



6BA7

6BA7

# PENTAGRID CONVERTER

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

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

Direct Interelectrode Capacitances:<sup>o</sup>

Grid No.3 to All Other Electrodes (RF Input) . . . . .	9.5	. . . . .	$\mu\mu\text{f}$
Plate to All Other Electrodes (Mixer Output) . . . . .	8.3	. . . . .	$\mu\mu\text{f}$
Grid No.1 to All Other Electrodes (Osc. Input) . . . . .	6.7	. . . . .	$\mu\mu\text{f}$
Grid No.3 to Plate . . . . .	0.19 max.	. . . . .	$\mu\mu\text{f}$
Grid No.3 to Grid No.1 . . . . .	0.1 max.	. . . . .	$\mu\mu\text{f}$
Grid No.1 to Plate . . . . .	0.05 max.	. . . . .	$\mu\mu\text{f}$
Grid No.1 to All Other Electrodes Except Cathode . . . . .	3.4	. . . . .	$\mu\mu\text{f}$
Grid No.1 to Cathode . . . . .	3.3	. . . . .	$\mu\mu\text{f}$
Cathode to All Other Electrodes Except Grid No.1 . . . . .	4.0	. . . . .	$\mu\mu\text{f}$

<sup>o</sup> With no external shield.

### Mechanical:

Mounting Position. . . . .	Any
Maximum Overall Length . . . . .	2-5/8"
Maximum Seated Length. . . . .	2-3/8"
Length, Base Seat to Bulb Top (excluding tip). . . . .	2" $\pm$ 3/32"
Maximum Diameter . . . . .	7/8"
Bulb . . . . .	T-6-1/2
Base . . . . .	Small-Button Noval 9-Pin
Basing Designation for BOTTOM VIEW . . . . .	8CT

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



Pin 6-Grid No.5,  
Internal  
Shield  
Pin 7-Grid No.3  
Pin 8-Internal  
Shield  
Pin 9-Plate

## CONVERTER SERVICE

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	300 max.	volts
GRID-No.5 & INTERNAL-SHIELD VOLTAGE <sup>▲</sup> . . . . .	0 max.	volts
GRIDS-No.2 & No.4 VOLTAGE. . . . .	100 max.	volts
GRIDS-No.2 & No.4 SUPPLY VOLTAGE . . . . .	300 max.	volts
PLATE DISSIPATION. . . . .	2.0 max.	watts
GRIDS-No.2 & No.4 DISSIPATION. . . . .	1.5 max.	watts
TOTAL CATHODE CURRENT. . . . .	22 max.	ma

<sup>▲</sup> See next page.

6BA7



## 6BA7 PENTAGRID CONVERTER

**GRID-NO. 3 VOLTAGE:**

Negative bias value. . . . . 100 max. volts

Positive bias value. . . . . 0 max. volts

**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
Grid-No. 5 & Internal Shield. . .	Connected directly to ground		
Grids-No. 2 & No. 4 (Screen) Voltage . . .	100	100	volts
Grid-No. 3 (Control Grid) Voltage . . . .	-1	-1	volt
Grid-No. 1 (Oscillator Grid) Resistor . .	20000	20000	ohms
Plate Resistance (Approx.) . . . . .	0.5	1	megohm
Conversion Transconductance . . . . .	900	950	$\mu$ mhos
Conversion Transconductance (Approx.)# .	3.5	3.5	$\mu$ mhos
Plate Current. . . . .	3.6	3.8	ma
Grids-No. 2 & No. 4 Current. . . . .	10.2	10	ma
Grid-No. 1 Current. . . . .	0.35	0.35	ma
Total Cathode Current. . . . .	14.2	14.2	ma

NOTE: The transconductance between grid No. 1 and grids No. 2 & No. 4 connected to plate (not oscillating) is approximately 8000 micromhos under the following conditions: signal applied to grid No. 1 at zero bias; grids-No. 2 and No. 4 and plate at 100 volts; grid No. 3 grounded. Under the same conditions, the plate current is 32 milliamperes and the amplification factor is 16.5.

▲ Internal shield (Pins No. 6 and No. 8) connected directly to ground.

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

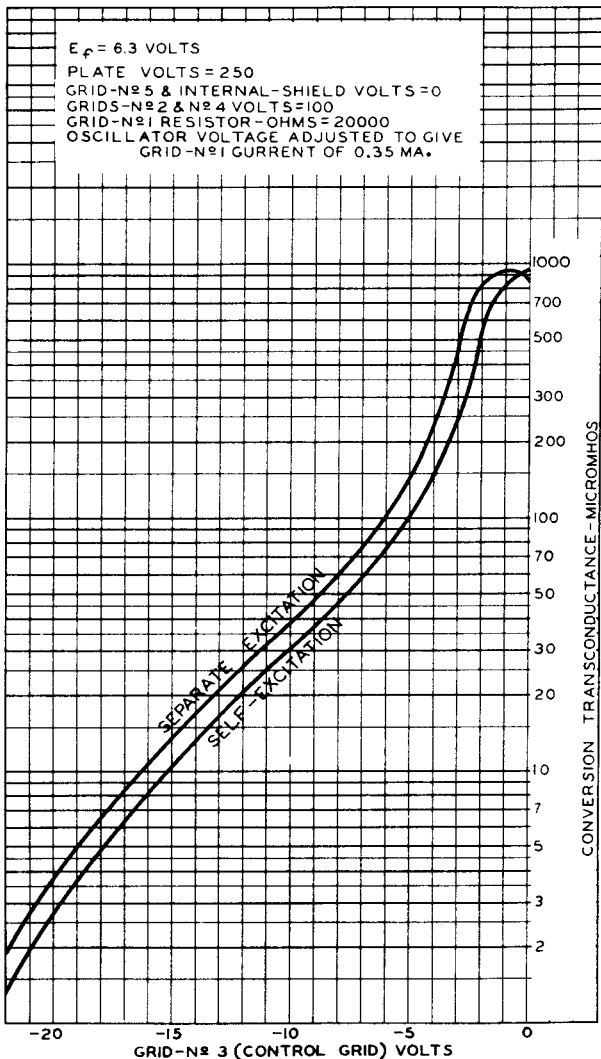
# With grid-No. 3 bias of -20 volts.



6BA7

6BA7

## OPERATION CHARACTERISTICS



AUGUST 27, 1948

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6982RI

6BA7



6BA7

### OPERATION CHARACTERISTICS WITH SELF-EXCITATION

$E_f = 6.3$  VOLTS

PLATE VOLTS = 250

GRID-N<sup>o</sup> 5 & INTERNAL-SHIELD VOLTS = 0

GRIDS-N<sup>o</sup> 2 & N<sup>o</sup> 4 VOLTS = 100

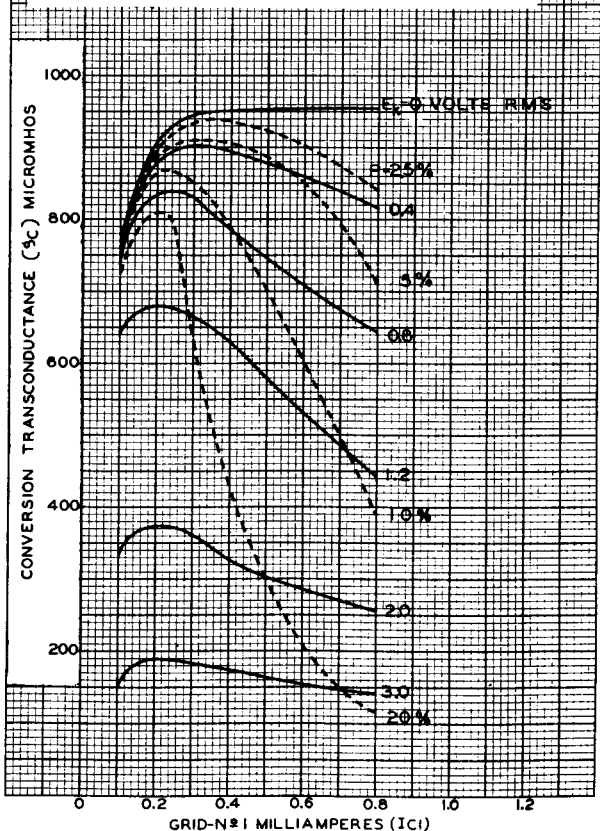
GRID-N<sup>o</sup> 3 (CONTROL GRID) VOLTS = -1

GRID-N<sup>o</sup> 1 RESISTOR-OHMS = 20000

P-PERCENTAGE RATIO OF  $E_K$  TO  $E_K + E_g$ , WHERE

$E_K$  = VOLTAGE ACROSS OSCILLATOR-COIL SECTION  
BETWEEN GROUND AND CATHODE AND

$E_g$  = OSCILLATOR VOLTAGE BETWEEN CATHODE  
AND GRID



AUGUST 25, 1948

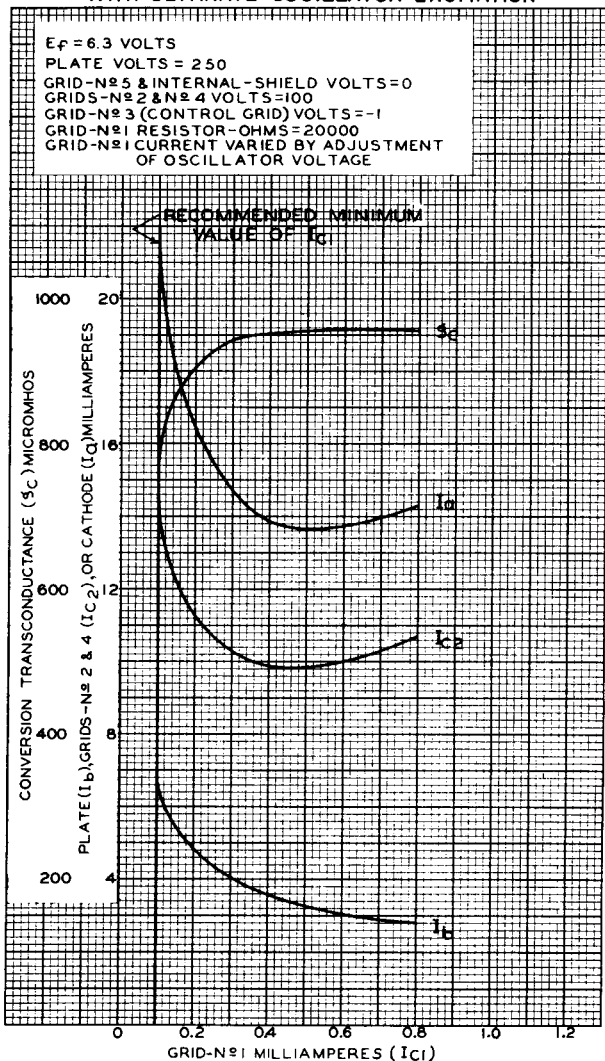
TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6981R1



6BA7

6BA7

OPERATION CHARACTERISTICS  
WITH SEPARATE OSCILLATOR EXCITATION

SEPT. 30, 1948

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6980R2