

VHF BEAM-POWER TYPES WL-8032 AND WL-8298

The WL-8032 and WL-8298 are new, improved octal based beam-power pentode type tubes. They are designed for service as very-high-frequency amplifiers or oscillators. They may also be used as audio amplifiers or modulators. Their small size makes them ideal for compact mobile and stationary communications equipment. These types are characterized by high power sensitivity, low plate and grid 2 voltages and low driving power.

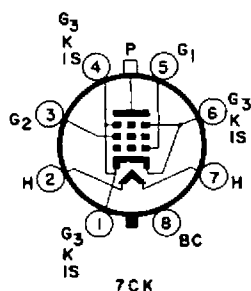
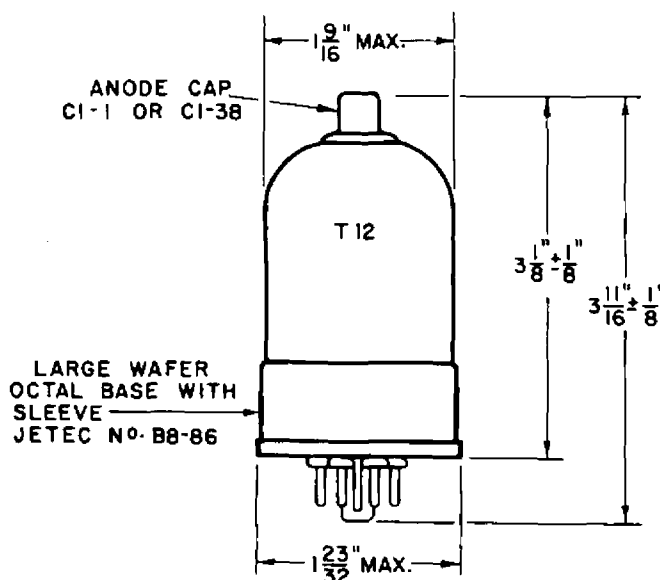
The cathode and grid 3 are connected to an internal shield and three base pins. These connections make possible an effective radio frequency ground. A T-12 bulb and a short internal lead button stem contribute to cooler operation and longer life. The short metal sleeve around the base provides shielding for the input. The top-cap plate connection isolates the input circuit from the output circuit. The top-cap is skirted to secure a better bond with the envelope and to increase its heat dissipation capabilities.

ELECTRICAL

Cathode.....	Coated Unipotential		
Heater:	WL-8298	WL-8032	
Voltage (ac or dc)	6.75	13.5	Volts
Current	1.165	0.585	Ampere
Direct Interelectrode Capacitances: (Unshielded)			
Grid 1 to Plate	0.22	max.	$\mu\mu\text{f}$
Input	13.5		$\mu\mu\text{f}$
Output	8.5		$\mu\mu\text{f}$

MECHANICAL

Bulb.....	T-12
Base.....	Large Wafer Octal with Sleeve (JEDEC B8-86) or Small Wafer Octal with Sleeve (JEDEC B8-150)
Basing.....	7CK
Top Cap....	Small (JEDEC C1-1) or Small Skirted (JEDEC C1-38)
Mounting Position.....	Any
Max. Bulb Temperature at Hottest Point.....	220 °C



AF POWER AMPLIFIER AND MODULATOR

CLASS AB₁ OPERATION[Ⓢ] TRIODE CONNECTED

MAXIMUM RATINGS

Absolute Maximum Values	CCS [▲]	ICAS [▲]	
DC Plate Voltage	400	400 max.	Volts
Grid 2	Connected to Plate		
DC Plate Current	90	90 max.	Ma.
DC Plate Power Input	35	35 max.	Watts
Plate Dissipation	20	25 max.	Watts
Peak Heater-Cathode Voltage:			
Heater Positive with Respect to Cathode	135	135 max.	Volts
Heater Negative with Respect to Cathode	135	135 max.	Volts
Grid 1 Circuit Resistance: *			
With Fixed Bias	0.1	0.1 max.	Megohm
With Cathode Resistor Bias	0.5	0.5 max.	Megohm

TYPICAL OPERATING CHARACTERISTICS

Two Tubes in Push-Pull	CCS [▲]	ICAS [▲]	
Plate Voltage	250	400	400 Volts
Grid 1 Voltage	-50	-100	-100 Volts
Peak Signal Grid 1 to Grid 1 Voltage*	100	200	200 Volts
Peak Signal Grid Driving Power* . .	0	0	0 Watts
Plate Current:			
Zero-Signal	120	40	40 Ma.
Maximum-Signal	125	100	100 Ma.
Plate-to-Plate Load Resistance . .	5000	8000	8000 Ohms
Peak Signal Power Output	10	22	22 Watts

CLASS AB₁ OPERATION[Ⓢ]

MAXIMUM RATINGS

Absolute Maximum Values	CCS [▲]	ICAS [▲]	
DC Plate Voltage	600	750 max.	Volts
DC Grid 2 Voltage	250	250 max.	Volts
DC Plate Current	125	135 max.	Ma.
DC Plate Power Input	60	85 max.	Watts
DC Grid 2 Power Input	3	3 max.	Watts
Plate Dissipation	20	25 max.	Watts
Peak Heater-Cathode Voltage:			
Heater Positive with Respect to Cathode	135	135 max.	Volts
Heater Negative with Respect to Cathode	135	135 max.	Volts
Grid 1 Circuit Resistance:			
With Fixed Bias	0.1	0.1 max.	Megohms
With Cathode-Resistor Bias		Not Recommended	

TYPICAL OPERATING CHARACTERISTICS IN CCS[▲]

Two Tubes in Push-Pull				
Plate Voltage	400	500	600	Volts
Grid 2 Voltage*	190	185	180	Volts
Grid 1 Voltage (Fixed Bias)	-40	-40	-45	Volts
Peak Signal Grid 1 to Grid 1 Voltage*	80	80	90	Volts
Peak Signal Driving Power*	0	0	0	Watts
Plate Current:				
Zero Signal	63	57	26	Ma.
Max. Signal	228	215	200	Ma.
Grid 2 Current:				
Zero Signal	2.5	2.0	1.0	Ma.
Max. Signal	25	25	23	Ma.
Plate-to-Plate Load Resistance . .	4000	5500	7000	Ohms
Peak Signal Power Output	55	70	82	Watts

TYPICAL OPERATING CHARACTERISTICS IN ICAS[▲]

Two Tubes in Push-Pull				
Plate Voltage	600	750		Volts
Grid 2 Voltage*	200	195		Volts
Grid 1 Voltage (Fixed Bias)	-50	-50		Volts
Peak Signal Grid 1 to Grid 1 Voltage*	100	100		Volts
Peak Signal Driving Power*	0	0		Watts
Plate Current:				
Zero Signal	28	23		Ma.
Max. Signal	229	220		Ma.
Grid 2 Current:				
Zero Signal	1.0	1.0		Ma.
Max. Signal	27	26		Ma.
Plate-to-Plate Load Resistance . .	6000	8000		Ohms
Peak Signal Power Output	95	120		Watts

CLASS AB₂ OPERATION[□]

MAXIMUM RATINGS

Absolute Maximum Values	CCS [▲]	ICAS [▲]	
DC Plate Voltage	600	750 max.	Volts
DC Grid 2 Voltage	250	250 max.	Volts
DC Plate Current	125	135 max.	Ma.
DC Plate Power Input	62.5	90 max.	Watts
DC Grid 2 Power Input	3	3 max.	Watts
Plate Dissipation	20	25 max.	Watts
Peak Heater-Cathode Voltage:			
Heater Negative with Respect to Cathode	135	135 max.	Volts
Heater Positive with Respect to Cathode	135	135 max.	Volts
Grid 1 Circuit Resistance:			
With Fixed Bias:			
Operated at Max. Ratings	300000	300000 max.	Ohms
Operated below Max. Ratings . . .	100000	100000 max.	Ohms
With Cathode-Resistor Bias		Not Recommended	

TYPICAL OPERATING CHARACTERISTICS IN CCS*

Two Tubes in Push-Pull

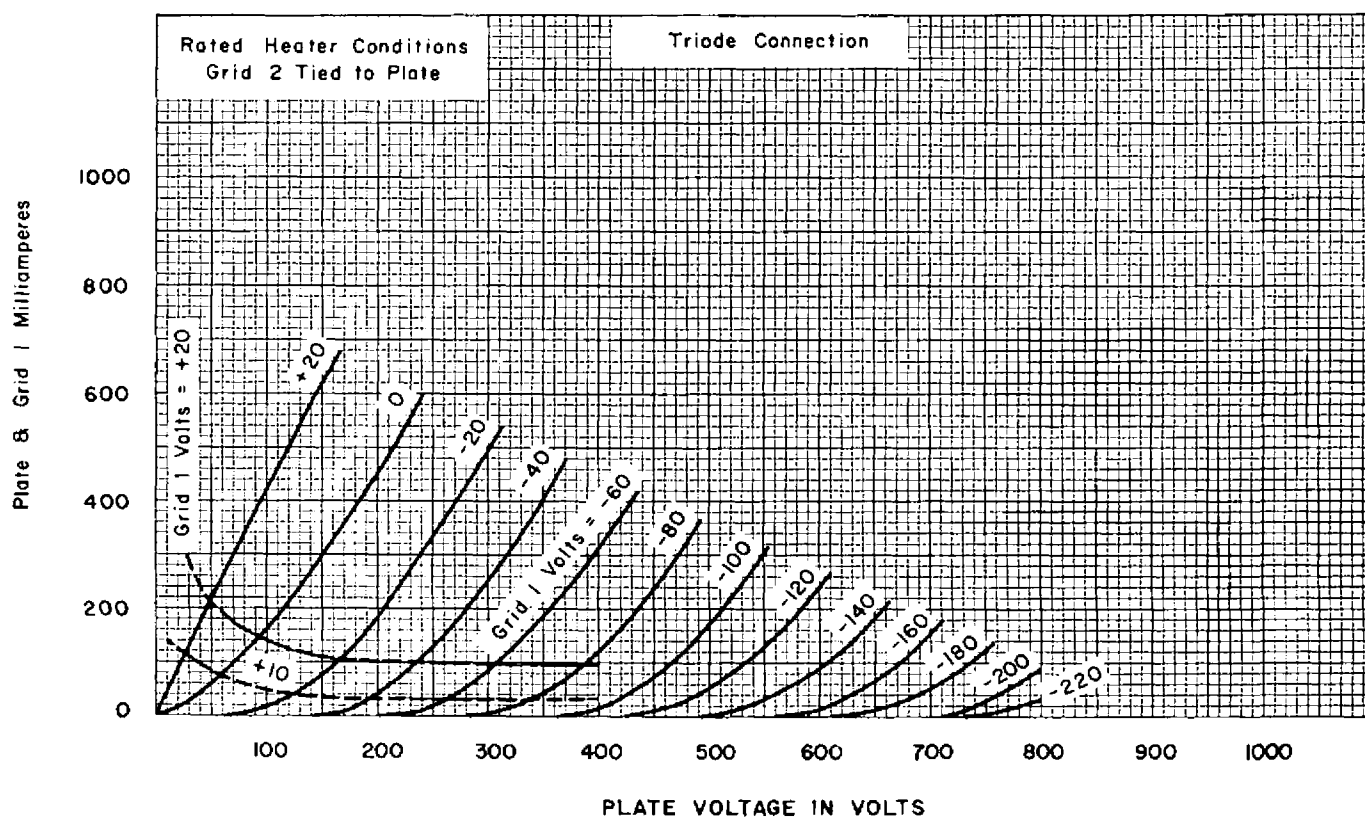
Plate Voltage	400	500	600	Volts
Grid 2 Voltage	175	175	165	Volts
Grid 1 Voltage (Fixed Bias)	-41	-44	-44	Volts
Peak Signal Grid 1 to Grid 1				
Voltage	95	102	97	Volts
Peak Signal Driving Power	0.2	0.3	0.2	Watts
Peak Current:				
Zero Signal	33	27	22	Ma.
Max. Signal	232	242	207	Ma.
Grid 2 Current:				
Zero Signal	1.1	0.7	0.6	Ma.
Max. Signal	18	18	17	Ma.
Peak Signal Grid 1 Current	1.6	1.9	1.1	Ma.
Plate-to-Plate Load Resistance	3700	4600	6800	Ohms
Peak Signal Power Output	62	83	90	Watts

TYPICAL OPERATING CHARACTERISTICS IN ICAS*

Two Tubes in Push-Pull

Plate Voltage	600	750	Volts
Grid 2 Voltage	190	165	Volts
Grid 1 Voltage (Fixed Bias)	-48	-46	Volts
Peak Signal Grid 1 to Grid 1			
Voltage	109	108	Volts
Peak Signal Driving Power	0.03	0.04	Watts
Plate Current:			
Zero Signal	28	22	Ma.
Max. Signal	270	240	Ma.
Grid 2 Current:			
Zero Signal	1.2	0.3	Ma.
Max. Signal	20	20	Ma.
Peak Signal Grid 1 Current	2.0	2.6	Ma.
Plate-to-Plate Load Resistance	5000	7400	Ohms
Peak Signal Power Output	113	131	Watts

AVERAGE PLATE CHARACTERISTICS



RF POWER AMPLIFIER AND OSCILLATOR

PLATE MODULATED CLASS C TELEPHONY MAX. MODULATED FACTOR OF 1.0

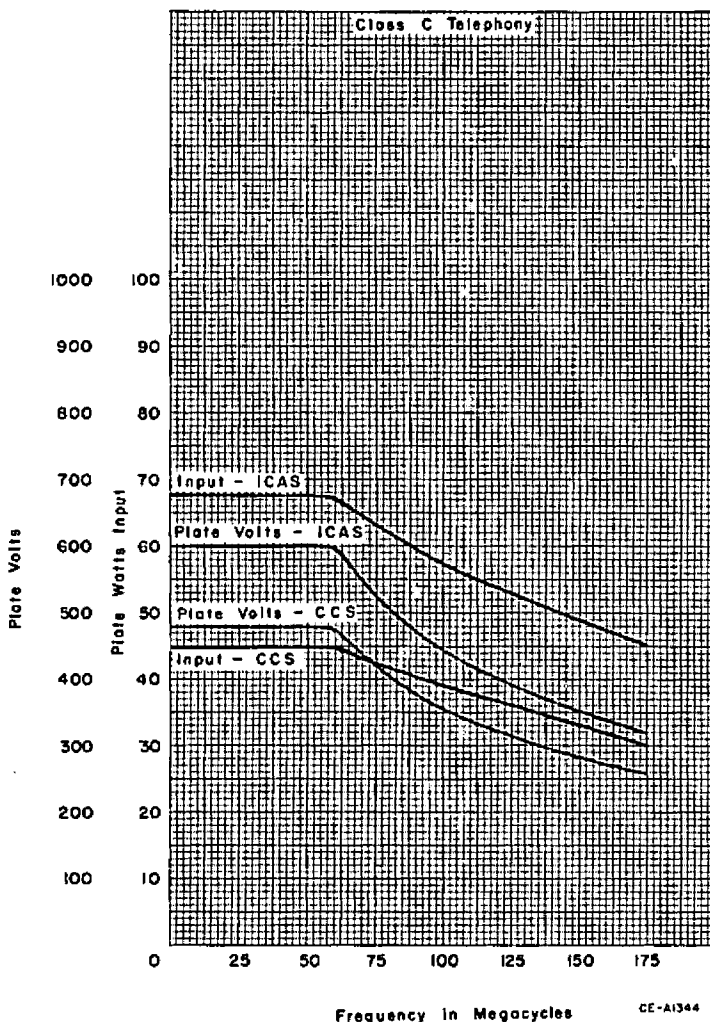
MAXIMUM RATINGS:

Absolute Maximum Values	CCS ^A	ICAS [*]	
DC Plate Voltage	480	600 max.	Volts
DC Grid 2 Voltage	250	250 max.	Volts
DC Grid 1 Voltage	-150	-150 max.	Volts
DC Plate Current	117	125 max.	Ma.
DC Grid 1 Current	3.5	4.0 max.	Ma.
DC Plate Power Input	45	67.5 max.	Watts
DC Grid 2 Power Input	2	2 max.	Watts
Plate Dissipation	13.3	16.7 max.	Watts
Peak Heater-Cathode Voltage:			
Heater Negative with Respect to Cathode	135	135 max.	Volts
Heater Positive with Respect to Cathode	135	135 max.	Volts
Grid 1 Circuit Resistance [†]			
Operated at Max. Ratings	30000	30000 max.	Ohms
Operated below Max. Ratings	100000	100000 max.	Ohms

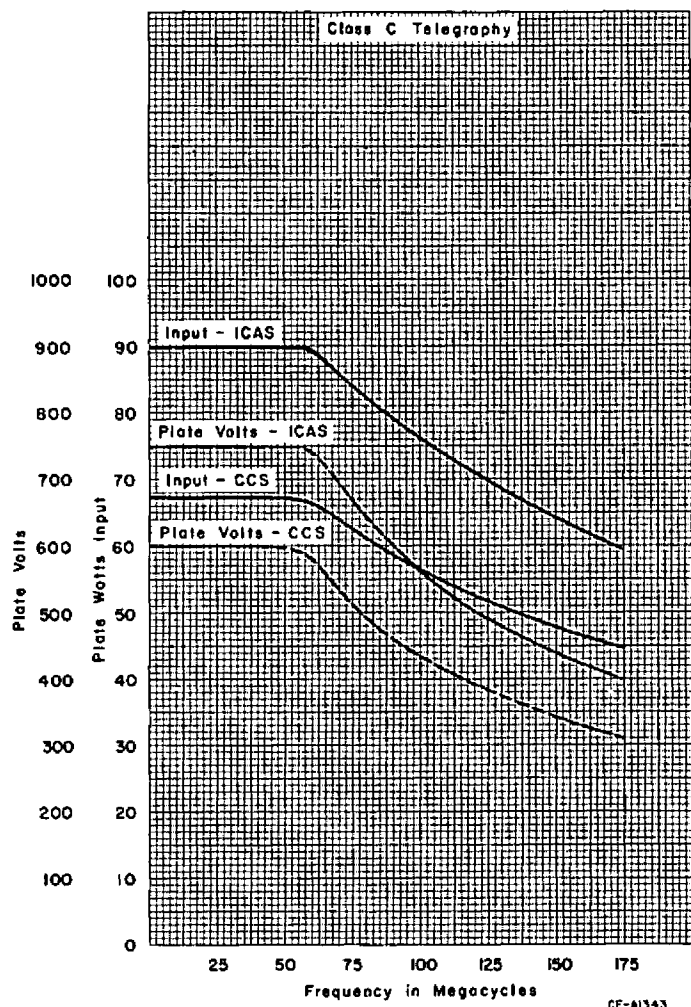
TYPICAL OPERATING CHARACTERISTICS

	CCS ^A	ICAS [*]	
Plate Voltage	400	475	600 Volts
Grid 2 Voltage [*]	150	135	150 Volts
Grid 2 Series Resistor [*]	33000	51000	56000 Ohms
Grid 1 Voltage [†]	-87	-77	-87 Volts
Grid 1 Resistor [†]	27000	27000	27000 Ohms
Peak RF Driving Signal:			
Voltage	107	95	107 Volts
Power	0.4	0.3	0.4 Watt
Plate Current	112	94	112 Ma.
Grid 2 Current	7.8	6.4	7.8 Ma.
Grid 1 Current	3.4	2.8	3.4 Ma.
Power Output	32	34	52 Watts

POWER INPUT - FREQUENCY CHARACTERISTICS



POWER INPUT - FREQUENCY CHARACTERISTICS



CONTINUOUS WAVE CLASS C TELEGRAPHY AND FREQUENCY MODULATED CLASS C TELEGRAPHY

MAXIMUM RATINGS

Absolute Maximum Values	CCS*	ICAS*	
DC Plate Voltage	600	750 max.	Volts
DC Grid 2 Voltage	250	250 max.	Volts
DC Grid 2 Key-Up Voltage	400	400 max.	Volts
DC Grid 1 Voltage	-150	-150 max.	Volts
DC Plate Current	140	150 max.	Ma.
DC Grid 1 Current	3.5	4.0 max.	Ma.
DC Plate Power Input	6 7.5	90 max.	Watts
DC Grid 2 Power Input	3.0	3.0 max.	Watts
Plate Dissipation	20	25 max.	Watts
Peak Heater-Cathode Voltage:			
Heater Negative with Respect to Cathode	135	135 max.	Volts
Heater Positive with Respect to Cathode	135	135 max.	Volts
Grid 1 Circuit Resistance [†]			
Operated at Max. Ratings	30000	30000 max.	Ohms
Operated below Max. Ratings	100000	100000 max.	Ohms

TYPICAL OPERATING CHARACTERISTICS

Frequencies up to 60 Megacycles	CCS*	ICAS*	
Plate Voltage	500	600	600 750 Volts
Grid 2 Voltage	170	150	180 160 Volts
Grid 2 Series Resistor	36000	51000	43000 56000 Ohms
Grid 1 Voltage	-66	-58	-71 -62 Volts
From Grid Resistor of	27000	20000	24000 20000 Ohms
or Cathode-Bias Resistor of	470	470	430 470 Ohms
Peak RF Driving Signal:			
Voltage	84	73	91 79 Volts
Power	0.2	0.2	0.3 0.2 Watts
Plate Current	135	112	150 120 Ma.
Grid 2 Current	9	9	10 11 Ma.
Grid 1 Current	2.5	2.8	2.8 3.1 Ma.
Power Output	48	52	66 70 Watts

TYPICAL OPERATING CHARACTERISTICS

175 Megacycle Amplifier	CCS*	ICAS*	
Plate Voltage	320	400	Volts
Grid 2 Voltage	180	190	Volts
Grid 2 Series Resistor	13000	20000	Ohms
Grid 1 Voltage	-51	-54	Volts
From Grid Resistor of	27000	24000	Ohms
or a Cathode Resistor of	330	330	Ohms
Peak RF Driving Signal:			
Voltage	64	68	Volts
Power	3	3	Watts
Plate Current	140	150	Ma.
Grid 2 Current	10	10.4	Ma.
Grid 1 Current	2	2.2	Ma.
Power Output	25	35	Watts

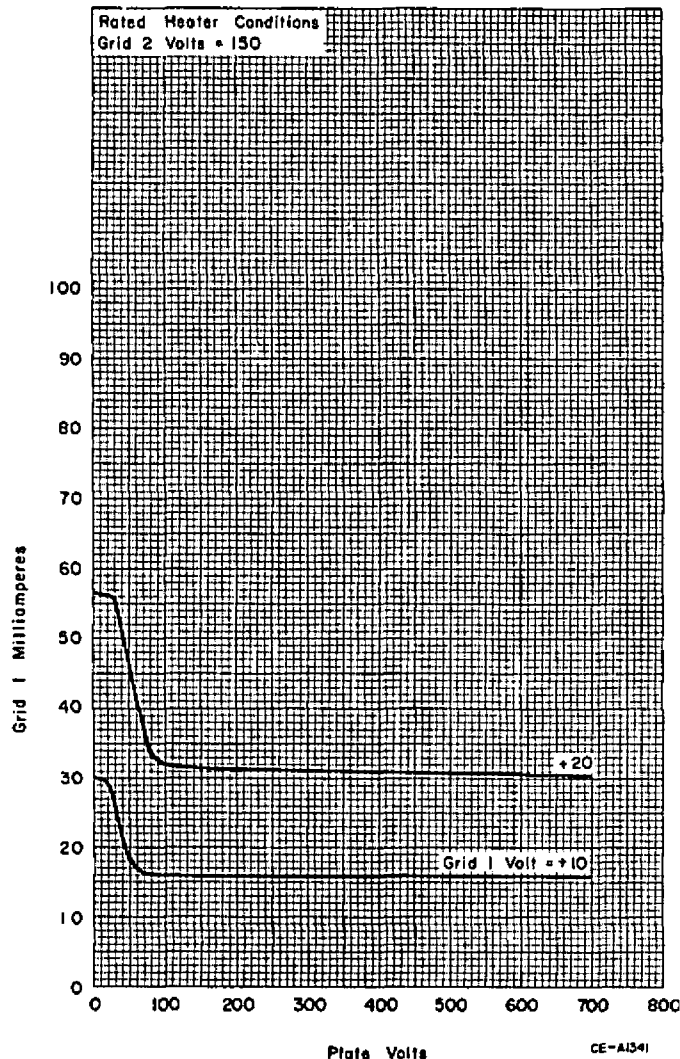
CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	WL-8298	WL-8032	
Heater Voltage	6.75	13.5	ac Volts
Heater Current:			
Minimum	1.100	0.550	Ampere
Maximum	1.230	0.620	Ampere
Grid 1 Plate Capacitance:			
Maximum	0.22		uuf
Input Capacitance			
Minimum	11.1		uuf
Maximum	15.9		uuf
Output Capacitance:			
Minimum	6.4		uuf
Maximum	10.6		uuf
Amplifier Oscillator†			
Plate Volts	300	600	Volts
Grid 2 Volts	200	180	Volts
Grid 1 Volts	-33	--	Volts
Grid 1 Resistor	--	30000	Ohms
Plate Current:			
Maximum	94	112	Ma.
Minimum	46	100	Ma.
Grid 2 Current:			
Maximum	5.5	--	Ma.
Minimum	--	--	Ma.
Grid 1 Current:			
Maximum	--	2.5	Ma.
Minimum	--	2.0	Ma.
Power Output:			
Minimum	--	47	Watts

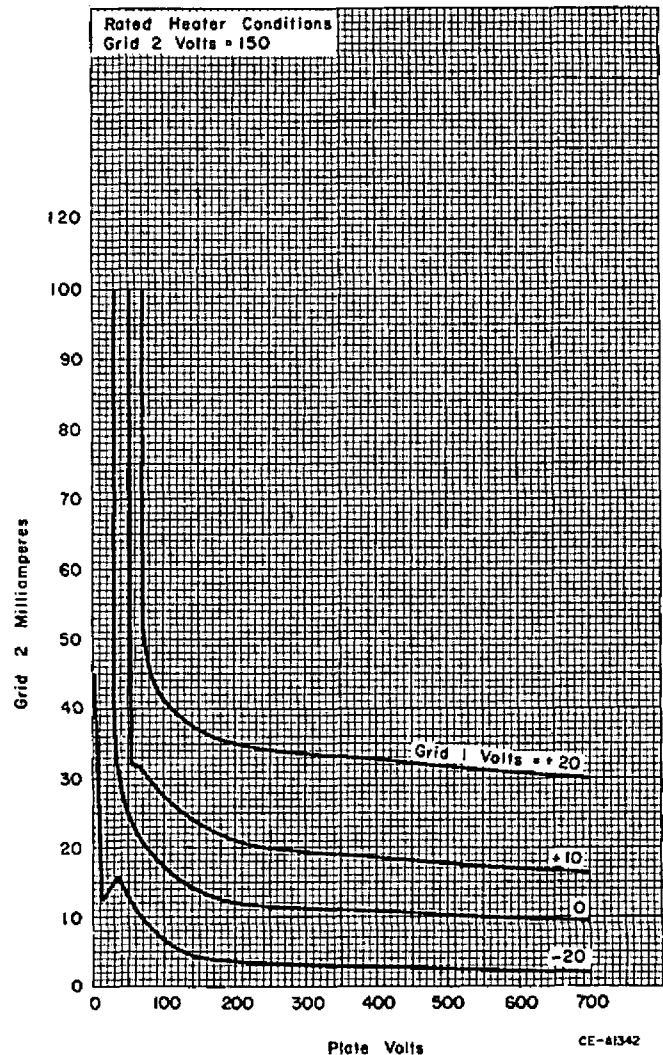
NOTES

- ① Pin 8 grounded.
- ② Subscript 1 indicates that no grid current flows during any part of the input cycle.
- ▲ Continuous Commercial Service
- * Intermittent Commercial and Amateur Service
- The input-coupling network used should not introduce too much resistance in the Grid 1 circuit. Transformer or impedance coupling arrangements are recommended.
- The driving stage should be capable of supplying these values of voltage and power at low distortion.
- The grid 1 voltage should not change with power supply load. A separate power supply or independent voltage-divider voltage source is recommended.
- Subscript 2 indicates grid 1 draws current during some part of the input cycle.
- † When grid 1 is driven positive and draws current the listed values must not be exceeded. If these values are insufficient to provide proper operating bias, other biasing methods must be used to provide the required extra bias without increasing grid 1 circuit resistance.
- It is recommended that the screen voltage be modulated with the plate voltage. This can be accomplished by an independent modulated power supply or a series resistor from the plate voltage supply.
- † The grid 1 bias should be generated by either grid resistor or combination grid resistor and cathode-bias resistor methods.
- ‡ Operated as a single tube self excited 15 Mc. Oscillator.

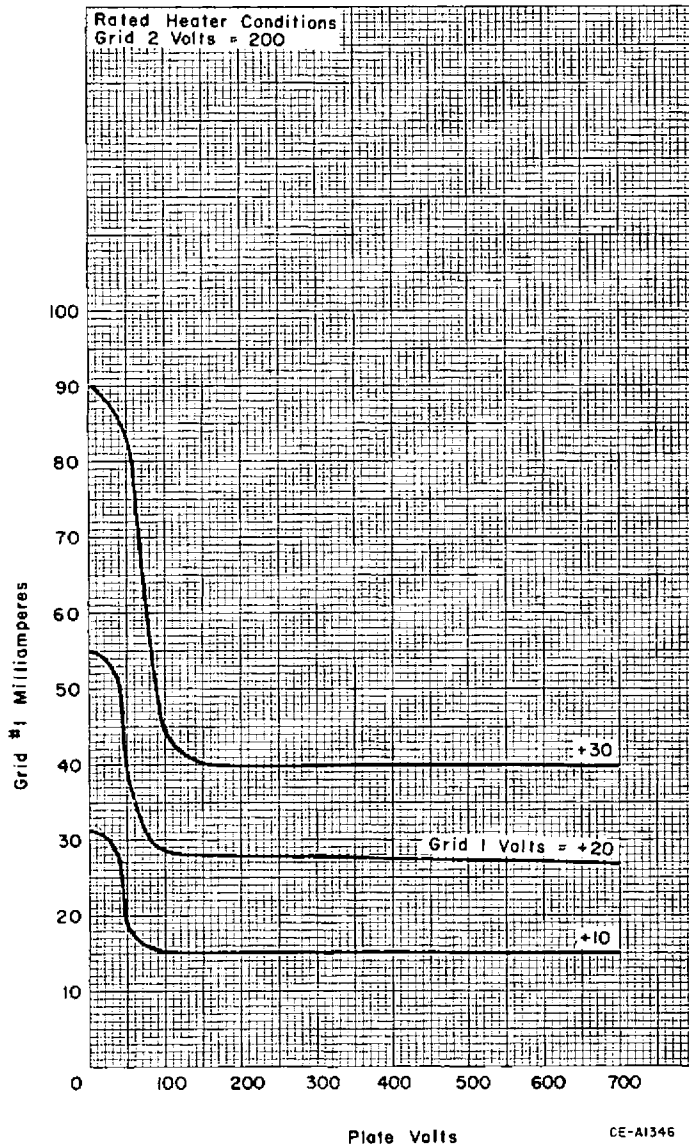
AVERAGE CHARACTERISTICS



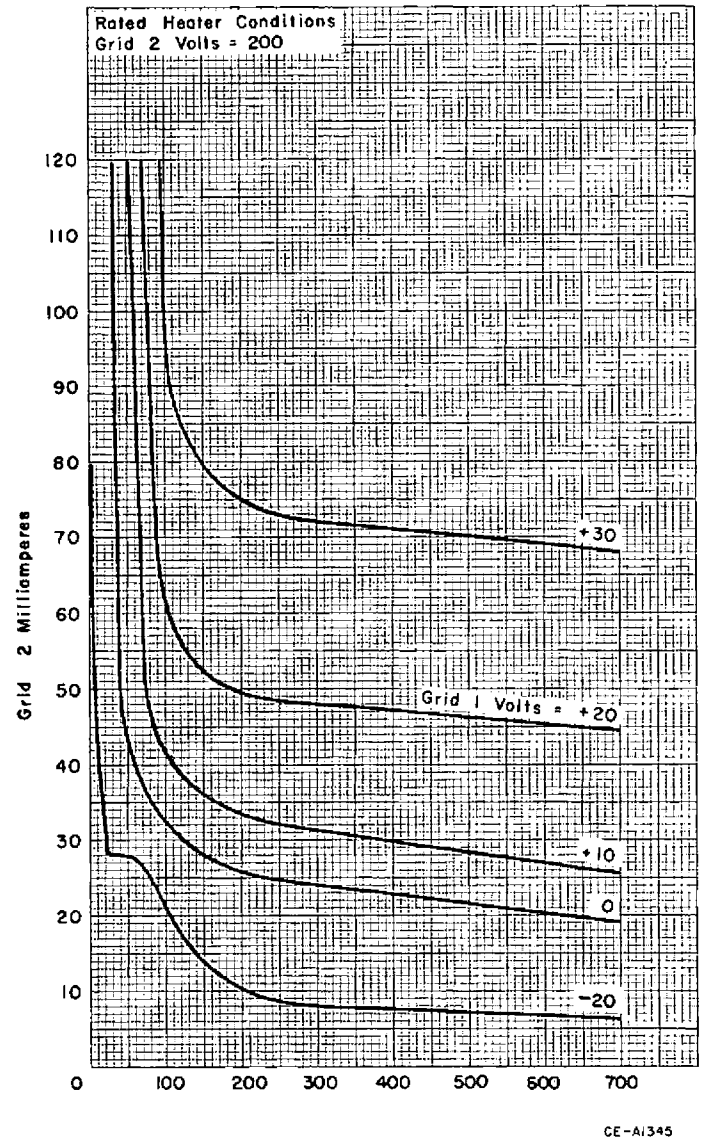
AVERAGE CHARACTERISTICS



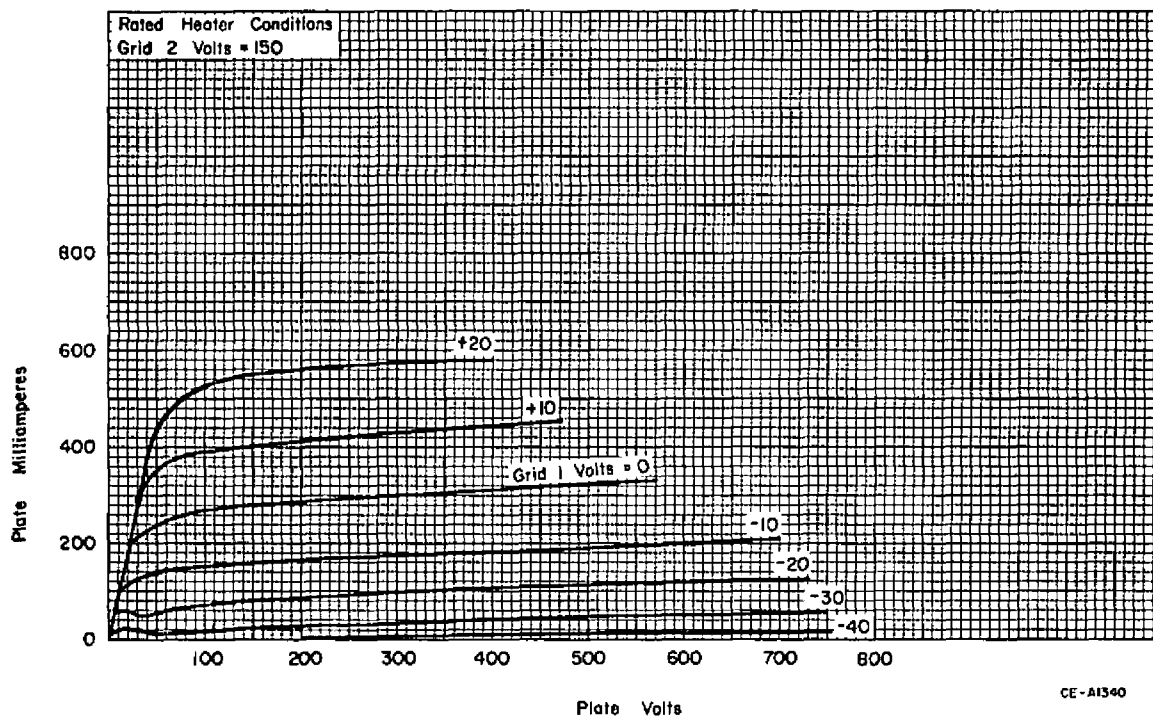
AVERAGE CHARACTERISTICS



AVERAGE CHARACTERISTICS



AVERAGE PLATE CHARACTERISTICS



AVERAGE PLATE CHARACTERISTICS

