

RADIO FREQUENCY POWER AMPLIFIER AND OSCILLATOR

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

MAXIMUM RATINGS

D-C PLATE VOLTAGE	- - - -	6000 MAX. VOLTS
D-C PLATE CURRENT	- - - -	600 MAX. MA.
PLATE DISSIPATION	- - - -	450 MAX. WATTS
GRID DISSIPATION	- - - -	80 MAX. WATTS

TYPICAL OPERATION, PER TUBE*

D-C Plate Voltage	- - - -	3000	4000	5000	Volts
D-C Grid Voltage	- - - -	-175	-200	-300	Volts
D-C Plate Current	- - - -	500	450	450	Ma.
D-C Grid Current	- - - -	95	85	90	Ma.
Peak R-F Grid Input Voltage	- - - -	400	410	570	Volts
Driving Power (approx.)	- - - -	35	35	46	Watts
Grid Dissipation	- - - -	21	18	24	Watts
Plate Power Input	- - - -	1500	1800	2250	Watts
Plate Dissipation	- - - -	450	450	450	Watts
Plate Power Output	- - - -	1050	1350	1800	Watts

*The figures show actual measured tube performance and do not allow for circuit losses.

APPLICATION

MECHANICAL

Mounting—The 450TH must be mounted vertically, base up or base down. Flexible connecting straps should be provided from the grid and plate terminals to the external grid and plate circuits. The tube must be protected from severe vibration and shock.

Cooling—Provision should be made for ample circulation of air around the 450TH. In the event that the design of the equipment restricts natural circulation, the use of a small fan or centrifugal blower to provide additional cooling for the tube will aid in obtaining maximum tube life. Special heat-dissipating connectors (Eimac HR-8) are available for use on the plate and grid terminals. These connectors help to prolong tube life by reducing the temperature of the seals.

ELECTRICAL

Filament Voltage—For maximum tube life the filament voltage, as measured directly at the filament pins, should be the rated value of 7.5 volts. Unavoidable variations in filament voltage must be kept within the range from 7.03 to 7.88 volts. All four socket terminals should be used, putting two in parallel for each filament connection.

Bias Voltage—Although there is no maximum limit on the bias voltage which may be used on the 450TH, there is little advantage in using bias voltages in excess of those given under "Typical Operation," except in certain very specialized applications. 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.

Grid Dissipation—The power dissipated by the grid of the

450TH must not exceed 80 watts. Grid dissipation may be calculated from the following expression:

$$P_g = e_{cgm} I_c$$

where P_g = Grid dissipation,

e_{cgm} = Peak positive grid voltage, and

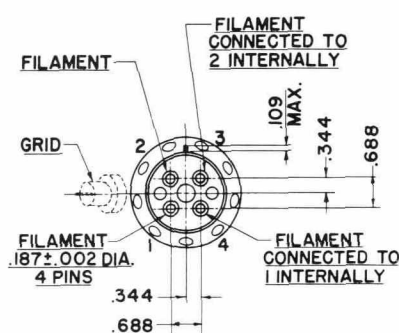
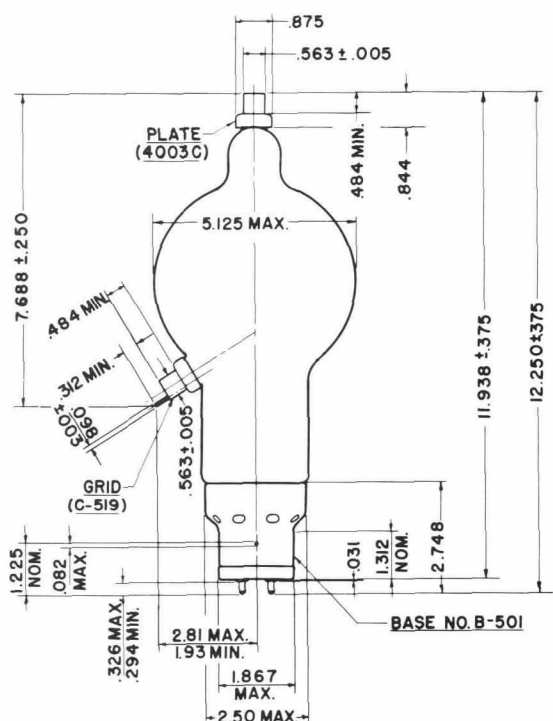
I_c = D-c grid current.

e_{cgm} may be measured by means of a suitable peak voltmeter connected between filament and grid.¹ In equipment in which the plate loading varies widely, such as oscillators used for radio-frequency heating, care should be taken to make certain that the grid dissipation does not exceed the maximum rating under any conditions of loading.

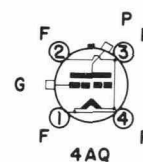
Plate Voltage—Except in very special applications, the plate supply voltage for the 450TH should not exceed 6000 volts. In most cases there is little advantage in using plate-supply voltages higher than those given under "Typical Operation" for the power output desired.

Plate Dissipation—Under normal operating conditions, the power dissipated by the plate of the 450TH should not be allowed to exceed 450 watts. At this dissipation the brightness temperature of the plate will appear a visible red color. The value of this color is somewhat effected by light from the filament as well as from external sources. Plate dissipation in excess of the maximum rating is permissible for short periods of time, such as during tuning procedures.

¹For suitable peak v.t.v.m. circuits see, for instance, "Vacuum Tube Ratings," Eimac News, January, 1945. This article is available in reprint form on request.



BOTTOM VIEW

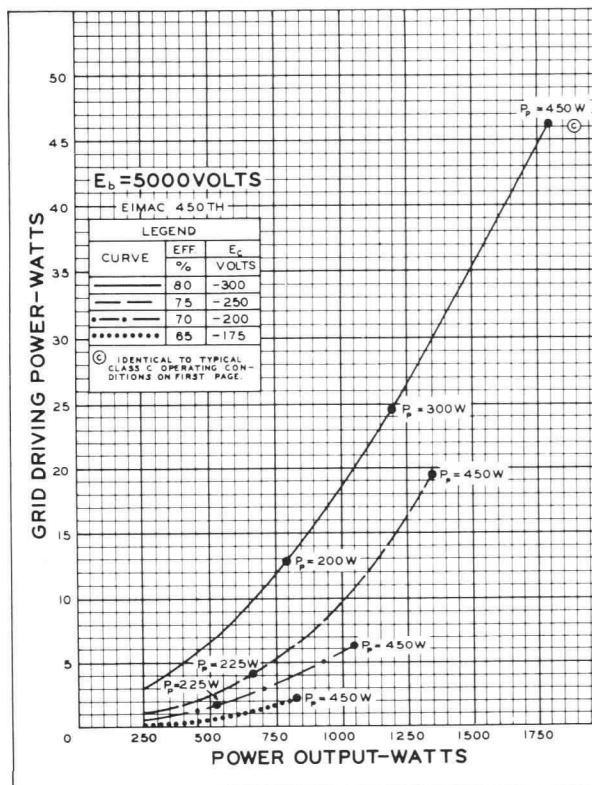
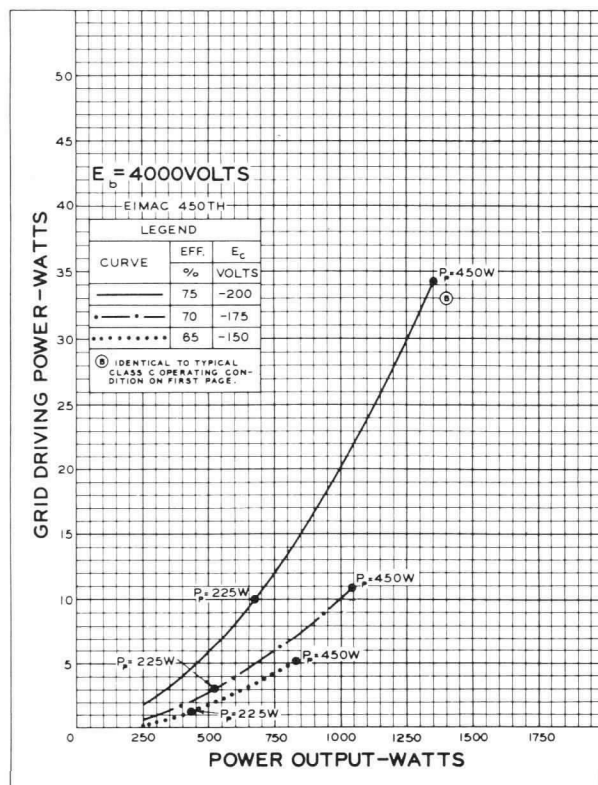
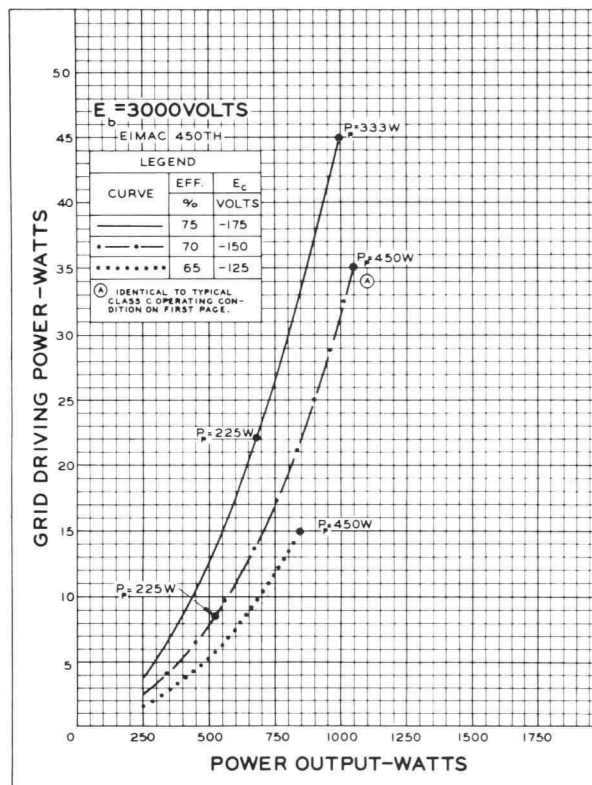


NOTE:—The grid terminal on the new 450TH and TL type tube is now .563" in diameter. To accommodate existing equipment which uses the 450TH or TL tubes with the old style .098" grid terminal, an adapter pin is provided. This adapter pin, if not needed, may be removed by unscrewing.

DRIVING POWER vs. POWER OUTPUT

The three charts on this page show the relationship of plate efficiency, power output and grid driving power at plate voltages of 3000, 4000, and 5000 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 3000, 4000, and 5000 volts respectively.





450TH

**EIMAC 450TH
TYPICAL
CONSTANT CURRENT
CHARACTERISTICS**

— PLATE CURRENT — AMPERES
- - - GRID CURRENT — AMPERES

