

5868/AX-9902

AMPEREX TUBE TYPE 5868/AX-9902

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

A.F. Power Amplifier and Modulator—Class B

Maximum Ratings, Absolute Values	CCS	CCS	CCS
D.C. Plate Voltage	4000 volts max.		
Maximum Signal D.C. Plate Current ¹	535 ma max.		
Maximum Signal Plate Input ¹	1500 watts max.		
Plate Dissipation ¹	450 watts max.		

Typical Operation

Unless otherwise specified, values are for two tubes.

	CCS	CCS	CCS
D.C. Plate Voltage	2500	3000	3500
D.C. Grid Voltage	-58	-72	-90
Peak A.F. Grid to Grid Voltage	452	440	448
Zero Signal D.C. Plate Current	70	100	130
Maximum Signal D.C. Plate Current	908	800	680
Effective Plate Resistance, R_p	6000	8800	11600
Maximum Signal Driving Power, approximate	58	40	26
Maximum Signal Power Output, approximate	1650	1820	1710

Plate-Modulated R.F. Power Amplifier

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

Maximum Ratings, Absolute Values	CCS
D.C. Plate Voltage	3000 volts max.
D.C. Grid Voltage	-500 volts max.
D.C. Plate Current	450 ma max.
D.C. Grid Current	115 ma max.
Plate Input	1400 watts max.
Plate Dissipation	300 watts max.

Typical Operation

	CCS
D.C. Plate Voltage	3000 volts
D.C. Grid Voltage	-375 volts
Peak R.F. Grid Voltage	580 volts
D.C. Plate Current	450 ma
D.C. Grid Current	85 ma
Driving Power, approximate	42 watts
Power Output, approximate	1050 watts

R.F. Power Amplifier and Oscillator

Key-down conditions per tube without amplitude modulation

Maximum Ratings, Absolute Values	CCS
D.C. Plate Voltage	4000 volts max.
D.C. Grid Voltage	-500 volts max.
D.C. Cathode Current	130 ma max.
D.C. Grid Current	150 ma max.
Plate Dissipation	450 watts max.

¹Averaged over any audio-frequency cycle of sine-wave form.

Typical Operation, Grounded-Filament Circuit

	CCS	CCS	CCS
Frequency	100	100	100
D.C. Plate Voltage	2500	3000	3500
D.C. Grid Voltage	-200	-250	-300
Peak R.F. Grid Voltage	405	460	520
D.C. Plate Current	535	535	535
D.C. Grid Current, approximate	115	115	115
Driving Power	42	48	54
Power Input	1340	1600	1880
Power Output, approximate	950	1175	1430
Plate Dissipation	390	425	450

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

	212	248	274	320
Driving Power, approximate	212	248	274	320
Power Output, approximate	1120	1375	1650	1950

Maximum ratings apply up to 100 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 tube at these frequencies.

Frequency	100	120	200
Class C Plate Modulated Telephony	100	87	73
Class C Telegraphy	100	87	73

Electrical Data and Limits

Characteristic Conditions	Min.	Bogey Max.	Limit
Grid Voltage	Eb = 500 volts	Ec = —	— 245 volts
Grid Current	Ib = 500 volts	Ic = —	— 800 ma
Plate Current	Eb = 4000 volts	Ic = —	— 214
Plate Current	Eb = 4000 volts	Ic = —	— 328
Plate Current	Eb = 4000 volts	Ic = —	— 442
Plate Current	Eb = 4000 volts	Ic = —	— 78
Plate Current	Eb = 4000 volts	Ic = —	— 130
Plate Current	Eb = 4000 volts	Ic = —	— 182
Plate Current	Eb = 4000 volts	Ic = —	— 11 ma
Power Output	Eb = 4000 volts	Po = 1000	—
Power Output	Ib = 375 ma	Po = 1000	—
Power Output	Ic = 50 ma	Po = 1000	—
Power Output	Ic = 50 ma	Po = 1000	—

¹Modulation essentially negative may be used, if the positive peak of the envelope does not exceed 110 per cent of the carrier conditions.

²Includes power transferred from driver stage.

TENTATIVE DATA

The 5868/AX-9902 is a three-electrode tube designed for use as a radio-frequency power amplifier and oscillator, suitable for grounded grid circuits. The anode is capable of dissipating 450 watts. The cathode is a thoriated-tungsten filament. Maximum ratings apply up to 100 megacycles. At reduced ratings it may be operated up to 120 megacycles.

ELECTRICAL DATA

	Min.	Bogey	Max.
Filament Voltage	9.5	10	10.5
Filament Current at Bogey Voltage	9.4	9.9	10.4
Amplification Factor	23	28	33
Ib = 150 ma, Eb = 3000-4000 volts	—	—	5000
Peak Cathode Current ¹	—	—	—
Direct Interelectrode Capacitances	6.9	8	8.7
Grid to Plate	9.6	11	12
Grid to Filament	—	—	0.35
Plate to Filament	—	—	—

MECHANICAL DATA

Mounting Position	vertical, base up or down
Required Air Flow to Envelope	25 cfm
Maximum Glass Temperature at bottom seals	180° C.
Maximum Glass Temperature at plate seal	220° C.

ACCESSORIES

Plate Connector	Amperex #S-3702
Socket	Amperex #S-3703
Net Weight, approximate	13.5 ounces

Represents maximum usable cathode current (plate current plus grid current) for any condition of operation. At maximum ratings and frequencies above 50 megacycles, forced-air cooling of the envelope is required.

CLASS C OSCILLATOR RECTIFIED, UNFILTERED, SINGLE-PHASE, FULL-WAVE PLATE SUPPLY

Maximum Ratings, Absolute Values (per tube)

For Frequencies up to 100 mc.

Plate Voltage	3600 volts
Grid Voltage ³	-320 volts
Plate Current ³	475 mA
Plate Power Input	2200 watts
Plate Dissipation	450 watts
Grid Dissipation	50 watts

TYPICAL OPERATION

Transformer Secondary Voltage (rms)	4000 ¹
Plate Voltage ³	3350 volts
Plate Current ³	3000 volts
Grid Current ³	450 mA
Grid Leak Resistance	100 mA
Plate Power Input	3000 ohms
Plate Dissipation	2000 watts
Plate Power Output	450 watts
	1500 watts

CLASS C OSCILLATOR RECTIFIED, UNFILTERED, THREE PHASE, HALF-WAVE PLATE SUPPLY

Maximum Ratings, Absolute Values (per tube)

For Frequencies up to 100 mc.

Plate Voltage ³	4000 volts dc
Grid Voltage ³	-500 volts dc
Plate Current ³	535 mA dc
Plate Power Input	2200 watts
Plate Dissipation	450 watts
Grid Dissipation	50 watts

TYPICAL OPERATION

Transformer Secondary Voltage (rms)	3400 ¹
Plate Voltage ³	4000 volts
Plate Current ³	535 mA
Grid Current ³	115 mA
Grid Leak Resistance	3000 ohms
Plate Power Input	2140 watts
Plate Dissipation	450 watts
Plate Power Output	1630 watts

NOTES:

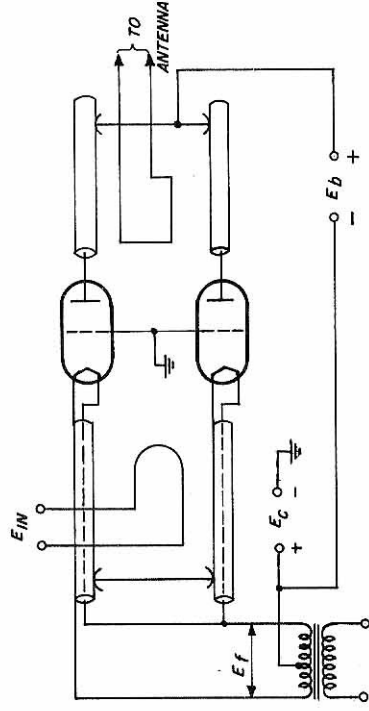
- Under these conditions, care must be taken not to exceed the maximum values shown either by variations in the supply voltage and load or by tolerances in the circuit elements.
- Under these conditions, normal deviations of voltages and load are permissible. The maximum ratings of the tube must not be exceeded, however.
- D.C. average value.

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H.F. CLASS C TELEGRAPHY GROUNDED GRID CIRCUIT

(For Frequencies up to 100 mc, Two Tubes in Push-Pull)

Plate Voltage	4000	3500	3000	2500 volts
Grid Voltage	-350	-300	-250	-200 volts
Plate Current	2x535	2x535	2x535	2x535 mA
Grid Current	2x115	2x115	2x115	2x115 mA
Peak R.F. Grid Voltage	580	520	460	405 volts
Driving Power	2x320	2x274	2x248	2x212 watts
Power Input	2x2140	2x1880	2x1600	2x1340 watts
Plate Dissipation	2x450	2x450	2x425	2x390 watts
Power Output	3380+520	2860+440	2350+400	1900+340 watts
Plate Efficiency	79	76	73.5	71 %



CLASS C OSCILLATOR SELF-RECTIFIED, INDUSTRIAL APPLICATION

Maximum Ratings, Absolute Values (per Tube)

For Frequencies up to 110 mc.

Transformer Secondary Voltage (rms)	4500 volts
Grid Voltage ³	-500 volts
Plate Current ³	280 mA
Grid Current ³	55 mA
Plate Power Input	1450 watts
Plate Dissipation	450 watts
Grid Dissipation	50 watts

TYPICAL OPERATION

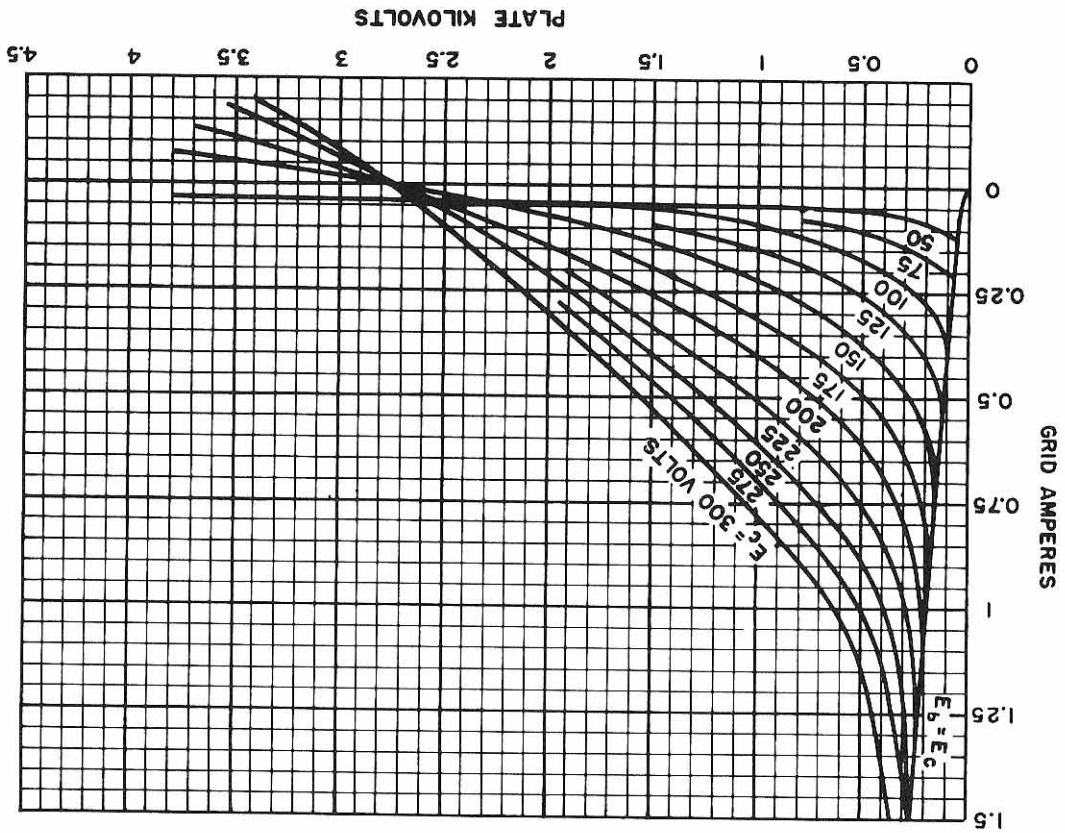
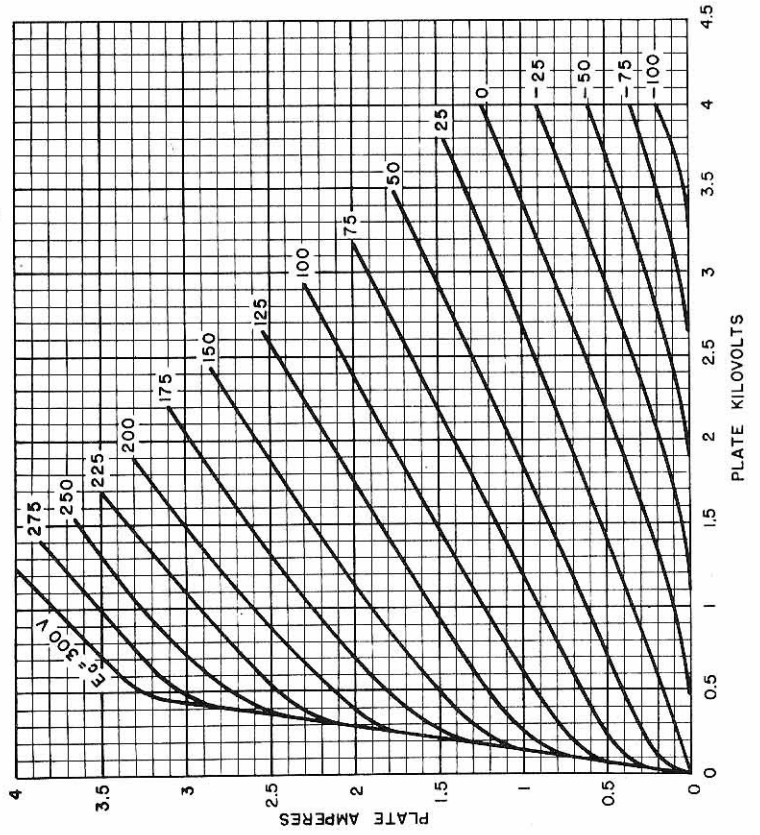
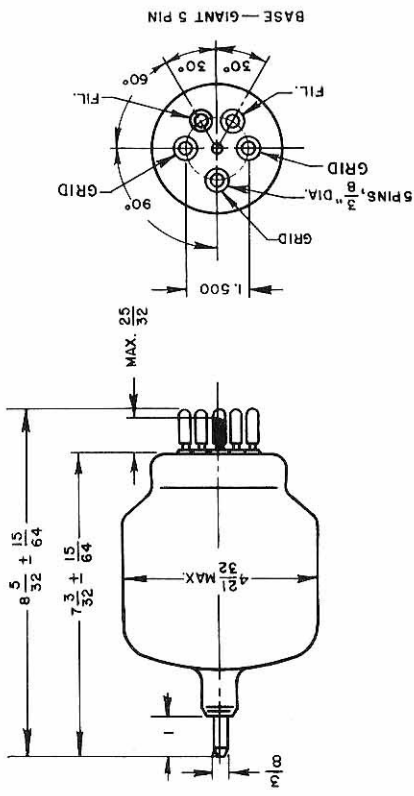
Transformer Secondary Voltage (rms)	4500 ¹
Plate Voltage ³	280
Plate Current ³	240 mA
Grid Leak Resistance	3400 ohms
Plate Power Input	1400 watts
Plate Dissipation	350 watts
Plate Power Output	1000 watts
Efficiency	71.5

NOTES:

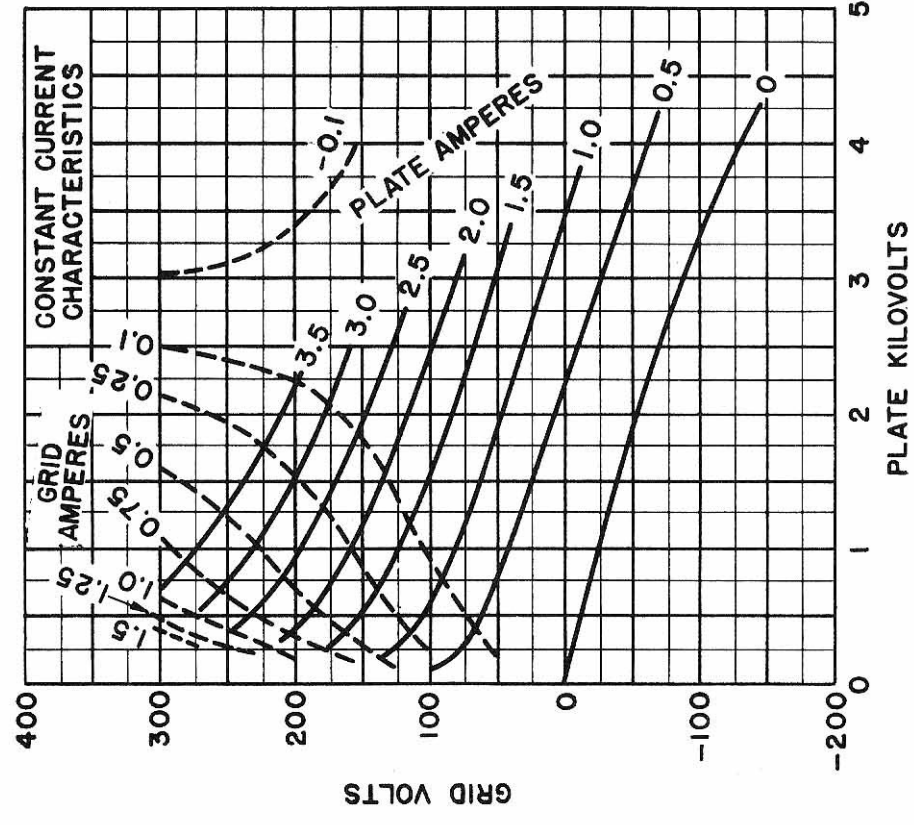
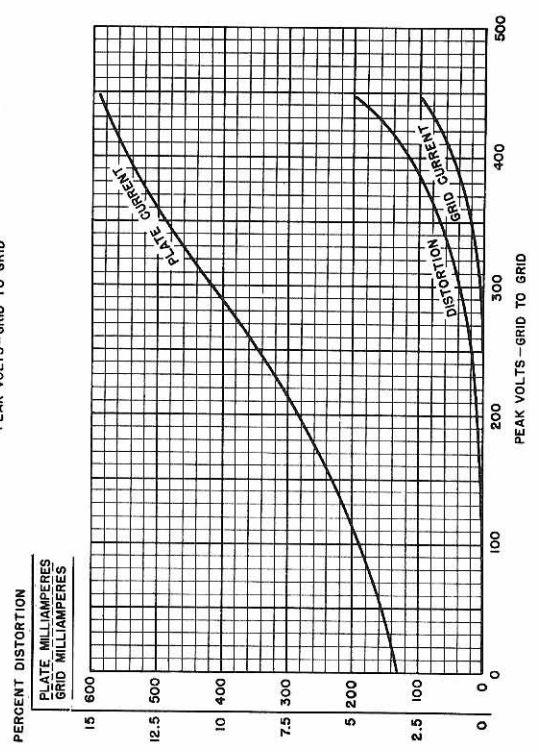
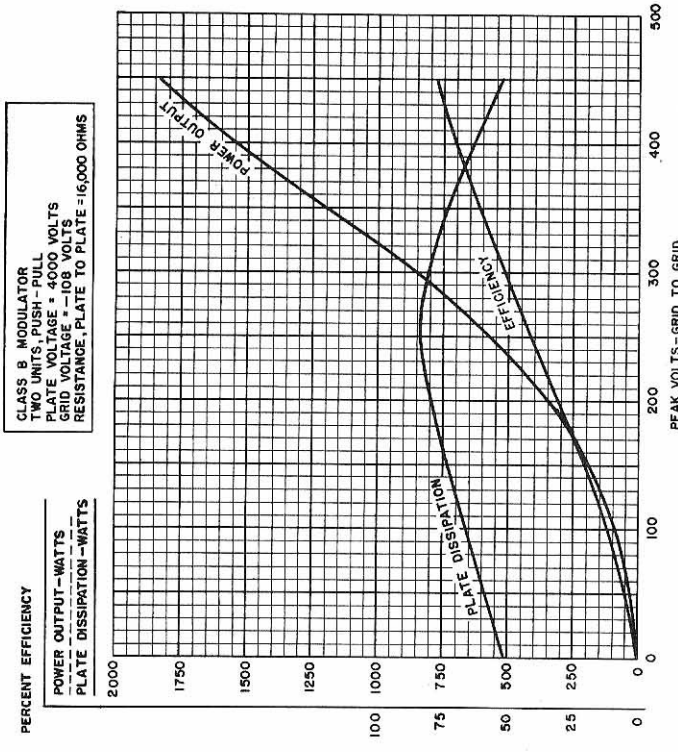
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- D.C. average value.
- Includes power transferred from driver stage.

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