EITEL-McCULLOUGH, INC.
SAN BRUNO, CALIFORNIA

7 5 T H

MEDIUM-MU TRIODE
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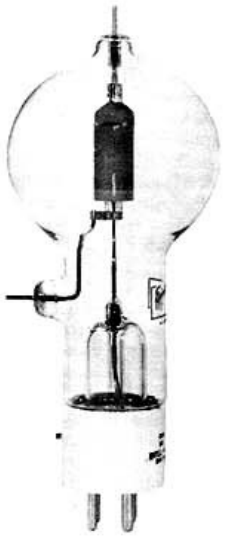
MODULATOR
OSCILLATOR
AMPLIFIER



▶ The Eimac 75TH is a medium-mu power triode intended for use as an amplifier, oscillator, or modulator. It has a maximum plate dissipation rating of 75 watts and a maximum plate voltage rating of 3000 volts at frequencies up to 40 Mc. Forced-air cooling is not required in properly designed equipment operating at frequencies below 40 Mc.

The 75TH in Class-C R-F service will deliver up to 225 watts plate power output with 10 watts driving power. Two 75TH's in Class-B modulator service will deliver up to 300 watts maximum-signal plate power output with 3 watts driving power.

GENERAL CHARACTERISTICS

ELECTRICAL

Filament: Thoriated Tungsten	
Voltage	5.0 volts
Current	6.25 amperes
Amplification Factor (Average)	20
Direct Interelectrode Capacitances (Average)	
Grid-Plate	2.3 $\mu\mu f$
Grid-Filament	2.7 $\mu\mu f$
Plate-Filament	0.3 $\mu\mu f$
Transconductance (I_b=225 ma., E_b=3000 v.)	4150 μmhos
▶ Highest Frequency for Maximum Ratings	40 Mc

▶ MECHANICAL

Base	Medium 4-pin bayonet
Basing	See outline drawing
Socket	Johnson type No. 122-224, National type No. XC-4 or CIR-4, or equivalent
Mounting Position	Vertical, base down or up
Cooling	Convection and radiation
Maximum Temperature of Plate and Grid Seals	225°C
Recommended Heat Dissipating Connectors:	
Plate	Eimac HR-3
Grid	Eimac HR-2
Maximum Overall Dimensions:	
Length	7.25 inches
Diameter	2.81 inches
Net Weight	3 ounces
Shipping Weight (Average)	1.5 pounds

RADIO FREQUENCY POWER AMPLIFIER AND OSCILLATOR

Class-C Telegraphy (Key-down conditions, 1 tube)

MAXIMUM RATINGS (Frequencies up to 40 Mc.)

D-C PLATE VOLTAGE	3000 MAX. VOLTS
D-C PLATE CURRENT	225 MAX. MA.
PLATE DISSIPATION	75 MAX. WATTS
GRID DISSIPATION	16 MAX. WATTS

TYPICAL OPERATION (Frequencies up to 40 Mc.)

D-C Plate Voltage	1000	1500	2000	volts
D-C Grid Voltage	—80	—125	—200	volts
D-C Plate Current	215	167	150	ma.
▶ D-C Grid Current (approx.)	35	23	32	ma.
▶ Peak R-F Grid Input Voltage (approx.)	270	280	350	volts
Driving Power (approx.)	9	6	10	watts
Plate Power Input	215	250	300	watts
Plate Dissipation	75	75	75	watts
Plate Power Output	140	175	225	watts

▶ PLATE MODULATED RADIO FREQUENCY AMPLIFIER

Class-C Telephony (Carrier conditions, per tube)

MAXIMUM RATINGS (Frequencies up to 40 Mc.)

D-C PLATE VOLTAGE	2400 MAX. VOLTS
D-C PLATE CURRENT	180 MAX. MA.
PLATE DISSIPATION	50 MAX. WATTS
GRID DISSIPATION	16 MAX. WATTS

TYPICAL OPERATION (Frequencies up to 40 Mc.)

D-C Plate Voltage	1000	1500	2000	volts
D-C Grid Voltage	—150	—200	—300	volts
D-C Plate Current	135	115	110	ma.
D-C Grid Current (approx.)	20	14	15	ma.
Peak R-F Grid Input Voltage (approx.)	300	330	440	volts
Driving Power (approx.)	6	5	6	watts
Grid Dissipation	3	2	2	watts
Plate Power Input	135	175	220	watts
Plate Dissipation	50	50	50	watts
Plate Power Output	85	125	170	watts

AUDIO FREQUENCY POWER AMPLIFIER AND MODULATOR

Class-B

MAXIMUM RATINGS (Per tube)

D-C PLATE VOLTAGE	3000 MAX. VOLTS
MAX-SIGNAL D-C PLATE CURRENT	225 MAX. MA.
PLATE DISSIPATION	75 MAX. WATTS
GRID DISSIPATION	16 MAX. WATTS

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

D-C Plate Voltage	1000	1500	2000	volts
▶ D-C Grid Voltage (approx.)[1]	—30	—60	—90	volts
Zero-Signal D-C Plate Current	90	67	50	ma.
Max-Signal D-C Plate Current	350	267	225	ma.
Effective Load, Plate-to-Plate	5300	11,400	19,300	ohms
Peak A-F Grid Input Voltage (per tube)	175	165	175	volts
Max-Signal Driving Power (approx.)	7	4	3	watts
Max-Signal Plate Dissipation (per tube)	75	75	75	watts
Max-Signal Plate Power Output	200	250	300	watts
▶ Total Harmonic Distortion	1.5	2.0	2.0	per cent

[1]Adjust to give stated zero-signal plate current.

IF IT IS DESIRED TO OPERATE THIS TUBE UNDER CONDITIONS WIDELY DIFFERENT FROM THOSE GIVEN UNDER "TYPICAL OPERATION", POSSIBLY EXCEEDING MAXIMUM RATINGS, WRITE EITEL-McCULLOUGH, INC., FOR INFORMATION AND RECOMMENDATIONS.

▶ Indicates change from sheet dated 7-1-44.

APPLICATION

MECHANICAL

Mounting—The 75TH 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-3 and HR-2) should be used at the plate and grid terminals of the 75TH. If the free circulation of air around the tube is restricted, a small fan or centrifugal blower should be used to provide additional cooling for the plate and grid seals.

Cooling requirements will be met if the temperature of the plate and grid seals is not allowed to exceed 225°C. One method of measuring these temperatures is provided by the use of "Tempilaq", a temperature-sensitive lacquer available from the Tempil Corporation, New York 11, N.Y.

ELECTRICAL

Filament Voltage—For maximum tube life the filament voltage, as measured directly at the base pins, should be the rated value of 5.0 volts. Variations must be kept within the range of 4.75 to 5.25 volts.

Bias Voltage—Although there is no maximum limit on the bias voltage which may be used on the 75TH, 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.

Plate Voltage—The plate-supply voltage for the 75TH should not exceed 3000 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.

Grid Dissipation—The power dissipated by the grid of the 75TH must not exceed 16 watts. 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 under any condition of loading.

Plate Dissipation— The plate of the 75TH operates at a visibly red temperature at its maximum rated dissipation of 75 watts. Plate dissipation in excess of the maximum rating is permissible only for short periods of time, such as during tuning procedures.

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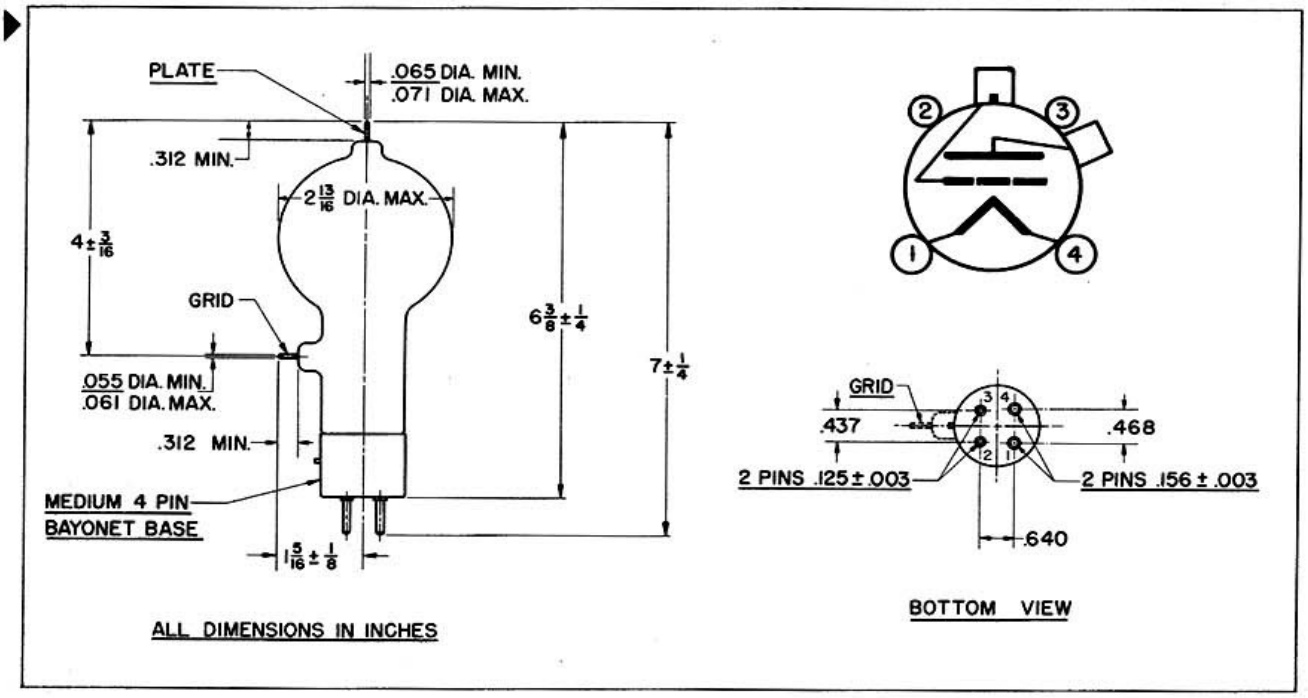
[1] For suitable peak v.t.v.m. circuits see, for instance, "Vacuum Tube Ratings", Eimac News, January, 1945. This article is available in reprint form on request.



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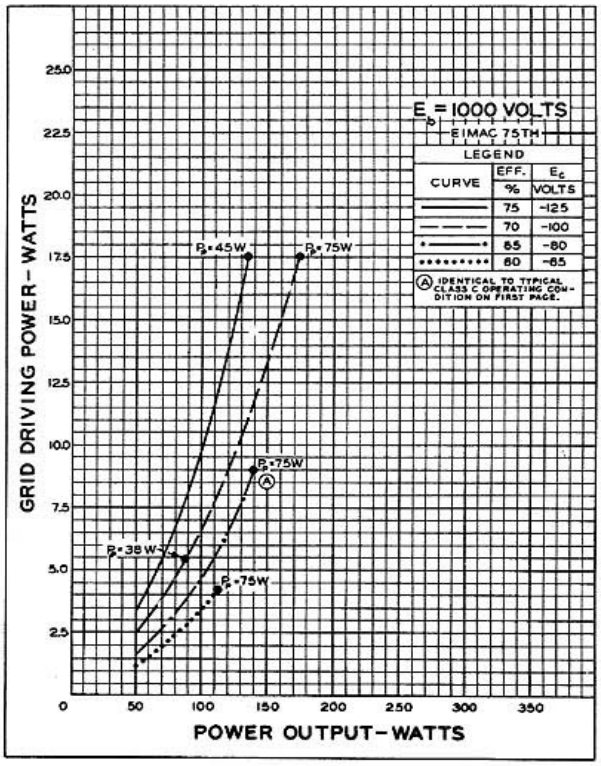
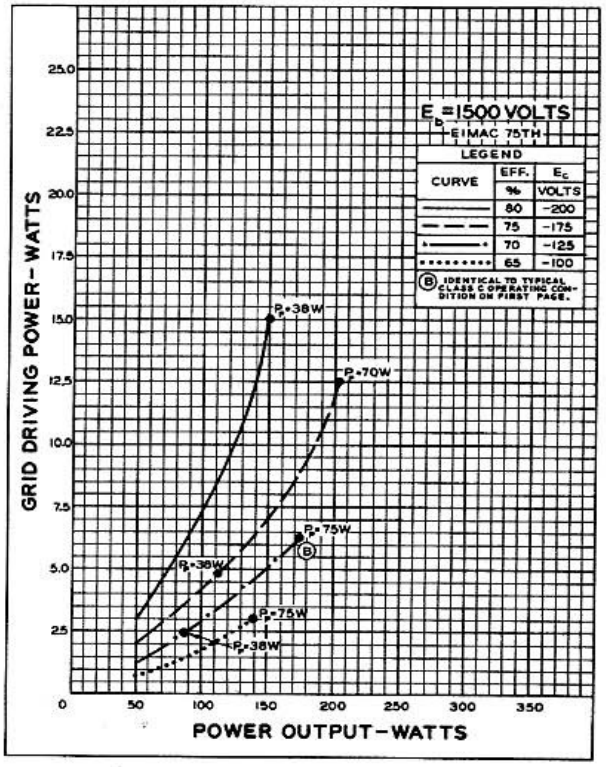
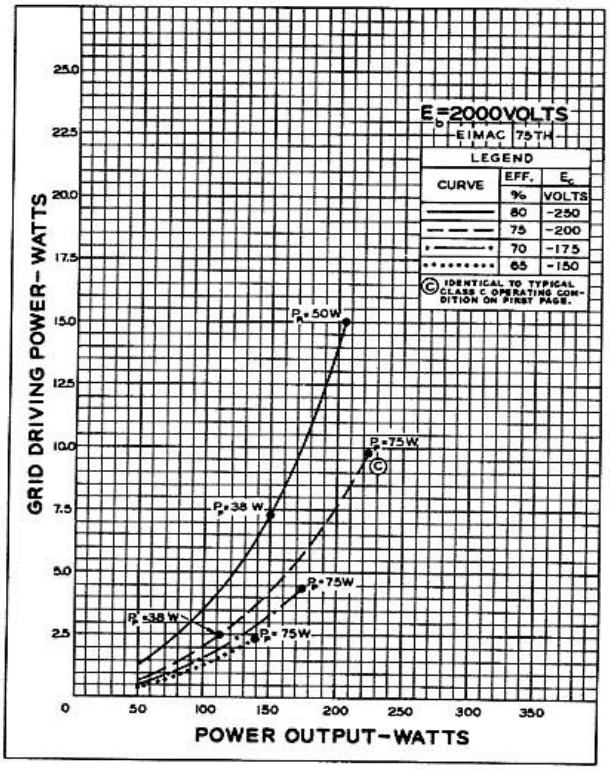
DRIVING POWER vs. POWER OUTPUT

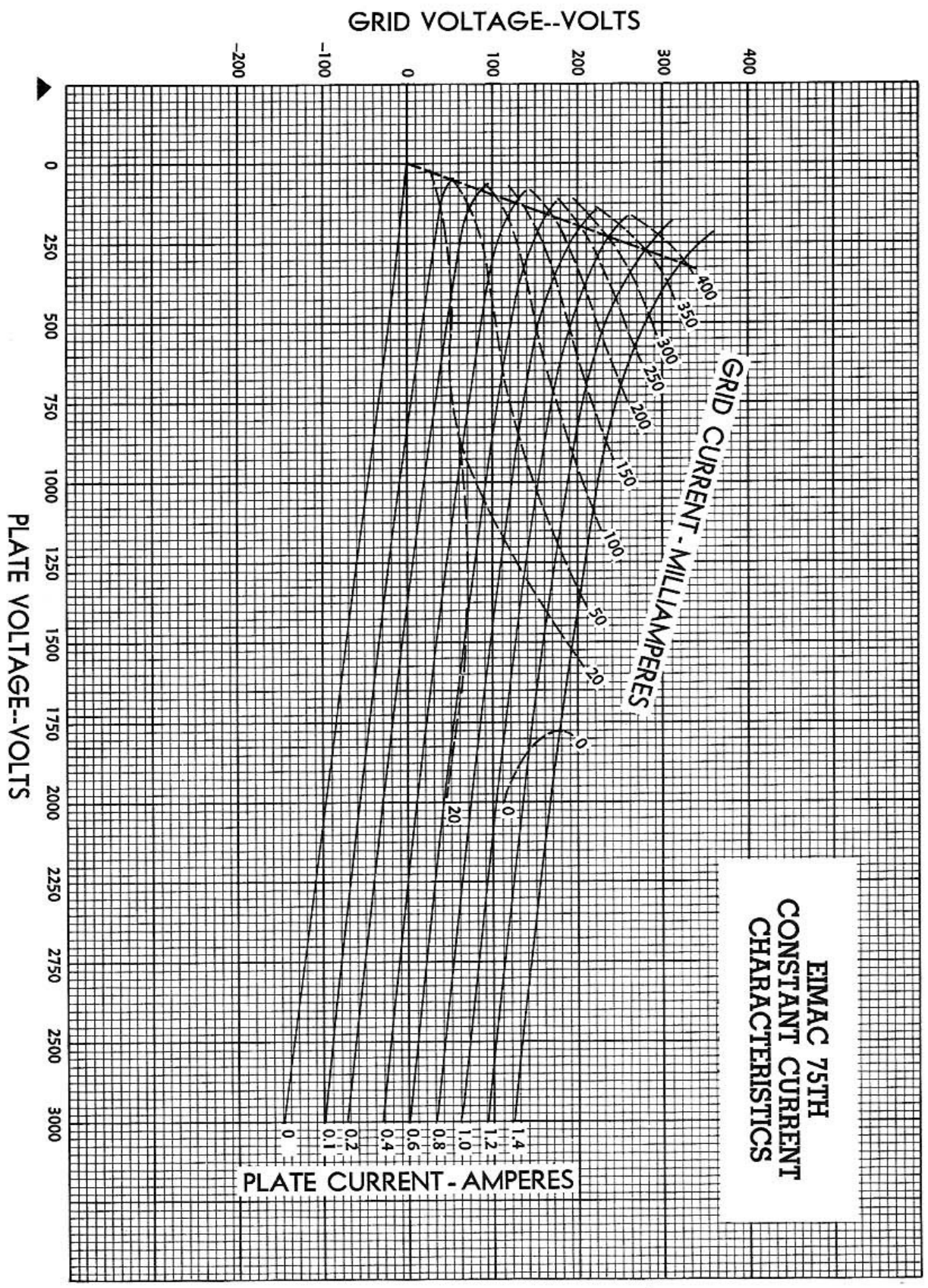
The three charts on this page show the relationship of plate efficiency, power output and grid driving power at plate voltages of 1000, 1500 and 2000 volts. These charts show combined grid and bias losses only. The driving power and power output figures do not include circuit losses. The plate dissipation 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 1000, 1500, and 2000 volts respectively.









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