

Introducing the Eimac **4X250B**

**A superior radial-beam power tetrode
unilaterally interchangeable with the Eimac 4X150A**

HIGHER POWER • EASIER COOLING • LONGER LIFE

4X250B, a new, superior radial-beam power tetrode by Eimac—originators of the famous 4X150A—is now available. This amazing new bantam is intended for modulator, oscillator, amplifier or frequency multiplier use at all frequencies into UHF. It is unilaterally interchangeable with the 4X150A in nearly all cases, but offers higher power, easier cooling and longer life.

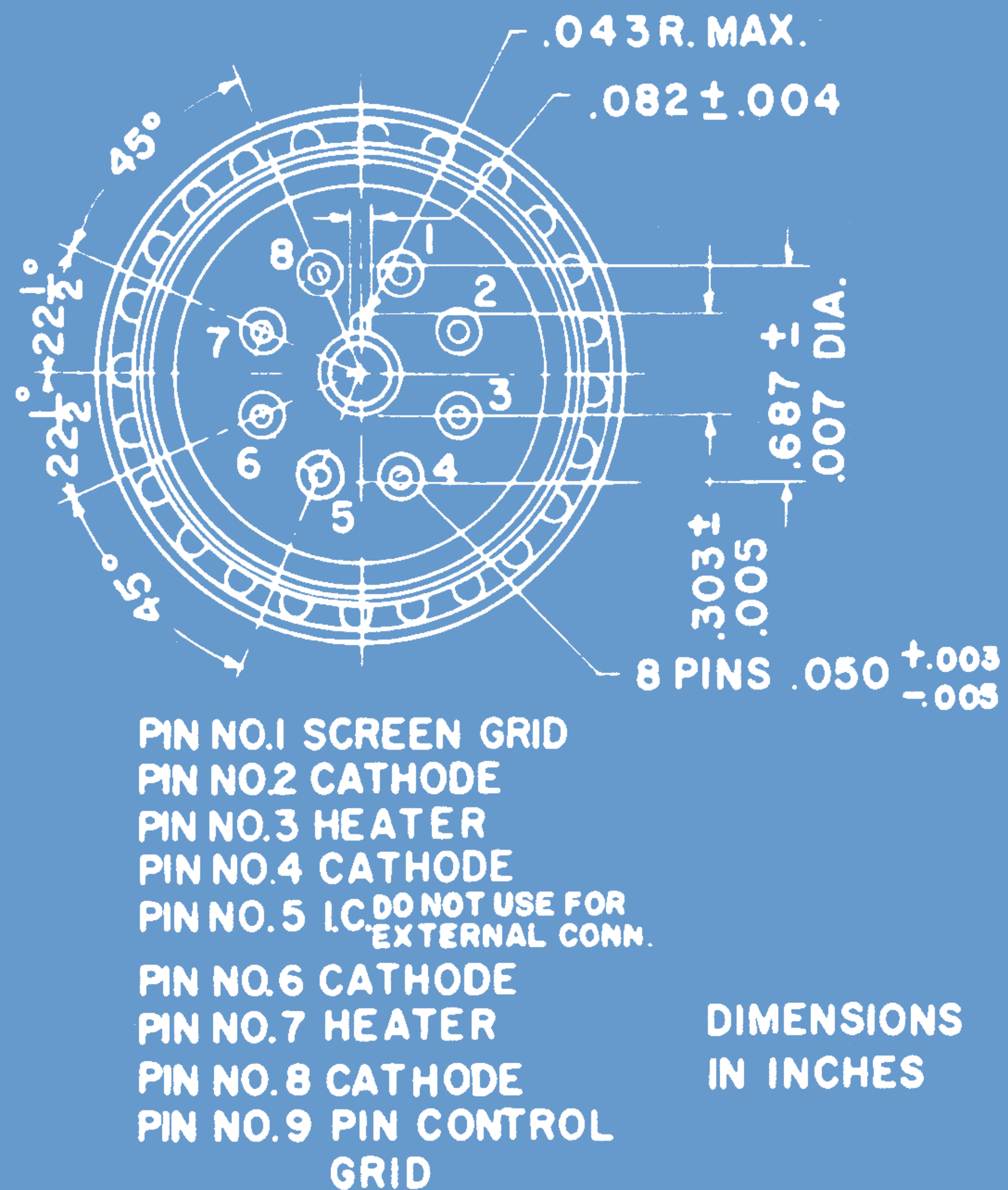
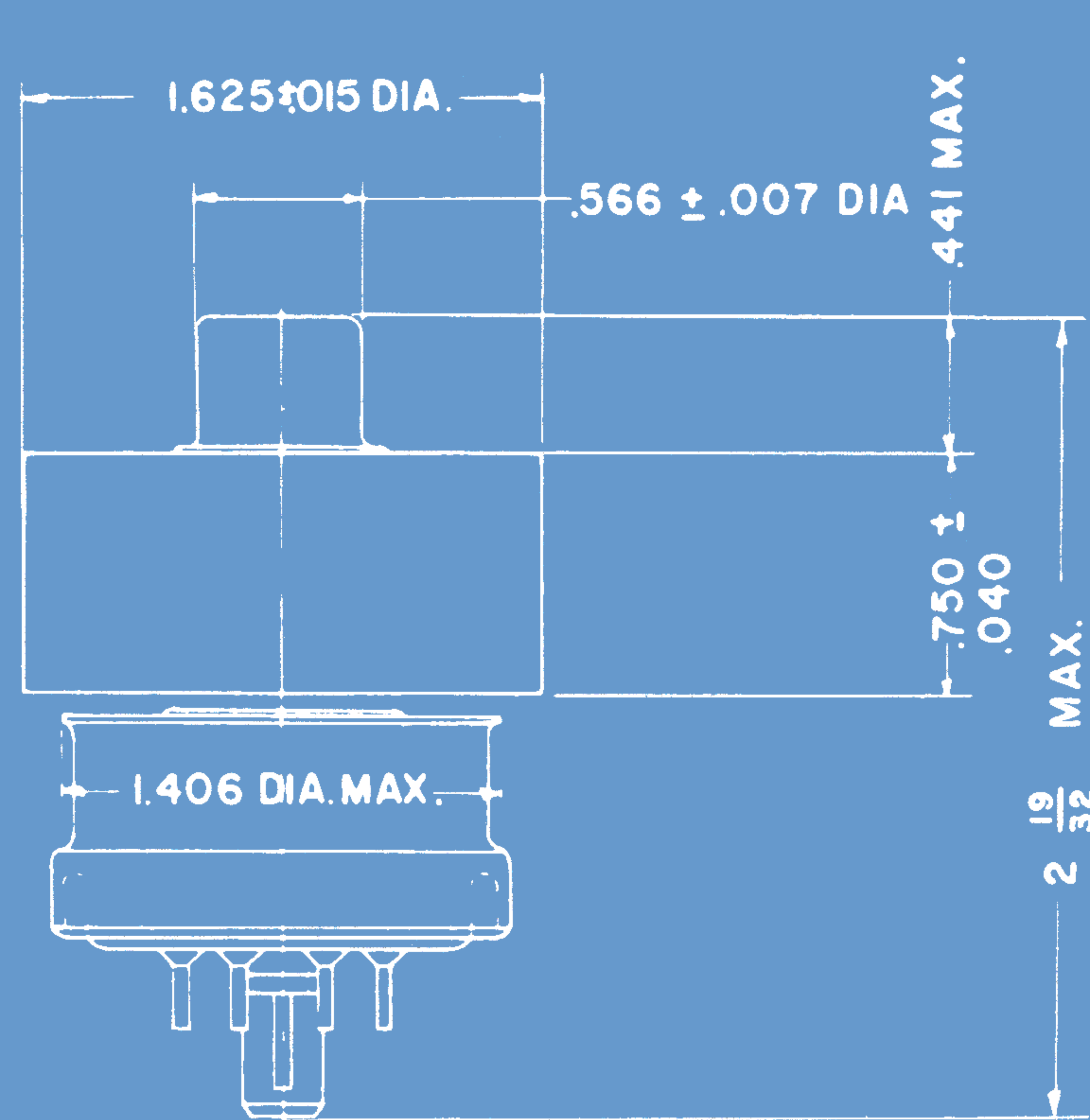
HIGHER POWER—Design advancements permit increased plate dissipation capabilities of 250 watts, compared to 150 watts for the 4X150A. Plate voltage ratings have been increased to 2000 volts and plate power input has been doubled to 500 watts.

EASIER COOLING—The new Eimac integral-finned anode, plus other design improvements, make the 4X250B considerably easier to cool than the 4X150A. Seal temperatures are lower, the

anode temperature tolerance is higher and the cooler is more efficient. At equal plate dissipations, the blower horsepower requirement of the 4X250B is one-half that of the 4X150A. Standby forced-air cooling of the 4X250B is eliminated if convection air is properly provided. The table on page four gives a cooling requirement comparison between the 4X250B and 4X150A.

LONGER LIFE—A newly designed, highly efficient oxide cathode, plus the lower seal temperatures, increased anode temperature tolerance and the more efficient cooler, enable the 4X250B to meet the most critical standards and assure longer life. New techniques in grid production, high vacuum outgassing and product evaluation are additional Eimac features that insure uniform quality and more hours of top performance.





The **Eimac 4X250B** is a compact, oxide-cathode, external-anode power tetrode, unilaterally interchangeable with the 4X150A in nearly all cases, and is intended for use as an amplifier, oscillator or frequency multiplier over a wide range of frequencies extending into the UHF region. It is cooled by convection and forced air.

A single 4X250B in a coaxial-cavity amplifier circuit will deliver up to 300 watts of useful power output at 400mc, although this is not the upper frequency limit of the tube.

The high transconductance of the 4X250B makes the tube useful at relatively low plate voltages. High ratio of transconductance to inter-electrode capacitance and a 250 watt plate dissipation rating make the tube ideal for wide-band amplifier applications.

The use of the Eimac 4X150A Air-System Socket or a socket providing equivalent air cooling and RF by-passing characteristics is required.

GENERAL CHARACTERISTICS

ELECTRICAL

Cathode: Oxide Coated, Unipotential	
Minimum Heating Time	30 seconds
Cathode-to-Heater Voltage	150 max. volts
Heater: Voltage	6.0 volts
Current	2.1 amperes
Grid-Screen Amplification Factor (Average)	5
Direct Inter-electrode Capacitances (Average)	
Grid-Plate	0.04 μf
Input	18.5 μf
Output	4.7 μf
Transconductance ($E_b=500\text{v.}$, $E_{c2}=250\text{v.}$, $I_b=200\text{ma}$)	12,000 μmhos
Frequency for Maximum Plate Voltage Ratings	400 Mc
(All other Maximum Ratings applicable to 500 Mc)	

MECHANICAL

Base	9-pin, special
Recommended Socket	Eimac 4X150A Air-System Socket
Base Connections	See outline drawing
Mounting	Any position
Cooling	Convection and Forced air
Maximum Over-All Dimensions	
Length	2.59 inches
Diameter	1.65 inches
Seated Height	2.03 inches
Net Weight	4.0 ounces
Shipping Weight	1.6 pounds

OPERATIONAL CHARACTERISTICS

RADIO-FREQUENCY POWER AMPLIFIER OR OSCILLATOR

(Class-C Telephony or FM Telephony)
(Key-Down conditions, per tube)

MAXIMUM RATINGS

D-C PLATE VOLTAGE	2000 MAX. VOLTS
D-C SCREEN VOLTAGE	300 MAX. VOLTS
D-C GRID VOLTAGE	-250 MAX. VOLTS
D-C PLATE CURRENT	250 MAX. MA
PLATE DISSIPATION	250 MAX. WATTS
SCREEN DISSIPATION	12 MAX. WATTS
GRID DISSIPATION	2 MAX. WATTS

TYPICAL OPERATION (Frequencies up to 175Mc, per tube)

D-C Plate Voltage	500	1000	1500	2000 volts
D-C Screen Voltage	250	250	250	250 volts
D-C Grid Voltage	-90	-90	-90	-90 volts
D-C Plate Current	250	250	250	250 ma
D-C Screen Current	45	35	30	25 ma
D-C Grid Current	32	28	28	27 ma
Peak R-F Grid Voltage (approx.)	118	116	116	115 volts
Driving Power	3.6	3.2	3.2	2.8 watts
Plate Power Input	125	250	375	500 watts
Plate Power Output	85	195	300	410 watts

PLATE-MODULATED RADIO-FREQUENCY AMPLIFIER

Class-C Telephony (Carrier conditions, per tube)

MAXIMUM RATINGS

D-C PLATE VOLTAGE	1500 MAX. VOLTS
D-C SCREEN VOLTAGE	300 MAX. VOLTS
D-C GRID VOLTAGE	-250 MAX. VOLTS
D-C PLATE CURRENT	200 MAX. MA
PLATE DISSIPATION	165 MAX. WATTS
SCREEN DISSIPATION	12 MAX. WATTS
GRID DISSIPATION	2 MAX. WATTS

TYPICAL OPERATION (Frequencies up to 175Mc, per tube)

D-C Plate Voltage	500	1000	1500 volts
D-C Screen Voltage	250	250	250 volts
D-C Grid Voltage	-100	-100	-100 volts
D-C Plate Current	200	200	200 ma
D-C Screen Current	45	35	25 ma
D-C Grid Current	22	19	17 ma
Peak R-F Grid Input Voltage	124	122	121 volts
Driving Power	2.7	2.3	2.1 watts
Plate Power Input	100	200	300 watts
Plate Power Output	75	160	250 watts

CLASS-AB POWER AMPLIFIER OR MODULATOR

MAXIMUM RATINGS (Per Tube)

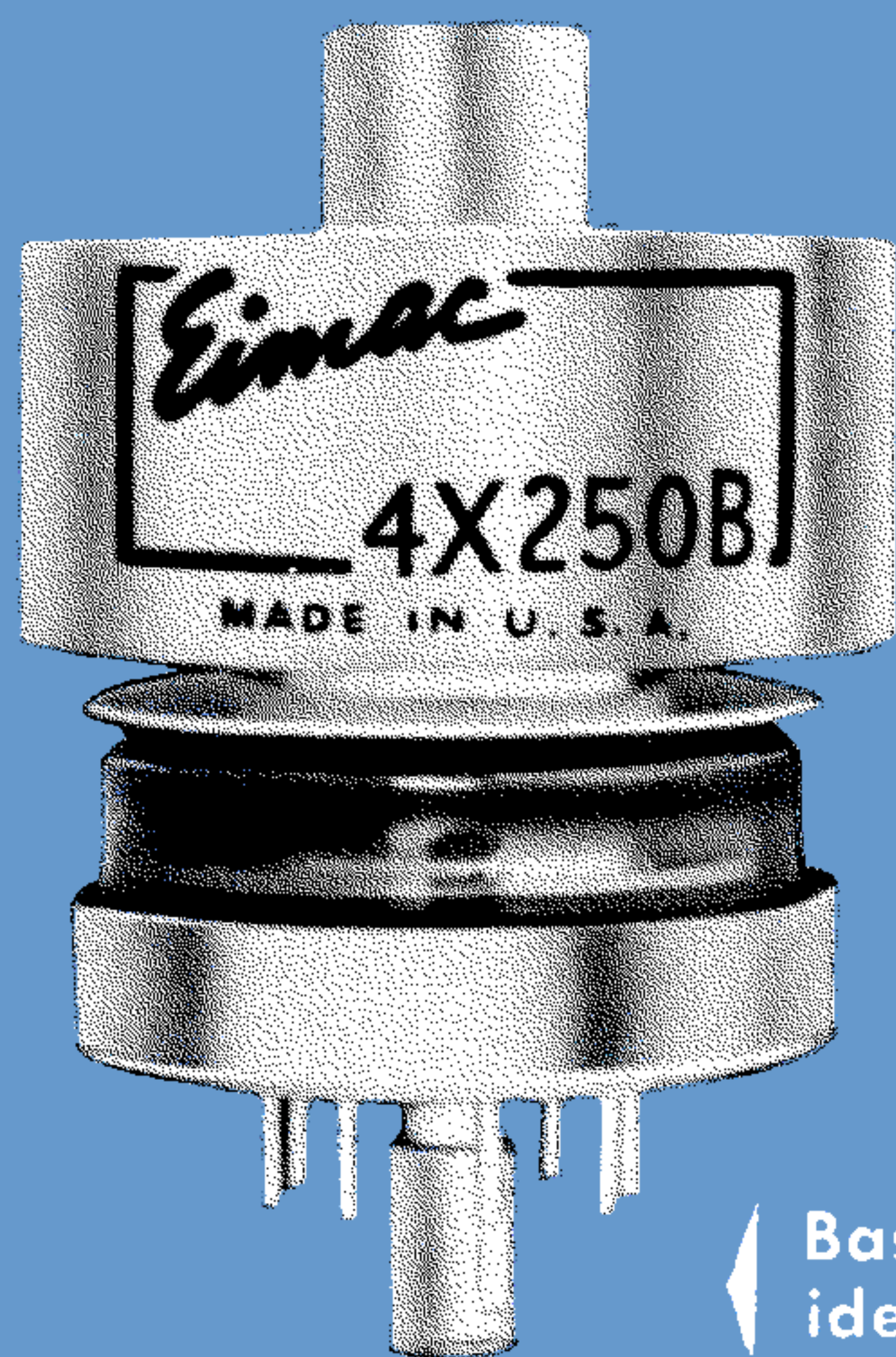
D-C PLATE VOLTAGE	2000 MAX. VOLTS
D-C SCREEN VOLTAGE	400 MAX. VOLTS
D-C PLATE CURRENT	250 MAX. MA
PLATE DISSIPATION	250 MAX. WATTS
SCREEN DISSIPATION	12 MAX. WATTS
GRID DISSIPATION	2 MAX. WATTS

TYPICAL OPERATION

Class-AB₁ R-F Linear Amplifier (Frequencies to 175 Mc, per tube)

D-C Plate Voltage	1000	1500	2000 volts
D-C Screen Voltage	350	350	350 volts
D-C Grid Voltage (Approx.)*	-50	-50	-50 volts
Zero-Signal D-C Plate Current	100	100	100 ma
Max-Signal D-C Plate Current	250	250	250 ma
Max-Signal D-C Screen Current	25	20	15 ma
Peak R-F Grid Voltage	50	50	50 volts
Driving Power	0	0	0 watts
Max-Signal Plate Dissipation	125	150	175 watts
Max-Signal Power Output	125	225	325 watts

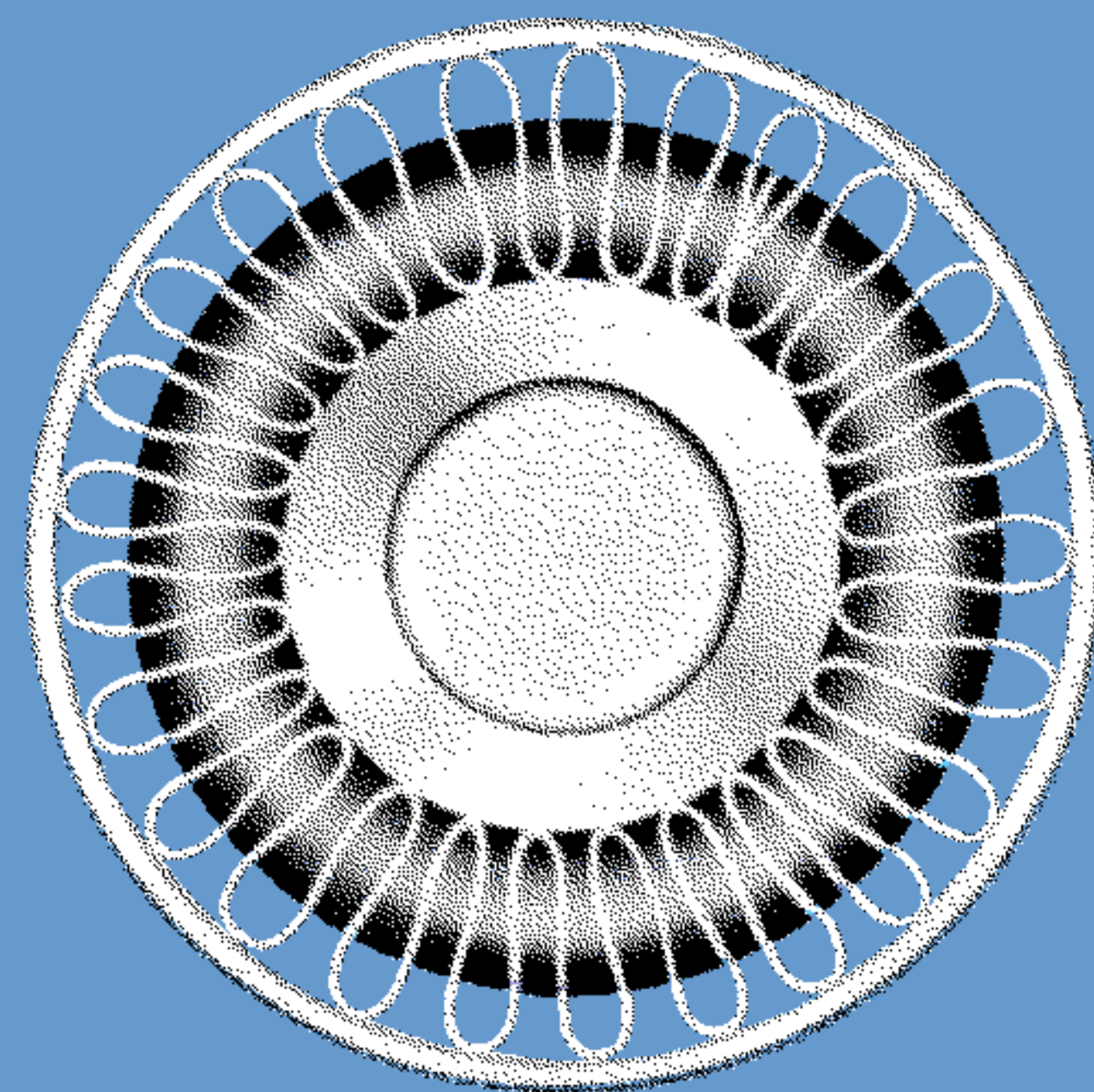
*Adjust grid voltage to obtain specified zero-signal plate current.



A
New unitized integral-finned anode makes cooling easier

B
New, improved oxide cathode

C
Basing arrangement identical to 4X150A



ACTUAL SIZE

SIDE AND TOP VIEW OF 4X250B SHOWING STRUCTURAL FEATURES

A The Eimac integral-finned anode, plus other new design and production techniques, permit higher power ratings for the 4X250B over the 4X150A and make it much easier to cool. The anode-cooler is now one unit, allowing a more efficient anode-to-fin heat transfer and creating an enlarged air-flow area without increasing anode dimensions. Improvements make cooling of the 4X250B easier than the 4X150A by: 1) Eliminating forced-air cooling during stand-by periods if convection air is properly provided, and 2) reducing air pressure and air volume requirements.

B A new improved oxide cathode adds extra hours of tube life.

C Basing arrangement identical to the 4X150A has been maintained, permitting use of the 4X250B in Eimac 4X150A air-system sockets and chimneys. For optimum cooling, the 4X250B should be used with Eimac air-system socket and chimney combinations.

Priced at only \$42.50, the 4X250B gives more watt-hours per dollar in all types of commercial, military and amateur operation.

When designing new equipment or replacing 4X150A's, consider the Eimac 4X250B — for higher power, longer life and easier cooling.

FORCED-AIR COOLING REQUIREMENTS

4X250B vs 4X150A

(with Eimac Air-System Socket at normal room temperatures)

CONDITIONS	4X250B	4X150A
Below 175mc		
150w plate dissipation		
volume	1.8 cfm	2.3 cfm
pressure	0.05 in.	0.11 in.
250w plate dissipation		
volume	3.6 cfm	---
pressure	0.23 in.	---
500mc		
volume	3.8 cfm	7.5 cfm
pressure	0.25 in.	0.6 in.
Standby	none required*	required

*if convection air is properly provided



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