MAGNETIC FOCUS

For Live-Scene, or Film Pickup with Black- and
White or Color Cameras. Features High Resolution
with High Sensitivity and Low Lag. Grid
No. 3 and Grid No. 4 Have Separate Base Terminals.

General:
Heater, for Unipotential Cathode:
  Voltage (AC or DC) .................. 6.3 ± 10% volts
  Current at 6.3 volts .................. 0.6 amp
Direct Inter-electrode Capacitance:
  Target to all other electrodes ........ 4.6 pf
Spectral Response ..................... See Curve

Photoconductive Layer:
  Maximum useful diagonal of rectangular
    image (4 x 3 aspect ratio) ............ 0.62"
Orientation of quality rectangle—Proper orientation is obtained
when the horizontal scan is essentially parallel to the
straight sides of the masked portions of the faceplate. The
straight sides are parallel to the plane passing through the
tube axis and short pin. The masking is for orientation only
and does not define the proper scanned area of the photoconductive layer.

Focusing Method ...................... Magnetic
Deflection Method ..................... Magnetic
Overall Length ....................... 6.250" ± 0.125"
Greatest Diameter .................... 1.125" ± 0.010"
Operating Position ................... Any
Weight (Approx.) ................. 2 oz
Bulb ................................ 100 W
Focusing Coil .................... Cleveland Electronics b, c No. VF-115-12,
                               or equivalent
Deflecting Yoke ................. Cleveland Electronics b, c No. VY-111-3,
                               or equivalent
Alignment Coil ..................... Cleveland Electronics b, c No. VA-118,
                               or equivalent
Base .................... Small-Button Ditetra 8-Pin (JEDEC No. E8-11)
Socket ........................... Cinch d No. 54A18088, or equivalent
Basing Designation for BOTTOM VIEW .................. 8ME

TARGET
IC

IC

1

TARGET
IC

3

G3

G2

G4

4

Pin 1 - Heater
Pin 2 - Grid No. 1
Pin 3 - Grid No. 4
Pin 4 - Do Not Use
Pin 5 - Grid No. 2

SHORT
PIN

H

H

Pin 6 - Grid No. 3
Pin 7 - Cathode
Pin 8 - Heater
Flange - Target
Short Pin - Do Not Use

DIRECTION OF LIGHT:
INTO FACE END OF TUBE

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DATA 1
3-64
Maximum Ratings, Absolute-Maximum Values:

For scanned area of 1/2" x 3/8"

<table>
<thead>
<tr>
<th>Component</th>
<th>Max Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid-No. 4 Voltage</td>
<td>1000</td>
<td>volts</td>
</tr>
<tr>
<td>Grid-No. 3 Voltage</td>
<td>1000</td>
<td>volts</td>
</tr>
<tr>
<td>Grid-No. 2 Voltage</td>
<td>750</td>
<td>volts</td>
</tr>
<tr>
<td>Grid-No. 1 Voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative bias value</td>
<td>300</td>
<td>volts</td>
</tr>
<tr>
<td>Positive bias value</td>
<td>0</td>
<td>volts</td>
</tr>
<tr>
<td>Peak Heater-Cathode Voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heater negative with</td>
<td>125</td>
<td>volts</td>
</tr>
<tr>
<td>respect to cathode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heater positive with</td>
<td>10</td>
<td>volts</td>
</tr>
<tr>
<td>respect to cathode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target Voltage</td>
<td>100</td>
<td>volts</td>
</tr>
<tr>
<td>Dark Current</td>
<td>0.25</td>
<td>μA</td>
</tr>
<tr>
<td>Peak Target Current</td>
<td>0.55</td>
<td>μA</td>
</tr>
<tr>
<td>Faceplate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illumination</td>
<td>1000</td>
<td>fc</td>
</tr>
<tr>
<td>Temperature</td>
<td>71</td>
<td>°C</td>
</tr>
</tbody>
</table>

Typical Operation and Performance Data:

For scanned area of 1/2" x 3/8" and faceplate temperature of 30° to 35° C

<table>
<thead>
<tr>
<th>Component</th>
<th>Low-Voltage Operation</th>
<th>High-Voltage Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid-No. 4 (Decelerator) Voltage</td>
<td>500</td>
<td>750</td>
</tr>
<tr>
<td>Grid-No. 3 (Beam-Focus Electrode) Voltage^</td>
<td>300g</td>
<td>450g</td>
</tr>
<tr>
<td>Grid-No. 2 (Accelerator) Voltage</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Grid-No. 1 Voltage for Picture Cutoff^</td>
<td>-45 to -100</td>
<td>-45 to -100</td>
</tr>
<tr>
<td>Lag J, Typical</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Average "Gamma" of Transfer Characteristic for signal-output current between 0.02 μA and 0.2 μA...

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual Equivalent Signal-to-Noise Ratio (Approx.)^</td>
<td>300:1</td>
</tr>
</tbody>
</table>

Minimum Peak-to-Peak Blanking Voltage:

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>When applied to grid No. 1</td>
<td>75</td>
</tr>
<tr>
<td>When applied to cathode</td>
<td>20</td>
</tr>
</tbody>
</table>

Limiting Resolution:

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>At center of picture</td>
<td>900</td>
</tr>
<tr>
<td>At corner of picture</td>
<td>600</td>
</tr>
</tbody>
</table>

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| Amplitude Response to a 400 TV Line Square-Wave Test Pattern at Center of Picture | 35 | 45 %  
| Field Strength at Center of Focusing Coil | 41 ± 4 | 52 ± 4 gauss  
| Peak Deflecting-Coil Current: Horizontal | 180 | 220 ma  
| Vertical | 33 | 40 ma  
| Field Strength of Adjustable Alignment Coil | 0 to 4 | 0 to 4 gauss  
| **Maximum-Sensitivity Operation** - 0.1 Footcandle on Faceplate |  
| Faceplate Illumination (Highlight) | 0.1 fc  
| Target Voltage | 35 to 70 volts  
| Dark Current | 0.2 μa  
| Signal-Output Current: Typical | 0.14 μa  
| **Intermediate-Sensitivity Operation** - 0.5 Footcandle on Faceplate |  
| Faceplate Illumination (Highlight) | 0.5 fc  
| Target Voltage | 30 to 60 volts  
| Dark Current | 0.10 μa  
| Signal-Output Current: Typical | 0.27 μa  
| **Average-Sensitivity Operation** - 1.0 Footcandle on Faceplate |  
| Faceplate Illumination (Highlight) | 1.0 fc  
| Target Voltage | 20 to 40 volts  
| Dark Current | 0.02 μa  
| Signal-Output Current: Typical | 0.20 μa  
| Minimum | 0.15 μa  
| **High-Light Level Operation** - 10 Footcandles on Faceplate |  
| Faceplate Illumination (Highlight) | 10 fc  
| Target Voltage | 10 to 22 volts  
| Dark Current | 0.005 μa  
| Signal-Output Current: Typical | 0.3 μa  

**RCA**

**Electronic Components and Devices**

**DATA 2**

**Harrison, N. J.**

**3-64**
This capacitance, which effectively is the output impedance of the 8507, is increased when the tube is mounted in the deflecting-yoke and focusing-coil assembly. The resistive component of the output impedance is in the order of 100 megohms.

These components are chosen to provide tube operation with minimum beam-landing error when mounted in the recommended position along the tube axis.

Video amplifiers must be designed to handle target currents of this magnitude to avoid amplifier overload or picture distortion.

Beam focus is usually attained by varying the focus-coil current to obtain a field-strength value within the range shown under Typical Operation and Performance Data. If the field-strength of the focus coil is fixed, beam focus is obtained within a ± 10 per cent range of the grid-No.4 and grid No.3 voltages. However, the recommended ratio of 0.6 between grid No.3 and grid No.4 must be maintained as these voltages are varied.

In general, grid No.3 should be operated above 250 volts and be 0.6 of grid-No.4 voltage.

With no blanking voltage on grid No.1, defined as the per cent of initial value of signal-output current 1/20 second after illumination is removed. Values shown are for initial signal-output current of 0.2 microampere and a dark current of 0.02 microampere.

Measured with high-gain, low-noise, cascade-input-type amplifier having bandwidth of 5 Mc and a peak signal-output current of 0.35 microampere. The noise in such a system is predominately of the high-frequency type, the visual equivalent signal-to-noise ratio is taken as the ratio of the highlight video-signal current to rms noise current, multiplied by a factor of 3.

The alignment coil should be located on the tube so that its center is at a distance of 3-11/16 inches from the face of the tube, and be positioned so that its axis is coincident with the axis of the tube, the deflecting yoke, and the focusing coil.

The target voltage for each 8507 must be adjusted to that value which gives the desired operating dark current.

Indicated range for each type of service serves only to illustrate the operating target-voltage range normally encountered.

The deflecting circuits must provide extremely linear scanning for good black-level reproduction. Dark-current signal is proportional to the scanning velocity. Any change in scanning velocity produces a black-level error in direct proportion to the change in scanning velocity.

Defined as the component of the highlight target current after the dark-current component has been subtracted.

**OPERATING CONSIDERATIONS**

The resolution capability of the 8507 at the center of the picture is about 1000 TV lines and about 700 TV lines at the corner. This high resolution is obtained when the 8507 is operated with a grid-No.4 voltage of 750 volts and a grid-No.3 voltage of 450 volts. When the 8507 is operated at a grid-No.4 voltage of 500 volts and a grid-No.3 voltage of 300 volts, its resolution is about 900 TV lines at the center and 600 TV lines at the corner of the picture.

The target connection is made by a suitable spring contact bearing against the edge of the metal ring at the face end of the tube. This spring contact may conveniently be provided as part of the focusing-coil design.
DIMENSIONS IN INCHES

**Note 1:** Straight sides of masked portions are parallel to the plane passing through tube axis and short index pin.

**Note 2:** Faceplate thickness is 0.094" ± 0.012".
TYPICAL CHARACTERISTIC

ILLUMINATION: 2870° K INCANDESCENT.
HIGHLIGHT SIGNAL-OUTPUT MICROAMPERES = 0.2
SCANNED AREA OF PHOTOCONDUCTIVE LAYER = 1/2" x 3/8"
FACEPLATE TEMPERATURE = 30° C APPROX.

TARGET VOLTS

0.1

TARGET VOLTS

0.005

0.01

0.1

DARK-CURRENT RANGE

SCANNED AREA OF PHOTOCONDUCTIVE LAYER = 1/2" x 3/8"
FACEPLATE TEMPERATURE = 30° C APPROX.
TYPICAL LIGHT TRANSFER CHARACTERISTICS

ILLUMINATION: UNIFORM OVER PHOTOCONDUCTIVE LAYER.
SCANNED AREA OF PHOTOCONDUCTIVE LAYER = 1/2" x 3/8"
FACEPLATE TEMPERATURE = 30°C APPROX.
TYPICAL SPECTRAL-SENSITIVITY CHARACTERISTIC

FOR EQUAL VALUES OF SIGNAL-OUTPUT CURRENT AT ALL WAVELENGTHS.
SIGNAL-OUTPUT MICROAMPERES FROM SCANNED AREA OF 1/2" x 3/8" = 0.02
DARK CURRENT (MICROAMPERES) = 0.02

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TYPICAL PERSISTENCE CHARACTERISTICS

INITIAL HIGHLIGHT SIGNAL—OUTPUT MICROAMPERES = 0.2
SCANNED AREA OF PHOTOCONDUCTIVE LAYER = 1/2" x 3/8"
FACEPLATE TEMPERATURE = 30° C APPROX.

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DATA 5
3-64
TYPICAL HORIZONTAL SQUARE-WAVE RESPONSE CHARACTERISTICS

HIGHLIGHT TARGET MICROAMPERES = 0.35
DARK CURRENT (MICROAMPERES) = 0.02
TEST PATTERN: TRANSPARENT SQUARE-WAVE RESOLUTION WEDGE.

CURVE A: GRID-No.4 VOLTS = 750;
GRID-No.3 VOLTS = 450
CURVE B: GRID-No.4 VOLTS = 500;
GRID-No.3 VOLTS = 300

UNCOMPENZATED HORIZONTAL PEAK-TO-PEAK SQUARE-WAVE RESPONSE AT CENTER OF PICTURE — PER CM

TV LINE NUMBER

92CM-12232

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