

AMPEREX TUBE TYPE 6075/AX9907

The 6075/AX9907 is a four-electrode, water-cooled tube designed for use as a R.F. power amplifier, modulator and frequency multiplier. The anode is capable of dissipating 3 kilowatts. The cathode is a thoriated tungsten filament. Maximum ratings apply up to 220 megacycles.

GENERAL CHARACTERISTICS

MECHANICAL DATA

Max. overall dimensions	
Length	6-5/16 inches
Length with water jacket	9½ inches
Diameter	2¾ inches
Mounting position	Vertical, anode down
Control Grid Connection	See note ²

WATER COOLING DATA

Plate dissipation (kilowatts)	Inlet water temperature ³ (° C)	Min. Water Flow (gal. per min.)	Inlet Pressure (lbs./sq. inch)
1	20	0.65	1.1
1	50	0.8	1.5
2	20	0.65	1.1
2	50	1.25	3.7
3	20	0.8	1.5
3	50	1.8	8

Air Cooling	See note ⁴
Max. Bulb Temperature	250° C
Max. Seal Temperature ⁴	180° C

ACCESSORIES

Water Jacket	Amperex #S-3737
Grid No. 2 Connector	Amperex #S-3706
Filament Connector	Amperex #S-3707
Net Weight—Tube (approx.)	14 oz.
Net Weight—Water Jacket (approx.)	1 lb., 5 oz.

ELECTRICAL DATA

Filament voltage	6.3 volts
Filament Current	32.5 amps
Filament Cold Resistance	0.02 ohms
Amplification factor (G ₂ - G ₁ Mu)	8.5
Transconductance (I _b = 2 amps)	19,000 micromhos
Direct Interelectrode Capacitances	
Input	23.5 μμf
Output	8.4 μμf
Plate to Control Grid	0.35 μμf
Peak cathode Current 1 (max.)	7 amps

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Plate and Screen Grid 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
(Frequencies up to 110 mc.)

	CCS
D.C. Plate Voltage	4000 max. volts
D.C. Grid No. 2 Voltage	800 max. volts
D.C. Grid No. 1 Voltage	-500 max. volts
D.C. Plate Current	0.9 max. amp
Plate Input	3.7 max. kilowatts
Plate Dissipation	2 max. kilowatts
Grid No. 2 Dissipation	100 max. watts ⁵
Grid No. 1 Dissipation	30 max. watts

Typical Operation

(Screen grid supply via a choke of 60 henrys)

	CCS
D.C. Plate Voltage	4000 volts
D.C. Grid No. 2 Voltage	800 volts
D.C. Grid No. 1 Voltage	-375 volts
Peak R.F. Grid No. 1 Voltage	625 volts
D.C. Plate Current	0.9 amp
D.C. Grid No. 2 Current	120 ma
D.C. Grid No. 1 Current	85 ma
Driving Power	48 watts
Power Output	2.7 kilowatts

R.F. Power Amplifier Class C Telephony

Key-down conditions per tube without amplitude modulation⁶

Maximum Ratings, Absolute Values
(Frequencies up to 110 mc.)

	CCS
D.C. Plate Voltage	5000 max. volts ⁷
D.C. Grid No. 2 Voltage	800 max. volts
D.C. Grid No. 1 Voltage	-500 max. volts
D.C. Plate Current	1.1 max. amps
Plate Input	5.5 max. kilowatts
Plate Dissipation	3 max. kilowatts
Grid No. 2 Dissipation	100 max. watts
Grid No. 1 Dissipation	30 max. watts

Typical Operation

Frequency	CCS 75	CCS 75	CCS 110	CCS 220 MC
D.C. Plate Voltage	4000	5000	5000	4000 volts
D.C. Grid No. 2 Voltage	800	800	800	800 volts
D.C. Grid No. 1 Voltage	-250	-250	-250	-250 volts
D.C. Plate Current	1.1	1.1	1.1	1.1 amps
D.C. Grid No. 2 Current	120	100	100	120 ma
D.C. Grid No. 1 Current	80	70	70	80 ma
Peak R.F. Grid No. 1 Voltage	500	480	480	500 volts
Driving Power	36	30	30	36 watts
Power Output	3.15	4.1	3.9	2.9 kilowatts

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

Negative Modulation, Positive Synchronization

Maximum Ratings, Absolute Values
(Frequencies up to 220 mc.)

	CCS
D.C. Plate Voltage ⁸	4000 max. volts
D.C. Grid No. 2 Voltage	800 max. volts
D.C. Grid No. 1 Voltage	-500 max. volts
D.C. Plate Current (sync.)	1.5 max. amps
Plate Input (sync.)	6 max KW
Plate Dissipation (sync.)	3 max. KW
Grid No. 2 Dissipation (sync.)	100 max. watts
Grid No. 1 Dissipation (sync.)	30 max. watts

Typical Operation Two Tubes Push-Pull

	CCS ^{10,12}	CCS ^{11,12}	CCS ^{8,11}
D.C. Plate Voltage	4000	4000	5000 volts
D.C. Grid No. 2 Voltage	800	800	800 volts
D.C. Grid No. 1 Voltage			
Synchronization level	-150	-150	-150 volts
Pedestal level	-230	-260	-260 volts
White level	-450	-450	-450 volts
R.F. Grid No. 1 Voltage			
peak to peak	850	850	900 volts ⁹
D.C. Plate Current			
Synchronization level	2.75	2.75	2.7 amps
Pedestal level	2.1	1.5	1.75 amps
D.C. Grid No. 2 Current			
Synchronization level	110	250	145 ma
Pedestal level	50	65	40 ma
D.C. Grid No. 1 Current			
Synchronization level	100	80	82 ma
Pedestal level	50	20	35 ma
Driving Power at			
Synchronization level	300-400	200-300	200-300 watts ¹³
Power Output			
Synchronization level	5	5.9	8 KW
Pedestal level	2.8	3.9	4.5 KW
Frequency	170-220	170-220	88 Mc

For Notes see Page 5

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CLASS AB₂ GROUNDED GRID LINEAR R.F. AMPLIFIER SINGLE SIDEBAND SUPPRESSED CARRIER OPERATION

Maximum Ratings, Absolute Values
(Frequencies up to 110 Mc)

DC Plate Voltage	CCS 5000 volts ⁶
DC Grid No. 2 Voltage	600 volts
DC Grid No. 1 Voltage	-500 volts
DC Plate Current	1.8 amps
Plate Input	8.2 kilowatts
Plate Dissipation	3 kilowatts
Grid No. 2 Dissipation	100 watts
Grid No. 1 Dissipation	30 watts

Typical Operation Single Tone and/or Two Tone Modulation

	CCS	CCS	CCS	CCS	CCS
DC Plate Voltage	5000	4500	4000	3500	3000 volts
DC Grid No. 2 Voltage	600	600	600	600	600 volts
DC Grid No. 1 Voltage	-50	-50	-50	-50	-50 volts
Zero Signal DC Plate Current	350	330	310	300	280 mA
Zero Signal DC Grid NO. 2 Current	2	2	2	3	3 mA
Effective RF Load Resistance	1600	1600	1300	1400	1500 ohms

Single Tone Modulation

Max Signal DC Plate Current	1.63	1.43	1.45	1.25	1.06 amps
Max Signal DC Grid No. 2 Current	110	95	95	93	103 mA
Max Signal DC Grid No. 1 Current	95	71	76	57	41 mA
Max Signal Peak RF Cathode Voltage	275	250	240	220	190 volts
Max Signal Driving Power	475	374	365	298	211 watts
Max Signal Plate Power Output	5350+428	4100+340	3500+320	2700+260	1975+186 watts
Max Signal Driver Feedthru Power	428	340	320	260	186 watts
Cathode Impedance	80	82	83	85	88 ohms

Two Tone Modulation

Average DC Plate Current	1110	990	1000	830	710 mA
Average DC Grid No. 2 Current	42	37	30	29	29 mA
Average DC Grid No. 1 Current	44	34	32	24	19 mA
Max Resultant Peak RF Cathode Voltage	275	250	240	220	190 volts
Average Plate Power Output	2675+214	2050+170	1750+160	1350+130	988+93 watts
Peak Envelope Plate Power Output	5350+428	4100+340	3500+320	2700+260	1975+186 watts
Average Driver Feedthru Power	214	170	160	130	93 watts
Peak Envelope Feedthru Power	428	340	320	260	186 watts
3rd Order Intermodulation Distortion	37	38	40	40+	40 db

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CLASS AB₂ LINEAR RF AMPLIFIER SINGLE SIDEBAND SUPPRESSED CARRIER OPERATION

Maximum Ratings, Absolute Values
(Frequencies up to 110 Mc)

DC Plate Voltage	CCS 5000 volts ⁶
DC Grid No. 2 Voltage	800 volts
DC Grid No. 1 Voltage	-500 volts
DC Plate Current	1.8 amps
Plate Input	8.2 kilowatts
Plate Dissipation	3 kilowatts
Grid No. 2 Dissipation	100 watts
Grid No. 1 Dissipation	30 watts

Typical Operation Single Tone and/or Two Tone Modulation

	CCS	CCS	CCS	CCS	CCS	CCS
DC Plate Voltage	5000	5000	4500	4000	3500	3000 volts
DC Grid No. 2 Voltage	800	800	800	800	800	800 volts
DC Grid No. 1 Voltage	-100	-100	-100	-100	-100	-90 volts
Zero Signal DC Plate Current	180	180	155	140	125	170 mA
Zero Signal DC Grid No. 2 Current	1	1	1	1	1	1 mA
Effective RF Load Resistance	1500	2100	1450	1170	1200	1350 ohms

Single Tone Modulation

Max Signal DC Plate Current	See Note 15	1.40	1.63	1.65	1.43	1.14 amps
Max Signal DC Grid No. 2 Current		110	120	113	106	94 mA
Max Signal DC Grid No. 1 Current		77	114	120	87	45 mA
Max Signal Peak RF Grid Voltage		310	350	360	320	255 volts
Max Signal Driving Power		22	36	39	25	11 watts
Max Signal Plate Power Output		4950	3700	3800	2900	2000 watts

Two Tone Modulation

Average DC Plate Current	1105	900	1050	1055	890	755 mA
Average DC Grid No. 2 Current	55	39	50	60	38	34 mA
Average DC Grid No. 1 Current	59	31	50	56	34	20 mA
Max Resultant Peak RF Grid Voltage	370	310	350	360	320	255 volts
Average Plate Power Output	2875	2475	2350	1900	1450	1025 watts
Peak Envelope Plate Power Output	5750	4950	4700	3800	2900	2050 watts
3rd Order Intermodulation Distortion	27	25	25	25	26	27 db

For Notes see page 5

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R.F. Power Amplifier Class B - Television Service Negative Modulation, Positive Synchronization

Maximum Ratings, Absolute Values
(Frequencies up to 220 mc.)

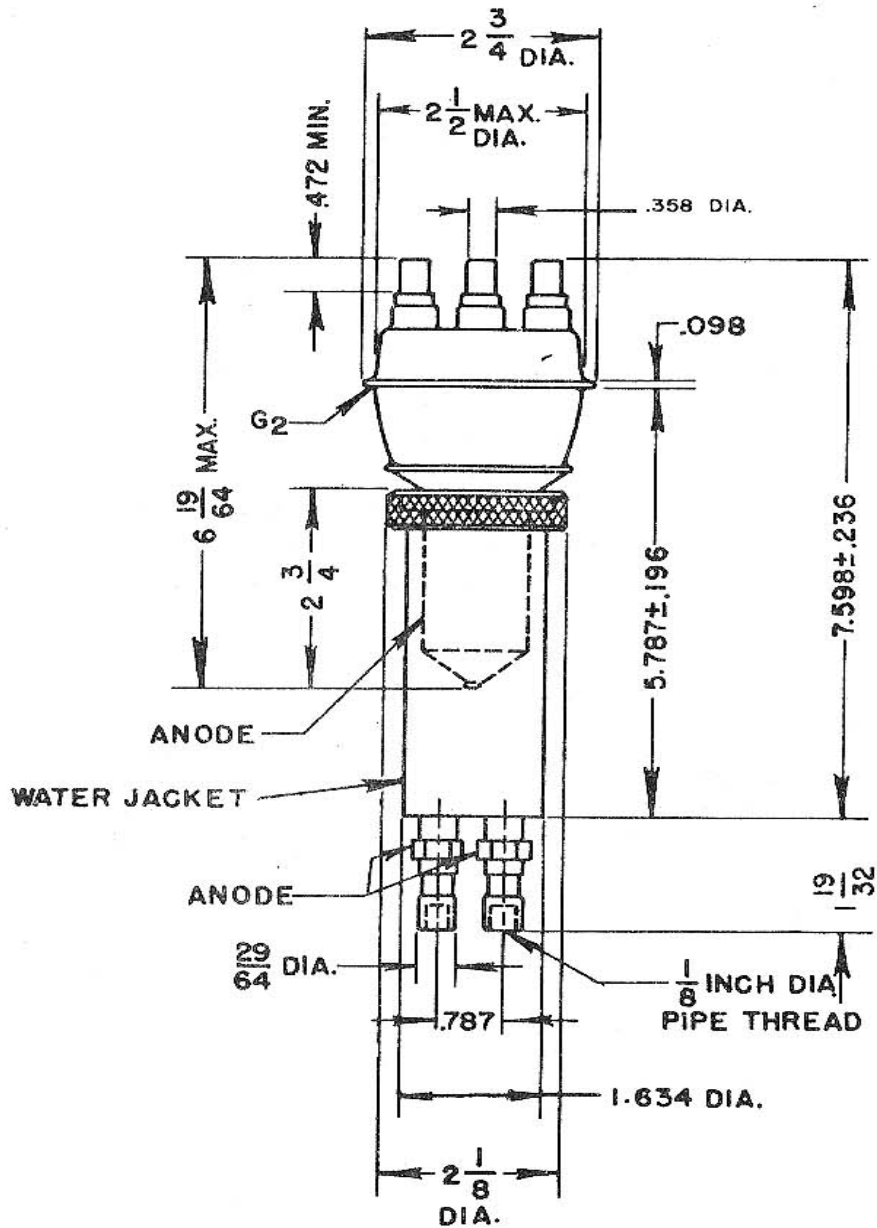
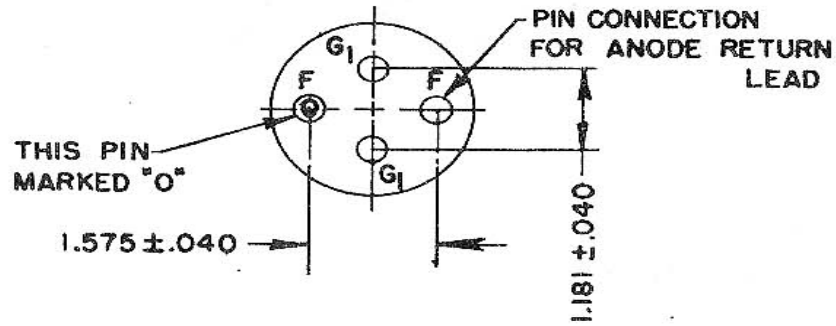
	CCS
D.C. Plate Voltage ⁸	4000 volts max
D.C. Grid No. 2 Voltage	800 volts max
D.C. Plate Current (sync.)	1.5 amps max
Plate Input (sync.)	6 kilowatts max
Plate Dissipation (sync.)	3 kilowatts max
Grid No. 2 Dissipation (sync.)	100 watts max
Grid No. 1 Dissipation (sync.)	30 watts max

Typical Operation Two Tubes, Push-Pull

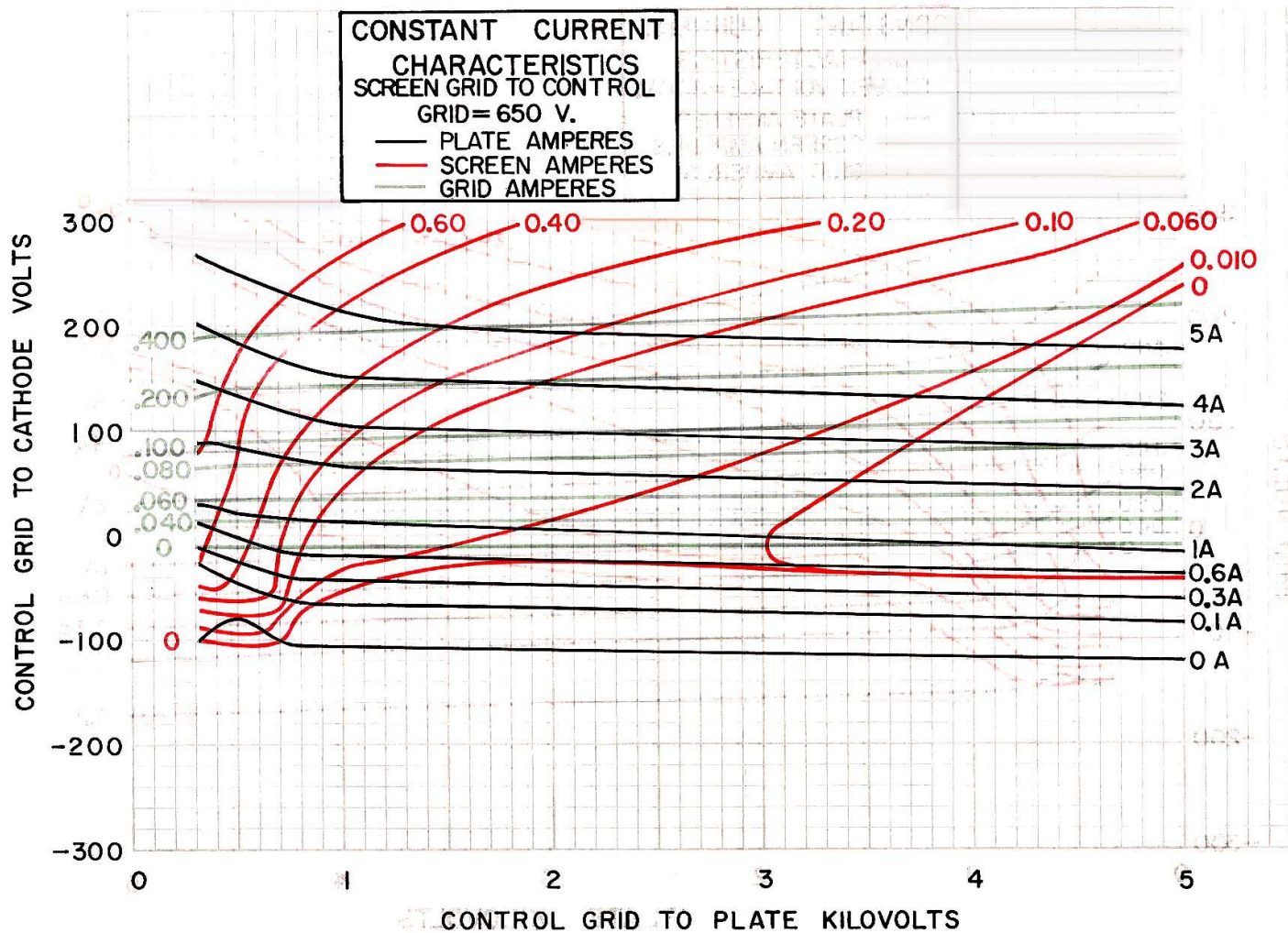
	CCS ¹⁴		CCS ¹⁴
D.C. Plate Voltage	4000 volts	D.C. Grid No. 2 Current	
D.C. Grid No. 2 Voltage	800 volts	Synchronization Level	110 ma
D.C. Grid No. 1 Voltage	-150 volts	Pedestal Level	50 ma
R.F. Grid No. 1 Voltage		D.C. Grid No. 1 Current	
Peak to Peak		Synchronization Level	100 ma
Synchronization Level ⁹	850 volts	Pedestal Level	50 ma
Pedestal Level ⁹	700 volts	Driving Power at	
D.C. Plate Current		Synchronization Level ¹³	300-400 watts
Synchronization Level	2.75 amps	Power Output	
Pedestal Level	2.1 amps	Synchronization Level	5 kilowatts
		Pedestal Level	2.8 kilowatts
		Frequency	170-220 mc

- ¹ Represents maximum usable cathode current for any condition of operation.
- ² Both pins must be used to make connection to the control grid at frequencies above 30 mc.
- ³ The maximum permissible value of the inlet temperature is 50°C.
- ⁴ To keep the temperature of the seals below the value as shown above, it may be necessary to direct an air flow of sufficient velocity to the seals. At frequencies below 75 mc. and a plate voltage below 4 kv, this air cooling will, in general, not be necessary (in the case of R.F. Class C plate and screen grid modulation, below 3.2 kv) At a plate voltage of 5 kv, air cooling at all frequencies is necessary.
- ⁵ For all other modulation methods the grid No. 2 dissipation is max. 65 watts.
- ⁶ Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of the carrier conditions.
- ⁷ At 220 Mc the D.C. plate Voltage = 4000 volts max. For other frequencies see derating curve
- ⁸ Up to 88 Mc., a D.C. Plate Voltage of 5000 volts is allowed.
- ⁹ Measured by increasing fixed bias until no grid current flows.
- ¹⁰ Wide band; 6.5 Mc bandwidth at -1.5 db or 12 Mc at -3 db.
- ¹¹ Narrow band; 7.5 Mc bandwidth at -3 db.
- ¹² The values of bandwidth are based on measurements on a circuit with a single LC-section.
- ¹³ Driving Power is accounted for largely by circuit losses. The indicated driving power is required to take care of losses in damping resistors, circuit losses and tube driving power.
- ¹⁴ Bandwidth; 6.5 Mc at -1.5 db. or 12 Mc at -12 Mc at -3 db. The values of bandwidth are based on measurements on a circuit with a single LC-section.
- ¹⁵ Single tone operation is not permissible at this two tone rating.

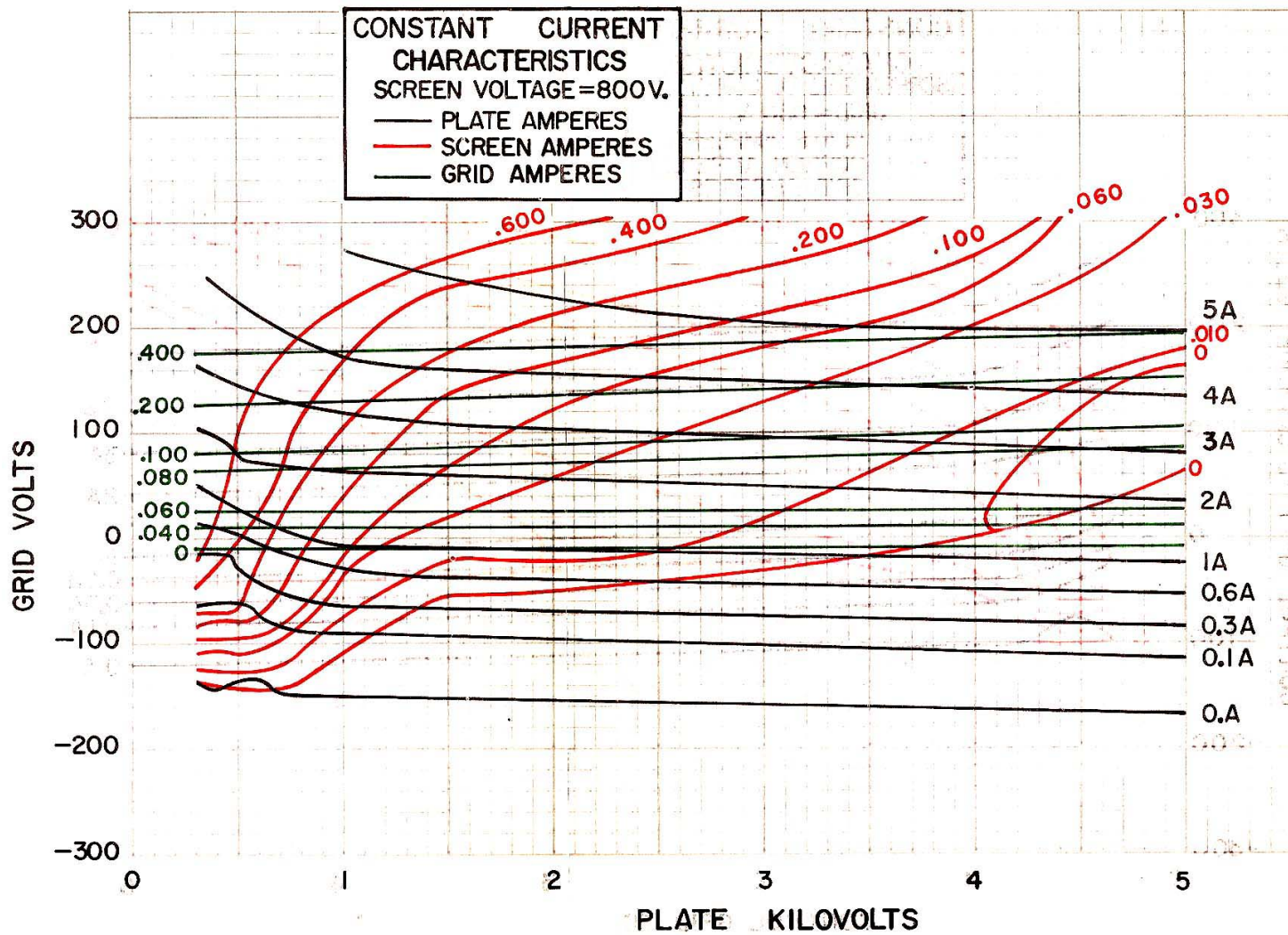
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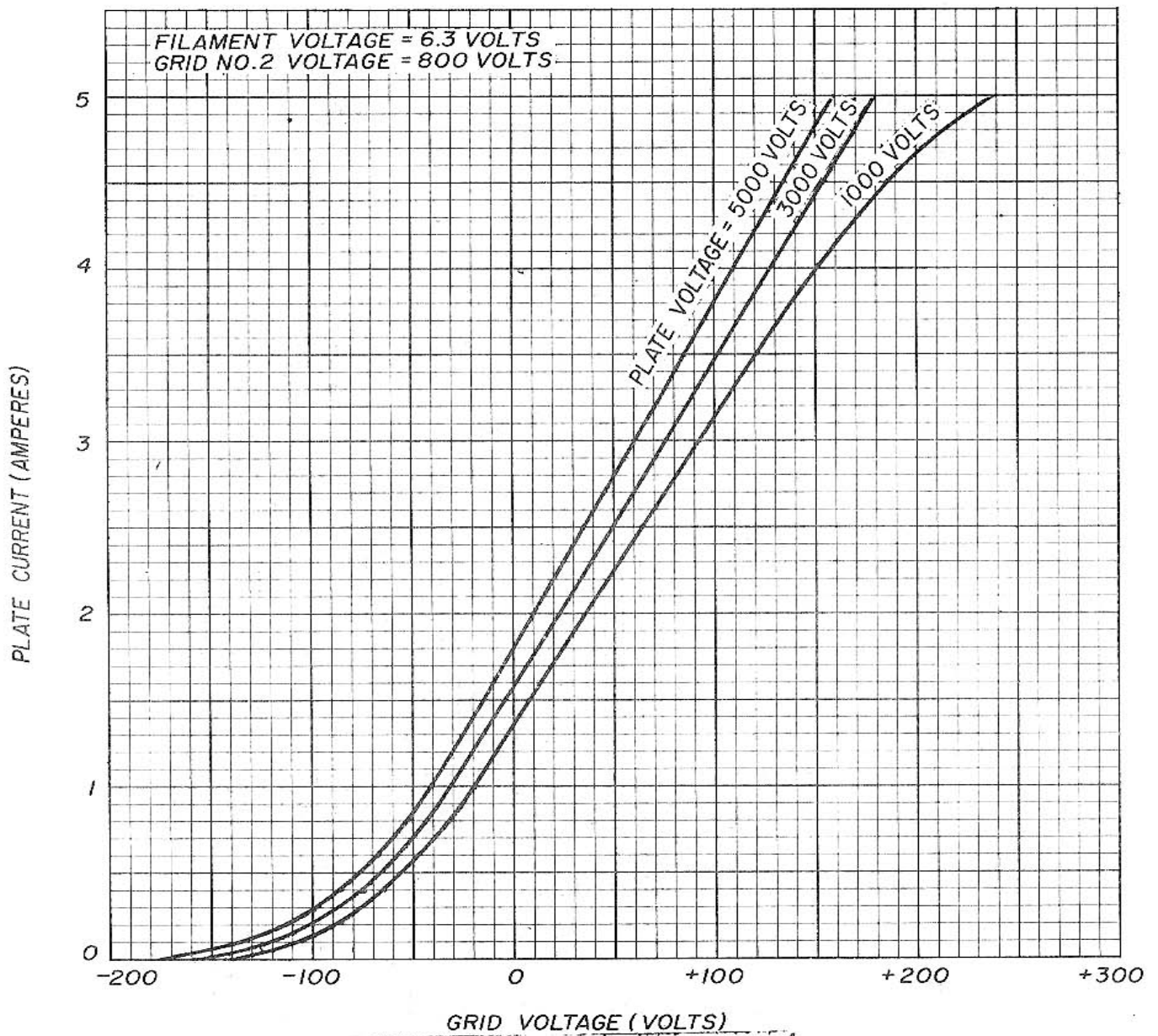


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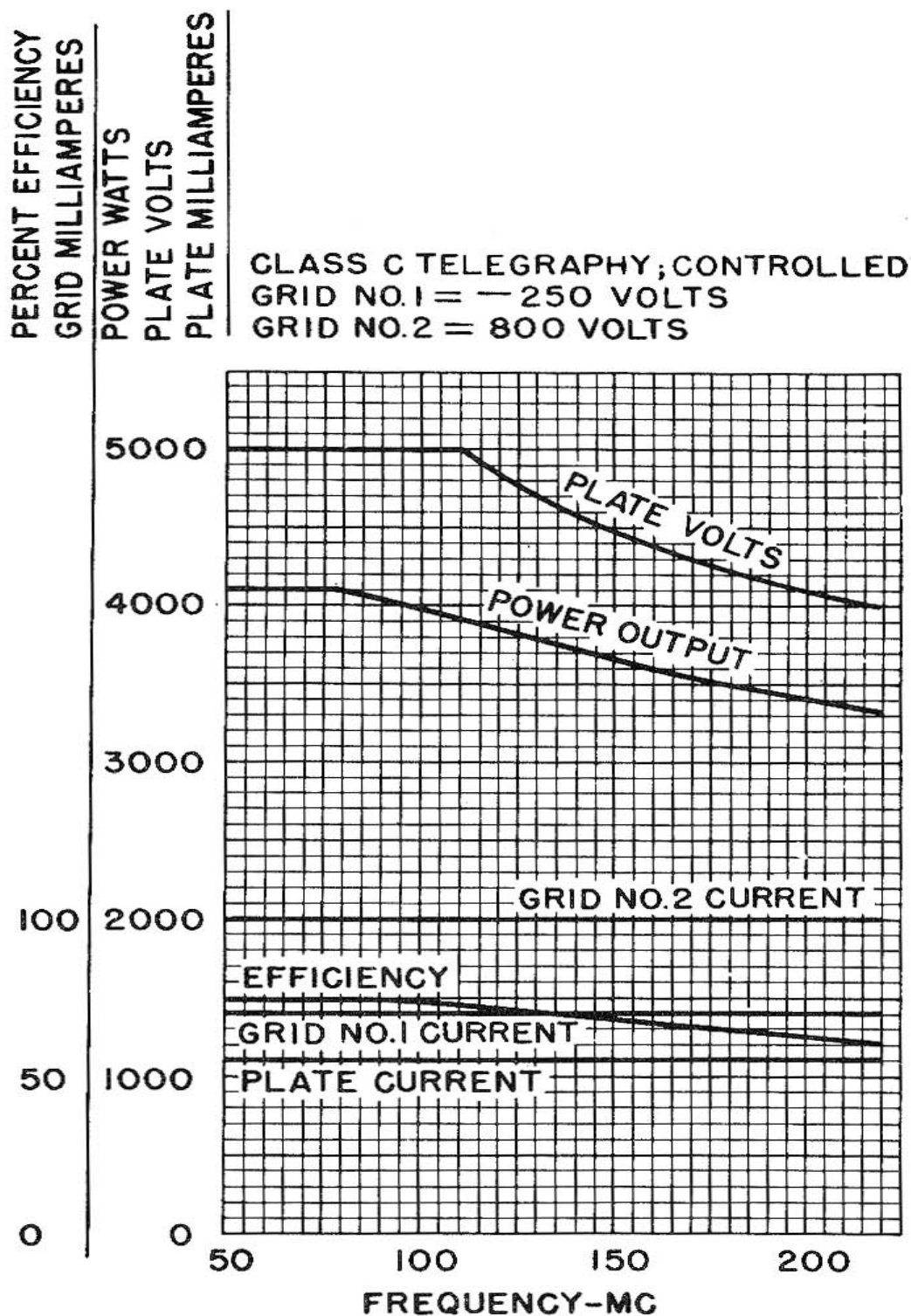


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TRANSFER CHARACTERISTICS



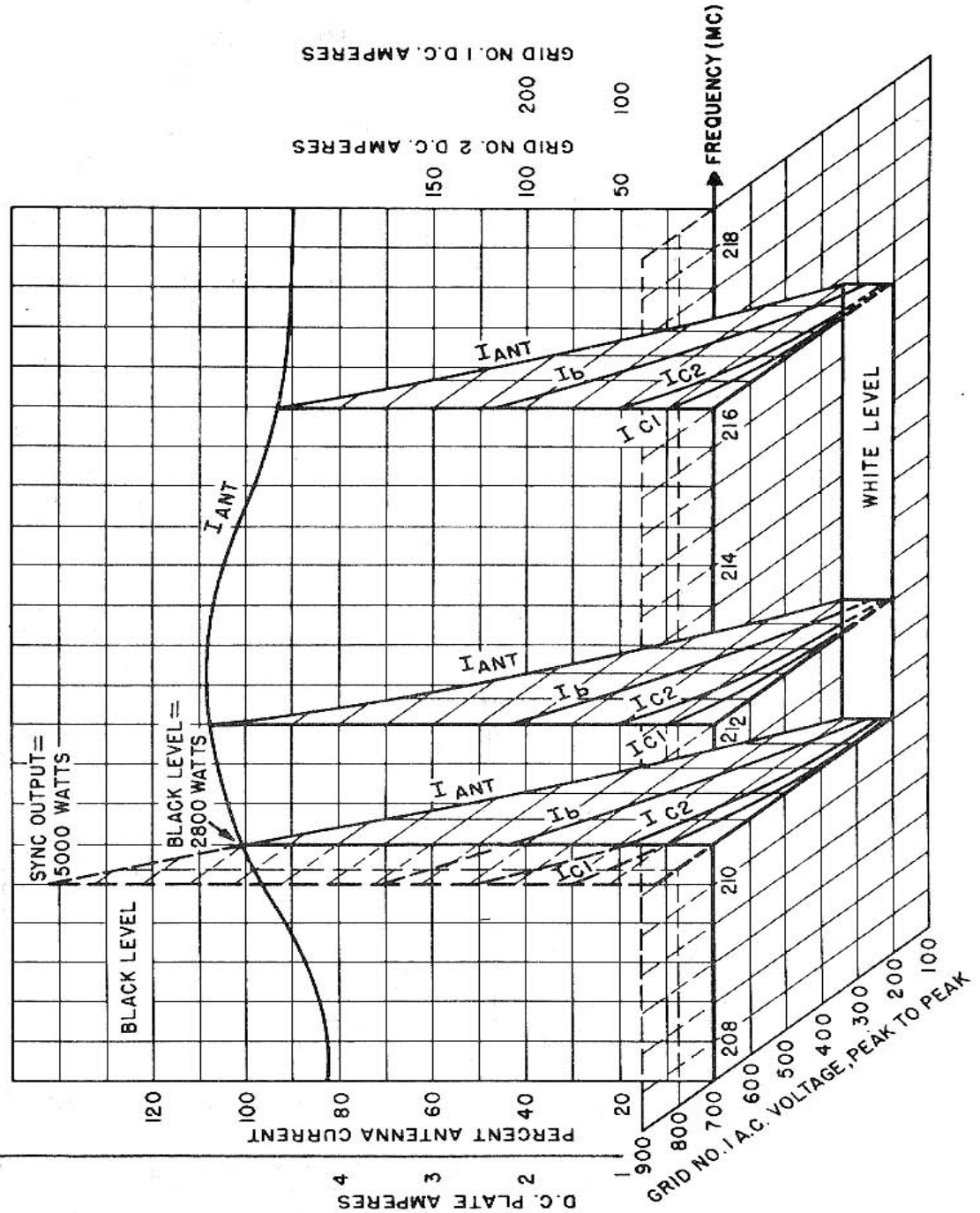
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GRID MODULATED H.F. CLASS B AMPLIFIER—TV SERVICE (2 TUBES, PUSH—PULL)

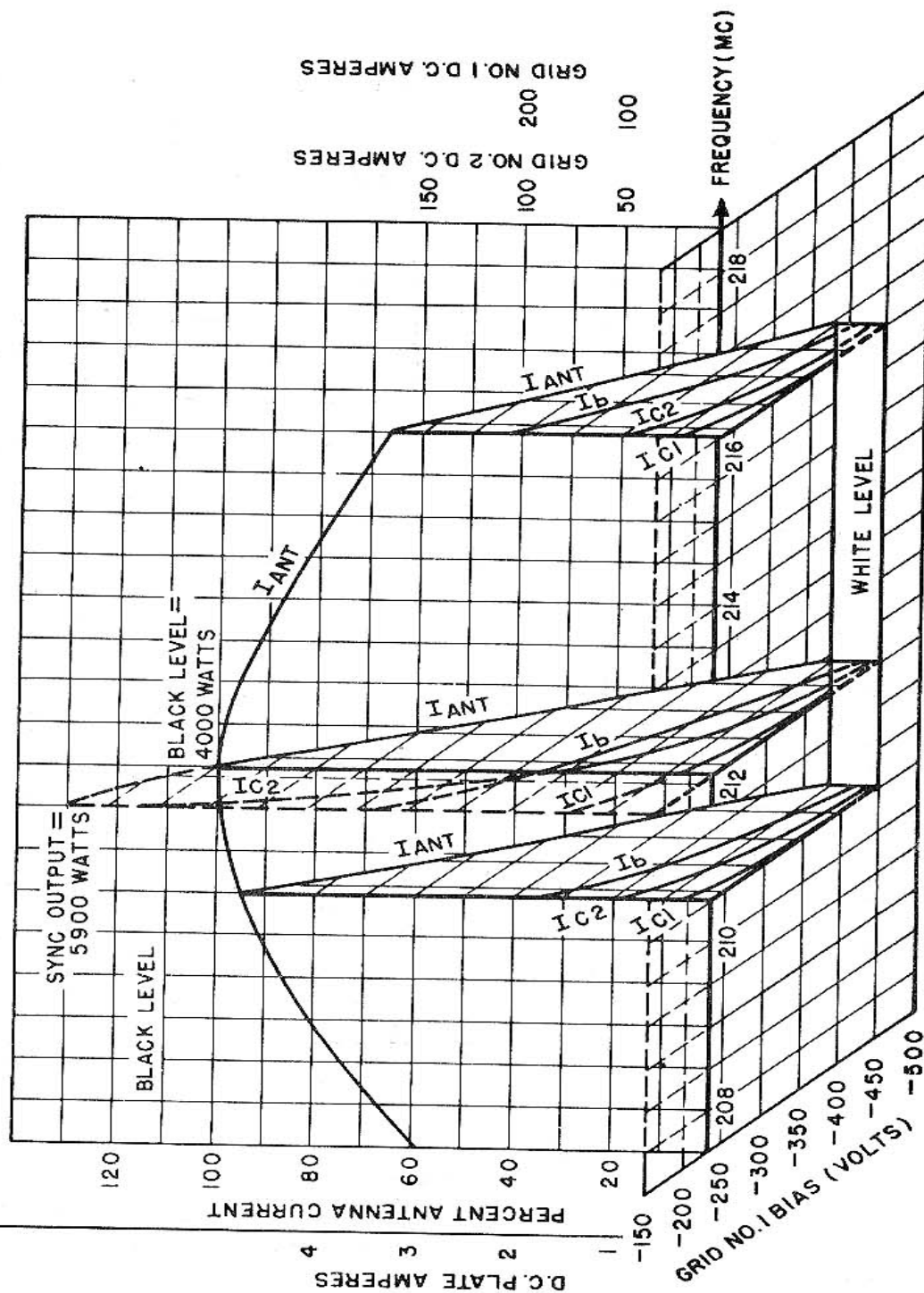
PLATE VOLTAGE = 4000 VOLTS
GRID NO. 2 VOLTAGE = 800 VOLTS
GRID NO. 1 BIAS = 150 VOLTS



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GRID MODULATED H.F. CLASS C AMPLIFIER—T.V. SERVICE (2 TUBES, PUSH—PULL)

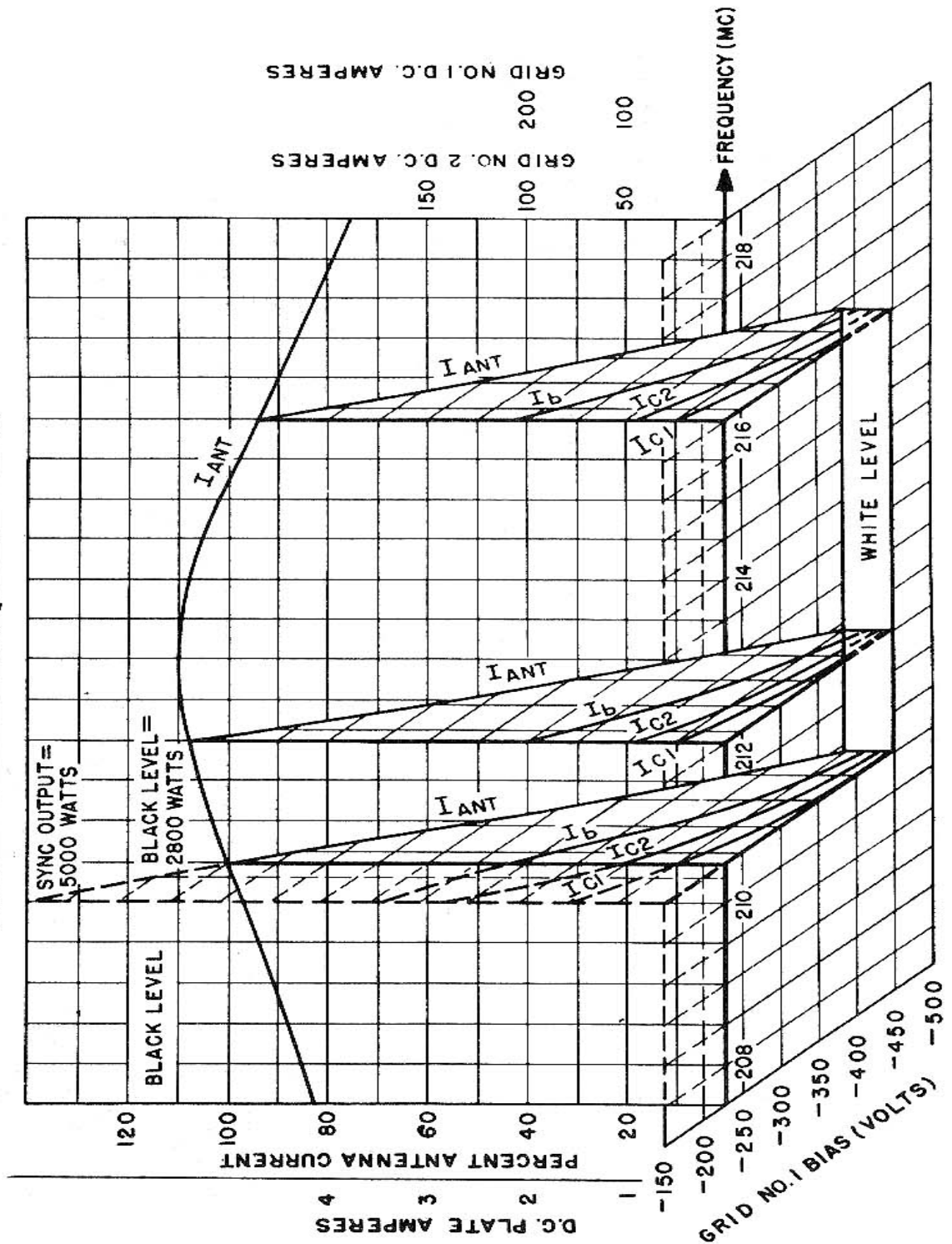
PLATE VOLTAGE = 4000 VOLTS
GRID NO. 2 VOLTAGE = 800 VOLTS
GRID NO. 1 A.C. VOLTAGE = 850 VOLTS, PEAK TO PEAK



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GRID MODULATED H.F. CLASS C AMPLIFIER — T.V. SERVICE (2 TUBES, PUSH-PULL)

PLATE VOLTAGE=4000 VOLTS
GRID NO. 2 VOLTAGE=800 VOLTS
GRID NO. 1 A.C. VOLTAGE=850 VOLTS, PEAK TO PEAK



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