5820
IMAGE ORTHICON

For outdoor and studio pickup

MAGNETIC FOCUS MAGNETIC DEFLECTION

DATA

General:

Heater, for Unipotential Cathode:
- Voltage . . . . . 6.3 ± 10% . . . . ac or dc volts
- Current . . . . . 0.6 . . . . . amp

Direct Interelectrode Capacitance:
- Anode to all other electrodes . . . . . 12 μμf

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" ± 0.25"
Greatest Diameter of Bulb . . . . . 3.00" ± 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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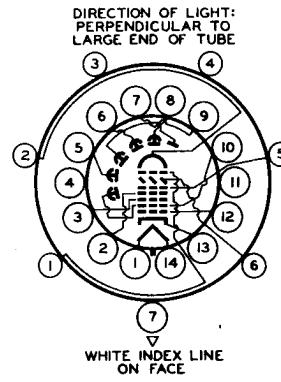
End Base. . . . Small-Shell Diheptal 14-Pin (JETEC No.B14-45)
BOTTOM VIEW

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
GRID-No.6 VOLTAGE	-550 max.	volts
TARGET VOLTAGE:		
Positive value	10 max.	volts
Negative value	10 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*	1350 max.	volts
VOLTAGE PER MULTIPLIER STAGE	350 max.	volts

*: 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°	−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	gauss
Field Strength of Alignment Coil (Approx.).	0 to 3	gauss

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

° 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-adapter rings can be obtained at a photographic-supply store.

→ Indicates a change.

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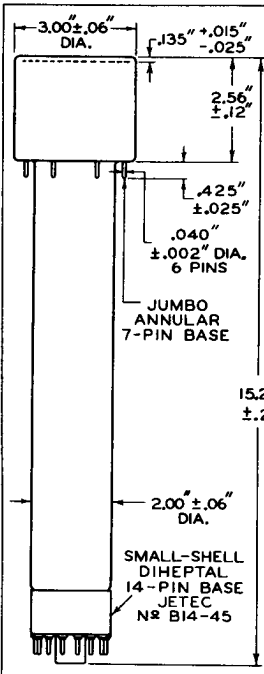
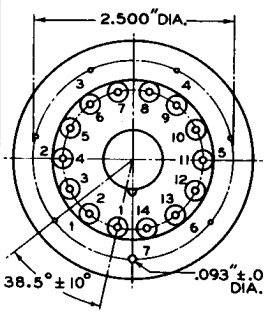
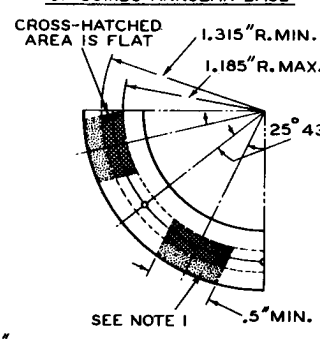




ENLARGED BOTTOM VIEW

DETAIL OF BOTTOM VIEW OF JUMBO ANNULAR BASE



NOTE 1: 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:

a. SIX HOLES HAVING DIAMETER OF 0.065" ± 0.001" AND ONE HOLE HAVING DIAMETER OF 0.150" ± 0.001". ALL HOLES HAVE DEPTH OF 0.265" ± 0.001". THE SIX 0.065" HOLES ARE ENLARGED BY 45° TAPER TO DEPTH OF 0.047". ALL HOLES ARE SPACED AT ANGLES OF 51°26' ± 5' ON CIRCLE DIAMETER OF 2.500" ± 0.001".

b. SEVEN STOPS HAVING HEIGHT OF 0.187" ± 0.001", CENTERED BETWEEN PIN HOLES, TO BEAR AGAINST FLAT AREAS OF BASE.

c. RIM EXTENDING OUT A MINIMUM OF 0.125" FROM 2.812" DIAMETER AND HAVING HEIGHT OF 0.126" ± 0.001".

d. NECK-CYLINDER CLEARANCE HOLE HAVING DIAMETER OF 2.200" ± 0.001".

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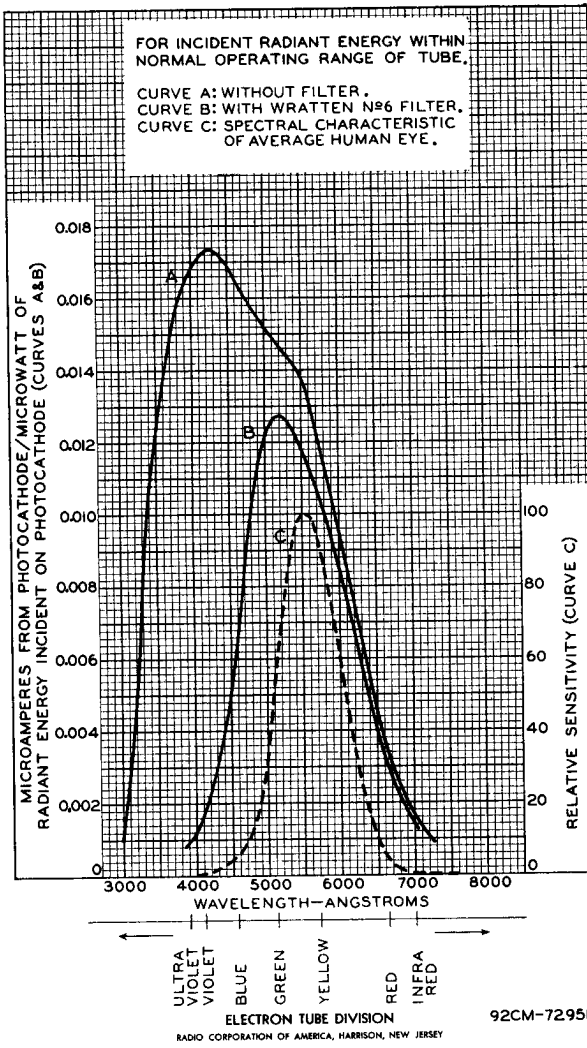
SPECTRAL-SENSITIVITY CHARACTERISTICS



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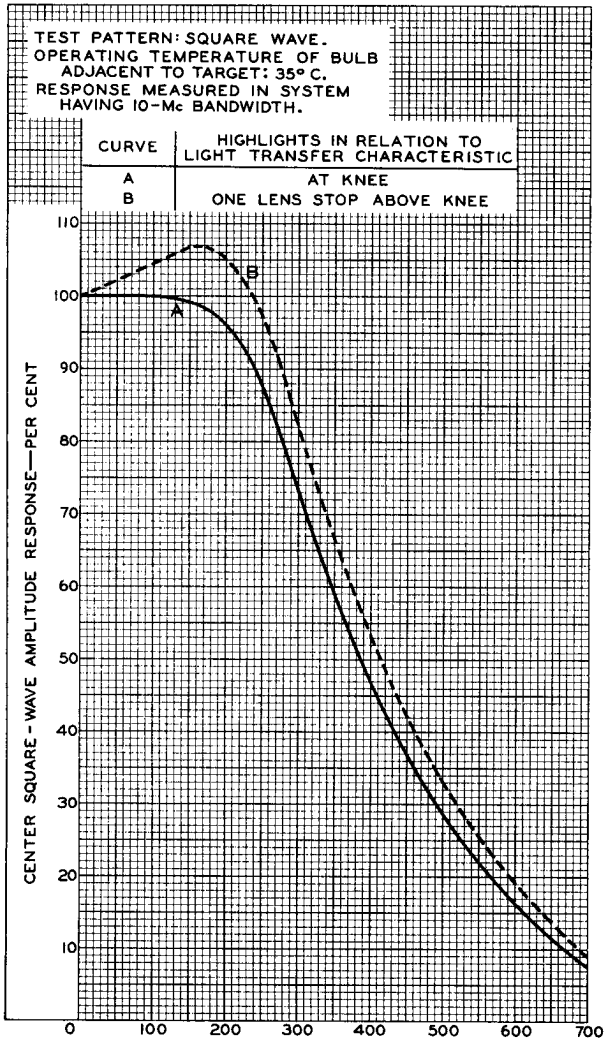
SQUARE-WAVE RESPONSE CHARACTERISTICS



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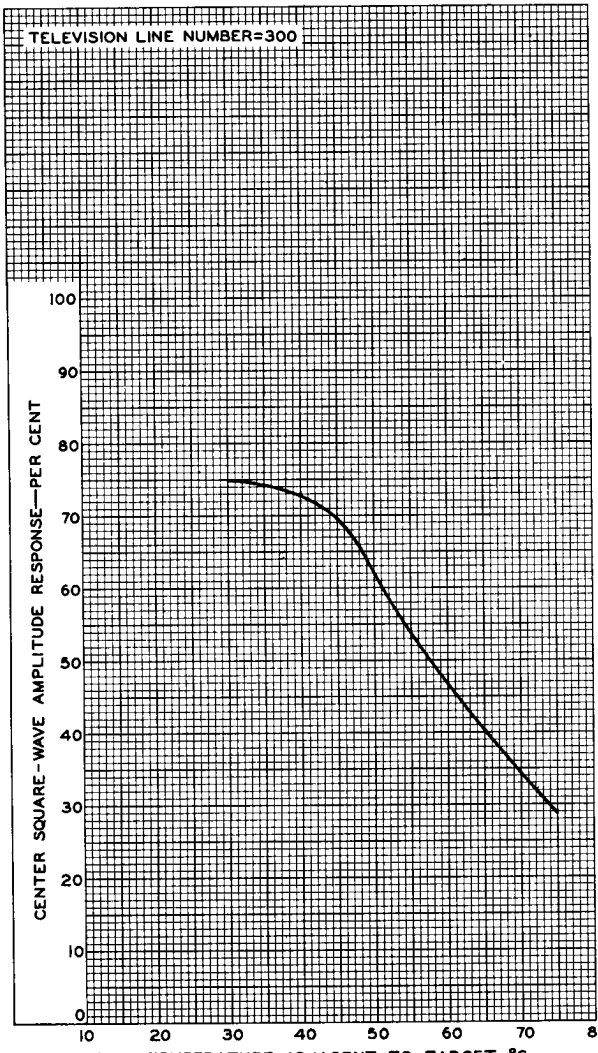
TEMPERATURE EFFECT ON SQUARE-WAVE RESPONSE



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BASIC LIGHT-TRANSFER CHARACTERISTIC