

# Eitel-McCullough, Inc.

SAN BRUNO, CALIFORNIA

## 3X3000A1 LOW-MU TRIODE MODULATOR AMPLIFIER

The Eimac 3X3000A1 is a low-mu forced-air-cooled power triode intended for use as an audio amplifier or modulator. The maximum rated plate dissipation is 3000 watts.

Two 3X3000A1's in class-AB<sub>1</sub> audio service will deliver up to 10 kilowatts maximum-signal plate power output at 6000 plate volts without drawing grid current.

### GENERAL CHARACTERISTICS

#### ELECTRICAL

|  |                         |
|--|-------------------------|
| Filament: Thoriated Tungsten                                       |                         |
| Voltage  | 7.5 volts               |
| Current  | 51 amperes              |
| Amplification Factor (Average)                                     | 5                       |
| Direct Interelectrode Capacitances (Average)                       |                         |
| Grid-Plate   | 17 $\mu\text{mfd}$      |
| Grid-Filament  | 29 $\mu\text{mfd}$      |
| Plate-Filament   | 2.5 $\mu\text{mfd}$     |
| Transconductance ( $I_b = 1.0 \text{ amp.}, E_b = 3000\text{v.}$ ) | 11,000 $\mu\text{mhos}$ |

#### MECHANICAL

|   |                           |
|---|---------------------------|
| Base  | See outline drawing       |
| Mounting Position                             | Vertical, base down or up |
| Cooling                                       | Forced air                |
| Maximum Temperatures:                         |                           |
| Grid and Filament Seals,<br>Anode Cooler Core | 150°C                     |
| Maximum Overall Dimensions:                   |                           |
| Length  | 9.0 inches                |
| Diameter                                      | 4.16 inches               |
| Net Weight                                    | 6.25 pounds               |
| Shipping Weight (Average)                     | 16 pounds                 |



#### AUDIO FREQUENCY POWER AMPLIFIER OR MODULATOR

Class-AB<sub>1</sub>

MAXIMUM RATINGS (Per tube)

|                   |                  |
|-------------------|------------------|
| D-C PLATE VOLTAGE | 6000 MAX. VOLTS  |
| D-C PLATE CURRENT | 2.5 MAX. AMPERES |
| PLATE DISSIPATION | 3000 MAX. WATTS  |
| GRID DISSIPATION  | 50 MAX. WATTS    |

|   |        |        |        |        |          |
|---|--------|--------|--------|--------|----------|
| TYPICAL OPERATION (Sinusoidal wave, two tubes unless otherwise specified) |        |        |        |        |          |
| D-C Plate Voltage   | 3000   | 4000   | 5000   | 6000   | volts    |
| D-C Grid Voltage (approx.) <sup>1</sup>                                   | -400   | -860   | -1080  | -1300  | volts    |
| Zero-Signal D-C Plate Current   | 465    | 500    | 400    | 335    | ma       |
| Max-Signal D-C Plate Current  | 3.35   | 3.00   | 2.80   | 2.65   | amps     |
| Effective Load, Plate-to-Plate  | 1170   | 2160   | 3320   | 4560   | ohms     |
| Peak A-F Grid Input Voltage<br>(per tube)                                 | 555    | 760    | 995    | 1250   | volts    |
| Max-Signal Driving Power (approx.)  | 0      | 0      | 0      | 0      | watts    |
| Max-Signal Plate Power Input  | 10,000 | 12,000 | 14,000 | 16,000 | watts    |
| Max-Signal Plate Dissipation<br>(per tube)                                | 3000   | 3000   | 3000   | 3000   | watts    |
| Max-Signal Plate Power Output   | 4000   | 6000   | 8000   | 10,000 | watts    |
| Total Harmonic Distortion <sup>2</sup>                                    | 2.7    | 1.8    | 2.6    | 2.1    | per cent |

<sup>1</sup>Adjust to stated Zero-Signal D-C Plate Current. Effective grid-circuit resistance must not exceed 200,000 ohms.

<sup>2</sup>At maximum signal without negative feedback.

#### APPLICATION

**Filament Voltage**—The filament voltage, as measured directly at the tube, should be the rated value of 7.5 volts. Variations should be held within the range of 7.12 to 7.87 volts.

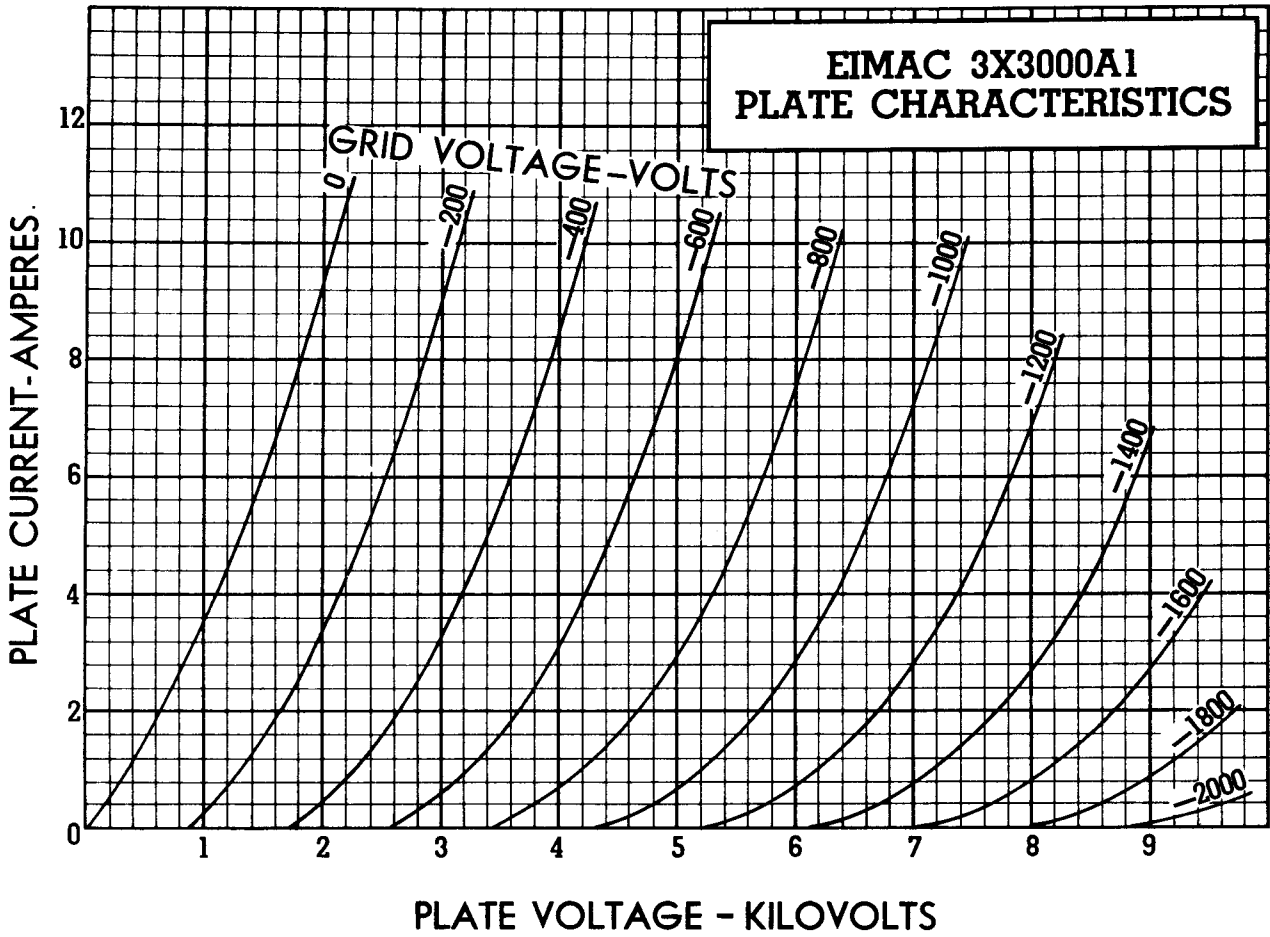
**Cooling**—The 3X3000A1 requires an air-flow of 150 cubic feet per minute through the anode cooler. This corresponds to a pressure drop across the cooler of 2.2 inches of water. A flow of 6 cubic feet per minute must also be directed into the filament stem structure, between the inner and outer filament conductors.

The air-flow must be started when power is applied to the filament, and must continue without interruption

until all electrode voltages have been removed from the tube. It is advisable to permit the air-cooling system to operate for two minutes or more after the removal of power.

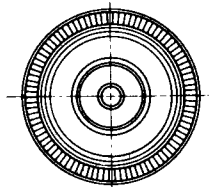
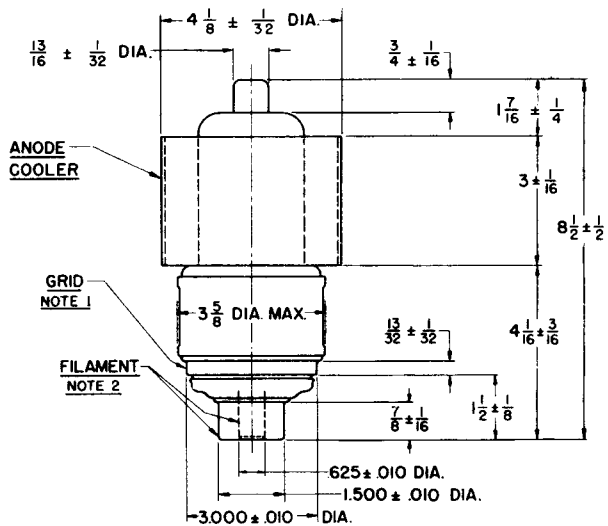
These air requirements are based upon operation at an ambient temperature of 20°C and at sea level.

Cooling conditions for the 3X3000A1 may be considered satisfactory if the temperature of the anode cooler core and of the metal parts of the metal-to-glass seals is not allowed to exceed 150°C. A convenient accessory for the measurement of these temperatures is "Tempilaq", a temperature-sensitive lacquer manufactured by the Tempil Corporation, 132 West 22nd St., New York 11, N. Y.



**NOTE 1**  
.040" MAXIMUM RUNOUT OF GRID CONTACT SURFACE WITH RESPECT TO AXIS DETERMINED BY ANODE AND OUTER FILAMENT CONTACT SURFACE.

**NOTE 2**  
.025" MAXIMUM RUNOUT OF INNER FILAMENT CONTACT SURFACE WITH RESPECT TO OUTER FILAMENT CONTACT SURFACE.



**BOTTOM VIEW**

**DIMENSIONS  
 IN INCHES**