

August 4th, 1950  
P.O. Box 4868  
Cleveland Park Station  
Washington, D.C.

Machlett Laboratories, Inc.  
Springdale, Conn.

Gentlemen:

I would like to secure one copy of the Summer number of Cathode Press which contains an article by Mr. R. H. Rheaume on your new type miniature ceramic lighthouse triode type ML280.

I have an application in mind which will require low level radio frequency amplification at about 1500 megacycles. Experiments with conventional lighthouse tubes type 2040 have not been very successful. Perhaps your new type ML280 is better adapted to this work.

Please quote price and possible delivery schedule upon a small number of these tubes.

Yours truly,

Grote Reber

# ML-280

## Tentative Technical Data

The ML-280 is a high-mu miniature ceramic "lighthouse" triode, designed primarily as an amplifier, oscillator, frequency multiplier, or detector for insertion in coaxial cavity circuits for u-h-f radio transmitting and receiving service. It has a theoretical upper frequency limit of 6000 mc/s. Its remarkable compactness, especially in view of the integral d-c isolated r-f cathode terminal, stems from the substitution of ceramic insulation and ring-type pure silver seals for glass and metal. This construction minimizes u-h-f skin effect and dielectric losses, at the same time reducing lead inductances and interelectrode capacitances. It is favorable to the precise maintenance of extremely small electrode spacings, maximizing transconductance and diminishing electron transit time losses. Therefore the ML-280 provides excellent voltage and power gains, with a minimum of thermal agitation noise and small r-f and d-c input requirements. The cathode is an indirectly heated, oxide-coated disc, requiring only 1.9 watts of heater power. The anode is forced-air cooled, and is capable of dissipating 6 watts.

### GENERAL CHARACTERISTICS

#### ELECTRICAL

|                                      |               |
|--------------------------------------|---------------|
| Heater Voltage                       | 5.0 volts     |
| Heater Current at 5.0 volts          | 0.38 amps     |
| Amplification Factor                 | 85            |
| Transconductance<br>( $I_b = 20$ mA) | 10000 umhos   |
| Interelectrode Capacitances          |               |
| Grid-Plate                           | 1.8 uuf       |
| Grid-Cathode                         | 2.9 uuf       |
| Plate-Cathode                        | 0.02 uuf max. |

#### MECHANICAL

|                                  |             |
|----------------------------------|-------------|
| Mounting Position                | Optional    |
| Type of Cooling                  | Forced Air* |
| Maximum Incoming Air Temperature | 45 °C       |
| Required Air Draft on Anode      | 7 ft/s      |
| Maximum Anode Temperature        | 175 °C      |
| Net Weight                       | 2 oz.       |

\*For maximum plate dissipation of 6 watts, air flow at a velocity of 7 ft./sec is recommended. Cooling must be sufficient to limit anode seal temperature to 175 °C. Cavity should be ventilated and an air flow provided, when necessary, to limit seal temperatures to 175 °C maximum.

ML-280

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Maximum Ratings and Typical Operating Conditions.

Class A Amplifier - Grid Separation Circuit

|                       | <u>Typical Operation</u> | <u>Maximum Ratings</u> |
|-----------------------|--------------------------|------------------------|
| Plate voltage         | 220                      | 250 volts              |
| Cathode-bias resistor | 30                       | ohms                   |
| Amplification factor  | 85                       |                        |
| Transconductance      | 10,000                   | umhos                  |
| Plate current         | 20                       | 23 ma                  |
| Plate resistance      | 8,500                    | ohms                   |

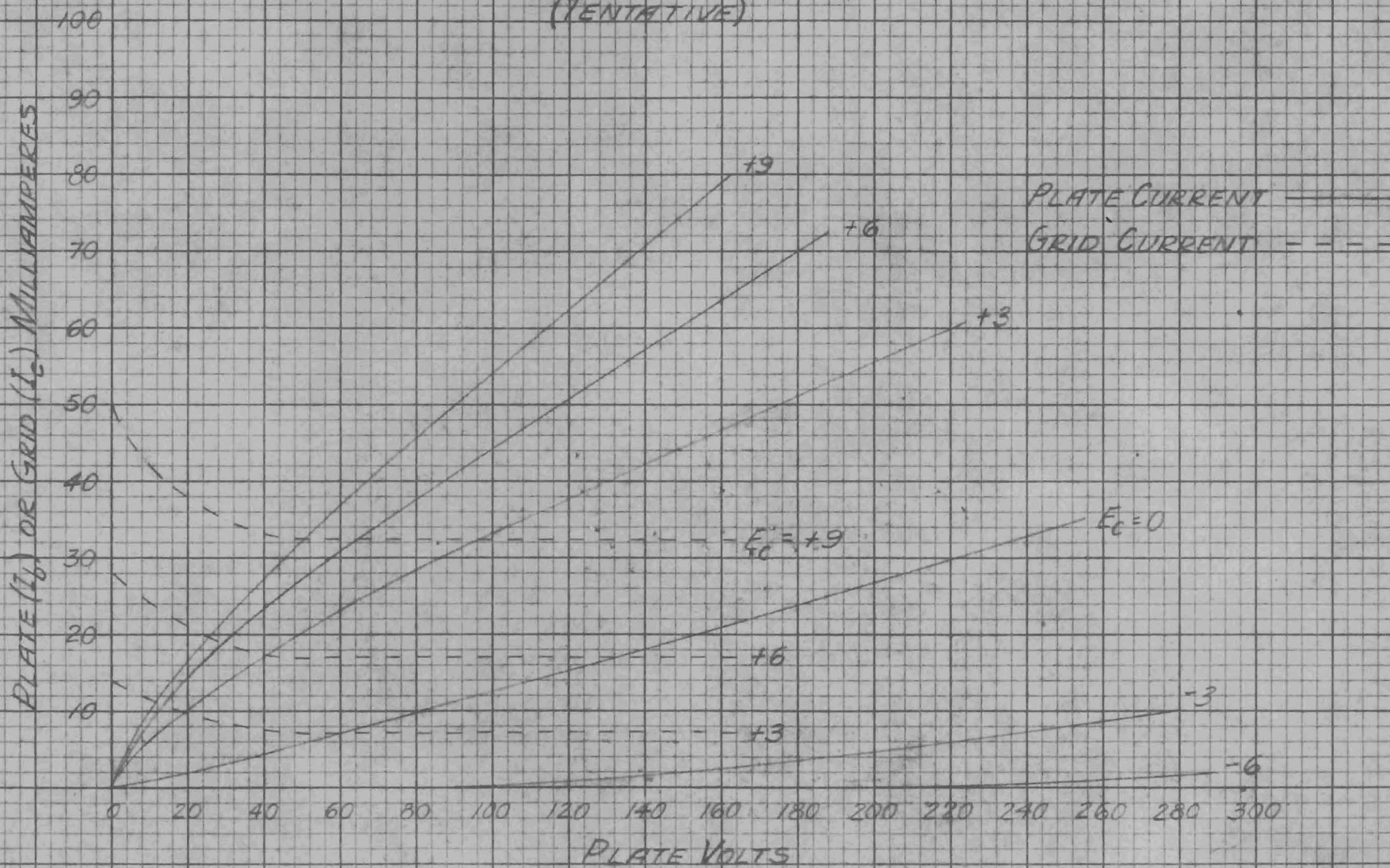
Class C CW Oscillator - Grid Separation Circuit

|                    | <u>Typical Operation</u> | <u>Maximum Ratings</u> |
|--------------------|--------------------------|------------------------|
| D-C plate voltage  | 220                      | 250 volts              |
| D-C grid voltage   | -12                      | -30 volts              |
| D-C plate current  | .007                     | amps                   |
| D-C grid current   | .005                     | .008 amps              |
| Plate input        | 1.6                      | watts                  |
| Plate dissipation  | 0.6                      | watts                  |
| Plate power output | 1.1                      | watts                  |
| Frequency          | 1000                     | mc/s                   |

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EP-280-31

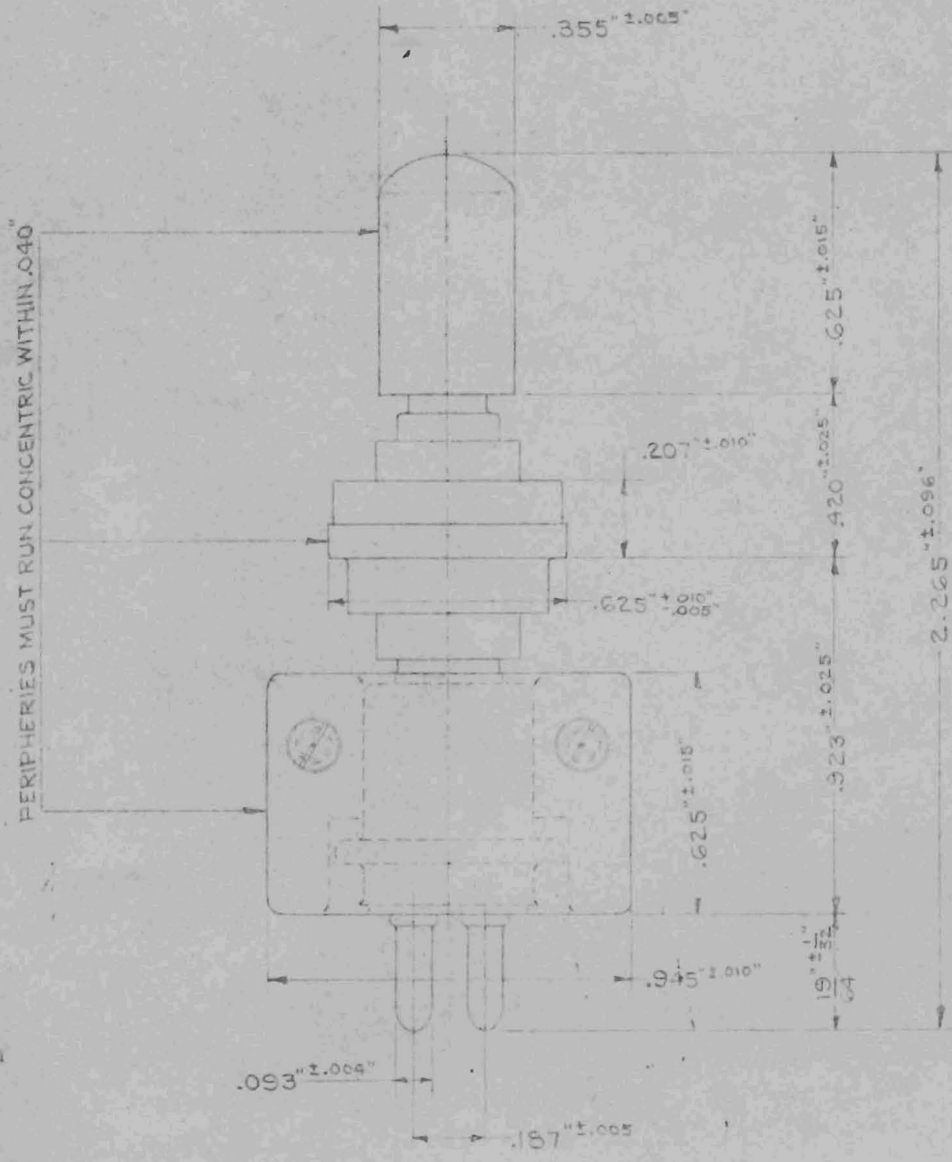
EP-280  
PLATE & GRID CHARACTERISTICS  
(TENTATIVE)



CFB 2-8-50

REVISIONS

4 REDRAWN & REVISED  
5-25-49 H.W.F.



TOLERANCE UNLESS OTHERWISE SPECIFIED

ON ALL DECIMAL DIMENSIONS ±

ON ALL FRACTIONAL DIMENSIONS ±

|          |         |         |          |            |         |
|----------|---------|---------|----------|------------|---------|
| MATERIAL | DATE    | SCALE   | DRAWN BY | CHECKED BY | APP. BY |
|          | 1-30-47 | 2" = 1" | E.F.P.   |            |         |

MACHLETT LABORATORIES, INC., SPRINGDALE, CONN.

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