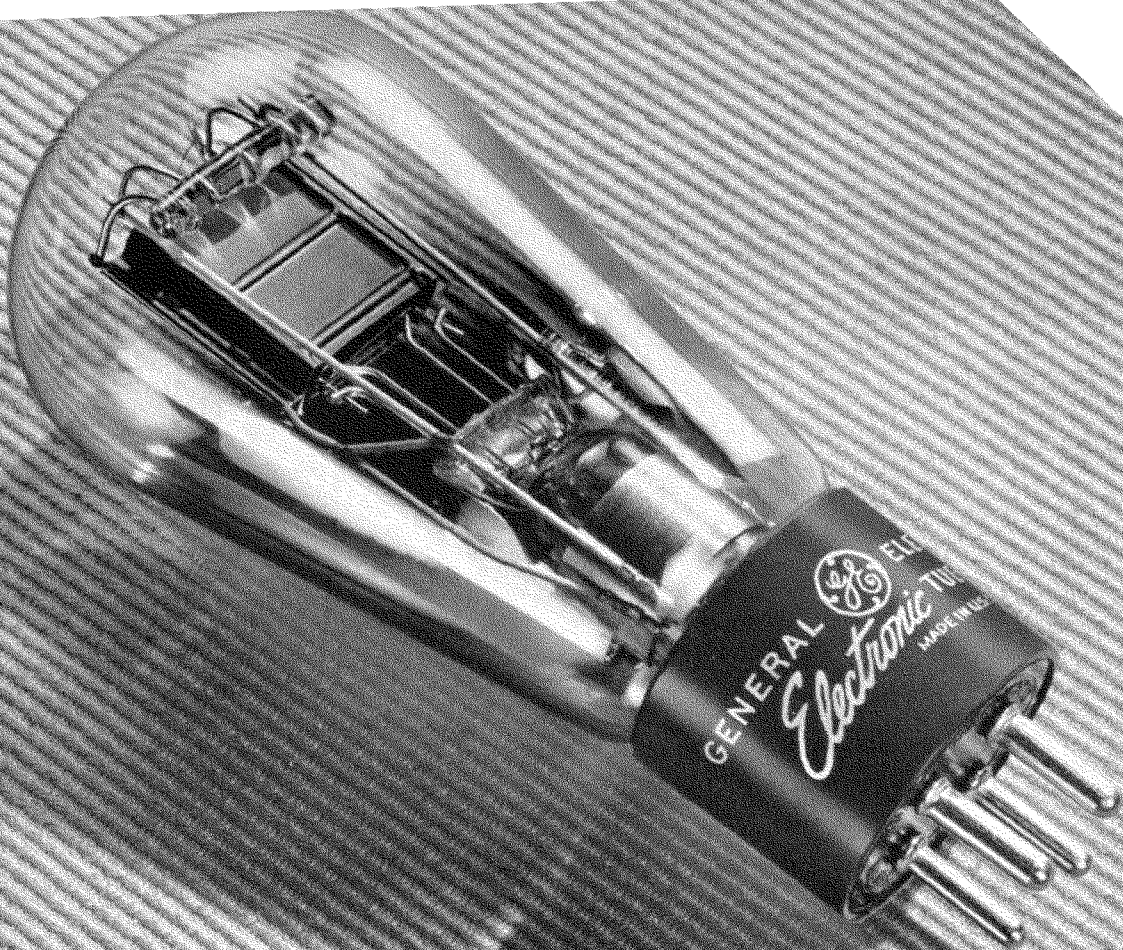




# PIOTRON

## DESCRIPTION

The PJ-8 is a high-vacuum tube designed for use in amplification and relay applications. The low grid power and uniformity of characteristics are particularly valuable in many control applications.

## TECHNICAL INFORMATION

*These data are for reference only. For design information refer to specifications.*

### GENERAL CHARACTERISTICS

|                                                                                                   |                      |
|---------------------------------------------------------------------------------------------------|----------------------|
| Number of electrodes .....                                                                        | 3                    |
| <b>Electrical</b>                                                                                 |                      |
| Filament voltage .....                                                                            | 4.5 volts            |
| Filament current .....                                                                            | 1.1 amperes          |
| Average characteristics when $E_b = 350$ volts,<br>$I_b = 19$ milliamperes, $E_f = 4.5$ volts d-c |                      |
| Grid voltage .....                                                                                | -20 volts            |
| Amplification factor .....                                                                        | 8.5                  |
| Grid-plate transconductance .....                                                                 | 1330 micromhos       |
| Direct interelectrode capacitance                                                                 |                      |
| Grid-plate .....                                                                                  | 8.3 micromicrofarads |
| Grid-cathode .....                                                                                | 4.0 micromicrofarads |
| Plate-cathode .....                                                                               | 3.0 micromicrofarads |



## TECHNICAL INFORMATION (CONT'D)

### Mechanical

|                               |                                                          |
|-------------------------------|----------------------------------------------------------|
| Base .....                    | medium 4-pin bayonet                                     |
| Net weight, approx. ....      | 3 ounces                                                 |
| Shipping weight, approx. .... | 3 pounds                                                 |
| Operating position .....      | vertical or horizontal with plane of electrodes vertical |

## MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

### CLASS A AUDIO-FREQUENCY AMPLIFIER AND MODULATOR

|                                              | Typical<br>Operation | Maximum<br>Ratings |
|----------------------------------------------|----------------------|--------------------|
| D-c plate voltage .....                      | 350                  | 350 volts          |
| Plate dissipation .....                      | ...                  | 7.5 watts          |
| D-c grid voltage .....                       | -30                  | ... volts          |
| Peak grid swing, approx. ....                | 30                   | ... volts          |
| D-c plate current .....                      | 9                    | ... milliamperes   |
| Plate resistance .....                       | 8700                 | ... ohms           |
| Load resistance .....                        | 18,000               | ... ohms           |
| Plate power output, 5% second harmonic. .... | 0.6                  | ... watts          |

### CLASS B RADIO-FREQUENCY POWER AMPLIFIER

*Carrier conditions per tube for use with a maximum modulation factor of 1.0*

|                              |     |                 |
|------------------------------|-----|-----------------|
| D-c plate voltage .....      | 350 | 350 volts       |
| D-c grid voltage .....       | -40 | ... volts       |
| D-c plate current .....      | 32  | 40 milliamperes |
| Plate input .....            | ... | 14 watts        |
| Plate dissipation .....      | ... | 10 watts        |
| Peak r-f grid input .....    | 90  | ... volts       |
| †Driving power, approx. .... | 0.1 | ... watts       |
| Output, approx. ....         | 2   | ... watts       |

### CLASS C RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR, PLATE MODULATED

*Carrier conditions per tube for use with a maximum modulation factor of 1.0*

|                                           |      |                 |
|-------------------------------------------|------|-----------------|
| D-c plate voltage .....                   | 300  | 350 volts       |
| D-c grid voltage .....                    | -100 | -150 volts      |
| D-c plate current .....                   | 30   | 40 milliamperes |
| D-c grid current, approx. ....            | 2    | 10 milliamperes |
| Plate input .....                         | ...  | 14 watts        |
| Plate dissipation .....                   | ...  | 7 watts         |
| Peak r-f grid input voltage, approx. .... | 140  | ... volts       |
| Driving power, approx. ....               | 0.3  | ... watts       |
| Plate power output .....                  | 4    | ... watts       |

### CLASS C RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR

*Key-down conditions per tube without modulation\**

|                                           |      |                 |
|-------------------------------------------|------|-----------------|
| D-c plate voltage .....                   | 350  | 350 volts       |
| D-c grid voltage .....                    | -80  | -150 volts      |
| D-c plate current .....                   | 35   | 40 milliamperes |
| D-c grid current, approx. ....            | 2    | 10 milliamperes |
| Plate input .....                         | ...  | 14 watts        |
| Plate dissipation .....                   | ...  | 10 watts        |
| Peak r-f grid input voltage, approx. .... | 130  | ... volts       |
| Driving power, approx. ....               | 0.25 | ... watts       |
| Plate power output, approx. ....          | 6    | ... watts       |

†At crest of audio-frequency cycle.

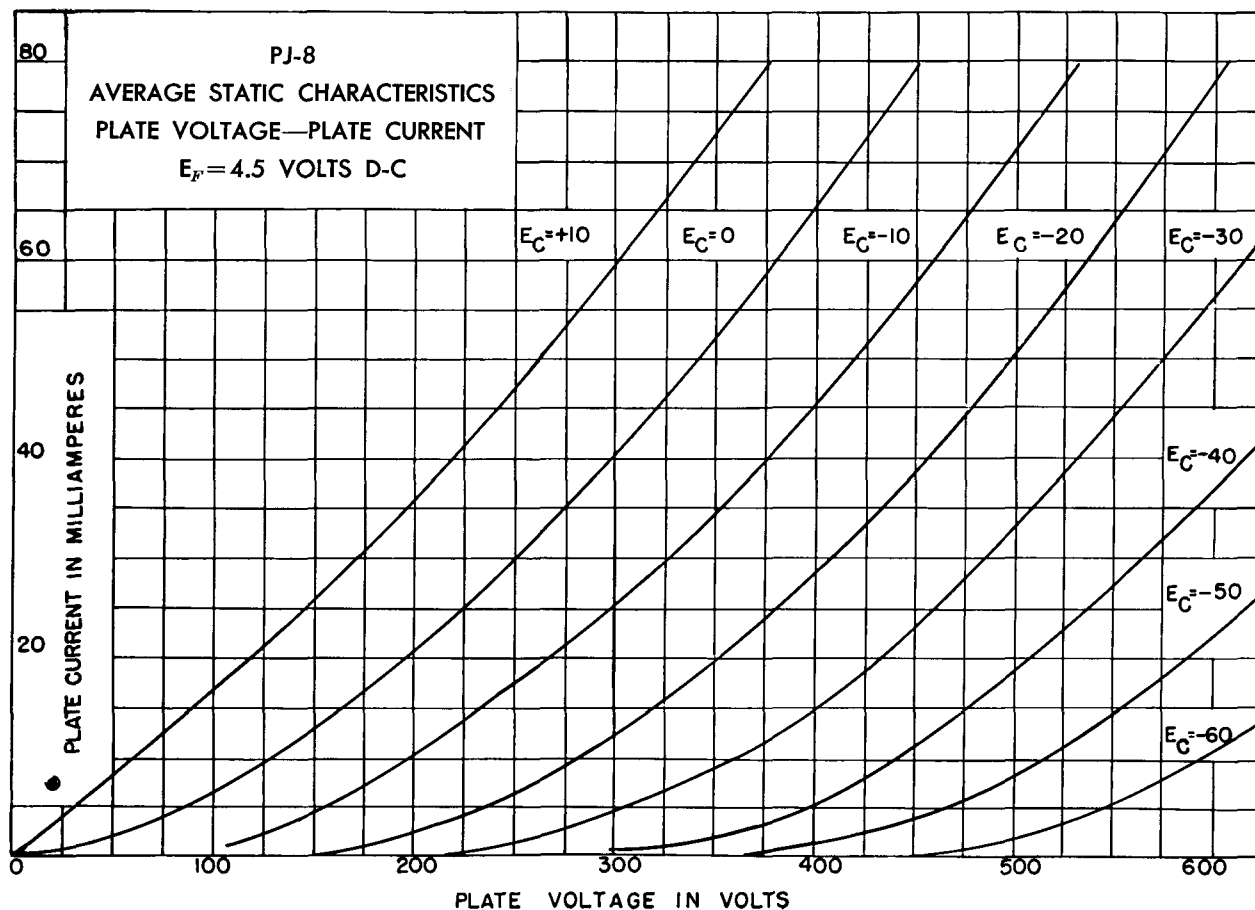
\*Modulation, essentially negative, may be used if the positive peak of the audio-frequency envelope does not exceed 115 per cent of the carrier conditions.

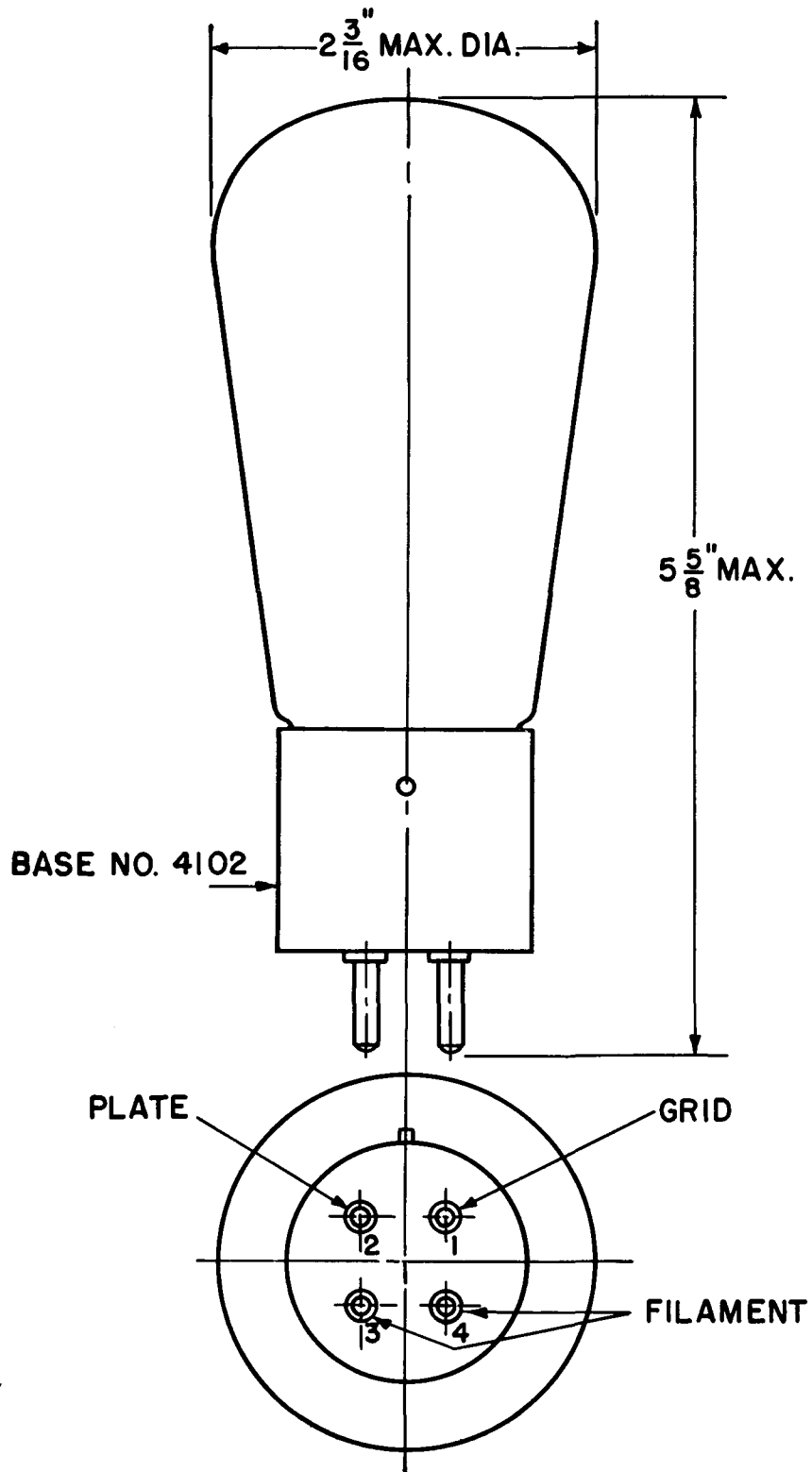
## APPLICATION NOTES

The PJ-8 can be operated at frequencies as high as six megacycles, and may be operated at higher frequencies provided the maximum values of plate voltage and power input are reduced as the frequency is raised (other maximum ratings are the same as shown under **TECHNICAL INFORMATION**). The tabulation below shows highest percentage of maximum plate voltage and power input that can be used up to thirty megacycles for the various classes of service. Special attention should be given to adequate ventilation of the bulb at these frequencies.

|                                              |     |    |               |
|----------------------------------------------|-----|----|---------------|
| Frequency.....                               | 6   | 15 | 30 megacycles |
| Class B, r-f.....                            | 100 | 85 | 70 per cent   |
| Class C, plate modulated or unmodulated..... | 100 | 75 | 50 per cent   |

The normal value of grid leak, when the PJ-8 is used as an oscillator or r-f power amplifier (Class C), is in the neighborhood of 10,000 ohms, although this may be replaced by a suitable fixed bias. If self-bias is used, the cathode should be approximately 2000 ohms.





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OUTLINE PJ-8 PIOTRON

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