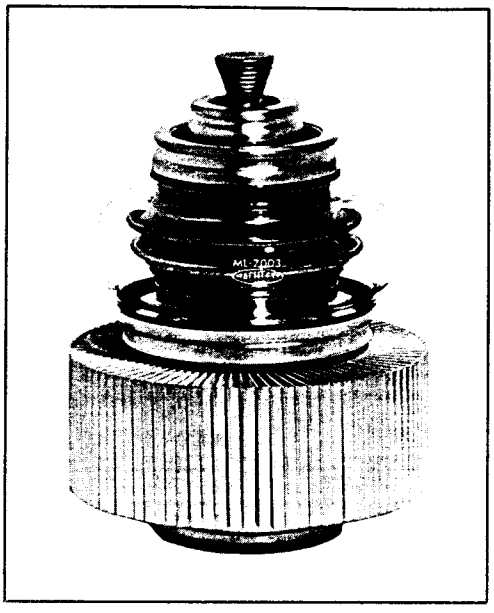


ISSUED 5-64

ML-7003

Shielded Grid Triode

Pulse Power to 2.5 Mw

MACHLETT

ELECTRON TUBE SPECIALIST

DESCRIPTION

The ML-7003 is a shielded-grid triode designed primarily to operate as a switch tube in hard-tube pulse modulators, for radar and similar applications. In this service it can deliver more than two megawatts pulse power output with less than 10 kilowatts driving power. .

The ML-7003 has sturdy electrodes arranged to form a cylindrical array of electron-optical systems, featuring a shield electrode connected internally to the cathode by direct, low-impedance paths. This design permits operation with low grid current, and it results in favorably low grid-plate capacitance. The presence of the ground-potential shield adjacent to the anode, furthermore, protects the cathode and grid from damage by transient arcs.

The cathode is a unipotential, oxide-coated type. The anode is forced-air cooled and is capable of dissipating 3kW with an air flow of 150 cfm.

GENERAL CHARACTERISTICS

Electrical		
Heater Voltage	6.0±5%	Volts
Heater Current	60	Amps
Heater Starting Current, maximum	300	Amps
Cathode Warm-up Time	10	Minutes*
Amplification Factor	200	
Interelectrode Capacitances:		
Grid Plate	2.5	pf
Input (Grid-Cathode)	250	pf
Output (Plate Cathode)	22	pf
Strapped Resonant Frequency, Grid-Cathode, approximate	63.5	Mc
Mechanical		
Mounting Position (support tube by anode radiator only)	Any	
Type of Cooling	Forced-air†	
Air flow on anode, minimum for 3kW dissipation	150 cfm at 0.2" water	
Air flow on grid	50	cfm
Maximum incoming air temperature	65	°C
Maximum Glass Temperature	175	°C†
Net Weight, approximate	25	lbs.

*For accelerated cathode warm-up, the filament may be energized at 7.0 volts for 5 minutes and then reduced to 6.0 volts for high-voltage operation. If a filament stand-by voltage of 5.0 volts is used, the minimum cathode warm-up time is 1 minute at 6.0 volts.

†Sufficient air flow must be provided to maintain glass temperatures at less than 175°C under all conditions of operation.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

Pulse Modulator or Pulse Amplifier

Maximum Ratings, Absolute Values

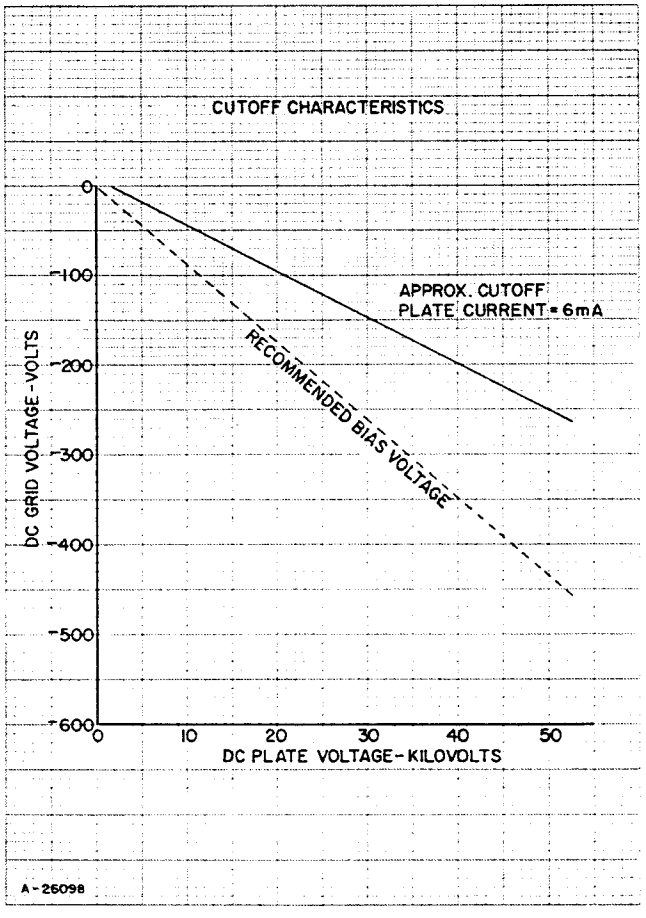
D-C Plate Voltage	45	kV
Peak Plate Voltage	50	kv
D-C Grid Voltage	−600	volts
Peak Positive Grid Voltage	+1.5	kv
Peak Negative Grid Voltage	−1500	volts
Pulse Cathode Current	90	amp
D-C Plate Current	250	mA
Grid Dissipation	75	watts
Plate Dissipation	3.0	kW
Pulse Duration*	25	μsec
Duty Factor*	0.03	

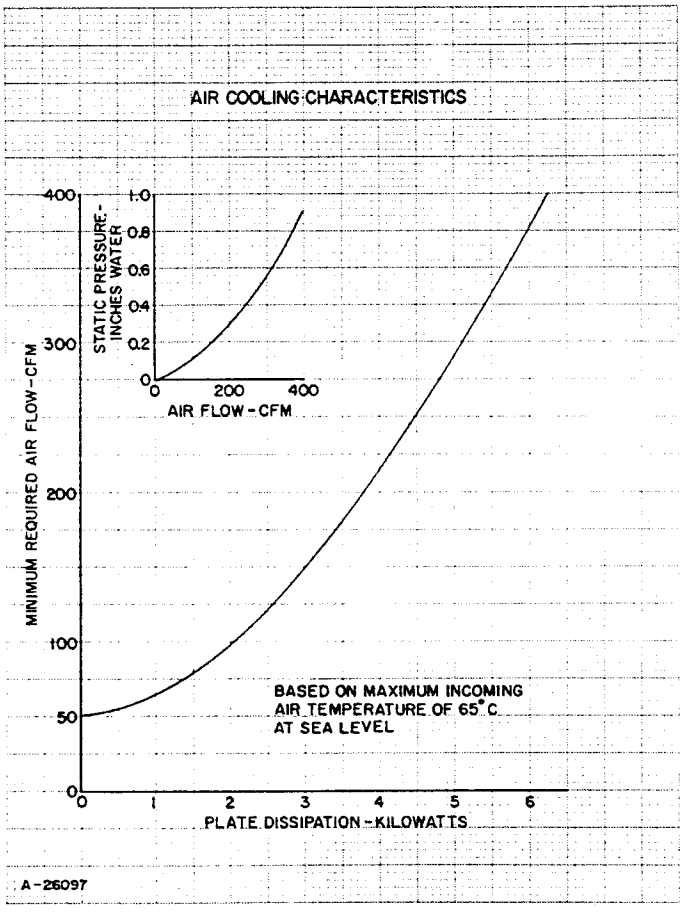
Typical Operation

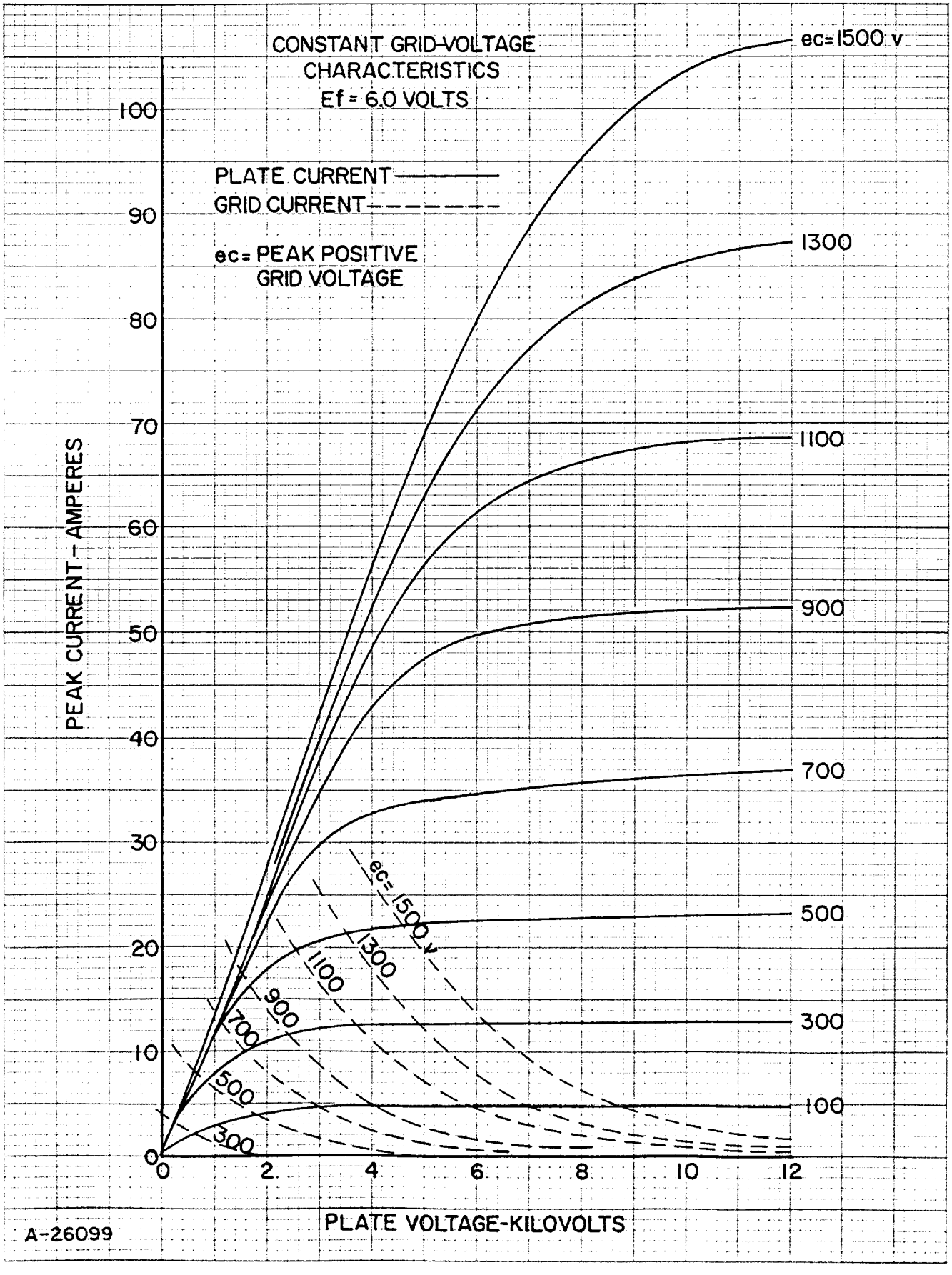
D-C Plate Voltage	35	40	kV
D-C Grid Voltage	−300	−350	volts
Pulse Positive Grid Voltage	+0.8	+1.3	kv
Pulse Plate Current	40	80	amp
Pulse Grid Current	3	4	amp
Pulse Driving Power	3.3	6.6	kw
Pulse Power Output	1.2	2.5	Mw
Plate Output Voltage	30	32	kv
Duty Factor	.006	.003	

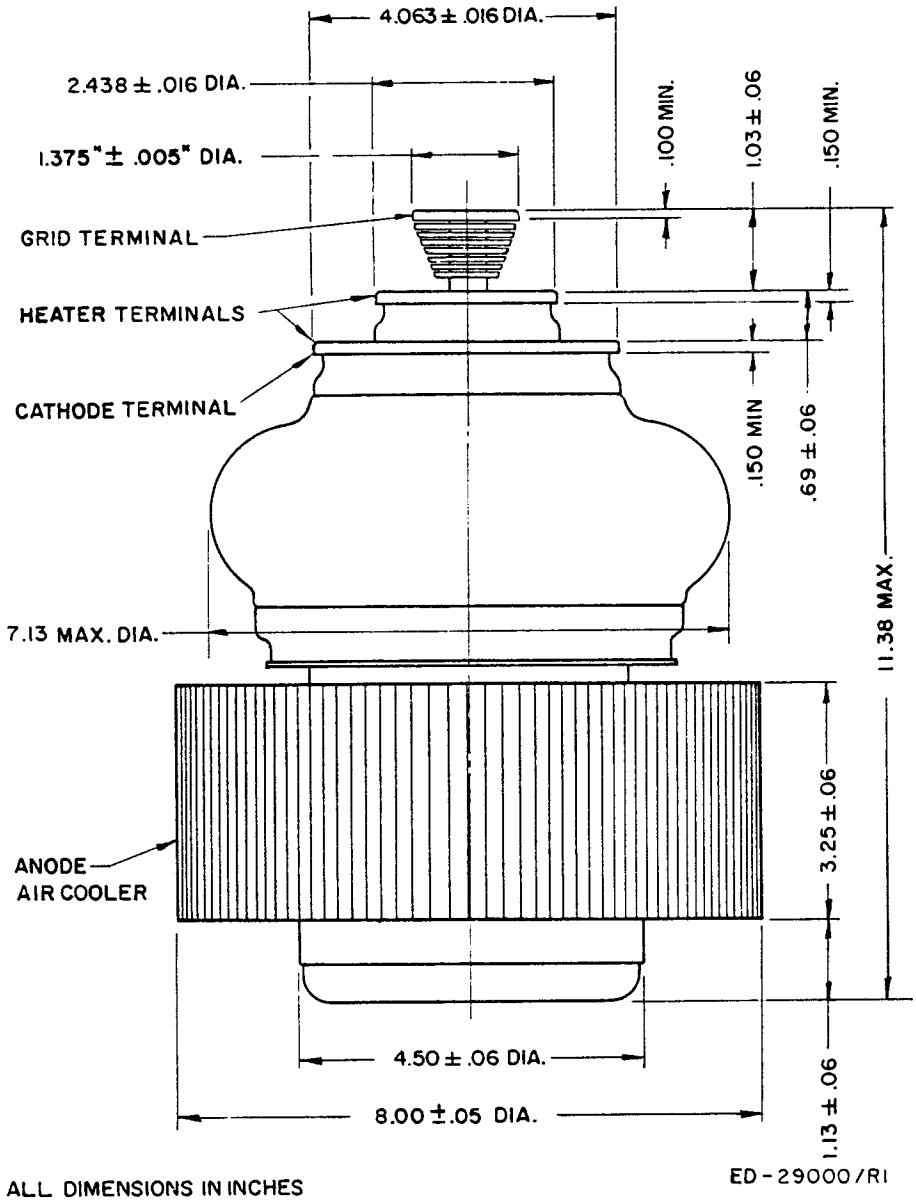
*For applications requiring longer pulse duration or higher duty factors, consult the Machlett Engineering Department.

WARNING: Operation of this tube may produce x-rays. Adequate rayproof shielding must therefore be provided in the equipment.






CONSTANT GRID-VOLTAGE
CHARACTERISTICS
Ef = 6.0 VOLTS
PLATE CURRENT
GRID CURRENT
ec= PEAK POSITIVE
GRID VOLTAGE
ec=1500 v
1300
1100
900
700
500
300
100
PEAK CURRENT - AMPERES
PLATE VOLTAGE-KILOVOLTS
0
2
4
6
8
10
12
10
20
30
40
50
60
70
80
90
100
A-26099



DIMENSIONS — ML-7003

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