MACHLETT

ML-5668
ML-5669

DESCRIPTION & RATINGS

DESCRIPTION

The ML-5668 and ML-5669 are three-electrode tubes designed specifically to meet the severe conditions of radio-frequency heating services. The cathodes of these tubes are stress-free pure tungsten filaments. The tubes incorporate rigidly supported grid and filament assemblies, glass surfaces completely shielded against electron bombardment and filament radiation, and rugged kovar anode, grid and filament seals. Maximum ratings of 14 kVdc plate voltage and 28 kW plate input apply at frequencies up to 5 Mc; operation up to 20 Mc is permissible with voltage and input reduced to one-half maximum ratings.

The ML-5668 supersedes the type 892 triode for industrial applications and will replace it with minor equipment modifications. The heavy-wall, high-conductivity copper anode is water cooled and with moderate water flow can readily dissipate 20 kilowatts.

The ML-5669 supersedes the type 892R triode for industrial applications and will replace it without equipment modifications. The heavy-wall, high-conductivity copper anode is forced-air cooled and with nominal air flow can readily dissipate 10 kilowatts.

GENERAL CHARACTERISTICS

Electrical

Filament Voltage		22.0	Volts
Filament Current		60	Amps
Filament Starting Current, maximum		120	Amps
Filament Cold Resistance		0.031	Ohms
Amplification Factor		50	
Interelectrode Capacitances	**ML-5668**	**ML-5669**	
Grid-Plate	30	31	$\mu\mu f$
Grid-Filament	18	18	$\mu\mu f$
Plate-Filament	1.5	2.0	$\mu\mu f$

Mechanical

Mounting Position	Vertical, anode down	
Type of Cooling, ML-5668	Water and forced-air*	
Water flow on anode, minimum for 20 kW dissipation	6.5	gpm
Maximum outgoing water temperature	70	°C
Type of Cooling, ML-5669	Forced-air	
Air flow on anode, minimum for 10 kW dissipation	700	cfm
Maximum incoming air temperature	45	°C
Maximum Glass Temperature	160	°C
Air flow on center of dish from 3" diameter nozzle	35	cfm*
Net Weights		
ML-5668	10	lbs.
ML-5669	52	lbs.

*Airflow on dish may be supplied from an auxiliary blower or, in the case of the ML-5669, by deflection of air passing through the radiator. At frequencies above 3 Mc, more air flow may be necessary to keep the temperature of the hottest point on the dish and seals below 160°C. Heat radiating connectors for grid and filament posts are recommended.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

(Continuous Commercial Service)

VALUES APPLY TO BOTH TYPES UNLESS OTHERWISE SPECIFIED

R-F Oscillator — Class C

Maximum Ratings, Absolute Values	ML-5668	ML-5669	
D-C Plate Voltage**	14000	14000	volts
D-C Grid Voltage	—1600	—1600	volts
D-C Plate Current	2.0	2.0	amps
D-C Grid Current	0.40	0.40	amp
Plate Input	28000	26000	watts
Plate Dissipation	20000	10000	watts

**D-C Plate Voltage Maximum Rating is 11000 volts when no provision is made for cooling dish at frequencies above 3 Mc.

Typical Operation				
D-C Plate Voltage	8000	10000	12000	volts
D-C Grid Voltage	—500	—600	—700	volts
Peak R-F Grid Voltage	1240	1420	1600	volts
Peak R-F Plate Voltage	6300	8100	9900	volts
D-C Plate Current	1.6	1.8	2.0	amps
D-C Grid Current	.20	.20	.20	amp
Power Output, approx.	8300	12300	17000	watts

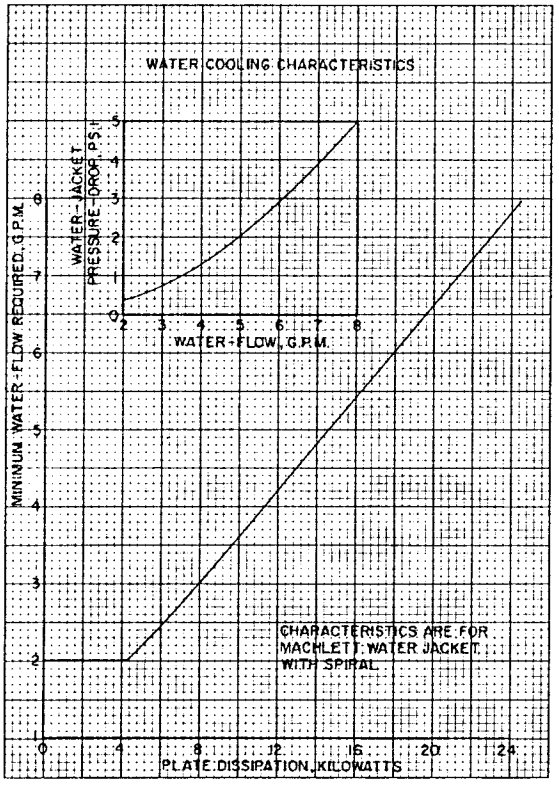
CHARACTERISTIC RANGE VALUES FOR EQUIPMENT DESIGN

Characteristics	Conditions		Limits Minimum	Limits Bogey	Limits Maximum	
Grid Voltage	e_b = 2000 volts; i_b = 8.0 amps	e_c:	——	——	1300	volts
Grid Current	e_b = 2000 volts; i_b = 8.0 amps	i_c:	——	——	3.5	amps
Plate Voltage	E_c = 0 Vdc; I_b = 0.5 Adc	E_b:	5.0	7.3	8.6	kVdc
Plate Voltage	E_c = —100 Vdc; I_b = 0.5 Adc	E_b:	10.0	12.3	14.8	kVdc
Grid Voltage	E_b = 15 kVdc; I_b = 0.02 Adc	E_c:	—220	—300	—420	Vdc
Power Output	E_b = 12 kVdc; E_c = —700 Vdc; I_b = 2.0 Adc; I_c = 0.20 Adc	P_o:	14.5	——	——	kW

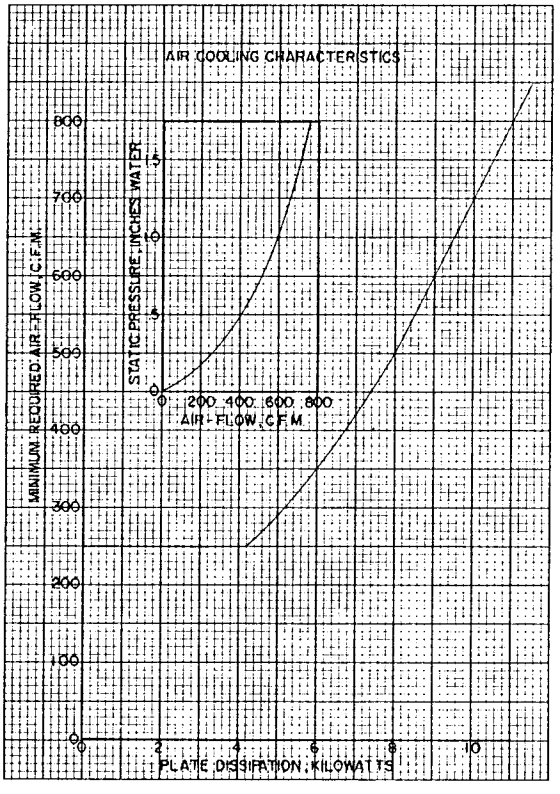
MAXIMUM FREQUENCY RATINGS

Maximum ratings apply at frequencies up to 5 Mc. These tubes can be operated at higher frequencies provided the maximum values of plate voltage and plate input are reduced in accordance with the table on the right. (Other maximum ratings are the same as shown above). Special attention should be given to adequate ventilation of the bulb at the higher frequencies.

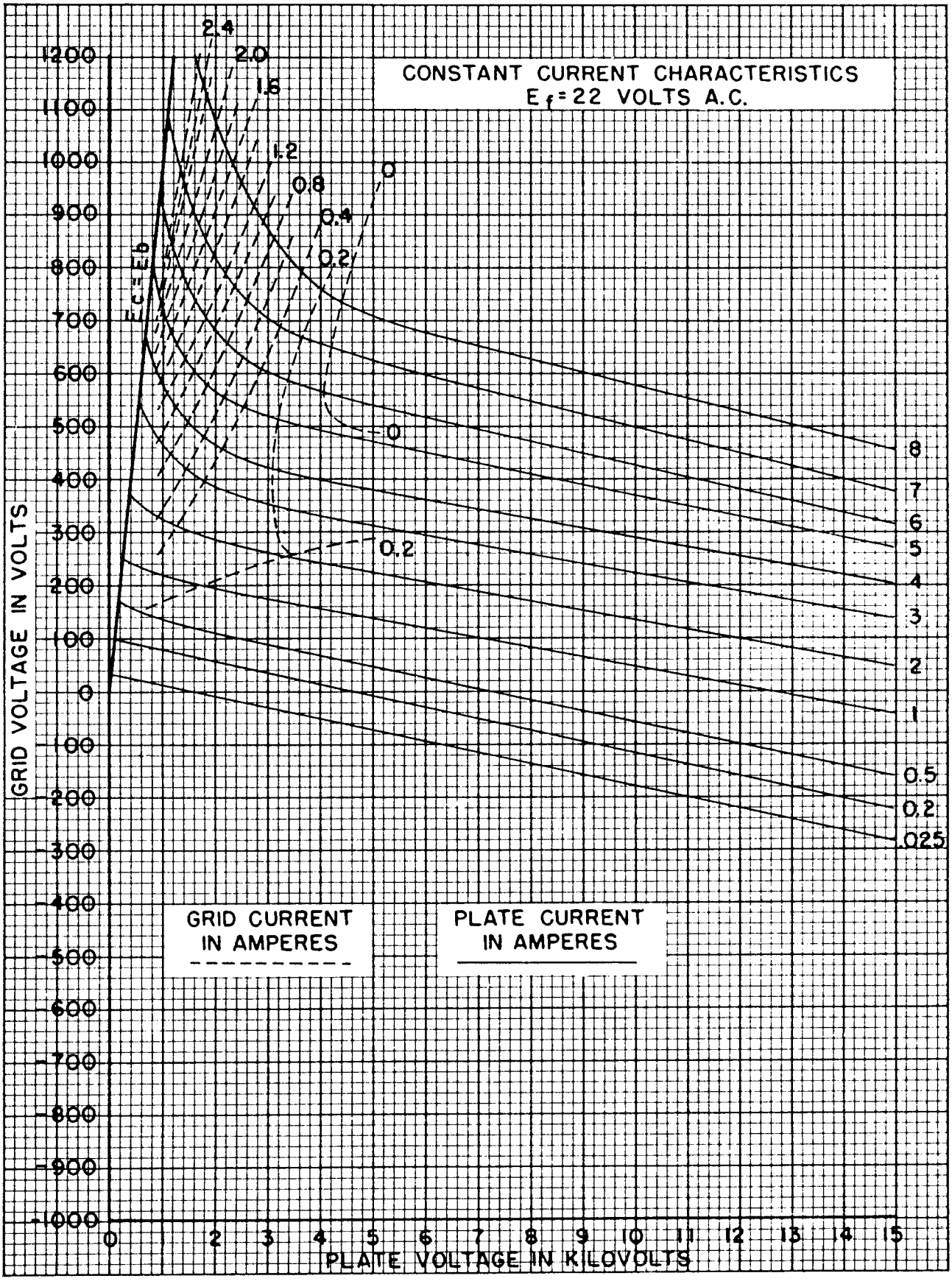
Frequency	5	12.5	20 Mc
Percentage of Maximum Rated Plate Voltage and Plate Input			
Class C Unmodulated	100	75	50



COOLING CHARACTERISTICS — ML-5668



COOLING CHARACTERISTICS — ML-5669


CONSTANT CURRENT CHARACTERISTICS
E_f = 22 VOLTS A.C.
GRID VOLTAGE IN VOLTS
PLATE VOLTAGE IN KILOVOLTS
Ec = Eb
2.4
2.0
1.6
1.2
0.8
0.4
0.2
0
0
0.2
8
7
6
5
4
3
2
1
0.5
0.2
.025
GRID CURRENT IN AMPERES
PLATE CURRENT IN AMPERES
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
-100
-200
-300
-400
-500
-600
-700
-800
-900
-1000
0
1
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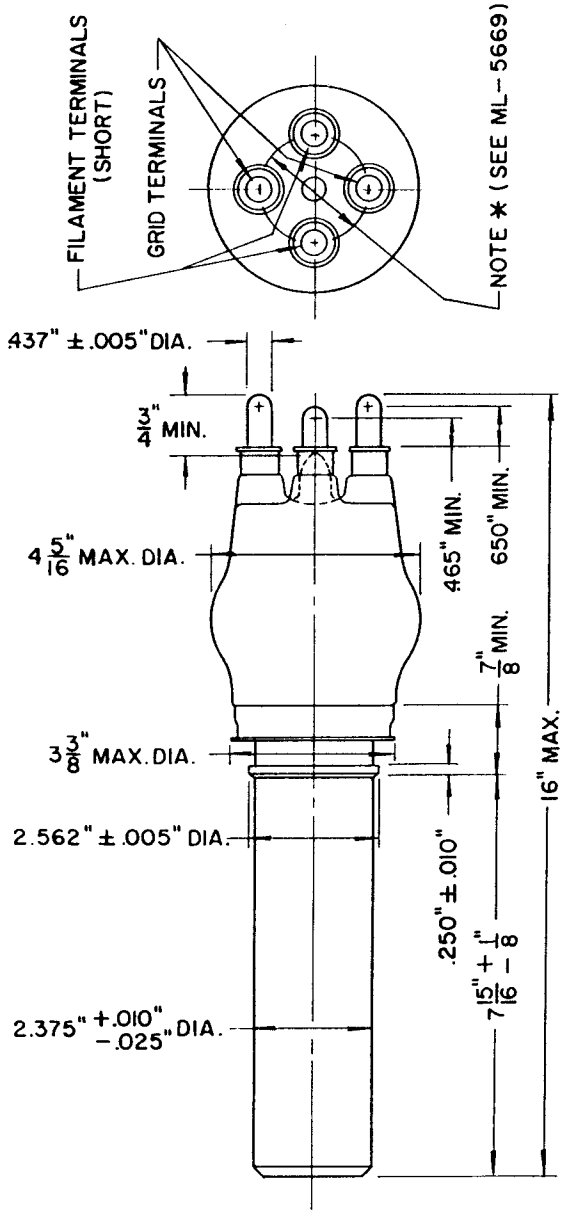
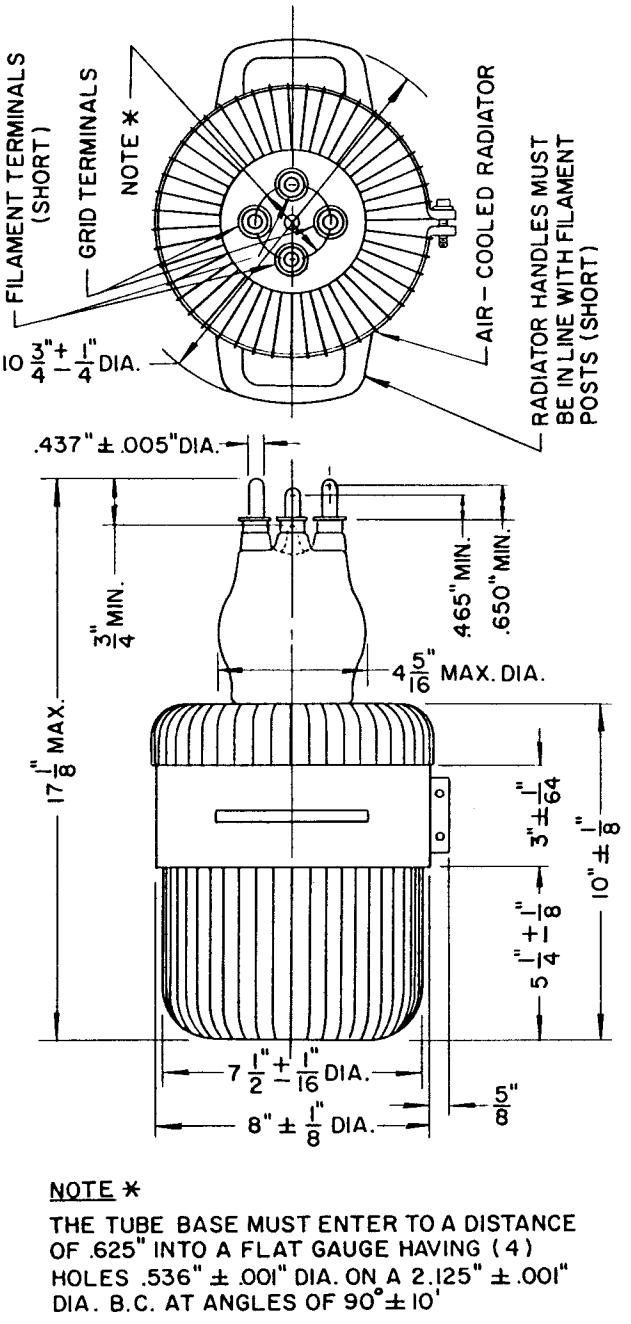


DIMENSIONS — ML-5668



NOTE *

THE TUBE BASE MUST ENTER TO A DISTANCE OF .625" INTO A FLAT GAUGE HAVING (4) HOLES .536" ± .001" DIA. ON A 2.125" ± .001" DIA. B.C. AT ANGLES OF 90° ± 10'

DIMENSIONS — ML-5669

MACHLETT LABORATORIES, INC.

SPRINGDALE MACHLETT **CONNECTICUT**

U. S. A.