

# TECHNICAL DATA

7A8

## Sylvania

TYPE 7A8

OCTODE CONVERTER

### RATINGS AND CHARACTERISTICS

|                                         |       |        |
|-----------------------------------------|-------|--------|
| Heater Voltage (Nominal) AC or DC       | 7.0   | Volts  |
| Heater Current (Nominal)                | 0.160 | Ampere |
| Maximum Plate Voltage                   | 300   | Volts  |
| Maximum Screen Supply Voltage           | 300   | Volts  |
| Maximum Screen Voltage                  | 100   | Volts  |
| Maximum Oscillator Anode Voltage        | 200   | Volts  |
| Maximum Oscillator Anode Supply Voltage | 300   | Volts  |
| Maximum Plate Dissipation               | 1     | Watt   |
| Maximum Screen Dissipation              | 0.3   | Watt   |
| Maximum Anode Grid Dissipation          | 0.75  | Watt   |
| Maximum Total Cathode Current           | 13    | Ma.    |
| Minimum Signal-Grid Bias Voltage        | 0     | Volt   |
| Maximum Heater-Cathode Voltage          | 90    | Volts  |

### Direct Interelectrode Capacitances:\*

|                                                   |      |          |
|---------------------------------------------------|------|----------|
| Grid G to Plate                                   | 0.15 | μf. Max. |
| Grid G to Grid Ga                                 | 0.3  | μf. Max. |
| Grid G to Grid Go                                 | 0.15 | μf. Max. |
| Grid Go to Grid Ga                                | 0.60 | μf.      |
| Grid G to all Electrodes (R-F Input)              | 7.5  | μf.      |
| Grid Ga to all Electrodes except Go (Osc. Output) | 3.4  | μf.      |
| Grid Go to all Electrodes except Ga (Osc. Input)  | 3.8  | μf.      |
| Plate to all Electrodes (Mixer Output)            | 9.0  | μf.      |

\* With 1 5/16" diameter shield (RMA Std. N8-308) connected to cathode.

### TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

|                                                         |         |         |        |
|---------------------------------------------------------|---------|---------|--------|
| Heater Voltage (AC or DC)                               | 6.3     | 6.3     | Volts  |
| Heater Current                                          | 0.150   | 0.150   | Ampere |
| Plate Voltage                                           | 100     | 250     | Volts  |
| Control Grid Voltage (G)                                | -3.0    | -3.0    | Volts  |
| Self-Bias Resistor                                      | 400     | 280     | Ohms   |
| Screen Grid Voltage (Gs)                                | 75      | 100     | Volts  |
| Oscillator Anode Voltage (Ga)                           | 100     | 250#    | Volts  |
| Oscillator Grid Resistor                                | 50,000  | 50,000  | Ohms   |
| Plate Current                                           | 1.8     | 3.0     | Ma.    |
| Screen Grid Current                                     | 2.7     | 3.2     | Ma.    |
| Oscillator Anode Current                                | 2.8     | 4.2     | Ma.    |
| Oscillator Grid Current                                 | 0.2     | 0.4     | Ma.    |
| Plate Resistance (Approx.)                              | 650,000 | 700,000 | Ohms   |
| Conversion Conductance                                  | 375     | 550     | μmhos  |
| Control Grid Voltage for 2 μmhos Conversion Conductance | -22.5   | -30     | Volts  |

# Applied through 20,000 ohm dropping resistor, properly bypassed.

### PHYSICAL SPECIFICATIONS

|                   |               |
|-------------------|---------------|
| Style             | Lock-In       |
| Base              | Lock-In 8-Pin |
| Bulb              | T-9           |
| Diameter          | 1 3/16" Max.  |
| Seated Height     | 2 1/4" Max.   |
| Overall Length    | 2 25/32" Max. |
| Mounting Position | Any           |

### BASE PIN CONNECTIONS

|            |                                            |
|------------|--------------------------------------------|
| Pin 1      | - Heater                                   |
| Pin 2      | - Plate                                    |
| Pin 3      | - Oscillator Anode Ga                      |
| Pin 4      | - Oscillator Grid Go                       |
| Pin 5      | - Screen Grid Gs                           |
| Pin 6      | - Control Grid G                           |
| Pin 7      | - Cathode, Suppressor<br>& Internal Shield |
| Pin 8      | - Heater                                   |
| RMA Basing | 8U-L-7                                     |

from RMA release #140, June 10, 1938  
originally sponsored by Philco Radio & Television Corp.

**OSCILLATOR DESIGN DATA  
NON OSCILLATING CONDITION**

|                                 |                |
|---------------------------------|----------------|
| Oscillator Anode Current        | 10 Ma.         |
| Mutual Conductance (Go to Ga)   | 1600 $\mu$ mos |
| Amplification Factor (Go to Ga) | 65             |

These measurements were taken with a plate voltage of 250 volts, oscillator anode voltage of 180 volts, screen voltage of 100 volts, oscillator grid at 0 volts, and Grid (G) connected to cathode.

**CIRCUIT APPLICATION**

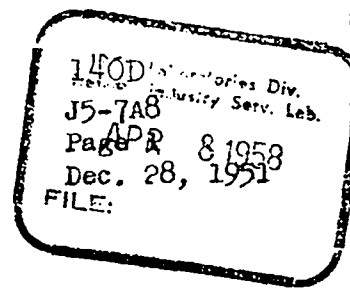
Sylvania Type 7A8 is a single-ended octode converter tube of Lock-In design suitable for use in A-C, AC-DC and auto receivers. Compactness, short connections to the electrodes and simplified shielding are some of the features of this tube.

The applications and operation are quite similar to the Sylvania Type 6A7, but the Type 7A8 has a suppressor grid added to improve the plate resistance particularly under low voltage conditions.

JEFEC DATA  
JOINT ELECTRON TUBE ENGINEERING COUNCIL  
COMMITTEE ON RECEIVING TUBES

JEFEC TYPE 7A8

OCTODE



MECHANICAL DATA

|                             |      |                                           |
|-----------------------------|------|-------------------------------------------|
| Coated unipotential cathode |      |                                           |
| Outline drawing             | 9-30 | Bulb. . . . . T-9                         |
| Base                        |      | D8-1, lock-in 8-pin                       |
| Maximum diameter            |      | 1-3/16"                                   |
| Maximum overall length      |      | 2-25/32"                                  |
| Maximum seated height       |      | 2-1/4"                                    |
| Pin connections             |      | Basing 8U                                 |
| Pin 1 - Heater              |      | Pin 5 - Grids #3 and #5                   |
| Pin 2 - Plate               |      | Pin 6 - Grid #4                           |
| Pin 3 - Grid #2             |      | Pin 7 - Cathode, grid #6, internal shield |
| Pin 4 - Grid #1             |      | Pin 8 - Heater                            |
| Mounting position           |      | any                                       |

ELECTRICAL DATA

Direct Interelectrode Capacitances\*

|                                                             |      |         |
|-------------------------------------------------------------|------|---------|
| Mixer grid to plate: ( $g_4$ to p) max.                     | 0.15 | $\mu f$ |
| Mixer grid to oscillator anode: ( $g_4$ to $g_2$ ) max.     | 0.30 | $\mu f$ |
| Mixer grid to oscillator grid: ( $g_4$ to $g_1$ ) max.      | 0.15 | $\mu f$ |
| Oscillator grid to oscillator anode: ( $g_1$ to $g_2$ )     | 0.60 | $\mu f$ |
| Mixer input: $g_4$ to ( $h+k+g_1+g_2+g_3$ and $5+g_6+p$ )   | 7.5  | $\mu f$ |
| Mixer output: p to ( $h+k+g_1+g_2+g_3$ and $5+g_4+g_6$ )    | 9.0  | $\mu f$ |
| Oscillator input: $g_1$ to ( $h+k+g_4+g_3$ and $5+g_6+p$ )  | 3.8  | $\mu f$ |
| Oscillator output: $g_2$ to ( $h+k+g_3$ and $5+g_4+g_6+p$ ) | 3.4  | $\mu f$ |

\*External shield #308 connected to pin #7

Ratings

|                                        |      |       |
|----------------------------------------|------|-------|
| Heater voltage (nominal) (ac or dc)    | 7.0  | volts |
| Maximum heater-cathode voltage         | 90   | volts |
| Maximum plate voltage                  | 300  | volts |
| Maximum grids #3 and #5 voltage        | 100  | volts |
| Maximum grids #3 and #5 supply voltage | 300  | volts |
| Maximum grid #2 voltage                | 200  | volts |
| Maximum grid #2 supply voltage         | 300  | volts |
| Minimum negative grid #4 voltage       | 0    | volts |
| Maximum plate dissipation              | 1.0  | watts |
| Maximum grids #3 and #5 dissipation    | 0.3  | watts |
| Maximum grid #2 dissipation            | 0.75 | watts |
| Maximum cathode current                | 13.0 | ma    |

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ELECTRICAL DATA (Continued)

Typical Operating Conditions and Characteristics\*

|                                             |        |        |        |
|---------------------------------------------|--------|--------|--------|
| Heater voltage. . . . .                     | 6.3    | 6.3    | volts  |
| Heater current. . . . .                     | 150    | 150    | ma     |
| Plate voltage. . . . .                      | 100    | 250    | volts  |
| Grids #3 and #5 voltage . . . . .           | 75     | 100    | volts  |
| Grid #2 voltage** . . . . .                 | 100    | 250    | volts  |
| Grid #4 voltage . . . . .                   | -3     | -3     | volts  |
| Grid #1 resistor. . . . .                   | 50,000 | 50,000 | ohms   |
| Plate resistance (approx.) . . . . .        | 0.65   | 0.70   | megohm |
| Conversion transconductance . . . . .       | 375    | 550    | μmhos  |
| Plate current . . . . .                     | 1.8    | 3.0    | ma     |
| Grids #3 and #5 current . . . . .           | 2.7    | 3.2    | ma     |
| Grid #2 (oscillator anode) current. . . . . | 2.8    | 4.2    | ma     |
| Grid #1 (oscillator grid) current . . . . . | 0.2    | 0.4    | ma     |
| Total cathode current. . . . .              | 7.5    | 10.8   | ma     |

\*Characteristics shown are obtained in the standard R.M.A. Conversion Conductance Test Set which uses separate excitation. The characteristics under these conditions correspond very closely with those obtained in a self-excited oscillatory circuit operating with zero bias.

\*\*Applied through a 20,000 ohm dropping resistor.

Oscillator characteristics (not oscillating)

|                                                           |      |       |
|-----------------------------------------------------------|------|-------|
| Plate voltage . . . . .                                   | 250  | volts |
| Grid #1 voltage . . . . .                                 | 0    | volts |
| Grid #2 voltage . . . . .                                 | 180  | volts |
| Grids #3 and #5 voltage . . . . .                         | 100  | volts |
| Grid #4 voltage . . . . .                                 | 0    | volts |
| Transconductance between grid #1 and grid #2. . . . .     | 1600 | μmhos |
| Amplification factor between grid #1 and grid #2. . . . . | 65   |       |
| Grid #2 (oscillator anode) current. . . . .               | 10   | ma    |

Refer to "Interpretation of Receiving Tube Ratings"