UNITED ELECTRONICS

TYPE HV-18

R-F POWER AMPLIFIER, OSCILLATOR, CLASS B MODULATOR

ENGINEERING INFORMATION

GENERAL RATINGS

Number of Electrodes	3
Filament Voltage	10 volts
Current	3.85 amperes
Type	Thoriated Tungsten
Average Characteristic Values Calculated at: 150 ma. Plate Current	
Amplification Factor	18
Plate Resistance	3600 ohms
Mutual Conductance	5000 micromhos
Average Direct Interelectrode Capacities:	
Grid to Plate	6.5 uuf
Grid to Filament	5.0 uuf
Plate to Filament	1.5 uuf
Maximum Overall Dimensions:	
Length	9 7-8 inches
Diameter	2 15-16 inches
Diameter plus Grid Terminal	4 1-16 inches
Bulb	T-23
Cap	Medium Metal
Grid Cap	Lava Insulated Medium Metal
Base	Jumbo 4-Large Pin
Type of Cooling	Air
Net Weight	9 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.	2500	volts
Maximum D-C Plate Current Modulated	175	ma.
Maximum D-C Plate Current Unmodulated	210	ma.
Maximum Plate Dissipation	200	watts
Maximum D-C Grid Current	60	ma.
Maximum R-F Grid Current	10	amp.
Frequency Rating for Operating Conditions with Maximum Rated Power Input and Nominal Output:		
Below	50	megacycles
Above	6	meters
*Maximum Frequency Rating with Reduced Power Input and Output:		
Below	*85	megacycles
Above	*3.5	meters

* 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.

INTERCHANGES WITH TYPE 200

High frequency triode for heavy duty industrial and communications uses.

INSTALLATION

The base of the UNITED HV-18 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 HV-18 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.

The plate dissipation of the HV-18 should never exceed the values given under Maximum Ratings and Typical Operation Conditions.

A heavy ribbon grid lead, which is brought out through the side wall of the bulb, is used to reduce R-F losses at the higher frequencies.

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.

United

A-F POWER AMPLIFIER AND MODULATOR—CLASS B

Maximum D-C Plate Voltage		2500	volts
Maximum D-C Plate Current	Averaged over any audio freq. cycle	200	watts
Maximum Plate Input		450	ma.
Maximum Plate Dissipation		150	watts

Typical Operation (2 tubes):

A-C Filament Voltage	10	10	volts
D-C Plate Voltage	2000	2500	volts
D-C Grid Voltage	—100	—130	volts
Peak A-F Grid to Grid Voltage	420	410	volts
Zero-Sig D-C Plate Cur.	60	60	ma.
Max.-Sig. D-C Plate Cur.	380	320	ma.
Load Resistance (per tube)	2800	4000	ohms
Effective Load Res. (plate to plate)	11200	16000	ohms
Max.-Signal Driving Power	9	2.5 approx.	watts
Power Output	500	500 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		150	ma.
Maximum Plate Input		250	watts
Maximum Plate Dissipation		150	watts
Maximum R-F Grid Current		10	amp.

Typical Operation:

A-C Filament Voltage	10	10	volts
D-C Plate Voltage	2000	2500	volts
D-C Grid Voltage	—110	—140	volts
Peak R-F Grid Voltage	125	130	volts
D-C Plate Current	110	90	ma.
D-C Grid Current†	0.5	0 approx.	ma.
Driving Power†	6	4 approx.	watts
Power Output	80	80 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		200	ma.
Maximum Plate Input		400	watts
Maximum Plate Dissipation		120	watts
Maximum D-C Grid Voltage		—500	volts
Maximum D-C Grid Current		50	ma.
Maximum R-F Grid Current		10	amp.

Typical Operation:

A-C Filament Voltage	10	10	volts
D-C Plate Voltage	1750	2000	volts
D-C Grid Voltage	—300	—350	volts
Peak R-F Grid Voltage	475	500	volts
D-C Plate Current	200	160	ma.
D-C Grid Current†	30	20 approx.	ma.
Driving Power†	14	9 approx.	watts
Power Output	270	250 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		200	ma.
Maximum Plate Input		550	watts
Maximum Plate Dissipation		150	watts
Maximum D-C Grid Voltage		—500	volts
Maximum D-C Grid Current		70	ma.
Maximum R-F Grid Current		10	amp.

Typical Operation:

A-C Filament Voltage	10	10	volts
D-C Plate Voltage	2000	2500	volts
D-C Grid Voltage	—250	—300	volts
Peak R-F Grid Voltage	400	450	volts
D-C Plate Current	200	200	ma.
D-C Grid Current	23	18 approx.	ma.
Driving Power†	9	8 approx.	watts
Power Output†	300	380 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.