**IMAGE ORTHICON**

**MAGNETIC FOCUS**

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 originating in the target-mesh assembly.

**MAGNETIC DEFLECTION**

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 ± 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 .................................................. 12 µµf

**GENERAL ELECTRIC**
TECHNICAL INFORMATION (CONT'D)

**Mechanical**
- Over-all Length: 15.20" ± 0.25" Inches
- Greatest Diameter of Bulb: 3.00" ± 0.06" Inches
- Minimum Deflecting Coil Inside Diameter: 2.54" Inches
- Deflecting Coil Length: 5" Inches
- Focusing Coil Length: 10" Inches
- Alignment Coil Length: 3/4" Inches
- Photocathode Distance Inside End of Focusing Coil: 1 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-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-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: -300 to -405 Volts
- Dynode-2 Voltage: 600 Volts
- Dynode-3 Voltage: 800 Volts
- Dynode-4 Voltage: 1000 Volts
- Dynode-5 Voltage: 1200 Volts
- Anode Voltage: 1250 Volts
- DC Anode Current: 3 Microamperes
- Signal Output Current, peak to peak: 0.01 to 5 Microamperes
- Target Voltage‡: -3 to +1 Volts
- Target Cutoff Voltage‡: -0.01 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 Blank 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

HIGHLIGHT ILLUMINATION ON PHOTOCATHODE IN FOOT-CANDLES

K-49087-262A12  4.3.57
NOTE I: DOTTED AREA IS FLAT OR EXTENDS TOWARD DlHEPTAL-BASE END OF TUBE BY 0.060" MAX.

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±0.001" AND ONE HOLE HAVING DIA. OF 0.150±0.001" AND ALL HOLES HAVE DEPTH OF 0.265±0.004".

b. SIX 0.065" HOLES ARE ENLARGED BY 45° TAPER TO DEPTH OF 0.047" AND ALL HOLES ARE SPACED AT ANGLES OF 51°26'±5' ON CIRCLE DIAMETER OF 2.500±0.001".

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

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

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

BASING DIAGRAM

SMALL-SHELL DIHEPTAL 14-PIN BASE

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

KEYED JUMBO ANNULAR 7-PIN BASE

1: GRID NO. 6
2: INTERNAL CONNECTION: DO NOT USE
3: INTERNAL CONNECTION: DO NOT USE
4: INTERNAL CONNECTION: DO NOT USE
5: GRID NO. 5
6: TARGET
7: INTERNAL CONNECTION: DO NOT USE