1000T

HIGH-MU TRIODE

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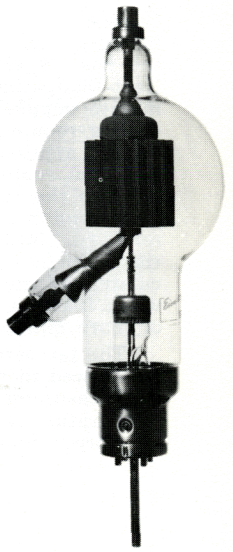
MODULATOR
OSCILLATOR
AMPLIFIER

TECHNICAL DATA

The Eimac 1000T is a high-mu power triode intended for use as a modulator, oscillator, or amplifier. The tube has a maximum plate dissipation rating of 1000 watts, and a maximum plate voltage rating of 7500 volts at frequencies up to 50 Mc. Cooling is by forced air and radiation.

The 1000T in Class-C r-f service will deliver up to 3000 watts plate power output with 60 watts driving power. Two 1000T's in Class AB_2 modulator service will deliver up to 4600 watts maximum signal plate power output with 60 watts driving power.



GENERAL CHARACTERISTICS

ELECTRICAL

Filament: Thoriated Tungsten	
Voltage	7.5 volts ± 5%
Current	15.5 amperes
Amplification Factor (Average)	35
Direct Interelectrode Capacitances (Average)	
Grid-Plate	5.1 μμf
Grid-Filament	9.3 μμf
Plate-Filament	0.5 μμf
Transconductance (I_b=750ma., E_b=6000v.)	9050 μmhos
Highest Frequency for Maximum Ratings	50 Mc

MECHANICAL

Base	50-watt jumbo 4-pin with air-conduction pipe
Connections	See outline drawing
Socket	Johnson type No. 123-211 or equivalent
Mounting Position	Vertical, base down or up
Cooling	Forced air and radiation
Maximum Temperature of Grid and Plate Seals	225°C
Recommended Grid and Plate Heat Dissipating Connectors	Eimac HR-9
Maximum Dimensions:	
Seated Height	12.3 inches
Diameter	5.13 inches
Net Weight	1.25 pounds
Shipping Weight (Average)	6.25 pounds

AUDIO-FREQUENCY POWER AMPLIFIER OR MODULATOR

Class-AB_2

MAXIMUM RATINGS (Per tube)

D-C PLATE VOLTAGE	7500 MAX. VOLTS
D-C PLATE CURRENT	750 MAX. MA
PLATE DISSIPATION	1000 MAX. WATTS
GRID DISSIPATION	80 MAX. WATTS

TYPICAL OPERATION (Sinusoidal wave, two tubes unless otherwise specified)

D-C Plate Voltage	4000	5000	6000	volts
D-C Grid Voltage[1]	−85	−125	−160	volts
Zero-Signal D-C Plate Current	335	270	220	ma
Max-Signal D-C Plate Current	1.25	1.14	1.05	amps
Effective Load, Plate-to-Plate	6250	9200	13,300	ohms
Peak A-F Grid Voltage (per tube)	260	290	335	volts
Max-Signal Driving Power*	35	37	60	watts
Max-Signal Plate Power Input	5000	5700	6300	watts
Max-Signal Plate Power Output	3000	3700	4600	watts

[1]Adjust to stated Zero-Signal Plate Current.

RADIO-FREQUENCY POWER AMPLIFIER OR OSCILLATOR

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

MAXIMUM RATINGS (Frequencies up to 50 Mc.)

D-C PLATE VOLTAGE	7500 MAX. VOLTS
D-C PLATE CURRENT	750 MAX. MA
PLATE DISSIPATION	1000 MAX. WATTS
GRID DISSIPATION	80 MAX. WATTS

TYPICAL OPERATION (Frequencies up to 50 Mc.)

D-C Plate Voltage	3000	4000	5000	6000 volts
D-C Grid Voltage	−150	−150	−225	−350 volts
D-C Plate Current	750	713	667	667 ma
D-C Grid Current*	90	100	87	110 ma
Peak R-F Grid Voltage	350	365	420	610 volts
Driving Power*	30	33	33	60 watts
Grid Dissipation*	21	19	14	25 watts
Plate Power Input	2250	2850	3335	4000 watts
Plate Power Output	1350	1850	2335	3000 watts

PLATE-MODULATED RADIO-FREQUENCY AMPLIFIER

Class-C Telephony (Carrier conditions, per tube)

MAXIMUM RATINGS (Frequencies up to 50 Mc.)

D-C PLATE VOLTAGE	6000 MAX. VOLTS
D-C PLATE CURRENT	600 MAX. MA
PLATE DISSIPATION	665 MAX. WATTS
GRID DISSIPATION	80 MAX. WATTS

TYPICAL OPERATION (Frequencies up to 50 Mc.)

D-C Plate Voltage	4000	5000	6000	volts
D-C Grid Voltage	−300	−400	−500	volts
D-C Plate Current	600	600	600	ma
D-C Grid Current*	80	90	95	ma
Peak R-F Grid Voltage	540	660	775	volts
Driving Power*	45	60	75	watts
Grid Dissipation*	20	24	25	watts
Plate Power Input	2400	3000	3600	watts
Plate Power Output	1735	2335	2935	watts

*Approximate values

IF IT IS DESIRED TO OPERATE THIS TUBE UNDER CONDITIONS WIDELY DIFFERENT FROM THOSE GIVEN UNDER "TYPICAL OPERATION," POSSIBLY EXCEEDING THE MAXIMUM RATINGS GIVEN FOR CW SERVICE, WRITE EIMAC DIVISION OF VARIAN ASSOCIATES, FOR INFORMATION AND RECOMMENDATIONS

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APPLICATION

MECHANICAL

Mounting—The 1000T must be mounted vertically. The base may be either down or up. The leads to the plate and grid terminals should be flexible, and the tube must be protected from vibration and shock.

Cooling—The envelope and seals of the 1000T require forced-air cooling. Air-conduction pipes are provided in the base of the tube and in the HR-9 plate and grid Heat-Dissipating Connectors. Two cubic feet of air per minute supplied to each of these pipes will satisfy the cooling requirements of the seals. An 8- or 10-inch fan located approximately a foot from the tube will provide sufficient cooling air for the envelope. Air must be supplied to the tube when plate and grid voltages are applied, and must be continued until these voltages are removed. In some cases, particularly in locations where the ambient temperature is high, or where the free circulation of air is impeded, cooling air must be supplied when filament voltage is applied, and continued for two or more minutes after all voltages are removed.

The temperature of the grid and plate seals must not be allowed to exceed 225°C. A convenient accessory for the measurements of these temperatures is "Tempilaq", a temperature-sensitive lacquer manufactured by the Tempil Corporation, 132 W. 22nd St., New York 11, N. Y.

ELECTRICAL

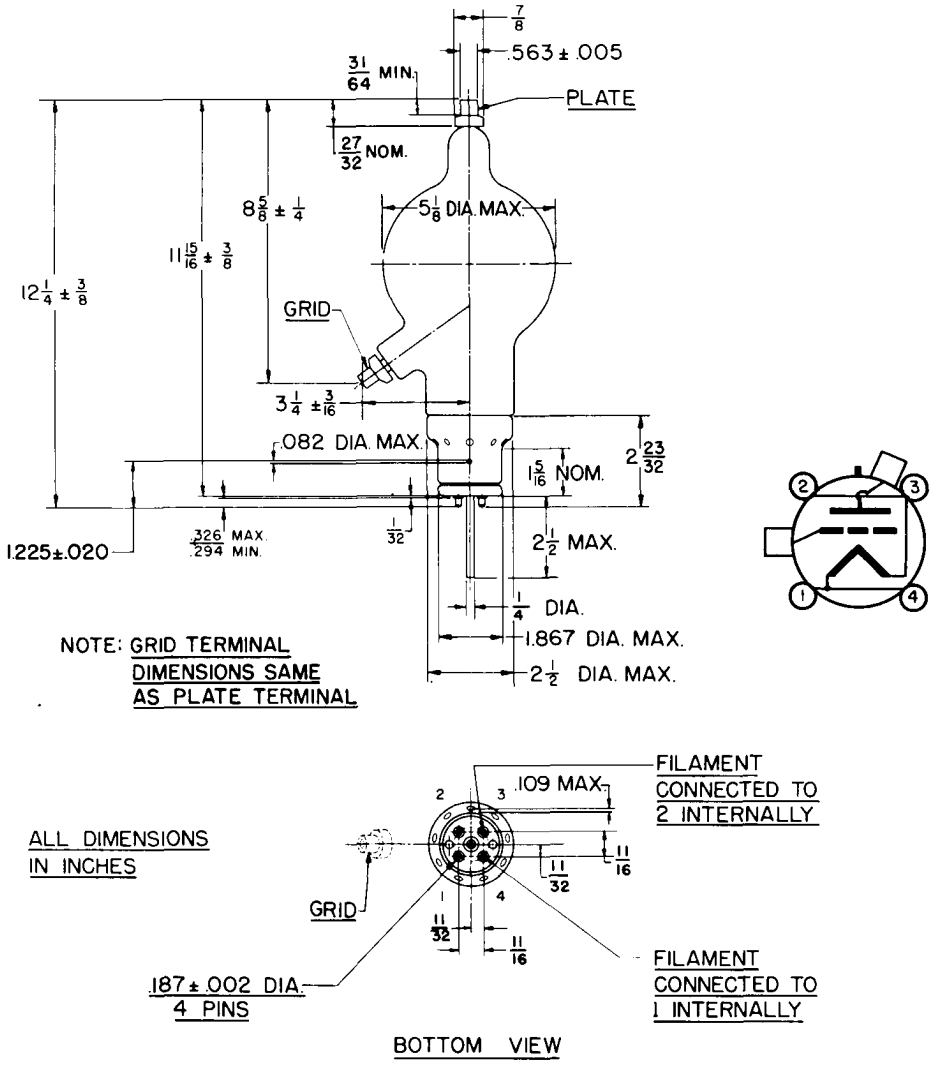
Filament—All four socket terminals should be used, putting two in parallel for each filament connection.

Bias Voltage—The maximum limit on bias voltages which may be used with the 1000T is considerably above those listed in "Typical Operation." Where bias is obtained by a grid leak, suitable protective means must be provided to prevent excessive plate dissipation in the event of loss of excitation.

Plate Voltage—The rated maximum d-c plate voltage of 7500 volts applies at frequencies up to 50 Mc. Above that frequency the tube must be operated at lower d-c voltages. In most cases there is little advantage in using plate supply voltages higher than those given under "Typical Operation" for the power output desired.

Grid Dissipation—Grid dissipation may be assumed to be the product of the d-c grid current and the peak positive cathode-to-grid voltage. This assumption is sufficiently accurate for the purpose of determining that the 1000T is operating within its maximum rated grid dissipation of 80 watts.

Plate Dissipation—Under normal operating conditions, the power dissipated by the plate of the 1000T should not be allowed to exceed 1000 watts. Plate dissipation in excess of the maximum rating is permissible for short periods of time, such as during tuning procedures.



DRIVING POWER vs. POWER OUTPUT

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The three charts on this page show the relationship of plate efficiency, power output and grid driving power at plate voltages of 4000, 5000 and 6000 volts. These charts show combined grid and bias losses only. The driving power and power output figures do not include circuit losses. The plate dissipation in watts is indicated by P_p.

Points A, B, and C are identical to the typical Class C operating conditions shown on the first page under 4000, 5000, and 6000 volts respectively.

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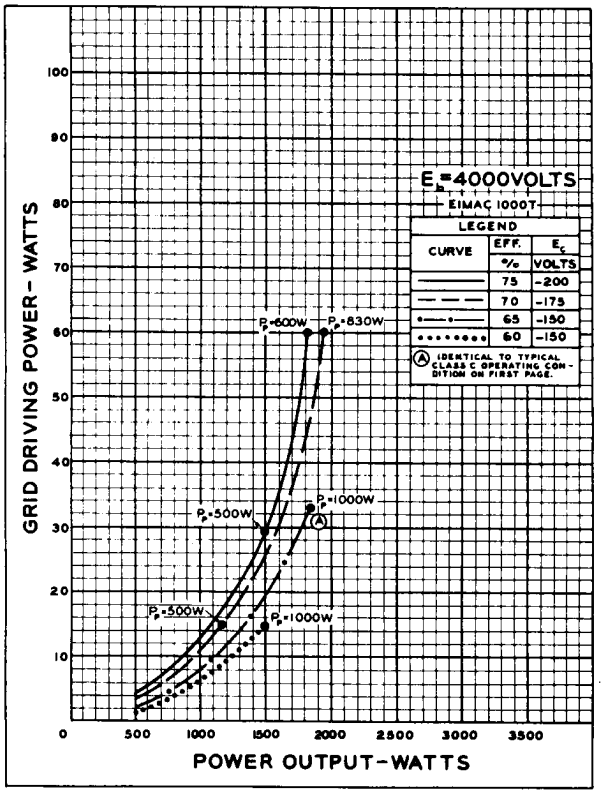

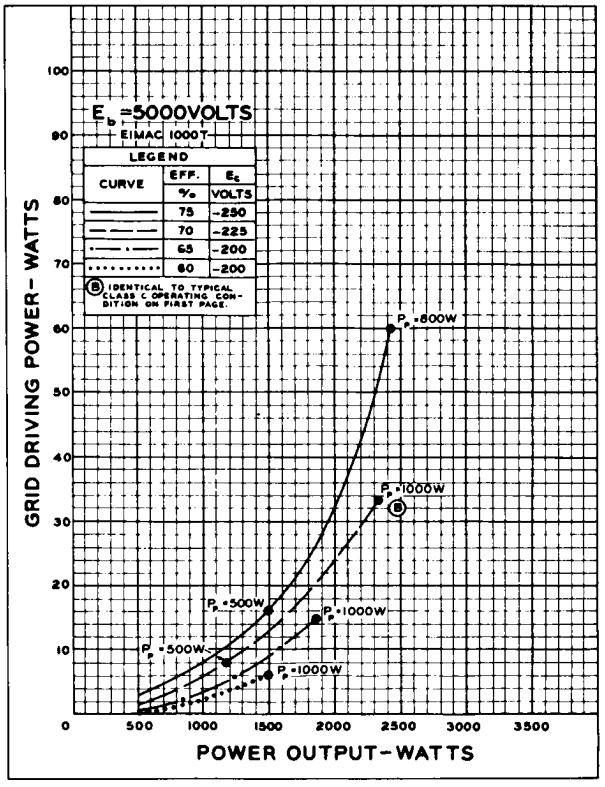

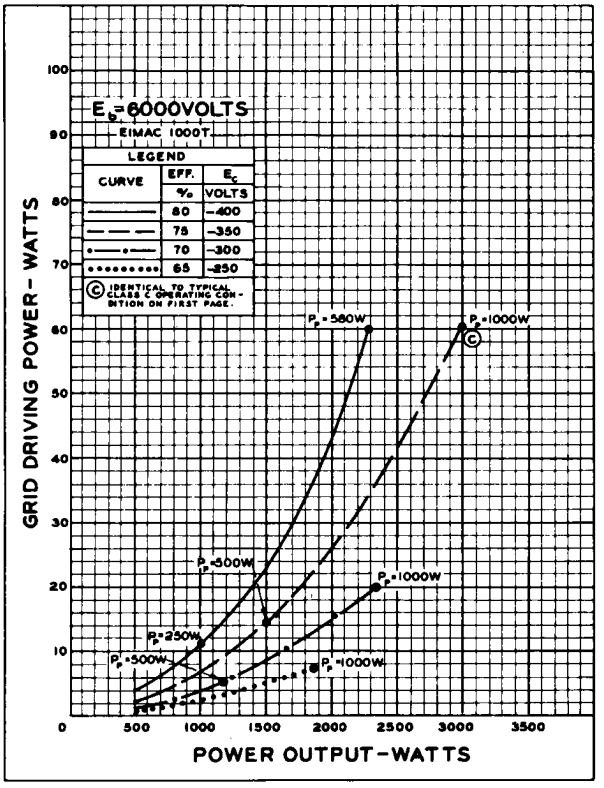

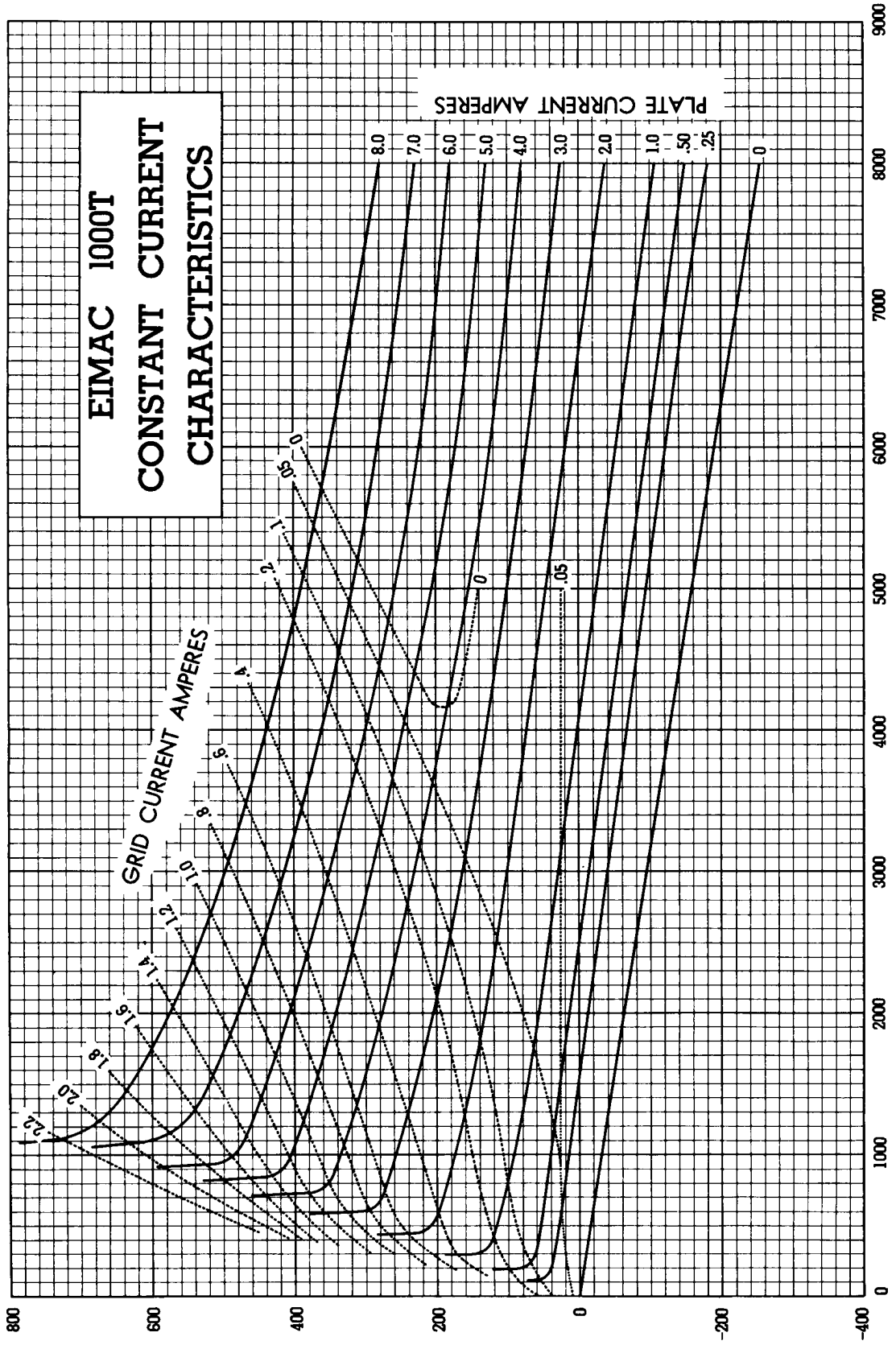

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