

RCA-807

Transmitting Beam Power Amplifier

RCA-807 is a heater-cathode type of transmitting tube incorporating new design principles involving the use of directed electron beams. Features resulting from the use of these principles in the 807 are that the screen does not absorb appreciable power and that efficient suppressor action is supplied by space-charge effects produced between the screen and the plate. The resultant high power sensitivity makes this tube especially suited for use as an r-f or a-f amplifier, frequency multiplier, oscillator and plate-modulated amplifier. The plate connection is brought out through a separate seal at the top of the bulb to maintain low grid-plate capacitance. In r-f applications the 807 may be operated at maximum ratings in all classes of service at frequencies as high as 60 megacycles. In class AB audio service two tubes of this type are capable of delivering an output of approximately 80 watts. RCA-807 has a ceramic base.

CHARACTERISTICS

Heater Volts (a-c or d-c)	6.3	Grid-Plate Capacitance (With external shielding)	0.2 max. μf
Heater Amperes	0.9	Input Capacitance	11 μf
Transconductance (For plate current of 72 ma.) Micromhos, approx.....	6000	Output Capacitance	7 μf

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

As Push-Pull Amplifier—Class AB₂[§] (Fixed bias)

D-C PLATE VOLTAGE	600 max. Volts
D-C SCREEN VOLTAGE (Grid No. 2).....	300 max. Volts
MAX.-SIGNAL D-C PLATE CURRENT*	120 max. Milliamperes
MAX.-SIGNAL PLATE INPUT*	60 max. Watts
SCREEN INPUT*	3.5 max. Watts
PLATE DISSIPATION*	25 max. Watts

TYPICAL OPERATION:

Unless otherwise specified, values are for 2 tubes

D-C Plate Voltage	400	500	600	Volts
D-C Screen Voltage	300	300	300	Volts
D-C Grid Voltage (Grid No. 1)	-25	-25	-30	Volts
Peak A-F Grid-to-Grid Voltage	80	80	80	Volts
Zero-Signal D-C Plate Current	100	100	60	Milliamperes
Max.-Signal D-C Plate Current	230	230	200	Milliamperes
Max.-Signal D-C Screen Current	10	10	10	Milliamperes
Load Resistance (Per tube)	950	1165	1665	Ohms
Load Resistance (Plate-to-Plate)	3800	4660	6660	Ohms
Max.-Signal Driving Power†	0.35	0.6	0.4	Watt
Max.-Signal Power Output**	60	75	80	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	600 max. Volts
D-C SCREEN VOLTAGE (Grid No. 2).....	300 max. Volts
D-C PLATE CURRENT	80 max. Milliamperes
PLATE INPUT	37.5 max. Watts
SCREEN INPUT	2.5 max. Watts
PLATE DISSIPATION	25 max. Watts

§, *, †, **: see end of tabulation.

TYPICAL OPERATION:

D-C Plate Voltage	400	500	600	Volts
D-C Screen Voltage	250	250	250	Volts
D-C Grid Voltage (Grid No. 1)	-25	-25	-25	Volts
Peak R-F Grid Voltage	30	30	20	Volts
D-C Plate Current	75	75	62.5	Milliamperes
D-C Screen Current	4	4	3	Milliamperes
D-C Grid Current (Approx.)	0	0	0	Milliamperes
Driving Power (Approx.)***	0.25	0.25	0.2	Watt
Power Output (Approx.)	9	12.5	12.5	Watts

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	475	max.	Volts
D-C SCREEN VOLTAGE (Grid No. 2)	300	max.	Volts
D-C GRID VOLTAGE (Grid No. 1)	-200	max.	Volts
D-C PLATE CURRENT	83	max.	Milliamperes
D-C GRID CURRENT	5	max.	Milliamperes
PLATE INPUT	40	max.	Watts
SCREEN INPUT	2.5	max.	Watts
PLATE DISSIPATION	16.5	max.	Watts

TYPICAL OPERATION:

D-C Plate Voltage	325	400	475	Volts
D-C Screen Voltage	225	225	225	Volts
D-C Grid Voltage	-45	-50	-50	Volts
Peak R-F Grid Voltage	70	70	70	Volts
D-C Plate Current	80	80	83	Milliamperes
D-C Screen Current	9	9	9	Milliamperes
D-C Grid Current (Approx.)	3	2	2	Milliamperes
Screen Resistor†	10000	16000	25000	Ohms
Grid Resistor	5000	10000	10000	Ohms
Driving Power (Approx.)	0.2	0.13	0.13	Watt
Power Output (Approx.)	15	19	24	Watts

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

Key-down conditions per tube without modulation††

D-C PLATE VOLTAGE	600	max.	Volts
D-C SCREEN VOLTAGE (Grid No. 2)	300	max.	Volts
D-C GRID VOLTAGE (Grid No. 1)	-200	max.	Volts
D-C PLATE CURRENT	100	max.	Milliamperes
D-C GRID CURRENT	5	max.	Milliamperes
PLATE INPUT	60	max.	Watts
SCREEN INPUT	3.5	max.	Watts
PLATE DISSIPATION	25	max.	Watts

TYPICAL OPERATION:

D-C Plate Voltage	400	500	600	Volts
D-C Screen Voltage	250	250	250	Volts
D-C Grid Voltage	-50	-50	-50	Volts
Peak R-F Grid Voltage	80	80	80	Volts
D-C Plate Current	95	95	100	Milliamperes
D-C Screen Current	9	9	9	Milliamperes
D-C Grid Current (Approx.)	2.5	2	3	Milliamperes
Screen Resistor	17000	28000	39000	Ohms
Grid Resistor	20000	25000	16700	Ohms
Driving Power (Approx.)	0.18	0.14	0.22	Watt
Power Output (Approx.)	25	30	37.5	Watts

***, †, ††: see next page.

§ Subscript (2) indicates that grid current flows during a part of input cycle.

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

† Driver stage should be capable of supplying the grids of the class AB stage with the specified peak values at low distortion. The effective resistance per grid circuit of the class AB stage should be kept below 500 ohms and the effective impedance at the highest desired response frequency should not exceed 700 ohms.

** With zero-impedance driver and perfect regulation, plate-circuit distortion does not exceed 2%. In practice, plate-voltage regulation, screen-voltage regulation, and grid-bias regulation, should be not greater than 5%, 4%, and 3%, respectively.

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

‡ Connected to modulated plate-voltage supply.

†† 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 RCA-807 fit the standard 5-contact socket which may be installed to hold the tube in any position.

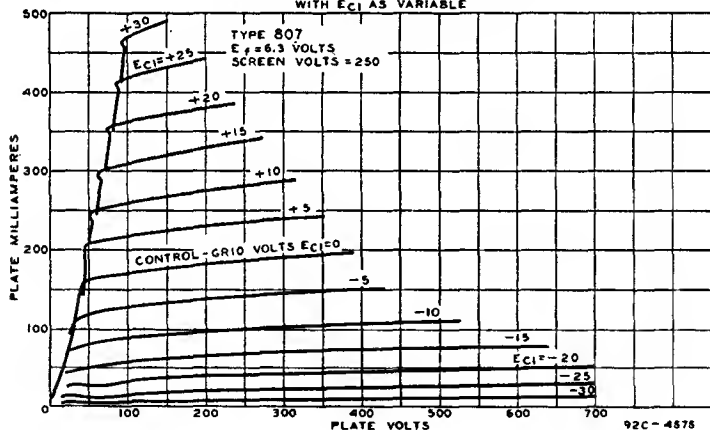
The heater voltage should not fluctuate so that it ever exceeds 7.0 volts. In circuits where the cathode is not directly connected to the heater, the potential difference between them should not exceed 100 volts.

The plate of the 807 shows no color at the maximum plate-dissipation ratings for each class of service. The screen should never be allowed to show color.

For high-frequency operation above 60 megacycles, see page 144.

For additional information, see chapters on INSTALLATION and APPLICATION.

AVERAGE PLATE CHARACTERISTICS
WITH E_{C1} AS VARIABLE



Top View of Socket Connections

