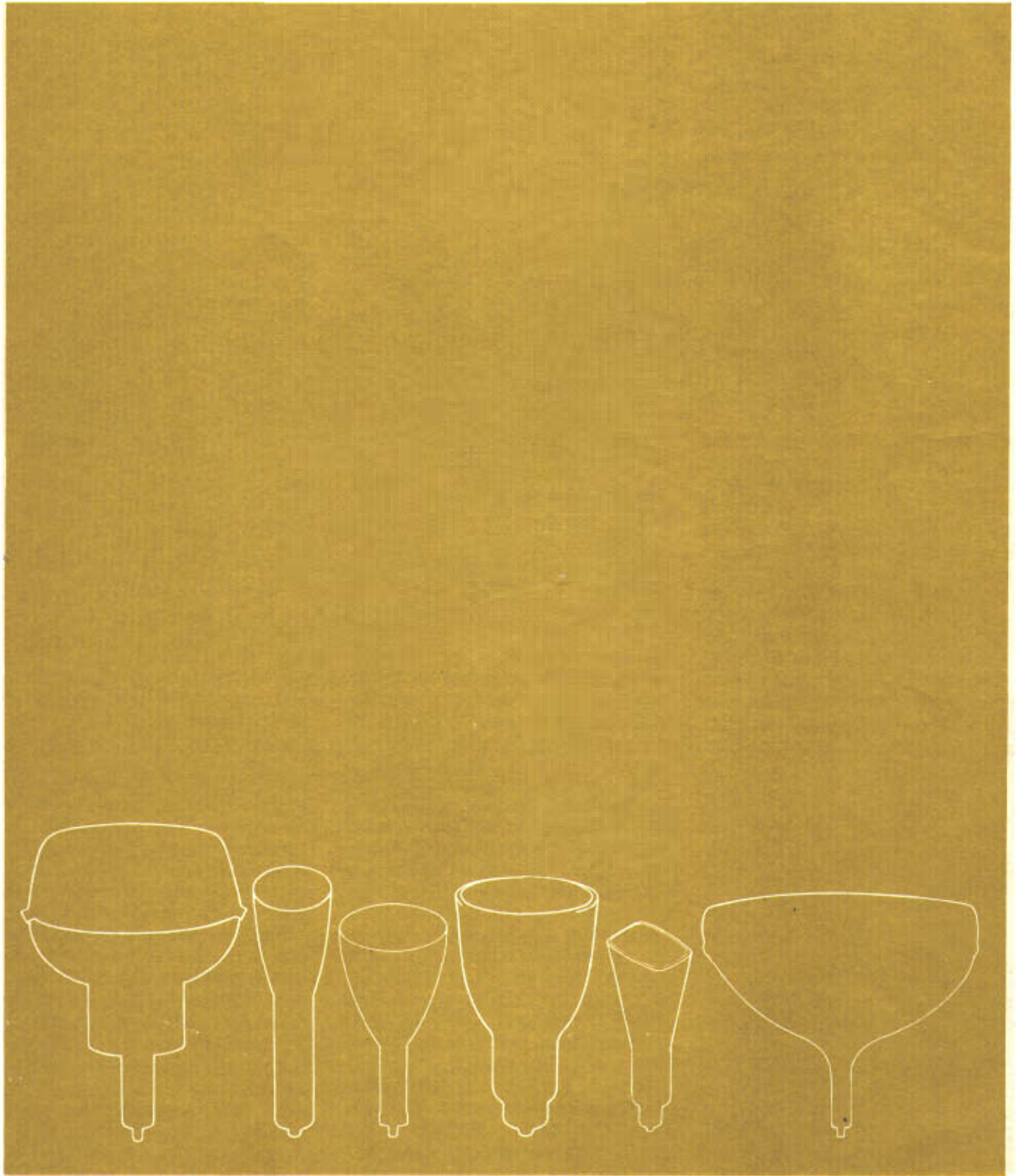


a guide to Sylvania industrial and military CRT'S



SYLVANIA

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Outstanding Features In Custom Engineered Cathode Ray Tubes

Sylvania Answers the Call for Custom Engineered Multi-Gun CRT's . . .

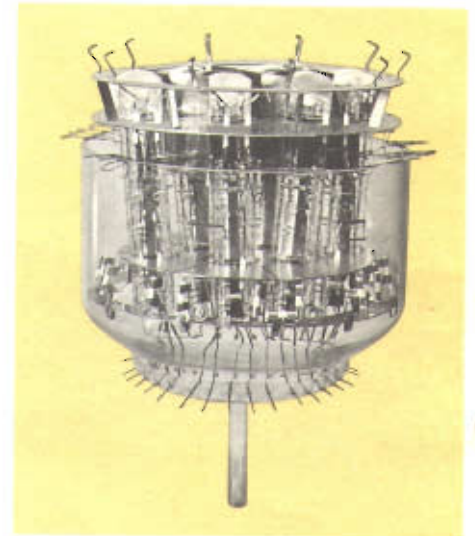
The inherent advantages of multi-gun cathode ray tubes are finding more and more application in systems where simultaneous, correlated display is essential.

Sylvania has custom engineered a line of multi-gun tubes—representative tube types are shown in the custom engineered cathode ray section of this brochure. These tubes feature maximum pattern linearity and deflection factor uniformity, high deflection sensitivity and maximum resolution! Multi-gun tubes have been manufactured with face diameters from 3 to 16 inches and length from 8 to 36 inches. Two, three, four, five and six gun tubes have been produced.



Theoretically there is no limit to the number of guns that can be put into a single tube.

If you have specific system re-



quirements that require special characteristics in a multi-gun tube, Sylvania will recommend a tube to fill your needs.



Fiber Optics can Increase Light Transmitting Efficiency 30 Times over conventional refractive optics in photographic recording.

This new, but proven, technique for optically coupling a cathode ray tube to a photographic film, represents a giant stride forward in recording technology. Light emitted from the phosphor screen is conducted along tiny optical fibers directly to the recording medium with virtually no distortion or loss of intensity.

In older systems using refractive optics to project the image to the film, the lens collected only a small fraction of light from the cathode ray tube screen. This resulted in a loss of clarity and detail in the recorded picture.

With fiber optics tubes, fiber

bundles are fused directly into the cathode ray tube faceplate forming a vacuum tight assembly. The phosphor screen is applied to the inside surface of the fibers, so that direct transmission is possible to the film contacting the other end of the optical path. Several fiber optics designs of this construction are available, using either circular areas or narrow rectangular strips. They normally measure about $\frac{1}{4}$ inch in thickness.

To maintain the high resolution of the fine grain screens of the CRT, fiber size must be between 4 and 15 microns.

For additional information on contact printing with fiber optics tubes, contact your nearest Sylvania sales representative.

Remarkable Low Power Heater— 1.5 v @ 140 ma.—from Sylvania. .

Continuing Sylvania research into modern materials and techniques has produced a remarkable low-power heater-cathode assembly that opens new design areas for battery-powered, portable scopes. It requires only 1.5 v @ 140 ma.—less than 6% of the power normally needed—thus offering lower tube

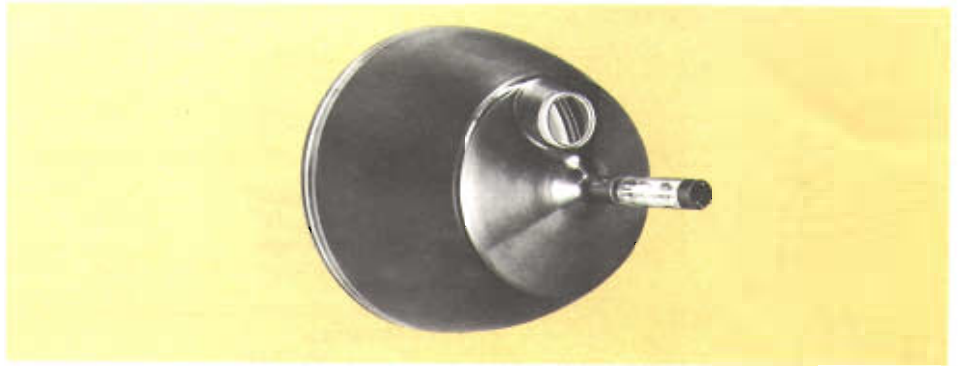


operating temperatures and low drain from battery or flyback heater supplies. Advanced powder metallurgy processes make possible a flat, pancake-like heater-cathode assembly, only .050" in diameter and .011" thick. Extreme low mass minimizes the possibility of damage from vibration and shock. It is adaptable to practically all present CRT designs.

With Sylvania's Rear Window CRT's you can Monitor and Photograph Simultaneously

Sylvania, by adding a discrete viewing window at the rear of a cathode ray tube, has made it possible to optically project overlay information onto the phosphor screen from the rear, for direct comparison with the electronic display. Sylvania's type SC-3875 is an example of such a tube. This is a large screen tube, 19 inches in diameter with a single ophthalmic quality window. It also features highly sensitive, character writing deflection plates for producing alphanumeric symbols. This tube also permits photographic recordings of the electronic image on the screen through the rear window without interfering with normal front viewing.

Multigun/multiwindow types are practical, with large or small screens. As with the SC-3875, character writing deflection plates can



be incorporated to produce changing numeric and alphanumeric symbols.

Combining the many features of rear window CRT's results in a device capable of forming a composite display from various information sources. The electron beams of the multiple guns can represent moving objects such as planes, ships, etc. Guns with character writing deflection plates will also display changing digital or alphabetical information on speed, altitude, identification, etc.

which can be programmed to accompany the appropriate "blip" as it changes position on the screen.

The rear viewing windows unobstructively allow for both optical projection onto the phosphor screen and photographic recording of the composite picture.

If you have a complex display problem, let Sylvania's experience work for you. An off-the-shelf or a custom designed rear window cathode ray tube may solve your particular systems problem.

Sylvania High Resolution Assemblies are completely preadjusted and prealigned plug-in packages. They offer the utmost in ease of installation and flexibility in high resolution photographic recording and flying spot scanning applications.

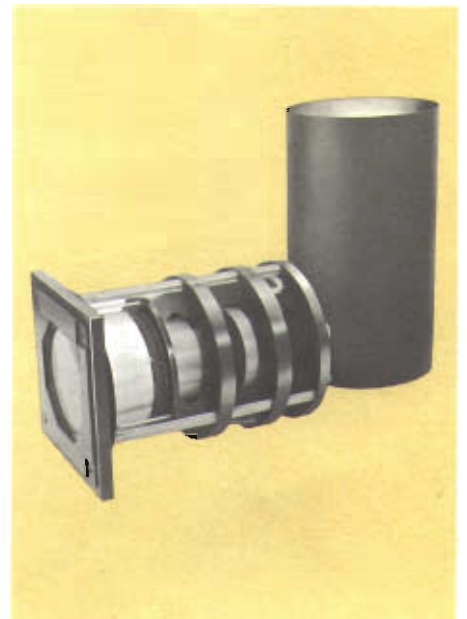
Each assembly contains a high resolution tube, deflection coil, focusing coil (when necessary), alignment magnets and supporting hardware encased in a protective mu metal shield. With only slight modification, various types of high resolution tubes can be accommodated. A listing of available types appears in the custom engineered section of this book. 5-inch, 7-inch and 10-inch types are available.

Special features of Sylvania's high resolution CRT's include: line width down to .0008", clear non-browning faceplates, extremely fine grained aluminized screens, and integral encapsulated high voltage connectors which minimize corona at high altitude.

Assemblies are made to customer specifications. They are individually engineered for optimum application efficiency and can be installed quickly by non-technical personnel.

Hours of maintenance and down time can be saved each time repair or replacement become necessary.

Let Sylvania custom design an assembly for your application or use a pre-designed package such as the AT-SK-6003/5CEP11.



Custom Engineered



FACE SIZE (IN.)	SYLVANIA TYPE NO.	CHARACTERISTICS
-----------------	-------------------	-----------------

Single Gun – Electrostatic Deflection

ROUND

1	SC-3016	Low Heater Power-Flat Face
2	SC-3502	Low Heater Power
3	SC-2812	Low Heater Power
3	SC-2830	Low Heater Power-Flat Face
3	SC-2840	Compact Design-High Brightness
3	SC-3802	Low Heater Power-Sensitivity for Transistor Drive
5	SC-3042	Flat Face-Clear Faceplate
5¼	SC-3116	Flat Face-Spiral Accelerator-Deflection Leads on Neck
5¼	SC-3301	Flat Face-Spiral Accelerator-Deflection Leads on Neck
7	SC-3383	Flat Face, High Resolution

10	SC-4022	Post Deflection Acceleration-Aluminized
10	SC-2558	Post Deflection Acceleration
10	SC-4096	Round Face, Electrostatic Focus
19	SC-3895	High Resolution and Brightness-Post Deflection Acceleration-Deflection Leads on Neck-Aluminized

RECTANGULAR

1½ x 3	SC-2751B	Low Heater Power-Integral Magnetic Shield
2¾ x 4¾	SC-3894	Low Heater Power or 6.3 V Heater-Sensitivity for Transistor Drive
3½ x 3½	SC-3377	6.3 V Heater-Sensitivity for Transistor Drive
3½ x 3½	SC-3511	Low Heater Power-Sensitivity for Transistor Drive
3½ x 3½	SC-3551	Low Heater Power
4½ x 5½	SC-4009	Clear Faceplate-High Linearity



Single Gun – Magnetic Deflection

ROUND

3	SC-3557	High Brightness-Compact Design
4	SC-3037P7	Compact Design-Airborne Radar
5	SC-2854	High Visibility Phosphor
5	SC-3179	Offset Neck-Airborne Radar-Short Length
5	SC-3180	Offset Neck-Airborne Radar
10	SC-3122	Monitor Tube-Flat Face

RECTANGULAR

5 x 6	ST-3183	Small Neck-Compact Monitor
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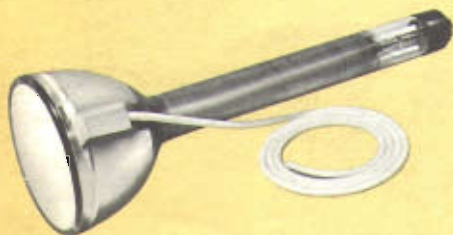
Multi-Gun – Electrostatic Deflection

ROUND

4½	SC-3397	2 Gun-Radar Indicator
7	SC-3804	5 Gun-Zoned Scan
7	SC-4014	2 Gun-Potted in MU-Metal
10	SC-3061	3 Gun-Monoaccelerator Design
10	SC-3399	5 Gun-Full Scan all Guns
10	SC-3880	5 Gun-Zoned Scan
16	SC-3886	2 Gun
16	SC-3892	5 Gun-Full Scan all Guns-Potted in MU-Metal-Monoaccelerator Design
19	SC-4039	2 Gun

RECTANGULAR

3¼ x 4¼	SC-3525	2 Gun-Flying Leads
4 x 6	SC-3561	3 Gun-Monoaccelerator Design
5½ x 5½	SC-3090	3 Gun-Spiral Post Deflection Accelerator
5½ x 5½	SC-4012	2 Gun
10 x 10½	SC-3814	6 Gun Limited Zone Scan-Potted in MU-Metal



CATHODE RAY TUBES

FACE SIZE (IN.)	SYLVANIA TYPE NO.	CHARACTERISTICS
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Double Deflection (Character Writing)

ROUND		
16	SC-3369	Magnetic Deflection
RECTANGULAR		
17/	SC-3365	Basic Design of 17DWP-
21/	SC-3185	Basic Design of 21EYP-

Monoscopes

ROUND		
3	SC-3093	2" Target-Customer Supplies Target Information
3	SC-3317	2" Target
3	SC-3891C	High Resolution

High Resolution for Photo-Recording

ROUND		
3	SC-3858	.002" Linewidth
5	5CEP-	.0015" Linewidth
5	SC-2782	.001" Linewidth
5	SC-2809	.0008" Linewidth
5	SC-3168	.002" Linewidth-Deflection Angle 20°
5	SC-3195	.003" Linewidth
5	SC-4008	.003" Linewidth-Deflection Angle 20°
7	SC-4099	.001" Linewidth-Flat Face
10	SC-3890	.002" Linewidth-Flat Face

- AT-SK-5053-1 Assembly Containing High Resolution Tube, Deflection Coil, Focus Coil, Magnetic Shield, Components and Connectors
- AT-SK-6003/5CEP- Assembly Containing High Resolution Tube, Deflection Coil, Focus Coil, Magnetic Shield, Components and Connectors

Fiber Optics

2	SC-4304	Solid Fiber Optics Face-Electrostatic Deflection
3 x 1/2	SC-3304	.001" Linewidth
4 x 6	SC-4082	Electrostatic Deflection
5 x 1/2	SC-3850	.0008" Linewidth
5	SC-4064	Similar to SC-3195
8 x 1/2	SC-3507	.002" Linewidth-Magnetic Deflection and Focus
8 x 1/2	SC-3800	.005" Linewidth-Electrostatic Focus-Magnetic Deflection
8 x 1/2	SC-3876	.004" Linewidth-Magnetic Deflection and Focus

Electrostatic Charge Tubes

ROUND		
2 3/4	SC-3863	Magnetic Focus and Deflection
3	SC-2795	Magnetic Focus and Deflection
8 1/2	SC-3144	Magnetic Focus and Deflection-Narrow Array
8 1/2	SC-3154	Magnetic Focus and Deflection-Wide Array

Rear Window Tubes

ROUND		
7	SC-3821	Magnetic Deflection
19	SC-3875	Magnetic Deflection



Oscilloscopes

Type	Faceplate			Overall Dimensions (Inches)		Focus/Deflection Method ES = Electrostatic MAG = Magnetic	Deflection Angle (Degrees)	Absolute Maximum Ratings			
	Shape	Tinted Clear Alum.	Curvature Radius (In.)	Faceplate Diameter or Width x Height	Length			Post Accel. (KV)	Anode (KV)	Focus Electrode Volts	Accel. G2 Volts
2AP1A	○	C	8	2	7 ⁷ / ₁₆	ES/ES	—	1.1	550	—	
2BP1	○	C	8	2	7 ⁵ / ₈	ES/ES	—	2.75	1100	—	
3ACP1A	○	C	Flat	3	10	ES/ES	—	6.6	2.2	1650	
3ACP2A	○	C	Flat	3	10	ES/ES	—	6.6	2.2	1650	
3ADP1	○	C	Flat	3	10	ES/ES	—	6.6	3.3	1100	
3ADP2	○	C	Flat	3	10	ES/ES	—	6.6	3.3	1100	
3ASP1	□	C	Flat	3 ³ / ₄ x 1 ¹ / ₂	8 ¹⁵ / ₁₆	ES/ES	—	3.0	1200	—	
3ASP2	□	C	Flat	3 ³ / ₄ x 1 ¹ / ₂	8 ¹⁵ / ₁₆	ES/ES	—	3.0	1200	—	
3BP1A	○	C	8	3	10	ES/ES	—	2.2	1100	—	
3BEP1	□	C	60	3 ³ / ₄ x 1 ¹ / ₂	9 ¹ / ₈	ES/ES	—	3	1200	—	
3BGP1	□	C	60	3 ³ / ₄ x 1 ¹ / ₂	9 ¹ / ₄	ES/ES	—	2.75	1100	—	
3BGP2	□	C	60	3 ³ / ₄ x 1 ¹ / ₂	9 ¹ / ₄	ES/ES	—	2.75	1100	—	
3BMP1	○	C	Flat	3	10	ES/ES	—	6.6	2.2	1500	
3BMP2	○	C	Flat	3	10	ES/ES	—	6.6	2.2	1500	
3JP1	○	C	8	3	10	ES/ES	—	4.4	2.2	1100	
3JP2	○	C	8	3	10	ES/ES	—	4.4	2.2	1100	
3KP1	○	C	8	3	11 ¹ / ₂	ES/ES	—	2.75	1100	—	
3MP1	○	C	8	3	8	ES/ES	—	2.75	1100	—	
3RP1	○	C	8	3	9 ¹ / ₈	ES/ES	—	2.75	1100	—	
3RP1A	○	C	Flat	3	9 ¹ / ₈	ES/ES	—	2.75	1100	—	
3SP1	□	C	15	3 x 1 ¹ / ₂	9 ¹ / ₈	ES/ES	—	3	1200	—	
3SP2	□	C	15	3 x 1 ¹ / ₂	9 ¹ / ₈	ES/ES	—	3	1200	—	
3WP1	○	C	Flat	3	11 ¹ / ₂	ES/ES	—	2.75	1100	—	
3WP2	○	C	Flat	3	11 ¹ / ₂	ES/ES	—	2.75	1100	—	
4MP1	□	C	30	3 ¹ / ₂ x 3 ¹ / ₂	13 ³ / ₄	ES/ES	—	6.6	3.3	1100	
5ABP1	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	6.6	2.86	1100	
5ABP1A	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	6.6	2.86	1100	
5ADP1	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	6.6	2.86	1100	
5ADP1A	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	6.6	2.86	1100	
5ADP2	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	6.6	2.86	1100	
5ADP2A	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	6.6	2.86	1100	
5ADP31A	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	6.6	2.86	1100	
5AMP1	○	C	Flat	5 ¹ / ₄	17 ⁷ / ₈	ES/ES	—	6.6	1650	—	
5AMP1A	○	C	Flat	5 ¹ / ₄	17 ⁷ / ₈	ES/ES	—	6.6	1650	—	
5AMP2	○	C	Flat	5 ¹ / ₄	17 ⁷ / ₈	ES/ES	—	6.6	1650	—	
5AMP2A	○	C	Flat	5 ¹ / ₄	17 ⁷ / ₈	ES/ES	—	6.6	1650	—	
5AMP31A	○	C	Flat	5 ¹ / ₄	17 ⁷ / ₈	ES/ES	—	6.6	1650	—	
5AQP1	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	4.4	1650	—	
5AQP1A	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	4.4	1650	—	
5AQP2	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	4.4	1650	—	
5AQP2A	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	4.4	1650	—	
5BP1A	○	C	8	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	2.2	1100	—	
5BGP1	○	CA	Flat	5 ¹ / ₄	17 ¹ / ₄	ES/ES	—	13.2	2.2	880	
5BGP2	○	CA	Flat	5 ¹ / ₄	17 ¹ / ₄	ES/ES	—	13.2	2.2	880	
5BHP1	○	CA	Flat	5 ¹ / ₄	18 ¹ / ₄	ES/ES	—	13.2	2.2	880	
5BHP1A	○	CA	Flat	5 ¹ / ₄	18 ¹ / ₄	ES/ES	—	13.2	2.2	880	
5BHP2	○	CA	Flat	5 ¹ / ₄	18 ¹ / ₄	ES/ES	—	13.2	2.2	880	
5BHP2A	○	CA	Flat	5 ¹ / ₄	18 ¹ / ₄	ES/ES	—	13.2	2.2	880	
5CP1A	○	C	8	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	4.4	2.2	1100	
5CP1B	○	C	8	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	4.4	2.2	1100	
5DEP1	○	C	20	5 ¹ / ₄	14 ³ / ₄	ES/ES	—	2.75	1100	—	
5DEP2	○	C	20	5 ¹ / ₄	14 ³ / ₄	ES/ES	—	2.75	1100	—	
5RP1A	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	27.5	3.85	1700	
5RP2A	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	27.5	3.85	1700	
5UP1	○	C	20	5 ¹ / ₄	14 ³ / ₄	ES/ES	—	2.75	1100	—	
7AEP1	○	C	Flat	7	15 ¹ / ₂	ES/ES	—	8.8	4.4	1375	
7AEP2	○	C	Flat	7	15 ¹ / ₂	ES/ES	—	8.8	4.4	1375	
7JP1/7VP1	○	C	20	7	14 ¹ / ₂	ES/ES	—	6.6	3100	—	
8CP1	○	C	20	8 ³ / ₈	16 ¹ / ₂	ES/ES	—	6.6	6.6	2750	
8CP2	○	C	20	8 ³ / ₈	16 ¹ / ₂	ES/ES	—	6.6	6.6	2750	

notes: • Line width measured at the center of tube face by the shrinking raster method at the current or brightness specified. Reference: MIL-E-1, Par. 4.12.6.1. The brightness shown for 3" and 5" round tubes is for 2" x 2" raster size, for other types, full screen illumination.

Standard Registered CATHODE RAY TUBES

Typical Operation					Deflection Factors Volts DC/Inch		Resolution	Remarks
Post Accel. (KV)	Anode (KV)	Focus Electrode Volts or Ma	Accel. G2 Volts	Grid No. 1 Voltage for Spot Cutoff	D1-D2	D3-D4	Line Width "A" Inches *	
—	1	137-300	—	-30 to -90	230	196	.018" @ 2 Ft. L	
—	2	300-560	—	-135	230-310	148-200	.018" @ 4 Ft. L	
4	2	390-550	—	-45 to -75	175-205	138-158	.016" @ Ib3 = 50 μ a	
4	2	390-550	—	-45 to -75	175-205	138-158	.016" @ Ib3 = 50 μ a	
4	2	320-470	—	-52 to -87	140-160*	61-70*	.014" @ Ib3 = 25 μ a	Deflection Plate Leads on Neck
4	2	320-470	—	-52 to -87	140-160	61-70	See 3ADP1*	Deflection Plate Leads on Neck
—	2	400-700	—	-40 to -70	68-92	28-38	.025" @ 10 Ft. L	Altitude 35K Ft.
—	2	400-700	—	-40 to -70	68-92	28-38	See 3ASP1*	Altitude 35K Ft.
—	2	400-690	—	-30 to -90	200	148	.020" @ 5 Ft. L	
—	1.5	247-465	—	-43.5 to -101	109-149	78-105	.016" @ 25 Ft. L	Encapsulated Leads; Altitude 70K Ft.
—	2	400-700	—	-38 to -67.5	68-92	28-38	.025" @ 20 Ft. L-1 $\frac{1}{8}$ x 1 $\frac{1}{16}$	Heater 1.5v/140ma; Altitude 35K Ft.
—	2	400-700	—	-38 to -67.5	68-92	28-38	See 3BGF1*	Heater 1.5v/140ma; Altitude 35K Ft.
4	2	375-575	—	-45 to -75	180-220	133-163	.016" @ Ib3 = 25 μ a	Heater 1.5v/140ma
4	2	375-575	—	-45 to -75	180-220	133-163	See 3BMP1*	Heater 1.5v/140ma
3	1.5	300-515	—	-22.5 to -67.5	127-173	94-128	.03" @ 25 Ft. L	
3	1.5	300-515	—	-22.5 to -67.5	127-173	94-128	See 3JP1*	
—	2	320-600	—	-38 to -90	100-136	76-104	.010" @ 5 Ft. L	
—	2	400-700	—	-126	230-290	220-280	—	
—	2	330-620	—	-135	146-198	104-140	.016" @ 20 Ft. L	
—	2	330-620	—	-45 to -135	146-198	104-140	.016" @ 20 Ft. L	
—	2	330-620	—	-58 to -135	146-198	104-140	.016" @ 25 Ft. L	
—	2	330-620	—	-58 to -135	146-198	104-140	See 3SP1*	
—	1.5	247-465	—	-45 to -75	62-76*	43-52*	.026" @ 7 Ft. L	
—	1.5	247-465	—	-45 to -75	62-76*	43-52*	See 3WP1*	
4	2	340-510	—	-52 to -87	68-82*	42-52*	.018" @ Ib3 = 25 μ a	Deflection Plate Leads on Neck
3	1.5	300-515	—	-39 to -65	40-54	27-36	.03" @ Ib3 = 25 μ a	
3	1.5	300-515	—	-39 to -65	40-54	27-36	.03" at Ib3 = 25 μ a	
3	1.5	300-515	—	-34 to -56	40-50*	30.5-37.5*	.03" @ Ib3 = 25 μ a	
3	1.5	300-515	—	-34 to -56	40-50*	30.5-37.5*	.03" at Ib3 = 25 μ a	
3	1.5	300-515	—	-34 to -56	40-50*	30.5-37.5*	See 5ADP1*	
3	1.5	300-515	—	-34 to -56	40-50*	30.5-37.5*	.03" @ Ib3 = 25 μ a	
3	1.5	300-515	—	-34 to -56	40-50*	30.5-37.5*	.03" @ Ib3 = 25 μ a	
—	2.5	0-300	—	-34 to -56	40-50*	20-25*	.032" @ 15 Ft. L	Deflection Plate Leads on Neck
—	2.5	0-300	—	-34 to -56	40-50*	20-25*	.032" @ 15 Ft. L.	Deflection Plate Leads on Neck
—	2.5	0-300	—	-34 to -56	40-50*	20-25*	See 5AMP1*	Deflection Plate Leads on Neck
—	2.5	0-300	—	-34 to -56	40-50	20-25*	See 5AMP1A *	Deflection Leads on Neck
—	2.5	0-300	—	-34 to -56	40-50	20-25	See 5AMP1A *	Deflection Leads on Neck
—	2.5	0-300	—	-34 to -56	40-50*	31.5-38.5*	.030" @ 15 Ft. L	
—	2.5	0-300	—	-34 to -56	40-50*	31.5-38.5*	.03" @ 15 Ft. L	Low Pattern Distortion
—	2.5	0-300	—	-34 to -56	40-50*	31.5-38.5*	See 5AQPI*	Low Pattern Distortion
—	2	315-562	—	-20 to -60	70-98	63-89	—	
10	1.67	180-590	—	-50 to -80	70-86*	28.4-34.8*	.016" @ Ib3 = 10 μ a	Spiral Accelerator; Deflection Plate Leads on Neck
10	1.67	180-590	—	-50 to -80	70-86*	28.4-34.8*	See 5BGP1*	Spiral Accelerator; Deflection Plate Leads on Neck
10	1.67	180-590	—	-50 to -80	70-85*	15-18.3*	.016" @ Ib3 = 10 μ a	Spiral Accelerator; Deflection Plate Leads on Neck
10	1.67	180-590	—	-50 to -80	70-85*	15-18.3*	See 5BHP1*	Spiral Accelerator; Deflection Plate Leads on Neck
10	1.67	180-590	—	-50 to -80	70-85*	15-18.3*	See 5BHP1A *	Spiral Accelerator; Deflection Plate Leads on Neck
4	2	375-690	—	-30 to -90	92	78	.030" @ 20 Ft. L	
4	2	400-690	—	-45 to -75	83-101	70-86	.030" @ 20 Ft. L	
—	2	340-640	—	-90	48-64	27-37	—	
—	2	340-640	—	-90	48-64	27-37	—	
20	2	362-695	—	-30 to -90	140-210	131-197	.03" @ Ib3 = 50 μ a	Deflection Plate Leads on Neck
20	2	362-695	—	-30 to -90	140-210	131-197	See 5RPIA*	Deflection Plate Leads on Neck
—	2	340-640	—	-90	56-77	46-62	.016" @ 6 Ft. L	
4	2	380-620	—	-45 to -75	81-101	67-83	.022" @ Ib3 = 25 μ a	
4	2	380-620	—	-45 to -75	81-101	67-83	See 7AEP1*	
—	6	1620-2400	—	-72 to -168	216	177	—	
4	2	540-800	—	-24 to -56	58-81	49-68	—	
4	2	540-800	—	-24 to -56	58-81	49-68	—	

* Useful scan is limited on this axis to a value less than full screen dimension.
 * Line Width A for this type is approximately equal to that of the referenced type, when operating at the same beam current. Light output of other phosphors are in general lower than that of P-1.

† An ion trap magnet is required with this tube type.

General Notes

1. All voltages are measured with respect to cathode.
2. Except when otherwise specified in the Remarks column, the heater voltage and current are 6.3 volts and 600 Ma for all types.

Radars Indicators

Type	Faceplate			Overall Dimensions (Inches)		Focus/Deflection Method	Deflection Angle (Degrees)	Absolute Maximum Ratings			
	Shape	Tinted Clear Alum.	Curvature Radius (In.)	Faceplate Diameter or Width x Height	Length	ES = Electrostatic MAG = Magnetic		Post Accel. (KV)	Anode (KV)	Focus Electrode Volts	Accel. G2 Volts
3ACP7A	○	C	Flat	3	10	ES/ES	—	6.6	2.2	1650	—
3ACP12A	○	C	Flat	3	10	ES/ES	—	6.6	2.2	1650	—
3ADP7	○	C	Flat	3	10	ES/ES	—	6.6	3.3	1100	—
3ASP7	□	C	60	3 ¹ / ₆₄ x 1 ¹ / ₂	8 ¹⁵ / ₁₆	ES/ES	—	—	3	1200	—
3BGP7	□	C	60	3 ¹ / ₆₄ x 1 ¹ / ₂	9 ¹ / ₄	ES/ES	—	—	2.75	1100	—
3BMP7	○	C	Flat	3	10	ES/ES	—	6.6	2.2	1500	—
3BMP12	○	C	Flat	3	10	ES/ES	—	6.6	2.2	1500	—
3FP7A	○	C	1 ¹ / ₄	3	10	ES/ES	—	4.4	2.2	2200	—
3JP7	○	C	8	3	10	ES/ES	—	4.4	2.2	1100	—
3JP12	○	C	8	3	10	ES/ES	—	4.4	2.2	1100	—
3KP7	○	C	8	3	11 ¹ / ₂	ES/ES	—	—	2.75	1100	—
5ABP7	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	6.6	2.86	1100	—
5ABP7A	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	6.6	2.86	1100	—
5ADP7	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	6.6	2.86	1100	—
5ADP7A	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	6.6	2.86	1100	—
5AHP7	○	C	24	4 ¹⁵ / ₁₆	11 ¹ / ₈	ES/MAG	53	—	11	-550 to +1100	770
5AHP7A	○	CA	24	4 ¹⁵ / ₁₆	11 ¹ / ₈	ES/MAG	53	—	11	-550 to +1100	770
5AHP14	○	C	24	4 ¹⁵ / ₁₆	11 ¹ / ₈	ES/MAG	53	—	11	-550 to +1100	770
5AHP14A	○	CA	24	4 ¹⁵ / ₁₆	11 ¹ / ₈	ES/MAG	53	—	11	-550 to +1100	770
5AHP19	○	C	24	4 ¹⁵ / ₁₆	11 ¹ / ₈	ES/MAG	53	—	11	-550 to +1100	770
5AHP19A	○	CA	24	4 ¹⁵ / ₁₆	11 ¹ / ₈	ES/MAG	53	—	11	-550 to +1101	770
5AMP7	○	C	Flat	5 ¹ / ₄	17 ⁷ / ₈	ES/ES	—	—	6.6	1650	—
5AMP7A	○	C	Flat	5 ¹ / ₄	17 ⁷ / ₈	ES/ES	—	—	6.6	1650	—
5AQP7	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	—	4.4	1650	—
5AQP7A	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	—	4.4	1650	—
5BCP1	○	C	24	4.95	7 ⁷ / ₁₆	MAG/MAG	70	—	11	—	—
5BCP7	○	C	24	4.95	7 ⁷ / ₁₆	MAG/MAG	70	—	11	—	—
5BGP7	○	CA	Flat	5 ¹ / ₄	17 ¹ / ₄	ES/ES	—	13.2	2.2	880	—
5BHP7	○	CA	Flat	5 ¹ / ₄	18 ¹ / ₄	ES/ES	—	13.2	2.2	880	—
5BHP7A	○	CA	Flat	5 ¹ / ₄	18 ¹ / ₄	ES/ES	—	13.2	2.2	880	—
5BRP1	○	CA	24	4.95	7	ES/MAG	70	—	10	-550 to +1100	770
5BRP7	○	CA	24	4.95	7	ES/MAG	70	—	10	-550 to +1100	770
5CP7A	○	C	8	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	4.4	2.2	1100	—
5CP12	○	C	8	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	4.4	2.2	1100	—
5CVP1	□	C	24	4 ³ / ₄ x 2 ³ / ₄	8 ¹⁵ / ₁₆	ES/MAG	54	—	4.5	-550 to +1100	550
5CVP7	□	C	24	4 ³ / ₄ x 2 ³ / ₄	8 ¹⁵ / ₁₆	ES/MAG	54	—	4.5	-550 to +1100	550
5CVP19	□	C	24	4 ³ / ₄ x 2 ³ / ₄	8 ¹⁵ / ₁₆	ES/MAG	54	—	4.5	-550 to +1100	550
5DEP7	○	C	20	5 ¹ / ₄	14 ³ / ₄	ES/ES	—	—	2.75	1100	—
5FP7A	○	C	24	4 ¹⁵ / ₁₆	10 ⁹ / ₈	MAG/MAG	53	—	8.8	—	770
5FP14A	○	C	24	4 ¹⁵ / ₁₆	10 ⁹ / ₈	MAG/MAG	53	—	8.8	—	770
5RP7A	○	C	Flat	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	27.5	3.85	1700	—
5UP7	○	C	20	5 ¹ / ₄	14 ³ / ₄	ES/ES	—	—	2.75	1100	—
7ABP7	○	C	24	7 ³ / ₁₆	13 ¹ / ₄	ES/MAG	50	—	11	-550 to +1100	770
7ABP7A	○	CA	24	7 ³ / ₁₆	13 ¹ / ₄	ES/MAG	50	—	11	-550 to +1100	770
7ABP14	○	C	24	7 ³ / ₁₆	13 ¹ / ₄	ES/MAG	50	—	11	-550 to +1100	770
7ABP14A	○	CA	24	7 ³ / ₁₆	13 ¹ / ₄	ES/MAG	50	—	11	-550 to +1100	770
7ABP19	○	C	24	7 ³ / ₁₆	13 ¹ / ₄	ES/MAG	50	—	11	-550 to +1100	770
7ABP19A	○	CA	24	7 ³ / ₁₆	13 ¹ / ₄	ES/MAG	50	—	11	-550 to +1100	770
7AEP7	○	C	Flat	7	15 ¹ / ₂	ES/ES	—	8.8	4.4	1375	—
7AQP7	○	C	24	7	8 ¹⁵ / ₁₆	ES/MAG	70	—	12	1100	770
7AQP19	○	C	24	7	8 ¹⁵ / ₁₆	ES/MAG	70	—	12	1100	770
7AQP25	○	C	24	7	8 ¹⁵ / ₁₆	ES/MAG	70	—	12	1100	770
7AUP7	○	C	24	7	8 ¹ / ₂	ES/MAG	70	—	11	1100	770
7BP2A	○	C	24	7	13 ¹ / ₄	MAG/MAG	53	—	8.8	—	770
7BP7A	○	C	24	7	13 ¹ / ₄	MAG/MAG	53	—	8.8	—	770
7JP7	○	C	20	7	14 ¹ / ₂	ES/ES	—	—	6.6	3000	—
7MP7	○	C	24	7 ³ / ₁₆	12 ³ / ₄	MAG/MAG	50	—	8.8	—	770

notes: • Line width measured at the center of tube face by the shrinking raster method at the current or brightness specified. Reference: MIL-E-1, Par. 4.12.6.1. The brightness shown for 3" and 5" round tubes is for 2" x 2" raster size, for other types, full screen illumination.

Standard Registered CATHODE RAY TUBES

Typical Operation				Deflection Factors Volts DC/Inch		Resolution		Remarks
Post Accel. (KV)	Anode (KV)	Focus Electrode Volts or Ma	Accel. G2 Volts	Grid No. 1 Voltage for Spot Cutoff	D1-D2	D3-D4	Line Width "A" Inches *	
4	2	390-550	—	-45 to -75	175-205	138-158	.016" @ Ib3 = 50 μ Adc	
4	2	390-550	—	-45 to -75	175-205	138-158	.012" @ Ib3 = 5 μ Adc	
4	2	320-470	—	-52 to -87	140-160*	61-70*	See 3ADP1*	Deflection Plate Leads on Neck
—	2	400-700	—	-40 to -70	68-92	28-38	See 3ASP1*	Altitude 35K Ft.
—	2	400-700	—	-38 to -67.5	68-92	28-38	See 3BGP1*	Heater 1.5v/140ma; Altitude 35K Ft.
4	2	375-575	—	-45 to -75	180-220	133-163	See 3BMP1*	Heater 1.5v/140ma
4	2	375-575	—	-45 to -75	180-220	133-163	See 3BMP1*	Heater 1.5v/140ma
4	2	460-775	—	-30 to -90	200-300	144-216	—	
3	1.5	300-515	—	-22.5 to -67.5	127-173	94-128	See 3JP1*	
3	1.5	300-515	—	-22.5 to -67.5	127-173	94-128	See 3JP1*	
—	2	320-600	—	-38 to -90	100-136	76-104	See 3KP1*	
3	1.5	300-515	—	-39 to -65	40-54	27-36	See 5ABP1*	
3	1.5	300-515	—	-39 to -65	40-54	27-37	See 5ABP1A*	
3	1.5	300-515	—	-34 to -56	40-50*	30.5-37.5*	See 5ADP1*	
3	1.5	300-515	—	-34 to -56	40-50*	30.5-37.5*	See 5ADP1A*	
—	7	0-250	300	-33 to -77	—	—	.016" @ Ib = 100 μ a	
—	7	0-250	300	-33 to -77	—	—	.016" @ Ib = 100 μ a	
—	7	0-250	300	-33 to -77	—	—	See 5AHP7*	
—	7	0-250	300	-33 to -77	—	—	See 5AHP7*	
—	7	0-250	300	-33 to -77	—	—	See 5AHP7*	
—	7	0-250	300	-33 to -77	—	—	See 5AHP7*	
—	2.5	0-300	—	-34 to -56	40-50*	20-25*	See 5AMP1*	Deflection Plate Leads on Neck
—	2.5	0-300	—	-34 to -56	40-50*	20-25*	See 5AMP1A*	Deflection Plate Leads on Neck
—	2.5	0-300	—	-34 to -56	40-50*	31.5-38.5*	See 5AQP1*	
—	2.5	0-300	—	-34 to -56	40-50*	31.5-38.5*	See 5AQP1A*	Low Pattern Distortion
—	8	56-84 Ma	—	-25 to -75	—	—	.011" @ Ib = 200 μ a	Heater 6.3v/300ma; Neck Dia $\frac{7}{8}$ "; Altitude 70K Ft.
—	8	56-84 Ma	—	-25 to -75	—	—	See 5BCP1*	Heater 6.3v/300ma; Neck Dia $\frac{7}{8}$ "; Altitude 70K Ft.
10	1.67	180-590	—	-50 to -80	70-86*	28.4-34.8*	See 5BGP1*	Spiral Accelerator; Deflection Plate Leads on Neck
10	1.67	180-590	—	-50 to -80	70-85*	15-18.3*	See 5BHP1*	Spiral Accelerator; Deflection Plate Leads on Neck
10	1.67	180-590	—	-50 to -80	70-85*	15-18.3*	See 5BHP1A*	Spiral Accelerator; Deflection Plate Leads on Neck
—	8	-50 to +350	300	-15 to -45	—	—	.014" @ Ib = 100 μ a	Heater 6.3v/300ma; Neck Dia $\frac{7}{8}$ "
—	8	-50 to +350	300	-15 to -45	—	—	See 5BRP1*	Heater 6.3v/300ma; Neck Dia $\frac{7}{8}$ "
4	2	375-690	—	-30 to -90	92	78	.032" @ Ib3 = 50 μ a	
4	2	375-690	—	-30 to -90	92	78	.016" @ Ib3 = 5 μ a	
—	4	0-120	300	-15 to -45	—	—	.006" @ Ib = 10 μ a	Encapsulated Leads; Heater 6.3v/300 ma; Altitude 70K Ft.; Neck Dia $\frac{7}{8}$ "
—	4	0-120	300	-15 to -45	—	—	See 5CVP1*	Encapsulated Leads; Heater 6.3v/300ma; Altitude 70K Ft.; Neck Dia $\frac{7}{8}$ "
—	4	0-120	300	-15 to -45	—	—	See 5CVP1*	Encapsulated Leads; Heater 6.3v/300ma; Altitude 70K Ft.; Neck Dia $\frac{7}{8}$ "
—	2	340-640	—	-90	48-64	27-37	—	
—	6	120 Ma	250	-25 to -70	—	—	See 5FP14A*	
—	6	120 Ma	250	-25 to -70	—	—	.01" @ Ib = 200 μ a	
20	2	362-695	—	-30 to -90	140-210	131-197	See 5RP1A*	Deflection Plate Leads on Neck
—	2	340-640	—	-90	56-77	46-62	See 5UP1*	
—	7	0-250	300	-28 to -72	—	—	.012" @ Ib = 100 μ a	
—	7	0-250	300	-28 to -72	—	—	.012" @ Ib = 100 μ a	
—	7	0-250	300	-28 to -72	—	—	See 7ABP7*	
—	7	0-250	300	-28 to -72	—	—	See 7ABP7A*	
—	7	0-250	300	-28 to -72	—	—	See 7ABP7*	
—	7	0-250	300	-28 to -72	—	—	See 7ABP7A*	
4	2	380-620	—	-45 to -75	—	—	See 7AEP1*	
—	10	50-350	300	-15 to -40	—	—	.015" @ Ib2 = 100 μ a	
—	10	50-350	300	-15 to -40	—	—	See 7AQP7*	
—	10	50-350	300	-15 to -40	—	—	See 7AQP7*	
—	8	0-300	—	-25 to -60	—	—	.012" @ Ib = 50 μ a	Heater 6.3v/300ma; Neck Dia $\frac{7}{8}$ "
—	7	99-135 Ma	250	-25 to -70	—	—	.02" @ Ib = 200 μ a	
—	7	99-135 Ma	250	-25 to -70	—	—	See 7BP2A*	
—	6	1620-2400	—	-72 to -168	216	177	—	
—	7	85 Ma	250	-27 to -63	—	—	.012" @ Ib = 200 μ a	

* Useful scan is limited on this axis to a value less than full screen dimension.
 * Line Width A for this type is approximately equal to that of the referenced type, when operating at the same beam current. Light output of other phosphors are in general lower than that of P-1.

† An ion trap magnet is required with this tube type.

General Notes

1. All voltages are measured with respect to cathode.
2. Except when otherwise specified in the Remarks column, the heater voltage and current are 6.3 volts and 600 Ma for all types.

Radar Indicators (continued)

Type	Faceplate			Overall Dimensions (Inches)		Focus/Deflection Method	Absolute Maximum Ratings				
	Shape	Tinted Clear Alum.	Curvature Radius (In.)	Faceplate Diameter or Width x Height	Length		ES = Electrostatic MAG = Magnetic	Deflection Angle (Degrees)	Post Accel. (KV)	Anode (KV)	Focus Electrode Volts
7MP14	○	C	24	7 ¹ / ₁₆	12 ³ / ₄	MAG/MAG	50	—	8.8	—	770
7UP7	○	CA	24	7	13 ³ / ₄	MAG/MAG	53	—	13.2	—	770
7UP25	○	CA	24	7	13 ³ / ₄	MAG/MAG	53	—	13.2	—	770
8CP7	○	C	20	8 ³ / ₁₆	16 ¹ / ₂	ES/ES	—	6.6	6.6	2750	—
8HP7	□	TA	27	8 ¹ / ₁₆ x 6 ¹ / ₁₆	9 ³ / ₁₆	ES/MAG	90	—	14	1100	550
10AKP7	○	TA	42	10 ¹ / ₂	17 ³ / ₈	MAG/MAG	50	—	11	—	1100
10ANP7	○	TA	42	10 ¹ / ₂	16	MAG/MAG	50	—	12	—	450
10ANP19	○	TA	42	10 ¹ / ₂	16	MAG/MAG	50	—	12	—	450
10ANP25	○	TA	42	10 ¹ / ₂	16	MAG/MAG	50	—	12	—	450
10KP7	○	T	42	10 ¹ / ₂	17 ³ / ₈	MAG/MAG	50	—	11	—	770
10KP7A	○	T	42	10 ¹ / ₂	17 ³ / ₈	MAG/MAG	50	—	11	—	770
10KP7B	○	TA	42	10 ¹ / ₂	17 ³ / ₈	MAG/MAG	50	—	13.2	—	770
10VP7	○	TA	42	10 ¹ / ₂	17 ³ / ₈	MAG/MAG	50	—	13.2	—	450
10WP7	○	T	42	10 ¹ / ₂	16 ¹ / ₁₆	ES/MAG	50	—	13.2	-550 to +1100	770
10WP7A	○	TA	42	10 ¹ / ₂	16 ¹ / ₁₆	ES/MAG	50	—	13.2	-550 to +1100	770
10WP14	○	T	42	10 ¹ / ₂	16 ¹ / ₁₆	ES/MAG	50	—	13.2	-550 to +1100	770
10WP14A	○	TA	42	10 ¹ / ₂	16 ¹ / ₁₆	ES/MAG	50	—	13.2	-550 to +1100	770
10WP19	○	T	42	10 ¹ / ₂	16 ¹ / ₁₆	ES/MAG	50	—	13.2	-550 to +1100	770
10WP19A	○	TA	42	10 ¹ / ₂	16 ¹ / ₁₆	ES/MAG	50	—	13.2	-550 to +1100	770
12ABP7	○	T	40	12 ¹ / ₁₆	18	ES/MAG	55	—	13.2	-550 to +1100	770
12ABP7A	○	TA	40	12 ¹ / ₁₆	18	ES/MAG	55	—	13.2	-550 to +1100	770
12ABP14	○	T	40	12 ¹ / ₁₆	18	ES/MAG	55	—	13.2	-550 to +1100	770
12ABP14A	○	TA	40	12 ¹ / ₁₆	18	ES/MAG	55	—	13.2	-550 to +1100	770
12ABP19	○	T	40	12 ¹ / ₁₆	18	ES/MAG	55	—	13.2	-550 to +1100	770
12ABP19A	○	TA	40	12 ¹ / ₁₆	18	ES/MAG	55	—	13.2	-550 to +1100	770
12DP7A	○	T	20	12	19 ³ / ₈	MAG/MAG	50	—	11	—	770
12DP7C	○	TA	20	12	19 ³ / ₈	MAG/MAG	50	—	13.2	—	770
12SP7	○	T	40	12 ¹ / ₁₆	18 ¹ / ₄	MAG/MAG	55	—	11	—	450
12SP7B	○	TA	40	12 ¹ / ₁₆	18 ¹ / ₄	MAG/MAG	55	—	11	—	550
12SP7D	○	TA	40	12 ¹ / ₁₆	18 ¹ / ₄	MAG/MAG	55	—	15	—	770
16AMP7	○	TA	27	16 ¹ / ₈	27 ³ / ₄	ES/ES	—	17.6	8.8	3300	—
Video Recorders											
2BP11	○	C	8	2	7 ⁵ / ₈	ES/ES	—	—	2.75	1100	—
3ACP11A	○	C	Flat	3	10	ES/ES	—	6.6	2.2	1650	—
3ADP11	○	C	Flat	3	10	ES/ES	—	6.6	3.3	1100	—
3ASP11	□	C	Flat	3 ¹ / ₄ x 1 ¹ / ₂	8 ⁵ / ₁₆	ES/ES	—	—	3	1200	—
3BGP11	□	C	60	3 ¹ / ₄ x 1 ¹ / ₂	9 ¹ / ₄	ES/ES	—	—	2.75	1100	—
3BMP11	○	C	Flat	3	10	ES/ES	—	6.6	2.2	1500	—
3KP11	○	C	8	3	11 ¹ / ₂	ES/ES	—	—	2.75	1100	—
3SP5	□	C	15	3 x 1 ¹ / ₂	9 ¹ / ₈	ES/ES	—	—	3	1200	—
3SP11	□	C	15	3 x 1 ¹ / ₂	9 ¹ / ₈	ES/ES	—	—	3	1200	—
3WP11	○	C	Flat	3	11 ¹ / ₂	ES/ES	—	—	2.75	1100	—
5ABP11	○	C	Flat	5 ¹ / ₄	16 ¹ / ₄	ES/ES	—	6.6	2.86	1100	—
5ABP11A	○	C	Flat	5 ¹ / ₄	16 ¹ / ₄	ES/ES	—	6.6	2.86	1100	—
5ADP11	○	C	Flat	5 ¹ / ₄	16 ¹ / ₄	ES/ES	—	6.6	2.86	1100	—
5ADP11A	○	C	Flat	5 ¹ / ₄	16 ¹ / ₄	ES/ES	—	6.6	2.86	1100	—
5AMP11	○	C	Flat	5 ¹ / ₄	17 ³ / ₈	ES/ES	—	—	6.6	1650	—
5AMP11A	○	C	Flat	5 ¹ / ₄	17 ³ / ₈	ES/ES	—	—	6.6	1650	—
5AQP11	○	C	Flat	5 ¹ / ₄	16 ¹ / ₄	ES/ES	—	—	4.4	1650	—
5AQP11A	○	C	Flat	5 ¹ / ₄	16 ¹ / ₄	ES/ES	—	—	4.4	1650	—
5BCP11	○	C	24	4.95	7 ¹ / ₁₆	MAG/MAG	70	—	11	—	—
5BGP11	○	CA	Flat	5 ¹ / ₄	17 ¹ / ₄	ES/ES	—	13.2	2.2	880	—
5BHP11	○	CA	Flat	5 ¹ / ₄	18 ¹ / ₄	ES/ES	—	13.2	2.2	880	—
5BHP11A	○	CA	Flat	5 ¹ / ₄	18 ¹ / ₄	ES/ES	—	13.2	2.2	880	—
5BRP11	○	CA	24	4.95	7	ES/MAG	70	—	10	-550 to +1100	—
5CP11A	○	C	8	5 ¹ / ₄	16 ³ / ₄	ES/ES	—	4.4	2.2	1100	—
5DEP11	○	C	20	5 ¹ / ₄	14 ¹ / ₄	ES/ES	—	—	2.75	1100	—
5DKP11	○	TA	24	4 ⁵ / ₁₆	11 ¹ / ₂	MAG/MAG	53	—	8.8	770	—
5FP11A	○	C	24	4 ⁵ / ₁₆	10 ³ / ₄	MAG/MAG	53	—	8.8	—	770
5RP5A	○	C	Flat	5 ¹ / ₄	16 ¹ / ₄	ES/ES	—	27.5	3.85	1700	—

notes: • Line width measured at the center of tube face by the shrinking raster method at the current or brightness specified. Reference: MIL-E-1, Par. 4.12.5.1. The brightness shown for 3" and 5" round tubes is for 2" x 2" raster size, for other types, full screen illumination.

Standard Registered CATHODE RAY TUBES

Typical Operation					Deflection Factors Volts DC/Inch		Resolution	Remarks
Post Accel. (KV)	Anode (KV)	Focus Electrode Volts or Ma	Accel. G2 Volts	Grid No. 1 Voltage for Spot Cutoff	D1-D2	D3-D4	Line Width "A" Inches *	
—	7	85 Ma	250	-27 to -63	—	—	See 7MP7*	
—	7	117 Ma	250	-25 to -70	—	—	.01" @ Ib = 200 μa	
—	7	111 Ma	250	-25 to -70	—	—	.008" @ Ib = 35 μa	
4	2	540-800	—	-24 to -56	56-81	49-68	—	
—	11	0-500	300	-28 to -72	—	—	—	
—	8	105 Ma	700	-20 to -80	—	—	.03" @ Ib = 200 μa	
—	9	—	250	-15 to -45	—	—	.013" @ Ia = 100 μa	
—	9	—	250	-15 to -45	—	—	See 10ANP7*	
—	9	—	250	-15 to -45	—	—	See 10ANP7*	
—	9	112 Ma	250	-27 to -63	—	—	.02" @ Ib = 200 μa	
—	9	112 Ma	250	-27 to -63	—	—	.015" @ Ib = 200 μa	
—	9	112 Ma	250	-27 to -63	—	—	.015" @ Ib = 200 μa	
—	11	110 Ma	250	-33 to -77	—	—	.020" @ Ib = 200 μa	
—	10	0-300	300	-33 to -77	—	—	.017" @ Ib = 100 μa	
—	10	0-300	300	-33 to -77	—	—	.017" @ Ib = 100 μa	
—	10	0-300	300	-33 to -77	—	—	See 10WP7*	
—	10	0-300	300	-33 to -77	—	—	See 10WP7A*	
—	10	0-300	300	-33 to -77	—	—	See 10WP7*	
—	10	0-300	300	-33 to -77	—	—	See 10WP7A*	
—	10	0-300	300	-33 to -77	—	—	.019" @ Ib = 100 μa	
—	10	0-300	300	-33 to -77	—	—	.019" @ Ib = 100 μa	
—	10	0-300	300	-33 to -77	—	—	See 7ABP7*	
—	10	0-300	300	-33 to -77	—	—	See 7ABP7A*	
—	10	0-300	300	-33 to -77	—	—	See 7ABP7*	
—	10	0-300	300	-33 to -77	—	—	See 7ABP7A*	
—	4	75-102 Ma	250	-25 to -70	—	—	.04" @ Ib = 200 μa	
—	4	75-102 Ma	250	-25 to -70	—	—	.019" @ Ib = 200 μa	
—	9	110 Ma	250	-27 to -63	—	—	.030" @ Ib = 200 μa	
—	9	104 Ma	250	-27 to -63	—	—	.015" @ Ib = 200 μa	
—	9	104 Ma	250	-27 to -63	—	—	.015" @ Ib = 200 μa	
12	7.5	1760-2670	—	-160 to -240	96-150	96-150	.019" @ Ia3 = 25 μa	
—	2	300-560	—	-67.5 to -135	230-310	148-200	See 2BP1*	
4	2	399-550	—	-45 to -75	175-205	138-158	.016" @ Ib3 = 50 μa	
4	2	320-470	—	-52 to -87	140-160	61-70	See 3ADP1*	Deflection Plate Leads on Neck
—	2	400-700	—	-40 to -70	68-92	28-38	See 3ASP1*	Altitude 35K Ft.
—	2	400-700	—	-38 to -67.5	68-92	28-38	See 3BGP1*	Heater 1.5v/140ma; Altitude 35K Ft.
4	2	375-575	—	-45 to -75	180-220	133-163	See 3BMP1*	Heater 1.5v/140ma
—	2	320-600	—	-38 to -90	100-136	76-104	See 3KP1*	
—	2	330-620	—	-58 to -135	146-198	104-140	See 3SP1*	
—	2	330-620	—	-58 to -135	146-198	104-140	See 3SP1*	
—	1.5	247-465	—	-45 to -75	62-76*	43-52*	See 3WP1*	
3	1.5	300-515	—	-39 to -65	40-54	27-36	See 5ABP1*	
3	1.5	300-515	—	-39 to -65	40-54	27-36	See 5ABP1A*	
3	1.5	300-515	—	-34 to -56	40-50*	30.5-37.5*	See 5ADP1*	
3	1.5	300-515	—	-34 to -56	40-50*	30.5-37.5*	See 5ADP1A*	
—	2.5	0-300	—	-34 to -56	40-50*	20-25*	See 5AMP1*	Deflection Plate Leads on Neck
—	2.5	0-300	—	-34 to -56	40-50*	20-25*	See 5AMP1A*	Deflection Plate Leads on Neck
—	2.5	0-300	—	-34 to -56	40-50*	31.5-38.5*	See 5AQP1*	
—	2.5	0-300	—	-34 to -56	40-50*	31.5-38.5*	See 5AQP1A*	Low Pattern Distortion
—	8	56-84 Ma	—	-25 to -75	—	—	See 5BCP1*	Heater 6.3v/300ma; Neck Dia 7/8"
10	1.67	180-590	—	-50 to -80	70-86*	28.4-34.8*	See 5BGP1*	Spiral Accelerator; Deflection Plate Leads on Neck
10	1.67	180-590	—	-50 to -80	70-85*	15-18.3*	See 5BHP1*	Spiral Accelerator; Deflection Plate Leads on Neck
10	1.67	180-590	—	-50 to -80	70-85*	15-18.3*	See 5BHP1A*	Spiral Accelerator; Deflection Plate Leads on Neck
—	8	-50 to +350	300	-15 to -45	—	—	See 5BRP1*	Heater 6.3v/300ma; Neck Dia 7/8"
4	2	375-690	—	-30 to -90	92	78	See 5CP1A*	
—	2	340-640	—	-90	48-64	27-37	See 5DEP1*	
—	8	—	250	-30 to -75	—	—	.007" at Ib2 = 200 μa	
—	6	120 Ma	250	-25 to -70	—	—	See 5FP14A*	
20	2	362-695	—	-30 to -90	140-210	131-197	See 5RP1A*	

* Useful scan is limited on this axis to a value less than full screen dimension.

* Line Width A for this type is approximately equal to that of the referenced type, when operating at the same beam current. Light output of other phosphors are in general lower than that of P-1.

† An ion trap magnet is required with this tube type.

General Notes

1. All voltages are measured with respect to cathode.

2. Except when otherwise specified in the Remarks column, the heater voltage and current are 6.3 volts and 600 Ma for all types.

Video Recorders (continued)

Type	Faceplate			Overall Dimensions (Inches)		Focus/Deflection Method	Deflection Angle (Degrees)	Absolute Maximum Ratings			
	Shape	Tinted Clear Alum.	Curvature Radius (In.)	Faceplate Diameter or Width x Height	Length	ES = Electrostatic MAG = Magnetic		Post Accel. (KV)	Anode (KV)	Focus Electrode Volts	Accel. GZ Volts
5RP11A	○	C	Flat	5¼	16¾	ES/ES	—	27.5	3.85	1700	—
5UP11	○	C	20	5¼	14¾	ES/ES	—	—	2.75	1100	—
5WP11	○	CA	Flat	5	11½	ES/MAG	50	—	30	6600	385
7AEP11	○	C	Flat	7	15½	ES/ES	—	8.8	4.4	1375	—
8CP11	○	C	20	8¾	16½	ES/ES	—	6.6	6.6	2750	—
10NP11	○	TA	42	10½	17¾	MAG/MAG	50	—	27.5	—	—
Industrial Monitors											
3KP4	○	C	8	3	11½	ES/ES	—	—	2.75	1100	—
3RP4	○	C	8	3	9¾	ES/ES	—	—	2.75	1100	—
5ABP4	○	C	Flat	5¼	16¾	ES/ES	—	6.6	2.86	1100	—
5ABP4A	○	C	Flat	5¼	16¾	ES/ES	—	6.6	2.86	1100	—
5AHP4	○	CA	24	4¼	11¾	ES/MAG	53	—	11	-550 to +1100	770
5AHP4A	○	CA	24	4¼	11¾	ES/MAG	53	—	11	-550 to +1100	770
5BCP4	○	C	24	4.95	7¾	MAG/MAG	70	—	11	—	—
5BRP4	○	CA	24	4.95	7	ES/MAG	70	—	10	-550 to +1100	770
5DKP4	○	TA	24	4¼	11¾	MAG/MAG	53	—	8.8	—	770
5DLP4	○	TA	24	4¼	8¾	ES/MAG	53	—	12	-550 to +1100	550
5FP4A	○	C	24	4¼	10¾	MAG/MAG	53	—	8.8	—	450
5QP4A	○	CA	24	4¼	11¾	MAG/MAG	53	—	13.2	—	770
5RP4A	○	C	Flat	5¼	16¾	ES/ES	—	27.5	3.85	1700	—
7AQP4	○	CA	24	7	8¼	ES/MAG	70	—	12	1100	770
7AUP4	○	CA	24	7	8½	ES/MAG	70	—	11	1100	770
8DP4	□	T	27	7¾ x 6¼	10¼	ES/MAG	90	—	8.8	-550 to +550	330
8FP4	□	TA	27	7¾ x 6¼	11¾	MAG/MAG	90	—	19.8	—	550
8HP4	□	TA	27	7¾ x 6¼	9¾	ES/MAG	90	—	14	1100	550
8KP4	□	TA	27	7¾ x 6¼	11¾	ES/MAG	90	—	18	800	700
8LP4	□	TA	11	6¼ x 8¼	8¼	ES/MAG	110	—	20	-550 to +1100	550
8QP4	□	TA	27	7¾ x 6¼	9¾	ES/MAG	90	—	18	1100	550
10ANP4	○	TA	42	10½	16	MAG/MAG	50	—	12	—	450
10SP4	○	TA	42	10½	16¾	ES/MAG	50	—	22	3300	450
14BAP4	□	TA	27	12½ x 9¼	16¾	ES/MAG	70	—	22	800	700
17DWP4	□	TA	27	15¾ x 12¾	19¾	ES/MAG	70	—	22	-550 to +1100	700
21EYP4	□	TA	33	20¼ x 16¾	23¾	ES/MAG	72	—	22	-550 to +1100	700
Receiver Check Tubes											
5AXP4	○	C	24	4¼	10¾	Auto ES/MAG	53	—	19.8	—	550
8XP4	□	T	27	7¾ x 6¼	11¾	Auto ES/MAG	90	—	22	—	550
8YP4	□	T	11	8¼ x 6¼	8¼	Auto ES/MAG	110	—	22	—	550
Flying Spot Scanners											
3ACP16A	○	C	Flat	3	10	ES/ES	—	6.6	2.2	1650	—
3KP16	○	C	8	3	11½	ES/ES	—	—	2.75	1000	—
5AUP24	○	CA	Flat	5	12½	ES/MAG	40	—	30	6600	385
5BGP15	○	CA	Flat	5¼	17¼	ES/ES	—	13.2	2.2	880	—
5BHP15	○	CA	Flat	5¼	18¼	ES/ES	—	13.2	2.2	880	—
5BHP15A	○	CA	Flat	5¼	18¼	ES/ES	—	13.2	2.2	880	—
5BNP16	○	CA	24	4¼	10¾	ES/MAG	53	—	19.8	-550 to +1100	550
5DKP15	○	TA	24	4¼	11¾	MAG/MAG	53	—	8.8	—	770
5DKP16	○	CA	24	4¼	11¾	MAG/MAG	53	—	8.8	—	770
5DKP24	○	TA	24	4¼	11½	MAG/MAG	53	—	8.8	—	770
5WP15	○	CA	Flat	5	11½	ES/MAG	50	—	30	6600	385
5ZP15	○	CA	Flat	5	14¾	ES/MAG	40	—	30	7700	385
5ZP16	○	CA	Flat	5	14¾	ES/MAG	40	—	30	7700	385
5ZP24	○	CA	Flat	5	14¾	ES/MAG	40	—	30	7700	385
7AQP16	○	CA	24	7	8¼	ES/MAG	70	—	12	1100	770
10ANP16	○	TA	42	10½	16	MAG/MAG	50	—	12	—	450
10VP15	○	CA	42	10½	17¾	MAG/MAG	50	—	13.2	—	450

notes: • Line width measured at the center of tube face by the shrinking raster method at the current or brightness specified. Reference: MIL-E-1, Par. 4.12.6.1. The brightness shown for 3" and 5" round tubes is for 2" x 2" raster size, for other types, full screen illumination.

Standard Registered CATHODE RAY TUBES

Typical Operation					Deflection Factors Volts DC/Inch		Resolution		Remarks
Post Accel. (KV)	Anode (KV)	Focus Electrode Volts or Ma	Accel. G2 Volts	Grid No. 1 Voltage for Spot Cutoff	D1-D2	D3-D4	Line Width "A" Inches *		
20	2	362-695	—	-30 to -90	140-210	131-197	See 5RP1A*	Ext. Cond. Coating; Optical Face Quality	
—	2	340-640	—	—	56-77	46-62	See 5UP1*		
—	27	4200-5400	200	-42 to -98	—	—	.010" @ Ib3 = 15 μa		
4	2	380-620	—	-45 to -75	81-101	67-83	See 7AEP1*		
4	2	540-800	—	-24 to -56	58-81	49-68	—		
—	18	110 Ma	—	-65 to -125	—	—	.008" @ Ib = 65 μa	Ext. Cond. Coating	
—	2	320-600	—	-38 to -90	100-136	76-104	See 3KP1*	Heater 6.3v/300ma; Neck Dia 7/8"	
—	2	330-620	—	-45 to -135	146-198	104-140	See 3RP1*		
3	1.5	300-515	—	-39 to -65	40-55	27-36	See 5ABP1*		
3	1.5	300-515	—	-39 to -65	40-54	27-36	See 5ABP1A*		
—	7	0-250	300	-33 to -77	—	—	.016" @ Ib = 100 μa		
—	7	0-250	300	-33 to -77	—	—	.016" @ Ib = 100 μa	Heater 6.3v/300ma; Neck Dia 7/8"	
—	8	56-84 Ma	—	-25 to -75	—	—	See 5BCP1*		
—	8	-50 to +350	300	-15 to -45	—	—	See 5BRP1*		
—	8	—	250	-30 to -75	—	—	See 5DKP11*		
—	10	0-400	300	-35 to -72	—	—	—		
—	6	120 Ma	250	-25 to -70	—	—	See 5FP14A*	Heater 6.3v/300ma; Neck Dia 7/8"	
—	10	—	300	-33 to -77	—	—	.006" @ 200 μa		
20	2	362-695	—	-30 to -90	140-210	131-197	See 5RP1A*		
—	10	50-350	300	-15 to -40	—	—	.015" @ Ib2 = 100 μa		
—	8	0-300	300	-25 to -60	—	—	.012" @ Ib = 50 μa		
—	8	60-360	200	-22 to -51	—	—	—	Ext. Cond. Coating	
—	16	125 Ma	300	-40 to -77	—	—	.006" @ Ib = 300 μa	Ext. Cond. Coating	
—	11	0-300	300	-28 to -72	—	—	—		
—	16	0-400	300	-40 to -77	—	—	.006" @ Ib = 300 μa		
—	16	0-400	300	-35 to -72	—	—	—		
—	16	0-400	300	-28 to -72	—	—	—		
—	9	—	250	-15 to -45	—	—	.013" at Ia2 = 400 μa	Ext. Cond. Coating	
—	14	1640-2225	200	-23 to -53	—	—	.012" @ Ib = 100 μa		
—	18	0-400	300	-40 to -77	—	—	.011" @ Ib = 300 μa		
—	18	0-400	300	-40 to -77	—	—	.013" @ Ib = 300 μa		
—	18	0-400	300	-40 to -77	—	—	.017" @ Ib = 300 μa		
—	14	—	300	-33 to -77	—	—	—	Ext. Cond. Coating	
—	16	—	300	-33 to -77	—	—	—		
—	16	—	300	-40 to -77	—	—	—		
4	2	399-550	—	-45 to -75	175-205	138-158	.016" @ Ib3 = 50 μa	Spiral Accelerator Spiral Accelerator; Deflection Plate Leads on Neck	
—	2	320-600	—	-38 to -90	100-136	76-104	See 3KP1*		
—	27	4600-5800	200	-40 to -100	—	—	.008" @ Ib2 = 15 μa		
10	1.67	180-590	—	-50 to -80	70-86*	28.4-34.8*	See 5BGP1*		
10	1.67	180-590	—	-50 to -80	70-85*	15-18.3*	See 5BHP1*		
10	1.67	180-590	—	-50 to -80	70-85*	15-18.3*	See 5BHPIA*	Spiral Accelerator; Deflection Plate Leads on Neck	
—	14	-50 to +350	300	-33 to -77	—	—	.012" @ Ib = 100 μa		
—	8	—	250	-30 to -75	—	—	See 5DKP16*		
—	8	136 Ma	250	-30 to -75	—	—	.0065" @ 200 μa		
—	8	—	250	-30 to -75	—	—	See 5DKP16*		
—	27	4200-5400	200	-42 to -98	—	—	.010" @ Ib = 15 μa	Ext. Cond. Coating; Optical Face Quality	
—	27	5500-7050	200	-42 to -98	—	—	.005" @ Ib = 15 μa		
—	27	5500-7050	200	-42 to -98	—	—	See 5ZP15*		
—	27	5500-7050	200	-42 to -98	—	—	See 5ZP15*		
—	10	50-350	300	-15 to -40	—	—	.015" @ Ib2 = 100 μa		
—	9	—	250	-15 to -45	—	—	.013" @ Ia = 400 μa	Ext. Cond. Coating	
—	11	110 Ma	250	-33 to -77	—	—	.020" @ Ib = 200 μa		

* Useful scan is limited on this axis to a value less than full screen dimension.
 * Line Width A for this type is approximately equal to that of the referenced type, when operating at the same beam current. Light output of other phosphors are in general lower than that of P-1.

♦ An ion trap magnet is required with this tube type.

General Notes

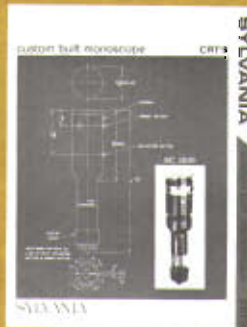
1. All voltages are measured with respect to cathode.
2. Except when otherwise specified in the Remarks column, the heater voltage and current are 6.3 volts and 600 Ma for all types.

Standard Registered Screen Phosphors

E.I.A. PHOSPHOR	EMISSION COLOR		PERSISTENCE	APPLICATION
	FLUORESCENCE	PHOSPHORESCENCE		
P-1	Yellowish green	Yellowish green	Medium	Used in cathode ray oscillograph and radar.
P-2	Yellowish green	Yellowish green	Medium	Used in cathode ray oscillographs.
P-3	Yellowish orange	Yellowish orange	Medium	
P-4	White	White	Medium to medium short	
P-5	Blue	Blue	Medium short	Used in monochrome television picture tubes. Photographic recording.
P-6	White	White	Short	Obsolete—Originally used in television receivers.
P-7	White	Yellowish green	Blue-medium short Yellowish green-long	Used for radar.
P-8	Obsolete	replaced by P-7		
P-9	Obsolete			
P-10			Dark trace-very long	Outside source of light is used for observation. Persistence from seconds to several months.
P-11	Blue	Blue	Medium short	Photographic recording.
P-12	Orange	Orange	Long	Used for radar.
P-13	Reddish orange	Reddish orange	Medium	
P-14	Purplish blue	Yellowish orange	Blue-medium short Orange-medium	Used for military displays where repetition rate is 2 to 4 seconds after excitation is removed.
P-15	Green	Green	Visible-short Ultra-violet-very short	Television pick-up of photographs by Flying Spot Scanning.
P-16	Bluish purple	Bluish purple	Very short	Television pick-up of photographs by Flying Spot Scanning.
P-17	Yellow white to blue white	Yellow	Blue-short Yellow-long	Used for military displays.
P-18	White	White	Medium to Medium short	Low frame rate television.
P-19	Orange	Orange	Long	Radar indicators.
P-20	Yellow green	Yellow green	Medium to medium short	High visibility displays.
P-21	Reddish orange	Reddish orange	Medium	
P-22	Tricolor phosphor screen		Medium short	Used for color television.
P-23	White	White	Medium short	Low temperature white-(Sepia) Interchangeable with P-4.
P-24	Green	Green	Short	Used in Flying Spot Scanner tubes.
P-25	Orange	Orange	Medium	Used for military displays where repetition rate is 10 seconds, to 2 minutes after excitation is removed.
P-26	Orange	Orange	Very long	Used for radar display.
P-27	Reddish orange	Reddish orange	Medium	Color Television Monitor Service.
P-28	Yellow green	Yellow green	Long	Used for radar display.
P-29	Two color phosphor screen		Medium	Used as indicator in aircraft instruments.
P-30*	—	—	—	—
P-31	Green	Green	Medium-short	Used in cathode ray oscillographs.
P-32	Purple-blue	Yellow green	Long	Used for radar display.
P-33	Orange	Orange	Very long	Used for radar display.
P-34	Bluish green	Yellow green	Very long	Used for oscillography, radar and visual information storage.
P-35	Green	Green	Medium short	Used for photographic recording on Orthochromatic film and visual observation.

*No data available—registration withdrawn.

Other Available Technical Literature



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