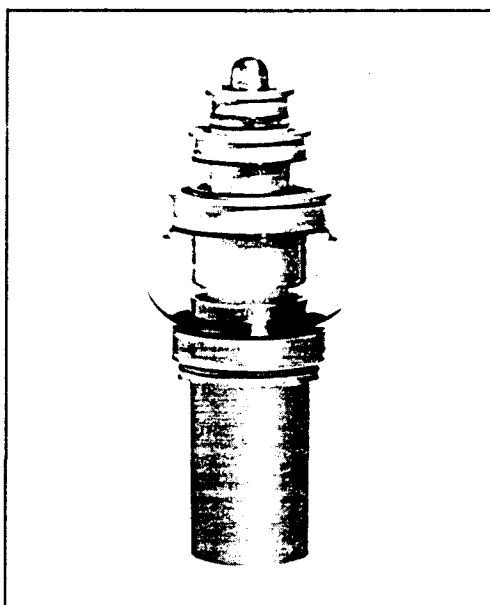




# ML-DP20

## High-Mu Triode

Pulse Power  
to 2 Mw



ELECTRON TUBE SPECIALIST

### DESCRIPTION

The ML-DP20 is a high-mu triode designed primarily to operate as a switch tube in hard-tube pulse modulators, for radar and similar applications. In this service the tube can deliver pulse power output in the order of 2 Mw.

The cathode of this tube consists of sturdy, self-supporting,

stress-free thoriated-tungsten filaments. The tube is designed for operation in oil or equivalent dielectric liquid, which is required for utilization of the maximum plate voltage rating of 90 kV. The anode is capable of dissipating 1.6 kW when cooled by free convection of oil.

*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

|                                         |       |     |
|-----------------------------------------|-------|-----|
| Filament Voltage .....                  | 7.0   | V   |
| Filament Current .....                  | 85    | A   |
| Filament Starting Current .....         | 400   | A   |
| Filament Cold Resistance .....          | .0095 | Ohm |
| Amplification Factor .....              | 180   |     |
| Interelectrode Capacitance, approximate |       |     |
| Grid-Plate .....                        | 14    | pf  |
| Grid-Cathode .....                      | 32    | pf  |
| Plate-Cathode .....                     | 1     | pf  |

#### Mechanical

|                                    |                      |
|------------------------------------|----------------------|
| Mounting Position .....            | Vertical, anode down |
| Type of Cooling .....              | Oil convection       |
| Maximum bulk oil temperature ..... | 75 °C†               |
| Maximum Glass Temperature .....    | 165 °C               |
| Net Weight, approximate .....      | 15 lb                |

†It might be necessary to promote mixing of oil by agitation.

# **MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS**

## **Pulse Modulator or Pulse Amplifier**

### Maximum Ratings, Absolute Values

|                                   |       |     |
|-----------------------------------|-------|-----|
| DC Plate Voltage .....            | 90    | kV§ |
| Peak Plate Voltage .....          | 100   | kV§ |
| DC Grid Voltage .....             | -1500 | V   |
| Peak Negative Grid Voltage .....  | -2500 | v   |
| Pulse Cathode Current .....       | 35    | a   |
| Grid Dissipation .....            | 300   | W   |
| Plate Dissipation .....           | 1.6   | kW‡ |
| Pulse Duration, approximate ..... | 1000  | μs# |
| Duty Factor .....                 | .03   | #   |

### Typical Operation

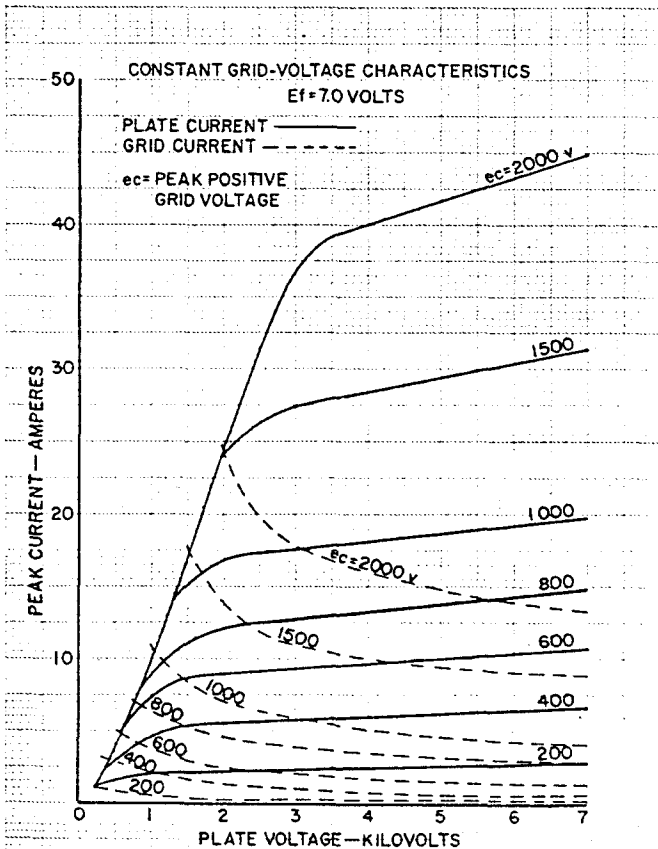
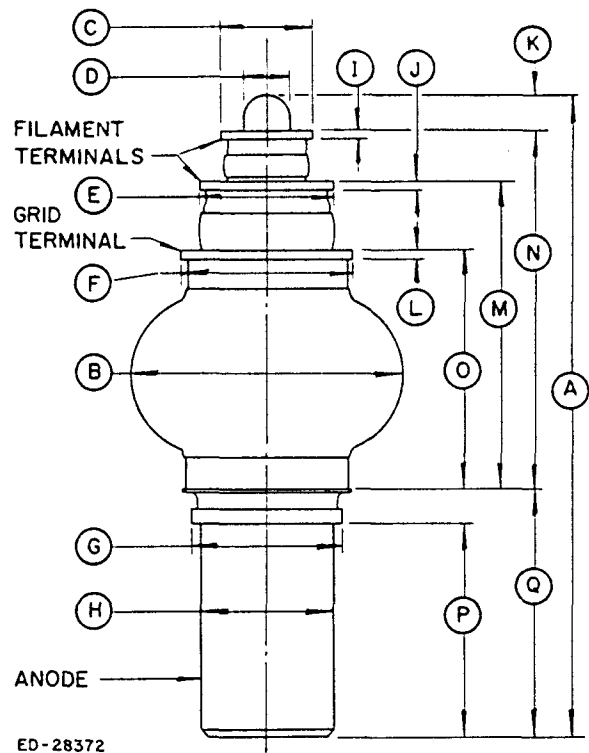
|                                   |      |    |
|-----------------------------------|------|----|
| DC Plate Voltage .....            | 80   | kV |
| DC Grid Voltage .....             | -600 | V  |
| Peak Positive Grid Voltage .....  | 1600 | v  |
| Pulse Plate Current .....         | 30   | a  |
| Pulse Grid Current .....          | 10   | a  |
| Pulse Driving Power .....         | 21   | kw |
| Pulse Power Output .....          | 2.2  | Mw |
| Pulsed Plate Output Voltage ..... | 76   | kv |
| Duty Factor .....                 | .01  |    |

§This voltage may be applied only when the tube is immersed in a suitable dielectric fluid.

‡With tube immersed in oil and cooled by natural convection. Higher plate dissipation is possible with forced-liquid cooling.

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

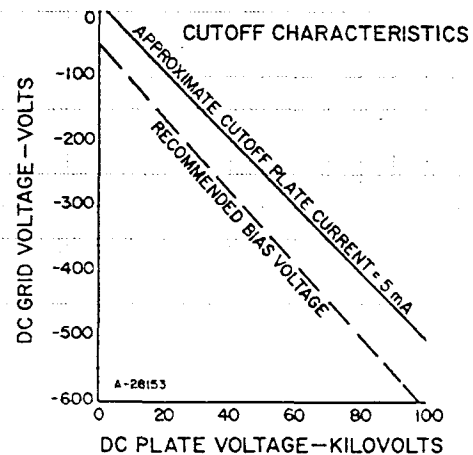
**WARNING:** Operation of this tube might produce x-rays. Adequate rayproof shielding must therefore be provided in the equipment.



**DIMENSIONS FOR OUTLINE OF ML-DP20**

| Ref. | Inches* |         |         | Notes |
|------|---------|---------|---------|-------|
|      | Minimum | Nominal | Maximum |       |
| A    |         | 16.4    |         |       |
| B    |         | 7.0     |         |       |
| C    |         | 2.50    |         |       |
| D    |         | 1.16    |         |       |
| E    |         | 3.50    |         |       |
| F    |         | 4.63    |         |       |
| G    |         | 4.00    |         |       |
| H    |         | 3.50    |         |       |
| I    |         | .19     |         |       |
| J    |         | .19     |         |       |
| K    |         | .94     |         |       |
| L    |         | .19     |         |       |
| M    |         | 8.00    |         |       |
| N    |         | 9.25    |         |       |
| O    |         | 6.31    |         |       |
| P    |         | 5.50    |         |       |
| Q    |         | 6.19    |         |       |

\*Limits to be determined.



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