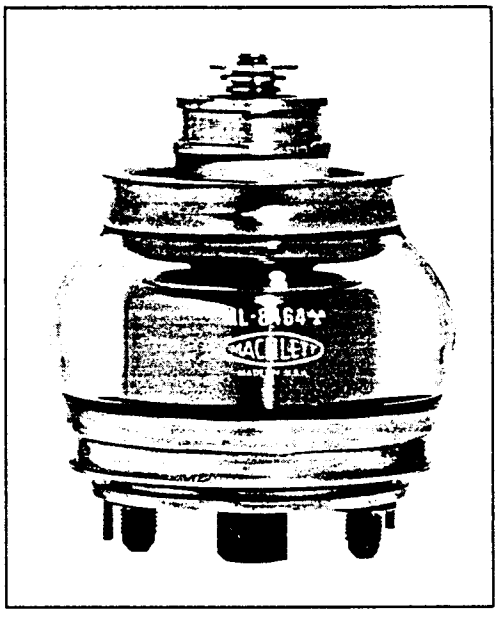
ISSUED 5-64



ML-8464

Ruggedized Shielded Grid Triode

Pulse Power to 500 kw

MACHLETT

ELECTRON TUBE SPECIALIST

DESCRIPTION

The ML-8464 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 400 kw pulse power output with less than 2.0 kw pulse driving power.

The ML-8464 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 provides a tube with extremely flat plate-current curves at constant grid-drive and very low grid-current values. The grid-plate capacitance of the tube is also very low.

The characteristics of this tube are particularly valuable when driving magnetron- and amplitron-type devices. The presence of the ground-potential shield between anode and control grid protects the cathode and control grid from damage by transient arcs. The ML-8464 will operate within ratings while being vibrated with moderately high acceleration and is suitable for applications in mobile equipment.

The cathode is a unipotential, oxide-coated type. The anode is liquid-cooled and is capable of dissipating 1500 W with a flow rate of 1.5 gpm of water.

Note: Data contained herein are based on initial design and test criteria. Before using these data in final equipment designs, consult Machlett for possible revisions.

GENERAL CHARACTERISTICS

Electrical		
Heater Voltage	5.5 ±7%	V
Heater Current	20	A
Heater Starting Current, maximum	80	A
Cathode Warm-Up Time	10	min*
Amplification Factor	200	
Interelectrode Capacitances		
Grid-Plate	1.2	pf
Grid-Cathode	78	pf
Plate-Cathode	12	pf
Mechanical		
Mounting Position	Any	
Type of Cooling	Liquid and forced-air†	
Water flow for 1.5 kW dissipation	1.5	gpm
Liquid pressure drop across tube at 1.5 gpm, approximate	15	psi
Maximum outgoing water temperature	70	°C
Air flow on heater terminal	15	cfm†
Maximum Glass Temperature	175	°C†
Net Weight, approximate	4.5	lb

*For accelerated cathode warm-up, the filament may be energized at 6.5 volts for 4 minutes and then reduced to 5.5 volts for high-voltage operation.

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

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

Pulse Modulator of Pulse Amplifier

Maximum Ratings, Absolute Values

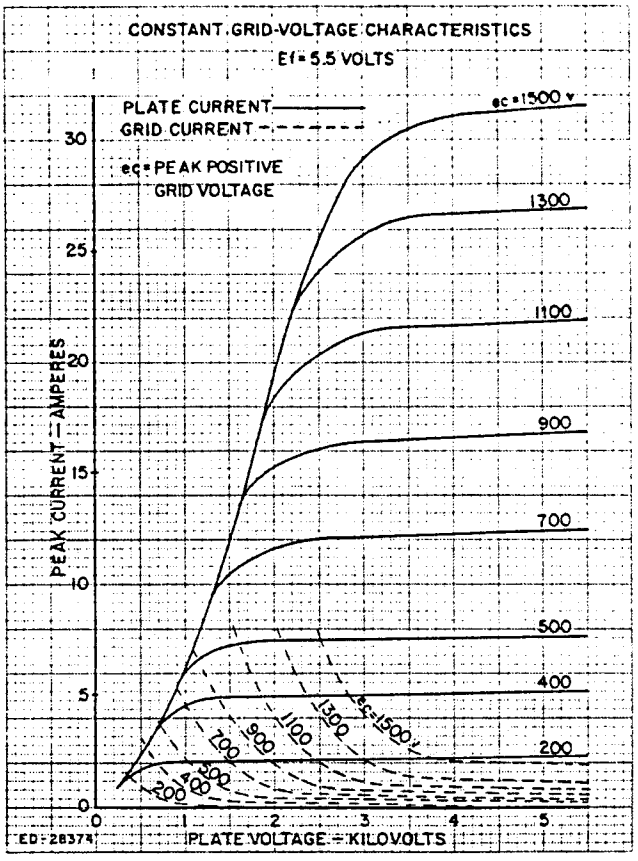
DC Plate Voltage	25	kV
Peak Plate Voltage	30	kv
DC Grid Voltage	−600	V
Peak Positive Grid Voltage	1600	v
Pulse Cathode Current	25	a
DC Plate Current	260	mA
Grid Dissipation	25	W
Plate Dissipation	1500	W
Pulse Duration	25	μs#
Duty Factor	.025	#

Typical Operation

DC Plate Voltage	23	22.5	kV
DC Grid Voltage	−250	−250	V
Pulse Positive Grid Voltage	1100	650	v
Pulse Plate Current	20	10	a
Pulse Grid Current	1.4	.5	a
Pulse Driving Power	2	.45	kw
Pulse Power Output	400	200	kw
Average Power Output	.4	5.0	kW
Pulsed Plate Output Voltage	20	20	kv
Duty Factor	.001	.025	

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

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

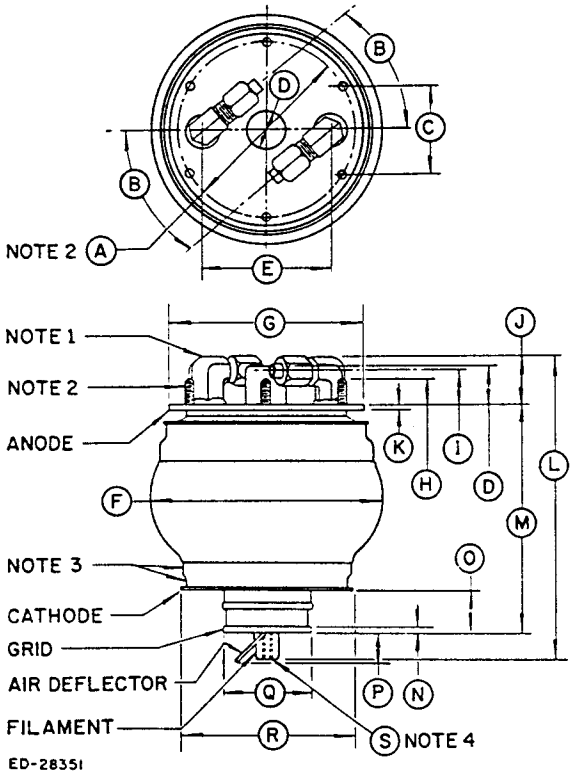


DIMENSIONS FOR OUTLINE OF ML-8464

Ref.	Inches			Notes
	Minimum	Nominal	Maximum	
A	—	3.442	—	2
B	37°	40°	43°	degrees
C	—	1.721	—	
D	—	.75	1.02	
E	—	2.48	—	
F	—	4.5	4.7	
G	3.70	3.75	3.80	
H	—	.50	—	
I	—	.64	—	
J	—	.95	1.02	
K	—	.12	—	
L	—	5.9	6.3	
M	4.20	4.44	4.65	
N	.08	.12	—	
O	.70	.84	.98	
P	—	.53	—	
Q	1.670	1.685	1.700	
R	3.350	3.375	3.400	
S	.43	.50	—	4

NOTES:

1. Water-cooling fittings for ¼" flared tubing.
2. Six mounting studs, 10-32 NF-2, on circle diameter of (A) inches.
3. Do not clamp on this surface (spring contact only).
4. Internal thread for filament connection, 10-32 NF-2, (S) inches deep.



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