

**TYPE 284-D****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 = 1250, Ec = -220, Ef = 10 D-C	
Plate Current	0.064 amperes
Amplification Factor	4.8
Plate Resistance	1900 ohms
Mutual Conductance	2500 micromhos
Average Direct Interelectrode Capacities:	
Grid to Plate	8.3 uuf
Grid to Filament	5.0 uuf
Plate to Filament	5.6 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	100	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	30	megacycles
Above	10	meters
*Maximum Frequency Rating with Reduced Power Input and Output:		
Below	*60	megacycles
Above	*5	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.

INSTALLATION

The base of the UNITED 284-D 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 284-D 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.

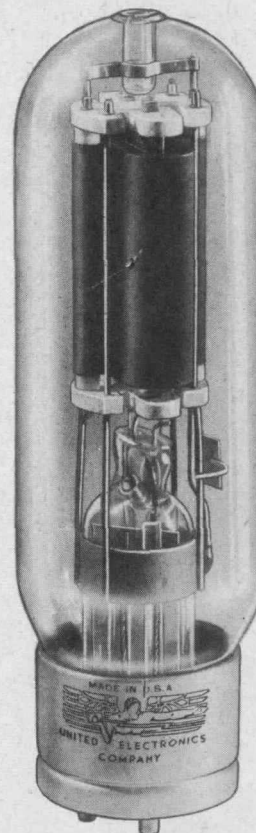
While the ratings printed herein are conservative, it is important to observe the requirements of good engineering practice as to transmitter design and operation. Adequate cabinet ventilation should be provided to carry off the heat dissipated during operation. Tube sockets should be inspected to avoid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

**REPLACES UNITED TYPE 384-D**

This rugged, specially designed low mu tube is ideally suited for audio applications. It may also be used for general purposes in accordance with the ratings shown.

A-F POWER AMPLIFIER AND MODULATOR—CLASS A

Maximum D-C Plate Voltage	1250	volts
Maximum Plate Dissipation	85	watts

Typical Operation:

Filament Voltage	10	10	10	a-c volts
D-C Plate Voltage	750	1000	1250	volts
D-C Grid Voltage	-109	-166	-225	volts
Peak Grid Swing	-104	-161	-220	volts
D-C Plate Current	100	80	64	ma.
Plate Resistance	1550	1720	1900	ohms
Mutual Conductance	3100	2800	2500	umhos
Load Resistance	8000	8500	10000	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	Averaged over any 175	ma.
Maximum Plate Dissipation	audio-freq. cycle ... 100	watts

Typical Operation (2 tubes):

Filament Voltage	10	10	a-c volts
D-C Plate Voltage	1000	1250	volts
D-C Grid Voltage	-195	-250	volts
Zero-Sig. Plate Cur. (per tube)	15	15	ma.
Max.-Sig. Plate Cur. (per tube)	100	100	ma.
Load Res. (plate to plate)	8800	11200	ohms
Power Output (2 tubes)	110	140	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	100	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	-225	-280	volts
D-C Plate Current	100	100	ma.
Peak Power Output	160	170	watts
Power Output	40	43	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	67	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	-340	-450	volts
D-C Plate Current	150	150	ma.
D-C Grid Current†	50	50	ma.
Driving Power†	12	14	watts
Power Output	75	100	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	100	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	-315	-417	-520	volts
D-C Plate Current	150	150	150	ma.
D-C Grid Current†	20	20	20	ma.
Driving Power†	5	6	7	watts
Power Output	75	100	125	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.

