

RCA-834

R-F Power Amplifier, Oscillator

Illustrated on page 42

RCA-834 is a three-electrode transmitting tube of the thoriated-tungsten filament type for use as a radio-frequency amplifier and oscillator, particularly at the higher radio frequencies. The grid and plate are supported from the top of the glass bulb by individual leads which are brought out of the tube through separate seals. This construction insures low interelectrode capacitances and minimum lead inductance. RCA-834 may be operated at maximum ratings at frequencies as high as 100 megacycles; it may be operated at reduced plate voltage and input up to 350 megacycles. The maximum plate dissipation for class C telegraph and class B services is 50 watts.

CHARACTERISTICS

Filament Volts (a-c or d-c)	7.5	Grid-Plate Capacitance	2.6 μ f
Filament Amperes	3.25	Grid-Filament Capacitance	2.2 μ f
Amplification Factor	10.5	Plate-Filament Capacitance	0.6 μ f

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

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	1250 max.	Volts
D-C PLATE CURRENT	100 max.	Milliamperes
PLATE INPUT	75 max.	Watts
PLATE DISSIPATION	50 max.	Watts

TYPICAL OPERATION:

D-C Plate Voltage	750	1000	1250	Volts
D-C Grid Voltage [§]	-70	-90	-115	Volts
Peak R-F Grid Voltage	90	100	115	Volts
D-C Plate Current	50	50	50	Milliamperes
D-C Grid Current (Approx.)	1	0.5	0	Milliamperes
Driving Power (Approx.) [†]	3.3	3.1	3	Watts
Power Output (Approx.)	11	16	20	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	1000 max.	Volts
D-C GRID VOLTAGE	-400 max.	Volts
D-C PLATE CURRENT	100 max.	Milliamperes
D-C GRID CURRENT	20 max.	Milliamperes
PLATE INPUT	100 max.	Watts
PLATE DISSIPATION	35 max.	Watts

TYPICAL OPERATION:

D-C Plate Voltage	750	1000	Volts
D-C Grid Voltage [§]	-290	-310	Volts
Peak R-F Grid Voltage	415	435	Volts
D-C Plate Current	90	90	Milliamperes
D-C Grid Current (Approx.)	20	17.5	Milliamperes
Grid Resistor	14500	17710	Ohms
Driving Power (Approx.)	7.5	6.5	Watts
Power Output (Approx.)	42	58	Watts

§, †: see next page.

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

Key-down conditions per tube without modulation††

D-C PLATE VOLTAGE	1250 max. Volts
D-C GRID VOLTAGE	-400 max. Volts
D-C PLATE CURRENT	100 max. Milliamperes
D-C GRID CURRENT	20 max. Milliamperes
PLATE INPUT	125 max. Watts
PLATE DISSIPATION	50 max. Watts

TYPICAL OPERATION:

D-C Plate Voltage	750	1000	1250	Volts
D-C Grid Voltage§	-175	-200	-225	Volts
Peak R-F Grid Voltage	300	325	350	Volts
D-C Plate Current	90	90	90	Milliamperes
D-C Grid Current (Approx.)	20	17.5	15	Milliamperes
Grid Resistor	8750	11400	15000	Ohms
Driving Power (Approx.)	5.5	5	4.5	Watts
Power Output (Approx.)	42	58	75	Watts

§ Grid voltages are given with respect to the mid-point of filament operated on a-c. If d-c is used, each stated value of grid voltage should be decreased by 5 volts and the circuit returns made to the negative end of the filament.

† 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 834 fit the standard four-contact socket, such as the RCA type UR-542A. The socket should be installed to hold the tube in a vertical position. The filament terminals are connected to the two large base pins; the grid and plate leads are brought out through separate seals at the top of the bulb. See outline drawing.

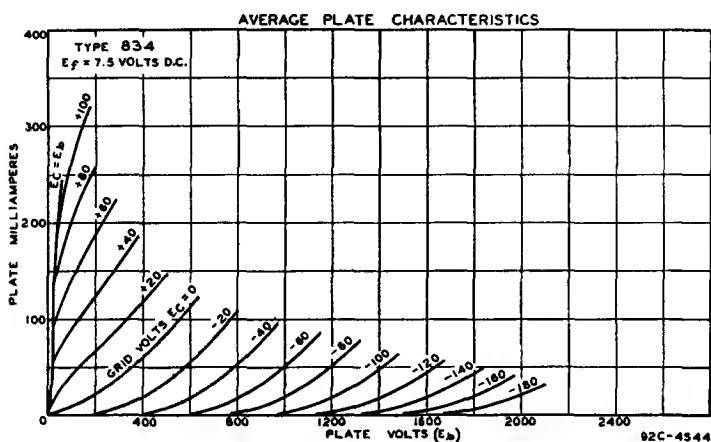
Connections to the grid and plate leads must be flexible enough so that normal expansion will not place a strain on the glass at the seals, yet heavy enough to carry the high circulating r-f current. It is also necessary to provide a means for cooling the lead tips and their seals. A recommended method of doing this is to increase the radiating surface of each lead by means of a copper clamp connector having a cross-sectional area of at least $\frac{3}{4}$ inch square. (See next page for constructional details.) Each lead wire should be connected to its copper clamp before the clamp is placed on the terminal tip. The clamp should be slightly sprung so that it can easily be slipped over its terminal. When the clamp is in place, carefully tighten the smaller bolt to insure good electrical contact. Connections should never be soldered directly to the tube terminal tips as the heat of the soldering operation may result in the cracking of the lead seals. The tube terminal tips should not be used to support coils, condensers, chokes, or other circuit parts.

The bulb becomes very hot during continuous operation. Therefore free circulation of air about the bulb should be provided. When the 834 is operated at frequencies higher than 60 megacycles, forced cooling of the tube is recommended. This may be done by means of a small electric fan. Under any condition of operation the maximum bulb temperature should not exceed 175°C (347°F) as measured by a thermometer placed against the glass at the top of the tube, midway between the grid and plate leads.

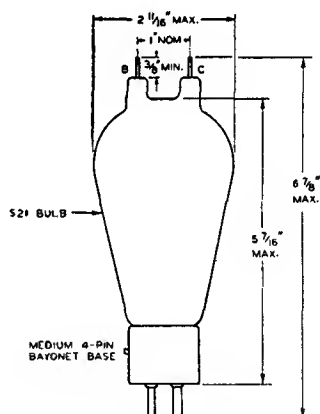
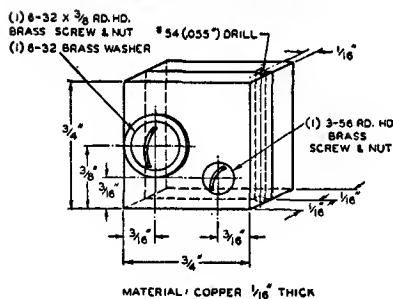
The plate of the 834 shows only a barely perceptible red color at the maximum plate-dissipation rating for each class of service.

For high-frequency operation above 100 megacycles, see page 144.

For additional information, see chapters on INSTALLATION and APPLICATION.



RADIATING CONNECTOR



Top View of Socket Connections

