

EIMAC

35T

High mu low capacity general purpose triode

The EIMAC 35T employs the now internationally famous EIMAC construction which embodies the following features:

- Plate and grid fabricated from TANTALUM. (No getter necessary or desirable to maintain proper vacuum.)
- Plate terminal at top of envelope.
- Extremely low interelectrode capacities.
- No internal insulators to break down or cause power loss
- Vertical bar grid. (Unique design permits definite savings in grid power.)
- Rugged thoriated tungsten filament.
- Hard glass bulb. (Nonex glass permits maximum safe heat dissipation making possible the small physical size of the EIMAC 35T.)



EIMAC 35T
Actual Size

The EIMAC 35T has electrical characteristics that make it ideally suited for use as an oscillator, R.F. Amplifier, doubler, and class "B" audio tube.

CHARACTERISTICS

Filament voltage.....	5 volts
Filament current.....	4 amperes
Amplification factor.....	30
Maximum plate current	100 milliamperes
Plate voltage.....	200-1500 volts
Plate dissipation.....	35 watts
Grid-plate capacity.....	2 mmfd.
Base.....	Standard UX-4 prong
Height—Overall.....	5½ inches
Maximum diameter.....	1¾ inches

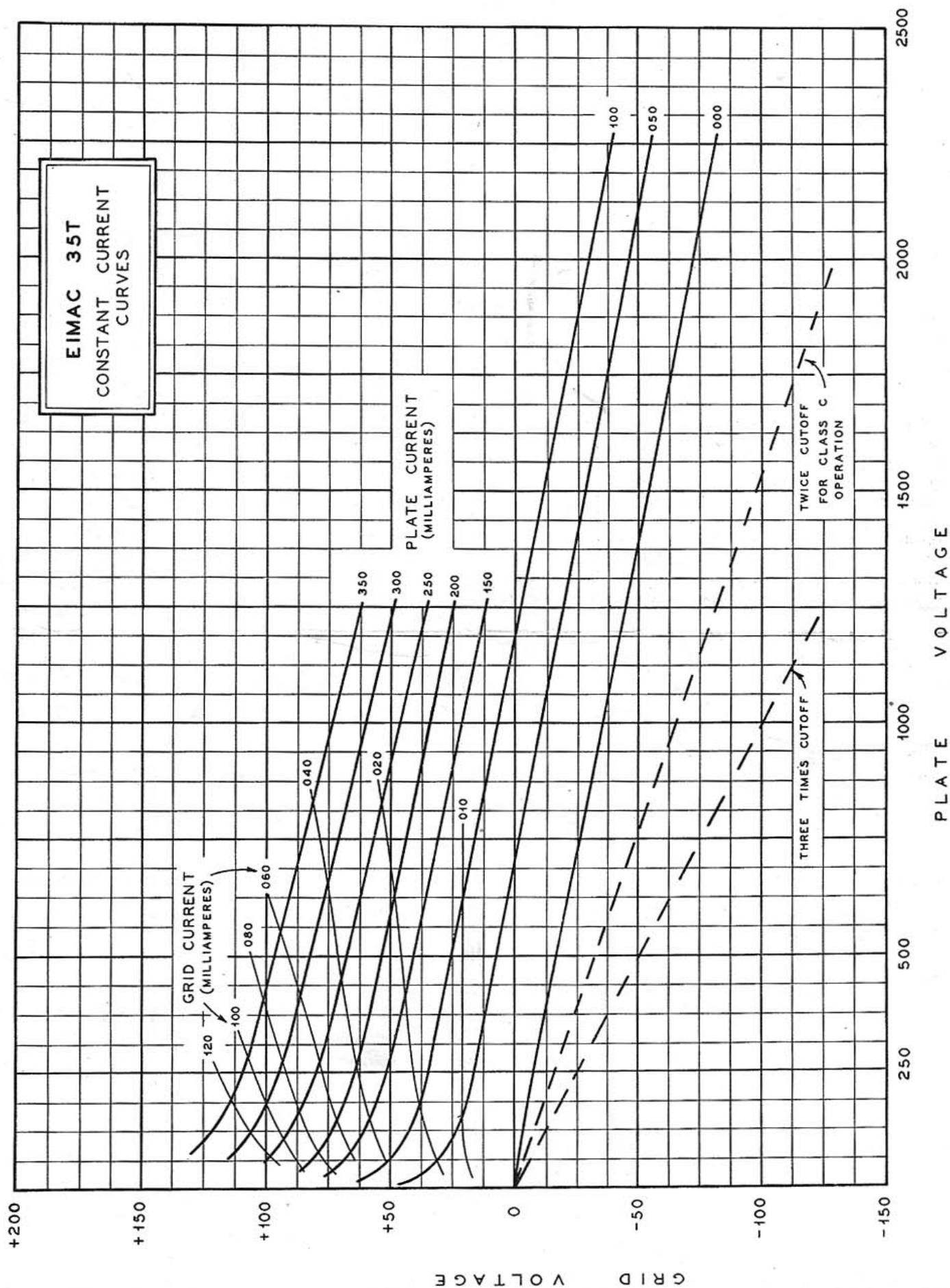
PERFORMANCE

Plate	Class "C" R.F.	Class "B" Audio
Voltage	(75 % eff.)	(two tubes)
500 volts	38 watts	50 watts
750 volts	56 watts	85 watts
1000 volts	75 watts	115 watts
1250 volts	94 watts	130 watts
1500 volts	112 watts	140 watts

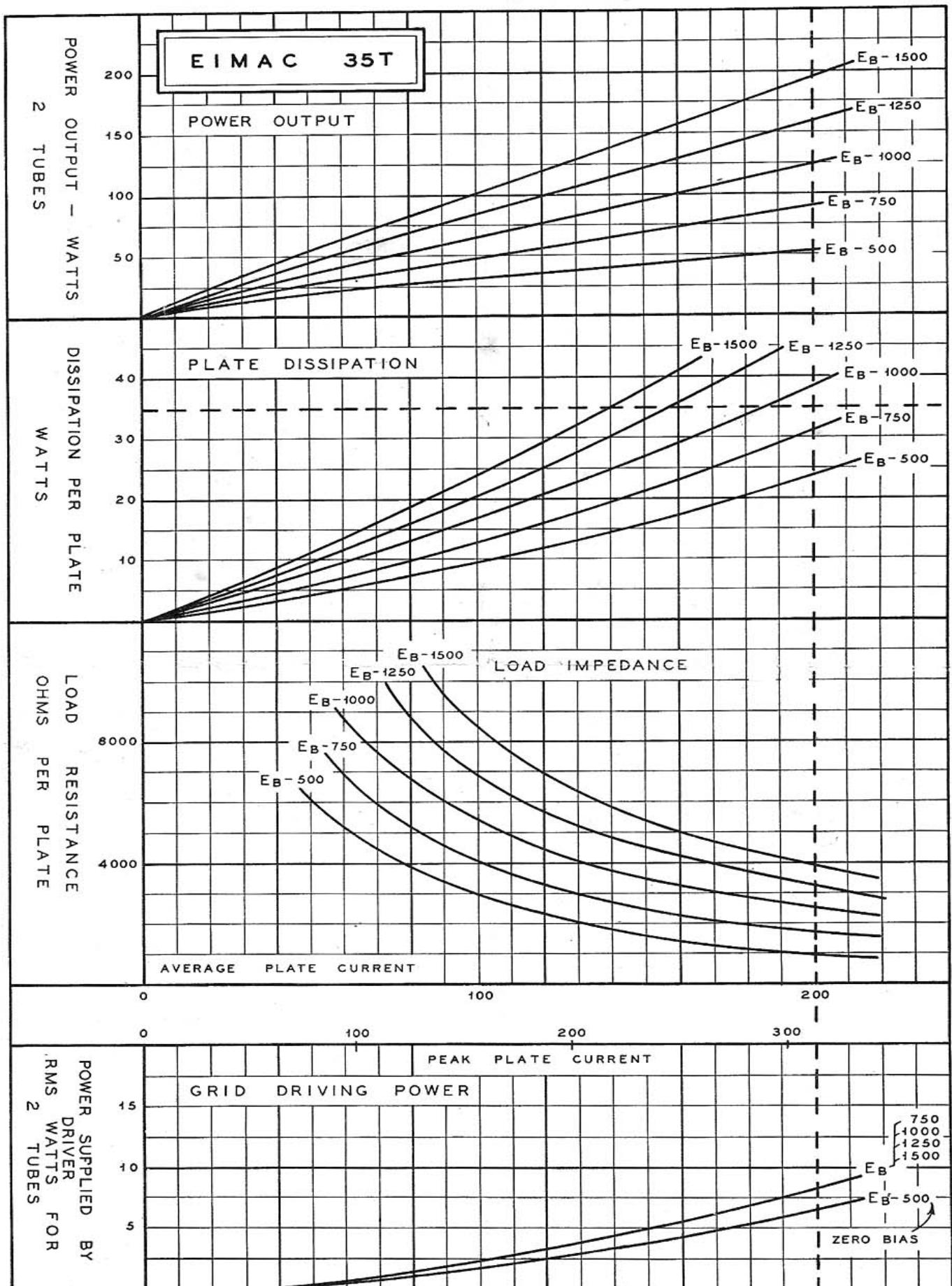
EITEL-McCULLOUGH, INC.

SAN BRUNO, CALIFORNIA
U. S. A.

CABLE "EIMAC"



CLASS B AUDIO CURVES



Eimac 35T Application Notes

CLASS "B" AUDIO

The EIMAC 35T is ideally suited for use as a class "B" audio tube. The high amplification factor permits zero bias operation at plate potentials up to 600 volts. At the higher voltages the bias requirements are easily met. Charts found elsewhere in this booklet give performance characteristics of the EIMAC 35T. It should be noted that power outputs given by the chart tolerate no curvature of the plate load curve due to diode effects. At any load condition approximately 25% more output than that shown on our charts can be obtained, without serious distortion, by supplying the necessary additional audio power to the grid circuit. To choose the optimum load impedance it will be necessary to note the tube limitations—(1) maximum permissible plate current, and (2) maximum plate dissipation. For low voltage operation, plate current is the limiting factor while for the higher voltages plate dissipation is the chief concern. To choose the proper load impedance or other tube characteristic from the chart place a straight edge perpendicular to the plate current ordinate so that it intersects all four sets of curves. The intersection of the straight edge with the proper plate voltage line in each set of curves will give directly (1) Average plate current, (2) Peak plate current, (3) Grid driving power, (4) Load impedance, (5) Plate dissipation, (6) Power output. Conditions of operation noted on the charts are for a sine waveform. The low value of average power in the average voice frequency waveform permits a substantial increase in effective power output without exceeding average maximum limits of operation. The class "B" audio charts were prepared to show exactly what effect various load impedances have on the operation of a vacuum tube.

CLASS "C" OPERATION

The ease with which the EIMAC 35T is excited to full output in class "C" service is made possible by the unique grid structure and by the excellent electrical characteristics of this tube. The high amplification factor greatly reduces the power ordinarily consumed by the bias supply as the bias voltage requirements are a minimum. For ordinary class "C" work it is unnecessary to use excessively high bias in order to obtain reasonably high efficiencies. Two or three times cut off bias is usually sufficient for most class "C" work. The value of grid current for optimum excitation is between 18 and 22 milliamperes. An actual loss in output may result from excessive values of grid currents or the use of too high bias. The values of bias at any plate potential are obtained directly from the constant current charts. The proper value of grid leak for class "C" operation, providing a value of 20 milliamperes of grid current is flowing, is 2000 ohms for each 500 volt increment in plate potential. For example—20 milliamperes of grid current flowing through 4000 ohm grid leak will provide sufficient bias for class "C" operation with 1000 volts on the plate. The radio frequency power generated by the EIMAC 35T can be enormous and due precautions should be taken to have adequately spaced condensers for the plate tank circuit especially if the higher plate voltages are employed. A plate

voltage of 1500 requires a spacing between adjacent rotor and stator plate of approximately .140", while if high level modulation is employed the spacing should be increased to approximately .225". Smaller spacings are adequate for lower voltages. The tank capacity should be sufficient to prevent excessive harmonic radiation, though large capacities will result in the lowering of the amplifier's efficiency. The tank circuit should be of low loss construction with low loss coils and extremely heavy solid copper leads to the condenser. The very low interelectrode capacities permit excellent performance at the highest radio frequencies. The low interelectrode capacities also permit easy and complete neutralization.

CLASS "C" DOUBLERS

The EIMAC 35T fills a need for a tube that will easily and efficiently permit frequency multiplication at a reasonable power level. For efficient operation the doubler should have at least three and one-half times cut off bias, though more bias is desirable. A successful doubler requires considerable excitation if maximum results are to be obtained. The plate tank circuit should be of low loss construction and should have a minimum value of tuning capacity. Comparatively high plate voltage with low values of plate current, high biases, reasonable excitation powers, and a low value of "C" are characteristic conditions of doubler operation. Under ideal conditions it is possible to realize very high plate efficiencies in a frequency multiplier circuit.

CRYSTAL OSCILLATOR

The EIMAC 35T makes an excellent crystal oscillator tube. The high amplification factor and low interelectrode capacities reduce crystal strain to a minimum. The small transfer of energy from the plate circuit to the grid circuit due to low tube capacities allows the use of comparatively high plate voltages with safety.

HIGH FREQUENCY OSCILLATOR

The EIMAC 35T is especially designed for high frequency operation. The low interelectrode capacities, the rugged low voltage filament, the heavy grid and plate leads, and the high electrical insulation are at once recognized as of extreme importance at the higher radio frequencies. The grid of the EIMAC 35T is readily controlled by means of a resonant line, making the use of a master oscillator for a higher powered amplifier a simple matter. The high amplification factor reduces the excitation voltage to a minimum so that losses in the grid circuit are reduced to a low value.

PLATE DISSIPATION

The plate of the EIMAC 35T is fabricated from completely degassed tantalum. The plate of the EIMAC 35T operates at a cherry red color at its rating of 35 watts. The temperature of the plate serves as a perfect indicator of the performance of the transmitter as the variation in plate temperature will indicate at once any maladjustments. The plate of the EIMAC 35T can be operated momentarily at heavy overloads without impairing the vacuum in any way.