

RCA-805

R-F Power Amplifier, Oscillator, Class B Modulator

RCA-805 is a high- μ , three-electrode transmitting tube of the thoriated-tungsten filament type for use as a radio-frequency amplifier, oscillator, and class B audio-frequency amplifier. The plate connection is brought out through a separate seal at the top of the bulb to insure good insulation. As an r-f amplifier or oscillator the 805 may be operated at maximum ratings for frequencies as high as 30 megacycles. The grid is designed so that the amplification of the tube varies with the amplitude of the input signal. This feature facilitates the design of class B amplifiers to give high output with low distortion. The maximum plate dissipation of the RCA-805 is 125 watts for class C telegraph and class B services.

CHARACTERISTICS

Filament Volts (a-c or d-c).....	10.0	Grid-Plate Capacitance	6.5 μ f
Filament Amperes	3.25	Grid-Filament Capacitance	8.5 μ f
		Plate-Filament Capacitance	10.5 μ f

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

As A-F Power Amplifier and Modulator—Class B

D-C PLATE VOLTAGE	1500 max. Volts
MAX.-SIGNAL D-C PLATE CURRENT*	210 max. Milliamperes
MAX.-SIGNAL PLATE INPUT*	315 max. Watts
PLATE DISSIPATION*	125 max. Watts

TYPICAL OPERATION:

Unless otherwise specified, values are for 2 tubes

D-C Plate Voltage	1250	1500	Volts
D-C Grid Voltage [§]	0	-16	Volts
Peak A-F Grid-to-Grid Voltage	235	280	Volts
Zero-Sig. D-C Plate Current	148	84	Milliamperes
Max.-Sig. D-C Plate Current	400	400	Milliamperes
Load Resistance (Per tube)	1675	2050	Ohms
Effective Load Res. (Plate-to-plate)	6700	8200	Ohms
Max.-Sig. Driving Power (Approx.)	6	7	Watts
Max.-Sig. Power Output (Approx.)	300 [†]	370 ^{**}	Watts

As R-F Power Amplifier—Class B Telephony

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

D-C PLATE VOLTAGE	1500 max. Volts
D-C PLATE CURRENT	150 max. Milliamperes
PLATE INPUT	185 max. Watts
PLATE DISSIPATION	125 max. Watts

TYPICAL OPERATION:

D-C Plate Voltage	1250	1500	Volts
D-C Grid Voltage [§]	0	-10	Volts
Peak R-F Grid Voltage	75	70	Volts
D-C Plate Current	135	115	Milliamperes
D-C Grid Current (Approx.)	15	15	Milliamperes
Driving Power (Approx.) [†]	11	7.5	Watts
Power Output (Approx.)	55	57.5	Watts

*. §. †. **. see next page.

As Plate-Modulated R-F Power Amplifier—Class C Telephony

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

D-C PLATE VOLTAGE	1250 max.	Volts
D-C GRID VOLTAGE	-500 max.	Volts
D-C PLATE CURRENT	175 max.	Milliamperes
D-C GRID CURRENT	70 max.	Milliamperes
PLATE INPUT	220 max.	Watts
PLATE DISSIPATION	85 max.	Watts

TYPICAL OPERATION:

D-C Plate Voltage	1000	1250	Volts
D-C Grid Voltage [§]	-155	-160	Volts
Peak R-F Grid Voltage	295	300	Volts
D-C Plate Current	160	160	Milliamperes
D-C Grid Current (Approx.)	60	60	Milliamperes
Grid Resistor	2600	2700	Ohms
Driving Power (Approx.)	16	16	Watts
Power Output (Approx.)	110	140	Watts

As R-F Power Amplifier and Oscillator—Class C Telegraphy

Key-down conditions per tube without modulation††

D-C PLATE VOLTAGE	1500 max.	Volts
D-C GRID VOLTAGE	-500 max.	Volts
D-C PLATE CURRENT	210 max.	Milliamperes
D-C GRID CURRENT	70 max.	Milliamperes
PLATE INPUT	315 max.	Watts
PLATE DISSIPATION	125 max.	Watts

TYPICAL OPERATION:

D-C Plate Voltage	1000	1250	1500	Volts
D-C Grid Voltage [§]	-95	-100	-105	Volts
Peak R-F Grid Voltage	225	230	235	Volts
D-C Plate Current	200	200	200	Milliamperes
D-C Grid Current (Approx.)	40	40	40	Milliamperes
Grid Resistor	2400	2500	2600	Ohms
Driving Power (Approx.)	8.5	8.5	8.5	Watts
Power Output (Approx.)	130	170	215	Watts

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

§ Grid voltages are given with respect to the mid-point of filament operated on a.c.

‡ Approximately 4% harmonic distortion.

** Approximately 3% harmonic distortion.

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

†† Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.

INSTALLATION AND APPLICATION

The base pins of the 805 fit the standard transmitting 4-contact socket, such as the RCA type UT-541A. The socket should be mounted to hold the tube in a vertical position with the base down. The plate lead is brought out to the cap at the top of the bulb.

The plate of the 805 shows only a barely perceptible red color when operated at the maximum plate-dissipation rating for each class of service.

When the 805 is operated as a class B audio-frequency amplifier and it is desirable to keep the audio-frequency distortion below 3%, the use of a small amount of grid-bias voltage at reduced plate voltage is advantageous. Typical

operating conditions are approximately the same as those for the 1250-volt condition. The exceptions are: grid-bias voltage, -14 volts; peak a-f grid-to-grid voltage, 250 volts; and zero-signal d-c plate current, 60 milliamperes (two tubes).

In class C telegraph service when the tube is operated at a plate voltage of 1250 volts or less, grid-leak bias is particularly useful. If the grid excitation is accidentally removed, the high plate resistance of the tube serves to protect it from overheating due to accidental overloads.

For high-frequency operation above 30 megacycles, see page 144.

For additional information, see chapters on INSTALLATION and APPLICATION.

