

# Low-Mu Twin Triode

For Use as a Series-Regulator Tube  
in Regulated DC Power Supplies

## GENERAL DATA

### Electrical:

|                                                                        |           |               |
|------------------------------------------------------------------------|-----------|---------------|
| Heater Characteristics and Ratings ( <i>Absolute-Maximum Values</i> ): |           |               |
| Voltage (AC or DC) . . . . .                                           | 6.3 ± 0.6 | volts         |
| Current at heater volts = 6.3 . . . . .                                | 5.000     | amp           |
| Peak heater-cathode voltage (Each Unit):                               |           |               |
| Heater negative with respect to cathode . . . . .                      | 300 max.  | volts         |
| Heater positive with respect to cathode . . . . .                      | 300 max.  | volts         |
| Cathode Warm-Up Time (Minimum) . . . . .                               | 30        | sec           |
| Direct Interelectrode Capacitances:                                    |           |               |
| Grid to plate (Each Unit) . . . . .                                    | 21.8      | $\mu\text{f}$ |
| Grid to cathode (Each Unit) . . . . .                                  | 16.7      | $\mu\text{f}$ |
| Plate to cathode (Each Unit) . . . . .                                 | 3.8       | $\mu\text{f}$ |
| Heater to cathode (Each Unit) . . . . .                                | 15        | $\mu\text{f}$ |
| Plate to plate . . . . .                                               | 0.6       | $\mu\text{f}$ |

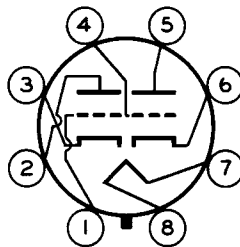
### Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):

|                                      |       |                  |
|--------------------------------------|-------|------------------|
| Plate Supply Voltage . . . . .       | 190   | volts            |
| Cathode Resistor . . . . .           | 200   | ohms             |
| Amplification Factor . . . . .       | 2.7   |                  |
| Plate Resistance (Approx.) . . . . . | 200   | ohms             |
| Transconductance . . . . .           | 13500 | $\mu\text{mhos}$ |

### Mechanical:

|                                              |                                                                                        |
|----------------------------------------------|----------------------------------------------------------------------------------------|
| Operating Position . . . . .                 | Vertical, base down or up, or<br>Horizontal with pins 1 and 4 in vertical plane        |
| Type of Cathodes . . . . .                   | Coated Unipotential                                                                    |
| Maximum Overall Length . . . . .             | 4.750"                                                                                 |
| Maximum Seated Length . . . . .              | 4.188"                                                                                 |
| Maximum Diameter . . . . .                   | 2.070"                                                                                 |
| Bulb . . . . .                               | TT16                                                                                   |
| Base . . . . .                               | Large-Wafer Octal 8-Pin with<br>External Barriers and Sleeve (JEDEC Group 7, No.B8-98) |
| Basing Designation for BOTTOM VIEW . . . . . | 8BD                                                                                    |

Pin 1—Grid of Unit No.2  
Pin 2—Plate of Unit No.2  
Pin 3—Cathode of Unit No.2  
Pin 4—Grid of Unit No.1



Pin 5—Plate of Unit No.1  
Pin 6—Cathode of Unit No.1  
Pin 7—Heater  
Pin 8—Heater



## SERIES-REGULATOR SERVICE

*Values are for Each Unit*

### Maximum Ratings, Absolute-Maximum Values:

*For operation at altitudes up to 60,000 feet<sup>a</sup>*

|                                                                 |          |       |
|-----------------------------------------------------------------|----------|-------|
| PLATE VOLTAGE. . . . .                                          | 400 max. | volts |
| GRID VOLTAGE:                                                   |          |       |
| Negative-bias value. . . . .                                    | 300 max. | volts |
| Positive-bias value. . . . .                                    | 0 max.   | volts |
| PLATE CURRENT. . . . .                                          | 400 max. | ma    |
| PLATE DISSIPATION. . . . .                                      | 30 max.  | watts |
| BULB TEMPERATURE (At hottest point on<br>bulb surface). . . . . | 250 max. | °C    |

### Maximum Circuit Values:

#### Grid-Circuit Resistance:<sup>b</sup>

|                                      |          |        |
|--------------------------------------|----------|--------|
| For fixed-bias operation . . . . .   | 0.2 max. | megohm |
| For cathode-bias operation . . . . . | 0.5 max. | megohm |

<sup>a</sup> cooling must be provided to keep bulb temperature within ratings at altitudes above 10,000 feet.

<sup>b</sup> Minimum resistance per cathode should be 27 ohms or that resistance necessary to provide 10 per cent of the grid bias voltage, whichever is greater.

## CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

|                                            | Note | Min.  | Max.  |       |
|--------------------------------------------|------|-------|-------|-------|
| Heater Current . . . . .                   | 1    | 4.75  | 5.25  | amp   |
| Amplification Factor (Each Unit) . . . . . | 1,2  | 2     | 3.4   |       |
| Plate Current (Each Unit). . . . .         | 1,2  | 165   | 200   | ma    |
| Plate Current (Each Unit). . . . .         | 1,3  | 0     | 10    | ma    |
| Transconductance (Each Unit) . . . . .     | 1,2  | 11000 | 16000 | μmhos |

Note 1: With 6.3 volts ac or dc on heater.

Note 2: With plate supply voltage of 190 volts, grid resistor of 500 ohms (each grid), and cathode resistor of 200 ohms (each cathode), both triode units operating.

Note 3: With plate voltage of 200 volts, and a grid-No.1 voltage of -100 volts (both triode units operating).

## SPECIAL RATINGS AND PERFORMANCE DATA

### Shock Rating:

|                              |          |   |
|------------------------------|----------|---|
| Impact Acceleration. . . . . | 720 max. | g |
|------------------------------|----------|---|

This test is performed on a sample lot of tubes from each production run to determine ability of tube to withstand the specified impact acceleration. Tubes are held rigid in four different positions in a Navy Type, High-Impact (Flyweight) Shock Machine and are subjected to 20 blows at a hammer angle of 48°. At the end of this test, tubes will be considered inoperative if they do not have a minimum plate current per unit of 150 milliamperes, a minimum transconductance per unit of 9000 micromhos, a maximum heater-to-cathode leakage current (both units) of 100 microamperes, and a maximum reverse grid current (both units) of 8 microamperes.

## Variable-Frequency-Vibration Performance:

This test is performed on a sample lot of tubes from each production run under the following conditions: Heater voltage of 6.3 volts, plate supply voltage of 190 volts, grid resistor of 500 ohms in each grid, cathode resistor of 200 ohms in each cathode (both units operating), and a plate load resistance of 2000 ohms per unit. During operation, tubes are vibrated through the frequency range from 10 to 50 cycles per second with a constant vibrational acceleration of 10 g. During the test, tubes will not show an rms output voltage across the plate load resistor in excess of 200 millivolts.

## 1000-Hour Intermittent Life Performance:

This test is performed on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures of any of the characteristics indicated below. Life testing is conducted under the following conditions: Heater voltage of 6.3 volts, plate supply voltage of 190 volts, grid resistor of 500 ohms in each grid, and cathode resistor of 200 ohms in each cathode (both units operating).

At the end of 1000 hours, tubes will be considered in-operative if they do not have a minimum plate current per unit of 150 milliamperes, a minimum transconductance per unit of 9000 micromhos, a maximum heater-to-cathode leakage current (both units) of 100 microamperes, and a maximum reverse grid current (both units) of 8 microamperes.

## OPERATING CONSIDERATIONS

Operating conditions for the 6336A should be selected to assure that there is always some voltage drop across the tube. In addition, bias voltage provided by the drop across the plate load resistor of the amplifier tube should not be less than 5 volts to allow for variations in the characteristics of individual 6336A's. A grid resistor of approximately 1000 ohms should be used to prevent parasitic oscillations.

