# 5866/AX-9900

## MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

### A.F. Power Amplifier and Modulator—Class B

**Maximum Ratings, Absolute Values**

| | CCS | |
|---|---|---|
| D.C. Plate Voltage | 2500 | volts max. |
| Maximum Signal D.C. Plate Current[1] | 205 | ma max. |
| Maximum Signal Plate Input[1] | 512 | watts max. |
| Plate Dissipation[1] | 135 | watts max. |

**Typical Operation**

Unless otherwise specified, values are for two tubes.

| | CCS | CCS | CCS | CCS | |
|---|---|---|---|---|---|
| D.C. Plate Voltage | 1000 | 1500 | 2000 | 2500 | volts |
| D.C. Grid Voltage | —23 | —46 | —65 | —86 | volts |
| Peak A-F Grid to Grid Voltage | 295 | 340 | 394 | 412 | volts |
| Zero Signal D.C. Plate Current | 60 | 60 | 60 | 60 | ma |
| Maximum Signal D.C. Plate Current | 420 | 420 | 416 | 356 | ma |
| Effective Load Resistance, Plate to Plate | 5000 | 8500 | 12000 | 18200 | ohms |
| Maximum Signal Driving Power, approximate | 10.8 | 12.2 | 14.6 | 15.6 | watts |
| Maximum Signal Power Output, approximate | 274 | 450 | 630 | 700 | watts |

### R.F. Power Amplifier—Class B

Carrier conditions per tube for use with a maximum modulation factor of 1.0.

**Maximum Ratings, Absolute Values**

| | CCS | |
|---|---|---|
| D.C. Plate Voltage | 2500 | volts max. |
| D.C. Plate Current | 120 | ma max. |
| Plate Input | 215 | watts max. |
| Plate Dissipation | 135 | watts max. |

**Typical Operation**

| | CCS | CCS | CCS | |
|---|---|---|---|---|
| D.C. Plate Voltage | 1500 | 2000 | 2500 | volts |
| D.C. Grid Voltage | —45 | —67 | —87 | volts |
| Peak R-F Grid Voltage | 100 | 100 | 100 | volts |
| D.C. Plate Current | 120 | 97 | 77 | ma |
| D.C. Grid Current, approximate | 6 | 4 | 0 | ma |
| Driving Power, approximate[2] | 9.4 | 5.1 | 3.6 | watts |
| Power Output, approximate | 59 | 64 | 65 | watts |

### Plate-Modulated R.F. Power Amplifier Class C Telephony

Carrier conditions per tube for use with a maximum modulation factor of 1.0.

**Maximum Ratings, Absolute Values**

| | CCS | |
|---|---|---|
| D.C. Plate Voltage | 2000 | volts max. |
| D.C. Grid Voltage | —300 | volts max. |
| D.C. Plate Current | 160 | ma max. |
| D.C. Grid Current | 45 | ma max. |
| Plate Input | 320 | watts max. |
| Plate Dissipation | 90 | watts max. |

**Typical Operation**

| | CCS | CCS | CCS | |
|---|---|---|---|---|
| D.C. Plate Voltage | 1000 | 1500 | 2000 | volts |
| D.C. Grid Voltage | —130 | —180 | —225 | volts |
| Peak R-F Grid Voltage | 320 | 370 | 415 | volts |
| D.C. Plate Current | 127 | 127 | 127 | ma |
| D.C. Grid Current, approximate | 40 | 40 | 40 | ma |
| Driving Power, approximate | 12 | 14 | 15 | watts |
| Power Output, approximate | 95 | 153 | 204 | watts |

[1]Averaged over any audio-frequency cycle of sine-wave form.
[2]At crest of A.F. cycle with modulation factor of 1.0.

### R.F. Power Amplifier and Oscillator Class C Telegraphy

Key-down conditions per tube without amplitude modulation[3]

**Maximum Ratings, Absolute Values**

| | CCS | |
|---|---|---|
| D.C. Plate Voltage | 2500 | volts max. |
| D.C. Grid Voltage | —300 | volts max. |
| D.C. Plate Current | 205 | ma max. |
| D.C. Grid Current | 45 | ma max. |
| Plate Input | 512 | watts max. |
| Plate Dissipation | 135 | watts max. |

**Typical Operation, Grounded-Filament Circuit**

| | CCS | CCS | CCS | CCS | |
|---|---|---|---|---|---|
| D.C. Plate Voltage | 1000 | 1500 | 2000 | 2500 | volts |
| D.C. Grid Voltage | —80 | —110 | —150 | —200 | volts |
| Peak R-F Grid Voltage | 260 | 300 | 340 | 390 | volts |
| D.C. Plate Current | 205 | 205 | 205 | 205 | ma |
| D.C. Grid Current, approximate | 40 | 40 | 40 | 40 | ma |
| Driving Power, approximate | 10 | 11 | 13 | 14 | watts |
| Power Output, approximate | 126 | 210 | 295 | 390 | watts |

**Typical Operation, Grounded-Grid Circuit**

Same Values as for Grounded-Filament Circuit with the following exceptions:

| | | | | |
|---|---|---|---|---|
| Driving Power, approximate | 50 | 59 | 68 | 79 watts |
| Power Output, approximate[4] | 166 | 258 | 350 | 455 watts |

Maximum ratings apply up to 150 megacycles. The tube may be operated at higher frequencies provided the maximum values of plate voltage and power input are reduced according to the tabulation below (other maximum ratings are the same as shown above). Special attention should be given to adequate ventilation of the bulb at these frequencies.

Percentage of Maximum Rated Plate Voltage and Plate Input

| Frequency (mc) | 150 | 200 | |
|---|---|---|---|
| | Plate Volts and Input | Plate Volts | Plate Input |
| Class B | 100% | 80% | 70% |
| Class C Plate Telephony | 100 | 80 | 70 |
| Class C Telegraphy | 100 | 80 | 70 |

### Electrical Data and Limits

| Characteristic | Conditions | | Limits Min. | Bogey | Max. | |
|---|---|---|---|---|---|---|
| Grid Voltage | Eb = 350 volts<br>Ib = 0.85 amperes | Ec: | — | — | 150 | volts |
| Grid Current | Eb = 350 volts<br>Ib = 0.85 amperes | Ic: | — | — | 250 | ma |
| Plate Current | Eb = 2500 volts<br>Ec = —50 volts | Ib: | 105 | 158 | 210 | ma |
| Plate Current | Eb = 2500 volts<br>Ec = —75 volts | Ib: | 32 | 57 | 82 | ma |
| Plate Current | Eb = 2500 volts<br>Ec = —125 volts | Ib: | — | — | 8 | ma |
| Power Output | Eb = 2500 volts<br>Ib = 180 ma<br>f = 60 megacycles<br>Ec = —200 volts<br>Ic = 40 ma | Po: | 315 | — | — | watts |

[3]Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of the carrier conditions.

[4]Includes power transferred from driver stage.

# AMPEREX TUBE TYPE 5866/AX-9900

***The 5866/AX-9900 is a three-electrode tube designed for use as a radio-frequency power amplifier, modulator and oscillator. The anode is capable of dissipating 135 watts. The cathode is a thoriated-tungsten filament. Maximum ratings apply up to 150 megacycles. At reduced ratings it may be operated up to 200 megacycles.***

## GENERAL CHARACTERISTICS

### ELECTRICAL DATA

| | Min. | Bogey | Max. | |
|---|---|---|---|---|
| Filament Voltage | 6.0 | 6.3 | 6.6 | volts |
| Filament Current at Bogey Voltage | 5.2 | 5.6 | 6.1 | amperes |
| Amplification Factor Ib=54 ma, Eb=2500 volts | 22 | 25 | 28 | |
| Peak Cathode Current[1] | — | — | 1600 | ma |

Direct Interelectrode Capacitances

| | | | | |
|---|---|---|---|---|
| Grid to Plate | 4.9 | 5.5 | 6.1 | μμf |
| Grid to Filament | 5.2 | 5.8 | 6.4 | μμf |
| Plate to Filament | 0.08 | 0.1 | 0.13 | μμf |

### MECHANICAL DATA

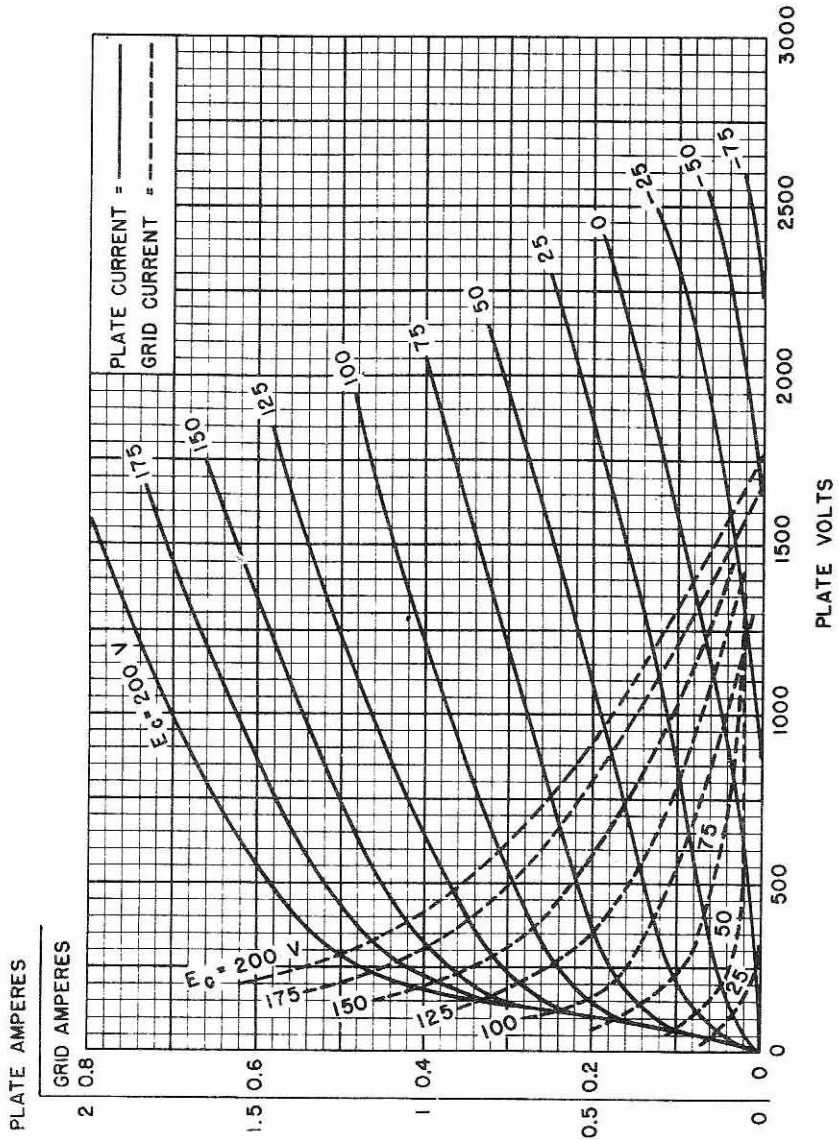
| | |
|---|---|
| Mounting Position—vertical, base up or down | |
| Maximum Plate Temperature | 850° C. |
| Required Air Flow to Envelope[2] | 5 cfm |
| Maximum Glass Temperature | |
| at bottom seals | 180° C. |
| at plate seal | 220° C. |
| Net Weight, approximate | 4 ounces |

[1] Represents maximum usable cathode current (plate current plus grid current) for any condition of operation.

[2]At maximum ratings and frequencies above 50 megacycles, forced-air cooling of the envelope is required.

# 5866/AX-9900

TYPICAL PERFORMANCE CURVES

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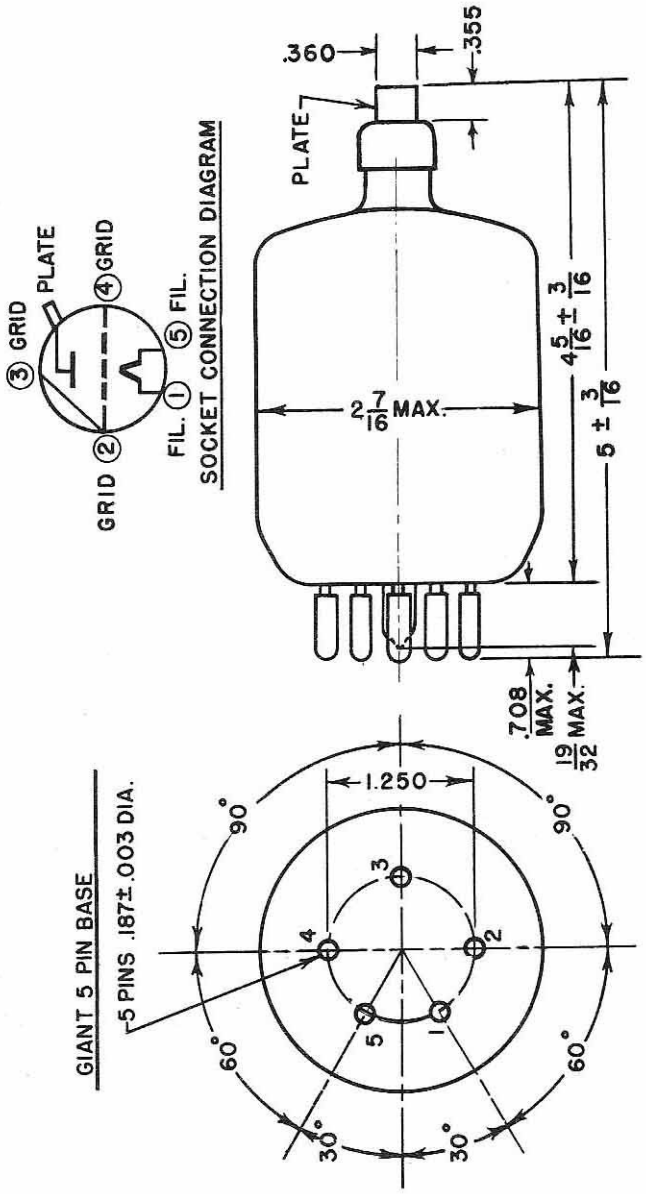

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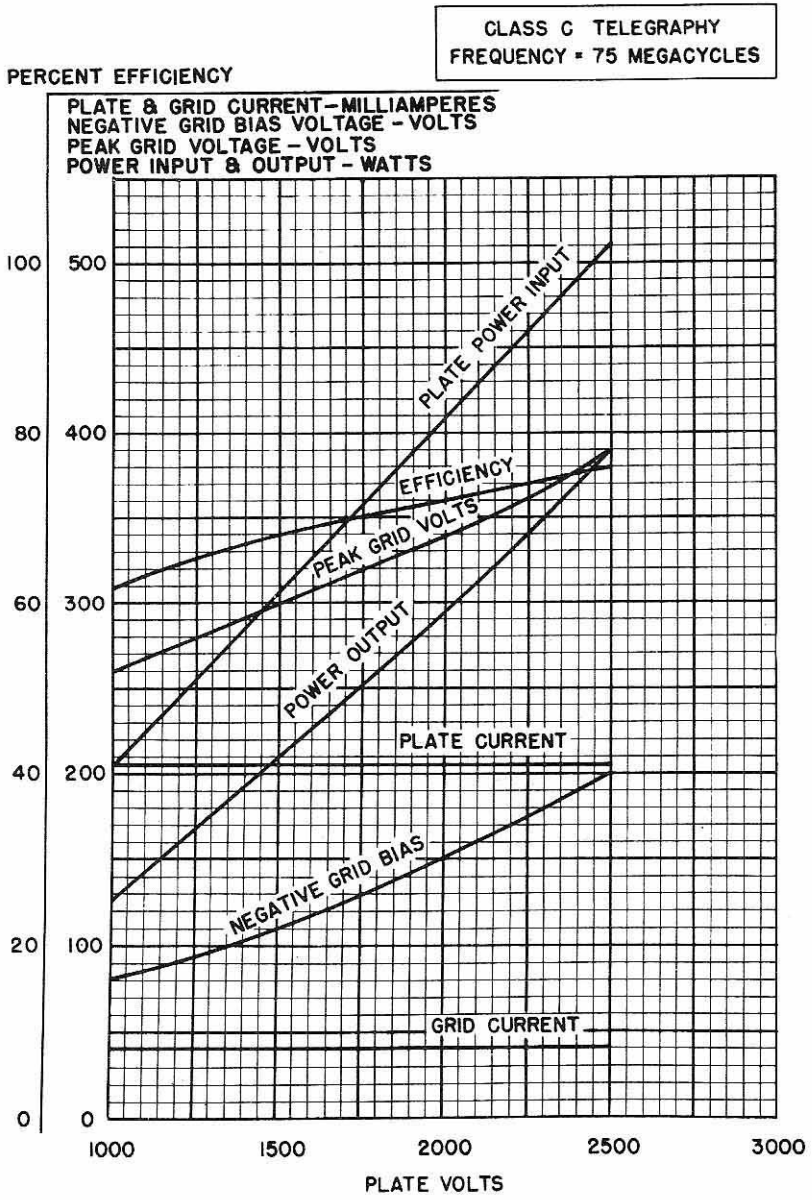


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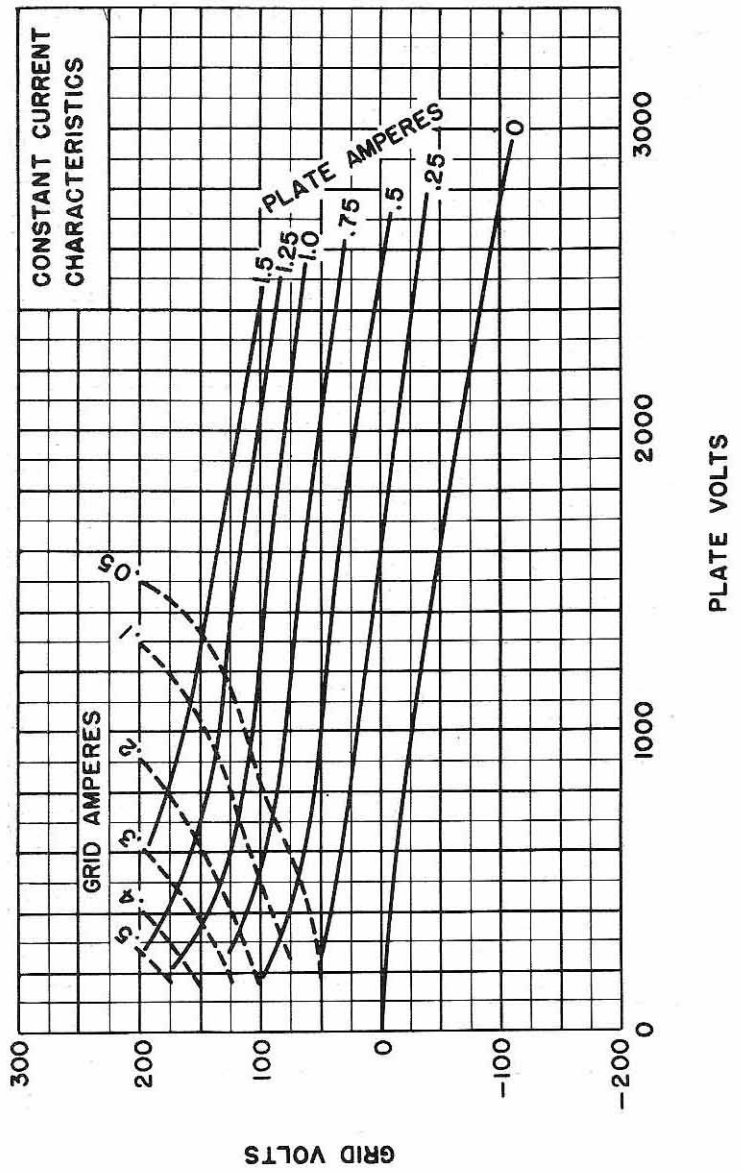

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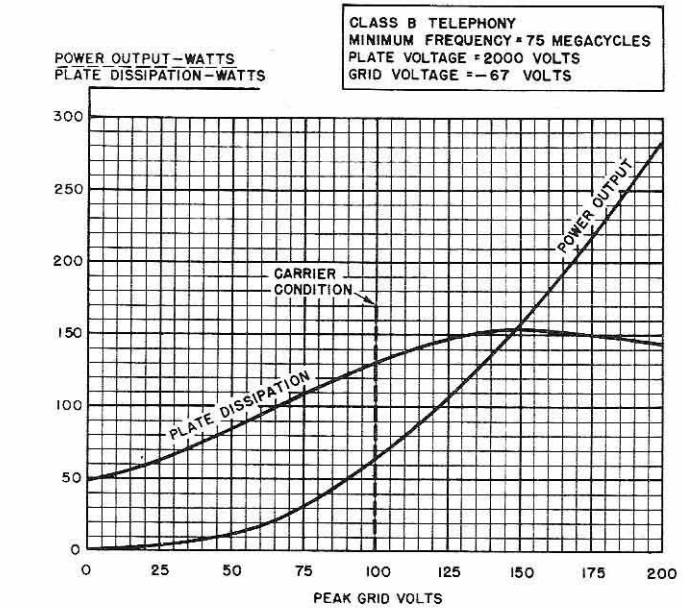


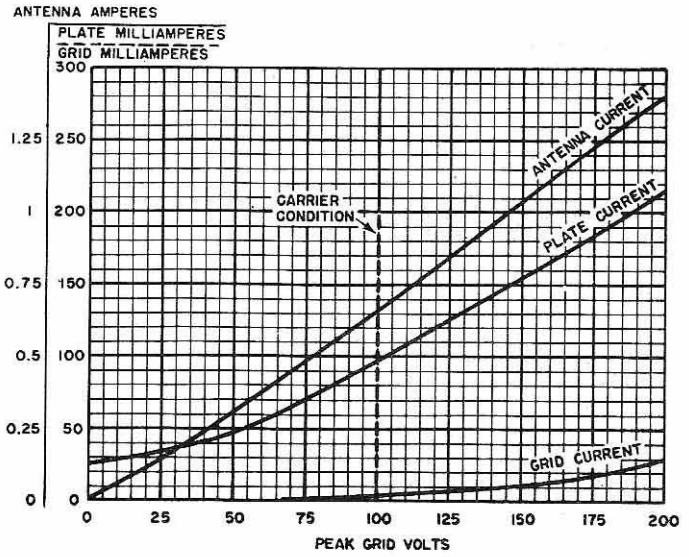


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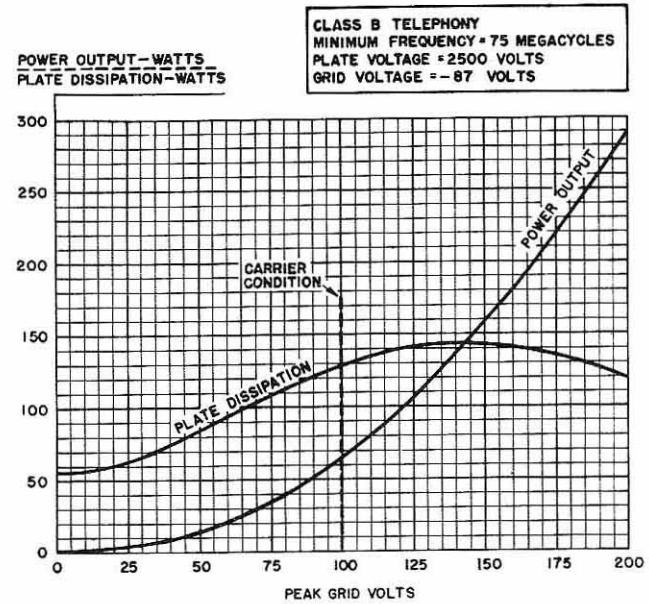


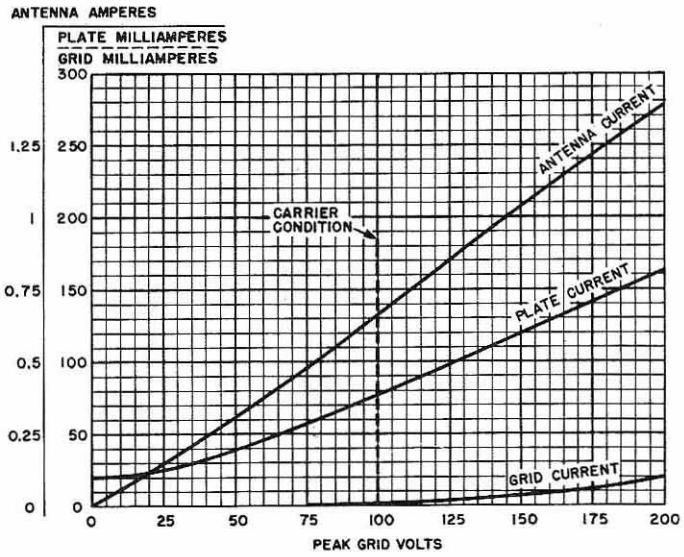

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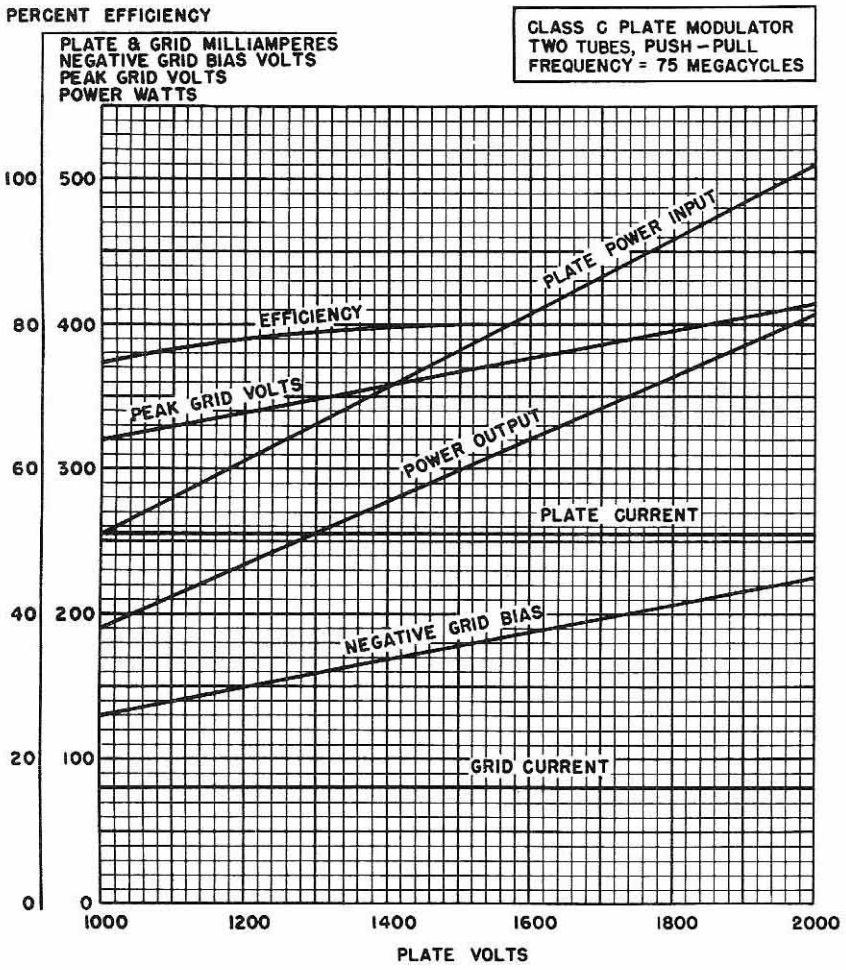


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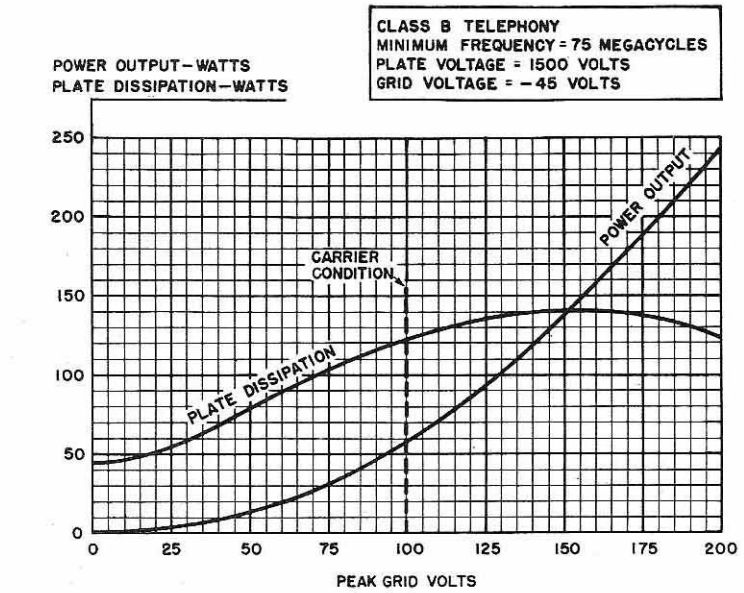


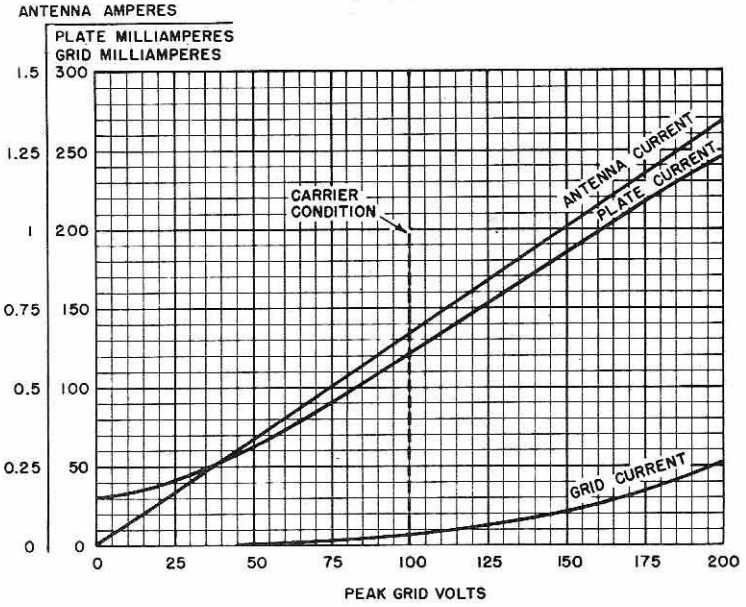

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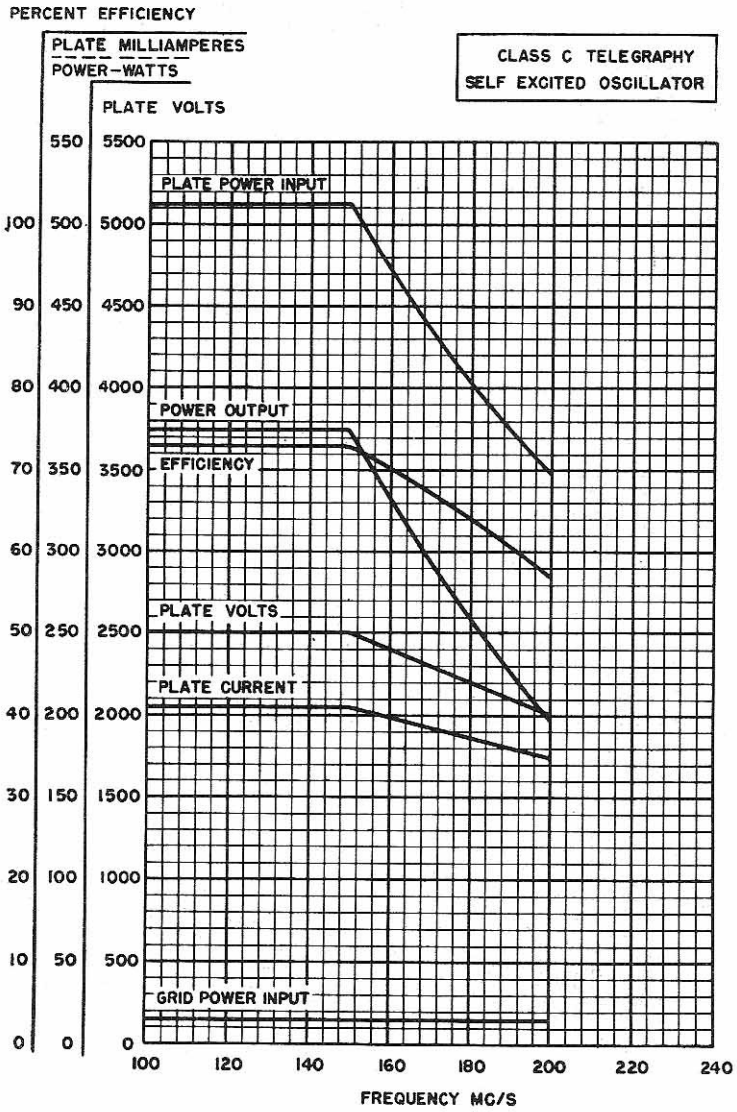


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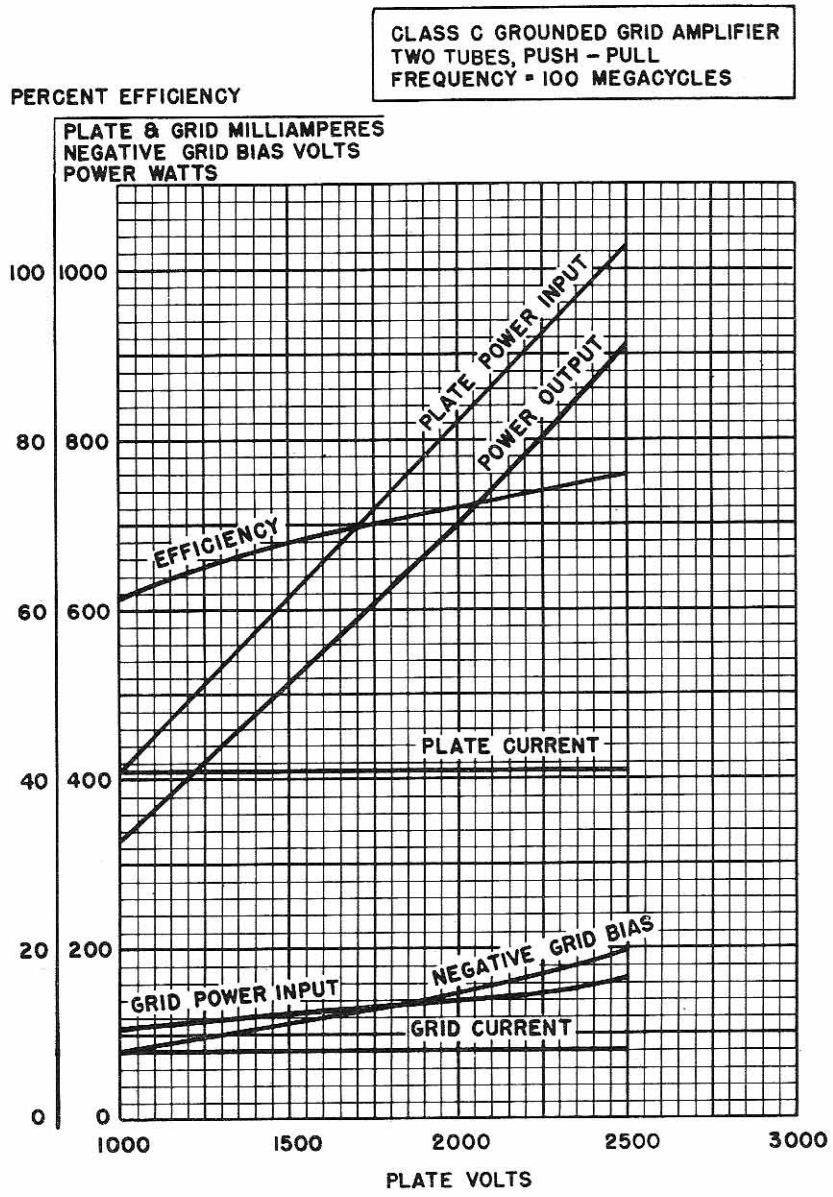

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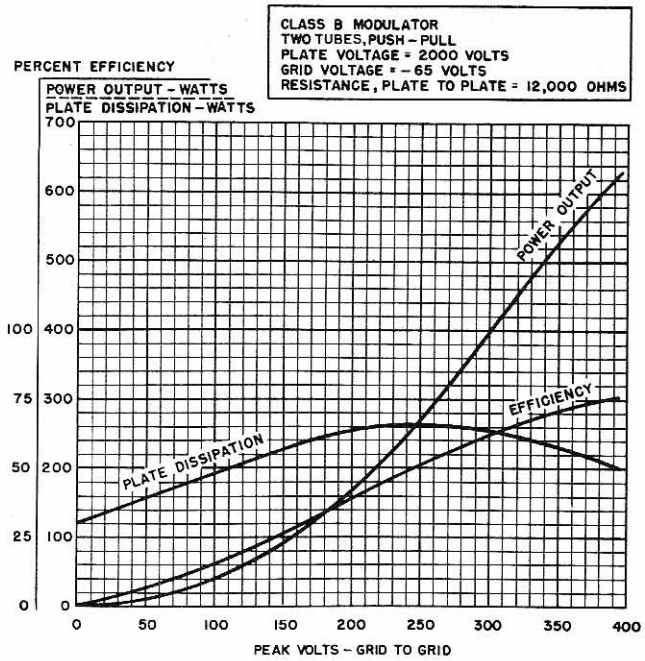


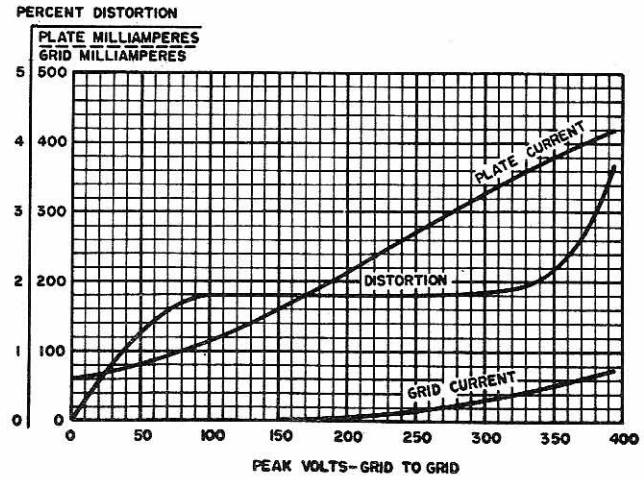


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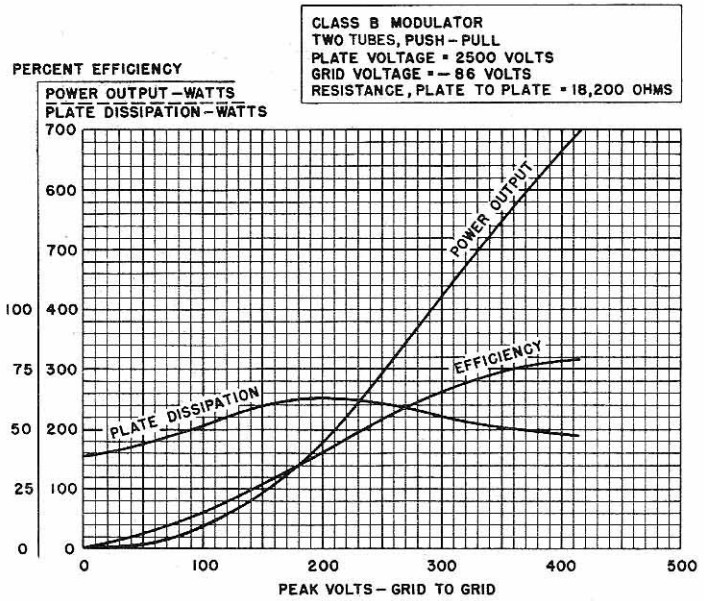


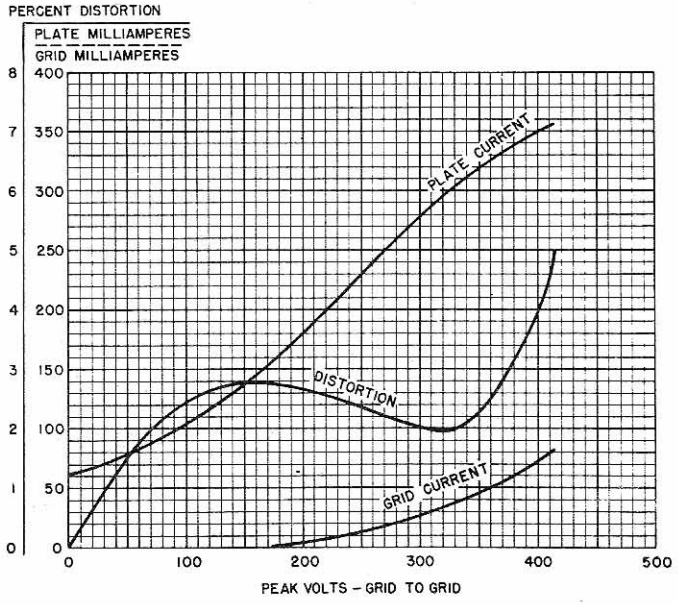

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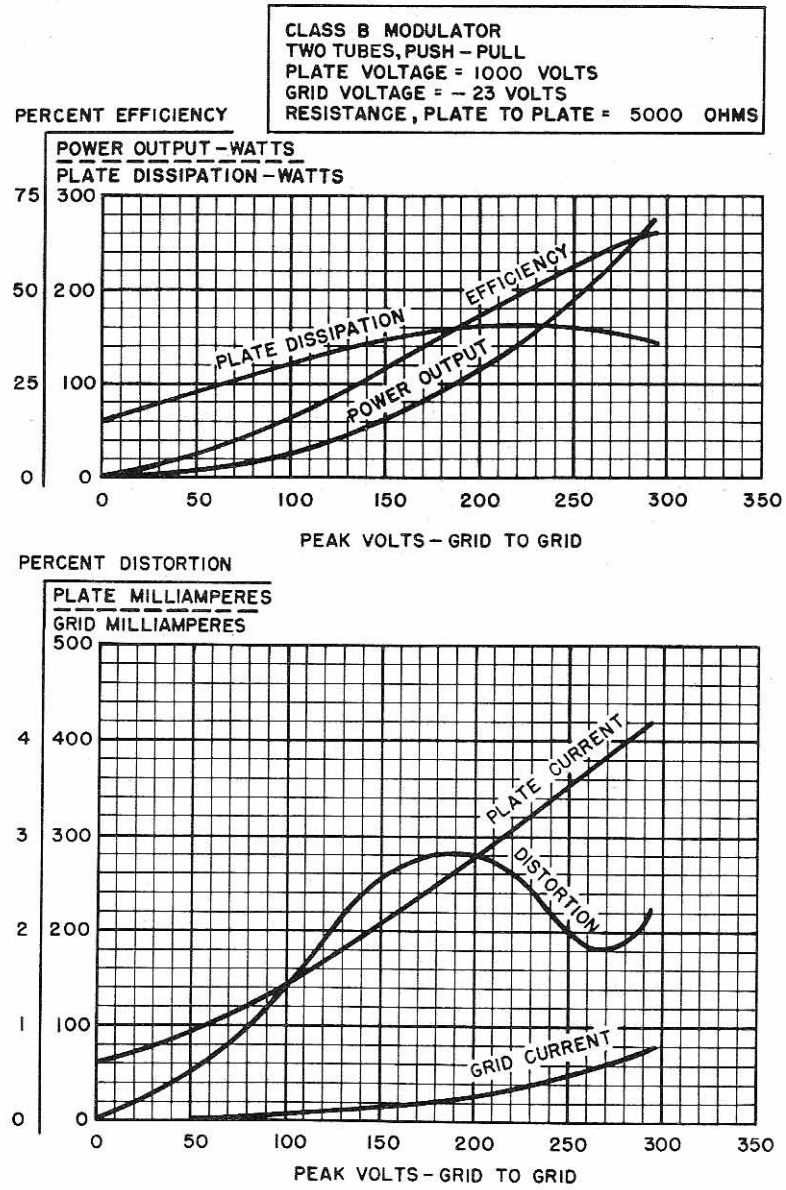


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