



3E22

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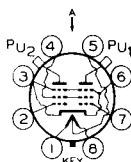
**PUSH-PULL H-F BEAM POWER AMPLIFIER***Unless otherwise specified, values are for both units*GENERAL DATA**Electrical:**

Heaters, for Unipotential Cathodes.

| Arrangement . . .                                   | <u>Series</u>  | <u>Parallel</u> |                |
|-----------------------------------------------------|----------------|-----------------|----------------|
| Voltage . . . . .                                   | 12.6 $\pm$ 10% | 6.3 $\pm$ 10%   | ac or dc volts |
| Current . . . . .                                   | 0.8            | 1.6             | amp            |
| Transconductance, for plate<br>current of 25 ma . . | 4000           |                 | $\mu$ mhos     |
| Grid-Screen Mu-Factor . .                           | 6.5            |                 |                |
| Direct Interelectrode Capacitances (Each Unit):*    |                |                 |                |
| Grid No.1 to Plate. . .                             | 0.22 max.      |                 | $\mu$ mf       |
| Input . . . . .                                     | 14             |                 | $\mu$ mf       |
| Output. . . . .                                     | 8.5            |                 | $\mu$ mf       |

**Mechanical:**

|                                                                |                                                                       |
|----------------------------------------------------------------|-----------------------------------------------------------------------|
| Mounting Position . . . . .                                    | Vertical, base up or down; or<br>Horizontal, plane of plates vertical |
| Overall Length. . . . .                                        | 4-3/8" $\pm$ 3/16"                                                    |
| Seated Length . . . . .                                        | 3-13/16" $\pm$ 3/16"                                                  |
| Maximum Diameter. . . . .                                      | 2-3/8"                                                                |
| Bulb. . . . .                                                  | T-16                                                                  |
| Caps (Two). . . . .                                            | Small                                                                 |
| Base. . . Large Wafer Octal 8-Pin Micanol with Sleeve No. T253 |                                                                       |
| Basing Designation for BOTTOM VIEW. . . . .                    | 8BY                                                                   |
| Pin 1-Heater                                                   | Pin 6-Cathode,<br>Grid No.3,<br>Internal<br>Shield                    |
| Pin 2-Grid No.1 of<br>Unit No.2                                | Pin 7-Grid No.1 of<br>Unit No.1                                       |
| Pin 3-Cathode,<br>Grid No.3,<br>Internal<br>Shield             | Pin 8-Heater                                                          |
| Pin 4-Grid No.2                                                | PU <sub>1</sub> - Plate of<br>Unit No.1                               |
| Pin 5-Heater<br>Center-Tap                                     | PU <sub>2</sub> - Plate of<br>Unit No.2                               |



PLANE OF ELECTRODES OF EACH UNIT  
IS PARALLEL TO PLANE THROUGH AXIS  
OF TUBE AND AA'

**PLATE-MODULATED PUSH-PULL RF POWER AMP. — Class C Telephony**

*Carrier conditions per tube for use with a maximum average modulation factor of 0.25*

**Maximum Ratings, Absolute Values:**

|                                               | <u>IMS</u>      |
|-----------------------------------------------|-----------------|
| DC PLATE VOLTAGE. . . . .                     | 560 max. volts  |
| DC GRID-No.2 (SCREEN) VOLTAGE . . . . .       | 225 max. volts  |
| DC GRID-No.1 (CONTROL-GRID) VOLTAGE . . . . . | -175 max. volts |
| DC PLATE CURRENT. . . . .                     | 160 max. ma.    |
| DC GRID-No.1 CURRENT. . . . .                 | 11 max. ma.     |
| PLATE INPUT . . . . .                         | 90 max. watts   |

\* , •, See next page.

← Indicates a change.

DEC. 20, 1946

**TUBE DEPARTMENT**  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA 1

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# PUSH-PULL H-F BEAM POWER AMPLIFIER

|                                                   |                |
|---------------------------------------------------|----------------|
| GRID-No.2 INPUT . . . . .                         | 6 max. watts   |
| PLATE DISSIPATION . . . . .                       | 30 max. watts  |
| PEAK HEATER-CATHODE VOLTAGE:                      |                |
| Heater negative with respect to cathode . . . . . | 100 max. volts |
| Heater positive with respect to cathode . . . . . | 100 max. volts |

## Typical Operation:

|                                                 |                                                                                                                                                                                                                                                                              |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DC Plate Voltage. . . . .                       | 560 . . volts                                                                                                                                                                                                                                                                |
| DC Grid-No.2 Voltage <sup>□</sup> . . . . .     | <div style="display: inline-block; vertical-align: middle;"> <div style="font-size: 3em; vertical-align: middle;">{</div> <div style="display: inline-block; vertical-align: middle;"> 200 . . volts<br/> 18000 . . ohms<br/> -50 . . volts<br/> 7700 . . ohms </div> </div> |
| DC Grid-No.1 Voltage <sup>Δ</sup> . . . . .     |                                                                                                                                                                                                                                                                              |
| Peak RF Grid-No.1-to-Grid-No.1 Voltage. . . . . |                                                                                                                                                                                                                                                                              |
| DC Plate Current. . . . .                       |                                                                                                                                                                                                                                                                              |
| DC Grid-No.2 Current. . . . .                   | 20 . . ma.                                                                                                                                                                                                                                                                   |
| DC Grid-No.1 Current (Approx.). . . . .         | 6.5 . . ma.                                                                                                                                                                                                                                                                  |
| Driving Power (Approx.). . . . .                | 0.4 . . watt                                                                                                                                                                                                                                                                 |
| Power Output (Approx.). . . . .                 | 67 . . watts                                                                                                                                                                                                                                                                 |

## Maximum Circuit Values:

|                                                     |                 |
|-----------------------------------------------------|-----------------|
| Grid-No.1-Circuit Resistance <sup>§</sup> . . . . . | 30000 max. ohms |
|-----------------------------------------------------|-----------------|

## PUSH-PULL RF POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

*Key-down conditions per tube without modulation #*

## Maximum Ratings, Absolute Values:

|                                                   |                        |
|---------------------------------------------------|------------------------|
|                                                   | <u>1A5<sup>•</sup></u> |
| DC PLATE VOLTAGE. . . . .                         | 600 max. volts         |
| DC GRID-No.2 (SCREEN) VOLTAGE . . . . .           | 225 max. volts         |
| DC GRID-No.1 (CONTROL GRID) VOLTAGE . . . . .     | -175 max. volts        |
| DC PLATE CURRENT. . . . .                         | 175 max. ma.           |
| DC GRID-No.1 CURRENT. . . . .                     | 11 max. ma.            |
| PLATE INPUT . . . . .                             | 100 max. watts         |
| GRID-No.2 INPUT . . . . .                         | 6 max. watts           |
| PLATE DISSIPATION . . . . .                       | 35 max. watts          |
| PEAK HEATER-CATHODE VOLTAGE:                      |                        |
| Heater negative with respect to cathode . . . . . | 100 max. volts         |
| Heater positive with respect to cathode . . . . . | 100 max. volts         |

## Typical Operation:

|                                                 |                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DC Plate Voltage. . . . .                       | 600 . . volts                                                                                                                                                                                                                                                                                  |
| DC Grid-No.2 Voltage <sup>•</sup> . . . . .     | <div style="display: inline-block; vertical-align: middle;"> <div style="font-size: 3em; vertical-align: middle;">{</div> <div style="display: inline-block; vertical-align: middle;"> 200 . . volts<br/> 20000 . . ohms<br/> -55 . . volts<br/> 7850 . . ohms<br/> 295 . . ohms </div> </div> |
| DC Grid-No.1 Voltage <sup>‡</sup> . . . . .     |                                                                                                                                                                                                                                                                                                |
| Peak RF Grid-No.1-to-Grid-No.1 Voltage. . . . . |                                                                                                                                                                                                                                                                                                |
| DC Plate Current. . . . .                       |                                                                                                                                                                                                                                                                                                |
| DC Grid-No.2 Current. . . . .                   | 20 . . ma.                                                                                                                                                                                                                                                                                     |
| DC Grid-No.1 Current (Approx.). . . . .         | 7 . . ma.                                                                                                                                                                                                                                                                                      |

\* , • , □ , Δ , # , † , § : See next page.

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TUBE DEPARTMENT

TENTATIVE DATA 1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



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**PUSH-PULL H-F BEAM POWER AMPLIFIER**

Driving Power (Approx.) . . . . . 0.45 . . watt  
 Power Output (Approx.) . . . . . 72 . . watts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance $\Omega$ . . . . . 30000 max. ohms

- Intermittent Mobile Service (IMS) is defined to include those applications, such as aircraft, where the transmitter design factors of minimum size, light weight, and exceedingly high power output for short intervals are the primary requirements, even though the average life expectancy of tubes used in such transmitters is reduced to about 100 hours.

Tube ratings for IMS service are established on the basis that the transmissions have maximum "on" periods of 15 seconds followed by "off" periods of at least 60 seconds, except that it is permissible to make equipment tests with maximum "on" periods of 5 minutes followed by off periods of at least 5 minutes provided the total "on" time of such periods does not exceed 10 hours during the life of any tube.

Although the use of tubes under IMS ratings involves great reduction in tube life, such use can be justified as economical practice in applications where high power is intermittently desired from small tubes.

- \* With no external shielding.
- Obtained preferably from a separate source modulated with the plate supply or from the modulated plate-supply through a series resistor of the value shown.
- $\Delta$  Obtained from grid-resistor of value shown or by partial self-bias methods.
- # Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of carrier conditions.
- ⊕ Obtained preferably from a separate source, or from the plate-voltage supply with a voltage divider, or through a series resistor of the value shown. The grid-No.2 voltage must not exceed 600 volts under key-up conditions.
- † Obtained from fixed-supply, by grid resistor of value shown, or cathode resistor of value shown, respectively.
- § Any additional bias required must be supplied by a cathode resistor or a fixed supply.

OUTLINE DIMENSIONS AND CURVES for the 3E22 are the same as those for the 815.