

**TYPE 204-A****R-F POWER AMPLIFIER, OSCILLATOR, CLASS B MODULATOR****ENGINEERING INFORMATION****GENERAL RATINGS**

Number of Electrodes	3
Filament Voltage	11 volts
Current	3.85 amperes
Type	Thoriated Tungsten
Average Characteristic Values Calculated at:	
Ep = 2000, Ec = -32, Ef = 11 A-C	
Plate Current	0.125 amperes
Amplification Factor	23
Plate Resistance	6300 ohms
Mutual Conductance	4000 micromhos
Average Direct Interelectrode Capacities:	
Grid to Plate	15.0 uuf
Grid to Filament	12.5 uuf
Plate to Filament	2.3 uuf
Maximum Overall Dimensions:	
Length	14 3/8 inches
Diameter	4 1/16 inches
Bulb	T-32
Cap	Standard 250-Watt
Base	Jumbo 3-Pin
Type of Cooling	Air
Net Weight	23 oz.

MAXIMUM RATINGS

Maximum D-C Plate Voltage Modulated	2000	volts
Maximum D-C Plate Voltage Unmodulated	2500	volts
Maximum A-C Plate Voltage R.M.S.	3000	volts
Maximum D-C Plate Current Modulated	275	ma.
Maximum D-C Plate Current Unmodulated	275	ma.
Maximum Plate Dissipation	250	watts
Maximum D-C Grid Current	80	ma.
Maximum R-F Grid Current	10	amp.
Frequency Rating for Operating Conditions with Maximum Rated Power Input and Nominal Output:		
Below	3	megacycles
Above	100	meters
*Maximum Frequency Rating with Reduced Power Input and Output:		
Below	*30	megacycles
Above	*10	meters

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

INSTALLATION

The base of the UNITED 204-A is designed for mounting in a "250 watt" socket of the three-pin type. The tube may be mounted either in a vertical position with the filament base end up, or in a horizontal position with the plate on edge. Ample air space should be provided for ventilation.

The filament of the 204-A should be operated at the rated value of 11 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 204-A should be operated preferably from an a-c source.

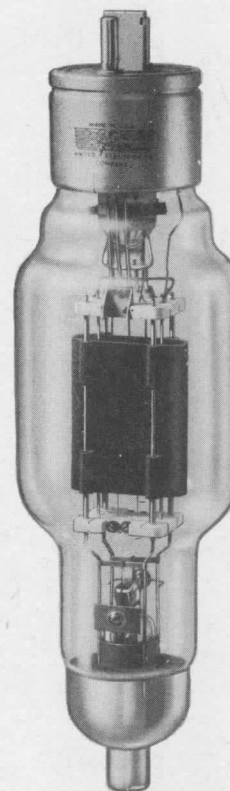
The plate dissipation of the 204-A should never exceed the values given under Maximum Ratings and Typical Operation Conditions.

GRAPHITE ANODE

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

Graphite being infusible, will not warp or twist. Therefore, it maintains its exact form under all temperatures, the result being constant inter-element relationship. The low operating temperature of the graphite anode tends to keep the grid cool, reduces overload hazards, and prevents gas current. The inherent qualities of graphite over metal as outlined above, are advantages of primary importance in designing tubes of this type for long and satisfactory service life.

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

**REPLACES UNITED TYPE 304-A**

Typical UNITED ELECTRONICS refinements of design are revealed in the above illustration of type 204-A.

A-F POWER AMPLIFIER AND MODULATOR—CLASS B

Maximum D-C Plate Voltage	3000	volts
Maximum D-C Plate Current	Averaged over... 275	ma.
Maximum Plate Dissipation	any audio... 250	watts
Maximum Plate Input	freq. cycle... 650	watts

Typical Operation (2 tubes):

Filament Voltage	11	11	11	a-c	volts
D-C Plate Voltage	1500	2000	2500		volts
Grid Voltage	—40	—60	—85	approx.	volts
Zero-Sig. Plate Cur. (per tube)	37	37	27		ma.
Max.-Sig. Plate Cur. (per tube)	250	250	210		ma.
Load Resistance (per tube)	1950	2200	3280		ohms
Effective Load Res. (plate to plate)	7800	8800	13120		ohms
Power Output	400	600	650	approx.	watts

R-F POWER AMPLIFIER—CLASS B TELEPHONY

(Carrier Conditions—Modulation Factor = 1.0)

Maximum D-C Plate Voltage	2500	volts
Maximum D-C Plate Current	225	ma.
Maximum Plate Dissipation	250	watts
Maximum Plate Input	400	watts
Maximum R-F Grid Current	8	amp.

Typical Operation:

Filament Voltage	11	11	a-c	volts
D-C Plate Voltage	1500	2000		volts
Grid Voltage	—50	—70	approx.	volts
D-C Plate Current	200	160		ma.
Driving Power	18	15	approx.	watts
Peak Power Output	320	400	approx.	watts
Carrier Power Output	80	100	approx.	watts

**PLATE MODULATED R-F POWER AMPLIFIER
CLASS C TELEPHONY**

(Carrier Conditions—Modulation Factor = 1.0)

Maximum D-C Plate Voltage	2000	volts
Maximum D-C Plate Current	275	ma.
Maximum Plate Dissipation	167	watts
Maximum R-F Grid Current	8	amp.
Maximum D-C Grid Current	80	ma.

Typical Operation:

Filament Voltage	11	11	a-c	volts
D-C Plate Voltage	1500	2000		volts
Grid Voltage	—200	—250	approx.	volts
D-C Plate Current	250	250		ma.
D-C Grid Current†	35	35		ma.
Driving Power†	20	20	approx.	watts
Power Output	225	350	approx.	watts

**R-F POWER AMPLIFIER AND OSCILLATOR
CLASS C TELEGRAPHY**

(Key Down Conditions)

Maximum D-C Plate Voltage	2500	volts
Maximum D-C Plate Current	275	ma.
Maximum Plate Dissipation	250	watts
Maximum Plate Input	690	watts
Maximum R-F Grid Current	10	amp.
Maximum D-C Grid Current	80	ma.

Typical Operation:

Filament Voltage	11	11	11	a-c	volts
D-C Plate Voltage	1500	2000	2500		volts
Grid Voltage	—150	—175	—200		volts
D-C Plate Current	250	250	250		ma.
D-C Grid Current†	30	30	30	approx.	ma.
Driving Power†	15	15	15	approx.	watts
Power Output	240	350	450	approx.	watts

†Subject to wide variations depending on the impedance of the load circuit. The driver stage should have a tank circuit of good regulation and should be capable of delivering considerably more than the required driving power.

