

**TRIODE
AMPLIFIER, OSCILLATOR OR MODULATOR**

Western Electric

DESCRIPTION

The 242C is a three-electrode tube designed for use as a radio-frequency amplifier or oscillator, audio-frequency amplifier or modulator. The anode is capable of dissipating 100 watts and

the cooling is accomplished by radiation. The tube is capable of operating up to 6 megacycles at maximum ratings and up to 30 megacycles at reduced ratings. The cathode is a thoriated tungsten filament.

MAXIMUM RATINGS

D-C Plate Voltage	1250 volts
D-C Plate Current	150 milliamperes
Continuous Plate Dissipation	100 watts
D-C Grid Current	50 milliamperes



GENERAL CHARACTERISTICS

ELECTRICAL DATA

	Min.	Bogey	Max.	
Filament Voltage	9.5	10.0	10.5	volts
Filament Current at Bogey Voltage	3.1	3.25	3.4	amperes
Amplification Factor				
Conditions: $E_b = 1250$ volts, $I_b = 68$ milliamperes	11	12.5	14	
Interelectrode Capacitances				
Grid-Plate	11.4	13.0	14.6	uuf
Grid-Filament	4.8	6.1	7.1	uuf
Plate-Filament	3.2	4.7	5.9	uuf
Maximum Usable Cathode Current ¹			1.3	amperes

MECHANICAL DATA

Mounting Position	Vertical, or horizontal with plane of filament vertical
Type of Cooling	Radiation
Net Weight, Approximate	8 ounces

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR — CLASS A₁

MAXIMUM RATINGS, Absolute Values

	CCS
D-C Plate Voltage	1250 volts
D-C Grid Voltage	−80 volts
Plate Input	85 watts
Plate Dissipation	85 watts

TYPICAL OPERATION

	CCS	CCS
D-C Plate Voltage	1000	1250 volts
D-C Grid Voltage	−47	−70 volts
Peak A-F Grid Voltage	47	70 volts
D-C Plate Current	85	68 milliamperes
Load Resistance	7000	9000 ohms
Total Harmonic Distortion	5	5 per cent
Power Output	12.5	22 watts

1. Represents maximum usable cathode current for tube as plate current plus grid current for any condition of operation.

AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR - CLASS B

MAXIMUM RATINGS, Absolute Values

	CCS
D-C Plate Voltage	1250 volts
Maximum Signal D-C Plate Current ²	150 milliamperes
Maximum Signal Plate Input ²	188 watts
Plate Dissipation ²	100 watts

TYPICAL OPERATION

Unless otherwise specified values are for 2 tubes

	CCS	CCS
D-C Plate Voltage	1000	1250 volts
D-C Grid Voltage	-70	-90 volts
Peak A-F Grid-to-Grid Voltage	312	336 volts
Zero Signal D-C Plate Current	16	20 milliamperes
Maximum Signal D-C Plate Current	300	300 milliamperes
Effective Load Resistance (plate-to-plate)	6000	7600 ohms
Maximum Signal Driving Power, Approximate	5.5	5.0 watts
Maximum Signal Power Output, Approximate	165	200 watts

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	1250 volts
D-C Plate Current	150 milliamperes
Plate Input	150 watts
Plate Dissipation	100 watts

TYPICAL OPERATION

	CCS	CCS
D-C Plate Voltage	1000	1250 volts
D-C Grid Voltage	-72	-95 volts
Peak R-F Grid Voltage	141	133 volts
D-C Plate Current	150	120 milliamperes
Plate Tank Impedance	1680	2680 ohms
D-C Grid Current, Approximate	4	1 milliamperes
Driving Power, Approximate ³	20	10 watts
Power Output, Approximate	50	50 watts

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

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

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	1000 volts
D-C Grid Voltage	-400 volts
D-C Plate Current	150 milliamperes
D-C Grid Current	50 milliamperes
Plate Input	150 watts
Plate Dissipation	67 watts

TYPICAL OPERATION

	CCS	CCS
D-C Plate Voltage	750	1000 volts
D-C Grid Voltage	-200	-260 volts
Peak R-F Grid Voltage	357	410 volts
D-C Plate Current	150	150 milliamperes
Plate Tank Impedance	2180	3270 ohms
D-C Grid Current, Approximate	38	30 milliamperes
Driving Power, Approximate	13	12 watts
Power Output, Approximate	72	100 watts

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR — CLASS C TELEGRAPHY

Key-down conditions per tube without amplitude modulation⁴

MAXIMUM RATINGS, Absolute Values

	CCS
D-C Plate Voltage	1250 volts
D-C Grid Voltage	-400 volts
D-C Plate Current	150 milliamperes
D-C Grid Current	50 milliamperes
Plate Input	188 watts
Plate Dissipation	100 watts

TYPICAL OPERATION

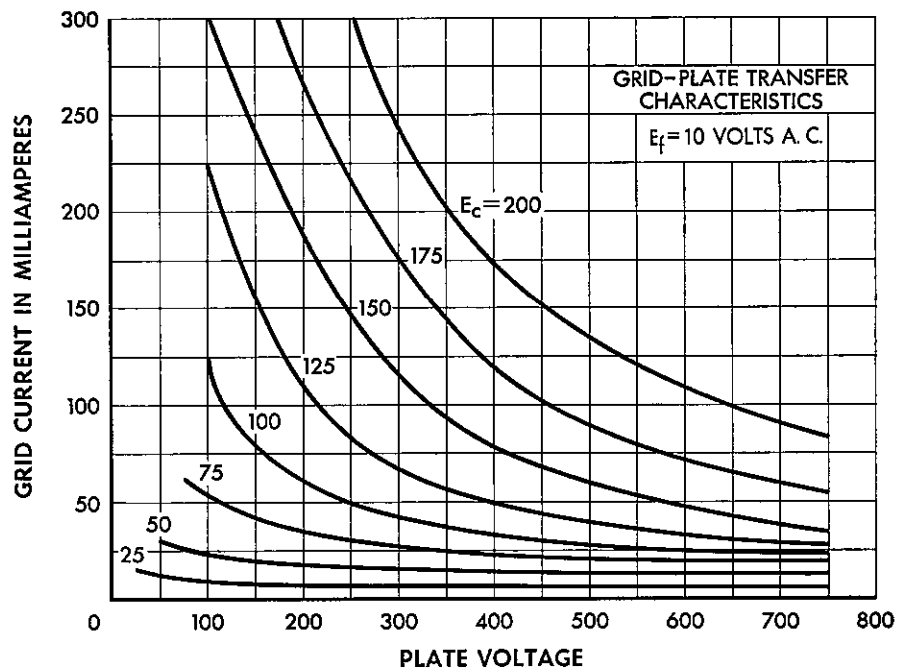
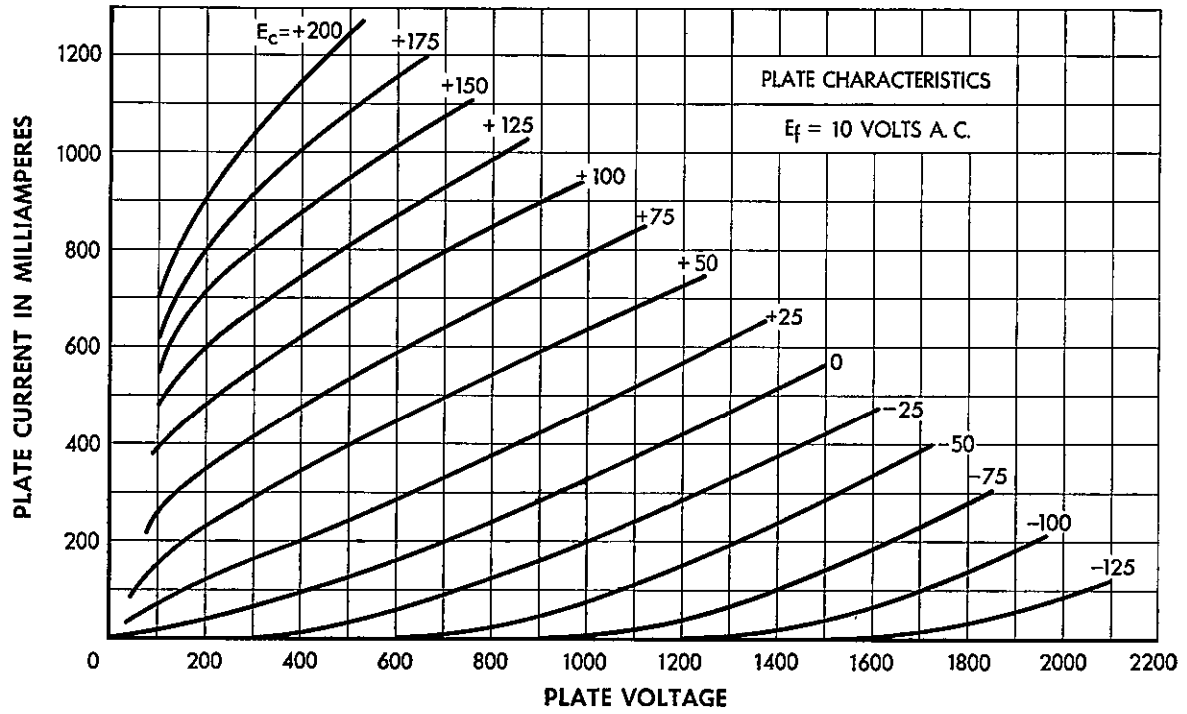
	CCS	CCS
D-C Plate Voltage	1000	1250 volts
D-C Grid Voltage	-175	-225 volts
Peak R-F Grid Voltage	305	355 volts
D-C Plate Current	150	150 milliamperes
Plate Tank Impedance	3080	3820 ohms
D-C Grid Current, Approximate	16	12 milliamperes
Driving Power, Approximate	5	5 watts
Power Output, Approximate	100	130 watts

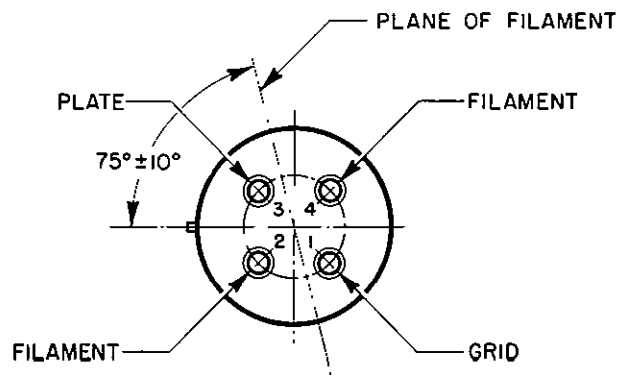
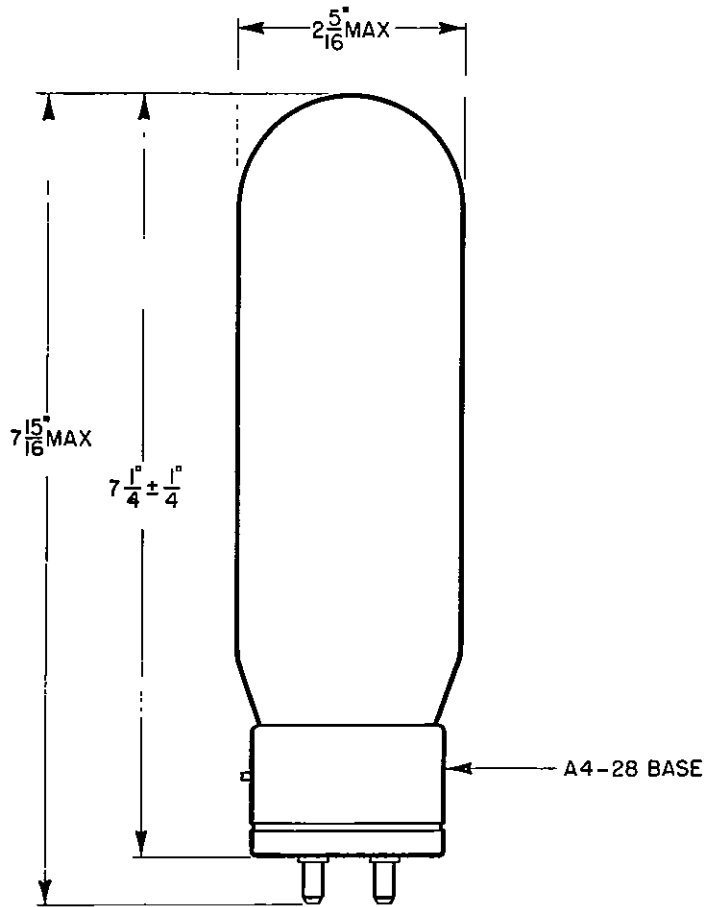
Maximum ratings apply up to 6 megacycles. The tube may be operated at higher frequencies provided the maximum values of plate voltage and power input are reduced

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.

Frequency	6	15	30 megacycles
Percentage of Maximum Rated Plate Voltage and Plate Input			
Class B	100	85	70 per cent
Class C Plate Modulated	100	75	50 per cent
Class C Unmodulated	100	75	50 per cent

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





Western Electric

A development of Bell Telephone Laboratories, the research laboratories of the American Telephone and Telegraph Company and the Western Electric Company.