MULTIPLIER PHOTOTUBE
9-STAGE TYPE WITH S-4 RESPONSE
For applications involving very low light levels

DATA

General:
Spectral Response. .............................................. S-4
Wavelength of Maximum Response .......................... 4000 ± 500 angstroms
Cathode:
  Minimum Projected Length* .................. 15/16"
  Minimum Projected Width* .................. 5/16"
Direct Interelectrode Capacitances:
  Anode to Dynode No. 9 .................. 4 μf
  Anode to All Other Electrodes ................. 6.5 μf
Maximum Overall Length .................................. 3 11/16"
Maximum Seated Length .................................. 3 1/8"
Seated Length to Center of Cathode ................ 1 15/16" ± 3/32"
Maximum Diameter ........................................ 1 5/16"
Bulb .......................................................... T-9
Mounting Position ........................................... Any
Base .................................................................. Small-Shell Submagnal 11-Pin,
  Non-Hygroscopic .............................................. 11K

Basing Designation for BOTTOM VIEW .................. 11K
Pin 1 – Dynode No.1 ........................................ Pin 7 – Dynode No.7
Pin 2 – Dynode No.2 ........................................ Pin 8 – Dynode No.8
Pin 3 – Dynode No.3 ........................................ Pin 9 – Dynode No.9
Pin 4 – Dynode No.4 ........................................ Pin 10 – Anode
Pin 5 – Dynode No.5 ........................................ Pin 11 – Cathode
Pin 6 – Dynode No.6 ........................................

Direction of Light

Maximum Ratings, Absolute Values:
ANODE–SUPPLY VOLTAGE (DC or Peak AC) O elev 1250 max. volts
SUPPLY VOLTAGE BETWEEN DYNOE No.9
  and ANODE (DC or Peak AC) O elev 250 max. volts
PEAK ANODE CURRENT ..................................... 1 max. ma
AVERAGE ANODE CURRENT O elev 0.1 max. ma
AMBIENT TEMPERATURE ................................. 75 max. °C

Characteristics:
With 100 volts per dynode stage and
100 volts between dynode No.9 and anode

<table>
<thead>
<tr>
<th>Min.</th>
<th>Av.</th>
<th>Max.</th>
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<tr>
<td>Anode Dark Current#* ........</td>
<td>–</td>
<td>–</td>
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</tbody>
</table>
| Sensitivity:
  At 4000 Angstroms .......... | – | 74000 | μamp/μwatt |
  Luminous#* .................. | 40 | 80 | amp/lumen |
| Current Amplification#* .. | – | 2000000 | – |
| Equivalent Noise Input* .. | – | 5 x 10^-13 | lumen |

* For the usual applications, the 931-A is recommended.
# The use of about 50 volts between dynode No.9 and anode will give improved operating stability without sacrifice in sensitivity as explained in note under Type 931-A.
* On plane perpendicular to indicated direction of incident light.
O Elev.; See next page.

NOV. 15, 1949
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
## Characteristics:

With 75 volts per dynode stage and 50 volts between dynode No. 9 and anode

<table>
<thead>
<tr>
<th>Sensitivity:</th>
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<tbody>
<tr>
<td>At 4000 Angstroms.</td>
<td>11000 µamp/µwatt</td>
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<tr>
<td>Luminous*</td>
<td>12 amp/lumen</td>
<td></td>
</tr>
<tr>
<td>Current Amplification*</td>
<td>300000</td>
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* Referred to cathode.
* Averaged over any interval of 30 seconds maximum.
* Dark current due to thermionic emission and ion feedback may be reduced by the use of refrigerants.
* For maximum signal-to-noise ratio, operation below 1000 volts is recommended.
* Measured under conditions specified on sheet "PHOTOTUBE SENSITIVITY and MEASUREMENTS" at the front of this Section.
* Ratio of anode sensitivity to cathode sensitivity.

Defined as the value where the rms output current is equal to the rms noise current determined under the following conditions: 100 volts per stage, 25°C tube temperature, bandwidth of 1 cycle per second, tungsten light source at 2870°K interrupted at a low audio frequency to produce incident radiation pulses alternating between zero and the value stated. The "on" period of the pulse is equal to the "off" period. The output current is measured through a filter which passes only the fundamental frequency of the pulses.

OUTLINE DIMENSIONS for Type 1P21 are the same as those for Type 931-A

SPECTRAL-SENSITIVITY CHARACTERISTIC of Phototube having S-4 Response is shown at the front of this Section.

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 indicates a change.

NOV. 15, 1949
EQUIVALENT-NOISE-INPUT CHARACTERISTIC

- 100 VOLTS PER STAGE
- BANDWIDTH: 1 CPS
- LIGHT SOURCE: TUNGSTEN, AT 2870°C;
- INTERRUPTED AT 90 CPS TO PRODUCE PULSES
- ALTERNATING BETWEEN ZERO AND FLUX VALUE
- SHOWN FOR ANY GIVEN TUBE TEMPERATURE;
- 'ON' PERIOD OF PULSE EQUAL TO 'OFF' PERIOD;
- RMS SIGNAL CURRENT = RMS NOISE CURRENT.