

RCA

CAMERA TUBES

STORAGE TUBES

CATHODE-RAY TUBES

- Developmental Types
- Recently Announced Types
- Other Suggested Types

FOR NEW-EQUIPMENT DESIGN



RADIO CORPORATION of AMERICA
ELECTRON TUBE DIVISION

HARRISON, N. J.

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RCA CAMERA TUBES

IMAGE ORTHICONS			
Type Number	Description	Maximum Dimensions	
		Overall Length inches	Diameter inches
5820	General-purpose tube for black-and-white outdoor or studio use. Features high sensitivity and stable performance.	15.45	3.06
7198	Very high sensitivity type designed to withstand severe shock and vibration, high humidity, and wide temperature variations. Ratings apply up to altitudes of 60,000 feet. For military and industrial applications.	15.45	3.06
7389-A	For high-quality black-and-white scene pick up. Features precision construction and increased target size. Uses same optical system as 3-inch types.	19.685	4.594
7513	For color and high-quality black-and-white TV cameras. Features precision construction for improved registration of images in color cameras.	15.45	3.06
C-73477	Special-purpose tube designed for industrial and scientific applications involving extremely low light levels.	25	4.2
C-74003	Similar to 7198 in construction and design. Has low heater-power rating of 0.6 watt making it suitable for transistorized cameras. Provides higher resolution than the 7198 at the same operating temperature. Can be operated at a temperature 20° C higher than that of the 7198 with performance equal to that of the 7198.	15.45	3.06
C-74004	For black-and-white outdoor or studio transistorized cameras. Has low heater-power rating of 0.6 watt. Provides higher resolution than the 5820 at the same operating temperature. Can be operated at a temperature 20° C higher than that of the 5820 with performance equal to that of the 5820.	15.45	3.06
C-74013	Similar to C-74004, but designed to withstand severe shock, vibration, and adverse environmental conditions.	15.45	3.06
C-74022	For color studio cameras. Features high output signal and high sensitivity. Suited for applications where light level on the scene is below 200 footcandles. Can be supplied in matched sets.	15.45	3.06
C-74026	Similar to 7389-A. For high-quality black-and-white scene pick up. Features precision construction and increased target size. Uses same optical system as 3-inch types.	19.685	4.594

VIDICONS			
Type Number	Description	Maximum Dimensions	
		Overall Length inches	Diameter inches
7038	For live or film pickup with color or black-and-white cameras. Features very high effective sensitivity and uniformity of characteristics from tube to tube. Has extremely uniform photoconductive surface.	6.50	1.135
7262	Small, sturdy type designed for use in transistorized cameras. Has low heater-power rating of only 0.6 watt. Good uniformity of characteristics from tube to tube.	5.18	1.135
7263	Similar to 7262 but designed to withstand severe shock, vibration, and high humidity. Ratings apply up to altitudes of 50,000 feet.	5.18	1.135
C-73439	Has high sensitivity in the ultraviolet region as low as 2300 angstroms. Utilizes fused-silica faceplate.	6.50	1.135
C-74008	Similar to 7038 but has higher sensitivity and slightly increased "lag" effects at low light levels.	6.50	1.135
C-74010	Features a special 1/2" x 3/8" signal electrode which eliminates "edge" effects and the need for blanking signals. This signal electrode also facilitates set-up procedure.	6.50	1.135
C-74019	Similar to 7038 but has higher effective sensitivity, higher response in the red region and a lower "gamma" value of the light transfer characteristic.	6.50	1.135

For Footnotes, see pages 6 & 7.

IMAGE ORTHICONS						
Maximum Photocathode Image Diagonal inches	Illumination on Tube Face* footcandles	Typical Resolution		Typical Signal-to-Noise Ratio		Type Number
		Amplitude Response at 400 TV lines per cent	Limiting Resolution TV Lines	With Bandwidth of 4.5 Mc*	With Bandwidth of 9 Mc*	
1.8	0.01	35	700	40:1	28:1	5820
1.8	{ 0.01 0.003 0.0003 0.00003	- - - -	{ 620 550 350 115	{ 35:1 28:1 14:1 4:1	{ 25:1 20:1 10:1 3:1	7198
1.6	0.08	60	800	80:1	56:1	7389-A
1.8	0.03	35	700	60:1	42:1	7513
2.0	{ 0.00002 0.0000002	- -	{ 500 100	6:1 -	4:1 -	C-73477
1.8	{ 0.01 0.003 0.0003 0.00003	- - - -	{ 720 650 450 215	{ 35:1 28:1 14:1 4:1	{ 25:1 20:1 10:1 3:1	C-74003
1.8	0.01	40	800	40:1	28:1	C-74004
1.8	0.01	40	800	40:1	28:1	C-74013
1.8	0.006	35	700	40:1	28:1	C-74022
1.6	0.04	60	800	60:1	42:1	C-74026

VIDICONS					
Image Size inches	Illumination on Tube Face† footcandles	Dark Current microamperes	Typical Resolution		Type Number
			Amplitude Response at 400 TV Lines per cent	Limiting Resolution TV Lines	
1/2 x 3/8	{ 1 to 3 10 to 20 50 to 200	{ 0.2 0.02 0.004	- 30 -	{ 700 750 750	7038
1/2 x 3/8	{ 1 to 3 10 to 20 50 to 200	{ 0.2 0.02 0.004	- 30 -	{ 700 750 750	7262
1/2 x 3/8	{ 1 to 3 10 to 20 50 to 200	{ 0.2 0.02 0.004	- 30 -	{ 700 750 750	7263
1/2 x 3/8	1 to 4	0.02	-	600	C-73439
1/2 x 3/8	0.2 to 0.6	0.02	-	600	C-74008
1/2 x 3/8	{ 1 to 3 10 to 20 50 to 200	{ 0.2 0.02 0.004	- 30 -	{ 700 750 750	C-74010
1/2 x 3/8	##	{ 0.2 0.02 0.004	- 30 -	{ 700 750 750	C-74019

For Footnotes, see pages 6 & 7.

RCA STORAGE TUBES

DISPLAY STORAGE TUBES				
Type Number	Description	Maximum Dimensions		Deflection Method
		Overall Length inches	Diameter inches	
7315	Direct-view type featuring slow writing speed to take full advantage of integrating and half-tone capabilities of tube. Has one writing gun, one viewing gun.	13.64	5.31	Electrostatic
7448	Direct-view type featuring high writing speed sufficient to "freeze" microsecond transients. Has one writing gun, and one viewing gun.	13.64	5.31	Electrostatic
C-73788	Direct-view type featuring increased display area. Has one writing gun and one viewing gun.	18.25	7	Electrostatic
C-73904	Direct-view type featuring two writing guns for simultaneous writing of two independent signals and one viewing gun.	13.64	5.31	Electrostatic
C-73922	Direct-view type having increased display area. Has one writing gun, one viewing gun, and one selective-erasing gun which permits erasure of specific parts of stored signal without erasing other portions.	18.25	7	Electrostatic
C-73931	Direct-view type having increased display area. Has two writing guns for simultaneous writing of two independent signals and one viewing gun.	18.25	7	Electrostatic
C-73938	Direct-view type having one writing gun, one viewing gun, and one selective-erasing gun which permits erasure of specific parts of stored signal without erasing other portions.	13.64	5.31	Electrostatic
C-73942	Direct-view type featuring integral magnetic shield, two writing guns for simultaneous writing of two independent signals, and one viewing gun.	16.00 [■]	5.31	Electrostatic
C-73958	Direct-view type featuring magnetic deflection. Has one writing gun and one viewing gun.	13.64	5.31	Magnetic
C-73959	Direct-view type having high-resolution capabilities, and slow writing speed. Has one writing gun and one viewing gun.	13.64	5.31	Electrostatic
C-73999	Direct-view type having integral magnetic shield. Has one writing gun capable of fast writing speed and one viewing gun. Electrically similar to type 7448.	13.64 [■]	5.5	Electrostatic

GRAPHECHON — Scan-Conversion Tube			
Type Number	Description	Maximum Dimensions	
		Overall Length inches	Diameter inches
7539	Sturdy charge-storage tube for use in data processing applications where information is to be continuously transformed from one time base or scanning presentation to another. It permits bright displays having a continuous range of half-tone information when viewed on suitable TV monitors. Has coaxial construction, one reading gun, and one writing gun.	26	3.4

For Footnotes, see pages 6 & 7.

DISPLAY STORAGE TUBES					
Writing Speed inches/second	Minimum Useful Viewing Diameter [§] inches	Maximum Erasing-Uniformity Factor ^{□□}	Brightness ^{♣♣} footlamberts	Resolution [#] lines/inch	Type Number [↓]
3000	3.8	0.4 to 0.45	1700 to 2500	50	7315
300000	3.8	0.4 to 0.45	1700 to 2500	50	7448
50000 [▲]	5.2	0.5	750	45	C-73788
75000 ^{▲◆}	3.8	0.4 to 0.45	2500	50	C-73904
8000 [▲]	5.2	0.5	750	45	C-73922
50000 ^{▲◆}	5.2	0.5	750	45	C-73931
12000 [▲]	3.8	0.4 to 0.45	2500	50	C-73938
36000 ^{▲◆}	4.0	-	2500	50	C-73942
50000 [▲]	3.8	0.4 to 0.45	1500	50	C-73958
3000 [▲]	3.8	0.5	200	110	C-73959
300000 [▲]	3.8	0.4 to 0.45	2500	50	C-73999

GRAPHECHON — Scan-Conversion Tube						
Deflection Method		Focusing Method		Minimum Number of Discernible Output-Signal Levels [#]	Resolution Capability at 50% Response range rings/display radius	Type Number [↓]
Writing Gun	Reading Gun	Writing Gun	Reading Gun			
Magnetic	Magnetic	Electrostatic	Magnetic	4	150	7539

For Footnotes, see pages 6 & 7.

RCA CATHODE-RAY TUBES

MONITOR KINESCOPIES					
Type Number	Description	Maximum Dimensions		Minimum Screen Diagonal inches	Phosphor
		Overall Length inches	Envelope Diagonal inches		
8HP4	Small, 8-inch, rectangular glass monitor kinescope. Has aluminized screen. For compact equipment.	10-1/4	9	7-13/16	P4
C-73667	Rectangular, 17-inch, glass monitor kinescope. Has aluminized screen, high resolution.	19-9/16	16-3/4	15-1/2	P4
C-73681	Rectangular, 14-inch, glass monitor kinescope. Has aluminized screen, high resolution.	17-1/8	13-13/16	12-1/2	P4

OSCILLOGRAPH TYPES					
Type Number	Description	Maximum Dimensions		Minimum Screen Diameter inches	Phosphor
		Overall Length inches	Envelope Diameter inches		
C-73954	Round, glass type for photographic-recording applications. Similar to 3KP11 except for low heater-power rating.†	11-3/4	3-1/16	2-3/4	P11
C-73978	Round, glass type for observing low- and medium-speed recurring electrical phenomena. Similar to 3RP1-A except for phosphor and low heater-power rating.†	9-3/8	3-1/16	2-3/4	P7
C-73991	Round, glass type for observing low- and medium-speed recurring electrical phenomena. Similar to 3WP1 except for low heater-power rating.†	11-5/8	3-1/16	2-3/4	P7
C-73996	Round, glass type for general-purpose oscilloscopes. Similar to 3RP1 except for low heater-power rating.†	9-3/8	3-1/16	2-3/4	P1

• Type numbers with prefix C are developmental types. Each of these C-numbers identifies a particular laboratory tube design but the number and the identifying data are subject to change. No obligations are assumed as to future manufacture unless otherwise arranged.

* Photocathode illumination at 2870° K required to reach "knee" of light transfer characteristic.

* Ratio of peak-to-peak highlight video-signal current to rms noise current for indicated bandwidth.

† Indicated values of illumination are those required to obtain maximum signal from the tube. Values of illumination 1/10 of those indicated will still produce a picture of usable quality.

§ Minimum useful viewing area may be eccentric with respect to tube face.

□ Determined as follows: With no erasing pulse, overscan the storage surface with writing beam to obtain maximum pattern brightness. Then cut off writing beam. Apply rectangular erasing pulses having an amplitude of between 8 to 10 volts and adjust duty cycle to obtain complete erasure in approximately 10 seconds. Measure time (t_1) from start of erasing to the instant at which any area within the minimum useful viewing diameter is reduced to background-brightness level, and time (t_2) from start of erasing to the instant at which the entire area within the minimum useful viewing diameter area is reduced to background-brightness level. The erasing-uniformity factor is defined as $(t_2 - t_1)/t_2$.

MONITOR KINESCOPIES						
Deflection Method	Focusing Method	Maximum Final High-Voltage Electrode (Ultor) ^{••} volts	Performance Characteristics			Type Number [↓]
			Final High-Voltage Electrode (Ultor) ^{••} volts	Limiting Resolution TV lines	Brightness footlamberts	
Magnetic	Electrostatic	14000	11000	600 to 1000	80	8HP4
Magnetic	Magnetic	20000	20000	2000 to 3000	20 to 30	C-73667
Magnetic	Magnetic	18000	18000	2000 to 3000	20 to 30	C-73681

OSCILLOGRAPH TYPES						
Maximum Final High-Voltage Electrode (Ultor) ^{••} volts	Typical Operating Conditions					Type Number [↓]
	Final High-Voltage Electrode (Ultor) ^{••} volts	Focusing-Electrode volts	Grid-No.1 Volts [◇]	Deflection Factors		
				DJ ₁ & DJ ₂ ⁺ volts dc/in	DJ ₃ & DJ ₄ ⁺⁺ volts dc/in	
2500	2000	320 to 600	-38 to -90	100 to 136	76 to 104	C-73954
2500	1000	165 to 310	-67.5 Max.	73 to 99	52 to 70	C-73978
2500	1000	165 to 310	-30 to -50	41.5 to 50.5	28.5 to 35	C-73991
2500	1000	165 to 310	-67.5 Max.	73 to 99	52 to 70	C-73996

⊕ Measured by shrinking-raster method at a display brightness of 50 per cent of saturated brightness.

▲ Writing speeds can be tailored to suit particular application requirements.

Requires only 3/4 the illumination at high light levels, and less than 1/2 the illumination at low light levels required by 7038 to produce same output current.

• The viewing gun produces an undeflected stream of electrons.

▣ Including integral magnetic shield.

↓↓ Measured with entire storage grid written to produce saturated brightness and with screen at indicated voltage.

◆ Each writing gun.

Defined as minimum number of output-signal levels, each related to a different input signal, which can be distinguished from each other regardless of their relative location on the storage surface.

∴ Heater requires 6.3 volts, 0.095 ampere.

•• The ultor is the electrode to which is applied the highest dc voltage for accelerating the electrons in the beam prior to its deflection.

◇ For visual extinction of undeflected focused spot.

+ DJ₁ & DJ₂ are nearer to screen.

++ DJ₃ & DJ₄ are nearer to base.

For further information or application assistance on the devices described in this folder please call your RCA Field Representative at our office nearest you.

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