

AMPEREX TUBE TYPE 5924A

The 5924A is a forced air-cooled three electrode tube designed for use as a power amplifier in TV and FM transmitters. The filament is thoriated tungsten. Maximum ratings apply up to 75 megacycles. At reduced ratings it may be operated up to 220 megacycles. All external surfaces are silver plated and the anode cooler shell is brazed to the cooler fins.

GENERAL CHARACTERISTICS

ELECTRICAL

	Min.	Bogey	Max.
Filament Voltage	12.0	12.6	13.2 volts
Filament Current at Bogey Voltage	30	33	36 amperes
Amplification Factor ($I_b=1$ amp, $E_b=4000$ volts)	26	32	38
Peak Cathode Current ¹	—	—	10 amperes
Direct Interelectrode Capacitances			
Grid to Plate	9.5	11	12.5 μf
Grid to Filament	13	16	19 μf
Plate to Filament	0.2	0.3	0.4 μf

MECHANICAL

Mounting position: vertical with plate up or down

Max. Temperature of Seals 180°C

Cooling — forced air

COOLING CHARACTERISTICS (see curves)

Plate Dissipation (kilowatts)	Altitude (feet)	Inlet Air Temperature (°C)	Min. Air Flow (cu. ft./minute)	Inlet Air Pressure (inches water)
1	0	35	106	0.32
	0	45	109	0.32
	5000	35	131	0.35
	10000	25	145	0.39
3	0	35	183	0.90
	0	45	215	1.14
	5000	35	219	1.03
	10000	25	233	1.03
5	0	35	325	2.68
	0	45	378	3.55
	5000	35	396	3.19
	10000	25	410	3.10

ACCESSORIES

Filament Connector Amperex #S-3707

Grid Connector Amperex #S-3706

Air Flow Chamber Amperex #S-3705

Net Weight (approx.) 10 pounds

¹ Represents maximum usable cathode current for any condition of operation.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

R.F. Power Amplifier and Oscillator - Class C Telephony
Key-down conditions per tube without amplitude modulation²

Maximum Ratings, Absolute Values (per Tube)

	CCS
D.C. Plate Voltage	6000 volts max.
D.C. Grid Voltage	-1000 volts max.
D.C. Plate Current	1.3 amps max.
D.C. Grid Current	0.35 amp max.
Plate Input	9000 watts max.
Plate Dissipation	6000 watts max.

Typical Operation, Grounded-Filament Circuit

	CCS	CCS	CCS
Frequency	75	75	75 megacycles
D.C. Plate Voltage	6	5	4 kilovolts
D.C. Grid Voltage	-400	-300	-200 volts
Peak R.F. Grid Voltage	740	640	500 volts
D.C. Plate Current	1.5	1.5	1.37 amps
D.C. Grid Current	approximate	0.31	0.33 0.35 amps
Driving Power	210	190	160 watts
Power Output, approximate	6.9	5.6	4.0 kilowatts

Typical Operation, Grounded-Grid Circuit, Two Tubes

	CCS	CCS	CCS	CCS
Frequency ¹	75	110	110	220 megacycles
D.C. Plate Voltage	6	5	4	4 kilovolts
D.C. Grid Voltage	400	-90	200	200 volts
Peak R.F. Grid Voltage	740	640	500	450 volts
D.C. Plate Current	3	3	2.75	2.5 amps
D.C. Grid Current	approximate	0.62	0.66	0.70 0.40 amp
Driving Power	2240	1840	1350	760 watts
Power Output, approximate ²	13.5	12.1	8.6	5.6 kilowatts

Max. Ratings (per Tube)	Up to 75 Mc	Up to 110 Mc	Up to 220 Mc ¹
D.C. Plate Voltage	6000	5000	4000 volts
D.C. Plate Current	1.5	1.5	1.5 amps
Plate Input	9000	7500	5000 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 (per Tube)

	CCS
D.C. Plate Voltage	6000 volts max.
D.C. Plate Current	1.1 amps max.
Plate Input	6600 watts max.
Plate Dissipation	6000 watts max.

Typical Operation

	CCS	CCS
	6	5 kilovolts
D.C. Plate Voltage	-180	-145 volts
D.C. Grid Voltage	250	225 volts
Peak R.F. Grid Voltage	0.99	0.9 amp
D.C. Plate Current	140	130 watts
Driving Power, approximate ³	1.9	1.45 kilowatts
Power Output, approximate	Up to 75 Mc	Up to 110 Mc Up to 220 Mc ¹
Max. Ratings (per Tube)	6000	5000 4000 volts
D.C. Plate Voltage	1.1	1.1 0.9 amps
D.C. Plate Current	6600	5500 3600 watts
Plate Input		

Grid-Modulated R.F. Power Amplifier
Class C Television Service

Negative Modulation, Positive Synchronization

Maximum Ratings, Absolute Values (per Tube)

	CCS
D.C. Plate Voltage	6000 volts
D.C. Grid No. 1 Voltage	
White Level	1000 volts
Plate current (sync.)	1.9 amps
Plate Input (sync.)	11.4 kilowatts
Plate Dissipation	6 kilowatts
Grid Dissipation	120 watts

Typical Operation in Television Service at 75 Mc and Bandwidth of 5.25 Mc at 85% Antenna Current and 6 Mc at 70% Antenna Current (Two Tubes, Push-Pull)

D.C. Plate Voltage	6000 volts
D.C. Grid No. 1 Voltage	
Synchronizing Level	-200 volts
Pedestal Level	-300 volts
White Level	-350 volts
R.F. Grid No. 1 Voltage Peak to Peak Synchronization Level	1000 volts
D.C. Plate Current	
Synchronization Level	3.8 amps
Pedestal Level	2.6 amps
D.C. Grid Current, approximate	
Synchronization Level	0.5 amp
Pedestal Level	0.35 amp
Driving Power at Synchronization Level, approximate	250 watts
Power Output, approximate	
Synchronization Level	9 kilowatts
Pedestal Level	5.35 kilowatts

Max. Ratings (per Tube)	Up to 75 Mc	Up to 110 Mc	Up to 220 Mc ¹
D.C. Plate Voltage	6000	5000	4000 volts
Plate Current (sync.)	1.9	1.9	1.9 amps
Plate Input (sync.)	11.4	9.5	8.5 kw

¹ When using the tube above 110 megacycles, particular attention must be given to a careful design of installation, otherwise the tube may be damaged. Therefore, guarantee for tubes operating above 110 Mc can only be given after approval of the prototype circuit by Amperex.² Power transferred from driving stage included.³ At crest of audio-frequency cycle with modulation factor of 1.0

R.F. Amplifier - Class B Television Service

Negative Modulation and Positive Synchronization

Maximum Ratings, Absolute Values (per Tube)

	CCS
D.C. Plate Voltage	6000 volts max.
D.C. Grid Voltage	-1000 volts max.
D.C. Plate Current (sync.)	1.9 amps max.
Plate Input (sync.)	11,400 watts max.
Plate Dissipation (sync.)	6000 watts max.
Grid Dissipation (sync.)	120 watts max.

Typical Operation in Television Service at 75 Mc and
bandwidth of 5.25 Mc at 85% Antenna Current and 8 Mc
at 70% Antenna Current (Two tubes, Push-Pull)

C. Voltage	5000 volts
C. Grid Voltage	-200 volts
R.F. Grid Voltage Peak to Peak	
Synchronization Level	1000 volts
Pedestal Level	800 volts
White Level	0 volt
D.C. Plate Current	
Synchronization Level	3.8 amps
Pedestal Level	3 amps
White Level	0.2 amp
D.C. Grid Current	
Synchronization Level	0.5 amp
Pedestal Level	0.22 amp
White Level	0 amp
Driving Power at Synchroniza- tion Level, approximate	250 watts
Power Output, approximate	
Synchronization Level	9 kilowatts
Pedestal Level	5.35 kilowatts

	Up to 75 Mc	Up to 220 Mc
D.C. Plate Voltage	6000	5000 volts
D.C. Plate Current (sync.)	1.9	1.9 amps
Plate Input (sync.)	11.4	9.5 kilowatts

Typical Operation in Television Service at 216 Mc.

One tube in a coaxial cavity

(Bandwidth obtained by critical coupling to identical dummy cavity)

D.C. Plate Voltage	4000	5000* volts
D.C. Grid Voltage	-125	-140 volts
Peak R.F. Grid Voltage		
Synchronization Level	405	495 volts
Black Level	305	360 volts
White Level	0	0 volts
C. Plate Current		
Synchronization Level	1.59	1.90 amps
Black Level	1.3	1.53 amps
White Level	0.4	0.4 amps
D.C. Grid Current (approx.)		
Synchronization Level	0.35	0.35 amps
Black Level	0.125	0.125 amps
White Level	0	0 amps
Power Output (approx.)		
Synchronization Level	5.0	6.25 kilowatts
Black Level	3.0	3.53 kilowatts
Power Input		
Synchronization Level	7.15	9.50 kilowatts
Black Level	5.85	7.65

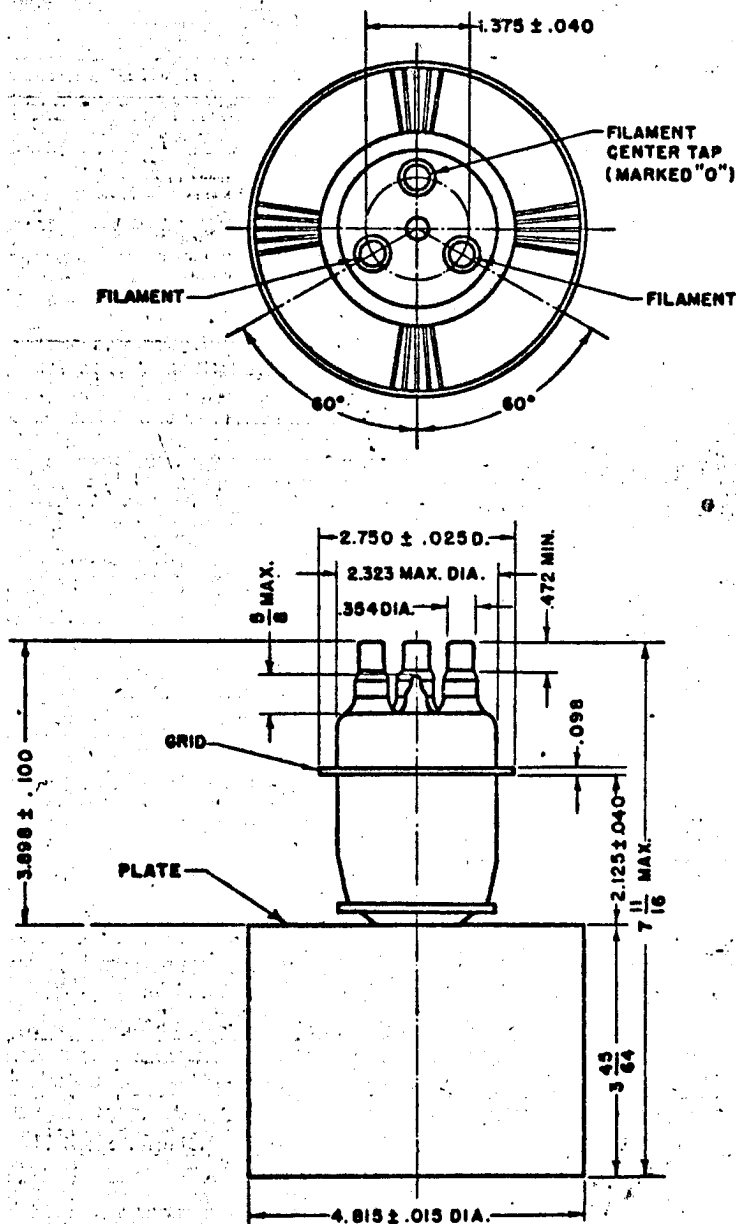
Electrical Data and Limits

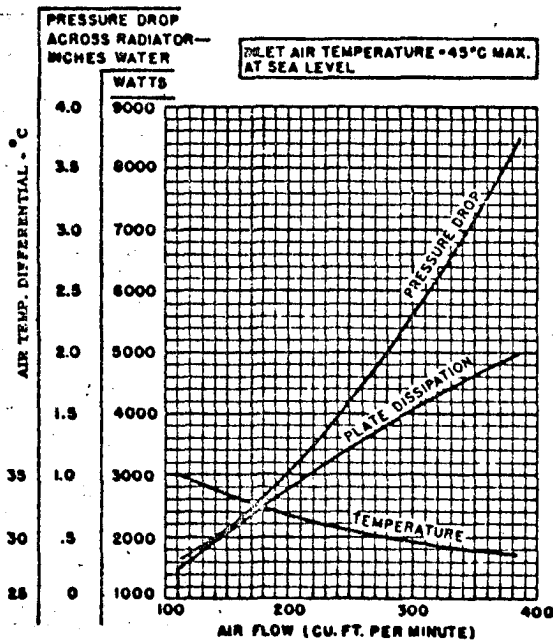
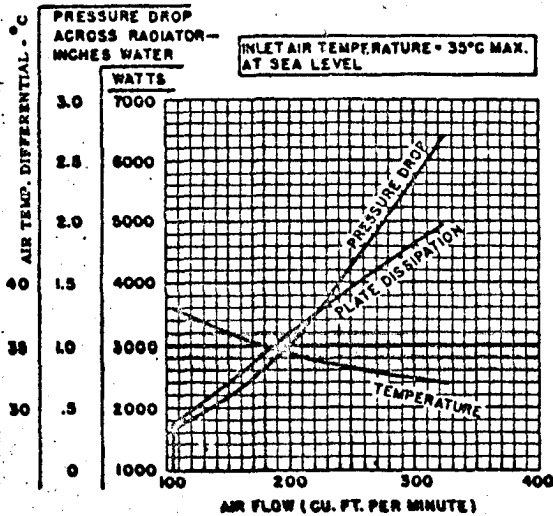
Characteristics	Description	Limits		
		Min.	Boozy	Max.
Grid Voltage ⁴	E _b = 1000 volts	E _c =	—	420 volts
	I _b = 6 amps			
Grid Current ⁴	E _b = 1000 volts	I _g =	—	2.8 amps
	I _b = 6 amps			
Plate Current	E _b = 6000 volts	I _p =	—	130 milliamps
	E _c = -185 volts			
Grid Current	E _b = 6000 volts	I _g =	—	40 microamps
	I _b = 0.85 amp			
Grid Voltage	E _b = 6000 volts	E _c =	67	94
	I _b = 0.85 amp			121 volts
Power Output	E _b = 6000 volts	P _{av} =	6	—
	I _b = 1.5 amps			— kilowatts
	E _c = -400 volts			
	I _g = 0.31 amp			
	f = 75 mc			

⁴ This data is given only for design purposes, not for measurements.

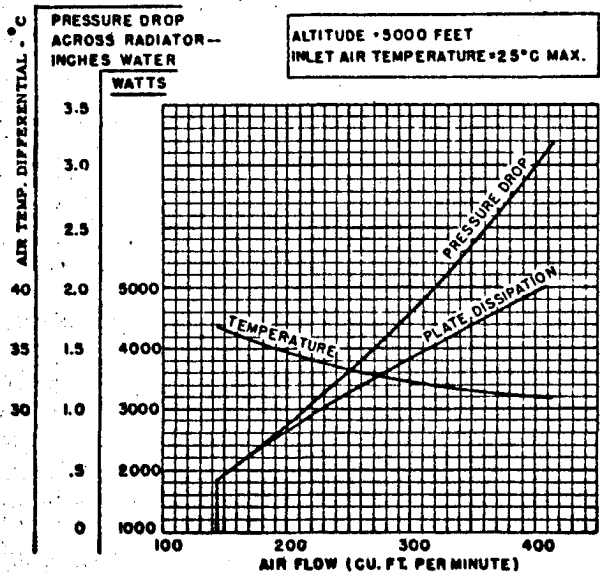
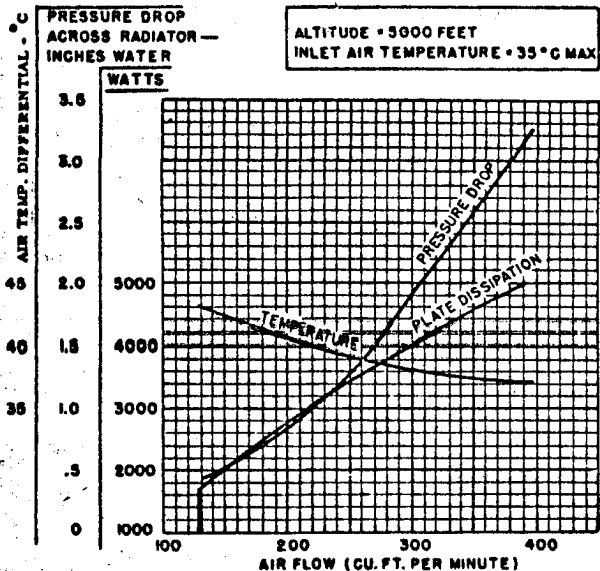
* NOTE: Maximum TV ratings up to 220 Mc are for 25 KW peak power output with 4 tubes operating in approved cavity construction.

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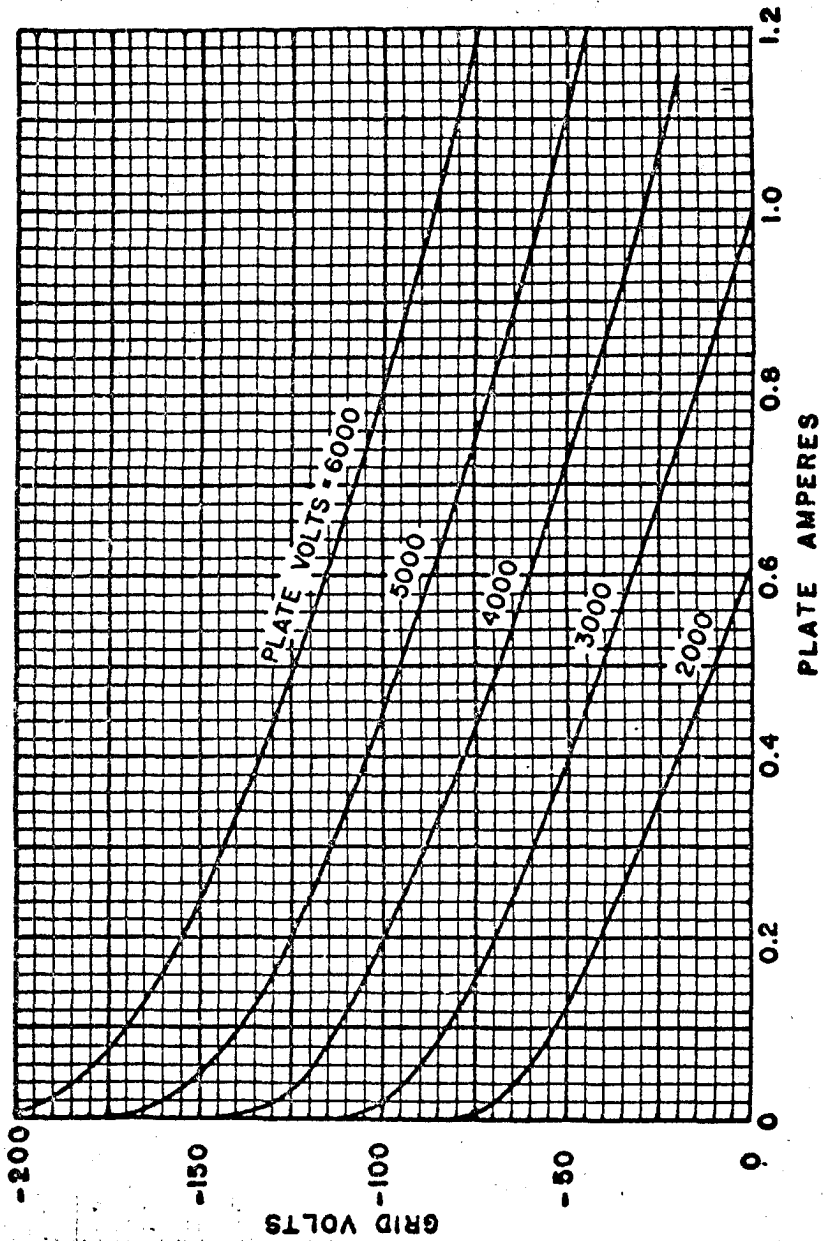




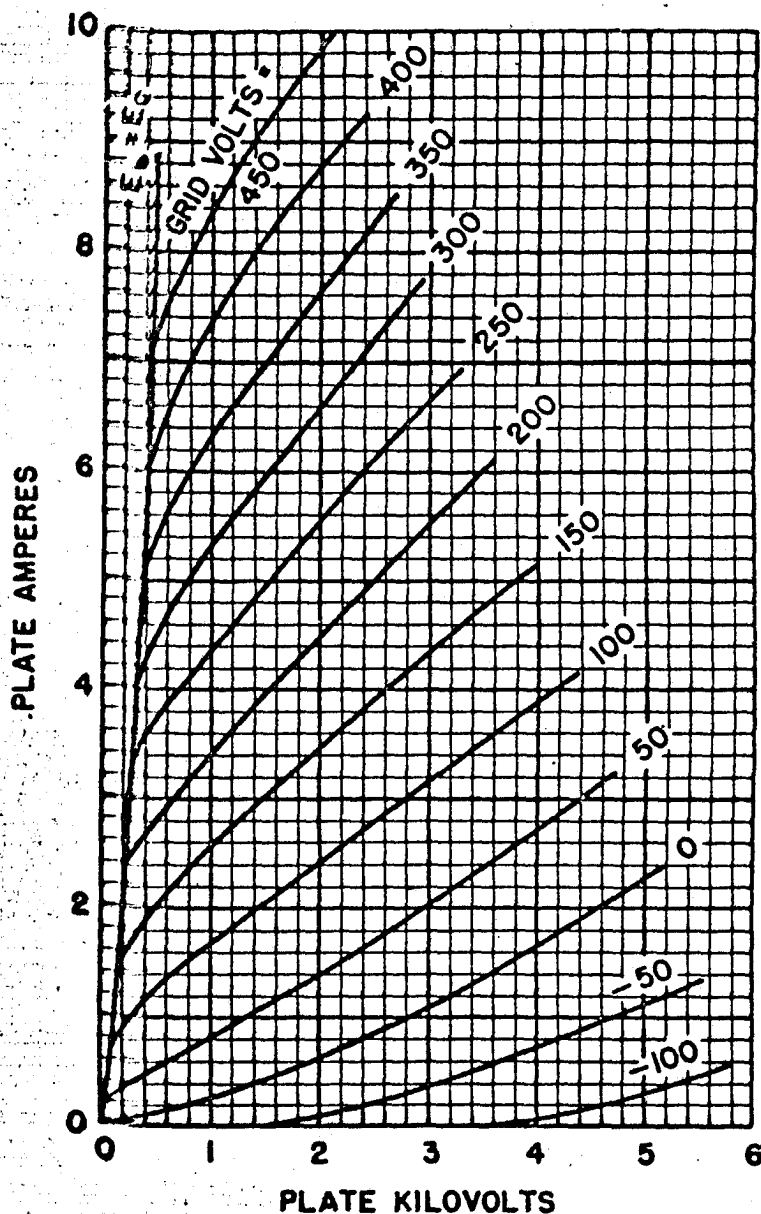
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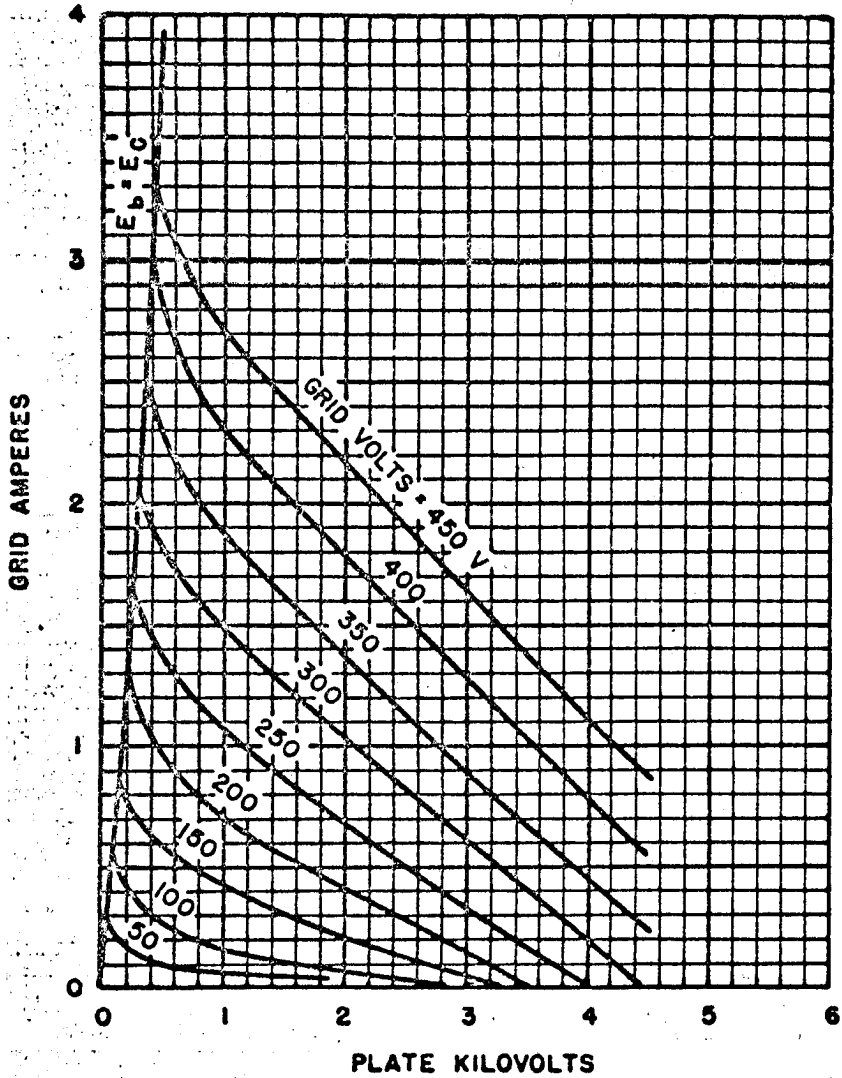


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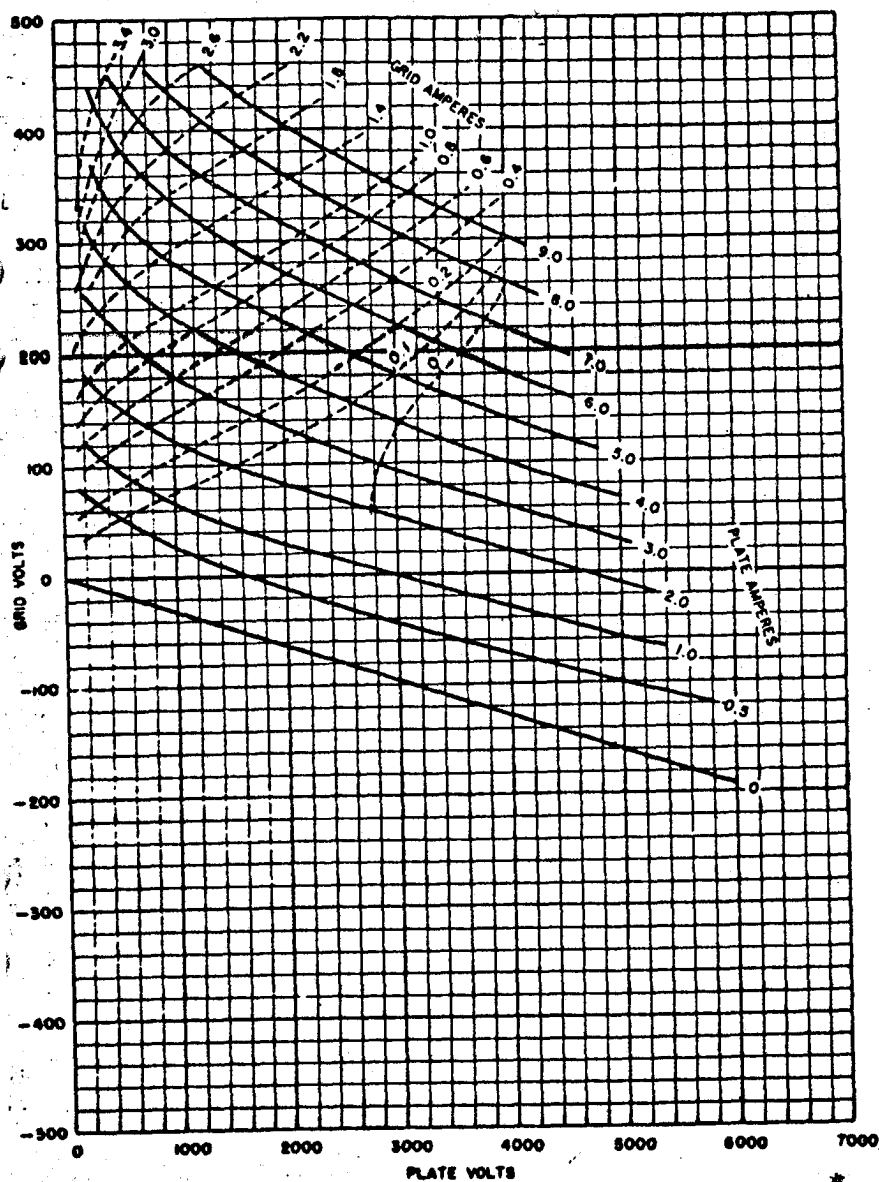


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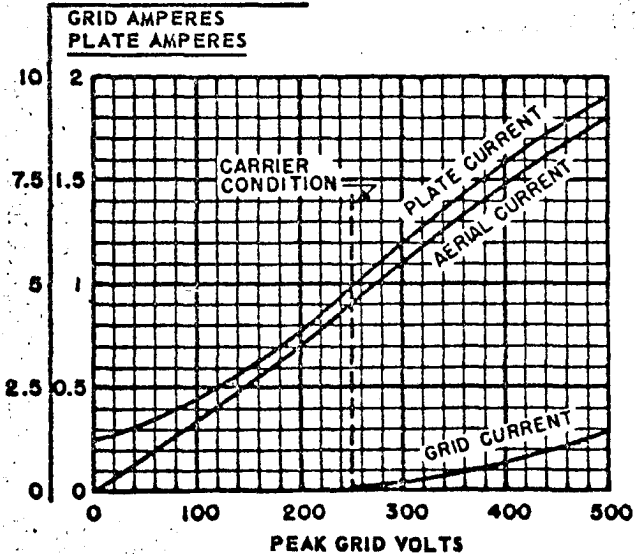
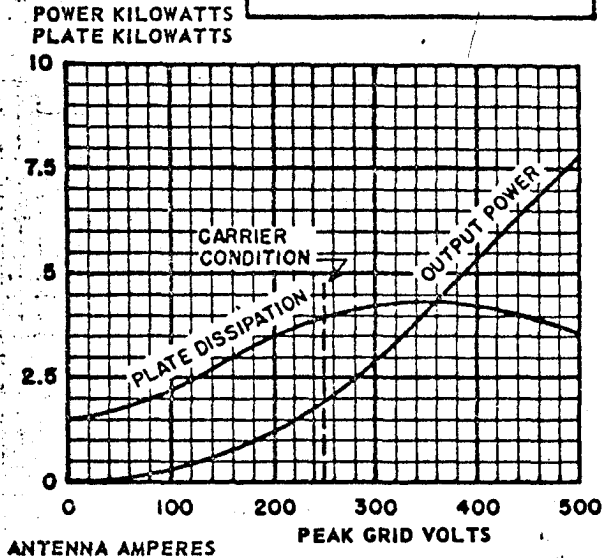




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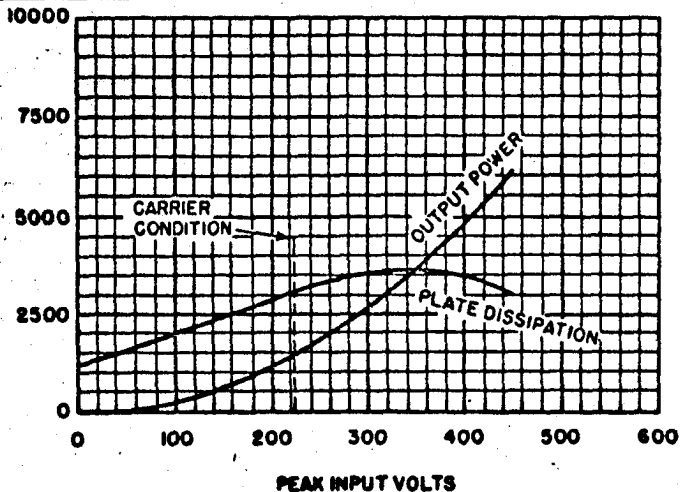
CLASS B TELEPHONY
 FREQUENCY = 75 MEGACYCLES
 PLATE VOLTAGE = 6000 VOLTS
 GRID VOLTAGE = -180 VOLTS



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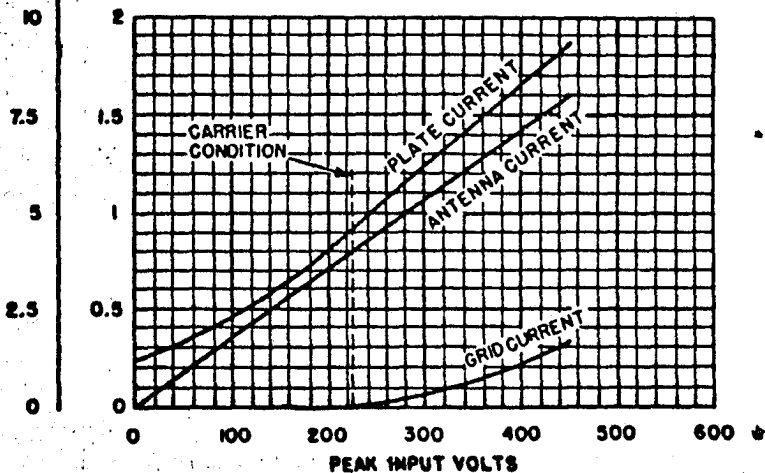
CLASS B TELEPHONY
WAVE LENGTH = 75 MC/SEC
PLATE VOLTAGE = 5000 VOLTS
GRID BIAS = -145 VOLTS

PLATE WATTS
POWER WATTS



ANTENNA AMPERES

GRID AMPERES
PLATE AMPERES



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