

AMPEREX TUBE TYPE 6077

The 6077 is a three-electrode water-cooled tube designed for use as a radio-frequency power amplifier, oscillator and modulator. The anode is capable of dissipating 50 kilowatts in class C telegraphy during Continuous Commercial Service. In radio-frequency class B operation, a plate dissipation of 100 kilowatts may be tolerated. The cathode is a thoriated-tungsten filament. Maximum ratings apply up to 15 megacycles. At reduced ratings it may be operated up to 30 megacycles.

GENERAL CHARACTERISTICS

ELECTRICAL DATA

	Min.	Bogey	Max.	
Filament Voltage	16.6	17.5	18.4	volts
Filament Current at Bogey Voltage	180	196	212	amperes
Filament Starting Current ¹	—	—	420	amperes
Filament Cold Resistance	—	0.012	—	ohms
Amplification Factor (Ib=5 amps., Eb=10 kv.)	23	27	31	
Peak Cathode Current ²	—	—	120	amperes
Direct Interelectrode Capacitances				
Grid-Plate	77	86	95	μf
Grid-Filament	98	116	134	μf
Plate-Filament	2.5	3.4	4.3	μf

MECHANICAL DATA

Mounting Position vertical, anode down

COOLING DATA³

	30		50		100		
Plate Dissipation	20	50	20	50	20	50	° C.
Inlet Temperature	6.6	12	8.5	17.0	15	32	min. gpm
Water Flow	2.2	6.6	3.7	12.5	8.8	44	max. psi
Water Pressure							
Inlet Water Temperature							max. 50° C.

Air Cooling: Above 6 megacycles the anode-seal and grid-seal must be cooled. (Air supply through the anti-corona ring, attached to the tube.) Air flow must be applied before or simultaneously with filament voltage.

Air Flow required (at 30 megacycles) min. 95 cfm
 Pressure 20 inches water
 Glass Temperature at Seals max. 180° C.
 Net Weight (approx.) 31 Pounds

ACCESSORIES

Water Jacket Amperex #S-3738
 Filament Connector Amperex #S-3739

¹Peak value.
²Represents maximum usable cathode current (plate current plus grid current) for any condition of operation.
³Water flow must be started before filament voltage is applied, and continued for 5 minutes after filament voltage is removed.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

Audio-Frequency Power Amplifier and Modulator—Class B

Maximum Ratings, Absolute Values

	CCS
D.C. Plate Voltage	12 kilovolts max.
Maximum Signal D.C. Plate Current ¹	12 amperes max.
Maximum Signal Plate Input ¹	162 kilowatts max.
Plate Dissipation	50 kilowatts max.

Typical Operation

Unless otherwise specified, values are for two tubes.

	CCS	CCS	CCS
D.C. Plate Voltage	8	8.5	9 kilovolts
D.C. Grid Voltage	—300	—325	—350 volts
Peak A.F. Grid to Grid Voltage	1120	1200	1300 volts
Zero Signal D.C. Plate Current	0.5	0.5	0.5 amperes
Maximum Signal D.C. Plate Current	8.2	8.8	9.6 amperes
Effective Load Resistance Plate to Plate	2210	2120	2080 ohms
Maximum Signal Driving Power, approximate	0.5	0.6	0.8 kilowatts
Maximum Signal Power Output, approximate	46.8	54	62 kilowatts
D.C. Plate Voltage	10	10	12 kilovolts
D.C. Grid Voltage	—400	—375	—450 volts
Peak A.F. Grid to Grid Voltage	1460	1480	2060 volts
Zero Signal D.C. Plate Current	0.4	1.0	1.3 amperes
Maximum Signal D.C. Plate Current	10.8	13.2	24 amperes
Effective Load Resistance, Plate to Plate	2060	1700	1200 ohms
Maximum Signal Driving Power, approximate	1	1.2	4.8 kilowatts
Maximum Signal Power Output, approximate	77	93	202 kilowatts

Radio-Frequency 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	12 kilovolts max. ²
D.C. Plate Current	12.5 amperes max.
Plate Input	150 kilowatts max. ²
Plate Dissipation	100 kilowatts max.

Typical Operation

	CCS
D.C. Plate Voltage	12 kilovolts
D.C. Grid Voltage	—420 volts
Peak R.F. Grid Voltage	700 volts
D.C. Plate Current	12.2 amperes
D.C. Grid Current, approximate	0.5 amperes
Driving Power, approximate ³	5.7 kilowatts
Power Output, approximate	51.5 kilowatts

Plate-Modulated Radio-Frequency 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	10 kilovolts max.
D.C. Grid Voltage	—1200 volts max.
D.C. Plate Current	9 amperes max.
D.C. Grid Current	3 amperes max.
Plate Input	90 kilowatts max.
Plate Dissipation	33 kilowatts max.

Typical Operation

	CCS
D.C. Plate Voltage	10 kilovolts
D.C. Grid Voltage	—1050 volts
Peak R.F. Grid Voltage	1750 volts
D.C. Plate Current	8.5 amperes
D.C. Grid Current, approximate	2.8 amperes
Driving Power, approximate	4.1 kilowatts
Power Output, approximate	65 kilowatts

Radio-Frequency Power Amplifier and Oscillator—Class C Telegraphy

Key-down conditions per tube without amplitude modulation¹

Maximum Ratings, Absolute Values

	CCS
D.C. Plate Voltage	12 kilovolts max. ²
D.C. Grid Voltage	—1250 volts max.
D.C. Plate Current	12 amperes max.
D.C. Grid Current	3 amperes max.
Plate Input	144 kilowatts max. ²
Plate Dissipation	50 kilowatts max.

Typical Operation

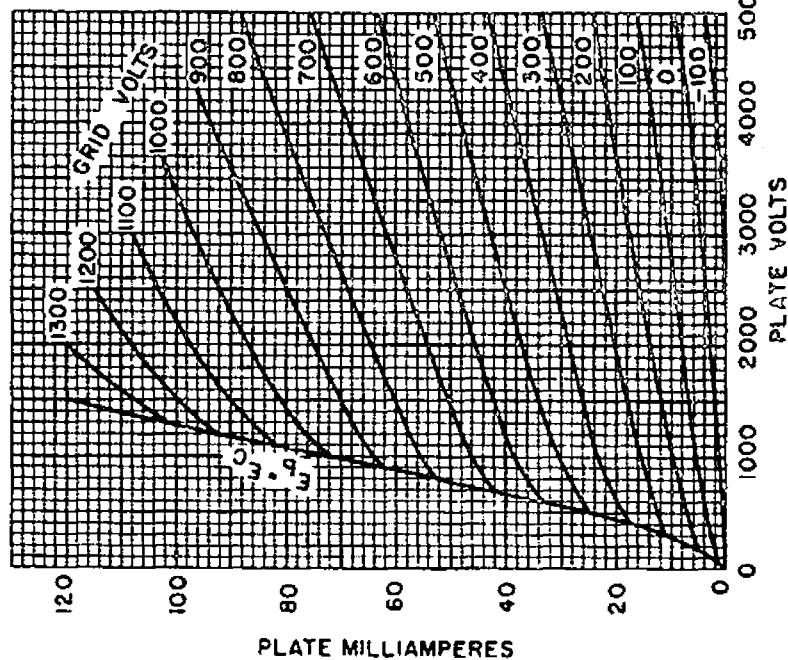
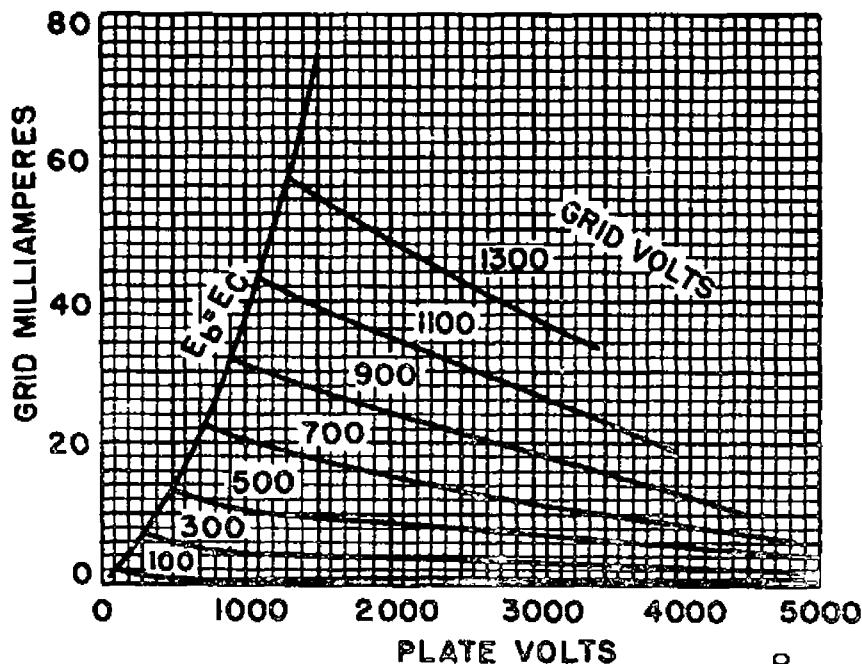
	CCS
D.C. Plate Voltage	12 kilovolts
D.C. Grid Voltage	—1000 volts
Peak R.F. Grid Voltage	1700 volts
D.C. Plate Current	12 amperes
D.C. Grid Current, approximate	2.25 amperes
Driving Power, approximate	3.5 kilowatts
Power Output, approximate	108 kilowatts

¹Averaged over any audio-frequency cycle of sine-wave form.
²At frequencies up to 4 megacycles the plate voltage and the plate input may be increased to 15 kilovolts and 150 kilowatts respectively.

³At crest of audio-frequency cycle with modulation factor of 1.0.

⁴Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of the carrier conditions.

⁵At frequencies up to 4 megacycles the plate voltage and the plate input may be increased to 15 kilovolts and 188 kilowatts respectively.



Maximum ratings apply up to 15 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.

At frequencies up to 4 megacycles the plate voltage and input in Class C telephony and on radio-frequency Class B amplifier may be increased as mentioned under these headings.

Frequency	15	20	30 megacycles
Percentage of Maximum Rated Plate Voltage			
Class B	100	100	83 per cent
Class C Plate Telephony	100	100	80 per cent
Class C Telephony	100	100	83 per cent
Percentage of Maximum Rated Plate Input			
Class B	100	07	47 per cent
Class C Plate Telephony	100	02	50 per cent
Class C Telephony	100	07	47 per cent

Characteristic Range Values for Equipment Design

Characteristic	Conditions	Units	Max.
Grid Voltage	$E_b = 2.5$ kilovolts $I_b = 70$ amperes	Va. Sec. Max.	980 volts
Grid Current	$E_b = 2.5$ kilovolts $I_b = 70$ amperes	—	25 amperes
Plate Voltage	$E_c = 0$ volts $I_b = 5$ amperes	E_b : 2.8 3.1 3.6 kilovolts	
Grid Voltage	$E_b = 12$ kilovolts $I_b = 6.3$ amperes	E_c : — 280 — 320 — 375 volts	
Plate Power Output	$E_b = 12$ kilovolts $E_c = -1000$ volts $I_b = 12$ amperes $I_c = 2.25$ amperes $f = 15$ megacycles	P_o : 100 — — kilowatts	
Plate Power Output	$E_b = 10$ kilovolts $E_c = -800$ volts $I_b = 6.7$ amperes $I_c = 1.4$ amperes $f = 50$ megacycles	P_o : 45 — — kilowatts	
Plate Current	$E_b = 12$ kilovolts $E_c = -500$ volts	I_b : — — 0.25 amperes	

