



2P23

2P23

IMAGE ORTHICON

MAGNETIC FOCUS--MAGNETIC DEFLECTION

DATA

General:

Heater, for Unipotential Cathode:

Voltage. 6.3 $\pm$ 10% ac or dc volts

Current. 0.6 amp

Direct Interelectrode Capacitance:

Anode to All Other Electrodes 20 μ f

Photocathode Spectral Response See Curve

Image Size (4 x 3 aspect ratio). 1.6" Diagonal

Focusing Method. Magnetic

Deflection Method. Magnetic

Overall Length 15-1/4" $\pm$ 1/4"Greatest Diameter of Bulb. 3" $\pm$ 1/16"

Minimum Deflecting-Coil Inside Diameter. 2-1/8"

Deflecting-Coil Length 5"

Focusing-Coil Length 10"

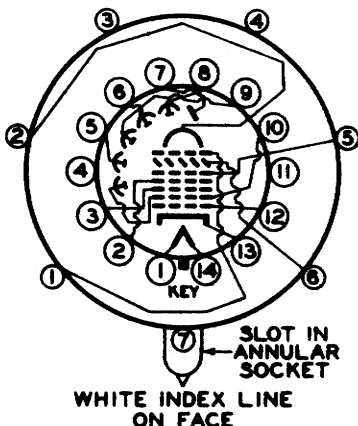
Alignment-Coil Length. 15/16"

Photocathode Distance Inside End of Focusing Coil. 1/2"

Operating Position Any except with diheptal base
up and tube axis at angle of
less than 20° from the vertical

End Base Small-Shell Diheptal 14-Pin

BOTTOM VIEW

DIRECTION OF LIGHT:
PERPENDICULAR TO
LARGE END OF TUBE

Pin 1-Heater
Pin 2-Grid No.4
Pin 3-Grid No.3
Pin 4-Internal Connec-
tion--Do Not Use

Pin 5-Dynode No.2
Pin 6-Dynode No.4
Pin 7-Anode
Pin 8-Dynode No.5
Pin 9-Dynode No.3
Pin 10-Dynode No.1,
Grid No.2

Pin 11-Internal Connec-
tion--Do Not Use

Pin 12-Grid No.1
Pin 13-Cathode
Pin 14-Heater

Shoulder Base. Jumbo Annular 7-Pin

Pin 1-Grid No.6
Pin 2-Photocathode
Pin 3-Internal Connec-
tion--Do Not Use
Pin 4-Internal Connec-
tion--Do Not Use

Pin 5-Grid No.5
Pin 6-Target
Pin 7-Internal Connec-
tion--Do Not Use

← Indicates a change.

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→ Maximum Ratings, Absolute Values:

PHOTOCATHODE VOLTAGE	-550 max.	volts
PHOTOCATHODE ILLUMINATION	50 max.	ft-c
OPERATING TEMPERATURE OF ANY PART OF BULB	65 max.	°C
OPERATING TEMPERATURE OF BULB AT LARGE END OF TUBE (Target Section)	35 min.	°C
TEMPERATURE DIFFERENCE BETWEEN TARGET SECTION AND ANY PART OF BULB HOTTER THAN TARGET SECTION	5 max.	°C
GRID-No.6 VOLTAGE	-550 max.	volts
TARGET VOLTAGE:		
Positive value	50 max.	volts
Negative value	50 max.	volts
GRID-No.5 VOLTAGE	150 max.	volts
GRID-No.4 VOLTAGE	300 max.	volts
GRID-No.3 VOLTAGE	400 max.	volts
GRID-No.2 & DYNODE-No.1 VOLTAGE	350 max.	volts
GRID-No.1 VOLTAGE:		
Negative bias value	125 max.	volts
Positive bias value	0 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	125 max.	volts
Heater positive with respect to cathode	10 max.	volts
ANODE-SUPPLY VOLTAGE*	1650 max.	volts
VOLTAGE PER MULTIPLIER STAGE	350 max.	volts

→ Typical Operation:

Photocathode Voltage (Image Focus)	-300 to -500	volts
Grid-No.6 Voltage (Accelerator)— 80% of photocathode voltage*	-240 to -400	volts
Target Voltage•	0	volts
Grid-No.5 Voltage (Decelerator)••	0 to 100	volts
Grid-No.4 Voltage (Beam Focus)	160 to 240	volts
Grid-No.3 Voltage#	225 to 330	volts
Grid-No.2 & Dynode-No.1 Voltage	300	volts
Grid-No.1 Voltage (For Picture Cutoff)	-15 to -85	volts
Dynode-No.2 Voltage	600	volts
Dynode-No.3 Voltage	880	volts
Dynode-No.4 Voltage	1160	volts
Dynode-No.5 Voltage	1450	volts
Anode Voltage	1500	volts
Anode Current	50	μamp
Target Temperature Range	35 to 60	°C
Ratio of Peak-to-Peak Highlight Video-Signal Current to RMS Noise Current (Approx.)	35	
Minimum Peak-to-Peak Blanking Voltage	10	volts
Field Strength at Center of Focusing Coil	75	gausses

•, *, •, ••, #: See next page.

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MAR. 15, 1948

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IMAGE ORTHICON

Focusing-Coil Current (Approx.) for coil listed below	75	ma
Deflecting-Coil Current (Approx. for assembly listed below):		
Horizontal (Peak to Peak)	625	ma
Vertical (Peak to Peak)	290	ma
Alignment-Coil Current (Approx. for coil listed below)	0 to 30	ma

Components:

Deflecting-Coil Assembly (Includes Keyed Jumbo Annular 7-Pin Socket) . .	RCA Type No. 201D75
Focusing-Coil Assembly	RCA Type No. 202D75
Alignment-Coil Assembly	RCA Type No. 204D75
Hor. Deflection Output Transformer . .	RCA Type No. 204T1
Ver. Deflection Output Transformer . .	RCA Type No. 204T2

- Ratio of dynode voltages is shown under Typical Operation.
- * For best operation, this voltage should be adjustable within $\pm 25\%$ of indicated value. For simplified equipment, this voltage can be fixed.
- Adjustable within ± 3 volts of indicated value, with blanking voltage off.
- Taps at 0, 30, 60, and 90 volts are recommended. Set at voltage giving most uniform resolution and signal output over entire picture area.
- # Adjust to give the most uniformly shaded picture near maximum signal.

OPERATING NOTES

After the 2P23 has been inserted in its sockets and the voltages applied, allow it to warm up for 1/2 to 1 hour with the camera lens iris closed. Then, proceed with normal operating adjustments.

When the equipment design or operating conditions are such that the maximum temperature rating or maximum temperature difference will be exceeded, provision should be made to direct a blast of cooling air from the diheptal-base end of the tube along the entire length of the bulb surface, i.e., through the space between the bulb surface and the surrounding deflecting coil and its extension. For this purpose, a small blower is satisfactory, but it should run at low speed to prevent vibration of the 2P23 and the associated amplifier equipment. Unless vibration is prevented, distortion of the picture may occur. To keep the operating temperature of the large end of the tube from falling below 45°C , some form of controlled heating should be employed. Ordinarily, adequate heat will be supplied by the focusing coil, deflection coils, and associated amplifier tubes so that the temperature can be controlled by the amount of cooling air directed along the bulb surface.

Resolution of better than 400 lines at the center of the picture can be produced by the 2P23 when the highlight illumination is above the knee of the typical signal-output curve for this type. To utilize such resolution capability in the horizontal direction with the standard scanning rate of 525 lines, it is necessary to use a video amplifier having a bandwidth of at least 5.5 megacycles. The maximum resolution obtainable is limited by the mesh-screen portion of the target.

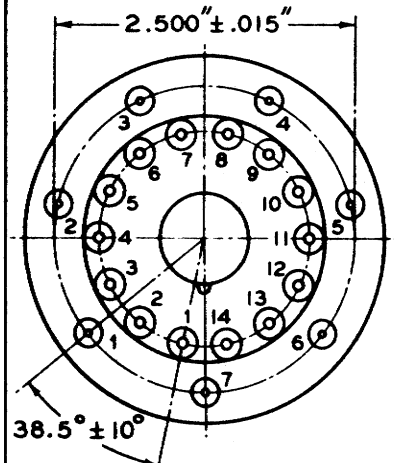
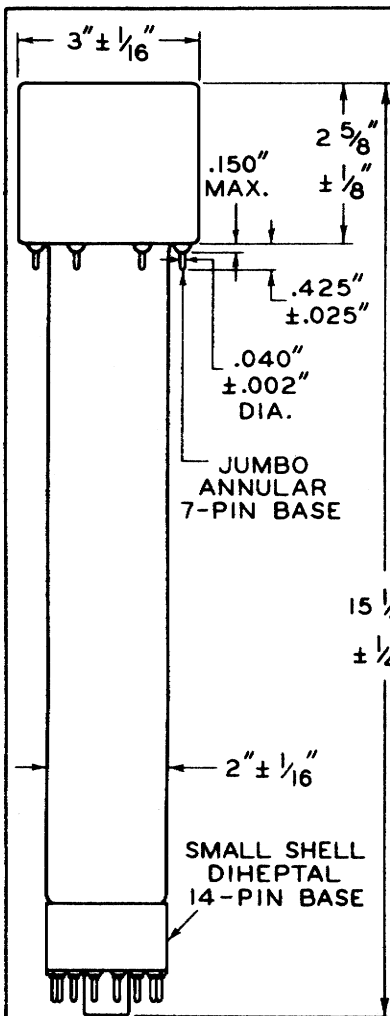
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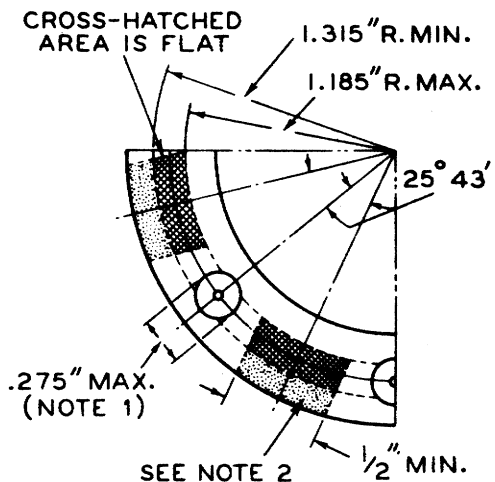
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IMAGE ORTHICON



ENLARGED BOTTOM VIEW

DETAIL OF BOTTOM VIEW OF JUMBO ANNULAR BASE



NOTE 1: MEASURED AT DISTANCE OF $\frac{1}{32}"$ BELOW BOTTOM OF ANNULAR BASE.

NOTE 2: DOTTED AREA IS FLAT OR EXTENDS TOWARD DIHEPTAL-BASE END OF TUBE BY $0.060"$ MAX.

ANNULAR BASE GAUGE

ANGULAR VARIATIONS BETWEEN PINS AS WELL AS ECCENTRICITY OF NECK CYLINDER WITH RESPECT TO PHOTOCATHODE CYLINDER ARE HELD TO TOLERANCES SUCH THAT PINS AND NECK CYLINDER WILL FIT FLAT-PLATE GAUGE WITH:

- SEVEN HOLES HAVING DIAMETER OF $0.065" \pm 0.001"$ AND DEPTH OF $0.265" \pm 0.001"$. HOLES ARE ENLARGED BY 45° TAPER TO DEPTH OF $0.047"$ AND ARE SPACED AT ANGLES OF $51^\circ 26' \pm 5'$ ON CIRCLE DIAMETER OF $2.500" \pm 0.001"$.
- SIX STOPS HAVING HEIGHT OF $0.187" \pm 0.001"$, CENTERED BETWEEN PIN HOLES, TO BEAR AGAINST FLAT AREAS OF BASE.
- RIM EXTENDING OUT A MINIMUM OF $\frac{1}{8}"$ FROM $2-13/16"$ DIAMETER AND HAVING HEIGHT OF $0.126" \pm 0.001"$.
- NECK-CYLINDER CLEARANCE HOLE HAVING DIAMETER OF $2.200" \pm 0.001"$.

92CM-6685

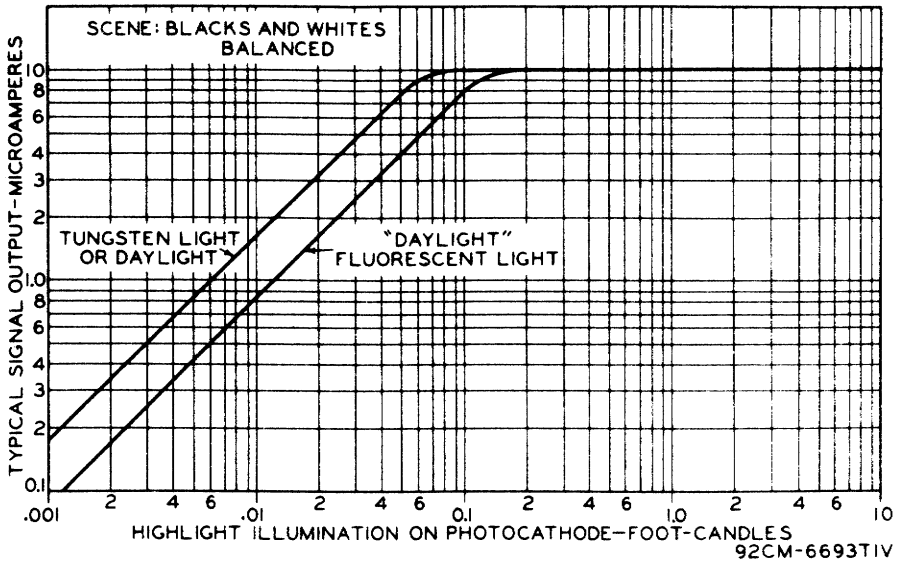


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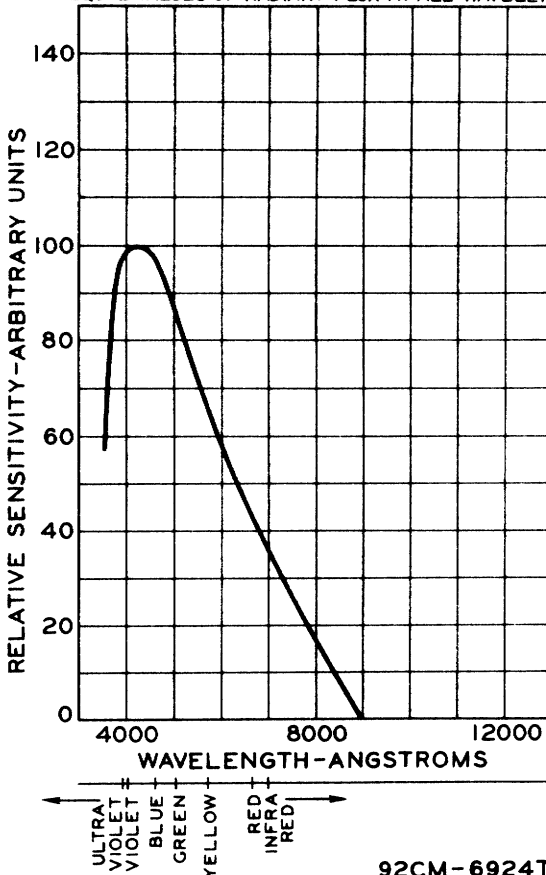
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CHARACTERISTIC CURVES

TYPICAL SIGNAL OUTPUT



SPECTRAL SENSITIVITY CHARACTERISTIC FOR EQUAL VALUES OF RADIANT FLUX AT ALL WAVELENGTHS



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