

EITEL-McCULLOUGH, INC.

SAN BRUNO, CALIFORNIA

750TL

MEDIUM-MU TRIODE

MODULATOR
OSCILLATOR
AMPLIFIER

► The Eimac 750TL is a medium-mu power triode intended for use as an amplifier, oscillator, or modulator. It has a maximum plate dissipation rating of 750 watts and a maximum plate voltage rating of 10,000 volts at frequencies up to 40 Mc. The 750TL is cooled by air-circulation and radiation.

The 750TL in class-C r-f service will deliver up to 3000 watts plate power output with 125 watts driving power. Two 750TL's in class-AB₂ modulator service will deliver up to 3500 watts maximum-signal plate power output with 46 watts driving power.

GENERAL CHARACTERISTICS

ELECTRICAL

Filament: Thoriated Tungsten

Voltage - - - - - 7.5 volts

Current - - - - - 21.0 amperes

Amplification Factor (Average) - - - - - 15

Direct Interelectrode Capacitances (Average)

Grid-Plate - - - - - 5.8 μf

Grid-Filament - - - - - 8.5 μf

Plate-Filament - - - - - 1.2 μf

► Transconductance ($I_b = 250\text{ma.}$, $E_b = 5000\text{v.}$) - - - - - 3500 μmhos

► Highest Frequency for Maximum Ratings - - - - - 40 Mc

MECHANICAL

Base - - - - - Special 4-pin

Connections - - - - - See outline drawing

Socket - - - - - Johnson type No. 124-214 or equivalent

Mounting Position - - - - - Vertical, base down or up

Cooling - - - - - Air-circulation and radiation

Recommended Plate and Grid Heat Dissipating Connectors - - - - -

Maximum Overall Dimensions:

Length - - - - - 17.0 inches

Diameter - - - - - 7.13 inches

Net Weight (Average) - - - - - 2.9 pounds

Shipping Weight (Average) - - - - - 13 pounds



Eimac HR-8

AUDIO-FREQUENCY POWER AMPLIFIER OR MODULATOR

Class-AB₂ (Sinusoidal wave)

MAXIMUM RATINGS (Per tube)

D-C PLATE VOLTAGE - - - - - 10,000 MAX. VOLTS

D-C PLATE CURRENT - - - - - 1000 MAX. MA

PLATE DISSIPATION - - - - - 750 MAX. WATTS

GRID DISSIPATION - - - - - 100 MAX. WATTS

TYPICAL OPERATION (Two tubes unless otherwise specified)

D-C Plate Voltage - - - - - 4000 5000 6000 volts

D-C Grid Voltage¹ - - - - - -230 -320 -390 volts

Zero-Signal D-C Plate Current - - - - - 250 200 166 ma.

Max-Signal D-C Plate Current - - - - - 950 860 834 ma

Effective Load, Plate-to-Plate - - - - - 8270 12,300 16,300 ohms

Peak A-F Grid Voltage (per tube) - - - - - 490 560 650 volts

Max-Signal Driving Power* - - - - - 38 28 46 watts

Max-Signal Plate Power Input - - - - - 3800 4300 5000 watts

Max-Signal Plate Power Output - - - - - 2300 2800 3500 watts

¹Adjust to stated zero-signal plate current.

RADIO-FREQUENCY POWER AMPLIFIER OR OSCILLATOR

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

MAXIMUM RATINGS (Frequencies up to 40 Mc.)

D-C PLATE VOLTAGE - - - - - 10,000 MAX. VOLTS

D-C PLATE CURRENT - - - - - 1000 MAX. MA

PLATE DISSIPATION - - - - - 750 MAX. WATTS

GRID DISSIPATION - - - - - 100 MAX. WATTS

TYPICAL OPERATION (Frequencies up to 40 Mc.)

D-C Plate Voltage - - - - - 3000 4000 5000 6000 volts

D-C Grid Voltage - - - - - -350 -450 -550 -700 volts

D-C Plate Current - - - - - 713 625 600 625 ma

D-C Grid Current* - - - - - 120 90 90 105 ma

Peak R-F Grid Voltage - - - - - 805 885 985 1040 volts

Driving Power* - - - - - 97 83 86 125 watts

Grid Dissipation* - - - - - 55 40 38 50 watts

Plate Power Input - - - - - 2140 2500 3000 3750 watts

Plate Power Output - - - - - 1390 1750 2250 3000 watts

PLATE-MODULATED RADIO-FREQUENCY AMPLIFIER

CLASS-C TELEPHONY (Carrier conditions, per tube)

MAXIMUM RATINGS (Frequencies up to 40 Mc.)

D-C PLATE VOLTAGE - - - - - 8000 MAX. VOLTS

D-C PLATE CURRENT - - - - - 800 MAX. MA

PLATE DISSIPATION - - - - - 500 MAX. WATTS

GRID DISSIPATION - - - - - 100 MAX. WATTS

TYPICAL OPERATION (Frequencies up to 40 Mc.)

D-C Plate Voltage - - - - - 3000 4000 5000 6000 volts

D-C Grid Voltage - - - - - -500 -650 -800 -950 volts

D-C Plate Current - - - - - 415 400 400 415 ma

D-C Grid Current* - - - - - 55 60 55 60 ma

Peak R-F Grid Voltage - - - - - 830 985 1150 1330 volts

Driving Power* - - - - - 45 50 60 75 watts

Grid Dissipation* - - - - - 15 15 16 20 watts

Plate Power Input - - - - - 1250 1600 2000 2500 watts

Plate Power Output - - - - - 750 1100 1500 2000 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 EITEL-McCULLOUGH, INC., FOR INFORMATION AND RECOMMENDATIONS.

APPLICATION

MECHANICAL

Mounting—The 750TL must be mounted vertically, base down or up. The plate and grid leads should be flexible. The tube must be protected from vibration and shock.

Cooling—Heat Dissipating Connectors (Eimac HR-8 or equivalent) must be used at the plate and grid terminals of the 750TL. Unobstructed circulation of air around the tube is required in sufficient quantity to prevent the seal temperatures from exceeding 225°C. Forced ventilation of compartments or equipment in which the tube is located is usually desirable. Forced movement of air across the tube seals and envelope is always beneficial, though not necessarily required.

Tube temperatures may be measured with the aid of "Tempilaq", a temperature-sensitive lacquer manufactured by the Tempil Corporation, 132 West 22nd Street, New York 11, N. Y.

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. Variations should be kept within the range of 7.5 to 7.85 volts. All four socket terminals should be used, placing two in parallel for each filament connection.

Bias Voltage—Although there is no maximum limit placed on the bias voltage which may be used with the 750TL, there is little advantage in using bias voltages in

excess of those given under "Typical Operation", except in certain very specialized applications.

When grid-leak bias is used, suitable protective means must be provided to prevent excessive plate dissipation in the event of loss of excitation, and the grid-leak resistor should be made adjustable to facilitate maintaining the bias voltage and plate current at the desired value from tube to tube.

Grid Dissipation—Grid dissipation may be calculated from the following expression:

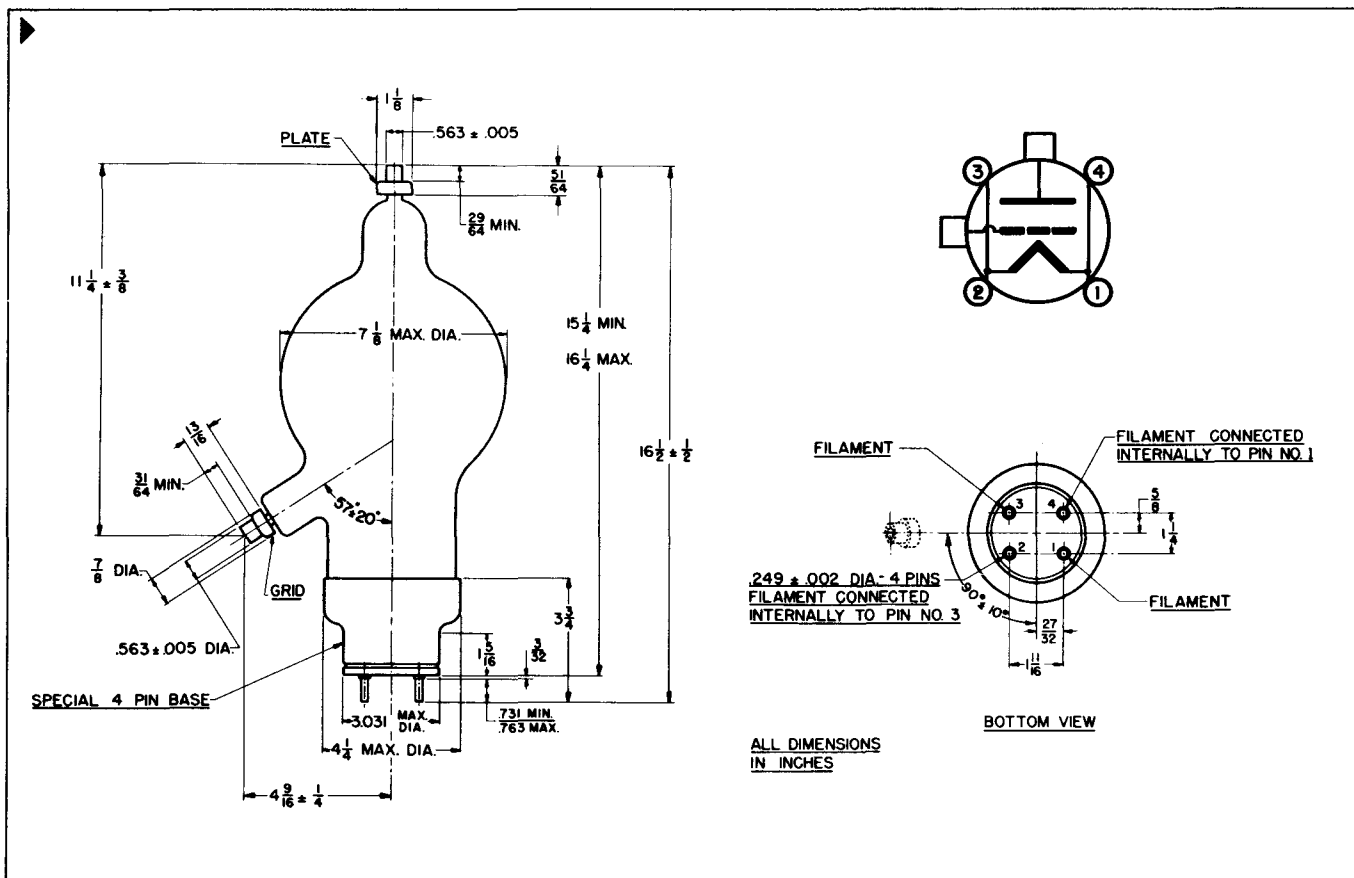
$$P_g = e_{cmp} I_c$$

where: P_g = Grid dissipation,
 e_{cmp} = Peak positive grid voltage, and
 I_c = D-C grid current.

e_{cmp} 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 of 100 watts under any conditions of loading.

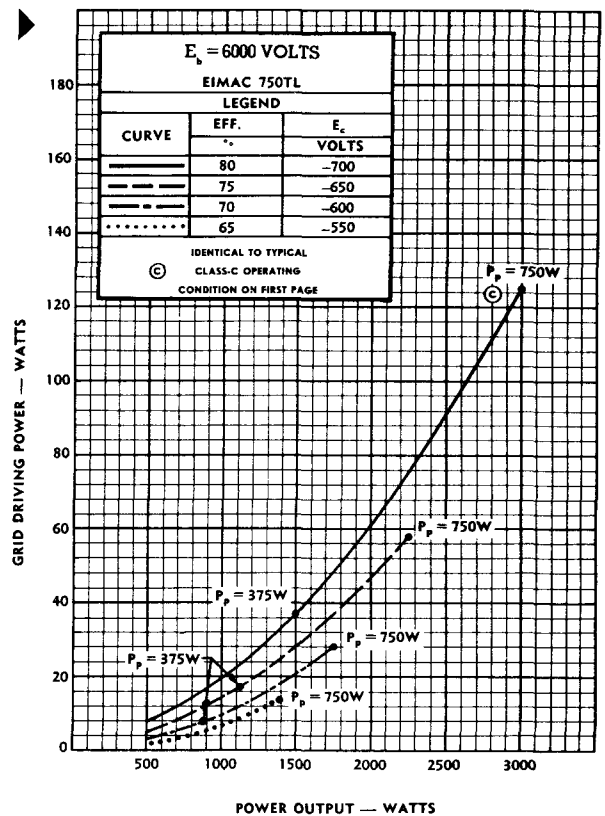
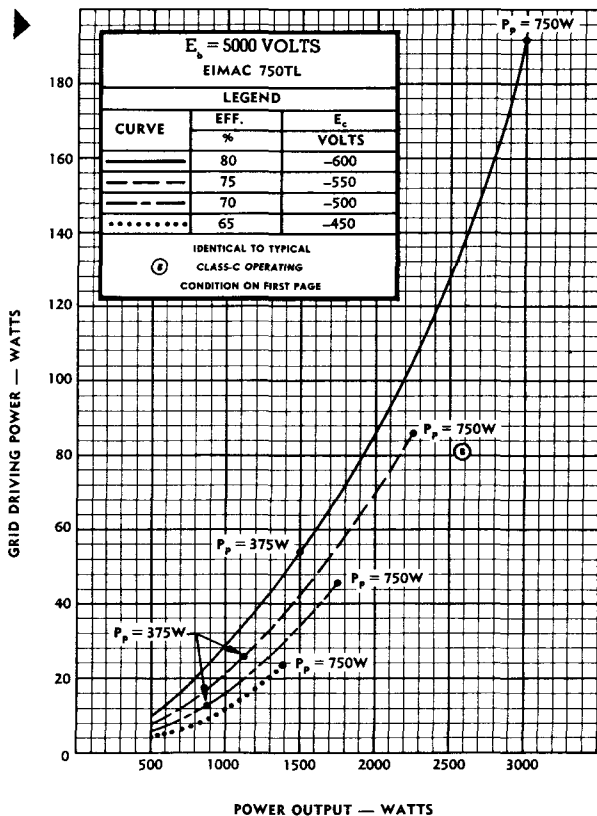
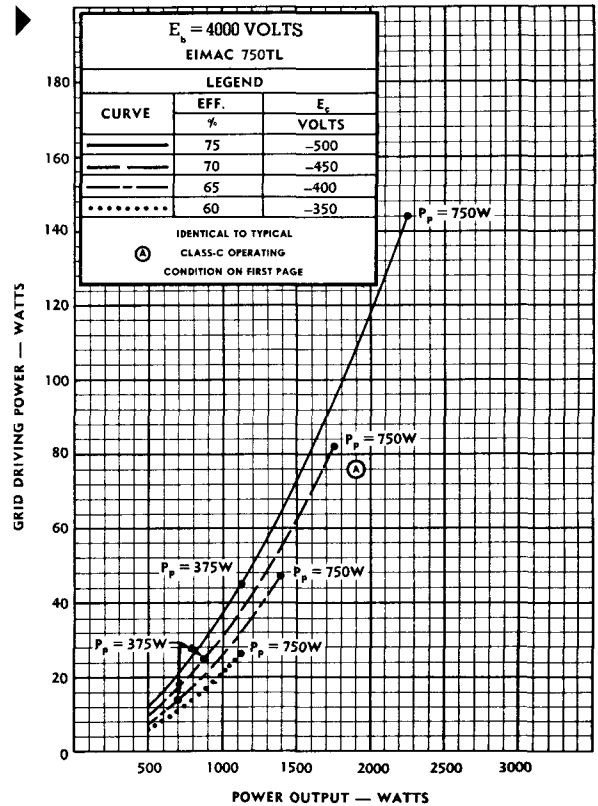
Plate Dissipation—Under normal operating conditions, the plate dissipation of the 750TL should not be allowed to exceed the maximum rating. Plate dissipation in excess of the maximum rating is permissible for short periods of time, such as during tuning procedures.

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.



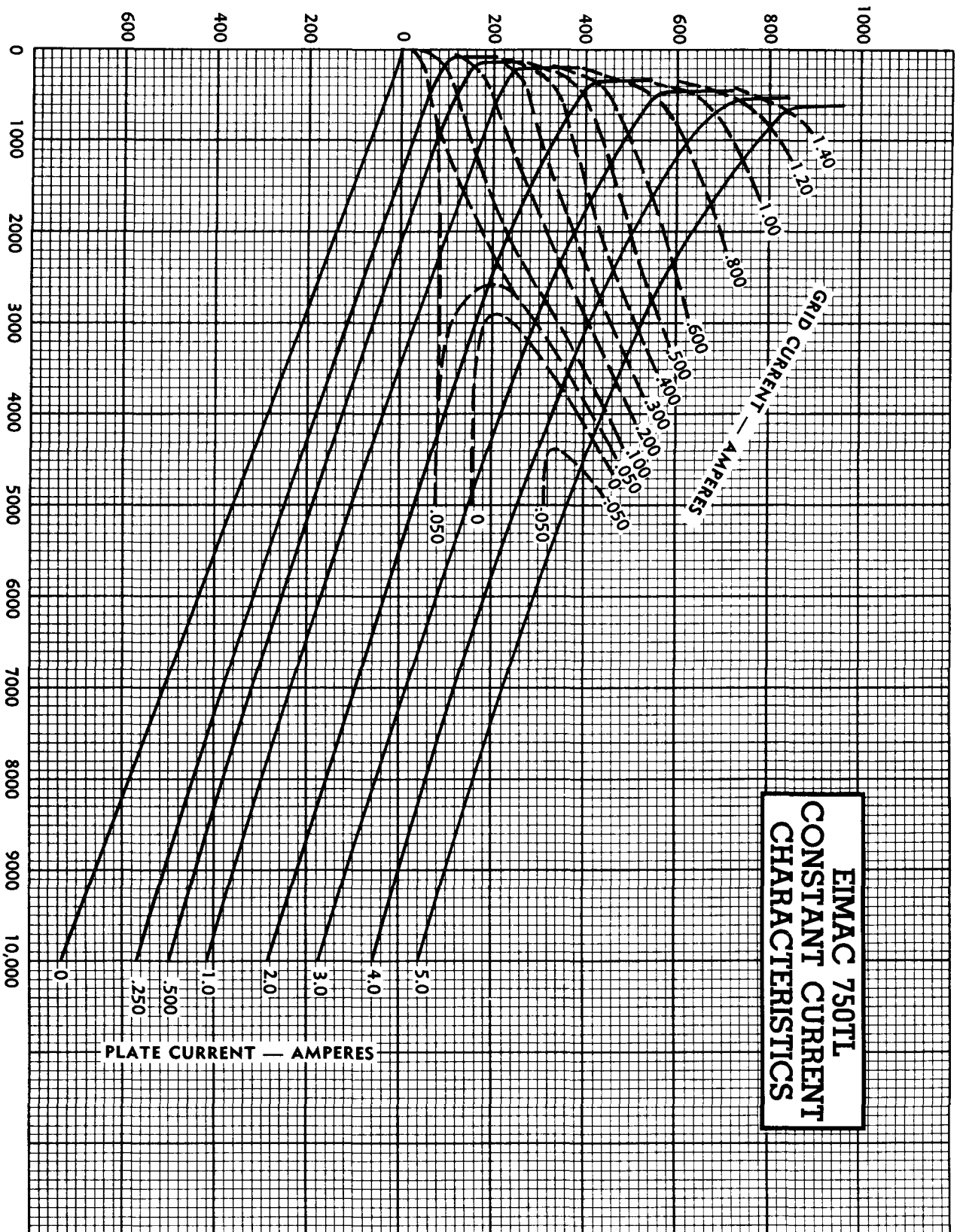
DRIVING POWER vs. POWER OUTPUT

The three charts on this page show the relationship of plate efficiency, power output and approximate 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.



GRID VOLTAGE - VOLTS

PLATE VOLTAGE - VOLTS



**EIMAC 750TL
 CONSTANT CURRENT
 CHARACTERISTICS**