

## IMAGE ORTHICON

MAGNETIC FOCUS

MAGNETIC DEFLECTION

LOW-LIGHT-LEVEL PICKUP

The GL-6849 is a television camera tube for extremely low-light-level pickup use. Typical applications are observation of fluoroscopic screens, scenes illuminated by starlight and direct images of stars.

Extremely wide target-to-mesh spacing reduces smearing or lag of moving images at low light levels by better beam modulation. This results in an increase in signal-to-noise ratio at low illumination levels. Wide spacing eliminates microphonics orig-

inating in the target-mesh assembly.

The GL-6849 photocathode is characterized by a spectral response with high blue and high green sensitivity, very good yellow sensitivity and good red sensitivity. It has practically no infra-red sensitivity. This characteristic of the response permits portrayal of colors in nearly their true tonal gradation since it prevents any color-masking by infra-red.

### TECHNICAL INFORMATION

#### GENERAL

##### Electrical

Cathode—Unipotential

Heater Voltage, AC or DC . . . . .  $6.3 \pm 10\%$  Volts

Heater Current . . . . . 0.6 Amperes

Photocathode—Semi-transparent

Response—See spectral sensitivity curve on page 3 for details.

Rectangular Image, 4 by 3 aspect ratio

Useful Size, maximum diagonal . . . . . 1.8 Inches

Orientation—Proper orientation is obtained when the vertical scan is essentially parallel to the plane passing through the center of the faceplate and pin No. 7 of the shoulder base.

Focusing Method—Magnetic

Deflecting Method—Magnetic

Direct Interelectrode Capacitance

Anode to All Other Electrodes . . . . . 12  $\mu\text{f}$

GENERAL  ELECTRIC

## TECHNICAL INFORMATION (CONT'D)

## Mechanical

Over-all Length	15.20" $\pm$ 0.25"	Inches
Greatest Diameter of Bulb	3.00" $\pm$ 0.06"	Inches
Minimum Deflecting Coil Inside Diameter	2 $\frac{3}{8}$	Inches
Deflecting Coil Length	.5	Inches
Focusing Coil Length	.10	Inches
Alignment Coil Length	$\frac{15}{16}$	Inches
Photocathode Distance Inside End of Focusing Coil	$\frac{1}{2}$	Inches
Weight, approximate	1.4	Pounds
Operating Position—Any, except with diheptal base up and the tube axis at an angle of less than 20 degrees from vertical.		

## MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

## Maximum Ratings, Absolute Values

Photocathode Voltage	— 550 Max	Volts
Photocathode Illumination	.50 Max	Foot-Candles
Anode Supply Voltage*	1350 Max	Volts
Grid-No. 1 Voltage		
Negative Bias Value	125 Max	Volts
Positive Bias Value	0 Max	Volts
Grid-No. 2 and Dynode-No. 1 Voltage	350 Max	Volts
Grid-No. 3 Voltage	400 Max	Volts
Grid-No. 4 Voltage	300 Max	Volts
Grid-No. 5 Voltage	150 Max	Volts
Grid-No. 6 Voltage	— 550 Max	Volts
Voltage Per Multiplier Stage	350 Max	Volts
Target Voltage		
Positive Value	10 Max	Volts
Negative Value	10 Max	Volts
Peak Heater-Cathode Voltage		
Heater Negative with Respect to Cathode	125 Max	Volts
Heater Positive with Respect to Cathode	10 Max	Volts
Operating Temperature of Any Part of Bulb	50 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

## Typical Operation

Photocathode Voltage, image focus	— 400 to — 540	Volts
Grid-No. 1 Voltage for Picture Cut-off, beam	— 45 to — 115	Volts
Grid-No. 2 and Dynode-No. 1 Voltage	300	Volts
Grid-No. 3 Voltage †, multiplier focus	.225 to 330	Volts
Grid-No. 4 Voltage, beam focus	140 to 180	Volts
Grid-No. 5 Voltage, decelerator	0 to 125	Volts
Grid-No. 6 Voltage, accelerator		
75 Percent of Photocathode Voltage, approximate	— 300 to — 405	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
DC Anode Current	.3	Microamperes
Signal Output Current, peak to peak	.001 to 5	Microamperes
Target Voltage ‡		
Target Cutoff Voltage ‡	— 3 to +1	Volts
Blanking Voltage, peak to peak	.5 to 20	Volts
Target Temperature Range	35 to 45	C
Ratio of Peak-to-Peak Highlight Video Signal		
Current to RMS Noise Current, approximate	35	
Minimum Peak-to-Peak Blanking Voltage	.5	Volts
Field Strength at Center of Focusing Coil §	.75	Gausses
Field Strength of Alignment Coil, approximate	0 to 3	Gausses

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

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

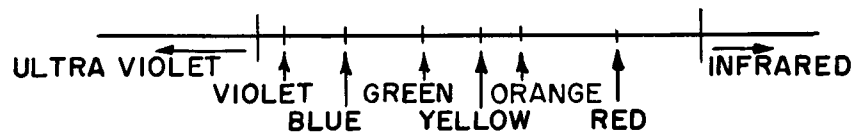
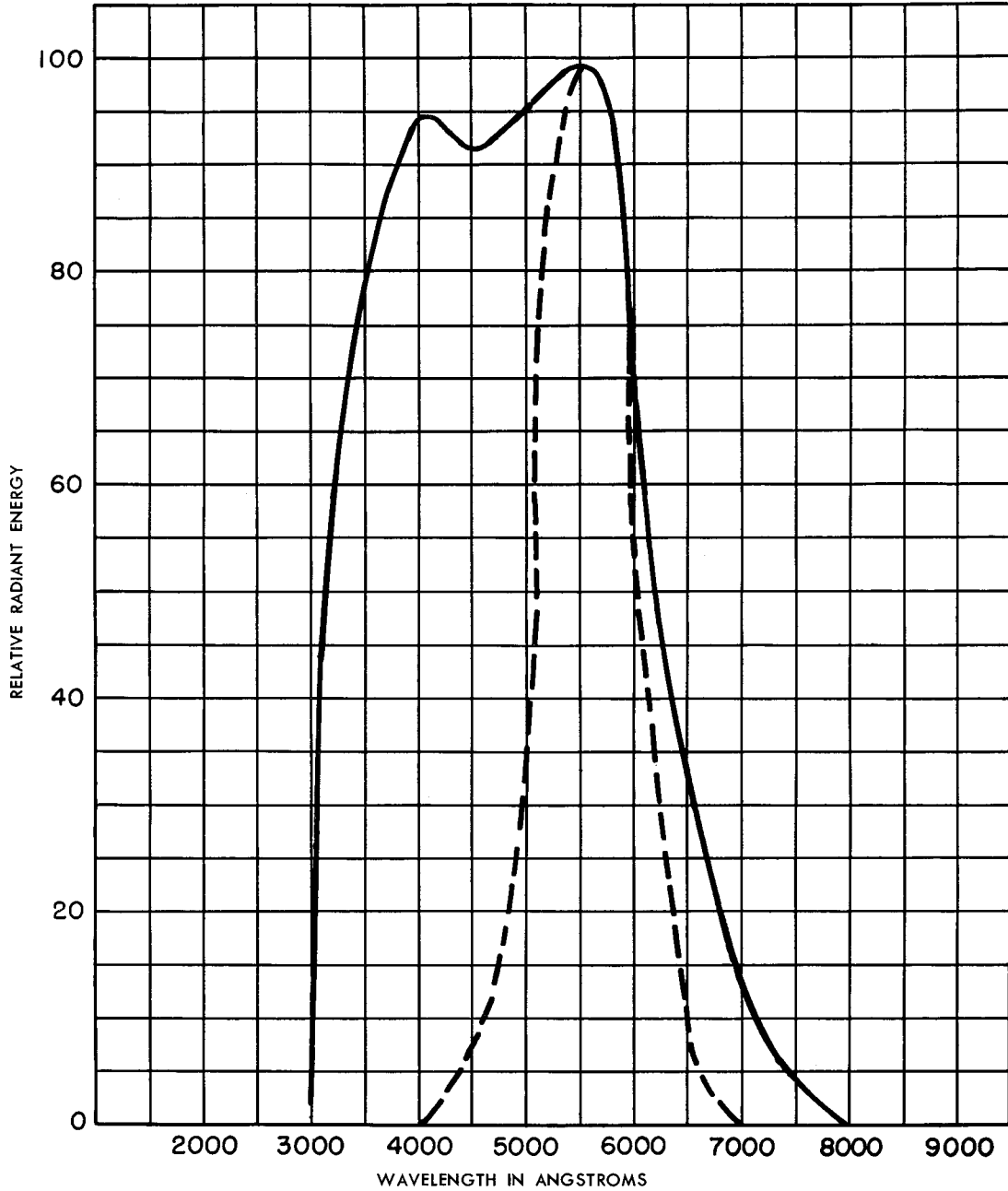
‡ Adjustable from — 3 to +5 volts with blanking voltage off. Normal setting of target voltage is +2 volts from target cutoff.

§ 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.

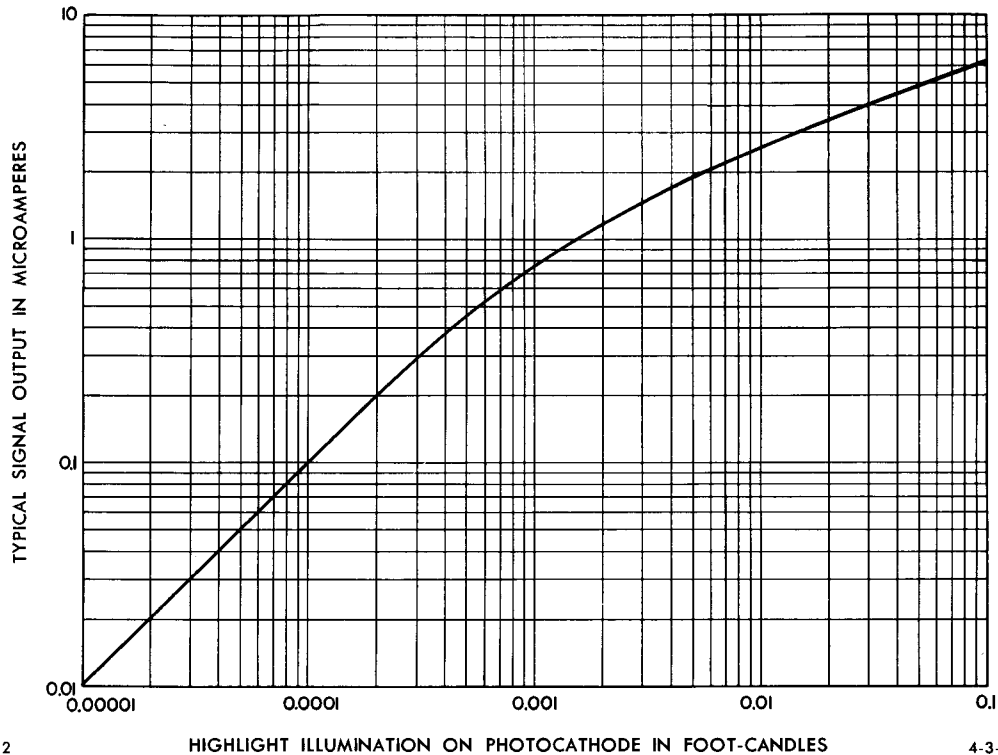
⊕ Denotes a change.

□ Denotes an addition.

SPECTRAL SENSITIVITY CHARACTERISTIC  
FOR EQUAL VALUES OF RADIANT FLUX AT ALL WAVELENGTHS  
DASHED CURVE SHOWS SPECTRAL CHARACTERISTIC OF AVERAGE HUMAN EYE

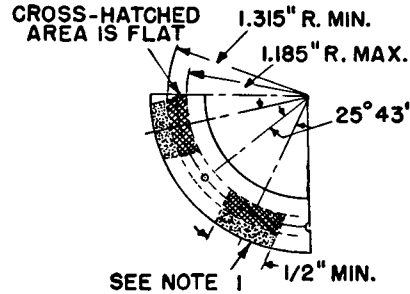
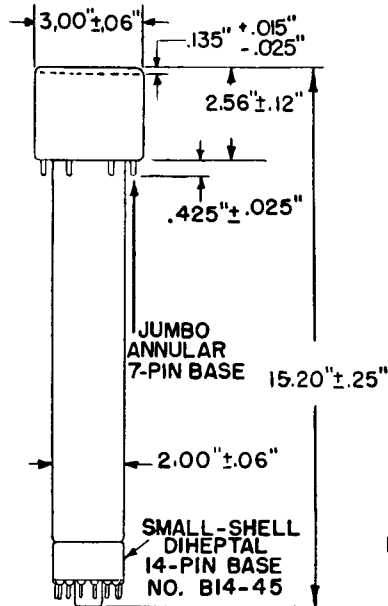


TYPICAL SIGNAL OUTPUT  
SCENE: BLACK AND WHITE BALANCED  
TUNGSTEN, DAYLIGHT, OR WHITE FLUORESCENT LIGHT



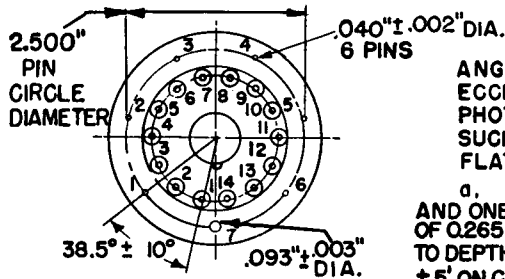
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DETAIL OF BOTTOM VIEW OF JUMBO ANNULAR BASE

NOTE 1: DOTTED AREA IS FLAT OR EXTENDS TOWARD DIHEPTAL-BASE END OF TUBE BY 0.060" MAX.

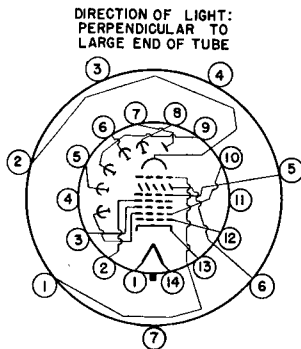


ENLARGED BOTTOM VIEW

**ANNULAR BASE GAGE**

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 GAGE WITH:

- a. SIX HOLES HAVING DIAMETER OF  $0.065 \pm 0.001$ " AND ONE HOLE HAVING DIA. OF  $0.150 \pm 0.001$ ". ALL HOLES HAVE DEPTH OF  $0.265 \pm 0.001$ ". THE SIX  $0.065$ " HOLES ARE ENLARGED BY  $45^\circ$  TAPER TO DEPTH OF  $0.047$ "; ALL HOLES ARE SPACED AT ANGLES OF  $51^\circ 26' \pm 5'$  ON CIRCLE DIAMETER OF  $2.500 \pm 0.001$ "
- b. SEVEN STOPS HAVING HEIGHT OF  $0.187 \pm 0.001$ ", 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  $0.126 \pm 0.001$ ".
- d. NECK-CYLINDER CLEARANCE HOLE HAVING DIAMETER OF  $2.200 \pm 0.001$ ".



WHITE INDEX LINE ON FACE

**BASING DIAGRAM  
SMALL-SHELL DIHEPTAL 14-PIN BASE**

- |                                       |                                  |                                        |
|---------------------------------------|----------------------------------|----------------------------------------|
| PIN 1: HEATER                         | PIN 6: DYNODE NO. 4              | PIN 11: INTERNAL CONNecTION-DO NOT USE |
| PIN 2: GRID NO. 4                     | PIN 7: ANODE                     | PIN 12: GRID NO. 1                     |
| PIN 3: GRID NO. 3                     | PIN 8: DYNODE NO. 5              | PIN 13: CATHODE                        |
| PIN 4: INTERNAL CONNecTION-DO NOT USE | PIN 9: DYNODE NO. 3              | PIN 14: HEATER                         |
| PIN 5: DYNODE NO. 2                   | PIN 10: DYNODE NO. 1, GRID NO. 2 |                                        |

**KEYED JUMBO ANNULAR 7-PIN BASE**

- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| PIN 1: GRID NO. 6                     | PIN 5: GRID NO. 5                     |
| PIN 2: PHOTOCATHODE                   | PIN 6: TARGET                         |
| PIN 3: INTERNAL CONNecTION-DO NOT USE | PIN 7: INTERNAL CONNecTION-DO NOT USE |
| PIN 4: INTERNAL CONNecTION-DO NOT USE |                                       |

**ELECTRONIC COMPONENTS DIVISION**  
**GENERAL  ELECTRIC**  
**Schenectady 5, N. Y.**