



TYPE 849

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

ENGINEERING INFORMATION

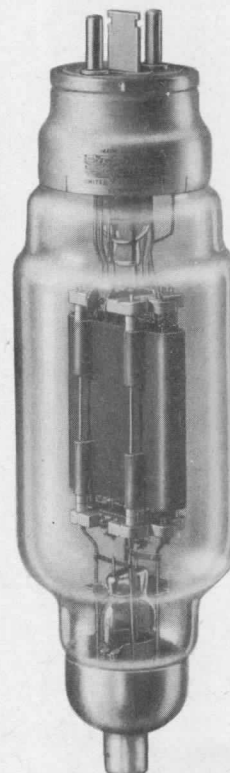
GENERAL RATINGS

Number of Electrodes	3
Filament Voltage	11 volts
Current	5.0 amperes
Type	Thoriated Tungsten
Average Characteristic Values Calculated at:	
Ep = 3000, Ec = -132, Ef = 11 A-C	
Plate Current	0.100 amperes
Amplification Factor	19
Plate Resistance	3200 ohms
Mutual Conductance	6000 micromhos
Average Direct Interelectrode Capacities:	
Grid to Plate	33.5 uuf
Grid to Filament	17.0 uuf
Plate to Filament	3.0 uuf
Maximum Overall Dimensions:	
Length	14 3/8 inches
Diameter	4 1/8 inches
Bulb	T-32
Cap	Standard 250-Watt
Base	Jumbo 3-Pin
Type of Cooling	Air
Net Weight	24 oz.

MAXIMUM RATINGS

Maximum D-C Plate Voltage Modulated	2000	volts
Maximum D-C Plate Voltage Unmodulated	3000	volts
Maximum A-C Plate Voltage R. M. S.	3000	volts
Maximum D-C Plate Current Modulated	350	ma.
Maximum D-C Plate Current Unmodulated	350	ma.
Maximum Plate Dissipation	400	watts
Maximum D-C Grid Current	125	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 Operation Conditions. The R-F grid current should never exceed the maximum rated value.



Replaces UNITED type 949

INSTALLATION

The base of the UNITED 849 is designed to fit the standard "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 849 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 849 should be operated preferably from an a-c source.

The plate dissipation of the 849 should never exceed the values given under Maximum Ratings and Typical Operation Conditions.

GRAPHITE ANODE

A graphite anode is used in this type 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.

A-F POWER AMPLIFIER AND MODULATOR—CLASS A

Maximum D-C Plate Voltage	3000	volts
Maximum Plate Dissipation	300	watts
Maximum Plate Input	300	watts

Typical Operation:

Filament Voltage	11	11	11	a-c	volts
D-C Plate Voltage	2000	2500	3000		volts
D-C Grid Voltage	-74	-104	-132 approx.		volts
Peak A-F Grid Voltage	68	98	126 approx.		volts
D-C Plate Current	135	110	100		ma.
Mutual Conductance	6500	6050	5850		umhos
Plate Resistance	2950	3150	3250		ohms
Load Resistance	6000	12000	18000		ohms
U. P. O. (5% 2nd harmonic)	58	81	100		watts

A-F POWER AMPLIFIER AND MODULATOR—CLASS B

Maximum D-C Plate Voltage	3000	volts
Maximum D-C Plate Current	Averaged over 0.35	amp.
Maximum Plate Dissipation	any audio	300 watts
Maximum Plate Input	freq. cycle	825 watts

Typical Operation (2 tubes):

Filament Voltage	11	11	11	a-c	volts
D-C Plate Voltage	2000	2500	3000		volts
D-C Grid Voltage	-105	-130	-155 approx.		volts
Zero-Sig. Plate Cur. (per tube)	7	10	12		ma.
Max.-Sig. Plate Cur. (per tube)	325	280	260		ma.
Load Resistance (per tube)	1600	2600	3200		ohms
Load Res. (plate to plate)	6400	10400	12800		ohms
Driving Power (per tube)	8	7	6 approx.		watts
Power Output (2 tubes)	900	1000	1100 approx.		watts

R-F POWER AMPLIFIER AND OSCILLATOR

(Carrier Conditions — Modulation Factor = 1.0)

Maximum D-C Plate Voltage	2500	volts
Maximum D-C Plate Current	350	ma.
Maximum Plate Dissipation	400	watts
Maximum Plate Input	600	watts
Maximum R-F Grid Current	8	amp.

Typical Operation:

Filament Voltage	11	11	11	a-c	volts
D-C Plate Voltage	1500	2000	2500		volts
D-C Grid Voltage	-70	-95	-125 approx.		volts
Peak R-F Grid Voltage	140	140	140 approx.		volts
D-C Plate Current	320	265	216		ma.
Driving Power†	18	15	12 approx.		watts
Power Output	150	170	180 approx.		watts

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

(Key Down Conditions)

Maximum D-C Plate Voltage	2000	volts
Maximum D-C Plate Current	350	ma.
Maximum Plate Dissipation	270	watts
Maximum Plate Input	700	watts
Maximum D-C Grid Current	125	ma.
Maximum R-F Grid Current	8	amp.

Typical Operation:

Filament Voltage	11	11	a-c	volts
D-C Plate Voltage	1500	2000		volts
D-C Grid Voltage	-250	-300 approx.		volts
Peak R-F Grid Voltage	400	450 approx.		volts
D-C Plate Current	300	300		ma.
D-C Grid Current†	35	30 approx.		ma.
Driving Power†	14	14 approx.		watts
Power Output	300	425 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	350	ma.
Maximum Plate Dissipation	400	watts
Maximum Plate Input	875	watts
Maximum D-C Grid Current	125	ma.
Maximum R-F Grid Current	10	amp.

Typical Operation:

Filament Voltage	11	11	11	a-c	volts
D-C Plate Voltage	1500	2000	2500		volts
D-C Grid Voltage	-175	-200	-250 approx.		volts
Peak R-F Grid Voltage	310	325	360 approx.		volts
D-C Plate Current	300	300	300		ma.
D-C Grid Current†	35	25	20 approx.		ma.
Driving Power†	11	9	8 approx.		watts
Power Output	300	425	560 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.

