Short, High-Resolution Type Having High Sensitivity and Low Lag for Live Scene Pickup in Transistorized Black-and-White and Color TV Cameras in Industrial and Other Closed-Circuit TV Systems.

GENERAL

Heater, for Unipotential Cathode:
Voltage (AC or DC) .................. 6.3 ± 10% V
Current at 6.3 volts .................. 0.1 A
Direct Interelectrode Capacitance:
Target to all other electrodes ....... 4.6 pF
Spectral Response ...................... See RCA Type II Spectral Response at front of this section
Photoconductive Layer:

Maximum useful diagonal of rectangular image (4 x 3 aspect ratio) ............... 0.62 in

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 index 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 ...................... 5.12" ± 0.06"
Greatest Diameter .................... 1.125" ± 0.010"
Bulb .................................. T8
Base ................................. Small-Button Ditetrar 8-Pin, (JEDEC No.E8-11)
Socket ............................... Cinch$b No.54A18088, or equivalent
Deflecting Yoke-Focusing Coil:
Alignment Coil Assembly ......... Cleveland Electronics$c,d No.VYFA-355-2, or equivalent
Operating Position .................. Any
Weight (Approx.) ..................... 2 oz

MAXIMUM RATINGS, Absolute-Maximum Values:
For scanned area of 1/2" x 3/8"
Grid-No.4 Voltage$ .................. 1000 max. V
Grid-No.3 Voltage$ .................. 1000 max. V
Grid-No.2 Voltage$ .................. 750 max. V

8573A Electronic Components

DATA 1
2-70
Grid-No.1 Voltage:
- Negative bias value .................... 300 max. V
- Positive bias value .................... 0 max. V

Peak Heater-Cathode Voltage:
- Heater negative with respect to cathode .................. 125 max. V
- Heater positive with respect to cathode .................. 10 max. V

Target Voltage ................................ 100 max. V
Dark Current ................................ 0.25 max. μA
Peak Target Current\(^g\) ................. 0.75 max. μA

Faceplate:
- Illumination\(^h\) .................. 5000 max. fc
- Temperature .................. 71 max. °C

TYPICAL OPERATION AND PERFORMANCE DATA

For scanned area of 1/2" x 3/8"
Faceplate temperature of 30° to 35° C and Standard TV
Scanning Rate

<table>
<thead>
<tr>
<th>Low-Voltage Mode</th>
<th>High-Voltage Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid-No.4 (Decelerator) Voltage(^f)</td>
<td>500</td>
</tr>
<tr>
<td>Grid-No.3 (Beam-Focus Electrode) Voltage(^f)</td>
<td>300</td>
</tr>
<tr>
<td>Grid-No.2 (Accelerator) Voltage</td>
<td>300</td>
</tr>
<tr>
<td>Grid-No.1 Voltage for Picture Cutoff(^i)</td>
<td>-65 to -100</td>
</tr>
</tbody>
</table>

Average "Gamma" of Transfer Characteristic for signal-output current between 0.02 μA and 0.2 μA .................. 0.65 0.65

Visual Equivalent Signal-to-Noise Ratio (Approx.)\(^k\) ................. 300:1 300:1

RCA Electronic Components

DATA 1
Lag-Per Cent of Initial Value of Signal-Output Current 1/20 Second After Illumination is Removed\textsuperscript{m} \hspace{1cm} 20 \hspace{1cm} 20 \hspace{1cm} \% \hline
Minimum Peak-to-Peak Blanking Voltage: When applied to grid No.1 \hspace{1cm} 75 \hspace{1cm} 75 \hspace{1cm} V \hline
When applied to cathode \hspace{1cm} 20 \hspace{1cm} 20 \hspace{1cm} V \hline
Limiting Resolution: At center of picture \hspace{1cm} 1000 \hspace{1cm} 1100 \hspace{1cm} TV lines \hline
At corner of picture \hspace{1cm} 600 \hspace{1cm} 700 \hspace{1cm} TV lines \hline
Amplitude Response to a 400 TV line Square-Wave Test Pattern at Center of Picture\textsuperscript{n} \hspace{1cm} 50 \hspace{1cm} 60 \hspace{1cm} \% \hline
Field Strength at Center of Focusing Coil\textsuperscript{p} \hspace{1cm} 40 \pm 4 \hspace{1cm} 58 \pm 4 \hspace{1cm} G \hline
Peak Deflecting-Coil Current: Horizontal \hspace{1cm} 350 \hspace{1cm} 480 \hspace{1cm} mA \hline
Vertical \hspace{1cm} 20 \hspace{1cm} 28 \hspace{1cm} mA \hline
Field Strength of Adjustable Alignment Coil\textsuperscript{q} \hspace{1cm} 0 \hspace{1cm} to \hspace{1cm} 4 \hspace{1cm} 0 \hspace{1cm} to \hspace{1cm} 4 \hspace{1cm} G \hline
Maximum-Sensitivity Operation — 0.1 Footcandle on Faceplate Faceplate Illumination (Highlight) \hspace{1cm} 0.1 \hspace{1cm} fc \hline
Target Voltage\textsuperscript{r,s} \hspace{1cm} 35 \hspace{1cm} to \hspace{1cm} 70 \hspace{1cm} V \hline
Dark Current\textsuperscript{t} \hspace{1cm} 0.2 \hspace{1cm} \mu A \hline
Signal-Output Current\textsuperscript{u} Typical \hspace{1cm} 0.14 \hspace{1cm} \mu A \hline
Intermediate-Sensitivity Operation — 0.5 Footcandle on Faceplate Faceplate Illumination (Highlight) \hspace{1cm} 0.5 \hspace{1cm} fc \hline
Target Voltage\textsuperscript{r,s} \hspace{1cm} 30 \hspace{1cm} to \hspace{1cm} 60 \hspace{1cm} V \hline
Dark Current\textsuperscript{t} \hspace{1cm} 0.10 \hspace{1cm} \mu A \hline
Signal-Output Current\textsuperscript{u} Typical \hspace{1cm} 0.27 \hspace{1cm} \mu A \hline
### Average-Sensitivity Operation — 1.0 Footcandle on Faceplate

- **Faceplate Illumination (Highlight)**: 1.0 fc
- **Target Voltage**\(^{r,s}\): 20 to 40 V
- **Dark Current**\(^{f}\): 0.02 μA
- **Signal-Output Current**:\(^{u}\)
  - **Typical**: 0.20 μA

### High-Light Level Operation — 10 Footcandles on Faceplate

- **Faceplate Illumination (Highlight)**: 10 fc
- **Target Voltage**\(^{r,s}\): 10 to 22 V
- **Dark Current**\(^{f}\): 0.005 μA
- **Signal-Output Current**:\(^{u}\)
  - **Typical**: 0.3 μA

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\(r,s\) This capacitance, which effectively is the output impedance of the 8573A, 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.

\(b\) Made by Cinch Manufacturing Corporation, 1501 Morse Ave., Elk Grove Village, IL 60007.

\(c\) Made by Cleveland Electronics Inc., 2000 Highland Road, Twinsburg, OH 44087.

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

\(f\) Grid-No.4 voltage must always be greater than grid-No.3 voltage. The maximum voltage difference between these electrodes, however, should not exceed 600 volts. The recommended ratio of grid-No.3 to grid-No.4 voltage is 6/10 to 5/10; best geometry being provided when the ratio is 6/10, and most uniform signal output when the ratio is 5/10. The operator should select the ratio within this range which provides the desired performance.

\(g\) Video amplifiers must be designed properly to handle target currents of this magnitude to avoid amplifier overload or picture distortion.

\(h\) For conditions where "white light" is uniformly diffused over entire tube face.

\(i\) With no blanking voltage on grid No.1.
k Measured with high-gain, low-noise, cascode-input-type amplifier having bandwidth of 5 MHz and a peak signal-output current of 0.35 microampere. Because 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.

m For initial signal-output current of 0.3 microampere and a dark current of 0.02 microampere.

n Amplitude response is the signal amplitude from a given TV line number (fine picture detail) expressed as a per cent of the signal amplitude from a very-low-frequency (large-area) picture element. In practice, the large-detail reference is usually 15 TV lines with signal amplitude set equal to 100 per cent. The TV line numbers are determined by the number of equal-width black and white lines that will fit into the physical height of the image focused on the camera-tube faceplate.

p The polarity of the focusing coil 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.

q 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.

r The target voltage for each 8573A must be adjusted to that value which gives the desired operating dark current.

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

t 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.

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

Note: Cross-hatching indicates wound portion of focusing coil.

DIMENSIONAL OUTLINE

BASE  JEDEC No. E8-11
NOTES FOR DIMENSIONAL OUTLINE

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

Note 2: Faceplate glass is Corning No. 7056 having a thickness of 0.094" ± 0.012".

TERMINAL DIAGRAM (Bottom View)

Pin 1: Heater
Pin 2: Grid No. 1
Pin 3: Grid No. 4
Pin 4: Internal Connection — Do Not Use
Pin 5: Grid No. 2
Pin 6: Grid No. 3
Pin 7: Cathode
Pin 8: Heater
Flange: Target
Short Index Pin — Internal Connection — Make No Connection

RANGE OF DARK CURRENT

<table>
<thead>
<tr>
<th>Target Volts</th>
<th>Dark Current — Microamperes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.005</td>
</tr>
<tr>
<td>4</td>
<td>0.01</td>
</tr>
<tr>
<td>6</td>
<td>0.1</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>4</td>
</tr>
</tbody>
</table>

Scanned Area of Photoconductive Layer = 1/2" x 3/8"
Faceplate Temperature = 30°C Approx.

92CS-12235

Electronic Components

DATA 4 2-70
LIGHT TRANSFER CHARACTERISTICS

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

INITIAL HIGHLIGHT SIGNAL - OUTPUT MICROAMPERES = 0.3
SCANNED AREA OF PHOTOCONDUCTIVE LAYER = 1/2" x 3/8"
FACEPLATE TEMPERATURE = 30°C APPROX.

- Signal Output Current — Per Cent of Initial Value
- Dark Current (Microamperes)

0 50 100 150 200 250 300
Time After Illumination Is Removed — Milliseconds

92LM-2171
HORIZONTAL SQUARE-WAVE RESPONSE

PEAK (HIGHLIGHT) SIGNAL MICROAMPERES • 0.40
DARK CURRENT (MICROAMPERES) • 0.02
TEST PATTERN: TRANSPARENT SLANT-LINE BURST*

CURVE A: GRID-No. 4 VOLTS • 900,
GRID-No. 3 VOLTS • 540
CURVE B: GRID-No. 4 VOLTS • 500,
GRID-No. 3 VOLTS • 300

*Amplitude response measured using the RCA P200 slant-line burst pattern with horizontal center response balanced on the 400 line chevrons.