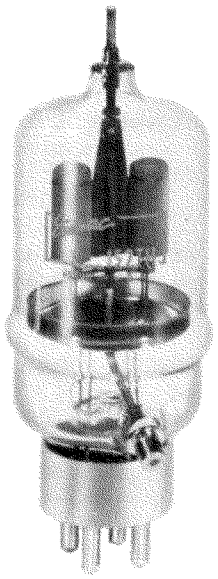
EITEL-McCULLOUGH, INC.
SAN BRUNO, CALIFORNIA

152TH

MEDIUM-MU TRIODE
•
MODULATOR
OSCILLATOR
AMPLIFIER



▶ The Eimac 152TH is a medium-mu power triode intended for use as an amplifier, oscillator or modulator. It has a maximum plate-dissipation rating of 150 watts and a maximum plate-voltage rating of 3000 volts at frequencies up to 40 Mc.

The 152TH in class-C r-f service will deliver up to 600 watts plate power output with 27 watts driving power. Two 152TH's in class-B modulator service will deliver up to 600 watts maximum-signal plate power output with 8 watts nominal driving power.

GENERAL CHARACTERISTICS

ELECTRICAL

Filament: Thoriated Tungsten	
Voltage	5.0 or 10.0 volts
Current	12.5 or 6.25 amperes
Amplification Factor (Average)	20
Direct Interelectrode Capacitances (Average)	
Grid-Plate	4.8 μμfd
Grid-Filament	5.7 μμfd
▶ Plate-Filament	0.4 μμfd
Transconductance (I_b=500 ma., E_b=3000 v.)	8300 μmhos
Highest Frequency for Maximum Ratings	40 Mc

▶MECHANICAL

Base	Special 4-pin
Basing	See outline drawing
Socket	Johnson type No. 124-213 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-5
Grid	Eimac HR-6
Maximum Over-all Dimensions:	
Length	7.63 inches
Diameter	2.57 inches
Net Weight	8 ounces
Shipping Weight	1.25 pounds

RADIO-FREQUENCY POWER AMPLIFIER OR OSCILLATOR

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

MAXIMUM RATINGS (Frequencies up to 40 Mc.)

D-C PLATE VOLTAGE	3000 MAX. VOLTS
D-C PLATE CURRENT	450 MAX. MA
PLATE DISSIPATION	150 MAX. WATTS
GRID DISSIPATION	30 MAX. WATTS

TYPICAL OPERATION (Frequencies up to 40 Mc.)

D-C Plate Voltage	1500	2000	3000	volts
D-C Grid Voltage	−125	−200	−300	volts
D-C Plate Current	335	300	250	ma
D-C Grid Current*	58	75	70	ma
Peak R-F Grid Voltage	265	335	410	volts
Driving Power*	13	20	27	watts
Plate Power Input	500	600	750	watts
Plate Dissipation	150	150	150	watts
Plate Power Output	350	450	600	watts

▶PLATE-MODULATED RADIO-FREQUENCY AMPLIFIER

Class-C Telephony (Carrier conditions, per tube)

MAXIMUM RATINGS (Frequencies up to 40 Mc.)

D-C PLATE VOLTAGE	2500 MAX. VOLTS
D-C PLATE CURRENT	350 MAX. MA
PLATE DISSIPATION	100 MAX. WATTS
GRID DISSIPATION	30 MAX. WATTS

TYPICAL OPERATION (Frequencies up to 40 Mc.)

D-C Plate Voltage	1000	1500	2000	2500	volts
D-C Grid Voltage	−150	−200	−300	−350	volts
D-C Plate Current	270	235	220	200	ma
D-C Grid Current*	40	28	30	30	ma
Peak R-F Grid Voltage	300	330	440	485	volts
Driving Power*	12	10	12	15	watts
Grid Dissipation*	6	4	4	4	watts
Plate Power Input	270	350	440	500	watts
Plate Dissipation	100	100	100	100	watts
Plate Power Output	170	250	340	400	watts

▶AUDIO-FREQUENCY POWER AMPLIFIER OR MODULATOR

Class-B

MAXIMUM RATINGS (Per tube)

D-C PLATE VOLTAGE	3000 MAX. VOLTS
D-C PLATE CURRENT	450 MAX. MA
PLATE DISSIPATION	150 MAX. WATTS

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

D-C Plate Voltage	1500	2000	2500	volts
D-C Grid Voltage[1]	−65	−95	−125	volts
Zero-Signal D-C Plate Current	65	50	40	ma
Max-Signal D-C Plate Current	515	405	340	ma
Effective Load, Plate-to-Plate	6000	11,000	17,000	ohms
Peak A-F Grid Voltage (per tube)	165	175	195	volts
Max-Signal Peak Driving Power*	25	17	16	watts
Max-Signal Nominal Driving Power*	13	9	8	watts
Max-Signal Plate Power Input	775	810	850	watts
Max-Signal Plate Power Output	500	550	600	watts

*Approximate values.
[1]Adjust to give stated Zero-Signal D-C Plate Current.

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.

▶ Indicates change from sheet dated 6-1-44.

▶ APPLICATION

MECHANICAL

Mounting—The 152TH must be mounted vertically, base down or up. The plate and grid leads should be flexible, and the tube must be protected from vibration and shock.

Cooling—Heat Dissipating Connectors (Eimac HR-5 and HR-6 or equivalent) must be used at the plate and grid terminals of the 152TH. Forced-air cooling is not required in properly designed equipment operating at frequencies below 40 Mc. If the free circulation of air around the tube is restricted, a small fan or centrifugal blower should be used to provide additional cooling.

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

ELECTRICAL

Filament Voltage—The filaments of the 152TH may be operated either at 10.0 volts when connected in series or at 5.0 volts when connected in parallel (see basing diagram). For maximum tube life the filament voltage should be maintained at the rated value. Variations must not be allowed to exceed ± 5%.

Bias Voltage—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—The power dissipated by the grid of the 152TH must not exceed 30 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-reading 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 plates of the 152TH operate at a visibly red color at the maximum rated dissipation of 150 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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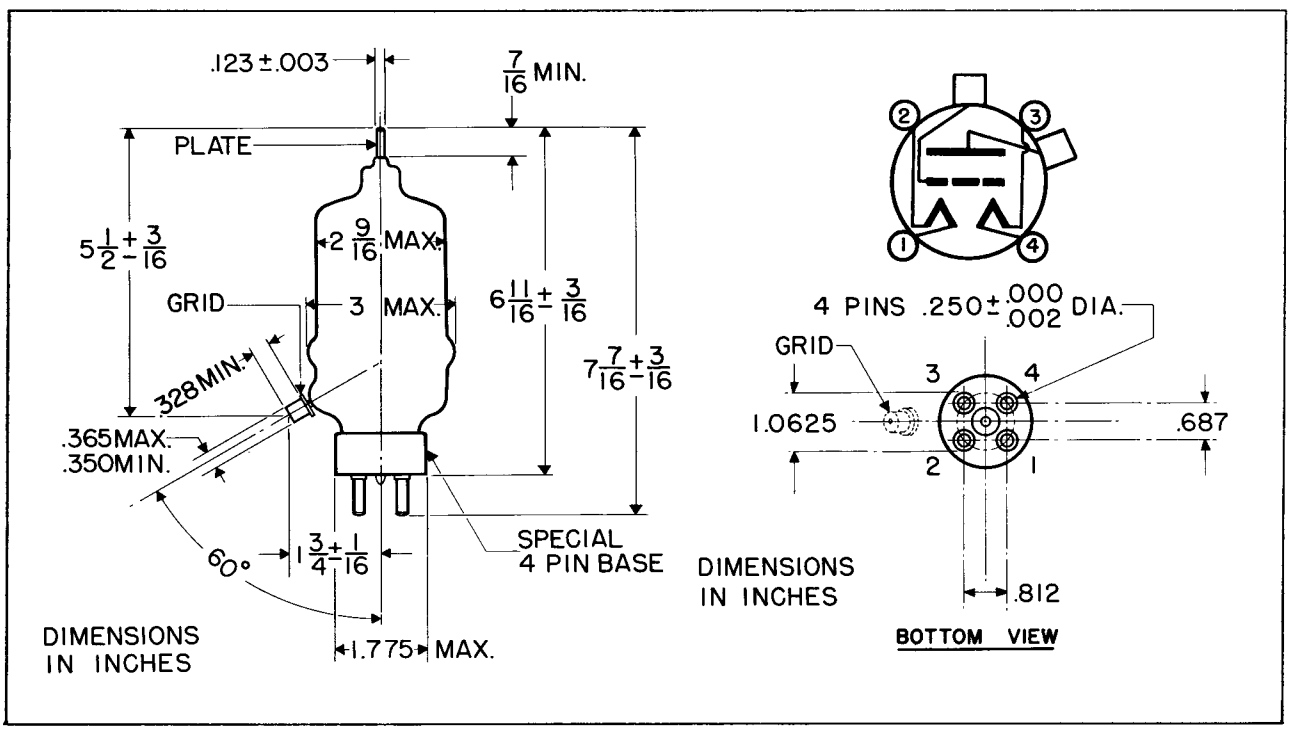
[1]For suitable peak v.t.v.m. circuits see, for instance, "Vacuum Tube Ratings," **Eimac News**, January, 1945. This article is available in reprint form on request.



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DRIVING POWER vs. POWER OUTPUT

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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 1500, 2000 and 3000 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 1500, 2000, and 3000 volts respectively.

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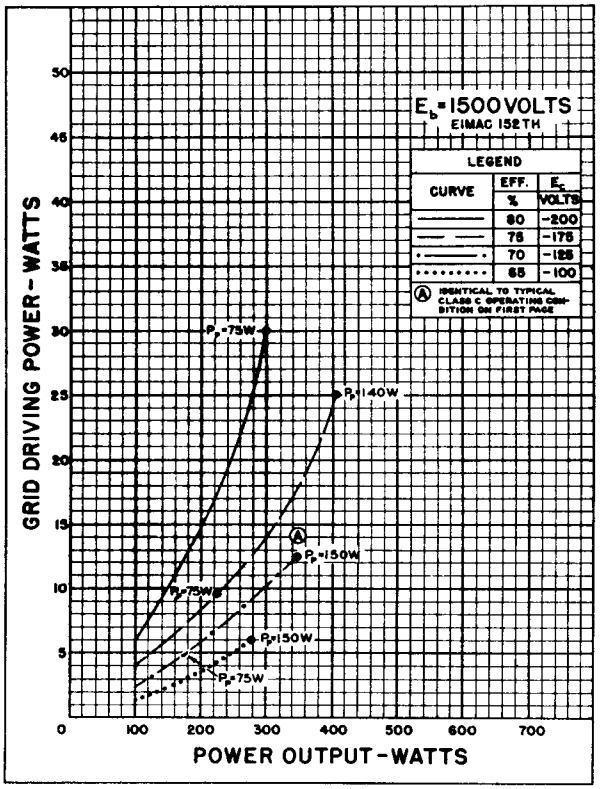

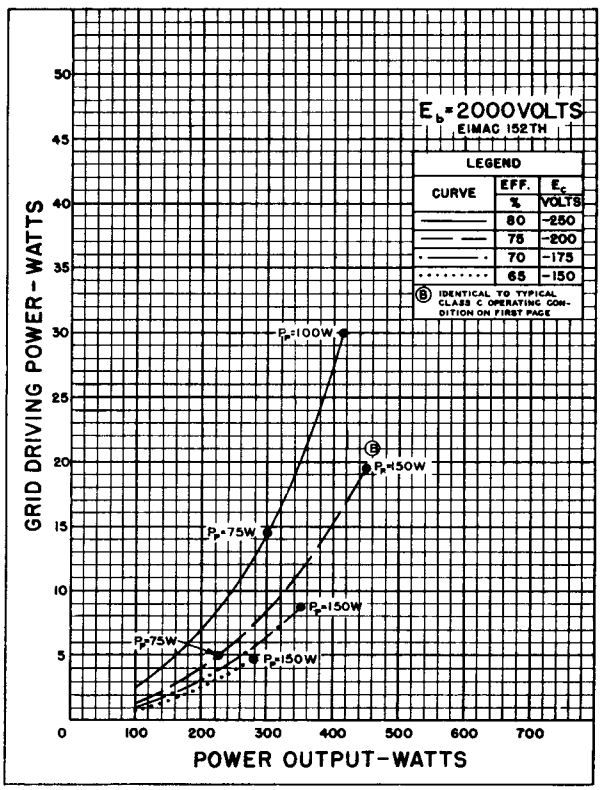

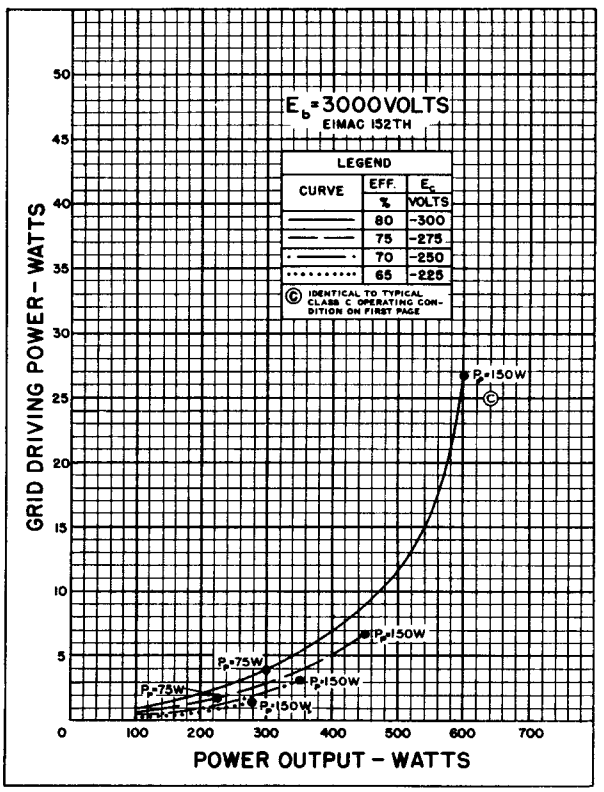

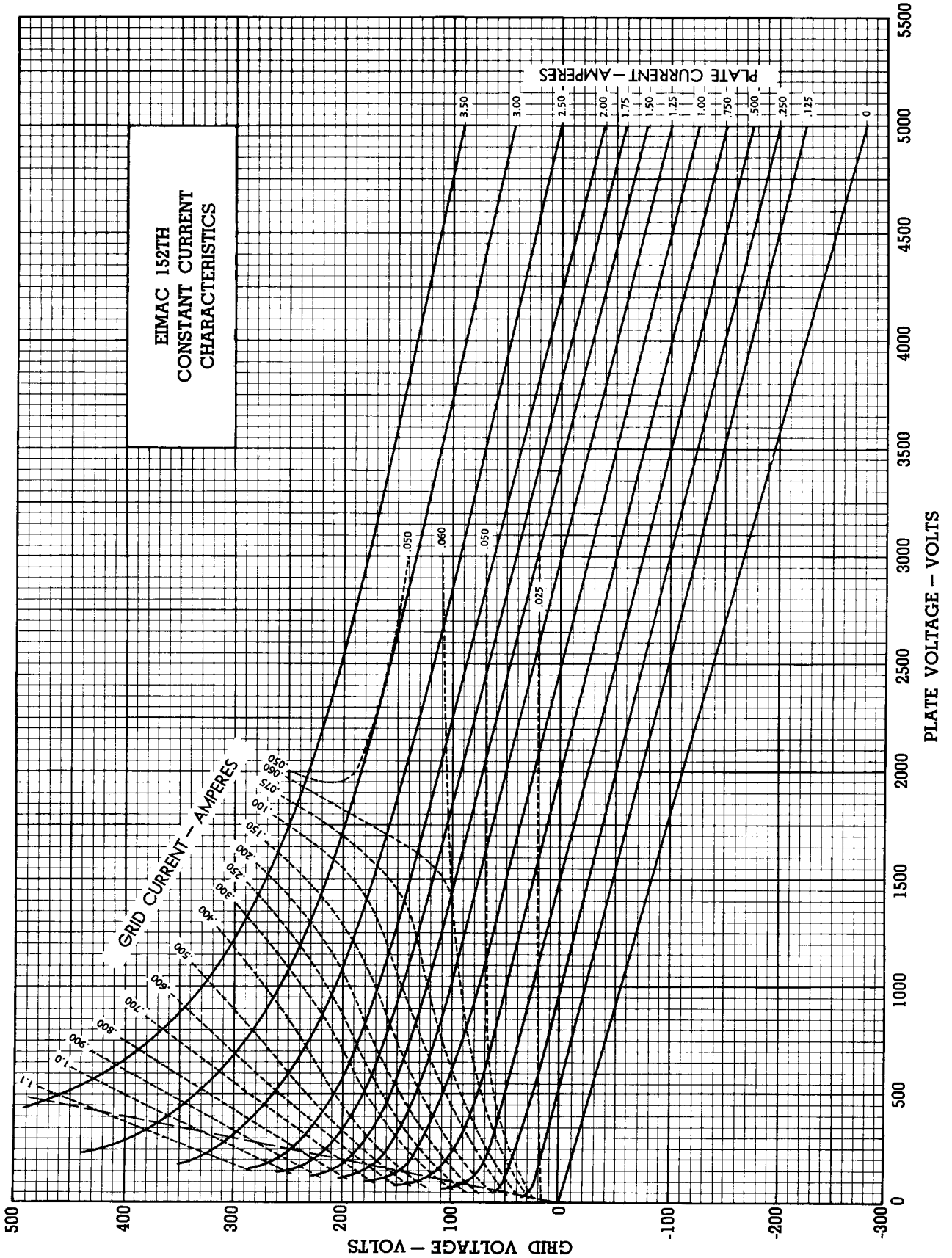

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