

The 833A/C is a triode especially designed for RF power amplifier applications, as well as audio frequency power amplifier and modulator service. Maximum ratings apply up to 30 MHz, and reduced ratings up to 75 MHz.

GENERAL CHARACTERISTICS

MECHANICAL

Mounting Position

Vertical, base up or down

Cooling

Radiation or forced air

Radiation cooling means that there is sufficient free circulation of air around the tube to keep the seal temperatures within limits.

Forced-air cooling means that an air flow of 40 CFM from a 2" diameter nozzle directed vertically on bulb between grid and plate seals is required to limit the temperature between these seals to 145°C.

ELECTRICAL

Filament		Thoriated Tungsten
Voltage		10.0 volts + 5%
Current		10 amps
Amplification factor	$E_c = -10 V$	35
	$I_b = 200 mA$	
Direct Interelectrode Capacitances		
Grid to plate		6.3 pF
Grid to filament		12.3 pF
Plate to filament		8.5 pF

AF POWER AMPLIFIER AND MODULATOR-CLASS B

MAXIMUM RATINGS, ABSOLUTE VALUES

	Radiation Cooling		Forced-air Cooling	
	<u>CCS</u>	<u>ICAS</u>	<u>CCS</u>	<u>ICAS</u>
DC Plate Voltage	3000	3300	4000	4000 V
Max-Signal DC plate current 1	500	500	500	500 mA
Max-Signal Plate input 1	1125	1300	1600	1800watts
Plate Dissipation 1	300	350	400	450 watts

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Radiation Cooling

Forced-air Cooling

TYPICAL OPERATION (2 Tubes)

	<u>CCS</u>	<u>ICAS</u>	<u>CCS</u>	<u>ICAS</u>	
DC Plate Voltage	3000	3300	4000	4000	volts
DC Grid Voltage ²	-70	-80	-100	-100	volts
Peak AF Grid-to-Grid Voltage	400	440	480	510	volts
Zero-Signal DC Plate Current	100	100	100	100	mA
Max. Signal DC Plate Current	750	780	800	900	mA
Effective Load Resistance (plate to plate)	9500	10500	12000	11000	ohms
Max.-Signal Driving Power (approx.)	20	30	29	38	watts
Max.-Signal Power Output (approx.)	1650	1900	2400	2700	watts

RF POWER AMPLIFIER - CLASS B TELEPHONY

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

MAXIMUM RATINGS, ABSOLUTE VALUES

Radiation Cooling

Forced-air Cooling

	<u>CCS</u>	<u>ICAS</u>	<u>CCS</u>	<u>ICAS</u>	
DC Plate Voltage	3000	3300	4000	4000	volts
DC Plate Current	300	300	300	300	mA
Plate Input	450	525	600	675	watts
Plate Dissipation	300	350	400	450	watts

TYPICAL OPERATION

DC Plate Voltage	3000	3300	4000	4000	volts
DC Grid Voltage ²	-70	-100	-120	-120	volts
Peak RF Grid Voltage	90	110	120	130	volts
DC Plate Current	150	150	150	150	mA
DC Grid Current (approx.)	2	2	2	3	mA
Driving Power (approx.) ³	10	11	14	21	atts
Power Output (approx.)	150	200	225	250	watts

PLATE-MODULATED RF POWER AMPLIFIER - CLASS C TELEPHONY

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

<u>MAXIMUM RATINGS, ABSOLUTE VALUES</u>	<u>Radiation Cooling</u>		<u>Forced-air Cooling</u>		
	<u>CCS</u>	<u>ICAS</u>	<u>CCS</u>	<u>ICAS</u>	
DC Plate Voltage	2500	3000	3000	4000	volts
DC Grid Voltage	-500	-500	-500	-500	volts
DC Plate Current	400	400	450	450	mA
DC Grid Current	100	100	100	100	mA
Plate Input	835	1000	1250	1800	watts
Plate Dissipation	200	250	270	350	watts

TYPICAL OPERATION

DC Plate Voltage	2500	3000	3000	4000	volts
DC Grid Voltage ⁴	-300	-240	-300	-325	volts
From a grid resistor of	4000	3400	3600	3600	ohms
Peak RF Grid Voltage	460	410	490	520	volts
DC Plate Current	335	335	415	450	mA
DC Grid Current (approx.) ⁵	75	70	85	90	mA
Driving Power (approx.) ⁵	30	26	37	42	watts
Power Output (approx.)	635	800	1000	1500	watts

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RF POWER AMPLIFIER & OSCILLATOR - CLASS C TELEGRAPHY 6

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RF POWER AMPLIFIER - CLASS C FM TELEPHONY

<u>MAXIMUM RATINGS, ABSOLUTE VALUES</u>	<u>Radiation Cooling</u>		<u>Forced-air Cooling</u>		
	<u>CCS</u>	<u>ICAS</u>	<u>CCS</u>	<u>ICAS</u>	
DC Plate Voltage	3000	3300	4000	4000	volts
DC Grid Voltage	-500	-500	-500	-500	volts
DC Plate Current	500	500	500	500	mA
DC Grid Current	100	100	100	100	mA
Plate Input	1250	1500	1800	2000	watts
Plate Dissipation	300	350	400	450	watts

<u>TYPICAL OPERATION</u>	<u>Radiation Cooling</u>				<u>Forced-air Cooling</u>		
	<u>CCS</u>	<u>ICAS</u>	<u>CCS</u>	<u>ICAS</u>	<u>CCS</u>	<u>ICAS</u>	
DC Plate Voltage	2250	3000	3000	3000	4000	4000	volts
DC Grid Voltage ⁷	-125	-200	-160	-155	-200	-225	volts
From a grid resistor of	1500	3600	2300	2150	2650	2400	ohms
From a cathode resistor of	235	425	400	270	380	380	ohms
Peak RF Grid Voltage	300	360	310	350	375	415	volts
DC Plate Current	445	415	335	500	450	500	mA
DC Grid Current (approx.) ⁵	85	55	70	70	75	95	mA
Driving Power (approx.) ⁵	23	20	20	25	26	35	watts
Power Output (approx.)	780	1000	800	1150	1440	1600	watts

AMPLIFIER or OSCILLATOR -CLASS C

*With Separate, Rectified, Unfiltered, Single-Phase,
Full-Wave Plate Supply*

<u>MAXIMUM RATINGS, ABSOLUTE VALUES</u>	<u>Radiation Cooling</u>		<u>Forced-air Cooling</u>		
	<u>CCS</u>	<u>ICAS</u>	<u>CCS</u>	<u>ICAS</u>	
DC Plate Voltage	2700	3000	3600	3600	volts
DC Grid Voltage	-450	-450	-450	-450	volts
DC Plate Current	500	500	500	500	mA
DC Grid Current	100	100	100	100	mA
Plate Input ¹⁰	1250	1500	1800	1800	watts
Plate Dissipation	300	350	400	400	watts

TYPICAL OPERATION

	<u>Radiation Cooling</u>		<u>Forced-air Cooling</u>		
	<u>CCS</u>	<u>ICAS</u>	<u>CCS</u>		
DC Plate Voltage			2500	2750	3600 volts
DC Grid Voltage ⁸			-130	-135	-155 volts
From a grid resistor of			1560	1770	2100 ohms
DC Plate Current			450	450	450 mA
DC Grid Current (approx.)			83	76	73 mA
Driving Power (approx.) ⁹			27	25	26 watts
Output-Circuit Efficiency (approx.)			85	85	85 %
Useful Power Output (approx.) ¹¹			1865	2040	2480 watts

RATINGS vs. FREQUENCY WITH RADIATION COOLING

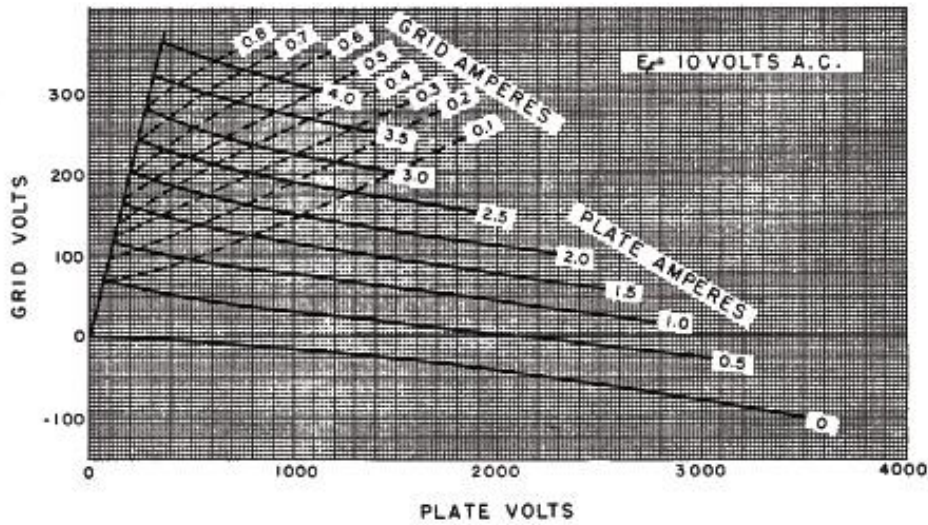
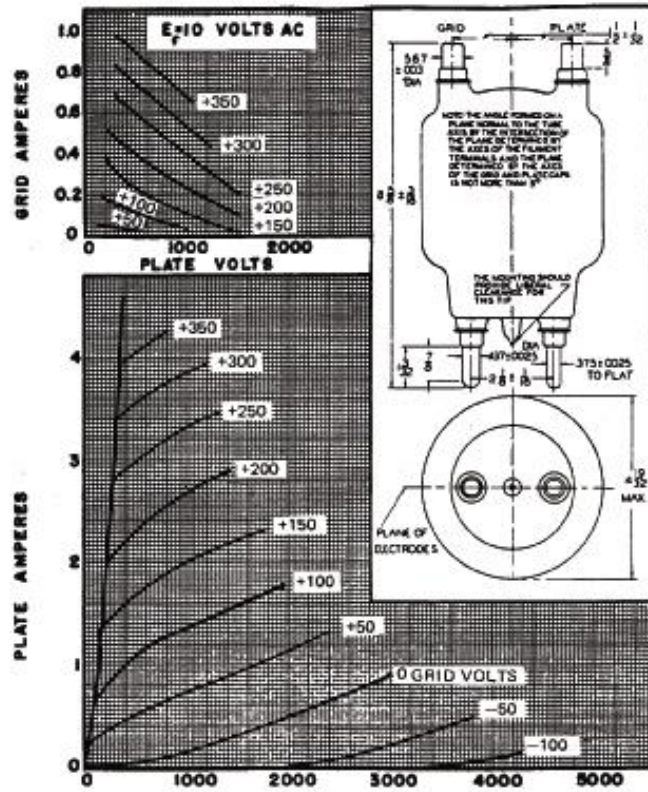
FREQUENCY	30	50	75	Mc
MAXIMUM PERMISSIBLE PERCENTAGE of MAXIMUM RATED PLATE VOLTAGE and PLATE INPUT:				
Class B Telephony	100	98	94	%
Class C Telephony	100	90	72	%
Class C Telegraphy	100	90	72	%

RATINGS vs. FREQUENCY WITH FORCED-AIR COOLING

FREQUENCY	20	50	75	Mc
MAXIMUM PERMISSIBLE PERCENTAGE of MAXIMUM RATED PLATE VOLTAGE and PLATE INPUT:				
Class B Telephony	100	97	93	%
Class C Telephony	100	83	65	%
Class C Telegraphy	100	83	65	%

FOOTNOTES

- 1 Averaged over any audio-frequency cycle of sine-wave form.
- 2 For AC filament supply.
- 3 At crest of audio-frequency cycle with modulation factor of 1.0.
- 4 Obtained by grid resistor, or from a combination of grid resistor with either fixed supply or cathode resistor.
- 5 Subject to wide variation depending on the impedance of the load circuit. High-impedance load circuits require more grid current and driving power to obtain the desired output. Low-impedance load circuits need less grid current and driving power, but plate-circuit efficiency is sacrificed. The driver stage should have good regulation and should be capable of delivering considerably more than the required driving power.
- 6 Key-down conditions per tube without amplitude modulation. Amplitude modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.
- 7 Obtained from fixed supply by grid resistor, by cathode resistor, or by combination methods.
- 8 Obtained from a grid resistor of the value shown or from a combination of grid resistor and cathode resistor. Fixed bias operation is not recommended. The bias resistor should not be bypassed for the plate and grid voltage supply frequency.
- 9 From a driver with a rectified, unfiltered, single-phase, full wave plate supply.
- 10 Power input to plate is 1.23 times the product of dc plate voltage times dc plate current.
- 11 This value of useful power is measured at load of output circuit having the indicated efficiency.



CONSTANT CURRENT CHARACTERISTICS