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: *
  Grid No.3 to All Other Electrodes
    (RF Input) .................................. 9.5 .... μf
  Plate to All Other Electrodes
    (Mixer Output) ............................. 8.3 .... μf
  Grid No.1 to All Other Electrodes
    (Osc. Input) ................................. 6.7 .... μf
  Grid No.3 to Plate .......................... 0.19 max. μf
  Grid No.3 to Grid No.1 ..................... 0.1 max. μf
  Grid No.1 to Plate .......................... 0.05 max. μf
  Grid No.1 to All Other Electrodes
    Except Cathode ............................. 3.4 .... μf
  Grid No.1 to Cathode ......................... 3.3 .... μf
  Cathode to All Other Electrodes
    Except Grid No.1 ........................... 4.0 .... μf

* 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" ± 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 6 - Grid No.5, Internal Shield
Pin 2 - Grid No.1 ............................... Pin 7 - Grid No.3
Pin 3 - Cathode ................................. Pin 8 - Internal Shield
Pin 4 - Heater .................................. Pin 9 - Plate

CONVERTER SERVICE

Maximum Ratings, Design-Center Values:

- PLATE VOLTAGE .............................. 300 max. volts
- GRID-No.5 & INTERNAL-SHIELD VOLTAGE ▲ .. 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

▲ See next page.

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TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
TENTATIVE DATA
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 μmhos
Conversion Transconductance (Approx.)# 3.5 3.5 μmhos
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.

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TENTATIVE DATA
E_C = 6.3 VOLTS
PLATE VOLTS = 250
GRID-Nº 5 & INTERNAL-SHIELD VOLTS = 0
GRIDS-Nº 2 & N° 4 VOLTS = 100
GRID-Nº 1 RESISTOR - OHMS = 20000
OSCILLATOR VOLTAGE ADJUSTED TO GIVE
GRID-Nº 1 CURRNET OF 0.35 MA.
$E_f = 6.3$ VOLTS
PLATE VOLTS = 2.50
GRID-N\#5 & INTERNAL-SHIELD VOLTS = 0
GRIDS-N\#2 & N\#4 VOLTS = 100
GRID-N\#3 (CONTROL GRID) VOLTS = -1
GRID-N\#1 RESISTOR OHMS = 20000
P-PERCENTAGE RATIO OF $E_k$ TO $E_k + E_q$, WHERE
$E_k =$ VOLTAGE ACROSS OSCILLATOR-COIL SECTION
BETWEEN GROUND AND CATHODE AND
$E_q =$ OSCILLATOR VOLTAGE BETWEEN CATHODE
AND GRID

CONVERSION TRANSCONDUTANCE (\%)
MIXROMHS

GRID-N\#1 MILLIAMPERES (IC1)

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92CM-6981RI
E<sub>p</sub> = 6.3 VOLTS
PLATE VOLTS = 250
GRID-№5 & INTERNAL-SHIELD VOLTS = 0
GRIDS-№2 & №4 VOLTS = 100
GRID-№3 (CONTROL GRID) VOLTS = -1
GRID-№1 RESISTOR-OHMES = 20000
GRID-№1 CURRENT VARIED BY ADJUSTMENT OF OSCILLATOR VOLTAGE

CONVERSION TRANS-CONDUCTANCE (g<sub>c</sub>) MICROHMS

PLATE (1b) , GRIDS-№2 & №4 (t<sub>c</sub>2) OR CATHODE (t<sub>c</sub>) MILLIAMPERES

GRID-№1 MILLIAMPERES (I<sub>c1</sub>)