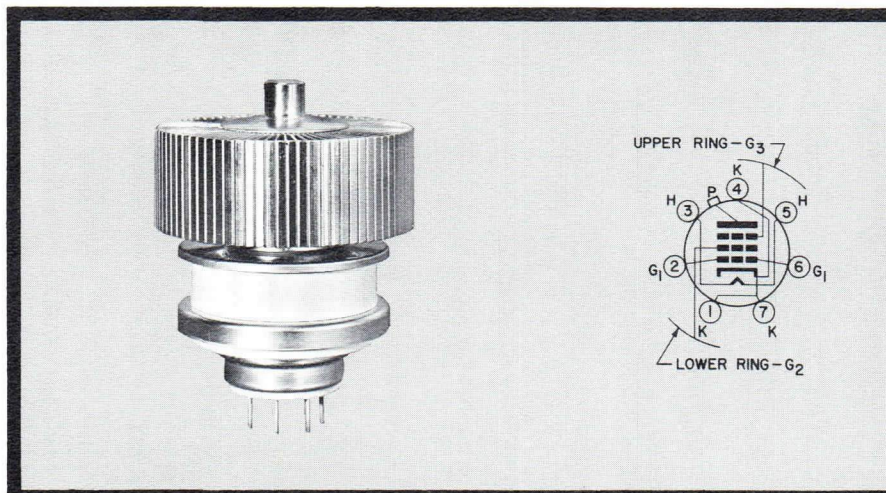




PL-8432

Ceramic Beam Pentode



DESCRIPTION

The PL-8432 is a forced-air cooled, 1000-watt plate dissipation ceramic-envelope beam pentode featuring compact construction. This tube is especially suited for low-distortion Class-AB₁ linear r-f amplifier use, where a single tube will deliver over 1500 watts of useful power output. The excellent characteristics of the PL-8432 also provide outstanding performance in Class-AB₂, and Class-B service.

ELECTRICAL CHARACTERISTICS

Cathode — Coated Unipotential	
Heater Voltage	6.0 volts
Heater Current	8.2 amperes
Minimum Cathode Heating Time	3 minutes
Grid-Screen mu Factor	3.4
Transconductance (1000 v. Eb, 500 v. Ec ₂ , 1 a. Ib)	23,000 μmhos
Interelectrode Capacitances	
Grid-Plate	0.09 μμf
Input	42 μμf
Output	20 μμf

MECHANICAL CHARACTERISTICS

Base	7-pin Septar, EIA E 7-2
Base Connections	See base diagram
Recommended Socket	PL-209A
Maximum Overall Dimensions	
Length	4.75 inches
Diameter	3.53 inches
Net Weight	2.5 pounds
Cooling	
Volume of air through cooler (at 1000 watts plate dissipation; 40°C max. incoming air temperature)	
	37 c.f.m., minimum
Pressure Drop (at 37 c. f. m.)	
Cooler only	0.10 in. water
Cooler plus PL-209A socket	0.18 in. water
Mounting Position	Any

19 October 1964

Form 92C-291B



THE PENTA LABORATORIES, INC.

A SUBSIDIARY OF RAYTHEON COMPANY

312 N. NOPAL STREET • SANTA BARBARA, CALIFORNIA 93102



PL-8432

MOUNTING

The PL-8432 may be mounted in any position. Support for the tube, when mounted with the axis vertical, should be by either the lower edge or upper flat portion of the suppressor-grid terminal ring, or by the anode cooler. For horizontal mounting, the PL-8432 should be supported by the anode cooler.

Spring contact material should be used to make contact with the suppressor and screen-grid contact surfaces. Contacts should be provided in at least three places around the periphery of each surface.

The PL-209A, a special socket which provides for the proper distribution of cooling air, is available. The socket includes contacts for all base pins and screen and suppressor-grid terminals. By-pass capacitors for the screen grid are included, and the suppressor-grid contacts are grounded to the frame of the socket.

A standard seven-pin Septar socket, such as the E. F. Johnson Co. type 122-247 or 122-248, will fit the base of the PL-8432. Support for the tube must be provided to make certain that the ceramic wafer at the base of the tube does not contact the socket.

COOLING

The graph below illustrates the cooling air requirements for the PL-8432 when installed in the PL-209A socket. Any additional pressure drops in the air system between the tube cooler and Penta socket, if used, such as might occur in an air duct, must be added to the pressure drop figure taken from the chart to determine the static pressure which must be maintained at the blower.

It is necessary to divert a small amount of cooling air from the anode cooling supply, either before or after entering the anode cooler, to limit the temperature of the base seals and screen-grid and suppressor-grid contact surfaces to a maximum of 250° C.

OPERATION — GENERAL

PL-8432 heater voltage should be held as closely as possible to the rated 6.0 volts. Although heater volt-

age variations of up to 10 per cent are permissible, decreased tube life and deviations in power output may result from prolonged operation at voltages more than five per cent from the rated value.

Permanent damage to the PL-8432 may result from screen-grid input in excess of the maximum rating. If screen voltage is obtained from a power supply separate from the plate voltage supply, the circuit should be so arranged that screen-grid voltage cannot be applied without plate voltage. A screen-grid over-current relay should be employed to remove screen voltage immediately in the event of excessive screen current resulting from circuit maladjustment, grid bias failure, or accidental removal of plate circuit loading.

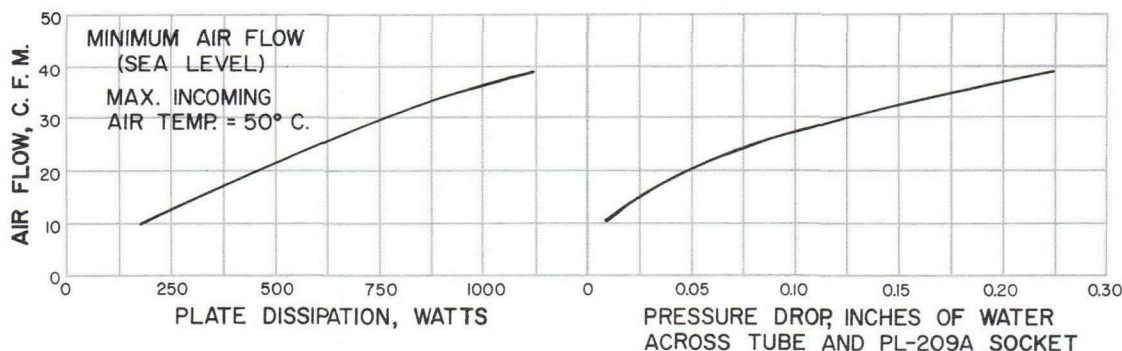
Grid bias voltage for the PL-8432 must be obtained from a fixed bias supply in Class-AB₁ or AB₂ applications. The total grid circuit resistance, including the internal resistance of the bias source, must not exceed 5000 ohms in Class-AB₁ applications or 2000 ohms in Class-AB₂ operation.

RADIO-FREQUENCY OPERATION

In low distortion Class-AB₁ linear amplifier service, where reaction on the driver circuit must be entirely eliminated, it will usually be found advisable to neutralize the small feedback capacitance of the PL-8432.

The input and output circuits of an amplifier using the PL-8432 should be separated by a metal chassis or equivalent shield. Care should be used in by-passing and shielding of the supply leads to prevent coupling between the input and output through external circuits.

When operating the PL-8432 as a Class-AB₁ linear amplifier, it is important that the screen voltage for the tube be obtained from a well-regulated source, to avoid excessive screen voltage variations caused by the changes in screen current which occur between zero-signal and full-signal conditions.



MAXIMUM RATINGS

CCS (Continuous Commercial Service)

	Class-C CW or FM	Class-AB ₁ Audio or RF	Class-AB ₁ Audio or RF	
D-C Plate Voltage	3000	3000	3000	volts
D-C Screen-Grid Voltage	500	500	600	volts
D-C Suppressor-Grid Voltage	75	75	75	volts
D-C Control-Grid Voltage	-200			volts
D-C Plate Current	1000	800	800	ma.
D-C Control-Grid Current	10	10		ma.
Control-Grid Dissipation	5	5		watts
Screen-Grid Input	30	30	30	watts
Plate Dissipation	1000	1000	1000	watts

TYPICAL OPERATION — Class AB₁ Linear R-F Amplifier¹

Single-Sideband, Suppressed Carrier; Grounded-Cathode Circuit

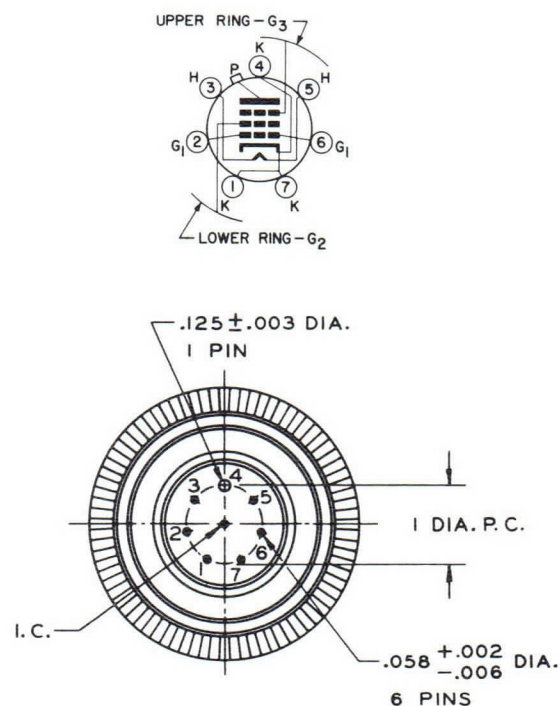
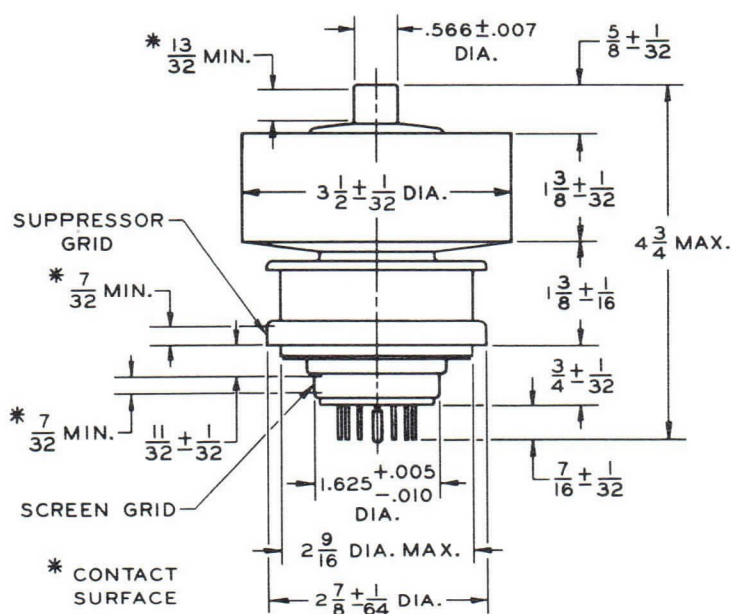
D-C Plate Voltage	2000	2500	3000	volts
D-C Screen-Grid Voltage	500	500	500	volts
D-C Suppressor-Grid Voltage	0	0	0	volts
D-C Control-Grid Voltage ²	-110	-112	-115	volts
Zero-Signal D-C Plate Current	200	200	200	ma.
Zero-Signal D-C Screen Current	6	4	3	ma.
Maximum-Signal D-C Plate Current	760	780	800	ma.
Maximum-Signal D-C Screen Current	60	55	52	ma.
Maximum-Signal Peak R-F Grid Voltage	110	112	115	volts
Intermodulation Distortion Level ³				
Third Order	-26	-27	-27	db
Fifth Order	-50	-45	-45	db
Maximum-Signal Power Input	1520	1950	2400	watts
Maximum-Signal Useful Power Output ⁴	1030	1280	1540	watts

¹ D-C current values shown are for peak conditions, or for single-tone modulation at full signal.

² Approximate value; adjust to give stated zero-signal plate current.

³ At maximum output. Referenced against one tone of two equal-tone signals. No degenerative feedback.

⁴ Single-tone or peak envelope power delivered to load from typical amplifier.





PL-8432

