

**TYPE 833-A****MODULATOR, A-F AND R-F POWER AMPLIFIER, OSCILLATOR****ENGINEERING INFORMATION****GENERAL RATINGS**

Number of Electrodes.....	3
Filament Voltage	10 volts
Current	10 amperes
Type	Thoriated Tungsten
Average Characteristic Values Calculated at:	
$E_b = 1500$, $E_c = +100$, $E_f = 10$ A-C	
Amplification Factor	35
Plate Resistance	2200 ohms
Mutual Conductance	16200 micromhos
Average Direct Interelectrode Capacities:	
Grid to Plate	6.3 uuf
Grid to Filament	12.3 uuf
Plate to Filament	8.5 uuf
Maximum Overall Dimensions:	
Length	8 13/16 inches
Diameter	4 19/32 inches
Bulb	T-32
Base	See Outline
Type of Cooling	Air
Net Weight	1 lb.

MAXIMUM RATINGS

	Cooling	
	Free-Air	Forced-Air
Max. D-C Plate Voltage Modulated.....	3000	4000
Max. D-C Plate Voltage Unmodulated.....	3000	4000
Max. D-C Plate Current Modulated.....	400	450
Max. D-C Plate Current Unmodulated.....	500	500
Max. Plate Dissipation.....	300	400
Max. D-C Grid Current.....	100	100
Frequency Rating for Operating Conditions with Maximum Rated Power Input and Nominal Output:		
Below	30	20
Above	10	15
*Maximum Frequency Rating with Reduced Power Input and Output:		
Below	*100	*100
Above	*3	*3

* For operation at the higher frequencies, the plate voltage, and plate input should not exceed 50% of the Maximum Ratings. The R-F grid current should never exceed the maximum rated value.

INSTALLATION

The design of the United 833-A eliminates the conventional base structure in favor of two sturdy filament-post terminals. The tube may be mounted in a vertical position with the filament-end down, or in a horizontal position with the plate on edge.

The filament of the 833-A should be operated at the rated value of 10 volts. Operation at other than rated value may result in loss of filament emission and short life. Except in cases where freedom from hum is essential, the filament of the 833-A should be operated preferably from an a-c source.

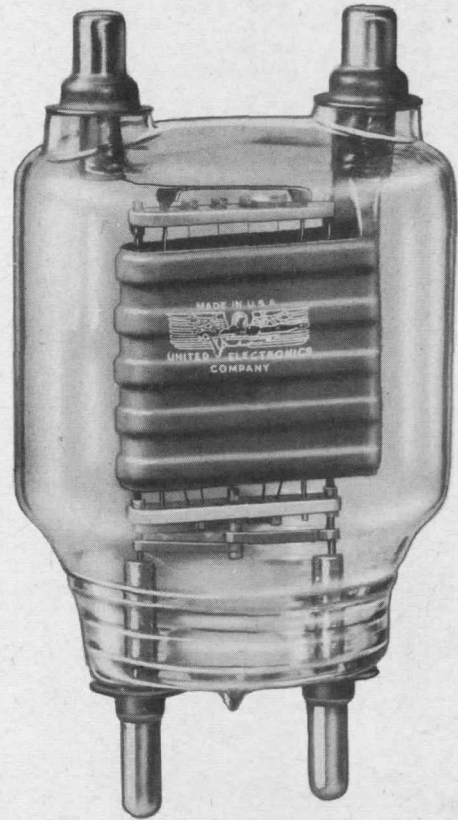
When free-air cooling is employed adequate cabinet ventilation should be provided. If forced-air cooling is used, an air flow of 40 cubic feet per minute should be directed downward between plate and grid seals. Bulb temperature between seals should not exceed 145°C.

GRAPHITE ANODE

A specially processed graphite anode is used in this tube type because of several specific advantages over metals such as tantalum, molybdenum, and nickel. The radiating area of graphite is approximately twice the projected anode area because of its surface porosity and it will dissipate at least four times more heat than metal.

Graphite, being infusible will not warp or twist. The exact form of graphite is maintained under all temperatures; hence constant inter-element relationships and uniform characteristics result. The inherent advantages of graphite over metal are of primary importance in designing tubes of this type for long and satisfactory service.

All ratings given are for continuous service. Higher ratings are permissible for intermittent operation. Additional data will be furnished upon request.

**UNITED TYPE 833-A**

High Perveance

Low Driving Power

High Plate Efficiency

100 Watt Filament

2000 Watts Input

A-F POWER AMPLIFIER AND MODULATOR—CLASS B

	Free-Air Cooling	Forced-Air Cooling	
Maximum D-C Plate Voltage.....	3000	4000	volts
Maximum D-C Plate Current*.....	500	500	ma.
Maximum Plate Input*.....	1125	1600	watts
Maximum Plate Dissipation*.....	300	400	watts

Typical Operation (2 tubes):

Filament Voltage	10	10	a-c volts
D-C Plate Voltage	3000	4000	volts
D-C Grid Voltage	-70	-100	volts
Zero-Sig. Plate Cur. (per tube)	100	100	ma.
Max.-Sig. Plate Cur. (per tube)	750	800	ma.
Load Resistance (per tube).....	2375	3000	ohms
Eff. Load Res. (plate to plate)	9500	12000	ohms
Max. Sig. Driving Power	20	29	watts
Max. Sig. Power Output	1650	2400	watts

* Average over any audio-frequency sine wave cycle.

PLATE MODULATED R-F POWER AMPLIFIER
CLASS C TELEPHONY

(Carrier Conditions — Modulation Factor = 1.0)

	Free-Air Cooling	Forced-Air Cooling	
Maximum D-C Plate Voltage	2500	3000	volts
Maximum D-C Grid Voltage	-500	-500	volts
Maximum D-C Plate Current	400	450	ma.
Maximum D-C Grid Current	100	100	ma.
Plate Input	835	1250	watts
Plate Dissipation	200	270	watts

Typical Operation:

Filament Voltage	10	10	a-c volts
D-C Plate Voltage	2500	3000	volts
D-C Grid Voltage	-300	-300	volts
Peak R-F Grid Voltage	460	490	volts
D-C Plate Current	335	415	ma.
D-C Grid Current	75	85 approx.	ma.
Driving Power	30	37 approx.	watts
Power Output	635	1000 approx.	watts

R-F POWER AMPLIFIER—CLASS B TELEPHONY

(Carrier Conditions — Modulation Factor = 1.0)

	Free-Air Cooling	Forced-Air Cooling	
Maximum D-C Plate Voltage	3000	4000	ma.
Maximum D-C Plate Current	300	300	ma.
Maximum Plate Input	450	600	watts
Maximum Plate Dissipation	300	400	watts

Typical Operation:

Filament Voltage	10	10	a-c volts
D-C Plate Voltage	3000	4000	volts
D-C Grid Voltage	-70	-120	volts
Peak R-F Grid Voltage	90	120	volts
D-C Plate Current	150	150	ma.
Driving Power	10	14 approx.	watts
Power Output	150	225 approx.	watts

R-F POWER AMPLIFIER AND OSCILLATOR
CLASS C TELEGRAPHY

(Key Down Conditions)

	Free-Air Cooling	Forced-Air Cooling	
Maximum D-C Plate Voltage	3000	4000	volts
Maximum D-C Grid Voltage	-500	-500	volts
Maximum D-C Plate Current	500	500	ma.
Maximum D-C Grid Current	100	100	ma.
Maximum Plate Input	1250	1800	watts
Maximum Plate Dissipation	300	400	watts

Typical Operation:

Filament Voltage	10	10	a-c volts
D-C Plate Voltage	3000	4000	volts
D-C Grid Voltage	-200	-200	volts
Peak R-F Grid Voltage	360	375	volts
D-C Plate Current	415	450	ma.
D-C Grid Current	55	75	ma.
Driving Power	20	26	watts
Power Output	1000	1440	watts

