



6BE6

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## PENTAGRID CONVERTER

MINIATURE TYPE

## GENERAL DATA

## Electrical:

Heater, for Unipotential Cathode:

|                   |     |                |
|-------------------|-----|----------------|
| Voltage . . . . . | 6.3 | ac or dc volts |
| Current . . . . . | 0.3 | amp            |

Direct Interelectrode

Without  
ShieldWith  
Shield<sup>o</sup>

Capacitances:

|                                                      |           |           |                  |
|------------------------------------------------------|-----------|-----------|------------------|
| Grid No.3 to All Other<br>Electrodes (RF Input) .    | 7 max.    | 7 max.    | $\mu\mu\text{f}$ |
| Plate to All Other Elec-<br>trodes (Mixer Input) . . | 8         | 13        | $\mu\mu\text{f}$ |
| Grid No.1 to All Other<br>Electrodes (Osc. Input)    | 5.5 max.  | 5.5 max.  | $\mu\mu\text{f}$ |
| Grid No.3 to Plate . . .                             | 0.30 max. | 0.25 max. | $\mu\mu\text{f}$ |
| Grid No.3 to Grid No.1 .                             | 0.15 max. | 0.15 max. | $\mu\mu\text{f}$ |
| Grid No.1 to Plate . . .                             | 0.1 max.  | 0.05 max. | $\mu\mu\text{f}$ |
| Grid No.1 to Cathode<br>and Grid No.5 . . . . .      | 3         | 3         | $\mu\mu\text{f}$ |
| Cathode and Grid No.5 to<br>All Other Electrodes     |           |           |                  |
| Except Grid No.1 . . .                               | 15        | 20        | $\mu\mu\text{f}$ |

<sup>o</sup> JETEC No.316 connected to pin No.2.

## Mechanical:

|                                                                |                                              |
|----------------------------------------------------------------|----------------------------------------------|
| Mounting Position . . . . .                                    | Any                                          |
| Maximum Overall Length . . . . .                               | 2-1/8"                                       |
| Maximum Seated Length . . . . .                                | 1-7/8"                                       |
| Length from Base Seat to<br>Bulb Top (Excluding tip) . . . . . | 1-1/2" $\pm$ 3/32"                           |
| Maximum Diameter . . . . .                                     | 3/4"                                         |
| Bulb . . . . .                                                 | T-5-1/2                                      |
| Base . . . . .                                                 | Small-Button Miniature 7-Pin (JETEC No.E7-1) |
| Basing Designation for BOTTOM VIEW . . . . .                   | 7CH                                          |

Pin 1-Grid No.1  
Pin 2-Cathode,  
Grid No.5  
Pin 3-Heater  
Pin 4-Heater



Pin 5-Plate  
Pin 6-Grid No.2,  
Grid No.4  
Pin 7-Grid No.3

## CONVERTER

## Maximum Ratings, Design-Center Values:

|                                              |          |       |
|----------------------------------------------|----------|-------|
| PLATE VOLTAGE . . . . .                      | 300 max. | volts |
| GRID-No.3 (CONTROL-GRID) VOLTAGE:            |          |       |
| Negative Bias Value . . . . .                | 50 max.  | volts |
| Positive Bias Value . . . . .                | 0 max.   | volts |
| GRIDS-No.2 & No.4 (SCREEN) VOLTAGE . . . . . | 100 max. | volts |
| GRIDS-No.2 & No.4 SUPPLY VOLTAGE . . . . .   | 300 max. | volts |

←Indicates a change

MAY 3, 1954

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RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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## PENTAGRID CONVERTER

|                                             |         |       |
|---------------------------------------------|---------|-------|
| TOTAL CATHODE CURRENT . . . . .             | 14 max. | ma    |
| PLATE DISSIPATION . . . . .                 | 1 max.  | watt  |
| GRIDS-No.2 & No.4 INPUT . . . . .           | 1 max.  | watt  |
| PEAK HEATER-CATHODE VOLTAGE:                |         |       |
| Heater negative with respect to cathode . . | 90 max. | volts |
| Heater positive with respect to cathode . . | 90 max. | volts |

→ **Characteristics - Separate Excitation:\***

|                                       |       |       |            |
|---------------------------------------|-------|-------|------------|
| Plate Voltage . . . . .               | 100   | 250   | volts      |
| Grids-No.2 & No.4 Voltage . . . . .   | 100   | 100   | volts      |
| Grid-No.3 Voltage . . . . .           | -1.5  | -1.5  | volts      |
| Grid-No.1 (Oscillator Grid)           |       |       |            |
| Voltage (rms) . . . . .               | 10    | 10    | volts      |
| Grid-No.1 Resistor . . . . .          | 20000 | 20000 | ohms       |
| Plate Resistance (Approx.) . . . . .  | 0.4   | 1     | megohm     |
| Conversion Transconductance . . . . . | 455   | 475   | $\mu$ mhos |
| Grid-No.3 Voltage (Approx.) for       |       |       |            |
| conversion transconductance of:       |       |       |            |
| 10 $\mu$ mhos . . . . .               | -30   | -30   | volts      |
| 100 $\mu$ mhos . . . . .              | -6    | -6    | volts      |
| Plate Current . . . . .               | 2.6   | 2.9   | ma         |
| Grids-No.2 & No.4 Current . . . . .   | 7     | 6.8   | ma         |
| Grid-No.1 Current . . . . .           | 0.5   | 0.5   | ma         |
| Total Cathode Current . . . . .       | 10.1  | 10.2  | ma         |

NOTE: With grids-No.2 & No.4 and plate at 100 volts, grids-No.1 & No.3 at zero volts, and signal applied to grid No.1, the oscillator transconductance (not oscillating) is 7250 micromhos; the cathode current is 25 milliamperes; and the amplification factor is 20. Grid-No.1 voltage (approx.) for plate current of 10 microamperes is -11 volts.

\* The characteristics shown with separate excitation correspond very closely with those obtained in a self-excited oscillator circuit operating with zero bias.

→ Indicates a change

MAY 3, 1954

TUBE DIVISION

DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

# Pentagrid Converter

## 7-PIN MINIATURE TYPE

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .  $6.3 \pm 10\%$  volts  
Current at 6.3 volts. . . . . 0.3 amp

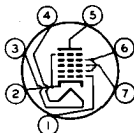
Direct Interelectrode Capacitances:

|                                                                       | Without<br>External<br>Shield | With<br>External<br>Shield <sup>a</sup> |               |
|-----------------------------------------------------------------------|-------------------------------|-----------------------------------------|---------------|
| Grid No.3 to all other electrodes (RF input) . . . . .                | 7                             | 7                                       | $\mu\text{f}$ |
| Plate to all other electrodes (Mixer input) . . . . .                 | 8                             | 13                                      | $\mu\text{f}$ |
| Grid No.1 to all other electrodes (Oscillator input) . . . . .        | 5.5                           | 5.5                                     | $\mu\text{f}$ |
| Grid No.3 to plate. . . . .                                           | 0.3 max.                      | 0.25 max.                               | $\mu\text{f}$ |
| Grid No.3 to grid No.1. . . . .                                       | 0.15 max.                     | 0.15 max.                               | $\mu\text{f}$ |
| Grid No.1 to plate. . . . .                                           | 0.1 max.                      | 0.05 max.                               | $\mu\text{f}$ |
| Grid No.1 to cathode & grid No.5 . . . . .                            | 3                             | 3                                       | $\mu\text{f}$ |
| Cathode & grid No.5 to all other electrodes except grid No.1. . . . . | 15                            | 20                                      | $\mu\text{f}$ |

#### Mechanical:

Operating Position. . . . . Any  
Maximum Overall Length. . . . .  $2\text{--}1\frac{1}{8}"$   
Maximum Seated Length. . . . .  $1\text{--}7\frac{7}{8}"$   
Length, Base Seat to Bulb Top (Excluding tip) . . . . .  $1\text{--}1\frac{1}{2}" \pm 3/32"$   
Diameter. . . . . 0.650" to 0.750"  
Dimensional Outline . . . . . See *General Section*  
Bulb. . . . . T5-1/2  
Base. . . . . Small-Button Miniature 7-Pin (JEDEC No.E7-1)  
Basing Designation for BOTTOM VIEW. . . . . 7CH

Pin 1 - Grid No.1  
Pin 2 - Cathode,  
Grid No.5  
Pin 3 - Heater  
Pin 4 - Heater



Pin 5 - Plate  
Pin 6 - Grid No.2,  
Grid No.4  
Pin 7 - Grid No.3

### CONVERTER

#### Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE . . . . . 330 max. volts  
GRID-No.3 (CONTROL-GRID) VOLTAGE:  
Negative-bias value . . . . . 55 max. volts  
Positive-bias value . . . . . 0 max. volts  
GRIDS-No.2 & No.4 (SCREEN-GRID)  
SUPPLY VOLTAGE. . . . . 330 max. volts  
GRIDS-No.2 & No.4 VOLTAGE . . . . . 110 max. volts

← Indicates a change.



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|                                           |                  |      |       |
|-------------------------------------------|------------------|------|-------|
| CATHODE CURRENT . . . . .                 | 15.5             | max. | ma    |
| GRIDS-No.2 & No.4 INPUT . . . . .         | 1.1              | max. | watts |
| PLATE DISSIPATION . . . . .               | 1.1              | max. | watts |
| PEAK HEATER-CATHODE VOLTAGE:              |                  |      |       |
| Heater negative with respect to cathode . | 200              | max. | volts |
| Heater positive with respect to cathode . | 200 <sup>b</sup> | max. | volts |

## Characteristics:

### *With separate excitation<sup>c</sup>*

|                                             |       |       |            |
|---------------------------------------------|-------|-------|------------|
| Plate Voltage . . . . .                     | 100   | 250   | volts      |
| Grid-No.3 Voltage . . . . .                 | -1.5  | -1.5  | volts      |
| Grids-No.2 & No.4 Voltage . . . . .         | 100   | 100   | volts      |
| RMS Grid-No.1 (Oscillator Grid) Voltage.    | 10    | 10    | volts      |
| Grid-No.1 Resistor. . . . .                 | 20000 | 20000 | ohms       |
| Plate Resistance (Approx.) . . . . .        | 0.4   | 1     | megohm     |
| Conversion Transconductance . . . . .       | 455   | 475   | $\mu$ mhos |
| Grid-No.3 Voltage (Approx.) for             |       |       |            |
| conversion transconductance ( $\mu$ mhos) = |       |       |            |
| 10. . . . .                                 | -30   | -30   | volts      |
| 100 . . . . .                               | -6    | -6    | volts      |
| Plate Current . . . . .                     | 2.6   | 2.9   | ma         |
| Grids No.2 & No.4 Current . . . . .         | 7     | 6.8   | ma         |
| Grid-No.1 Current . . . . .                 | 0.5   | 0.5   | ma         |
| Cathode Current . . . . .                   | 10.1  | 10.2  | ma         |

## Oscillator Characteristics (Not Oscillating):

### *With grids No.2 & No.4 connected to plate*

|                                                         |      |            |
|---------------------------------------------------------|------|------------|
| Plate and Grids-No.2 & No.4 Voltage . . . . .           | 100  | volts      |
| Grid-No.3 Voltage . . . . .                             | 0    | volts      |
| Grid-No.1 Voltage . . . . .                             | 0    | volts      |
| Amplification Factor between grid No.1 and              |      |            |
| grids No.2 & No.4 connected to plate. . . . .           |      |            |
| Transconductance between grid No.1 and                  | 20   |            |
| grids No.2 & No.4 connected to plate. . . . .           | 7250 | $\mu$ mhos |
| Cathode Current . . . . .                               | 25   | ma         |
| Grid-No.1 Voltage (Approx.) for plate $\mu$ a = 10. . . | -11  | volts      |

<sup>a</sup> With external shield JEDEC No.316 connected to cathode.

<sup>b</sup> The dc component must not exceed 100 volts.

<sup>c</sup> The characteristics shown with separate excitation correspond very closely with those obtained in a self-excited oscillator circuit operating with zero bias.

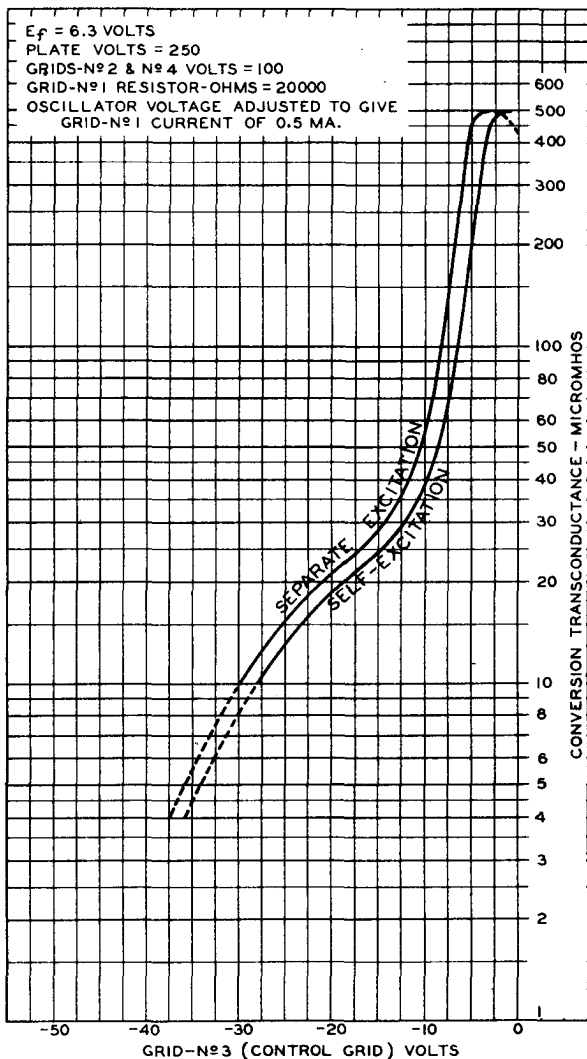




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## OPERATION CHARACTERISTICS



SEPT. 26, 1945

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RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6601

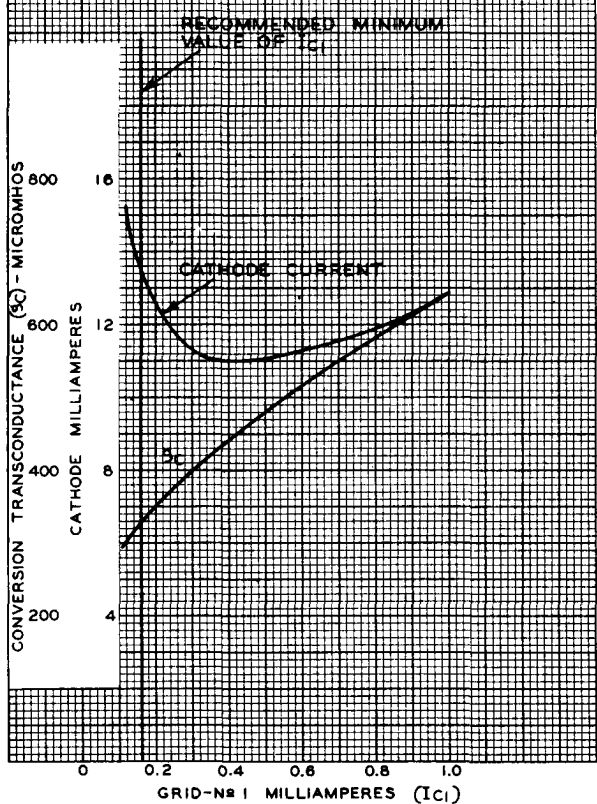
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# OPERATION CHARACTERISTICS WITH SEPARATE OSCILLATOR EXCITATION

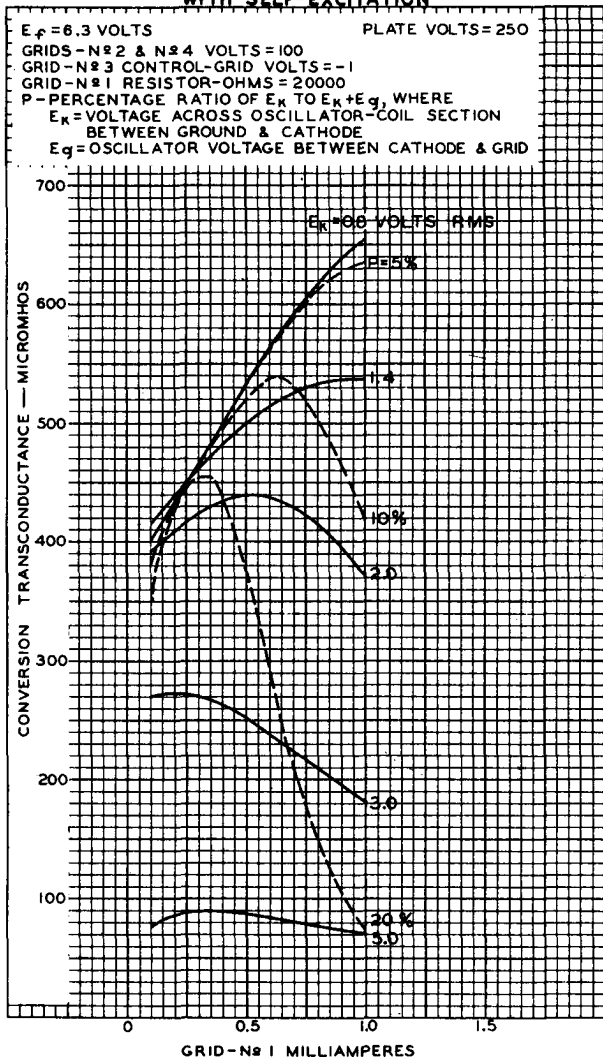
$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 250  
 GRIDS-№ 2 & № 4 VOLTS = 100  
 GRID-№ 3 (CONTROL GRID) VOLTS = -1.5  
 GRID-№ 1 RESISTOR-OHMS = 20000  
 GRID-№ 1 CURRENT VARIED BY ADJUSTMENT  
 OF OSCILLATOR VOLTAGE





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OPERATION CHARACTERISTICS  
WITH SELF-EXCITATION

NOV. 12, 1945

RCA VICTOR DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

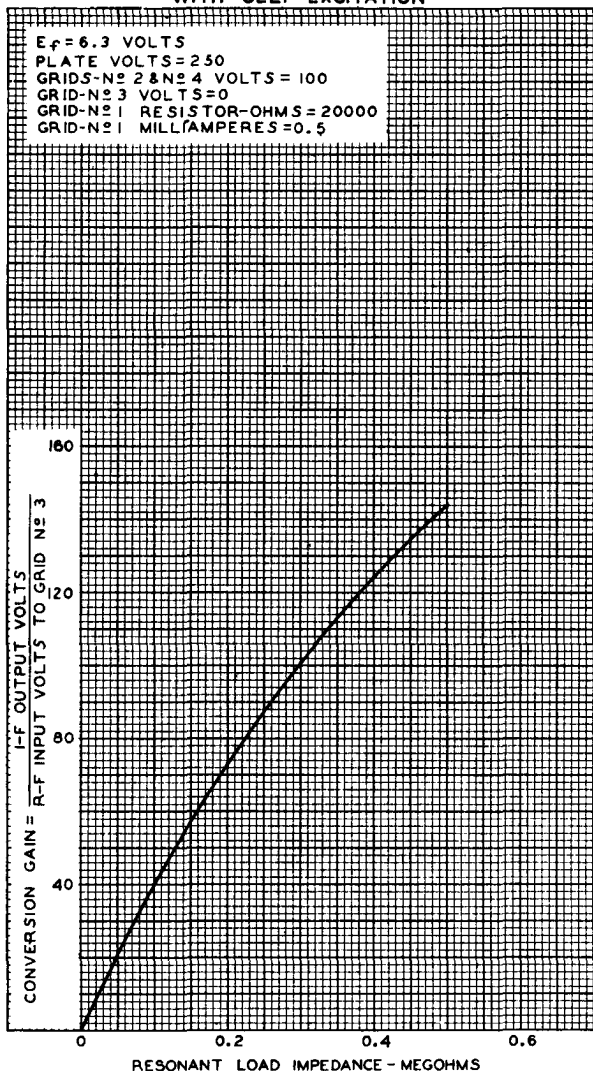
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# OPERATION CHARACTERISTIC WITH SELF-EXCITATION



OCT.16, 1945

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92CM - 6605