

MACHLETT

ML-7120

ML-7121

DESCRIPTION & RATINGS

DESCRIPTION

The ML-7120 and ML-7121 are low- μ , three-electrode tubes designed specifically for use as Class AB1 linear amplifiers or modulators. The ML-7120 and ML-7121 are mechanically equivalent to the ML-6420 and ML-6421, respectively. The cathode of each type is a sturdy, self-supporting, stress-free, thoriated-tungsten filament. The ML-7120 has

a water-cooled, heavy-wall anode capable of dissipating 12.5 kW with a water flow of approximately 5 gpm. The ML-7121 has a forced-air-cooled, heavy-wall anode capable of dissipating 10 kW with an air flow of approximately 475 cfm*. Maximum ratings of 10 kVdc plate voltage and 20 kW plate input apply at frequencies up to 30 Mc.

GENERAL CHARACTERISTICS

Electrical

Filament Voltage	7.0	Volts
Filament Current	85	Amps
Filament Starting Current, maximum	400	Amps
Filament Cold Resistance	0.0095	Ohm
Amplification Factor	4.4	
Interelectrode Capacitances:		
Grid-Plate	23	μf
Grid-Filament	32	μf
Plate-Filament	1.7	μf

Mechanical

Mounting Position	Vertical, anode down
Type of Cooling — ML-7120	Water and Forced air†
Water flow on anode, minimum for 12.5 kW dissipation	5 gpm
Maximum outgoing water temperature	70 °C
Type of Cooling — ML-7121	Forced-air
Air flow on anode, minimum for 10 kW dissipation *	Pressure: 475 cfm at 3.3" water
Maximum incoming air temperature	Exhaust: 550 cfm at 3.5" water
Maximum Glass Temperature	50 °C
Net Weight, approximate	165 °C†
ML-7120	10 lbs.
ML-7121	13.5 lbs.

*When used with Machlett ML-7121 Air Distributor F-17796.

†At frequencies up to 15 Mc, normal cabinet ventilation should be sufficient; at higher frequencies or high ambient temperature, auxiliary air flow of 25-50 cfm may be required and should be distributed to maintain uniform glass temperature, not greater than 165°C, around the circumference of the seals.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

(Continuous Commercial Service)

VALUES APPLY TO BOTH TYPES UNLESS OTHERWISE SPECIFIED

**Audio-Frequency Power Amplifier and Modulator
Class AB1**

Maximum Ratings, Absolute Values			
D-C Plate Voltage	10000	volts	
Max.-Signal D-C Plate Current	2.2	amps	
Max.-Signal Plate Input	20	kW	
Plate Dissipation			
ML-7120	12.5	kW	
ML-7121	10	kW	
Typical Operation (Values are for two tubes)			
D-C Plate Voltage	6000	8500	10000 volts
D-C Grid Voltage	-1450	-2050	-2350 volts
Peak A-F Grid-to-Grid Voltage	2800	4000	4600 volts
Peak A-F Plate-to-Plate Voltage	8600	13000	12800 volts
Zero-Signal D-C Plate Current	0.2	0.4	0.6 amp
Max.-Signal D-C Plate Current	1.2	1.6	4.2 amps
Effective Load Resistance, Plate-to-Plate	9150	10400	3900 ohms
Max.-Signal Driving Power ..	0	0	0 watts
Max.-Signal Power Output, approximate	4.0	8.1	21 kW
Typical Operation (Values are for two tubes)			
Random Noise Drive Conditions			
D-C Plate Voltage	ML-7120	10000	10000 volts
D-C Grid Voltage	-2350	-2350	volts
Peak A-F Grid-to-Grid Voltage	4650	4650	volts
Peak A-F Plate-to-Plate Voltage	15200	15800	volts
Zero-Signal D-C Plate Current	0.6	0.6	amp
Max.-Signal D-C Plate Current	2.5	2.0	amps
Effective Load Resistance, Plate-to-Plate	7750	10000	ohms
Max.-Signal Driving Power	0	0	watts
Max.-Signal Power Output at 1.0 Power Factor	15	12.5	kVA
Load Power Factor	0-1.0	0-1.0	

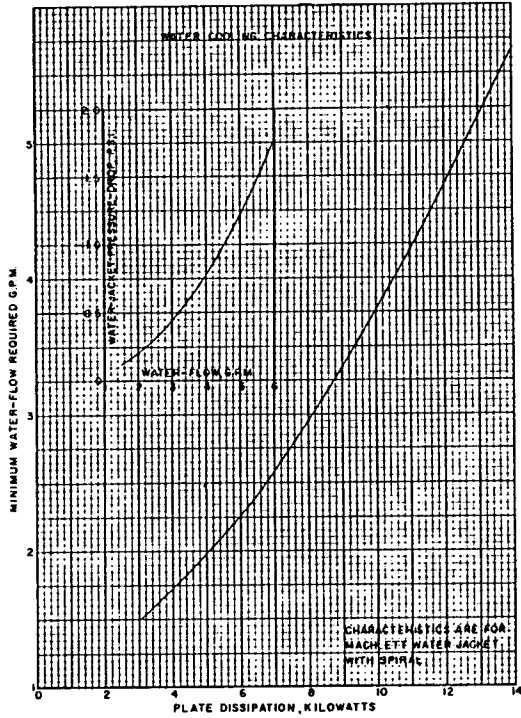
Linear RF Power Amplifier — Class AB
Single-Sideband Suppressed-Carrier Service

Maximum Ratings, Absolute Values			
D-C Plate Voltage	10000	volts	
Max.-Signal DC Plate Current	2.2	amps	
Max.-Signal Plate Input	20	kW	
Max.-Signal DC Grid Current	100	mA	
Plate Dissipation			
ML-7120	12.5	kW	
ML-7121	10	kW	
Typical Operation			
DC Plate Voltage	10000	volts	
DC Grid Voltage	-2350	volts	
Zero-Signal DC Plate Current	0.3	amp	
Effective RF Load Resistance	3050	ohms	
Single-Tone Modulation			
Max.-Signal DC Plate Current	1.5	amps	
Max.-Signal DC Grid Current	0	mA	
Max.-Signal Peak RF Plate Voltage	7200	volts	
Max.-Signal Peak RF Grid Voltage	2325	volts	
Max.-Signal Driving Power	0	watts	
Max.-Signal Plate Power Output	8.5	kW	
Two-Tone Modulation			
Average DC Plate Current	0.95	amp	
Average DC Grid Current	0	mA	
Max.-Resultant Signal Peak RF Grid Voltage	2325	volts	
Average Plate Power Output	4.25	kW	
Peak Envelope Plate Power Output	8.5	kW	

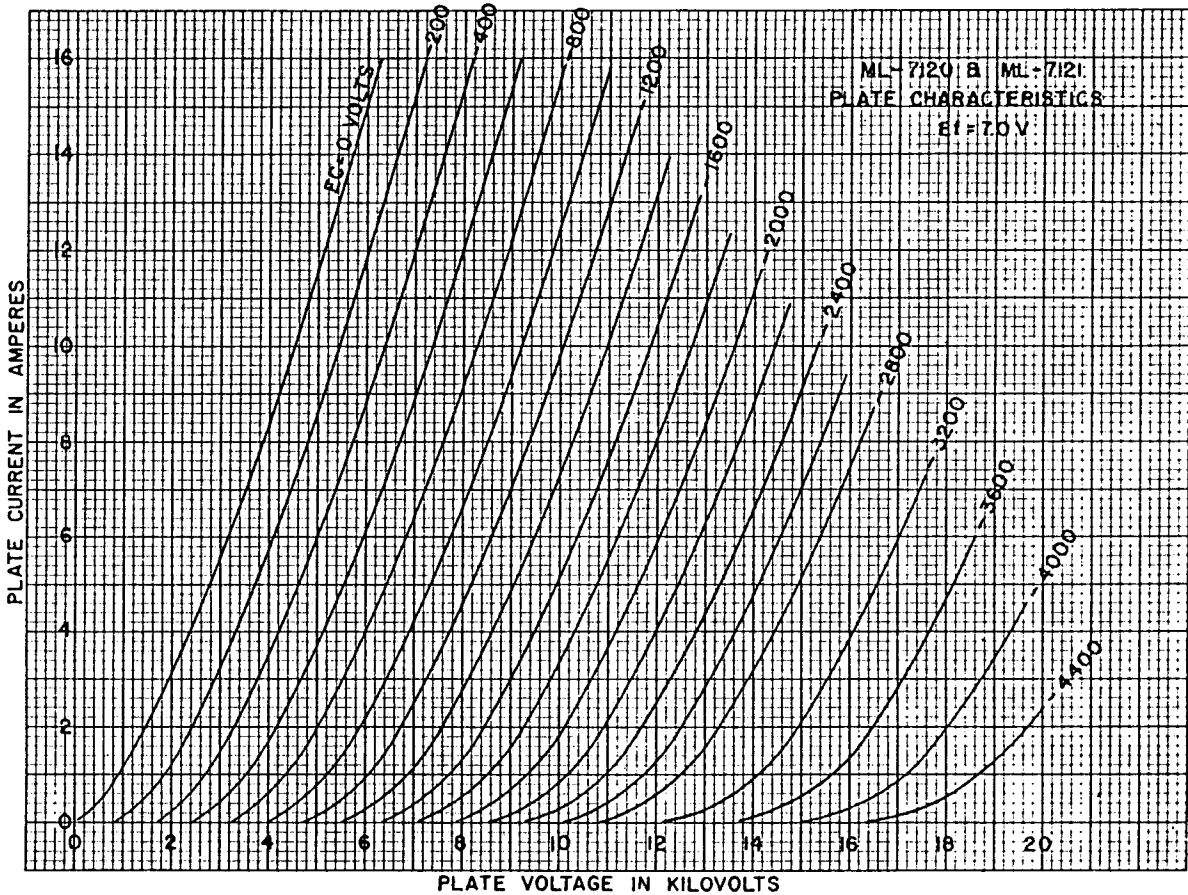
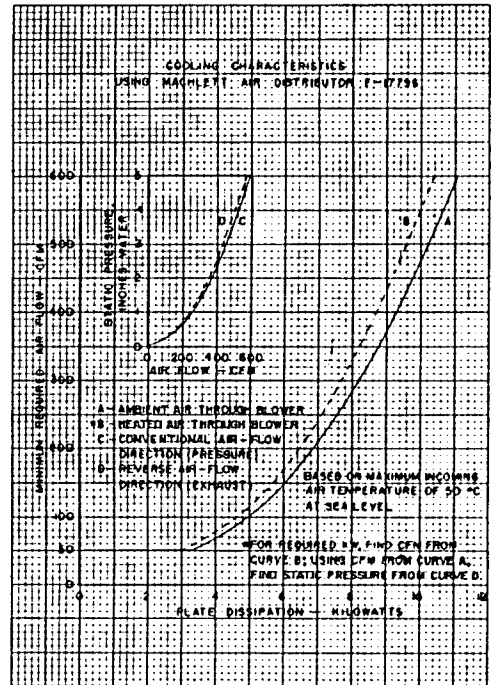
CHARACTERISTIC RANGE VALUES FOR EQUIPMENT DESIGN

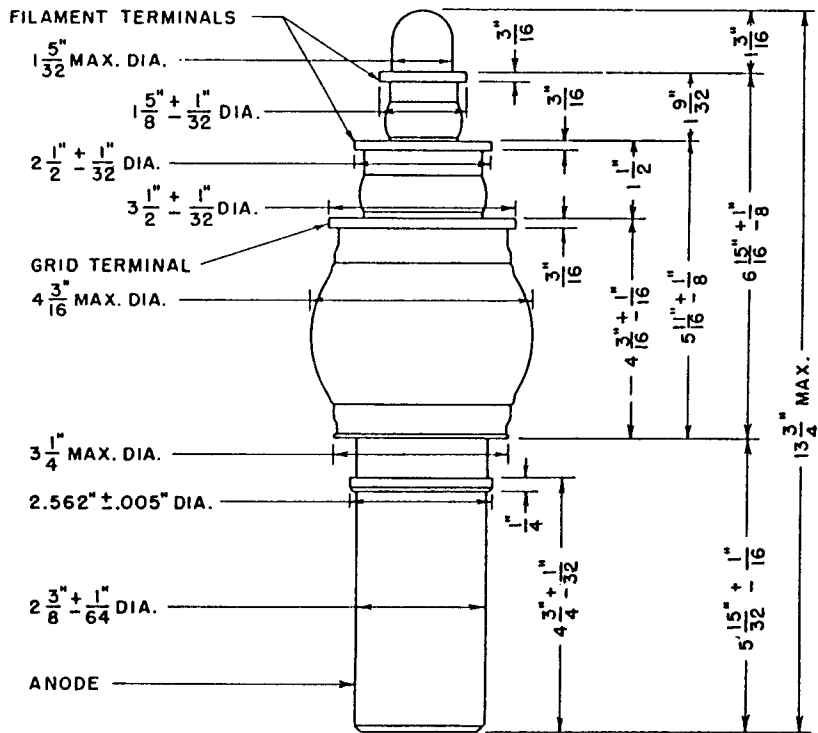
Characteristic	Conditions	Minimum	Limits Bogey	Maximum
Plate Voltage	$e_c = 0$ volts; $i_b = 15$ amps	e_b :	6.0	6.4 kv
Plate Voltage	$E_c = 0$ Vdc; $I_b = 1.0$ Adc	E_b :	0.7	1.0 kVdc
Plate Voltage	$E_c = -1000$ Vdc; $I_b = 1.0$ Adc	E_b :	4.9	5.6 kVdc
Grid Voltage	$E_b = 7.0$ kVdc; $I_b = 0.020$ Adc	E_c :	-1600	-2000 Vdc
Plate Power Output	$E_b = 10.0$ kVdc; $I_b = 1.5$ Adc	P_o :	7.5	8.5 kW
	$E_c = -2350$ Vdc; $I_c = 0$ Adc			

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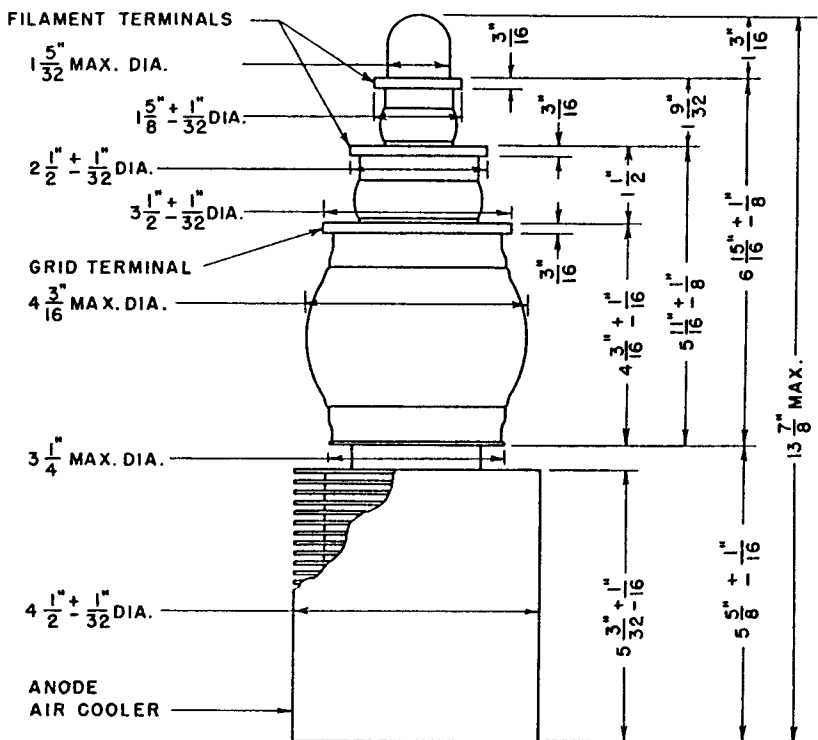


ML-7121





DIMENSIONS — ML-7120



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MACHLETT LABORATORIES, INC.

SPRINGDALE



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U. S. A.