EIMAC
Division of Varian
SAN CARLOS
CALIFORNIA

TENTATIVE DATA

3X3000A7

HIGH-MU POWER TRIODE

The Eimac 3X3000A7 is an external-anode power triode intended to be used as a zero-bias Class-B amplifier in audio or radio-frequency applications. Operation with zero grid bias offers circuit simplicity by eliminating the bias supply. In addition, grounded-grid operation is attractive since a power gain of over twenty times can be obtained with the 3X3000A7.

GENERAL CHARACTERISTICS

ELECTRICAL

Filament: Thoriated-Tungsten	
Voltage	7.5 volts
Current	51 amperes
Amplification Factor	200
Interelectrode Capacitances:	
Grid-Filament	38 uuf
Grid-Plate	24 uuf
Plate-Filament	0.6 uuf
Frequency for Maximum Ratings	75 Mc

MECHANICAL

Base	See outline drawing
Operating Position	Vertical, base up or down
Cooling	Forced air
Maximum Operating Temperatures:	
Anode Core and Seals	175°C
Maximum Dimensions:	
Height	8.6 inches
Diameter	4.16 inches
Net Weight	6.25 pounds

AF AMPLIFIER OR MODULATOR CLASS-B, GRID-DRIVEN

MAXIMUM RATINGS (Per Tube)

DC PLATE VOLTAGE	5000 VOLTS
DC PLATE CURRENT	2.5 AMPS
PLATE DISSIPATION	3 KW
GRID DISSIPATION	225 WATTS

*Approximate Values

TYPICAL OPERATION, Two Tubes, Sinusoidal Wave

DC Plate Voltage	4000 volts
DC Grid Voltage	0 volts
Zero-Sig DC Plate Current*	0.640 amps
Max-Sig DC Plate Current	4.00 amps
Max-Sig DC Grid Current	0.860 amps
Driving Power	120 watts
Peak AF Driving Voltage (per tube)	185 volts
Load Resistance, Plate-to-Plate	2200 ohms
Max-Sig Plate Output Power	11,000 watts

RF LINEAR AMPLIFIER
CLASS-B, GROUNDED-GRID

MAXIMUM RATINGS

DC PLATE VOLTAGE	5000 VOLTS
DC PLATE CURRENT	2.5 AMPS
PLATE DISSIPATION	3 KW
GRID DISSIPATION	225 WATTS

*Approximate Value

TYPICAL OPERATION, Single-Tone Conditions

DC Plate Voltage	4000	5000 volts
Zero-Sig DC Plate Current*	0.32	0.44 amps
Max-Sig DC Plate Current	2.00	1.56 amps
Max-Sig DC Grid Current	0.42	0.33 amps
Driving Impedance	50	50 ohms
Resonant Load Impedance	1120	1850 ohms
Max-Sig Driving Power	360	215 watts
Peak Envelope Plate Output Power	5500	5500 watts
Power Gain	15.3	25.6 times

RF LINEAR AMPLIFIER
CARRIER CONDITIONS, GRID-DRIVEN

MAXIMUM RATINGS

DC PLATE VOLTAGE	5000 VOLTS
DC PLATE CURRENT	2.5 AMPS
PLATE DISSIPATION	3 KW
GRID DISSIPATION	225 WATTS

*Approximate Value
†Modulation Crest Conditions

TYPICAL OPERATION

DC Plate Voltage	4000 volts
DC Grid Voltage	0 volts
Zero-Sig DC Plate Current*	0.32 amps
DC Plate Current	0.815 amps
DC Grid Current	0.205 amps
Driving Impedance†	220 ohms
Peak Driving Voltage†	160 volts
Driving Power	15 watts
Plate Output Power	1100 watts

NOTE: "TYPICAL OPERATION" data are obtained by calculation from published characteristic curves and confirmed by direct tests. No allowance for circuit losses, either input or output, has been made.

APPLICATION

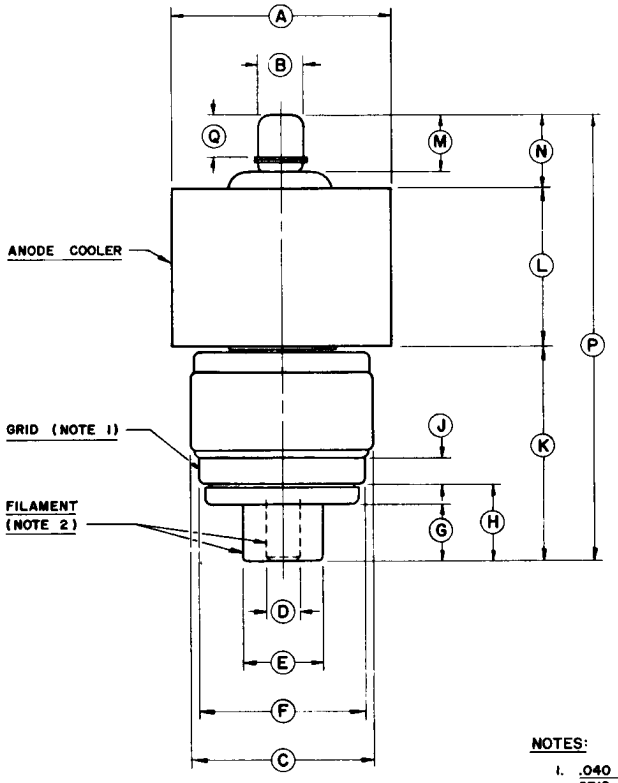
Input Circuit—When the 3X3000A7 is operated as a grounded-grid rf amplifier, the use of a resonant tank in the cathode circuit is recommended in order to obtain greatest linearity and power output. For best results with a single-ended amplifier it is suggested that the cathode tank circuit operate at a "Q" of five or more.

Cooling—The maximum temperature rating for the anode core and seals of the 3X3000A7 is 175°C. Sufficient forced-air cooling must be provided to keep the temperature of the anode core and the temperatures of the glass-to-metal seals below 175°C. Tube life is usually prolonged if these areas are maintained at temperatures below the maximum rating. Minimum air flow requirements to maintain anode-core and seal temperatures below 175°C at sea level with an inlet-air temperature of 50°C are tabulated for air-flow in the anode-to-base and base-to-anode directions. At higher ambient temperatures, frequencies above 30 Mc or at higher altitude, a greater quantity of air will be required. It is suggested that temperatures be monitored in any new installation to insure proper cooling.

In addition, a minimum air flow of 7 cfm must be directed into the filament stem structure, between the inner and outer filament conductors. This rate of air flow provides sufficient stem cooling at ambient temperatures up to 55°C.

Minimum Cooling Air-Flow Requirements				
Plate** Dissipation (Watts)	Anode-To-Base Air-Flow		Base-To-Anode Air Flow	
	Air Flow (CFM)	Pressure Drop (Inches of Water	Air Flow (CFM)	Pressure Drop (Inches of Water)
1000	42	0.4	25	0.15
2000	109	2.25	63	0.75
3000	215	7.8	130	2.6

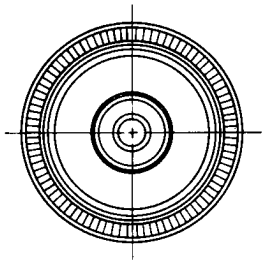
**Since the power dissipated by the filament is about 375 watts and since grid dissipation can, under some circumstances, represent another 225 watts, allowance has been made in preparing this tabulation for an additional 600 watts dissipation.



DIMENSIONS IN INCHES

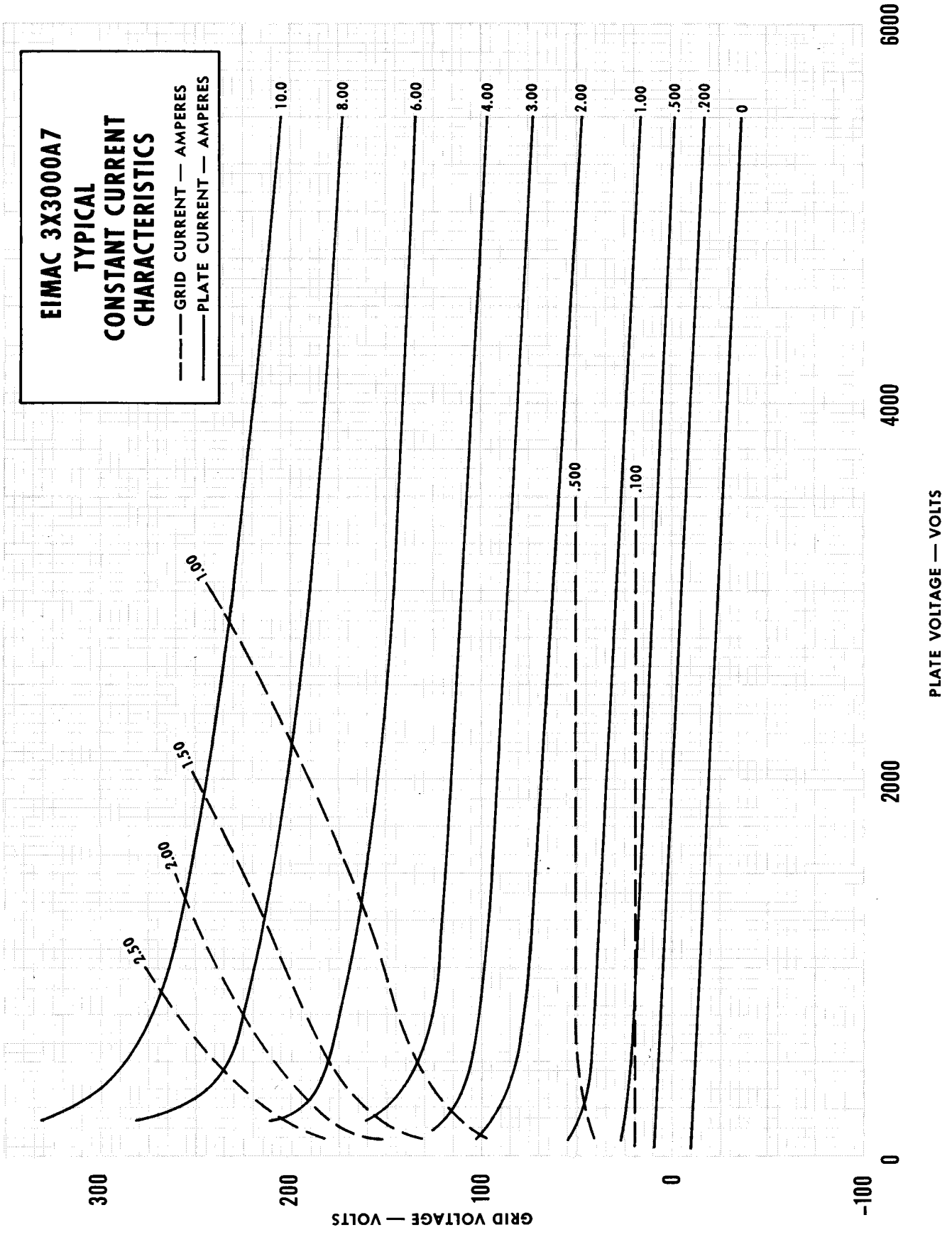
DIMENSIONAL DATA

REF.	MIN.	MAX.	NOM.
A	4.093	4.156	
B	.781	.843	
C		3.625	
D	.615	.635	
E	1.490	1.510	
F	2.990	3.010	
G	.812	.937	
H	1.437	1.562	
J	.375	.437	
K	4.	4.125	
L	2.968	3.031	
M	1.	1.125	
N	1.187	1.437	
P	8.156	8.593	
Q	.687	.812	



NOTES:

1. .040 MAX. RUNOUT OF GRID CONTACT SURFACE WITH RESPECT TO AXIS DETERMINED BY ANODE AND OUTER FILAMENT CONTACT SURFACE.
2. .025 MAX. RUNOUT OF INNER FILAMENT CONTACT SURFACE WITH RESPECT TO OUTER FILAMENT CONTACT SURFACE.


EIMAC 3X3000A7
TYPICAL
CONSTANT CURRENT
CHARACTERISTICS
GRID CURRENT — AMPERES
PLATE CURRENT — AMPERES
10.0
8.00
6.00
4.00
3.00
2.00
1.00
.500
.200
0
.500
.100
1.00
1.50
2.00
2.50
300
200
100
0
-100
0
2000
4000
6000
GRID VOLTAGE — VOLTS
PLATE VOLTAGE — VOLTS