

6BN6

Beam Tube

7-PIN MINIATURE TYPE

For Use in FM and TV Receivers As Combined Limiter,
Discriminator, and Audio-Voltage-Amplifier Tube

GENERAL DATA

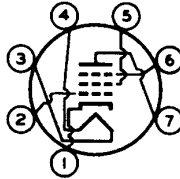
Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts ←
Current at 6.3 volts	0.3	amp
Direct Interelectrode Capacitances:▲		
Grid No.1 to cathode & internal shields, plate, grid No.3, grid No.2, and heater	4.2	μf
Grid No.3 to cathode & internal shields, plate, grid No.2, grid No.1, and heater	3.3	μf
Grid No.1 to grid No.3.	0.004 max.	μf

Mechanical:

Operating 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	0.650" to 0.750" ←
Dimensional Outline	See <i>General Section</i>
BulbT5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No.E7-1)
Basing Designation for BOTTOM VIEW	7DF

Pin 1 - Cathode,
Internal
Shields
Pin 2 - Grid No.1
Pin 3 - Heater



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

LIMITER & DISCRIMINATOR SERVICE ←

Maximum Ratings, Design-Maximum Values:

PLATE SUPPLY VOLTAGE	330 max.	volts
GRID-No.3 (QUADRATURE-GRID) VOLTAGE	•	
GRID-No.2 (ACCELERATOR-GRID) VOLTAGE	110 max.	volts
GRID-No.1 (LIMITER-GRID) VOLTAGE:		
Positive-peak value	60 max.	volts
CATHODE CURRENT	13 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 max.	volts

← Indicates a change.



6BN6

Typical Operation:

In accompanying typical quadrature-grid-fm-detector circuit

<i>Input-Signal</i>	<i>4.5</i>	<i>10.7</i>	<i>10.7</i>	<i>Mc</i>
Center Frequency				
Plate Supply Voltage.	270	85	285	volts
Plate Voltage	121	63	122	volts
Grid-No.3 Voltage . .	•	•	•	
Grid-No.2 Voltage . .	100	55	100	volts
Cathode-Circuit				
Resistance*	200 to 400	200 to 400	200 to 400	ohms
Peak AF Output Voltage	16.8	6	16.6	volts
Minimum Grid-No.1				
Signal Voltage (RMS)				
for AM rejection* .	2	1.25	2	volts
Minimum Grid-No.1				
Signal Voltage (RMS)				
for limiting action♦	1.25	1.25	1.25	volts
Plate Current	0.44	0.25	0.49	ma
Grid-No.2 Current . .	10	4.1	9.8	ma
Plate Load Resistor .	0.33	0.085	0.33	megohm
Linearity Resistor. .	1000	470	1500	ohms
Integrating				
Capacitor	0.001	0.002	0.001	μf
Coupling Capacitor. .	0.25	0.25	0.01	μf
Frequency Deviation .	±25	±75	±75	kc
AM Rejection:				
For grid-No.1 signal				
volts (RMS) = 2 .	25	31	20	db
For grid-No.1 signal				
volts (RMS) = 3 .	30	30	29	db
Total Harmonic				
Distortion.	1.8	2	1.6	%

▲ Without external shield.

● For proper operation of this electron tube in the accompanying Typical Quadrature-Grid-FM Detector Circuit, the Q of the quadrature-grid tuned circuit (L₁, C₆) should be sufficiently high to assure that a 4-volt rms signal is developed at the quadrature grid when a 2-volt rms signal at the center frequency is applied to grid No.1.

It is recommended that L₁ be shunted by a capacitance of at least 10 μmf. This capacitance may be composed of tube capacitance, stray capacitance, the distributed capacitance of L₁, and a fixed capacitor.

■ The dc component must not exceed 100 volts.

★ The cathode-circuit resistance should be adjusted for maximum AM rejection at the AF output of the circuit at the specified grid-No.1 signal voltage. AM rejection is measured with an applied signal containing 30 per cent amplitude modulation and 30 per cent frequency modulation.

♦ At signal levels above specified value, limiting is within ±2 decibels.

OPERATING CONSIDERATIONS

To insure proper phasing of the signal voltage developed at the quadrature grid, the components of the quadrature-grid circuit should be shielded from those of the control-grid circuit.

To obtain a symmetrical discriminator-response curve, the plate currents for no input signal and for unmodulated

→ Indicates a change.

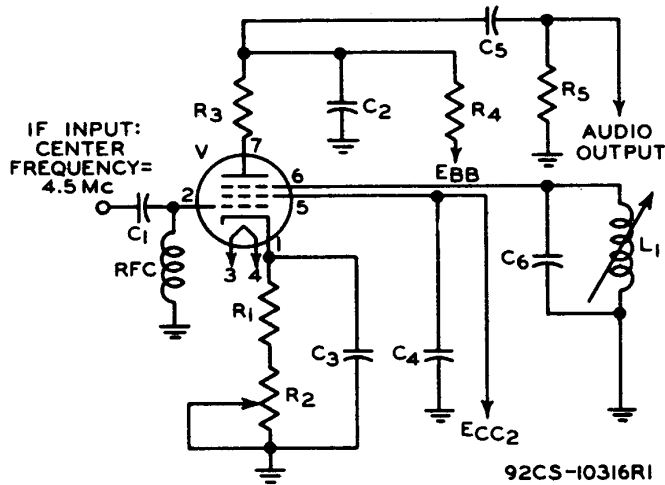


6BN6

input signal should be equal. To assure this equality, it is necessary that the plate voltage and grid-No.2 voltage have the proper values.

The proper plate voltage for any grid-No.2 voltage may be determined from the accompanying *Operation Characteristics* curve. This curve may also be used to determine the average dynamic plate current for any combination of grid-No.2 voltage and plate voltage.

TYPICAL QUADRATURE-GRID-FM-DETECTOR CIRCUIT



- C₁: 100 μf
- C₂: Integrating capacitor, 0.001 μf
- C₃ C₄: 0.01 μf
- C₅: 0.25 μf
- C₆: 10 μf
- L₁: •
- R₁: 200 ohms
- R₂: Cathode-bias potentiometer, 200 ohms
- R₃: Linearity resistor, 1000 ohms
- R₄: Plate-load resistor, 0.33 megohm
- R₅: 0.47 megohm
- V: Electron-tube-type 6BN6

- For proper operation of this electron tube in the accompanying Typical Quadrature-Grid-FM Detector Circuit, the Q of the quadrature-grid tuned circuit (L₁, C₆) should be sufficiently high to assure that a 4-volt rms signal is developed at the quadrature grid when a 2-volt rms signal at the center frequency is applied to grid No.1.

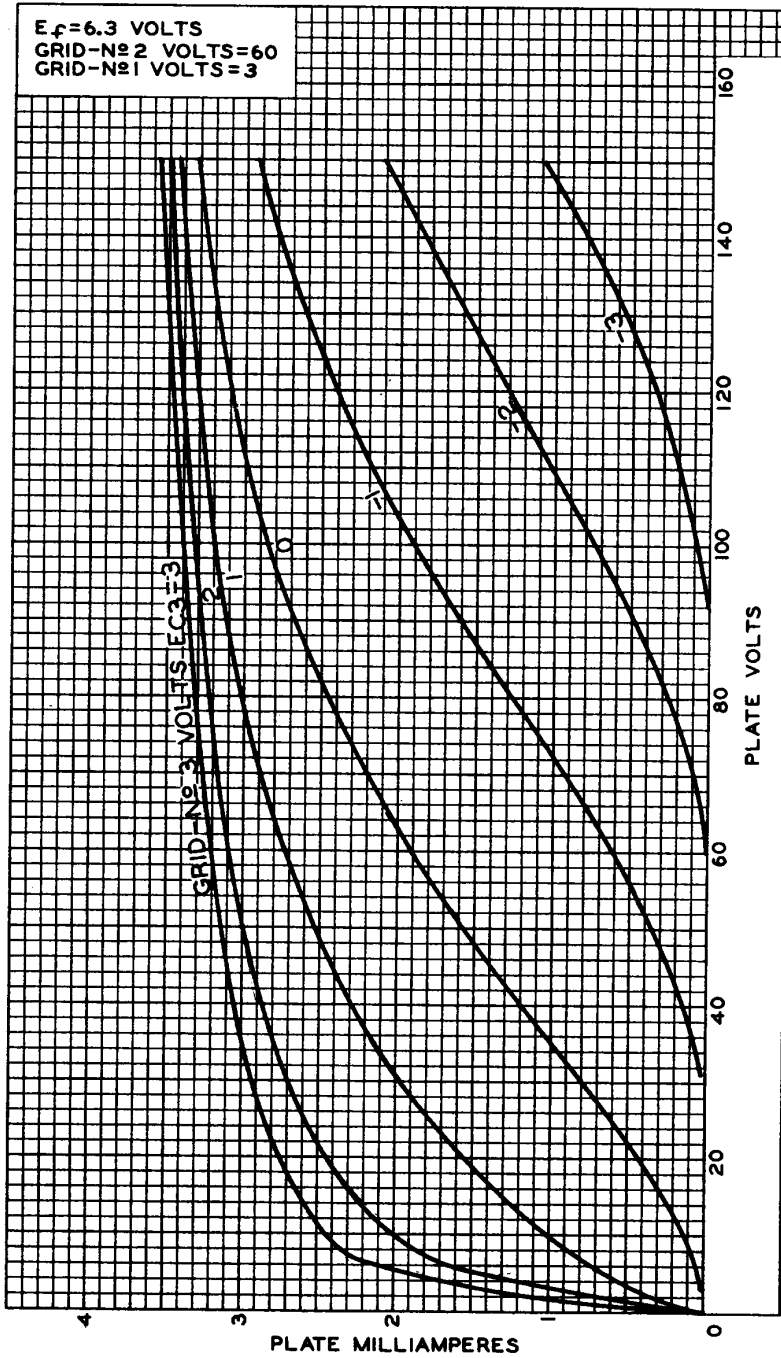
It is recommended that L₁ be shunted by a capacitance of at least 10 μf. This capacitance may be composed of tube capacitance, stray capacitance, the distributed capacitance of L₁, and a fixed capacitor.

Information furnished by RCA is believed to be accurate and reliable. However, no responsibility is assumed by RCA for its use; nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of RCA.



6BN6

AVERAGE PLATE CHARACTERISTICS



92CM-10319

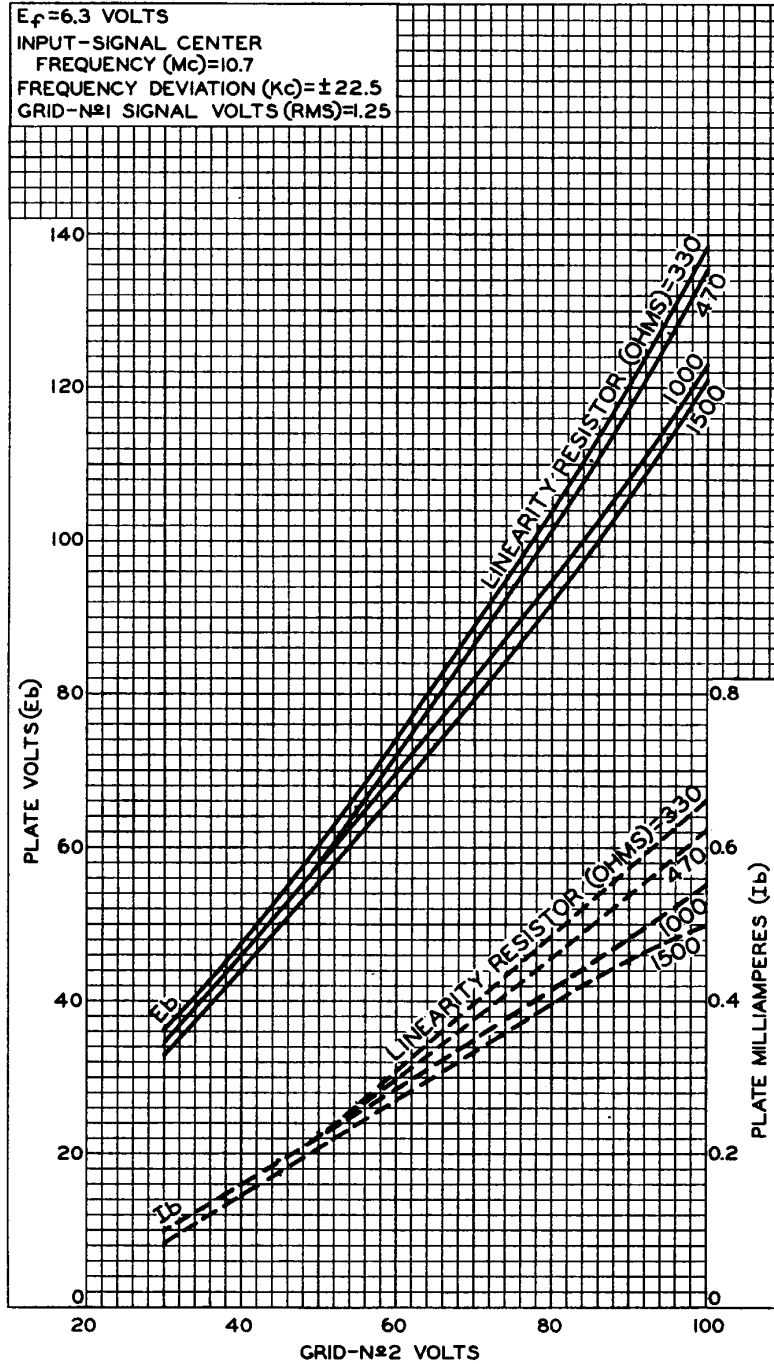
RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



6BN6

OPERATION CHARACTERISTICS



92CM-10321

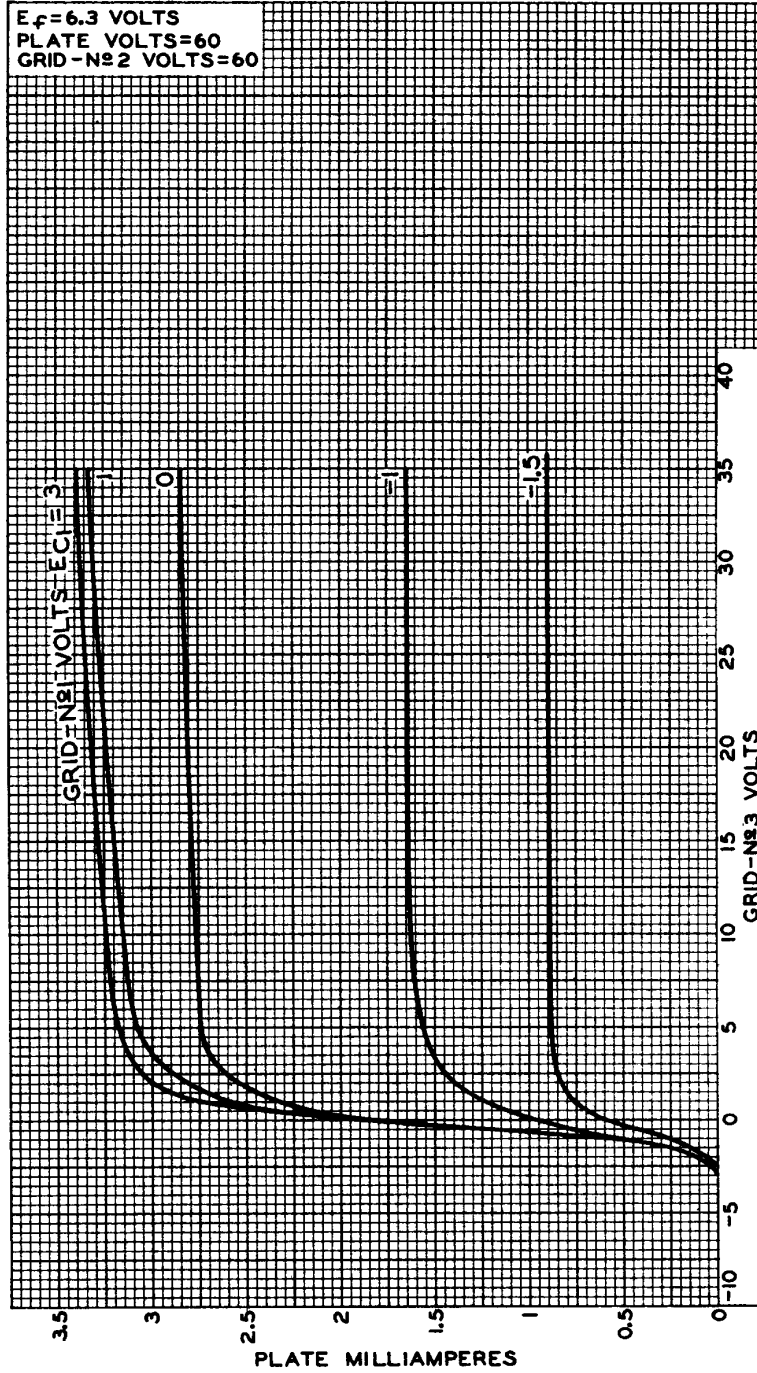


RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

DATA 3
8-60

6BN6

AVERAGE CHARACTERISTICS



92CM-10320

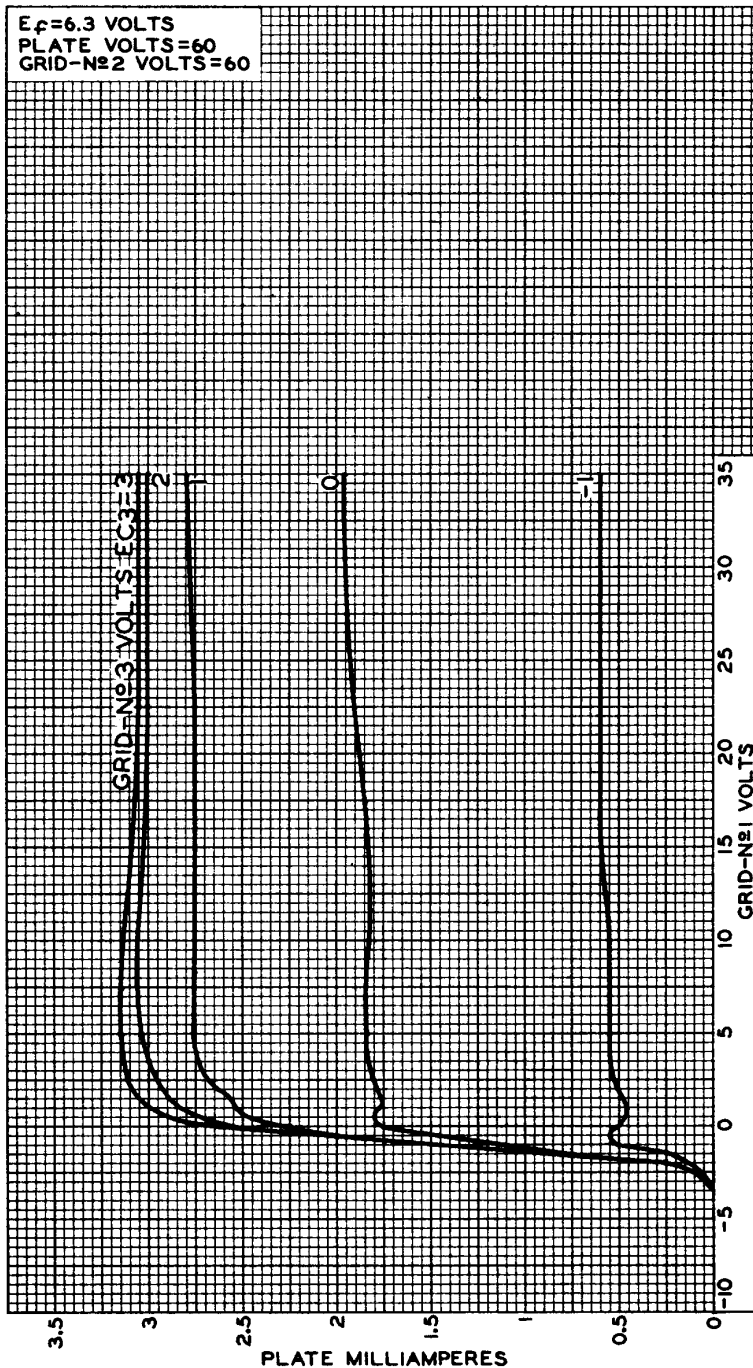
RADIO CORPORATION OF AMERICA
Electron Tube Division

Harrison, N. J.



6BN6

AVERAGE CHARACTERISTICS



92CM-10322



RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

DATA 4
8-60