



MODULATOR, A-F AND R-F POWER AMPLIFIER, OSCILLATOR

ENGINEERING INFORMATION

GENERAL RATINGS

Number of Electrodes	3
Filament Voltage	10 volts
Current	3.25 amperes
Type	Thoriated Tungsten
Average Characteristic Values Calculated at:	
Eb = 1000, Ec = -50, Ef = 10 D-C	
Plate Current	0.072 amperes
Amplification Factor	12
Plate Resistance	3400 ohms
Mutual Conductance	3530 micromhos
Average Direct Interelectrode Capacities:	
Grid to Plate	14.5 uuf
Grid to Filament	6.0 uuf
Plate to Filament	5.5 uuf
Maximum Overall Dimensions:	
Length	7 7/8 inches
Diameter	2 5/16 inches
Bulb	T-18
Base	Jumbo 4-Large Pin
Type of Cooling	Air
Net Weight	8 oz.

MAXIMUM RATINGS

Maximum D-C Plate Voltage Modulated.....	1000	volts
Maximum D-C Plate Voltage Unmodulated.....	1250	volts
Maximum A-C Plate Voltage R. M. S.	1250	volts
Maximum D-C Plate Current Modulated.....	150	ma.
Maximum D-C Plate Current Unmodulated.....	175	ma.
Maximum Plate Dissipation	125	watts
Maximum D-C Grid Current	50	ma.
Maximum R-F Grid Current	7.5	amp.

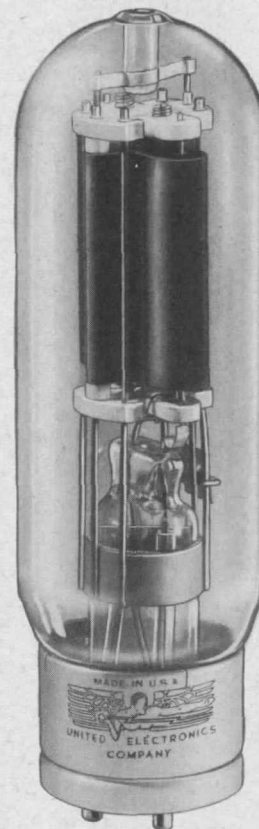
Frequency Rating for Operating Conditions with Maximum Rated Power Input and Nominal Output:

Below	15 megacycles
Above	20 meters

*Maximum Frequency Rating with Reduced Power Input and Output:

Below	*80 megacycles
Above	*3.75 meters

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



REPLACES UNITED TYPE 311

"Ruggedized" construction enables type 211 to withstand unusual shock and vibration conditions. This is one of the most enduring types of transmitting tubes.

INSTALLATION

The base of the UNITED 211 is designed for mounting in a standard "50 watt" socket of the four-pin, bayonet type. The tube should always be mounted vertically with ample air space provided for ventilation.

The filament of the 211 should be operated at the rated value of 10 volts. Operation at other than the rated value may result in loss of filament emission and short life.

While the ratings printed herein are conservative, it is important to observe the requirements of good engineering practice as to transmitter design and operation. Adequate cabinet ventilation should be provided to carry off the heat dissipated during operation. Tube sockets should be inspected to avoid high resistance contacts to the base-pin terminals.

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.

A-F POWER AMPLIFIER AND MODULATOR—CLASS A

Maximum D-C Plate Voltage.....	1250	volts
Maximum Plate Dissipation	100	watts
Typical Operation:		
Filament Voltage	10 10 10	a-c volts
D-C Plate Voltage	750 1000 1250	volts
D-C Grid Voltage	-46 -61 -80	volts
Peak Grid Swing	41 56 75 approx.	volts
D-C Plate Current	34 53 60	ma.
Plate Resistance	4400 3800 3600	ohms
Mutual Conductance	2750 3150 3300	umhos
Load Resistance	8800 7600 9200	ohms
U. P. O. (5% 2nd harmonic)	5.6 12.0 19.7	watts

A-F POWER AMPLIFIER AND MODULATOR—CLASS B

Maximum D-C Plate Voltage.....	1250	volts
Maximum D-C Plate Current.....	175	ma.
Maximum Plate Dissipation } Averaged over any..	125	watts
Maximum Plate Dissipation } audio-freq. cycle....		
Typical Operation (2 tubes):		
Filament Voltage	10 10	a-c volts
D-C Plate Voltage	1000 1250	volts
D-C Grid Voltage	-77 -100	volts
Zero-Sig. Plate Cur. (per tube).....	10 10	ma.
Max.-Sig. Plate Cur. (per tube).....	160 160	ma.
Load Res. (plate to plate).....	6900 9000	ohms
Power Output	200 260	watts

R-F POWER AMPLIFIER—CLASS B TELEPHONY
(Carrier Conditions—Modulation Factor = 1.0)

Maximum D-C Plate Voltage.....	1250	volts
Maximum D-C Plate Current.....	150	ma.
Maximum Plate Dissipation	125	watts
Maximum R-F Grid Current.....	6	amp.
Typical Operation:		
Filament Voltage	10 10	a-c volts
D-C Plate Voltage	1000 1250	volts
D-C Grid Voltage	-77 -100	volts
D-C Plate Current	130 160	ma.
Peak Power Output	160 170	watts
Power Output	40 42.5	watts

PLATE MODULATED R-F POWER AMPLIFIER
CLASS C TELEPHONY

(Carrier Conditions—Modulation Factor = 1.0)

Maximum D-C Plate Voltage.....	1000	volts
Maximum D-C Plate Current.....	175	ma.
Maximum Plate Dissipation	85	watts
Maximum R-F Grid Current.....	6	amp.
Maximum D-C Grid Current.....	50	ma.
Typical Operation:		
Filament Voltage	10 10	a-c volts
D-C Plate Voltage	750 1000	volts
D-C Grid Voltage	-200 -260	volts
D-C Plate Current	150 150	ma.
D-C Current†	35 35	ma.
Driving Power†	12 14	watts
Power Output	65 100 approx.	watts

R-F POWER AMPLIFIER AND OSCILLATOR
CLASS C TELEGRAPHY

(Key-Down Conditions)

Maximum D-C Plate Voltage.....	1250	volts
Maximum D-C Plate Current.....	175	ma.
Maximum Plate Dissipation	125	watts
Maximum R-F Grid Current.....	7.5	amp.
Maximum D-C Grid Current.....	50	ma.
Typical Operation:		
Filament Voltage	10 10 10	a-c volts
D-C Plate Voltage	750 1000 1250	volts
D-C Grid Voltage	-135 -175 -225	volts
D-C Plate Current	150 150 150	ma.
D-C Grid Current†	18 18 18	ma.
Driving Power†	5 6 7	watts
Power Output	65 100 130 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.

