



6SB7-Y

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# PENTAGRID CONVERTER

SINGLE-ENDED METAL TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

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

Direct Interelectrode Capacitances:

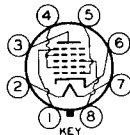
Grid No.3 to All Other Electrodes (RF Input) <sup>▲</sup> .	9.6 . . . . .	μf
Plate to All Other Electrodes (Mixer Output) <sup>▲</sup> .	9.2 . . . . .	μf
Grid No.1 to All Other Electrodes (Osc. Input) <sup>▲</sup> .	7.3 . . . . .	μf
Grid No.3 to Plate <sup>▲</sup> . . . . .	0.13 max.	μf
Grid No.3 to Grid No.1 <sup>▲</sup> . . . . .	0.16 max.	μf
Grid No.1 to Plate <sup>▲</sup> . . . . .	0.06 max.	μf
Grid No.1 to All Other Electrodes and Shell, Except Cathode	3.8 . . . . .	μf
Grid No.1 to Cathode . . . . .	3.4 . . . . .	μf
Cathode to All Other Electrodes and Shell Except Grid No.1	4.5 . . . . .	μf

### Mechanical:

Mounting Position. . . . .	Any
Maximum Overall Length . . . . .	2-5/8"
Maximum Seated Length. . . . .	2-1/16"
Maximum Diameter . . . . .	1-5/16"
Bulb . . . . .	MT-8G
Base . . . . .	Small Wafer Octal 8-Pin, Micanol

Basing Designation for BOTTOM VIEW . . . . . 8R

Pin 1-Shell, Grid No.5	Pin 5-Grid No.1
Pin 2-Heater	Pin 6-Cathode
Pin 3-Plate	Pin 7-Heater
Pin 4-Grids No.2 & No.4	Pin 8-Grid No.3



## CONVERTER SERVICE

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	300 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.
GRID -No.3 VOLTAGE:		
Negative Bias Voltage. . . . .	100 max.	volts
Positive Bias Voltage. . . . .	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

▲ with shell connected to cathode.

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## PENTAGRID CONVERTER

### Characteristics - - Separate Excitation:\*

Plate Voltage. . . . .	100	250	. .	volts
Grids-No.2 & No.4 (Screen) Voltage	100	100	. .	volts
Grid-No.3 (Control Grid) Voltage	-1.0	-1.0	. .	volt
Grid-No.1 (Oscillator Grid) Resistor	20000	20000	. .	ohms
Plate Resistance (Approx.) . .	0.5	1.0	. .	Megohm
Conversion Transconductance. .	900	950	. .	$\mu$ mhos
Conversion Transconductance**	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.

### Typical Operation in FM Band (88-108 Mc):

(See circuit on following page)

Plate Voltage. . . . .		250	. .	volts
Grids-No.2 & No.4 (Screen) Supply Voltage		250	. .	volts
Grids-No.2 & No.4 Resistor . . . . .		12000	. .	ohms
Grid-No.1 Resistor . . . . .		22000	. .	ohms
Signal Frequency . . . . .	88	108		Mc
Oscillation Frequency. . . . .	98.7	118.7		Mc
Plate Current. . . . .	6.8	6.5		ma.
Grids-No.2 & No.4 Current. . . . .	12.6	12.5		ma.
Grid-No.1 Current . . . . .	0.130	0.140		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.

\* 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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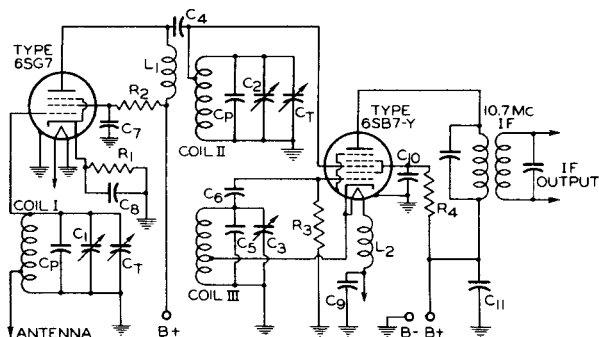
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## PENTAGRID CONVERTER

**TYPICAL SELF-EXCITED CONVERTER CIRCUIT  
FOR TYPE 6SB7-Y WITH RF STAGE**

**88-108Mc**

(SEE TYPICAL OPERATION)



C1 C2 C3 = GANGED TUNING CONDENSERS: 7 - 23  $\mu\text{f}$

C4 C5 C6 = 22  $\mu\text{f}$

C7 C8 C9 C10 C11 = BY-PASS CONDENSERS

Cp = PADDING CONDENSERS

Ct = TRIMMER CONDENSERS

L1 L2 = RF CHOKES

R1 = 68 OHMS

R2 = 33000 OHMS

R3 = 22000 OHMS

R4 = 12000 OHMS

COIL I = ANTENNA COIL\*: 2 TURNS No.14 WIRE + 1-1/4"

LEAD No.20 WIRE. COIL TAPPED AT 1 TURN.

COIL II = INTERSTAGE COIL\*: 2 TURNS No.14 WIRE + 1-1/4"

LEAD No.20 WIRE. COIL TAPPED AT 1-1/4 TURN.

COIL III = OSCILLATOR COIL\*: 1-7/8 TURNS No.14 WIRE, NO

ADDED LEAD. COIL TAPPED AT 5/8 TURN.

\* All coils 5/8" long, approx.

NOTE 1: All tap positions are approximate and should be adjusted to give stable operation.

NOTE 2: Insertion of a small non-inductive resistor of about 3 ohms in the circuit at grid-No.3 terminal of the 6SB7-Y is helpful in preventing oscillation at the signal frequency.

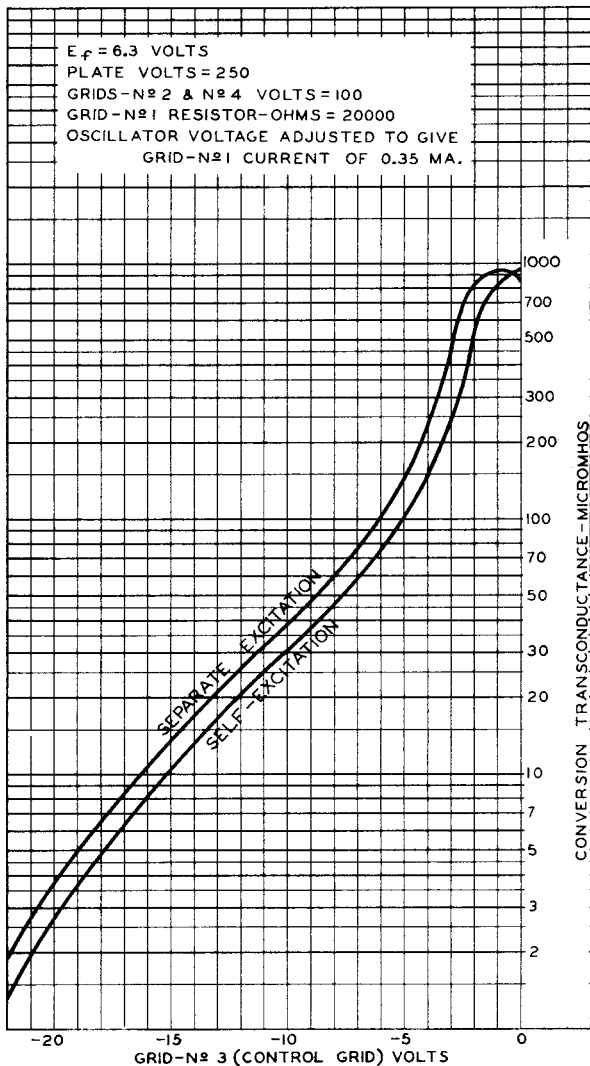
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## OPERATION CHARACTERISTICS



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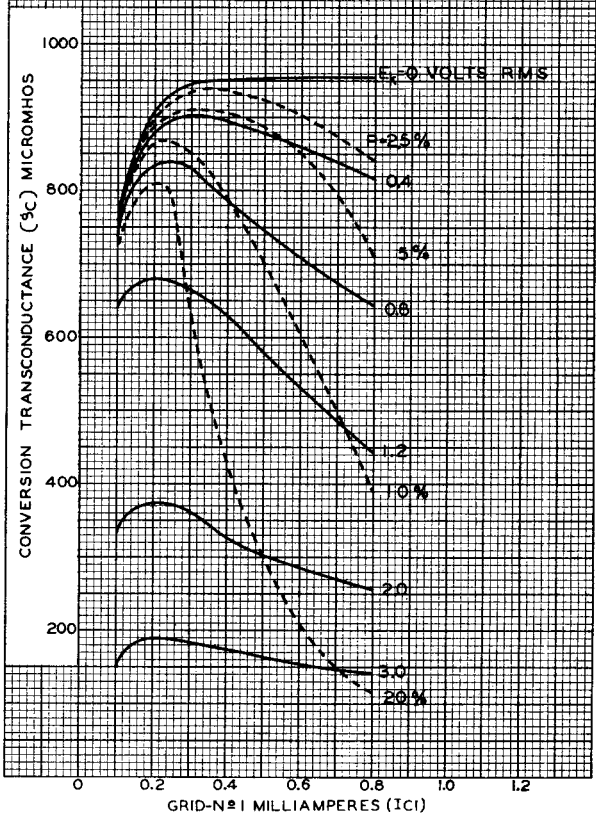
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## OPERATION CHARACTERISTICS WITH SELF-EXCITATION

$E_f = 6.3$  VOLTS  
PLATE VOLTS = 250  
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  $E_k + E_d$ , WHERE

$E_k$  = VOLTAGE ACROSS OSCILLATOR - COIL SECTION  
BETWEEN GROUND AND CATHODE, AND  
 $E_d$  = OSCILLATOR VOLTAGE BETWEEN CATHODE  
AND GRID



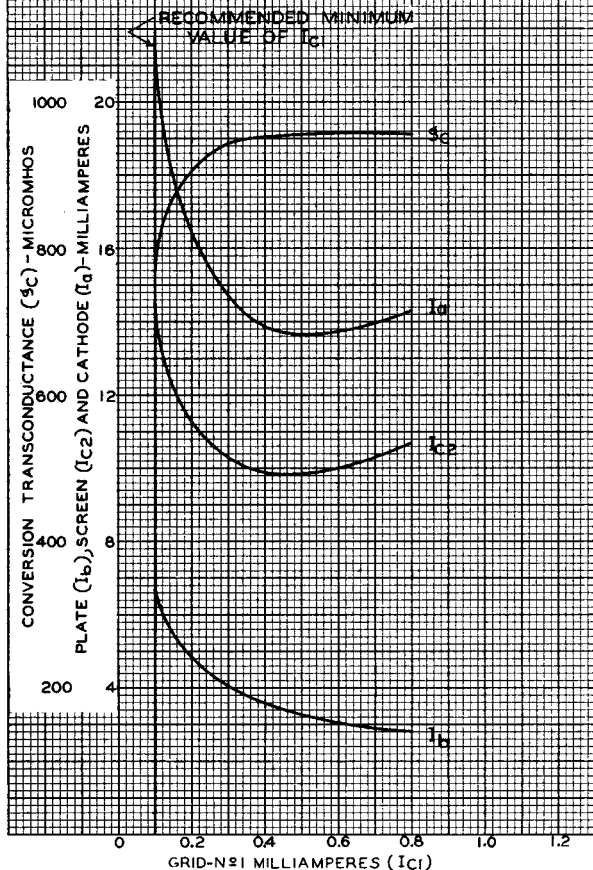
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### OPERATION CHARACTERISTICS WITH SEPARATE OSCILLATOR EXCITATION

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 250  
 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  
 GRID-N<sup>o</sup> 1 CURRENT VARIED BY ADJUSTMENT  
 OF OSCILLATOR VOLTAGE.



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