3KP1
OSCILLOGRAPH TUBE

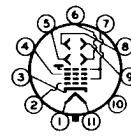
ELECTROSTATIC FOCUS ELECTROSTATIC DEFLECTION

DATA

General:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.6 ± 10%	amp ←
Direct Interelectrode Capacitances (Approx.):		
Grid No.1 to all other electrodes	8	μμf
Deflecting electrode DJ_1 to deflecting electrode DJ_2	2.5	μμf
Deflecting electrode DJ_3 to deflecting electrode DJ_4	2.5	μμf
DJ_1 to all other electrodes	11	μμf
DJ_2 to all other electrodes	8	μμf
DJ_3 to all other electrodes	7	μμf
DJ_4 to all other electrodes	8	μμf
Faceplate		Clear Glass ←
Phosphor (For Curves, see front of this Section)		P1
Fluorescence		Green
Phosphorescence		Green ←
Persistence		Medium
Focusing Method		Electrostatic
Deflection Method		Electrostatic
Overall Length		11-1/2" ± 1/4"
Greatest Diameter of Bulb		3" ± 1/16"
Mimimum Useful Screen Diameter		2-3/4"
Weight (Approx.)		9 oz ←
Mounting Position		Any
Bulb		J-24 ←
Base		Medium-Shell Magnal 11-Pin (JETEC No.B11-66) ←
Basing Designation for BOTTOM VIEW		11M

Pin 1 - Heater
Pin 2 - Grid No.1
Pin 3 - Cathode
Pin 4 - Grid No.3
Pin 5 - Deflecting Electrode DJ_3
Pin 6 - Deflecting Electrode DJ_4
Pin 7 - Ultor (Grid No.2, Grid No.4, Collector)



Pin 8 - Deflecting Electrode DJ_2
Pin 9 - Deflecting Electrode DJ_1
Pin 10 - Internal Connection-Do Not Use
Pin 11 - Heater

DJ_1 and DJ_2 are nearer the screen
DJ_3 and DJ_4 are nearer the base

← Indicates a change.

RCA

3KP1

OSCILLOGRAPH TUBE

With DJ_1 positive with respect to DJ_2, the spot is deflected toward pin 4. With DJ_3 positive with respect to DJ_4, the spot is deflected toward pin 1.

The plane through the tube axis and pin 1 may vary from the trace produced by DJ_3 and DJ_4 by ±10° (measured about the tube axis).

The angle between DJ_1 - DJ_2 trace and DJ_3 - DJ_4 trace is 90° ±3°.

Maximum Ratings, *Design-Center Values:*

ULTOR VOLTAGE	2500 max.	volts
→ ULTOR INPUT (AVERAGE)	6 max.	watts
GRID-No.3 VOLTAGE	1000 max.	volts
GRID-No.1 VOLTAGE:		
Negative bias value	200 max.	volts
Positive bias value	0 max.	volts
Positive peak value	2 max.	volts
PEAK VOLTAGE BETWEEN ULTOR AND ANY DEFLECTING ELECTRODE	500 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	125 max.	volts
Heater positive with respect to cathode	125 max.	volts

Equipment Design Ranges:

For any ultor voltage (E_{c_4}) between recommended minimum and 2500 volts*

Grid-No.3 Voltage for Focus	16% to 30% of E_{c_4}	volts
→ Grid-No.1 Voltage for Visual Extinction of Undeflected Focused Spot	1.9% to 4.5% of E_{c_4}	volts
Grid-No.3 Current for Any Operating Condition	−15 to +10	μamp
Deflection Factors:		
DJ_1 & DJ_2	50 to 68	v dc/in./kv of E_{c_4}
DJ_3 & DJ_4	38 to 52	v dc/in./kv of E_{c_4}
Spot Position	##	

Examples of Use of Design Ranges:

For ultor voltage of	*1000*	*2000*	*volts*
Grid-No.3 Voltage for Focus	160 to 300	320 to 600	volts

* Brilliance and definition decrease with decreasing ultor voltage. Recommended minimum for the 3KP1 in general service is 1000 volts but a value as low as 500 volts may be used under conditions of low-velocity deflection and low ambient-light levels.

The center of the undeflected focused spot will fall within a circle having 7.5-mm radius concentric with the center of the tube face.

→ Indicates a change.

3KP1

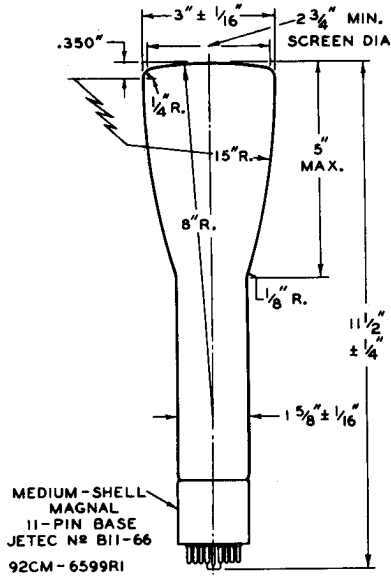
OSCILLOGRAPH TUBE

For ultor voltage of	*1000*	*2000*	*volts*
Grid-No.1 Voltage for Visual Extinction of Undeflected Focused Spot	-19 to -45	-38 to -90	volts ←
Deflection Factors:			
DJ_1 & DJ_2	50 to 68	100 to 136	volts dc/in.
DJ_3 & DJ_4	38 to 52	76 to 104	volts dc/in.

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	1.5 max.	megohms
Resistance in Any Deflecting Electrode Circuit■	5 max.	megohms

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



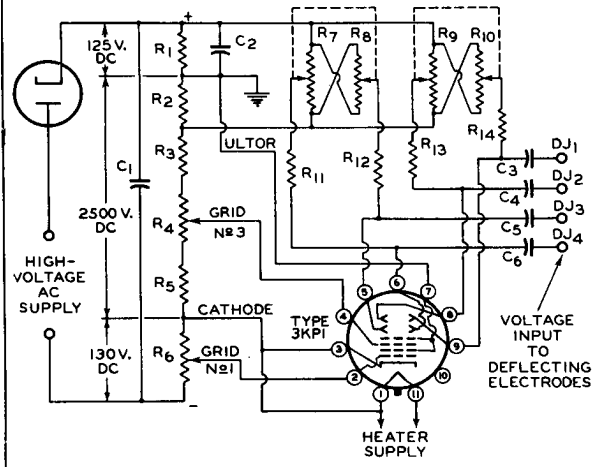
℄ OF BULB WILL NOT DEVIATE MORE THAN 2° IN ANY DIRECTION FROM PERPENDICULAR ERECTED AT CENTER OF BOTTOM OF BASE.

← Indicates a change.

3KP1

3KP1
OSCILLOGRAPH TUBE

TYPICAL OSCILLOGRAPH CIRCUIT



C1: 0.1 μf, 3000 Volts

C2: 1.0 μf, 200 Volts

C3 C4 C5 C6: 0.05-μf Blocking Capacitors*

R1 R2: 2 Megohms, 0.5 Watt

R3: 6 Megohms, 0.5 Watt

R4: 2-Megohm Potentiometer, 0.5 Watt

R5: 1.0 Megohm, 0.5 Watt

R6: 0.5-Megohm Potentiometer, 0.5 Watt

R7 R8: Dual 5-Megohm Potentiometer, 0.5 Watt

R9 R10: Dual 5-Megohm Potentiometer, 0.5 Watt

R11 R12 R13 R14: 2 Megohms, 0.5 Watt

* When cathode is grounded, capacitors should have high voltage rating (3000 volts); when ultor is grounded, they may have low voltage rating (200 volts). For dc amplifier service, deflecting electrodes should be connected direct to amplifier output. In this service, it is preferable usually to remove deflecting-electrode resistors to minimize loading effect on amplifier. In order to minimize spot defocusing, it is essential that ultor be returned to a point in the amplifier system which will give the lowest possible potential difference between ultor and the deflecting electrodes.

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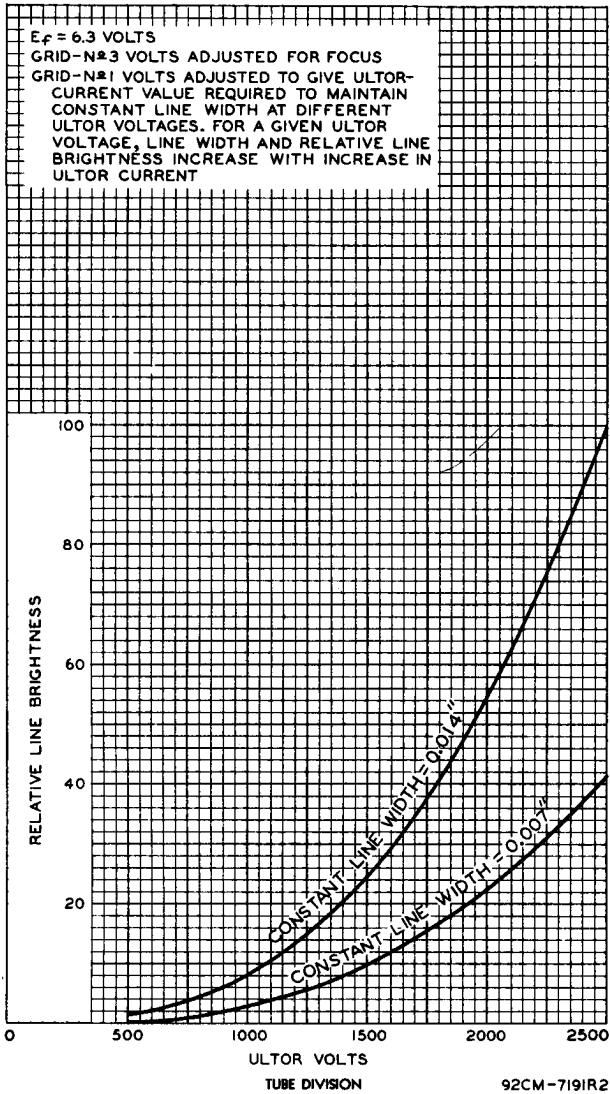
3KP1

CHARACTERISTICS



3KP1

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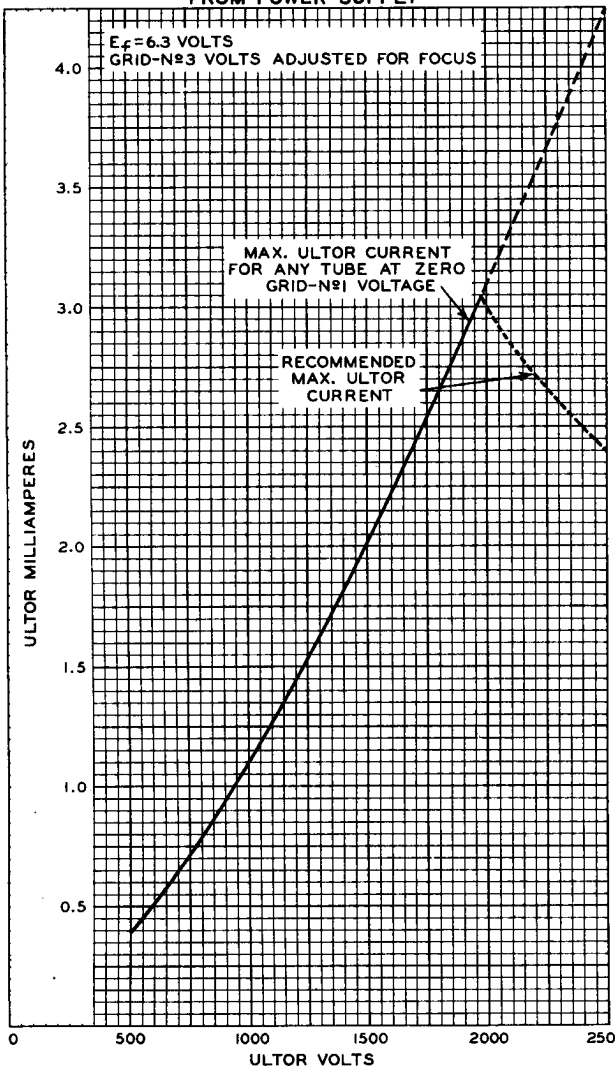
3KP1

MAXIMUM ULTOR-CURRENT REQUIREMENTS FROM POWER SUPPLY



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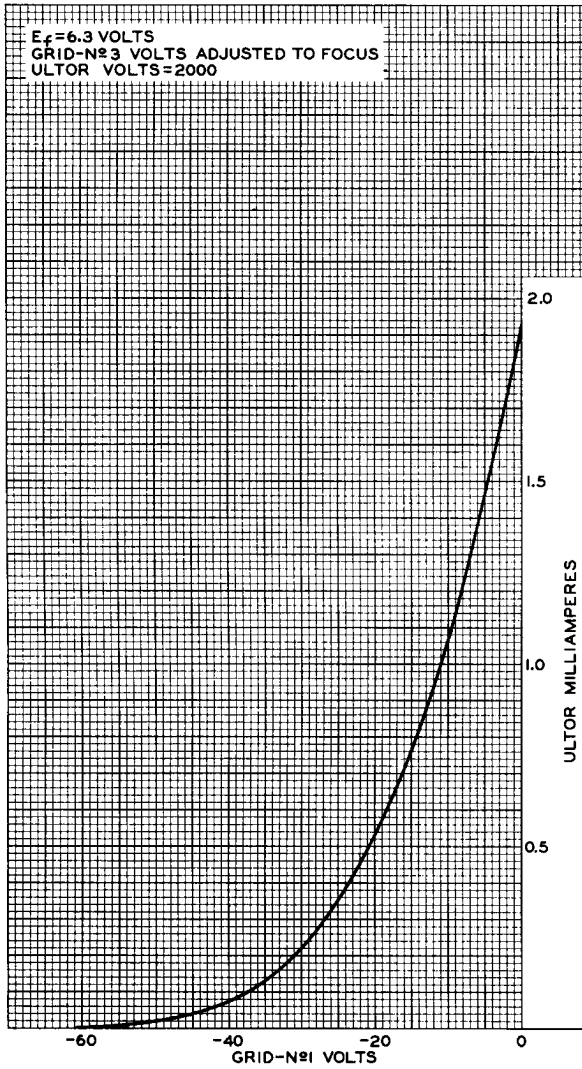
3KP1

AVERAGE CHARACTERISTIC



3KP4

OSCILLOGRAPH TUBE

ELECTROSTATIC FOCUS ELECTROSTATIC DEFLECTION

The 3KP4 is the same as the 3KP1 except for the following items:

General:

Phosphor (For curves, see front of this Section). . .P4—Sulfide Type
Fluorescence. . . . . White
Phosphorescence . . . . . White
Persistence . . . . . .Medium-Short ←

In general, operation of the 3KP4 at an ultor voltage less than 1500 volts is not recommended.

The PERSISTENCE CHARACTERISTICS of the P4-sulfide phosphor are the same as those shown for the P11 phosphor at the front of this Section

3KP7

OSCILLOGRAPH TUBE

ELECTROSTATIC FOCUS ELECTROSTATIC DEFLECTION

The 3KP7 is the same as the 3KP1 except for the following items:

General:

Phosphor (For Curves, see front of this Section). P7
Fluorescence. . . . . Purplish-Blue ←
Persistence . . . . . .Medium-Short ←
Phosphorescence . . . . . Yellowish-Green ←
Persistence . . . . . Very Long ←

In general, operation of the 3KP7 at an ultor voltage less than 1500 volts is not recommended.

3KP11

OSCILLOGRAPH TUBE

ELECTROSTATIC FOCUS ELECTROSTATIC DEFLECTION

The 3KP11 is the same as the 3KP1 except for the following items:

General:

Phosphor (For Curves, see front of this Section). P11
Fluorescence. . . . . .Blue
Phosphorescence . . . . . .Blue
Persistence . . . . . .Medium-Short ←

In general, operation of the 3KP11 at an ultor voltage less than 1500 volts is not recommended.

← Indicates a change.

3KP16
OSCILLOGRAPH TUBE

ELECTROSTATIC FOCUS ELECTROSTATIC DEFLECTION

The 3KP16 is the same as the 3KP1 except for the following items:

General:

Phosphor (For Curves, see front of this Section) P16
Fluorescence—
Visible radiation. . . . . Violet
Invisible radiation. . . . . Near-Ultraviolet
Phosphorescence—
Persistence of visible radiation . . . . . Very Short
Persistence of invisible radiation . . . . . Very Short

In general, operation of the 3KP16 at an ultor voltage less than 1500 volts is not recommended.

3KP4
KINESCOPE

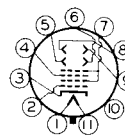
ELECTROSTATIC FOCUS ELECTROSTATIC DEFLECTION

DATA

General:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.6	amp
Direct Interelectrode Capacitances (Approx.):		
Grid No.1 to All Other Electrodes	8	μμf
Cathode to All Other Electrodes	5	μμf
DJ_1 to DJ_2	2.5	μμf
DJ_3 to DJ_4	2.5	μμf
DJ_1 to All Other Electrodes	11	μμf
DJ_2 to All Other Electrodes	8	μμf
DJ_3 to All Other Electrodes	7	μμf
DJ_4 to All Other Electrodes	8	μμf
Phosphor (For Curves, see front of this Section)		No.4
Fluorescence and Phosphorescence		White
Persistence of Phosphorescence		Medium
Focusing Method		Electrostatic
Deflection Method		Electrostatic
Overall Length		11-1/2" ± 1/4"
Greatest Diameter of Bulb		3" ± 1/16"
Minimum Useful Screen Diameter		2-3/4"
Raster Size (Approx.)		1-7/8" x 2-1/2"
Mounting Position		Any
Base		Medium-Shell Magnal 11-Pin
Basing Designation for BOTTOM VIEW		11M

Pin 1 – Heater
Pin 2 – Grid No.1
Pin 3 – Cathode
Pin 4 – Anode No.1
Pin 5 – Deflecting Electrode DJ_3
Pin 6 – Deflecting Electrode DJ_4



Pin 7 – Anode No.2, Grid No.2
Pin 8 – Deflecting Electrode DJ_2
Pin 9 – Deflecting Electrode DJ_1
Pin 10 – Internal Connection-Do Not Use
Pin 11 – Heater

DJ_1 and DJ_2 are nearer the screen

DJ_3 and DJ_4 are nearer the base

With DJ_1 positive with respect to DJ_2, the spot is deflected toward pin 4. With DJ_3 positive with respect to DJ_4, the spot is deflected toward pin 1.

The angle between the trace produced by DJ_3 and DJ_4 and its intersection with the plane through the tube axis and pin 1 does not exceed 10°.

The angle between the trace produced by DJ_3 and DJ_4 and the trace produced by DJ_1 and DJ_2 is 90° ± 3°.

3KP4

3KP4
KINESCOPE

Maximum Ratings, *Design-Center Values:*

ANODE-No.2 VOLTAGE■	2500 max.	volts
ANODE-No.1 VOLTAGE	1000 max.	volts
GRID-No.1 (CONTROL ELECTRODE) VOLTAGE:		
Negative bias value	200 max.	volts
Positive bias value	0 max.	volts
Positive peak value	2 max.	volts
PEAK VOLTAGE BETWEEN ANODE No.2 AND ANY DEFLECTING ELECTRODE	500 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode:	125 max.	volts
Heater positive with respect to cathode.	125 max.	volts

Equipment Design Ranges:

For any anode-No.2 voltage (Eb_2) between 1500 and 2500 volts*

Anode-No.1 Voltage for Focus□	16% to 30% of E_{b_2}	volts
Grid-No.1 Voltage for Visual Cutoff	1.9% to 4.5% of E_{b_2}	volts
Anode-No.1 Current for Any Operating Condition	−15 to +10	μamp
Deflection Factors:		
DJ_1 & DJ_2	50 to 68 v dc/in./kv of E_{b_2}	
DJ_3 & DJ_4	38 to 52 v dc/in./kv of E_{b_2}	
Spot Position	⊕	

Examples of Use of Design Ranges:

For anode-No.2 voltage of 2000 volts

Anode-No.1 Voltage□	320 to 600	volts
Grid-No.1 Voltage for Visual Cutoff	−38 to −90	volts
Deflection Factors:		
DJ_1 & DJ_2	100 to 136	volts dc/in.
DJ_3 & DJ_4	76 to 104	volts dc/in.

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	1.5 max.	megohms
Resistance in Any Deflecting Electrode Circuit○	5 max.	megohms

Minimum Circuit Values:

When the output capacitor of the power supply is capable of storing more than 250 microcoulombs, and when the inherent regulation of the power supply permits the instantaneous short-circuit current to exceed 1 ampere, the effective resistance in circuit between indicated electrode and the output capacitor should be as follows:

Grid-No.1-Circuit Resistance	220 min.	ohms
Anode-No.1-Circuit Resistance	1100 min.	ohms
Anode-No.2-Circuit Resistance	3000 min.	ohms

■, *, □, ⊕, ○: See next page.

3KP4
KINESCOPE

The resistors should be capable of withstanding the applied voltage.

■ Anode No. 2 and grid No. 2 which are connected together within tube are referred to herein as anode No. 2.

* Brilliance and definition decrease with decreasing anode-No. 2 voltage.

□ With the combined grid-No. 1-bias voltage and video-signal voltage adjusted for a highlight brightness of 2 foot-lamberts on a 1-7/8"x2-1/2" picture area.

⊕ With 1500 volts on anode No. 2, grid-No. 1 bias adjusted so that spot is just visible, and no deflection, the center of the spot will fall within a circle having 7.5-mm radius concentric with the center of the tube face.

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

OUTLINE DIMENSIONS for Type 3KP4
are the same as those shown for Type 3KP1

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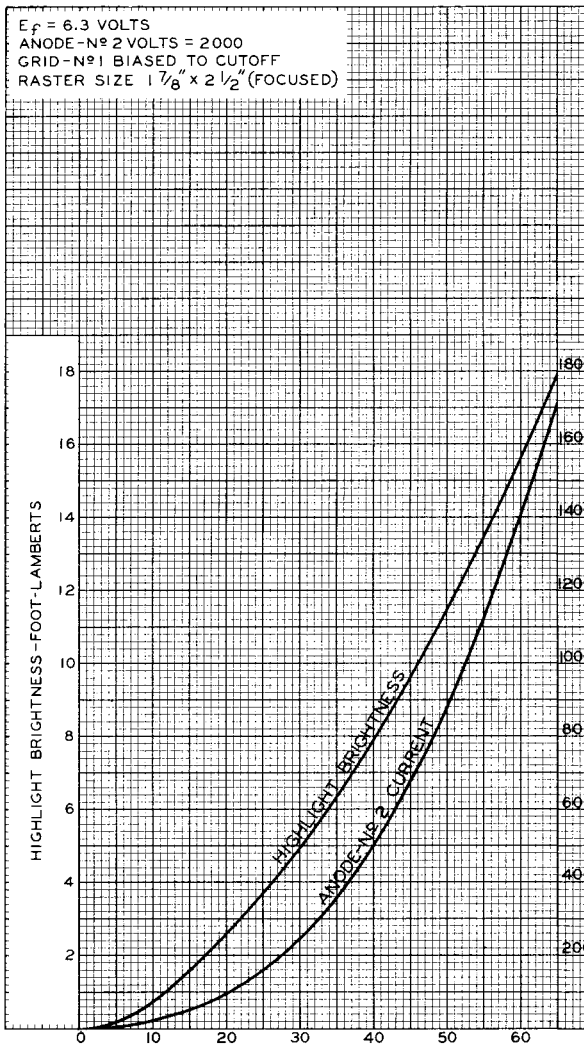
3KP4

AVERAGE CHARACTERISTICS



3KP11

OSCILLOGRAPH TUBE

ELECTROSTATIC FOCUS ELECTROSTATIC DEFLECTION

The 3KP11 is the same as the 3KP1 except that it has a phosphor of the short-persistence, blue-fluorescence type designated P11. The blue radiation of the P11 screen is highly actinic and has sufficiently short persistence to permit use of the 3KP11 in all moving-film photographic applications without blurring except in those where film moves at a high speed. The 3KP11 is also quite satisfactory for visual observation of phenomena because its phosphor has unusually high brightness for a blue screen.

In general, operation of the 3KP11 at an anode-No.2 voltage less than 1500 volts is not recommended.

THE SPECTRAL-ENERGY EMISSION CHARACTERISTIC and the PERSISTENCE CHARACTERISTIC of the P11 Phosphor are shown at the front of this Section

The curve showing MAXIMUM ANODE-No.2 CURRENT REQUIREMENTS FROM POWER SUPPLY for Type 3KP1 also applies to the 3KP11

3KP11

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3KP11

AVERAGE CHARACTERISTICS