

R-F Power Amplifier, Oscillator

Illustrated on page 89

RCA-833 is a three-electrode, high- μ transmitting tube of the thoriated-tungsten filament type for use as a radio-frequency amplifier, oscillator, and class B modulator. Because of its high perveance, the 833 can be operated at high plate efficiency with low driving power. Designed in a new way with post terminals which provide a rugged structure and make bases unnecessary, RCA-833 has a minimum amount of insulation within the tube. The plate is supported directly from its post terminal at the top of the tube. As a result of its construction, the 833 can be operated in class C telegraph service with maximum input of 1250 watts at frequencies as high as 30 megacycles, and with reduced input at frequencies as high as 100 megacycles.

TENTATIVE CHARACTERISTICS AND RATINGS

Filament Volts (a-c or d-c)	10.0	Grid-Plate Capacitance	6.3 μ f
Filament Amperes	10	Grid-Filament Capacitance	12.3 μ f
Amplification Factor	35	Plate-Filament Capacitance	8.5 μ f

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

As A-F Power Amplifier and Modulator—Class B

D-C PLATE VOLTAGE	3000 max.	Volts
MAX.-SIGNAL D-C PLATE CURRENT*	500 max.	Milliamperes
MAX.-SIGNAL PLATE INPUT*	1125 max.	Watts
PLATE DISSIPATION*	300 max.	Watts

TYPICAL OPERATION:

Unless otherwise specified, values are for 2 tubes

D-C Plate Voltage	2500	2650	3000	Volts
D-C Grid Voltage [§]	-57	-62	-70	Volts
Peak A-F Grid-to-Grid Voltage	380	300	400	Volts
Zero-Sig. D-C Plate Current	100	100	100	Milliamperes
Max.-Sig. D-C Plate Current	800	520	750	Milliamperes
Load Resistance (Per tube)	1825	2600	2375	Ohms
Effective Load Res. (Plate-to-plate)	7300	10400	9500	Ohms
Max.-Sig. Driving Power (Approx.)	15	5	20	Watts
Max.-Sig. Power Output (Approx.)	1425	840	1650	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	3000 max.	Volts
D-C PLATE CURRENT	400 max.	Milliamperes
PLATE INPUT	450 max.	Watts
PLATE DISSIPATION	300 max.	Watts

TYPICAL OPERATION:

D-C Plate Voltage	2500	3000	Volts
D-C Grid Voltage [§]	-60	-70	Volts
Peak R-F Grid Voltage	80	90	Volts
D-C Plate Current	150	150	Milliamperes
D-C Grid Current (Approx.)	2	2	Milliamperes
Driving Power (Approx.) [†]	10	10	Watts
Power Output (Approx.)	125	150	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	2500 max.	Volts
D-C GRID VOLTAGE	-500 max.	Volts
D-C PLATE CURRENT	400 max.	Milliamperes
D-C GRID CURRENT	75 max.	Milliamperes
PLATE INPUT	835 max.	Watts
PLATE DISSIPATION	200 max.	Watts

* , § , †: see next page.

TYPICAL OPERATION:

D-C Plate Voltage	2000	2500	Volts
D-C Grid Voltage	-300	-300	Volts
Peak R-F Grid Voltage	460	460	Volts
D-C Plate Current	375	335	Milliamperes
D-C Grid Current (Approx.)	75	75	Milliamperes
Driving Power (Approx.)	30	30	Watts
Power Output (Approx.)	550	635	Watts

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

Key-down conditions per tube without modulation††

D-C PLATE VOLTAGE	3000 max.	Volts
D-C GRID VOLTAGE	-500 max.	Volts
D-C PLATE CURRENT	500 max.	Milliamperes
D-C GRID CURRENT	75 max.	Milliamperes
PLATE INPUT	1250 max.	Watts
PLATE DISSIPATION	300 max.	Watts

TYPICAL OPERATION:

D-C Plate Voltage	2500	3000	Volts
D-C Grid Voltage	-200	-200	Volts
Peak R-F Grid Voltage	390	360	Volts
D-C Plate Current	475	415	Milliamperes
D-C Grid Current (Approx.)	65	55	Milliamperes
Driving Power (Approx.)	25	20	Watts
Power Output (Approx.)	925	1000	Watts

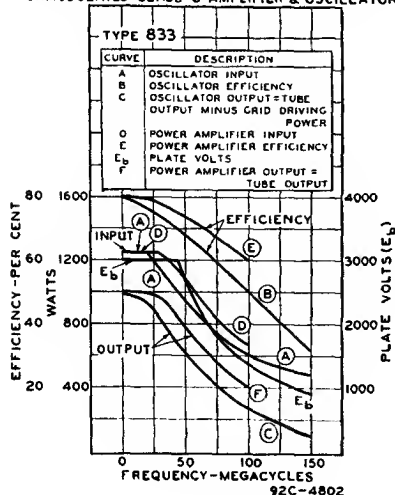
* Averaged over any audio-frequency cycle of sine-wave form.

† 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.

§ 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 7 volts and the circuit returns made to the negative end of the filament.

INSTALLATION AND APPLICATION

FREQUENCY PERFORMANCE CHARACTERISTICS
UNMODULATED CLASS C AMPLIFIER & OSCILLATOR

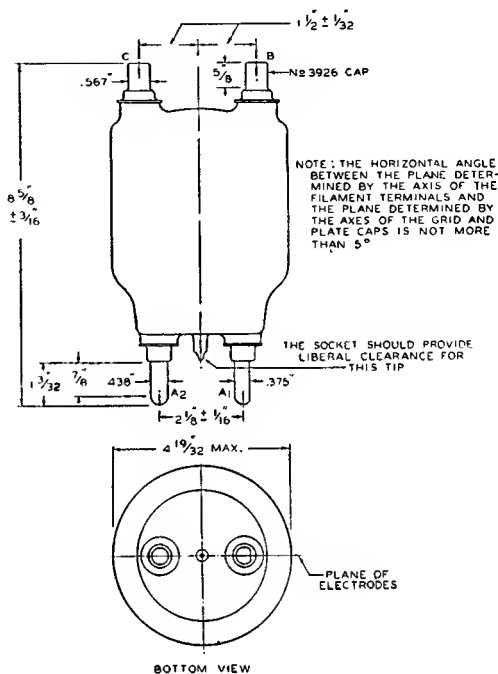
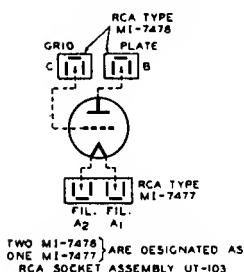
Terminal connections for the 833 can be conveniently made with the special connectors, collectively identified as RCA type UT-103. The UT-103 consists of one polarized mounting, type MI-7477, for the filament, and two connectors, MI-7478, for the grid and plate. RCA-833 may be operated in either a vertical or a horizontal position. When the tube is operated in a horizontal position, it should be mounted with the plate in a vertical plane (on edge). Special grid- and plate-post connectors, such as the RCA type MI-7478, should be used when the tube is operated at frequencies above 15 Mc. The connectors aid in cooling the terminal posts and their seals.

The plate of the 833 shows an orange-red color at the maximum plate-dissipation rating for each class of service.

The maximum ratings of the RCA-833 at high frequencies are shown on the curve on page 91. The improved efficiency for amplifier service is made possible by the fact that the input and output circuits of an amplifier are isolated, so that the plate-voltage phase may be adjusted independently of the applied grid voltage.

For additional information, see chapters on INSTALLATION and APPLICATION.

Connections to End-Mountings



AVERAGE PLATE CHARACTERISTICS

