



814

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## TRANSMITTING BEAM POWER AMPLIFIER

GENERAL DATA**Electrical:**

Filament, Thoriated Tungsten:

Voltage. . . . . 10  $\pm$  0.5 . . . . . ac or dc volts

Current. . . . . 3.25 . . . . . amp

Transconductance (Approx.)

for plate current of 39 ma. 3300 . . . . .  $\mu$ mhosDirect Interelectrode Capacitances:<sup>o</sup>Grid No.1 to Plate . . . . . 0.15 max. . . . .  $\mu$ mf ←Input. . . . . 13.5 . . . . .  $\mu$ mfOutput . . . . . 13.5 . . . . .  $\mu$ mf<sup>o</sup> Without external shielding.**Mechanical:**Mounting Position. . . . . Vertical, base down; Horizontal,  
pins 2 & 4 in vertical planeOverall Length . . . . . 7-7/16"  $\pm$  1/4"Seated Length. . . . . 6-13/16"  $\pm$  1/4"

Maximum Diameter . . . . . 2-1/16"

Bulb . . . . . T-16

Cap. . . . . Small

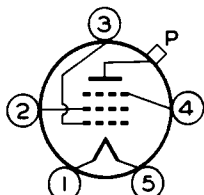
Base . . . . . Medium-Shell Small 5-Pin, Micanol

Basing Designation for BOTTOM VIEW . . . . . 5J

Pin 1-Filament

Pin 2-Grid No.2

Pin 3-Grid No.1



Pin 4-Grid No.3

Pin 5-Filament

Cap -Plate

RF POWER AMPLIFIER-Class B Telephony

Carrier conditions per tube for use with a max. modulation factor of 1.0

**Maximum Ratings, Absolute Values:**

|                                        | <u>CCS<sup>o</sup></u> | <u>ICAS<sup>oo</sup></u> |         |
|----------------------------------------|------------------------|--------------------------|---------|
| DC PLATE VOLTAGE . . . . .             | 1250 max.              | 1500 max.                | volts ← |
| DC GRID-No.2 (SCREEN) VOLTAGE. . . . . | 400 max.               | 400 max.                 | volts   |
| DC PLATE CURRENT . . . . .             | 60 max.                | 60 max.                  | ma      |
| PLATE INPUT. . . . .                   | 75 max.                | 90 max.                  | watts   |
| GRID-No.2 INPUT. . . . .               | 6.7 max.               | 6.7 max.                 | watts   |
| PLATE DISSIPATION. . . . .             | 50 max.                | 60 max.                  | watts   |

**Typical Operation:**

|                                                                |      |      |                      |
|----------------------------------------------------------------|------|------|----------------------|
| DC Plate Voltage . . . . .                                     | 1000 | 1250 | 1500 . . . . . volts |
| DC Grid-No.3 (Suppressor)<br>Voltage† . . . . .                | 0    | 0    | 0 . . . . . volts    |
| DC Grid-No.2 Voltage . . . . .                                 | 200  | 200  | 250 . . . . . volts  |
| DC Grid-No.1 (Control-<br>Grid) Voltage <sup>o</sup> . . . . . | -28  | -28  | -35 . . . . . volts  |

<sup>o</sup>, <sup>oo</sup>, <sup>†</sup>, <sup>o</sup>: See next page.

← Indicates a change.

NOV. 15, 1948

TUBE DEPARTMENT

DATA 1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



# TRANSMITTING BEAM POWER AMPLIFIER

|                                            | CCS* |      | ICAS**   |       |
|--------------------------------------------|------|------|----------|-------|
| Peak RF Grid-No.1 Voltage. . .             | 50   | 50   | 56 . .   | volts |
| DC Plate Current . . . . .                 | 60   | 60   | 60 . .   | ma    |
| DC Grid-No.2 Current . . . .               | 1.3  | 1    | 1.5 . .  | ma    |
| DC Grid-No.1 Current<br>(Approx.)* . . . . | 1.8  | 1.8  | 1.5 . .  | ma    |
| Driving Power (Approx.) <sup>□</sup> * .   | 0.65 | 0.65 | 0.85 . . | watt  |
| Power Output (Approx.) . . .               | 20   | 25   | 30 . .   | watts |

## GRID-MODULATED RF POWER AMPLIFIER - Class C Telephony

Carrier conditions per tube for use with a max. modulation factor of 1.0

### Maximum Ratings, Absolute Values:

|                                                | CCS*      |  | ICAS**    |       |
|------------------------------------------------|-----------|--|-----------|-------|
| DC PLATE VOLTAGE . . . . .                     | 1250 max. |  | 1500 max. | volts |
| → DC GRID-No.2 (SCREEN) VOLTAGE.               | 400 max.  |  | 400 max.  | volts |
| DC GRID-No.1 (CONTROL-<br>GRID) VOLTAGE. . . . | -250 max. |  | -250 max. | volts |
| DC PLATE CURRENT . . . . .                     | 60 max.   |  | 60 max.   | ma    |
| PLATE INPUT. . . . .                           | 75 max.   |  | 90 max.   | watts |
| GRID-No.2 INPUT. . . . .                       | 6.7 max.  |  | 6.7 max.  | watts |
| PLATE DISSIPATION. . . . .                     | 50 max.   |  | 60 max.   | watts |

### Typical Operation:

|                                                 |      |      |          |       |
|-------------------------------------------------|------|------|----------|-------|
| DC Plate Voltage . . . . .                      | 1000 | 1250 | 1500 . . | volts |
| DC Grid-No.3 (Suppressor)<br>Voltage† . . . . . | 0    | 0    | 0 . .    | volts |
| DC Grid-No.2 Voltage . . . .                    | 200  | 200  | 250 . .  | volts |
| DC Grid-No.1 Voltage* . . .                     | -100 | -100 | -120 . . | volts |
| → Peak RF Grid-No.1 Voltage. .                  | 129  | 129  | 150 . .  | volts |
| Peak AF Grid-No.1 Voltage. .                    | 64   | 64   | 90 . .   | volts |
| DC Plate Current . . . . .                      | 60   | 60   | 60 . .   | ma    |
| DC Grid-No.2 Current . . . .                    | 2    | 1.4  | 3 . .    | ma    |
| DC Grid-No.1 Current<br>(Approx.)* . . . .      | 3    | 2.8  | 2.5 . .  | ma    |
| Driving Power (Approx.) <sup>□</sup> * .        | 2.5  | 2.3  | 4.2 . .  | watts |
| Power Output (Approx.) . . .                    | 25   | 29   | 35 . .   | watts |

## PLATE-MODULATED RF POWER AMPLIFIER - Class C Telephony

Carrier conditions per tube for use with a max. modulation factor of 1.0

### Maximum Ratings, Absolute Values:

|                                                  | CCS*      |  | ICAS**    |       |
|--------------------------------------------------|-----------|--|-----------|-------|
| DC PLATE VOLTAGE . . . . .                       | 1000 max. |  | 1250 max. | volts |
| → DC GRID-No.2 (SCREEN) VOLTAGE.                 | 400 max.  |  | 400 max.  | volts |
| DC GRID-No.1 (CONTROL-GRID)<br>VOLTAGE . . . . . | -300 max. |  | -300 max. | volts |

□ At crest of audio-frequency cycle with a modulation factor of 1.0.

•, \*\*, †, \*, : See next page.

→ Indicates a change.



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## TRANSMITTING BEAM POWER AMPLIFIER

|                                | CCS*     | ICAS**   |       |
|--------------------------------|----------|----------|-------|
| DC PLATE CURRENT . . . . .     | 120 max. | 150 max. | ma    |
| DC GRID-No.1 CURRENT . . . . . | 15 max.  | 15 max.  | ma    |
| PLATE INPUT. . . . .           | 120 max. | 180 max. | watts |
| GRID-No.2 INPUT. . . . .       | 6.7 max. | 6.7 max. | watts |
| PLATE DISSIPATION. . . . .     | 34 max.  | 50 max.  | watts |

## Typical Operation:

|                                                 |       |       |       |    |       |
|-------------------------------------------------|-------|-------|-------|----|-------|
| DC Plate Voltage . . . . .                      | 900   | 1000  | 1250  | .. | volts |
| DC Grid-No.3 (Suppressor)<br>Voltage† . . . . . | 0     | 0     | 0     | .. | volts |
| DC Grid-No.2 Voltage▲ . . . . .                 | 300   | 300   | 300   | .. | volts |
|                                                 | 40000 | 40000 | 48000 | .. | ohms  |
| DC Grid-No.1 Voltage††* . . . . .               | -150  | -150  | -150  | .. | volts |
|                                                 | 15000 | 15000 | 15000 | .. | ohms  |
| Peak RF Grid-No.1 Voltage. . . . .              | 215   | 222   | 222   | .. | volts |
| DC Plate Current . . . . .                      | 120   | 120   | 144   | .. | ma    |
| DC Grid-No.2 Current . . . . .                  | 15    | 17.5  | 20    | .. | ma    |
| DC Grid-No.1 Current<br>(Approx.)* . . . . .    | 10    | 10    | 10    | .. | ma    |
| Driving Power (Approx.)* . . . . .              | 2     | 2     | 2     | .. | watts |
| Power Output (Approx.) . . . . .                | 76    | 87    | 130   | .. | watts |

▲▲ obtained preferably from modulated plate-voltage supply through resistor of value shown.

## RF POWER AMPLIFIER &amp; OSCILLATOR—Class C Telegraphy

Key-down conditions per tube without modulation■

## Maximum Ratings, Absolute Values:

|                                                  | CCS*      | ICAS**    |         |
|--------------------------------------------------|-----------|-----------|---------|
| DC PLATE VOLTAGE . . . . .                       | 1250 max. | 1500 max. | volts   |
| DC GRID-No.2 (SCREEN) VOLTAGE. . . . .           | 400 max.  | 400 max.  | volts ← |
| DC GRID-No.1 (CONTROL-<br>GRID) VOLTAGE. . . . . | -300 max. | -300 max. | volts   |
| DC PLATE CURRENT . . . . .                       | 150 max.  | 150 max.  | ma      |
| DC GRID-No.1 CURRENT . . . . .                   | 15 max.   | 15 max.   | ma      |
| PLATE INPUT. . . . .                             | 180 max.  | 225 max.  | watts   |
| GRID-No.2 INPUT. . . . .                         | 10 max.   | 10 max.   | watts   |
| PLATE DISSIPATION. . . . .                       | 50 max.   | 65 max.   | watts   |

## Typical Operation:

|                                                 |       |       |       |    |       |
|-------------------------------------------------|-------|-------|-------|----|-------|
| DC Plate Voltage . . . . .                      | 1000  | 1250  | 1500  | .. | volts |
| DC Grid-No.3 (Suppressor)<br>Voltage† . . . . . | 0     | 0     | 0     | .. | volts |
| DC Grid-No.2 Voltage■† . . . . .                | 300   | 300   | 300   | .. | volts |
|                                                 | 40000 | 42000 | 50000 | .. | ohms  |
| DC Grid-No.1 Voltage††* . . . . .               | -70   | -80   | -90   | .. | volts |
|                                                 | 7000  | 8000  | 9000  | .. | ohms  |
|                                                 | 395   | 455   | 490   | .. | ohms  |
| Peak RF Grid-No.1 Voltage. . . . .              | 150   | 165   | 170   | .. | volts |

•, \*\*, †, \*, ††, ■, ■■, ‡: See next page.

← Indicates a change.

NOV. 15, 1948

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA 2



# TRANSMITTING BEAM POWER AMPLIFIER

|                               | <u>CCS*</u> |      | <u>ICAS**</u> |       |
|-------------------------------|-------------|------|---------------|-------|
| DC Plate Current . . . . .    | 150         | 144  | 150           | ma    |
| DC Grid-No.2 Current . . . .  | 17.5        | 22.5 | 24            | ma    |
| DC Grid-No.1 Cur. (Approx.) * | 10          | 10   | 10            | ma    |
| Driving Power Approx.) *. . . | 1.35        | 1.5  | 1.5           | watts |
| Power Output (Approx.) . . .  | 100         | 130  | 160           | watts |

• Continuous Commercial Service.

•• Intermittent Commercial & Amateur Service.

† Connect grid No.3 to mid-point of filament operated on ac, or to the negative end of filament operated on dc.

\* For effect of load resistance on grid current and driving power, refer to TUBE RATINGS—Grid Current and Driving Power in the General Section.

†† Obtained preferably from grid-No.1 resistor, although combination of either grid-No.1 resistor and cathode resistor or grid resistor and fixed supply may be used.

■ Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.

■ Obtained from a separate source, from the plate-voltage supply with a voltage divider, or through a series resistor (40000, 42000, 50000).

⊗ If preceding stage is keyed, partial fixed-bias is required.

⊗ For ac filament supply.

## CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

|                              | <u>Note</u> | <u>Min.</u> | <u>Max.</u> |       |
|------------------------------|-------------|-------------|-------------|-------|
| Filament Current . . . . .   | 1           | 3.10        | 3.40        | amp   |
| Grid No.1—Plate Capacitance  | —           | —           | 0.15        | μμf   |
| Input Capacitance. . . . .   | —           | 11.1        | 15.9        | μμf   |
| Output Capacitance . . . . . | —           | 10.1        | 16.9        | μμf   |
| Plate Current. . . . .       | 1,2         | 30          | 48          | ma    |
| Grid-No.2 Current. . . . .   | 1,2         | —           | 3.5         | ma    |
| Grid-No.1 Current. . . . .   | 1,3         | 22          | 52          | ma    |
| Power Output . . . . .       | 1,4         | 120         | —           | watts |

NOTE 1: DC filament volts = 10.0.

NOTE 2: With dc plate voltage of 1250 volts; dc grid-No.3 voltage of 0 volts; dc grid-No.2 voltage of 300 volts; and dc grid-No.1 voltage of -19 volts.

NOTE 3: With dc plate voltage of 175 volts; dc grid-No.3 voltage of 0 volts; dc grid-No.2 voltage of 175 volts; and dc grid-No.1 voltage of +65 volts.

NOTE 4: With dc plate voltage of 1250 volts; dc grid-No.3 voltage of 0 volts; dc grid-No.2 voltage of 300 volts; plate current of 150 ma., grid-No.1 current of 10-15 ma.; grid-No.1 resistor of 8000 ±10% ohms; and frequency of 15 Mc.

OUTLINE DIMENSIONS for Type 814 are the same as those for Type 828.

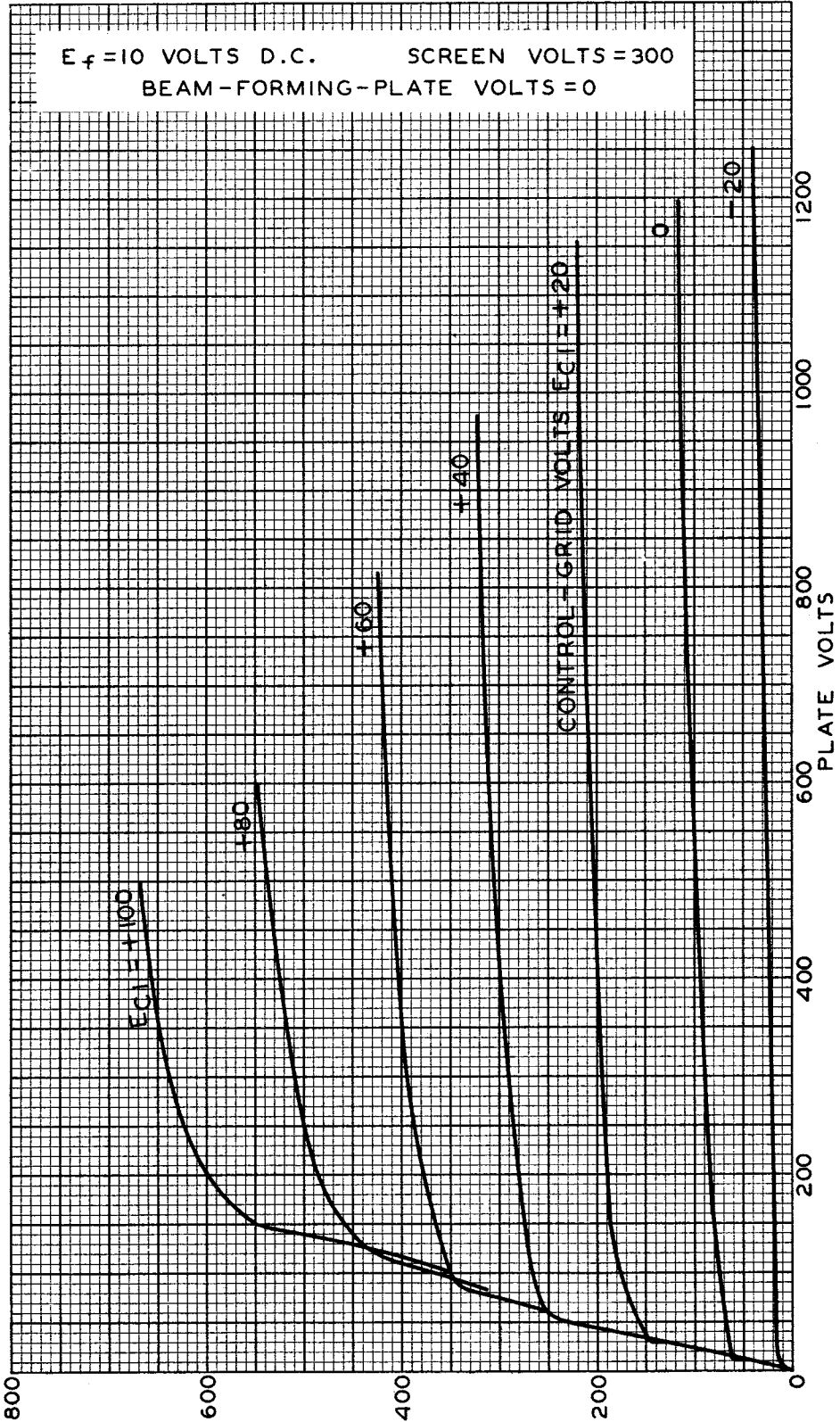
Data on operating frequencies for the 814 are given on the sheet TRANS. TUBE RATINGS vs FREQUENCY.

→ Indicates a change.



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# AVERAGE PLATE CHARACTERISTICS WITH $E_{C1}$ AS VARIABLE



NOV. 11, 1937

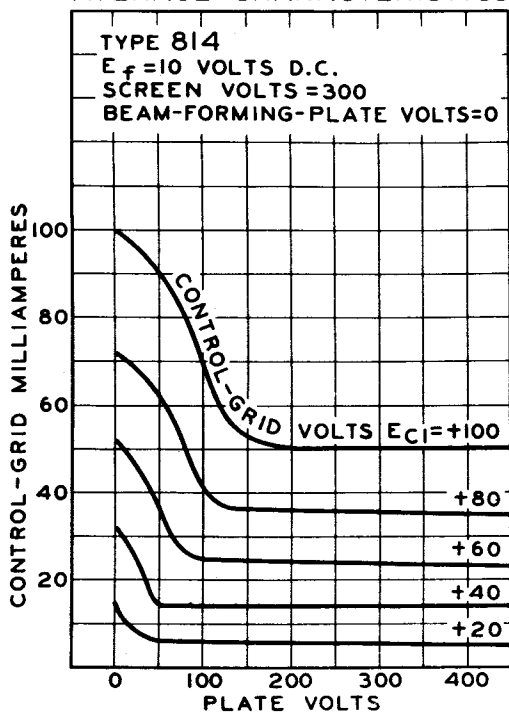
PLATE MILLIAMPERES  
RCA RADOTRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

92C-4845



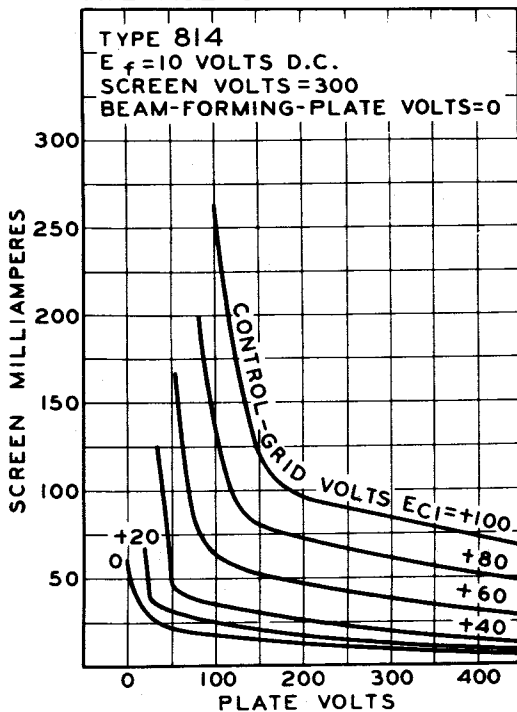
## TRANSMITTING BEAM POWER AMPLIFIER

AVERAGE CHARACTERISTICS



92C-4846

AVERAGE CHARACTERISTICS



92C-4847