



5820

5820

IMAGE ORTHICON

For outdoor and studio pickup

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. 12 μ f

Photocathode, Semitransparent:

Response See accompanying Spectral-Sensitivity-Characteristics curves

Rectangular image (4 x 3 aspect ratio):

Useful size of 1.8" max. diagonal

Note: The size of the optical image focused on the photocathode should be adjusted so that its maximum diagonal does not exceed the specified value. The corresponding electron image on the target should have a size such that the corners of the rectangle just touch the target ring.

Orientation of Proper orientation is obtained when the vertical scan is essentially parallel to the plane passing through center of faceplate and pin 7 of the shoulder base.

Focusing Method. Magnetic

Deflection Method. Magnetic

Overall Length 15.20" $\pm$ 0.25"Greatest Diameter of Bulb. 3.00" $\pm$ 0.06"

Minimum Deflecting-Coil Inside Diameter. 2-3/8"

Deflecting-Coil Length 5"

Focusing-Coil Length 10"

Alignment-Coil Length. 15/16"

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

Operating Position See Operating Considerations

Weight (Approx.) 1 lb 6 oz

Shoulder Base. Keyed Jumbo Annular 7-Pin

BOTTOM VIEW[■]

Pin 1—Grid No.6

Pin 2—Photocathode

Pin 3—Internal Connection—Do Not Use

Pin 4—Internal Connection—Do Not Use

Pin 5—Grid No.5

Pin 6—Target

Pin 7—Internal Connection—Do Not Use

[■] See basing diagram on next page.

← Indicates a change.

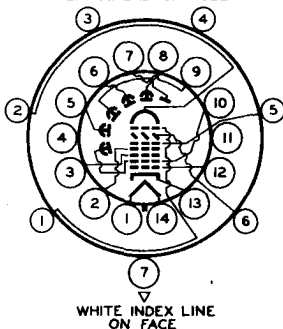


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IMAGE ORTHICON

End Base. . . . Small-Shell Diheptal 14-Pin (JETEC No.B14-45)

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 Connection—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 Connection—Do Not Use
 Pin 12-Grid No.1
 Pin 13-Cathode
 Pin 14-Heater

Maximum and Minimum Ratings, Absolute Values:**PHOTOCATHODE:**

Voltage	-550 max.	volts
Illumination.	50 max.	ft-c

OPERATING TEMPERATURE:

Of any part of bulb	50 max.	°C
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
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GRID-No.6 VOLTAGE	-550 max.	volts
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TARGET VOLTAGE:

Positive value.	10 max.	volts
Negative value.	10 max.	volts

GRID-No.5 VOLTAGE	150 max.	volts
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GRID-No.4 VOLTAGE	300 max.	volts
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GRID-No.3 VOLTAGE	400 max.	volts
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GRID-No.2 & DYNODE-No.1 VOLTAGE	350 max.	volts
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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*	1350 max.	volts
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VOLTAGE PER MULTIPLIER STAGE.	350 max.	volts
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*: See next page.



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Typical Operation and Characteristics:

Photocathode Voltage (Image Focus) . .	-400 to -540	volts
Grid-No.6 Voltage (Accelerator)—		
Approx. 75% of photocathode voltage.	-300 to -405	volts
Target-Cutoff Voltage ^o	-3 to +1	volts
Grid-No.5 Voltage (Decelerator). . . .	0 to 125	volts
Grid-No.4 Voltage (Beam Focus)	140 to 180	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 .	-45 to -115	volts
Dynode-No.2 Voltage.	600	volts
Dynode-No.3 Voltage.	800	volts
Dynode-No.4 Voltage.	1000	volts
Dynode-No.5 Voltage.	1200	volts
Anode Voltage.	1250	volts
Anode Current (DC)	30	μa
Signal-Output Current (Peak to peak) .	3 to 24	μa
Target-Temperature Range	35 to 45	°C
Ratio of Peak-to-Peak Highlight		
Video-Signal Current to RMS		
Noise Current (Approx.).	35	
Minimum Peak-to-Peak Blanking Voltage.	5	volts
Field Strength at Center of		
Focusing Coil [▲]	75	gausses
Field Strength of Alignment Coil		
(Approx.).	0 to 3	gausses

* Ratio of dynode voltages is shown under *Typical Operation*.

^o Normal setting of target voltage is +2 volts from target cutoff. The target-supply voltage should be adjustable from -3 to +5 volts.

* Adjust to give the most uniformly shaded picture near maximum signal.

[▲] Direction of current should be such that a north-seeking pole is attracted to the image end of the focusing coil, with the indicator located outside of and at the image end of the focusing coil.

OPERATING CONSIDERATIONS

The *operating position* of the 5820 should preferably be such that any loose particles in the neck of the tube will not fall down and strike or become lodged on the target. Therefore, it is recommended that the tube never be operated in a vertical position with the Diheptal-base end up nor in any other position where the axis of the tube with base up makes an angle of less than 20° with the vertical.

When the equipment-design or operating conditions are such that the maximum temperature rating or maximum temperature difference as given under *Maximum and Minimum Ratings* 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 assembly and its extension. Any attempt to effect cooling

← indicates a change.



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IMAGE ORTHICON

of the tube by circulating even a large amount of air around the focusing coil will do little good, but a small amount of air directly in contact with the bulb surface will effectively drop the bulb temperature. For this purpose, a small blower is satisfactory, but it should be run at low speed to prevent vibration of the 5820 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 35°C , some form of controlled heating should be employed. Ordinarily, adequate heat will be supplied by the focusing coil, deflecting coils, and associated amplifier tubes so that the temperature can be controlled by the amount of cooling air directed along the bulb surface. If, in special cases, a target heater is required, it should fit between the focusing coil and the bulb near the shoulder of the tube, and be non-inductively wound.

Resolution in excess of 500 lines at the center of the picture can be produced by the 5820. The Square-Wave Response Characteristics curves show the center square-wave amplitude response versus television line number for the 5820 when it is operated with the highlights at the knee of the light-transfer characteristic and at one lens stop above the knee and at a temperature of 35°C . The values of response plotted on the curves are those obtained after optimum adjustments are made.

To utilize the resolution capability of the 5820 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 6 megacycles.

For very high illumination or for individual tubes with exceptionally high photocathode sensitivity, it may not be possible to stop the lens down far enough to reduce the high-light illumination on the photocathode to a value near the knee of the transfer characteristic. When such a condition is encountered, the use of a Wratten neutral filter selected to give the required reduction in illumination is recommended. Ordinarily, two filters—one having 10% transmission and the other 20%—will give sufficient choice. Such filters with lens-adaptor rings can be obtained at a photographic-supply store.

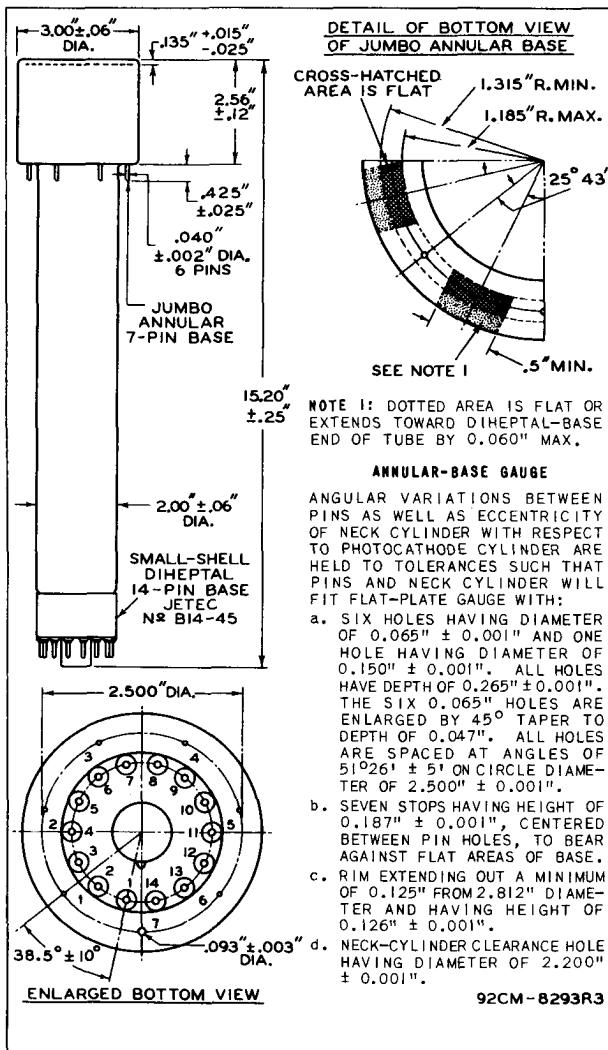
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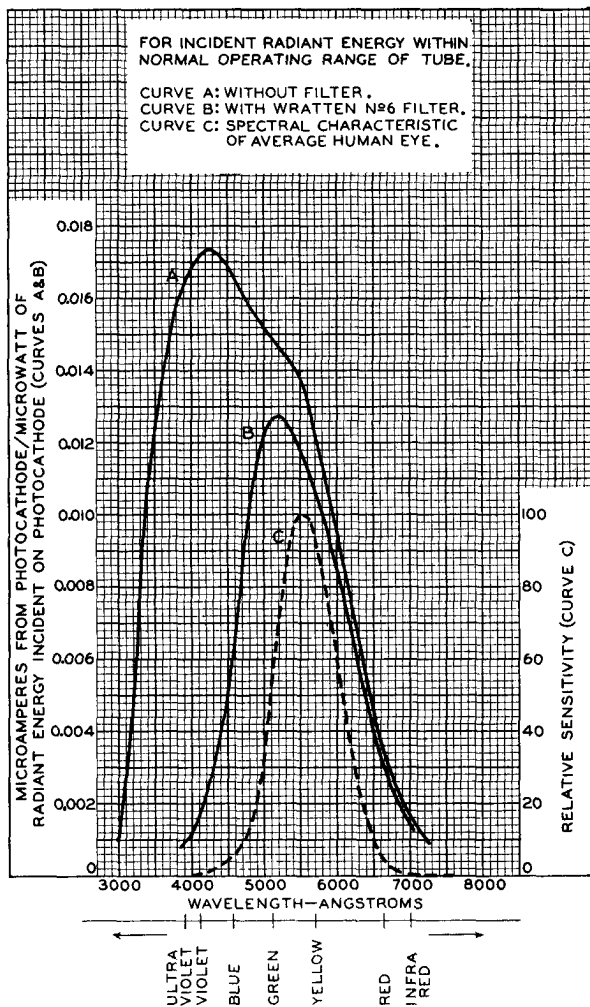
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IMAGE ORTHICON





SPECTRAL-SENSITIVITY CHARACTERISTICS



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

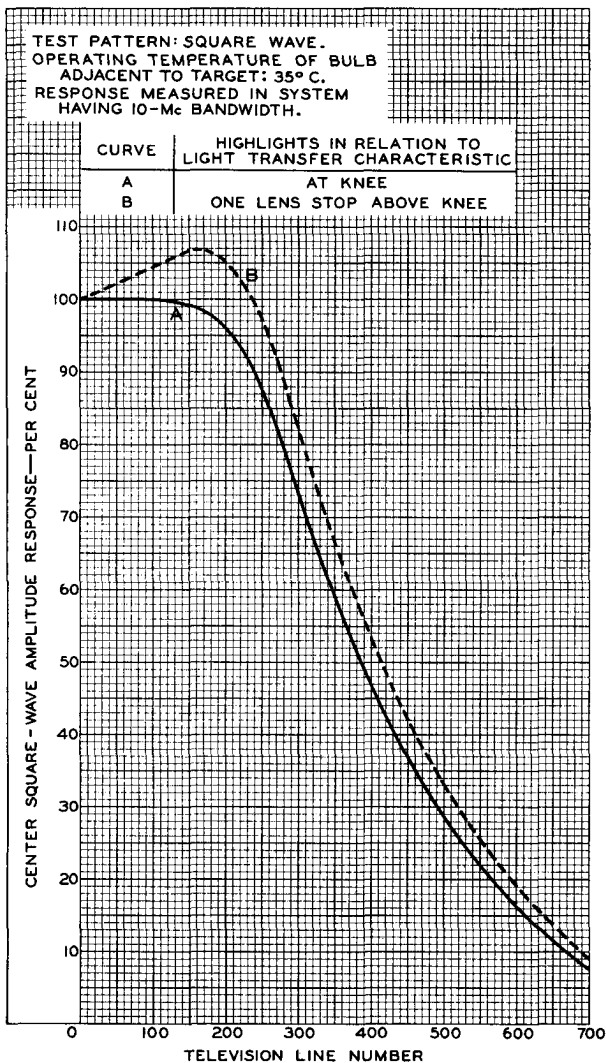
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SQUARE-WAVE RESPONSE CHARACTERISTICS

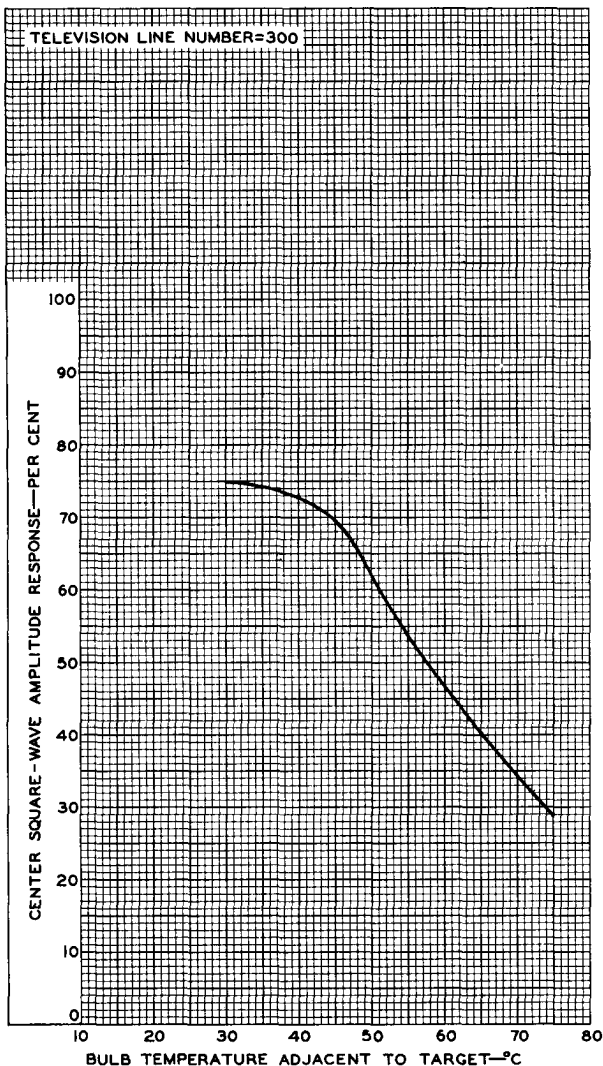


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TEMPERATURE EFFECT ON SQUARE-WAVE RESPONSE



ELECTRON TUBE DIVISION

92CM-8272R1

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BASIC LIGHT-TRANSFER CHARACTERISTIC

