

250

**RCA TUBE  
HANDBOOK  
HB-3**

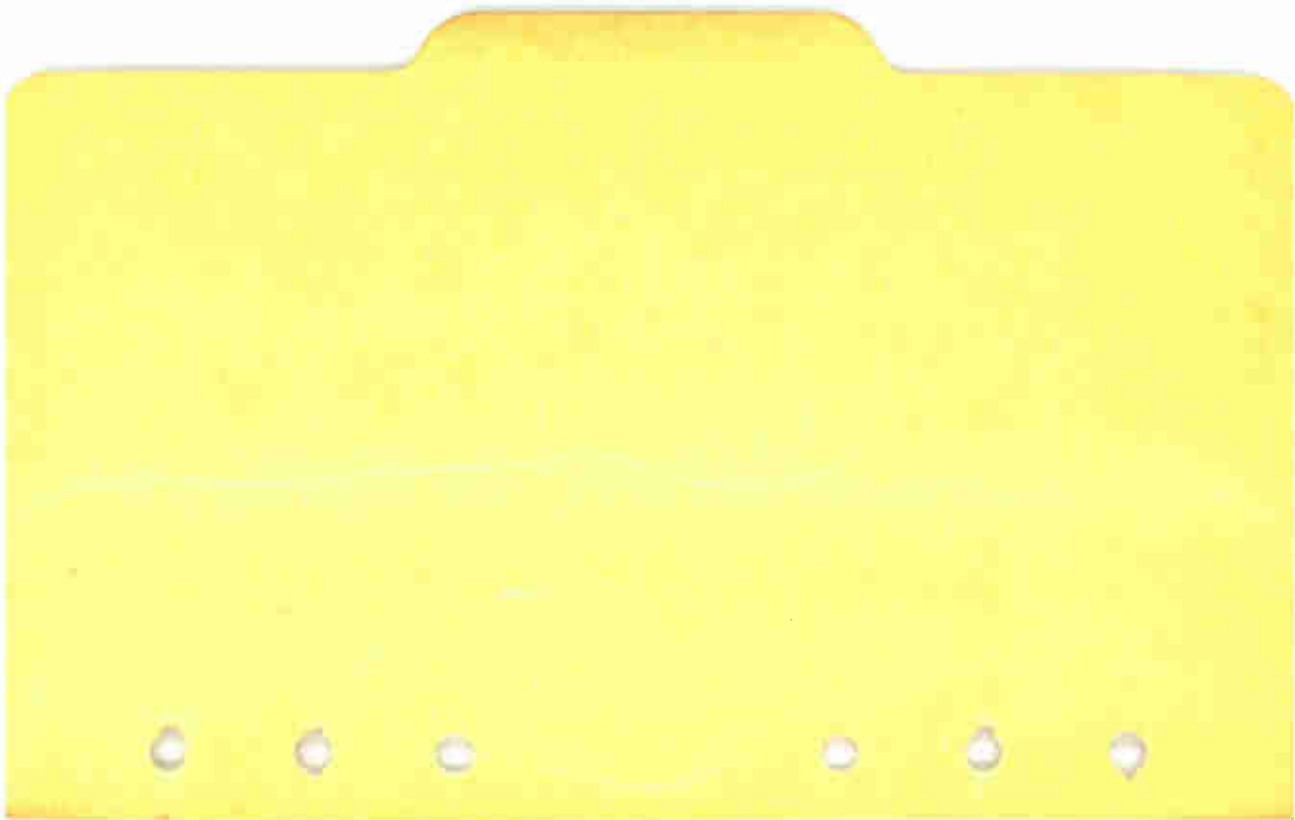


**RECEIVING  
TUBE  
SECTION — Part 2**

This Section contains data for those tubes used primarily in broadcast and home-television receivers.

Receiving Tubes — Part 2

*For further Technical Information, write to  
Commercial Engineering, Tube Division,  
Radio Corporation of America, Harrison, N. J.*





6BJ8

6BJ8

# TWIN DIODE—MEDIUM-MU TRIODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage. . . . .	6.3 . . . . .	ac or dc volts
Current. . . . .	0.6 . . . . .	amp
Warm-up time (Average) . . . . .	11 . . . . .	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances:<sup>0</sup>

#### Triode Unit:

Grid to plate . . . . .	2.6	$\mu\mu\text{f}$
Grid to heater and cathode . . . . .	2.8	$\mu\mu\text{f}$
Plate to heater and cathode. . . . .	0.31	$\mu\mu\text{f}$

#### Diode Units:

Diode-No.1 plate to triode grid. . . . .	0.07 max.	$\mu\mu\text{f}$
Diode-No.2 plate to triode grid. . . . .	0.11 max.	$\mu\mu\text{f}$
Diode-No.1 cathode to all other electrodes . . . . .	4.8	$\mu\mu\text{f}$
Diode-No.2 cathode to all other electrodes . . . . .	4.8	$\mu\mu\text{f}$
Diode-No.1 plate to diode-No.2 plate . . . . .	0.06 max.	$\mu\mu\text{f}$
Diode-No.1 plate to diode-No.1 cathode and heater . . . . .	1.9	$\mu\mu\text{f}$
Diode-No.2 plate to diode-No.2 cathode and heater . . . . .	1.9	$\mu\mu\text{f}$
Diode-No.1 cathode to diode-No.1 plate and heater . . . . .	4.6	$\mu\mu\text{f}$
Diode-No.2 cathode to diode-No.2 plate and heater . . . . .	4.6	$\mu\mu\text{f}$
Diode-No.1 plate to all other electrodes . . . . .	3	$\mu\mu\text{f}$
Diode-No.2 plate to all other electrodes . . . . .	3	$\mu\mu\text{f}$

### Characteristics, Class A<sub>1</sub> Amplifier (Triode Unit):

Plate Voltage. . . . .	90	250	volts
Grid Voltage . . . . .	0	-9	volts
Amplification Factor . . . . .	22	20	
Plate Resistance (Approx.) . . . . .	4700	7150	ohms
Transconductance . . . . .	4700	2800	$\mu\text{mhos}$
Plate Current. . . . .	13.5	8	ma
Plate Current for grid volts = -12.5. . . . .	-	1.7	ma
Grid Voltage (Approx.) for plate $\mu\text{a.} = 10$ . . . . .	-7	-18	volts

<sup>0</sup>: See next page.

6BJ8



6BJ8

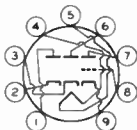
## TWIN DIODE—MEDIUM-MU TRIODE

**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 . . . . .	7/8"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JETEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9ER

Pin 1—Diode—No. 2  
PlatePin 2—Diode—No. 2  
CathodePin 3—Diode—No. 1  
Cathode

Pin 4—Heater



Pin 5—Heater

Pin 6—Diode—No. 1  
Plate

Pin 7—Triode Plate

Pin 8—Triode Grid

Pin 9—Triode  
Cathode**TRIODE UNIT — AMPLIFIER — Class A<sub>1</sub>****Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE . . . . .	300 max.	volts
GRID VOLTAGE:		
Positive bias value . . . . .	0 max.	volts
AVERAGE CATHODE CURRENT . . . . .	20 max.	ma
PLATE DISSIPATION . . . . .	3.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	volts

**Maximum Circuit Values:**

Grid-Circuit Resistance . . . . .	1 max.	megohm
-----------------------------------	--------	--------

**TRIODE UNIT — VERTICAL DEFLECTION AMPLIFIER****Maximum Ratings, Design-Center Values Except as Noted:**For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	300 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum) <sup>*</sup> . . . . .	1200 <sup>■</sup> max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	250 max.	volts
CATHODE CURRENT:		
Peak . . . . .	70 max.	ma
Average . . . . .	20 max.	ma
PLATE DISSIPATION . . . . .	3.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	volts

○, ▲, □, \*, ■: See next page.



6BJ8

6BJ8

# TWIN DIODE—MEDIUM-MU TRIODE

## Maximum Circuit Values:

Grid-Circuit Resistance:

For cathode-bias operation. . . . . 2.2 max. megohms

## DIODE UNITS — Two

## Maximum Ratings, Design-Center Values:

*Values are for Each Unit*

PEAK PLATE CURRENT. . . . . 54 max. ma

DC PLATE CURRENT. . . . . 9 max. ma

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . 200 max. volts

Heater positive with respect to cathode . 200<sup>▲</sup> max. volts

○ without external shield.

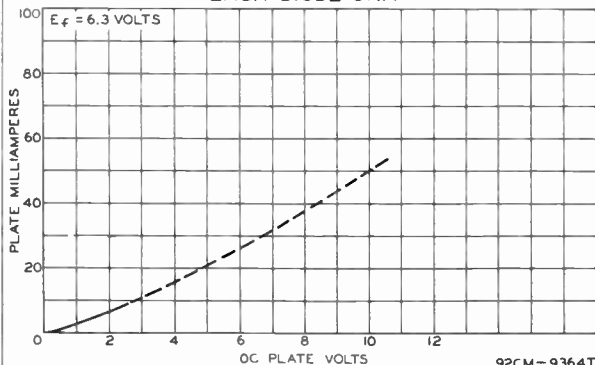
▲ The dc component must not exceed 100 volts.

□ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

\* This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

■ Under no circumstances should this absolute value be exceeded.

## AVERAGE PLATE CHARACTERISTIC EACH DIODE UNIT



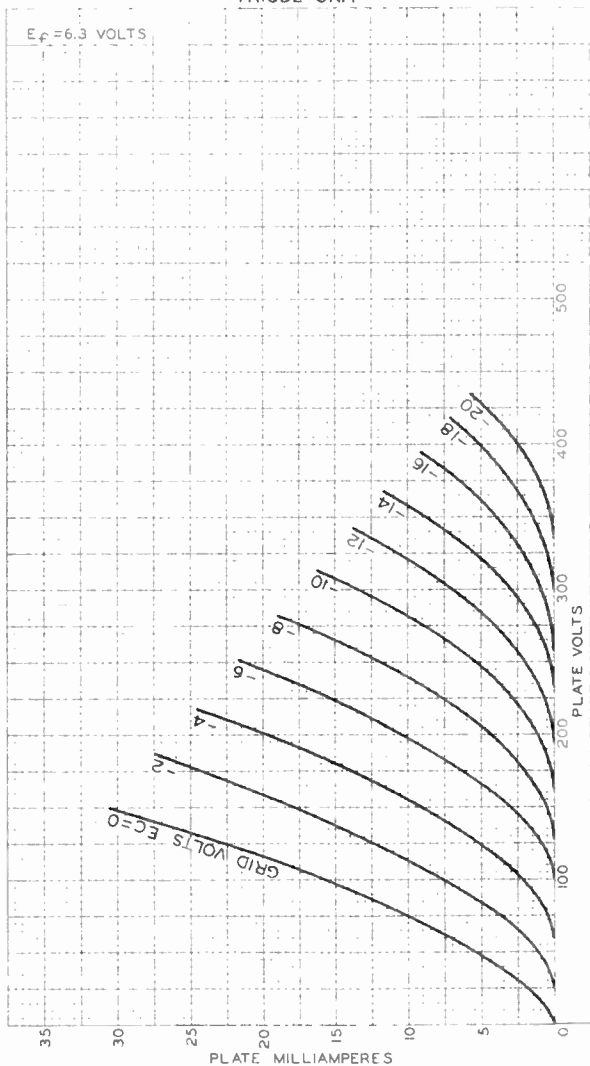
6BJ8



6BJ8

# AVERAGE PLATE CHARACTERISTICS TRIODE UNIT

$E_f = 6.3$  VOLTS



ELECTRON TUBE DIVISION

92CM-9531

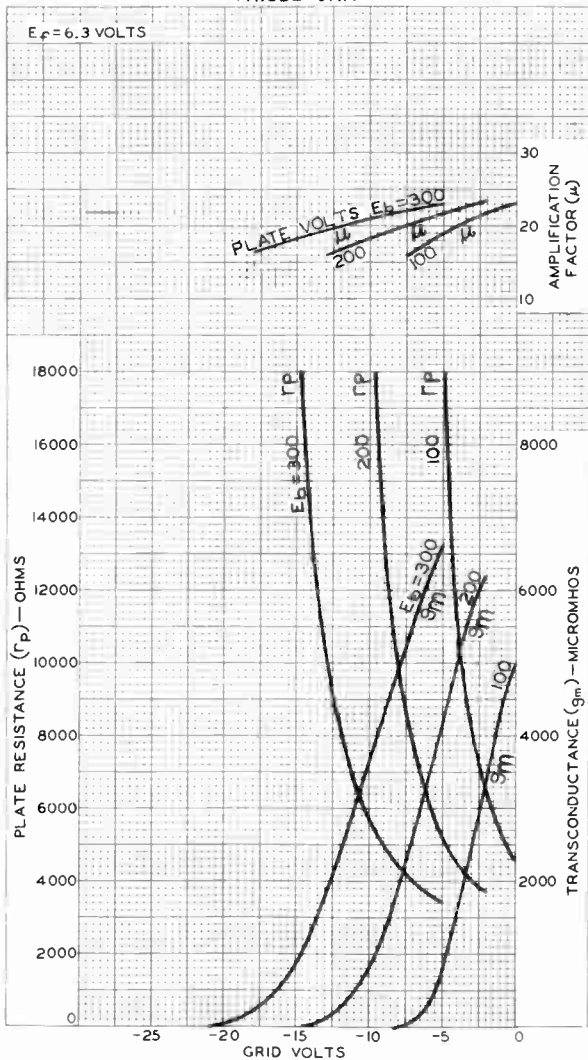
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY



6BJ8

6BJ8

### AVERAGE CHARACTERISTICS TRIODE UNIT



ELECTRON TUBE DIVISION

92CM-9535

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History







6BK4

6BK4

# SHARP-CUTOFF BEAM TRIODE

HIGH-VOLTAGE, LOW-CURRENT, REGULATOR TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage. . . . . 6.3 . . . . . ac or dc volts

Current. . . . . 0.2 . . . . . amp

Direct Interelectrode Capacitances:

Grid to plate. . . . . 0.03  $\mu\mu\text{f}$

Grid to cathode and heater . . . . . 2.6  $\mu\mu\text{f}$

Plate to cathode and heater. . . . . 1  $\mu\mu\text{f}$

Amplification Factor (Approx.) . . . . . 2000

### Mechanical:

Mounting Position. . . . . Any

Maximum Overall Length . . . . . 5-7/32"

Seated Length. . . . . 4-1/2"  $\pm$  3/16"

Maximum Diameter . . . . . 1-23/32"

Bulb . . . . . T-12

Cap. . . . . Small (JETEC No.C1-1)

Base . . . . . Short Jumbo-Shell Octal 8-Pin with External Barriers (JETEC No.B8-71)

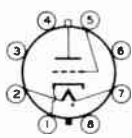
Basing Designation for Bottom View . . . . . 8GC

Pin 1 - Cathode

Pin 2 - Heater

Pin 3 - Internal Connection-  
Do Not Use

Pin 4 - Same As Pin 3



Pin 5 - Grid

Pin 6 - Same as Pin 3

Pin 7 - Heater

Pin 8 - Same as Pin 3

Cap - Plate

## VOLTAGE-CONTROL SERVICE

### Maximum Ratings, Design-Center Values:

DC PLATE VOLTAGE . . . . . 25000 max. volts

UNREGULATED DC SUPPLY VOLTAGE. . . . . 55000 max. volts

GRID VOLTAGE:

DC value . . . . . -125 max. volts

Peak value <sup>■</sup> . . . . . -400 max. volts

DC PLATE CURRENT . . . . . 1.5 max. ma

PLATE DISSIPATION. . . . . 25 max. watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. 225 max. volts

Heater positive with respect to cathode. Not Recommended

### Typical Operation As Shunt Voltage-Regulator Tube

In Accompanying Circuit:

Unregulated Supply:

DC voltage . . . . . 36000 volts

Equivalent resistance. . . . . 11 megohms

<sup>■</sup> For interval of 20 seconds maximum duration during equipment warm-up period.

6BK4



6BK4

## SHARP-CUTOFF BEAM TRIODE

## Voltage Divider Values:

R <sub>1</sub> (5 watts) . . . . .	220	megohms
R <sub>2</sub> (2 watts) . . . . .	1	megohm
R <sub>3</sub> (1/2 watt) . . . . .	820000	ohms

## Reference Voltage Supply:

DC value . . . . .	200	volts
Equivalent resistance . . . . .	1000	ohms
Effective Grid-Plate Transconductance . . . . .	200	μmhos

## DC Plate Current:

For load current of 0 ma . . . . .	1000	μamp
For load current of 1 ma . . . . .	45	μamp

## Regulated DC Output Voltage:

For load current of 0 ma . . . . .	25000	volts
For load current of 1 ma . . . . .	24500	volts

## Maximum Circuit Values:

## Grid-Circuit Resistance:

For use with "Flyback Transformer" high-voltage supply . . . . .	3 max.	megohms
---	--------	---------

## CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Grid Voltage (1) . . . . .	1	-7	-	volts
Grid Voltage (2) . . . . .	2	-	-40	volts
Grid-Voltage Change . . . . .	3	-	9	volts

Note 1: with dc plate voltage of 30000 volts and dc plate current of 1 ma.

Note 2: with dc plate voltage of 30000 volts and dc plate current of 0.1 ma.

Note 3: Difference between grid voltage (1) and grid voltage (2).

## OPERATING CONSIDERATIONS

Operation of the 6BK4 with a plate voltage above approximately 16000 volts (absolute value) results in the production of X-rays which can constitute a health hazard on prolonged exposure at close range unless the tube is adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.

MAR. 1, 1955

TUBE DIVISION

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

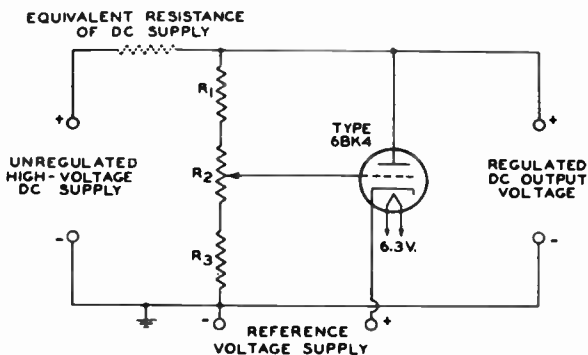


6BK4

6BK4

## SHARP-CUTOFF BEAM TRIODE

### SHUNT VOLTAGE-REGULATOR CIRCUIT



92CS-8435

Typical performance data for this basic circuit with certain characteristics of the unregulated dc supply and related voltage-divider values are given in the above tabulated data. Other combinations are feasible within the maximum ratings and the maximum circuit values for the 6BK4.

Devices and arrangements shown or described herein may use patents of RCA or others. Information contained herein is furnished without responsibility by RCA for its use and without prejudice to RCA's patent rights.

MAR. 1, 1955

TUBE DIVISION  
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

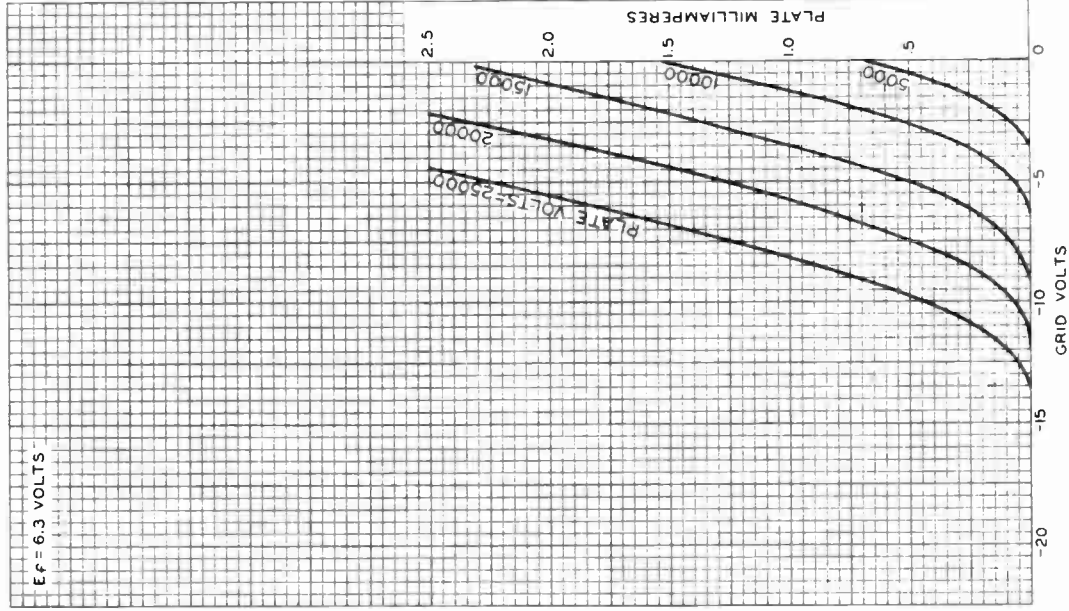
CE-8435

6BK4



6BK4

# AVERAGE TRANSFER CHARACTERISTICS



OCT. 18, 1954

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARTFORD, NEW JERSEY

92CM-8432RI



6BK5

# 6BK5 BEAM POWER TUBE

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 6.3 . . . . . ac or dc volts  
Current . . . . . 1.2 . . . . . amp

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

Grid No.1 to plate . . . . . 0.6  $\mu$ f  
Grid No.1 to cathode & grid No.3,  
grid No.2, and heater. . . . . 13  $\mu$ f  
Plate to cathode & grid No.3,  
grid No.2, and heater. . . . . 5  $\mu$ f

### 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 (JETEC No.E9-1)  
Basing Designation for BOTTOM VIEW . . . . . 9BQ

Pin 1 - Plate  
Pin 2 - No Connection  
Pin 3 - Grid No.1  
Pin 4 - Heater  
Pin 5 - Heater



Pin 6 - Cathode,  
Grid No.3  
Pin 7 - Grid No.1  
Pin 8 - Grid No.2  
Pin 9 - No Connection

## AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . . 250 max. volts  
GRID-No.2 (SCREEN) VOLTAGE . . . . . 250 max. volts  
DC GRID-No.1 (CONTROL-GRID) VOLTAGE:  
Positive bias value . . . . . 0 max. volts  
GRID-No.2 INPUT . . . . . 2.5 max. watts  
PLATE DISSIPATION . . . . . 9 max. watts  
PEAK HEATER-CATHODE VOLTAGE:  
Heater negative with respect to cathode. . . . . 100 max. volts  
Heater positive with respect to cathode. . . . . 100 max. volts

### Typical Operation and Characteristics:

Plate Voltage . . . . . 250 volts  
Grid-No.2 Voltage . . . . . 250 volts  
Grid-No.1 Voltage . . . . . -5 volts  
Peak AF Grid-No.1 Voltage . . . . . 5 volts  
Zero-Signal Plate Current . . . . . 35 ma  
Max.-Signal Plate Current (Approx.) . . . . . 37 ma  
Zero-Signal Grid-No.2 Current . . . . . 3.5 ma

<sup>o</sup> without external shield.

MAY 1, 1955

TUBE DIVISION

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

6BK5



6BK5

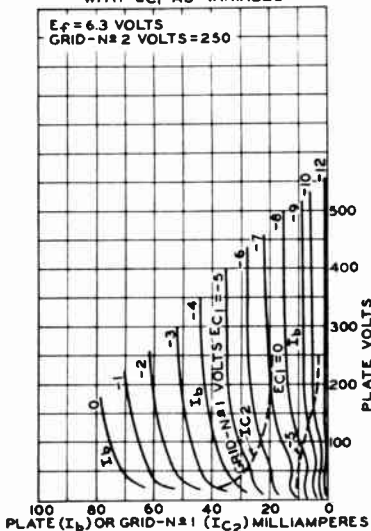
## BEAM POWER TUBE

Max.-Signal Grid-No.2 Current (Approx.) . . .	10	ma
Plate Resistance (Approx.) . . . . .	0.1	megohm
Transconductance . . . . .	8500	$\mu$ hos
Load Resistance . . . . .	6500	ohms
Total Harmonic Distortion (Approx.) . . . .	7	%
Power Output . . . . .	3.5	watts

## Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

AVERAGE PLATE CHARACTERISTICS  
WITH  $E_{c1}$  AS VARIABLE

MAY 1, 1955

TUBE DIVISION

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History



6BK7-B

# 6BK7-B

## MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

With heater having controlled warm-up time. For TV tuners using direct-coupled cathode-drive circuits.

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3	. . . . . ac or dc volts
Current . . . . .	0.45	. . . . . amp
Warm-up time (Average). . . . .	11	. . . . . sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances:<sup>0</sup>

	Unit No. 1	Unit No. 2	
Grid to plate . . . . .	1.8	1.8	$\mu\mu\text{f}$
Grid to cathode, internal shield, and heater. . . . .	3	3	$\mu\mu\text{f}$
Plate to cathode, internal shield, and heater. . . . .	1	0.9	$\mu\mu\text{f}$
Heater to cathode . . . . .	2.8	3	$\mu\mu\text{f}$
Plate to cathode. . . . .	0.22	0.22	$\mu\mu\text{f}$
Cathode to grid, internal shield, and heater. . . . .	6	6	$\mu\mu\text{f}$
Plate to grid, internal shield, and heater. . . . .	2.4	2.4	$\mu\mu\text{f}$
Grid of unit No.1 to grid of unit No.2. . . . .	0.004 max.		$\mu\mu\text{f}$
Plate of unit No.1 to plate of unit No.2. . . . .	0.075 max.		$\mu\mu\text{f}$

#### Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):

Plate-Supply Voltage. . . . .	150	volts
Cathode Resistor. . . . .	56	ohms
Amplification Factor. . . . .	43	
Plate Resistance (Approx.). . . . .	4600	ohms
Transconductance. . . . .	9300	$\mu\text{mhos}$
Plate Current . . . . .	18	ma
Grid Volts (Approx.) for plate $\mu\text{a} = 10$ . . . . .	-11	volts

#### Mechanical:

Operating Position. . . . .	Any
Maximum Overall Length. . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-9/16" $\pm$ 3/32"
Diameter. . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb. . . . .	T6-1/2

<sup>0</sup> without external shield.

6BK7-B



6BK7-B

# MEDIUM-MU TWIN TRIODE

Base . . . . . Small-Button Noval 9-Pin (JETEC No.E9-1)  
Basing Designation for BOTTOM VIEW . . . . . 9AJ

- Pin 1 - Plate of Unit No.2
- Pin 2 - Grid of Unit No.2
- Pin 3 - Cathode of Unit No.2
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Plate of Unit No.1
- Pin 7 - Grid of Unit No.1
- Pin 8 - Cathode of Unit No.1
- Pin 9 - Internal Shield

### AMPLIFIER — Class A<sub>1</sub>

Values are for Each Unit

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

PLATE VOLTAGE . . . . .	300 max. volts
GRID VOLTAGE:	
Negative-bias value . . . . .	50 max. volts
PLATE DISSIPATION . . . . .	2.7 max. watts
PEAK HEATER-CATHODE VOLTAGE:	
Heater negative with respect to cathode.	200 <sup>■</sup> max. volts
Heater positive with respect to cathode.	200 <sup>▲</sup> max. volts

<sup>■</sup> Under cutoff conditions in direct-coupled cathode-drive circuits, it is permissible for this voltage to be as high as 300 volts.

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



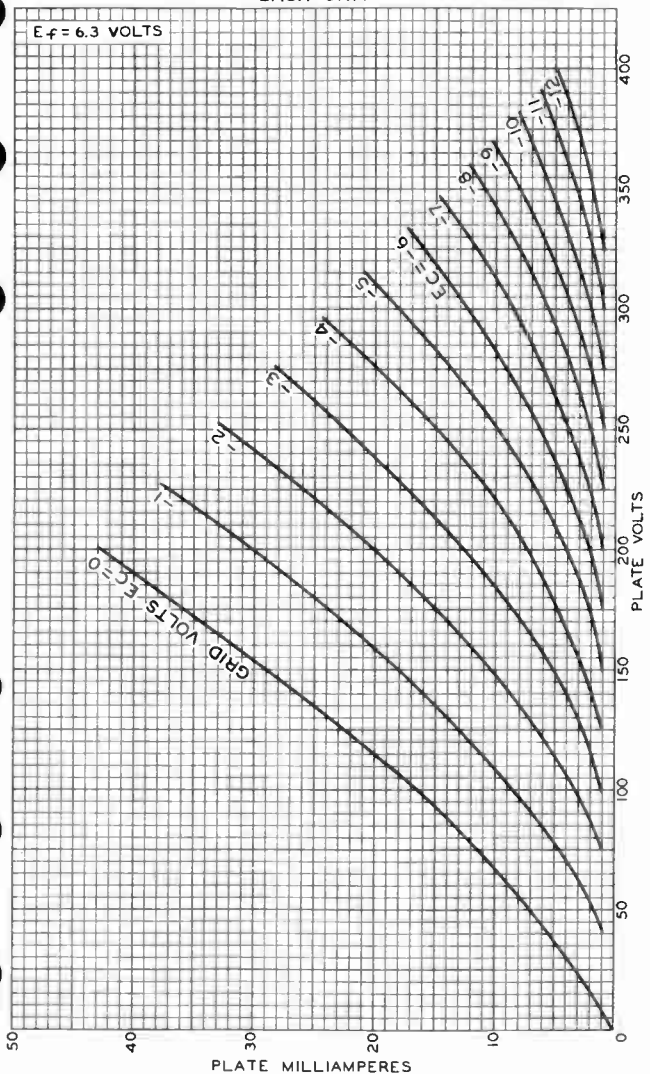


6BK7-B

# 6BK7-B

## AVERAGE PLATE CHARACTERISTICS

EACH UNIT



ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

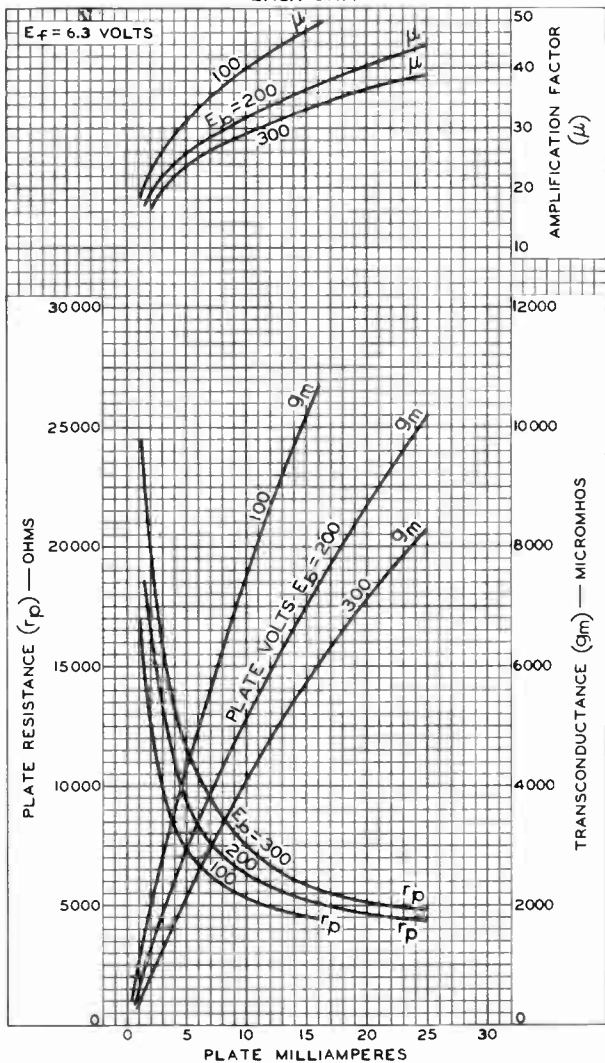
92CM-9764

6BK7-B



6BK7-B

AVERAGE CHARACTERISTICS  
EACH UNIT





6BL7-GTA

# 6BL7-GTA

## MEDIUM-MU TWIN TRIODE

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 6.3 . . . . . ac or dc volts  
Current . . . . . 1.5 . . . . . amp

Direct Interelectrode Capacitance (Approx.):<sup>0</sup>

	Unit No. 1	Unit No. 2	
Grid to plate . . . . .	6	6	$\mu\text{mf}$
Grid to cathode and heater . . .	4.2	4.6	$\mu\text{mf}$
Plate to cathode and heater . . .	0.9	0.9	$\mu\text{mf}$

Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):

Plate Voltage . . . . .	150	250	250	volt
Grid Voltage . . . . .	0	-17	-9	volt
Amplification Factor . . . . .	-	-	15	
Plate Resistance (Approx.) . . . .	-	-	2150	$\Omega$
Transconductance . . . . .	-	-	7000	$\mu\text{mhos}$
Plate Current . . . . .	65*	4	40	ma
Grid voltage (Approx.) for plate current of 50 $\mu\text{a}$ . . . . .	-	-	-3	volt

#### Mechanical:

Operating Position . . . . . Any  
 Maximum Overall Length . . . . . 3-5/16"  
 Maximum Seated Length . . . . . 2-3/4"  
 Maximum Diameter . . . . . 1-9/32"  
 Dimensional Outline . . . . . See General Section  
 Base . . . . . T9  
 Base . . . . . Short Intermediate-Shell Octal 8-Pin  
 with External Barrier (JETEC No. 88-58)

Basing Designation for BOTTOM VIEW . . . . . 8BD

- |                                  |  |                                  |
|----------------------------------|--|----------------------------------|
| Pin 1 - Grid of<br>Unit No. 2    |  | Pin 5 - Plate of<br>Unit No. 1   |
| Pin 2 - Plate of<br>Unit No. 2   |  | Pin 6 - Cathode of<br>Unit No. 1 |
| Pin 3 - Cathode of<br>Unit No. 2 |  | Pin 7 - Heater                   |
| Pin 4 - Grid of<br>Unit No. 1    |  | Pin 8 - Heater                   |

### VERTICAL DEFLECTION OSCILLATOR<sup>1</sup>

Unless Otherwise Specified, Values are for Each Unit

Maximum Ratings, Design-Center Values:

For operation in a 525-line, 40-frame system<sup>2</sup>

DC PLATE VOLTAGE . . . . . 300 max. volt  
 PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . . 400 max. volt

<sup>0</sup>, <sup>1</sup>, <sup>2</sup>: See next page.



## 6BL7-GTA

## MEDIUM-MU TWIN TRIODE

## CATHODE CURRENT:

Peak . . . . .	210	max.	ma
DC . . . . .	50	max.	ma

## PLATE DISSIPATION:

Either plate . . . . .	10	max.	watts
Both plates (Both units operating) . . .	12	max.	watts

## PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup>	max.	volts

## Maximum Circuit Values:

Grid-Circuit Resistance. . . . .	4.7	max.	megohms
----------------------------------	-----	------	---------

VERTICAL DEFLECTION AMPLIFIER<sup>◆</sup>

*Unless Otherwise Specified, Values are for Each Unit*

## Maximum Ratings, Design-Center Values Except as Noted:

*For operation in a 525-line, 30-frame system<sup>□</sup>*

DC PLATE VOLTAGE . . . . .	500	max.	volts
----------------------------	-----	------	-------

PEAK POSITIVE-PULSE PLATE VOLTAGE<sup>#</sup>

(Absolute maximum) . . . . .	2000 <sup>■</sup>	max.	volts
------------------------------	-------------------	------	-------

PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	250	max.	volts
--	-----	------	-------

## CATHODE CURRENT:

Peak . . . . .	210	max.	ma
DC . . . . .	60	max.	ma

## PLATE DISSIPATION:

Either plate <sup>†</sup> . . . . .	10	max.	watts
Both plates (Both units operating) . . .	12	max.	watts

## PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup>	max.	volts

## Maximum Circuit Values:

## Grid-Circuit Resistance:

For Cathode-bias operation <sup>†</sup> . . . . .	4.7	max.	megohms
---	-----	------	---------

<sup>○</sup> without external shield.

<sup>■</sup> This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

<sup>◆</sup> when this tube type is operated as a combined vertical deflection oscillator and amplifier, it is recommended that unit No.1 (pins 4, 5, and 6) be used as the oscillator.

<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

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

<sup>#</sup> This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

<sup>■</sup> under no circumstances should this absolute value be exceeded.

<sup>†</sup> In stages operating with grid-resistor bias, an adequate cathode resistor or other suitable means is required to protect the tube in the absence of excitation.

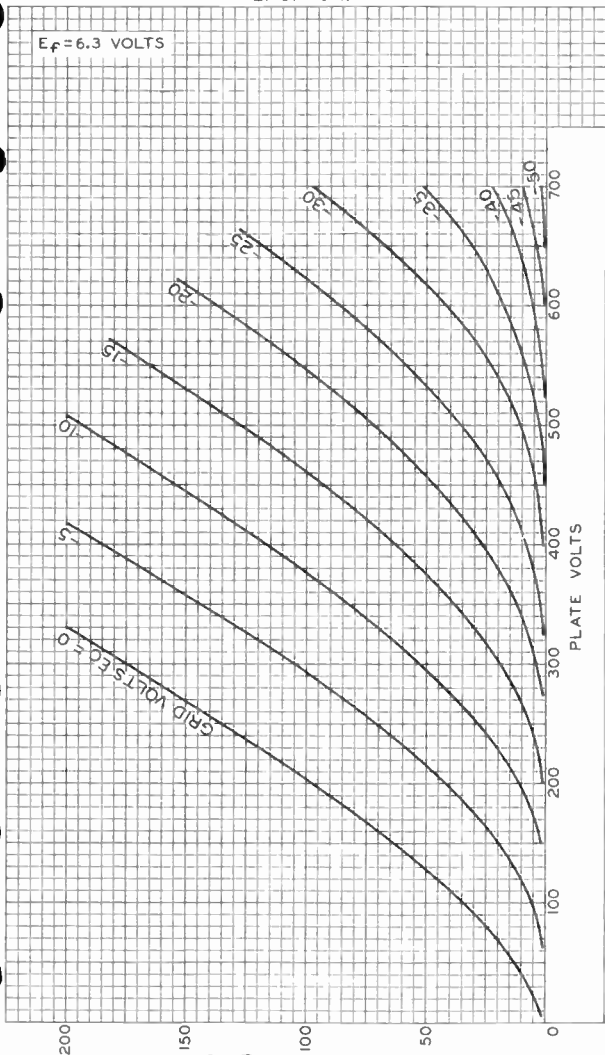


6BL7-GTA

# 6BL7-GTA

## AVERAGE PLATE CHARACTERISTICS

EACH UNIT



200

150

100

50

0

PLATE MILLIAMPERES  
ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9526





6BN4

6BN4

# MEDIUM-MU TRIODE

7-PIN MINIATURE TYPE

For use as rf amplifier in grid-drive circuits of VHF television tuners

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3 ± 10%	volts
Current . . . . .	0.2	amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid to plate . . . . .	1.2	μf
Grid to cathode and heater. . . . .	3.2	μf
Plate to cathode and heater . . . . .	1.4	μf
Heater to cathode . . . . .	2.8	μf

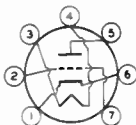
### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Supply Voltage . . . . .	150	volts
Cathode Resistor . . . . .	220	ohms
Amplification Factor . . . . .	43	
Plate Resistance (Approx.) . . . . .	6300	ohms
Transconductance . . . . .	6800	μmhos
Plate Current . . . . .	9	ma
Grid Voltage (Approx.) for plate μa = 100 . . . . .	-6	volts

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bolt Top (Excluding tip). . . . .	1-1/2" ± 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 . . . . .	7EC

- Pin 1 - Cathode
- Pin 2 - Grid
- Pin 3 - Heater
- Pin 4 - Heater



- Pin 5 - Plate
- Pin 6 - Cathode
- Pin 7 - Grid

## AMPLIFIER — Class A<sub>1</sub>

### Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE . . . . .	275 max.	volts
GRID VOLTAGE:		
Positive-bias value . . . . .	0 max.	volts
CATHODE CURRENT . . . . .	22 max.	ma
PLATE DISSIPATION . . . . .	2.2 max.	watts

← Indicates a change.

6BN4



6BN4

## MEDIUM-MU TRIODE

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . 100 max. volts  
Heater positive with respect to cathode. . 100 max. volts

### Maximum Circuit Values:

Grid-Circuit Resistance . . . . . 0.5 max. megohm

- With external shield JEDEC No.316 connected to cathode except as noted.
- With external shield JEDEC No.316 connected to ground.



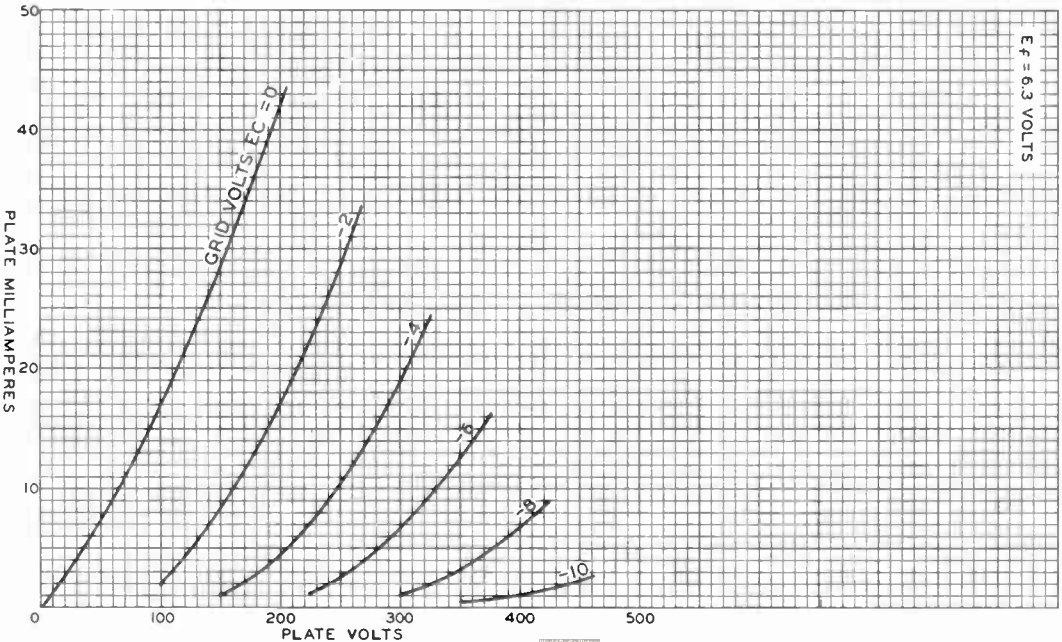


6BN4

6BN4

# AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS



TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

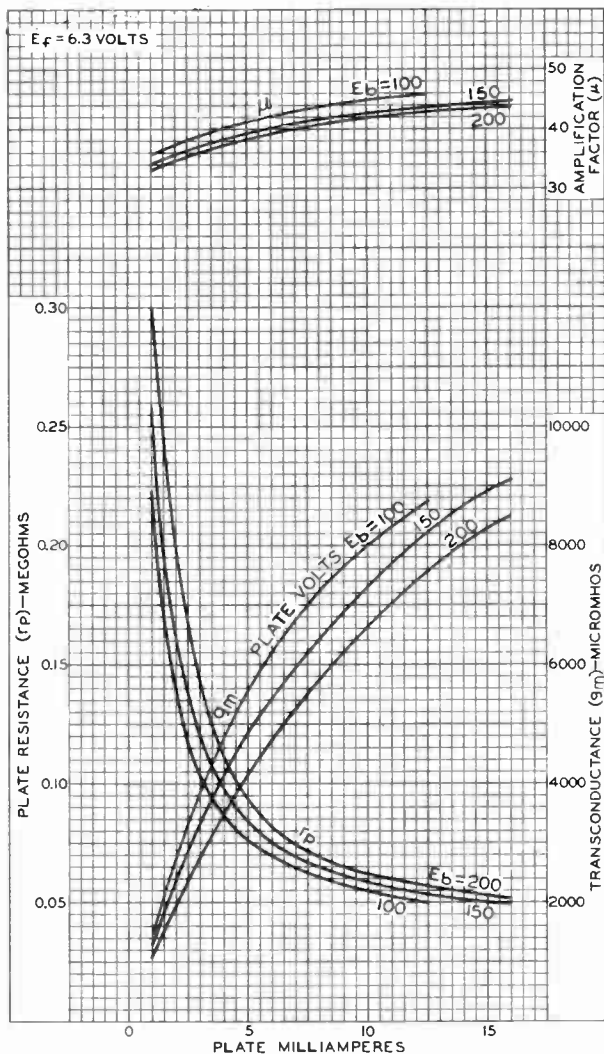
92CM-8933R1

6BN4



6BN4

## AVERAGE CHARACTERISTICS





6BN4-A

# 6BN4-A MEDIUM-MU TRIODE

7-PIN MINIATURE TYPE

Supersedes Type 6BN4

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3	volts
Current . . . . .	0.2	amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid to plate . . . . .	1.2	$\mu$ f
Grid to cathode and heater . . . . .	3.2	$\mu$ f
Plate to cathode and heater . . . . .	1.4	$\mu$ f

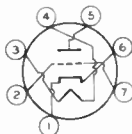
### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Supply Voltage . . . . .	150	volts
Cathode Resistor . . . . .	220	ohms
Amplification Factor . . . . .	43	
Plate Resistance (Approx) . . . . .	5400	ohms
Transconductance . . . . .	8000	$\mu$ mhos
Plate Current . . . . .	9	ma
Grid Volts (Approx.) for plate $\mu$ a = 100 . . . . .	-6	volts

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-1/2" $\pm$ 3/32"
Diameter . . . . .	0.650" to 0.750"
Bulb . . . . .	T5-1/2
Base . . . . .	Small-Button Miniature 7-Pin (JEDEC No. E7-1)
Basing Designation for BOTTOM VIEW . . . . .	7EG

- Pin 1 - Cathode
- Pin 2 - Grid
- Pin 3 - Heater
- Pin 4 - Heater



- Pin 5 - Plate
- Pin 6 - Cathode
- Pin 7 - Grid

## AMPLIFIER — Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	275 max.	volts
GRID VOLTAGE:		
Positive-bias value . . . . .	0 max.	volts
CATHODE CURRENT . . . . .	22 max.	ma
PLATE DISSIPATION . . . . .	2.2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	100 max.	volts
Heater positive with respect to cathode . . . . .	100 max.	volts

### Maximum Circuit Values:

Grid-Circuit Resistance . . . . .	0.5 max.	megohm
-----------------------------------	----------	--------

6BN4-A



6BN4-A

MEDIUM-MU TRIODE

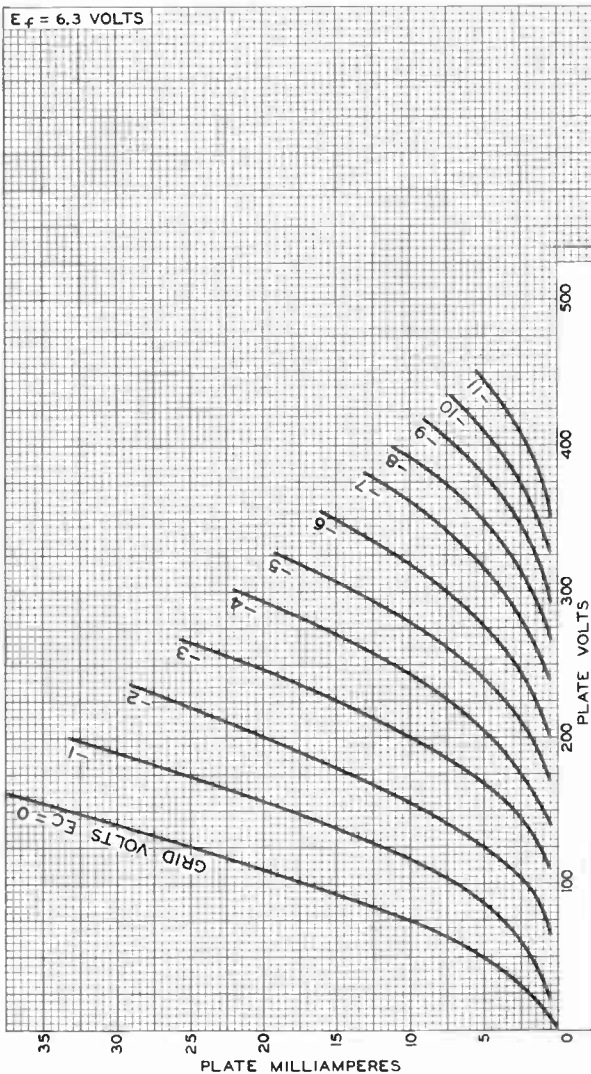
<sup>0</sup> With external shield JEDEC No.316 connected to cathode.



6BN4-A

6BN4-A

### AVERAGE PLATE CHARACTERISTICS



ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

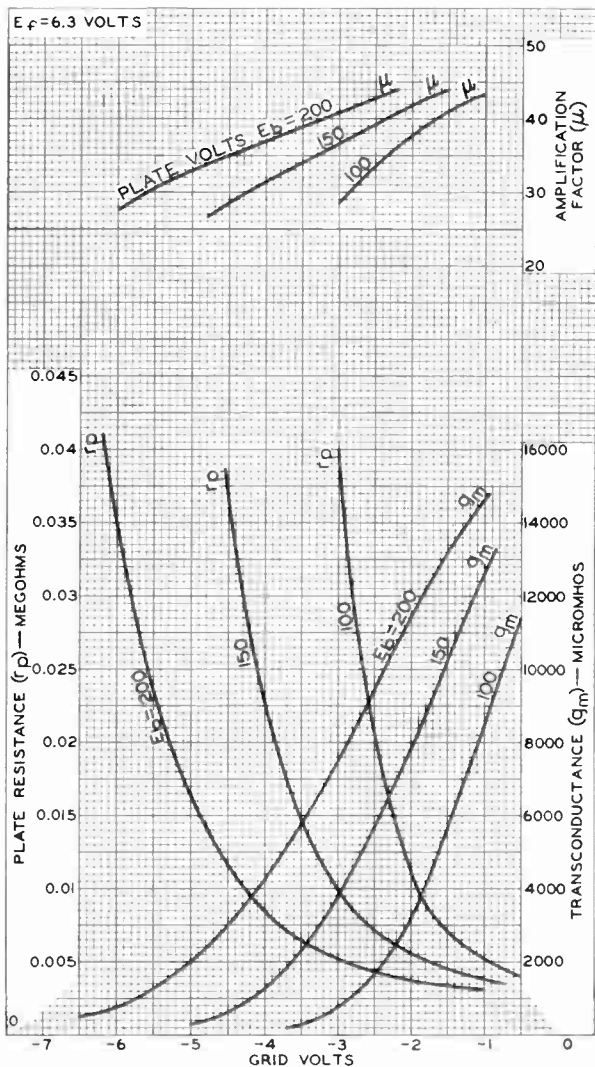
92CM-9941

6BN4-A



6BN4-A

## AVERAGE CHARACTERISTICS





6BN6

6BN6

### BEAM TUBE

7-PIN MINIATURE TYPE

For limiter & discriminator service in FM & TV applications

#### GENERAL DATA

##### Electrical:

Heater, for Unipotential Cathode:

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

Direct interelectrode Capacitances:<sup>0</sup>

Grid No.1 to cathode & internal shields, plate, grid No.3, grid No.2, and heater. . . . .	4.2	$\mu$ f
Grid No.3 to cathode & internal shields, plate, grid No.2, grid No.1, and heater. . . . .	3.3	$\mu$ f
Grid No.1 to grid No.3 . . . . .	0.004 max.	$\mu$ f

##### 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 . . . . .	3/4"
Dimensional Outline. . . . .	See General Section
Bulb . . . . .	T-5-1/2
Base . . . . .	Small-Button Miniature 7-Pin (JETEC 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-Center Values:

PLATE-SUPPLY VOLTAGE . . . . .	300 max.	volts
GRID-No.2 VOLTAGE. . . . .	100 max.	volts
GRID-No.1 VOLTAGE:		
Positive peak value. . . . .	55 max.	volts
CATHODE CURRENT. . . . .	11.5 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	90 max.	volts
Heater positive with respect to cathode. . . . .	90 max.	volts

<sup>0</sup> without external shield.







6BN8

6BN8

# TWIN DIODE-HIGH-MU TRIODE

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	6.3	volts
Current . . . . .	0.8 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

Direct Interelectrode Capacitances:<sup>0</sup>

#### Triode Unit:

Grid to plate . . . . .	2.5	μμf
Grid to heater and cathode . . . . .	3.6	μμf
Plate to heater and cathode . . . . .	0.25	μμf

#### Diode Units:

Diode-No.1 plate to triode grid . . . . .	0.06 max.	μμf
Diode-No.2 plate to triode grid . . . . .	0.1 max.	μμf
Diode-No.1 cathode to all other electrodes . . . . .	5	μμf
Diode-No.2 cathode to all other electrodes . . . . .	5	μμf
Diode-No.1 plate to diode-No.2 plate . . . . .	0.07 max.	μμf
Diode-No.1 plate to diode-No.1 cathode and heater . . . . .	1.9	μμf
Diode-No.2 plate to diode-No.2 cathode and heater . . . . .	1.9	μμf
Diode-No.1 cathode to diode-No.1 plate and heater . . . . .	4.8	μμf
Diode-No.2 cathode to diode-No.2 plate and heater . . . . .	4.8	μμf
Diode-No.1 plate to all other electrodes . . . . .	3	μμf
Diode-No.2 plate to all other electrodes . . . . .	3	μμf

### Characteristics, Class A<sub>1</sub> Amplifier (Triode Unit):

Plate Voltage . . . . .	100	250	volts
Grid Voltage . . . . .	-1	-3	volts
Amplification Factor . . . . .	75	70	
Plate Resistance (Approx.) . . . . .	21000	28000	ohms
Transconductance . . . . .	3500	2500	μmhos
Plate Current . . . . .	1.5	1.6	ma
Grid Voltage (Approx.) for plate μa = 10 . . . . .	-2.5	-5.5	volts

### 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"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section

← Indicates a change.

6BN8



6BN8

## TWIN DIODE—HIGH-MU TRIODE

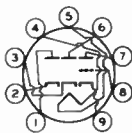
Bulb. . . . . T6-1/2  
 Base. . . . . Small-Button Noval 9-Pin (JEDEC No. E9-1)  
 Basing Designation for BOTTOM VIEW. . . . . 9ER

Pin 1—Diode-No.2  
 Plate

Pin 2—Diode-No.2  
 Cathode

Pin 3—Diode-No.1  
 Cathode

Pin 4—Heater



Pin 5—Heater

Pin 6—Diode-No.1  
 Plate

Pin 7—Triode Plate

Pin 8—Triode Grid

Pin 9—Triode  
 Cathode

TRIODE UNIT — AMPLIFIER — Class A<sub>1</sub>

## → Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE . . . . . 330 max. volts  
 GRID VOLTAGE:  
 Positive-bias value . . . . . 0 max. volts  
 PLATE DISSIPATION . . . . . 1.7 max. watts  
 PEAK HEATER-CATHODE VOLTAGE:  
 Heater negative with respect to cathode . . . . . 200 max. volts  
 Heater positive with respect to cathode . . . . . 200<sup>▲</sup> max. volts

## Maximum Circuit Values:

Grid-Circuit Resistance . . . . . 1 max. megohm

## DIODE UNITS — Two

## Maximum Ratings, Design-Maximum Values:

Values are for Each Unit

PEAK PLATE CURRENT. . . . . 54 max. ma  
 DC PLATE CURRENT. . . . . 9 max. ma  
 PEAK HEATER-CATHODE VOLTAGE:  
 Heater negative with respect to cathode . . . . . 200 max. volts  
 Heater positive with respect to cathode . . . . . 200<sup>▲</sup> max. volts

O Without external shield.

▲ The dc component must not exceed 100 volts.

→ Indicates a change.

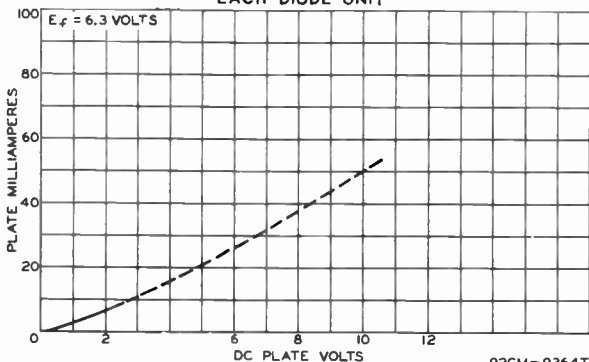


6BN8

6BN8

# TWIN DIODE—HIGH-MU TRIODE

AVERAGE PLATE CHARACTERISTIC  
EACH DIODE UNIT



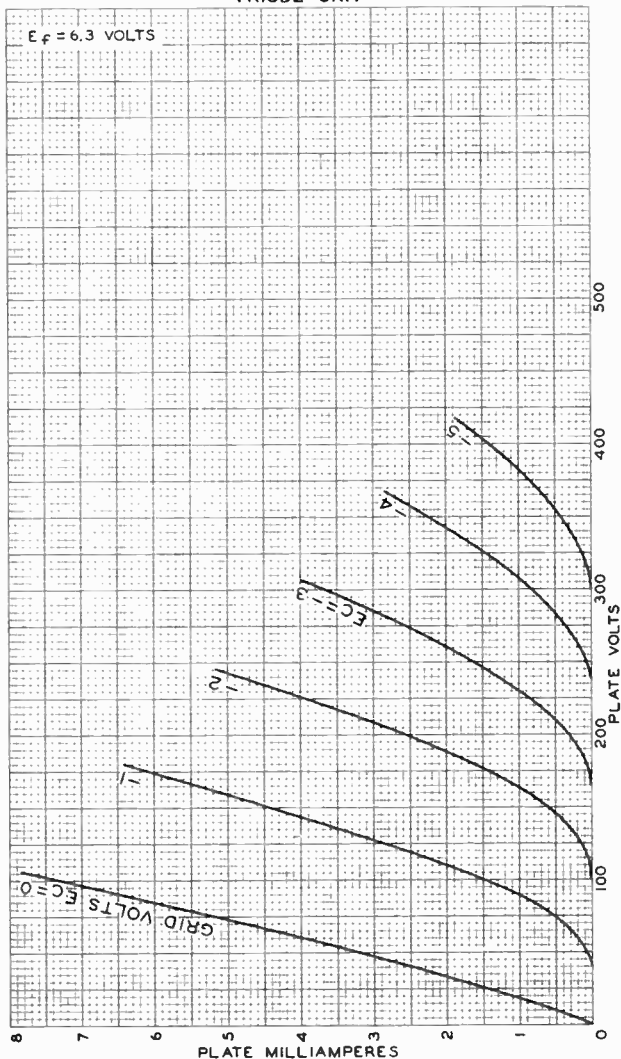
92CM-9364T

6BN8



6BN8

# AVERAGE PLATE CHARACTERISTICS TRIODE UNIT

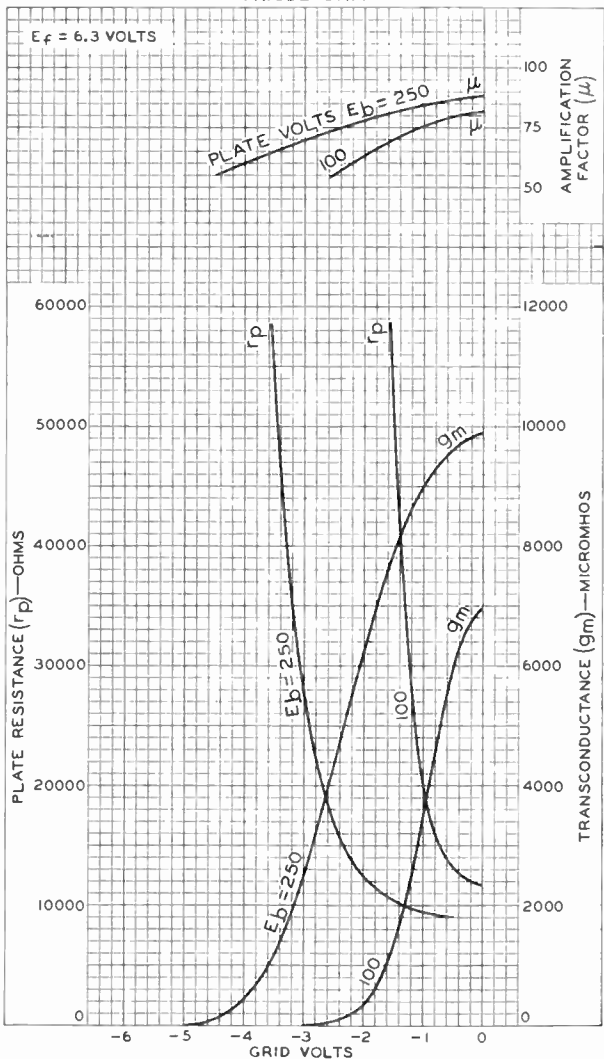




6BN8

AVERAGE CHARACTERISTICS  
TRIODE UNIT

6BN8







6BQ5

# 6BQ5 POWER PENTODE

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	. . . . . ac or dc volts
Current . . . . .	0.76	. . . . . amp

Direct Interelectrode Capacitances:<sup>0</sup>

Grid No.1 to plate. . . . .	0.5 max.	$\mu\text{f}$
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	10.8	$\mu\text{f}$
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	6.5	$\mu\text{f}$

### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	250	volts
Grid-No.2 (Screen-grid) Voltage . . . . .	250	volts
Grid-No.1 (Control-grid) Voltage. . . . .	-7.3	volts
Plate Resistance (Approx.). . . . .	38000	ohms
Transconductance. . . . .	11300	$\mu\text{mhos}$
Plate Current . . . . .	48	ma
Grid-No.2 Current . . . . .	5.5	ma

### Mechanical:

Operating Position. . . . .	Any
Maximum Overall Length. . . . .	3-1/16"
Maximum Seated Length . . . . .	2-13/16"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	2-7/16" $\pm$ 3/32"
Diameter. . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb. . . . .	T6-1/2
Base. . . . .	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW. . . . .	9CV

Pin 1 - Internal Connection—  
Do Not Use  
Pin 2 - Grid No.1  
Pin 3 - Cathode,  
Grid No.3



Pin 4 - Heater  
Pin 5 - Heater  
Pin 6 - Same as Pin 1  
Pin 7 - Plate  
Pin 8 - Same as Pin 1  
Pin 9 - Grid No.2

## AMPLIFIER — Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	300 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE: Positive-bias value . . . . .	0 max.	volts
CATHODE CURRENT . . . . .	65 max.	ma
PLATE DISSIPATION . . . . .	12 max.	watts
GRID-No.2 INPUT . . . . .	2 max.	watts

6BQ5



6BQ5

## POWER PENTODE

## PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode.	100 max.	volts
Heater positive with respect to cathode.	100 <sup>▲</sup> max.	volts

## Typical Operation:

Plate Voltage. . . . .	250	volts
Grid-No.2 Voltage. . . . .	250	volts
Grid-No.1 Voltage. . . . .	-7.3	volts
Peak AF Grid-No.1 Voltage. . . . .	6.2	volts
Zero-Signal Plate Current. . . . .	48	ma
Max.-Signal Plate Current. . . . .	50.6	ma
Zero-Signal Grid-No.2 Current. . . . .	5.5	ma
Max.-Signal Grid-No.2 Current. . . . .	10	ma
Effective Load Resistance. . . . .	4500	ohms
Total Harmonic Distortion. . . . .	10	%
Max.-Signal Power Output . . . . .	5.7	watts

## Maximum Circuit Values:

## Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.3 max.	megohm
For cathode-bias operation . . . . .	1 max.	megohm

○ Without external shield.

● Grid-No.2 Input must not exceed 4 watts under maximum-signal conditions.

▲ The dc component must not exceed 100 volts.

## OPERATING CONSIDERATIONS

The *bulb* becomes hot during operation. To insure adequate cooling, therefore, it is essential that free circulation of air be provided.





6BQ5

6BQ5

### AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID-№2 VOLTS = 250

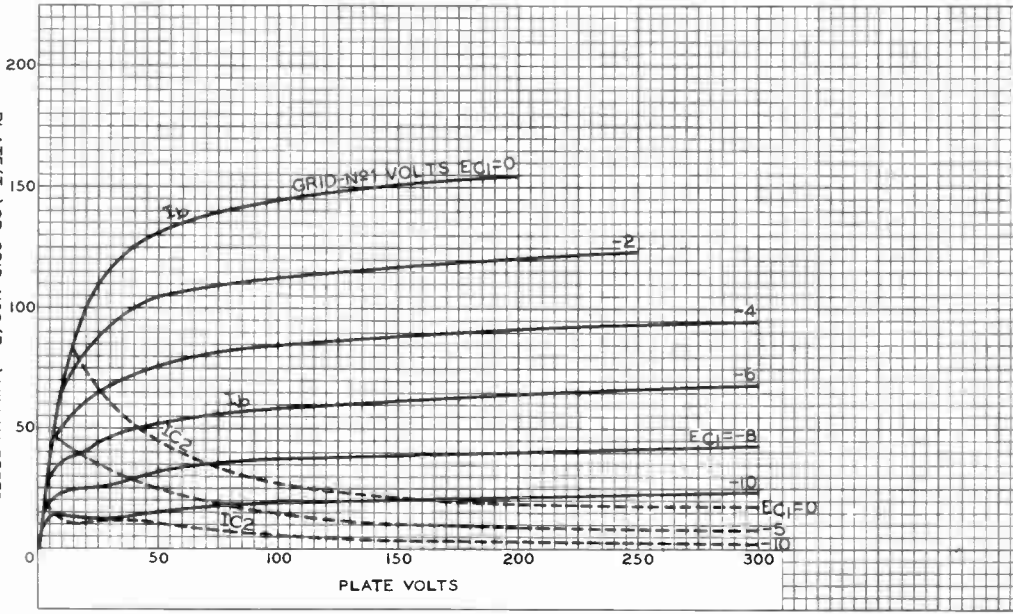


PLATE (I<sub>b</sub>) OR GRID-№2 (I<sub>c2</sub>) MILLIAMPERES  
ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY  
92CM-9903

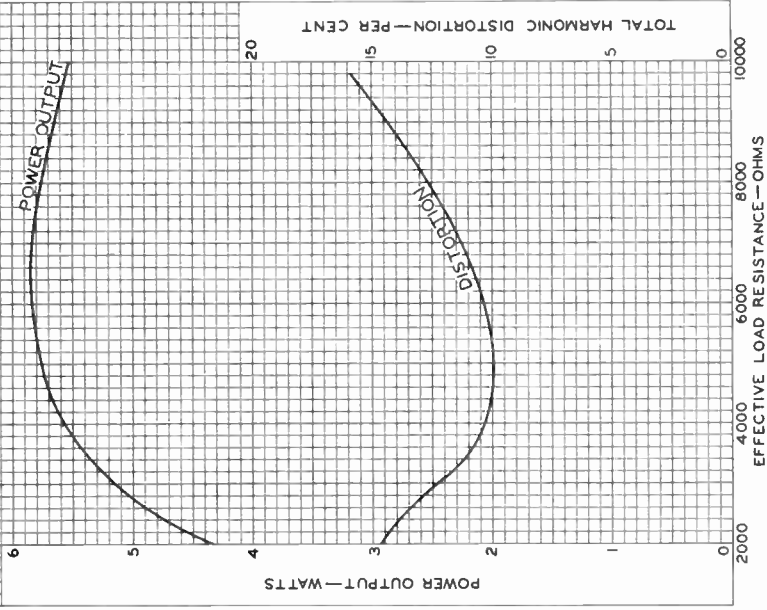
6BQ5



6BQ5

## OPERATION CHARACTERISTICS

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 250  
 GRID-№2 VOLTS = 250  
 GRID-№1 VOLTS = -7.3  
 AF GRID-№1 VOLTS  
 (RMS) = 4.4



Wald-Pfeiffer



6BQ6-GTB

# 6BQ6-GTB/6CU6 BEAM POWER TUBE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	ac or dc volts
Current . . . . .	1.2	amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid No.1 to plate . . . . .	0.6	$\mu\text{mf}$
Grid No.1 to cathode & grid No.3, grid No.2, and heater. . . . .	15	$\mu\text{mf}$
Plate to cathode & grid No.3, grid No.2, and heater. . . . .	7.5	$\mu\text{mf}$

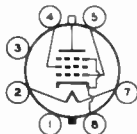
### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	60	150	250	volts
Grid No.2 (Screen) Voltage . . . . .	150	150	150	volts
Grid No.1 (Control-Grid) Voltage . . . . .	0	-22.5	-22.5	volts
Mu-Factor, Grid No.2 to Grid No.1 . . . . .	-	4.3	-	
Plate Resistance . . . . .	-	-	18000	ohms
Transconductance . . . . .	-	-	6000	$\mu\text{mhos}$
Plate Current . . . . .	270*	-	65	ma
Grid-No.2 Current . . . . .	30*	-	2.1	ma
Grid-No.1 Voltage (Approx.) for plate current of 1 ma. . . . .	-	-	-46	volts

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	3-7/8"
Seated Length . . . . .	3-5/32" $\pm$ 5/32"
Maximum Diameter . . . . .	1-9/32"
Bulb . . . . .	T-9
Cap . . . . .	Skirted Miniature (JETEC No.C1-3)
Base . . . . .	Intermediate-Shell Octal 7-Pin (JETEC No.B7-7), Intermediate-Shell Octal 6-Pin (JETEC No.B6-B1), Short Intermediate-Shell Octal 7-Pin with External Barriers (JETEC No.B7-59), or Short Intermediate-Shell Octal 6-Pin with External Barriers (JETEC No.B6-84)
Basing Designation for BOTTOM VIEW . . . . .	6AM

Pin 1  $\blacklozenge$  - No Connection  
 Pin 2 - Heater  
 Pin 3 - No Connection  
 Pin 4 - Grid No.2



Pin 5 - Grid No.1  
 Pin 7 - Heater  
 Pin 8 - Cathode,  
 Grid No.3  
 Cap - Plate

<sup>0</sup> Without external shield.

\* These values can be measured by a method involving a recurrent wave form such that the plate dissipation and grid-No.2 input will be kept within ratings in order to prevent damage to the tube.

$\blacklozenge$  On the 6-pin bases, pin 1 as well as pin 6 is omitted.

6BQ6-GTB



# 6BQ6-GTB

## BEAM POWER TUBE

### HORIZONTAL DEFLECTION AMPLIFIER

Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	600	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum) <sup>⊙</sup> . . . . .	6000 <sup>■</sup>	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE . . . . .	1250	max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE . . . . .	200	max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE . . . . .	-50	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE . . . . .	300	max.	volts
CATHODE CURRENT:			
Peak . . . . .	400	max.	ma
Average . . . . .	112.5	max.	ma
GRID-No.2 INPUT . . . . .	2.5	max.	watts
PLATE DISSIPATION <sup>†</sup> . . . . .	11	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 <sup>▲</sup>	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface) . . . . .			
	220	max.	°C

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For grid resistor-bias operation<sup>†</sup>. . . . 1.0 max. megohm

<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

<sup>■</sup> Under no circumstances should this absolute value be exceeded.

<sup>⊙</sup> The duration of the voltage pulse must not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

<sup>†</sup> It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value should be employed.

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

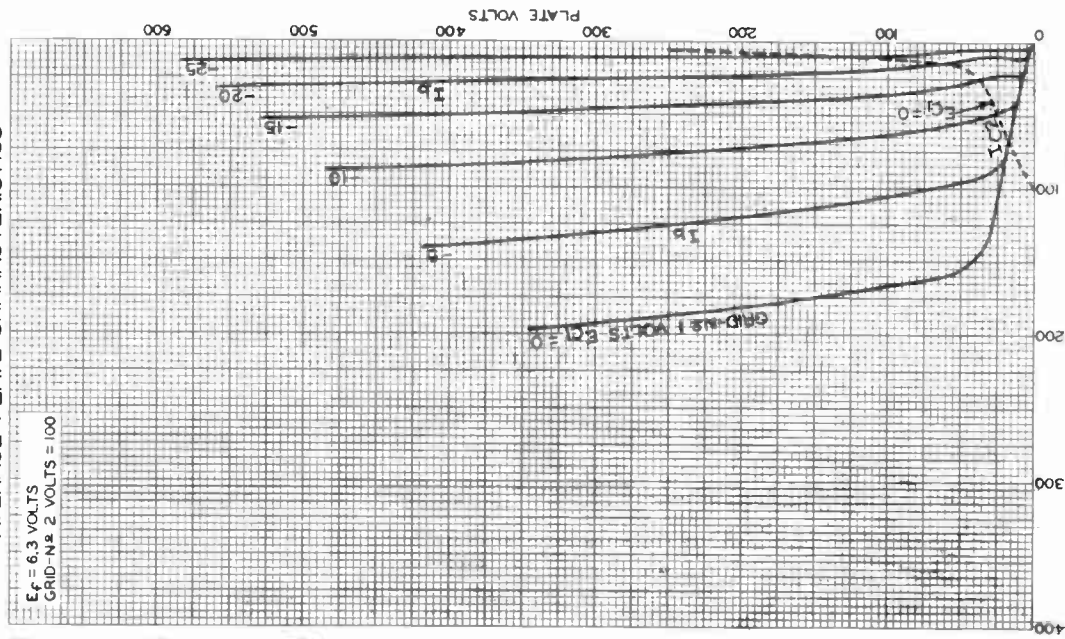


6BQ6-GTB

6BQ6-GTB

### AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID-N<sub>2</sub> 2 VOLTS = 100



JAN. 11, 1955

PLATE ( $I_b$ ) OR GRID - N<sub>2</sub> ( $I_{c2}$ ) MILLIAMPERES

TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

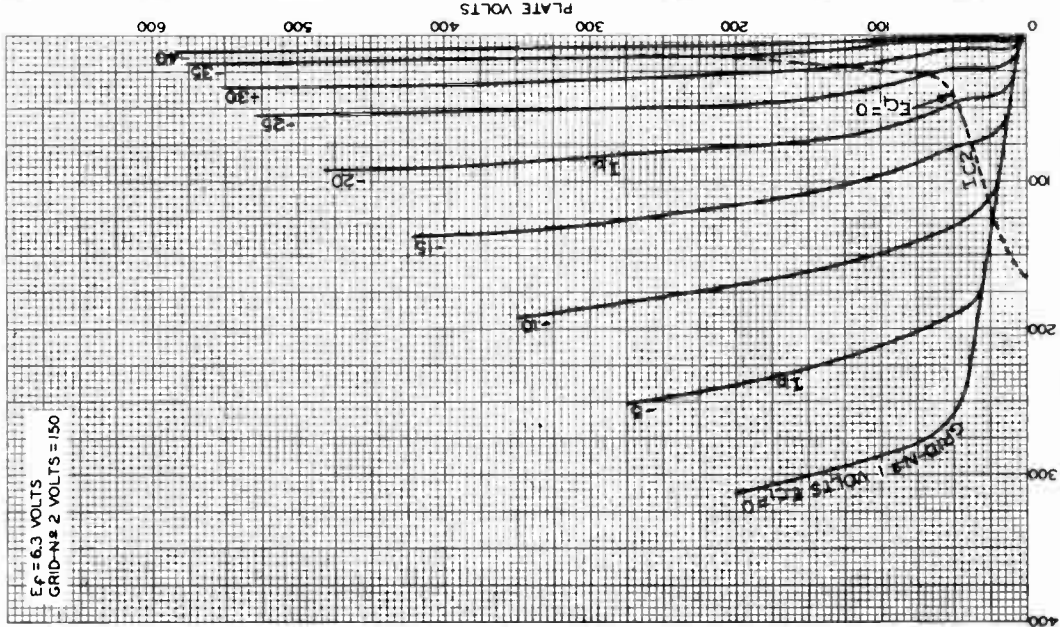
92CM-8500



6BQ6-GTB

### AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID-N# 2 VOLTS = 150



JAN. 14, 1955

PLATE ( $I_b$ ) OR GRID - N# 2 ( $I_{c2}$ ) MILLIAMPERES

TUBE DIVISION

Radio Corporation of America, Harrison, New Jersey

92CM - 8501



6BQ7-A

# 6BQ7-A

## MEDIUM-MU TWIN TRIODE

LOW-NOISE 9-PIN MINIATURE TYPE  
For Driven RF-Grounded-Grid Circuits

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . . 6.3 . . . . . ac or dc volts  
Current . . . . . 0.4 . . . . . amp

Direct Interelectrode Capacitances (According to RTMA Standard ET-109-A with external shield No.3151):

	Unit No. 1	Unit No. 2	
Grid to Plate . . . . .	1.15	1.15	$\mu\mu\text{f}$
Input . . . . .	2.85	-	$\mu\mu\text{f}$
Input (Grounded Grid) . . . . .	-	4.95	$\mu\mu\text{f}$
Output . . . . .	1.35	-	$\mu\mu\text{f}$
Output (Grounded Grid) . . . . .	-	2.27	$\mu\mu\text{f}$
Plate to Cathode . . . . .	0.15 max.	0.15 max.	$\mu\mu\text{f}$
Heater to Cathode . . . . .	2.65	2.70	$\mu\mu\text{f}$
Plate of Unit No.1 to Plate of Unit No.2 . . . . .		0.010 max.	$\mu\mu\text{f}$
Plate of Unit No.2 to Plate & Grid of Unit No.1 . . . . .		0.024 max.	$\mu\mu\text{f}$

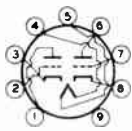
#### Characteristics, Amplifier Class A:

Plate Voltage . . . . .	150	volts
Cathode-Bias Resistor . . . . .	220	ohms
Amplification Factor . . . . .	39	
Plate Resistance . . . . .	6100	ohms
Transconductance . . . . .	6400	$\mu\text{mhos}$
Plate Current . . . . .	9	ma
Grid Volts (Approx.) for plate current of 10 $\mu\text{amp}$ . . . . .	-10	volts

#### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Maximum Diameter . . . . .	7/8"
Bulb . . . . .	T-6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9AJ

- |                                 |                                 |
|---------------------------------|---------------------------------|
| Pin 1 - Plate of Triode No. 2   | Pin 6 - Plate of Triode No. 1   |
| Pin 2 - Grid of Triode No. 2    | Pin 7 - Grid of Triode No. 1    |
| Pin 3 - Cathode of Triode No. 2 | Pin 8 - Cathode of Triode No. 1 |
| Pin 4 - Heater                  | Pin 9 - Internal Shield         |
| Pin 5 - Heater                  |                                 |



6BQ7-A



6BQ7-A

MEDIUM-MU TWIN TRIODE

AMPLIFIER - Class A

Values are for Each Unit

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	250 <sup>▲</sup>	max.	volts
PLATE DISSIPATION. . . . .	2	max.	watts
CATHODE CURRENT. . . . .	20	max.	ma
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode .	200 <sup>▲</sup>	max.	volts
Heater positive with respect to cathode.	200	max.	volts

Typical Operation in Push-Pull RF-Grounded-Grid Circuit:

Values are for Each Unit

Plate Voltage. . . . .	150	volts
Grid Voltage*. . . . .	-2	volts
Cathode Resistor (Common to both units). .	100	ohms
Plate Current. . . . .	10	ma

Typical Operation in RF-Grounded-Grid Circuit

with Direct-Coupled Drive:

Unit No. 1 (driver tube) is directly coupled to Unit No. 2 (driven rf-grounded-grid amplifier tube) as shown in accompanying circuit

	Unit No. 1	Unit No. 2	
Plate Supply Voltage . . . . .	250	250	volts
Plate Voltage. . . . .	135	115	volts
Grid Voltage . . . . .	-1	-	volt
Grid Resistor. . . . .	-	0.5	megohm
Plate Current. . . . .	10	10	ma
Grid Current . . . . .	0	0	ma
Grid Voltage (Approx.) for plate current of 10 $\mu$ amp . .	-14	-	volts
Peak Heater-Cathode Voltage:			
Heater negative with respect to cathode . . . . .	1	250	volts

Maximum Circuit Values (Each Unit):

Grid-Circuit Resistance. . . . .	0.5 max.	megohm
----------------------------------	----------	--------

\* obtained from cathode resistor.  
 ▲ under cutoff conditions in rf-grounded-grid circuit with direct-coupled drive, it is permissible for this voltage to be as high as 300 volts.



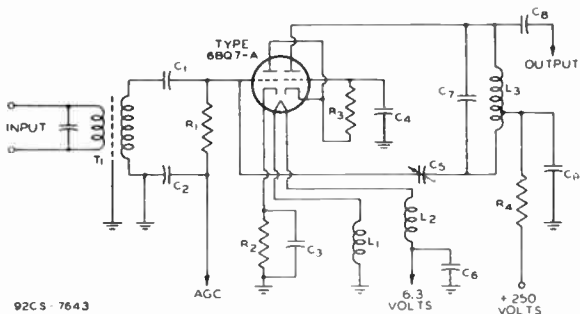


# 6BQ7-A

6BQ7-A

## MEDIUM-MU TWIN TRIODE

### RCA-6BQ7-A in Driven RF-Grounded-Grid Amplifier Circuit with Direct-Coupled Drive

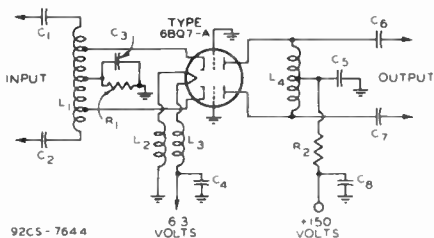


92CS-7643

- C1: 33  $\mu\text{mf}$ , 400 volts
- C2: 1000  $\mu\text{mf}$ , 400 volts
- C3: 1000  $\mu\text{mf}$ , 400 volts
- C4: 1000  $\mu\text{mf}$ , 400 volts
- C5: 0.5 to 1.5  $\mu\text{mf}$ , 400 volts
- C6: 1000  $\mu\text{mf}$ , 400 volts
- C7: 2  $\mu\text{mf}$ , 400 volts
- C8: 33  $\mu\text{mf}$ , 400 volts
- C9: 1000  $\mu\text{mf}$ , 400 volts
- R1: 10000 ohms, 0.5 watt
- R2: 100 ohms, 0.5 watt
- R3: 500000 ohms, 0.5 watt
- R4: 100 ohms, 0.5 watt

- L1, L2: Bifilar chokes, each 10 turns no.18 enamel
- L3: Tuned circuit element of tuner. Value depends on distributed circuit capacitances. To determine tap point, tap down to 80 to 90% of total number of turns
- T1: Tuned circuit element of tuner. Value depends on distributed circuit capacitances.

### RCA-6BQ7-A in Push-Pull RF-Grounded-Grid Circuit



92CS-7644

- C1 C2 C3 C4 C5:
- 1000  $\mu\text{mf}$ , 400 volts
- C6 C7: 100  $\mu\text{mf}$ , 400 volts
- C8: 1000  $\mu\text{mf}$ , 400 volts
- R1 R2: 100 ohms, 0.5 watt

- L1 L4: Tuned circuit elements of tuner. Values depend on distributed circuit capacitances.
- L2 L3: Bifilar chokes, each 10 turns of No.18 enamel wire, 1/4" coil form.

Devices and arrangements shown or described herein may use patents of RCA or others. Information contained herein is furnished without responsibility by RCA for its use and without prejudice to RCA's patent rights.

6BQ7-A



6BQ7-A

# AVERAGE PLATE CHARACTERISTICS FOR EACH UNIT

$E_f = 6.3$  VOLTS

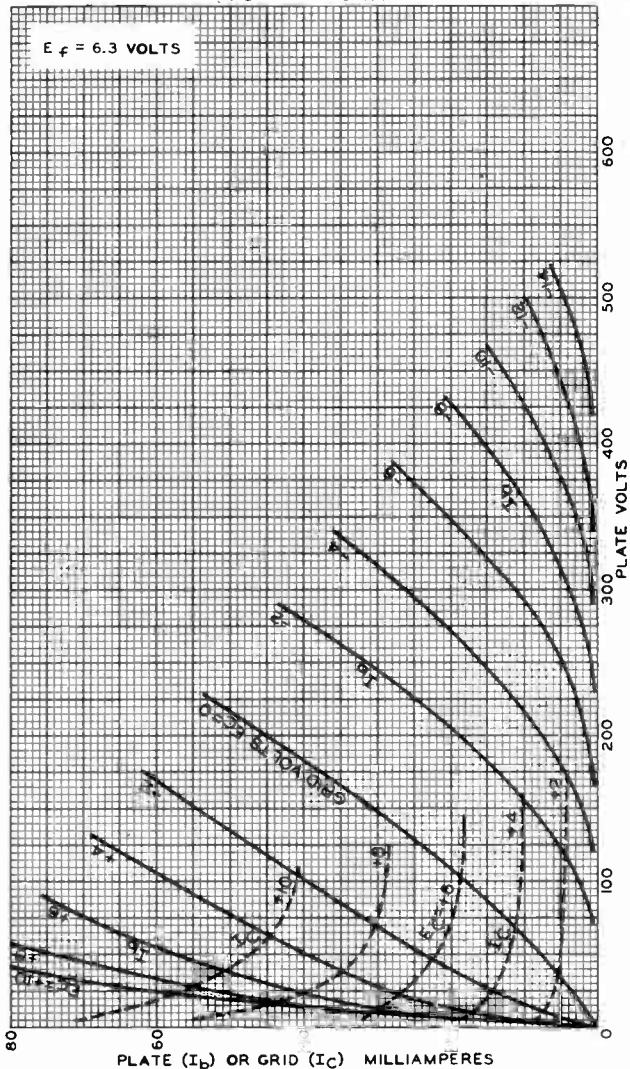


PLATE ( $I_b$ ) OR GRID ( $I_c$ ) MILLIAMPERES

AUG. 25, 1952

TUBE DEPARTMENT

92CM-7536R1

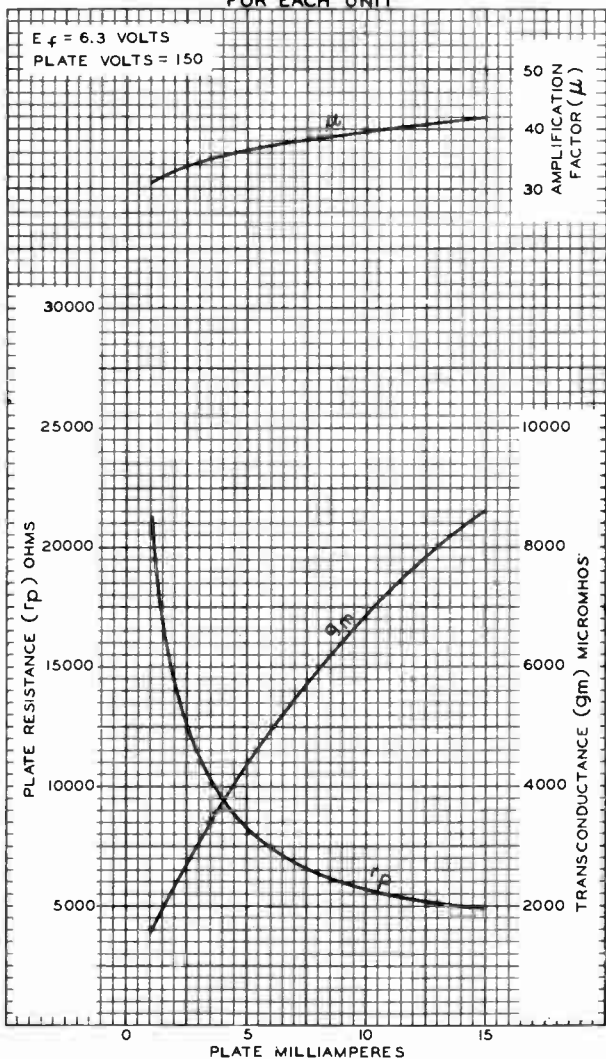
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



6BQ7-A

6BQ7-A

### AVERAGE CHARACTERISTICS FOR EACH UNIT



AUG. 27, 1952

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7538RI

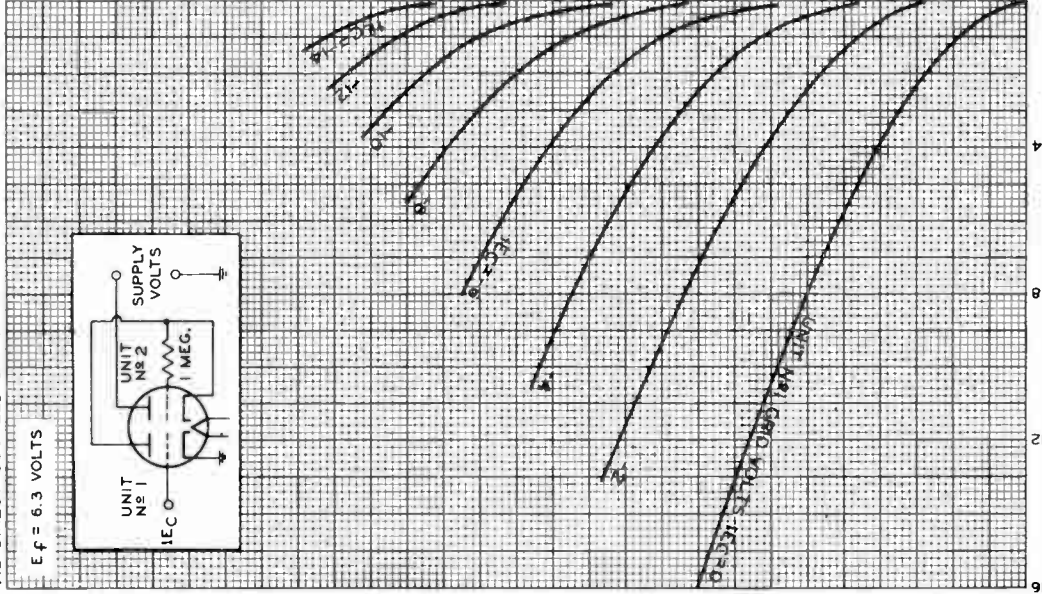
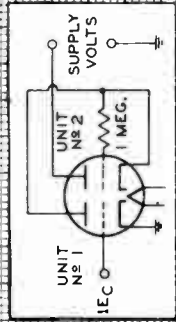
6BQ7-A



# 6BQ7-A

## AVERAGE PLATE CHARACTERISTICS AS DIRECT-COUPLED DRIVEN RF-GROUNDED-GRID AMPLIFIER

$E_f = 6.3$  VOLTS



OCT. 3, 1950

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7549R1



6BQ7-A

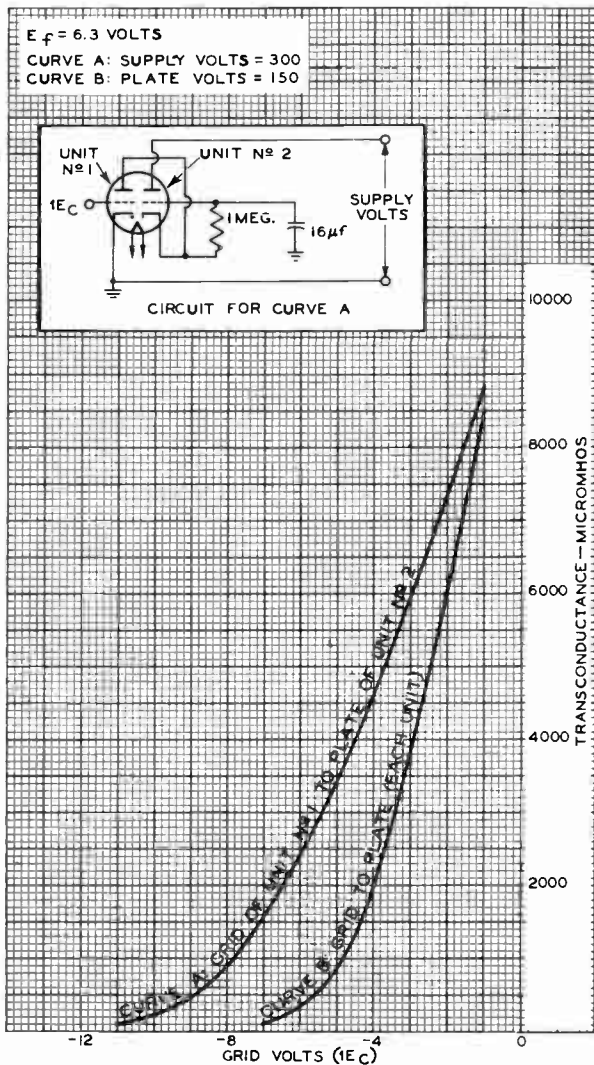
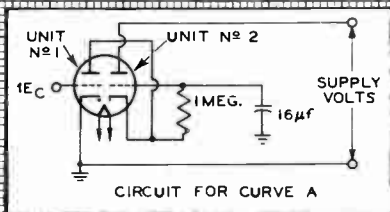
6BQ7-A

### AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS

CURVE A: SUPPLY VOLTS = 300

CURVE B: PLATE VOLTS = 150







6BR8

6BR8

# MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . . 6.3 . . . . . ac or dc volts

Current . . . . . 0.45 . . . . . amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield <sup>o</sup>	
<i>Triode Unit:</i>			
Grid to plate . . . . .	1.8	1.8	$\mu\mu\text{f}$
Grid to cathode and heater . . . . .	2.5	2.5	$\mu\mu\text{f}$
Plate to cathode and heater . . . . .	0.4	1	$\mu\mu\text{f}$

<i>Pentode Unit:</i>			
Grid No.1 to plate . . . . .	0.015 max.	0.008 max.	$\mu\mu\text{f}$
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater . . . . .	5	5	$\mu\mu\text{f}$
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater . . . . .	2.6	3.5	$\mu\mu\text{f}$
Heater to cathode (Each unit).	3	3 <sup>o</sup>	$\mu\mu\text{f}$

### Characteristics:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
Plate-Supply Voltage . . . . .	150	250	volts
Grid-No.2 (Screen-Grid) Supply Voltage . . . . .	—	110	volts
Cathode Resistor . . . . .	56	68	ohms
Amplification Factor . . . . .	40	—	
Plate Resistance (Approx.) . . . . .	5000	400000	ohms
Transconductance . . . . .	8500	5200	$\mu\text{mhos}$
Plate Current . . . . .	18	10	ma
Grid-No.2 Current . . . . .	—	3.5	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 $\mu\text{a}$ . . . . .	-12	-10	volts

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" $\pm$ 3/32"
Maximum Diameter . . . . .	7/8"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2

<sup>o</sup>, <sup>•</sup>: See next page.

6BR8



6BR8

## MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

Base . . . . . Small-Button Noval 9-Pin (JETEC No.E9-1)  
Basing Designation for BOTTOM VIEW. . . . . 9FA

Pin 1—Triode Grid  
Pin 2—Triode Plate  
Pin 3—Triode Cathode  
Pin 4—Heater  
Pin 5—Heater  
Pin 6—Pentode Plate  
Pin 7—Pentode  
Grid No.2



Pin 8—Pentode  
Cathode,  
Pentode  
Grid No.3,  
Internal  
Shield  
Pin 9—Pentode  
Grid No.1

### CONVERTER SERVICE

Maximum Ratings, Design-Center Values:

	Triode Unit as Osc.	Pentode Unit as Mixer	
PLATE VOLTAGE . . . . .	300 max.	300 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	—	300 max.	volts
GRID-No.2 VOLTAGE . . . . .	—	See Grid-No.2 Input	
<i>Rating Chart at front of Receiving Tube Section</i>			
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive bias value . . . . .	0 max.	0 max.	volts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts . . . . .	—	0.5 max.	watt
For grid-No.2 voltages between 150 and 300 volts . . . . .	—	See Grid-No.2 Input	
<i>Rating Chart at front of Receiving Tube Section</i>			
PLATE DISSIPATION . . . . .	2.7 max.	2.8 max.	watts
PFAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode. . . . .	200 max.	200 max.	volts
Heater positive with respect to cathode. . . . .	200 <sup>▲</sup> max.	200 <sup>▲</sup> max.	volts

<sup>○</sup> with external shield JETEC No.315 connected to cathode of unit under test except as noted.

<sup>●</sup> with external shield JETEC No.315 connected to ground.

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

Curves shown under Type 6U8-A also apply to the 6BR8





6BR8-A

6BR8-A

# MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3	ac or dc volts
Current . . . . .	0.45	amp
Warm-up time (Average) . . . . .	11	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield <sup>o</sup>	
<i>Triode Unit:</i>			
Grid to plate . . . . .	1.8	1.8	$\mu\mu\text{f}$
Grid to cathode and heater . . . . .	2.5	2.5	$\mu\mu\text{f}$
Plate to cathode and heater . . . . .	0.4	1	$\mu\mu\text{f}$
<i>Pentode Unit:</i>			
Grid No.1 to plate . . . . .	0.015 max.	0.008 max.	$\mu\mu\text{f}$
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater . . . . .	5	5	$\mu\mu\text{f}$
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater . . . . .	2.6	3.5	$\mu\mu\text{f}$
Heater to cathode (Each unit) . . . . .	3	3 <sup>o</sup>	$\mu\mu\text{f}$

### Characteristics:

	Triode Unit	Pentode Unit	
Plate-Supply Voltage . . . . .	150	250	volts
Grid-No.2 (Screen-grid) Supply Voltage . . . . .	—	110	volts
Cathode Resistor . . . . .	56	68	ohms
Amplification Factor . . . . .	40	—	
Plate Resistance (Approx.) . . . . .	5000	400000	ohms
Transconductance . . . . .	8500	5200	$\mu\text{mhos}$
Plate Current . . . . .	18	10	ma
Grid-No.2 Current . . . . .	—	3.5	ma
Grid-no.1 Voltage (Approx.) for plate $\mu\text{a} = 10$ . . . . .	-12	-10	volts

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"

<sup>o</sup>: See next page.

6BR8-A



6BR8-A

## MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

Maximum Seated Length . . . . . 1-15/16"  
 Length, Base Seat to Bulb Top (Excluding tip) . 1-9/16"  $\pm$  3/32"  
 Diameter . . . . . 0.750" to 0.875"  
 Dimensional Outline . . . . . See General Section  
 Bulb . . . . . T6-1/2  
 Base . . . . . Small-Button Noval 9-Pin (JEDEC No. E9-1)  
 Basing Designation for BOTTOM VIEW . . . . . 9FA

Pin 1 - Triode Grid  
 Pin 2 - Triode Plate  
 Pin 3 - Triode Cathode  
 Pin 4 - Heater  
 Pin 5 - Heater  
 Pin 6 - Pentode Plate  
 Pin 7 - Pentode  
           Grid No. 2



Pin 8 - Pentode  
           Cathode,  
           Pentode  
           Grid No. 3,  
           Internal  
           Shield  
 Pin 9 - Pentode  
           Grid No. 1

### CONVERTER SERVICE

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

	Triode Unit as Osc.	Pentode Unit as Mixer	
PLATE VOLTAGE . . . . .	300 max.	300 max.	volts
GRID-No. 2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	-	300 max.	volts
GRID-No. 2 VOLTAGE . . . . .		See Grid-No. 2 Input	

*Rating Chart at front of Receiving Tube Section*

GRID-No. 1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value . . . . .	0 max.	0 max.	volts
GRID-No. 2 INPUT:			
For grid-No. 2 voltages up to 150 volts . . . . .	-	0.5 max.	watt
For grid-No. 2 voltages between 150 and 300 volts . . . . .	-	See Grid-No. 2 Input	

*Rating Chart at front of Receiving Tube Section*

PLATE DISSIPATION . . . . .	2.7 max.	2.8 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200 max.	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	200 <sup>▲</sup> max.	volts

<sup>○</sup> with external shield JEDEC no. 315 connected to cathode of unit under test except as noted.

<sup>●</sup> with external shield JEDEC no. 315 connected to ground.

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

Curves shown under Type 6U8-A also apply to the 6BR8-A



6BS8

# MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

For use in cascode-type circuits of VHF TV tuners

6BS8

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage	: . . . . .	6.3	. . . . .	ac or dc	volts
Current	. . . . .	0.4	. . . . .		amp

Direct Interelectrode Capacitances:<sup>0</sup>

	Unit No.1	Unit No.2	
Grid to plate . . . . .	1.15	1.15	$\mu\mu\text{f}$
Grid to cathode, internal shield, and heater. . . . .	2.6	-	$\mu\mu\text{f}$
Plate to cathode, internal shield, and heater. . . . .	1.2	-	$\mu\mu\text{f}$
Plate to cathode. . . . .	0.15 max.	0.15 max.	$\mu\mu\text{f}$
Heater to cathode. . . . .	2.6	2.6	$\mu\mu\text{f}$
Cathode to grid, internal shield, and heater. . . . .	-	5	$\mu\mu\text{f}$
Plate to grid, internal shield, and heater. . . . .	-	2.2	$\mu\mu\text{f}$
Plate of unit No.1 to plate of unit No.2. . . . .	0.010 max.		$\mu\mu\text{f}$
Plate of unit No.2 to plate and grid of unit No.1. . . . .	0.024 max.		$\mu\mu\text{f}$

Characteristics, Class A<sub>1</sub> Amplifier (Each Unit Except as Noted):

Plate-Supply Voltage. . . . .	150	volts
Cathode Resistor. . . . .	220	ohms
Amplification Factor. . . . .	3 <sup>f</sup>	
Plate Resistance (Approx.). . . . .	5000	ohms
Transconductance. . . . .	7200	$\mu\text{mhos}$
Plate Current . . . . .	10	ma
Grid Voltage (Approx.) for plate current of 10 $\mu\text{amp}$ <sup>†</sup> . . . . .	-7	volts

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length. . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-9/16" $\pm$ 3/32"
Maximum Diameter. . . . .	7/8"
Dimensional Outline . . . . .	See General Section
Bulb. . . . .	T6-1/2
Base. . . . .	Small Button Noval 9-Pin (JETEC No. E9-1)

<sup>0</sup> with external shield JETEC No. 315 connected to pin 9.

<sup>†</sup> This value applies to unit No.2 only.

6BS8

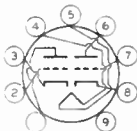


6BS8

## MEDIUM-MU TWIN TRIODE

Basing Designation for BOTTOM VIEW . . . . . 9AJ

Pin 1 - Plate of  
Unit No. 2  
Pin 2 - Grid of  
Unit No. 2  
Pin 3 - Cathode of  
Unit No. 2  
Pin 4 - Heater  
Pin 5 - Heater



Pin 6 - Plate of  
Unit No. 1  
Pin 7 - Grid of  
Unit No. 1  
Pin 8 - Cathode of  
Unit No. 1  
Pin 9 - Internal  
Shield

AMPLIFIER - Class A<sub>1</sub>

Values are for Each Unit

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	150 max.	volts
CATHODE CURRENT . . . . .	20 max.	ma
PLATE DISSIPATION . . . . .	2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 max.	volts

## Typical Operation and Characteristics with Cascode-Type Circuit:

Plate-Supply Voltage . . . . .	250	volts
Grid Voltage . . . . .	-1	volt
Transconductance . . . . .	10000	$\mu$ mhos
Plate Current . . . . .	16	ma
Grid Voltage (Approx.) for transconductance of 50 $\mu$ mhos . . . . .	-6	volts

## Maximum Circuit Values:

Grid-Circuit Resistance . . . . .	0.5 max.	megohm
-----------------------------------	----------	--------



6BU8

6BU8

# SHARP-CUTOFF TWIN PENTODE

With Common Cathode. Grid No. 1, and Grid No. 2

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 plate (Each unit) . . . . .	1.9	μf
Grid No.1 to all other electrodes. . . . .	6	μf
Grid No.3 to all other electrodes (Each unit). . . . .	3.6	μf
Plate to all other electrodes (Each unit). . . . .	3	μf
Grid No.3 (Unit No.1) to grid No.3 (Unit No.2). . . . .	0.015 max.	μf

### Characteristics, Class A<sub>1</sub> Amplifier:

*With Both Units Operating*

Plate Voltage (Each unit) . . . . .	100	100	volts
Grid-No.3 (Suppressor-Grid) Voltage (Each unit). . . . .	-10	0	volts
Grid-No.2 (Screen-Grid) Voltage. . . . .	67.5	67.5	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	♦	♦	volts
Plate Current (Each unit). . . . .	-	2.2	ma
Grid-No.2 Current. . . . .	6.5	3.3	ma
Cathode Current. . . . .	6.6	7.8	ma

*With One Unit Operating<sup>■</sup>*

Plate Voltage. . . . .	100	100	volts
Grid-No.3 Voltage. . . . .	0	0	volts
Grid-No.2 Voltage. . . . .	67.5	67.5	volts
Grid-No.1 Voltage. . . . .	0	♦	volts
Grid-No.3-to-Plate Transconductance. . . . .	-	180	μmhos
Grid-No.1-to-Plate Transconductance. . . . .	1500	-	μmhos
Plate Current. . . . .	-	2.2	ma
Grid-No.3 Voltage (Approx.) for plate current of 100 μa . . . . .	-	-4.5	volts
Grid-No.1 Voltage (Approx.) for plate current of 100 μa. . . . .	-	-2.3	volts

### 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 . . . . .	. . . . .	7/8"
Dimensional Outline. . . . .	. . . . .	See General Section

<sup>o</sup>, ♦, ■: See next page.



6BU8

## SHARP-CUTOFF TWIN PENTODE

With Common Cathode, Grid No. 1, and Grid No. 2

Bulb. . . . . T6-1/2  
 Base. . . . . Small-Button Noval 9-Pin (JETEC No. E9-1)  
 Basing Designation for BOTTOM VIEW. . . . . 9GF

Pin 1 - Cathode  
 Pin 2 - Grid No. 2,  
           Internal  
           Shield  
 Pin 3 - Plate of  
           Unit No. 2  
 Pin 4 - Heater  
 Pin 5 - Heater



Pin 6 - Grid No. 3 of  
           Unit No. 2  
 Pin 7 - Grid No. 1  
 Pin 8 - Plate of  
           Unit No. 1  
 Pin 9 - Grid No. 3 of  
           Unit No. 1

### AMPLIFIER - Class A<sub>1</sub>

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

PLATE VOLTAGE (Each unit) . . . . .	270	max.	volts
GRID-No. 3 (SUPPRESSOR-GRID) VOLTAGE (Each unit):			
Peak positive value . . . . .	45	max.	volts
DC negative value . . . . .	45	max.	volts
DC positive value . . . . .	2.7	max.	volts
GRID-No. 2 (SCREEN-GRID) VOLTAGE . . . . .	135	max.	volts
GRID-No. 1 (CONTROL-GRID) VOLTAGE:			
Negative bias value . . . . .	45	max.	volts
CATHODE CURRENT . . . . .	10.5	max.	ma
GRID-No. 2 INPUT . . . . .	0.6	max.	watt
PLATE DISSIPATION (Each unit) . . . . .	0.9	max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup>	max.	volts

#### Maximum Circuit Values:

Grid-No. 3-Circuit Resistance (Each unit) .	0.5	max.	megohm
Grid-No. 1-Circuit Resistance. . . . .	0.5	max.	megohm

◊ Without external shield.

◆ Adjusted to give a dc grid-No. 1 current of 100 microamperes.

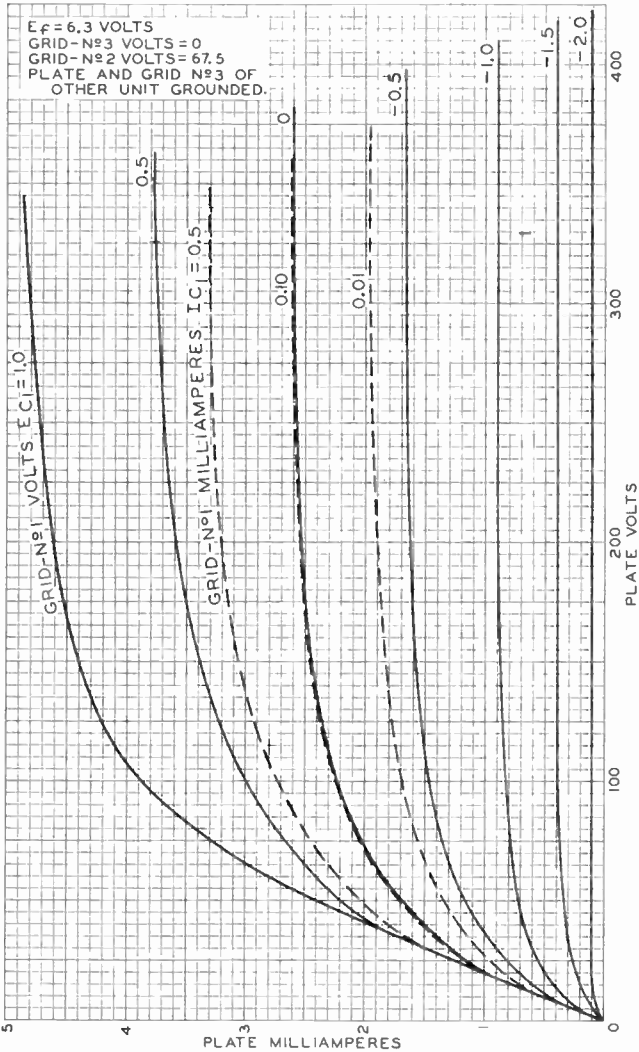
■ With plate and grid No. 3 of the other unit connected to ground.

▲ The dc component must not exceed 100 volts.



6BU8

### AVERAGE PLATE CHARACTERISTICS EACH UNIT

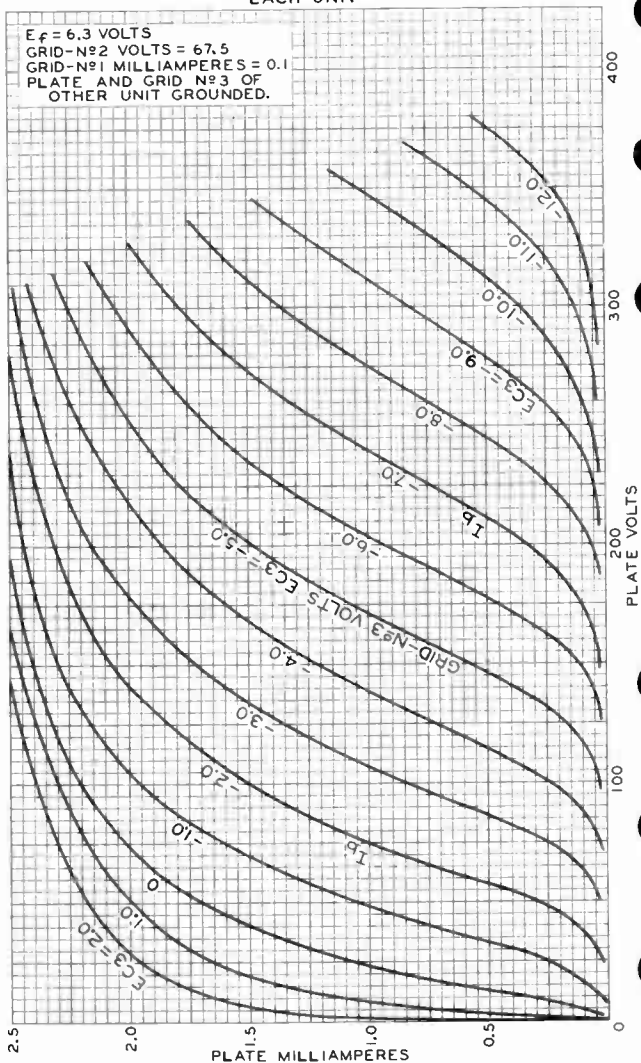


6BU8



6BU8

### AVERAGE PLATE CHARACTERISTICS EACH UNIT



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9429

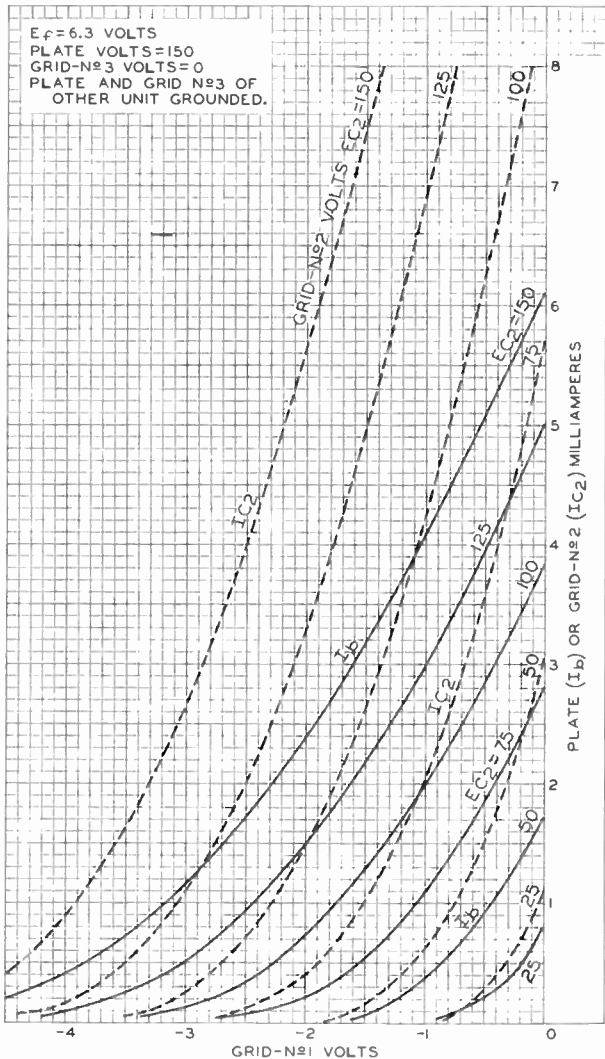




6BU8

6BU8

### AVERAGE CHARACTERISTICS EACH UNIT



ELECTRON TUBE DIVISION

92CM-9433

RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

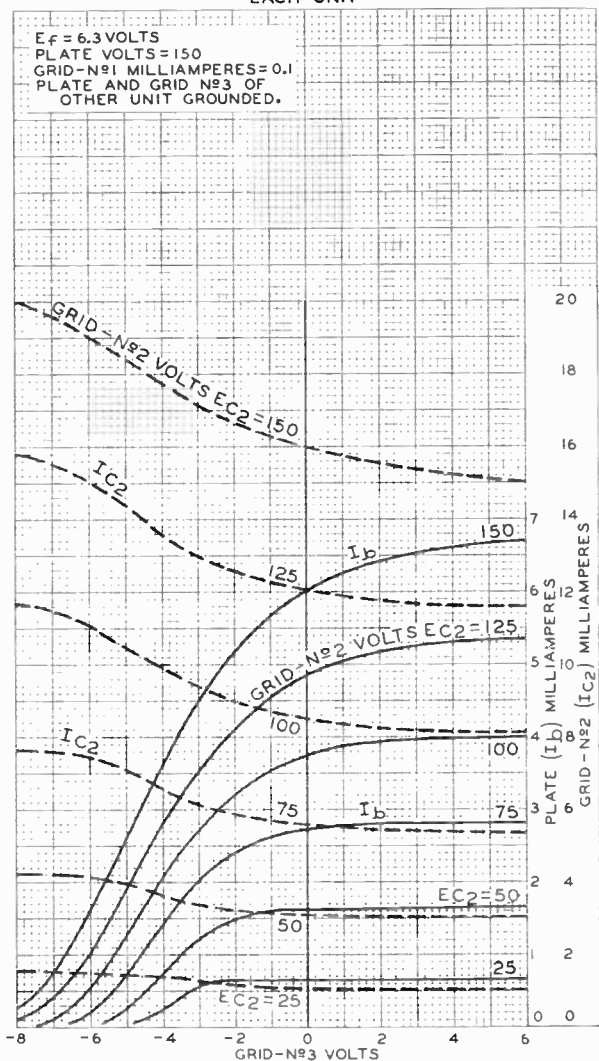
6BU8



6BU8

### AVERAGE CHARACTERISTICS EACH UNIT

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 150  
 GRID-N<sup>o</sup>1 MILLIAMPERES = 0.1  
 PLATE AND GRID N<sup>o</sup>3 OF  
 OTHER UNIT GROUNDING.



ELECTRON TUBE DIVISION

92CM-9434

RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

World Radio History



6BW4

6BW4

# FULL-WAVE VACUUM RECTIFIER

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3	volts
Current . . . . .	0.9	amp

### 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"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9DJ

- Pin 1 - Plate No. 2
- Pin 2 - No Connection
- Pin 3 - Same as Pin 2
- Pin 4 - Heater



- Pin 5 - Heater
- Pin 6 - Same as Pin 2
- Pin 7 - Plate No. 1
- Pin 8 - Same as Pin 2
- Pin 9 - Cathode

## FULL-WAVE RECTIFIER

### Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE . . . . .	1275 max.	volts
AC PLATE SUPPLY VOLTAGE PER PLATE (RMS) (See Rating Chart I) . . . . .	450 max.	volts
STEADY-STATE PEAK PLATE CURRENT PER PLATE (See Rating Chart II) . . . . .	350 max.	ma
TRANSIENT PEAK PLATE CURRENT PER PLATE (See Rating Chart III) . . . . .	2 max.	amp
DC OUTPUT CURRENT . . . . .	See Rating Chart I	
DC HEATER-CATHODE VOLTAGE: Heater negative with respect to cathode . . . . .	450 max.	volts

### Typical Operation:

	With capacitor input to filter	With choke input to filter	
AC Plate-to-Plate Supply Voltage (RMS)▲	650	900	volts
Filter-Input Capacitor.	40	-	μf
Filter-Input Choke. . .	-	10	henries
Total Effective Plate Supply Resistance Per Plate . . . . .	82	-	ohms
DC Output Voltage at Input to Filter . . . . .	330	360	volts

6BW4



6BW4

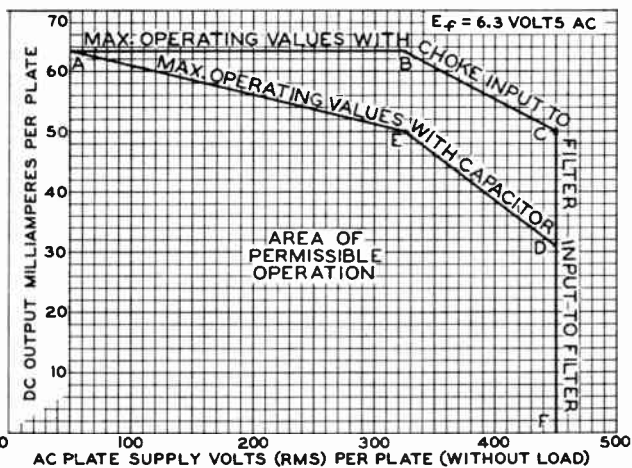
FULL-WAVE VACUUM RECTIFIER

	<i>With capacitor input to filter</i>	<i>With choke input to filter</i>	
DC Output Current . . .	100	100	ma
<b>Characteristics:</b>			
<i>Values are for Each Unit</i>			
Tube-Voltage Drop for plate ma. = 100 . . . . .		40	volts
▲ AC plate supply voltage is measured without load.			

10-59

DATA

RATING CHART I





6BW4

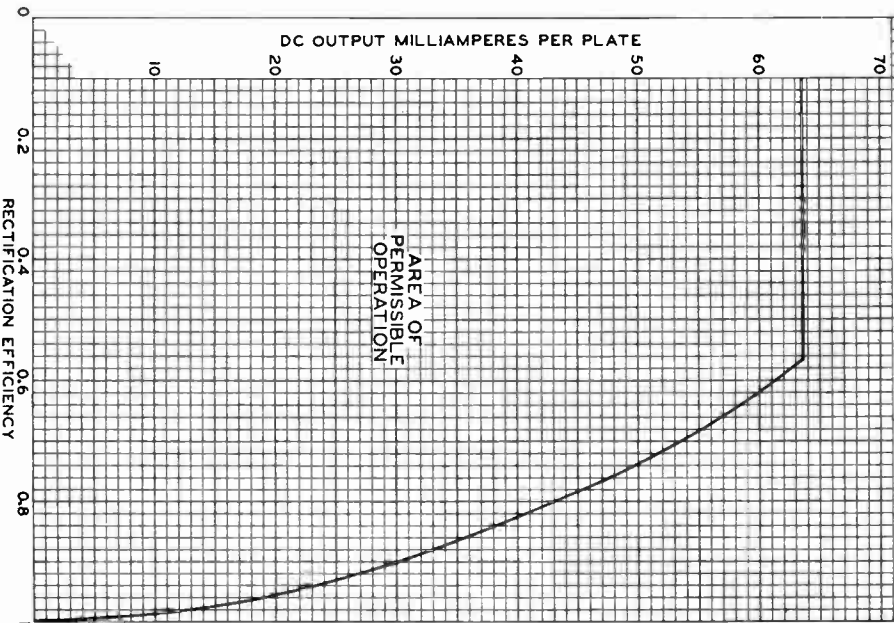
6BW4

### RATING CHART II CAPACITOR INPUT TO FILTER

$E_f = 6.3$  VOLTS AC  
STEADY-STATE PEAK PLATE CURRENT PER  
PLATE = 350 MA.

RECTIFIER EFFICIENCY =  $\frac{\sqrt{2} E_s}{\bar{E}}$

WHERE  $\bar{E}$  = DC OUTPUT VOLTS AT INPUT TO FILTER  
 $E_s$  = AC PLATE SUPPLY VOLTS (RMS) PER  
PLATE (WITHOUT LOAD)



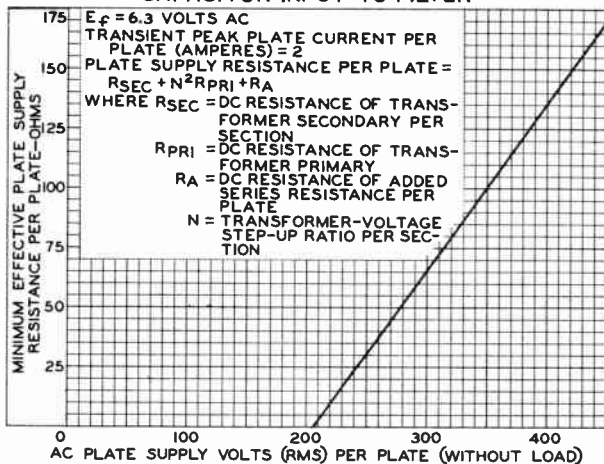
6BW4



6BW4

### RATING CHART III

#### CAPACITOR INPUT TO FILTER



92CS-10224



6BX7-GT

6BX7-GT

MEDIUM-MU TWIN TRIODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3	ac or dc volts
Current . . . . .	1.5	amp

Direct Interelectrode Capacitances (Approx.):

	without External Shield	with External Shield <sup>o</sup>	
<i>Unit No. 1:</i>			
Grid to plate . . . . .	4.2	4.2	$\mu\text{mf}$
Grid to cathode and heater.	4.4	5.0	$\mu\text{mf}$
Plate to cathode and heater.	1.1	3.4	$\mu\text{mf}$
<i>Unit No. 2:</i>			
Grid to plate . . . . .	4.0	4.0	$\mu\text{mf}$
Grid to cathode and heater.	4.0	5.0	$\mu\text{mf}$
Plate to cathode and heater.	1.2	3.2	$\mu\text{mf}$
Grid to grid. . . . .	0.11	0.10	$\mu\text{mf}$
Plate to plate. . . . .	1.5	1.2	$\mu\text{mf}$

Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):

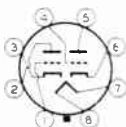
Plate Voltage . . . . .	100	250	volts
Grid Voltage. . . . .	0	-	volts
Cathode Resistor. . . . .	-	390	ohms
Amplification Factor. . . . .	-	10	
Plate Resistance (Approx.). . . . .	-	1300	ohms
Transconductance. . . . .	-	7600	$\mu\text{mhos}$
Plate Current . . . . .	80	42	ma
Grid Voltage (Approx.) for plate current of 50 $\mu\text{amp}$ . . . . .	-	-40	volts

Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length. . . . .	3-5/16"
Maximum Seated Length . . . . .	2-3/4"
Maximum Diameter. . . . .	1-9/32"
Dimensional Outline . . . . .	See General Section
Bulb. . . . .	T-9
Base. . . . .	Short Intermediate-Shell Octal 8-Pin with External Barriers (JETEC No. 88-58)

Easing Designation for BOTTOM VIEW . . . . . 8E0

Pin 1 - Grid of Unit No. 2	Pin 5 - Plate of Unit No. 1
Pin 2 - Plate of Unit No. 2	Pin 6 - Cathode of Unit No. 1
Pin 3 - Cathode of Unit No. 2	Pin 7 - Heater
Pin 4 - Grid of Unit No. 1	Pin 8 - Heater



<sup>o</sup> with external shield JETEC No. 308 connected to cathode of unit under test.



## 6BX7-GT

## MEDIUM-MU TWIN TRIODE

VERTICAL DEFLECTION OSCILLATOR<sup>♦</sup>

Values are for Each Unit

## Maximum Ratings, Design-Center Values:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	500 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	400 max.	volts
CATHODE CURRENT:		
Peak . . . . .	180 max.	ma
Average . . . . .	60 max.	ma
PLATE DISSIPATION:		
Either plate . . . . .	10 max.	watts
Both plates (Both units operating) . . . . .	12 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	volts

## Maximum Circuit Values:

Grid-Circuit Resistance . . . . . 2.2 max. megohms

VERTICAL DEFLECTION AMPLIFIER<sup>♦</sup>

Values are for Each Unit

## Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	500 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE <sup>#</sup> (Absolute maximum) . . . . .	2000 <sup>■</sup> max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	250 max.	volts
CATHODE CURRENT:		
Peak . . . . .	180 max.	ma
Average . . . . .	60 max.	ma
PLATE DISSIPATION:		
Either plate . . . . .	10 max.	watts
Both plates (Both units operating) . . . . .	12 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	volts

## Maximum Circuit Values:

Grid-Circuit Resistance:  
For cathode-bias operation . . . . . 2.2 max. megohms

<sup>♦</sup> when the 6BX7-GT is operated as a combined vertical deflection amplifier and oscillator, it is recommended that unit No.1 (pins 4, 5, and 6) be used as the oscillator.

<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

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

<sup>#</sup> This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

<sup>■</sup> Under no circumstances should this absolute value be exceeded.





6BY5-GA

# 6BY5-GA FULL-WAVE VACUUM RECTIFIER

For Television Damper Service

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3 . . . . .	ac or dc volts
Current . . . . .	1.6 . . . . .	amp

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	3-7/8"
Maximum Seated Length . . . . .	3-5/16"
Maximum Diameter . . . . .	1-9/16"
Bulb . . . . .	T-12

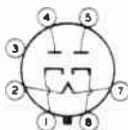
Base . . . . . Medium-Shell Octal 7-Pin (JETEC No. B7-12),  
or Short-Medium-Shell Octal 7-Pin  
with External Barriers (JETEC No. B7-119)

Basins Designation for BOTTOM VIEW . . . . . 6CN

Pin 1 - Cathode of Unit No. 2

Pin 2 - Heater

Pin 3 - No Connection - Do Not Use\*



Pin 4 - Plate of Unit No. 2

Pin 5 - Plate of Unit No. 1

Pin 7 - Heater

Pin 8 - Cathode of Unit No. 1

## DAMPER SERVICE

Values are for Each Unit

Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system<sup>□</sup>

PEAK INVERSE PLATE VOLTAGE (Absolute maximum)* . . . . .	3000 <sup>■</sup> max.	volts
PEAK PLATE CURRENT . . . . .	525 max.	ma
DC PLATE CURRENT . . . . .	175 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	450 max.	volts
Heater positive with respect to cathode . . . . .	100 max.	volts

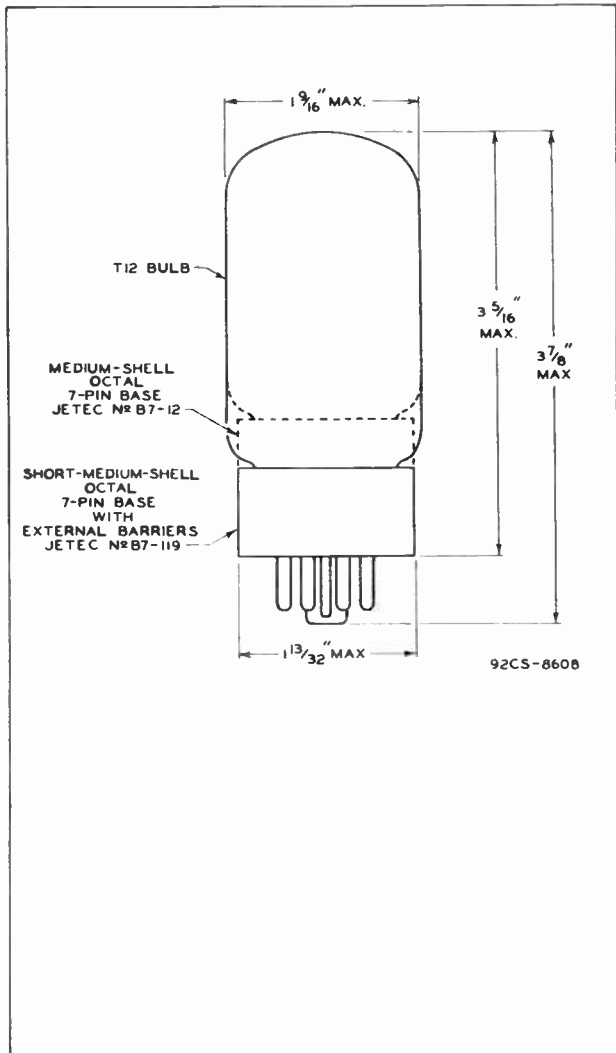
- Socket terminal No. 3 should not be used as tie point.
- As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- \* This rating is applicable where the duty cycle of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.
- Under no circumstances should this absolute value be exceeded.

6BY5-GA



6BY5-GA

FULL-WAVE VACUUM RECTIFIER





6BY6

6BY6

# PENTAGRID AMPLIFIER

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.1 to Plate . . . . .	0.08 max.	$\mu$ f
Grid No.3 to Plate . . . . .	0.35 max.	$\mu$ f
Grid No.1 to Grid No.3 . . . . .	0.15 max.	$\mu$ f
Grid No.1 to All Other Electrodes and Heater . . . . .	5.4	$\mu$ f
Grid No.3 to All Other Electrodes and Heater . . . . .	6.9	$\mu$ f
Plate to All Other Electrodes and Heater . . . . .	7.6	$\mu$ f

Characteristics, Class A<sub>1</sub> Amplifier:

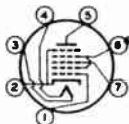
Plate Voltage . . . . .	250	volts
Grids-No.2-and-No.4 Voltage . . . . .	100	volts
Grid-No.3 Voltage . . . . .	-2.5	volts
Grid-No.1 Voltage . . . . .	-2.5	volts
Grid-No.3-to-Plate Transconductance . . . . .	500	$\mu$ hos
Grid-No.1-to-Plate Transconductance . . . . .	1900	$\mu$ hos
Plate Current . . . . .	6.5	ma
Grids-No.2-and-No.4 Current . . . . .	9	ma
Grid-No.3 Volts (Approx.) for plate current of 35 $\mu$ amp and grid-No.1 volts = -4 . . . . .	-15	volts
Grid-No.1 Volts (Approx.) for plate current of 35 $\mu$ amp and grid-No.3 volts = 0 . . . . .	-12	volts

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length from Base Seat to 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. F7-1)

### BOTTOM VIEW

- 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

\*: with no external shield.

6BY6



6BY6

## PENTAGRID AMPLIFIER

## GATED AMPLIFIER SERVICE

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max. volts
GRIDS-No.2-and-No.4 VOLTAGE . . . . .	See Rating Curve at front of this Section
GRIDS-No.2-and-No.4 SUPPLY VOLTAGE . . . . .	300 max. volts
GRID-No.3 SUPPLY VOLTAGE:	
Negative Bias Value . . . . .	50 max. volts
Positive Bias Value . . . . .	0 max. volts
Positive Peak Value . . . . .	25 max. volts
GRID-No.1 SUPPLY VOLTAGE:	
Negative Bias Value . . . . .	100 max. volts
PLATE DISSIPATION . . . . .	2 max. watts
GRID-No.3 INPUT . . . . .	0.1 max. watt
GRIDS-No.2-and-No.4 INPUT . . . . .	1 max. watt
GRID-No.1 INPUT . . . . .	0.1 max. watt
PEAK HEATER-CATHODE VOLTAGE:	
Heater negative with respect to cathode . . . . .	200 max. volts
Heater positive with respect to cathode . . . . .	200 <sup>#</sup> max. volts

## Characteristics as Sync Separator and Sync Clipper:

Plate Voltage . . . . .	10	volts
Grid-No.3 Voltage . . . . .	0	volts
Grids-No.2-and-No.4 Voltage . . . . .	25	volts
Grid-No.1 Voltage . . . . .	0	volts
Plate Current . . . . .	1.4	ma
Grids-No.2-and-No.4 Current . . . . .	3.5	ma
Grid-No.3 Bias Volts (Approx.) for plate voltage of 25 volts, grids-No.2-and-No.4 voltage of 25 volts, grid-No.1 voltage of 0 volts, and plate current of 50 $\mu$ amp . . . . .	-2.5	volts
Grid-No.1 Bias Volts (Approx.) for plate voltage of 25 volts, grids-No.2-and-No.4 voltage of 25 volts, grid-No.3 voltage of 0 volts, and plate current of 50 $\mu$ amp . . . . .	-2.3	volts

## Maximum Circuit Values:

Grid-No.1 or Grid-No.3-Circuit Resistance:	
For fixed-bias operation . . . . .	0.5 max. megohm
For cathode-bias operation . . . . .	1.0 max. megohm

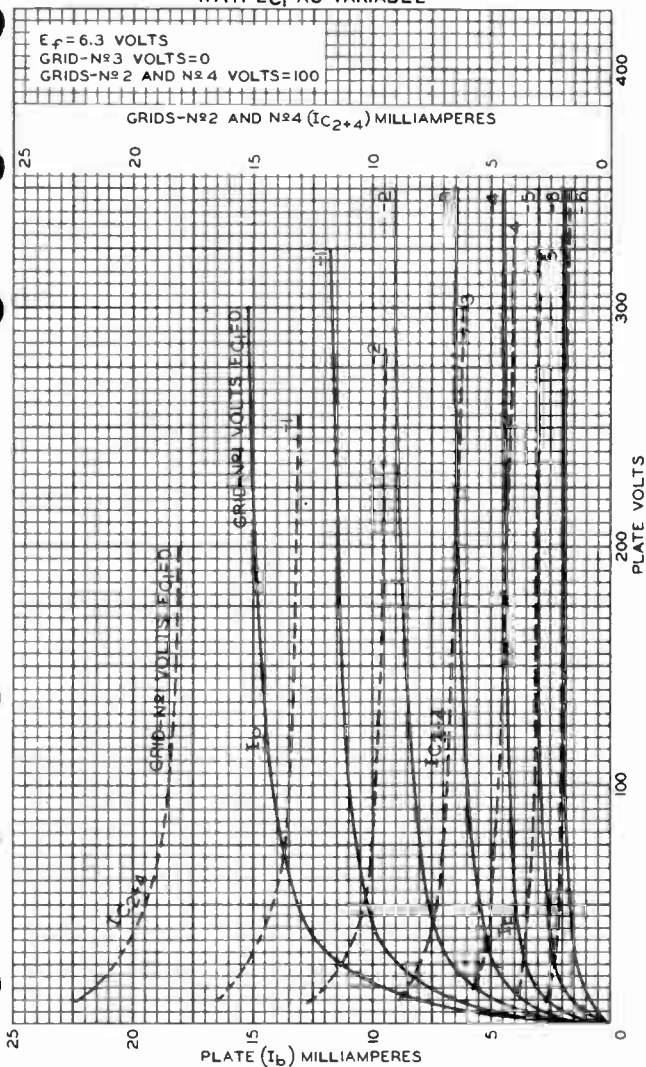
<sup>#</sup> The dc component must not exceed 100 volts.



6BY6

6BY6

# AVERAGE OPERATION CHARACTERISTICS WITH $E_{C1}$ AS VARIABLE



NOV. 5, 1953

TUBE DEPARTMENT

92CM-8140

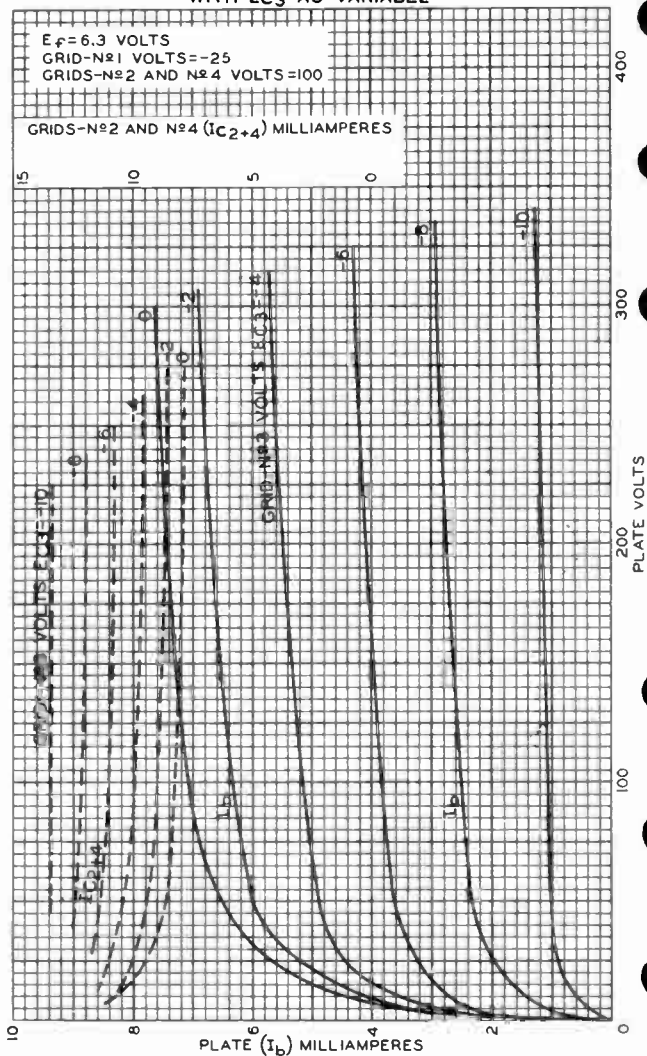
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

6BY6



6BY6

# AVERAGE OPERATION CHARACTERISTICS WITH $E_{C3}$ AS VARIABLE



NOV. 5, 1953

 TUBE DEPARTMENT  
 RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

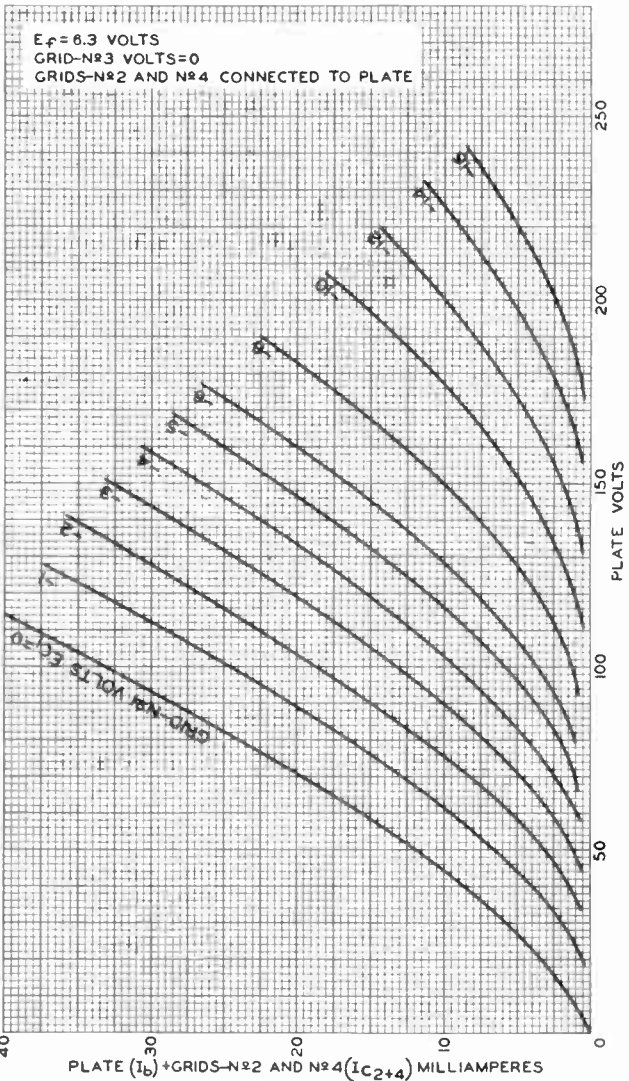
92CM-8139



6BY6

6BY6

### AVERAGE PLATE CHARACTERISTICS



NOV. 5, 1953

TUBE DEPARTMENT

92CM-8138

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History







6BY8

6BY8

# DIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having series heater-string arrangement*

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3	. . . . .	ac or dc volts
Current . . . . .	0.6	. . . . .	amp
Warm-up time (Average),	11	. . . . .	sec.

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*

Direct Interelectrode Capacitances:<sup>0</sup>

#### Diode Unit:

Plate to cathode, pentode		
plate, pentode grid No.3 & internal shield, pentode		
grid No.2, pentode grid No.1, pentode cathode, and heater . . . . .	4.8*	μf

#### Pentode Unit:

Grid No.1 to plate . . . . .	0.0035 max.	μf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . .	5.5	μf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . .	5	μf

### Characteristics, Class A<sub>1</sub> Amplifier (Pentode Unit):

Plate-Supply Voltage . . . . .	100	250	volts
Grid No.3 (Suppressor Grid) . . . . .	<i>Connected to cathode at socket</i>		
Grid-No.2 (Screen-Grid) Supply Voltage . . . . .	100	150	volts
Cathode Resistor . . . . .	150	68	ohms
Plate Resistance (Approx.) . . . . .	0.5	1	megohm
Transconductance . . . . .	3900	5200	μmhos
Plate Current . . . . .	5	10.6	ma
Grid-No.2 Current . . . . .	2.1	4.3	ma
Grid-No.1 (Control-Grid) Voltage (Approx.) for plate $\mu = 10$ . . . . .	-4.2	-6.5	volts

### 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"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	<i>See General Section</i>
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JETEC No.E9-1)

<sup>0</sup>, \* See next page.

6BY8



6BY8

## DIODE—SHARP-CUTOFF PENTODE

Basing Designation for BOTTOM VIFW . . . . . 9FN

Pin 1—Pentode  
Grid No.1  
Pin 2—Pentode  
Grid No.3.  
Internal  
Shield  
Pin 3—Diode  
Cathode



Pin 4—heater  
Pin 5—Heater  
Pin 6—Diode Plate  
Pin 7—Pentode Plate  
Pin 8—Pentode  
Grid No.2  
Pin 9—Pentode  
Cathode

PENTODE UNIT — AMPLIFIER — Class A<sub>1</sub>

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . . 300 max. volts  
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE. . . . . 0 max. volts  
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . . 300 max. volts  
GRID-No.2 VOLTAGE. . . . . See Grid-No.2 Input Rating Chart  
at front of Receiving Tube Section

## GRID-No.1 (CONTROL-GRID) VOLTAGE:

Negative-bias value. . . . . 50 max. volts  
Positive-bias value. . . . . 0 max. volts

## GRID-No.2 INPUT:

For grid-No.2 voltages up to 150 volts. . . . . 0.65 max. watt  
For grid-No.2 voltages between 150  
and 300 volts. . . . . See Grid-No.2 Input Rating Chart  
at front of Receiving Tube Section

PLATE DISSIPATION. . . . . 3 max. watts

## PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . . . . 200 max. volts  
Heater positive with respect to cathode. . . . . 200<sup>▲</sup> max. volts

## Maximum Circuit Values:

## Grid-No.1—Circuit Resistance:

For fixed-bias operation . . . . . 0.25 max. megohm  
For cathode-bias operation . . . . . 1 max. megohm

## DIODE UNIT

## Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE . . . . . 430 max. volts

## PLATE CURRENT:

Peak . . . . . 180 max. ma  
DC . . . . . 45 max. ma

## PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . . . . 200 max. volts  
Heater positive with respect to cathode. . . . . 200<sup>▲</sup> max. volts

<sup>○</sup> with external shield JETEC No.315 connected to pentode cathode (pin 9) except as noted.

<sup>●</sup> with external shield JETEC No.315 connected to ground.

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



6BY8

6BY8

## DIODE—SHARP-CUTOFF PENTODE

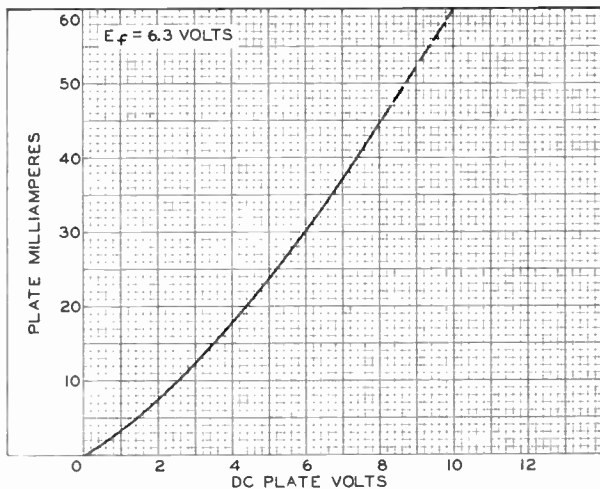
### CURVES

shown under Type 6AU6 also apply to the  
pentode unit of the 6BY8

9-58

TENTATIVE DATA 2

### AVERAGE PLATE CHARACTERISTIC DIODE UNIT



92CS-9616

ELECTRON TUBE DIVISION

RCA CORPORATION OF AMERICA HARRISON, NEW JERSEY

World Radio History





6BZ6

6BZ6

# SEMIREMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3 ± 10%	volts
Current . . . . .	0.3	amp

Direct Interelectrode Capacitances:

	<i>Without External Shield</i>	<i>With External Shield<sup>o</sup></i>	
Grid No.1 to plate. . . . .	0.025 max.	0.015 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater . . . .	7	7	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater. . . . .	2	3	μμf

### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Supply Voltage. . . . .	125	volts
Grid No.3 . . . . .	<i>Connected to cathode at socket</i>	
Grid-No.2 Supply Voltage. . . . .	125	volts
Cathode Resistor. . . . .	56	ohms
Plate Resistance (Approx.) . . . . .	0.26	megohm
Transconductance. . . . .	8000	μmhos
Plate Current . . . . .	14	ma
Grid-No.2 Current . . . . .	3.6	ma
Grid-No.1 Voltage (Approx.) for trans- conductance (μmhos) = 50. . . . .	-19	volts
Grid-No.1 Voltage (Approx.) for trans- conductance (μmhos) = 700 and cathode resistor (ohms) = 0 . . . . .	-4.5	volts

### Mechanical:

Operating Position. . . . .	Any
Maximum Overall Length. . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-1/2" ± 3/32"
Diameter. . . . .	0.650" to 0.750"
Dimensional Outline . . . . .	<i>See General Section</i>
Bulb. . . . .	T5-1/2
Base. . . . .	Small-Button Miniature 7-Pin (JEDEC No. E7-1)
Basing Designation for BOTTOM VIEW. . . . .	7CM

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



- Pin 6 - Grid No.2
- Pin 7 - Grid No.3,  
Internal  
Shield

← Indicates a change.

6BZ6



6BZ6

## SEMIREMOTE-CUTOFF PENTODE

AMPLIFIER — Class A<sub>1</sub>→ **Maximum Ratings, Design-Maximum Values:**

PLATE VOLTAGE . . . . .	330	max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE . .	0	max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE.	330	max.	volts
GRID-No.2 VOLTAGE . . . . .	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>		
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value . . . . .	0	max.	volts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to			
165 volts . . . . .	0.55	max.	watt
For grid-No.2 voltages between 165			
and 330 volts . . . . .	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>		
PLATE DISSIPATION . . . . .	2.3	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with			
respect to cathode. . . . .	200	max.	volts
Heater positive with			
respect to cathode. . . . .	200 <sup>▲</sup>	max.	volts

**Maximum Circuit Values:**

## Grid-No.1-Circuit Resistance:

For fixed-bias operation. . . . .	0.25	max.	megohm
For cathode-bias operation. . . . .	1	max.	megohm

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

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

→ Indicates a change.

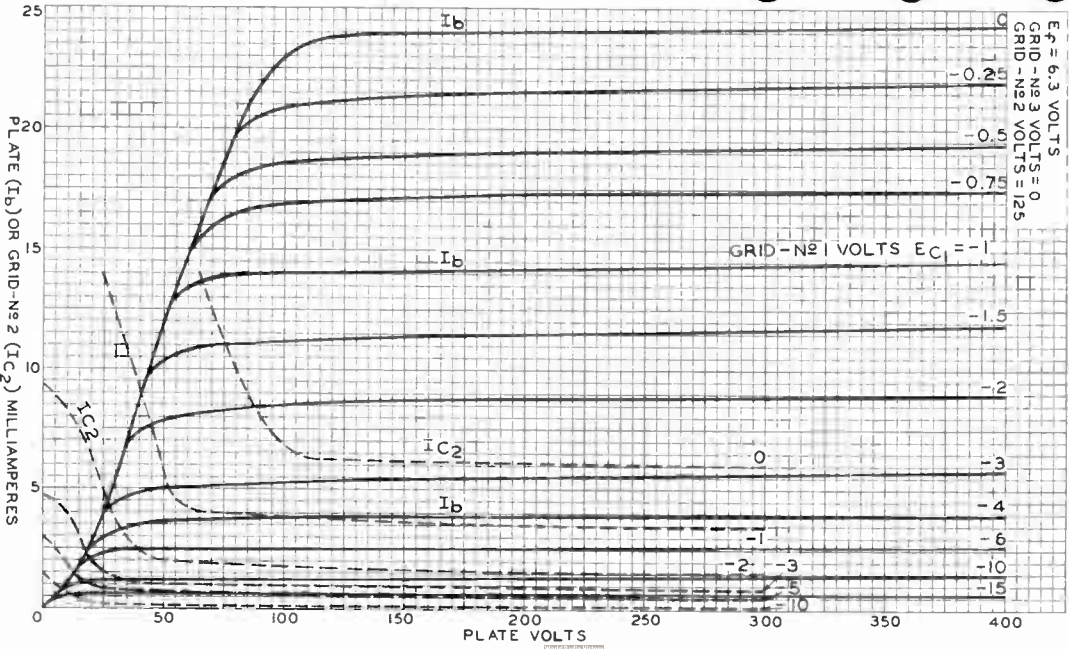


6BZ6

6BZ6

AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID - No 3 VOLTS = 0  
GRID - No 2 VOLTS = 125



ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8508R2

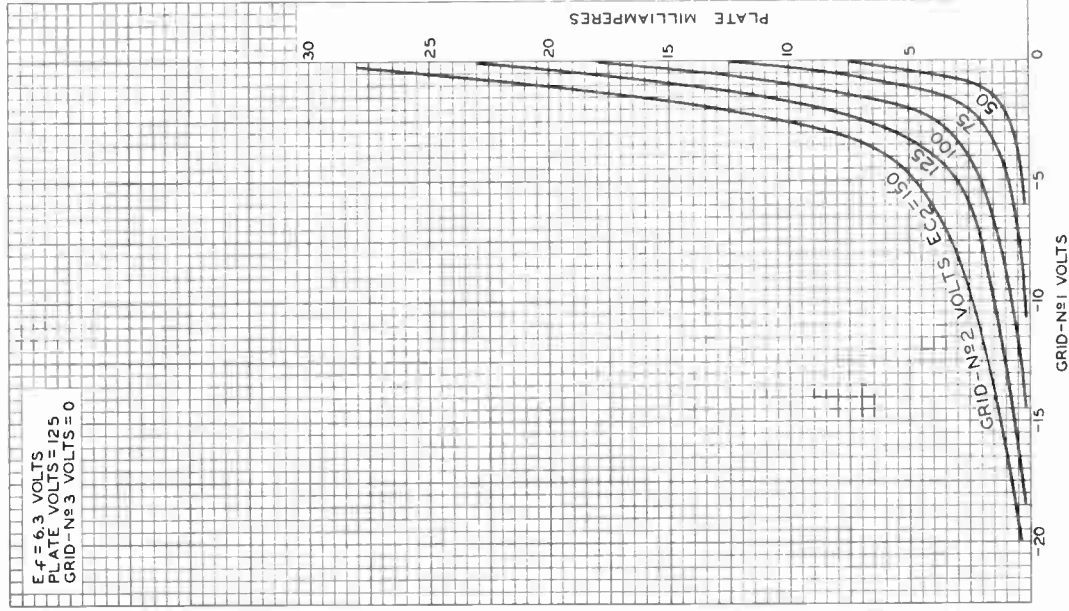
6BZ6



6BZ6

## AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 125  
 GRID - No 3 VOLTS = 0



GRID-No 1 VOLTS

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-948IRI



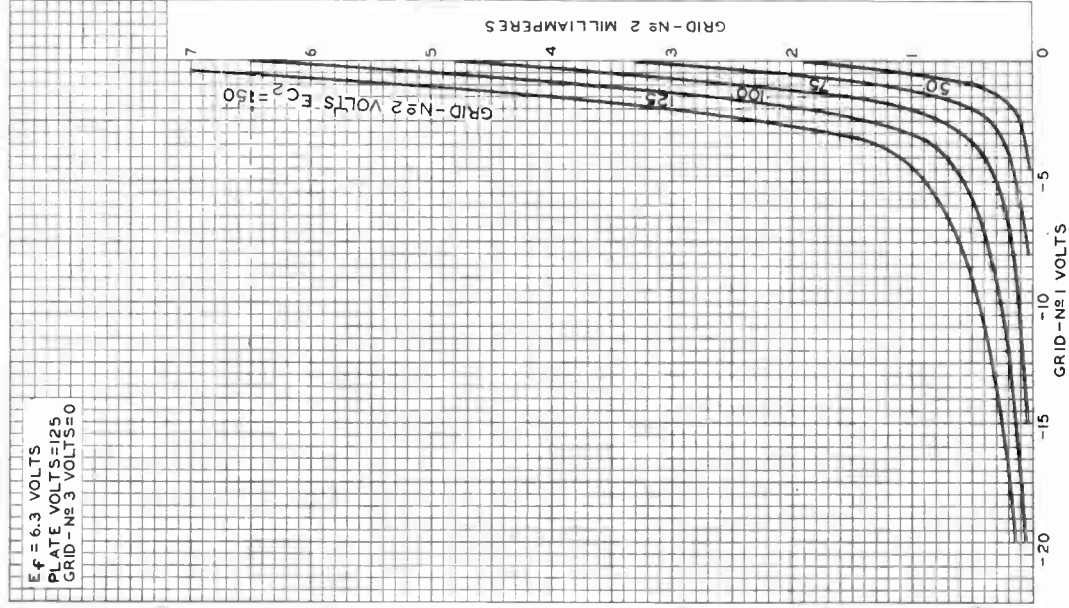


6BZ6

6BZ6

### AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
PLATE VOLTS = 125  
GRID - No 3 VOLTS = 0

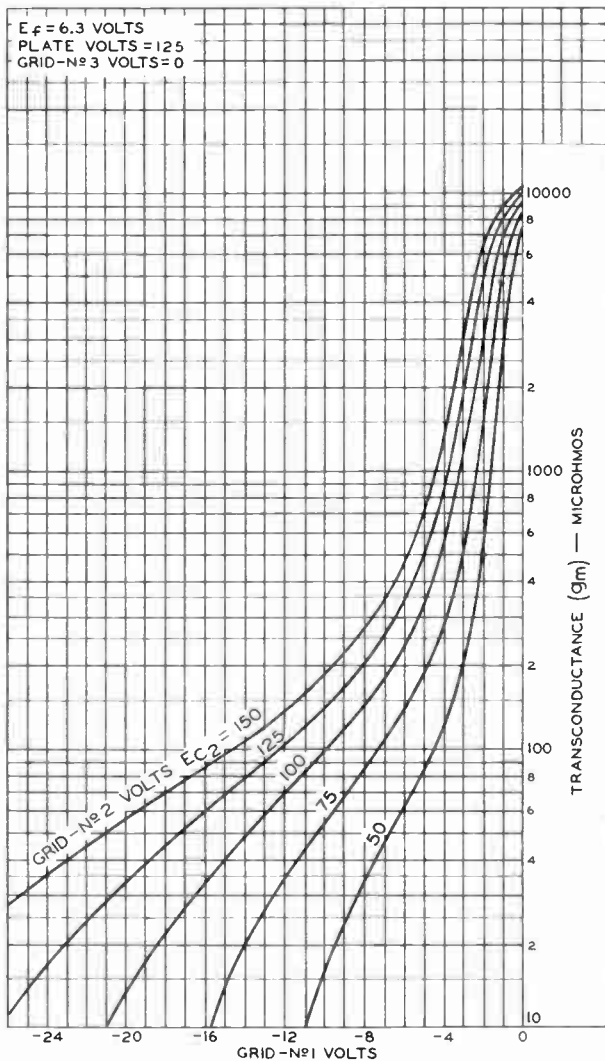


6BZ6



6BZ6

## AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

92CM-8509R1



6BZ7

6BZ7

# MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3 . . . . .	ac or dc volts
Current . . . . .	0.4 . . . . .	amp

Direct Interelectrode Capacitances (With external shield JETEC No.315 connected to cathode):

	Unit No.1	Unit No.2	
Grid to plate . . . . .	1.15	1.15	$\mu\mu\text{f}$
Grid to cathode, heater, and internal shield. . . .	2.5	-	$\mu\mu\text{f}$
Plate to cathode. . . . .	0.15 max.	0.15 max.	$\mu\mu\text{f}$
Plate to cathode, heater, and internal shield. . . .	1.35	-	$\mu\mu\text{f}$
Plate to grid, heater, and internal shield. . . .	-	2.27	$\mu\mu\text{f}$
Cathode to grid, heater, and internal shield. . . .	-	4.95	$\mu\mu\text{f}$
Cathode to heater . . . . .	2.6	2.7	$\mu\mu\text{f}$
Plate of unit No.1 to plate of unit No.2 . . . .		0.010 max.	$\mu\mu\text{f}$
Plate of unit No.2 to plate & grid of unit No.1		0.024 max.	$\mu\mu\text{f}$

### Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):

Plate Supply Voltage . . . . .	150	volts
Cathode-Bias Resistor . . . . .	220	ohms
Amplification Factor . . . . .	38	
Plate Resistance . . . . .	5600	ohms
Transconductance . . . . .	6800	$\mu\text{mhos}$
Plate Current . . . . .	10	ma
Grid Volts (Approx.) for plate current of 10 $\mu\text{amp}$ . . . . .	-11	volts

### Mechanical:

Mounting Position . . . . . Any

Maximum Overall Length . . . . . 2-3/16"

Maximum Seated Length . . . . . 1-15/16"

Maximum Diameter . . . . . 7/8"

Bulb . . . . . T-6-1/2

Base . . . . . Small-Button Noval 9-Pin (JETEC No.E9-1)

Basing Designation for BOTTOM VIEW . . . . . 9AJ

Pin 1 - Plate of Unit No.2

Pin 2 - Grid of Unit No.2

Pin 3 - Cathode of Unit No.2

Pin 4 - Heater

Pin 5 - Heater



Pin 6 - Plate of Unit No.1

Pin 7 - Grid of Unit No.1

Pin 8 - Cathode of Unit No.1

Pin 9 - Internal Shield

JUNE 14, 1954

TUBE DIVISION

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

6BZ7



6BZ7

## MEDIUM-MU TWIN TRIODE

### AMPLIFIER - Class A<sub>1</sub>

*Values are for Each Unit*

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

PLATE VOLTAGE . . . . .	250 <sup>▲</sup>	max.	volts
PLATE DISSIPATION . . . . .	2	max.	watts
CATHODE CURRENT . . . . .	20	max.	ma
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode .	200 <sup>▲</sup>	max.	volts
Heater positive with respect to cathode .	200	max.	volts

<sup>▲</sup> In cathode-drive circuits with direct-coupled drive, it is permissible for this voltage to be as high as 250 volts.



6BZ8

6BZ8

# MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	6.3	volts
Current . . . . .	0.4	amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid to plate (Unit No.1) . . . . .	1.15	$\mu$ f
Plate to cathode, internal shield, and heater (Unit No.2) . . . . .	0.15	$\mu$ f
Plate of unit No.1 to plate of unit No.2. . . . .	0.01	$\mu$ f

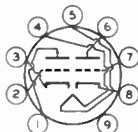
### Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):

Plate Supply Voltage . . . . .	125	volts
Cathode Resistor . . . . .	100	ohms
Amplification Factor . . . . .	45	
Plate Resistance (Approx.) . . . . .	5600	ohms
Transconductance . . . . .	8000	$\mu$ mhos
Plate Current . . . . .	10	ma
Grid Voltage (Approx.) for transconductance ( $\mu$ mhos) = 50. . . . .	-13	volts

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" $\pm$ 3/32"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9AJ

- Pin 1 - Plate of Unit No.2
- Pin 2 - Grid of Unit No.2
- Pin 3 - Cathode of Unit No.2
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Plate of Unit No.1
- Pin 7 - Grid of Unit No.1
- Pin 8 - Cathode of Unit No.1
- Pin 9 - Internal Shield

### AMPLIFIER — Class A<sub>1</sub>

Values are for Each Unit

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	250 max.	volts
CATHODE CURRENT . . . . .	20 max.	ma
PLATE DISSIPATION . . . . .	2.2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 max.	volts

<sup>o</sup> With external shield JEDEC No.315 connected to cathode of unit under test.

6BZ8



6BZ8

# MEDIUM-MU TWIN TRIODE

## Typical Operation and Characteristics:

*In cascode-type circuit*

Plate Supply Voltage. . . . .	250	volts
Grid Voltage. . . . .	-0.5	volt
Transconductance. . . . .	10000	$\mu$ mhos
Plate Current . . . . .	15	ma

## Maximum Circuit Values:

Grid-Circuit Resistance . . . . .	0.1 max.	megohm
-----------------------------------	----------	--------



6C4

6C4

# MEDIUM-MU TRIODE

For use in FM and other HF circuits

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 6.3 . . . . . ac or dc volts

Current . . . . . 0.15 . . . . . amp

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

Grid to plate . . . . . 1.6  $\mu$ f

Grid to cathode and heater . . . . . 1.8  $\mu$ f

Plate to cathode and heater . . . . . 1.3  $\mu$ f

### Mechanical:

Mounting Position . . . . . Any

Maximum Overall Length . . . . . 2-1/8" ←

Maximum Seated Length . . . . . 1-7/8" ←

Length, Base Seat to Bulb Top (Excluding tip) . 1-1/2" ± 3/32" ←

Maximum Diameter . . . . . 3/4"

Bulb . . . . . T-5-1/2

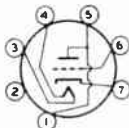
Base . . . . . Small-Button Miniature 7-Pin (JETEC No. E7-1) ←

Basing Designation for BOTTOM VIEW . . . . . 6BG

Pin 1 - Plate

Pin 2 - Internal Connection  
Do Not Use

Pin 3 - Heater



Pin 4 - Heater

Pin 5 - Plate

Pin 6 - Grid

Pin 7 - Cathode

## AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . . 300 max. volts

PLATE DISSIPATION . . . . . 3.5 max. watts ←

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . 200 max. volts

Heater positive with respect to cathode . 200<sup>■</sup> max. volts

### Characteristics:

Plate Voltage . . . . . 100 250 volts

Grid Voltage . . . . . 0 -8.5 volts

Amplification Factor . . . . . 19.5 17

Plate Resistance (Approx.) . . . . . 6250 7700 ohms

Transconductance . . . . . 3100 2200  $\mu$ hos

Plate Current . . . . . 11.8 10.5 ma

### Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias operation . . . . . 0.25 max. megohm

For cathode-bias operation . . . . . 1.0 max. megohm

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

<sup>■</sup>: See next page.

← indicates a change.

6C4



6C4

## MEDIUM-MU TRIODE

### → Typical Operation as Resistance-Coupled Amplifier:

See *RESISTANCE-COUPLED AMPLIFIER CHART No. 10*  
at front of this Section.

### RF POWER AMPLIFIER & OSCILLATOR—Class C Telegraphy

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

DC PLATE VOLTAGE . . . . .	300 max.	volts
DC GRID VOLTAGE . . . . .	-50 max.	volts
DC PLATE CURRENT . . . . .	25 max.	ma
DC GRID CURRENT . . . . .	8 max.	ma
PLATE DISSIPATION . . . . .	5 max.	watts

#### → PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>max.</sup>	volts

#### Typical Operation at Frequencies up to 50 Mc:\*

DC Plate Voltage . . . . .	300	volts
DC Grid Voltage . . . . .	-27	volts
DC Plate Current . . . . .	25	ma
DC Grid Current (Approx.) . . . . .	7	ma
Driving Power (Approx.) . . . . .	0.35	watt
Useful Power Output (Approx.) . . . . .	5.5	watts

\* The dc component must not exceed 100 volts.

• Approximately 2.5 watts can be obtained when the 6C4 is used at 150 Mc as an oscillator with grid resistor of 10000 ohms and maximum rated input.

→ Indicates a change.





6C4

6C4

### AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS

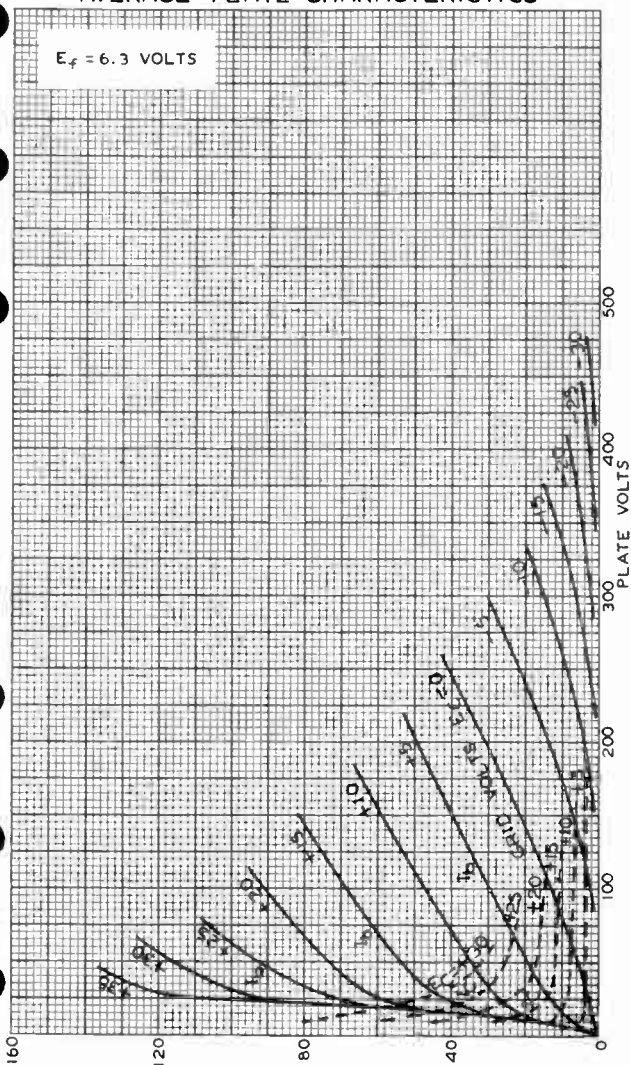


PLATE ( $I_b$ ) OR GRID ( $I_c$ ) MILLIAMPERES

MARCH 16, 1942

RCA RADITRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

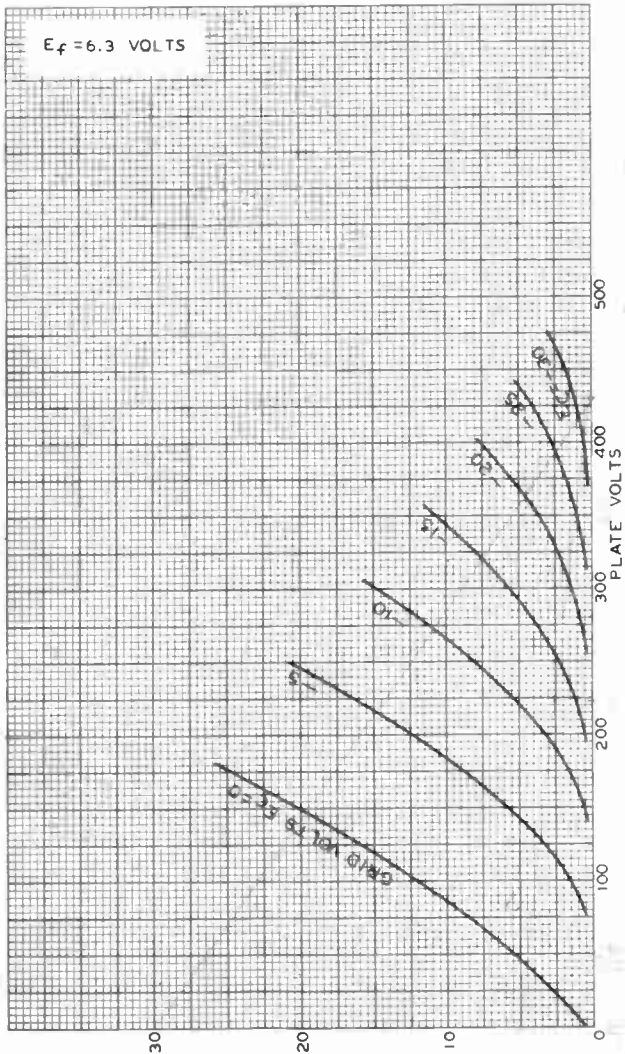
92C-6378

6C4



6C4

# AVERAGE PLATE CHARACTERISTICS



MARCH 14, 1942

PLATE MILLIAMPERES

RCA RADOTRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

92C-6377

6C5  
6C5-GT/G

## 6C5, 6C5-GT/G

## DETECTOR AMPLIFIER TRIODE

Heater <sup>■</sup>		Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts	
Current	0.3	amp.	
		6C5	6C5-GT/G
Direct Interelectrode Cap.	▲	▲▲	
Grid to Plate	2.0	2.2	μf
Grid to Cathode	3.0	4.4	μf
Plate to Cathode	11	12	μf
Maximum Overall Length	2-5/8"	3-5/16"	
Maximum Seated Height	2-1/16"	2-3/4"	
Maximum Diameter	1-5/16"	1-5/16"	
Bulb	Metal Shell, MT-8	T-9	
Base	{ Small Wafer Octal 6-Pin	{ Small Wafer Octal 6-Pin, Sleeve	
Basing Designation	6Q	GT-6Q	
Pin 1 { 6C5, Shell 6C5-GT/G, Sleeve		Pin 5 - Grid	
Pin 2 - Heater		Pin 7 - Heater	
Pin 3 - Plate		Pin 8 - Cathode	
Mounting Position			Any

BOTTOM VIEW

*- Maximum And Minimum Ratings Are Design-Center Values*

AMPLIFIER

Plate Voltage		300 max. volts
Grid Voltage		0 min. volts
Plate Dissipation		2.5 max. watts
<b>Characteristics - Class A<sub>1</sub> Amplifier:</b>		
Plate Voltage		250 volts
Grid Voltage *		-8 volts
Amplification Factor		20
Plate Resistance		10000 ohms
Transconductance		2000 μmhos
Plate Current		8 ma.

*Typical Operation with Resistance Coupling:*  
See RESISTANCE-COUPLED AMPLIFIER CHART.

DETECTOR

Typical Operation:	Biased	Grid Leak	
Plate Voltage	250	45 to 100	volts
Grid Voltage	-17 approx.	Return to cathode	volts
Plate Current	Adjusted to 0.2 ma. with no input signal	-	
Grid Leak	-	0.1 to 1.0	megohm
Grid Condenser	-	0.00005 to 0.0005	μf

■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

▲ with shell of 6C5 connected to cathode. Values are approximate.

▲▲ with external shield connected to cathode. Values are approximate.

\* Under maximum rated conditions, the resistance in the grid circuit should not exceed 1.0 megohm.

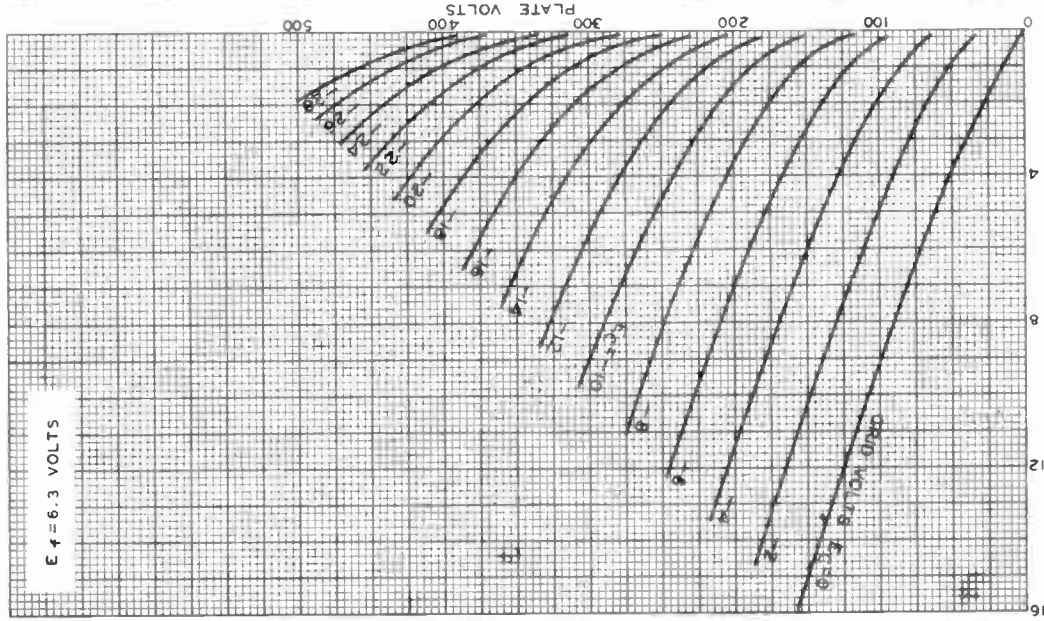
6C5



6C5

# AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS



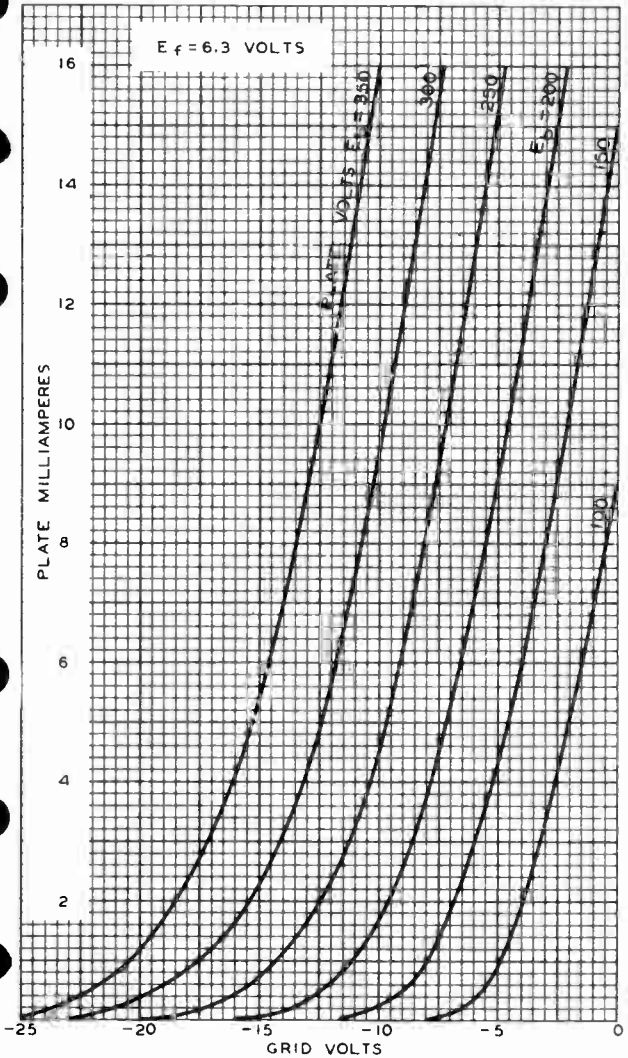
JULY 23, 1935

RCA VICTOR DIVISION  
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

PLATE MILLIAMPERES

92C-4441

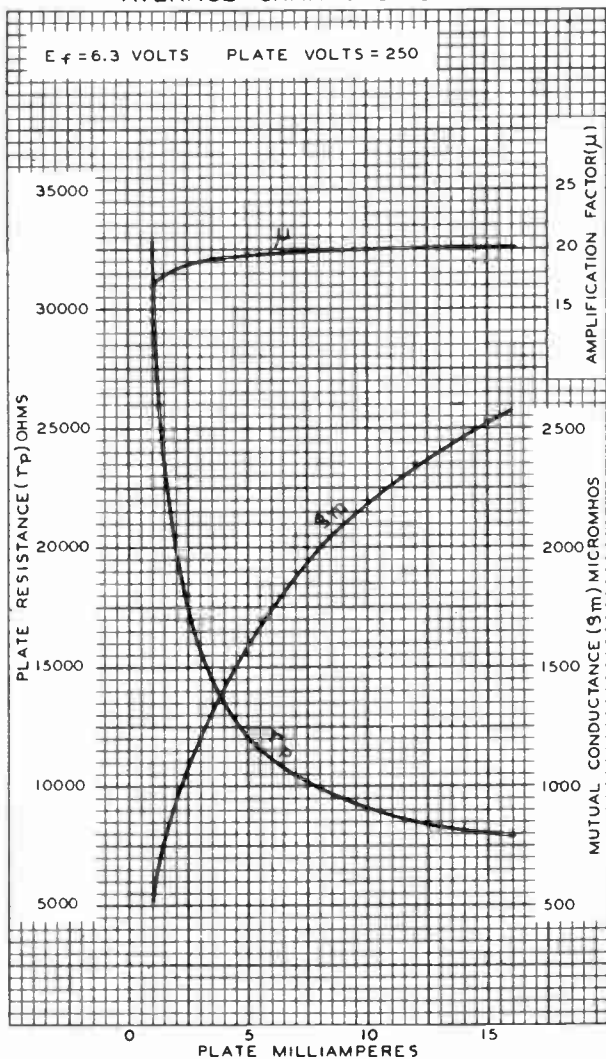
AVERAGE CHARACTERISTICS



6C5

RCA **Cunningham** Radiotron **RADIO TUBES**  
RCA-6C5

## AVERAGE CHARACTERISTICS



AUG. 23, 1935

RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

92C-4462

World Radio History



6C6

6C6

# SHARP-CUTOFF PENTODE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

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

Direct Interelectrode Capacitances:

Pentode Connection:

Grid No.1 to Plate <sup>o</sup> . . . . .	0.007 max. . . . .	$\mu\mu\text{f}$
Input <sup>oo</sup> . . . . .	5 . . . . .	$\mu\mu\text{f}$
Output <sup>oo</sup> . . . . .	6.5 . . . . .	$\mu\mu\text{f}$

Triode Connection<sup>\*oo</sup>:

Grid No.1 to Plate . . . . .	2 . . . . .	$\mu\mu\text{f}$
Grid No.1 to Cathode . . . . .	3 . . . . .	$\mu\mu\text{f}$
Plate to Cathode . . . . .	10.5 . . . . .	$\mu\mu\text{f}$

<sup>o</sup> with external shield connected to cathode.

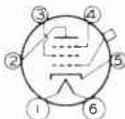
<sup>oo</sup> with no external shield.

\* with grid No.2 and grid No.3 connected to plate.

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	4-15/16"
Seated Length . . . . .	4-3/16" $\pm$ 1/8"
Maximum Diameter . . . . .	1-9/16"
Bulb . . . . .	ST-12
Cap. . . . .	Small
Base . . . . .	Small-Shell Small 6-Pin
Basing Designation for BOTTOM VIEW . . . . .	6F

- Pin 1 - Heater
- Pin 2 - Plate
- Pin 3 - Grid No.2
- Pin 4 - Grid No.3



- Pin 5 - Cathode, Internal Shield
- Pin 6 - Heater Cap - Grid No.1

*Maximum Ratings, Characteristics, and Typical Operating Conditions are the same as for Type 6J7.*

*Curves for Type 6C6 are the same as those for Type 6J7.*

*For additional data, see RESISTANCE-COUPLED AMPLIFIER CHARTS at the front of this Section.*







6C8-G

6C8-G



## TWIN-TRIODE AMPLIFIER

Heater <sup>■</sup> Coated Unipotential Cathodes  
 Voltage 6.3 a-c or d-c volts  
 Current 0.3 amp.

Direct Interelectrode Capacitances (Approx.):

	Triode Unit $T_1$	Triode Unit $T_2$	
Grid to Plate	2.6	1.8	$\mu\text{f}$
Grid to Cathode	2.6	1.3	$\mu\text{f}$
Plate to Cathode	2.0	2.2	$\mu\text{f}$
Grid to Grid		0.1	$\mu\text{f}$
Plate to Plate		2.0	$\mu\text{f}$

Overall Length 4-7/32" to 4-15/32"

Seated Height 3-21/32" to 3-29/32"

Maximum Diameter 1-9/16"

Bulb ST-12

Cap Skirted Miniature, Style A

Base Small Shell Octal 8-Pin

Pin 1 - No Connection Pin 6 - Plate (Triode  $T_1$ )

Pin 2 - Heater Pin 7 - Heater

Pin 3 - Plate (Triode  $T_2$ ) Pin 8 - Cathode (Triode  $T_1$ )Pin 4 - Cathode (Triode  $T_2$ ) Cap - Grid (Triode  $T_2$ )Pin 5 - Grid (Triode  $T_1$ )

Mounting Position Any



BOTTOM VIEW (G-8G)

EACH TRIODE UNIT

Plate Voltage 250 max. volts

Grid Voltage 0 min. volts

Plate Dissipation 1.0 max. watt

Characteristics - Class  $A_1$  Amplifier:

Plate 250 volts

Grid -4.5 volts

Amp. Fact. 36

Plate Res. 22500 ohms

Transcond. 1600  $\mu\text{mhos}$ 

Plate Cur. 3.2 ma.

Typical Operation - Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART.

<sup>■</sup> In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

← Indicates a change.

Dec. 1, 1941

RCA RADIODRON DIVISION  
RCA MANUFACTURING COMPANY INC

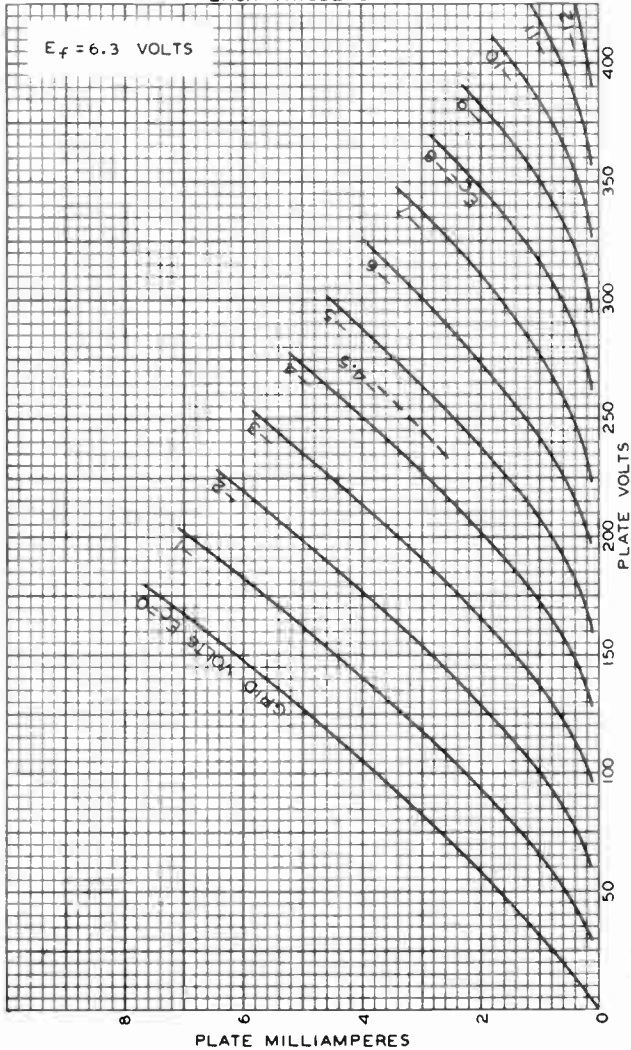
DATA

6C8-G



6C8-G

### AVERAGE PLATE CHARACTERISTICS EACH TRIODE UNIT



SEPT. 18, 1941

RCA RADIONRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

92C-4957R1



6CB5-A

6CB5-A

BEAM POWER TUBE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3 ± 10%	volts
Current . . . . .	2.5	amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid No.1 to plate . . . . .	0.4	μf
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	22	μf
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	10	μf

Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	75	175	volts
Grid-No.2 Voltage . . . . .	150	175	volts
Grid-No.1 Voltage . . . . .	0	-30	volts
Mu-Factor, Grid No.2 to Grid No.1 . . . . .	-	3.8	
Plate Resistance (Approx.) . . . . .	-	5000	ohms
Transconductance . . . . .	-	8800	μmhos
Plate Current . . . . .	460*	90	ma
Grid-No.2 Current . . . . .	42*	6	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 1 . . . . .	-	-60	volts

Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	5"
Seated Length . . . . .	4-1/4" ± 3/16"
Maximum Diameter . . . . .	1-23/32"
Bulb . . . . .	T12
Cap . . . . .	Small (JEDEC No.C1-1)
Base . . . . .	Short Jumbo-Shell Octal 8-Pin with External Barriers (JEDEC Group 1, No.88-71), or Short Medium-Shell Octal 8-Pin with External Barriers, Style B (JEDEC Group 1, No.88-118)
Basing Designation for BOTTOM VIEW . . . . .	8GD

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



- Pin 6 - Cathode,  
Grid No.3
- Pin 7 - Heater
- Pin 8 - Grid No.2  
Cap - Plate

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system<sup>0</sup>

DC (Including boost) PLATE VOLTAGE . . . . .	880 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE <sup>#</sup> . . . . .	6800 max.	volts

← Indicates a change.



## 6CB5-A

## BEAM POWER TUBE

PEAK NEGATIVE-PULSE PLATE VOLTAGE . . .	1650	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE. . .	220	max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE . .	-55	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE .	220	max.	volts
CATHODE CURRENT:			
Peak. . . . .	850	max.	ma
DC. . . . .	240	max.	ma
GRID-No.2 INPUT . . . . .	4	max.	watts
PLATE DISSIPATION†. . . . .	26	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode. . . . .	200	max.	volts
Heater positive with respect to cathode. . . . .	200 <sup>▲</sup>	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface). . . . .	220	max.	°C

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:

For grid-resistor-bias operation. . . 0.47 max. megohm

○ Without external shield.

\* These values can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

□ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

\* The duration of the voltage pulse must not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

† An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

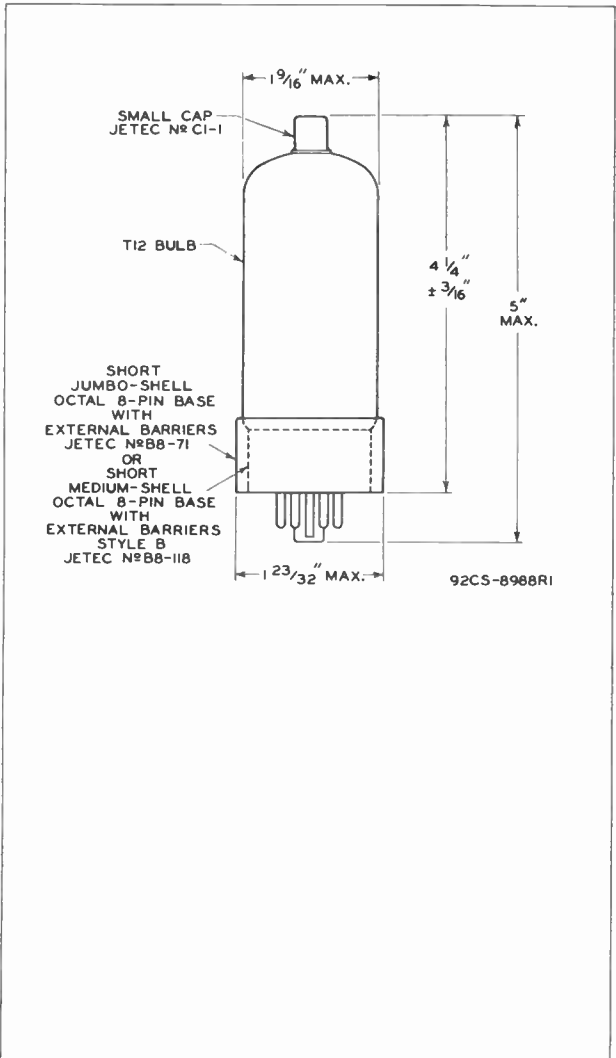
▲ The dc component must not exceed 100 volts.



6CB5-A

# BEAM POWER TUBE

6CB5-A

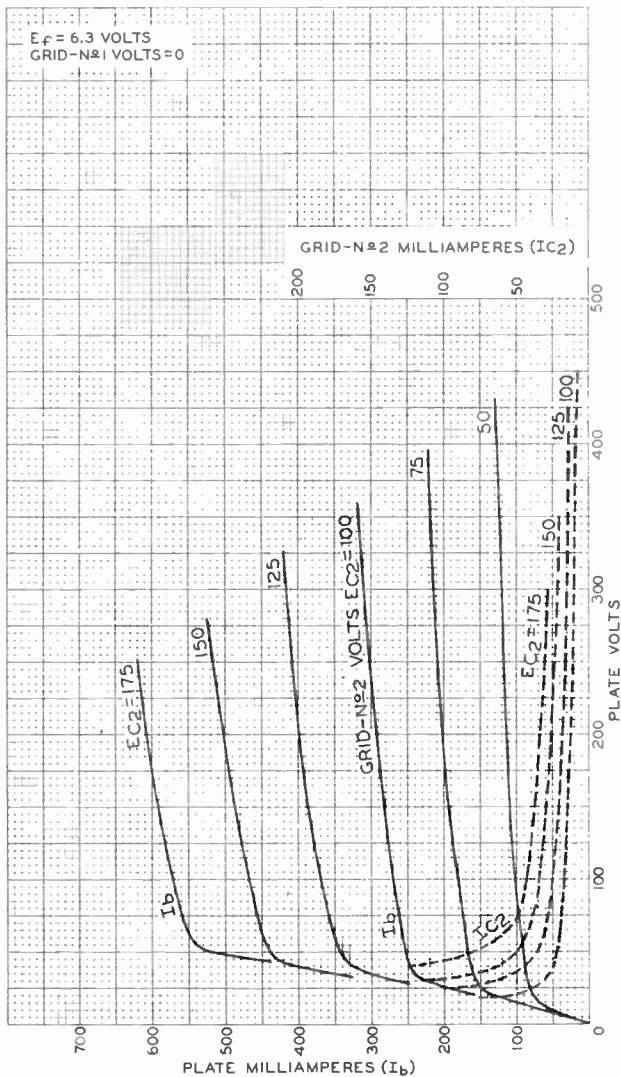


6CB5-A



6CB5-A

### AVERAGE CHARACTERISTICS

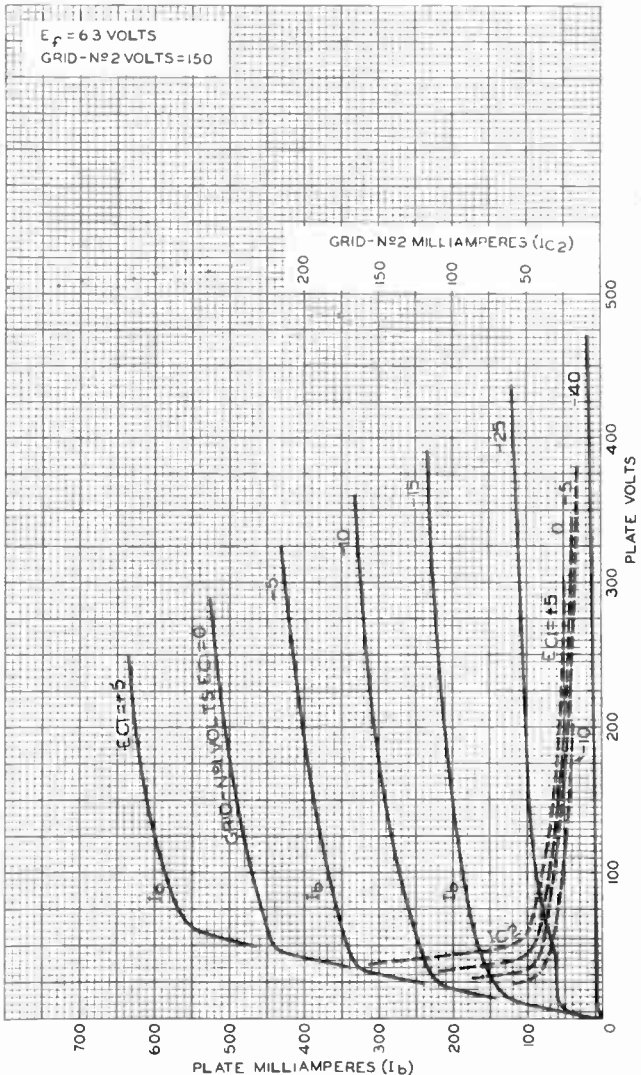




6CB5-A

6CB5-A

AVERAGE CHARACTERISTICS









6CB6

6CB6

# SHARP-CUTOFF PENTODE

MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage. . . . .	6.3	ac or dc volts
Current. . . . .	.03	amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield <sup>o</sup>	
Grid No.1 to plate . . . .	0.020 max.	0.010 max.	$\mu$ f
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . .	6.5	6.5	$\mu$ f
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . .	1.9	3.0	$\mu$ f

### Mechanical:

Mounting Position. . . . . Any

Maximum Overall Length . . . . . 2-1/8"

Maximum Seated Length. . . . . 1-7/8"

Length, Base Seat to Bulb Top (Excluding tip). 1-1/2"  $\pm$  3/32"

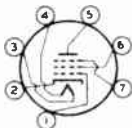
Maximum Diameter . . . . . 3-4"

Bulb . . . . . T-5-1/2

Base . . . . . Small-Button Miniature 7-Pin (JETEC No.E7-1)

Basing Designation for BOTTOM VIEW . . . . . 7CM

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



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

### AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	300 max.	volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE. . . . .	300 max.	volts
GRID-No.2 VOLTAGE. . . . .	See Grid-No.2 Input Rating Chart at front of Receiving Tube Section	
PLATE DISSIPATION. . . . .	2 max.	watts
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 150 volts . .	0.5 max.	watt
For grid-No.2 voltages between 150 and 300 volts. . . . .	See Grid-No.2 Input Rating Chart at front of Receiving Tube Section	

<sup>o</sup> with external shield JETEC No.316 connected to cathode.

← Indicates a change.

6CB6



6CB6

## SHARP-CUTOFF PENTODE

## → PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	volts

## Typical Operation and Characteristics:

Plate Voltage . . . . .	200	volts
Grid No.3 (Suppressor) . . . . .	Connected to cathode at socket	
Grid-No.2 Voltage . . . . .	150	volts
Cathode-Bias Resistor . . . . .	180	ohms
Plate Resistance (Approx.) . . . . .	0.6	megohm
Transconductance . . . . .	6200	μmhos
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp. . . . .	-8	volts
Plate Current . . . . .	9.5	ma
Grid-No.2 Current . . . . .	2.8	ma

▲ The dc component must not exceed 100 volts.

→ Indicates a change.

MAR. 1, 1955

TUBE DIVISION

DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

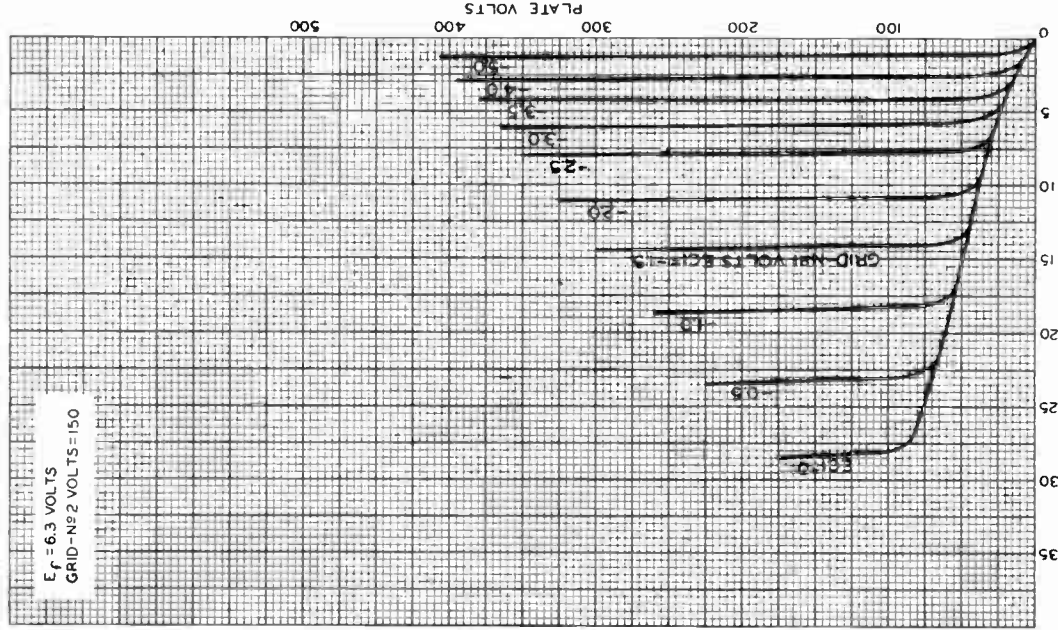
World Radio History



6CB6

# AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID-NO 2 VOLTS = 150



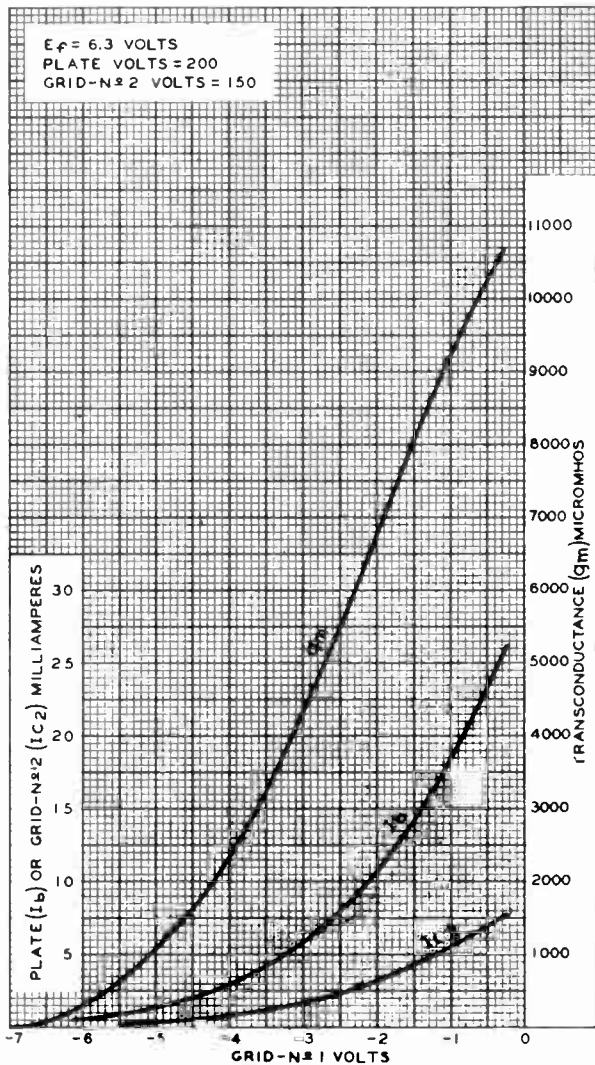
6CB6

6CB6



6CB6

## AVERAGE CHARACTERISTICS



SEPT. 28, 1949

 TUBE DIVISION  
 RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY  
 World Radio History

92CM-7375



6CB6-A

# 6CB6-A

## SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

With heater having controlled warm-up time

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3 . . . . .	ac or dc volts
Current . . . . .	0.3 ± 6% . . . . .	amp
Warm-up time (Average) . . . . .	11 . . . . .	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield <sup>o</sup>	
Grid No.1 to plate . . . . .	0.025 max.	0.015 max.	μμf
Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater . . . . .	6.5	6.5	μμf
Plate to cathode & internal shield & grid No.3, grid No.2, and heater . . . . .	2	3	μμf

#### Characteristics, Class A<sub>1</sub> Amplifier:

Plate-Supply Voltage . . . . .	125	125	volts
Grid No.3 . . . . .	♦	♦	
Grid-No.2 Supply Voltage . . . . .	125	125	volts
Grid-No.1 Voltage . . . . .	-3	-	volts
Cathode Resistor . . . . .	-	56	ohms
Plate Resistance (Approx.) . . . . .	-	0.28	megohm
Transconductance . . . . .	-	8000	μmhos
Plate Current . . . . .	2.8	13	ma
Grid-No.2 Current . . . . .	-	3.7	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20 . . . . .	-	-6.5	volts

#### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-1/2" ± 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)

<sup>o</sup>, ♦: See next page.

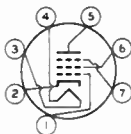


## 6CB6-A

## SHARP-CUTOFF PENTODE

Basing Designation for Bottom View. . . . . 7CM

Pin 1—Grid No.1  
Pin 2—Cathode  
Pin 3—Heater  
Pin 4—Heater  
Pin 5—Plate



Pin 6—Grid No.2  
Pin 7—Grid No.3,  
Internal  
Shield

AMPLIFIER — Class A<sub>1</sub>

## Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE . . . . .	330 max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE . .	0 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE.	330 max.	volts
GRID-No.2 VOLTAGE . . . . .	<i>See Grid-No.2 Input</i>	

*Rating Chart at front of Receiving Tube Section*

GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive-bias value . . . . .	0 max.	volts

## GRID-No.2 INPUT:

For grid-No.2 voltages up to 165 volts. . . . .	0.55 max.	watt
For grid-No.2 voltages between 165 and 330 volts . . . . .	<i>See Grid-No.2 Input</i>	

*Rating Chart at front of Receiving Tube Section*

PLATE DISSIPATION . . . . .	2.3 max.	watts
-----------------------------	----------	-------

## PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . . . .	200 max.	volts
Heater positive with respect to cathode. . . . .	200 <sup>▲</sup> max.	volts

## Maximum Circuit Values:

Grid-No.1—Circuit Resistance:		
For fixed-bias operation. . . . .	0.25 max.	megohm
For cathode-bias operation. . . . .	1 max.	megohm

○ with external shield JEDEC No.316 connected to cathode.

◆ connected to cathode at socket.

▲ The dc component must not exceed 100 volts.

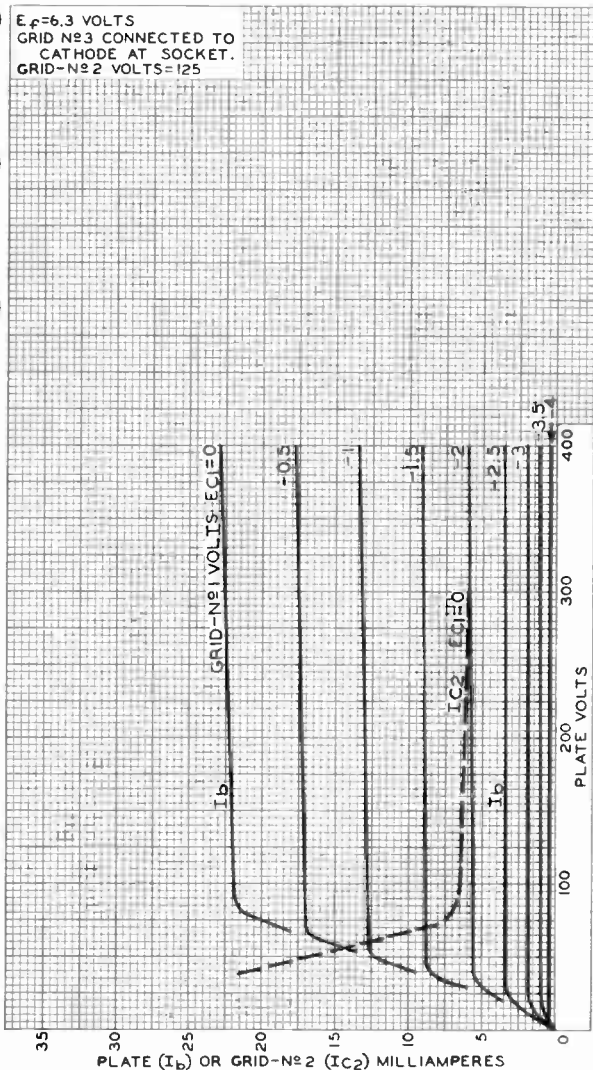


6CB6-A

6CB6-A

### AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID No 3 CONNECTED TO  
CATHODE AT SOCKET.  
GRID-No 2 VOLTS = 125



ELECTRON TUBE DIVISION

92CM-9854

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

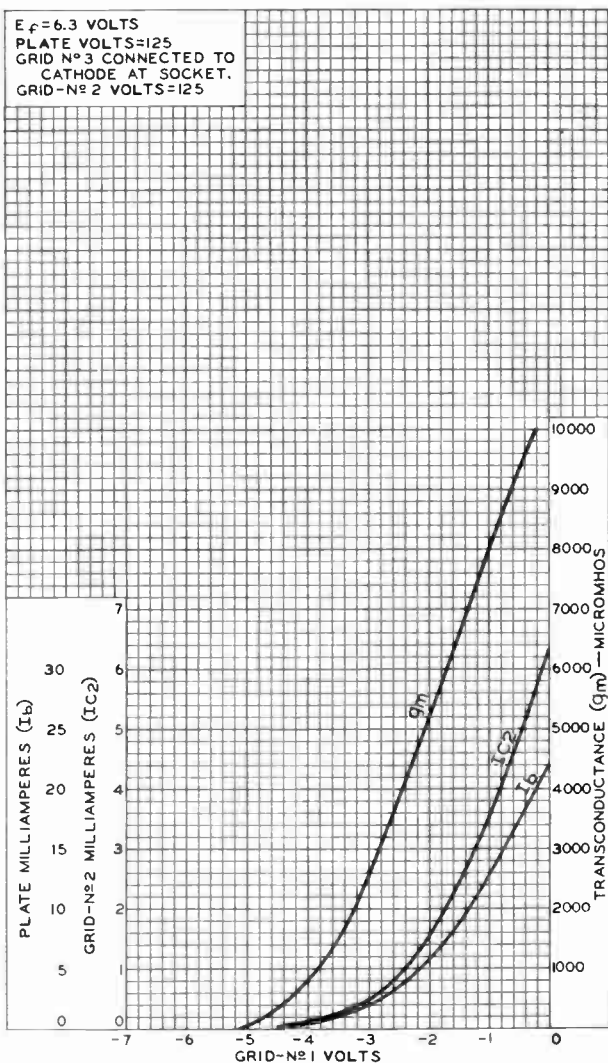
6CB6-A



6CB6-A

## AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 125  
 GRID N°3 CONNECTED TO  
 CATHODE AT SOCKET.  
 GRID-N°2 VOLTS = 125







6CD6-GA

# 6CD6-GA BEAM POWER TUBE

Supersedes Type 6CD6-G

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 6.3 . . . . . ac or dc volts  
Current . . . . . 2.5 . . . . . amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid No.1 to plate. . . . . 1.1  $\mu$ f  
Grid No.1 to cathode & grid No.3,  
grid No.2, and heater . . . . . 22  $\mu$ f  
Plate to cathode & grid No.3,  
grid No.2, and heater . . . . . 8.5  $\mu$ f

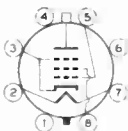
### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . . 60 175 volts  
Grid-No.2 (Screen-Grid) Voltage . . . 100 175 volts  
Grid-No.1 (Control-Grid) Voltage. . . 0 -30 volts  
 $\mu$ -Factor, Grid No.2 to Grid No.1 . . - 3.9  
Plate Resistance (Approx.). . . . . - 7200 ohms  
Transconductance. . . . . - 7700  $\mu$ hos  
Plate Current . . . . . 230\* 75 ma  
Grid-No.2 Current . . . . . 21\* 5.5 ma  
Grid-No.1 Voltage (Approx.) for  
plate current of 1 ma . . . . . - -55 volts

### Mechanical:

Mounting Position . . . . . vertical, base up or down, or  
Horizontal with pins 2 and 7 in vertical plane  
Maximum Overall Length. . . . . 5"  
Seated Length . . . . . 4-1/4"  $\pm$  3/16"  
Maximum Diameter. . . . . 1-9/16"  
Bulb. . . . . T-12  
Cap . . . . . Small (JETEC No.C1-1)  
Base. . . . . Short Medium-Shell Octal 8-Pin  
with External Barriers, Style A (JETEC No.B8-110),  
or Short Medium-Shell Octal 8-Pin  
with External Barriers, Style B (JETEC No.B8-118)  
Basing Designation for BOTTOM VIEW. . . . . 5RT

Pin 1 - No Connection  
Pin 2 - Heater  
Pin 3 - Cathode,  
Grid No.3  
Pin 4 - No Connection  
Pin 5 - Grid No.1  
Pin 6 - No Connection  
Pin 7 - Heater  
Pin 8 - Grid No.2  
Cap - Plate



<sup>0</sup> without external shield.  
\* These values can be measured by a method involving a recurrent wave form such that the cathode current will be kept within ratings in order to prevent damage to the tube.



## 6CD6-GA

## BEAM POWER TUBE

## HORIZONTAL DEFLECTION AMPLIFIER

## Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	700	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum) <sup>⊕</sup> . . . . .	7000 <sup>■</sup>	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE . . . . .	1500	max.	volts
DC GRID-No.2 (SCHWEN-GRID) VOLTAGE . . . . .	175	max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE . . . . .	-50	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE . . . . .	200	max.	volts
CATHODE CURRENT:			
Peak . . . . .	700	max.	ma
Average . . . . .	200	max.	ma
GRID-No.2 INPUT . . . . .	3	max.	watts
PLATE DISSIPATION <sup>†</sup> . . . . .	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200	max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup>	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface) . . . . .			
	225	max.	°C

## Maximum Circuit Values:

## Grid-No.1-Circuit Resistance:

For grid-resistor-bias operation . . . . . 0.47 max. megohm

□ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

■ Under no circumstances should this absolute value be exceeded.

⊕ The duration of the voltage pulse must not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

† It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value should be employed.

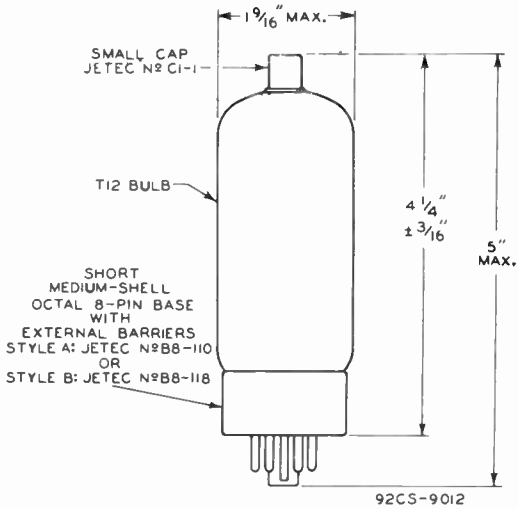
▲ The dc component must not exceed 100 volts.



6CD6-GA

BEAM POWER TUBE

6CD6-GA

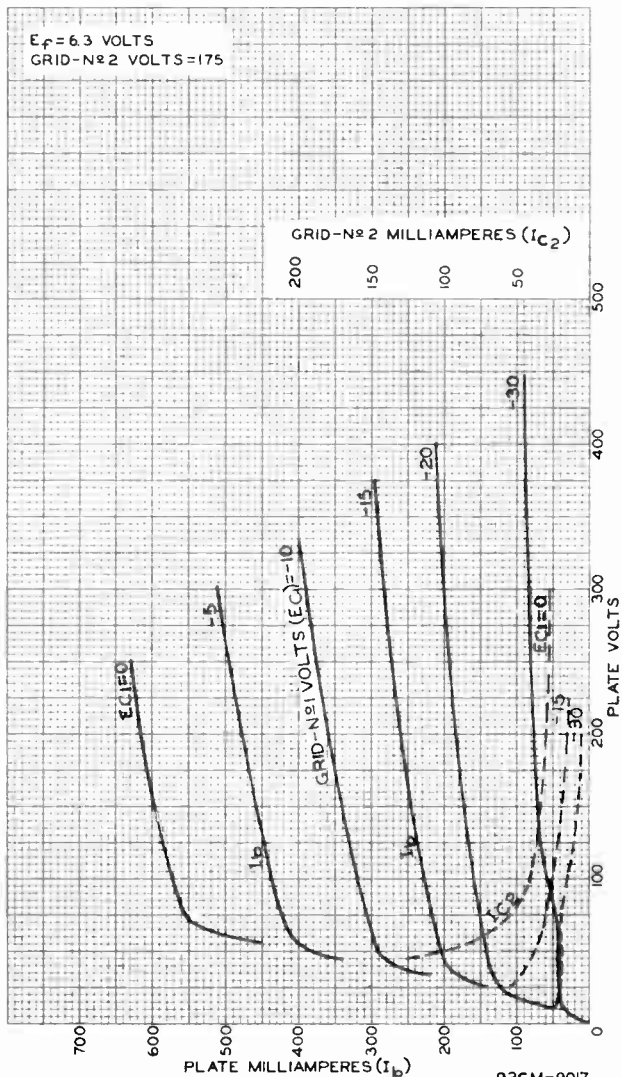


6CD6-GA



6CD6-GA

## AVERAGE CHARACTERISTICS



92CM-9017

TUBE DIVISION

RADIO CORPORATION OF AMERICA - HARRISON, NEW JERSEY

World Radio History



6CD6-GA

6CD6-GA

AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID-Nº1 VOLTS = 0

GRID-Nº 2 MILLIAMPERES ( $I_{C2}$ )

200  
150  
100  
50

500

400

300

200

100

0

700

600

500

400

300

200

100

0

$E_{C2} = 175$

150

125

GRID-Nº 2 VOLTS ( $E_{C2}$ ) 100

75

50

125

100

$E_{C2} = 175$

150

100

PLATE MILLIAMPERES ( $I_b$ )  
TUBE DIVISION

92CM-9016

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY





6CF6

6CF6

## SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

## GENERAL DATA

## Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3 ± 10%	volts
Current . . . . .	0.3	amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield <sup>a</sup>	
Grid No.1 to plate . . . . .	0.025 max.	0.015 max.	μuf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater . . . . .	6.5	6.5	μuf
Plate to cathode & grid No. 3 & internal shield, grid No.2, and heater . . .	2	3	μuf

Characteristics, Class A<sub>1</sub> Amplifier:

Plate Supply Voltage . . . . .	125	volts
Grid No.3 . . . . .	Connected to cathode at socket	
Grid-No.2 Supply Voltage . . . . .	125	volts
Cathode Resistor . . . . .	56	ohms
Plate Resistance (Approx.) . . . . .	0.3	megohm
Transconductance . . . . .	7800	μmhos
Plate Current . . . . .	12.5	ma
Grid-No.2 Current . . . . .	3.7	ma
Grid-No.1 Voltage (Approx.) for plate $\mu_a = 20$ . . . . .	-6	volts
Grid-No.1 Voltage (Approx.) for plate $\mu_a = 2.2$ , and cathode resistor (ohms) = 0 . . . . .	-3	volts

## Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-1/2" ± 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)

← Indicates a change.

6CF6

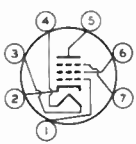


6CF6

# SHARP-CUTOFF PENTODE

Basing Designation for BOTTOM VIEW. . . . .7CM

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



- Pin 6 - Grid No.2
- Pin 7 - Grid No.3,  
Internal  
Shield

## AMPLIFIER — Class A<sub>1</sub>

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

- PLATE VOLTAGE. . . . . 330 max. volts
- GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . 330 max. volts
- GRID-No.2 VOLTAGE. . . . . See Grid-No.2 Input  
*Rating Chart at front of Receiving Tube Section*
- GRID-No.1 (CONTROL-GRID) VOLTAGE:  
Positive-bias value. . . . . 0 max. volts
- GRID-No.2 INPUT:  
For grid-No.2 voltages up  
to 165 volts . . . . . 0.55 max. watt
- For grid-No.2 voltages be-  
tween 165 and 330 volts. . . . . See Grid-No.2 Input  
*Rating Chart at front of Receiving Tube Section*
- PLATE DISSIPATION. . . . . 2.3 max. watts
- PEAK HEATER-CATHODE VOLTAGE:  
Heater negative with respect to cathode. 200 max. volts
- Heater positive with respect to cathode. 200<sup>▲</sup> max. volts

<sup>0</sup> With external shield JEDEC No.316 connected to cathode.  
<sup>▲</sup> The dc component must not exceed 100 volts.

→ Indicates a change.





6CF6

6CF6

# AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID N<sup>o</sup>3 CONNECTED TO  
CATHODE AT SOCKET.  
GRID-N<sup>o</sup>2 VOLTS=125

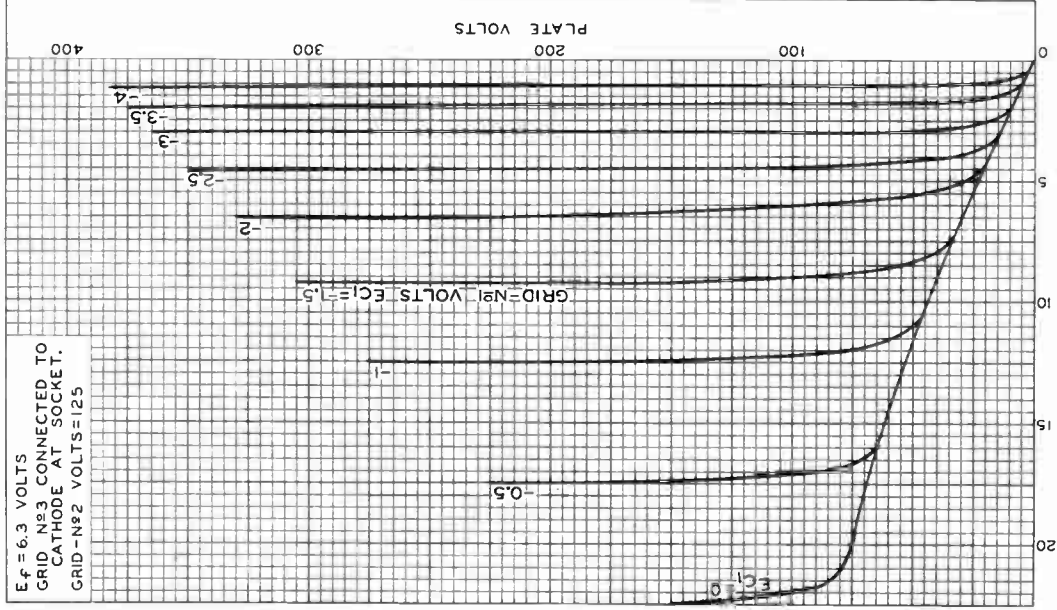


PLATE MILLIAMPERES

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM - 10243

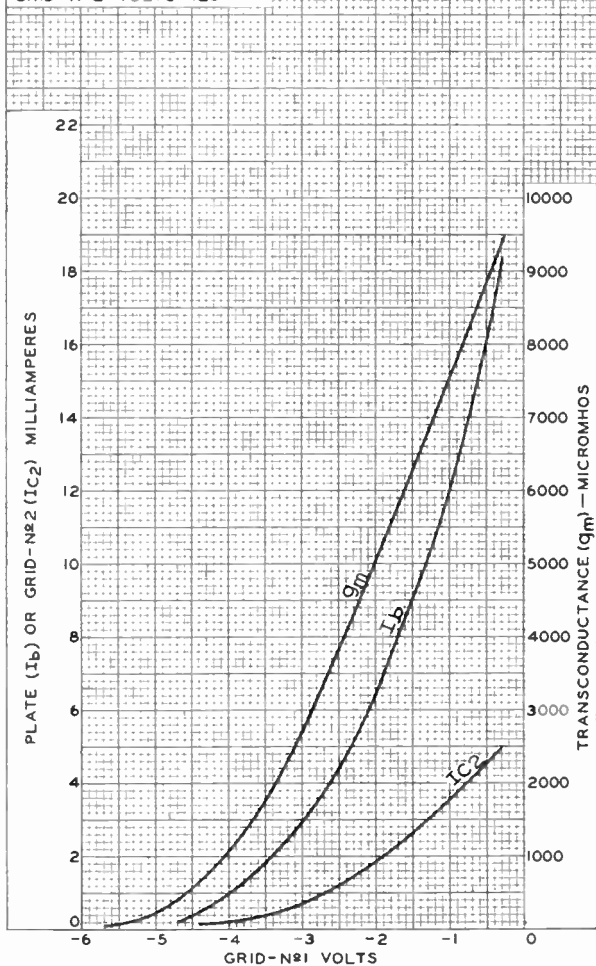
6CF6



6CF6

## AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 125  
 GRID-N $\#$ 3 CONNECTED TO  
 CATHODE AT SOCKET.  
 GRID-N $\#$ 2 VOLTS = 125





6CG7

6CG7

# MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	6.3	volts
Current . . . . .	0.6 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

Direct Interelectrode Capacitances (Each unit, approx.):<sup>o</sup>

Grid to plate . . . . .	4	μf
Grid to cathode, internal shield, and heater. . . . .	2.3	μf
Plate to cathode, internal shield, and heater. . . . .	2.2	μf

### Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):

Plate Voltage . . . . .	90	250	volts
Grid Voltage . . . . .	0	-8	volts
Amplification Factor . . . . .	20	20	
Plate Resistance (Approx.) . . . . .	6700	7700	ohms
Transconductance . . . . .	3000	2600	μmhos
Plate Current . . . . .	10	9	ma
Plate Current for grid volts = -12.5. . . . .	-	1.3	ma
Grid Voltage (Approx.) for plate μa = 10 . . . . .	-7	-18	volts

### 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"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9AJ

- Pin 1 - Plate of Unit No. 2
- Pin 2 - Grid of Unit No. 2
- Pin 3 - Cathode of Unit No. 2
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Plate of Unit No. 1
- Pin 7 - Grid of Unit No. 1
- Pin 8 - Cathode of Unit No. 1
- Pin 9 - Internal Shield

### AMPLIFIER - Class A<sub>1</sub>

Values are for Each Unit

### Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE . . . . .	330 max.	volts
GRID VOLTAGE:		
Positive-bias value . . . . .	0 max.	volts

← Indicates a change.

6CG7



6CG7

## MEDIUM-MU TWIN TRIODE

CATHODE CURRENT . . . . .	22 max.	ma
PLATE DISSIPATION:		
Either plate. . . . .	4 max.	watts
Both plates (Both units operating). . .	5.7 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	200 max.	volts
Heater positive with respect to cathode. . . . .	200 <sup>▲</sup> max.	volts

### Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART No. 29  
at front of this Section

### Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation. . . . .	1 max.	megohm

### HORIZONTAL-DEFLECTION OSCILLATOR

Values are for Each Unit

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

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE. . . . .	330 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE. . . .	660 max.	volts
CATHODE CURRENT:		
Peak. . . . .	330 max.	ma
DC. . . . .	22 max.	ma
PLATE DISSIPATION:		
Either plate. . . . .	4 max.	watts
Both plates (Both units operating). . .	5.7 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	200 max.	volts
Heater positive with respect to cathode. . . . .	200 <sup>▲</sup> max.	volts

### Maximum Circuit Values:

Grid-Circuit Resistance . . . . .	2.2 max.	megohms
-----------------------------------	----------	---------

### VERTICAL-DEFLECTION OSCILLATOR

Values are for Each Unit

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

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE. . . . .	330 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE. . . .	440 max.	volts
CATHODE CURRENT:		
Peak. . . . .	77 max.	ma
DC. . . . .	22 max.	ma

→ Indicates a change.



6CG7

6CG7

### MEDIUM-MU TWIN TRIODE

**PLATE DISSIPATION:**

Either plate. . . . .	4 max.	watts
Both plates (Both units operating). . .	5.7 max.	watts

**PEAK HEATER-CATHODE VOLTAGE:**

Heater negative with respect to cathode. . . . .	200 max.	volts
Heater positive with respect to cathode. . . . .	200 <sup>▲</sup> max.	volts

**Maximum Circuit Values:**

Grid-Circuit Resistance . . . . .	2.2 max.	megohms
-----------------------------------	----------	---------

□ without external shield.

▲ The dc component must not exceed 100 volts.

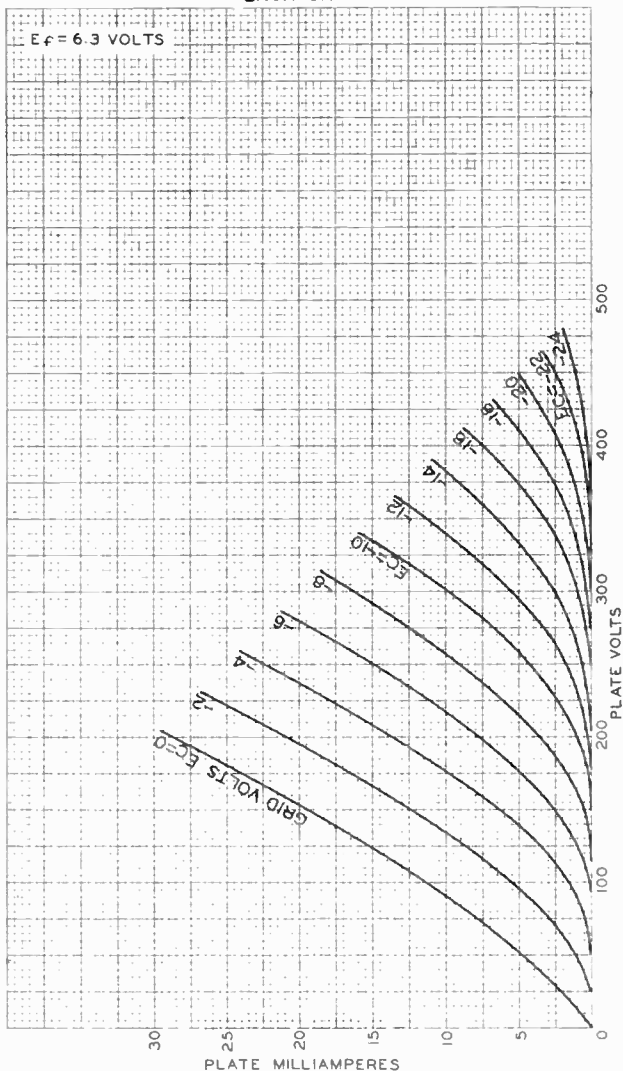
□ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

6CG7



6CG7

# AVERAGE PLATE CHARACTERISTICS EACH UNIT



ELECTRON TUBE DIVISION

RAD O CORPORATION OF AMERICA HARRISON NEW JERSEY

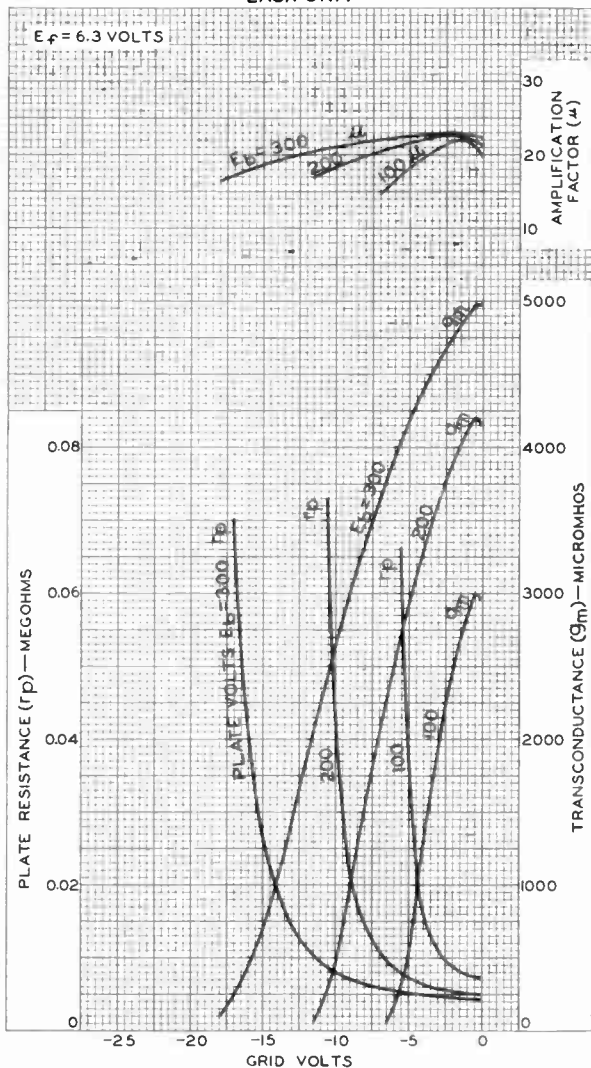
92CM-8442



6CG7

# AVERAGE CHARACTERISTICS EACH UNIT

6CG7



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

92CM-8441R1







6CG8

6CG8

# TRIODE-PENTODE CONVERTER

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	. . . . . ac or dc volts
Current . . . . .	0.45	. . . . . amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield <sup>a</sup>	
<i>Triode Unit:</i>			
Grid to plate . . . . .	1.5	1.5	$\mu\mu\text{f}$
Grid to cathode & pentode grid No.3, and heater. . . . .	2.6	3	$\mu\mu\text{f}$
Plate to cathode & pentode grid No.3, and heater. . . . .	0.05	1	$\mu\mu\text{f}$
<i>Pentode Unit:</i>			
Grid No.1 to plate. . . .	0.03 max.	0.016 max.	$\mu\mu\text{f}$
Grid No.1 to cathode & grid No.3, grid No.2, and heater. . . .	4.8	5	$\mu\mu\text{f}$
Plate to cathode & grid No.3, grid No.2, and heater. . . .	0.9	1.6	$\mu\mu\text{f}$
Pentode grid No.1 to triode plate. . . . .	0.05 max.	0.04 max.	$\mu\mu\text{f}$
Pentode plate to triode plate. . . . .	0.05 max.	0.007 max.	$\mu\mu\text{f}$
Heater to cathode . . . . .	5.5	5.5 <sup>b</sup>	$\mu\mu\text{f}$

### Characteristics:

	Triode Unit	Pentode Unit	
Plate-Supply Voltage. . . . .	100	250	volts
Grid-No.2 Supply Voltage. . . .	-	150	volts
Cathode Resistor. . . . .	100	200	ohms
Amplification Factor. . . . .	40	-	
Plate Resistance (Approx.) . . .	6900	750000	ohms
Transconductance. . . . .	3800	4600	$\mu\text{mhos}$
Plate Current . . . . .	8.5	7.7	ma
Grid-No.2 Current . . . . .	-	1.6	ma
Grid-No.1 Voltage (Approx.) . .			
for plate current of 10 $\mu\text{amp}$ . . . . .	-10	-10	volts

<sup>a</sup> with external shield JETEC No.315 connected to cathode except as noted.

<sup>b</sup> with external shield JETEC No.315 connected to ground.

6CG8



6CG8

# TRIODE-PENTODE CONVERTER

## Mechanical:

Mounting Position. . . . .	Any
Maximum Overall Length. . . . .	2-3/16"
Maximum Seated Length. . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-9/16" ± 3/32"
Maximum Diameter. . . . .	7/8"
Dimensional Outline. . . . .	See General Section
Bulb. . . . .	T-6-1/2
Base. . . . .	Small-Button Noval 9-Pin (JETEC No. E9-1)
Basing Designation for BOTTOM VIEW. . . . .	9GF
Pin 1 - Triode Grid	Pin 7 - Pentode
Pin 2 - Triode Plate	Grid No. 2
Pin 3 - Cathode	Pin 8 - Pentode
Pin 4 - Heater	Grid No. 3,
Pin 5 - Heater	Cathode
Pin 6 - Pentode Plate	Pin 9 - Pentode
	Grid No. 1



## CONVERTER SERVICE

### Maximum Ratings, Design-Center Values:

	Triode Unit as Osc.	Pentode Unit as Mixer	
PLATE VOLTAGE. . . . .	250 max.	250 max.	volts
GRID-No. 2 (SCREEN-GRID) SUPPLY VOLTAGE. . . . .	-	250 max.	volts
GRID-No. 2 VOLTAGE. . . . .	-	See Grid-No. 2 Input	

Rating Chart at front of Receiving Tube Section

GRID-No. 1 (CONTROL-GRID) VOLTAGE:			
Negative bias value. . . . .	40 max.	40 max.	volts
Positive bias value. . . . .	0 max.	0 max.	volts
PLATE DISSIPATION. . . . .	1.5 max.	2 max.	watts

GRID-No. 2 INPUT:			
For grid-No. 2 voltages up to 150 volts. . . . .	-	0.5 max.	watt
For grid-No. 2 voltages between 150 and 300 volts. . . . .	-	See Grid-No. 2 Input	

Rating Chart at front of Receiving Tube Section

GRID-No. 1 INPUT. . . . .	0.5 max.	-	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode. . . . .	200 max.	200 max.	volts
Heater positive with respect to cathode. . . . .	200 <sup>▲</sup> max.	200 <sup>▲</sup> max.	volts

▲ The dc component must not exceed 100 volts.



6CG8

6CG8

# TRIODE-PENTODE CONVERTER

## Typical Operation:

	<i>Triode Unit as 250-Mc Osc.*</i>	<i>Pentode Unit as Mixer*</i>	
Plate Voltage. . . . .	150	150	volts
Grid-No.2 Voltage. . . . .	-	150	volts
Mixer Grid-No.1 Supply Voltage . . . . .	-	-3.5	volts
Oscillator Voltage (rms) at Mixer Grid No.1 . . . .	-	2.6	volts
Mixer Grid-No.1-Circuit Resistance . . . . .	-	120000	ohms
Oscillator Grid Resistor .	2700	-	ohms
Conversion Trans- conductance. . . . .	-	2100	$\mu$ mhos
Plate Current. . . . .	13	6.2	ma
Grid-No.2 Current. . . . .	-	1.8	ma
Grid Current . . . . .	3.6	-	ma
Grid-No.1 Current. . . . .	-	2	$\mu$ amp
Oscillator Power Output (Approx.) . . . . .	0.5	-	watt

## Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

- \* In TV or FM receivers, it is generally desirable to operate the oscillator with less power input than shown in the tabulated data in order to avoid over-excitation and excessive oscillator radiation.
- \* with separate excitation and triode unit connected to ground.

6CG8



6CG8

# AVERAGE CHARACTERISTICS TRIODE UNIT



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

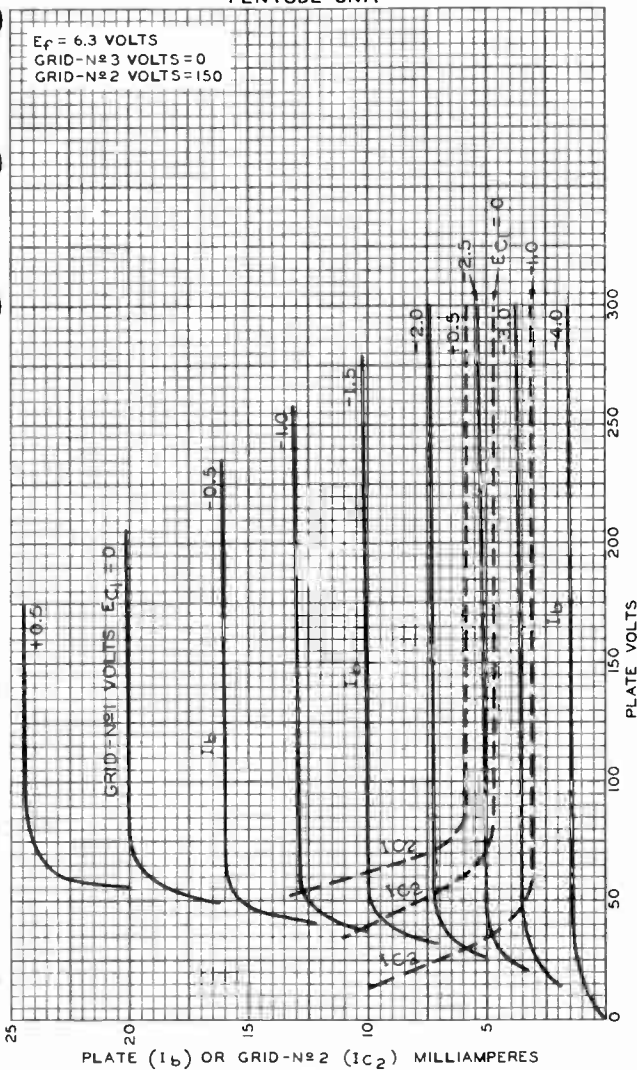
92CM-7531



6CG8

6CG8

### AVERAGE CHARACTERISTICS PENTODE UNIT



TUBE DIVISION

92CM-7532

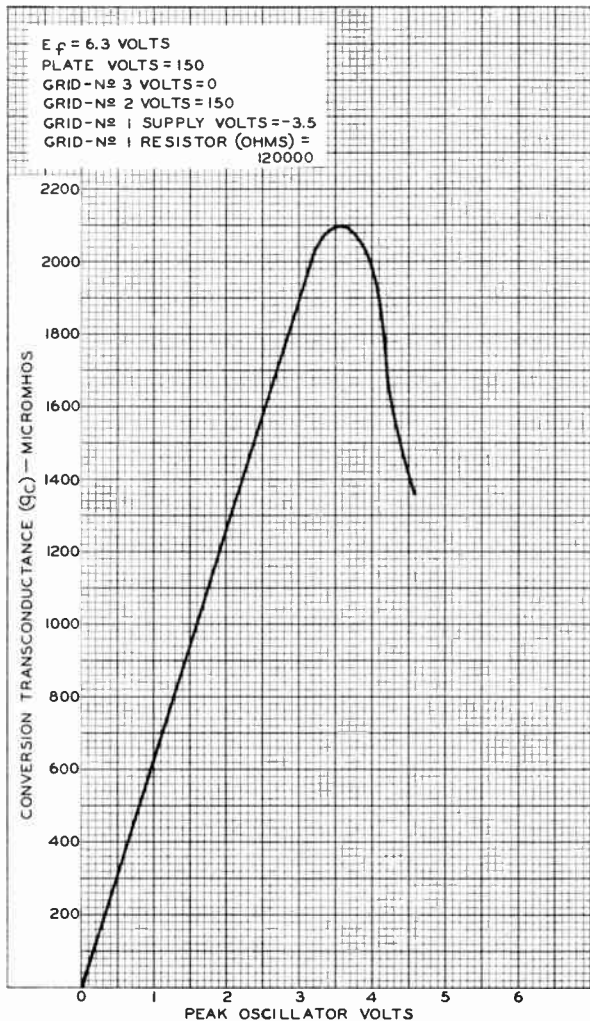
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CG8



6CG8

OPERATION CHARACTERISTIC  
WITH SEPARATE OSCILLATOR EXCITATION  
PENTODE UNIT



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7546RI

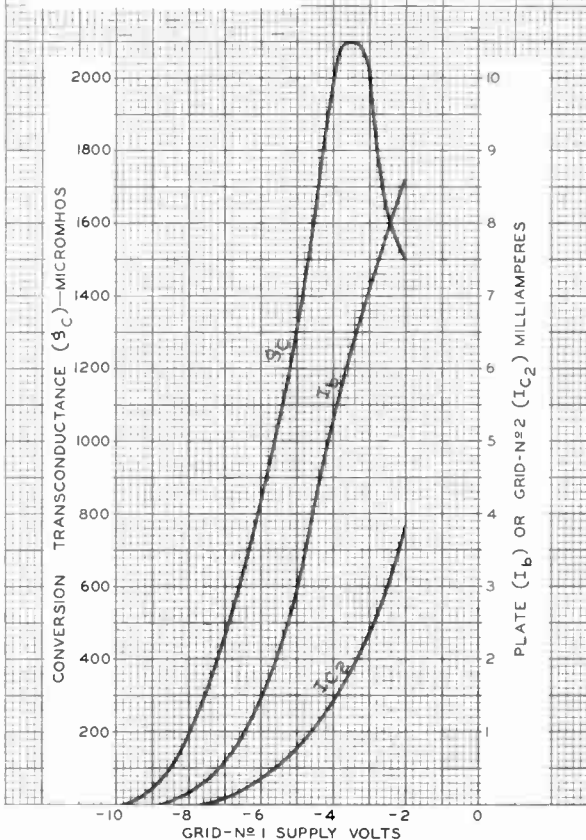


6CG8

6CG8

### OPERATION CHARACTERISTICS WITH SEPARATE OSCILLATOR EXCITATION PENTODE UNIT

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 150  
 GRID-N<sup>o</sup> 3 VOLTS = 0  
 GRID-N<sup>o</sup> 2 VOLTS = 150  
 GRID-N<sup>o</sup> 1 RESISTOR (OHMS) = 1200  
 OSCILLATOR VOLTS AT  
 GRID-N<sup>o</sup> 1 = 2.6 RMS



TUBE DIVISION

92CM-7547RI

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY







6CG8-A

## 6CG8-A

## TRIODE-PENTODE CONVERTER

9-PIN MINIATURE TYPE

Intended for use in equipment having  
series heater-string arrangement

## GENERAL DATA

## Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	. . . . .	ac or dc volts
Current . . . . .	0.45	. . . . .	amp
Warm-up time (Average).	11	. . . . .	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield <sup>o</sup>	
<i>Triode Unit:</i>			
Grid to plate . . . . .	1.5	1.5	$\mu\text{f}$
Grid to cathode & pentode grid No.3, and heater. . . . .	2.6	3	$\mu\text{f}$
Plate to cathode & pentode grid No.3, and heater. . . . .	0.05	1	$\mu\text{f}$
<i>Pentode Unit:</i>			
Grid No.1 to plate. . . . .	0.03 max.	0.016 max.	$\mu\text{f}$
Grid No.1 to cathode & grid No.3, grid No.2, and heater. . . . .	4.8	5	$\mu\text{f}$
Plate to cathode & grid No.3, grid No.2, and heater. . . . .	0.9	1.6	$\mu\text{f}$
Pentode grid No.1 to triode plate. . . . .	0.05 max.	0.04 max.	$\mu\text{f}$
Pentode plate to triode plate. . . . .	0.05 max.	0.007 max.	$\mu\text{f}$
Heater to cathode . . . . .	5.5	5.5 <sup>•</sup>	$\mu\text{f}$

## Characteristics:

	Triode Unit	Pentode Unit	
Plate-Supply Voltage. . . . .	100	250	volts
Grid-No.2 Supply Voltage. . .	-	150	volts
Cathode Resistor. . . . .	100	200	ohms
Amplification Factor. . . . .	40	-	
Plate Resistance (Approx.). . .	6900	750000	ohms
Transconductance. . . . .	5800	4600	$\mu\text{mhos}$
Plate Current . . . . .	8.5	7.7	ma
Grid-No.2 Current . . . . .	-	1.6	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 $\mu\text{amp}$ .	-10	-10	volts

<sup>o</sup> with external shield JETEC No.315 connected to cathode except as noted.

<sup>•</sup> with external shield JETEC No.315 connected to ground.

6CG8-A



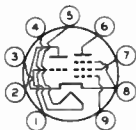
6CG8-A

## TRIODE-PENTODE CONVERTER

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-9/16" ± 3/32"
Maximum Diameter . . . . .	7/8"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JETEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9GF

Pin 1 - Triode Grid  
 Pin 2 - Triode Plate  
 Pin 3 - Cathode  
 Pin 4 - Heater  
 Pin 5 - Heater  
 Pin 6 - Pentode Plate



Pin 7 - Pentode  
           Grid No. 2  
 Pin 8 - Pentode  
           Grid No. 3,  
           Cathode  
 Pin 9 - Pentode  
           Grid No. 1

### CONVERTER SERVICE

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

	Triode Unit as Osc.	Pentode Unit as Mixer	
PLATE VOLTAGE . . . . .	250 max.	250 max.	volts
GRID-No. 2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	-	250 max.	volts
GRID-No. 2 VOLTAGE . . . . .	-	See Grid-No. 2 Input Rating Chart at front of Receiving Tube Section	
GRID-No. 1 (CONTROL-GRID) VOLTAGE:			
Negative bias value . . . . .	40 max.	40 max.	volts
Positive bias value . . . . .	0 max.	0 max.	volts
PLATE DISSIPATION . . . . .	1.5 max.	2 max.	watts
GRID-No. 2 INPUT:			
For grid-No. 2 voltages up to 125 volts . . . . .	-	0.5 max.	watt
For grid-No. 2 voltages between 125 and 250 volts . . . . .	-	See Grid-No. 2 Input Rating Chart at front of Receiving Tube Section	
GRID-No. 1 INPUT . . . . .	0.5 max.	-	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200 max.	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	200 <sup>▲</sup> max.	volts

▲ The dc component must not exceed 100 volts.



6CG8-A

6CG8-A

### TRIODE-PENTODE CONVERTER

#### Typical Operation:

	Triode Unit as 250-Mc Osc.*	Pentode Unit as Mixer*	
Plate Voltage . . . . .	150	150	volts
Grid-No.2 Voltage . . . . .	-	150	volts
Mixer Grid-No.1 Supply Voltage . . . . .	-	-3.5	volts
Oscillator Voltage (rms) at mixer grid No.1. . . . .	-	2.6	volts
Mixer Grid-No.1-Circuit Resistance . . . . .	-	120000	ohms
Oscillator Grid Resistor.	2700	-	ohms
Conversion Trans- conductance . . . . .	-	2100	$\mu$ mhos
Plate Current . . . . .	13	6.2	ma
Grid-No.2 Current . . . . .	-	1.8	ma
Grid Current . . . . .	3.6	-	ma
Grid-No.1 Current . . . . .	-	2	$\mu$ amp
Oscillator Power Output (Approx.). . . . .	0.5	-	watt

#### Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation. . . . .	0.1 max.	megohm
For cathode-bias operation. . . . .	0.5 max.	megohm

- In TV or FM receivers, it is generally desirable to operate the oscillator with less power input than shown in the tabulated data in order to avoid over-excitation and excessive oscillator radiation.
- \* with separate excitation and triode unit connected to ground.

Curves shown under Type 6X8 also apply to the 6CG8-A





6CH8

# 6CH8 MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3 . . . . .	ac or dc volts
Current . . . . .	0.45 . . . . .	amp

Direct Interelectrode Capacitances:<sup>0</sup>

#### Triode Unit:

Grid to plate . . . . .	1.6	$\mu\text{f}$
Grid to cathode, heater & pentode grid No.3 & internal shield . . . . .	1.9	$\mu\text{f}$
Plate to cathode, heater & pentode grid No.3 & internal shield . . . . .	1.6	$\mu\text{f}$

#### Pentode Unit:

Grid No.1 to plate . . . . .	0.025 max.	$\mu\text{f}$
Grid No.1 to cathode, grid No.2, heater & grid No.3 & internal shield . . . . .	7	$\mu\text{f}$
Plate to cathode, grid No.2, heater & grid No.3 & internal shield . . . . .	2.25	$\mu\text{f}$
Triode grid to pentode plate . . . . .	0.005	$\mu\text{f}$
Pentode grid No.1 to triode plate . . . . .	0.02	$\mu\text{f}$
Pentode plate to triode plate . . . . .	0.04	$\mu\text{f}$

### Characteristics, Class A<sub>1</sub> Amplifier:

	Triode Unit	Pentode Unit	
Plate-Supply Voltage . . . . .	200	200	volts
Grid-No.3 Supply Voltage . . . . .	—	0	volts
Grid-No.2 Supply Voltage . . . . .	—	150	volts
Grid-No.1 Voltage . . . . .	-6	—	volts
Cathode Resistor . . . . .	—	180	ohms
Amplification Factor . . . . .	19	—	
Plate Resistance (Approx.) . . . . .	5750	300000	ohms
Transconductance . . . . .	3300	6200	$\mu\text{mhos}$
Plate Current . . . . .	13	9.5	ma
Grid-No.2 Current . . . . .	—	2.8	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 $\mu\text{amp}$ . . . . .	-19	-8	volts

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" $\pm$ 3/32"
Maximum Diameter . . . . .	7/8"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T-6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JETEC No.E9-1)

<sup>0</sup> without external shield.

6CH8



6CH8

## MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

Basing Designation for EUTTON V1EA . . . . . 9F1

Pin 1 - Triode Cathode	Pin 6 - Pentode Cathode
Pin 2 - Pentode Plate	Pin 7 - Pentode Grid No. 1
Pin 3 - Pentode Grid No. 2	Pin 8 - Triode Grid
Pin 4 - Heater	Pin 9 - Triode Plate
Pin 5 - Heater, Pentode Grid No. 3, internal Shield	



### AMPLIFIER - Class A<sub>1</sub>

#### Maximum Ratings, Design-Center Values\*

	Triode Unit	Pentode Unit	
PLATE VOLTAGE . . . . .	300 max.	300 max.	volts
GRID-NO. 3 (SUPPRESSOR-GRID) VOLTAGE . . . . .	-	0 max.	volts
GRID-NO. 2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	-	300 max.	volts
GRID-NO. 2 VOLTAGE . . . . .	-	See Grid-No. 2 Input	

Rating Chart at front of Receiving Tube Section

GRID-NO. 1 (CONTROL-GRID) VOLTAGE:			
Positive bias value . . . . .	0 max.	0 max.	volts
PLATE DISSIPATION . . . . .	2.0 <sup>†</sup> max.	2 max.	watts
GRID-NO. 2 INPUT:			
for grid-No. 2 voltages up to 150 volts . . . . .	-	0.5 max.	watt
for grid-No. 2 voltages between 150 and 300 volts . . . . .	-	See Grid-No. 2 Input	

Rating Chart at front of Receiving Tube Section

PEAK HEATER-CATHODE VOLTAGE:			
heater negative with respect to cathode . . . . .	200 max.	▲	volts
heater positive with respect to cathode . . . . .	200 <sup>‡</sup> max.	0 max.	volts

▲ The heater-cathode voltage should not exceed the value of the operating cathode bias because the voltage between the heater and cathode is also applied between the cathode and grid No. 3. The net result is to make grid No. 3 negative with respect to cathode with possible change in tube characteristics.

‡ The dc component must not exceed 100 volts.



6CH8

# 6CH8 MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

## Maximum Circuit Values:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
Grid-No.1-Circuit Resistance:			
For fixed-bias operation. . .	0.5 max.	0.25 max.	megohm
For cathode-bias operation. .	1.0 max.	1.0 max.	megohm

\* If either unit is operated at maximum rated conditions, grid-no.1-circuit resistances for both units should not exceed the stated values.

## OPERATING CONSIDERATIONS

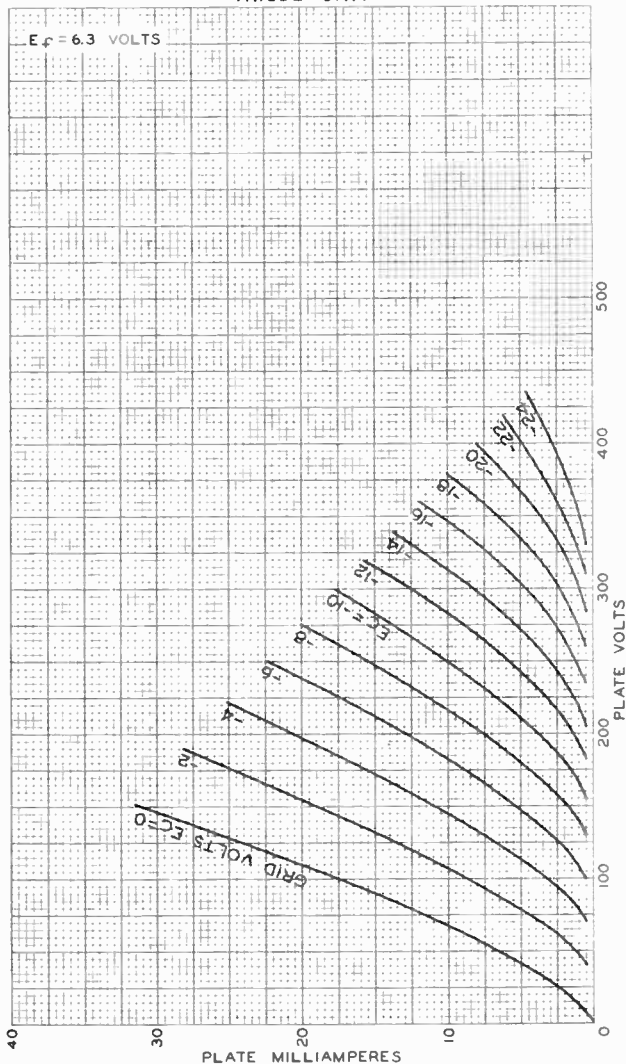
Because *grid No.3* is connected within the tube to one side of the heater (pin 5), it is important that pin 5 be connected to ground to maintain grid No.3 at ground potential. If this precaution is not observed and pin 5 is connected to the ungrounded side of the heater supply, grid No.3 will operate at the heater-supply voltage. As a result, tube characteristics will be changed. Furthermore, if an ac heater supply is used, ac voltage will be applied to grid No.3 with resulting amplitude modulation of the grid-No.3 voltage.

6CH8



6CH8

# AVERAGE PLATE CHARACTERISTICS TRIODE UNIT



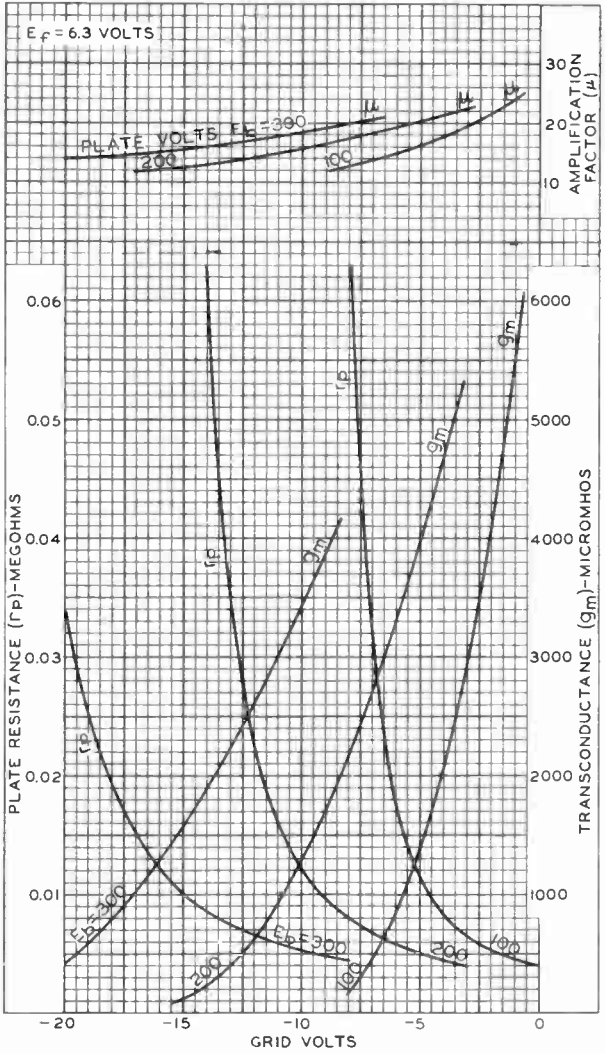




6CH8

6CH8

### AVERAGE CHARACTERISTICS TRIODE UNIT

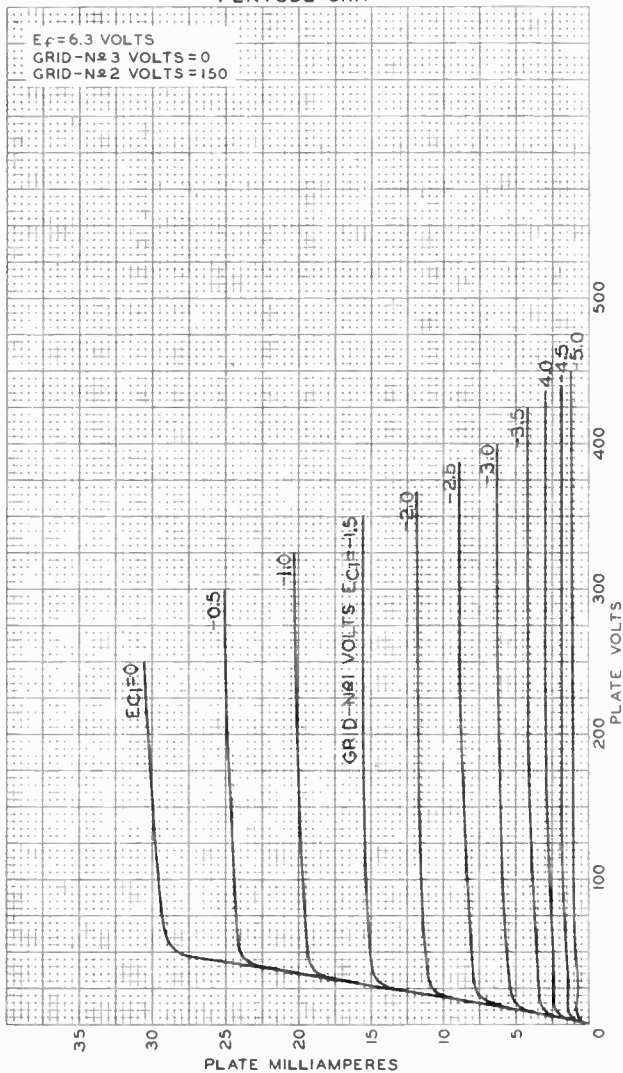


6CH8



6CH8

# AVERAGE PLATE CHARACTERISTICS PENTODE UNIT



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

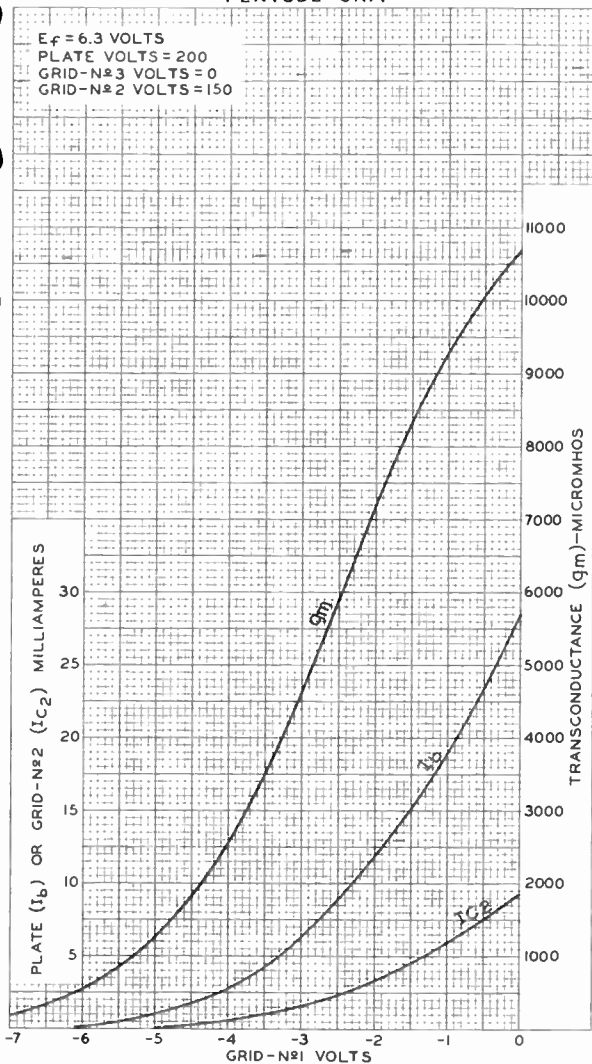
92CM-8206RI



6CH8

AVERAGE CHARACTERISTICS  
PENTODE UNIT

6CH8



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8208R1





6CK4

6CK4

# LOW-MU TRIODE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3 ± 10%	volts
Current . . . . .	1.25	amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid to plate . . . . .	6.5	μf
Grid to cathode and heater . . . . .	8	μf
Plate to cathode and heater . . . . .	1.8	μf

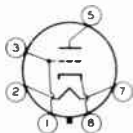
### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	100	250	volts
Grid Voltage . . . . .	0	-28	volts
Amplification Factor . . . . .	-	6.6	
Plate Resistance (Approx.) . . . . .	-	1200	ohms
Transconductance . . . . .	-	5500	μmhos
Plate Current . . . . .	125*	40	ma
Plate Current for grid volts = -38. . . . .	-	10	ma
Grid Voltage (Approx.) for plate ma. = 0.5 . . . . .	-	-50	volts

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	3-7/16"
Maximum Seated Length . . . . .	2-7/8"
Maximum Diameter . . . . .	1-9/32"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T9
Base . . . . .	Short Intermediate-Shell Octal 6-Pin with External Barriers, Arrangement 1 (JEDEC Group 1, No. B6-60)
Basing Designation for BOTTOM VIEW . . . . .	8JB

Pin 1 - Grid  
Pin 2 - Heater  
Pin 3 - Grid



Pin 5 - Plate  
Pin 7 - Heater  
Pin 8 - Cathode

## VERTICAL-DEFLECTION AMPLIFIER

### Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system<sup>o</sup>

DC PLATE VOLTAGE . . . . .	550 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE* . . . . .	2000 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	250 max.	volts
CATHODE CURRENT:		
Peak . . . . .	350 max.	ma
Average . . . . .	100 max.	ma

6CK4



6CK4

## LOW-MU TRIODE

PLATE DISSIPATION. . . . . 12 max. watts  
PEAK HEATER-CATHODE VOLTAGE:  
Heater negative with respect to cathode. . 200 max. volts  
Heater positive with respect to cathode. . 200<sup>▲</sup> max. volts

### Maximum Circuit Values:

Grid-Circuit Resistance:  
For cathode-bias operation. . . . . 2.2 max. megohms

- without external shield.
- This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.
- As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.
- # This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.
- ▲ The dc component must not exceed 100 volts.



6CL6

6CL6

# POWER PENTODE

MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	ac or dc volts
Current . . . . .	0.65	amp

Direct Interelectrode Capacitances (without external shield):

Grid No.1 to Plate . . . . .	0.120	$\mu\mu\text{f}$
Input . . . . .	11	$\mu\mu\text{f}$
Output . . . . .	5.5	$\mu\mu\text{f}$

### Characteristics, Amplifier Class A<sub>1</sub>:

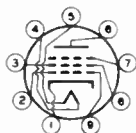
Plate Voltage . . . . .	250	volts
Grid No.3 . . . . .	Connected to cathode at socket	
Grid-No.2 Voltage . . . . .	150	volts
Grid-No.1 Voltage . . . . .	-3	volts
Peak AF Grid-No.1 Signal Voltage . . . . .	3	volts
Zero-Signal DC Plate Current . . . . .	30	ma
Max.-Signal DC Plate Current . . . . .	31	ma
Zero-Signal DC Grid-No.2 Current . . . . .	7	ma
Max.-Signal DC Grid-No.2 Current . . . . .	7.2	ma
Plate Resistance (Approx.) . . . . .	0.15	megohm
Transconductance . . . . .	11000	$\mu\text{mhos}$
Grid-No.1 Voltage (Approx.) for plate current of 10 $\mu\text{amp}$ . . . . .	-14	volts
Load Resistance . . . . .	7500	ohms
Total Harmonic Distortion . . . . .	8	per cent
Max.-Signal Power Output . . . . .	2.8	watts

### 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 (JETEC No. E9-1)

### BOTTOM VIEW

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



Pin 6 - Plate  
 Pin 7 - Grid No.3,  
 Int. Shield  
 Pin 8 - Grid No.2  
 Pin 9 - Grid No.1

### AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
PLATE SUPPLY VOLTAGE . . . . .	300 max.	volts
GRID-No.3 (SUPPRESSOR) VOLTAGE . . . . .	0 max.	volts

SEPT. 1, 1952

TUBE DEPARTMENT

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CL6



6CL6

## POWER PENTODE

GRID-No.2 (SCREEN) VOLTAGE . . . . .	See Rating Curve at front of this Section
GRID-No.2 SUPPLY VOLTAGE . . . . .	300 max. volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:	
Negative bias value . . . . .	50 max. volts
Positive bias value . . . . .	0 max. volts
PLATE DISSIPATION . . . . .	7.5 max. watts
GRID-No.2 INPUT . . . . .	1.7 max. watts
PEAK HEATER-CATHODE VOLTAGE:	
Heater negative with respect to cathode .	90 max. volts
Heater positive with respect to cathode .	90 max. volts
BULB TEMPERATURE (At hottest point on bulb surface) . . . . .	200 max. °C

## Typical Operation in 4-Mc Bandwidth Video Amplifier

Circuit of Fig. 1:

Plate Supply Voltage . . . . .	300	volts
Grid No.3 . . . . .	Connected to cathode at socket	
Grid-No.2 Supply Voltage . . . . .	300	volts
Grid-No.1 Bias Voltage . . . . .	-2	volts
Grid-No.1 Signal Voltage (Peak to Peak) .	3	volts
Grid-No.2 Resistor . . . . .	24000	ohms
Grid-No.1 Resistor . . . . .	0.1	megohm
Load Resistor . . . . .	3900	ohms
Zero-Signal Plate Current . . . . .	30	ma
Zero-Signal Grid-No.2 Current . . . . .	7.0	ma
Voltage Output (Peak to Peak) . . . . .	132	volts

## Maximum Circuit Values:

## Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max. megohm
For cathode-bias operation . . . . .	0.5 max. megohm

SEPT. 1, 1952

TUBE DEPARTMENT

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



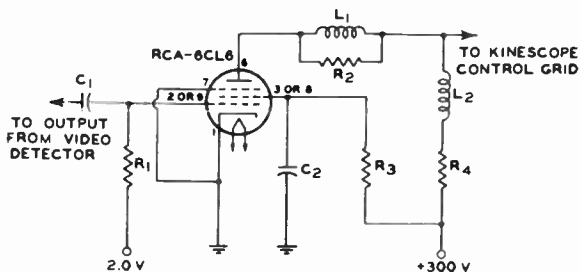


6CL6

6CL6

# POWER PENTODE

Fig. 1 - Typical Video Voltage Amplifier Circuit Having Bandwidth of 4 Mc.



92CS-7804

C1: 0.1  $\mu$ f, 400 volts

C2: 4  $\mu$ f, 400 volts

L1: Peaking Coil, 180  $\mu$ h

L2: Peaking Coil, 120  $\mu$ h

R1: 100000 ohms, 0.5 watt

R2: 47000 ohms, 0.5 watt

R3: 24000 ohms, 2 watts

R4: 3900 ohms, 5 watts

non-inductive type

Devices and arrangements shown or described herein may use patents of RCA or others. Information contained herein is furnished without responsibility by RCA for its use and without prejudice to RCA's patent rights.



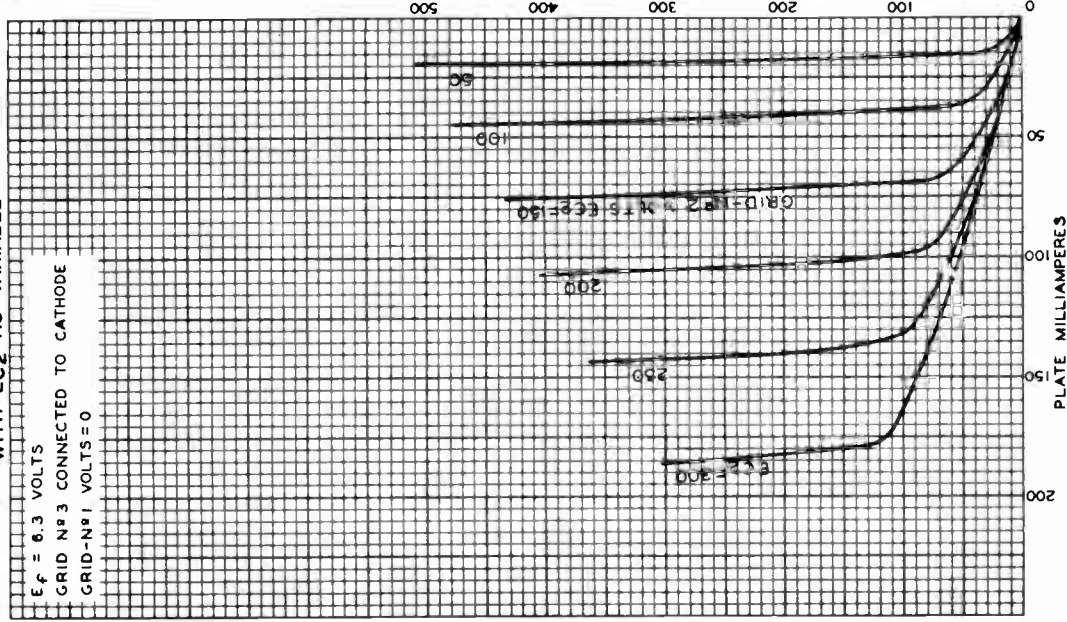
6CL6

# AVERAGE PLATE CHARACTERISTICS WITH EC2 AS VARIABLE

$E_f = 6.3$  VOLTS

GRID No 3 CONNECTED TO CATHODE

GRID-No 1 VOLTS = 0



6CL6

MAY 22, 1952

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARTFORD, NEW HAVEN

92CM-7803



6CL6

6CL6

# AVERAGE PLATE CHARACTERISTICS WITH $E_{C1}$ AS VARIABLE

$E_f = 6.3$  VOLTS  
GRID N° 3 CONNECTED TO CATHODE  
GRID-N° 2 VOLTS = 150

GRID-N° 1 ( $I_{C1}$ ) MILLIAMPERES

30 20 10 0

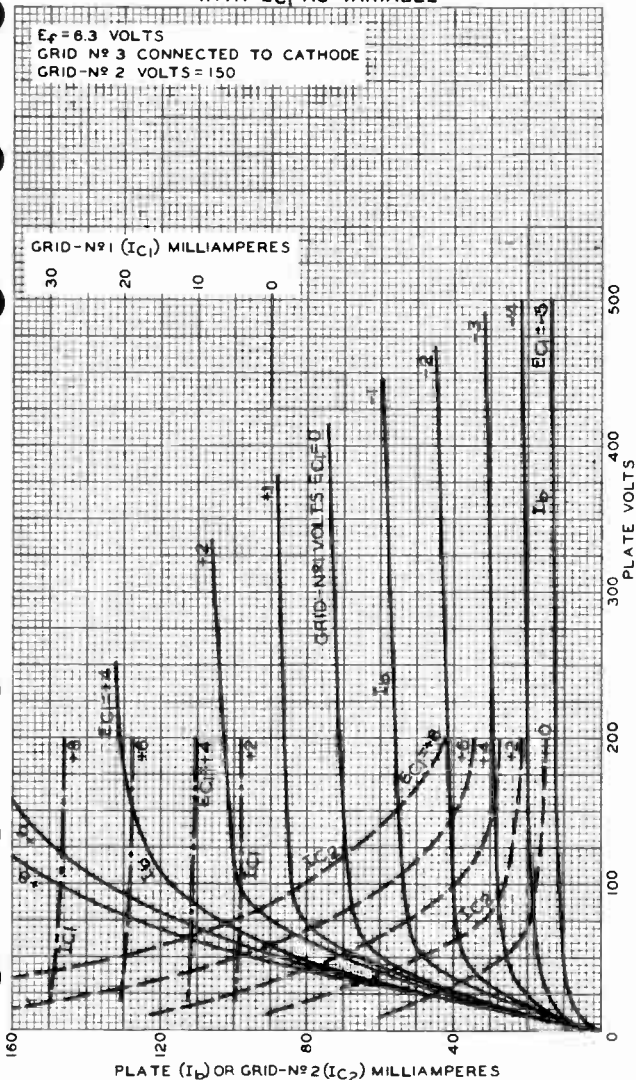


PLATE ( $I_B$ ) OR GRID-N° 2 ( $I_{C2}$ ) MILLIAMPERES

MAY 22, 1952

TUBE DEPARTMENT

92CM - 7802

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

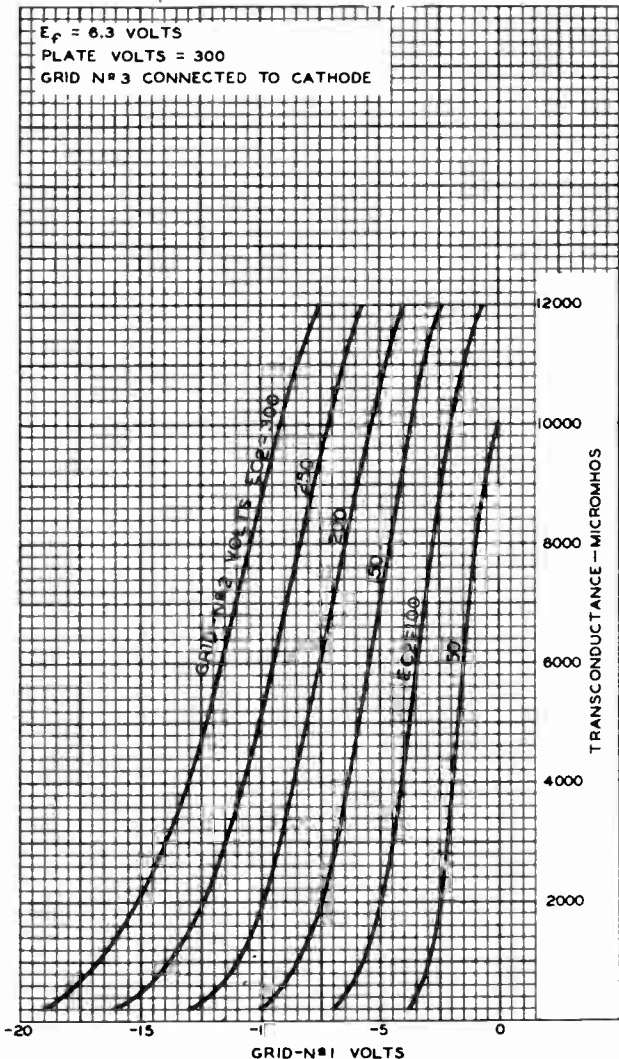
6CL6



6CL6

### AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
PLATE VOLTS = 300  
GRID N#3 CONNECTED TO CATHODE



MAY 21, 1952

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7801

World Radio History



6CL6

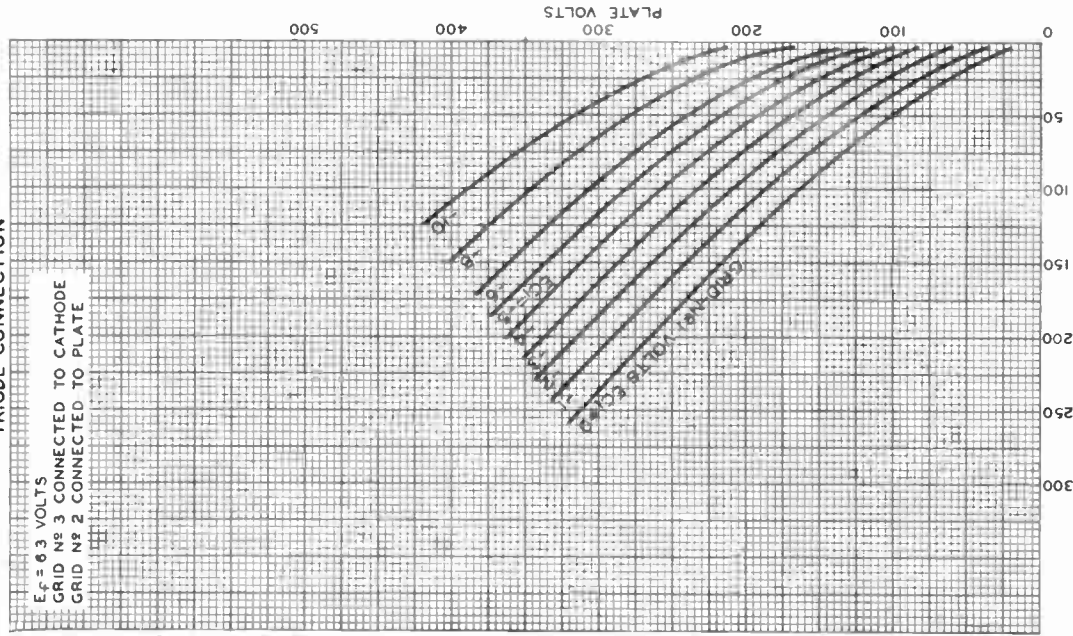
6CL6

# AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION

$E_f = 6.3$  VOLTS

GRID #3 CONNECTED TO CATHODE

GRID #2 CONNECTED TO PLATE



MAY 26, 1952

PLATE MILLIAMPERES  
TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7808





6CL8-A

# 6CL8-A MEDIUM-MU TRIODE— SHARP-CUTOFF TETRODE

9-PIN MINIATURE TYPE

with heater having controlled warm-up time

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	6.3	volts
Current . . . . .	0.45 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield <sup>o</sup>	
<b>Triode Unit:</b>			
Grid to plate . . . . .	1.8	1.8	μf
Grid to cathode, tetrode cathode & internal shield, and heater . . . . .	2.8	2.8	μf
Plate to cathode, tetrode cathode & internal shield, and heater . . . . .	1.5	2	μf
<b>Tetrode Unit:</b>			
Grid No.1 to plate . . . . .	0.02 max.	0.01 max.	μf
Grid No.1 to cathode & internal shield, grid No.2, and heater . . . . .	5	5	μf
Plate to cathode & internal shield, grid No.2, and heater . . . . .	2	3	μf
Tetrode grid No.1 to triode plate . . . . .	0.015 max.	0.01 max.	μf
Tetrode plate to triode plate . . . . .	0.15 max.	0.03 max.	μf
Heater to cathode (Each Unit) . . . . .	3	3	μf

### Characteristics, Class A<sub>1</sub> Amplifier:

	Triode Unit	Tetrode Unit	
Plate Voltage . . . . .	125	100	125 volts
Grid-No.2 Voltage . . . . .	-	70	125 volts
Grid-No.1 Voltage . . . . .	-1	-	-1 volt
Amplification Factor . . . . .	40	-	-
Plate Resistance (Approx.) . . . . .	5000	-	20000 ohms
Transconductance . . . . .	8000	7000	6500 μmhos
Plate Current . . . . .	14	-	12 ma
Grid-No.2 Current . . . . .	-	-	4 ma
Grid-No.1 Voltage (Approx.) for plate μa = 20 . . . . .	-9	-	-9 volts

← Indicates a change.

6CL8-A



6CL8-A

## MEDIUM-MU TRIODE— SHARP-CUTOFF TETRODE

### Mechanical:

Operating Position. . . . . Any  
 Maximum Overall Length. . . . . 2-3/16"  
 Maximum Seated Length. . . . . 1-15/16"  
 Length, Base Seat to Bulb Top (Excluding tip) 1-9/16"  $\pm$  3/32"  
 Diameter. . . . . 0.750" to 0.875"  
 Dimensional Outline . . . . . See General Section  
 Bulb. . . . . T6-1/2  
 Base. . . . . Small-Button Noval 9-Pin (JEDEC No. E9-1)

→ Basing Designation for BOTTOM VIEW. . . . . 9FX

Pin 1—Triode Grid  
 Pin 2—Triode Plate  
 Pin 3—Triode  
     Cathode  
 Pin 4—Heater  
 Pin 5—Heater  
 Pin 6—Tetrode Plate



Pin 7—Tetrode  
     Grid No.2  
 Pin 8—Tetrode  
     Cathode,  
     Internal  
     Shield  
 Pin 9—Tetrode  
     Grid No.1

### CONVERTER

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

	Triode Unit as Osc.	Tetrode Unit as Mixer	
PLATE VOLTAGE. . . . .	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	-	330 max.	volts
GRID-No.2 VOLTAGE. . . . .	-	See Grid-No.2 Input Rating Chart at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value. . . . .	0 max.	0 max.	volts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 165 volts. . . . .	-	0.55 max.	watt
For grid-No.2 voltages between 165 and 330 volts. . . . .	-	See Grid-No.2 Input Rating Chart at front of Receiving Tube Section	
PLATE DISSIPATION. . . . .	2.5 max.	3 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode. . . . .	200 max.	200 max.	volts
Heater positive with respect to cathode. . . . .	200 <sup>▲</sup> max.	200 <sup>▲</sup> max.	volts

→ Indicates a change.





6CL8-A

6CL8-A

# MEDIUM-MU TRIODE— SHARP-CUTOFF TETRODE

## Maximum Circuit Values:

	<i>Triode Unit</i>	<i>Tetrode Unit</i>	
Grid-No.1-Circuit Resistance:			
For fixed-bias operation. . .	0.5 max.	0.25 max.	megohm
For cathode-bias operation. .	1 max.	1 max.	megohm

U With external shield JEDEC No.315 connected to cathode of unit under test except as noted.

• With external shield JEDEC No.315 connected to ground.

▲ The dc component must not exceed 100 volts.





6CM6

BEAM POWER TUBE

9-PIN MINIATURE TYPE

6CM6

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	. . . . . ac or dc volts
Current . . . . .	0.45	. . . . . amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid No.1 to plate. . . . .	0.7	$\mu\mu\text{f}$
Grid No.1 to cathode, grid No.3, grid No.2, and heater . . . . .	8	$\mu\mu\text{f}$
Plate to cathode, grid No.3, grid No.2, and heater . . . . .	8.5	$\mu\mu\text{f}$

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" $\pm$ 3/32"
Diameter. . . . .	.0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb. . . . .	T6-1/2
Base. . . . .	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW. . . . .	9CK

- Pin 1-Grid No.2
- Pin 2-No Connection
- Pin 3-Grid No.1
- Pin 4-Heater
- Pin 5-Heater



- Pin 6-Grid No.1
- Pin 7-Cathode,  
Grid No.3
- Pin 8-No Connection
- Pin 9-Plate

AMPLIFIER — Class A<sub>1</sub>

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	315	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	285	max.	volts
GRID-No.2 INPUT . . . . .	2	max.	watts
PLATE DISSIPATION . . . . .	12	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200	max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup>	max.	volts

Typical Operation and Characteristics:

Plate Voltage . . . . .	180	250	315	volts
Grid-No.2 Voltage . . . . .	180	250	225	volts
Grid-No.1 (Control-Grid) Voltage. . . . .	-8.5	-12.5	-13	volts
Peak AF Grid-No.1 Voltage . . . . .	8.5	12.5	13	volts
Zero-Signal Plate Current . . . . .	29	45	34	ma
Max.-Signal Plate Current . . . . .	30	47	35	ma
Zero-Signal Grid-No.2 Current . . . . .	3	4.5	2.2	ma
Max.-Signal Grid-No.2 Current . . . . .	4	7	6	ma

<sup>o</sup>, <sup>▲</sup>: See next page.

6CM6



6CM6

## BEAM POWER TUBE

Plate Resistance (Approx.) . . . . .	50000	50000	80000	ohms
Transconductance . . . . .	3700	4100	3750	$\mu$ mhos
Load Resistance . . . . .	5500	5000	8500	ohms
Total Harmonic Distortion . . . . .	8	8	12	%
Max.-Signal Power Output . . . . .	2	4.5	5.5	watts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

## VERTICAL-DEFLECTION AMPLIFIER

**Maximum Ratings, Design-Center Values Except as Noted:***For operation in a 525-line, 30-frame system<sup>□</sup>*

DC PLATE VOLTAGE . . . . .	315 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE <sup>#</sup> (Absolute maximum) . . . . .	2000 <sup>■</sup> max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	285 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL- GRID) VOLTAGE . . . . .	250 max.	volts
CATHODE CURRENT:		
Peak . . . . .	120 max.	ma
DC . . . . .	40 max.	ma
GRID-No.2 INPLT . . . . .	1.75 max.	watts
PLATE DISSIPATION . . . . .	8 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	volts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:

For cathode-bias operation . . . . .	2.2 max.	megohms
--------------------------------------	----------	---------

## VERTICAL-DEFLECTION AMPLIFIER

*Triode Connection<sup>†</sup>***Maximum Ratings, Design-Center Values Except as Noted:**

DC PLATE VOLTAGE . . . . .	315 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE <sup>#</sup> (Absolute maximum) . . . . .	2000 <sup>■</sup> max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL- GRID) VOLTAGE . . . . .	250 max.	volts
CATHODE CURRENT:		
Peak . . . . .	120 max.	ma
DC . . . . .	40 max.	ma
PLATE DISSIPATION . . . . .	9 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	volts

□, ▲, #, ■, †: See next page.



6CM6

6CM6

### BEAM POWER TUBE

#### Characteristics:

Plate Voltage . . . . .	250	volts
Grid-No.1 Voltage . . . . .	-12.5	volts
Amplification Factor . . . . .	9.8	
Plate Resistance (Approx.) . . . . .	1960	ohms
Transconductance . . . . .	5000	$\mu$ mhos
Plate Current . . . . .	49.5	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 0.5 . . . . .	-37	volts

#### Maximum Circuit Values:

Grid-No.1-Circuit Resistance:  
For cathode-bias operation. . . . . 2.2 max. megohms

- c without external shield.
- ▲ The dc component must not exceed 100 volts.
- As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.
- # This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.
- Under no circumstances should this absolute value be exceeded.
- † Grid-No.2 connected to plate.

**CURVES**  
shown under Types 6V6 and 6V6-GT, within ratings,  
also apply to the 6CM6





6CM7

6CM7

**MEDIUM-MU DUAL TRIODE****With Dissimilar Units**

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement***GENERAL DATA****Electrical:**

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3	ac or dc volts
Current . . . . .	0.6	amp
Warm-up time (Average) . . . . .	11	sec

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

	Unit No. 1 Oscillator	Unit No. 2 Amplifier	
Grid to plate . . . . .	3.8	3	μf
Grid to cathode and heater	2	3.5	μf
Plate to cathode and heater	0.5	0.4	μf

**Characteristics, Class A<sub>1</sub> Amplifier:**

	Unit No. 1 Oscillator	Unit No. 2 Amplifier	
Plate Voltage . . . . .	200	250	volts
Grid Voltage . . . . .	-7	-8	volts
Amplification Factor . . . . .	20	18	
Plate Resistance (Approx.) . . . . .	11000	4100	ohms
Transconductance . . . . .	2000	4400	μmhos
Plate Current . . . . .	5	20	ma
Plate Current for grid voltage of -10 volts . . . . .	1	-	ma
Grid Voltage (Approx.) for plate current of 10 microamperes . . . . .	-14	-	volts

**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"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T-6-1/2

<sup>o</sup> without external shield.

6CM7



6CM7

## MEDIUM-MU DUAL TRIODE

With Dissimilar Units

Base . . . . .	Small-Button Noval 9-Pin (JETEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9ES
Pin 1 - Plate of Unit No. 2	Pin 6 - Plate of Unit No. 1
Pin 2 - No Connection	Pin 7 - Grid of Unit No. 1
Pin 3 - Cathode of Unit No. 1	Pin 8 - Grid of Unit No. 2
Pin 4 - Heater	Pin 9 - Cathode of Unit No. 2
Pin 5 - Heater	



### VERTICAL DEFLECTION OSCILLATOR

Values are for Unit No. 1

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

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	500 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	200 max.	volts
CATHODE CURRENT:		
Peak . . . . .	70 max.	ma
Average . . . . .	15 max.	ma
PLATE DISSIPATION . . . . .	1.25 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	200 max.	volts
Heater positive with respect to cathode. . . . .	200 <sup>▲</sup> max.	volts

#### Maximum Circuit Values:

##### Grid-Circuit Resistance:

For fixed-bias, grid-resistor bias, or cathode-bias operation . . . . .	2.2 max.	megohms
---	----------	---------

### VERTICAL DEFLECTION AMPLIFIER

Values are for Unit No. 2

#### Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	500 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE# (Absolute maximum) . . . . .	2200 <sup>■</sup> max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	200 max.	volts
CATHODE CURRENT:		
Peak . . . . .	70 max.	ma
Average . . . . .	20 max.	ma
PLATE DISSIPATION . . . . .	5.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	200 max.	volts
Heater positive with respect to cathode. . . . .	200 <sup>▲</sup> max.	volts

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

<sup>□</sup>, <sup>■</sup>, <sup>#</sup>: See next page.

JULY 1, 1955

TUBE DIVISION

TENTATIVE DATA 1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History





6CM7

6CM7

## MEDIUM-MU DUAL TRIODE With Dissimilar Units

### Maximum Circuit Values:

#### Grid-Circuit Resistance:

For fixed-bias operation . . . . . 1.0 max. megohm  
For cathode-bias operation . . . . . 2.5 max. megohms

□ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

# This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

■ under no circumstances should this absolute value be exceeded.

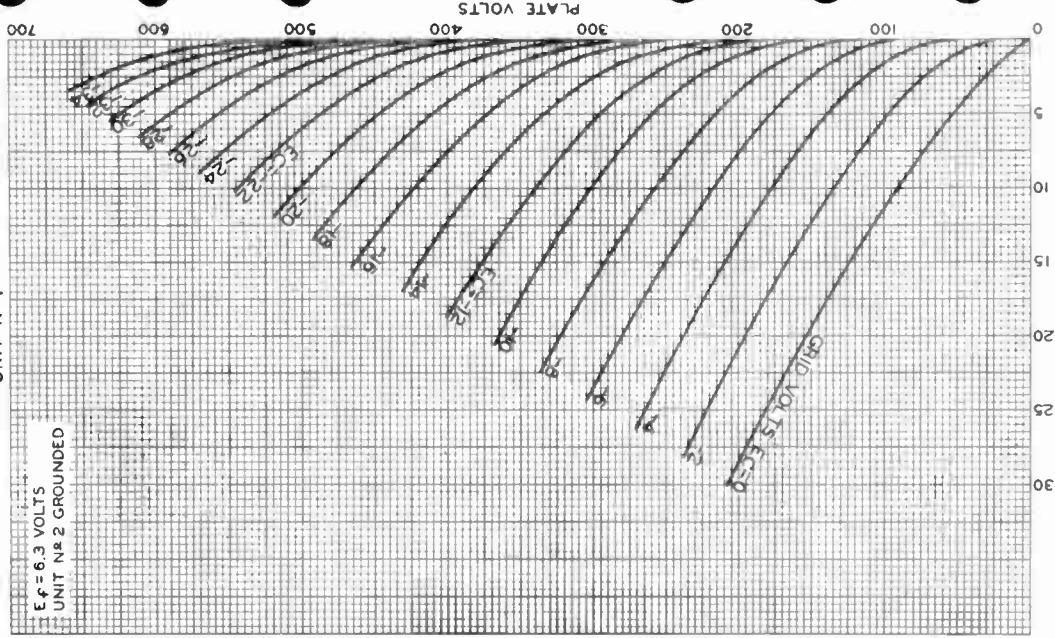


6CM7

# AVERAGE PLATE CHARACTERISTICS

UNIT N° 1

$E_f = 6.3$  VOLTS  
UNIT N° 2 GROUND



MAY 17, 1955

PLATE MILLIAMPERES

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HAMBURG, NEW JERSEY

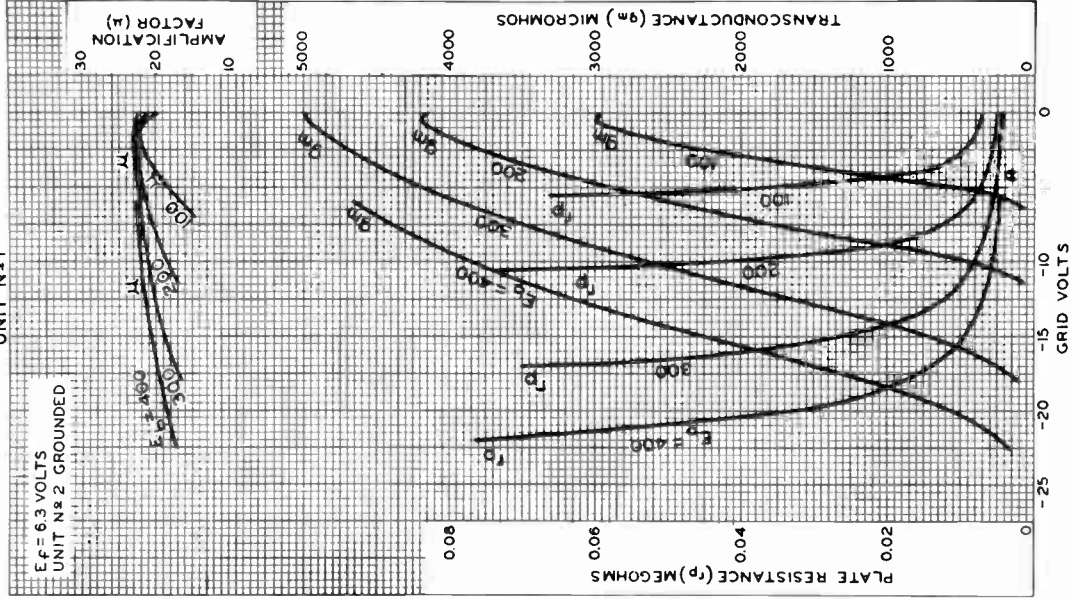
92CM-8617



6CM7

# AVERAGE CHARACTERISTICS UNIT N<sub>2</sub>1

$E_f = 6.3$  VOLTS  
UNIT N<sub>2</sub>2 GROUNDED



6CM7

MAY 16, 1955

TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, N.J.

92CM - 8616

6CM7

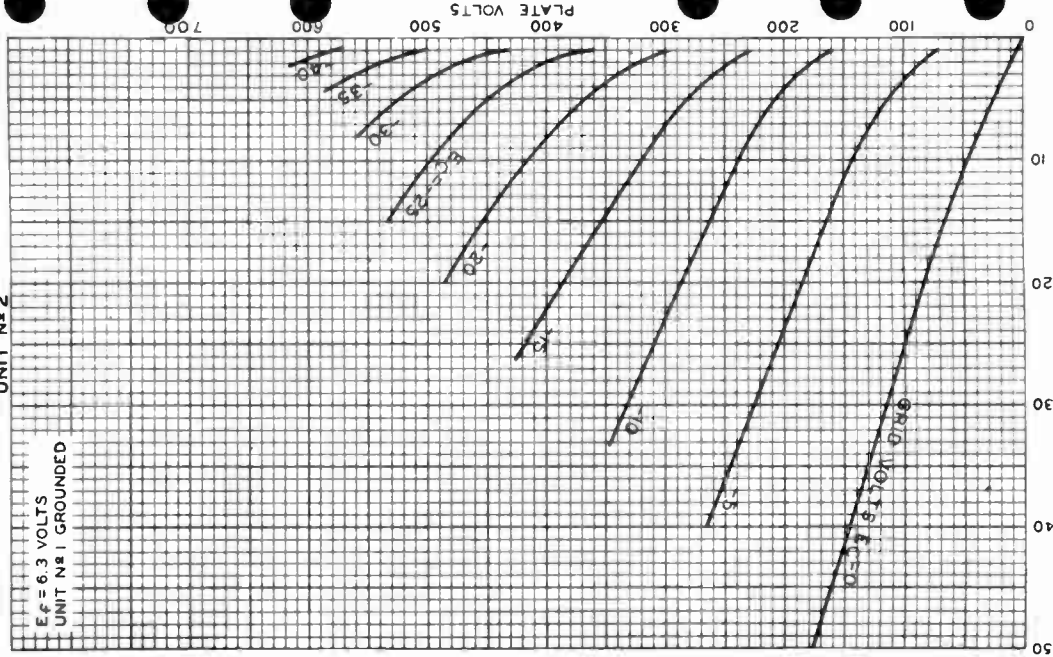


6CM7

# AVERAGE PLATE CHARACTERISTICS

UNIT N#2

$E_f = 6.3$  VOLTS  
UNIT N#1 GROUND



700

600

500

400

300

200

100

0

50

40

30

20

10

MAY 16, 1955

PLATE MILLIAMPERES  
TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARTFORD, NEW BRITAIN

92CM-8615

AVERAGE CHARACTERISTICS

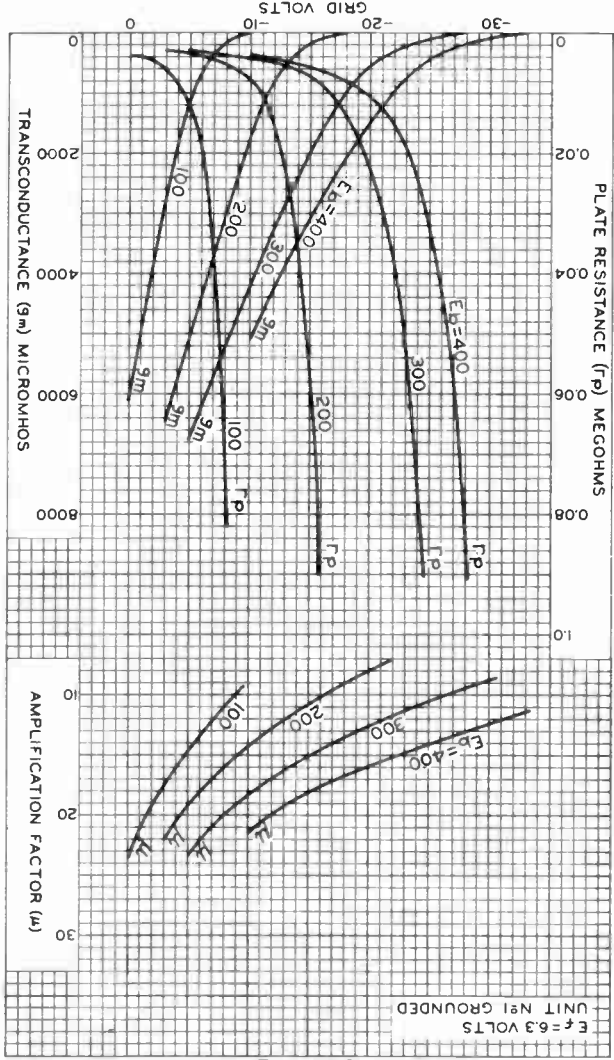
UNIT No 2

$E_f = 6.3$  VOLTS  
UNIT No 1 GROUND

6CM7



World Radio History







6CM8

6CM8

# HIGH-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes.

Voltage (AC or DC) . . . . .	6.3	volts
Current . . . . .	0.45 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

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

#### Triode Unit:

Grid to plate . . . . .	1.9	μμf
Grid to cathode and heater . . . . .	1.6	μμf
Plate to cathode and heater . . . . .	0.22	μμf

#### Pentode Unit:

Grid No.1 to plate . . . . .	0.04 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater . . . . .	6	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater . . . . .	2.6	μμf
Triode grid to pentode plate . . . . .	0.01 max.	μμf
Pentode grid No.1 to triode plate . . . . .	0.15 max.	μμf
Pentode plate to triode plate . . . . .	0.1 max.	μμf

### Characteristics, Class A<sub>1</sub> Amplifier:

	Triode Unit	Pentode Unit	
Plate Supply Voltage . . . . .	250	250	volts
Grid-No.2 Supply Voltage . . . . .	-	150	volts
Grid-No.1 Voltage . . . . .	-2	0	volts
Cathode Resistor . . . . .	-	180	ohms
Amplification Factor . . . . .	100	-	
Plate Resistance (Approx.) . . . . .	0.05	0.6	megohm
Transconductance . . . . .	2000	6200	μmhos
Plate Current . . . . .	1.8	9.5	ma
Grid-No.2 Current . . . . .	-	2.8	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10 . . . . .	-	-8	volts

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" ± 3/32"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2

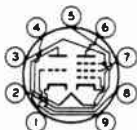
6CM8



# 6CM8 HIGH-MU TRIODE— SHARP-CUTOFF PENTODE

Base . . . . . Small-Button Noval 9-Pin (JEDEC No.E9-1)  
Basing Designation for BOTTOM VIEW. . . . . 9FZ

Pin 1—Triode Plate  
Pin 2—Pentode  
Grid No.1  
Pin 3—Pentode  
Cathode,  
Pentode  
Grid No.3,  
Internal  
Shield  
Pin 4—Heater



Pin 5—Heater  
Pin 6—Pentode  
Plate  
Pin 7—Pentode  
Grid No.2  
Pin 8—Triode  
Cathode  
Pin 9—Triode  
Grid

## AMPLIFIER — Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

	Triode Unit	Pentode Unit	
PLATE VOLTAGE. . . . .	300 max.	300 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	-	300 max.	volts
GRID No.2 VOLTAGE. . . . .	-	See Grid No.2 Input	

*Rating Chart at front of Receiving Tube Section*

	Triode Unit	Pentode Unit	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value. . . . .	0 max.	0 max.	volts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts. . . . .	-	0.5 max.	watt
For grid-No.2 voltages between 150 and 300 volts. . . . .	-	See Grid-No.2 Input	

*Rating Chart at front of Receiving Tube Section*

	Triode Unit	Pentode Unit	
PLATE DISSIPATION. . . . .	1 max.	2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200 max.	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	200 <sup>▲</sup> max.	volts

### Maximum Circuit Values:

	Triode Unit	Pentode Unit	
Grid-No.1-Circuit Resistance:			
For fixed-bias operation. . . . .	0.25 max.	0.25 max.	megohm
For cathode-bias operation. . . . .	1 max.	1 max.	megohm





6CM8

# 6CM8 HIGH-MU TRIODE— SHARP-CUTOFF PENTODE

○ without external shield.

▲ The dc component must not exceed 100 volts.

## OPERATING CONSIDERATIONS

Because the internal shield is connected to the cathode and grid No.3, the impedance in the cathode circuit should be kept as low as possible to minimize cross-coupling effects.





6CN7

6CN7

# TWIN DIODE-HIGH-MU TRIODE

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

	Series	Parallel	
Heater arrangement			
Voltage (AC or DC) . . . . .	6.3	3.15	volts
Current . . . . .	0.3	0.6	amp
Warm-up time (Average) . . . . .	-	11	sec

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

#### Triode Unit:

Grid to plate . . . . .	1.8	$\mu\mu\text{f}$
Grid to cathode and heater . . . . .	1.5	$\mu\mu\text{f}$
Plate to cathode and heater . . . . .	0.5	$\mu\mu\text{f}$

#### Diode Units:

Diode-No.1 plate to cathode of diodes No.1 and No.2 & internal shield, and heater . . . . .	3.6	$\mu\mu\text{f}$
Diode-No.2 plate to cathode of diodes No.1 and No.2 & internal shield, and heater . . . . .	3.6	$\mu\mu\text{f}$
Triode grid to either diode plate . . . . .	0.006	$\mu\mu\text{f}$

### Characteristics, Class A, Amplifier (Triode Unit):

Plate Voltage . . . . .	100	250	volts
Grid Voltage . . . . .	-1	-3	volts
Amplification Factor . . . . .	70	70	
Plate Resistance (Approx.) . . . . .	54000	58000	ohms
Transconductance . . . . .	1300	1200	$\mu\text{mhos}$
Plate Current . . . . .	0.8	1	ma

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" $\pm$ 3/32"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9EN

Pin 1 - Diode-No.2  
Plate  
Pin 2 - Diode-No.1  
Plate  
Pin 3 - Cathode of  
Diodes No.1  
& No.2,  
Internal  
Shield



Pin 4 - Heater  
Pin 5 - Heater  
Pin 6 - Triode  
Cathode  
Pin 7 - Triode Grid  
Pin 8 - Triode Plate  
Pin 9 - Heater  
Mid-Tap

← Indicates a change.

6CN7



6CN7

## TWIN DIODE—HIGH-MU TRIODE

### TRIODE UNIT — AMPLIFIER — Class A<sub>1</sub>

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

PLATE VOLTAGE. . . . .	300 max.	volts
GRID VOLTAGE:		
Positive-bias value. . . . .	0 max.	volts
PLATE DISSIPATION. . . . .	1 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	volts

#### Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART No. 7  
at front of this Section

### DIODE UNITS — Two

Values are for Each Unit

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

PLATE CURRENT. . . . .	5 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	volts

#### → Characteristics:

Plate Current for plate volts = 5 . . . . . 20 ma

○ Without external shield.

▲ The dc component must not exceed 100 volts.

→ Curves shown under Type 6T8-A also apply to the 6CN7

→ Indicates a change.



6CQ8

6CQ8

# MEDIUM-MU TRIODE — SHARP-CUTOFF TETRODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3	. . . . . ac or dc volts
Current . . . . .	0.45	. . . . . amp
Warm-up time (Average). . . . .	11	. . . . . sec

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield <sup>o</sup>	
<i>Triode Unit:</i>			
Grid to plate . . . . .	1.8	1.8	$\mu\mu\text{f}$
Grid to cathode and heater. . . . .	2.7	2.7	$\mu\mu\text{f}$
Plate to cathode and heater. . . . .	0.4	1.2	$\mu\mu\text{f}$
<i>Tetrode Unit:</i>			
Grid No.1 to plate. . . . .	0.019 max.	0.015 max.	$\mu\mu\text{f}$
Grid No.1 to cathode & internal shield, grid No.2, and heater. . . . .	5	5	$\mu\mu\text{f}$
Plate to cathode & internal shield, grid No.2, and heater. . . . .	2.5	3.3	$\mu\mu\text{f}$
Tetrode plate to triode plate . . . . .	0.07 max.	0.01 max.	$\mu\mu\text{f}$
Heater to cathode . . . . .	3	3 <sup>*</sup>	$\mu\mu\text{f}$

### Characteristics:

	Triode Unit	Tetrode Unit	
Plate Voltage . . . . .	125	125	volts
Grid-No.2 (Screen-Grid) Voltage . . . . .	-	125	volts
Grid-No.1 (Control-Grid) Voltage. . . . .	-	-1	volt
Cathode Resistor. . . . .	56	-	ohms
Amplification Factor. . . . .	40	-	
Plate Resistance (Approx.). . . . .	5000	140000	ohms
Transconductance. . . . .	8000	5800	$\mu\text{mhos}$
Plate Current . . . . .	15	12	ma
Grid-No.2 Current . . . . .	-	4.2	ma
Grid-No.1 Voltage (Approx.) for plate current of 100 $\mu\text{amp}$ . . . . .	-7	-7	volts

<sup>o</sup> with external shield JETEC No.315 connected to cathode of unit under test except as noted.  
<sup>\*</sup> with external shield JETEC No.315 connected to ground.

6CQ8



6CQ8

## MEDIUM-MU TRIODE — SHARP-CUTOFF TETRODE

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" ± 3/32"
Maximum Diameter . . . . .	7/8"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	Tf-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9GE

Pin 1 - Triode Plate

Pin 2 - Tetrode

Grid No.1

Pin 3 - Tetrode

Grid No.2

Pin 4 - Heater

Pin 5 - Heater

Pin 6 - Tetrode Plate

Pin 7 - Tetrode

Cathode,

Internal

Shield

Pin 8 - Triode

Cathode

Pin 9 - Triode

Grid



### CONVERTER SERVICE

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

	Triode Unit as Osc.	Tetrode Unit as Mixer	
PLATE VOLTAGE . . . . .	300 max.	300 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	-	300 max.	volts
GRID-No.2 VOLTAGE . . . . .	-	See Grid-No.2 Input	

Rating Chart at front of Receiving Tube Section

GRID-No.1 (CONTROL-GRID)

VOLTAGE:

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

GRID-No.2 INPUT:

For grid-No.2 voltages

up to 150 volts . . . . . - 0.6 max. watt

For grid-No.2 voltages

between 150 and

300 volts . . . . . - See Grid-No.2 Input

Rating Chart at front of Receiving Tube Section

GRID INPUT . . . . . 0.5 max. - watt

PLATE DISSIPATION . . . . . 2.7 max. 2.0 max. watts

PEAK HEATER-CATHODE

VOLTAGE:

Heater negative with

respect to cathode . . . . . 200 max. 200 max. volts

Heater positive with

respect to cathode . . . . . 200<sup>▲</sup> max. 200<sup>▲</sup> max. volts

▲ The ac component must not exceed 100 volts.



6CQ8

6CQ8

# MEDIUM-MU TRIODE — SHARP-CUTOFF TETRODE

## Maximum Circuit Values:

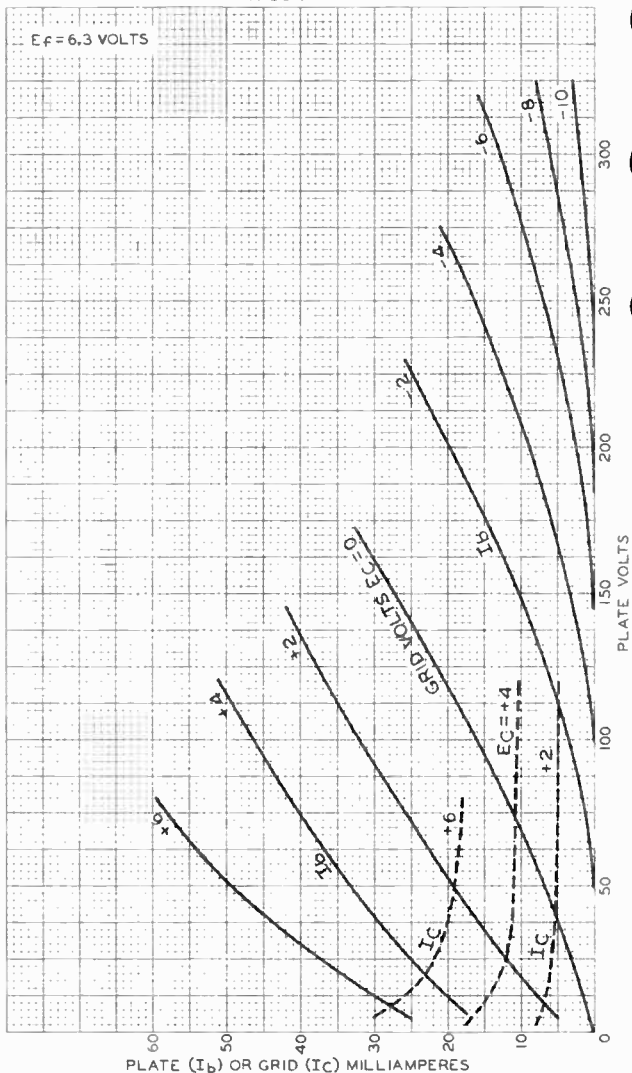
	<i>Triode Unit</i>	<i>Tetrode Unit</i>	
Grid-No.1-Circuit Resistance:			
For fixed-bias operation. . . .	0.5 max.	0.25 max.	megohm
For cathode-bias operation. . .	1.0 max.	1.0 max.	megohm

6CQ8



6CQ8

# AVERAGE CHARACTERISTICS TRIODE UNIT



TUBE DIVISION

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-9190R1

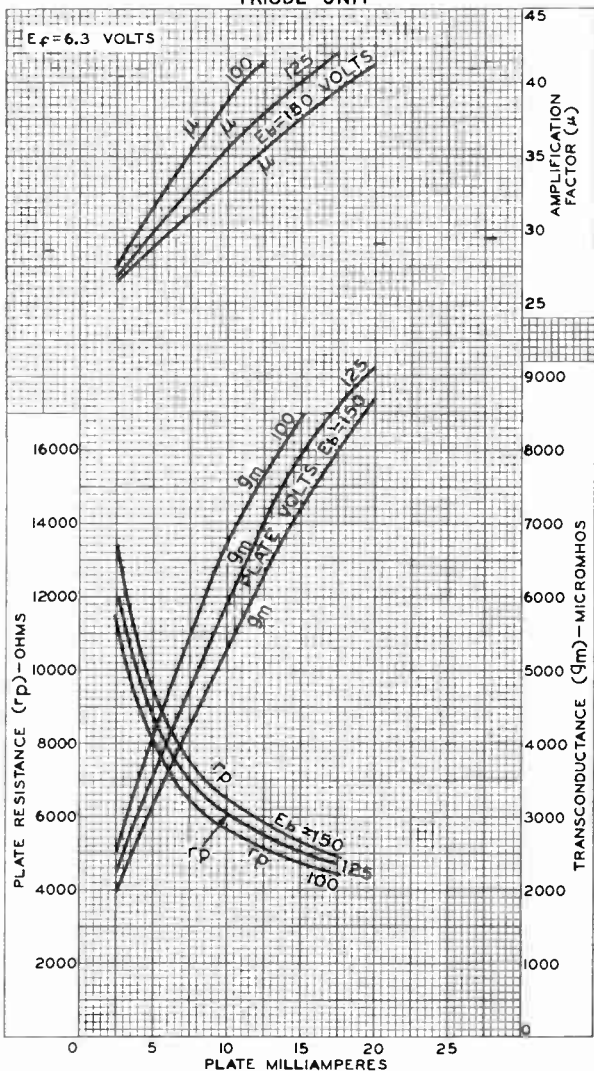




6CQ8

6CQ8

### AVERAGE CHARACTERISTICS TRIODE UNIT



6CQ8



6CQ8

# AVERAGE CHARACTERISTICS TETRODE UNIT

$E_f = 6.3$  VOLTS  
GRID - No 2 VOLTS = 125

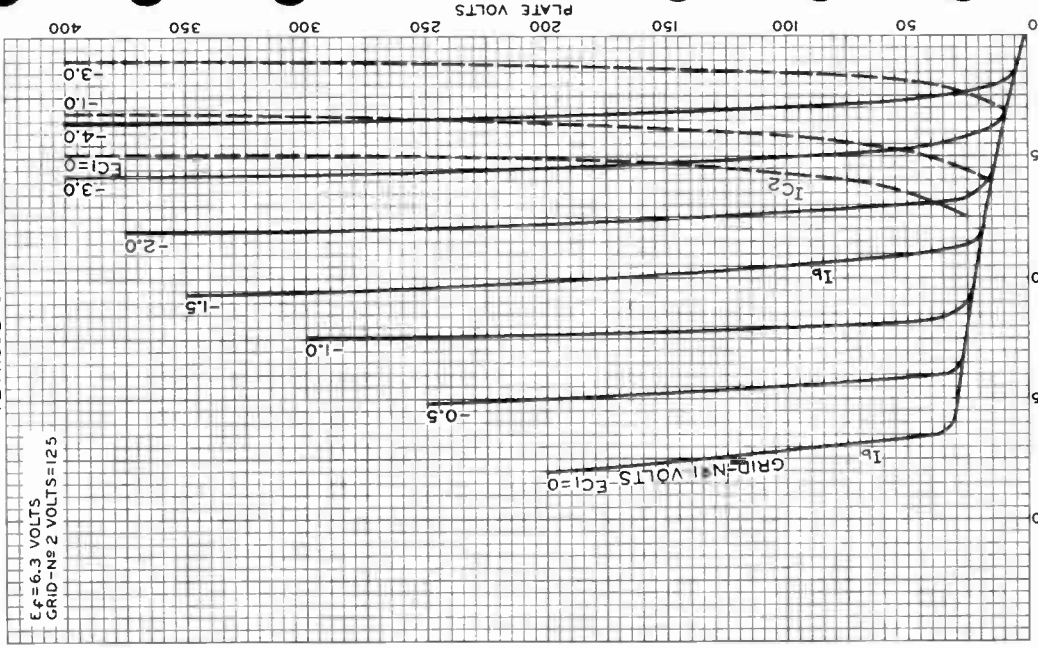


PLATE ( $I_{b1}$ ) OR GRID - No 2 ( $I_{c2}$ ) MILLIAMPERES

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

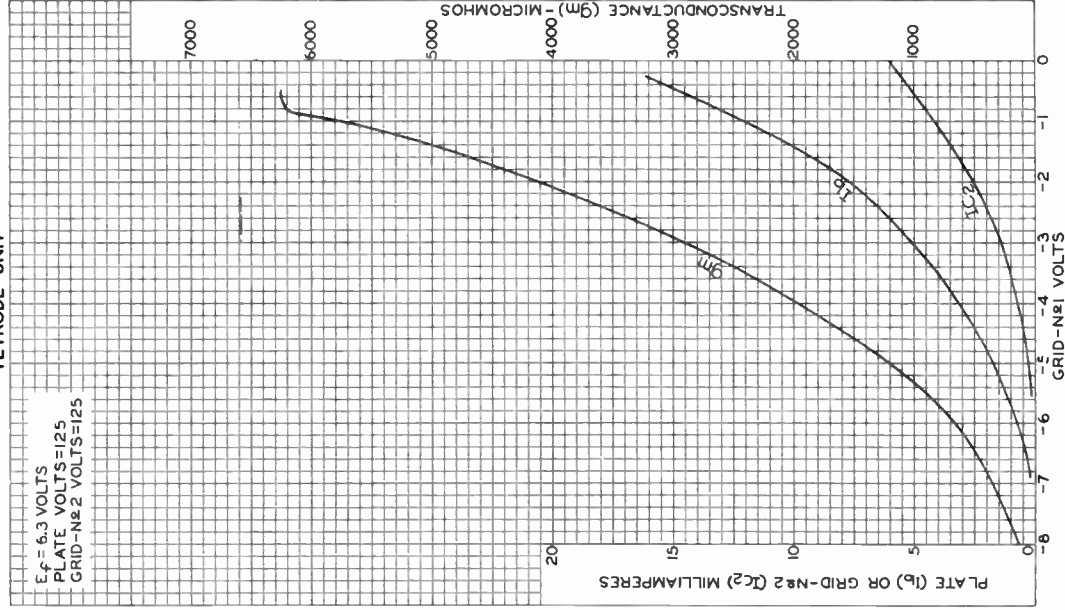
92CM-9197



6CQ8

# AVERAGE CHARACTERISTICS TETRODE UNIT

$E_f = 6.3$  VOLTS  
PLATE VOLTS = 125  
GRID-N&2 VOLTS = 125



6CQ8





6CR6

6CR6

# DIODE—REMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

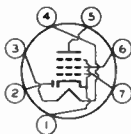
Heater, for Unipotential Cathode:

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

### Mechanical:

Operating Position. . . . .	Any
Maximum Overall Length. . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-1/2" ± 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. . . . .	7EA

Pin 1—Cathode,  
Pentode  
Grid No.3  
Pin 2—Diode  
Plate  
Pin 3—Heater  
Pin 4—Heater



Pin 5—Pentode  
Plate  
Pin 6—Pentode  
Grid No.2  
Pin 7—Pentode  
Grid No.1

## PENTODE UNIT — Amplifier - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max. volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE. . . . .	300 max. volts
GRID-No.2 VOLTAGE . . . . .	See Grid-No.2 Input Rating Chart at front of Receiving Tube Section
GRID-No.1 (CONTROL-GRID) VOLTAGE:	
Positive-bias value . . . . .	0 max. volts
GRID-No.2 INPUT:	
For grid-No.2 voltages up to 150 volts. . . . .	0.3 max. watt
For grid-No.2 voltages between 150 and 300 volts . . . . .	See Grid-No.2 Input Rating Chart at front of Receiving Tube Section
PLATE DISSIPATION . . . . .	2.5 max. watts
PEAK HEATER-CATHODE VOLTAGE:	
Heater negative with respect to cathode . . . . .	100 max. volts
Heater positive with respect to cathode . . . . .	100 max. volts

### Characteristics:

Plate Voltage . . . . .	250	volts
Grid-No.2 Voltage . . . . .	100	volts
Grid-No.1 Voltage . . . . .	-2	volts
Plate Resistance (Approx.) . . . . .	0.8	megohm
Transconductance. . . . .	2200	μmhos

6CR6



6CR6

## DIODE—REMOTE-CUTOFF PENTODE

Plate Current . . . . .	9.6	ma
Grid-No.2 Current . . . . .	2.6	ma
Grid-No.1 Voltage (Approx.) for transconductance of 10 $\mu$ mhos . . . . .	-32	volts

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For cathode-bias operation . . . . .	1	max. megohm
For fixed-bias operation . . . . .	0.25	max. megohm

### DIODE UNIT

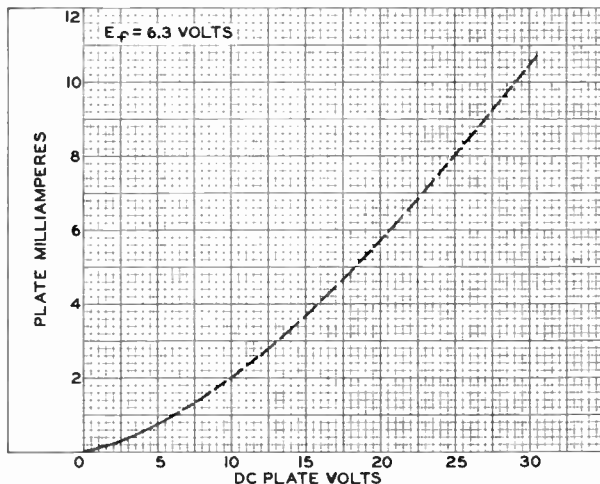
### Maximum Ratings, Design-Center Values:

PLATE CURRENT . . . . .	1	max.	ma
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	100	max.	volts
Heater positive with respect to cathode.	100	max.	volts

2-59

TENTATIVE DATA

## AVERAGE PLATE CHARACTERISTIC DIODE UNIT



ELECTRON TUBE DIVISION

92CS-9705

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

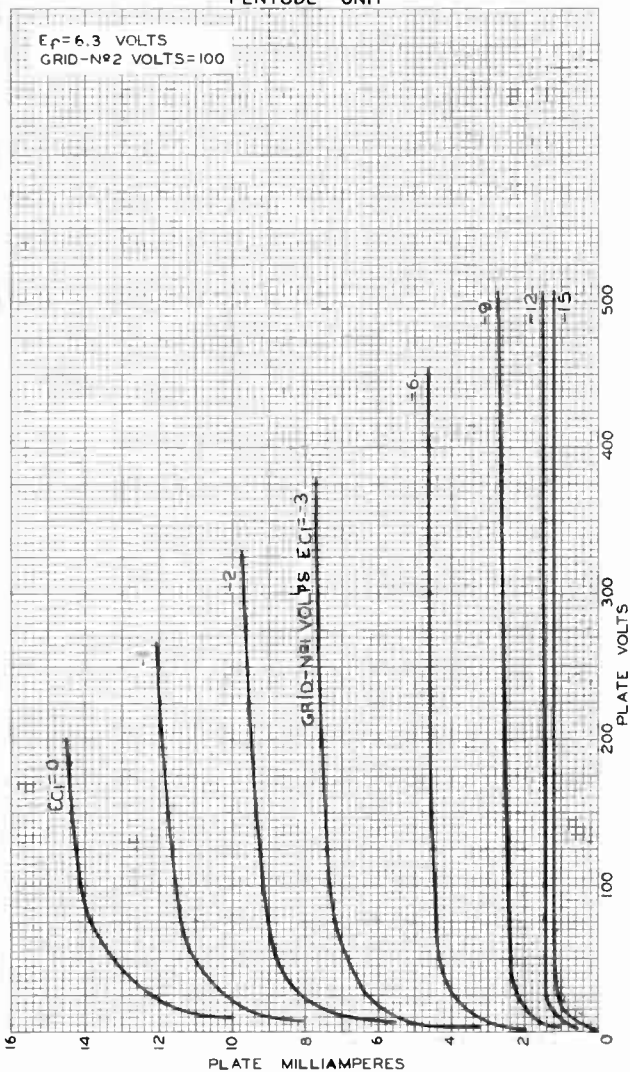
World Radio History



6CR6

6CR6

### AVERAGE PLATE CHARACTERISTICS PENTODE UNIT



ELECTRON TUBE DIVISION

92CM-9718

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

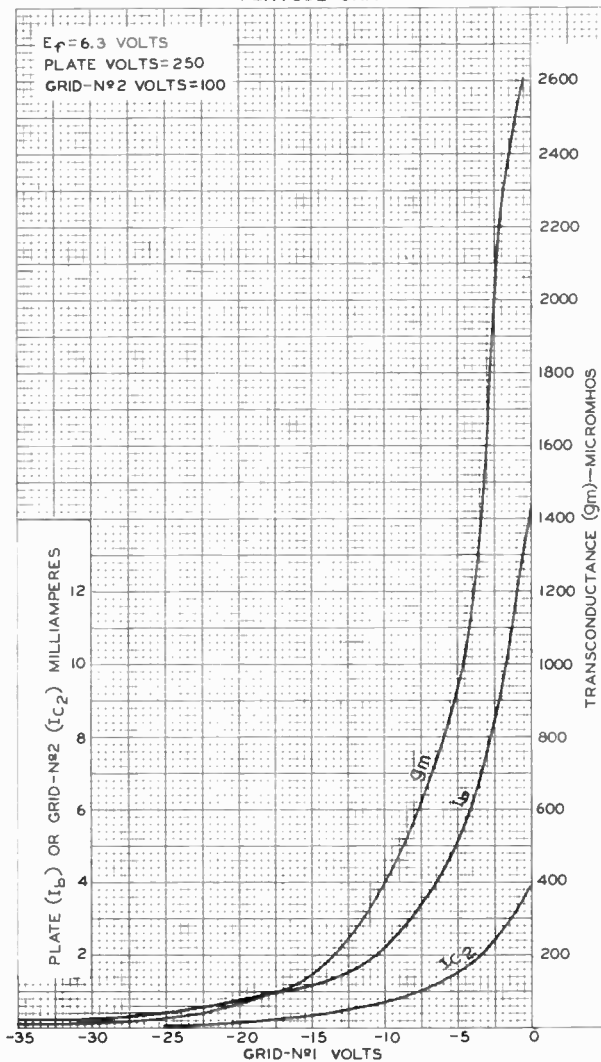
World Radio History

6CR6



6CR6

### AVERAGE CHARACTERISTICS PENTODE UNIT



ELECTRON TUBE DIVISION

92CM-9719

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History





6CS6

6CS6

# PENTAGRID AMPLIFIER

7-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

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

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid No.1 to plate . . . . .	0.07 max.	$\mu\mu\text{f}$	←
Grid No.3 to plate . . . . .	0.36 max.	$\mu\mu\text{f}$	←
Grid No.1 to grid No.3 . . . . .	0.22 max.	$\mu\mu\text{f}$	←
Grid No.1 to cathode & grid No.5, grid No.4 & grid No.2, grid No.3, and heater . . . . .	5.5	$\mu\mu\text{f}$	
Grid No.3 to cathode & grid No.5, grid No.4 & grid No.2, grid No.1, and heater . . . . .	7	$\mu\mu\text{f}$	
Plate to cathode & grid No.5, grid No.4 & grid No.2, grid No.3, grid No.1, and heater . . . . .	7.5	$\mu\mu\text{f}$	

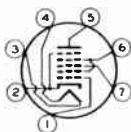
### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	100	100	volts
Grid-No.2 & Grid-No.4 Voltage . . . . .	30	30	volts
Grid-No.3 Voltage . . . . .	-1	0	volt
Grid-No.1 Voltage . . . . .	0	-1	volt
Plate Resistance (Approx.) . . . . .	0.7	1	megohm
Grid-No.3-to-Plate Transconductance . . . . .	1500	-	$\mu\text{mhos}$ ←
Grid-No.1-to-Plate Transconductance . . . . .	-	1100	$\mu\text{mhos}$ ←
Plate Current . . . . .	0.8	1	ma ←
Grid-No.2 & Grid-No.4 Current . . . . .	5.5	1.3	ma ←
Grid-No.3 Voltage (Approx.) for plate current of 50 $\mu\text{amp}$ . . . . .	-2.2	-	volts
Grid-No.1 Voltage (Approx.) for plate current of 50 $\mu\text{amp}$ . . . . .	-	-2.5	volts

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-1/2" $\pm$ 3/32"
Maximum Diameter . . . . .	3/4"
Dimensional Outline . . . . .	See General Section
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 5 - Plate                   |
| Pin 2 - Cathode,<br>Grid No.5 | Pin 6 - Grid No.2,<br>Grid No.4 |
| Pin 3 - Heater                | Pin 7 - Grid No.3               |
| Pin 4 - Heater                |                                 |



<sup>o</sup> without external shield.

← Indicates a change.

6CS6



6CS6

## PENTAGRID AMPLIFIER

## GATED AMPLIFIER SERVICE

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	300 max.	volts
GRID-No.2 & GRID-No.4 SUPPLY VOLTAGE . . . . .	300 max.	volts
GRID-No.2 & GRID-No.4 VOLTAGE. . . . .	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	

PLATE DISSIPATION. . . . .	1 max.	watt
----------------------------	--------	------

## GRID-No.2 &amp; GRID-No.4 INPUT:

For grid-No.2 & grid-No.4 voltages up to 150 volts. . . . .	1 max.	watt
---	--------	------

For grid-No.2 & grid-No.4 voltages between 150 and 300 volts. . . . .	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
---	--	--

CATHODE CURRENT. . . . .	14 max.	ma
--------------------------	---------	----

## PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . .	200 max.	volts
---	----------	-------

Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	volts
---	-----------------------	-------

## Typical Operation as Sync Separator and Sync Clipper:

Plate Voltage. . . . .	10	volts
Grid-No.2 & Grid-No.4 Voltage. . . . .	30	volts
Grid-No.3 Voltage. . . . .	0	volts
Grid-No.1 Voltage. . . . .	0	volts
Plate Current. . . . .	2.0	ma
Grid-No.2 & Grid-No.4 Current. . . . .	4.5	ma

## Maximum Circuit Values:

Grid-No.1-Circuit Resistance . . . . .	0.47 max.	megohm
Grid-No.3-Circuit Resistance . . . . .	2.2 max.	megohms

▲ The dc component must not exceed 100 volts.

→ Indicates a change.



6CS6

6CS6

# AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
 GRID-N<sup>o</sup>3 VOLTS = 0  
 GRIDS-N<sup>o</sup>2 & N<sup>o</sup>4 VOLTS = 30

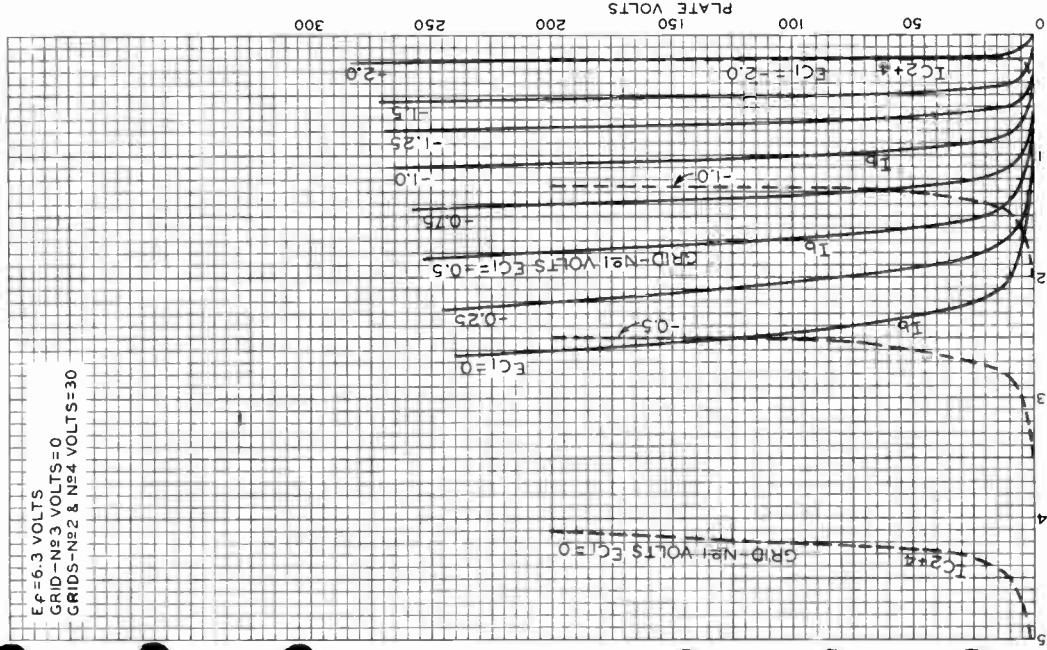


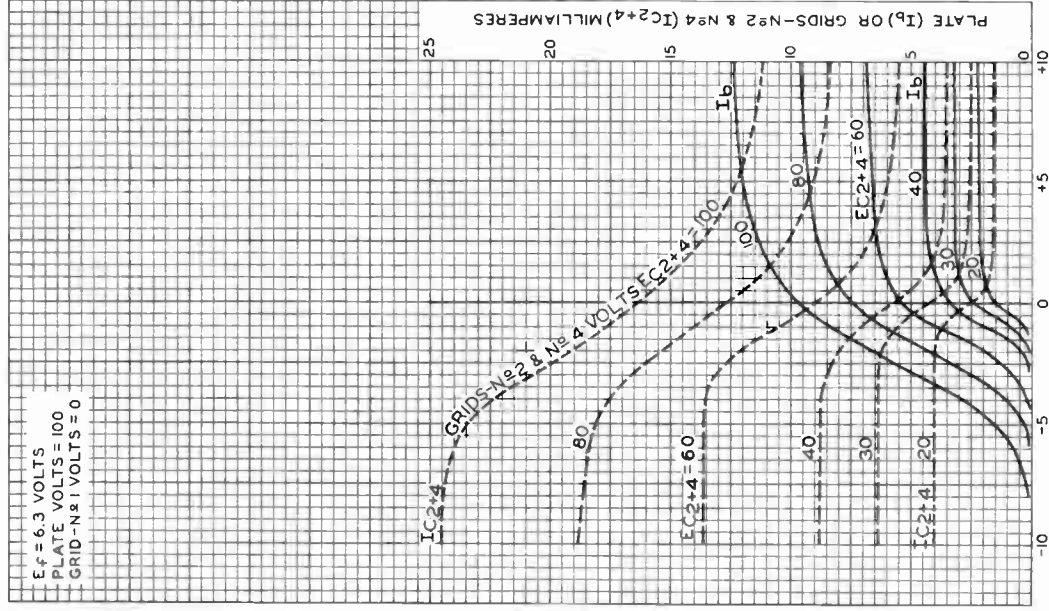
PLATE ( $I_b$ ) OR GRIDS-N<sup>o</sup>2 & N<sup>o</sup>4 ( $I_{c2+4}$ ) MILLIAMPERES



6CS6

# AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
PLATE VOLTS = 100  
GRID-N&1 VOLTS = 0



6CS6



6CS7

6CS7

# MEDIUM-MU DUAL TRIODE

## With Dissimilar Units

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3	ac or dc volts
Current . . . . .	0.6	amp
Warm-up time (Average) . . . . .	11	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

	Unit No. 1 Oscillator	Unit No. 2 Amplifier	
Grid to plate . . . . .	2.6	2.6	$\mu\mu\text{f}$
Grid to cathode and heater . . . . .	1.8	3	$\mu\mu\text{f}$
Plate to cathode and heater . . . . .	0.5	0.5	$\mu\mu\text{f}$

Characteristics, Class A<sub>1</sub> Amplifier:

	Unit No. 1 Oscillator	Unit No. 2 Amplifier	
Plate voltage . . . . .	250	250	volts
Grid Voltage . . . . .	-8.5	-10.5	volts
Amplification Factor . . . . .	17	15.5	
Plate Resistance (Approx.) . . . . .	7700	3450	ohms
Transconductance . . . . .	2200	4500	$\mu\text{mhos}$
Plate Current . . . . .	10.5	19	ma
Plate Current for grid volts = -16 . . . . .	-	3	ma
Grid Voltage (Approx.) for plate current of:			
10 microamperes . . . . .	-24	-	volts
50 microamperes . . . . .	-	-22	volts

#### 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" $\pm$ 3/32"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2

<sup>o</sup>: See next page.

6CS7



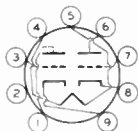
6CS7

## MEDIUM-MU DUAL TRIODE

### With Dissimilar Units

Base . . . . . Small-Button Nova! 9-Pin (JETEC No. E9-1)  
 Basing Designation for BOTTOM VIEW . . . . . 9EF

Pin 1 - Plate of  
Unit No. 2  
 Pin 2 - No Connection  
 Pin 3 - Grid of  
Unit No. 2  
 Pin 4 - Heater  
 Pin 5 - Heater



Pin 6 - Plate of  
Unit No. 1  
 Pin 7 - Grid of  
Unit No. 1  
 Pin 8 - Cathode of  
Unit No. 1  
 Pin 9 - Cathode of  
Unit No. 2

### VERTICAL-DEFLECTION OSCILLATOR

*Values are for Unit No. 1*

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

*For operation in a 525-line, 30-frame system<sup>□</sup>*

DC PLATE VOLTAGE . . . . .	500 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	400 max.	volts
CATHODE CURRENT:		
Peak . . . . .	70 max.	ma
DC . . . . .	20 max.	ma
PLATE DISSIPATION . . . . .	1.25 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup> max.	volts

#### Maximum Circuit Values:

Grid-Circuit Resistance . . . . .	2.2 max.	megohms
-----------------------------------	----------	---------

### VERTICAL-DEFLECTION AMPLIFIER

*Values are for Unit No. 2*

#### Maximum Ratings, Design-Center Values Except as Noted:

*For operation in a 525-line, 30-frame system<sup>□</sup>*

DC PLATE VOLTAGE . . . . .	500 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE <sup>#</sup> (Absolute maximum) . . . . .	2200 <sup>■</sup> max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	250 max.	volts
CATHODE CURRENT:		
Peak . . . . .	105 max.	ma
DC . . . . .	30 max.	ma
PLATE DISSIPATION . . . . .	6.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup> max.	volts

<sup>□</sup>, <sup>▲</sup>, <sup>#</sup>, <sup>■</sup>: See next page.



6CS7

MEDIUM-MU DUAL TRIODE  
With Dissimilar Units

6CS7

Maximum Circuit Values:

Grid-Circuit Resistance. . . . . 2.2 max. megohms

- As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.
- ▲ The dc component must not exceed 100 volts.
- \* This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.
- Under no circumstances should this absolute value be exceeded.
- without external shield.







6CU5

# 6CU5

## BEAM POWER TUBE

7-PIN MINIATURE TYPE

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	. . . . . ac or dc volts
Current . . . . .	1.2	. . . . . amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid No.1 to plate. . . . .	0.7	$\mu$ f
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	13.2	$\mu$ f
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	8.6	$\mu$ f

#### 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 . . . . .	3/4"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T-5-1/2
Base . . . . .	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW . . . . .	7CV

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



Pin 4 - Heater  
Pin 5 - Grid No.1  
Pin 6 - Grid No.2  
Pin 7 - Plate

### AMPLIFIER - Class A<sub>1</sub>

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

PLATE VOLTAGE . . . . .	135 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	117 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value . . . . .	0 max.	volts
PLATE DISSIPATION . . . . .	6 max.	watts
GRID-No.2 INPUT . . . . .	1.25 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	volts
BULB TEMPERATURE (At hottest point on bulb surface). . . . .	220 max.	$^{\circ}$ C

#### Typical Operation and Characteristics:

Plate Voltage . . . . .	120	volts
Grid-No.2 Voltage . . . . .	110	volts
Grid-No.1 Voltage . . . . .	-8	volts
Peak AF Grid-No.1 Voltage . . . . .	8	volts

<sup>o</sup> without external shield.

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

6CU5



6CU5

## BEAM POWER TUBE

Zero-Signal Plate Current . . . . .	49	ma
Max.-Signal Plate Current . . . . .	50	ma
Zero-Signal Grid-No.2 Current . . . . .	4	ma
Max.-Signal Grid-No.2 Current . . . . .	8.5	ma
Plate Resistance (Approx.) . . . . .	10000	ohms
Transconductance . . . . .	7500	$\mu$ hos
Load Resistance . . . . .	2500	ohms
Total Harmonic Distortion . . . . .	10	%
Max.-Signal Power Output . . . . .	2.3	watts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:

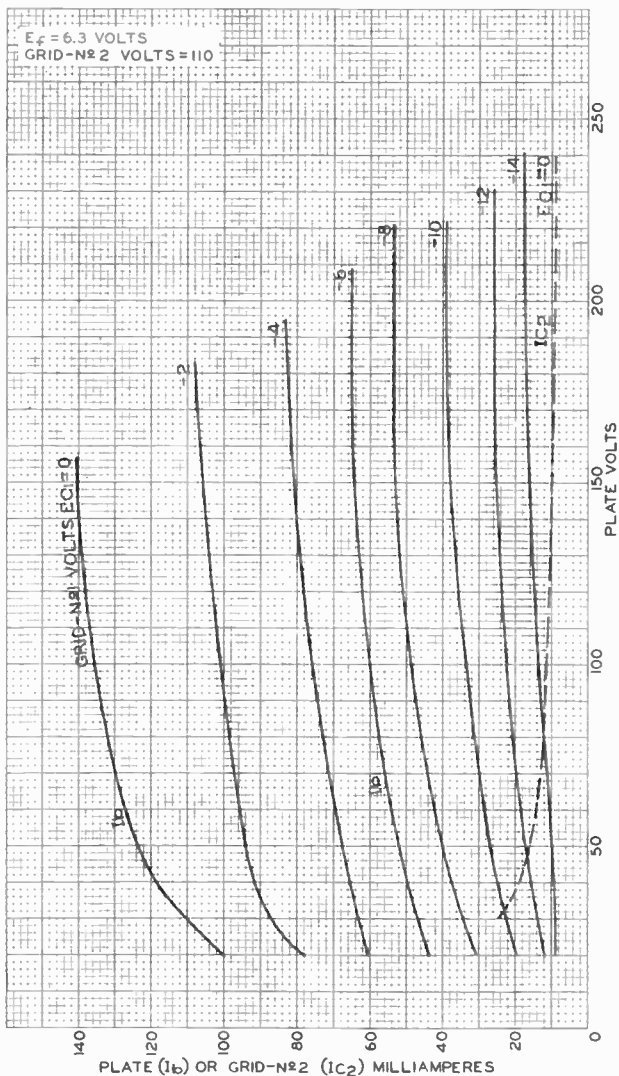
For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm



6CU5

6CU5

### AVERAGE CHARACTERISTICS



TUBE DIVISION

92CM-8908RI

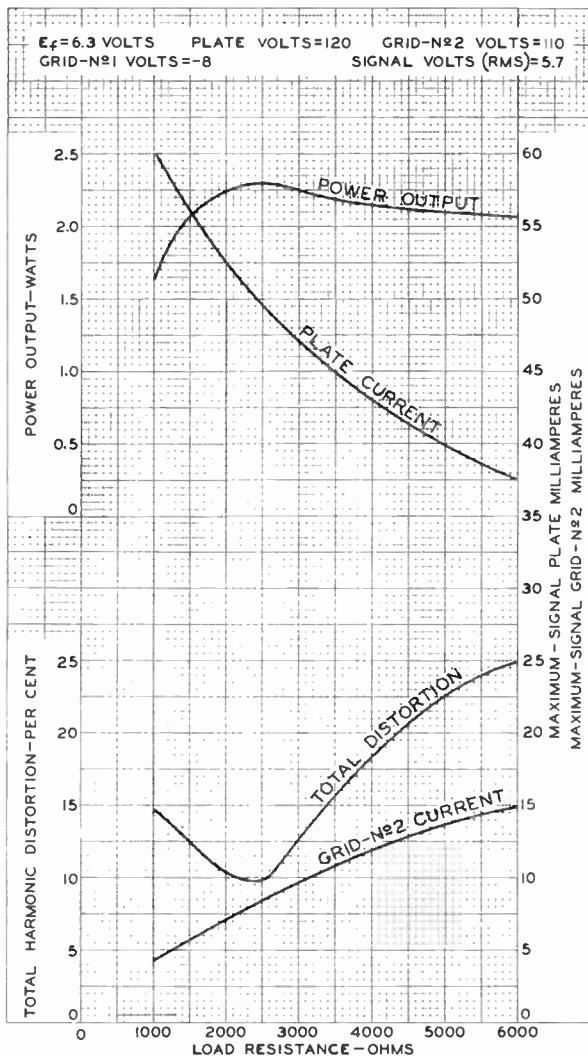
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CU5



6CU5

## OPERATION CHARACTERISTICS



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8918



6CU8

6CU8

# MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

The 6CU8 is the same as the 6AN8 except for the following items:

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3	. . . . .	ac or dc volts
Current . . . . .	0.45	. . . . .	amp
Warm-up time (Average). . . . .	11	. . . . .	sec

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*

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

#### Triode Unit:

Grid to plate . . . . .	1.6	$\mu$ f
Grid to cathode & pentode grid No.3 & internal shield, and heater . . . . .	1.9	$\mu$ f
Plate to cathode & pentode grid No.3 & internal shield, and heater . . . . .	1.6	$\mu$ f

#### Pentode Unit:

Grid No.1 to plate. . . . .	0.025 max.	$\mu$ f
Grid No.1 to cathode, grid No.3 & triode cathode & internal shield, grid No.2, and heater . . . . .	7	$\mu$ f
Plate to cathode, grid No.3 & triode cathode & internal shield, grid No.2, and heater . . . . .	2.4	$\mu$ f
Triode grid to pentode plate. . . . .	0.005	$\mu$ f
Pentode grid No.1 to triode plate . . . . .	0.02	$\mu$ f
Pentode plate to triode plate . . . . .	0.04	$\mu$ f

### Mechanical:

Base. . . . . Small-Button Noval 9-Pin (JETEC No.E9-1)  
Basing Designation for BOTTOM VIEW. . . . . 9GM

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

<sup>o</sup> without external shield.





6CX8

6CX8

# MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	6.3 ± 10%	volts
Current . . . . .	0.75	amp

Direct Interelectrode Capacitances:<sup>0</sup>

#### Triode Unit:

Grid to plate . . . . .	4.4	μf
Grid to cathode and heater . . . . .	2.2	μf
Plate to cathode and heater . . . . .	0.38	μf

#### Pentode Unit:

Grid No.1 to plate . . . . .	0.06	μf
Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater . . . . .	9	μf
Plate to cathode & internal shield & grid No.3, grid No.2, and heater . . . . .	4.4	μf
Triode grid to pentode plate . . . . .	0.018 max.	μf
Pentode grid No.1 to triode plate . . . . .	0.005 max.	μf
Pentode plate to triode plate . . . . .	0.17 max.	μf

### Characteristics, Class A<sub>1</sub> Amplifier:

	Triode Unit	Pentode Unit	
Plate Supply Voltage . . . . .	150	40 200	volts
Grid-No.2 Supply Voltage . . . . .	-	125 125	volts
Grid-No.1 Voltage . . . . .	-	0 -	volts
Cathode Resistor . . . . .	150	- 68	ohms
Amplification Factor . . . . .	40	- -	
Plate Resistance (Approx.) . . . . .	8700	- 70000	ohms
Transconductance . . . . .	4600	- 10000	μmhos
Plate Current . . . . .	9.2	40* 24	ma
Grid-No.2 Current . . . . .	-	15.5* 5.2	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100 . . . . .	-5	- -8.5	volts

### 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"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No.E9-1)

6CX8



6CX8

## MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

Basing Designation for BOTTOM VIEW. . . . . 9DX

Pin 1 - Triode  
Cathode  
Pin 2 - Triode  
Grid  
Pin 3 - Triode  
Plate  
Pin 4 - Heater  
Pin 5 - Heater



Pin 6 - Pentode  
Cathode,  
Grid No.3,  
Internal  
Shield  
Pin 7 - Pentode  
Grid No.1  
Pin 8 - Pentode  
Grid No.2  
Pin 9 - Pentode  
Plate

### AMPLIFIER — Class A<sub>1</sub>

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

	Triode Unit	Pentode Unit	
PLATE VOLTAGE. . . . .	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE. . . . .	-	330 max.	volts
GRID-No.2 VOLTAGE. . . . .	-	See Grid-No.2 Input	

*Rating Chart at front of Receiving Tube Section*

GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value. . . . .	0 max.	0 max.	volts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 165 volts. . . . .	-	1.1 max.	watts
For grid-No.2 voltages between 165 and 330 volts. . . . .	-	See Grid-No.2 Input	

*Rating Chart at front of Receiving Tube Section*

PLATE DISSIPATION. . . . .	2 max.	5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode. . . . .	200 max.	200 max.	volts
Heater positive with respect to cathode. . . . .	200 <sup>▲</sup> max.	200 <sup>▲</sup> max.	volts

#### Maximum Circuit Values:

	Triode Unit	Pentode Unit	
Grid-No.1-Circuit Resistance:			
For fixed-bias operation . .	0.5 max.	0.25 max.	megohm
For cathode-bias operation .	1 max.	1 max.	megohm

○ without external shield.

\* This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

▲ The dc component must not exceed 100 volts.





6CY5

# 6CY5 SHARP-CUTOFF TETRODE

7-PIN MINIATURE TYPE

For use as rf amplifier in VHF tuners of television receivers

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3 ± 10%	volts
Current . . . . .	0.2	amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid No.1 to plate . . . . .	0.03	μf
Grid No.1 to cathode & internal shield, grid No.2, and heater . . . . .	4.5	μf
Plate to cathode & internal shield, grid No.2, and heater . . . . .	3	μf

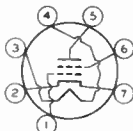
### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	125	volts
Grid-No.2 Voltage . . . . .	80	volts
Grid-No.1 Voltage . . . . .	-1	volt
Plate Resistance (Approx.) . . . . .	0.1	megohm
Transconductance . . . . .	8000	μmhos
Plate Current . . . . .	10	ma
Grid-No.2 Current . . . . .	1.5	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20 . . . . .	-6	volts

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-1/2" ± 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 . . . . .	7EW

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



Pin 5-Plate  
Pin 6-Grid No.2  
Pin 7-Cathode,  
Internal  
Shield

## AMPLIFIER — Class A<sub>1</sub>

### Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE . . . . .	180 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	180 max.	volts
GRID-No.2 VOLTAGE . . . . .	See Grid-No.2 Input Rating Chart at front of Receiving Tube Section	

← Indicates a change.

6CY5



6CY5

# SHARP-CUTOFF TETRODE

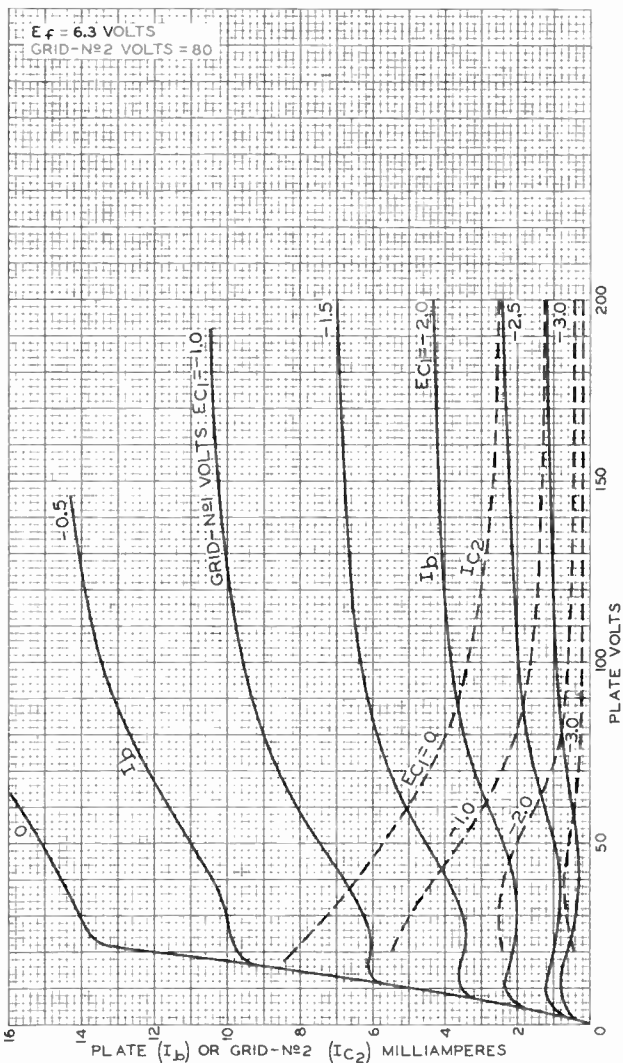
GRID-No.1 (CONTROL-GRID) VOLTAGE:  
 Positive-bias value. . . . . 0 max. volts  
 CATHODE CURRENT. . . . . 20 max. ma  
 GRID-No.2 INPUT:  
 For grid-No.2 voltages up to 90 volts. . . 0.5 max. watt  
 For grid-No.2 voltages between 90 and  
 180 volts. . . . . See Grid-No.2 Input Rating Chart  
 at front of Receiving Tube Section  
 PLATE DISSIPATION. . . . . 2 max. watts  
 PEAK HEATER-CATHODE VOLTAGE:  
 Heater negative with respect to cathode. . 100 max. volts  
 Heater positive with respect to cathode. . 100 max. volts  
**Maximum Circuit Values:**  
 Grid-No.1-Circuit Resistance . . . . . 0.5 max. megohm  
<sup>o</sup> with external shield JEDEC No.316 connected to cathode.



6CY5

6CY5

### AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION

92CM-9518

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

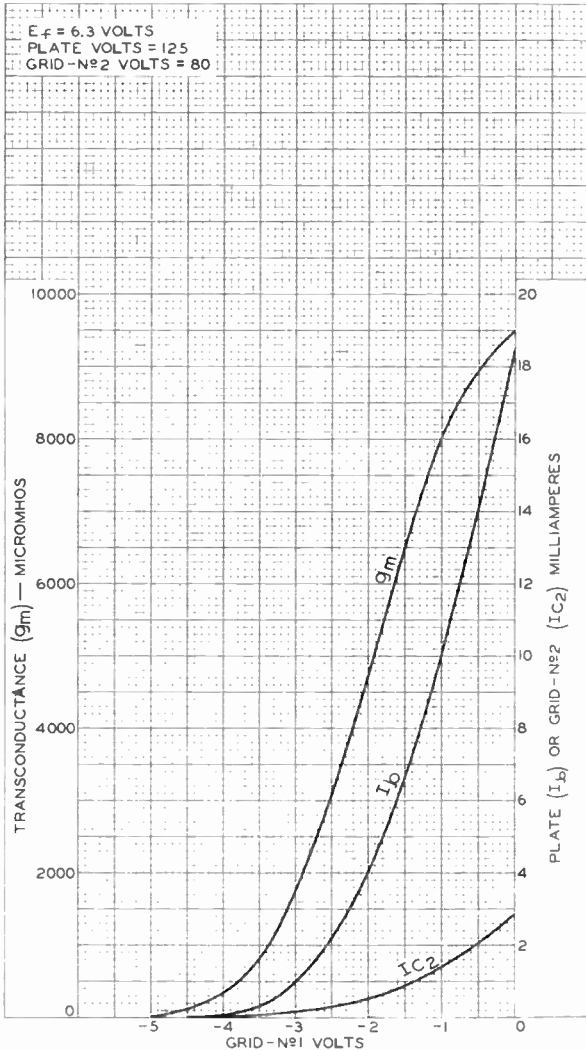
World Radio History

6CY5



6CY5

## AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION

92CM-9519

RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

World Radio History



6CY7

6CY7

# DUAL TRIODE With High-Mu Unit and Low-Mu Unit

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	6.3 ± 10%	volts
Current . . . . .	0.75	amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

	Unit No. 1	Unit No. 2	
Grid to plate . . . . .	1.8	4.4	μμf
Grid to cathode and heater, . .	1.5	5	μμf
Plate to cathode and heater . .	0.3	1	μμf

### Characteristics, Class A<sub>1</sub> Amplifier:

	Unit No. 1	Unit No. 2	
Plate Supply Voltage . . . . .	250	60 150	volts
Grid Voltage . . . . .	-3	0 -	volts
Cathode Resistor . . . . .	-	- 620	ohms
Amplification Factor . . . . .	68	- 5	
Plate Resistance (Approx.) . . .	52000	- 920	ohms
Transconductance . . . . .	1300	- 5400	μmhos
Plate Current . . . . .	1.2	80 30	ma
Plate Current for grid volts = -30 . . . . .	-	- 3.5	ma
Grid Voltage (Approx.) for plate μa = 10 . . . . .	-5.5	- -	volts
Grid Voltage (Approx.) for plate μa = 200 . . . . .	-	- -40	volts

### 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"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9LG

- Pin 1 - Plate of Unit No. 2
- Pin 2 - Internal Connection—Do Not Use
- Pin 3 - Grid of Unit No. 2
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Plate of Unit No. 1
- Pin 7 - Grid of Unit No. 1
- Pin 8 - Cathode of Unit No. 1
- Pin 9 - Cathode of Unit No. 2

6CY7



6CY7

## DUAL TRIODE

With High-Mu Unit and Low-Mu Unit

## VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No. 1

## Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE. . . . .	350	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE. . . . .	400	max.	volts
PLATE DISSIPATION . . . . .	1	max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200	max.	volts

## Maximum Circuit Values:

Grid-Circuit Resistance . . . . .	2.2	max.	megohms
-----------------------------------	-----	------	---------

## VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No. 2

## Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE. . . . .	350	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE <sup>#</sup> . . . . .	1800	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE. . . . .	250	max.	volts
CATHODE CURRENT:			
Peak. . . . .	120	max.	ma
Average . . . . .	35	max.	ma
PLATE DISSIPATION . . . . .	5.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200	max.	volts

## Maximum Circuit Values:

Grid-Circuit Resistance:			
For cathode-bias operation. . . . .	2.2	max.	megohms

<sup>○</sup> without external shield.<sup>■</sup> This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.<sup>▲</sup> The dc component must not exceed 100 volts.<sup>\*</sup> This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.



6CZ5

6CZ5

# BEAM POWER TUBE

9-PIN MINIATURE TYPE

For vertical-deflection amplifier service in 110° systems having series heater-string arrangement

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	. . . . . ac or dc volts
Current . . . . .	0.45	. . . . . amp
Warm-up time (Average). . . . .	11	. . . . . sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

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

Grid No.1 to plate. . . . .	0.7 max.	μf
Grid No.1 to cathode & grid No.3, grid No.2, and heater. . . . .	8	μf
Plate to cathode & grid No.3, grid No.2, and heater. . . . .	8.5	μf

### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	75	250	volts
Grid-No.2 (Screen-Grid) Voltage . . . . .	250	250	volts
Grid-No.1 (Control-Grid) Voltage. . . . .	0	-14	volts
Plate Resistance (Approx.). . . . .	-	7300	ohms
Transconductance. . . . .	-	4800	μmhos
Plate Current . . . . .	130*	46	ma
Grid-No.2 Current . . . . .	16*	4.6	ma
Grid-No.1 Voltage (Approx.) for plate current of 100 μamp . . . . .	-	-35	volts

### 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"
Dimensional Outline . . . . .	See General Section
Bulb. . . . .	TC-1/2
Base. . . . .	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW. . . . .	9HN

- Pin 1 - Grid No.2
- Pin 2 - No Connection
- Pin 3 - Grid No.1
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Grid No.1



- Pin 7 - Cathode, Grid No.3
- Pin 8 - Internal Connection - Do not Use
- Pin 9 - Plate

<sup>o</sup> without external shield.

\* These values can be measured by a method involving a recurrent wave form such that the cathode current and grid-no.2 input will be kept within ratings in order to prevent damage to the tube.

6CZ5



6CZ5

## BEAM POWER TUBE

## VERTICAL DEFLECTION AMPLIFIER

## Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	315	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum) <sup>⊕</sup> . . . . .	2200 <sup>■</sup>	max.	volts
DC GRID-No. 2 (SCREEN-GRID) VOLTAGE . . . . .	285	max.	volts
PEAK NEGATIVE-PULSE GRID-No. 1 (CONTROL-GRID) VOLTAGE . . . . .	250	max.	volts
CATHODE CURRENT:			
Peak . . . . .	140	max.	ma
Average . . . . .	40	max.	ma
GRID-No. 2 INPUT . . . . .	2	max.	watts
PLATE DISSIPATION . . . . .	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200	max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup>	max.	volts
BULB TEMPERATURE At hottest point on bulb surface). . . . .	250	max.	°C

## Maximum Circuit Values:

## Grid-No. 1-Circuit Resistance:

For fixed-bias operation . . . . .	0.5	max.	megohm
For cathode-bias operation . . . . .	1.0	max.	megohm

AF POWER AMPLIFIER - Class A<sub>1</sub>

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	350	max.	volts
GRID-No. 2 (SCREEN-GRID) VOLTAGE . . . . .	285	max.	volts
GRID-No. 2 INPUT . . . . .	2	max.	watts
PLATE DISSIPATION . . . . .	12	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200	max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup>	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface). . . . .	250	max.	°C

## Typical Operation and Characteristics:

Plate Voltage . . . . .	250	volts
Grid-No. 2 Voltage . . . . .	250	volts
Grid-No. 1 (Control-Grid) Voltage . . . . .	-14	volts
Peak AF Grid-No. 1 Voltage . . . . .	13	volts
Zero-Signal Plate Current . . . . .	46	ma

<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

<sup>⊕</sup> This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.6 milliseconds.

<sup>■</sup> Under no circumstances should this absolute value be exceeded.

<sup>▲</sup>: See next page.





6CZ5

6CZ5

## BEAM POWER TUBE

Max.—Signal Plate Current. . . . .	46	ma
Zero-Signal Grid-No.2 Current. . . . .	4.6	ma
Max.—Signal Grid-No.2 Current. . . . .	8	ma
Plate Resistance (Approx.) . . . . .	73000	ohms
Transconductance . . . . .	4800	μmhos
Load Resistance. . . . .	5000	ohms
Total Harmonic Distortion. . . . .	10	%
Max.—Signal Power Output . . . . .	5.4	watts

**Maximum Circuit Values:**

Grid-No.1—Circuit Resistance:

For fixed-bias operation . . . . .	0.1	max. megohm
For cathode-bias operation . . . . .	1.0	max. megohm

**PUSH-PULL AF POWER AMPLIFIER - Class AB<sub>1</sub>****Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE. . . . .	350	max. volts
GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . .	285	max. volts
GRID-No.2 INPUT. . . . .	2	max. watts
PLATE DISSIPATION. . . . .	12	max. watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200	max. volts
Heater positive with respect to cathode	200 <sup>▲</sup>	max. volts
BULB TEMPERATURE (At hottest point on bulb surface) . . . . .		
	250	max. °C

**Typical Operation:***Values are for 2 tubes*

Plate Voltage. . . . .	350	volts
Grid-No.2 Voltage. . . . .	280	volts
Grid-No.1 (Control-Grid) Voltage. . . . .	-23.5	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage . . . . .	47	volts
Zero-Signal Plate Current. . . . .	46	ma
Max.—Signal Plate Current. . . . .	103	ma
Zero-Signal Grid-No.2 Current. . . . .	3	ma
Max.—Signal Grid-No.2 Current. . . . .	13	ma
Effective Load Resistance (Plate to plate). . . . .	7500	ohms
Total Harmonic Distortion. . . . .	1	%
Max.—Signal Power Output . . . . .	21.5	watts

**Maximum Circuit Values:**

Grid-No.1—Circuit Resistance:

For fixed-bias operation . . . . .	0.1	max. megohm
For cathode-bias operation . . . . .	1.0	max. megohm

▲ The dc component must not exceed 100 volts.

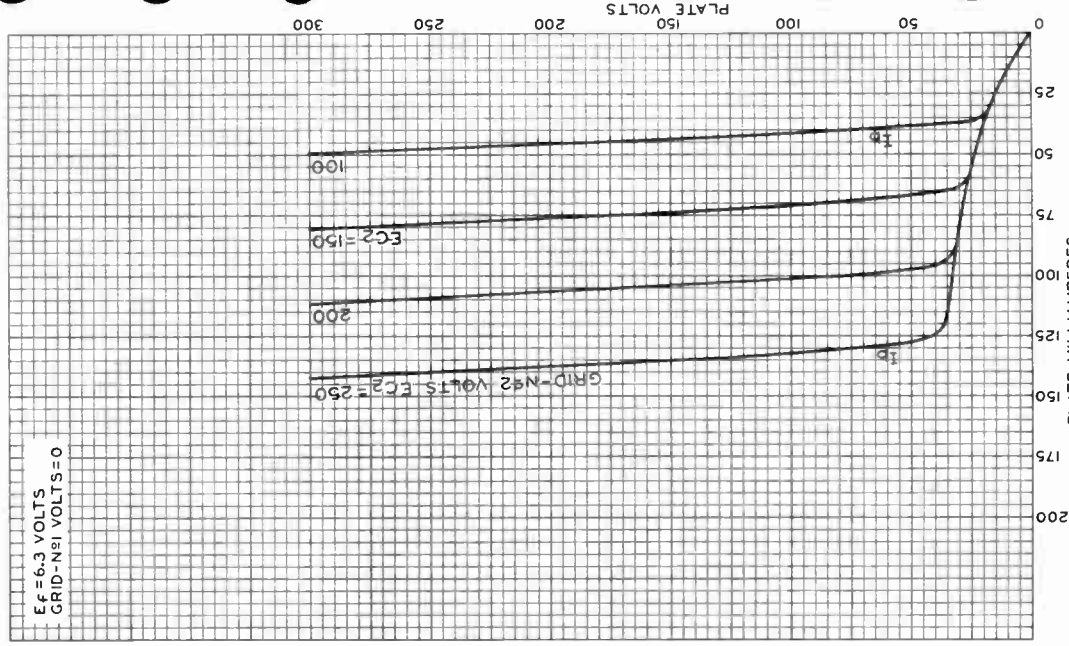
● The type of input coupling network used should not introduce too much resistance in the grid-No.1 circuit. Transformer- or impedance-coupling devices are recommended.



6CZ5

# AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID- $N_2$  VOLTS = 0



92CM-9155

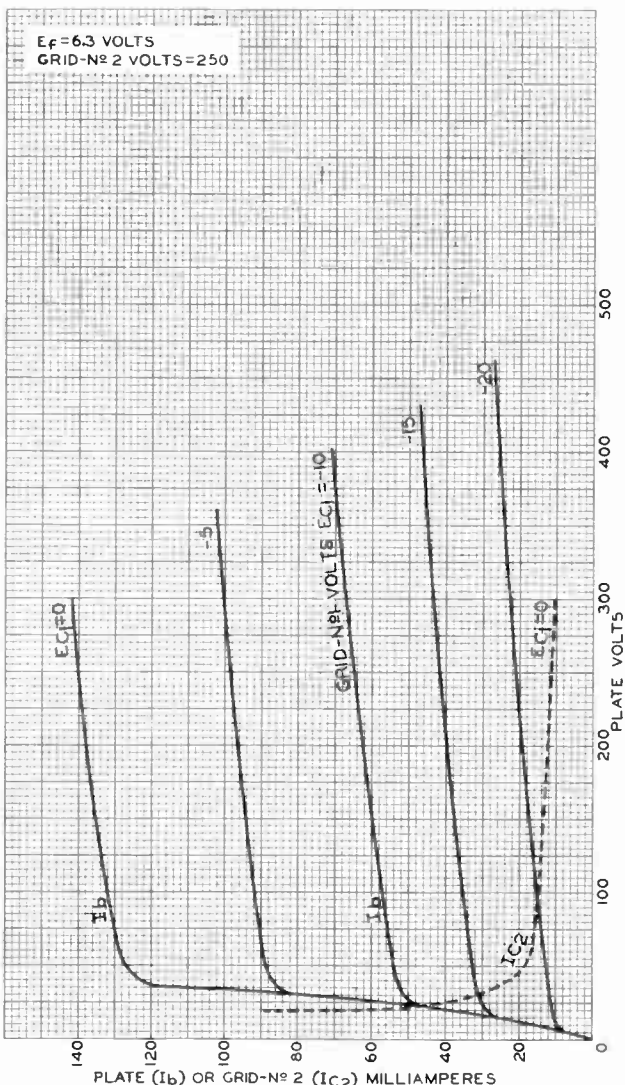
TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



6CZ5

6CZ5

### AVERAGE CHARACTERISTICS



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

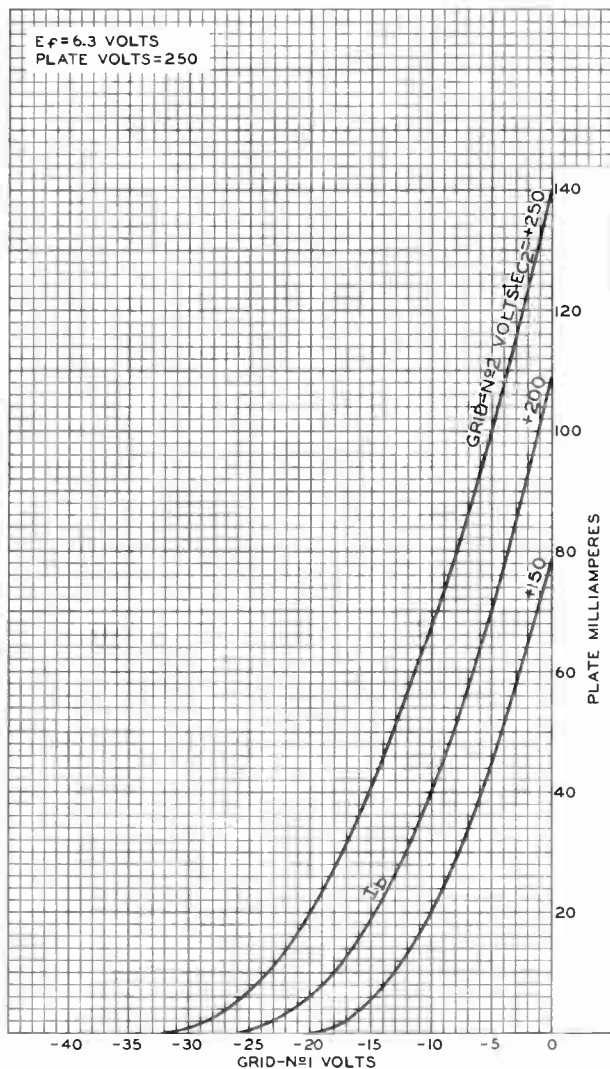
92CM-9157

6CZ5



6CZ5

## AVERAGE CHARACTERISTICS



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History


92CM-9156



6D6

6D6

**TRIPLE-GRID SUPER-CONTROL AMPLIFIER**

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances:		
Grid to Plate	0.007 max. <sup>o</sup>	$\mu\text{f}$
Input	4.7	$\mu\text{f}$
Output	6.5	$\mu\text{f}$
Overall Length	4-11/16" to 4-15/16"	
Seated Height	4-1/16" to 4-5/16"	
Maximum Diameter	1-9/16"	
Bulb	ST-12	
Cap	Small Metal	
Base	Small 6-Pin	
Pin 1 - Heater		Pin 5 - Cathode
Pin 2 - Plate		Pin 6 - Heater
Pin 3 - Screen		Cap - Grid
Pin 4 - Suppressor		
Mounting Position	BOTTOM VIEW (6F)	Any

- In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
- With close-fitting shield connected to cathode.

*Maximum Ratings, Typical Operating Conditions and Curves are the same as for Type 887-0.*

← Indicates a change.

Sept. 2, 1941

DATA

**RCA RADOTRON DIVISION**  
RCA MANUFACTURING COMPANY INC.

World Radio History

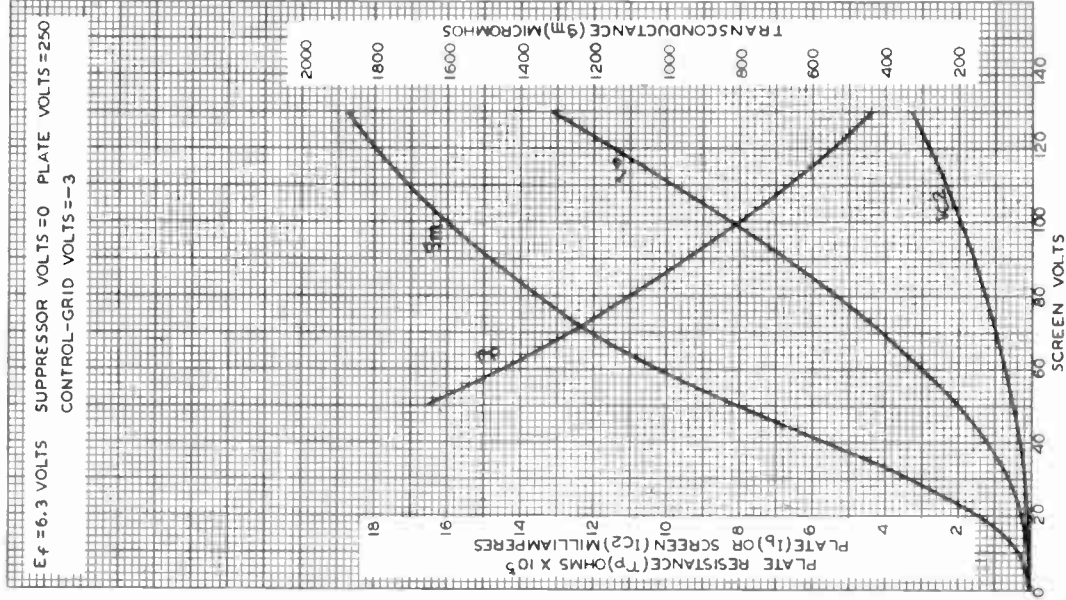
6D6



6D6

## AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS SUPPRESSOR VOLTS = 0 PLATE VOLTS = 250  
CONTROL-GRID VOLTS = -3



JULY 31, 1941

RCA RADIIOTRON DIVISION  
RCA MANUFACTURING COMPANY INC

92C - 4743RI



6DA4

6DA4

# HALF-WAVE VACUUM RECTIFIER

For television damper service

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3 ± 10%	volts
Current . . . . .	1.2	amp

Direct Interelectrode Capacitances  
(Approx.):<sup>o</sup>

Plate to cathode and heater . . . . .	6	μf
Cathode to plate and heater . . . . .	8	μf
Heater to cathode . . . . .	3	μf

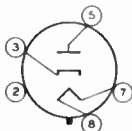
### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	3-5/16"
Maximum Seated Length . . . . .	2-3/4"
Maximum Diameter . . . . .	1-9/32"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T9

Base . . . . . Intermediate-Shell Octal 5-Pin,  
Arrangement 2 (JEDEC Group 1, No. B5-82),  
Intermediate-Shell Octal 6-Pin,  
Arrangement 1 (JEDEC Group 1, No. B6-8),  
Short Intermediate-Shell Octal 5-Pin  
with External Barriers, Arrangement 2  
(JEDEC Group 1, No. B5-85), or  
Short Intermediate-Shell Octal 6-Pin  
with External Barriers, Arrangement 1  
(JEDEC Group 1, No. B6-60)

Basing Designation for BOTTOM VIEW . . . . . 4CG

Pin 1 ♦ - Same as  
Pin 2  
Pin 2 - Internal  
Connection—  
Do Not Use •



Pin 3 - Cathode  
Pin 5 - Plate  
Pin 7 - Heater  
Pin 8 - Heater

## DAMPER SERVICE

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system<sup>o</sup>

PEAK INVERSE PLATE VOLTAGE* . . . . .	4400 max.	volts
PEAK PLATE CURRENT . . . . .	900 max.	ma
DC PLATE CURRENT . . . . .	155 max.	ma
PLATE DISSIPATION . . . . .	5.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	4400 <sup>▲</sup> max.	volts
Heater positive with respect to cathode . . . . .	300 <sup>*</sup> max.	volts

6DA4



6DA4

# HALF-WAVE VACUUM RECTIFIER

## Characteristics:

Tube-Voltage Drop for plate		
ma. = 250 . . . . .	22	volts

- ⊆ without external shield.
- ◆ On the 5-pin bases, pin 1 as well as pins 4 and 6 is omitted.
- Socket terminals 1, 2, 4 and 6 should not be used as tie points.
- As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.
- \* This rating is applicable when the duty cycle of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.
- ▲ The dc component must not exceed 900 volts.
- # The dc component must not exceed 100 volts.





6DC6

6DC6

# SEMIREMOTE-CUTOFF PENTODE

MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 6.3 . . . . . ac or dc volts

Current . . . . . 0.3 . . . . . amp

Direct Interelectrode Capacitances (No external shield):

Grid No.1 to plate . . . 0.02 max. . . . .  $\mu\mu\text{f}$

Input . . . . . 6.5 . . . . .  $\mu\mu\text{f}$

Output . . . . . 2 . . . . .  $\mu\mu\text{f}$

### Mechanical:

Maximum Overall Length . . . . . 2-1/8"

Maximum Seated Length . . . . . 1-7/8"

Length, Base Seat to 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 (JEDEC No. E7-1)

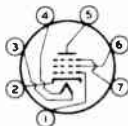
Basing Designation for BOTTOM VIEW . . . . . 7CM

Pin 1 - Grid No.1

Pin 2 - Cathode

Pin 3 - Heater

Pin 4 - Heater



Pin 5 - Plate

Pin 6 - Grid No.2

Pin 7 - Grid No.3,  
Internal  
Shield

## AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . . 300 max. volts

GRID-No.3 (SUPPRESSOR) VOLTAGE . . . . . 0 max. volts

GRID-No.2 SUPPLY VOLTAGE . . . . . 300 max. volts

GRID-No.2 (SCREEN) VOLTAGE . . . . . See Rating Curve at  
front of this Section

GRID-No.1 (CONTROL-GRID) VOLTAGE:

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

PLATE DISSIPATION . . . . . 2 max. watts

GRID-No.2 INPUT . . . . . 0.5 max. watt

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . 200 max. volts

Heater positive with respect to cathode . . . 200<sup>▲</sup> max. volts

### Typical Operation and Characteristics:

Plate Supply Voltage . . . . . 200 volts

Grid No.3 . . . . . Connected to cathode at socket

Grid-No.2 Voltage . . . . . 150 volts

Cathode-Bias Resistor . . . . . 180 ohms

Plate Resistance (Approx.) . . . . . 0.5 megohm

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

6DC6



6DC6

### SEMIREMOTE-CUTOFF PENTODE

Transconductance . . . . .	5500	$\mu$ hos
Grid-No.1 Voltage (Approx.) for transconductance of 50 $\mu$ hos . . . .	-12.5	volts
Plate Current . . . . .	9	ma
Grid-No.2 Current . . . . .	3	ma

**Maximum Circuit Values (For maximum rated conditions):**

Grid-No.1-Circuit Resistance:		
For fixed-bias operation . . . . .	0.25 max.	megohm
For cathode-bias operation . . . . .	1.0 max.	megohm

JUNE 14, 1954

TUBE DIVISION

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History



6DC6

6DC6

# AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID - N<sup>o</sup> 3 VOLTS = 0  
GRID - N<sup>o</sup> 2 VOLTS = 150

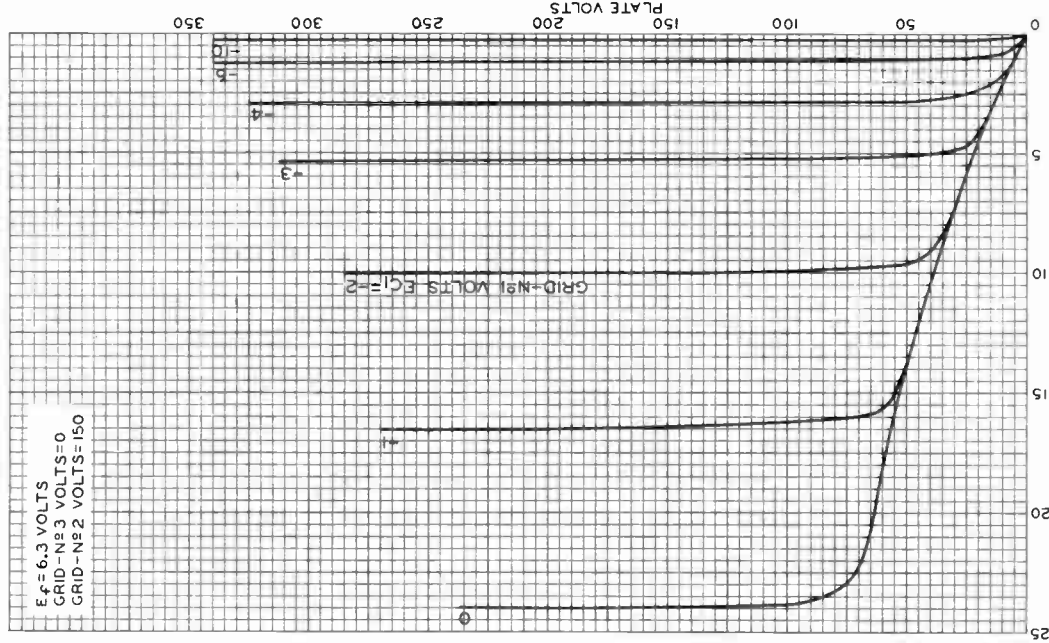


PLATE MILLIAMPERES

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

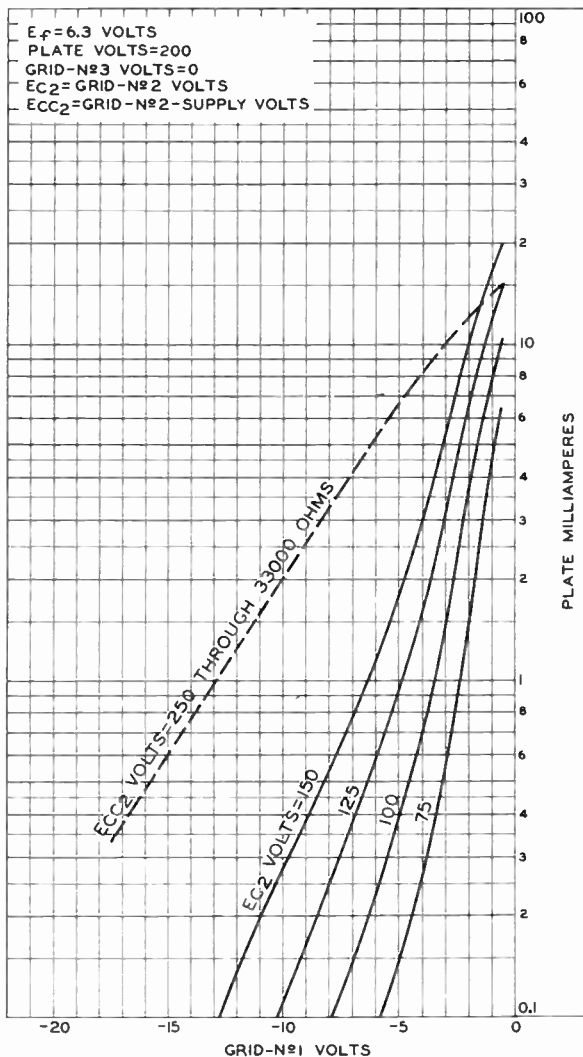
92CM-8330RI

6DC6



6DC6

## AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

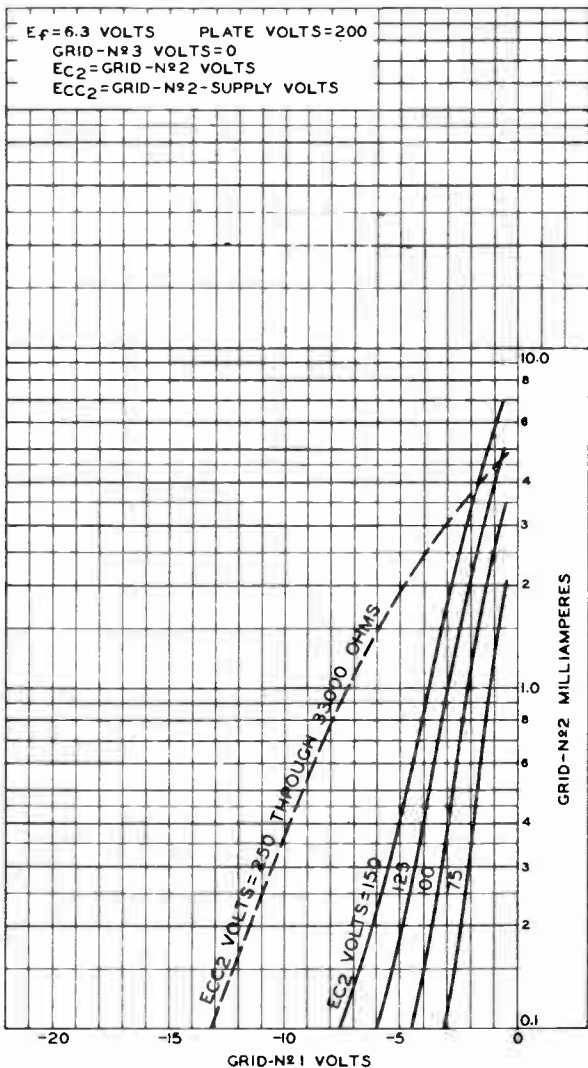
92CM-8337



6DC6

6DC6

### AVERAGE CHARACTERISTICS



JUNE 15, 1954

TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARTISON, NEW JERSEY

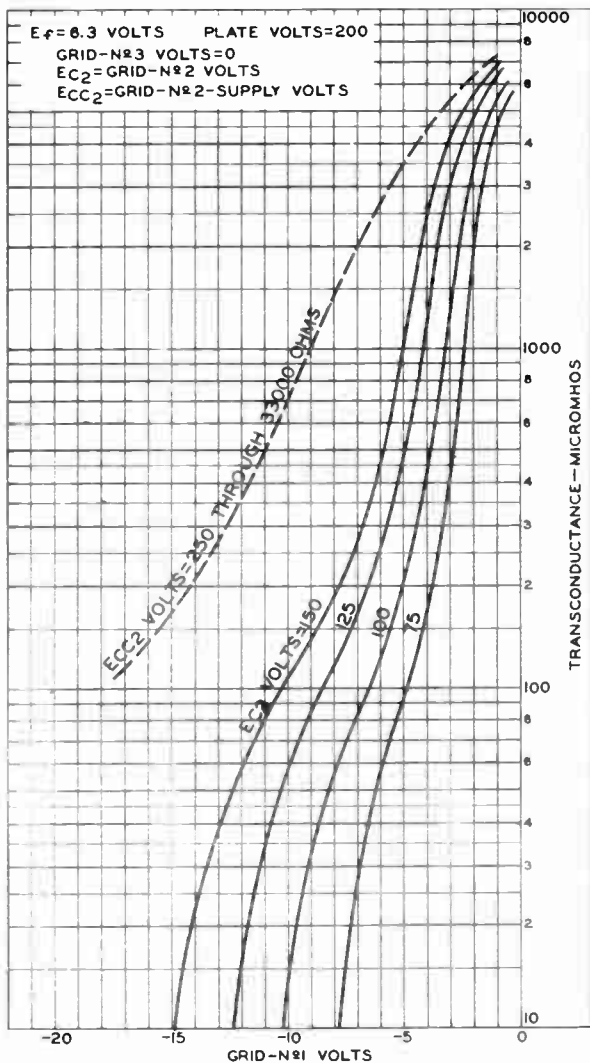
92CM-8338

6DC6



6DC6

## AVERAGE CHARACTERISTICS



JUNE 15, 1954

 TUBE DIVISION  
 RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8336



6DE4

6DE4

# HALF-WAVE VACUUM RECTIFIER

For television damper service in 110° systems

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3 ± 10%	ac or dc volts
Current . . . . .	1.6	amp

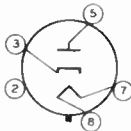
Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Plate to cathode and heater . . . . .	8.5	μf
Cathode to plate and heater . . . . .	11.5	μf
Heater to cathode . . . . .	4	μf

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	3-13/16"
Maximum Seated Length . . . . .	3-1/4"
Diameter . . . . .	1.062" to 1.188"
Bulb . . . . .	T9
Base . . . . .	Short Intermediate-Shell Octal 5-Pin (Arrangement 2), with External Barriers (JEDEC Group 1, No. B5-85)
Basing Designation for BOTTOM VIEW . . . . .	4CG

Pin 2 - Internal Connection—  
Do Not Use  
Pin 3 - Cathode



Pin 5 - Plate  
Pin 7 - Heater  
Pin 8 - Heater

## DAMPER SERVICE

### Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system<sup>#</sup>

PEAK INVERSE PLATE VOLTAGE . . . . .	5000 <sup>■</sup> max.	volts
PEAK PLATE CURRENT . . . . .	1100 max.	ma
DC PLATE CURRENT . . . . .	1/5 max.	ma
PLATE DISSIPATION . . . . .	6.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	5000 <sup>■</sup> max.	volts
Heater positive with respect to cathode . . . . .	300 <sup>†</sup> max.	volts

<sup>o</sup> Without external shield.

<sup>#</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

<sup>■</sup> This rating is applicable where the duty cycle of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

<sup>•</sup> The dc component must not exceed 900 volts.

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

6DE4

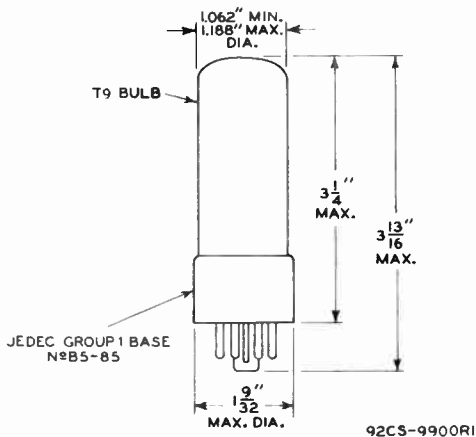


6DE4

## HALF-WAVE VACUUM RECTIFIER

### OPERATING CONSIDERATIONS

The base pins of the 6DE4 fit the standard Octal socket. Socket terminals for pins 1, 2, 4, and 6 should not be used for tie points. It is also recommended that socket clips for these pins be removed to reduce the possibility of arc-over and to minimize leakage.



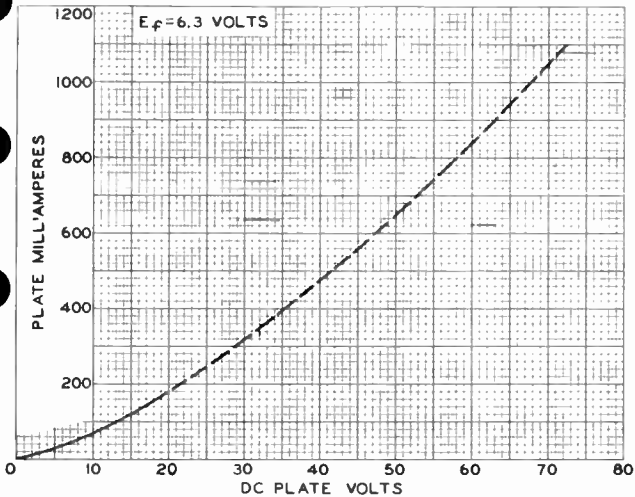




6DE4

6DE4

### AVERAGE PLATE CHARACTERISTIC



92CS-9884

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History





6DE6

# SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

6DE6

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3 ± 10%	volts
Current . . . . .	0.3	amp

Direct Interelectrode Capacitances:

	<i>Without External Shield</i>	<i>With External Shield<sup>o</sup></i>	
Grid No.1 to plate . . . . .	0.025 max.	0.015 max.	μf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . .	6.5	6.5	μf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . .	2	3	μf

### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Supply Voltage . . . . .	125	volts
Grid No.3 . . . . .	↓	
Grid-No.2 Supply Voltage . . . . .	125	volts
Cathode Resistor . . . . .	56	ohms
Plate Resistance (Approx.) . . . . .	0.25	megohm
Transconductance . . . . .	8000	μhos
Plate Current . . . . .	15.5	ma
Grid-No.2 Current . . . . .	4.2	ma
Grid-No.1 Voltage (Approx.) for plate $\mu_a = 20$ . . . . .	-9	volts
Grid-No.1 Voltage (Approx.) for transconductance ( $\mu\text{hos}$ ) = 700 and cathode resistor (ohms) = 0 . . . . .	-5.5	volts

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-1/2" ± 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)

← Indicates a change.

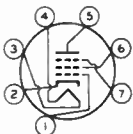


6DE6

## SHARP-CUTOFF PENTODE

Basing Designation for BOTTOM VIEW . . . . . 7CM

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



Pin 6 - Grid No.2  
 Pin 7 - Grid No.3,  
 Internal  
 Shield

AMPLIFIER — Class A<sub>1</sub>

## ← Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE. . . . . 330 max. volts  
 GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE. . . . . 0 max. volts  
 GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . . 330 max. volts  
 GRID-No.2 VOLTAGE. . . . . See Grid-No.2 Input

Rating Chart at front of Receiving Tube Section

GRID-No.1 (CONTROL-GRID) VOLTAGE:

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

GRID-No.2 INPUT:

For grid-No.2 voltages up  
 to 165 volts . . . . . 0.55 max. watt

For grid-No.2 voltages be-  
 tween 165 and 330 volts. . . . . See Grid-No.2 Input

Rating Chart at front of Receiving Tube Section

PLATE DISSIPATION. . . . . 2.3 max. watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with  
respect to cathode . . . . . 200 max. voltsHeater positive with  
respect to cathode . . . . . 200<sup>▲</sup> max. volts

## Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . . 0.25 max. megohm

For cathode-bias operation . . . . . 1 max. megohm

◊ With external shield JEDEC no.316 connected to cathode.

◆ Connected to cathode at socket.

▲ The dc component must not exceed 100 volts.

← Indicates a change.

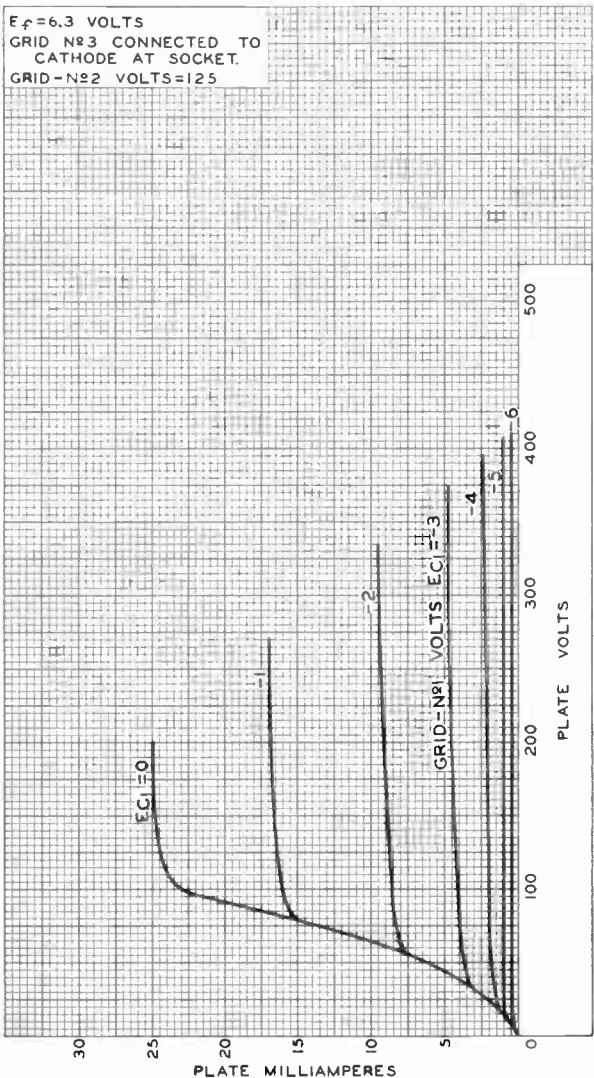


6DE6

6DE6

### AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID N<sup>o</sup>3 CONNECTED TO  
CATHODE AT SOCKET.  
GRID-N<sup>o</sup>2 VOLTS = 125



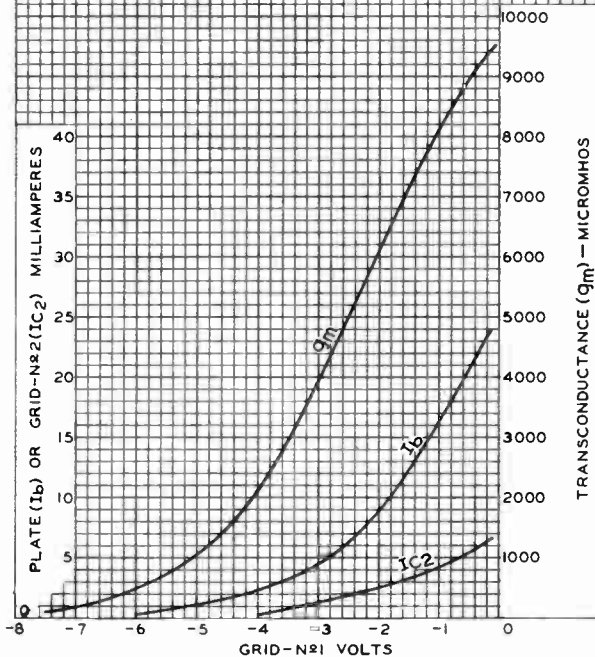
6DE6



6DE6

## AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 125  
 GRID N<sup>o</sup>3 CONNECTED TO  
 CATHODE AT SOCKET.  
 GRID-N<sup>o</sup>2 VOLTS = 125





6DE7

# DUAL TRIODE

With Medium-Mu Unit and Low-Mu Unit

9-FIN MINIATURE TYPE

6DE7

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3 ± 10%	. . . . .	ac or dc volts
Current . . . . .	0.9	. . . . .	amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

	Unit No. 1	Unit No. 2	
Grid to plate . . . . .	4	8.5	μμf
Grid to cathode and heater . . . . .	2.2	5.5	μμf
Plate to cathode and heater . . . . .	0.52	1	μμf

### Characteristics, Class A<sub>1</sub> Amplifier:

	Unit No. 1	Unit No. 2	
Plate Voltage . . . . .	250	60 150	volts
Grid Voltage . . . . .	-11	0 -17.5	volts
Amplification Factor . . . . .	17.5	- 6	
Plate Resistance (Approx.) . . . . .	8750	- 925	ohms
Transconductance . . . . .	2000	- 6500	μmhos
Plate Current . . . . .	5.5	80* 35	ma
Plate Current for grid voltage of -24 volts . . . . .	-	- 10	ma
Grid Voltage (Approx.) for plate current of 10 μa . . . . .	-20	- -	volts
Grid Voltage (Approx.) for plate current of 50 μa . . . . .	-	- -44	volts

### 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"

Diameter . . . . . 0.750" to 0.875"

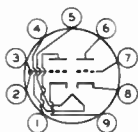
Dimensional Outline . . . . . See General Section

Bulb . . . . . T6-1/2

Base . . . . . Small-Button Noval 9-Pin (JEDEC No. E9-1)

Basing Designation for BOTTOM VIEW . . . . . 9HF

- Pin 1 - Plate of Unit No. 2
- Pin 2 - Grid of Unit No. 2
- Pin 3 - Grid of Unit No. 2
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Plate of Unit No. 1
- Pin 7 - Grid of Unit No. 1
- Pin 8 - Cathode of Unit No. 1
- Pin 9 - Cathode of Unit No. 2



6DE7

## DUAL TRIODE

With Medium-Mu Unit and Low-Mu Unit

## VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No. 1

## Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE. . . . .	330	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE. . . . .	400	max.	volts
CATHODE CURRENT:			
Peak. . . . .	77	max.	ma
Average . . . . .	22	max.	ma
PLATE DISSIPATION <sup>⊙</sup> . . . . .	7	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup>	max.	volts

## Maximum Circuit Values:

Grid-Circuit Resistance:

For grid-resistor-bias or cathode-bias operation. . . . .	2.2	max.	megohms
--	-----	------	---------

## VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No. 2

## Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE. . . . .	275	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE <sup>#</sup> . . . . .	1500	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE. . . . .	250	max.	volts
CATHODE CURRENT:			
Peak. . . . .	175	max.	ma
Average . . . . .	50	max.	ma
PLATE DISSIPATION <sup>⊙</sup> . . . . .	7	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup>	max.	volts

## Maximum Circuit Values:

Grid-Circuit Resistance:

For grid-resistor-bias or cathode-bias operation. . . . .	2.2	max.	megohms
--	-----	------	---------

<sup>⊙</sup> Without external shield.<sup>\*</sup> This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.<sup>⊕</sup> In stages operating with grid-resistor bias, an adequate cathode-bias resistor or other suitable means is required to protect the tube in the absence of excitation.<sup>▲</sup> The dc component must not exceed 100 volts.





6DE7

6DE7

**DUAL TRIODE**  
**With Medium-Mu Unit and Low-Mu Unit**

\* This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

6DE7



6DE7

# AVERAGE PLATE CHARACTERISTICS UNIT No. 1

$E_f = 6.3$  VOLTS

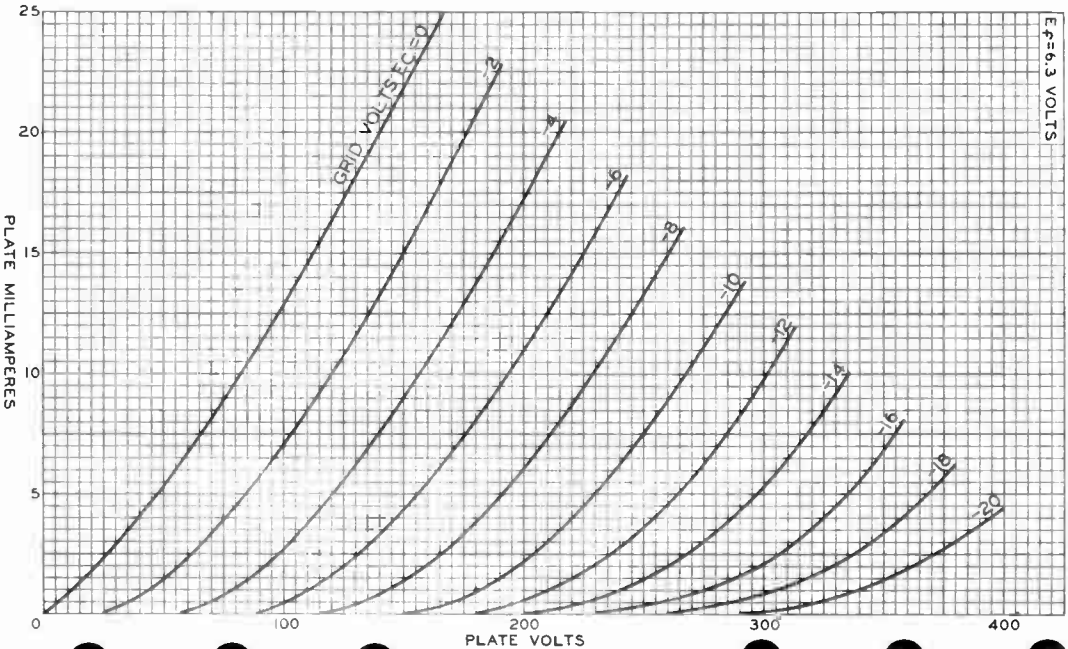


PLATE MILLIAMPERES

PLATE VOLTS

ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

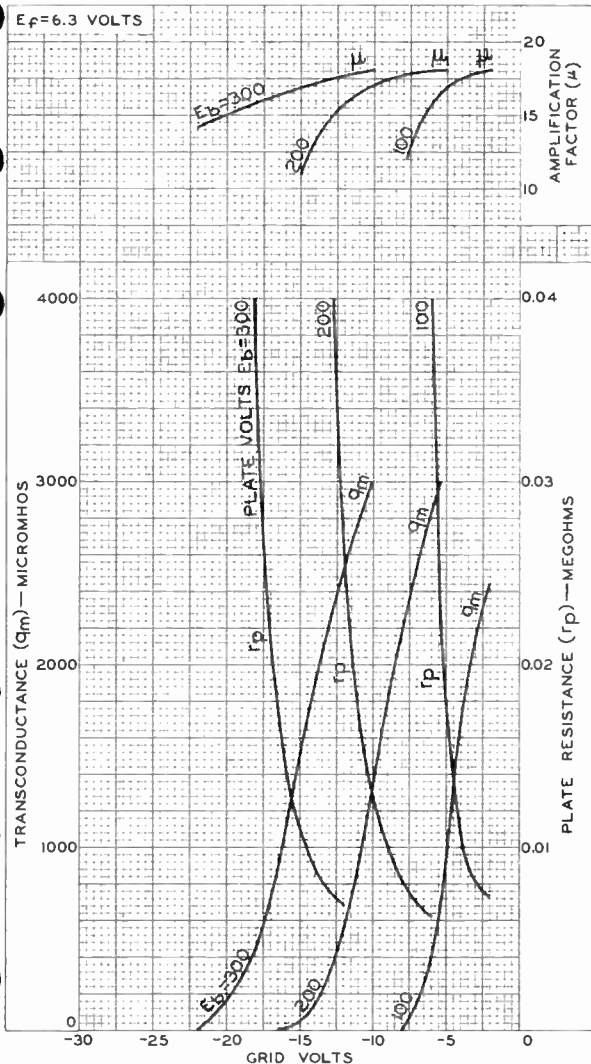
92CM-9988



6DE7

AVERAGE CHARACTERISTICS  
UNIT №1

6DE7



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

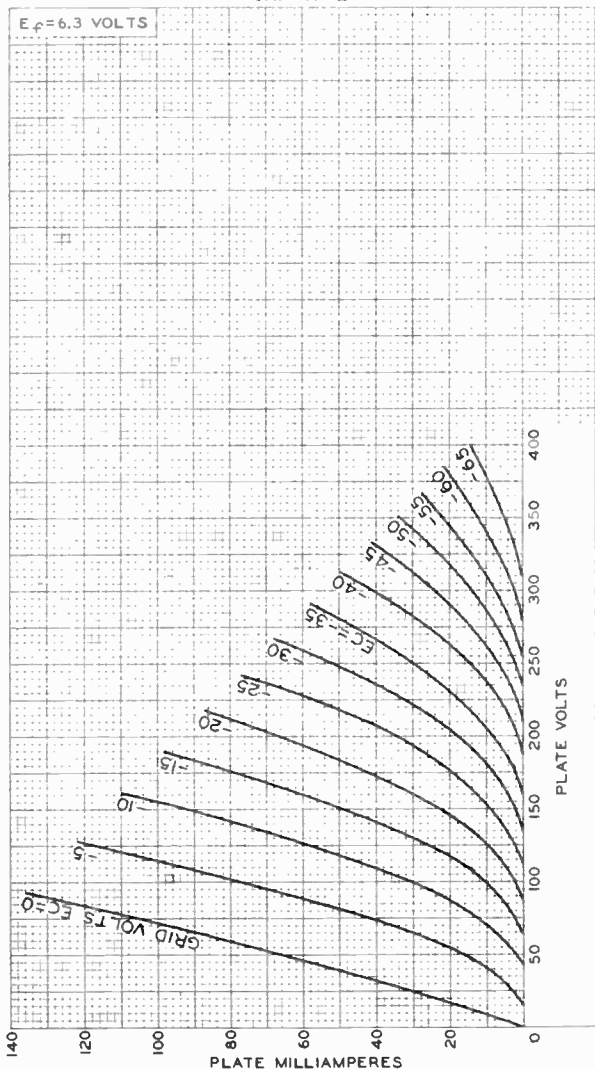
92CM-9991

6DE7



6DE7

AVERAGE PLATE CHARACTERISTICS  
UNIT No 2



ELECTRON TUBE DIVISION

92CM-9913

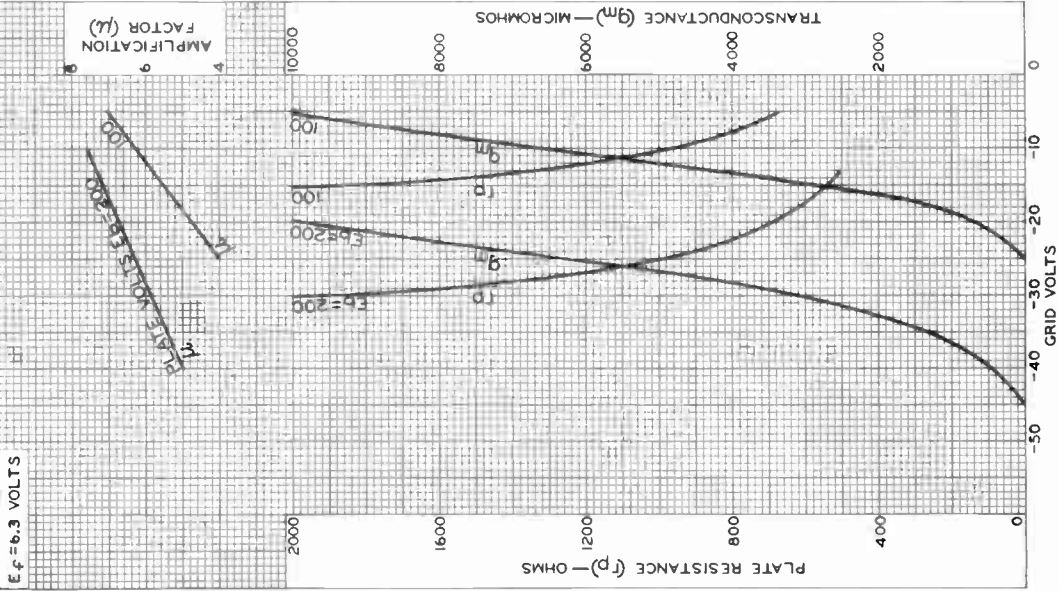
RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY



6DE7

6DE7

# AVERAGE CHARACTERISTICS UNIT No 2







6DG6-GT

# 6DG6-GT

## BEAM POWER TUBE

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	ac or dc volts
Current . . . . .	1.2	amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid No.1 to plate . . . . .	0.6	$\mu$ f
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	15	$\mu$ f
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	10	$\mu$ f

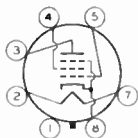
#### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	3-5/16"
Maximum Seated Length . . . . .	2-3/4"
Maximum Diameter . . . . .	1-9/32"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T-9

Base . . . . . Intermediate-Shell Octal 7-Pin (JETEC No. B7-7),  
Short Intermediate-Shell Octal 7-Pin  
with External Barriers (JETEC No. B7-59),  
Intermediate-Shell Octal 6-Pin (JETEC No. B6-81),  
or Short Intermediate-Shell Octal 6-Pin  
with External Barriers (JETEC No. B6-84)

Basing Designation for BOTTOM VIEW . . . . . 7S

Pin 1  $\blacklozenge$  - No Connection  
Pin 2 - Heater  
Pin 3 - Plate  
Pin 4 - Grid No.2



Pin 5 - Grid No.1  
Pin 7 - Heater  
Pin 8 - Cathode,  
Grid No.3

### AMPLIFIER - Class A<sub>1</sub>

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

PLATE VOLTAGE . . . . .	200 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	125 max.	volts
PLATE DISSIPATION . . . . .	10 max.	watts
GRID-No.2 INPUT . . . . .	1.25 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	90 max.	volts
Heater positive with respect to cathode . . . . .	90 max.	volts

#### Typical Operation and Characteristics:

Plate Voltage . . . . .	110	200	volts
Grid-No.2 Voltage . . . . .	110	125	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	-7.5	0	volts

<sup>0</sup> without external shield.

$\blacklozenge$  On the 6-pin bases, pin 1 as well as pin 6 is omitted.

6DG6-GT



# 6DG6-GT BEAM POWER TUBE

Peak AF Grid-No.1 Voltage. . . . .	7.5	8.5	volts
Cathode Resistor . . . . .	0	180	ohms
Zero-Signal Plate Current. . . . .	49	46	ma
Max.-Signal Plate Current. . . . .	50	47	ma
Zero-Signal Grid-No.2 Current. . . . .	4	2.2	ma
Max.-Signal Grid-No.2 Current. . . . .	10	8.5	ma
Plate Resistance (Approx.) . . . . .	13000	28000	ohms
Transconductance . . . . .	8000	8000	$\mu$ mhos
Load Resistance. . . . .	2000	4000	ohms
Total Harmonic Distortion. . . . .	10	10	%
Max.-Signal Power Output . . . . .	2.1	3.8	watts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

Curves shown under Type 50L6-GT also apply to the 6DG6-GT





6DK6

6DK6

# SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

## DATA

### Electrical:

Heater, for Unipotential Cathode:

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

Direct Interelectrode Capacitances:°

Grid No.1 to plate . . . . .	0.02 max.	$\mu\mu\text{f}$
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . .	6.3	$\mu\mu\text{f}$
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater. . . . .	1.9	$\mu\mu\text{f}$

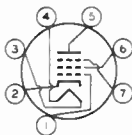
### Characteristics, Class A<sub>1</sub> Amplifier:

Plate-Supply Voltage . . . . .	125	volts
Grid-No.3 . . . . .	<i>Connected to cathode at socket</i>	
Grid-No.2-Supply Voltage . . . . .	125	volts
Cathode Resistor . . . . .	56	ohms
Plate Resistance (Approx.) . . . . .	0.35	megohm
Transconductance . . . . .	9800	$\mu\text{mhos}$
Plate Current . . . . .	12	ma
Grid-No.2 Current . . . . .	3.8	ma
Grid-No.1 Voltage (Approx.) for plate $\mu\text{a} = 20$ . . . . .	-6.5	volts

### Mechanical:

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

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



Pin 6 - Grid No.2  
 Pin 7 - Grid No.3,  
 Internal  
 Shield

### AMPLIFIER — Class A<sub>1</sub>

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE . . . . .	330 max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE . . . . .	0 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	330 max.	volts

°: See next page.

6DK6



6DK6

### SHARP-CUTOFF PENTODE

GRID-No.2 VOLTAGE. . . . . See Grid-No.2 Input  
*Rating Chart at front of Receiving Tube Section*

GRID-No.1 (CONTROL-GRID) VOLTAGE:  
Positive-bias value. . . . . 0 max. volts

GRID-No.2 INPUT:  
For grid-No.2 voltages up to  
165 volts. . . . . 0.55 max. watt

For grid-No.2 voltages between  
165 and 330 volts. . . . . See Grid-No.2 Input  
*Rating Chart at front of Receiving Tube Section*

PLATE DISSIPATION. . . . . 2.3 max. watts

PEAK HEATER-CATHODE VOLTAGE:  
Heater negative with  
respect to cathode . . . . . 200 max. volts  
Heater positive with  
respect to cathode . . . . . 200<sup>▲</sup>max. volts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:  
For fixed-bias operation . . . . . 0.25 max. megohm  
For cathode-bias operation . . . . . 1 max. megohm

<sup>○</sup> without external shield.  
<sup>▲</sup> The dc component must not exceed 100 volts.

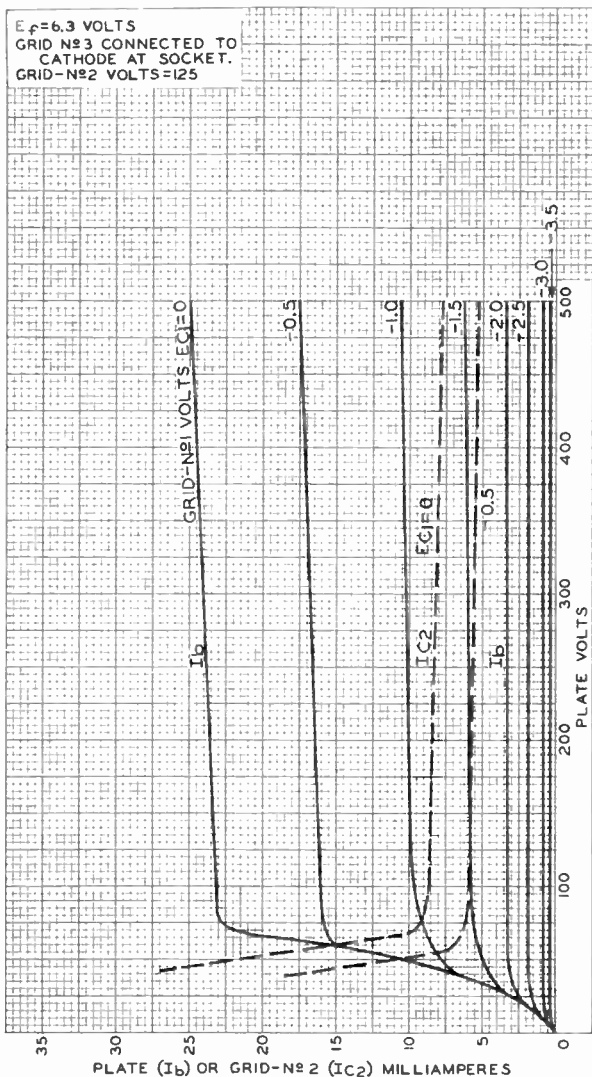


6DK6

6DK6

### AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID-№3 CONNECTED TO  
CATHODE AT SOCKET.  
GRID-№2 VOLTS = 125



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9851R1

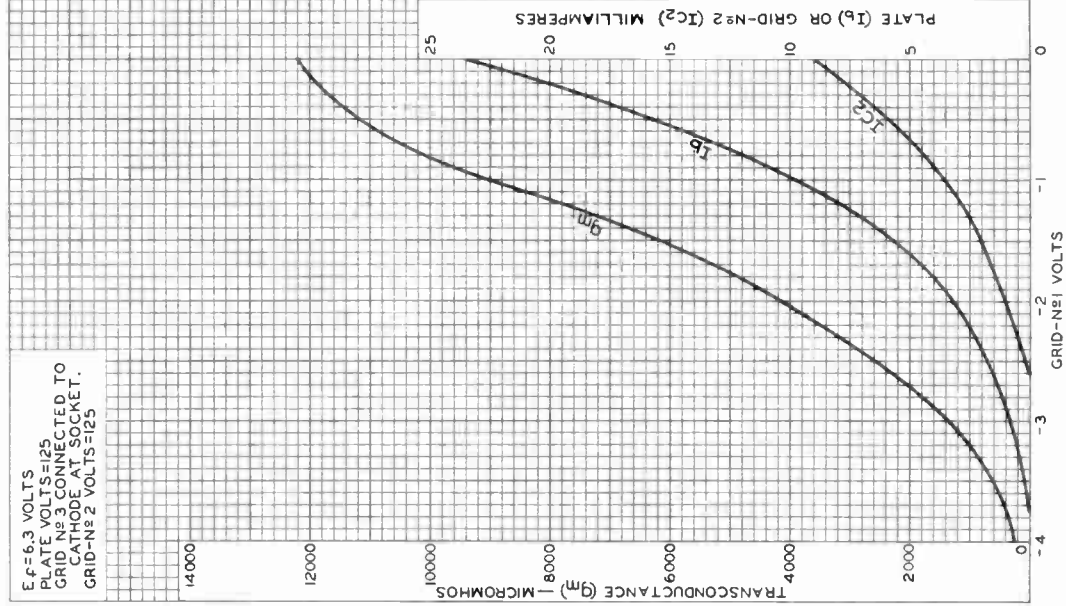
6DK6



6DK6

## AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 125  
 GRID No 3 CONNECTED TO  
 CATHODE AT SOCKET.  
 GRID-No 2 VOLTS = 125





6DN6

# 6DN6 BEAM POWER TUBE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3	volts
Current . . . . .	2.5	amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid No.1 to plate . . . . .	0.8	$\mu\text{f}$
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	22	$\mu\text{f}$
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	11.5	$\mu\text{f}$

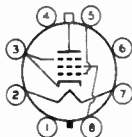
### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	50	125	volts
Grid-No.2 Voltage . . . . .	100	125	volts
Grid-No.1 Voltage . . . . .	0	-18	volts
Plate Resistance (Approx.) . . . . .	-	4000	ohms
Transconductance . . . . .	-	9000	$\mu\text{mhos}$
Plate Current . . . . .	240 <sup>*</sup>	70	ma
Grid-No.2 Current . . . . .	30 <sup>*</sup>	6.3	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 0.5 . . . . .	-	-36	volts

### Mechanical:

Operating Position . . . . .	Vertical, or Horizontal with pins 1 and 3 in vertical plane
Maximum Overall Length . . . . .	5"
Seated Length . . . . .	4-1/4" $\pm$ 3/16"
Diameter . . . . .	1.438" to 1.562"
Bulb . . . . .	T12
Cap . . . . .	Small (JEDEC No. C1-1)
Base . . . . .	Short Medium-Shell Octal 8-Pin with External Barriers, Style B (JEDEC Group 1, No. B8-118)
Basing Designation for BOTTOM VIEW . . . . .	5BT

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



- Pin 5 - Grid No.1
- Pin 6 - No Connection
- Pin 7 - Heater
- Pin 8 - Grid No.2  
Cap - Plate

### HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	700 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum) <sup>®</sup> . . . . .	6600 <sup>■</sup> max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE . . . . .	1500 max.	volts

6DN6



6DN6

## BEAM POWER TUBE

DC GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . .	175	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL- GRID) VOLTAGE . . . . .	200	max.	volts
CATHODE CURRENT:			
Peak . . . . .	700	max.	ma
Average . . . . .	200	max.	ma
GRID-No.2 INPUT . . . . .	3	max.	watts
PLATE DISSIPATION†. . . . .	15	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode .	200	max.	volts
Heater positive with respect to cathode .	200	max.▲	volts
BULB TEMPERATURE (At hottest point on bulb surface) . . . . .	225	max.	°C

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance† . . . . . 0.47 max. megohm

○ Without external shield.

\* This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

□ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

● This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

■ Under no circumstances should this absolute value be exceeded.

† An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

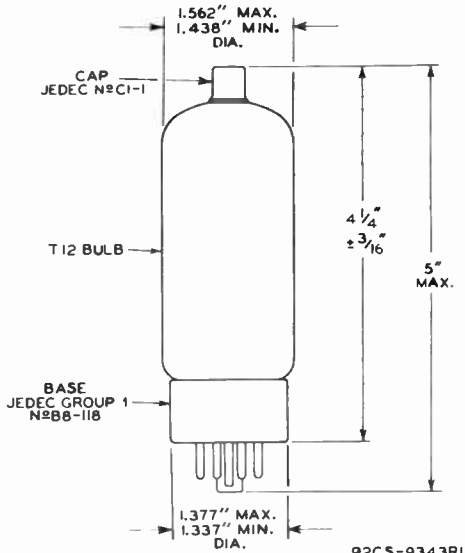
▲ The dc component must not exceed 100 volts.



6DN6

BEAM POWER TUBE

6DN6









6DN7

6DN7

MEDIUM-MU DUAL TRIODE  
With Dissimilar Units

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	6.3 ± 10%	volts
Current . . . . .	0.9	amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

	Unit No. 1	Unit No. 2	
Grid to plate . . . . .	4	5.5	μf
Grid to cathode and heater. . .	2.2	4.6	μf
Plate to cathode and heater . .	0.7	1	μf

Characteristics, Class A<sub>1</sub> Amplifier:

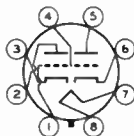
	Unit No. 1	Unit No. 2	
Plate Voltage . . . . .	250	150 250	volts
Grid Voltage. . . . .	-8	0 -9.5	volts
Amplification Factor. . . . .	22.5	- 15.4	
Plate Resistance (Approx.). . . .	9000	- 2000	ohms
Transconductance. . . . .	2500	- 7700	μmhos
Plate Current . . . . .	8	68 41	ma
Grid Voltage (Approx.) for plate ma. = 10 . . . . .	-18	- -	volts
Grid Voltage (Approx.) for plate ma. = 50 . . . . .	-	- -23	volts

Mechanical:

Operating Position. . . . .	Any
Maximum Overall Length. . . . .	3"
Maximum Seated Length . . . . .	2-7/16"
Maximum Diameter. . . . .	1-9/32"
Bulb. . . . .	T9
Base. . . . .	Intermediate-Shell Octal 8-Pin with External Barriers (JEDEC Group 1, B8-142)

Basing Designation for BOTTOM VIEW. . . . . 8BD

- Pin 1 - Grid of Unit No. 2
- Pin 2 - Plate of Unit No. 2
- Pin 3 - Cathode of Unit No. 2
- Pin 4 - Grid of Unit No. 1



- Pin 5 - Plate of Unit No. 1
- Pin 6 - Cathode of Unit No. 1
- Pin 7 - Heater
- Pin 8 - Heater

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No. 1

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE. . . . .	350 max.	volts
---------------------------	----------	-------

6DN7



6DN7

## MEDIUM-MU DUAL TRIODE

With Dissimilar Units

PEAK NEGATIVE-PULSE GRID VOLTAGE. . . . .	400	max.	volts
PLATE DISSIPATION . . . . .	1	max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 <sup>▲</sup>	max.	volts

### Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias operation. . . . .	2.2	max.	megohms
For cathode-bias operation. . . . .	2.2	max.	megohms

### VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No. 2

### Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE. . . . .	550	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE <sup>#</sup> . . . . .	2500	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE. . . . .	250	max.	volts
CATHODE CURRENT:			
Peak. . . . .	150	max.	ma
Average . . . . .	50	max.	ma
PLATE DISSIPATION . . . . .	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 <sup>▲</sup>	max.	volts

### Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias operation. . . . .	2.2	max.	megohms
-----------------------------------	-----	------	---------

<sup>○</sup> Without external shield.

<sup>\*</sup> This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

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

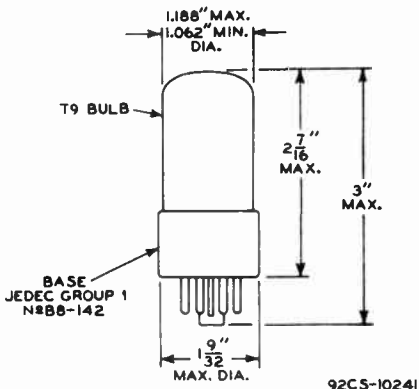
<sup>#</sup> This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle; in a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.



6DN7

MEDIUM-MU DUAL TRIODE  
With Dissimilar Units

6DN7







6DQ5

6DQ5

# BEAM POWER TUBE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 6.3 . . . . . ac or dc volts

Current . . . . . 2.5 . . . . . amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid No.1 to plate . . . . . 0.5  $\mu\text{f}$

Grid No.1 to cathode & grid No.3,  
grid No.2, and heater . . . . . 23  $\mu\text{f}$

Plate to cathode & grid No.3,  
grid No.2, and heater . . . . . 11  $\mu\text{f}$

### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . . 125 70 175 volts

Grid-No.2 (Screen-Grid) Voltage . 125 125 125 volts

Grid-No.1 (Control-Grid) Voltage. -25 0 -25 volts

Mu-Factor, Grid No.2 to Grid No.1. 3.3 - -

Plate Resistance (Approx.). . . . - - 5500 ohms

Transconductance. . . . . - - 10500  $\mu\text{mhos}$

Plate Current . . . . . - 550\* 110 ma

Grid-No.2 Current . . . . . - 42\* 5 ma

Grid-No.1 Voltage (Approx.)  
for plate current of 1 ma . . . - - -55 volts

### Mechanical:

Mounting Position . . . . . Any

Maximum Overall Length. . . . . 5"

Seated Length . . . . . 4-1/4"  $\pm$  3/16"

Maximum Diameter. . . . . 1-9/16"

Bulb . . . . . T12

Cap . . . . . Small (JETFC No.C1-1)

Base. . . . . Short Medium-Shell Octal 8-Pin  
with External Barriers, Style B (JETEC No.B8-118)

Basing Designation for BOTTOM VIEW. . . . . 8JC

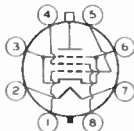
Pin 1 - Grid No.1

Pin 2 - Heater

Pin 3 - Cathode,  
Grid No.3

Pin 4 - Grid No.2

Pin 5 - Grid No.1



Pin 6 - Cathode,

Grid No.3

Pin 7 - Heater

Pin 8 - Grid No.2

Cap - Plate

<sup>o</sup> without external shield.

\* These values can be measured by a method involving a recurrent wave form such that the plate dissipation, grid-No.2 input, and cathode current will be kept within ratings in order to prevent damage to the tube.

6DQ5



6DQ5

## BEAM POWER TUBE

## HORIZONTAL DEFLECTION AMPLIFIER

Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	900	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute value) <sup>#</sup> . . . . .	7000 <sup>®</sup>	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE <sup>#</sup> . . . . .	1500	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	175	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE . . . . .	200	max.	volts
CATHODE CURRENT:			
Peak . . . . .	1000	max.	ma
DC . . . . .	285	max.	ma
GRID-No.2 INPUT . . . . .	3.2	max.	watts
PLATE DISSIPATION <sup>†</sup> . . . . .	24	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200	max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup>	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface). . . . .			
	240	max.	°C

## Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For grid-resistor-bias operation<sup>†</sup>. . . . 0.47 max. megohm

□ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

# This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30 frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

® Under no circumstances should this absolute value be exceeded.

▲ The dc component must not exceed 100 volts.

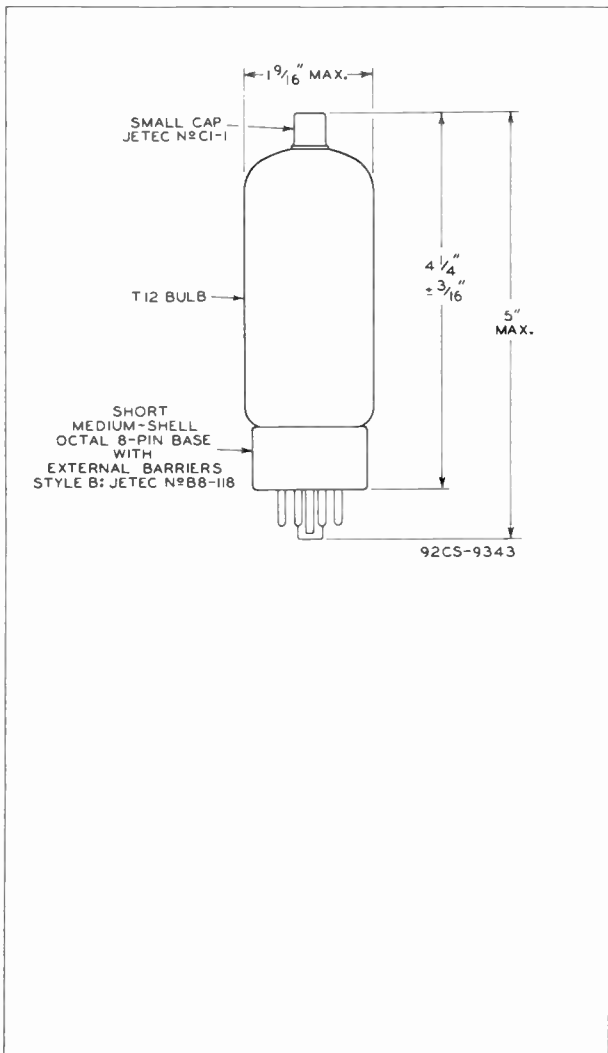
† It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value be employed.



6DQ5

6DQ5

# BEAM POWER TUBE

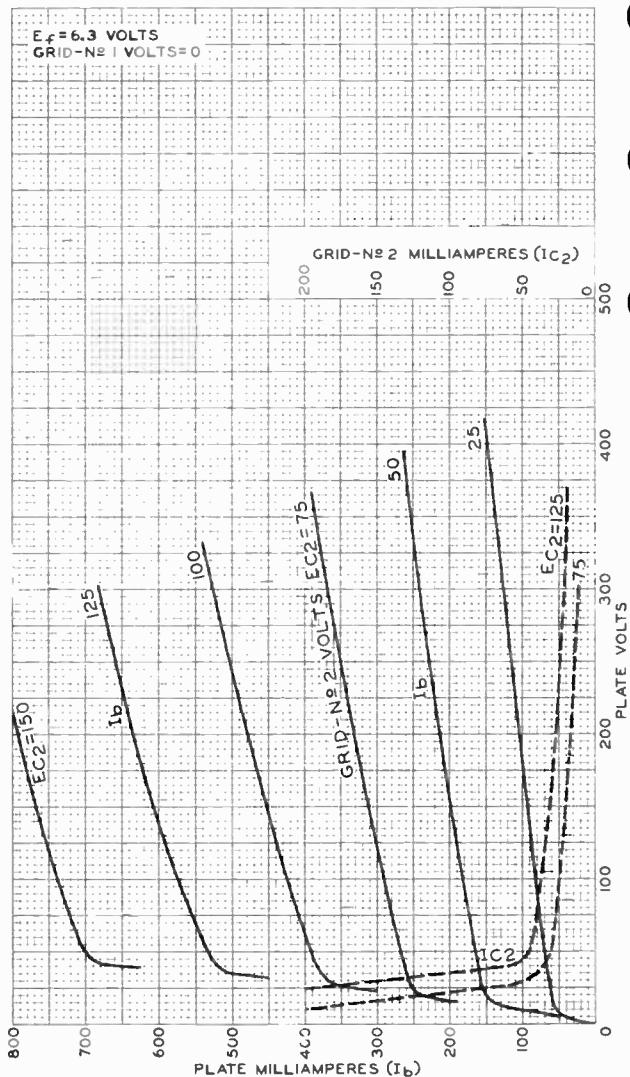


6DQ5



6DQ5

## AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9311





6DQ5

6DQ5

### AVERAGE CHARACTERISTICS

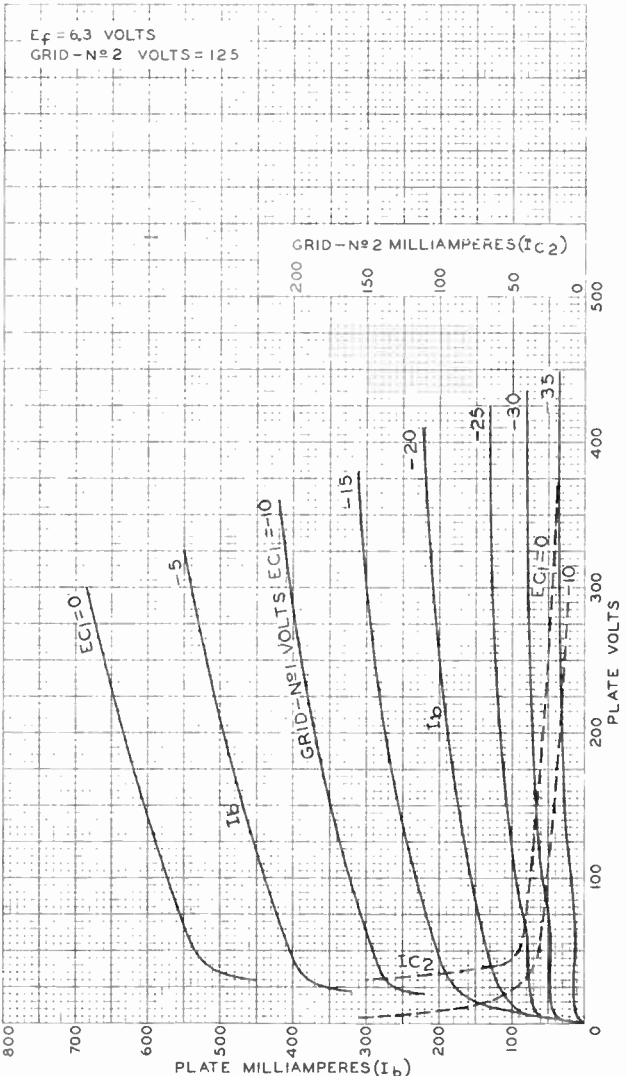


PLATE MILLIAMPERES ( $I_b$ )

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

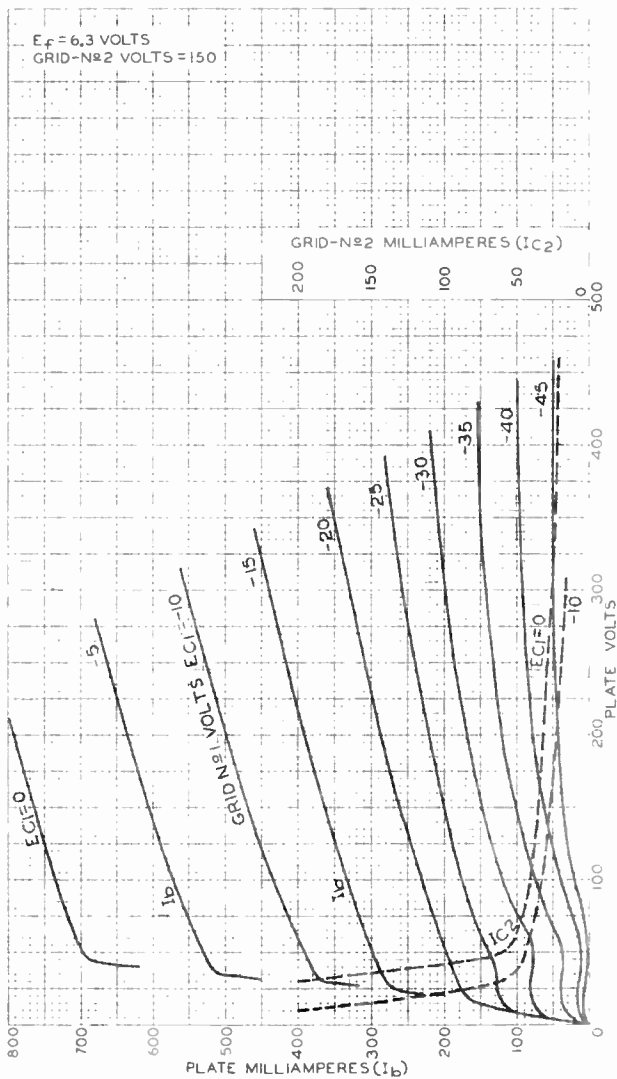
92CM-9309

6DQ5



6DQ5

## AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

92CM-9310



6DQ6-A

# 6DQ6-A

## BEAM POWER TUBE

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	. . . . .	ac or dc volts
Current . . . . .	1.2	. . . . .	amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid No.1 to plate. . . . .	0.55		$\mu\mu\text{f}$
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	15		$\mu\mu\text{f}$
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	7		$\mu\mu\text{f}$

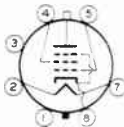
#### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	60	150	250	volts
Grid-No.2 (Screen-Grid) Voltage . . . . .	150	150	150	volts
Grid-No.1 (Control-Grid) Voltage. . . . .	0	-22.5	-22.5	volts
Mu-factor, Grid No.2 to Grid No.1 . . . . .	-	4.1	-	
Plate Resistance (Approx.). . . . .	-	-	20000	ohms
Transconductance. . . . .	-	-	6600	$\mu\text{mhos}$
Plate Current . . . . .	300*	-	75	ma
Grid-No.2 Current . . . . .	27*	-	2.4	ma
Grid-No.1 Voltage (Approx.) for plate current of 1 ma . . . . .	-	-	-46	volts

#### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length. . . . .	4-1/4"
Seated Length . . . . .	3-1/2" $\pm$ 3/16"
Maximum Diameter. . . . .	1-9/16"
Bulb. . . . .	T-12
Cap . . . . .	Skirted Miniature (JETEC No.C1-3)
Base. . . . .	Short Medium-Shell Octal 7-Pin with External Earriers, Style B (JETEC No.B7-119)
Basing Designation for BOTTOM VIEW. . . . .	6AM

- Pin 1 - No Connection
- Pin 2 - Heater
- Pin 3 - No Connection
- Pin 4 - Grid No.2



- Pin 5 - Grid No.1
- Pin 7 - Heater
- Pin 8 - Cathode,  
Grid No.3
- Cap - Plate

<sup>o</sup> without external shield.

\* These values can be measured by a method involving a recurrent wave form such that the plate dissipation, grid-No.2 input, and cathode current will be kept within ratings in order to prevent damage to the tube.

6DQ6-A



6DQ6-A

## BEAM POWER TUBE

## HORIZONTAL DEFLECTION AMPLIFIER

## Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	700 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum) <sup>⊠</sup> . . . . .	6000 <sup>■</sup> max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE . . . . .	1375 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	200 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE . . . . .	-50 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE . . . . .	300 max.	volts
CATHODE CURRENT:		
Peak . . . . .	440 max.	ma
Average . . . . .	140 max.	ma
GRID-No.2 INPUT . . . . .	3 max.	watts
PLATE DISSIPATION <sup>†</sup> . . . . .	15 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	volts
BULB TEMPERATURE (At hottest point on bulb surface) . . . . .	220 max.	°C

## Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For grid resistor-bias operation<sup>†</sup> . . . . . 1.0 max. megohm

<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

<sup>■</sup> Under no circumstances should this absolute value be exceeded.

<sup>⊠</sup> The duration of the voltage pulse must not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

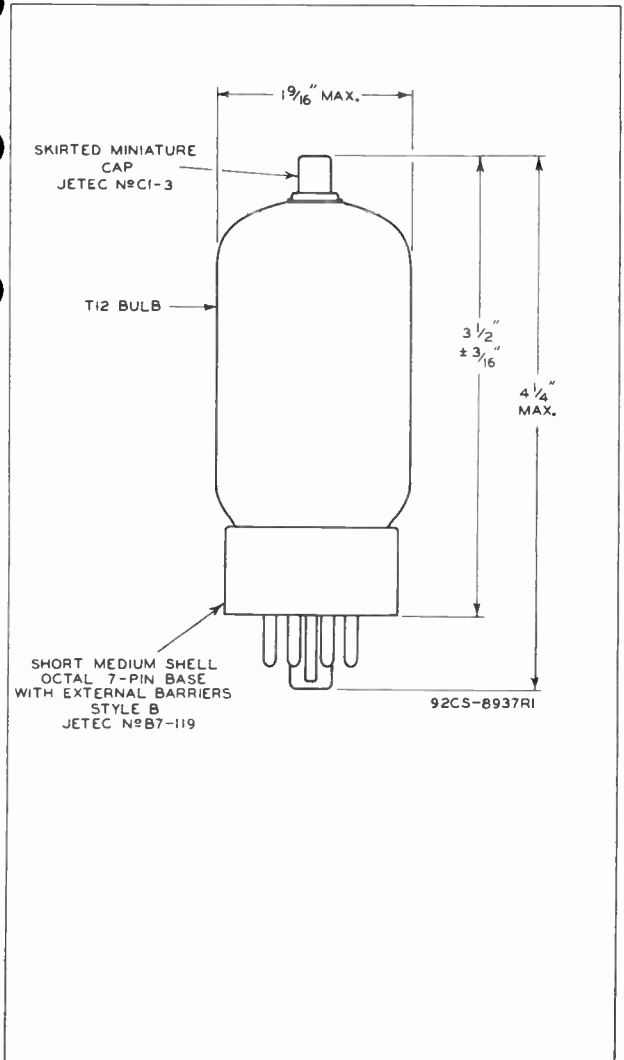
<sup>†</sup> It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value should be employed.

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



6DQ6-A

# 6DQ6-A BEAM POWER TUBE



6DQ6-A



6DQ6-A

# AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID-N $\pm$ 2 VOLTS = 100

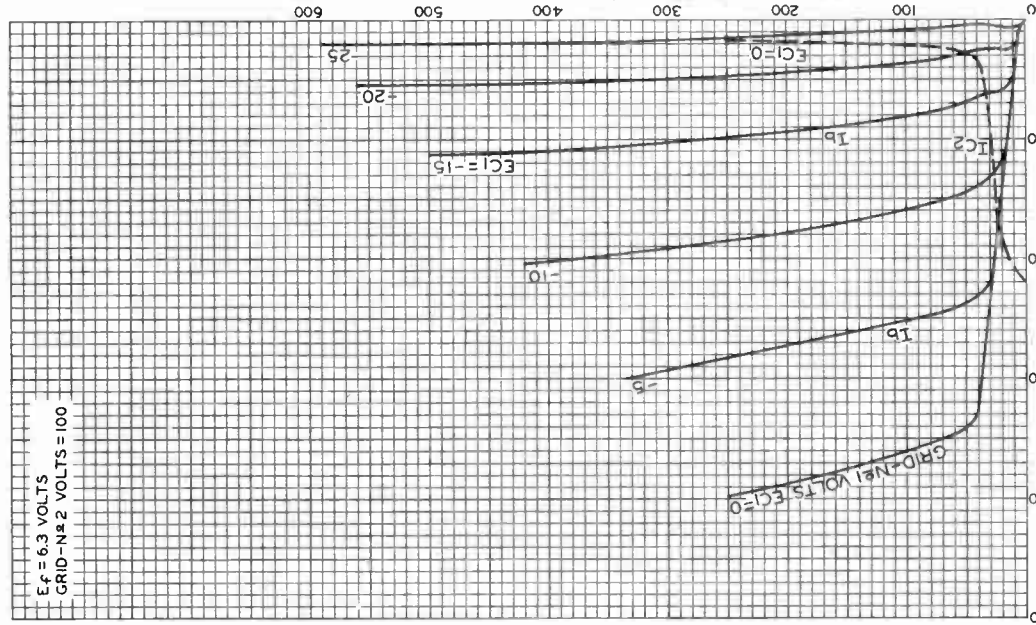


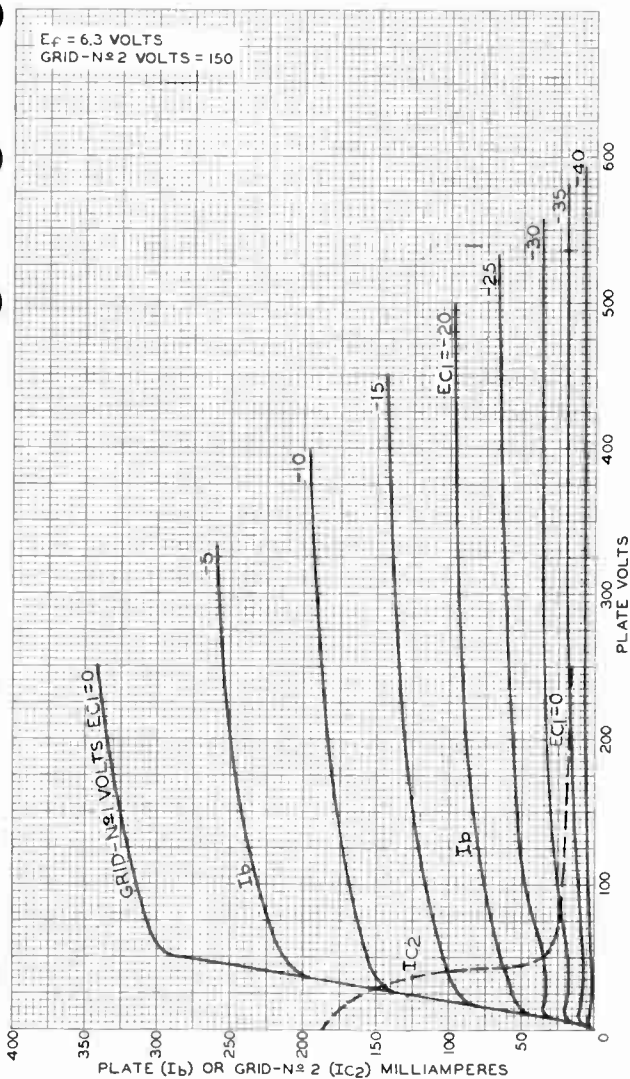
PLATE ( $I_p$ ) OR GRID-N $\pm$ 2 ( $I_{C2}$ ) MILLIAMPERES  
TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY  
92CM-8952



6DQ6-A

6DQ6-A

### AVERAGE CHARACTERISTICS



TUBE DIVISION

92CM-8953

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY







6DR7

6DR7

# DUAL TRIODE

With High-Mu Unit and Low-Mu Unit

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3 ± 10%	. . . . . ac or dc volts
Current . . . . .	0.9	. . . . . amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

	Unit No. 1	Unit No. 2	
Grid to plate . . . . .	4.5	8.5	μμf
Grid to cathode and heater . . . . .	2.2	5.5	μμf
Plate to cathode and heater . . . . .	0.34	1	μμf

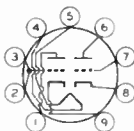
### Characteristics, Class A<sub>1</sub> Amplifier:

	Unit No. 1	Unit No. 2	
Plate Voltage . . . . .	250	150	volts
Grid Voltage . . . . .	-3	-17.5	volts
Amplification Factor . . . . .	68	6	
Plate Resistance (Approx.) . . . . .	40000	925	ohms
Transconductance . . . . .	1600	6500	μmhos
Plate Current . . . . .	1.4	35	ma
Plate Current for plate volts = 60 and grid volts = 0 . . . . .	-	80	ma
Plate Current for grid volts = -24 . . . . .	-	10	ma
Grid Voltage (Approx.) for plate μa = 10 . . . . .	-5.5	-	volts
Grid Voltage (Approx.) for plate μa = 50 . . . . .	-	-44	volts

### 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"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	.9HF

- Pin 1 - Plate of Unit No. 2
- Pin 2 - Grid of Unit No. 2
- Pin 3 - Grid of Unit No. 2
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Plate of Unit No. 1
- Pin 7 - Grid of Unit No. 1
- Pin 8 - Cathode of Unit No. 1
- Pin 9 - Cathode of Unit No. 2



6DR7

## DUAL TRIODE

### With High-Mu Unit and Low-Mu Unit

#### VERTICAL-DEFLECTION OSCILLATOR

*Values are for Unit No. 1*

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

*For operation in a 525-line, 30-frame system\**

DC PLATE VOLTAGE . . . . .	330	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	400	max.	volts
CATHODE CURRENT:			
Peak . . . . .	70	max.	ma
Average. . . . .	20	max.	ma
PLATE DISSIPATION. . . . .	1	max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200	max.	volts

##### Maximum Circuit Values:

Grid-Circuit Resistance:

For grid-resistor-bias or cathode-bias operation . . . . . 2.2 max. megohms

#### VERTICAL-DEFLECTION AMPLIFIER

*Values are for Unit No. 2*

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

*For operation in a 525-line, 30-frame system\**

DC PLATE VOLTAGE . . . . .	275	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE <sup>#</sup> . . . . .	1500	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	250	max.	volts
CATHODE CURRENT:			
Peak . . . . .	175	max.	ma
Average. . . . .	50	max.	ma
PLATE DISSIPATION. . . . .	7	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200	max.	volts

##### Maximum Circuit Values:

Grid-Circuit Resistance:

For grid-resistor-bias or cathode-bias operation . . . . . 2.2 max. megohms

<sup>o</sup> Without external shield.

<sup>\*</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

<sup>#</sup> This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

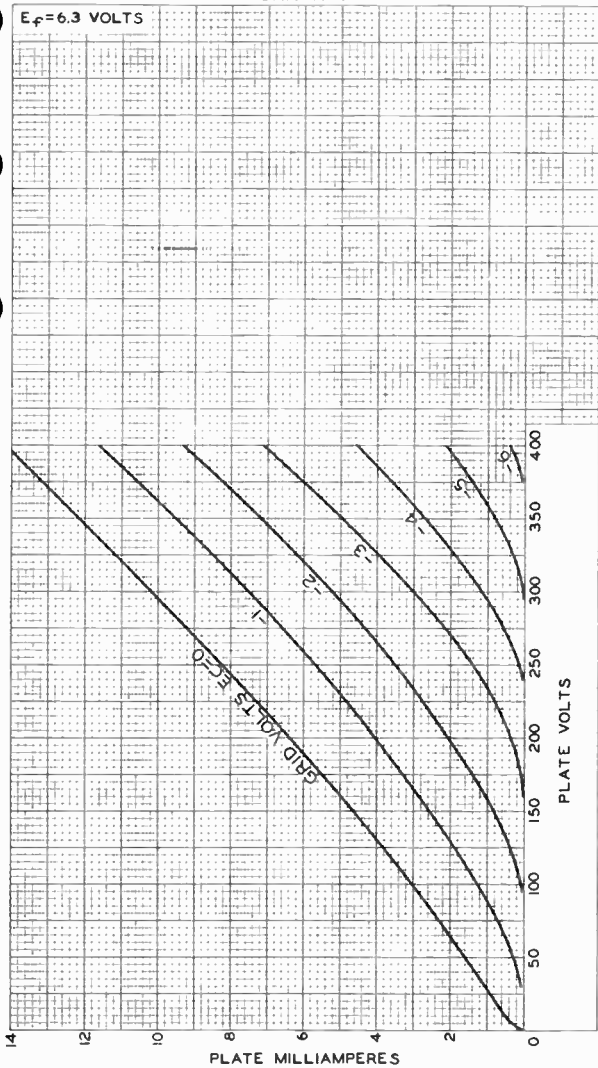
<sup>■</sup> The dc component must not exceed 100 volts.



6DR7

6DR7

### AVERAGE PLATE CHARACTERISTICS UNIT No 1



ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9912

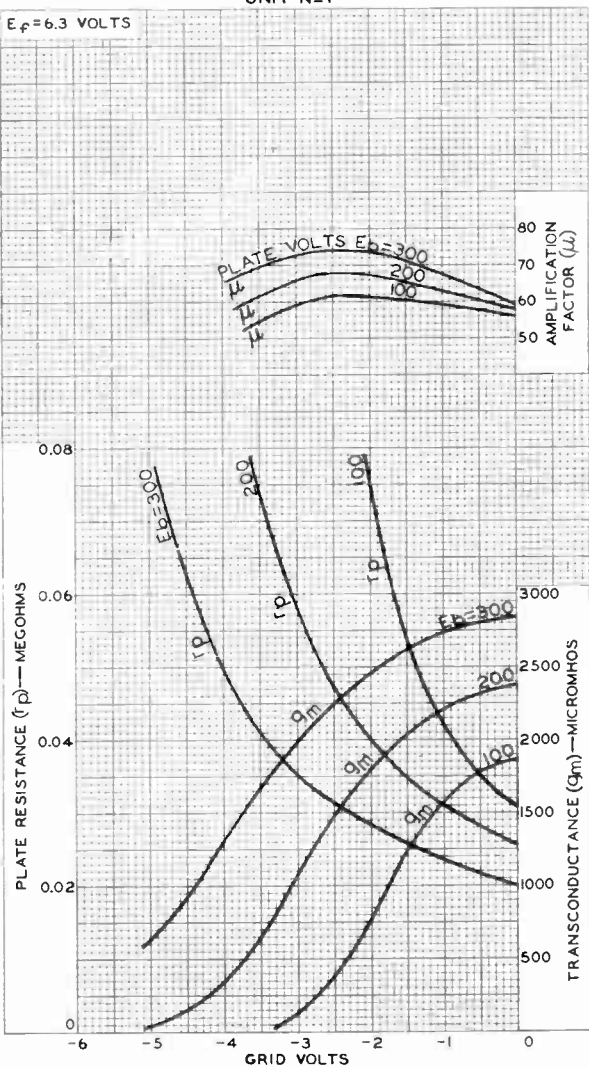
6DR7



6DR7

# AVERAGE CHARACTERISTICS

UNIT No. 1

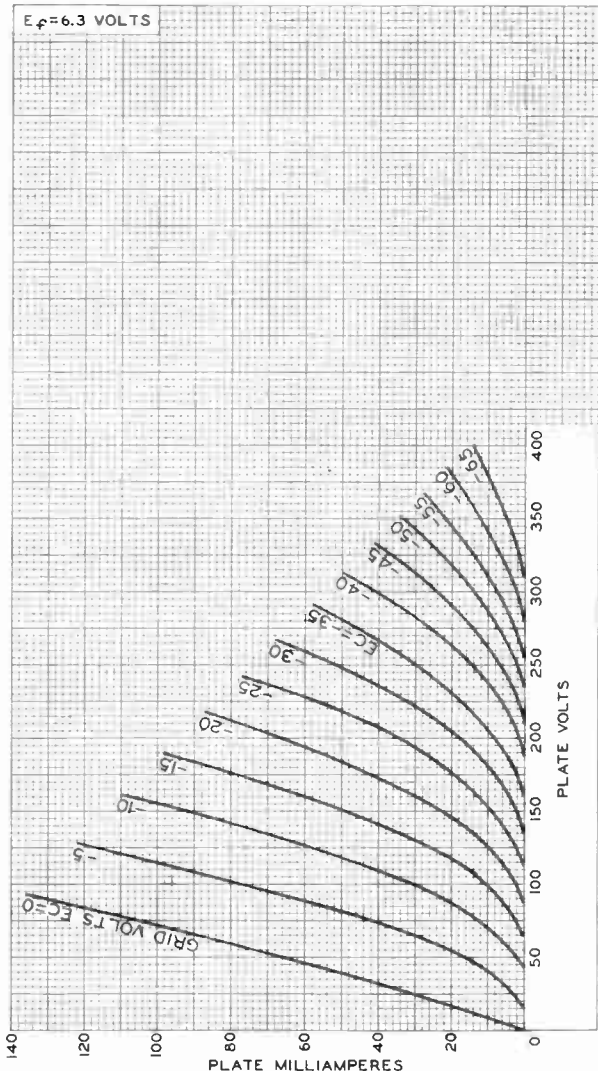
 $E_f = 6.3$  VOLTS




6DR7

6DR7

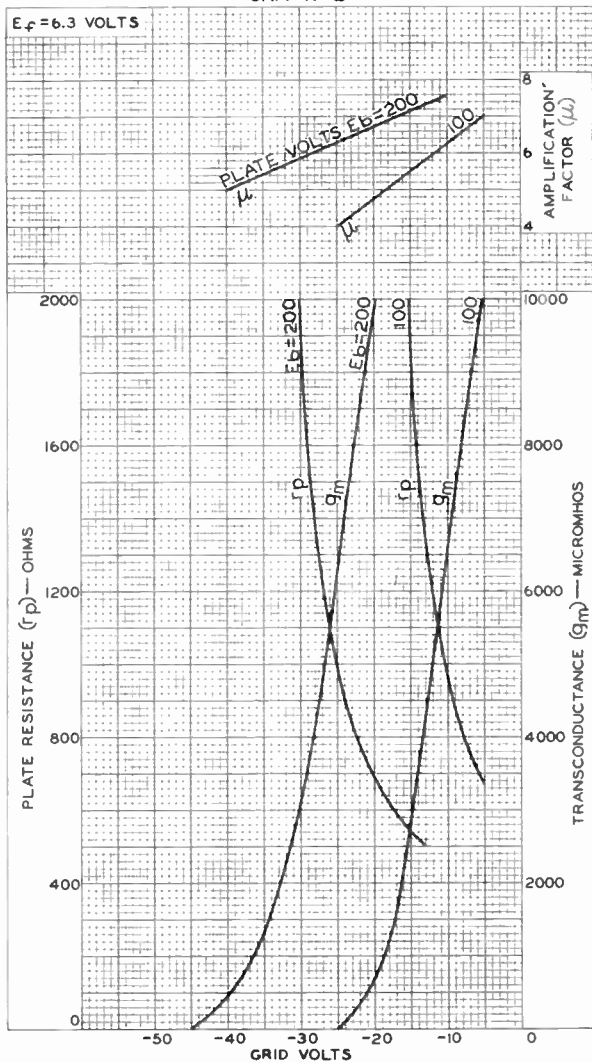
AVERAGE PLATE CHARACTERISTICS  
UNIT No 2



6DR7



# 6DR7 AVERAGE CHARACTERISTICS UNIT No 2





6DS5

# BEAM POWER TUBE

7-PIN MINIATURE TYPE

6DS5

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	. . . . . ac or dc volts
Current . . . . .	0.8	. . . . . amp

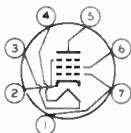
Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid No.1 to plate. . . . .	0.19	$\mu\mu\text{f}$
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	9.5	$\mu\mu\text{f}$
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	6.3	$\mu\mu\text{f}$

### 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 . . . . .	3/4"
Dimensional Outline . . . . .	See General Section
Bulb. . . . .	T5-1/2
Base. . . . .	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW. . . . .	7BZ

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



Pin 4 - Heater  
Pin 5 - Plate  
Pin 6 - Grid No.2  
Pin 7 - Grid No.1

## AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	250 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	250 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value . . . . .	0 max.	volts
GRID-No.2 INPUT . . . . .	2 max.	watts
PLATE DISSIPATION . . . . .	8 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	90 max.	volts
Heater positive with respect to cathode . . . . .	90 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface). . . . .	250 max.	$^{\circ}\text{C}$

### Typical Operation and Characteristics:

#### Fixed-Bias Operation

Plate Voltage . . . . .	200	250	volts
Grid-No.2 Voltage . . . . .	200	200	volts
Grid-No.1 Voltage . . . . .	-7.5	-8.5	volts
Peak AF Grid-No.1 Voltage . . . . .	7.5	8.5	volts

<sup>o</sup> without external shield.

6DS5



6DS5

## BEAM POWER TUBE

Zero-Signal Plate Current . . . . .	35	29	ma
Max.-Signal Plate Current . . . . .	36	32	ma
Zero-Signal Grid-No.2 Current . . . . .	3	3	ma
Max.-Signal Grid-No.2 Current . . . . .	9	10	ma
Plate Resistance (Approx.) . . . . .	28000	28000	ohms
Transconductance . . . . .	6000	5800	$\mu$ mhos
Load Resistance . . . . .	6000	8000	ohms
Total Harmonic Distortion . . . . .	9	10	%
Max.-Signal Power Output . . . . .	3	3.8	watts

*Cathode-Bias Operation*

Plate-Supply Voltage . . . . .	200	250	volts
Grid-No.2 Supply Voltage . . . . .	200	200	volts
Cathode Resistor . . . . .	180	270	ohms
Peak AF Grid-No.1 Voltage . . . . .	7.5	9.2	volts
Zero-Signal Plate Current . . . . .	34.5	27	ma
Max.-Signal Plate Current . . . . .	32.5	25	ma
Zero-Signal Grid-No.2 Current . . . . .	3.5	3	ma
Max.-Signal Grid-No.2 Current . . . . .	9	9	ma
Plate Resistance (Approx.) . . . . .	28000	28000	ohms
Transconductance . . . . .	6000	5800	$\mu$ mhos
Load Resistance . . . . .	6000	8000	ohms
Total Harmonic Distortion . . . . .	10	10	%
Max.-Signal Power Output . . . . .	2.8	3.6	watts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	1.0 max.	megohm

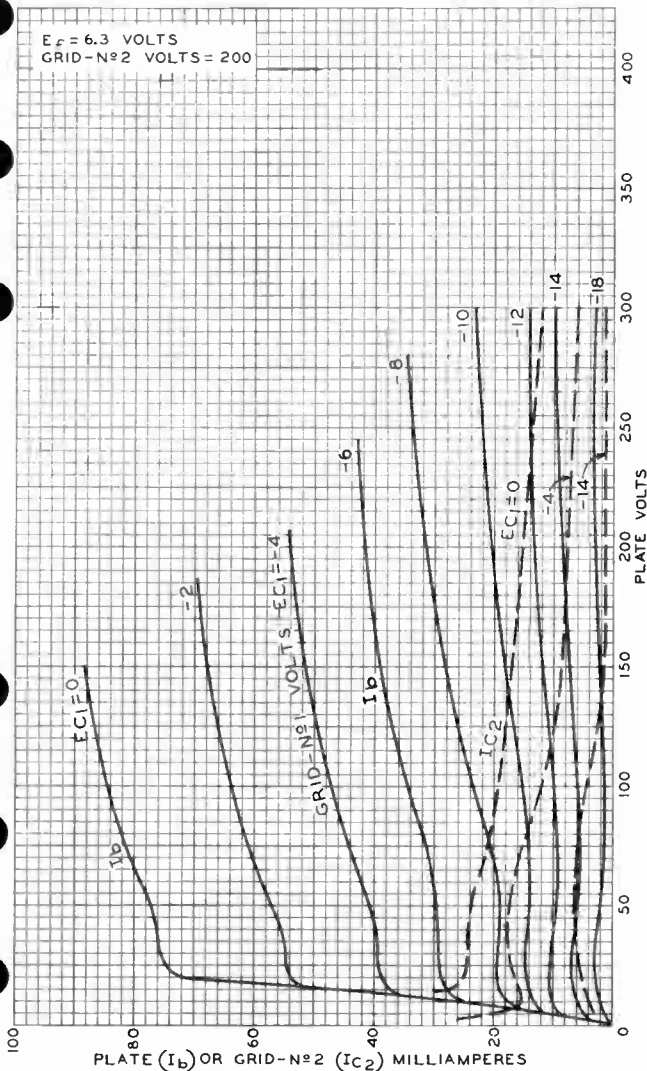




6DS5

6DS5

### AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

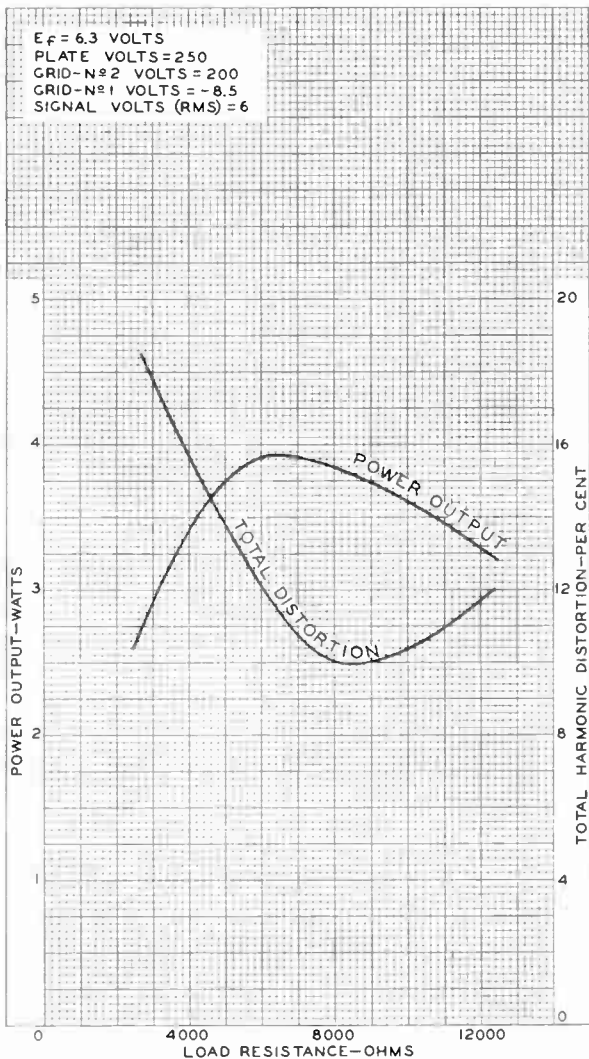
92CM-9292

6DS5



6DS5

## OPERATION CHARACTERISTICS





6DT5

BEAM POWER TUBE

9-PIN MINIATURE TYPE

6DT5

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3 ± 10%	volts
Current . . . . .	1.2	amp

Direct Interelectrode Capacitances

(Approx.):<sup>o</sup>

Grid No.1 to plate . . . . .	0.57	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	12.5	μμf
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	4.9	μμf

Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	60	80	250	volts
Grid-No.2 Voltage . . . . .	150	250	250	volts
Grid-No.1 Voltage . . . . .	0	0	-16.5	volts
Transconductance . . . . .	-	-	6200	μmhos
Plate Current . . . . .	95	195	44	ma
Grid-No.2 Current . . . . .	8.5	19	1.5	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 100 . . . . .	-	-	-35	volts

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"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9HN

- Pin 1-Grid No.2
- Pin 2-No Connection
- Pin 3-Grid No.1
- Pin 4-Heater
- Pin 5-Heater
- Pin 6-Grid No.1



- Pin 7-Cathode, Grid No.3
- Pin 8-Internal Connection—Do Not Use
- Pin 9-Plate

VERTICAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	315 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE <sup>#</sup> . . . . .	2200 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	285 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE . . . . .	250 max.	volts

6DT5



6DT5

## BEAM POWER TUBE

## CATHODE CURRENT:

Peak . . . . .	190	max.	ma
Average . . . . .	55	max.	ma
GRID-No. 2 INPUT . . . . .	2	max.	watts
PLATE DISSIPATION . . . . .	9	max.	watts

## PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . .	200	max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup>	max.	volts

## Maximum Circuit Values:

## Grid-No. 1-Circuit Resistance:

For fixed-bias operation. . . . .	0.5	max.	megohm
For cathode-bias operation. . . . .	1	max.	megohm

○ Without external shield.

\* This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

□ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

# This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

▲ The dc component must not exceed 100 volts.



6DT6

# SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

For FM detector service

6DT6

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC) . . . . .	6.3 ± 10%	volts
Current . . . . .	0.3	amp
Direct Interelectrode Capacitances (Approx.): <sup>0</sup>		
Grid No.1 to plate. . . . .	0.02	μf
Grid No.1 to cathode & internal shield, grid No.3, grid No.2, and heater. . . . .	5.8	μf
Grid No.3 to plate. . . . .	1.4	μf
Grid No.1 to grid No.3. . . . .	0.1	μf
Grid No.3 to cathode & internal shield, plate, grid No.2, grid No.1, and heater. . . . .	6.1	μf

### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Supply Voltage. . . . .	150	volts
Grid-No.3 Supply Voltage. . . . .	0	volts
Grid-No.2 Supply Voltage. . . . .	100	volts
Cathode Resistor. . . . .	560	ohms
Plate Resistance (Approx.). . . . .	0.15	megohm
Transconductance, Grid No.1 to Plate. . . . .	800	μmhos
Transconductance, Grid No.3 to Plate. . . . .	515	μmhos
Plate Current . . . . .	1.1	ma
Grid-No.2 Current . . . . .	2.1	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10 . . . . .	-4.5	volts
Grid-No.3 Voltage (Approx.) for plate μa = 10 . . . . .	-3.5	volts

### Mechanical:

Operating Position. . . . .	Any
Maximum Overall Length. . . . .	2-1/8"
Maximum Seated Length. . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-1/2" ± 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. . . . .	7EN

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



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

← Indicates a change.

6DT6



6DT6

## SHARP-CUTOFF PENTODE

## FM DETECTOR SERVICE

→ **Maximum Ratings, Design-Maximum Values:**

PLATE VOLTAGE. . . . .	330 max.	volts
GRID-No. 3 (SUPPRESSOR-GRID) VOLTAGE. . . . .	28 max.	volts
GRID-No. 2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	330 max.	volts
GRID-No. 2 VOLTAGE. . . . .	<i>See Grid-No. 2 Input Rating Chart at front of Receiving Tube Section</i>	
GRID-No. 1 (CONTROL-GRID) VOLTAGE:		
Positive-bias value. . . . .	0 max.	volts
GRID-No. 2 INPUT:		
For grid-No. 2 voltages up to 165 volts . . . . .	1.1	watts
For grid-No. 2 voltages between 165 and 330 volts. . . . .	<i>See Grid-No. 2 Input Rating Chart at front of Receiving Tube Section</i>	
PLATE DISSIPATION. . . . .	1.7 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	200 max.	volts
Heater positive with respect to cathode. . . . .	200 <sup>▲</sup> max.	volts

**Maximum Circuit Values:**

## Grid-No. 1-Circuit Resistance:

For fixed-bias operation . . . . .	0.25 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

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

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

→ Indicates a change.



6DT6

6DT6

### AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID-N<sup>o</sup> 3 VOLTS = 0  
GRID-N<sup>o</sup> 2 VOLTS = 100

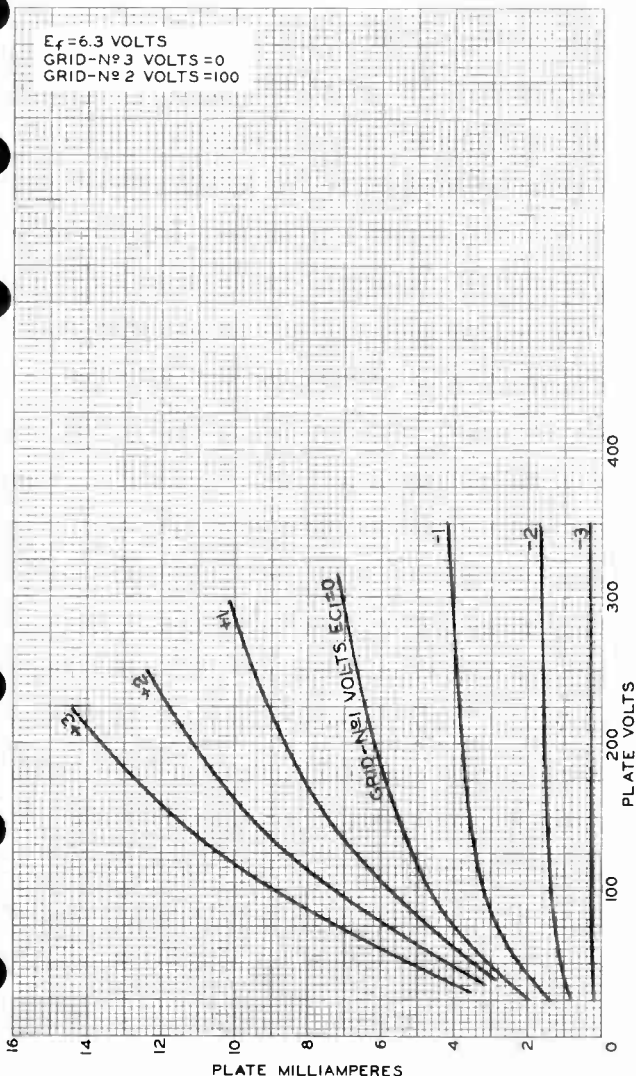


PLATE MILLIAMPERES

PLATE VOLTS

TUBE DIVISION

92CM-8827

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

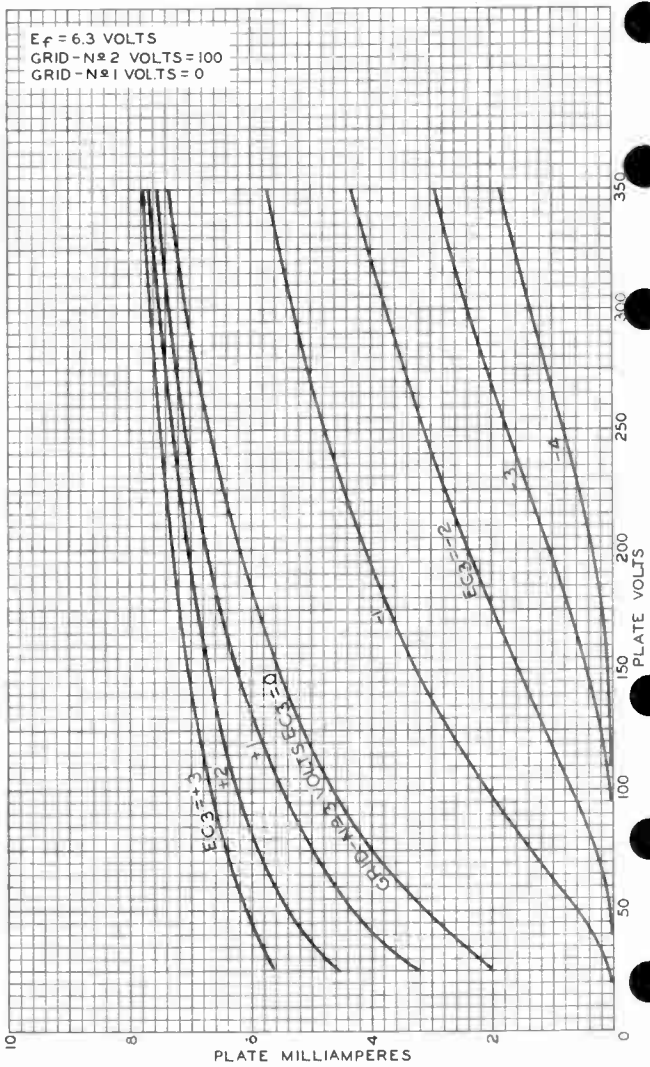
6DT6



6DT6

# AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID - N<sup>o</sup> 2 VOLTS = 100  
GRID - N<sup>o</sup> 1 VOLTS = 0



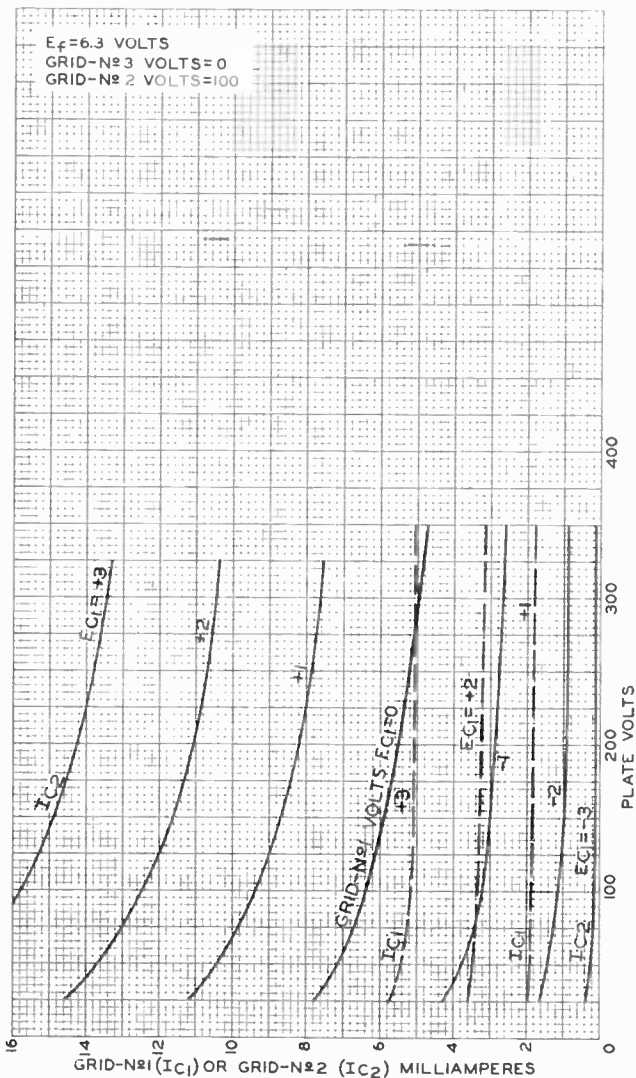




6DT6

6DT6

### AVERAGE CHARACTERISTICS



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8828

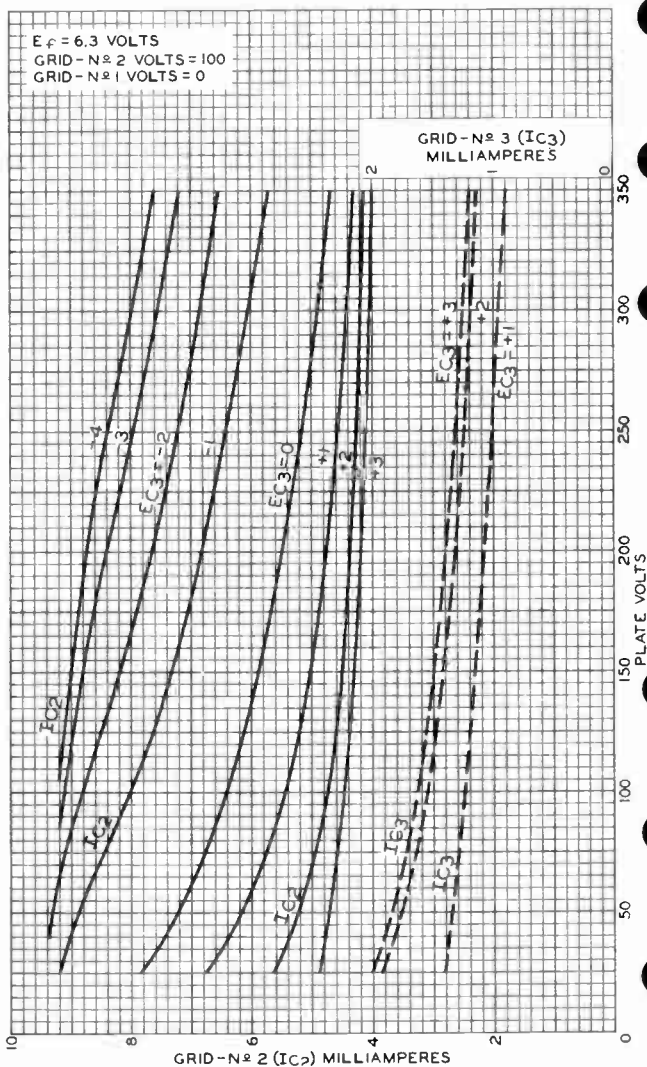
World Radio History

6DT6



6DT6

## AVERAGE CHARACTERISTICS



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

92CM-8829

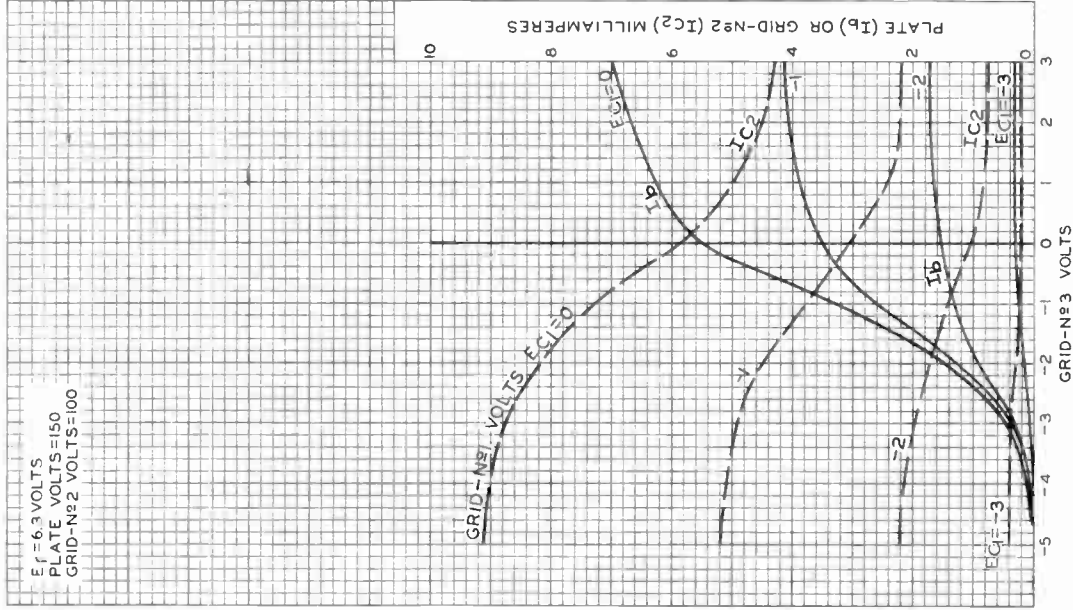


6DT6

6DT6

### AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
PLATE VOLTS = 150  
GRID-N<sub>2</sub> VOLTS = 100

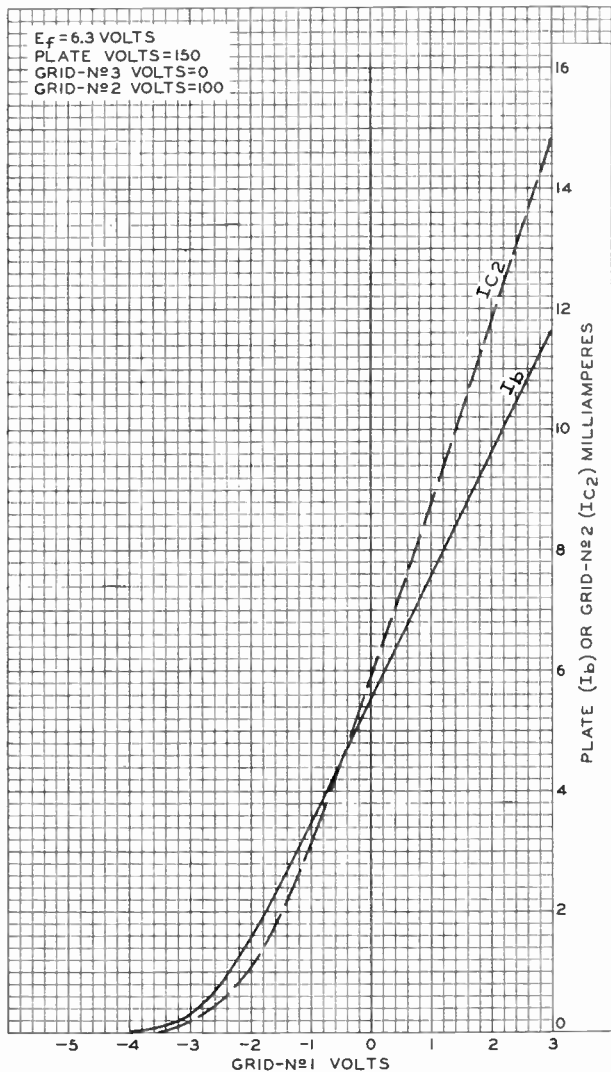


6DT6



6DT6

## AVERAGE CHARACTERISTICS



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

92CM-8825



6DT8

6DT8

# HIGH-MU TWIN TRIODE

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

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

Direct Interelectrode Capacitances (Approx.):

	Unit No. 1	Unit No. 2	
<i>Grid-Drive Operation:</i> <sup>o</sup>			
Grid to plate . . . . .	1.0	1.6	$\mu\text{mf}$
Grid to cathode, internal shield, and heater. . . .	2.7	2.7	$\mu\text{mf}$
Plate to cathode, internal shield, and heater. . . .	1.6	1.6	$\mu\text{mf}$
Heater to cathode <sup>•</sup> . . . .	3	3	$\mu\text{mf}$
<i>Cathode-Drive Operation:</i> <sup>o</sup>			
Cathode to grid, internal shield, and heater. . . .	-	5.3	$\mu\text{mf}$
Plate to grid, internal shield, and heater. . . .	-	2.8	$\mu\text{mf}$

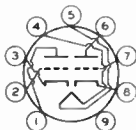
### Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):

Plate-Supply Voltage. . . . .	100	250	volts
Cathode Resistor. . . . .	270	200	ohms
Amplification Factor. . . . .	60	60	
Plate Resistance (Approx.). . . .	15000	10900	ohms
Transconductance. . . . .	4000	5500	$\mu\text{mhos}$
Plate Current . . . . .	3.7	10	ma
Grid Voltage (Approx.) for plate current of 10 $\mu\text{a}$ . . . .	-5	-12	volts

### Mechanical:

Operating Position. . . . .	Any
Maximum Overall Length. . . . .	2-3/16"
Maximum Seated Length. . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tin). . . . .	1-9/16" $\pm$ 3/32"
Maximum Diameter. . . . .	7/8"
Dimensional Outline . . . . .	See General Section
Bulb. . . . .	T6-1/2
Base. . . . .	Small-Button Noval 9-Pin (JETEC No. E9-1)
Basino Designation for BOTTOM VIEW. . . . .	9AJ

Pin 1 - Plate of Unit No. 2	Pin 6 - Plate of Unit No. 1
Pin 2 - Grid of Unit No. 2	Pin 7 - Grid of Unit No. 1
Pin 3 - Cathode of Unit No. 2	Pin 8 - Cathode of Unit No. 1
Pin 4 - Heater	Pin 9 - Internal Shield
Pin 5 - Heater	



<sup>o</sup> With external shield JETEC NO. 315 connected to cathode of unit under test except as noted.

<sup>•</sup>, <sup>o</sup>: See next page.

6DT8



6DT8

# HIGH-MU TWIN TRIODE

## AMPLIFIER — Class A<sub>1</sub>

Values are for Each Unit

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300	max.	volts
GRID VOLTAGE:			
Negative bias value . . . . .	50	max.	volts
PLATE DISSIPATION . . . . .	2.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup>	max.	volts

### Maximum Circuit Values:

Grid-Circuit Resistance:			
For fixed-bias operation. . . . .	0.25	max.	megohm
For cathode-bias operation. . . . .	1	max.	megohm

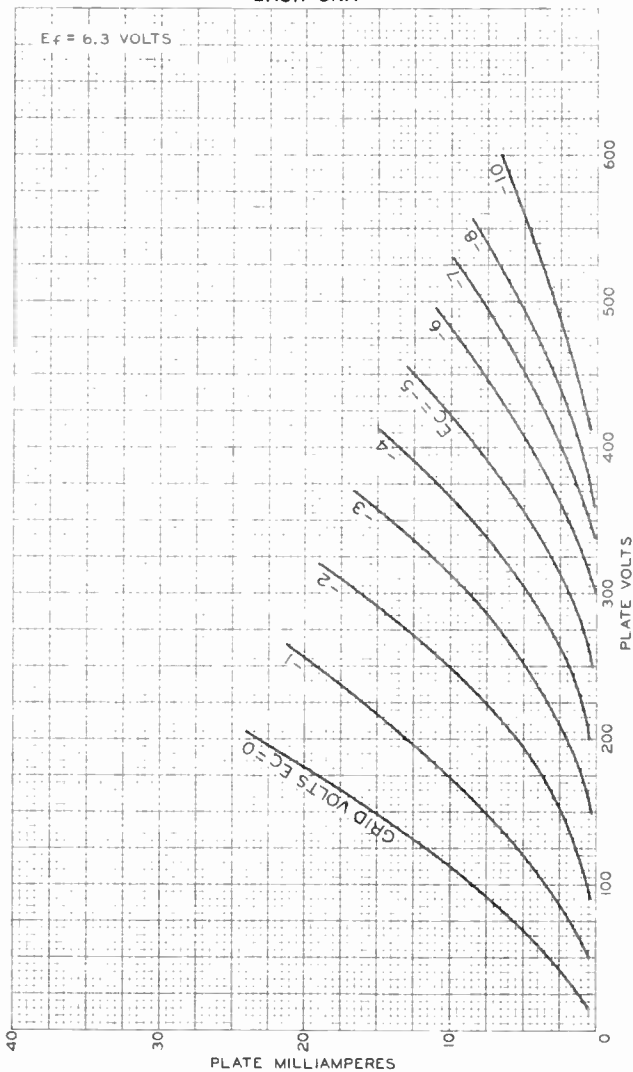
- With external shield JETEC No.315 connected to ground.
- With external shield JETEC No.315 connected to grid of unit under test.
- ▲ The dc component must not exceed 100 volts.



6DT8

# AVERAGE PLATE CHARACTERISTICS EACH UNIT

6DT8



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

World Radio History

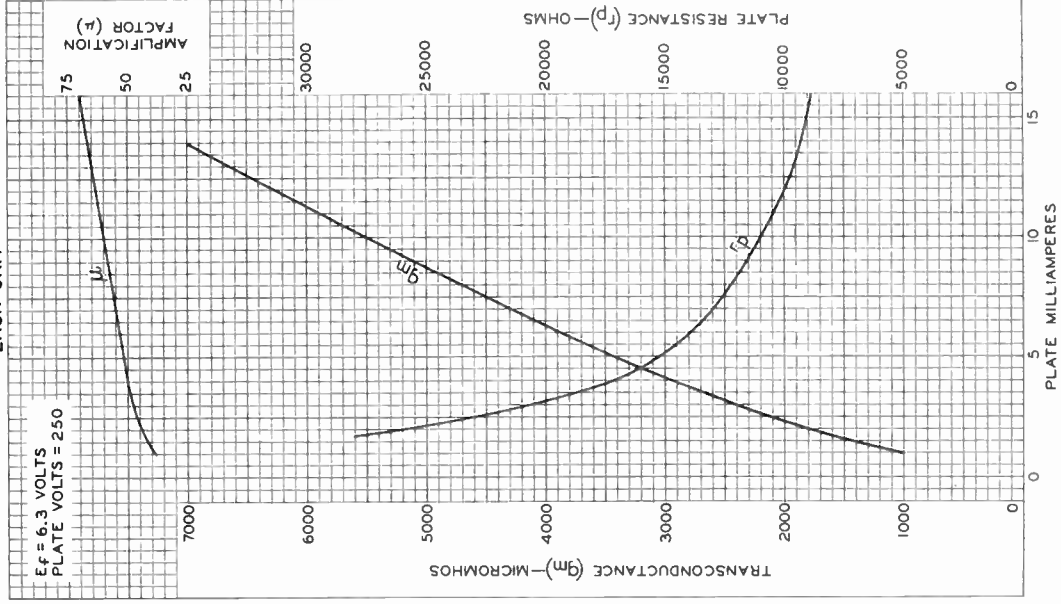
92CM-9397

6DT8



6DT8

# AVERAGE CHARACTERISTICS EACH UNIT







6E5

6E5

**ELECTRON-RAY TUBE**

INDICATOR TYPE WITH TRIODE UNIT

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Overall Length		4" ± 3/16" ←
Seated Height		3-3/8" ± 3/16" ←
Maximum Diameter		1-3/16" ←
Bulb		T-9
Base		Small 6-Pin
Pin 1 - Heater		Pin 4 - Target
Pin 2 - Plate		Pin 5 - Cathode
Pin 3 - Grid		Pin 6 - Heater
Mounting Position	BOTTOM VIEW (6R)	Any* ←



Maximum and Minimum Ratings Are Design-Center Values

INDICATOR SERVICE

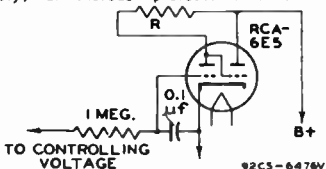
Plate-Supply Voltage		250 max. volts	
Target Voltage		250 max. volts ←	
		125 min. volts ←	
D-C Heater-Cathode Potential		90 max. volts ←	
Typical Operation:			
Plate and Target Supply	125	250	volts ←
Series Triode-Plate Resistor**	1	1	megohm ←
Target Current*** †	0.8	2	ma. ←
Triode-Plate Current***	0.1	0.2	ma. ←
Triode-Grid Voltage (Approx.):			
For shadow angle of 0°	-4.0	-7.5	volts ←
For shadow angle of 90°	0	0	volts ←

\* The plane of the ray-control electrode passes through pins No. 2 and No. 5.

\*\* Designated as R in circuit diagram. † Subject to wide variations.

\*\*\* For zero triode-grid voltage. ← Indicates a change.

The 6E5 is a high-vacuum type of tube designed to indicate visually the effect of change in the controlling voltage. For different controlling voltages, the shaded pattern produced on the fluorescent target varies through an angle from 90° to approximately 0°. The extent of the shaded area is controlled by the voltage on the ray-control electrode which is an extension of the triode plate between cathode and target. The voltage on the ray-control electrode is determined by the voltage applied to the grid of the triode connected as a d-c amplifier as shown in the circuit. A decrease in triode-grid bias decreases the voltage on the ray-control electrode; conversely, an increase produces an increased voltage on the ray-control electrode. In the practical use of the 6E5 as a tuning indicator, controlling voltage applied to the triode-grid is obtained from a suitable point in the a.v.c. circuit.



The license extended to the purchaser of tubes appears in the license Notice accompanying them. Information contained herein is furnished without assuming any obligations. ← Indicates a change.

DEC. 15, 1944

RCA VICTOR DIVISION

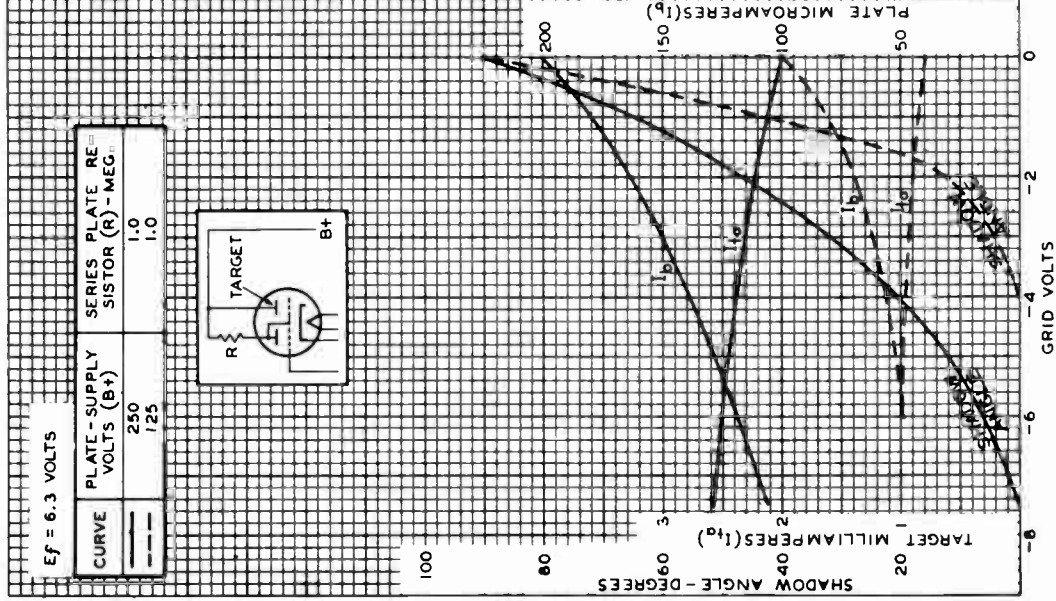
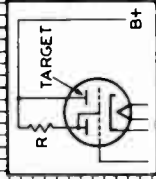
DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

## AVERAGE CONTROL CHARACTERISTICS

 $E_f = 6.3$  VOLTS

CURVE	PLATE - SUPPLY VOLTS ( $B+$ )	SERIES RESISTOR (R) - MEG. $\Omega$	PLATE RE- SISTOR (R) - MEG. $\Omega$
—	250	1.0	1.0
- - -	125	1.0	1.0





6EA8

6EA8

# MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3 . . . . .	ac or dc volts
Current . . . . .	0.45 ± 6% . . . . .	amp
Warm-up time (Average) . . . . .	11 . . . . .	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield <sup>o</sup>	
<i>Triode Unit:</i>			
Grid to plate . . . . .	1.7	1.7	μf
Grid to cathode and heater . . . . .	3	3.2	μf
Plate to cathode and heater . . . . .	0.3	1.1	μf
<i>Pentode Unit:</i>			
Grid No.1 to plate . . . . .	0.02 max.	0.01 max.	μf
Grid No.1 to cathode & grid No.3 & internal shield, grid-No.2, and heater . . . . .	5	5	μf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater . . . . .	2.6	3.4	μf
Heater to cathode . . . . .	3	3 <sup>o</sup>	μf

Characteristics, Class A<sub>1</sub> Amplifier:

	Triode Unit	Pentode Unit	
Plate-Supply Voltage . . . . .	150	125	volts
Grid-No.2 Voltage . . . . .	—	125	volts
Grid-No.1 Voltage . . . . .	—	-1	volt
Cathode Resistor . . . . .	56	—	ohms
Amplification Factor . . . . .	40	—	
Plate Resistance (Approx.) . . . . .	5000	8000	ohms
Transconductance . . . . .	8500	6400	μmhos
Plate Current . . . . .	18	12	ma
Grid-No.2 Current . . . . .	—	4	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10 . . . . .	-12	-9	volts

### Mechanical:

Operating Position . . . . . Any

<sup>o</sup>, <sup>•</sup>: See next page.

6EA8



6EA8

## MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

Maximum Overall Length . . . . . 2-3/16"  
 Maximum Seated Length . . . . . 1-15/16"  
 Length, Base Seat to Bulb Top (Excluding tip) . . . 1-9/16" ± 3/32"  
 Diameter . . . . . 0.750" to 0.875"  
 Dimensional Outline . . . . . See General Section  
 Bulb . . . . . T6-1/2  
 Base . . . . . Small-Button Noval 9-Pin (JEDEC No. E9-1)  
 Basing Designation for BOTTOM VIEW . . . . . 9AE

Pin 1—Triode Plate  
 Pin 2—Pentode  
           Grid No. 1  
 Pin 3—Pentode  
           Grid No. 2  
 Pin 4—Heater  
 Pin 5—Heater  
 Pin 6—Pentode Plate



Pin 7—Pentode  
           Cathode,  
           Pentode  
           Grid No. 3,  
           Internal  
           Shield  
 Pin 8—Triode Cathode  
 Pin 9—Triode Grid

### CONVERTER SERVICE

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

	Triode Unit as Osc.	Pentode Unit as Mixer	
PLATE VOLTAGE . . . . .	330 max.	330 max.	volts
GRID-No. 2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	—	330 max.	volts
GRID-No. 2 VOLTAGE . . . . .	—	See Grid-No. 2 Input	
<i>Rating Chart at front of Receiving Tube Section</i>			
GRID-No. 1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value . . . . .	0 max.	0 max.	volts
GRID-No. 2 INPUT:			
For grid-No. 2 voltages up to 165 volts . . . . .	—	0.55 max.	watt
For grid-No. 2 voltages between 165 and 330 volts . . . . .	—	See Grid-No. 2 Input	
<i>Rating Chart at front of Receiving Tube Section</i>			
PLATE DISSIPATION . . . . .	3 max.	3.1 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200 max.	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	200 <sup>▲</sup> max.	volts

○ with external shield JEDEC No. 315 connected to cathode of unit under test except as noted.

● with external shield JEDEC No. 315 connected to ground.

▲ The dc component must not exceed 100 volts.

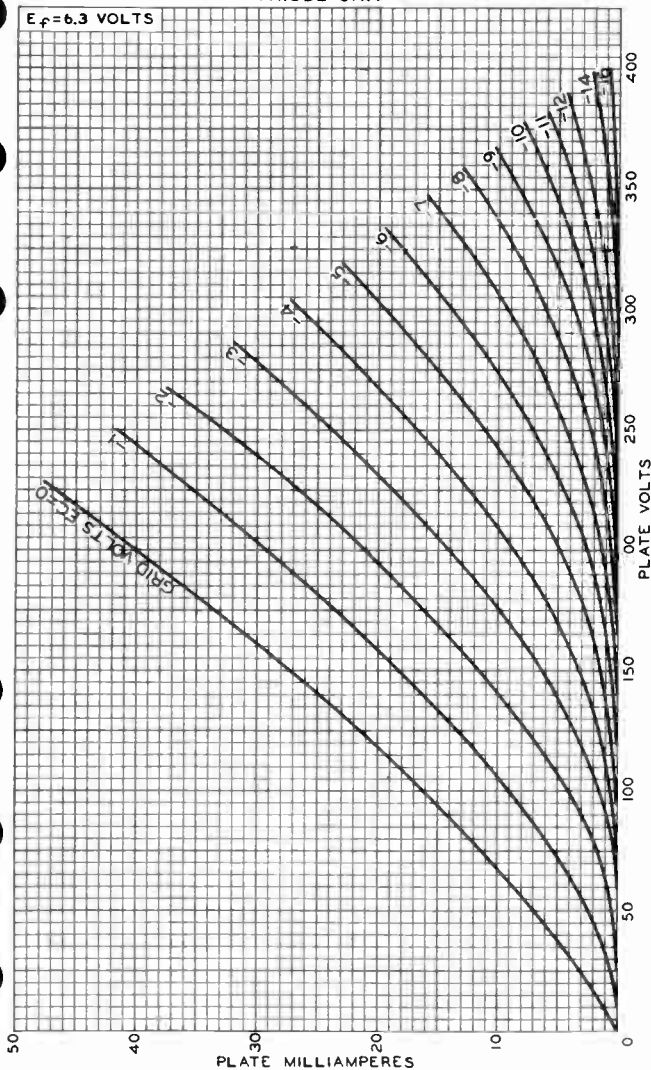


6EA8

# AVERAGE PLATE CHARACTERISTICS TRIODE UNIT

6EA8

$E_f = 6.3$  VOLTS



ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

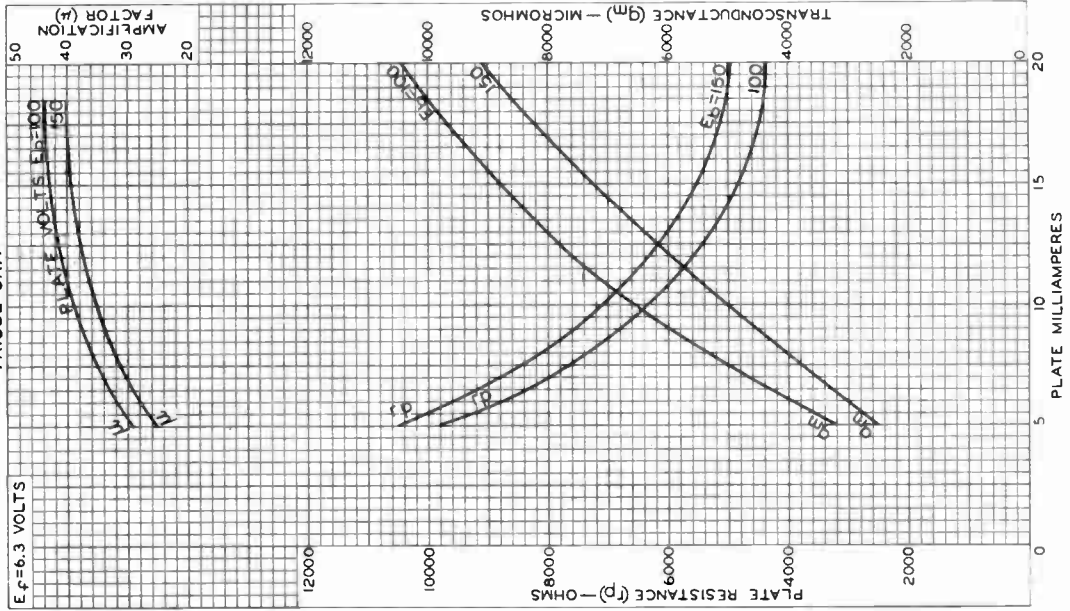
92CM-9866

6EA8



6EA8

# AVERAGE CHARACTERISTICS TRIODE UNIT

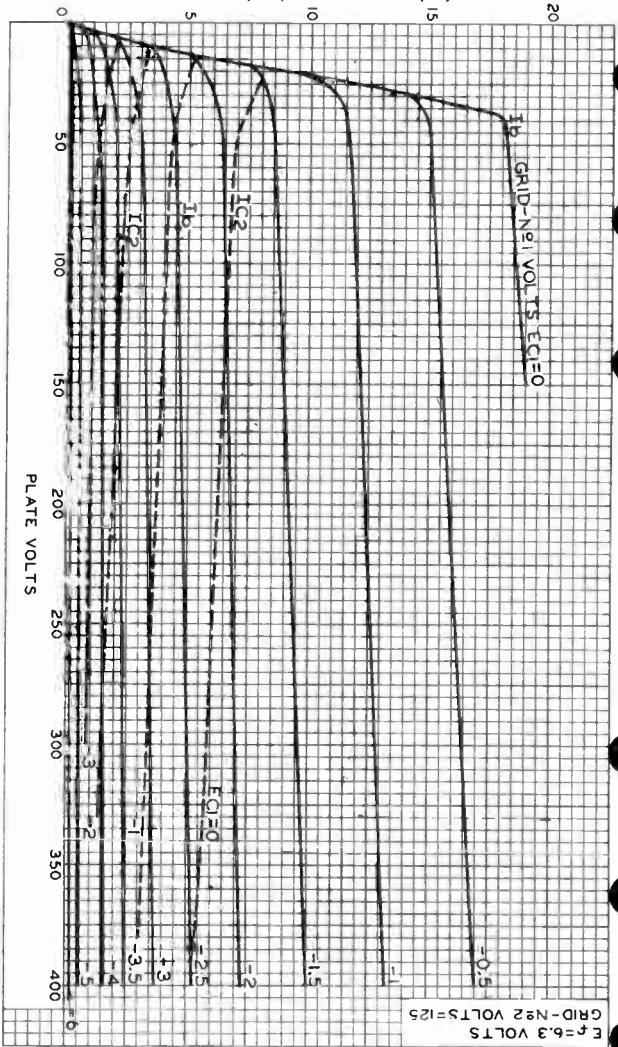


6E A8



World Radio History

AVERAGE CHARACTERISTICS  
PENTODE UNIT



$E_f = 6.3$  VOLTS  
GRID-No 2 VOLTS=125

PLATE VOLTS

PLATE ( $I_b$ ) OR GRID-No 2 ( $I_{c2}$ ) MILLIAMPERES

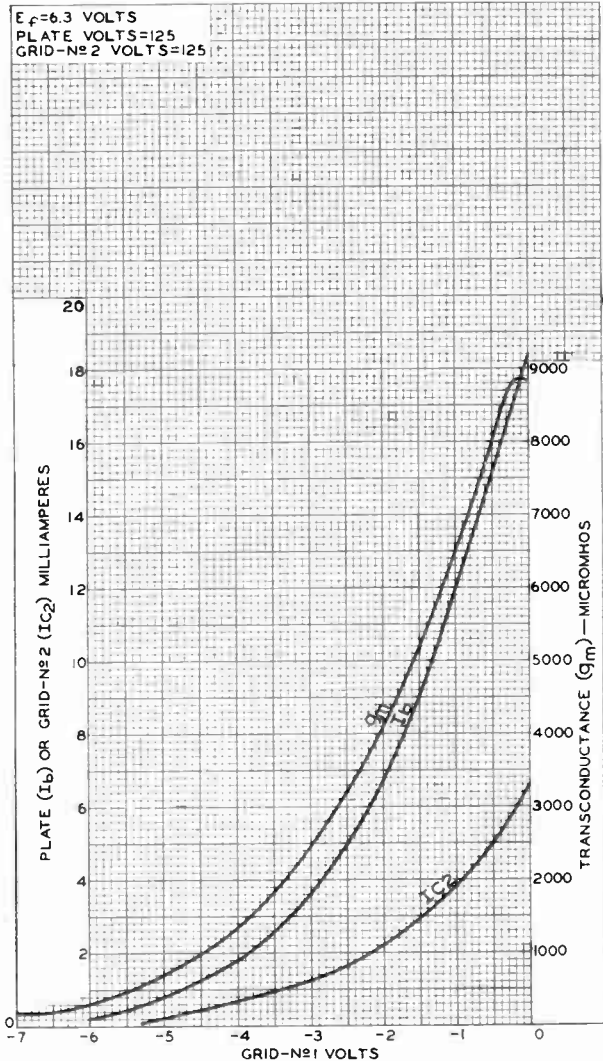
6E A8

6EA8



6EA8

### AVERAGE CHARACTERISTICS PENTODE UNIT



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9868





6EB8

6EB8

# HIGH-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage. . . . . 6.3 ± 10% . . . . ac or dc volts

Current. . . . . 0.75 . . . . . amp

Direct Interplate Triode Capacitance:<sup>0</sup>

#### Triode Unit:

Grid to plate. . . . . 4.4 μμf

Grid to cathode and heater . . . . . 2.4 μμf

Plate to cathode and heater. . . . . 0.36 μμf

#### Pentode Unit:

Grid No.1 to plate . . . . . 0.1 max. μμf

Grid No.1 to cathode &  
internal shield & grid  
No.3, grid No.2, and  
heater . . . . . 11 μμf

Plate to cathode & internal  
shield & grid No.3, grid  
No.2, and heater . . . . . 4.2 μμf

Triode grid to pentode plate . . . . . 0.018 max. μμf

Pentode grid No.1 to triode plate. . . . . 0.005 max. μμf

Pentode plate to triode plate. . . . . 0.17 max. μμf

### Characteristics, Class A<sub>1</sub> Amplifier:

	Triode Unit	Pentode Unit	
Plate-Supply Voltage . . . . .	250	45 200	volts
Grid-No.2 Supply Voltage . . . . .	-	125 125	volts
Grid-No.1 Voltage. . . . .	-2	0 -	volts
Cathode Resistor . . . . .	-	- 68	ohms
Amplification Factor . . . . .	100	- -	
Plate Resistance (Approx.) . . . . .	37000	- 75000	ohms
Transconductance . . . . .	2700	- 12500	μmhos
Plate Current. . . . .	2	40* 25	ma
Grid-No.2 Current. . . . .	-	15* 7	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100 . . . . .	-	- -9	volts
Grid Voltage (Approx.) for plate μa = 20. . . . .	-5	- -	volts

### 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"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2

6EB8



6EB8

## HIGH-MU TRIODE— SHARP-CUTOFF PENTODE

Base . . . . . Small-Button Noval 9-Pin (JEDEC No. E9-1)  
 Basing Designation for BOTTOM VIEW . . . . . 9DX

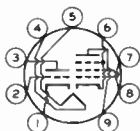
Pin 1 - Triode  
 Cathode

Pin 2 - Triode  
 Grid

Pin 3 - Triode  
 Plate

Pin 4 - Heater

Pin 5 - Heater



Pin 6 - Pentode  
 Cathode,  
 Grid No. 3,  
 Internal  
 Shield

Pin 7 - Pentode  
 Grid No. 1

Pin 8 - Pentode  
 Grid No. 2

Pin 9 - Pentode  
 Plate

### AMPLIFIER — Class A<sub>1</sub>

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

*Triode Unit Pentode Unit*

PLATE VOLTAGE . . . . . 330 max. 330 max. volts

GRID-NO. 2 (SCREEN-GRID)

SUPPLY VOLTAGE . . . . . - 330 max. volts

GRID-NO. 2 VOLTAGE . . . . . - See Grid-No. 2 Input

*Rating Chart at front of Receiving Tube Section*

GRID-NO. 1 (CONTROL-GRID)

VOLTAGE:

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

PLATE DISSIPATION . . . . . 1 max. 5 max. watts

GRID-NO. 2 INPUT:

For grid-No. 2 voltages

up to 165 volts . . . . . - 1.1 max. watts

For grid-No. 2 voltages

between 165 and 330

volts . . . . . - See Grid-No. 2 Input

*Rating Chart at front of Receiving Tube Section*

PEAK HEATER-CATHODE

VOLTAGE:

Heater negative with

respect to cathode. . . 200 max. 200 max. volts

Heater positive with

respect to cathode. . . 200<sup>▲</sup> max. 200<sup>▲</sup> max. volts

#### Maximum Circuit Values:

*Triode Unit Pentode Unit*

Grid-No. 1-Circuit

Resistance:

For fixed-bias operation. 0.5 max. 0.25 max. megohm

For cathode-bias

operation . . . . . 1 max. 1 max. megohm



6EB8

6EB8

# HIGH-MU TRIODE— SHARP-CUTOFF PENTODE

- Without external shield.
- This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.
- ▲ The dc component must not exceed 100 volts.

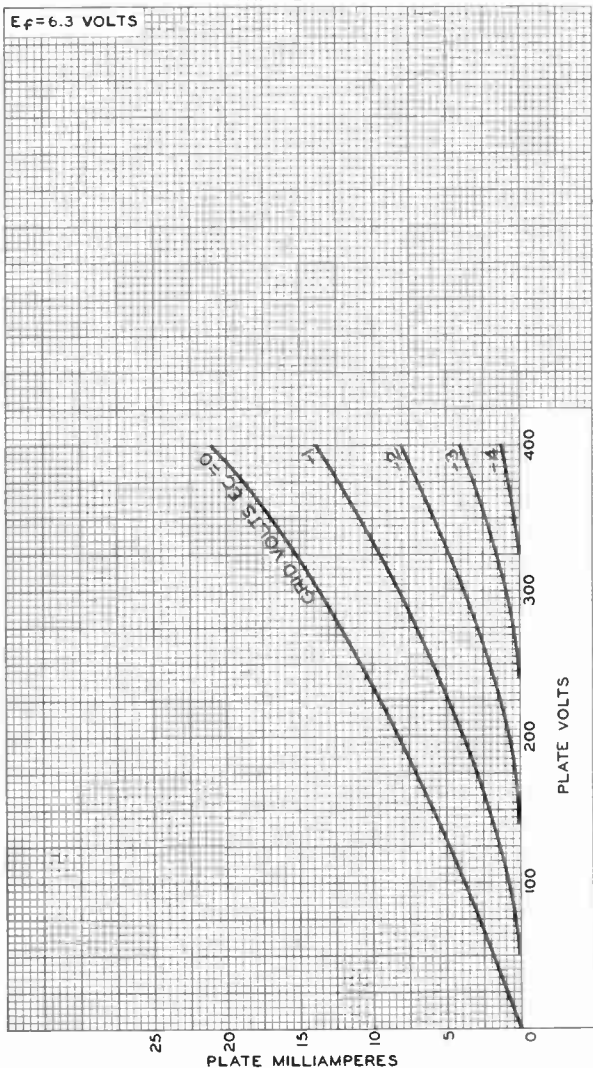
6EB8



6EB8

# AVERAGE PLATE CHARACTERISTICS TRIODE UNIT

$E_f = 6.3$  VOLTS

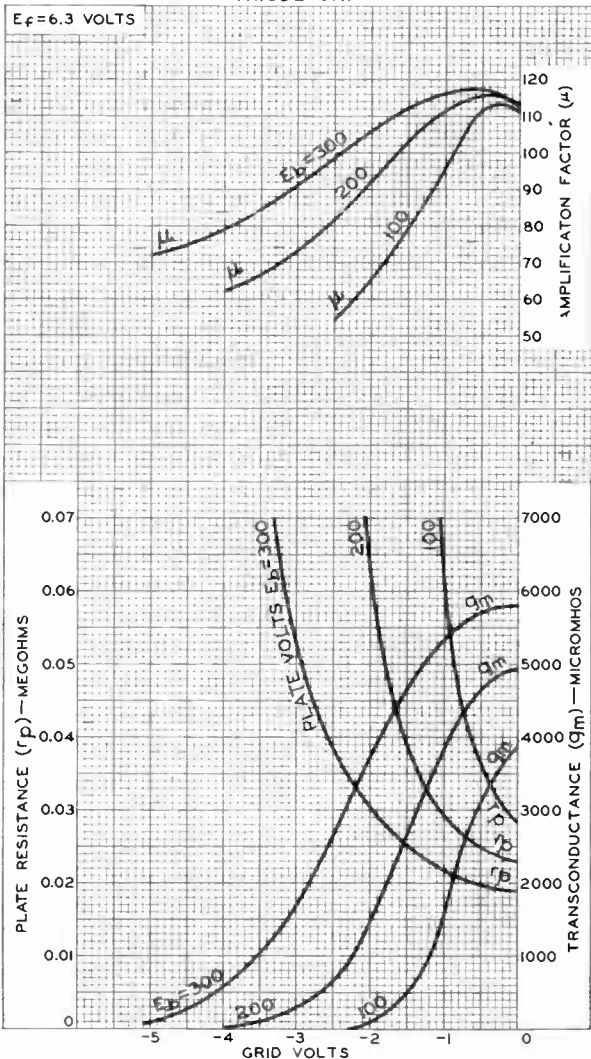




6EB8

6EB8

### AVERAGE CHARACTERISTICS TRIODE UNIT



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

92CM-9908

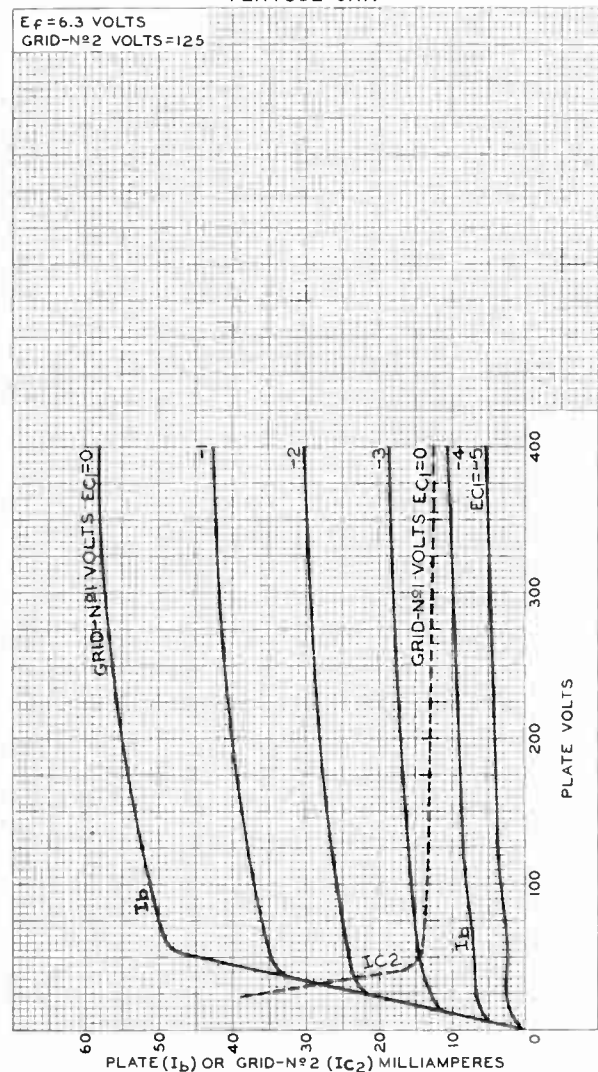
6EB8



6EB8

# AVERAGE CHARACTERISTICS PENTODE UNIT

$E_f = 6.3$  VOLTS  
GRID-Nº2 VOLTS = 125



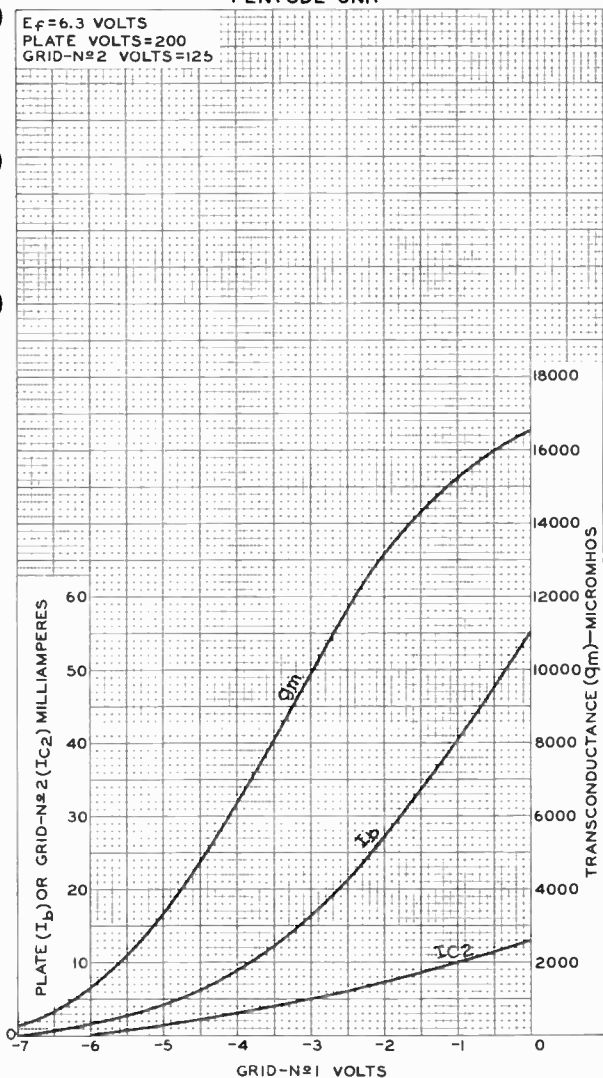


6EB8

6EB8

### AVERAGE CHARACTERISTICS PENTODE UNIT

$E_f = 6.3$  VOLTS  
PLATE VOLTS = 200  
GRID-N<sup>o</sup>2 VOLTS = 125



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9905

World Radio History







6EH5

# 6EH5 POWER PENTODE

7-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage. . . . . 6.3 . . . . . ac or dc volts  
Current. . . . . 1.2 . . . . . amp

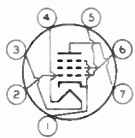
Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid No.1 to plate . . . . . 0.65  $\mu\mu\text{f}$   
Grid No.1 to cathode & grid No.3,  
grid No.2, and heater. . . . . 17  $\mu\mu\text{f}$   
Plate to cathode & grid No.3,  
grid No.2, and heater. . . . . 9  $\mu\mu\text{f}$

### 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"  $\pm$  3/32"  
Diameter . . . . . 0.650" to 0.750"  
Dimensional Outline. . . . . See General Section  
Bulb . . . . . T5-1/2  
Base . . . . . Small-Button Miniature 7-Pin (JETEC No.E7-1)  
Basing Designation for BOTTOM VIEW . . . . . 7CV

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



Pin 4 - Heater  
Pin 5 - Grid No.1  
Pin 6 - Grid No.2  
Pin 7 - Plate

## AMPLIFIER — Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . . 135 max. volts  
GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . . 117 max. volts  
GRID-No.1 (CONTROL-GRID) VOLTAGE:  
Positive-bias value. . . . . 0 max. volts  
GRID-No.2 INPUT. . . . . 1.75 max. watts  
PLATE DISSIPATION. . . . . 5 max. watts  
PEAK HEATER-CATHODE VOLTAGE:  
Heater negative with respect to cathode. 200 max. volts  
Heater positive with respect to cathode. 200<sup>▲</sup> max. volts  
BULB TEMPERATURE ( $\Delta t$  hottest point  
on bulb surface) . . . . . 220 max. °C

### Typical Operation and Characteristics:

Plate-Supply voltage . . . . . 110 volts  
Grid-No.2 Supply Voltage . . . . . 115 volts  
Cathode Resistor . . . . . 62 ohms  
Peak AF Grid-No.1 Voltage. . . . . 3 volts

<sup>o</sup>, <sup>▲</sup>: See next page.

6EH5



6EH5

## POWER PENTODE

Zero-Signal Plate Current. . . . .	42	ma
Max.-Signal Plate Current. . . . .	42	ma
Zero-Signal Grid-No.2 Current. . . . .	11.5	ma
Max.-Signal Grid-No.2 Current. . . . .	14.5	ma
Plate Resistance (Approx.) . . . . .	11000	ohms
Transconductance . . . . .	14600	μmhos
Load Resistance. . . . .	3000	ohms
Total Harmonic Distortion. . . . .	7	%
Max.-Signal Power Output . . . . .	1.4	watts

**Maximum Circuit Values:**

## Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

**PUSH-PULL AF POWER AMPLIFIER — Class AB<sub>1</sub>****Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE. . . . .	150 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . .	130 max.	volts
GRID-No.2 INPUT. . . . .	1.75 max.	watts
PLATE DISSIPATION. . . . .	5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup> max.	volts
BULB TEMPERATURE (At hottest point		
on bulb surface) . . . . .	220 max.	°C

**Typical Operation and Characteristics:***Values are for 2 tubes*

Plate-Supply Voltage . . . . .	140	volts
Grid-No.2 Supply Voltage . . . . .	120	volts
Cathode Resistor . . . . .	68	ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage . . . . .	9.4	volts
Zero-Signal Plate Current. . . . .	47	ma
Max.-Signal Plate Current. . . . .	51	ma
Zero-Signal Grid-No.2 Current. . . . .	11	ma
Max.-Signal Grid-No.2 Current. . . . .	17.7	ma
Effective Load Resistance (Plate		
to plate). . . . .	6000	ohms
Total Harmonic Distortion. . . . .	5	%
Max.-Signal Power Output . . . . .	3.8	watts

**Maximum Circuit Values:**

## Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

° without external shield.

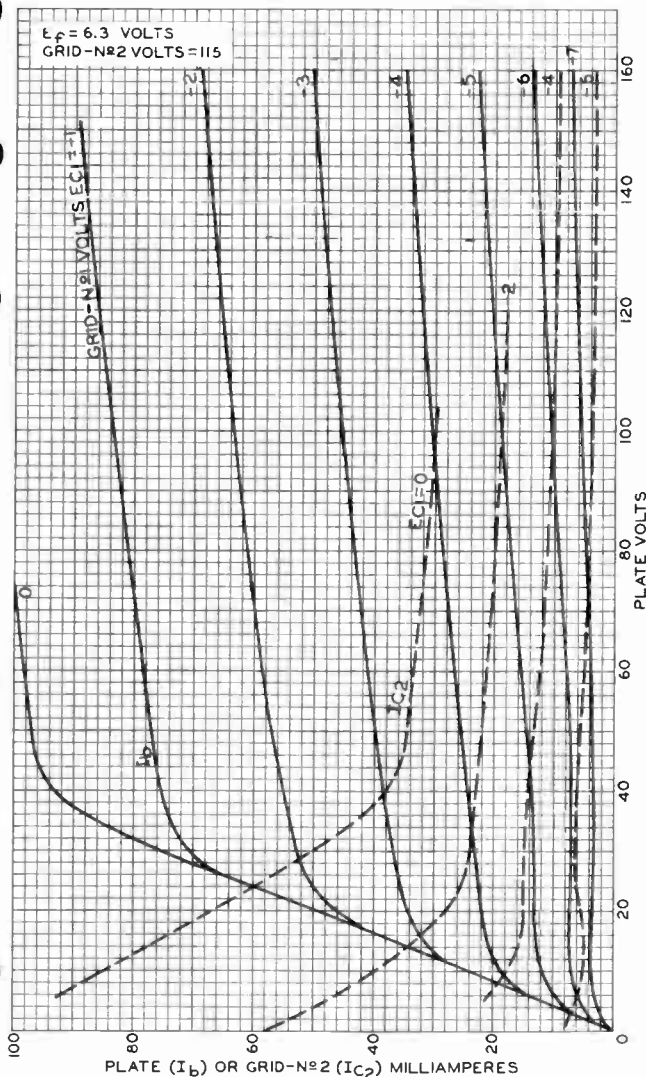
▲ The dc component must not exceed 100 volts.



6EH5

6EH5

### AVERAGE CHARACTERISTICS

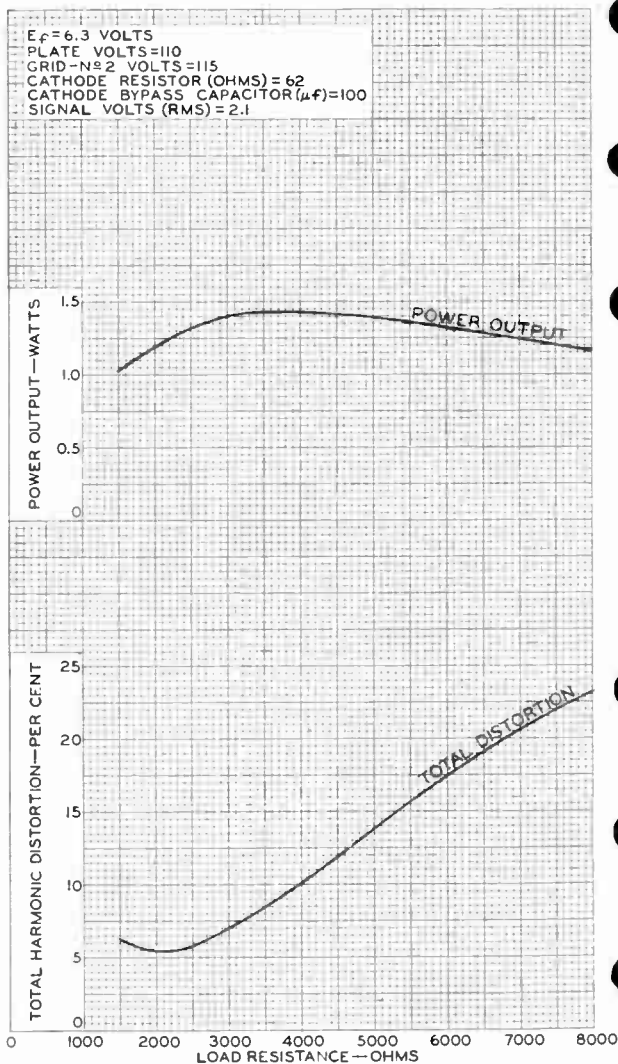


6EH5



6EH5

## OPERATION CHARACTERISTICS



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9626

World Radio History



6EH8

6EH8

# TRIODE-PENTODE CONVERTER

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3	volts
Current . . . . .	0.45 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield <sup>o</sup>	
<i>Triode Unit:</i>			
Grid to plate . . . . .	1.8	1.8	μf
Grid to cathode & pentode grid No.3 & internal shield, and heater. . . . .	2.8	2.8	μf
Plate to cathode & pentode grid No.3 & internal shield, and heater. . . . .	1.7	2.2	μf
<i>Pentode Unit:</i>			
Grid No.1 to plate. . . . .	0.02 max.	0.012 max.	μf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater. . . . .	4.8	4.8	μf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater . . . .	2.4	3.2	μf
Heater to cathode & pentode grid No.3 & internal shield . . . . .	8.5	8.5 <sup>o</sup>	μf

### Characteristics, Class A<sub>1</sub> Amplifier:

	Triode Unit	Pentode Unit	
Plate Voltage . . . . .	125	125	volts
Grid-No.2 Voltage . . . . .	-	125	volts
Grid-No.1 Voltage . . . . .	-1	-1	volt
Amplification Factor . . . . .	40	-	
Plate Resistance (Approx.) . . . . .	-	0.17	megohm
Transconductance. . . . .	7500	6000	μmhos
Plate Current . . . . .	13.5	12	ma
Grid-No.2 Current . . . . .	-	4	ma
Grid-No.1 Voltage (Approx.) for plate μ <sub>a</sub> = 20 . . . . .	-9	-10	volts

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"

6EH8



6EH8

## TRIODE-PENTODE CONVERTER

Maximum Seated Length. . . . . 1-15/16"  
 Length, Base Seat to Bulb Top (Excluding tip). 1-9/16"  $\pm$  3/32"  
 Diameter . . . . . 0.750" to 0.875"  
 Dimensional Outline. . . . . See General Section  
 Bulb . . . . . T6-1/2  
 Base . . . . . Small-Button Noval 9-Pin (JEDEC No. E9-1)  
 Basing Designation for BOTTOM VIEW . . . . . 9JG

Pin 1 - Cathode,  
 Pentode  
 Grid No. 3,  
 Internal  
 Shield  
 Pin 2 - Triode Grid  
 Pin 3 - Triode Plate  
 Pin 4 - Heater  
 Pin 5 - Heater



Pin 6 - Cathode,  
 Pentode  
 Grid No. 3,  
 Internal  
 Shield  
 Pin 7 - Pentode  
 Grid No. 1  
 Pin 8 - Pentode  
 Grid No. 2  
 Pin 9 - Pentode Plate

### CONVERTER SERVICE

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

	Triode Unit as Osc.	Pentode Unit as Mixer	
PLATE VOLTAGE. . . . .	300 max.	300 max.	volts
GRID-No. 2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	-	300 max.	volts
GRID-No. 2 VOLTAGE. . . . .	-	See Grid-No. 2 Input	
<i>Rating Chart at front of Receiving Tube Section</i>			
GRID-No. 1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value. . . . .	0 max.	0 max.	volts
GRID-No. 2 INPUT:			
For grid-No. 2 voltages up to 150 volts. . . . .	-	0.5 max.	watt
For grid-No. 2 voltages between 150 and 300 volts. . . . .	-	See Grid-No. 2 Input	
<i>Rating Chart at front of Receiving Tube Section</i>			
PLATE DISSIPATION. . . . .	2.5 max.	2.8 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200 max.	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	200 <sup>▲</sup> max.	volts



6EH8

6EH8

# TRIODE-PENTODE CONVERTER

## Maximum Circuit Values:

	<i>Triode</i>	<i>Pentode</i>	
	<i>Unit</i>	<i>Unit</i>	

Grid-No.1-Circuit Resistance:

For fixed-bias operation. . . . 0.5 max. 0.25 max. megohm

For cathode-bias operation. . . . 1 max. 1 max. megohm

○ with external shield JEDEC No.315 connected to cathode except as noted.

● with external shield JEDEC No.315 connected to ground.

▲ The dc component must not exceed 10V volts.







6EM5

# 6EM5

## BEAM POWER TUBE

9-PIN MINIATURE TYPE

For vertical-deflection-amplifier service in 110° systems

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	ac or dc volts
Current . . . . .	0.8	amp

Direct Inter-electrode Capacitances:<sup>0</sup>

Grid No. 1 to plate . . . . .	0.7 max	μmf
Grid No. 1 to cathode & grid No. 3, grid No. 2, and heater . . . . .	10	μmf
Plate to cathode & grid No. 3, grid No. 2, and heater . . . . .	5.1	μmf

#### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	60	250	volts
Grid-No. 2 (Screen-Grid) Voltage . . . . .	250	250	volts
Grid-No. 1 (Control-Grid) Voltage . . . . .	0	-18	volts
Factor, Grid No. 1 to Grid No. 2 . . . . .	-	8.7	
Transconductance . . . . .	-	5100	μmhos
Plate Current . . . . .	180*	35	ma
Grid-No. 2 Current . . . . .	30*	3	ma
Grid-No. 1 Voltage (Approx.) for plate max. - 1 . . . . .	-	-37	volts

#### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	3-1/16"
Maximum Seated Length . . . . .	2-13/16"
Length, Base Seat to Bolt Top (Excluding tip) . . . . .	2-7/16" ± 3/32"
Diameter . . . . .	0.750" to 0.850"
Dimensional Outline . . . . .	See General Section
Bolt . . . . .	T6-1/2
Base . . . . .	Small-Button Novel 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	.9HN

Pin 1 - Grid No. 2  
 Pin 2 - No Connection  
 Pin 3 - Grid No. 1  
 Pin 4 - Heater  
 Pin 5 - Heater  
 Pin 6 - Grid No. 1



Pin 7 - Cathode,  
 Grid No. 3  
 Pin 8 - Internal  
 Connection—  
 Do Not Use  
 Pin 9 - Plate

### VERTICAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system<sup>U</sup>

DC PLATE VOLTAGE . . . . .	315 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)* . . . . .	2200 <sup>■</sup> max.	volts

0, \*, □, #, ■: See next page.

6EM5



6EM5

## BEAM POWER TUBE

DC GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . .	285	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE. . . . .	250	max.	volts
PEAK CATHODE CURRENT. . . . .	210	max.	ma
DC CATHODE CURRENT. . . . .	40	max.	ma
GRID-No.2 INPUT . . . . .	1.5	max.	watts
PLATE DISSIPATION . . . . .	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup>	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface). . . . .	250	max.	°C

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:

For fixed-bias operation. . . . .	2.2	max.	megohms
For cathode-bias operation. . . . .	2.2	max.	megohms

○ Without external shield.

\* This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

□ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

# This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

■ Under no circumstances should this absolute value be exceeded.

▲ The dc component must not exceed 100 volts.



6EM5

6EM5

### AVERAGE CHARACTERISTICS

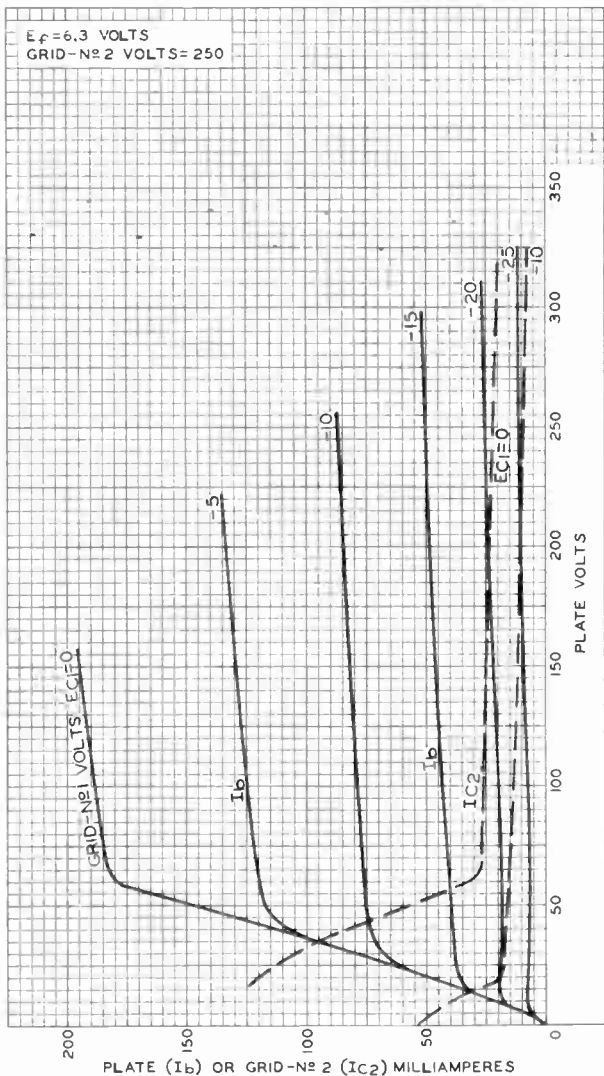


PLATE ( $I_b$ ) OR GRID-№2 ( $I_{c2}$ ) MILLIAMPERES

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-9797

6EM5



AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID-№ 1 VOLTS = 0

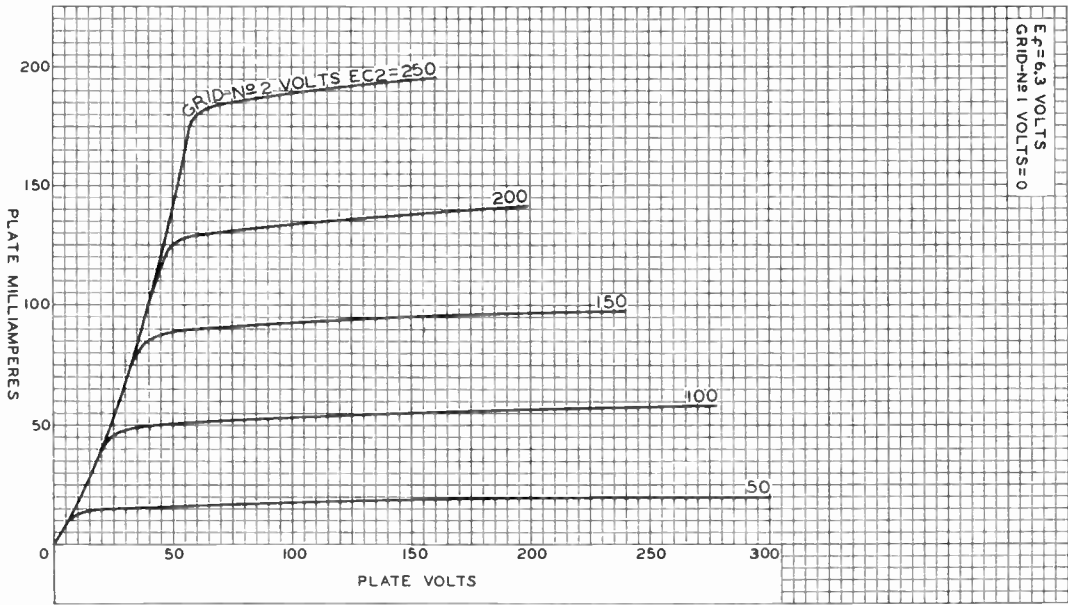


PLATE MILLIAMPERES  
ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

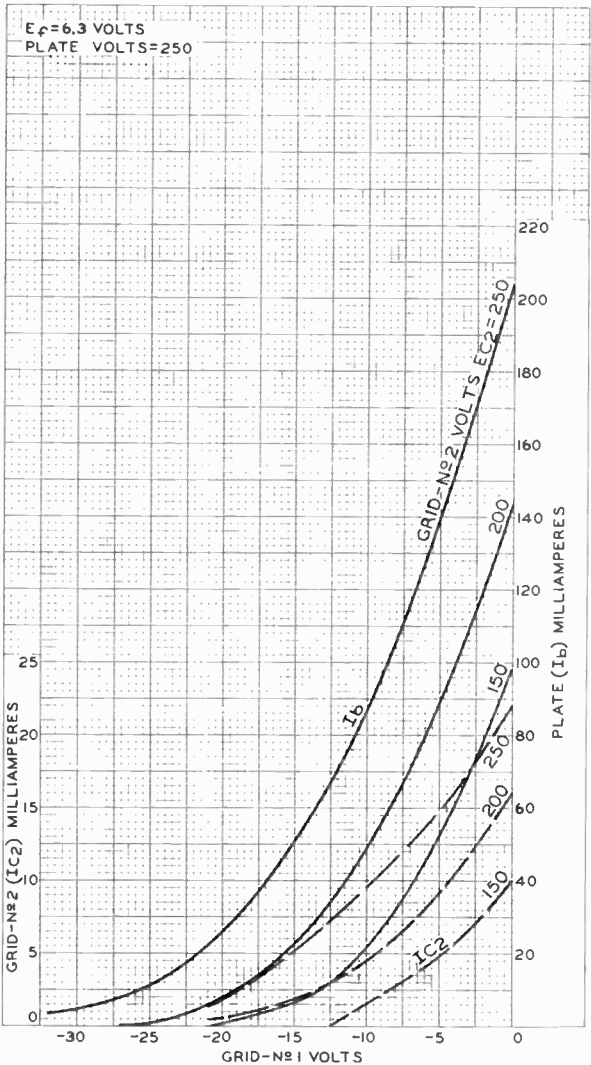
92CM-9672



6EM5

6EM5

### AVERAGE CHARACTERISTICS







6ER5

# 6ER5

## SEMIREMOTE-CUTOFF TETRODE

7-PIN MINIATURE TYPE

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3	volts
Current . . . . .	0.18	amp

Direct Interelectrode Capacitances:

	<i>Without External Shield</i>	<i>With External Shield<sup>o</sup></i>	
Grid No.1 to plate. . . . .	0.38	0.36	$\mu\mu\text{f}$
Grid No.1 to cathode, grid-No.2, and heater . . .	4.4	4.4	$\mu\mu\text{f}$
Plate to cathode, grid No.2, and heater . . .	3	4	$\mu\mu\text{f}$
Grid No.1 to heater . . . . .	0.28 max.	0.28 max.	$\mu\mu\text{f}$
Plate to cathode. . . . .	0.24	0.2 <sup>•</sup>	$\mu\mu\text{f}$
Cathode to grid No.1. . . . .	3.1	3.1 <sup>•</sup>	$\mu\mu\text{f}$
Heater to cathode . . . . .	2.5	2.5 <sup>•</sup>	$\mu\mu\text{f}$

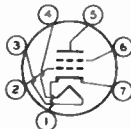
#### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	200	volts
Grid-No.2 Voltage . . . . .	0	volts
Grid-No.1 Voltage . . . . .	-1.2	volts
Amplification Factor. . . . .	80	
Plate Resistance (Approx.). . . . .	8000	ohms
Transconductance. . . . .	10500	$\mu\text{mhos}$
Plate Current . . . . .	10	ma
Grid-No.2 Current . . . . .	0	ma
Grid-No.1 Voltage (Approx.) for transconductance ( $\mu\text{mhos}$ ) = 500. . . . .	-3.8	volts
Grid-No.1 Voltage (Approx.) for transconductance ( $\mu\text{mhos}$ ) = 100. . . . .	-5.6	volts

#### Mechanical:

Operating Position. . . . .	Any
Maximum Overall Length. . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-1/2" $\pm$ 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. . . . .	7FN

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



Pin 5 - Plate  
 Pin 6 - Grid No.2  
 Pin 7 - Cathode

6ER5



6ER5

# SEMIREMOTE-CUTOFF TETRODE

## AMPLIFIER — Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	250 max.	volts
GRID-No.2 VOLTAGE. . . . .	100 max.	volts
GRID-No.1 VOLTAGE:		
Negative-bias value. . . . .	50 max.	volts
CATHODE CURRENT. . . . .	20 max.	ma
GRID-No.2 INPUT. . . . .	0.5 max.	watt
PLATE DISSIPATION. . . . .	2.2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. .	100 max.	volts
Heater positive with respect to cathode. .	100 max.	volts

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance . . . . . 1 max. megohm

○ with external shield JEDEC No.316 connected to cathode except as noted.

● with external shield JEDEC No.316 connected to ground.





6EW6

6EW6

# SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3 ± 10%	volts
Current . . . . .	0.4	amp

Direct Interelectrode Capacitances.

	<i>Without External Shield</i>	<i>With External Shield<sup>o</sup></i>	
Grid No.1 to plate . . . . .	0.04 max.	0.03 max.	μf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater. . . . .	10	10	μf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . .	2.4	3.4	μf

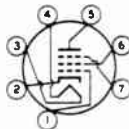
### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Supply Voltage . . . . .	125	volts
Grid No.3 . . . . .	<i>Connected to cathode at socket</i>	
Grid-No.2 Supply Voltage . . . . .	125	volts
Cathode Resistor . . . . .	56	ohms
Plate Resistance (Approx.) . . . . .	0.2	megohm
Transconductance . . . . .	14000	μmhos
Plate Current . . . . .	11	ma
Grid-No.2 Current . . . . .	3.2	ma
Grid-No.1 Voltage (Approx.) for plate $\mu a = 20$ . . . . .	-3.5	volts

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-1/2" ± 3/32"
Diameter . . . . .	0.650" to 0.750"
Dimensional Outline . . . . .	<i>See General Section</i>
Bulb . . . . .	T5-1/2
Base . . . . .	Small-Button Miniature 7-Pin (JEDEC No.E7-1)
Basing Designation for BOTTOM VIEW . . . . .	7CM

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



- Pin 6 - Grid No.2
- Pin 7 - Grid No.3,  
Internal  
Shield

6EW6



6EW6

# SHARP-CUTOFF PENTODE

## AMPLIFIER — Class A<sub>1</sub>

### Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE. . . . .	330 max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE. . . . .	0 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	330 max.	volts
GRID-No.2 VOLTAGE. . . . .	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive-bias value. . . . .	0 max.	volts
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 165 volts . . . . .	0.65 max.	watt
For grid-No.2 voltages between 165 and 330 volts. . . . .	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
PLATE DISSIPATION. . . . .	3.1 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	volts

<sup>○</sup> with external shield JEDEC No.316 connected to cathode.

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

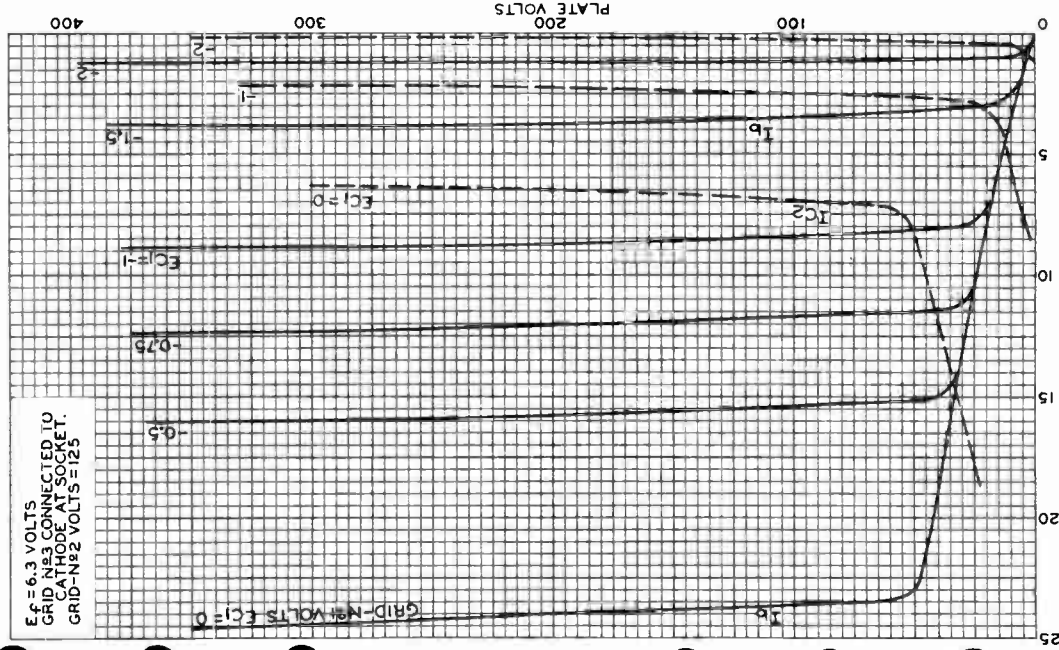


6EW6

6EW6

### AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID No.3 CONNECTED TO  
CATHODE AT SOCKET.  
GRID-No.2 VOLTS = 125



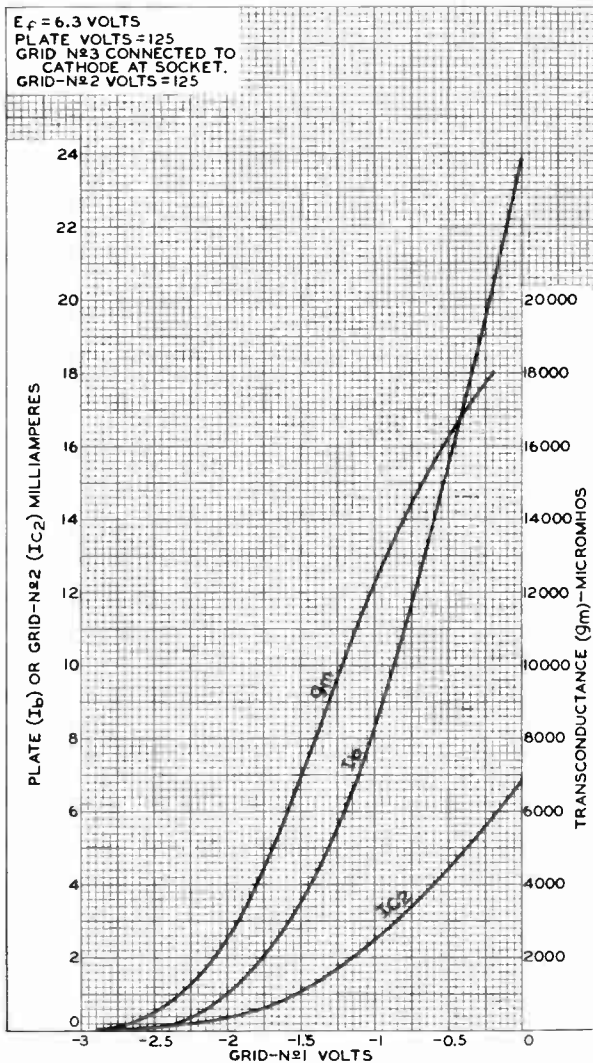
6EW6



6EW6

## AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 125  
 GRID-N $\#$ 3 CONNECTED TO  
 CATHODE AT SOCKET.  
 GRID-N $\#$ 2 VOLTS = 125



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

92CM-9962

6F5  
6F5-GT

# 6F5, 6F5-GT HIGH-MU TRIODE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage. . . . . 6.3 . . . . . ac or dc volts

Current. . . . . 0.3 . . . . . amp

Direct Interelectrode Capacitances (Approx.):

	6F5 <sup>o</sup>	6F5-GT <sup>oo</sup>
Grid to Plate. . . . .	7.4	2.0 . . . μμf
Grid to Cathode. . . . .	5.5	2.2 . . . μμf
Plate to Cathode. . . . .	4.0	3.2 . . . μμf

<sup>o</sup> With shell connected to cathode.

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

### Mechanical:

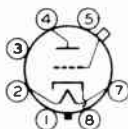
Mounting Position. . .	Any	Any
Maximum Overall Length	3-1/8"	3-5/16"
Seated Length. . . . .	2-7/16" ± 1/8"	2-5/16"—2-3/4"
Maximum Diameter . . .	1-5/16"	1-5/16"
Bulb . . . . .	Metal Shell, MTT8A	T-9
Cap . . . . .	Miniature	Miniature
Base . . . . .	Small-Wafer Octal 7-Pin	Intermed. Shell Octal 7-Pin
Basing Designation . .	5M1	G-5M <sub>1</sub>

### BOTTOM VIEW

Pin 1 { 6F5, Shell  
6F5-GT, No  
Connection

Pin 2 - Heater

Pin 3 - No  
Connection



Pin 4 - Plate

Pin 5 - No  
Connection

Pin 7 - Heater

Pin 8 - Cathode

Cap - Grid

*Maximum Ratings and Characteristics for the 6F5 and 6F5-GT are the same as shown for Type 6SF5. Typical Operating Conditions are shown in the RESISTANCE-COUPLED AMPLIFIER CHART at front of this Section.*

Curve under Type 6SF5 also applies to the  
6F5 and 6F5-GT.

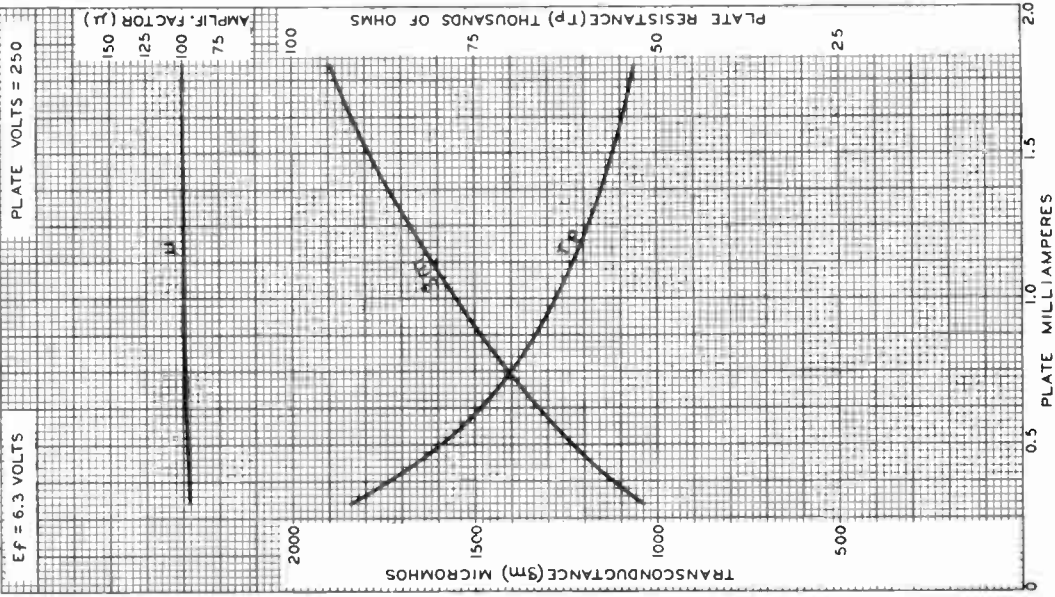
← Indicates a change.

6F5



6F5

### AVERAGE CHARACTERISTICS



SEPT. 4, 1935

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARTFORD, NEW HAVEN

92CM-4470



6F6

6F6

# POWER PENTODE

METAL TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	. . . . .	ac or dc volts
Current . . . . .	0.7	. . . . .	amp

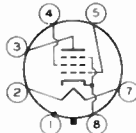
Direct Interelectrode Capacitances (Approx.):

Grid No.1 to plate. . . . .	0.26	$\mu\mu\text{f}$	←
Grid No.1 to cathode & grid No.3, grid No.2, shell, and heater . . . . .	6.5	$\mu\mu\text{f}$	
Plate to cathode & grid No.3, grid No.2, shell, and heater . . . . .	13.5	$\mu\mu\text{f}$	

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	3-1/4"
Maximum Seated Length . . . . .	2-11/16"
Maximum Diameter . . . . .	1-5/16"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	Metal Shell MT8B ←
Base . . . . .	Small-Wafer Octal 7-Pin (JETEC No. B7-22) ←
Basing Designation for BOTTOM VIEW . . . . .	7S

Pin 1 - Shell  
 Pin 2 - Heater  
 Pin 3 - Plate  
 Pin 4 - Grid No.2



Pin 5 - Grid No.1  
 Pin 7 - Heater  
 Pin 8 - Cathode,  
 Grid No.3

### AF POWER AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	375 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	285 max.	volts
GRID-No.2 INPUT . . . . .	3.75 max.	watts
PLATE DISSIPATION . . . . .	11 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	90 max.	volts
Heater positive with respect to cathode . . . . .	90 max.	volts

### Typical Operation and Characteristics:

	Fixed Bias		Cathode Bias		
	250	285	250	285	
Plate Voltage . . . . .	250	285	250	285	volts
Grid-No.2 Voltage . . . . .	250	285	250	285	volts
Grid-No.1 (Control- Grid) Voltage . . . . .	-16.5	-20	-	-	volts
Cathode Resistor . . . . .	-	-	410	440	ohms
Peak AF Grid-No.1 Voltage . . . . .	16.5	20	16.5	20	volts
Zero-Signal Plate Current . . . . .	34	38	34	38	ma

← Indicates a change.

6F6



6F6

## POWER PENTODE

	Fixed Bias		Cathode Bias		
Max.—Signal Plate Current . . . . .	36	40	35	38	ma
Zero-Signal Grid-No.2 Current . . . . .	6.5	7	6.5	7	ma
Max.—Signal Grid-No.2 Current . . . . .	10.5	13	9.7	12	ma
Plate Resistance (Approx.) . . . . .	80000	78000	—	—	ohms
Transconductance . . . . .	2500	2550	—	—	μmhos
Load Resistance . . . . .	7000	7000	7000	7000	ohms
Total Harmonic Distortion . . . . .	8	9	8.5	9	%
Max.—Signal Power Output . . . . .	3.2	4.8	3.1	4.5	watts

**Maximum Circuit Values:**

Grid-No.1—Circuit Resistance:

For fixed-bias operation . . . . . 0.1 max. megohm

For cathode-bias operation . . . . . 0.5 max. megohm

**AF POWER AMPLIFIER - Class A<sub>1</sub>***Triode Connector - Grid No.2 Connected to Plate***Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE . . . . . 350 max. volts

PLATE DISSIPATION . . . . . 10 max. watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . . 90 max. volts

Heater positive with respect to cathode . . . . . 90 max. volts

**Typical Operation and Characteristics:**

	Fixed Bias	Cathode Bias	
Plate Voltage . . . . .	250	250	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	-20	—	volts
Cathode Resistor . . . . .	—	650	ohms
Peak AF Grid-No.1 Voltage . . . . .	20	20	volts
Zero-Signal Plate Current . . . . .	31	31	ma
Max.—Signal Plate Current . . . . .	34	32	ma
Amplification Factor . . . . .	6.8	—	
Plate Resistance (Approx.) . . . . .	2600	—	ohms
Transconductance . . . . .	2600	—	μmhos
Load Resistance . . . . .	4000	4000	ohms
Total Harmonic Distortion . . . . .	6.5	6.5	%
Max.—Signal Power Output . . . . .	0.85	0.8	watt

**Maximum Circuit Values:**

Grid-No.1—Circuit Resistance:

For fixed-bias operation . . . . . 0.1 max. megohm

For cathode-bias operation . . . . . 0.5 max. megohm

→ Indicates a change.





6F6

6F6

# POWER PENTODE

## PUSH-PULL AF POWER AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	375 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . .	285 max.	volts
GRID-No.2 INPUT. . . . .	3.75 max.	watts
PLATE DISSIPATION. . . . .	11 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	90 max.	volts
Heater positive with respect to cathode.	90 max.	volts

### Typical Operation:

Values are for 2 tubes

	Fixed Bias	Cathode Bias	
Plate Voltage. . . . .	315	315	volts
Grid-No.2 Voltage. . . . .	285	285	volts
Grid-No.1 Voltage. . . . .	-24	-	volts
Cathode Resistor. . . . .	-	320	ohms
Peak AF Grid-No.1-to-			
Grid-No.1 Voltage. . . . .	48	58	volts
Zero-Signal Plate Current.	62	62	ma
Max.-Signal Plate Current.	80	73	ma
Zero-Signal Grid-No.2			
Current. . . . .	12	12	ma
Max.-Signal Grid-No.2			
Current. . . . .	19.5	18	ma
Effective Load Resistance (Plate to plate) . . . . .	10000	10000	ohms
Total Harmonic Distortion.	4	3	%
Max.-Signal Power Output .	11	10.5	watts

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

## PUSH-PULL AF POWER AMPLIFIER - Class AB<sub>2</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	375 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . .	285 max.	volts
GRID-No.2 INPUT. . . . .	3.75 max.	watts
PLATE DISSIPATION. . . . .	11 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	90 max.	volts
Heater positive with respect to cathode.	90 max.	volts

### Typical Operation:

Values are for 2 tubes

	Fixed Bias	Cathode Bias	
Plate Voltage. . . . .	375	375	volts

← Indicates a change.

6F6



6F6

## POWER PENTODE

	Fixed Bias	Cathode Bias	
Grid-No.2 Voltage. . . . .	250	250	volts
Grid-No.1 Voltage. . . . .	-26	-	volts
Cathode Resistor . . . . .	-	340	ohms
Peak AF Grid-No.1-to-			
Grid-No.1 Voltage. . . . .	82	94	volts
Zero-Signal Plate Current. . .	34	54	ma
Max.-Signal Plate Current. . .	82	77	ma
Zero-Signal Grid-No.2			
Current. . . . .	5	8	ma
Max.-Signal Grid-No.2			
Current. . . . .	19.5	18	ma
Effective Load Resistance			
(Plate to plate) . . . . .	10000	10000	ohms
Total Harmonic Distortion. . .	3.5	5	%
Max.-Signal Power Output . . .	18.5	19	watts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

**PUSH-PULL AF POWER AMPLIFIER - Class AB<sub>2</sub>***Triode Connection - Grid No.2 Connected to Plate***Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE. . . . .	350 max.	volts
PLATE DISSIPATION. . . . .	10 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	90 max.	volts
Heater positive with respect to cathode.	90 max.	volts

**Typical Operation:***Values are for 2 tubes*

	Fixed Bias	Cathode Bias	
Plate Voltage. . . . .	350	350	volts
Grid-No.1 (Control-Grid)			
Voltage. . . . .	-38	-	volts
Cathode Resistor . . . . .	-	730	ohms
Peak AF Grid-No.1-to-			
Grid-No.1 Voltage. . . . .	123	132	volts
Zero-Signal Plate Current. . .	48	50	ma
Max.-Signal Plate Current. . .	92	60	ma
Effective Load Resistance			
(Plate to plate) . . . . .	6000	10000	ohms
Total Harmonic Distortion. . .	2	3	%
Max.-Signal Power Output . . .	13	9	watts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

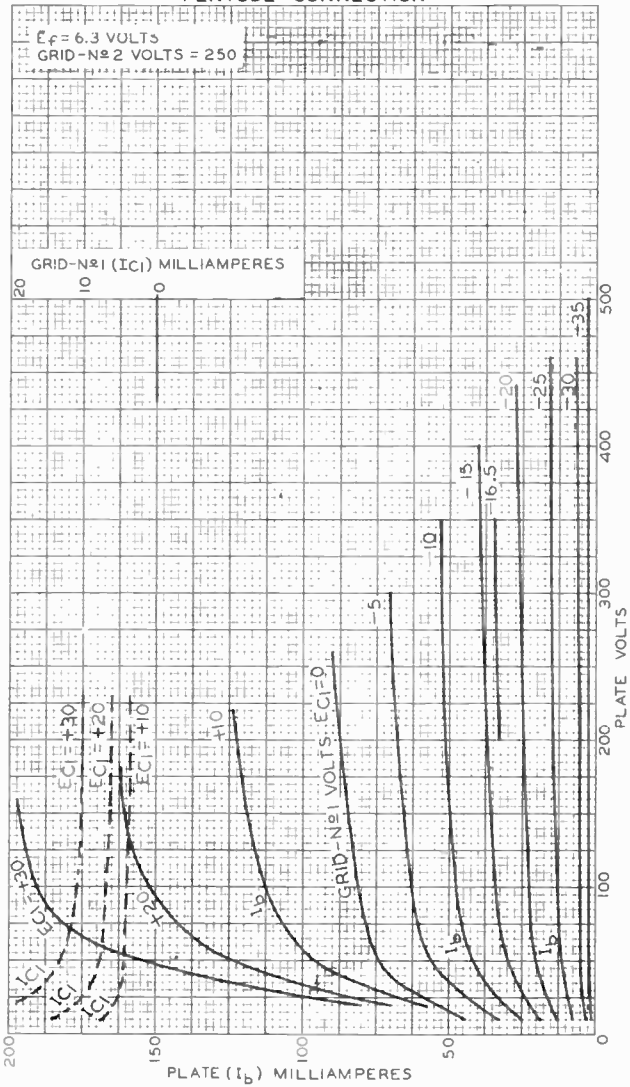
→ Indicates a change.



6F6

6F6

# AVERAGE CHARACTERISTICS PENTODE CONNECTION



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-443IR1

World Radio History

6F6



6F6

# AVERAGE CHARACTERISTICS TRIODE CONNECTION

$E_f = 6.3$  VOLTS  
GRID No 2 CONNECTED TO PLATE

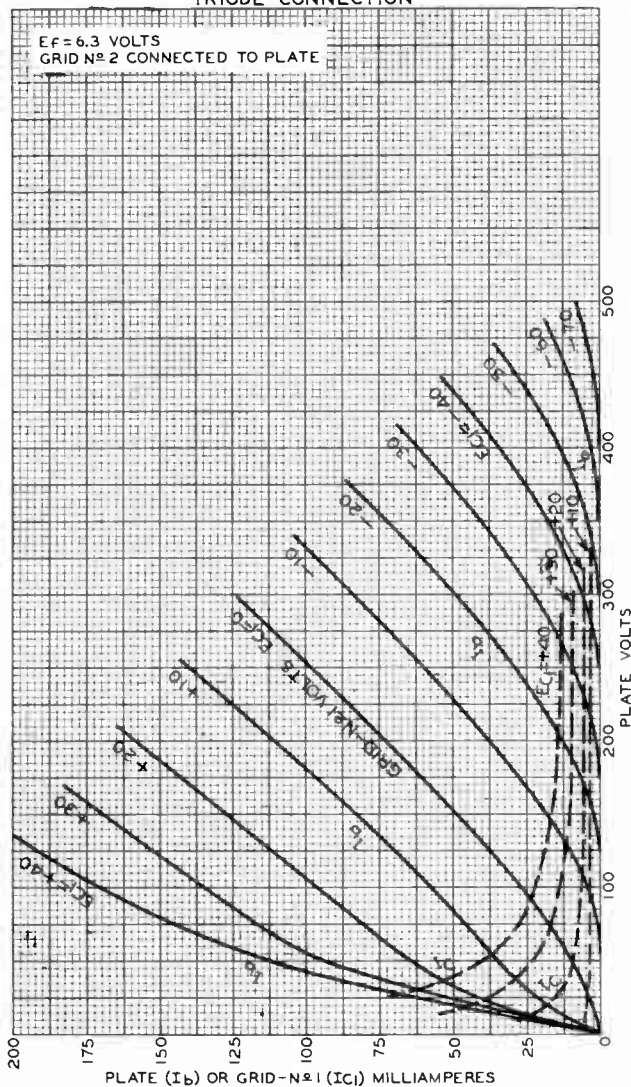


PLATE ( $I_b$ ) OR GRID-NO 1 ( $I_c$ ) MILLIAMPERES

TUBE DIVISION

92CM-4440R1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History



6F6

6F6

## OPERATION CHARACTERISTICS PENTODE CONNECTION—CLASS AB2 OPERATION

$E_f = 6.3$  VOLTS

INPUT STAGE: CLASS A<sub>1</sub> DRIVER—ONE TYPE 6F6 AS TRIODE.

PLATE-SUPPLY VOLTS=250

CATHODE RESISTOR (OHMS)=650

OUTPUT STAGE: CLASS AB<sub>2</sub>—TWO TYPE 6F6'S AS PENTODES.  
ZERO-SIGNAL PLATE VOLTS=375 FROM SOURCE HAVING  
RESISTANCE ( $R_b$ ) SHOWN IN TABLE.

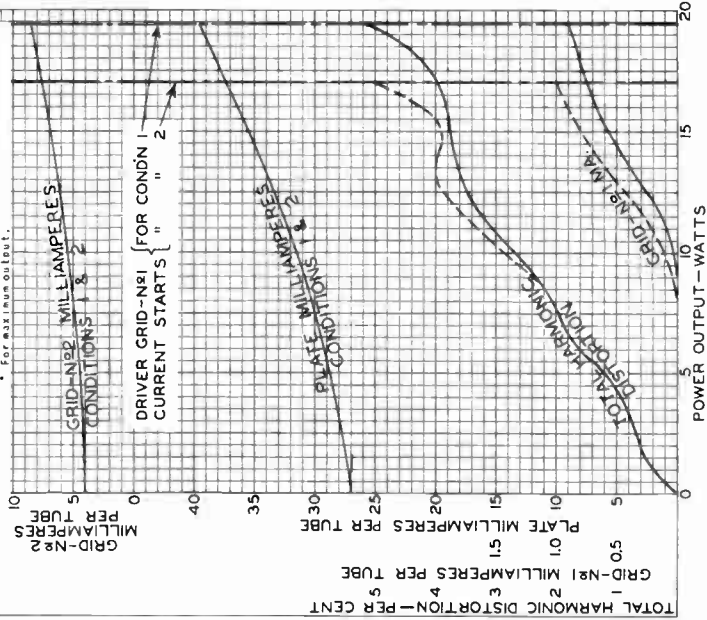
ZERO-SIGNAL GRID-N<sub>2</sub> VOLTS=250 FROM THE ABOVE  
375-VOLT PLATE SUPPLY THROUGH RESISTANCE ( $R_b$ )  
SHOWN IN TABLE.

ZERO-SIGNAL BIAS VOLTS=VALUE FROM GRID RESISTOR  
( $R_c$ ) OF 310 OHMS.

EFFECTIVE LOAD RESISTANCE (PLATE TO PLATE)=10000 OHMS

CONDI- TION	CURVE	DRIVER STAGE		INTERSTAGE TRANSFORMER		Peak Power Efficiency Per Cent
		$R_b$ Ohms	$R_d$ Ohms	Input-Sig. Volts* (RMS)	Plate Load Ohms	
1	---	0	0	14.6	51100	2.50:1
2	---	1000	2000	10.3	33100	1.74:1
						47.7
						64.4

\* For maximum output.







6F6-G

6F6-G  
6F6-GT

### POWER PENTODE

#### GENERAL DATA

##### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 6.3 . . . . . ac or dc volts  
Current . . . . . 0.7 . . . . . amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid No.1 to plate . . . . . 0.5  $\mu$ f  
Grid No.1 to cathode & grid No.3, grid No.2,  
and heater . . . . . 8  $\mu$ f  
Plate to cathode & grid No.3, grid No.2,  
and heater . . . . . 6.5  $\mu$ f

##### Mechanical:

Mounting Position . . . . . Any  
Maximum Overall Length . . . . . 4-5/8"  
Maximum Seated Length . . . . . 4-1/16"  
Maximum Diameter . . . . . 1-13/16"  
Dimensional Outline . . . . . See General Section  
Bulb . . . . . ST-14  
Base . . . . . Medium-Shell Octal 7-Pin (JETEC No. 67-12)  
Basing Designation for BOTTOM VIEW . . . . . 7S

Pin 1 - No Connection  
Pin 2 - Heater  
Pin 3 - Plate  
Pin 4 - Grid No.2



Pin 5 - Grid No.1  
Pin 7 - Heater  
Pin 8 - Cathode,  
Grid No.3

Additional data and curves for the 6F6-G are the same as those shown under type 6F6

<sup>o</sup> Without external shield.

← Indicates a change.

6F6-GT

### POWER PENTODE

#### GENERAL DATA

##### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 6.3 . . . . . ac or dc volts  
Current . . . . . 0.7 . . . . . amp

##### Mechanical:

Mounting Position . . . . . Any  
Maximum Overall Length . . . . . 3-7/16"  
Maximum Seated Length . . . . . 2-7/8"  
Maximum Diameter . . . . . 1-9/32"

6F6-GT



6F6-GT

POWER PENTODE

Dimensional Outline. . . . . See General Section

Bulb . . . . . T-9

Base . . . . . Intermediate-Shell Octal 7-Pin (JETEC No. B7-7),

Short Intermediate-Shell Octal 7-Pin (JETEC No. B7-47),

Intermediate-Shell Octal 6-Pin (JETEC No. B6-81),

or Short Intermediate-Shell Octal 6-Pin

with External Barriers (JETEC No. B6-84)

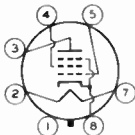
Basing Designation for BOTTOM VIEW . . . . . 7S

Pin 1 ♦ - No Connection

Pin 2 - Heater

Pin 3 - Plate

Pin 4 - Grid No. 2



Pin 5 - Grid No. 1

Pin 7 - Heater

Pin 8 - Cathode, Grid No. 3

Additional data and curves for the 6F6-GT are the same as those shown under type 6F6

♦ Pin 1 as well as pin 6 is omitted on the 6-pin bases.



## RCA-6F7 TRIODE-PENTODE

Heater - Coated Uni-potential Cathode  
 Voltage 6.3 o-c or d-c volts  
 Current 0.3 amp.

**Direct Interelectrode Capacitances:**

<b>Triode Unit:</b>		
Grid to Plate	2.0	μuf
Grid to Cathode	2.5	μuf
Plate to Cathode	3.0	μuf
<b>Pentode Unit:</b>		
Grid to Plate	0.008 max. <sup>⊙</sup>	μuf
input	3.2	μuf
Cutput	12.5	μuf

Overall Length 4-9/32" to 4-17/32"

Maximum Diameter 1-9/16"

Bulb ST-12

Cap Small Metal

Base Small 7-Pin <sup>▲</sup>



BOTTOM VIEW

### AMPLIFIER SERVICE

	<u>Triode Unit</u>	<u>Pentode Unit</u>		
Plate Voltage	100 max.	100	250 max.	volts
Screen Voltage	-	100	100 max.	volts
Grid Voltage	-3	-3	-3 min.	volts
Amp. Fact.	8	300	900	
Plate Res.	16000	290000	850000	ohms
Mut. Cond.	500	1050	1100	μmhos
Mut. Cond. at -75 volts bias	-	9	10	μmhos
Plate Cur.	3.5	6.3	6.5	ma.
Screen Cur.	-	1.6	1.5	ma.

### CONVERTER SERVICE

	<u>Triode Unit</u>	<u>Pentode Unit</u>		
Plate Voltage	100 max.	250 max.		volts
Screen Voltage	-	100 max.		volts
Grid Voltage	##	-3 min.		volts
Oscillator Plate Cur. (av.)	4 max.	-		ma.
<b>Typical Operation:</b>				
Plate	100 <sup>⊙</sup>	250		volts
Screen	-	100		volts
Grid Bias	##	-10 <sup>⊙⊙</sup>		volts
Plate Resistance	-	2		megohms
Conversion Conductance	-	300		μmhos
D-c Plate Current	2.4	2.8		ma.
D-c Grid Current	0.45	0		ma.
Screen Current	-	0.6		ma.
Oscillator Peak Voltage Input	-	7		volts

- ## Usually obtained by means of a grid leak.
- ⊙⊙ Grid bias should be at least .3 volts greater than the peak oscillator voltage applied to the pentode grid.
- ⊙ May be obtained from 250-volt source through 60000-ohm dropping resistor.
- ⊙⊙ Obtained by means of 1700-ohm self-biasing (cathode) resistor.
- \* In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
- ▲ Requires different socket than medium 7-pin base.
- ⊙ With shield-can.





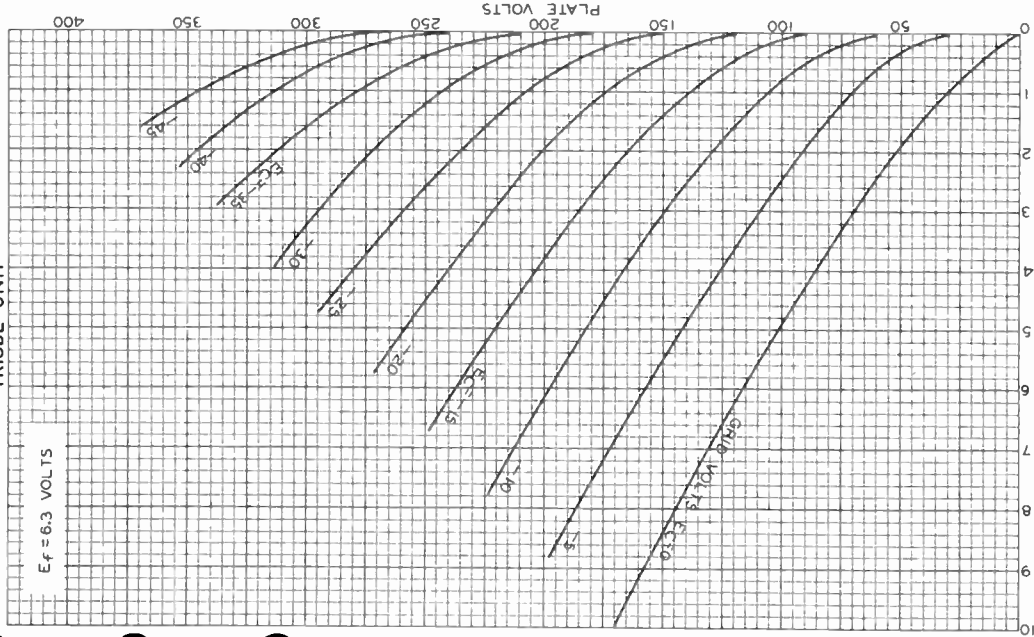
RCA-6F7



C-6F7

9F7

### AVERAGE PLATE CHARACTERISTICS TRIODE UNIT



6F7



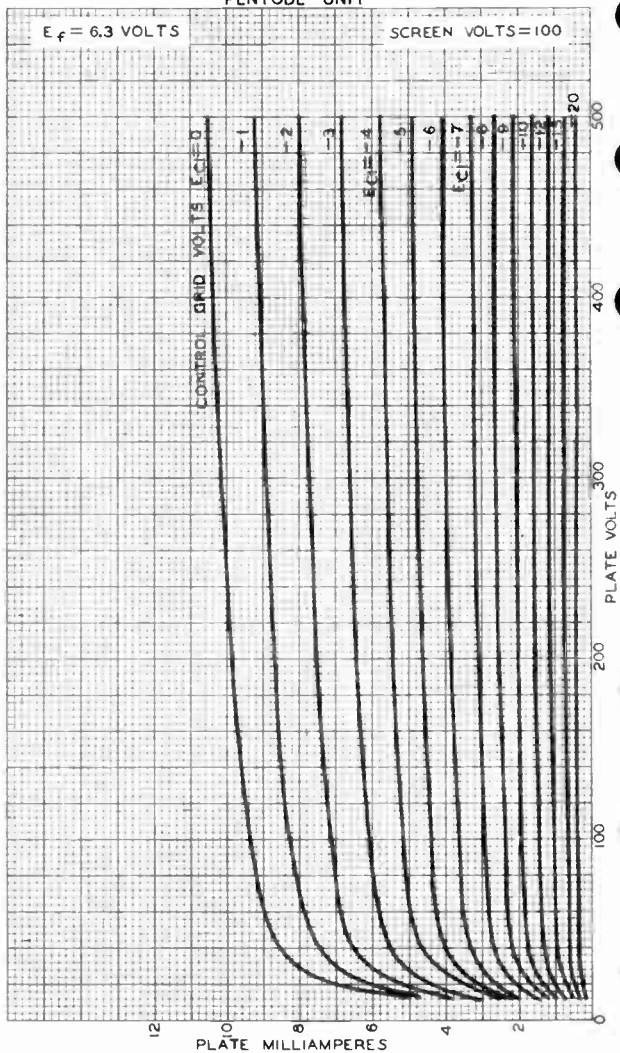
Radiotron

RCA-6F7

Cunningham  
RADIO TUBES

C-6F7

### AVERAGE PLATE CHARACTERISTICS PENTODE UNIT





6F8-G

6F8-G

## TWIN-TRIODE AMPLIFIER

Heater <sup>■</sup>	Coated Unipotential Cathodes		
Voltage	6.3	a-c or d-c volts	
Current	0.6	amp.	
Direct Interelectrode Capacitances (Approx.): <sup>○</sup>			
	<u>Triode Unit #1</u>	<u>Triode Unit #2</u>	
Grid to Plate	3.8	3.2	μf
Grid to Cathode	3.2	1.9	μf
Plate to Cathode	1.0	1.9	μf
Maximum Overall Length	4-15/32"		
Maximum Seated Height	3-29/32"		
Maximum Diameter	1-9/16"		
Bulb	ST-12		
Cap	Skirted Miniature		
Base	Small Shell Octal 8-Pin		
Pin 1 - No Connection	Pin 6 - Plate T <sub>1</sub>		
Pin 2 - Heater	Pin 7 - Heater		
Pin 3 - Plate T <sub>2</sub>	Pin 8 - Cathode T <sub>1</sub>		
Pin 4 - Cathode T <sub>2</sub>	Cap - Grid T <sub>2</sub>		
Pin 5 - Grid T <sub>1</sub>			
Mounting Position	BOTTOM VIEW (G-8G)	Any	



For convenience, one triode unit is identified as #1; the other as #2  
 Maximum And Minimum Ratings Are Design-Center Values

## AMPLIFIER - Each Unit

Plate Voltage	300 max. volts	
Grid Voltage	0 min. volts	
Plate Dissipation	2.5 max. watts	
Characteristics - Class A <sub>1</sub> Amplifier:		
Plate	90	250 volts
Grid	0	-8 volts
Amp. Fact.	20	20
Plate Res.	6700	7700 ohms
Transcond.	3000	2600 μmhos
Plate Cur.	10	9 ma.

Typical Operation with Resistance Coupling:  
 See RESISTANCE-COUPLED AMPLIFIER CHART.

- In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
- with no external shield.

Curves under Type 6J5 apply to each unit of the 6F8-G.

← Indicates a change.

Jan. 1, 1943

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

DATA





6FH8

6FH8

# MEDIUM-MU TRIODE— THREE-PLATE TETRODE

9-PIN MINIATURE TYPE

For harmonic-generator applications

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3 ± 10%	volts
Current . . . . .	0.45	amp

Direct Interelectrode Capacitances,<sup>0</sup>

*Triode Unit:*

Grid to plate . . . . .	1.4	μf
Grid to cathode & heater. . . . .	2.6	μf
Plate to cathode & heater . . . . .	1	μf

*Tetrode Unit:*

Grid No.1 to plate No.1 . . . . .	0.06 max.	μf
Grid No.1 to cathode & heater, plate No.3, plate No.2, and grid No.2 . . . . .	4.5	μf
Plate No.1 to cathode & heater, plate No.3, plate No.2, and grid No.2 . . . . .	1.4	μf
Tetrode grid No.1 to triode plate . . .	0.35 max.	μf
Tetrode plate No.1 to triode plate. . .	0.008 max.	μf

### Characteristics, Class A<sub>1</sub> Amplifier:

*Triode Unit*

Plate Voltage . . . . .	100	volts
Grid Voltage . . . . .	-1	volt
Amplification Factor . . . . .	40	
Plate Resistance (Approx.) . . . . .	7400	ohms
Transconductance . . . . .	5400	μmhos
Plate Current . . . . .	7.9	ma
Grid Voltage (Approx.) for plate μa = 100 . . . . .	-7	volts

*Tetrode Unit with plates No.2  
and No.3 connected to cathode*

Plate-No.1 Voltage . . . . .	250	volts
Grid-No.2 Voltage . . . . .	250	volts
Grid-No.1 Voltage . . . . .	-2	volts
Plate-No.1 Resistance (Approx.) . . . . .	0.75	megohm
Transconductance, Grid No.1 to Plate No.1 . . . . .	4400	μmhos
Plate-No.1 Current . . . . .	7.3	ma
Grid-No.2 Current . . . . .	1.4	ma
Grid-No.1 Voltage (Approx.) for plate-No.1 μa = 100 . . . . .	-7	volts

<sup>0</sup> with external shield JEDEC No.315 connected to cathode.

6FH8



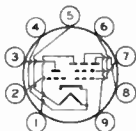
6FH8

## MEDIUM-MU TRIODE— THREE-PLATE TETRODE

### Mechanical:

Operating Position. . . . .	Any
Maximum Overall Length. . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-9/16" ± 3/32"
Diameter. . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb. . . . .	T6-1/2
Base. . . . .	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW. . . . .	9KP

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



Pin 6 - Tetrode  
Grid No.1  
Pin 7 - Tetrode  
Grid No.2  
Pin 8 - Tetrode  
Plate No.2  
Pin 9 - Tetrode  
Plate No.1

### HARMONIC-GENERATOR SERVICE

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

	Triode Unit	Tetrode Unit	
PLATE VOLTAGE. . . . .	275 max.	-	volts
PLATE-No.1 VOLTAGE . . . . .	-	275 max.	volts
PLATE-No.2 VOLTAGE . . . . .	-	200 max.	volts
PLATE-No.3 VOLTAGE . . . . .	-	200 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	-	275 max.	volts
GRID-No.2 VOLTAGE. . . . .	-	See Grid-No.2 Input	
<i>Rating Chart at front of Receiving Tube Section</i>			
GRID-No.1 (CONTROL- GRID) VOLTAGE:			
Negative-bias value. . . . .	40 max.	40 max.	volts
Positive-bias value. . . . .	0 max.	0 max.	volts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 137.5 volts. . . . .	-	0.45 max.	watt
For grid-No.2 voltages between 137.5 and 275 volts. . . . .	-	See Grid-No.2 Input	
<i>Rating Chart at front of Receiving Tube Section</i>			
PLATE DISSIPATION. . . . .	1.7 max.	-	watts
PLATE-No.1 DISSIPATION . . . . .	-	2.3 max.	watts
PLATE-No.2 DISSIPATION . . . . .	-	0.3 max.	watt
PLATE-No.3 DISSIPATION . . . . .	-	0.3 max.	watt





6FH8

6FH8

### MEDIUM-MU TRIODE— THREE-PLATE TETRODE

#### Typical Operation:

*Tetrode Unit with separate plate operation*

Plates—No.1, No.2, and No.3 Voltage . . . . .	100	volts
Grid—No.2 Voltage . . . . .	50	volts
Grid—No.1 Voltage . . . . .	-1	volt
Plate—No.1 Current . . . . .	1.6	ma
Plate—No.2 Current . . . . .	0.04	ma
Plate—No.3 Current . . . . .	0.04	ma
Grid—No.2 Current . . . . .	0.3	ma
Transconductance (Approx.):		
Grid No.1 to plate No.1 . . . . .	2500	$\mu$ hos
Grid No.1 to plate No.2 . . . . .	70	$\mu$ hos
Grid No.1 to plate No.3 . . . . .	70	$\mu$ hos

#### Maximum Circuit Values:

*Triode Unit    Tetrode Unit*

Grid—No.1—Circuit

Resistance:

For fixed-bias

operation . . . . .	0.5 max.	0.5 max.	megohm
---------------------	----------	----------	--------

6FH8



6FH8

# AVERAGE CHARACTERISTICS TRIODE UNIT

$E_f = 6.3$  VOLTS

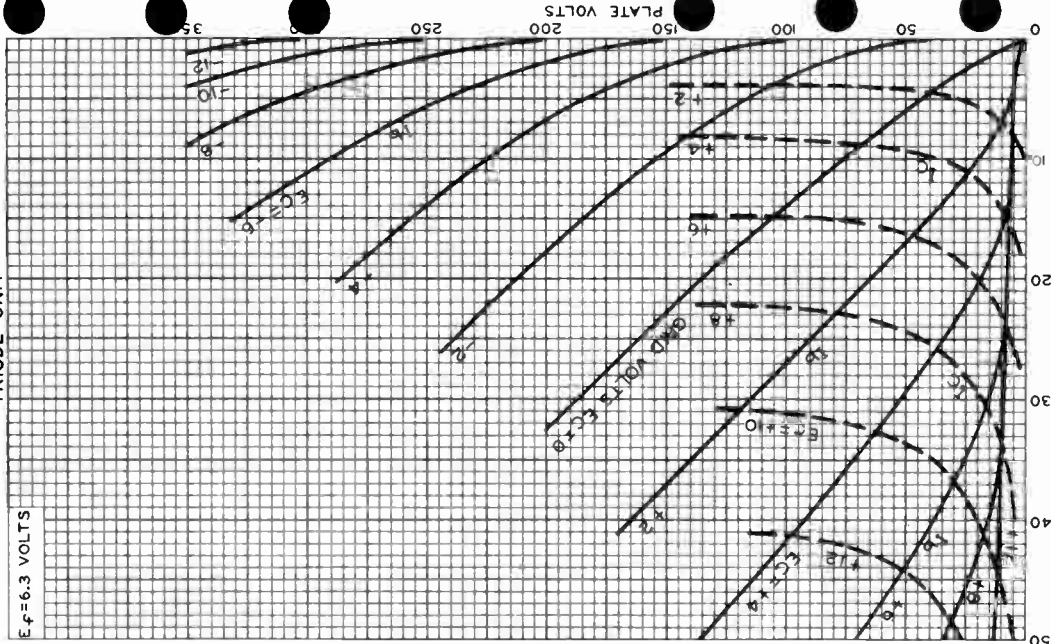


PLATE (I<sub>b</sub>) OR GRID (I<sub>c</sub>) MILLIAMPERES

ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-10220



6FH8

6FH8

# AVERAGE CHARACTERISTICS TETRODE UNIT

$E_f = 6.3$  VOLTS

PLATES NO. 2 AND NO. 3 CONN-  
ECTED TO CATHODE.

GRID-NO. 2 VOLTS = 150

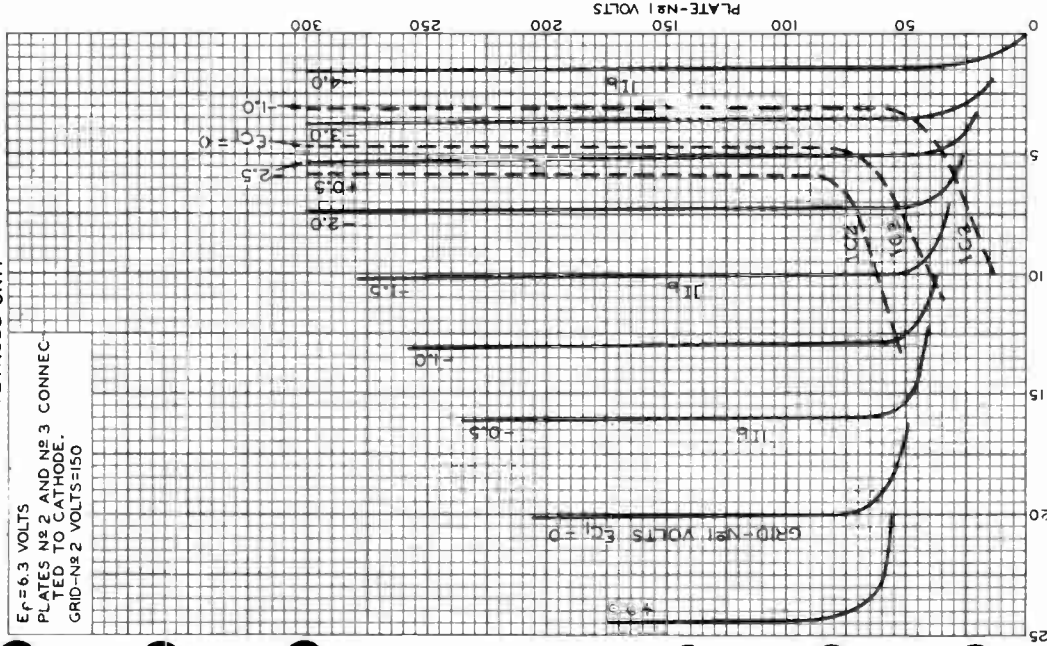


PLATE-NO. 1 ( $I_b$ ) OR GRID-NO. 2 ( $I_{c2}$ ) MILLIAMPERES

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-10221





6FV6

6FV6

# SHARP-CUTOFF TETRODE

7-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3 ± 10%	. . . . . ac or dc volts
Current . . . . .	0.2	. . . . . amp

Direct Interelectrode Capacitances:<sup>0</sup>

Grid No.1 to plate . . . . .	0.03 max.	μmf
Grid No.1 to cathode, grid No.2, internal shield, and heater. . . . .	4.5	μmf
Plate to cathode, grid No.2, internal shield, and heater. . . . .	3	μmf
Cathode to heater. . . . .	2.7*	μmf

### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	125	volts
Grid-No.2 (Screen-grid) Voltage . . . . .	80	volts
Grid-No.1 (Control-grid) Voltage . . . . .	-1	volt
Plate Resistance (Approx.) . . . . .	0.1	megohm
Transconductance . . . . .	8000	μmhos
Plate Current . . . . .	10	ma
Grid-No.2 Current . . . . .	1.5	ma
Grid-No.1 Voltage (Approx.) for plate μ = 20. . . . .	-6	volts

### Mechanical:

Operating Position . . . . .	. . . . . Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-1/2" ± 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 . . . . .	7FQ

Pin 1 - Grid No.1  
 Pin 2 - Internal  
           Shield  
 Pin 3 - Heater



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

## AMPLIFIER — Class A<sub>1</sub>

### Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE . . . . .	275 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	180 max.	volts
GRID-No.2 VOLTAGE . . . . .	See Grid-No.2 Input Rating Chart at front of Receiving Tube Section	

6FV6



6FV6

## SHARP-CUTOFF TETRODE

GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive-bias value. . . . .	0	max. volts
CATHODE CURRENT. . . . .	20	max. ma
GRID-No.2 INPUT:		
For grid-No.2 voltages up to		
90 volts . . . . .	0.5	max. watt
For grid-No.2 voltages between		
90 and 180 volts . . . . .	See Grid-No.2 Input Rating Chart at front of Receiving Tube Section	
PLATE DISSIPATION. . . . .	2	max. watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200	max. volts
Heater positive with respect to cathode.	200*	max. volts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance . . . . . 0.5 max. megohm

<sup>o</sup> with external shield JEDEC No.316 connected to cathode except as noted.

<sup>•</sup> with external shield JEDEC No.316 connected to ground.

\* The dc component must not exceed 100 volts.

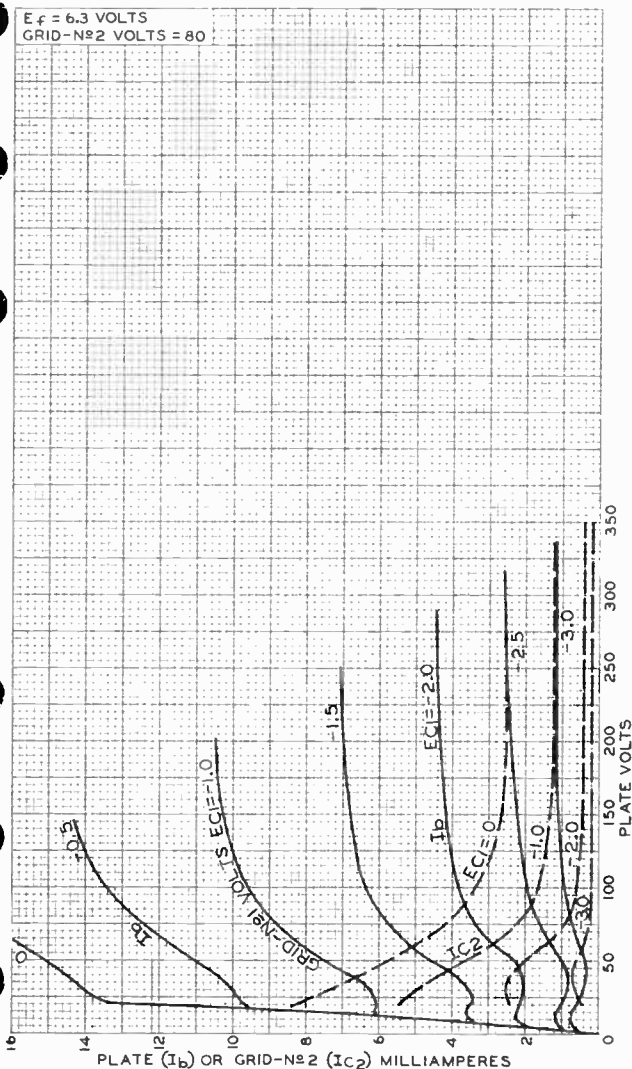


6FV6

6FV6

### AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID-№2 VOLTS = 80



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

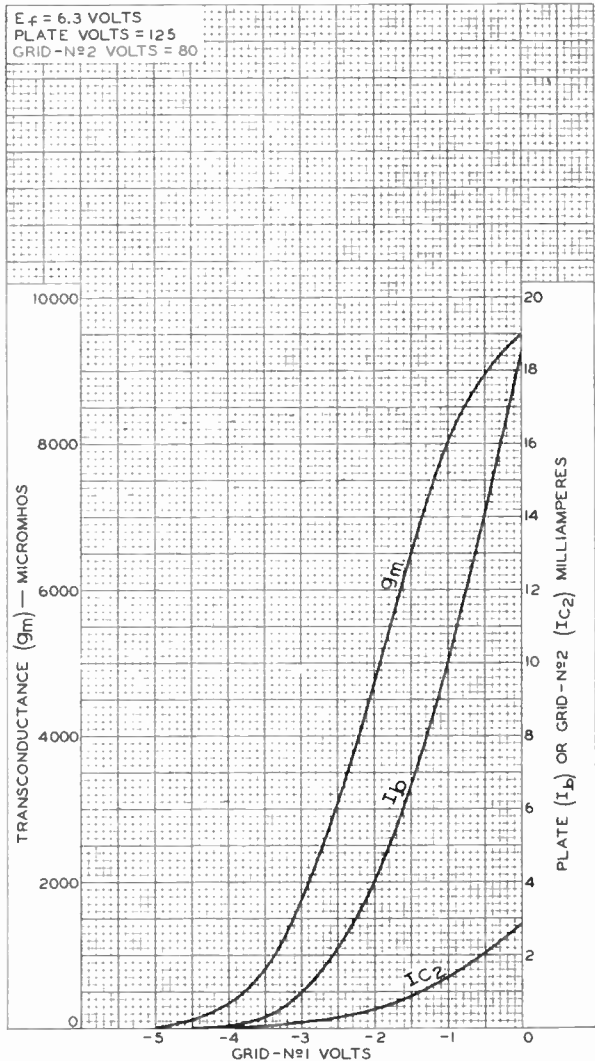
92CM-10058

6FV6



6FV6

## AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION

92CM-9519

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History





6G6-G

6G6-G

## POWER AMPLIFIER PENTODE

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.15	amp.
Direct Interelectrode Capacitances (Approx.): <sup>o</sup>		
Grid to Plate	0.5	$\mu\text{f}$
Input	5.5	$\mu\text{f}$
Output	7.0	$\mu\text{f}$
Maximum Overall Length		4-1/8"
Maximum Seated Height		3-9/16"
Maximum Diameter		1-9/16"
Bulb		ST-12
Base		Small Shell Octal 7-Pin
Pin 1—No Connection		Pin 5—Grid
Pin 2—Heater		Pin 7—Heater
Pin 3—Plate		Pin 8—Cathode
Pin 4—Screen		
Mounting Position	BOTTOM VIEW (G-7S)	Any



Maximum Ratings Are Design-Center Values

## AMPLIFIER — Pentode Connection

Plate Voltage	300	max. volts
Screen Voltage	300	max. volts
Plate Dissipation	2.75	max. watts
Screen Dissipation	0.75	max. watt
D-C Heater-Cathode Potential	90	max. volts

Typical Operation and Characteristics — Class A<sub>1</sub> Amplifier:

Plate Voltage	135	180	volts
Screen Voltage	135	180	volts
Grid Voltage*	-6	-9	volts
Peak A-F Grid Voltage	6	9	volts
Zero-Sig. Plate Cur.	11.5	15	ma.
Zero-Sig. Screen Cur.	2	2.5	ma.
Plate Resistance	0.170	0.175	megohm
Transconductance	2100	2300	$\mu\text{mhos}$
Load Resistance	12000	10000	ohms
Total Harmonic Dist.	7.5	10	%
Max.-Sig. Power Output	0.6	1.1	watts

AMPLIFIER — Triode Connection<sup>▲</sup>

Plate Voltage	300	max. volts
Plate Dissipation	3.5	max. watts
D-C Heater-Cathode Potential	90	max. volts

Typical Operation and Characteristics — Class A<sub>1</sub> Amplifier:

Plate Voltage	180	volts
Grid Voltage*	-12	volts
Peak A-F Grid Voltage	12	volts
Amplification Factor	9.5	
Plate Resistance	4750	ohms
Transconductance	2000	$\mu\text{mhos}$
Plate Current	11	ma.

← Indicates a change.

<sup>o</sup>, <sup>▲</sup>, \* : See next page.

APRIL 1, 1944

RCA VICTOR DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

DATA

6G6-G



6G6-G

## POWER AMPLIFIER PENTODE

(continued from preceding page)

Load Resistance	12000	ohms
Total Harmonic Distortion	5	%
Max.-Sig. Power Output	0.25	watt

° with no external shield.

\* Under maximum rated conditions, the d-c resistance in the grid circuit may be as high as 0.5 megohm with cathode bias or 0.1 megohm with fixed bias.

▲ with screen connected to plate.

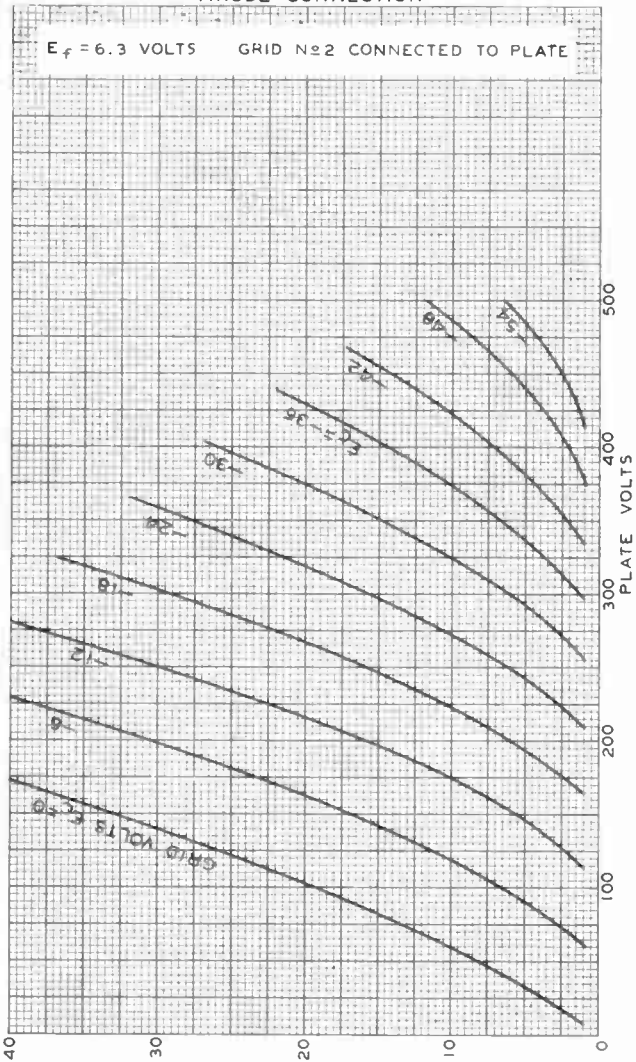


6G6-G

# AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION

6G6-G

$E_f = 6.3$  VOLTS      GRID No 2 CONNECTED TO PLATE



AUG. 12, 1943

PLATE MILLIAMPERES  
RCA VICTOR DIVISION  
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY  
World Radio History

92CM-6122R1

6G6-G



# 6G6-G AVERAGE PLATE CHARACTERISTICS PENTODE CONNECTION

$E_f = 6.3$  VOLTS

SCREEN VOLTS = 180

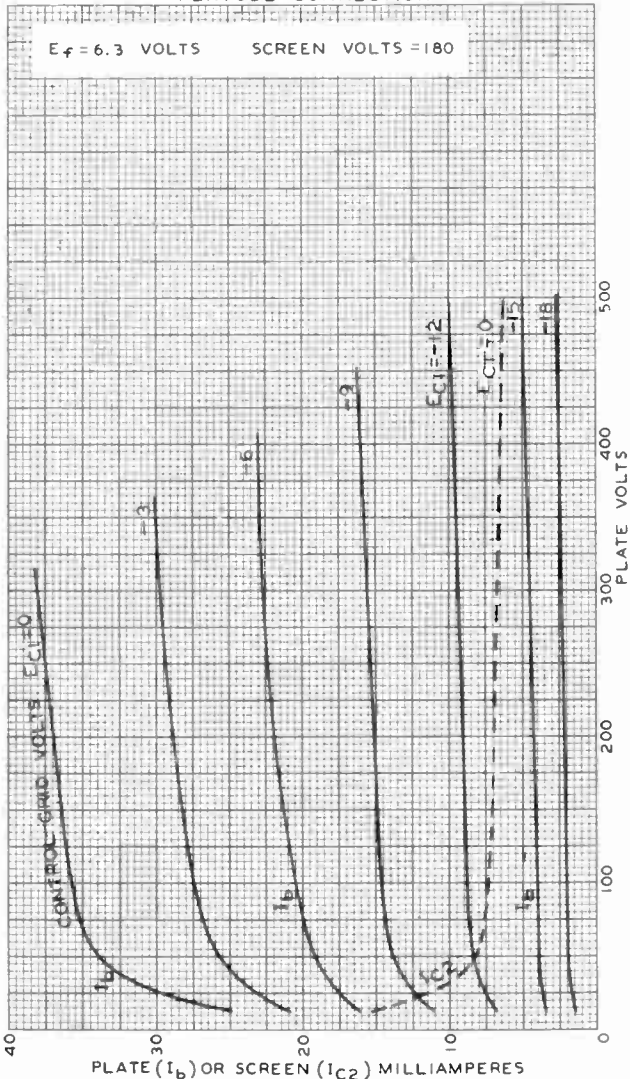


PLATE ( $I_b$ ) OR SCREEN ( $I_{c2}$ ) MILLIAMPERES

AUG. 19, 1943

RCA VICTOR DIVISION

92CM-4956R1

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

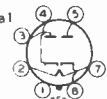
World Radio History

6H6  
6H6-GT/G

## 6H6, 6H6-GT/G

## TWIN DIODE

Heater		Coated Unipotential Cathodes	
Voltage	6.3	a-c or d-c volts	
Current	0.3	amp.	
	6H6	6H6-GT/G	
Direct Interelectrode Cap. <sup>o</sup>			
Plate #1 to Cathode #1	3.0	3.0	μf
Plate #2 to Cathode #2	3.4	4.0	μf
Plate #1 to Plate #2	0.10 max.	0.10 max.	μf
Maximum Overall Length	1-3/4"	3-5/16"	
Maximum Seated Height	1-3/16"	2-3/4"	
Maximum Diameter	1-5/16"	1-5/16"	
Bulb	Metal Shell MT-8	T-9	
Base	{ Small Wafer { Octal 7-Pin	{ Intermed. Shell { Octal 7-Pin	
Basing Designation	70	G-7Q	
Pin 1	{ 6H6, Shell { 6H6-GT/G, Internal shield	Pin 4 - Cathode #2	
Pin 2 - Heater		Pin 5 - Plate #1	
Pin 3 - Plate #2		Pin 7 - Heater	
RCA Socket		Pin 8 - Cathode #1	
Mounting Position		Stock No. 9924	←
		Any	



BOTTOM VIEW

Maximum Ratings Are Design-Center Values

## RECTIFIER OR DOUBLER

Peak Inverse Voltage		420 max. volts	←
Peak Plate Current per Plate		48 max. ma.	←
D-C Heater-Cathode Potential		330 max. volts	←
As Half-Wave Rectifier: <sup>o</sup>			←
A-C Plate Voltage per Plate (RMS)	117	150 max. volts	
Total Effect. Plate-Supply Impedance per Plate <sup>Δ</sup>	15 min.	40 min. ohms	
D-C Output Current per Plate	8 max.	8 max. ma.	
As Voltage Doubler: <sup>o</sup>			←
	Half-Wave	Full-Wave	
A-C Plate Voltage per Plate (RMS)	117	117	volts
Total Effect. Plate-Supply Impedance per Plate <sup>Δ</sup>	30 min.	15 min. ohms	
D-C Output Current	8 max.	8 max. ma.	

- <sup>o</sup> With shell or external and internal shields connected to cathodes.  
<sup>Δ</sup> In half-wave service, the two units may be used separately or in parallel.  
<sup>Δ</sup> When a filter-input condenser larger than 40 μf is used, it may be necessary to use more plate-supply impedance than the minimum value shown to limit the peak plate current to the rated value.

Circuits for the 6H6 and 6H6-GT/G are the same as those shown under Type 25Z5.

← Indicates a change.

AUG. 1, 1942

RCA RADOTRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

DATA

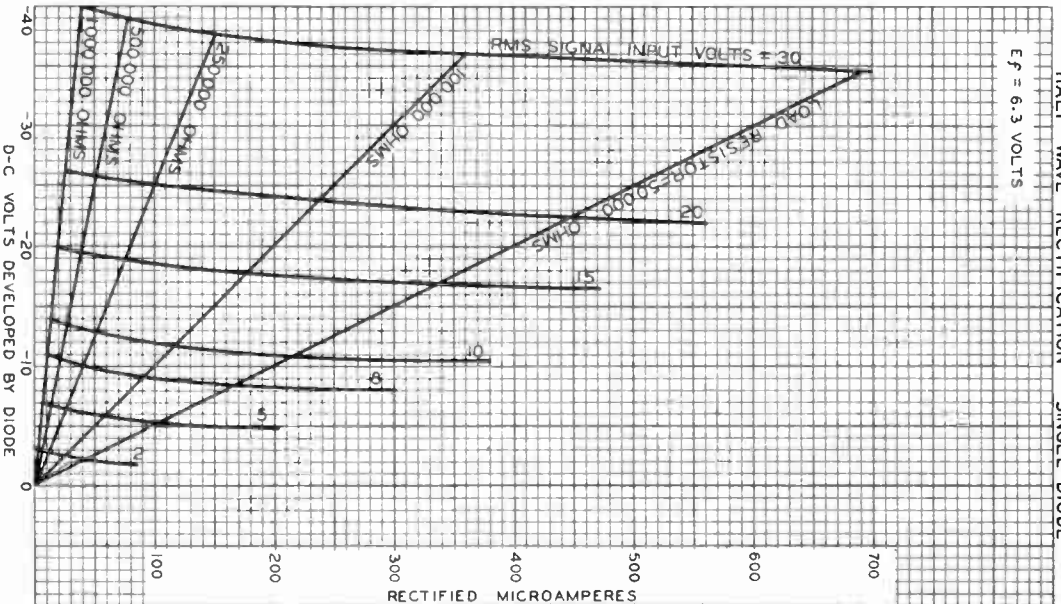
6H6



6H6

# AVERAGE CHARACTERISTICS HALF-WAVE RECTIFICATION - SINGLE DIODE

$E_f = 6.3$  VOLTS



JULY 26, 1935

RCA RADIONTRON DIVISION  
RCA MANUFACTURING COMPANY INC.

92C-4446



6J5  
6J5-GT

# 6J5, 6J5-GT MEDIUM-MU TRIODE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

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

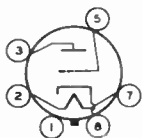
	6J5	6J5-GT	
Direct Interelectrode Cap. (Approx.):	-	▲▲	
Grid to Plate. . . . .	3.4	3.8	μuf
Grid to Cathode. . . . .	3.4	4.2	μuf
Plate to Cathode. . . . .	3.6	5.0	μuf

▲▲ with No. 308 shield connected to cathode.

### Mechanical:

Mounting Position. . . . .	Any	Any
Maximum Overall Length. . . . .	2-5/8"	3-5/16"
Maximum Seated Height. . . . .	2-1/16"	2-3/4"
Maximum Diameter. . . . .	1-5/16"	1-5/16"
Bulb. . . . .	Metal Shell, MT8G	T-9
Base. . . . .	{ Small-Wafer Octal 6-Pin	{ Sm.-Wafer Octal 6-Pin, Sleeve
Basing Designation for BOTTOM VIEW	6Q	GT-6Q

- Pin 1 { 6J5, Shell  
6J5-GT, Base  
Sleeve
- Pin 2 - Heater



- Pin 3 - Plate
- Pin 5 - Grid
- Pin 7 - Heater
- Pin 8 - Cathode

### AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	300 max.	volts
GRID VOLTAGE. . . . .	0 max.	volts
CATHODE CURRENT. . . . .	20 max.	ma
PLATE DISSIPATION. . . . .	2.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	90 max.	volts
Heater positive with respect to cathode.	90 max.	volts

### Typical Operation and Characteristics:

Plate Voltage. . . . .	90	250	volts
Grid Voltage. . . . .	0	-8	volts
Amplification Factor. . . . .	20	20	-
Plate Resistance. . . . .	6700	7700	ohms
Transconductance. . . . .	3000	2600	μmhos
Plate Current. . . . .	10	9	ma

6J5  
6J5-GT



# 6J5, 6J5-GT MEDIUM-MU TRIODE

### Maximum Circuit Values:

Grid-Circuit Resistance. . . . . 1.0 max. megohm

### Typical Operation as Resistance-Coupled Amplifier:

*See RESISTANCE-COUPLED AMPLIFIER CHART  
at the front of this Section.*

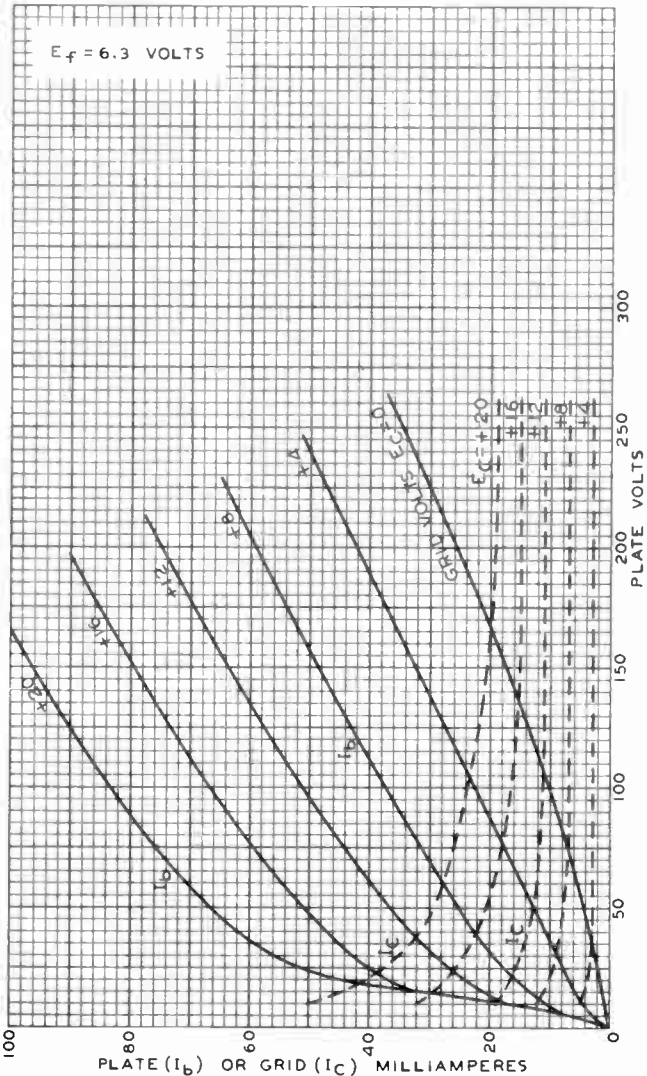




6J5

6J5

### AVERAGE PLATE CHARACTERISTICS



AUG. 10, 1943

TUBE DEPARTMENT

92CM-6448

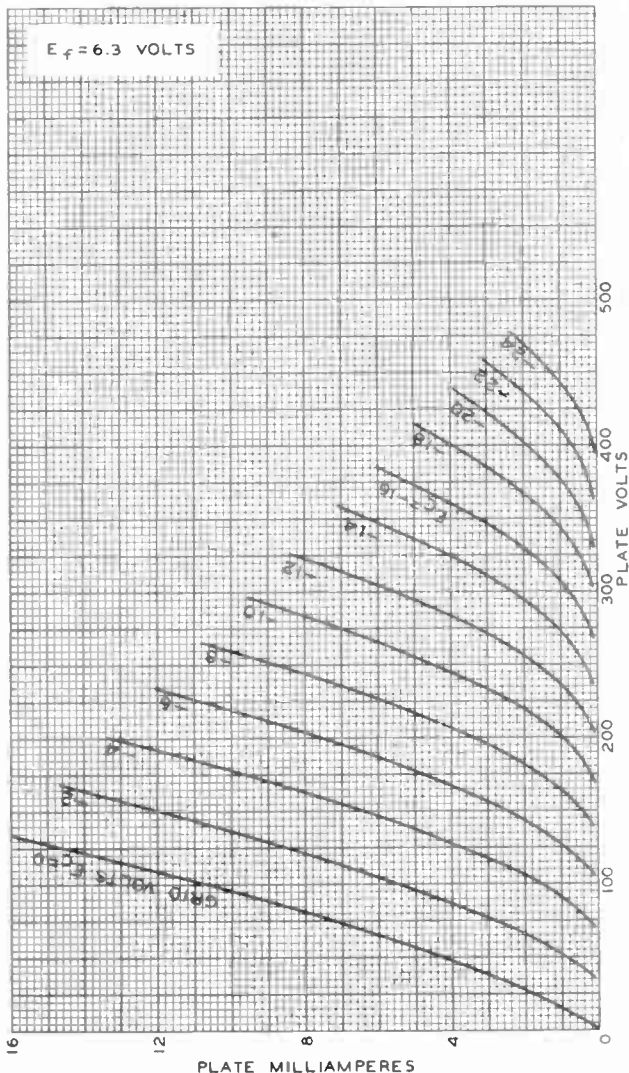
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

6J5



6J5

# AVERAGE PLATE CHARACTERISTICS



APRIL 27, 1943

TUBE DEPARTMENT

92CM-4771R1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History



6J6

6J6

# MEDIUM-MU TWIN TRIODE

MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater for Unipotential Cathode:

Voltage. . . . .	6.3	. . . . .	ac or dc volts
Current. . . . .	0.45	. . . . .	amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield <sup>o</sup>	
<i>Unit No. 1</i>			
Grid to plate. . . . .	1.6	1.5	$\mu\text{f}$
Grid to cathode and heater . . . . .	2.2	2.6	$\mu\text{f}$
Plate to cathode and heater . . . . .	0.4	1.6	$\mu\text{f}$
<i>Unit No. 2</i>			
Grid to plate. . . . .	1.6	1.5	$\mu\text{f}$
Grid to cathode and heater . . . . .	2.2	2.6	$\mu\text{f}$
Plate to cathode and heater . . . . .	0.4	1.0	$\mu\text{f}$

### Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):

Plate Voltage. . . . .	100	volts
Cathode-Bias Resistor <sup>■</sup> . . . . .	50 $\blacklozenge$	ohms
Amplification Factor . . . . .	38	
Plate Resistance . . . . .	7100	ohms
Transconductance . . . . .	5300	$\mu\text{hos}$
Plate Current. . . . .	8.5	ma

### Mechanical:

Mounting Position. . . . . Any

Maximum Overall Length . . . . . 2-1/8"

Maximum Seated Length. . . . . 1-7/8"

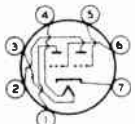
Length, Base Seat to Bulb Top (Excluding tip). 1-1-2"  $\pm$  3/32"

Maximum Diameter . . . . . 3/4"

Bulb . . . . . T-5-1/2

Base . . . . . Small-Button Miniature 7-Pin (JETEC No. E7-1)

Basing Designation for BOTTOM VIFW . . . . . 7BF

Pin 1 - Plate of Unit No. 2		Pin 5 - Grid of Unit No. 1
Pin 2 - Plate of Unit No. 1		Pin 6 - Grid of Unit No. 2
Pin 3 - Heater		Pin 7 - Cathode
Pin 4 - Heater		

<sup>o</sup> with external shield JETEC No. 316 connected to cathode.

<sup>■</sup> Fixed-bias operation is not recommended.

$\blacklozenge$  value is for both units operating at the specified conditions.

← Indicates a change.

MAR. 1, 1955

DATA

6J6



6J6

## MEDIUM-MU TWIN TRIODE

### AMPLIFIER - Class A<sub>1</sub>

Values are for Each Unit

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

PLATE VOLTAGE . . . . .	300 max.	volts
GRID VOLTAGE:		
Positive bias value . . . . .	0 max.	volts
PLATE DISSIPATION . . . . .	1.5 max.	watts
→ PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	100 max.	volts
Heater positive with respect to cathode. . . . .	100 max.	volts

#### Maximum Circuit Values (For maximum rated conditions):

Grid-Circuit Resistance:		
For cathode-bias operation . . . . .	0.5 max.	megohm

### RF POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

Key-down conditions per tube without modulation

Values are for Each Unit

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

DC PLATE VOLTAGE . . . . .	300 max.	volts
DC GRID VOLTAGE:		
Negative bias value . . . . .	-40 max.	volts
Positive bias value . . . . .	0 max.	volts
DC PLATE CURRENT . . . . .	15 max.	ma
DC GRID CURRENT . . . . .	8 max.	ma
DC PLATE INPUT . . . . .	4.5 max.	watts
PLATE DISSIPATION . . . . .	1.5 max.	watts
→ PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	100 max.	volts
Heater positive with respect to cathode. . . . .	100 max.	volts

#### Typical Push-Pull Operation at Frequencies up to 50 Mc.\*

Values are for Both Units

DC Plate Voltage . . . . .	150	volts
DC Grid Voltage:		
From a fixed supply of . . . . .	-10	volts
From a grid resistor of . . . . .	625	ohms
From a cathode resistor of . . . . .	220	ohms
DC Plate Current . . . . .	30	ma
DC Grid Current (Approx.)* . . . . .	16	ma
Driving Power (Approx.)* . . . . .	0.35	watt
Useful Power Output (Approx.). . . . .	3.5	watts

\* Approximately 1.0 watt can be obtained when the 6J6 is used at 250 Mc as a push-pull oscillator with a plate voltage of 150 volts, with maximum rated plate dissipation, and with a grid resistor of 2000 ohms common to both units.

\* For effect of load resistance on grid current and driving power, refer to TUBE RATINGS-Grid Current and Driving Power in the General Section.

→ Indicates a change.

MAR. 1, 1955

TUBE DIVISION

DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

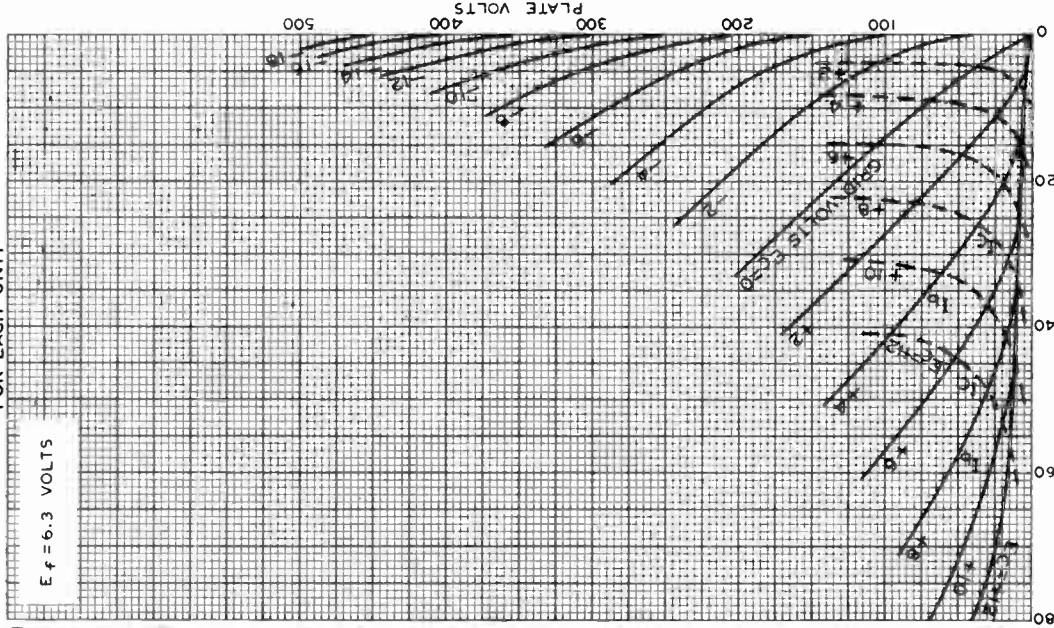
World Radio History



6J6

# AVERAGE PLATE CHARACTERISTICS FOR EACH UNIT

$E_f = 6.3$  VOLTS



9J6

OCT. 21, 1944

RCA VICTOR DIVISION

RAD O CORPORATION OF AMERICA HARTFORD, NEW HAVEN

PLATE ( $I_b$ ) OR GRID ( $I_c$ ) MILLIAMPERES

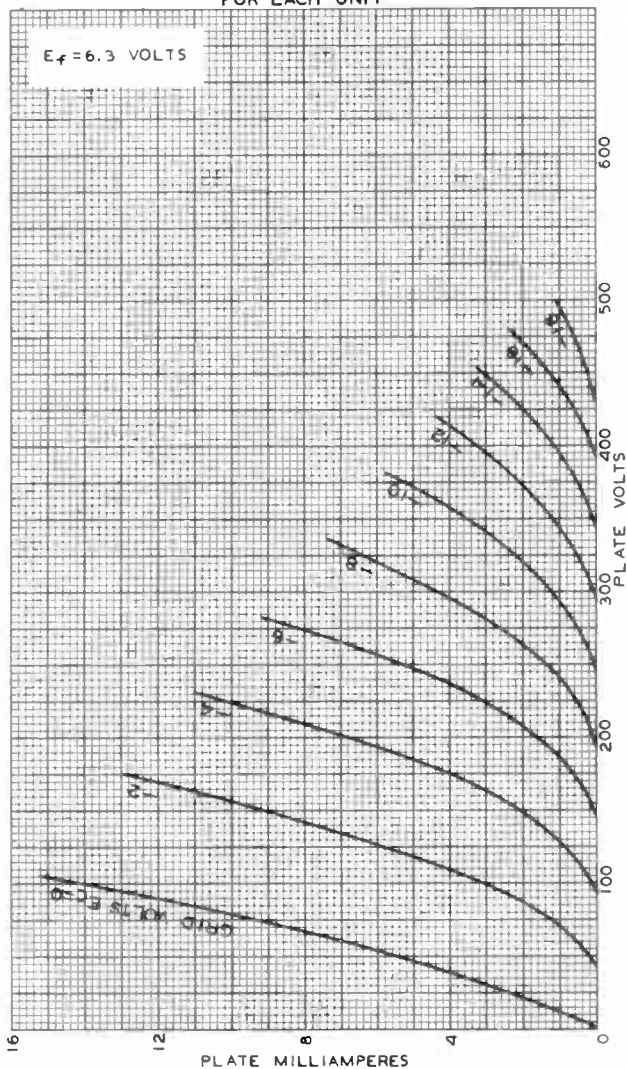
92CM-6403RI

6J6



6J6

# AVERAGE PLATE CHARACTERISTICS FOR EACH UNIT



SEPT. 20, 1944

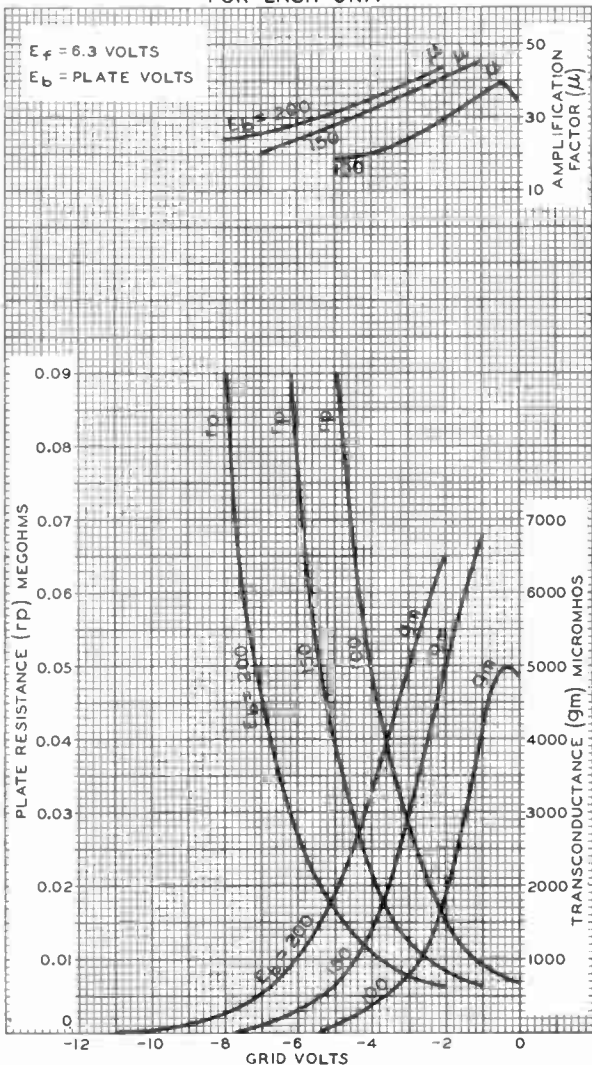
RCA VICTOR DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6402RI



6J6

# 6J6 AVERAGE CHARACTERISTICS FOR EACH UNIT









6J7  
6J7-G  
6J7-GT

# 6J7, 6J7-G, 6J7-GT SHARP-CUTOFF PENTODE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

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

Direct Interelectrode Capacitances:

	6J7 <sup>▲</sup>	6J7-G	6J7-GT	
<b>Pentode Connection:</b>				
Grid No. 1 to Plate	0.005 max.	0.007 max. ●	0.005 max. ●	111pF
Input . . . . .	7 . .	4.6 ● . .	4.6 ● . .	144pF
Output . . . . .	12 . .	12 ● . .	12 ● . .	144pF
<b>Triode Connection:*</b>				
Grid No. 1 to Plate	2 . .	1.8 <sup>□</sup> . .	1.8 <sup>□</sup> . .	144pF
Grid No. 1 to Cath.	5 . .	2.6 <sup>□</sup> . .	2.6 <sup>□</sup> . .	144pF
Plate to Cathode.	14 . .	17 <sup>□</sup> . .	17 <sup>□</sup> . .	144pF

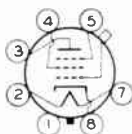
### Mechanical:

Mounting Position . .	Any	Any	Any
Max. Overall Length .	3-1/8"	4-15/32"	3-5/16"
Seated Length . . .	2-7/16" ± 1/8"	3-3/4" ± 5/32"	{ 2-5/16" to 2-3/4" }
Maximum Diameter. . .	1-5/16"	1-9/16"	1-5/16"
Bulb . . . . .	{ Metal Shell MTTBA }	ST-12	T-9
Cap . . . . .	Miniature	{ Skirted Miniature }	{ Skirted Miniature }
Base . . . . .	{ Small-Wafer Octal 7-Pin }	{ Small-Shell Octal 7-Pin }	{ Small-Wafer Octal 7-Pin, Sleeve }
Basing Designation	7R	G-7R	GT-7R

### BOTTOM VIEW

Pin 1 { 5J7 - Shell  
6J7-G - Internal  
Shield  
6J7-GT - Base  
Sleeve

Pin 2 - Heater  
Pin 3 - Plate



Pin 4 - Grid No. 2  
Pin 5 - Grid No. 3  
Pin 7 - Heater  
Pin 8 - Cathode

Cap - Grid No. 1

### AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	125 max.	volts
GRID-No.2 SUPPLY VOLTAGE . . . . .	300 max.	volts
PLATE DISSIPATION . . . . .	0.75 max.	watt
GRID-No.2 DISSIPATION . . . . .	0.1 max.	watt

(continued on next page)

- ▲ with shell connected to cathode.      □ without external shield.
- with external shield connected to cathode.
- \* with grid No. 2 and grid No. 3 connected to plate.

6J7  
6J7-G  
6J7-GT



# 6J7, 6J7-G, 6J7-GT SHARP-CUTOFF PENTODE

<b>GRID-No.1 (CONTROL-GRID) VOLTAGE:</b>		
Positive bias value. . . . .	0	max. volts
<b>PEAK HEATER-CATHODE VOLTAGE:</b>		
Heater negative with respect to cathode. .	90	max. volts
Heater positive with respect to cathode. .	90	max. volts

**Typical Operation and Characteristics:**

Plate Voltage. . . . .	100	250	..	volts
Grid No.3 (Suppressor) .	Connected to cathode at socket			
Grid-No.2 Voltage. . . . .	100	100	..	volts
Grid-No.1 Voltage. . . . .	-3	-3	..	volts
Plate Resistance (Approx.) . . . . .	1	#	..	megohm
Transconductance . . . . .	1185	1225	..	μmhos
Grid-No.1 Bias (Approx.) for cathode-current cutoff. . .	-7	-7	..	volts
Plate Current. . . . .	2	2	..	ma
Grid-No.2 Current. . . . .	0.5	0.5	..	ma

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance . . . . .	1	max. megohm
--	---	-------------

AMPLIFIER - Class A<sub>1</sub>

*Triode Connection - Grids No.2 & No.3 Connected to Plate*

**Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE. . . . .	250	max. volts
PLATE DISSIPATION (Total). . . . .	1.75	max. watts
<b>GRID-No.1 VOLTAGE:</b>		
Positive bias value. . . . .	0	max. volts
<b>PEAK HEATER-CATHODE VOLTAGE:</b>		
Heater negative with respect to cathode. .	90	max. volts
Heater positive with respect to cathode. .	90	max. volts

**Typical Operation and Characteristics:**

Plate Voltage. . . . .	180	250	..	volts
Grid-No.1 Voltage. . . . .	-5.3	-8	..	volts
Amplification Factor . . . . .	20	20		
Plate Resistance (Approx.) . . . . .	11000	10500	..	ohms
Transconductance . . . . .	1800	1900	..	μmhos
Plate Current. . . . .	5.3	6.5	..	ma

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance . . . . .	1	max. megohm
--	---	-------------

BIASED DETECTOR

**Typical Operation:**

Plate-Supply Voltage. . . . .	100	100	250	250	volts
Grid No.3. . . . .	Connected to cathode at socket				
Grid-No.2 Voltage. . . . .	12	30	50	100	volts
RF Grid-No.1 Volts (RMS)*	1.05	1.6	1.18	1.37	volts

#, ♦, \* : See next page.



6J7  
6J7-G  
6J7-GT

## 6J7, 6J7-G, 6J7-GT SHARP-CUTOFF PENTODE

Cathode-Bias Resistor.	16000	10000	3000	10000	ohms
Zero-Sig. Cathode Cur.	0.063	0.183	0.65	0.43	ma
Plate Resistor . . . .	1.0	0.25	0.25	0.5	megohm
Blocking Capacitor . .	0.01	0.01	0.3	0.3	$\mu$ f
Grid Resistor* . . . .	1.0	0.5	0.25	0.25	megohm

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance . . . . . 1 max. megohm

\* Greater than 1 megohm.

♦ Voltage at plate will be "Plate-Supply" voltage minus voltage drop in plate resistor caused by plate current.

▲ With these signal values modulated 20%, the voltage output under each set of conditions is 17 peak volts at the grid of the following amplifier. This value is sufficient to insure full audio output from a 6F6 (class A pentode) at 250 volts on plate.

● For the following amplifier tube.

For additional data, see *RESISTANCE-COUPLED AMPLIFIER CHARTS* at the front of this Section.

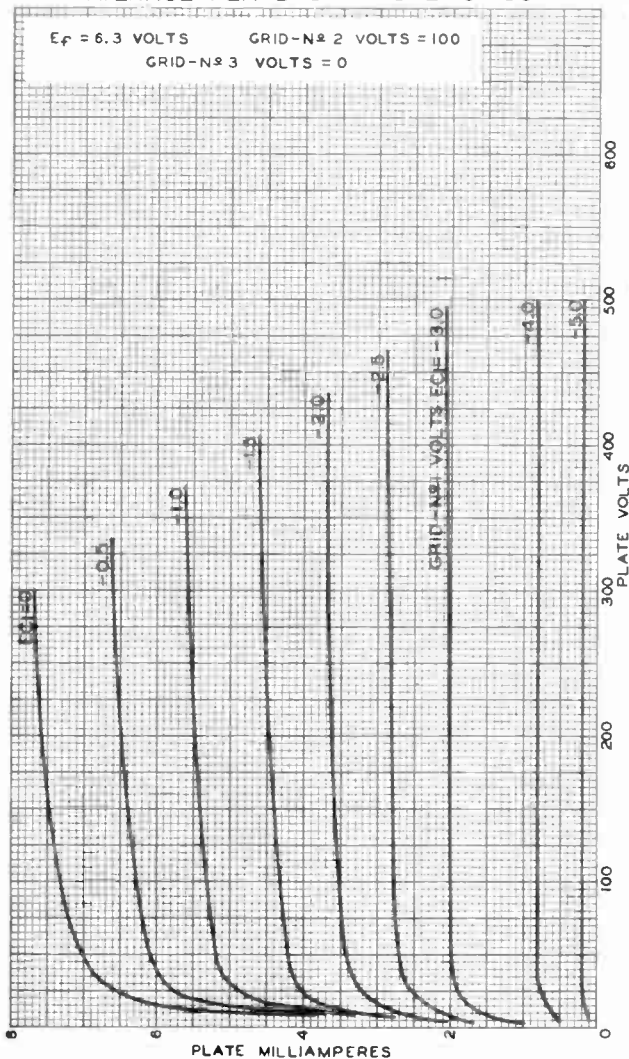
6J7



6J7

### AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS      GRID-N<sup>o</sup> 2 VOLTS = 100  
GRID-N<sup>o</sup> 3 VOLTS = 0



MAY 12, 1948

TUBE DEPARTMENT

92CM-4741R2

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

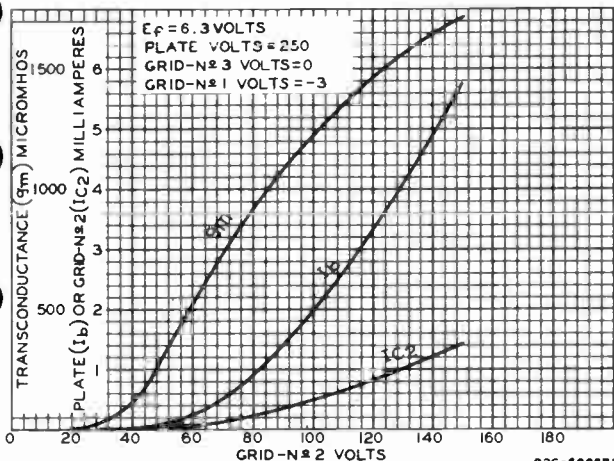
World Radio History



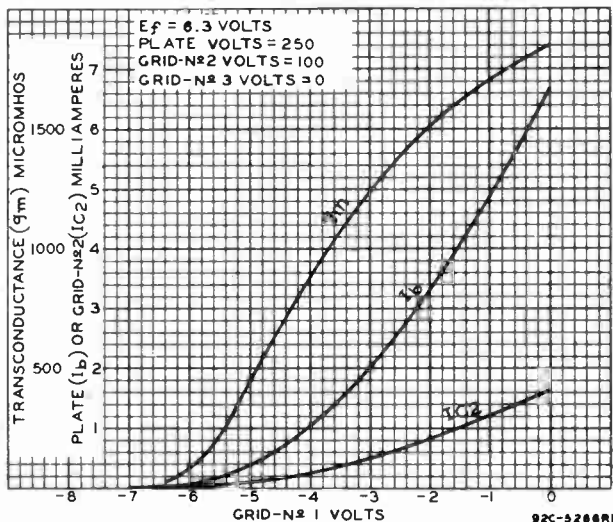
6J7

6J7

## AVERAGE CHARACTERISTICS



## AVERAGE CHARACTERISTICS



MAY 18, 1948

 TUBE DEPARTMENT  
 RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6007R1

6J7

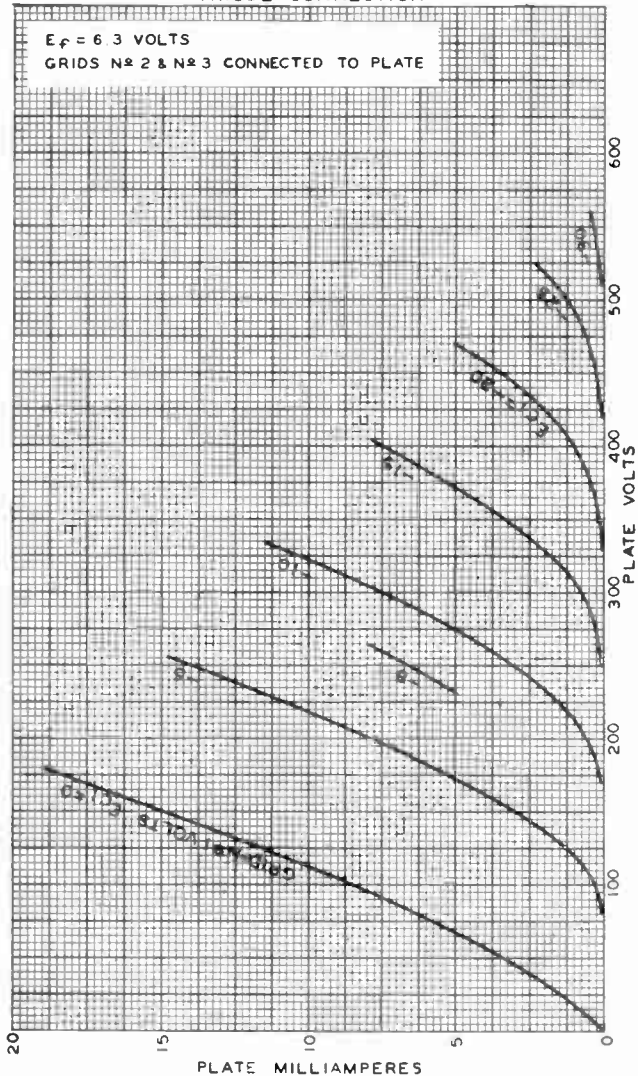


6J7

# AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION

$E_f = 6.3$  VOLTS

GRIDS N<sup>o</sup> 2 & N<sup>o</sup> 3 CONNECTED TO PLATE



MAY 11, 1948

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-4842RI



6K6-GT

6K6-GT

# POWER PENTODE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	. . . . .	ac or dc volts
Current . . . . .	0.4	. . . . .	amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

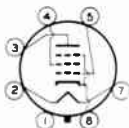
Grid No.1 to plate. . . . .	0.5	$\mu$ f
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	5.5	$\mu$ f
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	6	$\mu$ f

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length. . . . .	3-5/16"
Maximum Seated Length . . . . .	2-3/4"
Maximum Diameter. . . . .	1-9/32"
Dimensional Outline . . . . .	See General Section

Eult. . . . .	T-9
Base. . . . .	Intermediate-Shell Octal 7-Pin (JETEC No. E7-7), Short Intermediate-Shell Octal 7-Pin with External Barriers (JETEC No. E7-59), Intermediate-Shell Octal 6-Pin (JETEC No. E6-81), or Short Intermediate-Shell Octal 6-Pin with External Barriers (JETEC No. B6-84)
Easing Designation for BOTTOM VIEW . . . . .	7S

Pin 1  $\blacklozenge$  - No Connection  
 Pin 2 - Heater  
 Pin 3 - Plate  
 Pin 4 - Grid No.2



Pin 5 - Grid No.1  
 Pin 7 - Heater  
 Pin 8 - Cathode,  
 Grid No.3

## AF POWER AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	315 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	285 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value . . . . .	0 max.	volts
GRID-No.2 INPUT . . . . .	2.8 max.	watts
PLATE DISSIPATION . . . . .	8.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	volts

<sup>0</sup> without external shield.

$\blacklozenge$  Pin 1 as well as pin 6 is omitted on the 6-Pin bases.

<sup>▲</sup>: See next page.

← Indicates a change.



6K6-GT

## POWER PENTODE

## Typical Operation and Characteristics:

Plate Voltage . . . . .	100	250	315	volts
Grid-No.2 Voltage . . . . .	100	250	250	volts
Grid-No.1 Voltage . . . . .	-7	-18	-21	volts
Peak AF Grid-No.1 Voltage . .	7	18	21	volts
Zero-Signal Plate Current . .	9	32	25.5	ma
Max.-Signal Plate Current . .	9.5	33	28	ma
Zero-Signal Grid-No.2 Current . . . . .	1.6	5.5	4	ma
Max.-Signal Grid-No.2 Current . . . . .	3	10	9	ma
Plate Resistance (Approx.) . .	104000	90000	110000	ohms
Transconductance . . . . .	1500	2300	2100	μmhos
Load Resistance . . . . .	12000	7600	9000	ohms
Total Harmonic Distortion . .	11	11	15	%
Max.-Signal Power Output . . .	0.35	3.4	4.5	watts

## Maximum Circuit Values:

## Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohms
For cathode-bias operation . . . . .	0.5 max.	megohms

PUSH-PULL AF POWER AMPLIFIER - Class A<sub>1</sub>

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	315 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	285 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value . . . . .	0 max.	volts
GRID-No.2 INPUT . . . . .	2.8 max.	watts
PLATE DISSIPATION . . . . .	8.5 max.	watts
→ PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup> max.	volts

## Typical Operation:

Values are for 2 tubes

	Fixed Bias	Cathode Bias	
Plate Voltage . . . . .	285	285	volts
Grid-No.2 Voltage . . . . .	285	285	volts
Grid-No.1 Voltage . . . . .	-25.5	-	volts
Cathode Resistor . . . . .	-	400	ohms
Peak AF Grid-No.1-to-			
Grid-No.1 Voltage . . . . .	51	51	volts
Zero-Signal Plate Current . .	55	55	ma
Max.-Signal Plate Current . .	72	71	ma
Zero-Signal Grid-No.2 Current . . . . .	9	9	ma
Max.-Signal Grid-No.2 Current . . . . .	17	15	ma

▲: See next page.

→ Indicates a change.





6K6-GT

6K6-GT

## POWER PENTODE

	Fixed Bias	Cathode Bias	
Effective Load Resistance (Plate to plate) . . . . .	12000	12000	ohms
Total Harmonic Distortion . .	6	4	%
Max.-Signal Power Output. . .	10.5	9.8	watts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:			
For fixed-bias operation. . . . .		0.1 max.	megohm
For cathode-bias operation. . . . .		0.5 max.	megohm

**AF POWER AMPLIFIER - Class A<sub>1</sub>***Triode Connection - Grid No.2 Connected to Plate***Characteristics:**

Plate Voltage . . . . .	250	volts
Grid-No.1 Voltage . . . . .	-18	volts
Amplification Factor. . . . .	6.8	
Plate Resistance (Approx.) . . . . .	2500	ohms
Transconductance. . . . .	2700	μmhos
Plate Current . . . . .	37.5	ma
Grid-No.1 Voltage (Approx.) for plate current of 0.5 ma . . . . .	-48	volts

**VERTICAL DEFLECTION AMPLIFIER***Triode Connection - Grid No.2 Connected to Plate***Maximum Ratings, Design-Center Values Except as Noted:***For operation in a 525-line, 30-frame system<sup>D</sup>*

DC PLATE VOLTAGE. . . . .	315 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum) <sup>#</sup> . . . . .	1200 <sup>■</sup> max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE . .	-250 max.	volts
CATHODE CURRENT:		
Peak. . . . .	75 max.	ma
Average . . . . .	25 max.	ma
PLATE DISSIPATION . . . . .	7 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup> max.	volts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:		
For cathode-bias operation. . . . .	2.2 max.	megohms

▲ The dc component must not exceed 100 volts.

□ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

# This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 percent of one vertical scanning cycle is 2.5 milliseconds.

■ Under no circumstances should this absolute value be exceeded.

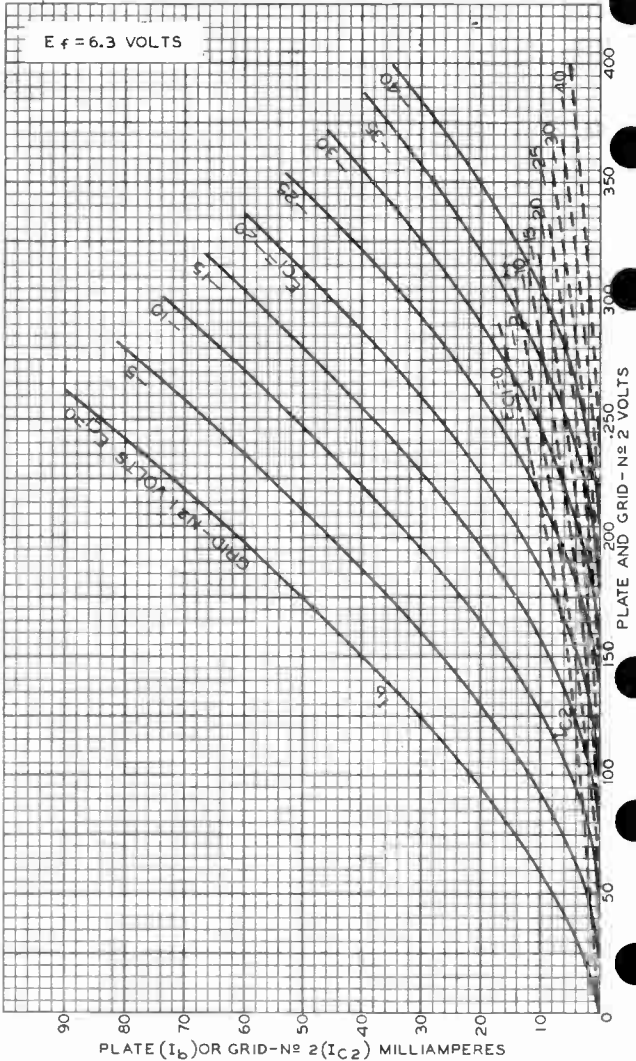
← Indicates a change.

6K6-GT



6K6-GT

AVERAGE CHARACTERISTICS



TUBE DIVISION

92CM-5209R2

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

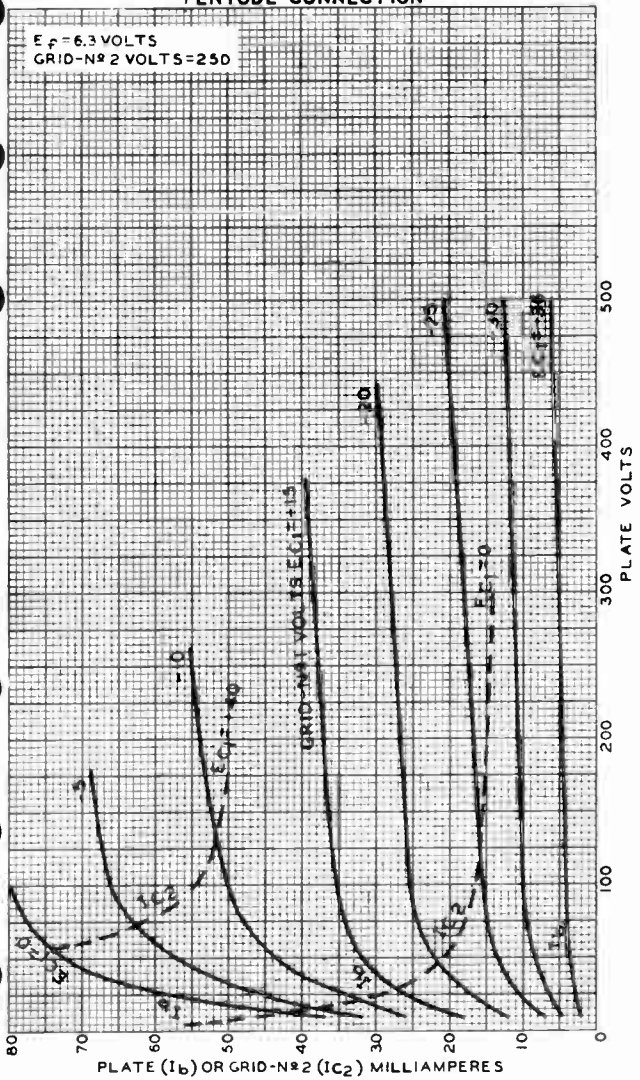


6K6-GT

6K6-GT

# AVERAGE PLATE CHARACTERISTICS PENTODE CONNECTION

$E_f = 6.3$  VOLTS  
GRID-N<sup>o</sup> 2 VOLTS = 250



FEB. 13, 1948

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-4881R2

6K6-GT

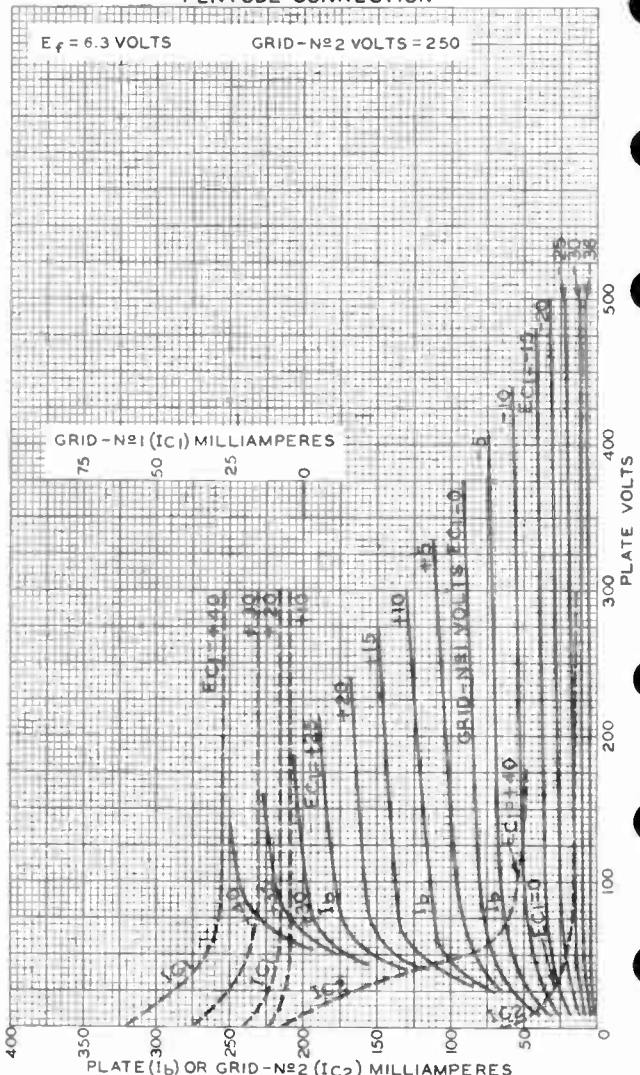


6K6-GT

### AVERAGE PLATE CHARACTERISTICS PENTODE CONNECTION

$E_f = 6.3$  VOLTS

GRID- $N^{\circ}2$  VOLTS = 250



FEB. 13, 1948

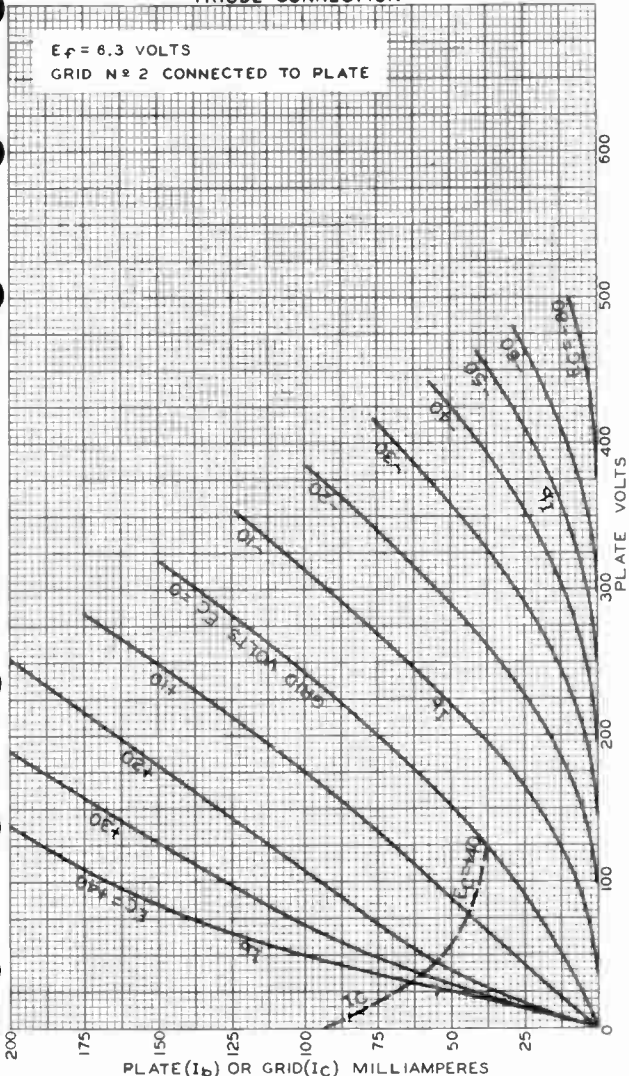
TUBE DEPARTMENT

92CM-6311R1



6K6-GT

# 6K6-GT AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION



AUG. 18, 1941

TUBE DEPARTMENT

92CM-6313

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

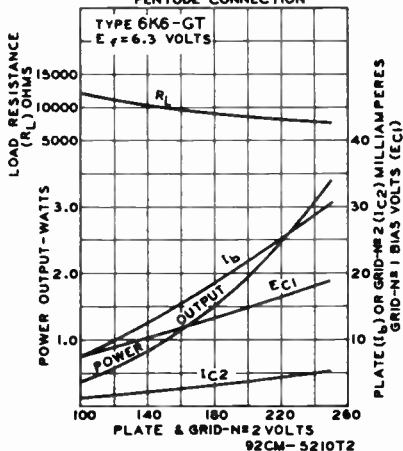
World Radio History

6K6-GT

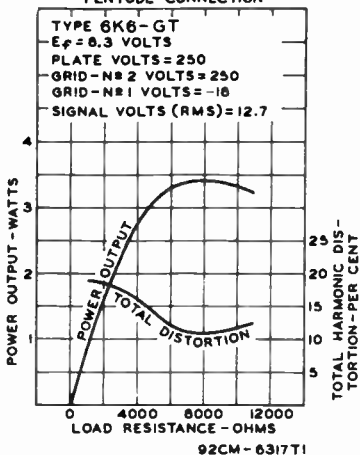


# 6K6-GT POWER PENTODE

OPERATION CHARACTERISTICS  
PENTODE CONNECTION



OPERATION CHARACTERISTICS  
PENTODE CONNECTION



OCTOBER 1, 1951

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

CE-5210T2 - 6317T1

World Radio History



6K7  
6K7-G  
6K7-GT  
★

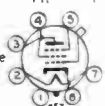
# 6K7, 6K7-G, 6K7-GT

## TRIPLE-GRID SUPER-CONTROL AMPLIFIER

Heater <sup>■</sup> Coated Unipotential Cathode  
 Voltage 6.3 a-c or d c volts  
 Current 0.3 amp.

	6K7	6K7-G	6K7-GT
Direct Interelectrode Cap.	▲	▲▲	▲▲
Grid to Plate	0.005	0.007	0.005 $\mu\text{f}$
Input	7	5	4.6 $\mu\text{f}$
Output	12	12	12 $\mu\text{f}$
Overall Length	{ 3-1/8" max.	{ 4-7/32" to 4-15/32"	3-5/16" max.
Seated Height	{ 2 9/16" max.	{ 3-21/32" to 3-29/32"	2-3/4" max.
Maximum Diameter	1-5/16"	1-9/16"	1-5/16"
Bulb	Metal Shell, MT-8	ST-12	T-9
Cap	Miniature	{ Skirted Min. Style C	{ Skirted Min. Style C
Base	{ Small Wafer Octal 7-Pin	{ Small Shell Octal 7-Pin	{ Sm. Wafer Octal 7-Pin, Sleeve
Basing Designation	7R	G-7R	GT-7R

Pin 1 { 6K7, Shell  
 6K7-G, No Con.  
 6K7-GT, Base Sleeve  
 Pin 2 - Heater  
 Pin 3 - Plate



Pin 4 - Screen  
 Pin 5 - Suppressor  
 Pin 7 - Heater  
 Pin 8 - Cathode  
 Cap - Grid

Mounting Position **BOTTOM VIEW** Any  
**AMPLIFIER**

Plate Voltage	300 max.	volts
Screen Voltage	125 max.	volts
Screen Supply Voltage	300 max.	volts
Grid Voltage	0 min.	volts
Plate Dissipation	2.75 max.	watts
Screen Dissipation	0.35 max.	watt

**Typical Operation and Characteristics - Class A<sub>1</sub> Amplifier:**

Plate	100	250	250	volts
Screen	100	100	125	volts
Grid	-1	-3	-3	volts
Suppressor	Connected to cathode at socket			
Plate Res.	0.15	0.8	0.6	approx. megohm
Transcond.	1650	1450	1650	$\mu\text{mhos}$
Grid Bias for transcond.				
of approx. 2 $\mu\text{mhos}$	-38.5	-42.5	-52.5	volts
Plate Cur.	9.5	7.0	10.5	ma.
Screen Cur.	2.7	1.7	2.6	ma.

- In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
- ▲ with shell connected to cathode.
- ▲▲ with close-fitting shield connected to cathode. The internal shield in the dome is connected to cathode within 6K7-G and 6K7-GT.

Curves under type 78 also apply to the 6K7, 6K7-G, and 6K7-GT.

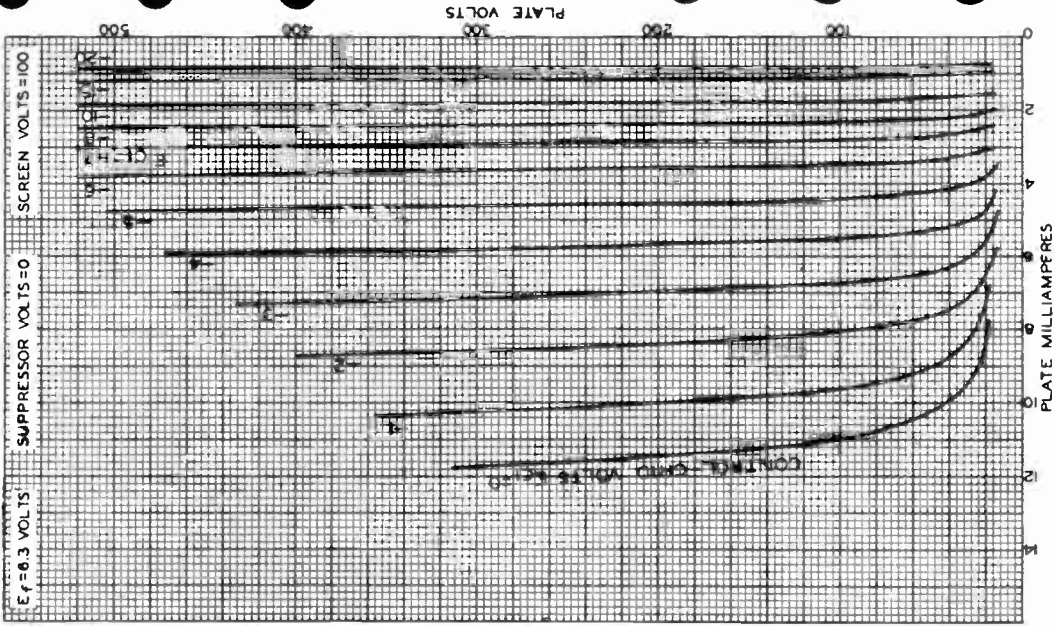
← Indicates a change.

6K7



6K7

# AVERAGE PLATE CHARACTERISTICS



FEB. 24, 1937

RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

92C-4742





6K8  
6K8-G  
6K8-GT

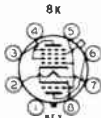


# 6K8, 6K8-G, 6K8-GT TRIODE-HEXODE CONVERTER

Heater <sup>■</sup> Coated Unipotential Cathode  
Voltage 6.3 a-c or d-c volts  
Current 0.3 amp.

Direct Interelectrode Capacitances:	6K8 <sup>o</sup>	6K8-G <sup>▲</sup>	6K8-GT <sup>▲</sup>
Hexode Grid #3 to Hexode Plate	0.03	0.08	0.08 max. $\mu$ uf
Hexode Grid #3 to Triode Plate	0.02	0.05	0.05 max. $\mu$ uf
Hexode Grid #3 to Triode Grid & Hexode Grid #1	0.2	0.2	0.2 max. $\mu$ uf
Triode Grid & Hexode Grid #1 to Triode Plate	1.1	1.8	1.8 $\mu$ uf
Triode Grid & Hexode Grid #1 to Hexode Plate	0.1	0.15	0.15 max. $\mu$ uf
Hexode Grid #3 to All Other Electrodes (R-F Input)	0.5	4.6	4.6 $\mu$ uf
Triode Plate to All Other Electrodes Except Triode Grid & Hexode Grid #1 (Osc. Output)	3.2	3.4	3.4 $\mu$ uf
Triode Grid & Hexode Grid #1 to All Other Electrodes Except Triode Plate (Osc. Input)	6.0	6.5	6.5 $\mu$ uf
Hexode Plate to All Other Electrodes (Mixer Output)	3.5	4.8	4.8 $\mu$ uf
Overall Length	{ 3-1/8" max. 2-9/16" max.	{ 4-7/32" to 4-15/32" 3-21/32" to 3-29/32"	{ 3-9/16" max. 3" max.
Seated Height	{ 1-5/16" max.	{ 1-9/16" max. ST-12	{ T-9
Maximum Diameter	1-5/16"	1-9/16"	1-5/16"
Bulb Cap	Metal Shell, MT-8 Miniature	Skirted Min. Sm. Shell Oct. 8-Pin	Skirted Min. Sm. Wafer Oct. 8-Pin, Sleeve
Base	{ Small Wafer Octal 8-Pin	{ Sm. Shell Oct. 8-Pin	{ Sm. Wafer Oct. 8-Pin, Sleeve

Basing Designation  
 Pin 1 { 6K8, Shell  
 6K8-G, No Con.  
 6K8-GT, Sleeve  
 Pin 2 - Heater  
 Pin 3 - Hexode Plate  
 Pin 4 - Hexode Grids #2 & #4  
 Mounting Position



BOTTOM VIEW

## CONVERTER SERVICE

Hexode Plate Voltage		300 max. volts
Hexode Screen (Grids #2 & #4) Voltage		150 max. volts
Hexode Screen Supply Voltage		300 max. volts
Hexode Control-Grid (Grid #3) Voltage		0 min. volts
Triode Plate Voltage		125 max. volts
Hexode Plate Dissipation		0.75 max. watt
Hexode Screen Dissipation		0.7 max. watt
Triode Plate Dissipation		0.75 max. watt
Total Cathode Current		16 max. ma.
Typical Operation:		
Hexode Plate Voltage	100	250 volts
Hexode Screen Voltage	100	100 volts
Hexode Control-Grid Voltage	-3	-3 volts
Triode Plate Voltage	100	100 volts
Triode Grid Resistor	50000	50000 ohms
Hexode Plate Resistance (approx.)	0.4	0.6 megohm
Conversion Transconductance	325	350 $\mu$ hos
Conversion Transcond. with Hexode Grid #3 Bias of -30 volts (approx.)	2	2 $\mu$ hos
Hexode Plate Current	2.3	2.5 ma.
Hexode Screen Current	6.2	6.0 ma.
Triode Plate Current	3.8	3.8 ma.
Triode Grid & Hexode Grid #1 Current	0.15	0.15 ma.
Total Cathode Current	12.5	12.5 ma.

NOTE: The transconductance of the triode section, not oscillating, is approximately 3000  $\mu$ hos when the triode plate volts = 100 and the triode grid volts = 0.

■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

▲ with close-fitting shield connected to cathode.

○ with shell connected to cathode. ← Indicates a change

May 1, 1941

RCA RADIODRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

DATA

6K8

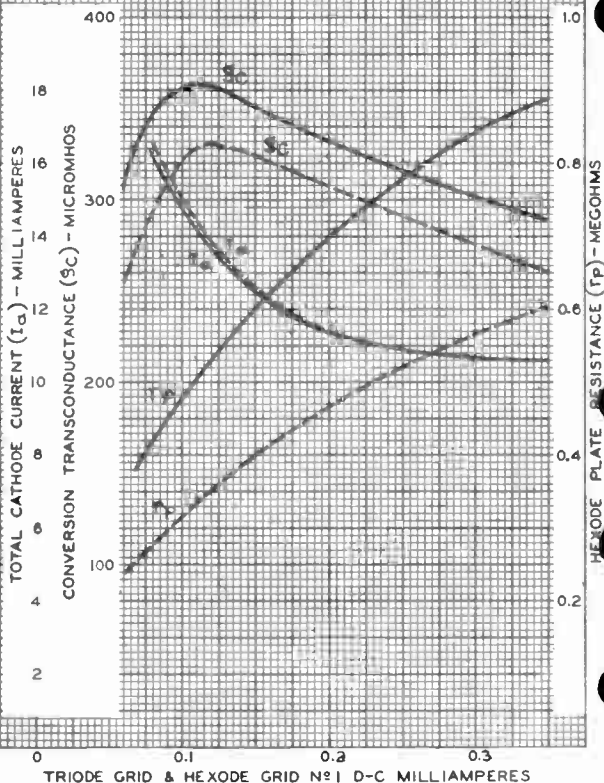


6K8

## OPERATION CHARACTERISTICS

 $E_f = 6.3$  VOLTS

CURVE	-----	-----
HEXODE PLATE VOLTS	100	250
TRIODE PLATE VOLTS	100	100
HEXODE SCREEN (GRIDS N° 2 & 4) VOLTS	100	100
HEXODE CONTROL-GRID (GRID N° 3) VOLTS	-3	-3
TRIODE GRID RESISTOR (OHMS)	50000	50000



APRIL 8, 1938

RCA RADIONRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

92C-4866R1

World Radio History

6L6  
6L6-G

## 6L6, 6L6-G

## BEAM POWER TUBE

## GENERAL DATA

## Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 6.3 . . . . . ac or dc volts

Current . . . . . 0.9 . . . . . amp

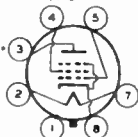
Direct Interelectrode Capacitances (Approx.):

	6L6 <sup>o</sup>	6L6-G <sup>oo</sup>	
Grid No.1 to plate . .	0.4	0.9	$\mu\mu\text{f}$
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	10	11.5	$\mu\mu\text{f}$
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	12	9.5	$\mu\mu\text{f}$

## Mechanical:

	6L6	6L6-G
Mounting Position . . . .	Any	Any
Maximum Overall Length .	4-5/16"	5-5/16"
Maximum Seated Length . .	3-3/4"	4-3/4"
Maximum Diameter . . . .	1-5/8"	2-1/16"
Bulb . . . . .	Metal Shell MT-10	ST-16
Base . . . . .	{ Small-Wafer Octal 7-Pin (JETEC No.B7-22)	{ Medium-Shell Octal 7-Pin (JETEC No.B7-12)
Basing Designation	7AC	G-7AC

Pin 1 { 6L6, Shell  
6L6-G, No Conn.  
Pin 2 - Heater  
Pin 3 - Plate



Pin 4 - Grid No.2  
Pin 5 - Grid No.1  
Pin 7 - Heater  
Pin 8 - Cathode,  
Grid No.3

AF POWER AMPLIFIER - Class A<sub>1</sub> †

Triode Connection - Grid No.2 Connected to Plate

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	275 max.	volts
PLATE DISSIPATION . . . . .	19 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	180 max.	volts
Heater positive with respect to cathode .	180 max.	volts

## Typical Operation and Characteristics:

	Fixed Bias	Cathode Bias	
Plate Voltage . . . . .	250	250	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	-20	-	volts
Cathode-Bias Resistor . . . .	-	490	ohms

0,00 †; see next page.

← indicates a change.

6L6  
6L6-G

# 6L6, 6L6-G

## BEAM POWER TUBE

	Fixed Bias	Cathode Bias	
Peak AF Grid-No.1 Voltage . . .	20	20	volts
Zero-Signal Plate Current . . .	40	40	ma
Max.-Signal Plate Current . . .	44	42	ma
Amplification Factor . . . . .	8	-	
Plate Resistance (Approx.) . . .	1700	-	ohms
Transconductance . . . . .	4700	-	$\mu$ hos
Load Resistance . . . . .	5000	6000	ohms
Total Harmonic Distortion . . .	5	6	%
Max.-Signal Power Output . . . .	1.4	1.3	watts

### Maximum Circuit Values (For maximum rated conditions):

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

### AF POWER AMPLIFIER - Class A<sub>1</sub>†

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	360 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	270 max.	volts
PLATE DISSIPATION . . . . .	19 max.	watts
GRID-No.2 INPUT . . . . .	2.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	180 max.	volts
Heater positive with respect to cathode .	180 max.	volts

### Typical Operation and Characteristics:

#### Fixed-Bias Operation

Plate Voltage . . . . .	200	250	300	350	volts
Grid-No.2 Voltage . . . . .	200	250	200	250	volts
Grid-No.1 Voltage . . . . .	-11.5	-14	-12.5	-18	volts
Peak AF Grid-No.1 Voltage .	11.5	14	12.5	18	volts
Zero-Signal Plate Current .	52	72	48	54	ma
Max.-Signal Plate Current .	57	79	55	66	ma
Zero-Signal Grid-No.2					
Current . . . . .	3.5	5.0	2.5	2.5	ma
Max.-Signal Grid-No.2					
Current . . . . .	5.7	7.3	4.7	7.0	ma
Plate Resistance (Approx.)	35000	22500	35000	33000	ohms
Transconductance . . . . .	5300	6000	5300	5200	$\mu$ hos
Load Resistance . . . . .	3000	2500	4500	4200	ohms
Total Harmonic Distortion .	9	10	11	15	%
Max.-Signal Power Output .	4	6.5	6.5	10.8	watts

#### Cathode-Bias Operation

Plate Voltage . . . . .	200	250	300	volts
Grid-No.2 Voltage . . . . .	200	250	200	volts

o With shell connected to cathode.

oo With no external shield.

†: See next page.

→ indicates a change.

NOV. 5, 1954

TUBE DIVISION

DATA 1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

6L6  
6L6-G

## 6L6, 6L6-G

## BEAM POWER TUBE

Cathode-Bias Resistnr . . . . .	186	167	218	ohms
Peak AF Grid-No.1 Voltage . . . . .	11.5	14	12.7	volts
Zero-Signal Plate Current . . . . .	55	75	51	ma
Max.-Signal Plate Current . . . . .	56	78	54.5	ma
Zero-Signal Grid-No.2 Current . . . . .	4.2	5.4	3.0	ma
Max.-Signal Grid-No.2 Current . . . . .	5.6	7.2	4.6	ma
Load Resistance . . . . .	3000	2500	4500	ohms
Total Harmonic Distortion . . . . .	9	10	11	%
Max.-Signal Power Output . . . . .	4	6.5	6.5	watts

**Maximum Circuit Values (For maximum rated conditions):**

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

**PUSH-PULL AF POWER AMPLIFIER - Class A<sub>1</sub>†****Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE . . . . .	360 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	270 max.	volts
PLATE DISSIPATION . . . . .	19 max.	watts
GRID-No.2 INPUT . . . . .	2.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	180 max.	volts
Heater positive with respect to cathode .	180 max.	volts

**Typical Operation and Characteristics:***Unless otherwise specified, values are for 2 tubes*

	Fixed Bias		Cathode Bias		
Plate Voltage . . . . .	250	270	250	270	volts
Grid-No.2 Voltage . . . . .	250	270	250	270	volts
Grid-No.1 Voltage . . . . .	-16	-17.5	-	-	volts
Cathode-Bias Resistor . . . . .	-	-	124	124	ohms
Peak AF Grid-No.1-to-					
Grid-No.1 Voltage . . . . .	32	35	35	28.2	volts
Zero-Signal Plate Current	120	134	120	134	ma
Max.-Signal Plate Current	140	155	130	145	ma
Zero-Signal Grid-No.2					
Current . . . . .	10	11	10	11	ma
Max.-Signal Grid-No.2					
Current . . . . .	16	17	15	17	ma
Plate Resistance (Per tube)					
(Approx.) . . . . .	24500	23500	-	-	ohms
Transconductance (Per tube)	5500	5700	-	-	μmhos
Effective Load Resistance					
(Plate to plate) . . . . .	5000	5000	5000	5000	ohms
Total Harmonic Distortion	2	2	2	2	%
Max.-Signal Power Output.	14.5	17.5	13.8	18.5	watts

†: See next page.

←Indicates a change

6L6  
6L6-G



# 6L6, 6L6-G

## BEAM POWER TUBE

→ **Maximum Circuit Values (For maximum rated conditions):**

Grid-No.1-Circuit Resistance:  
 For fixed-bias operation . . . . . 0.1 max. megohm  
 For cathode-bias operation . . . . . 0.5 max. megohm

**PUSH-PULL AF POWER AMPLIFIER - Class AB<sub>1</sub>†**

**Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE . . . . . 360 max. volts  
 GRID-No.2 (SCREEN) VOLTAGE . . . . . 270 max. volts  
 PLATE DISSIPATION . . . . . 19 max. watts  
 GRID-No.2 INPUT . . . . . 2.5 max. watts

→ **PEAK HEATER-CATHODE VOLTAGE:**

Heater negative with respect to cathode . 180 max. volts  
 Heater positive with respect to cathode . 180 max. volts

→ **Typical Operation:**

*Values are for 2 tubes*

	Fixed Bias		Cathode Bias	
Plate Voltage . . . . .	360	360	360	volts
Grid-No.2 Voltage . . . . .	270	270	270	volts
Grid-No.1 Voltage <sup>▲</sup> . . . . .	-22.5	-22.5	-	volts
Cathode-Bias Resistor . . . . .	-	-	248	ohms
<b>Peak AF Grid-No.1-to-</b>				
Grid-No.1 Voltage . . . . .	45	45	40.6	volts
Zero-Signal Plate Current . . . . .	88	88	88	ma
Max.-Signal Plate Current . . . . .	132	140	100	ma
Zero-Signal Grid-No.2				
Current . . . . .	5	5	5	ma
Max.-Signal Grid-No.2				
Current . . . . .	15	11	17	ma
Effective Load Resistance				
(Plate to plate). . . . .	6600	3800	9000	ohms
Total Harmonic Distortion . . . . .	2	2	4	%
Max.-Signal Power Output . . . . .	26.5	18	24.5	watts

→ **Maximum Circuit Values (For maximum rated conditions):**

Grid-No.1-Circuit Resistance:<sup>▲</sup>  
 For fixed-bias operation . . . . . 0.1 max. megohm  
 For cathode-bias operation . . . . . 0.5 max. megohm

**PUSH-PULL AF POWER AMPLIFIER - Class AB<sub>2</sub>‡**

**Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE . . . . . 360 max. volts  
 GRID-No.2 (SCREEN) VOLTAGE . . . . . 270 max. volts  
 PLATE DISSIPATION . . . . . 19 max. watts  
 GRID-No.2 INPUT . . . . . 2.5 max. watts

▲, †, ‡: See next page.

→ indicates a change.



6L6  
6L6-G

# 6L6, 6L6-G BEAM POWER TUBE

**PEAK HEATER-CATHODE VOLTAGE:**  
 Heater negative with respect to cathode. . . 180 max. volts  
 Heater positive with respect to cathode. . . 180 max. volts

### Typical Operation:

*Values are for 2 tubes*

	Fixed Bias		
Plate Voltage. . . . .	360	360	volts
Grid-No.2 Voltage. . . . .	225	270	volts
Grid-No.1 Voltage. . . . .	-18	-22.5	volts
Peak AF Grid-No.1-to Grid-No.1 Voltage	52	77	volts
Zero-Signal Plate Current. . . . .	78	88	ma
Max.-Signal Plate Current. . . . .	142	205	ma
Zero-Signal Grid-No.2 Current. . . . .	3.5	5	ma
Max.-Signal Grid-No.2 Current. . . . .	11	16	ma
Effective Load Resistance (Plate to plate). . . . .	6000	3800	ohms
Peak Grid-Input Power. . . . .	140	270	mw
Total Harmonic Distortion. . . . .	2	2	%
Max.-Signal Power Output . . . . .	31	47	watts

### Maximum Circuit Values (For maximum rated conditions):

Grid-No.1-Circuit Resistance†:  
 For fixed-bias operation . . . . . 0.1 max. megohm  
 For cathode-bias operation . . . . . Not recommended

† Subscript 1 indicates that grid-no.1 current does not flow during any part of input cycle.

◆ Subscript 2 indicates that grid-no.1 current flows during some part of input cycle.

‡ Driver stage should be capable of supplying the specified driving power at low distortion to the No.1 grids of the AB<sub>2</sub> stage. To minimize distortion, the effective resistance per grid-no.1 circuit of the AB<sub>2</sub> stage should be held at a low value. For this purpose, the use of transformer coupling is recommended.

▲ The type of input coupling used should not introduce too much resistance in the grid-no.1 circuit. Transformer- or impedance-coupling devices are recommended.

←Indicates a change.

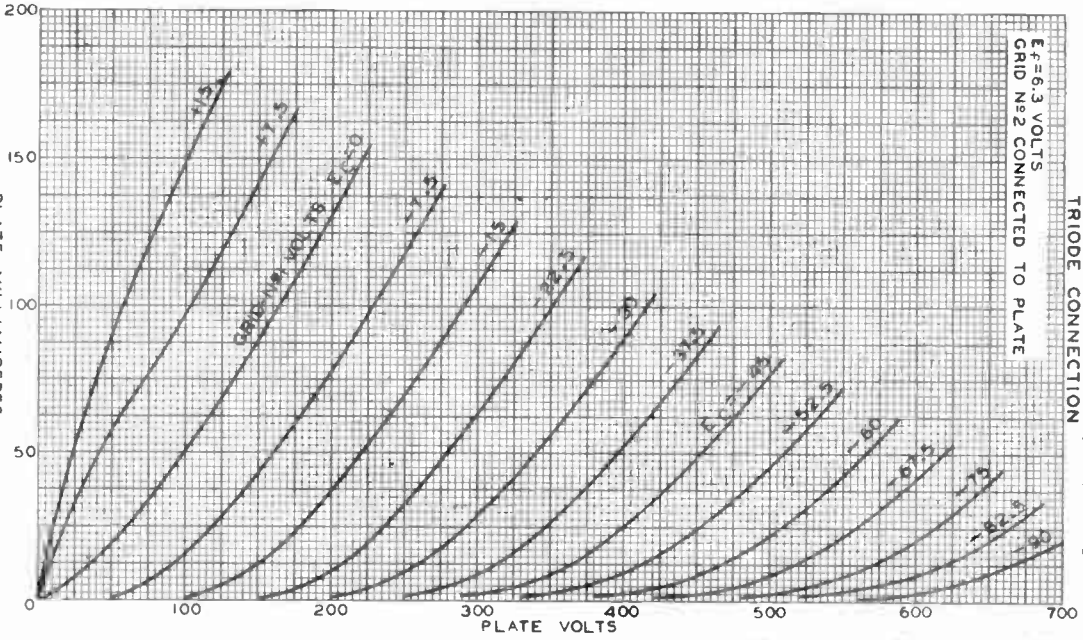
6L6



6L6

# AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION

$E_f = 6.3$  VOLTS  
GRID No 2 CONNECTED TO PLATE



SEPT. 6 1938

PLATE MILLIAMPERES  
TUBE DIVISION  
RADIO CORPORATION OF AMERICA, WARREN, NEW JERSEY

92CM-4966RI





6L6

# 6L6 AVERAGE PLATE CHARACTERISTICS WITH $E_{C1}$ AS VARIABLE

$E_f = 6.3$  VOLTS

SCREEN VOLTS = 250

LOAD LINE CORRECTED TO COMPENSATE  
FOR EFFECTS OF RECTIFICATION  
WITH LARGE SIGNALS

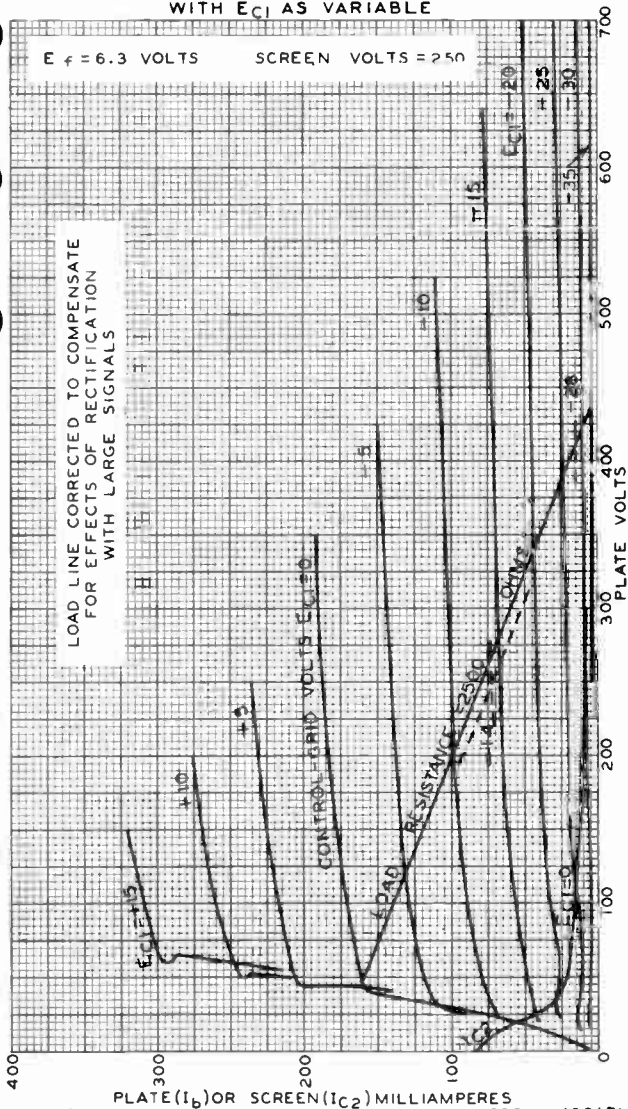


PLATE ( $I_b$ ) OR SCREEN ( $I_{c2}$ ) MILLIAMPERES  
MAY 6, 1936 TUBE DEPARTMENT 92CM-4581R1

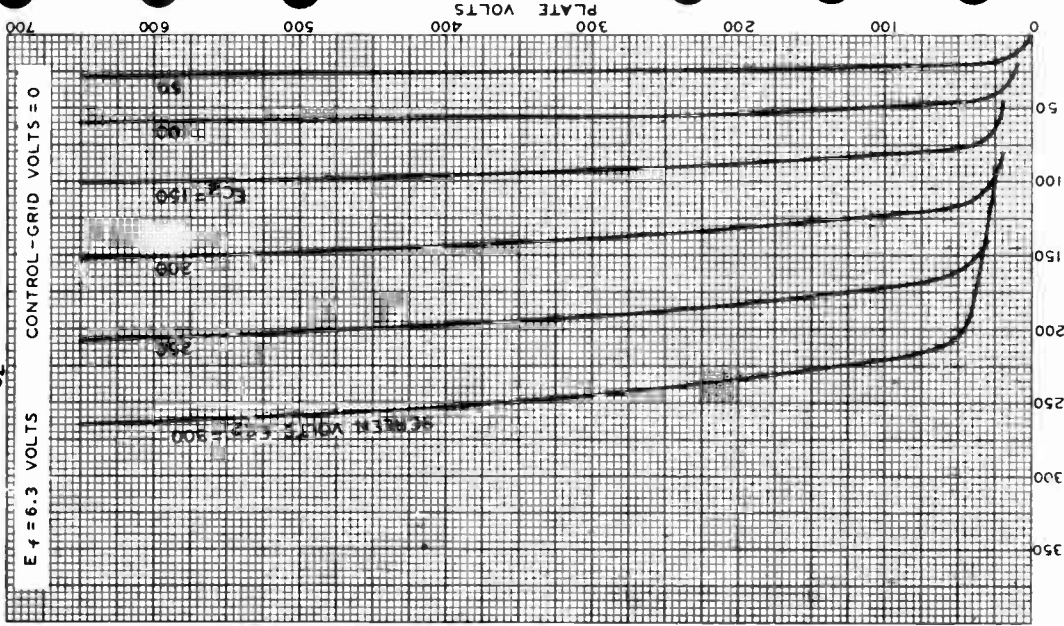
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY



6L6

# AVERAGE PLATE CHARACTERISTICS WITH EC<sub>2</sub> AS VARIABLE

E<sub>1</sub> = 6.3 VOLTS CONTROL - GRID VOLTS = 0



MAY 8, 1936

PLATE MILLIAMPERES  
RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY INC.

92C-4580R1

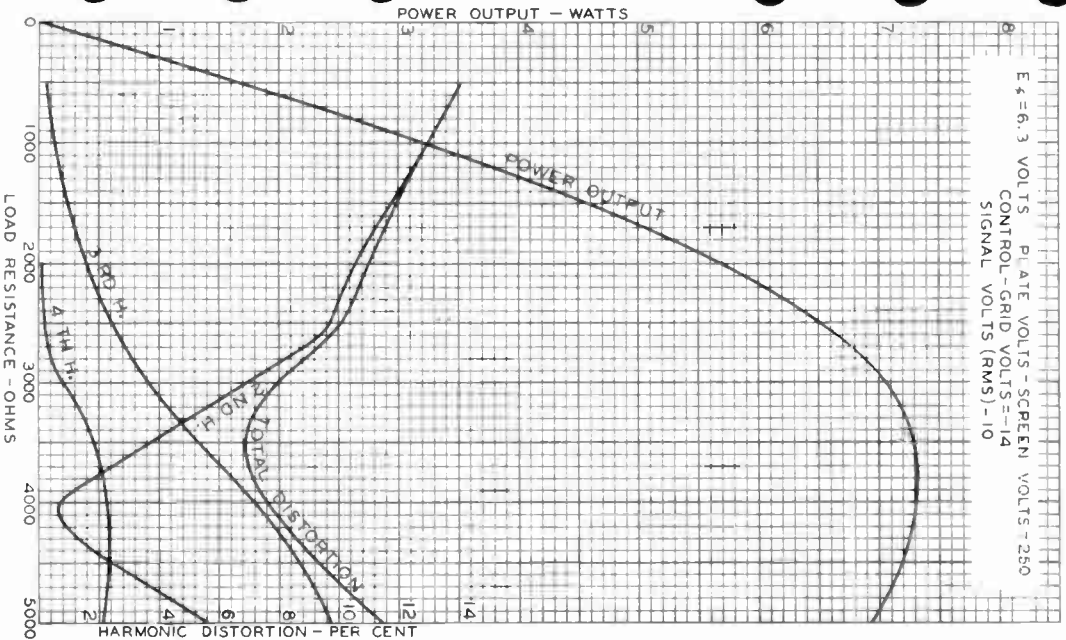


6L6

6L6

### OPERATION CHARACTERISTICS

$E_f = 6.3$  VOLTS    PLATE VOLTS - SCREEN VOLTS - 250  
CONTROL - GRID VOLTS - -14  
SIGNAL VOLTS (RMS) - 10



POWER OUTPUT - WATTS

LOAD RESISTANCE - OHMS

HARMONIC DISTORTION - PER CENT

MAY 7, 1936

RCA RADIODIODE DIVISION  
RCA MANUFACTURING COMPANY INC

92C-4608

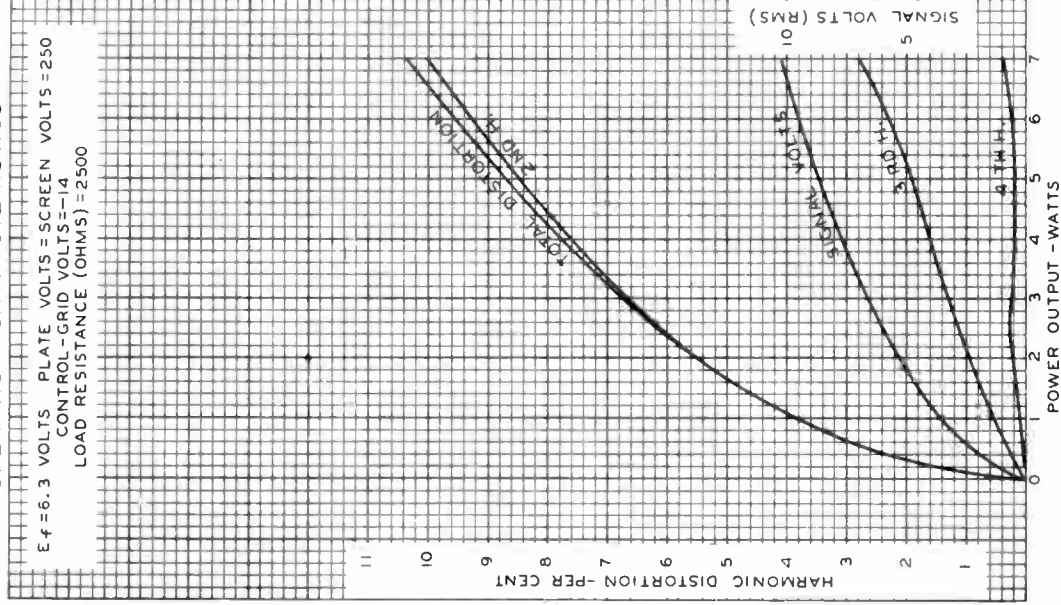
6L6



6L6

## OPERATION CHARACTERISTICS

$E_f = 6.3$  VOLTS    PLATE VOLTS = SCREEN VOLTS = 250  
 CONTROL-GRID VOLTS = -14  
 LOAD RESISTANCE (OHMS) = 2500



MAY 7, 1936

RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY INC.

92C-4609



6L6-GB

# 6L6-GB

## BEAM POWER TUBE

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	. . . . .	ac or dc volts
Current . . . . .	0.9	. . . . .	amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid No.1 to plate. . . . .	0.9	$\mu$ f
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	11.2	$\mu$ f
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	9.5	$\mu$ f

#### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	4-1/4"
Maximum Seated Length . . . . .	3-11/16"
Maximum Diameter . . . . .	1-9/16"

Bulb . . . . . T12  
 Base . . . . . Medium-Shell Octal 7-Pin (JETEC No. B7-12),  
 Short Medium-Shell Octal 7-Pin  
 with External Barriers, Style A (JETEC No. B7-111),  
 or Short Medium-Shell Octal 7-Pin  
 with External Barriers, Style B (JETEC No. B7-119)  
 Basing Designation for BOTTOM VIEW . . . . . 7AC

Pin 1 - No Connection  
 Pin 2 - Heater  
 Pin 3 - Plate  
 Pin 4 - Grid No.2



Pin 5 - Grid No.1  
 Pin 7 - Heater  
 Pin 8 - Cathode,  
 Grid No.3

### AF POWER AMPLIFIER - Class A<sub>1</sub>

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

PLATE VOLTAGE . . . . .	360 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	270 max.	volts
GRID-No.2 INPUT . . . . .	2.5 max.	watts
PLATE DISSIPATION . . . . .	19 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	180 max.	volts
Heater positive with respect to cathode . . . . .	180 max.	volts

#### Typical Operation and Characteristics:

##### Fixed-Bias Operation

Plate Voltage . . . . .	200	250	300	350	volts
Grid-No.2 Voltage . . . . .	200	250	200	250	volts
Grid No.1 (Control-Grid) Voltage . . . . .	-11.5	-14	-12.5	-18	volts

<sup>o</sup> without external shield.

6L6-GB



6L6-GB

## BEAM POWER TUBE

Peak AF Grid-No.1 Voltage. . . . .	11.5	14	12.5	18	volts
Zero-Signal Plate Current. . . . .	52	72	48	54	ma
Max.-Signal Plate Current. . . . .	57	79	55	66	ma
Zero-Signal Grid-No.2 Current. . . . .	3.5	5	2.5	2.5	ma
Max.-Signal Grid-No.2 Current. . . . .	5.7	7.3	4.7	7	ma
Plate Resistance (Approx.) . . . . .	35000	22500	35000	33000	ohms
Transconductance . . . . .	5300	6000	5300	5200	μmhos
Load Resistance. . . . .	3000	2500	4500	4200	ohms
Total Harmonic Distortion. . . . .	9	10	11	15	%
Max.-Signal Power Output . . . . .	4	6.5	6.5	10.8	watts

*Cathode-Bias Operation*

Plate-Supply Voltage . . . . .	200	250	300		volts
Grid-No.2 Supply Voltage . . . . .	200	250	200		volts
Cathode Resistor . . . . .	186	167	218		ohms
Peak AF Grid-No.1 Voltage. . . . .	11.5	14	12.7		volts
Zero-Signal Plate Current. . . . .	55	75	51		ma
Max.-Signal Plate Current. . . . .	56	78	54.5		ma
Zero-Signal Grid-No.2 Current. . . . .	4.2	5.4	3		ma
Max.-Signal Grid-No.2 Current. . . . .	5.6	7.2	4.6		ma
Load Resistance. . . . .	3000	2500	4500		ohms
Total Harmonic Distortion. . . . .	9	10	11		%
Max.-Signal Power Output . . . . .	4	6.5	6.5		watts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

**AF POWER AMPLIFIER - Class A<sub>1</sub>***Triode Connection - Grid No.2 Connected to Plate***Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE. . . . .	275 max.	volts
PLATE DISSIPATION. . . . .	19 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	180 max.	volts
Heater positive with respect to cathode.	180 max.	volts

**Typical Operation and Characteristics:**

	<i>Fixed Bias</i>	<i>Cathode Bias</i>	
Plate-Supply Voltage . . . . .	250	250	volts
Grid-No.1 (Control-Grid) Voltage	-20	-	volts
Cathode Resistor . . . . .	-	490	ohms
Peak AF Grid-No.1 Voltage. . . . .	20	20	volts
Zero-Signal Plate Current. . . . .	40	40	ma
Max.-Signal Plate Current. . . . .	44	42	ma
Plate Resistance (Approx.) . . . . .	1700	-	ohms



6L6-GB

6L6-GB

BEAM POWER TUBE

	Fixed Bias	Cathode Bias	
Amplification Factor . . . . .	8	-	
Transconductance . . . . .	4700	-	μhos
Load Resistance . . . . .	5000	6000	ohms
Total Harmonic Distortion . . . . .	5	6	%
Max.-Signal Power Output . . . . .	1.4	1.3	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max. megohm
For cathode-bias operation . . . . .	0.5 max. megohm

PUSH-PULL AF POWER AMPLIFIER - Class A<sub>1</sub>

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	360 max. volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	270 max. volts
GRID-No.2 INPUT . . . . .	2.5 max. watts
PLATE DISSIPATION . . . . .	19 max. watts
PEAK HEATER-CATHODE VOLTAGE:	
Heater negative with respect to cathode.	180 max. volts
Heater positive with respect to cathode.	180 max. volts

Typical Operation and Characteristics:

Unless otherwise specified, values are for 2 tubes

	Fixed Bias		Cathode Bias		
Plate Voltage . . . . .	250	270	250	270	volts
Grid-No.2 Voltage . . . . .	250	270	250	270	volts
Grid-No.1 Voltage . . . . .	-16	-17.5	-	-	volts
Cathode Resistor . . . . .	-	-	124	124	ohms
Peak AF Grid-No.1-to-					
Grid-No.1 Voltage . . . . .	32	35	35.6	28.2	volts
Zero-Signal Plate Current . . . . .	120	134	120	134	ma
Max.-Signal Plate Current . . . . .	140	155	130	145	ma
Zero-Signal Grid-No.2					
Current . . . . .	10	11	10	11	ma
Max.-Signal Grid-No.2					
Current . . . . .	16	17	15	17	ma
Plate Resistance (Approx., per tube) . . . . .	24500	23500	-	-	ohms
Transconductance .					
(Per tube) . . . . .	5500	5700	-	-	μhos
Effective Load Resistance					
(Plate to plate) . . . . .	5000	5000	5000	5000	ohms
Total Harmonic Distortion . . . . .	2	2	2	2	%
Max.-Signal Power Output . . . . .	14.5	17.5	13.8	18.5	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max. megohm
For cathode-bias operation . . . . .	0.5 max. megohm



## 6L6-GB

## BEAM POWER TUBE

PUSH-PULL AF POWER AMPLIFIER - Class AB<sub>1</sub>

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	360 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	270 max.	volts
GRID-No.2 INPUT . . . . .	2.5 max.	watts
PLATE DISSIPATION . . . . .	19 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	180 max.	volts
Heater positive with respect to cathode . . . . .	180 max.	volts

## Typical Operation:

Values are for 2 tubes

	Fixed Bias		Cathode Bias	
Plate Voltage . . . . .	360	360	360	volts
Grid-No.2 Voltage . . . . .	270	270	270	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	-22.5	-22.5	-	volts
Cathode Resistor . . . . .	-	-	248	ohms
Peak AF Grid-No.1-to- Grid-No.1 voltage . . . . .	45	45	40.6	volts
Zero-Signal Plate Current . . . . .	88	88	88	ma
Max.-Signal Plate Current . . . . .	132	140	100	ma
Zero Signal Grid-No.2 Current . . . . .	5	5	5	ma
Max.-Signal Grid-No.2 Current . . . . .	15	11	17	ma
Effective Load Resistance (Plate to plate) . . . . .	6600	3800	9000	ohms
Total Harmonic Distortion . . . . .	2	2	4	%
Max.-Signal Power Output . . . . .	26.5	18	24.5	watts

## Maximum Circuit Values:

Grid-No.1-Circuit Resistance: <sup>*</sup>	
For fixed-bias operation . . . . .	0.1 max. megohm
For cathode-bias operation . . . . .	0.5 max. megohm

PUSH-PULL AF POWER AMPLIFIER - Class AB<sub>2</sub>

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	360 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	270 max.	volts
GRID-No.2 INPUT . . . . .	2.5 max.	watts
PLATE DISSIPATION . . . . .	19 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	180 max.	volts
Heater positive with respect to cathode . . . . .	180 max.	volts

\* The type of input coupling used should not introduce too much resistance in the grid-no.1 circuit. Transformer- or impedance-coupling devices are recommended.





6L6-GB

6L6-GB

BEAM POWER TUBE

Typical Operation\*

Values are for 2 tubes

Plate Voltage . . . . .	360	360	volts
Grid-No.2 Voltage . . . . .	225	270	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	-18	-22.5	volts
Peak AF Grid-No.1-to- Grid-No.1 Voltage . . . . .	52	72	volts
Zero-Signal Plate Current . . . . .	78	88	ma
Max. Signal Plate Current . . . . .	117	115	ma
Zero-Signal Grid-No.2 Current . . . . .	3.5	5	ma
Max.-Signal Grid-No.2 Current . . . . .	11	10	ma
Effective Load Resistance (Plate to plate) . . . . .	6000	3800	ohms
Total Harmonic Distortion . . . . .	2	2	%
Max.-Signal Power Output . . . . .	31	47	watts

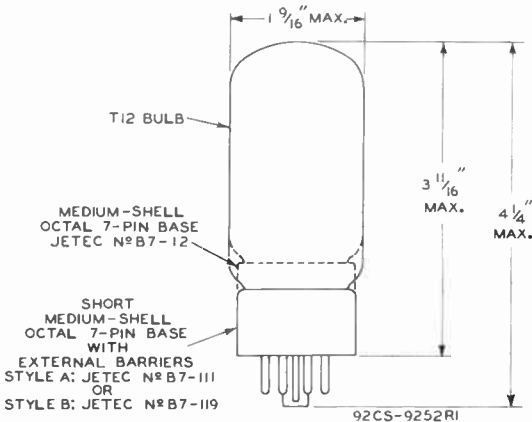
Maximum Circuit Values:

Grid-No.1-Circuit Resistance:▲

For fixed-bias operation . . . . . 0.1 max. megohm

For cathode-bias operation . . . . . Not recommended

▲ Driver stage should be capable of supplying the specified driving power at low distortion to the No.1 grids of the AB<sub>2</sub> stage. To minimize distortion, the effective resistance per grid-No.1 circuit of the AB<sub>2</sub> stage should be held at a low value. For this purpose, the use of transformer coupling is recommended.



6L6-GB



6L6-GB

### AVERAGE PLATE CHARACTERISTICS

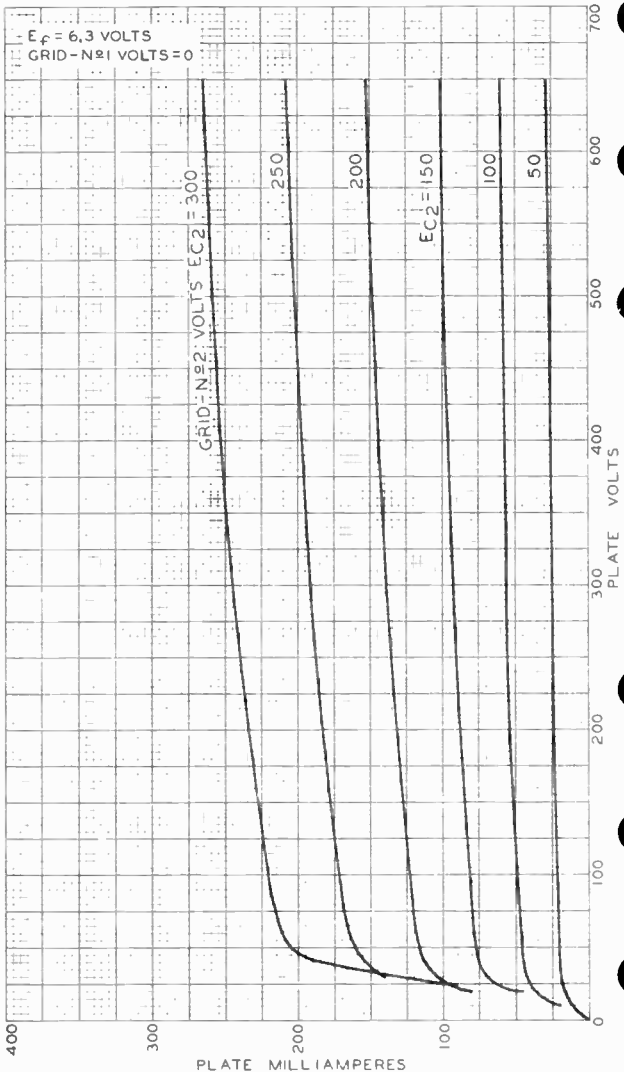


PLATE MILLIAMPERES

TUBE DIVISION

RADIO CORPORATION OF AMERICA HARTSEASON, NEW JERSEY

92CM-4580R2



6L6-GB

# 6L6-GB AVERAGE CHARACTERISTICS

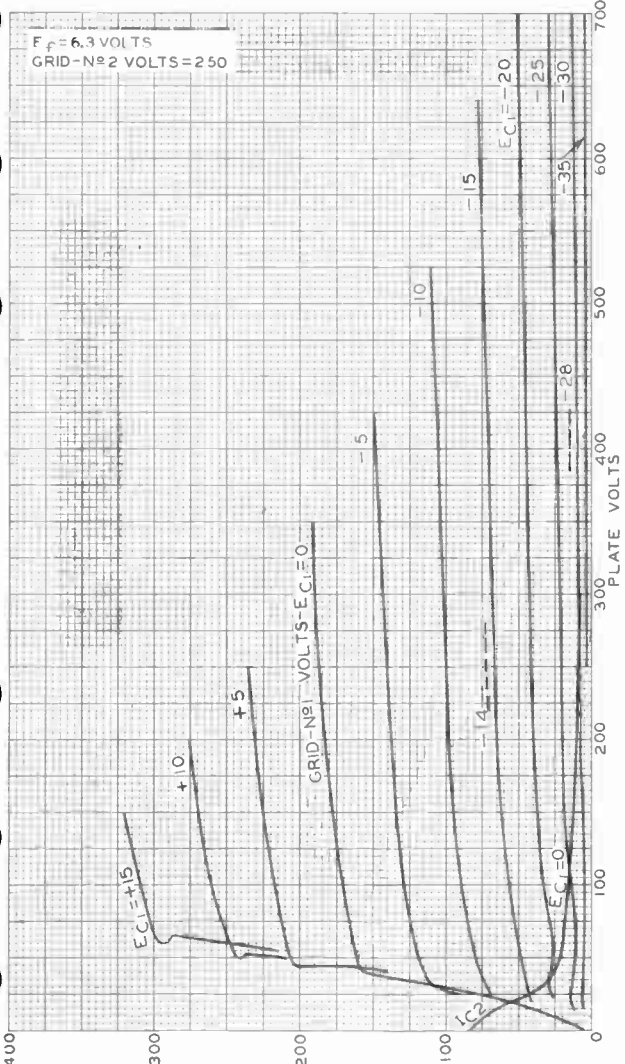


PLATE (I<sub>b</sub>) OR GRID-№2 (I<sub>c2</sub>) MILLIAMPERES  
TUBE DIVISION  
92CM-4581R2

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

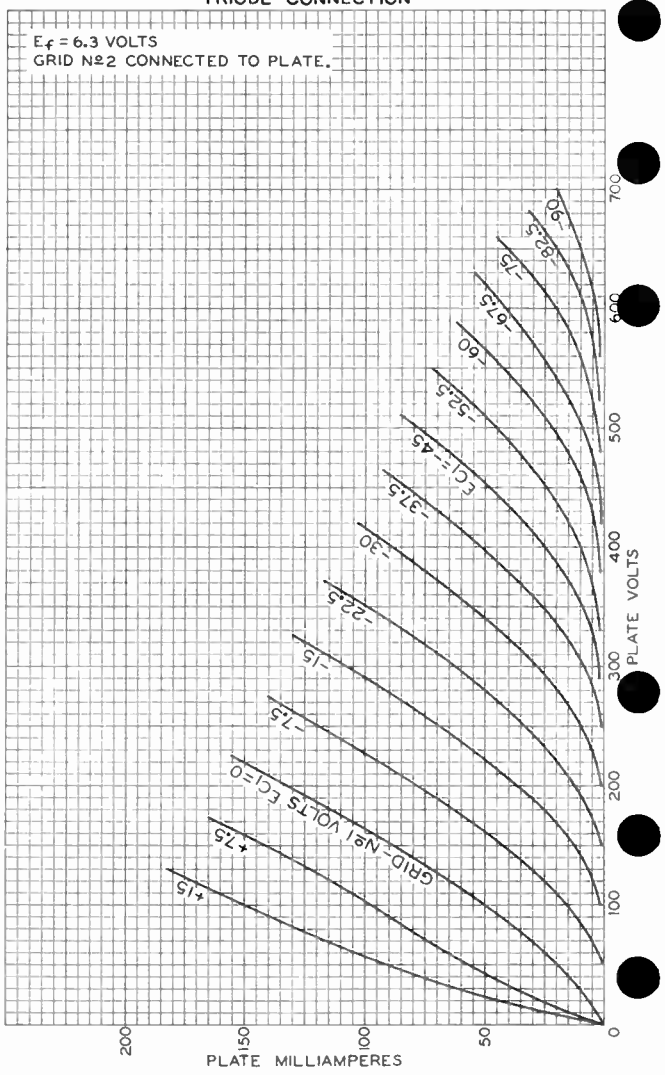
6L6-GB



6L6-GB

### AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION

$E_f = 6.3$  VOLTS  
GRID #2 CONNECTED TO PLATE.



200

PLATE MILLIAMPERES

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

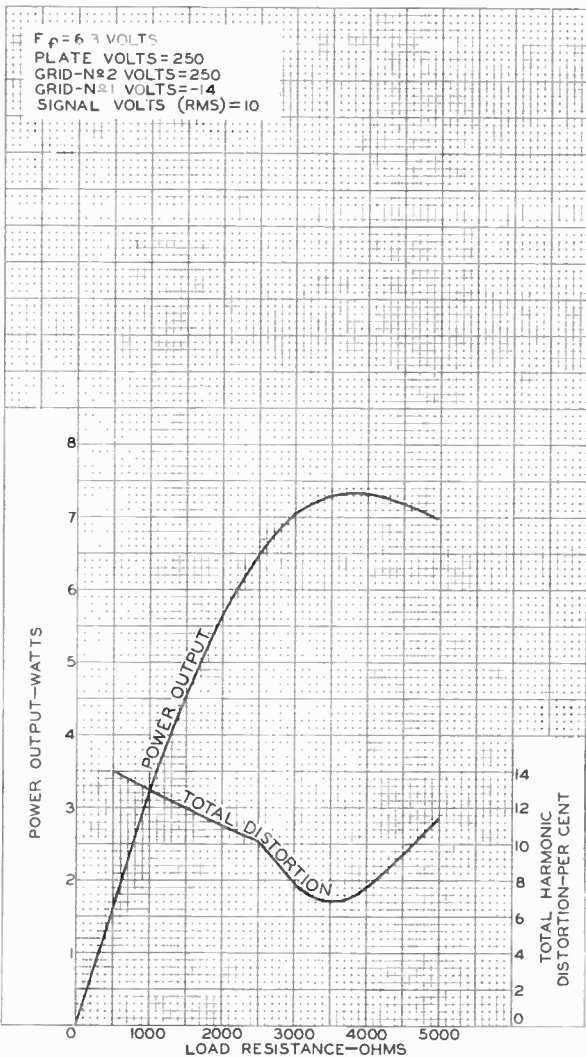
92CM-4966R2



6L6-GB

6L6-GB

### OPERATION CHARACTERISTICS







6L7, 6L7-G

6L7  
6L7-G**PENTAGRID MIXER AMPLIFIER**

Heater <sup>■</sup> Coated Unipotential Cathode  
 Voltage 6.3 a-c or d-c volts  
 Current 0.3 amp.

	6L7	6L7-G
Direct Interelectrode Cap.	▲	▲▲
Grid #1 to Grid #3	0.2 max.	0.2 max. $\mu\text{f}$
Grid #1 to Plate	0.001 max.	0.005 max. $\mu\text{f}$
Grid #3 to Plate	0.1	0.24 $\mu\text{f}$
Grid #1 to All Other Electrodes	7.5	6 $\mu\text{f}$
Grid #3 to All Other Electrodes	10	12 $\mu\text{f}$
Plate to All Other Electrodes	11	10 $\mu\text{f}$

Overall Length 3-1/8" max. { 4-7/32" to 4-15/32"

Maximum Diameter 1-5/16" 1-9/16"

Bulb Metal Shell, MT-8 ST-12

Cap Miniature Skirted Min.

Base { Small Wafer { Small Shell

Basing Designation 7T G-7T

Pin 1 { 6L7, Shell Pin 5 - Grid #3

{ 6L7-C, No Con. Pin 7 - Heater

Pin 2 - Heater Pin 8 - Cathode & Grid #5

Pin 3 - Plate Cap - Grid #1

Pin 4 - Grids #2 & #4  
 Mounting Position Any



BOTTOM VIEW

AMPLIFIER - Class A<sub>1</sub>

Plate Voltage 300 max. volts

Screen Voltage (Grids #2 & #5) 100 max. volts

Plate Dissipation 1.5 max. watts

Screen Dissipation 1.0 max. watt

Typical Operation:

Plate 250 volts

Screen 100 volts

Control Grid (Grid #1) -3 volts

Control Grid (Grid #3) -3 volts

Plate Res. (approx.) 0.6 megohm

Transcond., Grid #1 to Plate 1100  $\mu\text{mhos}$

Transcond., Grid #1 to Plate\* 5 approx.  $\mu\text{mhos}$

Plate Cur. 5.3 ma.

Screen Cur. 6.5 ma.

MIXER

Plate Voltage 300 max. volts

Screen Voltage (Grids #2 & #4) 150 max. volts

Plate Dissipation 1.0 max. watt

Screen Dissipation 1.5 max. watts

■ In circuits where the cathode is not connected directly to the heater, the potential difference between heater and cathode should be kept as low as possible.

▲▲ With shell connected to cathode.

▲ With close-fitting shield connected to cathode.

\* with grid #1 bias of -15 volts, and grid #3 bias of -15 volts.

FEB. 2, 1940

RCA RADIONRON DIVISION  
RCA MANUFACTURING COMPANY INC.

DATA

6L7  
6L7-G

6L7,6L7-G

## PENTAGRID MIXER AMPLIFIER

(continued from preceding page)

## Typical Operation:

Plate	250	250#	volts
Screen	100	150#	volts
Signal-Grid (Grid #1)	-3 min.	-6# min.	volts
Oscillator Grid (Grid #3) **	-10	-15	volts
Peak Osc.-Grid Voltage Applied to Grid #3	12 min.	18 min.	volts
Plate Res.	Greater than 1		megohm
Conversion Transcond.	375	350	$\mu$ mhos
Conversion Transcond.	5 <sup>●</sup>	5 <sup>△</sup>	$\mu$ mhos
Plate Cur.	2.4	3.3	ma.
Screen Cur.	7.1	9.2	ma.

\*\* The d-c resistance in grid #3 circuit should not exceed 50000 ohms.

● With grid #1 bias of -30 volts.     △ With grid #1 bias of -45 volts.

# These conditions are recommended for multi-range receiver applications.

FEB. 2, 1940

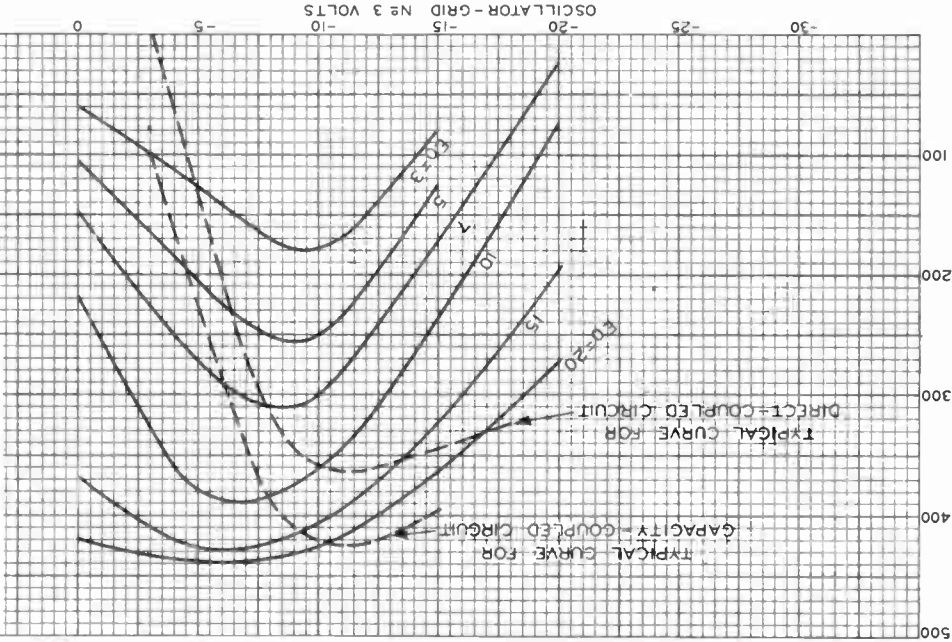
RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY INC

DATA



OPERATION CHARACTERISTICS

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 250  
 SCREEN VOLTS = 100  
 SIGNAL-GRID №1 VOLTS = -3  
 PEAK OSCILLATOR VOLTS =  $E_0$



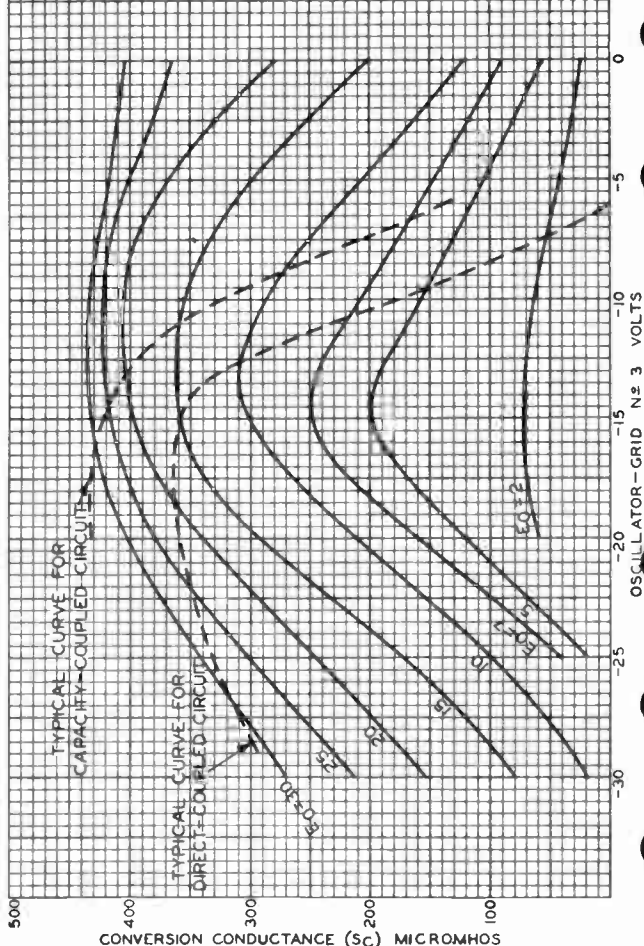
6L7



RCA-6L7

## OPERATION CHARACTERISTICS

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 250  
 SCREEN VOLTS = 150  
 SIGNAL-GRID N<sup>o</sup> 1 VOLTS = -6  
 PEAK OSCILLATOR VOLTS =  $E_0$



JULY 26, 1935

 RCA RADIOTRON DIVISION  
 RCA MANUFACTURING COMPANY, INC.

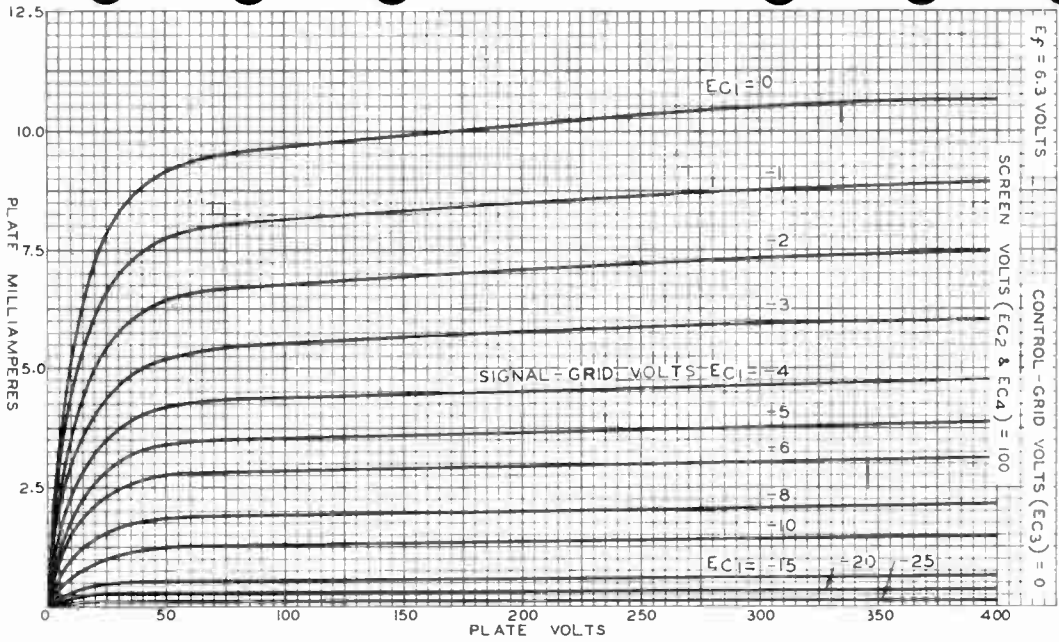
92C-4445



6L7

6L7

# AVERAGE PLATE CHARACTERISTICS WITH $E_{C1}$ AS VARIABLE



JAN. 3, 1936

PLATE MILLIAMPERES

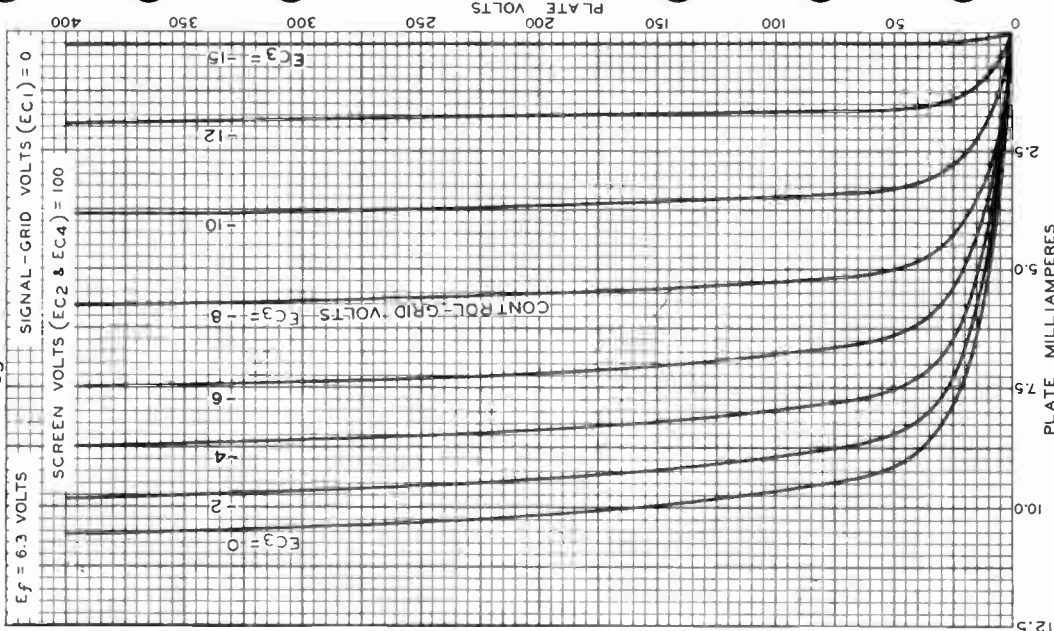
RCA RADIOTRON DIVISION  
E. A. SPENCER, JR., MANAGER

92C-4531



6L7

# AVERAGE PLATE CHARACTERISTICS WITH $E_{C3}$ AS VARIABLE



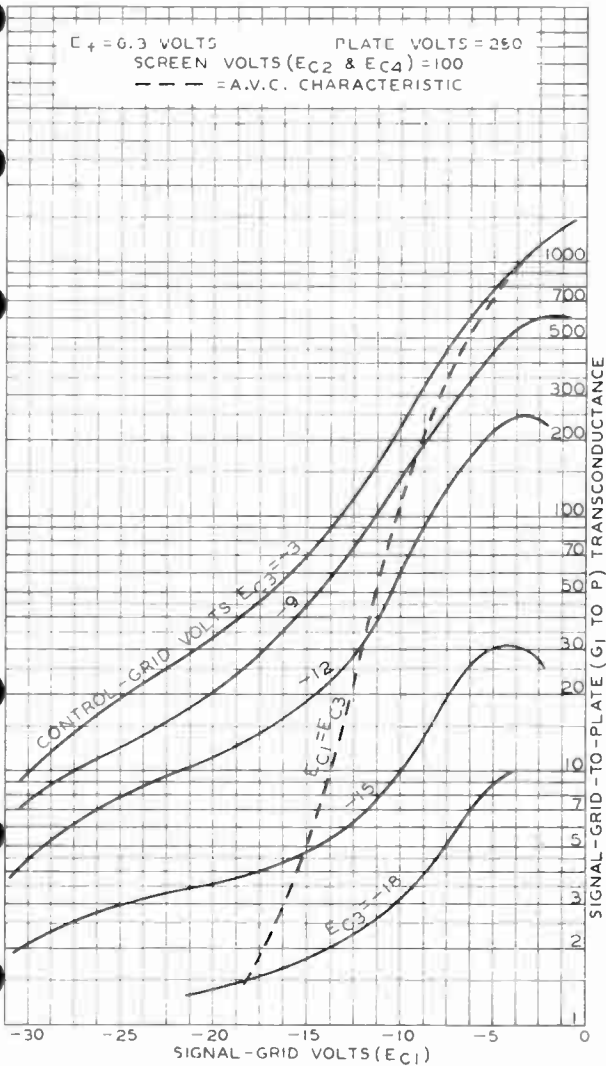
6L7



6L7

6L7

### AVERAGE CHARACTERISTICS



JAN. 8, 1936

RCA RADOTRON DIVISION  
 A MANUFACTURING COMPANY INC.

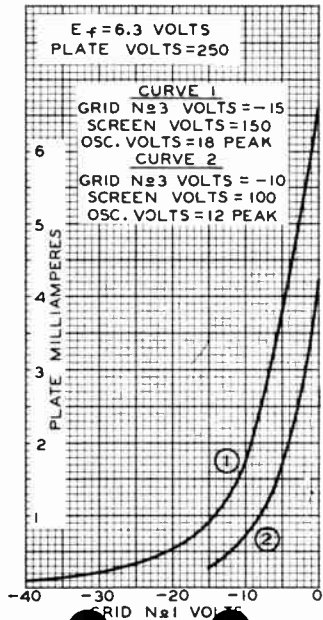
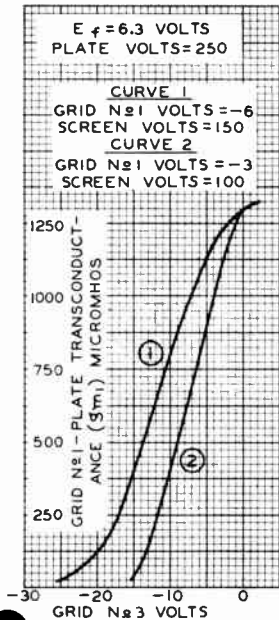
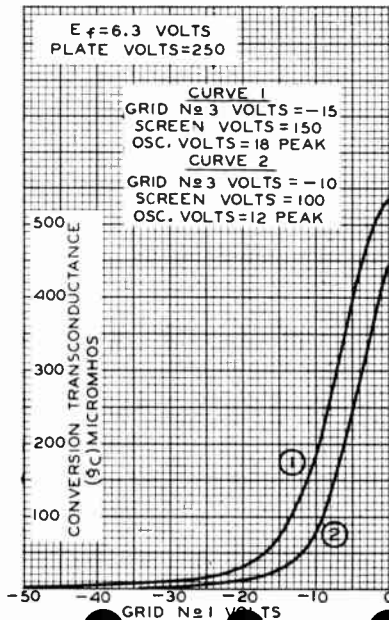
92C-4536

6L7

## AVERAGE CHARACTERISTICS



6L7



AUG. 5, 1935

RCA RADIONEON DIVISION  
RCA MANUFACTURING COMPANY, INC.

92C-4442

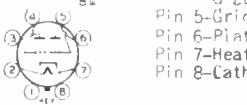


6N7  
6N7-GT/G

# 6N7, 6N7-GT/G

## CLASS B TWIN AMPLIFIER

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.8	amp.
Maximum Overall Length	6N7 3-1/4"	6N7-GT/G 3-5/16"
Maximum Seated Height	2-11/16"	2-2/4"
Maximum Diameter	1-5/16"	1-5/16"
Bulb	Metal Shell, MT-8 { Small Wafer { Octal 8-Pin	T-9 { Intermed. Sh. { Octal 8-Pin
Base	8P	G 8P
Basing Designation		
Pin 1- { 6N7, Shell 6N7-GT/G, No Conn.		Pin 5-Grid (Triode T <sub>1</sub> )
Pin 2-Heater		Pin 6-Plate (Triode T <sub>1</sub> )
Pin 3-Plate (Triode T <sub>2</sub> )		Pin 7-Heater
Pin 4-Grid (Triode T <sub>2</sub> )		Pin 8-Cathode
Mounting Position	BOTTOM VIEW	Any



For convenience, one triode unit is identified as T<sub>1</sub>; the other as T<sub>2</sub>.

Maximum Ratings Are Design-Center Values

### CLASS B POWER AMPLIFIER

Plate Voltage	300 max. volts
Peak Plate Current (per plate)	125 max. ma.
Average Plate Dissipation (per plate)	5.5 max. watts

Typical Operation:

*Unless otherwise specified, values are for the two units*

Plate-Supply Impedance	0	1000 <sup>□</sup>	ohms
Effective Grid-Circuit Impedance (per unit)	0	516 <sup>□□</sup>	ohms
Plate Voltage	300	300	volts
Grid Voltage	0	0	volts
Peak A-F Grid-to-Grid Voltage <sup>▲</sup>	58	82	volts
Zero-Sig. D-C Plate Cur.	35	35	ma.
Max.-Sig. D-C Plate Cur.	70	70	ma.
Peak Grid Cur. (per unit)	20	22	ma.
Effective Load Res. (plate to plate)	8000	8000	ohms
Total Harmonic Distortion	4	8	%
Third Harmonic Distortion	3.5	7.5	%
Fifth Harmonic Distortion	1.5	2.5	%
Max.-Sig. Power Output	10	10	watts

<sup>□</sup> Practical design value.  
 At 400 cycles for class B stage in which the effective resistance per grid circuit is 500 ohms, and the leakage reactance of the coupling transformer is 50 millihenries. The driver stage should be capable of supplying the grids of the class B stage with the specified values at low distortion.

• Includes peak voltage drop through the grid circuit impedance.  
 ▲ For power output shown.

Two 6N7's or 6N7-G's can be operated in a class B output stage with the two triode units of each tube connected in parallel to give a power output of 20 watts (approx.) under conditions of 300 volts on the plates and a 5000-ohm plate-to-plate load.

■ See next page.      ← Indicates a change.



## 6N7, 6N7-GT/G

## CLASS B TWIN AMPLIFIER

(continued from preceding page)

CLASS A<sub>1</sub> AMPLIFIER - As Driver

Both grids connected together at socket; likewise, both plates.

Plate Voltage	300 max. volts
Plate Dissipation (per plate)	1.0 max. watt

## Typical Operation:

Plate	250	294	volts
Grid <sup>▲</sup>	-5	-6	volts
Amp. Fact.	35	35	
Plate Res.	11300	11000	ohms
Transcond.	3100	3200	μmhos
Plate Cur.	6	7	ma.

Plate Load—Depends largely on the design factors of the class B amplifier. In general, the load will be between 2000 and 4000 ohms.

Power Output—under max. voltage conditions, upwards of 400 mw. can be obtained.

■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

▲ The d-c resistance in the grid circuit of the 6N7 or 6N7-GT/G as a class A amplifier may be as high as 0.5 megohm with cathode bias. With fixed bias, the resistance should not exceed 0.1 megohm.

For additional curves, see Types 6A6 and 53; for data, see RESISTANCE-COUPLED AMPLIFIER CHART.

← Indicates a change.

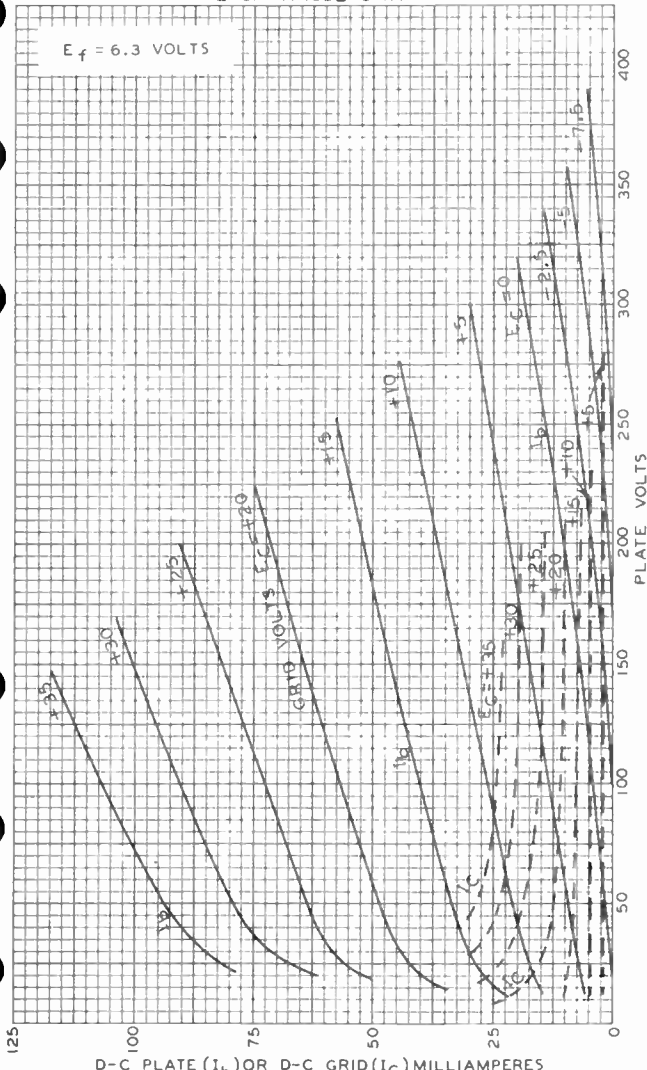




6N7

6N7

# AVERAGE PLATE CHARACTERISTICS EACH TRIODE UNIT



DEC. 18, 1939

RCA RADOTRON DIVISION  
RCA MANUFACTURING COMPANY INC

92C-4611

6P5-GT/G



6P5-GT/G

# DETECTOR AMPLIFIER TRIODE

Heater <sup>■</sup> Coated Unipotential Cathode  
 Voltage 6.3 a-c or d-c volts  
 Current 0.3 amp.

Direct Interelectrode Capacitances:<sup>o</sup>  
 Grid to Plate 2.6  $\mu\text{f}$   
 Grid to Cathode 3.4  $\mu\text{f}$   
 Plate to Cathode 5.5  $\mu\text{f}$

Maximum Overall Length 3-5/16"  
 Maximum Seated Height 2-3/4"  
 Maximum Diameter 1-5/16"  
 Bulb T-9

Base Intermediate Shell Octal 6-Pin  
 Pin 1 - No Connection  
 Pin 2 - Heater  
 Pin 3 - Plate  
 Pin 5 - Grid  
 Pin 7 - Heater  
 Pin 8 - Cathode  
 Mounting Position Any



BOTTOM VIEW (G-6Q)

Maximum Ratings Are Design-Center Values

### AMPLIFIER

Plate Voltage 250 max. volts  
 Plate Dissipation 1.25 max. watts

#### Typical Operation and Characteristics - Class A<sub>1</sub> Amplifier:

Plate	100	250	volts
Grid #	-5	-13.5	volts
Amp. Fact.	13.8	13.8	
Plate Res.	12000	9500	ohms
Transcond.	1150	1450	$\mu\text{mhos}$
Plate Cur.	2.5	5	ma.

- In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
- <sup>o</sup> With shield connected to cathode. Values are approximate.
- \* Under maximum rated conditions, the d-c resistance in the grid circuit should not exceed 1.0 megohm.

Curves for the Type 6P5-GT/G are the same as for the 56 and the 76.



6Q7-G  
6Q7-GT

# 6Q7, 6Q7-G, 6Q7-GT

## DUPLEX-DIODE HIGH-MU TRIODE

Heater #	Coated Unipotential Cathode			
Voltage	0.3	a-c or d-c volts		
Current	0.3	amp.		
	6Q7	6Q7-G	6Q7-GT	
Direct Interelectrode Cap.	▲	▲▲	▲▲	
Grid to Plate	1.4	1.5	1.6 μmf	
Grid to Cathode	5.0	3.2	2.2 μmf	
Plate to Cathode	3.8	5.0	5.0 μmf	
Overall Length	{ 3-1/8" max.	{ 4-1/12" to 4-15/32"	3-5/16" max.	
Seated Height	{ 2-9/16" max.	{ 3-21/32" to 3-29/32"	2-3/4" max.	
Maximum Diameter	1-5/16"	1-9/16"	1-5/16"	
Bulb	Metal Shell, MT-8	ST-12	T-9	
Cap	Miniature	{ Skirted Miniature	{ Skirted Min. Style C	
Base	{ Small Wafer Octal 7-Pin	{ Small Shell Octal 7-Pin	{ Sm. Wafer Octal 7-Pin, Sleeve	
Easing Designation	7V	G-7V	GT-7V	
Pin 1 { 6Q7, Shell 6Q7-G, No Con. 6Q7-GT, Base Sleeve		Pin 4 - Diode Plate #2	Pin 5 - Diode Plate #1	
Pin 2 - Heater		Pin 7 - Heater	Pin 8 - Cathode	
Pin 3 - Triode Plate		Cap - Triode Grid	Any	
Mounting Position				
		BOTTOM VIEW TRIODE UNIT		

Plate Voltage 300 max. volts

### Characteristics - Class A<sub>1</sub> Amplifier:

Plate	100	250	volts
Grid	-1	-3	volts
Amp. Fact.	70	70	
Plate Res.	58000	58000	ohms
Transcond.	1200	1200	μmhos
Plate Cur.	0.8	1.0	ma.

### Typical Operation - Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART

### DIODE UNITS - Two

Consideration of these units is given under Type 85. Circuits will be similar to those shown for Type 55 with fixed bias. Diode biasing of the triode unit of the 6Q7, 6Q7-G or 6Q7-GT is not suitable. Diode curves under Type 687 apply to the 6Q7, 6Q7-G, and 6Q7-GT.

■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

▲ With shell connected to cathode. Values are approximate.

▲▲ With close-fitting shield connected to cathode. Values are approximate.

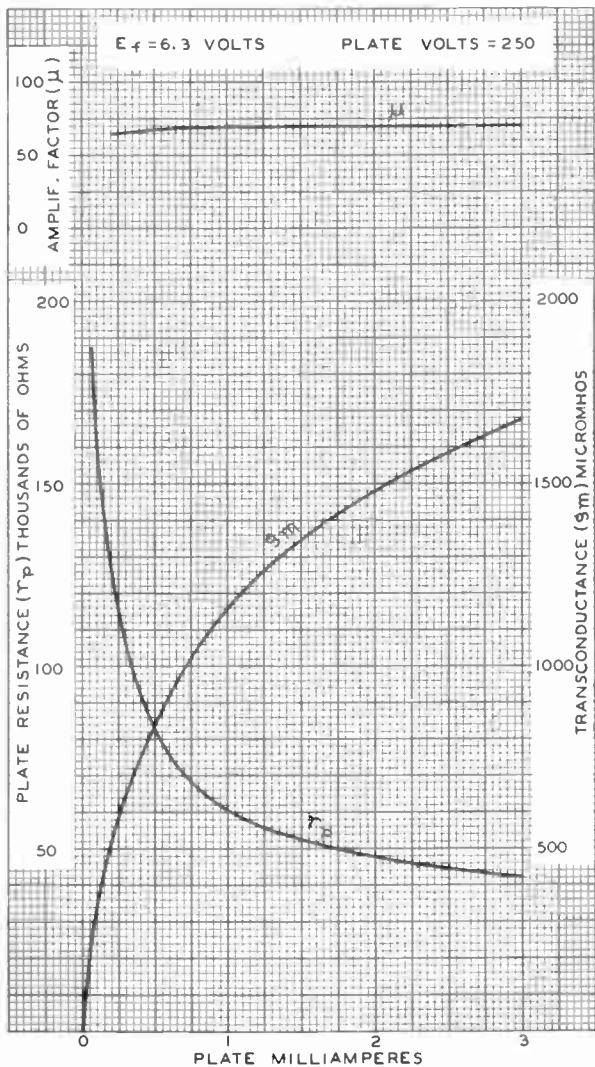
← Indicates a change.

6Q7



6Q7

## AVERAGE CHARACTERISTICS



JUNE 29, 1936

RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY INC

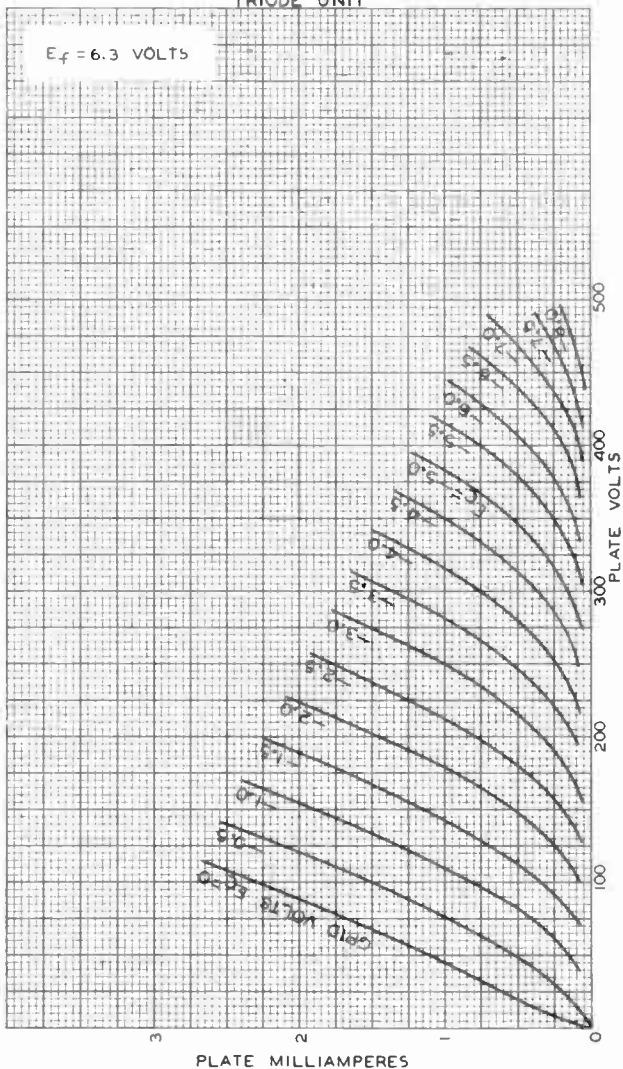
92C-4577



6Q7

# AVERAGE PLATE CHARACTERISTICS TRIODE UNIT

6Q7



SEPT. 10, 1941

RCA RADIONRON DIVISION  
RCA MANUFACTURING COMPANY INC.

92C-4522R2



6R7  
6R7-GT/G

## 6R7, 6R7-GT/G

## DUPLEX-DIODE TRIODE

Heater		Coated Inertential Cathode	
Voltage	6.3	a-c or d-c volts	
Current	0.3	amp.	
	6R7	6R7-GT/G	
Direct Interelectrode Cap.	▲		
Grid to Plate	2.4	-	μf
Grid to Cathode	4.8	-	μf
Plate to Cathode	3.8	-	μf
Maximum Overall Length	3-1/8"	3-5/16"	
Maximum Seated Height	2-9/16"	2 3/4"	
Maximum Diameter	1-5/16"	1-5/16"	
Bulb	Metal Shell, MT-8		T-9
Cap	Miniature		{ Skirted
Base	{ Small Wafer	{ Intermed. Shell	
Basing Designation	{ Octal 7-Pin	{ Octal 7-Pin	
Pin 1	7V	G-7V	
Pin 1	{ 6R7, Shell	Pin 4 - Diode Plate #2	
	{ 6R7-GT/G, No	Pin 5 - Diode Plate #1	
	Connection	Pin 7 - Heater	
Pin 2 - Heater		Pin 8 - Cathode	
Pin 3 - Triode Plate		Cap - Triode Grid	
Mounting Position			Any



BOTTOM VIEW

Maximum Ratings Are Design-Center Values

## TRIODE UNIT

Plate Voltage	250 max. volts
Plate Dissipation	2.5 max. watts
D-C Heater-Cathode Potential	100 max. volts
<i>Typical Operation and Characteristics—Class A<sub>1</sub> Amplifier:</i>	
Plate	250 volts
Grid	-9 volts
Amp. Fact.	16
Plate Res.	8500 ohms
Transcond.	1900 μmhos
Plate Cur.	9.5 ma.

*Typical Operation—Resistance-Coupled Amplifier:*

See RESISTANCE-COUPLED AMPLIFIER CHART. Under maximum rated conditions, the d-c resistance in the grid circuit of the 6R7 and 6R7-GT/G should not exceed 1.0 megohm.

## DIODE UNITS - Two

For consideration of these units, see Type 85. Circuits will be similar to those shown for Type 55 with fixed bias. Diode biasing of the triode unit of the 6R7 and 6R7-GT/G is not suitable. Diode curves under Type 687 apply to the 6R7 and 6R7-GT/G.

▲ Triode unit with shell connected to cathode. values are approximate.

An additional curve applying to Types 6R7 and 6R7-GT/G is

← Indicates a change. is shown under Type 6SK7.

6R7

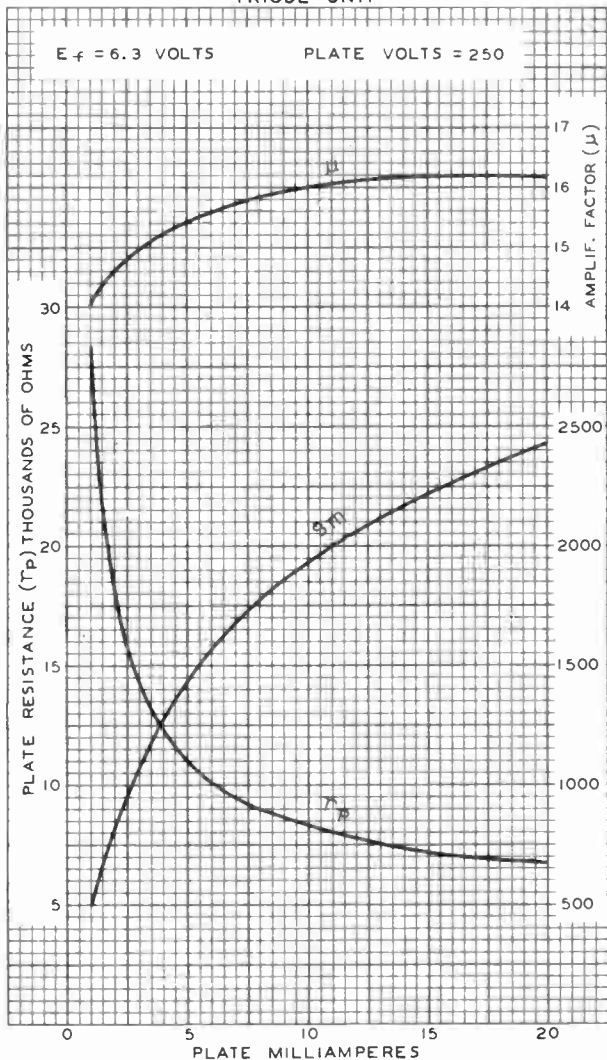


6R7

# AVERAGE CHARACTERISTICS TRIODE UNIT

 $E_f = 6.3$  VOLTS

PLATE VOLTS = 250



DEC. 14, 1943

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

92CM-4546R1





6S4-A

# 6S4-A

## MEDIUM-MU TRIODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	ac or dc volts
Current . . . . .	0.6	amp
Warm-up time (Average) . . . . .	11	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid to plate . . . . .	2.6	$\mu\mu\text{f}$
Grid to cathode and heater . . . . .	4.2	$\mu\mu\text{f}$
Plate to cathode and heater . . . . .	0.9	$\mu\mu\text{f}$

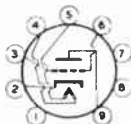
#### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	250	volts
Grid Voltage . . . . .	-8	volts
Amplification Factor . . . . .	16	
Plate Resistance (Approx.) . . . . .	3600	ohms
Transconductance . . . . .	4500	$\mu\text{mhos}$
Plate Current . . . . .	26	ma
Plate Current for grid voltage of -15 volts . . . . .	4.5	ma
Grid Voltage (Approx.) for plate current of 50 $\mu\text{amp}$ . . . . .	-23	volts

#### 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 (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW . . . . .	.9AC

- Pin 1 - Internal Connection- Do Not Use
- Pin 2 - Cathode
- Pin 3 - Grid
- Pin 4 - Heater



- Pin 5 - Heater
- Pin 6 - Grid
- Pin 7 - Same as Pin 1
- Pin 8 - Same as Pin 1
- Pin 9 - Plate

<sup>0</sup> without external shield.

MAR. 1, 1955

TUBE DIVISION

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6S4-A



6S4-A

## MEDIUM-MU TRIODE

## VERTICAL DEFLECTION AMPLIFIER

## Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	500 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE#		
(Absolute maximum) . . . . .	2200 <sup>■</sup> max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	250 max.	volts
CATHODE CURRENT:		
Peak . . . . .	105 max.	ma
Average . . . . .	30 max.	ma
PLATE DISSIPATION . . . . .	7.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	200 max.	volts
Heater positive with respect to cathode. . . . .	200 <sup>▲</sup> max.	volts

## Maximum Circuit Values:

## Grid-Circuit Resistance:

For cathode-bias operation . . . . . 2.2 max. megohms

<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

<sup>#</sup> This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

<sup>■</sup> Under no circumstances should this absolute value be exceeded.

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

MAR. 1, 1955

TUBE DIVISION

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

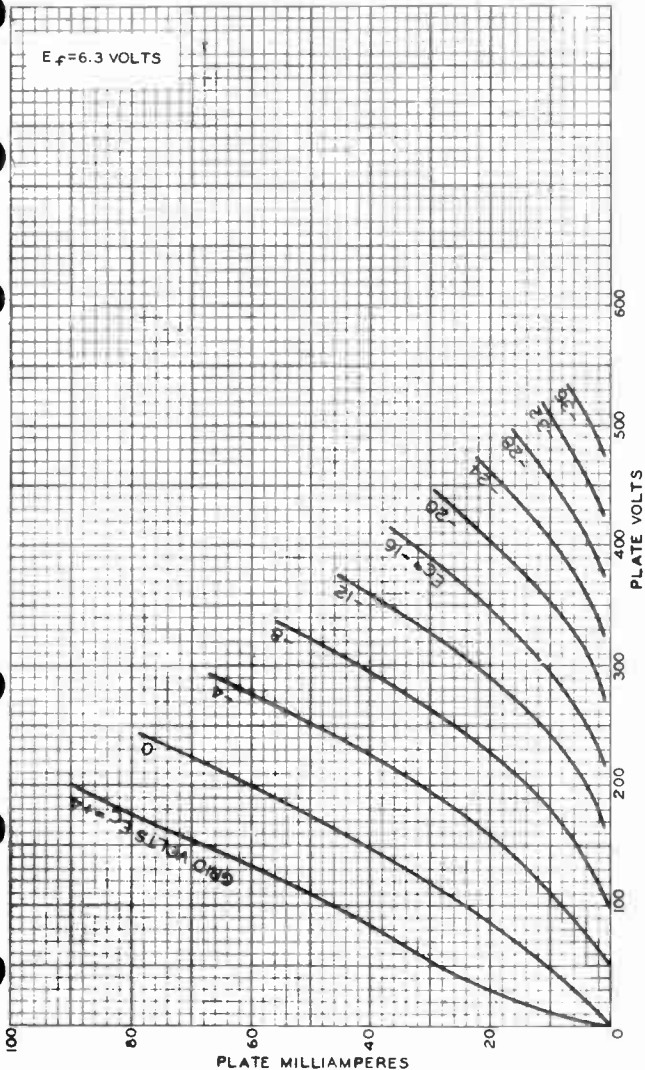
World Radio History



6S4-A

6S4-A

### AVERAGE PLATE CHARACTERISTICS







6S7, 6S7-G



6S7, 6S7-G

## TRIPLE-GRID SUPER-CONTROL AMPLIFIER

	Coated Unipotential Cathode	
	6S7	6S7-G
Heater <sup>■</sup>	6.3 a-c or d-c volts	
Voltage	0.15 amp.	
Current		
Direct Interelectrode Cap.	▲	▲▲
Grid to Plate	0.005 max.	0.008 max. μf
Input	6.5	4.4 μf
Output	10.5	8 μf
Overall Length	3-1/8" max.	{ 4-7/32" to 4-15/32"
Maximum Diameter	1-5/16"	1-9/16"
Bulb	Metal Shell, MT-8	ST-12
Cap	Miniature	Skirted Min.
Base	{ Small Wafer { Octal 7-Pin	{ Small Shell { Octal 7-Pin
Basing Designation	7R	G-7R
Pin 1	{ 6S7, Shell { 6S7-G, No Con.	Pin 5 - Suppressor
Pin 2 - Heater		Pin 7 - Heater
Pin 3 - Plate		Pin 8 - Cathode
Pin 4 - Screen		Cap - Grid
Mounting Position	Any	



BOTTOM VIEW

AMPLIFIER - Class A<sub>1</sub>

Plate Voltage	300 max. volts	
Screen Voltage	100 max. volts	
Screen Supply Voltage	300 max. volts	
Grid Voltage	0 min. volts	
Plate Dissipation	2.25 max. watts	
Screen Dissipation	0.25 max. watt	
Typical Operation:		
Plate	135	250 volts
Screen	67.5	100 volts
Grid	-3	-3 volts
Suppressor	Connected to cathode at socket	
Plate Res. (approx.)	1	1 megohm
Transcond.	1250	1750 μmhos
Transcond.	10 <sup>●</sup>	10 <sup>▲</sup> μmhos
Plate Cur.	3.7	8.5 ma.
Screen Cur.	0.9	2 ma.

■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

▲ With shell connected to cathode.

▲▲ With close-fitting shield connected to cathode.

● With grid bias of -25 volts.

▲ With grid bias of -38.5 volts.

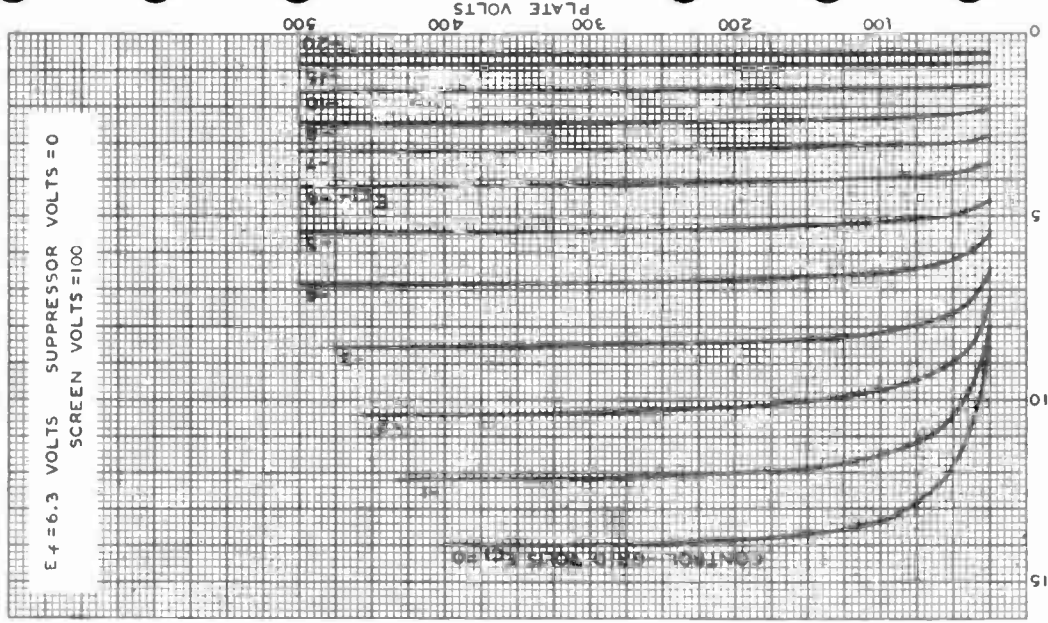
657



6S7

# AVERAGE PLATE CHARACTERISTICS

E<sub>f</sub> = 6.3 VOLTS    SUPPRESSOR VOLTS = 0  
SCREEN VOLTS = 100



JAN. 17, 1938

PLATE MILLIAMPERES

RCA RADIODIODE DIVISION  
RCA MANUFACTURING COMPANY, INC.

92C - 4868



6S8-GT

6S8-GT

# TRIPLE DIODE-HIGH-MU TRIODE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

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

Direct Interelectrode Capacitances:\*

Triode Unit:

Grid to Plate . . . . .	1.2	$\mu\text{f}$
Grid to Cathode. . . . .	2.0	$\mu\text{f}$
Plate to Cathode . . . . .	3.8	$\mu\text{f}$

Each Diode Unit:

Plate to Cathode (Approx.). . . . .	1.0	$\mu\text{f}$
-------------------------------------	-----	---------------

\* With external shield.

### Mechanical:

Mounting Position. . . . .	Any
Maximum Overall Length . . . . .	3-5/8"
Maximum Seated Length. . . . .	3-1/16"
Maximum Diameter . . . . .	1-9/32"
Bulb . . . . .	T-9
Base . . . . .	Intermediate-Shell Octal 8-Pin
Basing Designation for BOTTOM VIEW . . . . .	8CB

- Pin 1 - Diode Plate No.3
- Pin 2 - Cathode of Triode & Diodes Nos. 2 & 3
- Pin 3 - Diode Plate No.1



- Pin 4 - Diode Plate No.2
- Pin 5 - Cathode of Diode No.1
- Pin 6 - Triode Plate
- Pin 7 - Heater
- Pin 8 - Heater Cap - Triode Grid

## TRIODE UNIT AMPLIFIER - Class A1

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	300 max.	volts
PLATE DISSIPATION. . . . .	0.5 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:

Plate Voltage. . . . .	50	100	250	volts
Grid Voltage . . . . .	0	-1	-2	volts
Grid Resistor. . . . .	10	0	0	megohms
Amplification Factor . . . . .	85	100	100	
Plate Resistance . . . . .	285000	110000	91000	ohms
Transconductance . . . . .	300	900	1100	$\mu\text{mhos}$
Plate Current. . . . .	0.07	0.4	0.9	ma

6S8-GT



6S8-GT

# TRIPLE DIODE—HIGH-MU TRIODE

## DIODE UNITS

### Maximum Ratings, Design-Center Values:

PLATE CURRENT (For Each Diode) . . . . . 1.0 max. ma

### Diode Considerations:

Diode units No.2 & No.3 and the triode unit have a common cathode, and diode unit No.1 has a separate cathode. Diodes No.1 (pins 3 & 5) and No.3 (pins 1 & 2) are recommended for use in FM detector applications, while diode No.2 (pins 4 & 2) is recommended for use as an AM detector.

Further consideration of these units, including diode curves, is given at the front of this section. Diode biasing of the triode unit of the 6S8-GT is not suitable.

AUGUST 29, 1947

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

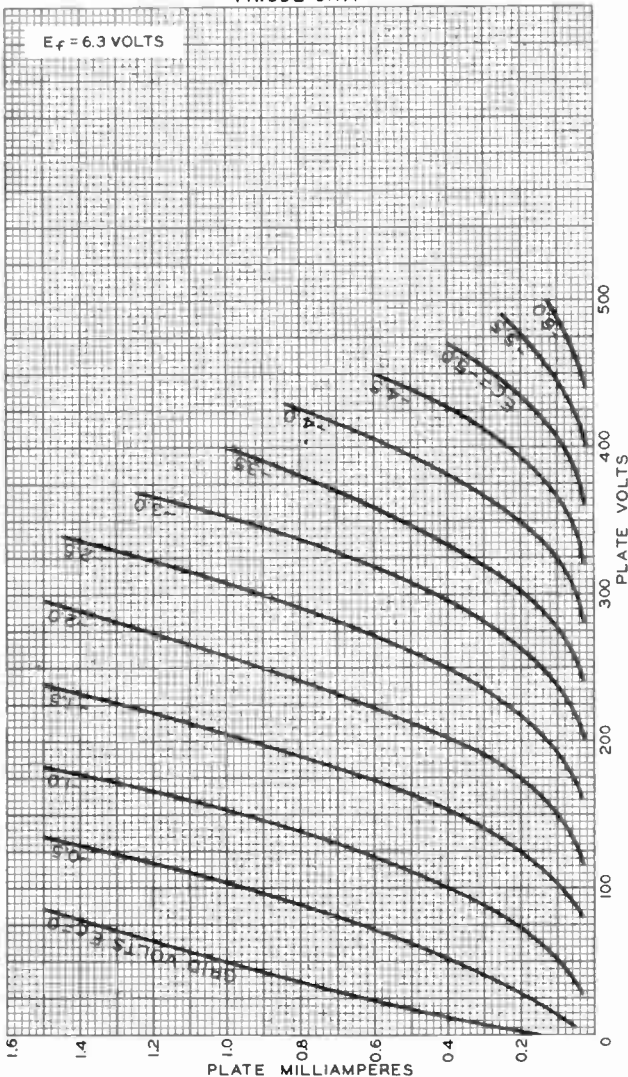




6S8-GT

6S8-GT

### AVERAGE PLATE CHARACTERISTICS TRIODE UNIT



JULY 25, 1947

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY  
World Radio History

92CM-6876





6SA7  
6SA7-GT/G

# 6SA7, 6SA7-GT/G

## PENTAGRID CONVERTER

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances:	6SA7	6SA7-GT/G
Grid #3 to All Other Electrodes (R-F Input)	9.5 <sup>▲</sup>	11 <sup>▲▲</sup> μf
Plate to All Other Electrodes (Mixer Output)	12 <sup>▲</sup>	11 <sup>▲▲</sup> μf
Grid #1 to All Other Electrodes (Osc. Input)	7 <sup>▲</sup>	8 <sup>▲▲</sup> μf
Grid #3 to Plate	0.13 max. <sup>▲</sup>	0.5 max. <sup>▲▲</sup> μf
Grid #3 to Grid #1	0.15 max. <sup>▲</sup>	0.4 max. <sup>▲▲</sup> μf
Grid #1 to Plate	0.06 max. <sup>▲</sup>	0.2 max. <sup>▲▲</sup> μf
Grid #1 to Shell, Grid #5, and All Other Electrodes except Cathode	4.4	- μf
Grid #1 to All Other Electrodes except Cathode & Grid #5	-	5 μf
Grid #1 to Cathode	2.6	- μf
Grid #1 to Cathode & Grid #5	-	3 μf
Cathode to Shell, Grid #5, and All Other Electrodes except Grid #1	5	- μf
Cathode and Grid #5 to All Other Electrodes except Grid #1	-	14 μf
Maximum Overall Length	2-5/8"	3-5/16"
Maximum Seated Height	2-1/16"	2-3/4"
Maximum Diameter	1-5/16"	1-5/16"
Bulb	Metal Shell MT-8	T-9
Base	{ Small Wafer { Octal B-Pin	{ intermed. Sh. { Octal d-Pin
Pin 1	{ 6SA7, Shell, Grid #5 { 6SA7-GT/G, No Conn.	
Pin 2	Heater	
Pin 3	Plate	
Pin 4	Grids #2 & #4	
Pin 5	Grid #1	
Pin 6	{ 6SA7, Cathode { 6SA7-GT/G, Cathode & Grid #5	
Pin 7	Heater	
Pin 8	Grid #3	
Mounting Position		Any

<i>Maximum And Minimum Ratings Are Design-Center Values</i>	
<u>CONVERTER SERVICE</u>	
Plate Voltage	300 max. volts
Grids #2 & #4 Voltage	100 max. volts
Grids #2 & #4 Supply Voltage	300 max. volts
Grid #3 Voltage	0 min. volts
Plate Dissipation	1.0 max. watt
Screen Dissipation	1.0 max. watt
Total Cathode Current	14 max. ma.

■	In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
▲	with shell connected to cathode.
▲▲	with external shield connected to cathode.
*	For self-excited oscillator.
←	Indicates a change.



Jan. 1, 1943

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

DATA

6SA7  
6SA7-GT/G



# 6SA7, 6SA7-GT/G PENTAGRID CONVERTER

(continued from preceding page)

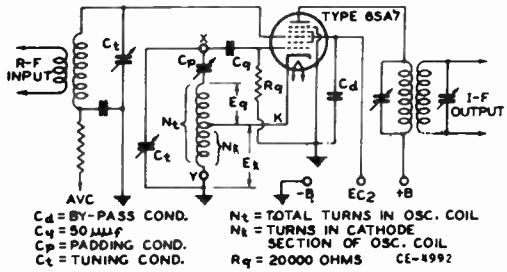
Characteristics:	Self-excitation*		Separate Excitation		
Plate Voltage	100	250	100	250	volts
Grids #2 & #4 Volt.	100	100	100	100	volts
Grid #3 (Control) Volt.	0	0	-2	-2	volts
Grid #1 Resistor	20000	20000	20000	20000	ohms
Plate Res. (Approx.)	0.5	1.0	0.5	1.0	megohm
Conversion Transcond.	425	450	425	450	$\mu$ mhos
Conversion Transcond. (Approx.) †	2	2	2	2	$\mu$ mhos
Plate Current	3.3	3.5	3.3	3.5	ma.
Grids #2 & #4 Current	8.5	8.5	8.5	8.5	ma.
Grid #1 Current	0.5	0.5	0.5	0.5	ma.
Total Cathode Current	12.3	12.5	12.3	12.5	ma.

NOTE: The transconductance between Grid #1 and Grids #2 & #4 connected to plate (not oscillating) is approximately 4500  $\mu$ mhos under the following conditions: Grids #1, #3, and shell at 0 volts; Grids #2 & #4 and plate at 100 volts.

\* Characteristics are approximate only and are shown for a Hartley circuit with a feedback of approximately 2 volts peak in the cathode circuit.

† With Grid #3 bias of -35 volts.

TYPICAL SELF-EXCITED CONVERTER CIRCUIT FOR TYPE 6SA7



The license extended to the purchaser of tubes appears in the License Notice accompanying them. Information contained herein is furnished without assuming any obligations.

Jan. 1, 1943

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

DATA

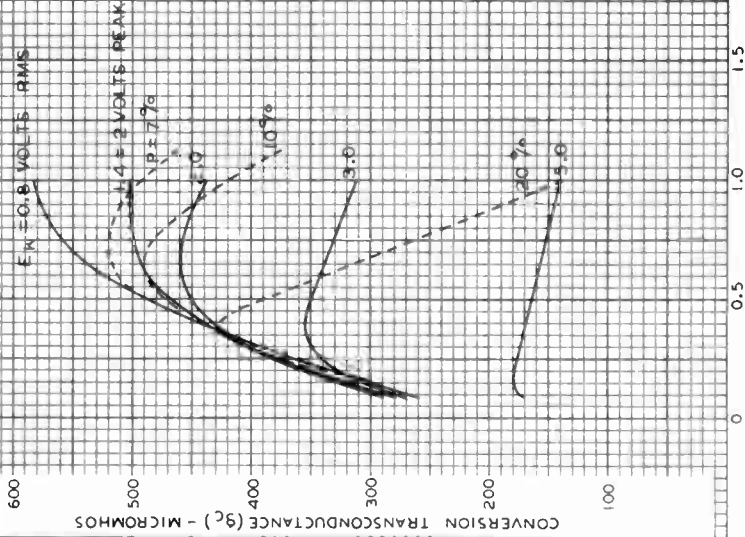


6SA7

6SA7

# OPERATION CHARACTERISTICS WITH SELF-EXCITATION

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 250  
 GRIDS - N<sub>2</sub> & N<sub>3</sub> 4 VOLTS = 100  
 GRID - N<sub>3</sub> (CONTROL GRID) VOLTS = -1  
 GRID - N<sub>2</sub> 1 RESISTOR - OHMS = 20000  
 P = PERCENTAGE RATIO OF  $E_k$  TO  $E_k + E_g$ : SEE CIRCUIT



NOV. 2, 1938

GRID-N<sub>2</sub>1 MILLIAMPERES (I<sub>C1</sub>)
 RCA RADIOTRON DIVISION  
 RCA MANUFACTURING COMPANY, INC.

92C-4993

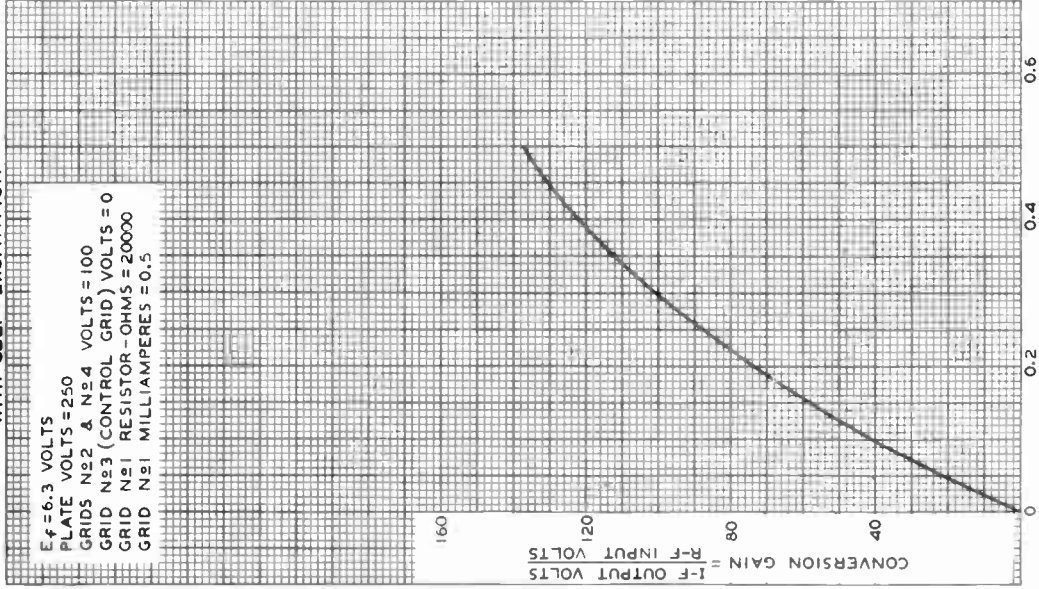
65A7



65A7

### OPERATION CHARACTERISTIC WITH SELF-EXCITATION

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 250  
 GRIDS N<sub>2</sub> & N<sub>4</sub> VOLTS = 100  
 GRID N<sub>3</sub> (CONTROL GRID) VOLTS = 0  
 GRID N<sub>1</sub> RESISTOR - OHMS = 20000  
 GRID N<sub>1</sub> MILLIAMPERES = 0.5



APR. 25, 1941

RESONANT LOAD IMPEDANCE - MEGOHMS

 RCA RADIODIODE DIVISION  
 RCA MANUFACTURING COMPANY, INC.

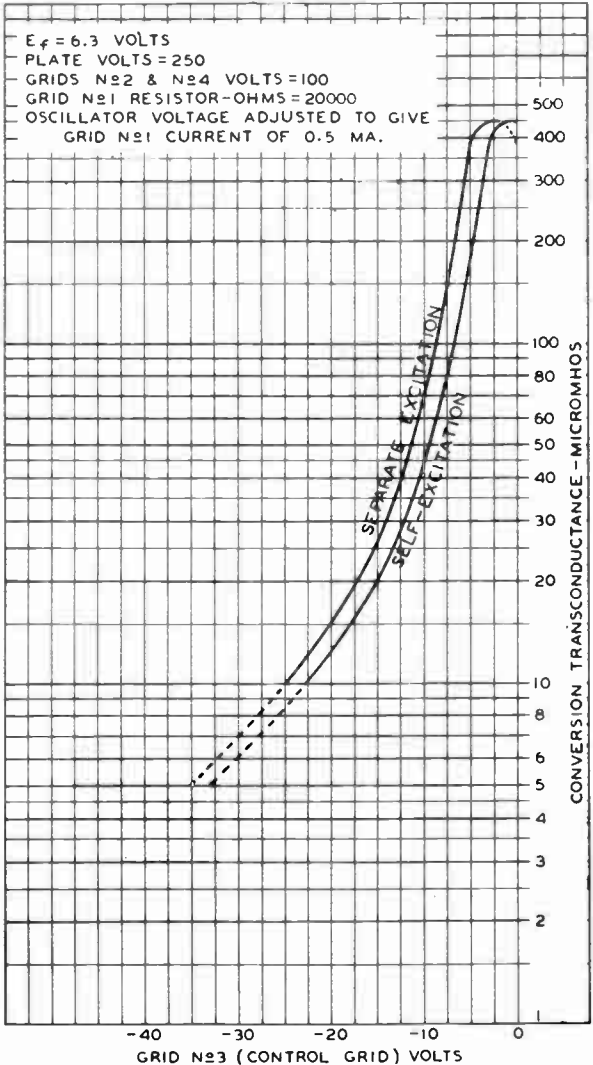
CE-4994



6SA7

6SA7

### OPERATION CHARACTERISTICS



OCT. 25, 1938

RCA RADHOTRON DIVISION  
RCA MANUFACTURING COMPANY, INC.  
World Radio History

92C-4989

6SA7



6SA7

### OPERATION CHARACTERISTICS WITH SEPARATE OSCILLATOR EXCITATION

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

CONVERSION TRANSDUCANCE ( $g_c$ ) - MICROMHMS

CATHODE MILLIAMPERES

16  
12  
8  
4

GRID-№1 MILLIAMPERES ( $I_{C1}$ )

RECOMMENDED MINIMUM  
VALUE OF  $I_{C1}$

CATHODE CURRENT

$g_c$

APR. 24, 1941

RCA RADOTRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

World Radio History

92C-4990R1





6SB7-Y

6SB7-Y

# 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

<sup>▲</sup> with shell connected to cathode.

APRIL 1, 1946

RCA VICTOR DIVISION

TENTATIVE DATA 1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6SB7-Y



6SB7-Y

## 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	. .	μmhos
Conversion Transconductance**	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.

### 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.



6SB7-Y

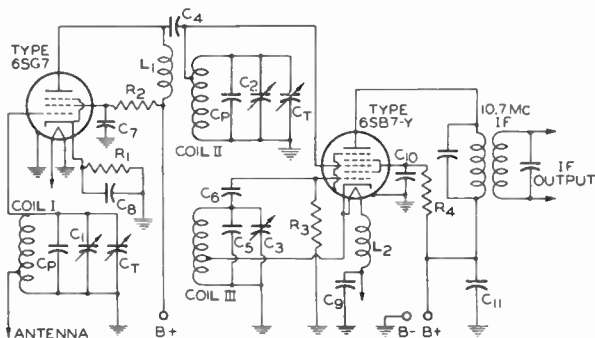
6SB7-Y

# 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 = MF 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.

92CM-6650

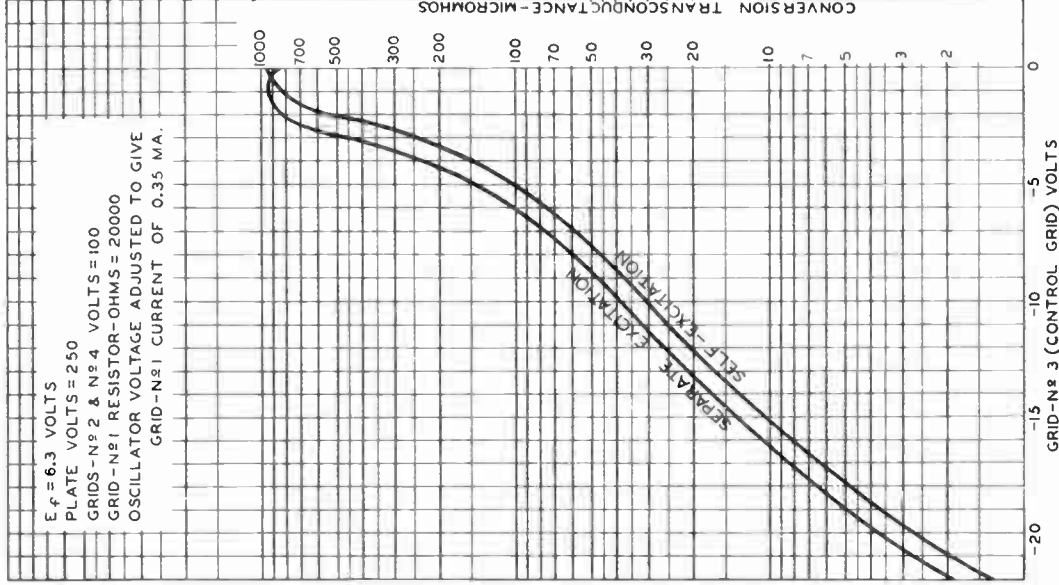
6SB7-Y



6SB7-Y

## OPERATION CHARACTERISTICS

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 250  
 GRIDS - N<sup>o</sup> 2 & N<sup>o</sup> 4 VOLTS = 100  
 GRID - N<sup>o</sup> 1 RESISTOR - OHMS = 20000  
 OSCILLATOR VOLTAGE ADJUSTED TO GIVE  
 GRID - N<sup>o</sup> 1 CURRENT OF 0.35 MA.



NOV. 8, 1945

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

92CM-6619



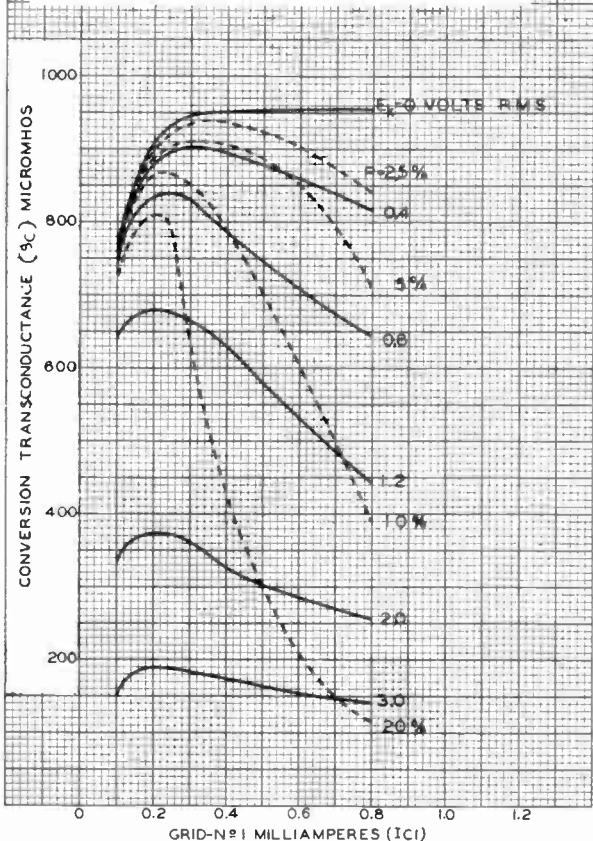
6SB7-Y

# 6SB7-Y

## OPERATION CHARACTERISTICS WITH SELF-EXCITATION

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 250  
 GRIDS-Nº 2 & Nº 4 VOLTS = 100  
 GRID-Nº 3 (CONTROL GRID) VOLTS = -1  
 GRID-Nº 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



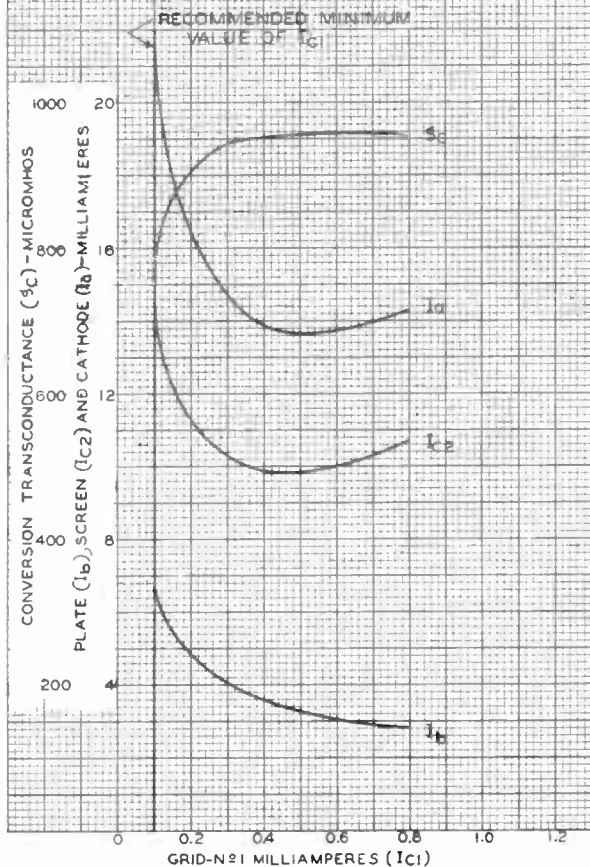
6SB7-Y



6SB7-Y

### OPERATION CHARACTERISTICS WITH SEPARATE OSCILLATOR EXCITATION

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



NOV. 20, 1945

RCA VICTOR DIVISION  
 RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY  
 World Radio History

92CM-6634



6SC7

6SC7

# HIGH-MU TWIN TRIODE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

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

Direct Interelectrode Capacitances (Approx.):\*

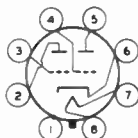
Grid to plate . . . . .	2	$\mu\text{uf}$
Grid to cathode, heater, and shell . . . . .	2	$\mu\text{uf}$
Plate to cathode, heater, and shell . . . . .	3	$\mu\text{uf}$

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-5/8"
Maximum Seated Length . . . . .	2-1/16"
Maximum Diameter . . . . .	1-5/16"
Bulb . . . . .	Metal Shell, MT-8
Base . . . . .	Small-Wafer Octal 8-Pin (JETEC No.88-21)

Basing Designation for BOTTOM VIEW . . . . . 8S

Pin 1 - Shell	Pin 5 - Plate of Unit No.1
Pin 2 - Plate of Unit No.2	Pin 6 - Cathode
Pin 3 - Grid of Unit No.2	Pin 7 - Heater
Pin 4 - Grid of Unit No.1	Pin 8 - Heater



## AMPLIFIER - Class A<sub>1</sub>

Values are for Each Unit

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	250 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:

Plate Voltage . . . . .	250	volts
Grid Voltage . . . . .	-2	volts
Amplification Factor . . . . .	70	
Plate Resistance (Approx.) . . . . .	53000	ohms
Transconductance (Approx.) . . . . .	1325	$\mu\text{mhos}$
Plate Current . . . . .	2	ma

### Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART No.17 at front of this Section

\* values for each unit with pin 1 connected to pin 6.

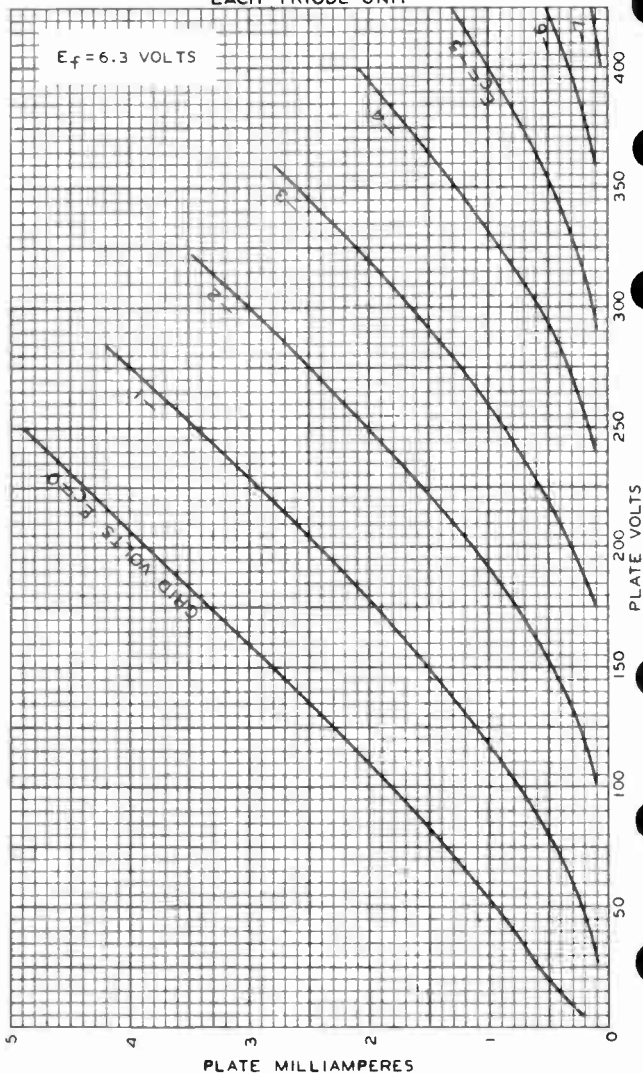
← indicates a change.

6SC7



6SC7

### AVERAGE PLATE CHARACTERISTICS EACH TRIODE UNIT



OCT. 16, 1940

PLATE MILLIAMPERES

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

92CM-6096R1



6SF5  
6SF5-GT

# 6SF5, 6SF5-GT HIGH-MU TRIODE

Heater		Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts	
Current	0.3	amp.	
Direct Interelectrode Cap.	6SF5 $\Delta$	6SF5-GT	
Grid to Plate	2.4	-	uuf
Grid to Cathode	4.0	-	uuf
Plate to Cathode	3.6	-	uuf
Maximum Overall Length	2-5/8"	3-5/16"	
Maximum Seated Height	2-1/16"	2-3/4"	
Maximum Diameter	1-5/16"	1-5/16"	
Bulb	Metal Shell MT-8	T-9	
Base	{ Small Wafer { Octal 6-Pin	{ Intermed. Shell { Octal 6-Pin	
Basing Designation	GAB	G-6AB	
Pin 1	{ 6SF5, Shell { 6SF5-GT, No Con.	Pin 5 - Plate	
Pin 2 - Cathode		Pin 7 - Heater	
Pin 3 - Grid		Pin 8 - Heater	
Mounting Position			Any



BOTTOM VIEW

AMPLIFIER

Plate Voltage		300 max.	volts
<i>Characteristics - Class A<sub>1</sub> Amplifier:</i>			
Plate	100	250	volts
Grid	-1	-2	volts
Amp. Fact.	100	100	
Plate Res.	85000	66000	ohms
Transcond.	1150	1500	umhos
Plate Cur.	0.4	0.9	ma.

*Typical Operation - Resistance Coupled Amplifier:*

Same as 6F5 in RESISTANCE-COUPLED AMPLIFIER CHART.

- In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
- ▴ with shell connected to cathode. Values are approximate.

The curve under type 6F5 also applies to the 6SF5 and 6SF5-GT.

← Indicates a change.

May 1, 1941

RCA RADIONRON DIVISION  
RCA MANUFACTURING COMPANY INC

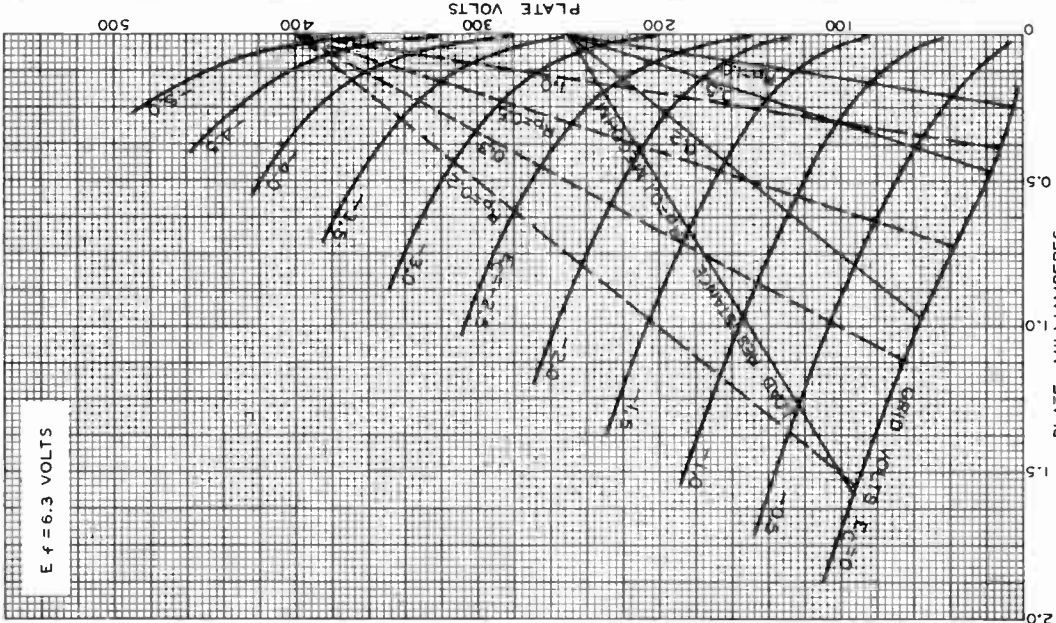
DATA



6SF5

# AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS



6SF5

SEPT. 23 1938

RCA RADIIOTRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

92C-4974



6SF7



6SF7

**DIODE - SUPER-CONTROL AMPLIFIER PENTODE**

SINGLE-ENDED METAL TYPE

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances: <sup>0</sup>		
<i>Pentode Unit</i>		
Grid to Plate	0.004 max.	μf
Input	5.5	μf
Output	6.0	μf
<i>Pentode Grid to Diode</i>		
Pentode Plate to Diode	0.002 max.	μf
	0.8	μf
Maximum Overall Length		2-5/8"
Maximum Seated Height		2-1/16"
Maximum Diameter		1-5/16"
Bulb		Metal Shell, MT-8
Base		Small Wafer Octal 8-Pin
Pin 1 - Shell		Pin 5 - Diode Plate
Pin 2 - Pentode Grid		Pin 6 - Pentode Plate
Pin 3 - Cathode		Pin 7 - Heater
Pin 4 - Screen		Pin 8 - Heater
Mounting Position		Any



BOTTOM VIEW (7AZ)

PENTODE UNIT - AMPLIFIER

Plate Voltage	300 max. volts	
Screen Voltage	100 max. volts	
Screen-Supply Voltage	300 max. volts	
Grid Voltage	0 min. volts	
Plate Dissipation	3.5 max. watts	
Screen Dissipation	0.5 max. watt	
<i>Typical Operation and Characteristics - Class A<sub>1</sub> Amplifier:</i>		
Plate	100	250 volts
Screen	100	100 volts
Grid	-1	-1 volts
Plate Resistance (Approx.)	0.2	0.7 megohm
Transconductance	1975	2050 μmhos
Grid Bias (Approx.) †	-35	-35 volts
Plate Current	12	12.4 ma.
Screen Current	3.4	3.3 ma.

DIODE UNIT - One

Consideration of this unit is similar to that given under Type 6B8-G with the exception that there is one diode in Type 6SF7. Diode curves shown under Type 6B7 apply to the 6SF7.

■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

○ with shell connected to cathode.

† For transconductance of 10 μmhos.

← Indicates a change.

Dec. 1, 1941

RCA RADITRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

TENTATIVE DATA

6SF7

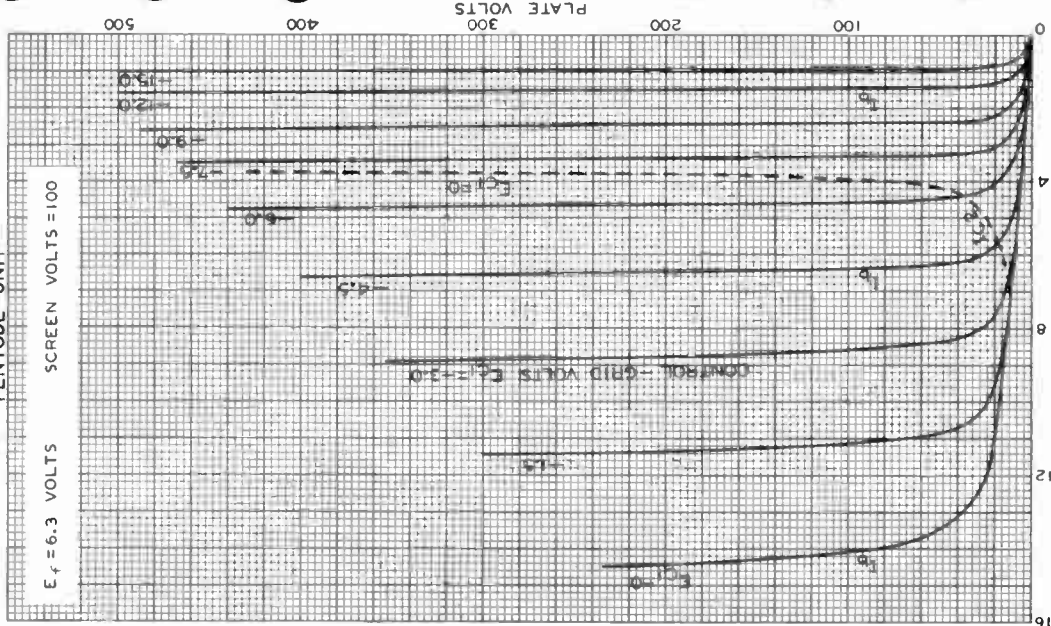


6SF7

# AVERAGE PLATE CHARACTERISTICS PENTODE UNIT

$E_f = 6.3$  VOLTS

SCREEN VOLTS = 100



FEB. 20, 1941

BCA RADIIOTRON DIVISION  
BCA MANUFACTURING COMPANY INC

PLATE ( $I_b$ ) OR SCREEN ( $I_{c2}$ ) MILLIAMPERES

92C-6254

  
**6SG7**

6SG7

## H-F AMPLIFIER PENTODE

SINGLE-ENDED METAL TYPE WITH SEMI-REMOTE CUT-OFF

Heater <sup>■</sup>	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances: <sup>○</sup>		
Grid to Plate	0.003 max.	μf
Input	8.5	μf
Output	7.0	μf
Maximum Overall Length		2-5/8"
Maximum Seated Height		2-1/16"
Maximum Diameter		1-5/16"
Bulb		Metal Shell, MT-8
Base		Small Water Octal, 8-Pin
Pin 1 - Shell		Pin 5 - Cathode
Pin 2 - Heater		Pin 6 - Screen
Pin 3 - Cathode		Pin 7 - Heater
Pin 4 - Grid		Pin 8 - Plate
Mounting Position		Any



BOTTOM VIEW (8BK)

*Maximum And Minimum Ratings Are Design-Center Values*  
 AMPLIFIER

Plate Voltage	300 max. volts
Screen Voltage	200 max. volts
Screen Supply Voltage	300 max. volts
Grid Voltage	0 min. volts
Plate Dissipation	3 max. watts
Screen Dissipation	0.6 max. watt
<i>Typical Operation and Characteristics—Class A<sub>1</sub> Amplifier:</i>	
Plate Voltage	100      250      250      volts
Screen Voltage	100      125      150      volts
Grid Voltage	-1      -1      -2.5      volts
Suppressor	Connected to pin #3 internally
Plate Resistance (Approx.)	0.25      0.9      #      megohm
Transconductance	4100      4700      4000      μmhos
Grid Bias*	-11.5      -14      -17.5      volts
Plate Current	8.2      11.8      9.2      ma.
Screen Current	3.2      4.4      3.4      ma.

- In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
- # Greater than 1 megohm.
- \* Approximate, for transconductance of 40 micromhos.
- with shell connected to cathode.

— Indicates a change.

May 1, 1942

RCA RADOTRON DIVISION  
RCA MANUFACTURING COMPANY INC

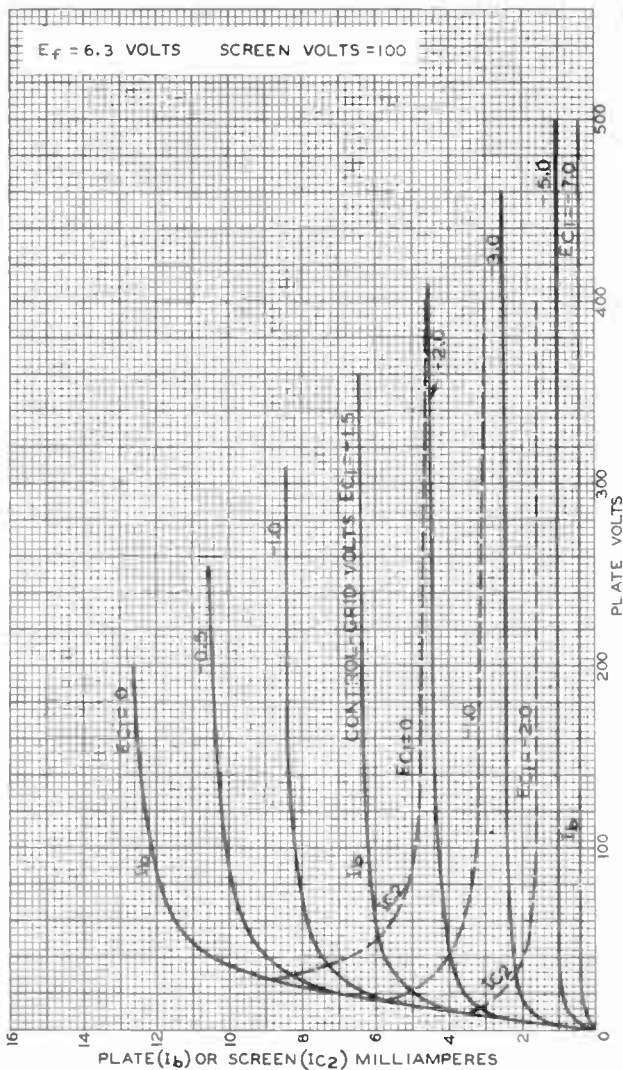
TENTATIVE DATA

6SG7



6SG7

## AVERAGE PLATE CHARACTERISTICS



APRIL 16, 1942

RCA RADIODRON DIVISION  
RCA MANUFACTURING COMPANY INC.

92C-6253R2

World Radio History



6SG7

6SG7

## AVERAGE CHARACTERISTICS

 $E_f = 6.3$  VOLTS

CURVES $I_b$	$I_{C2}$	PLATE VOLTS	SCREEN SUP- PLY VOLTS	SERIES SCREEN RESISTOR-OHMS
1 A		250	50	—
2 B		250	75	—
3 C		250	100	—
4 D		250	125	—
5 E		250	150	—
6 F		250	250	30000

— PLATE CURRENT ( $I_b$ )  
 - - - SCREEN CURRENT ( $I_{C2}$ )

PLATE ( $I_b$ ) OR SCREEN ( $I_{C2}$ ) MILLIAMPERES

20

15

10

5

0

CONTROL - GRID VOLTS

-5

-10

-15

-20

APRIL 16, 1942

RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY INC.

92C-6248R2

6SG7

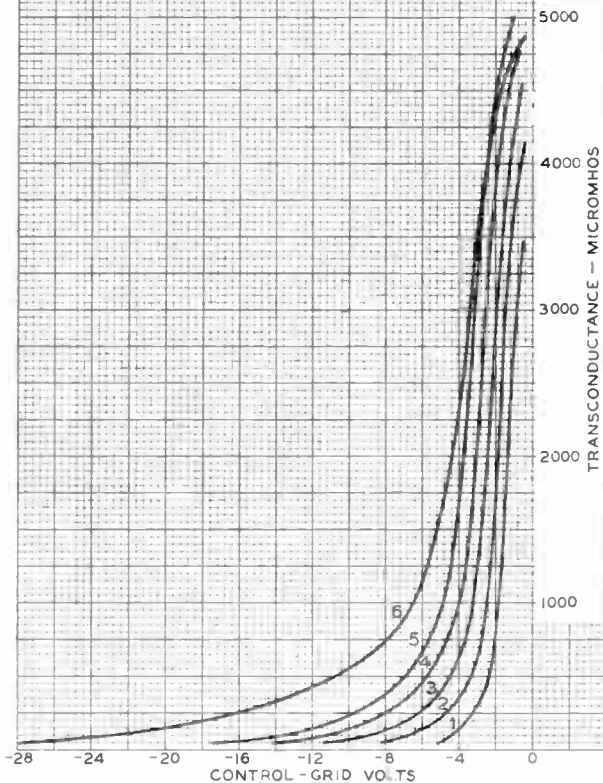


6SG7

## AVERAGE CHARACTERISTICS

 $E_f = 6.3$  VOLTS

CURVE	PLATE VOLTS	SCREEN SUPPLY VOLTS	SERIES SCREEN RESISTOR-OHMS
1	250	50	—
2	250	75	—
3	250	100	—
4	250	125	—
5	250	150	—
6	250	250	30000



APRIL 16, 1942

RCA RADIOTRON DIVISION

92C-6245R2

World Radio History





6SH7

6SH7

**H-F AMPLIFIER PENTODE**

SINGLE-ENDED METAL TYPE WITH SHARP CUT-OFF

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances: <sup>o</sup>		
Grid to Plate	0.003 max.	$\mu$ f
Input	8.5	$\mu$ f
Output	7.0	$\mu$ f
Maximum Overall Length		2-5/8"
Maximum Seated Height		2-1/16"
Maximum Diameter		1-5/16"
Bulb		Metal Shell, MT-A
Base		Small Wafer Octal, 8-Pin
Pin 1 - Shell		Pin 5 - Cathode
Pin 2 - Heater		Pin 6 - Screen
Pin 3 - Cathode		Pin 7 - Heater
Pin 4 - Grid		Pin 8 - Plate
Mounting Position	BOTTOM VIEW (2BK)	Any



Maximum And Minimum Ratings Are Design-Center Values

AMPLIFIER

Plate Voltage	300 max.	volts
Screen Voltage	150 max.	volts
Screen Supply Voltage	300 max.	volts
Grid Voltage	0 min.	volts
Plate Dissipation	3 max.	watts
Screen Dissipation	0.7 max.	watt

Typical Operation and Characteristics - Class A<sub>1</sub> Amplifier:

Plate Voltage	100	250	volts
Screen Voltage	100	150	volts
Grid Voltage	-1	-1	volts
Plate Resistance	0.35	0.9	approx. megohm
Transconductance	4000	4900	$\mu$ mos
Grid Bias for			
Plate Current = 10 $\mu$ amp.	-4	-5.5	volts
Plate Current	5.3	10.8	ma.
Screen Current	2.1	4.1	ma.

NOTE: This type is not recommended for high-gain audio amplifier applications because undesirable hum may be encountered.

■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

<sup>o</sup> with shell connected to cathode.

← Indicates a change.

June 1, 1942

RCA RADIODRON DIVISION  
RCA MANUFACTURING COMPANY INC.

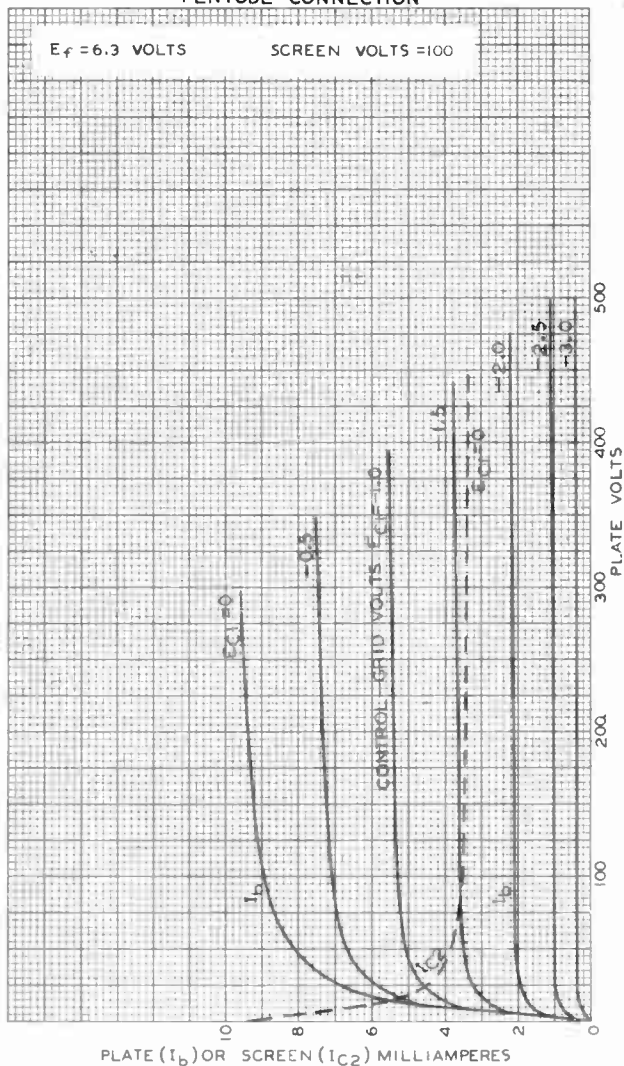
TENTATIVE DATA

6SH7



6SH7

# AVERAGE PLATE CHARACTERISTICS PENTODE CONNECTION



JULY 24, 1941

RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

92C-6300

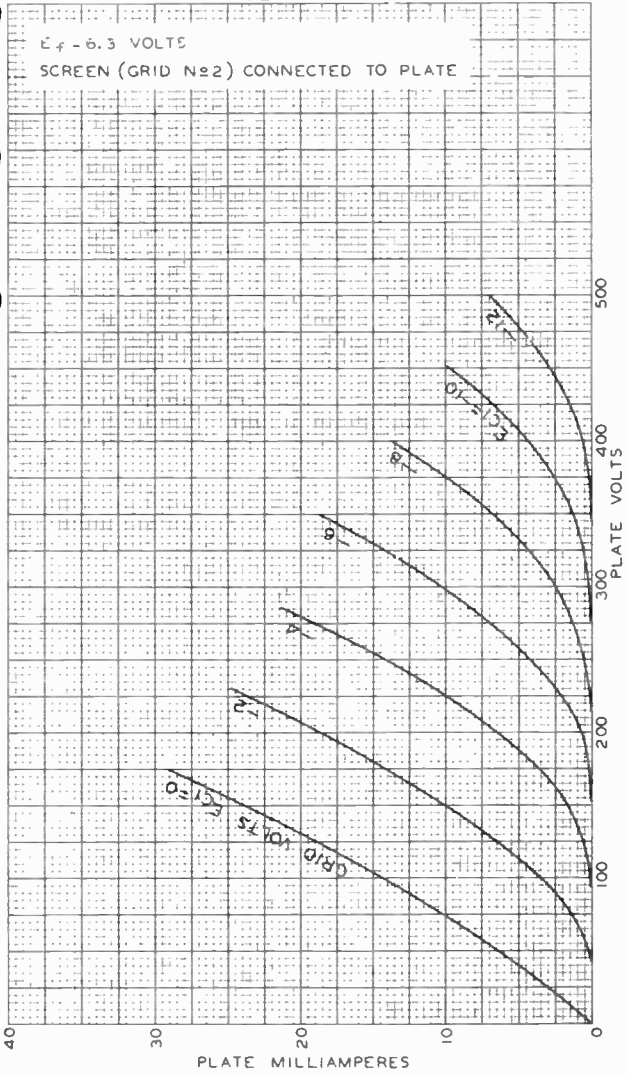
World Radio History



6SH7

6SH7

# AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION



MAY 11, 1942

RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

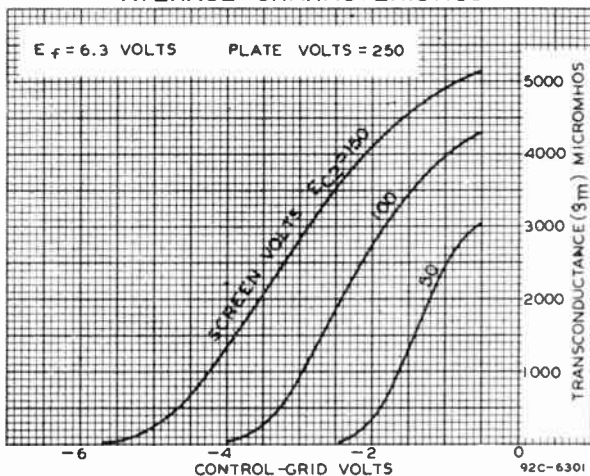
92C-6395

6SH7

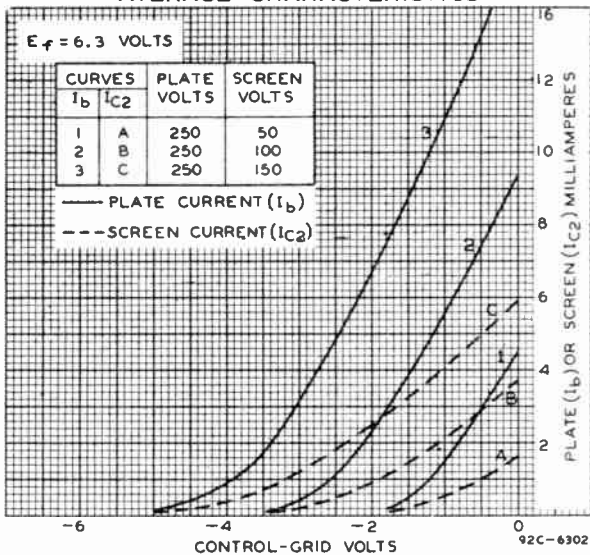


6SH7

## AVERAGE CHARACTERISTICS



## AVERAGE CHARACTERISTICS



MAY 14, 1942

RCA RADIODIODE DIVISION  
RCA MANUFACTURING COMPANY, INC.

92C-6401



6SJ7  
6SJ7-GT

# 6 SJ7, 6SJ7-GT SHARP-CUTOFF PENTODE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

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

Direct Interelectrode Capacitances:

Pentode Connection:	6SJ7 <sup>o</sup>	6SJ7-GT <sup>oo</sup>	
Grid No.1 to Plate . . . . .	0.005 max.	0.005 max.	$\mu\text{f}$
Input . . . . .	6	7	$\mu\text{f}$
Output . . . . .	7	7	$\mu\text{f}$
Triode Connection*:			
Grid No.1 to Plate . . . . .	2.8	2.8	$\mu\text{f}$
Grid No.1 to Cathode . . . . .	3.4	3.4	$\mu\text{f}$
Plate to Cathode . . . . .	11	11	$\mu\text{f}$

<sup>o</sup> with shell connected to cathode.

<sup>oo</sup> with external shield connected to cathode.

\* with grid No.2 and grid No.3 connected to plate.

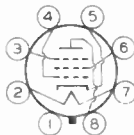
### Mechanical:

Mounting Position . . . . .	Any	Any
Maximum Overall Length . . . . .	2-5/8"	3-5/16"
Maximum Seated Length . . . . .	2-1/16"	2-3/4"
Maximum Diameter . . . . .	1-5/16"	1-5/16"
Bulb . . . . .	Metal Shell, MT8G	T-9
Base . . . . .	{ Small-Wafer Octal 8-Pin	Sm.-Wafer Octal 8-Pin, Sleeve GT-8N
Basing Designation . . . . .	8N	

### BOTTOM VIEW

Pin 1 { 6SJ7, Shell  
6SJ7-GT,  
Base Sleeve

Pin 2-Heater  
Pin 3-Grid No.3



Pin 4-Grid No.1  
Pin 5-Cathode  
Pin 6-Grid No.2  
Pin 7-Heater  
Pin 8-Plate

### AMPLIFIER-Class A<sub>1</sub>

#### Pentode Connection

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	125 max.	volts
GRID-No.2 SUPPLY VOLTAGE . . . . .	300 max.	volts
PLATE DISSIPATION . . . . .	2.5 max.	watts
GRID-No.2 DISSIPATION . . . . .	0.7 max.	watt
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
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

← Indicates a change.

JUNE 15, 1948

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

DATA

6SJ7  
6SJ7-GT



## 6SJ7, 6SJ7-GT SHARP-CUTOFF PENTODE

**Typical Operation and Characteristics:**

Plate voltage. . . . .	100	250	. .	volts
Grid No.3 (Suppressor) .	Connected to cathode at socket			
Grid-No.2 Voltage. . . . .	100	100	. .	volts
Grid-No.1 Voltage. . . . .	-3	-3	. .	volts
Plate Resistance (Approx.) . . . . .	0.7	#	. .	megohm
Transconductance . . . . .	1575	1650	. .	$\mu$ mhos
Grid-No.1 Bias (Approx.) for plate current of 10 $\mu$ amp . . . . .	-8	-8	. .	volts
Plate Current. . . . .	2.9	3.0	. .	ma
Grid-No.2 Current. . . . .	0.9	0.8	. .	ma

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance . . . . .	1 max.	megohm
--	--------	--------

AMPLIFIER - Class A<sub>1</sub>

*Triode Connection - Grids No.2 and No.3 Connected to Plate*

**Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE. . . . .	250 max.	volts
PLATE DISSIPATION (Total). . . . .	2.5 max.	watts
GRID-No.1 VOLTAGE:		
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

**Typical Operation and Characteristics:**

Plate Voltage. . . . .	180	250	. .	volts
Grid-No.1 Voltage. . . . .	-6	-8.5	. .	volts
Amplification Factor . . . . .	19	19		
Plate Resistance (Approx.) . . . . .	8250	7600	. .	ohms
Transconductance . . . . .	2300	2500	. .	$\mu$ mhos
Plate Current. . . . .	6.0	9.2	. .	ma

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance . . . . .	1 max.	megohm
--	--------	--------

# Greater than 1 megohm.

*For additional data, see RESISTANCE-COUPLED AMPLIFIER CHART  
at the front of this Section*

→Indicates a change.

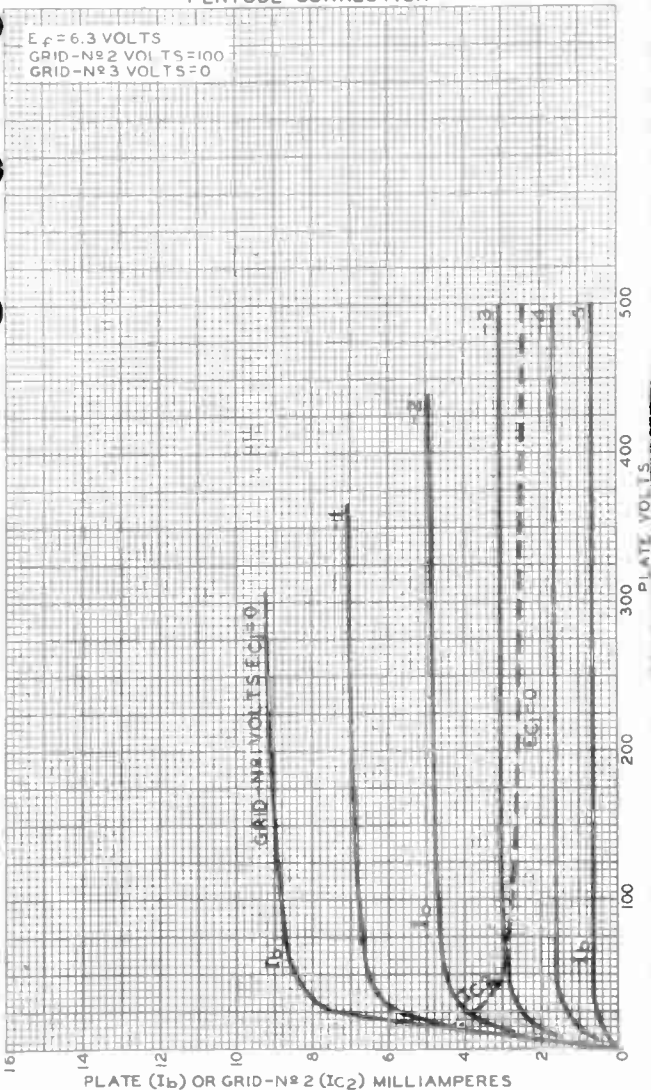


6SJ7

6SJ7

# AVERAGE PLATE CHARACTERISTICS PENTODE CONNECTION

$E_f = 6.3$  VOLTS  
GRID-N<sup>o</sup>2 VOLTS = 100  
GRID-N<sup>o</sup>3 VOLTS = 0



OCT. 16, 1947

TUBE DEPARTMENT

92CM-4939RI

RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

World Radio History

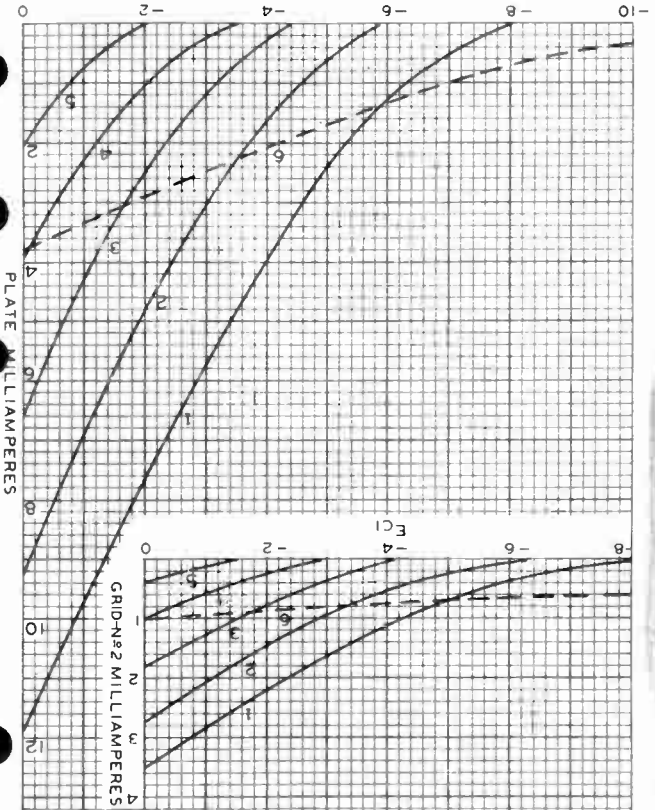
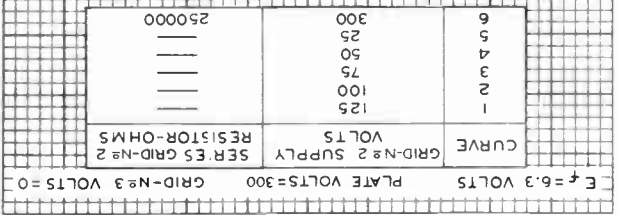
65J7

65J7



World Radio History

AVERAGE CHARACTERISTICS  
PENTODE CONNECTION







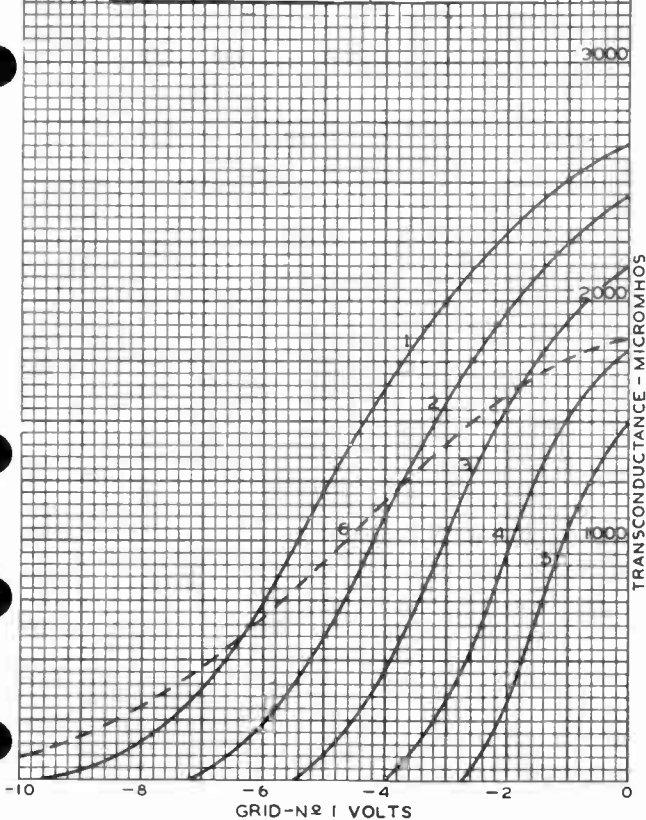
6SJ7

6SJ7

### AVERAGE CHARACTERISTICS PENTODE CONNECTION

$E_f = -6.3$  VOLTS    PLATE VOLTS = 300    GRID-N $\circ$ 3 VOLTS = 0

CURVE	GRID-N $\circ$ 2-SUPPLY VOLTS	SERIES GRID-N $\circ$ 2 RESISTOR-OHMS
1	125	—
2	100	—
3	75	—
4	50	—
5	25	—
6	300	250000



MARCH 5, 1948

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6444RI

6SJ7

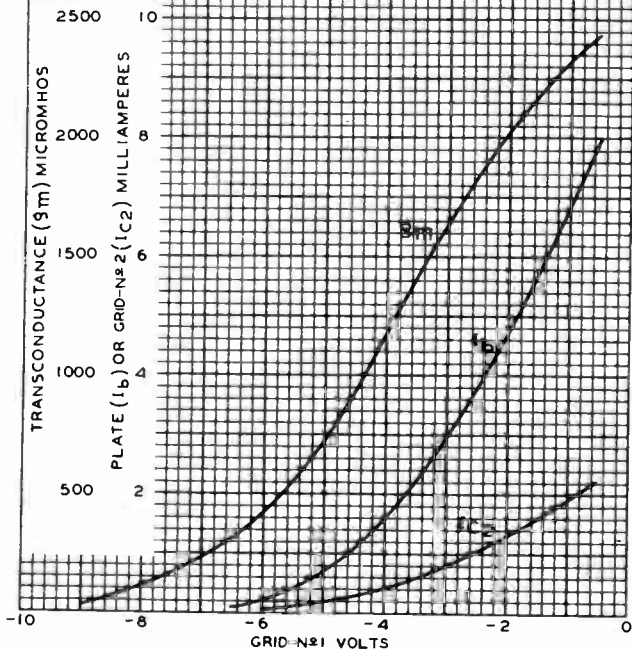


6SJ7

### AVERAGE CHARACTERISTICS PENTODE CONNECTION

$E_f = 6.3$  VOLTS  
GRID-N $\#$ 3 VOLTS = 0

PLATE VOLTS = 250  
GRID-N $\#$ 2 VOLTS = 100



MARCH 5, 1948

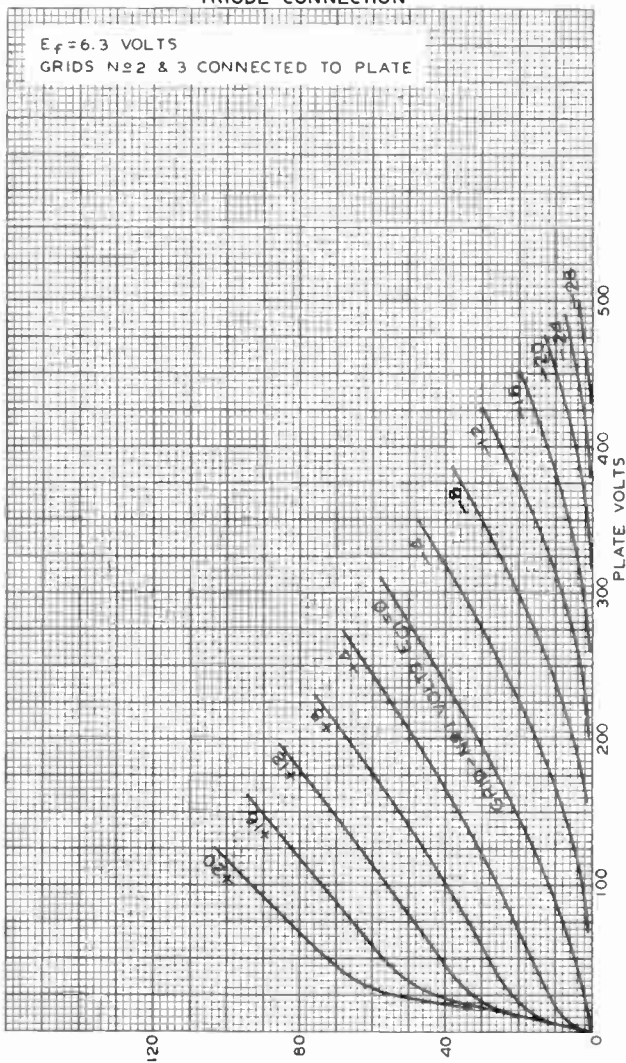
TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-4937R1



6SJ7

6SJ7

AVERAGE PLATE CHARACTERISTICS  
TRIODE CONNECTION

MAY 12, 1948

PLATE MILLIAMPERES

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-6409R1





6SK7  
6SK7-GT/G

# 6SK7, 6SK7-GT/G

## TRIPLE-GRID SUPER-CONTROL AMPLIFIER

	Coated Unipotential Cathode	
Heater Voltage	6.3	a-c or d-c volts
Heater Current	0.3	amp.
	6SK7	6SK7-GT/G
Direct Interelectrode Cap.	▲	▲▲
Grid to Plate	0.003 max.	0.005 max. $\mu$ f
Input	6.0	6.5 $\mu$ f
Output	7.0	7.5 $\mu$ f
Maximum Overall Length	2-5/8"	3-5/16"
Maximum Seated Height	2-1/16"	2-3/4"
Maximum Diameter	1-5/16"	1-5/16"
Bulb	Metal Shell, MT-8	T-9
Base	{ Small Wafer Octal 8-Pin	{ Small Wafer Octal 8-Pin, Sleeve
Basing Designation	8N	GT-8N
Pin 1 { 6SK7, Shell 6SK7-GT/G, Base Sleeve		Pin 4 - Grid
Pin 2 - Heater		Pin 5 - Cathode
Pin 3 - Suppressor		Pin 6 - Screen
Mounting Position		Pin 7 - Heater
		Pin 8 - Plate



BOTTOM VIEW

Maximum And Minimum Ratings Are Design-Center Values  
AMPLIFIER

Plate Voltage	300 max.	volts
Screen Voltage	125 max.	volts
Screen Supply Voltage	300 max.	volts
Grid Voltage	0 min.	volts
Plate Dissipation	4.0 max.	watts
Screen Dissipation	0.4 max.	watt
<i>Typical Operation and Characteristics - Class A<sub>1</sub> Amplifier:</i>		
Plate	100	250 volts
Screen	100	100 volts
Grid	-1	-3 volts
Suppressor	Connected to cathode at socket	
Plate Res.	0.12	0.8 approx. megohm
Transcond.	2350	2000 $\mu$ mhos
Grid Bias for		
transcond. of 10 $\mu$ mhos	-35	-35 volts
Plate Cur.	13	9.2 ma.
Screen Cur.	4.0	2.6 ma.

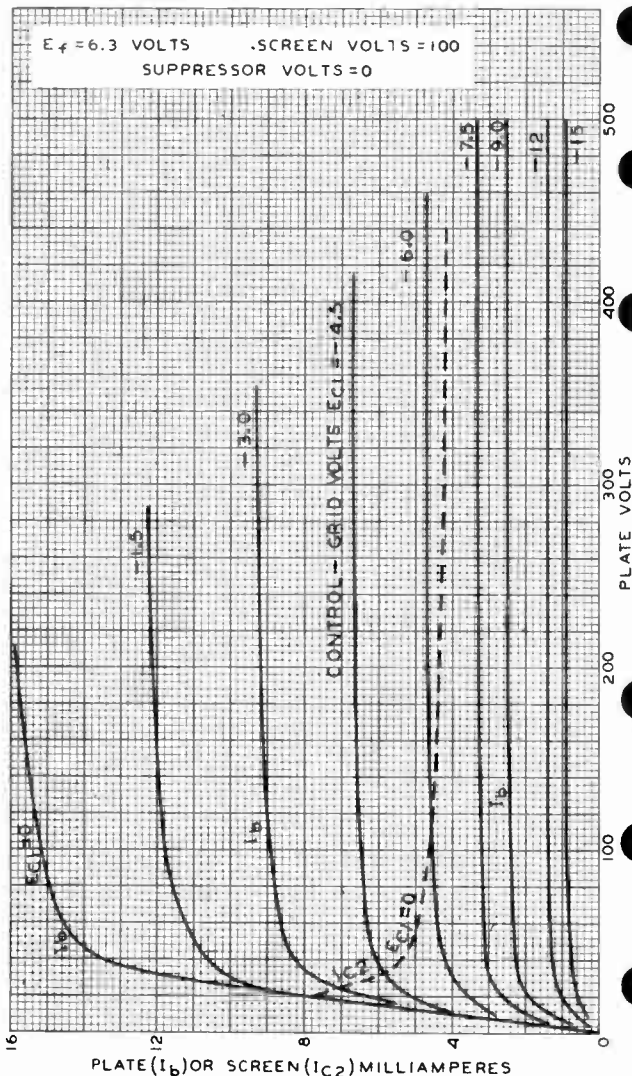
■ In circuits where the cathode is not connected directly to the heater, the potential difference between heater and cathode should be kept as low as possible.  
 ▲ with shell connected to cathode.  
 ▲▲ with shield connected to cathode.

6SK7



6SK7

### AVERAGE PLATE CHARACTERISTICS



JUNE 24, 1938

RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

92C-4940



6SK7

6SK7

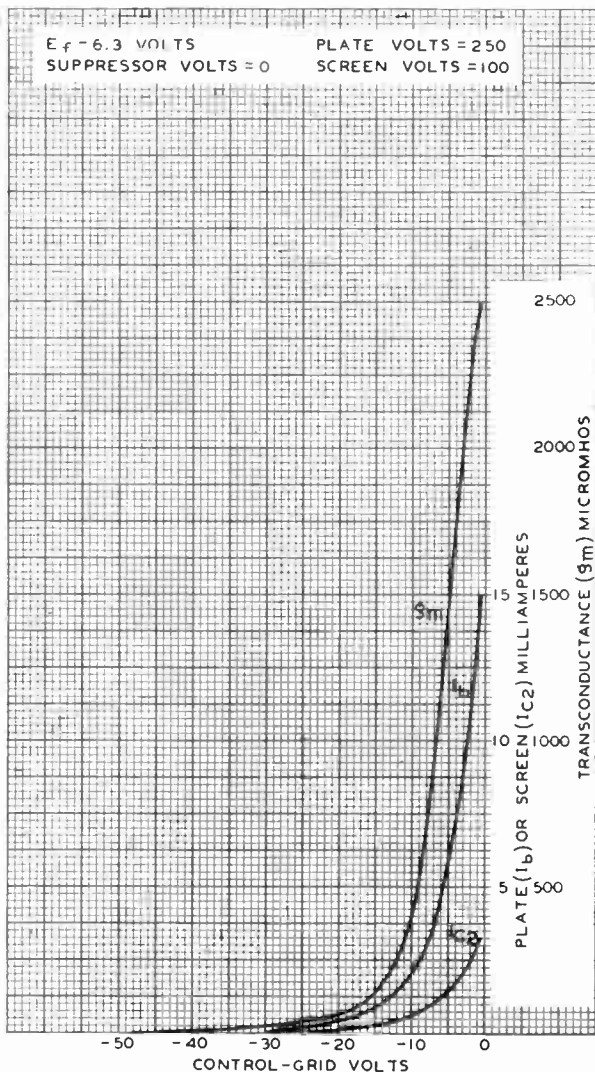
### AVERAGE CHARACTERISTICS

$E_f = -6.3$  VOLTS

SUPPRESSOR VOLTS = 0

PLATE VOLTS = 250

SCREEN VOLTS = 100



JUNE 23, 1938

RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY INC

92C-4938







6SL7-GT

# 6SL7-GT

## HIGH-MU TWIN TRIODE

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathodes:

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

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

	Unit No. 1	Unit No. 2	
Grid to plate . . . . .	2.8	2.8	μf
Grid to cathode and heater . . . . .	3.0	3.4	μf
Plate to cathode and heater . . . . .	3.8	3.2	μf

#### Mechanical:

Mounting Position . . . . . Any  
 Maximum Overall Length . . . . . 3-5/16"  
 Maximum Seated Length . . . . . 2-3/4"  
 Maximum Diameter . . . . . 1-9/32" ←

Bulb . . . . . T-9 ←

Base . . . . . Intermediate-Shell Octal 8-Pin (JETEC No. 88-6) ←  
 or Short Intermediate-Shell Octal 8-Pin (JETEC No. 88-46)

Basing Designation for BOTTOM VIEW . . . . . 8BD

- Pin 1 - Grid of Unit No. 2
- Pin 2 - Plate of Unit No. 2
- Pin 3 - Cathode of Unit No. 2
- Pin 4 - Grid of Unit No. 1
- Pin 5 - Plate of Unit No. 1
- Pin 6 - Cathode of Unit No. 1
- Pin 7 - Heater
- Pin 8 - Heater



### AMPLIFIER—Class A<sub>1</sub>

Values are for Each Unit

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

PLATE VOLTAGE . . . . . 300 max. volts ←  
 GRID VOLTAGE:  
 Positive bias value . . . . . 0 max. volts  
 PLATE DISSIPATION . . . . . 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:

Plate Voltage . . . . . 250 volts

<sup>o</sup> With close-fitting shield (JETEC No. 308) connected to cathode. ←

←Indicates a change.

6SL7-GT



6SL7-GT

HIGH-MU TWIN TRIODE

Grid Voltage . . . . .	-2	volts
Amplification Factor . . . . .	70	
Plate Resistance (Approx.) . . . . .	44000	ohms
Transconductance . . . . .	1600	$\mu$ hos
Plate Current. . . . .	2.3	ma

→ Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART No.7  
at front of this Section

→ indicates a change.

NOV. 5, 1954

TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA

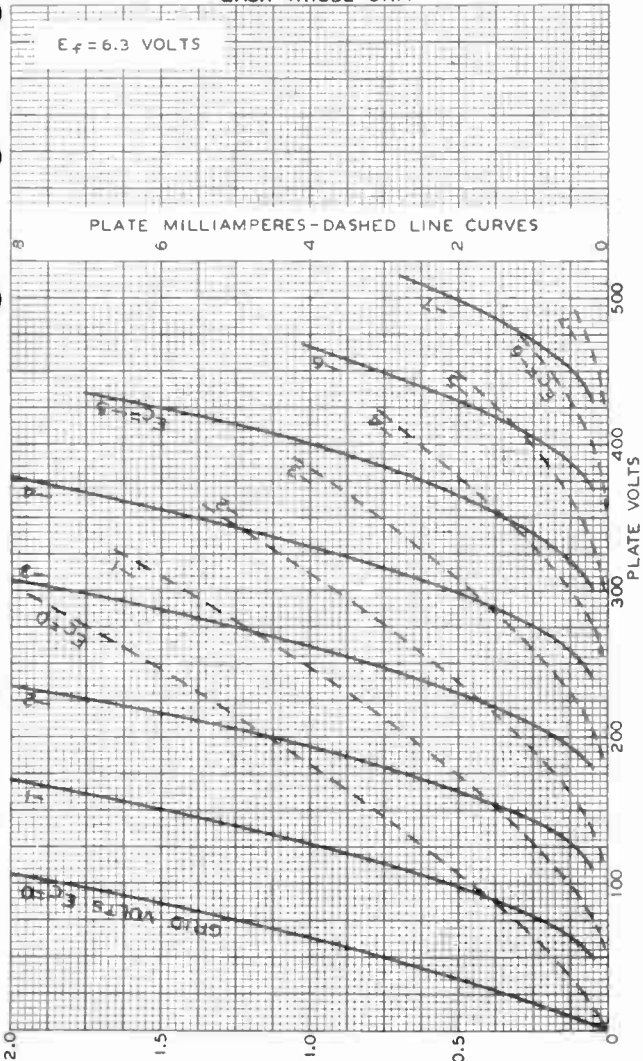


6SL7-GT

# 6SL7-GT

## AVERAGE PLATE CHARACTERISTICS EACH TRIODE UNIT

$E_f = 6.3$  VOLTS







6SN7-GT

6SN7-GT

## TWIN-TRIODE AMPLIFIER

Heater Coated Unipotential Cathodes  
 Voltage 6.3 a-c or d-c volts  
 Current 0.6 amp.

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

	Triode Unit $F_1$		Triode Unit $F_2$		
Grid to Plate	3.8		4.0		$\mu\text{f}$
Grid to Cathode	2.8		3.0		$\mu\text{f}$
Plate to Cathode	0.8		1.2		$\mu\text{f}$

Maximum Overall Length 3-5/16"

Maximum Seated Height 2-3/4"

Maximum Diameter 1-5/16"

Bulb T-9

Base Intermediate Shell Octal 8-Pin

Pin 1-Grid  $T_2$  Pin 5-Plate  $T_1$ Pin 2-Plate  $T_2$  Pin 6-Cathode  $T_1$ Pin 3-Cathode  $T_2$  Pin 7-HeaterPin 4-Grid  $T_1$  Pin 8-Heater

Mounting Position Any



BOTTOM VIEW (8BD)

For convenience, one triode unit is identified as  $F_1$ ; the other as  $F_2$ .

Maximum And Minimum Ratings Are Design-Center Values

## AMPLIFIER-Each Unit

Plate Voltage	300 max. volts
Grid Voltage	0 min. volts
Plate Dissipation	2.5 max. watts
D-C Heater-Cathode Potential	90 max. volts
Cathode Current	20 max. ma.

Characteristics — Class  $A_1$  Amplifier:

Plate	90	250	volts
Grid #	0	-8	volts
Amp. Fact.	20	20	
Plate Res.	6700	7700	ohms
Transcond.	3000	2600	$\mu\text{mhos}$
Plate Cur.	10	9	ma.

## Typical Operation with Resistance Coupling:

Same as for Type 6F8-G in RESISTANCE-COUPLED AMPLIFIER CHAR

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

\* Under maximum rated conditions, the d-c resistance in the grid circuit should not exceed 1.0 megohm per unit.

The curves under Type 6J5 also apply to each unit of the  
6SN7-GT.

← Indicates a change.

APRIL 1, 1944

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

DATA

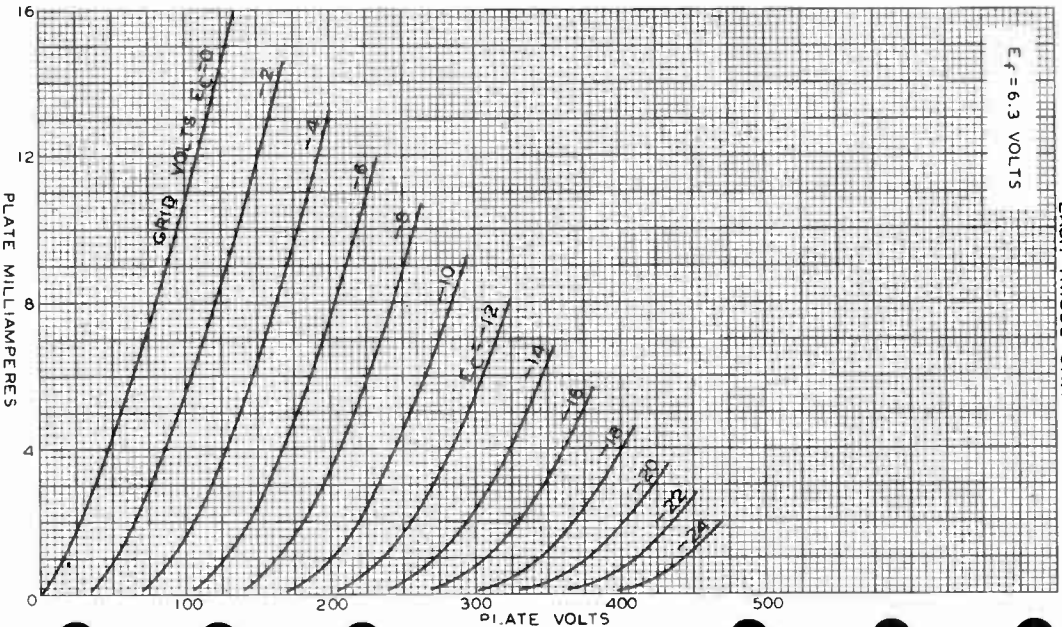
6SN7-GT



6SN7-GT

# AVERAGE PLATE CHARACTERISTICS EACH TRIODE UNIT

$E_f = 6.3$  VOLTS



FEB. 21, 1941

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

92CM-6257



# 6SN7-GTA

6SN7-GTA

## MEDIUM-MU TWIN TRIODE

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3 . . . . .	ac or dc volts
Current . . . . .	0.6 . . . . .	amp

Direct Interelectrode Capacitances (With no external shield):

	Unit No. 1	Unit No. 2	
Grid to plate . . . . .	4	3.8	$\mu\mu\text{f}$
Grid to cathode and heater . . . . .	2.2	2.6	$\mu\mu\text{f}$
Plate to cathode and heater . . . . .	0.7	0.7	$\mu\mu\text{f}$

#### Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):

Plate Voltage . . . . .	90	250	volts
Grid Voltage . . . . .	0	-8	volts
Amplification Factor . . . . .	20	20	volts
Plate Resistance (Approx.) . . . . .	6700	7700	ohms
Transconductance . . . . .	3000	2600	$\mu\text{mhos}$
Plate Current . . . . .	10	9	ma
Plate Current for grid voltage of -12.5 volts . . . . .	-	1.3	ma
Grid Voltage (Approx.) for plate current of 10 $\mu\text{amp}$ . . . . .	-7	-18	volts

#### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	3-5/16"
Maximum Seated Length . . . . .	2-3/4"
Maximum Diameter . . . . .	1-9/32"
Bulb . . . . .	T-9
Base . . . . .	Short Intermediate-Shell Octal 8-Pin with External Barriers (JETEC No. 88-58)
Basing Designation for BOTTOM VIEW . . . . .	8BD

Pin 1 - Grid of  
Unit No. 2  
Pin 2 - Plate of  
Unit No. 2  
Pin 3 - Cathode of  
Unit No. 2  
Pin 4 - Grid of  
Unit No. 1



Pin 5 - Plate of  
Unit No. 1  
Pin 6 - Cathode of  
Unit No. 1  
Pin 7 - Heater  
Pin 8 - Heater

### AMPLIFIER - Class A<sub>1</sub>

Values are for Each Unit

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

PLATE VOLTAGE . . . . .	450 max.	volts
CATHODE CURRENT . . . . .	20 max.	ma

6SN7-GTA



# 6SN7-GTA

## MEDIUM-MU TWIN TRIODE

### PLATE DISSIPATION:

Either plate . . . . .	5 max.	watts
Both plates (Both units operating) . . .	7.5 max.	watts

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 <sup>▲</sup> max.	volts

### Maximum Circuit Values:

#### Grid-Circuit Resistance:

For fixed-bias operation . . . . .	1 max.	megohm
------------------------------------	--------	--------

### Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART No. 29 at front of this Section

## HORIZONTAL DEFLECTION OSCILLATOR

Values are for Each Unit

### Maximum Ratings, Design-Center Values:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	450 max.	volts
----------------------------	----------	-------

PEAK NEGATIVE-PULSE GRID VOLTAGE <sup>↓</sup> . . . . .	600 max.	volts
---	----------	-------

### CATHODE CURRENT:

Peak . . . . .	300 max.	ma
Average . . . . .	20 max.	ma

### PLATE DISSIPATION:

Either plate . . . . .	5 max.	watts
Both plates (Both units operating) . . .	7.5 max.	watts

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 <sup>▲</sup> max.	volts

### Maximum Circuit Values:

#### Grid-Circuit Resistance:

For fixed-bias, grid-resistor bias, or cathode-bias operation . . . . .	2.2 max.	megohms
---	----------	---------

## VERTICAL DEFLECTION OSCILLATOR

Values are for Each Unit

### Maximum Ratings, Design-Center Values:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	450 max.	volts
----------------------------	----------	-------

PEAK NEGATIVE-PULSE GRID VOLTAGE <sup>#</sup> . . . . .	400 max.	volts
---	----------	-------

### CATHODE CURRENT:

Peak . . . . .	70 max.	ma
Average . . . . .	20 max.	ma

▲, □, ↓, #: See next page.





6SN7-GTA

# 6SN7-GTA

## MEDIUM-MU TWIN TRIODE

### PLATE DISSIPATION:

Either plate . . . . .	5	max.	watts
Both plates (Both units operating) . . .	7.5	max.	watts

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 <sup>▲</sup>	max.	volts

### Maximum Circuit Values:

#### Grid-Circuit Resistance:

For fixed-bias, grid-resistor bias, or cathode-bias operation . . . . .	2.2	max.	megohms
--	-----	------	---------

## VERTICAL DEFLECTION AMPLIFIER

*Values are for Each Unit*

### Maximum Ratings, Design-Center Values Except as Noted:

*For operation in a 525-line, 30-frame system<sup>□</sup>*

DC PLATE VOLTAGE . . . . .	450	max.	volts
----------------------------	-----	------	-------

### PEAK POSITIVE-PULSE PLATE VOLTAGE<sup>#</sup>:

(Absolute Maximum) . . .	1500 <sup>■</sup>	max.	volts
--------------------------	-------------------	------	-------

PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	250	max.	volts
--	-----	------	-------

### CATHODE CURRENT:

Peak . . . . .	70	max.	ma
Average . . . . .	20	max.	ma

### PLATE DISSIPATION:

Either plate . . . . .	5	max.	watts
Both plates (Both units operating) . . .	7.5	max.	watts

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 <sup>▲</sup>	max.	volts

### Maximum Circuit Values:

#### Grid-Circuit Resistance:

For cathode-bias operation . . . . .	2.2	max.	megohms
--------------------------------------	-----	------	---------

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

<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

<sup>♣</sup> This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 micro-seconds.

<sup>#</sup> This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milli-seconds.

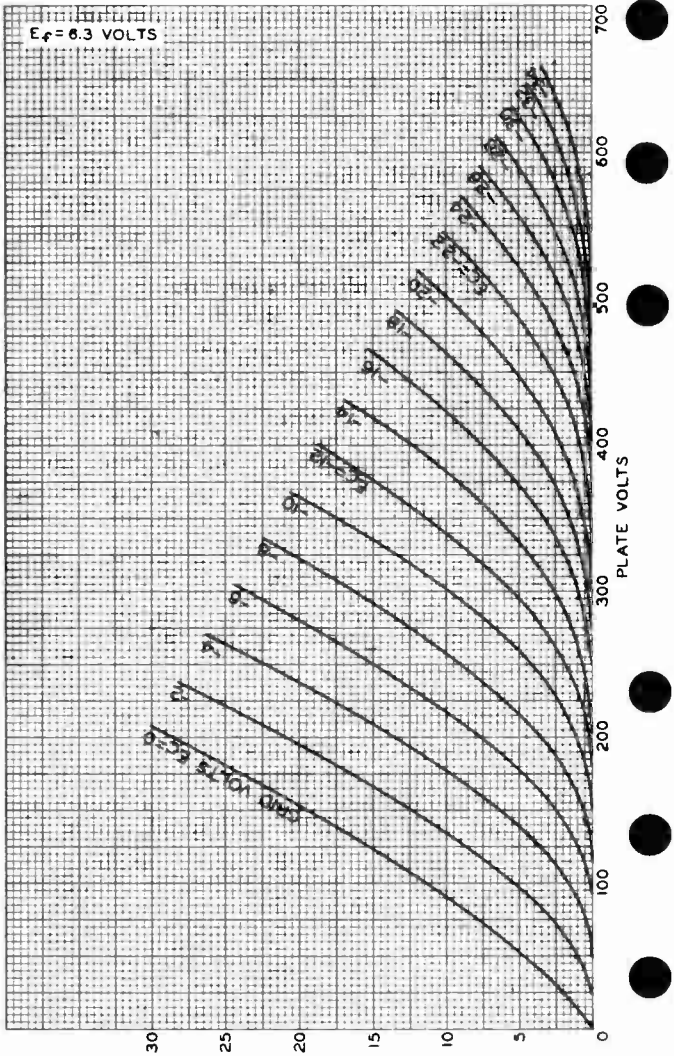
<sup>■</sup> under no circumstances should this absolute value be exceeded.

6SN7-GTA



# 6SN7-GTA

## AVERAGE PLATE CHARACTERISTICS FOR EACH UNIT



APRIL 28, 1954

PLATE MILLIAMPERES

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

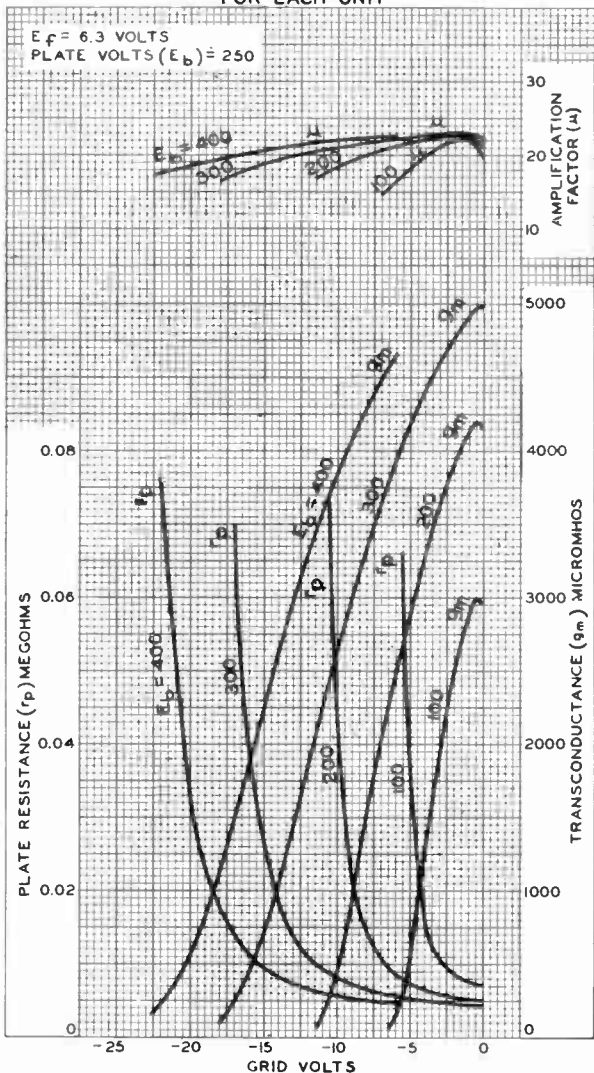
92CM-8322



6SN7-GTA

# 6SN7-GTA

## AVERAGE CHARACTERISTICS FOR EACH UNIT



OCT. 14, 1953

TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY  
World Radio History

92CM-8122





6SN7-GTB

# 6SN7-GTB

## MEDIUM-MU TWIN TRIODE

*Intended for use in equipment having  
series heater-string arrangement*

The 6SN7-GTB is the same as the 6SN7-GTA except for the following item:

Heater, for Unipotential Cathodes:

Warm-up time (Average) . 11 . . . . .sec

*For definition of heater warm up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*





6SQ7  
6SQ7-GT/G

# 6SQ7, 6SQ7-GT/G

## DUPLEX-DIODE HIGH-MU TRIODE

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.

	6SQ7	6SQ7-GT/G
--	------	-----------

Direct Interelectrode Cap.  $\blacktriangle$   $\bullet$

**Triode Unit:**

Grid to Plate	1.6	1.8 $\mu\text{mf}$
Grid to Cathode	3.2	4.2 $\mu\text{mf}$
Plate to Cathode	3.0	3.4 $\mu\text{mf}$
Maximum Overall Length	2-5/8"	3-5/16"
Maximum Seated Height	2-1/16"	2-3/4"
Maximum Diameter	1-5/16"	1-5/16"

Bulb	Metal Shell, MT-8	T-9
------	-------------------	-----

Base	{ Small Wafer Octal 8-Pin 8Q	{ Small Wafer Octal 8-Pin, Sleeve GT-8Q
------	------------------------------------	---

Basing Designation

Pin 1 { 6SQ7, Shell  
6SQ7-GT/G,  
Base Sleeve

Pin 2 - Triode Grid

Pin 3 - Cathode

Mounting Position



BOTTOM VIEW

Pin 4 - Diode Plate #2  
Pin 5 - Diode Plate #1  
Pin 6 - Triode Plate  
Pin 7 - Heater  
Pin 8 - Heater

Any

Maximum Ratings Are Design-Center Values

TRIODE UNIT

Plate Voltage	300 max. volts
D-C Heater-Cathode Potential	100 max. volts

**Characteristics - Class A<sub>1</sub> Amplifier:**

Heater	6.3	6.3	volts
Plate	100	250	volts
Grid	-1	-2	volts
Amp. Fact.	100	100	
Plate Res.	110000	91000	ohms
Transcond.	900	1100	$\mu\text{mhos}$
Plate Cur.	0.4	0.9	ma.

**Typical Operation - Resistance-Coupled Amplifier:**

Same as Type 75 in RESISTANCE-COUPLED AMPLIFIER CHART.

DIODE UNITS - Two

Consideration of these units is given under Type 85. Circuits will be similar to those shown for Type 55 with fixed bias. Diode biasing of the triode unit of the 6SQ7 or 6SQ7-GT/G is not suitable. Diode curves under Type 6B7 apply to the 6SQ7 and 6SQ7-GT/G.

- $\blacktriangle$  with shell connected to cathode. Values are approximate.
- $\bullet$  with no external shield. Values are approximate.

The curve under Type 75 also applies to the 6SQ7 and the 6SQ7-GT/G.

$\leftarrow$  Indicates a change.

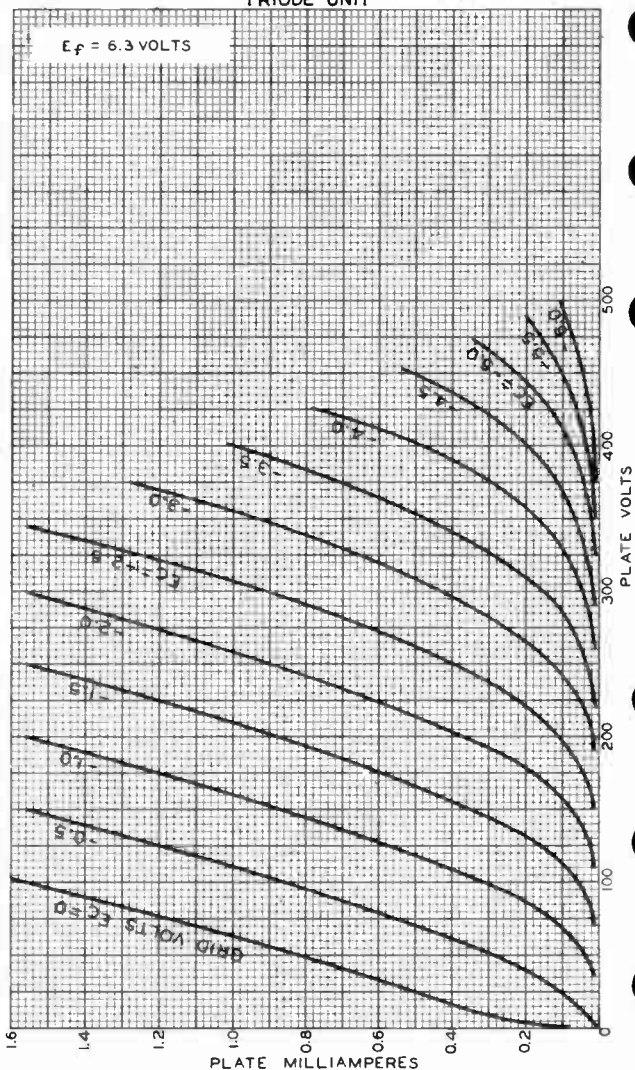
6SQ7



6SQ7

# AVERAGE PLATE CHARACTERISTICS TRIODE UNIT

$E_f = 6.3$  VOLTS



DEC. 14, 1943

RCA VICTOR DIVISION  
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-4975R2

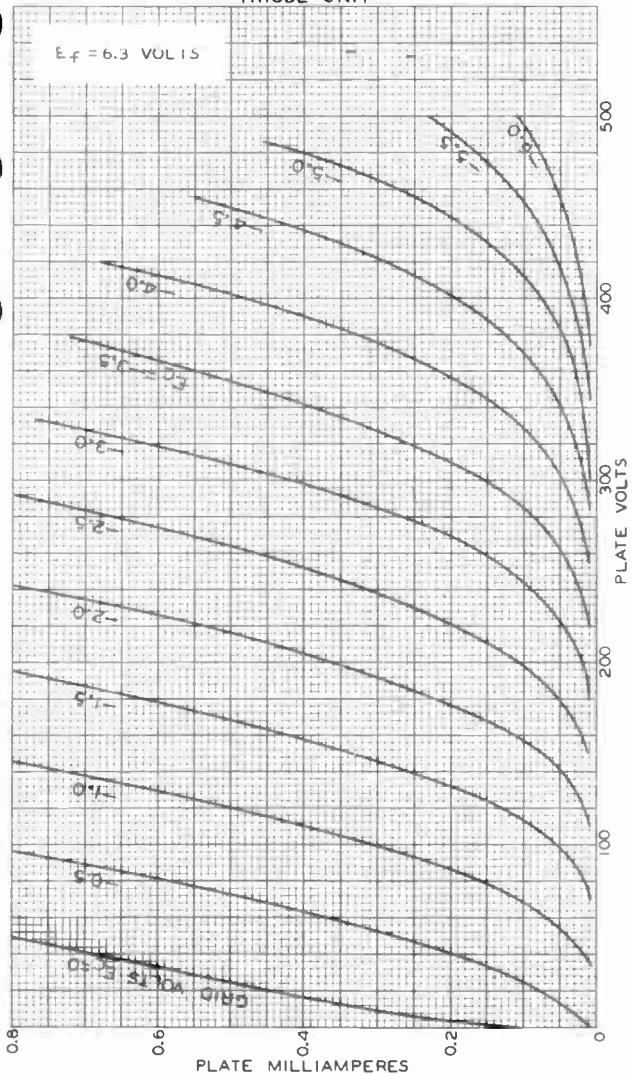




6SQ7

# AVERAGE PLATE CHARACTERISTICS TRIODE UNIT

6SQ7



AUG. 13, 1941

RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY INC.

92C-6310





6SR7

6SR7

**DUPLEX-DIODE TRIODE**

SINGLE-ENDED METAL TYPE

Heater <sup>■</sup>	Coated Unipotential Cathode	
Voltage	0.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances—Triode Unit: <sup>○</sup>		
Grid to Plate	2.4	μf
Grid to Cathode	3.6	μf
Plate to Cathode	2.8	μf
Maximum Overall Length		2-5/8"
Maximum Seated Height		2-1/16"
Maximum Diameter		1-5/16"
Bulb		Metal Shell, Mi-B
Base		Small Wafer Octal 8-Pin
Pin 1—Shell		Pin 5—Diode Plate #1
Pin 2—Triode Grid		Pin 6—Triode Plate
Pin 3—Cathode		Pin 7—Heater
Pin 4—Diode Plate #2		Pin 8—Heater
Mounting Position		Any

BOTTOM VIEW (8Q)

TRIODE UNIT - Class A<sub>1</sub> Amplifier

Plate Voltage	250 max.	volts
Plate Dissipation	2.5 max.	watts
<i>Typical Operation with Transformer Coupling:</i>		
Plate	250	volts
Grid	-9	volts
Amp. Fact.	15	
Plate Res.	8500	ohms
Transconductance	1900	μmhos
Plate Cur.	9.5	ma.
Load Res.	10000	ohms
Power Output	300	mw

*Typical Operation with Resistance Coupling:*

See RESISTANCE-COUPLED AMPLIFIER CHART, Type 6R7.

DIODE UNITS—Two

For consideration of these units, see Type 85. Circuits will be similar to those shown for Type 55 with fixed bias. Diode biasing of the triode unit of the 6SR7 is not suitable. Diode curves under Type 6B7 apply to the 6SR7.

- In circuits where the cathode is not connected directly to the heater, the potential difference between heater and cathode should be kept as low as possible.
- with shell connected to cathode. values are approximate.

An additional curve applying to the 6SR7 is shown under Type 6R7.

April 15, 1940

RCA RADIODRON DIVISION  
RCA MANUFACTURING COMPANY INC

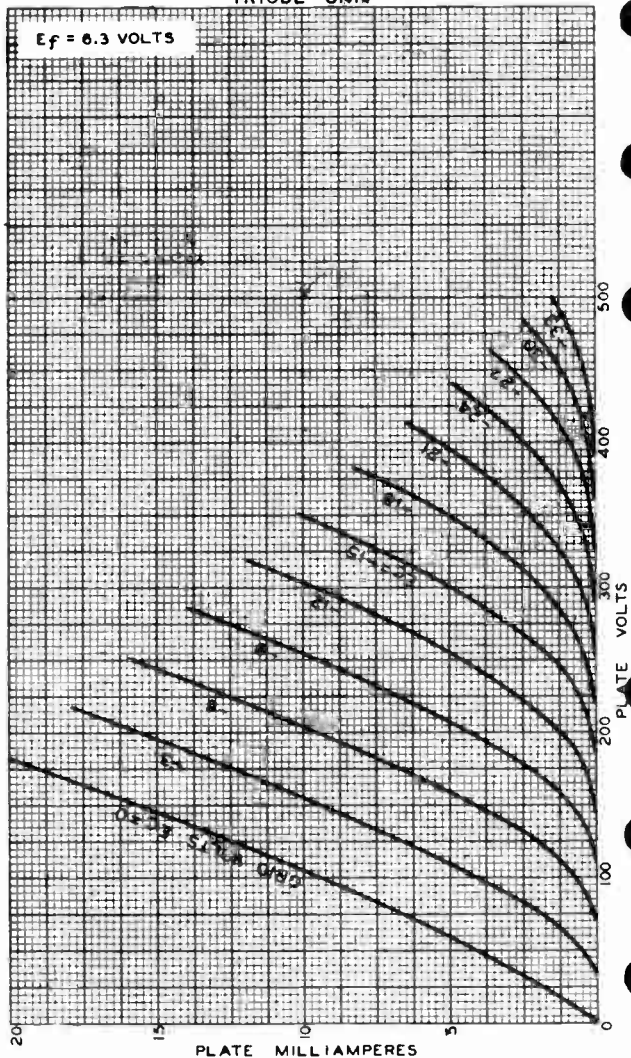
TENTATIVE DATA

6SR7



6SR7

# AVERAGE PLATE CHARACTERISTICS TRIODE UNIT



JAN. 14, 1936

RCA RADOTRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

92C-6141



6SS7

6SS7



# TRIPLE-GRID SUPER-CONTROL AMPLIFIER

SINGLE-ENDED METAL TYPE

Heater	Coated Unipotential Cathode		
Voltage	6.3	a-c or d-c volts	
Current	0.15	amp.	
Direct Interelectrode Capacitances: <sup>o</sup>			
Grid to Plate		0.004 max.	$\mu$ f
Input		5.5	$\mu$ f
Output		7.0	$\mu$ f
Maximum Overall Length		2-5/8"	
Maximum Seated Height		2-1/16"	
Maximum Diameter		1-5/16"	
Bulb		Metal Shell, MT-8	
Base		Small Wafer Octal, 8-Pin	
Pin 1 - Shell		Pin 5 - Cathode	
Pin 2 - Heater		Pin 6 - Screen	
Pin 3 - Suppressor		Pin 7 - Heater	
Pin 4 - Grid		Pin 8 - Plate	
Mounting Position		Any	



BOTTOM VIEW (8N)

AMPLIFIER

Plate Voltage	300 max.	volts
Screen Voltage	100 max.	volts
Screen Supply Voltage	300 max.	volts
Grid Voltage	0 min.	volts
Plate Dissipation	2.25 max.	watts
Screen Dissipation	0.35 max.	watt

*Typical Operation and Characteristics - Class A<sub>1</sub> Amplifier:*

Plate Voltage	100	250	volts
Screen Voltage	100	100	volts
Grid Voltage	-1	-3	volts

Connected to cathode at socket

Suppressor			
Plate Res.	0.12	1.0 approx.	megohm
Transcond.	1930	1850	$\mu$ mhos
Grid Bias for Transcond.			
of 10 $\mu$ mhos (approx.)	-35	-35	volts
Plate Cur.	12.2	9	ma.
Screen Cur.	3.1	2	ma.

- In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
- o with shell connected to cathode.

May 1, 1941

RCA RADIODRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

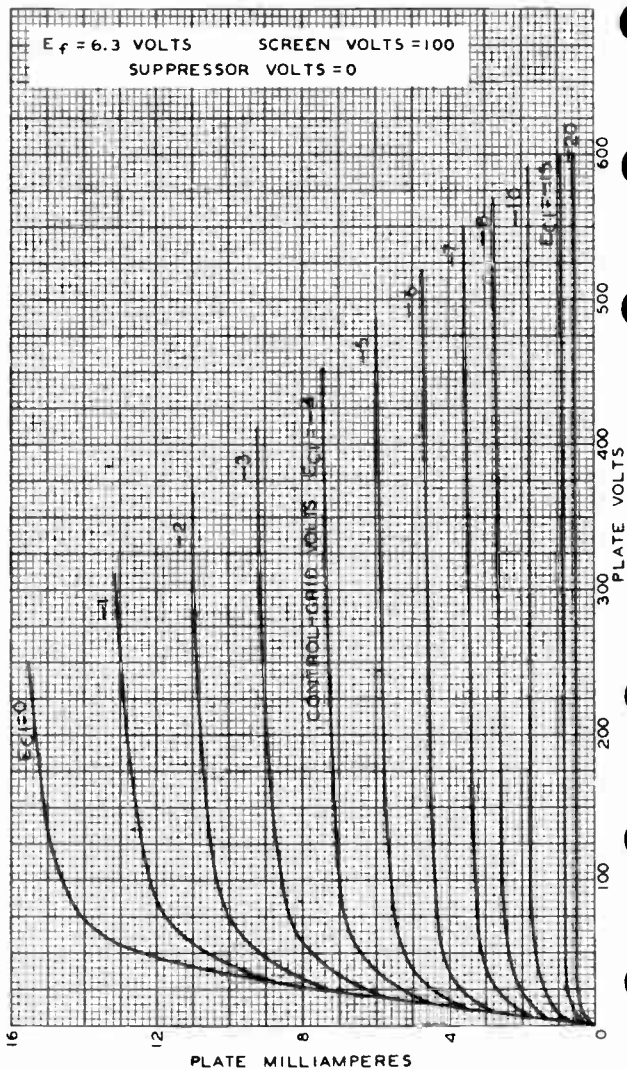
TENTATIVE DATA

6SS7



6SS7

## AVERAGE PLATE CHARACTERISTICS



APR. 3, 1941

 RCA RADOTRON DIVISION  
 RCA MANUFACTURING COMPANY, INC.

92C-6270



6T4

6T4

## MEDIUM-MU TRIODE

7-PIN MINIATURE TYPE

For UHF TV service

## GENERAL DATA

## Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	ac or dc volts
Current . . . . .	0.225	amp

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	With External Shield <sup>U</sup>	
Grid to plate . . . . .	1.7	1.7	$\mu\text{mf}$
Grid to cathode and heater . . . . .	2.6	3.2	$\mu\text{mf}$
Plate to cathode and heater . . . . .	0.40	2.0	$\mu\text{mf}$
Heater to cathode . . . . .	3.0	3.0	$\mu\text{mf}$
Grid to cathode . . . . .	2.4	2.4	$\mu\text{mf}$
Plate to cathode . . . . .	0.24	0.22	$\mu\text{mf}$

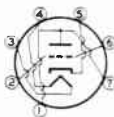
Characteristics, Class A<sub>1</sub> Amplifier:

Plate-Supply Voltage . . . . .	80	volts
Cathode Resistor . . . . .	150	ohms
Amplification Factor . . . . .	13	
Transconductance . . . . .	7000	$\mu\text{mhos}$
Plate Current . . . . .	18	ma
Grid Voltage (Approx.) for plate current of 50 $\mu\text{amp}$ . . . . .	-15	volts

## Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	1-3/4"
Maximum Seated Length . . . . .	1-1/2"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-1/8" $\pm$ 3/32"
Maximum Diameter . . . . .	3/4"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T-5-1/2
Base . . . . .	Small-Button Miniature 7-Pin (JEDEC No. E7-1)
Basing Designation for BOTTOM VIEW . . . . .	7DK

Pin 1 - Plate  
Pin 2 - Grid  
Pin 3 - Heater  
Pin 4 - Heater



Pin 5 - Cathode  
Pin 6 - Grid  
Pin 7 - Plate

## OSCILLATOR IN UHF TELEVISION RECEIVERS

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	200 max.	volts
GRID CURRENT . . . . .	8 max.	ma

<sup>U</sup> with external shield JEDEC No. 316 connected to cathode, except as noted.

<sup>•</sup> with external shield JEDEC No. 316 connected to ground.

6T4



6T4

### MEDIUM-MU TRIODE

CATHODE CURRENT. . . . .	30	max.	ma
PLATE DISSIPATION. . . . .	3.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode .	50	max.	volts
Heater positive with respect to cathode .	50 <sup>▲</sup>	max.	volts

▲ The dc component must not exceed 25 volts.





6T8

6T8

## TRIPLE DIODE—HIGH-MU TRIODE

9-PIN MINIATURE TYPE

## GENERAL DATA

## Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3	ac or dc volts
Current . . . . .	0.45	amp

Direct Inter-electrode Capacitances:<sup>0</sup>

Triode unit:

Grid to plate . . . . .	1.8	$\mu\mu\text{f}$
Grid to cathode & internal shield (pin 7), and heater . . . . .	1.6	$\mu\mu\text{f}$
Plate to cathode & internal shield (pin 7), and heater . . . . .	1.1	$\mu\mu\text{f}$
Diode-No.1 plate to cathode & internal shield (pin 7), and heater . . . . .	3.8	$\mu\mu\text{f}$
Diode-No.2 plate to cathode & internal shield (pin 3), and heater . . . . .	4.5	$\mu\mu\text{f}$
Diode-No.3 plate to cathode & internal shield (pin 7), and heater . . . . .	3.8	$\mu\mu\text{f}$
Diode-No.2 cathode & internal shield (pin 3) to all other electrodes . . . . .	8.5	$\mu\mu\text{f}$
Triode grid to any diode plate . . . . .	0.035 max.	$\mu\mu\text{f}$

Characteristics, Class A<sub>1</sub> Amplifier (Triode Unit):

Plate Voltage . . . . .	100	250	volts
Grid Voltage . . . . .	-1	-3	volts
Amplification Factor . . . . .	70	70	
Plate Resistance (Approx.) . . . . .	54000	58000	ohms
Transconductance . . . . .	1300	1200	$\mu\text{mhos}$
Plate Current . . . . .	0.8	1	ma

## Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" $\pm$ 3/32"
Maximum Diameter . . . . .	7/8"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T-6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JETEC No. E9-1)

Basing Designation for BOTTOM VIEW . . . . .	9E
--	----

Pin 1 - Diode-No.3 Plate	Pin 6 - Diode-No.1 Plate
Pin 2 - Diode-No.2 Plate	Pin 7 - Cathode of Triode & Diodes No.1 & No.3, Internal Shield
Pin 3 - Diode-No.2 Cathode, Internal Shield	Pin 8 - Triode Grid
Pin 4 - Heater	Pin 9 - Triode Plate
Pin 5 - Heater	

<sup>0</sup> without external shield.

← Indicates a change.



## TRIPLE DIODE—HIGH-MU TRIODE

### TRIODE UNIT — AMPLIFIER - Class A<sub>1</sub>

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

→ PLATE VOLTAGE. . . . .	300 max.	volts
→ GRID VOLTAGE:		
Positive bias value. . . . .	0 max.	volts
PLATE DISSIPATION. . . . .	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

#### Typical Operation as Resistance-Coupled Amplifier:

See *RESISTANCE-COUPLED AMPLIFIER CHART No.7*  
at front of this Section

### DIODE UNITS - Three

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

→ PLATE CURRENT (For each diode) . . . . .	5 max.	ma
→ PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	90 max.	volts
Heater positive with respect to cathode.	90 max.	volts

#### Diode Considerations:

Diode No.1, diode No.3, and the triode have a common cathode, and diode No.2 has a separate cathode. Diode No.2 (pins 2 & 3) and diode No.3 (pins 1 & 7) are recommended for use in FM detector applications, while diode No.1 (pins 6 & 7) is recommended for use as an AM detector.

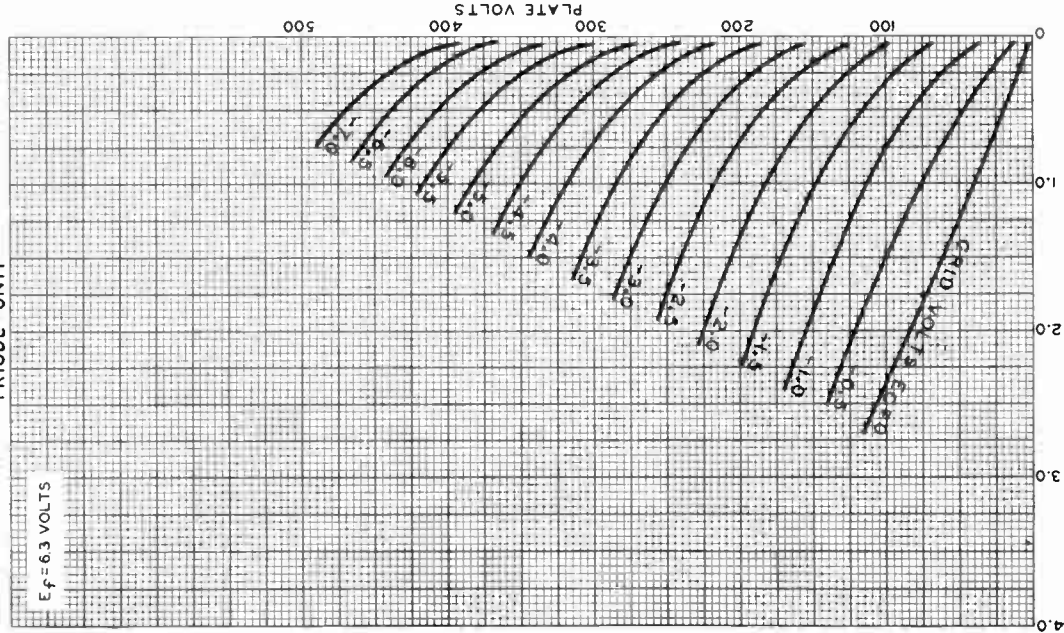
→ Indicates a change.



6T8

# AVERAGE PLATE CHARACTERISTICS TRIODE UNIT

$E_f = 6.3$  VOLTS



6T8

AUG. 19, 1948

PLATE MILLIAMPERES

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARTISON, NEW JERSEY

92CM-7063





6T8-A

6T8-A

# TRIPLE DIODE-HIGH-MU TRIODE

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3	. . . . .	ac or dc volts
Current . . . . .	0.45 ± 6%	. . . . .	amp
Warm-up time (Average). . . . .	11	. . . . .	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield*	
<i>Triode Unit:</i>			
Grid to plate . . . . .	1.7	1.7	μf
Grid to cathode & internal shield (pin 7), and heater. . . . .	1.6	1.7	μf
Plate to cathode & internal shield (pin 7), and heater. . . . .	1.2	2.4	μf
<i>Diode Units:</i>			
Diode-No.1 plate to cathode & internal shield (pin 7), and heater. . . . .	3.8	3.8	μf
Diode-No.2 plate to cathode & internal shield (pin 3), and heater. . . . .	3.8	3.8 <sup>•</sup>	μf
Diode-No.3 plate to cathode & internal shield (pin 7), and heater. . . . .	3.4	3.6	μf
Diode-No.2 cathode & internal shield (pin 3) to all other electrodes, and heater. . . . .	7.5	8.5 <sup>■</sup>	μf
Triode grid to any diode plate . . . . .	0.034 max.	0.034 max.	μf

### Characteristics, Class A<sub>1</sub> Amplifier (Triode Unit):

Plate Voltage . . . . .	100	250	volts
Grid Voltage. . . . .	-1	-3	volts
Amplification Factor. . . . .	70	70	
Plate Resistance (Approx.). . . . .	54000	58000	ohms
Transconductance. . . . .	1300	1200	μmhos
Plate Current . . . . .	0.8	1	ma

### Mechanical:

Operating Position. . . . .	. . . . .	Any
Maximum Overall Length. . . . .	. . . . .	2-3/16"

\* , • , ■ : See next page.



6T8-A

## TRIPLE DIODE—HIGH-MU TRIODE

Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" $\pm$ 3/32"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	.9E

Pin 1—Diode—No.3  
PlatePin 2—Diode—No.2  
PlatePin 3—Diode—No.2  
Cathode,  
Internal  
Shield

Pin 4—Heater

Pin 5—Heater

Pin 6—Diode—No.1  
PlatePin 7—Cathode of  
Triode &  
Diodes No.1  
& No.3,  
Internal  
Shield

Pin 8—Triode Grid

Pin 9—Triode Plate

TRIODE UNIT — AMPLIFIER — Class A<sub>1</sub>

## Maximum Ratings, Design-Maximum Values.

PLATE VOLTAGE . . . . .	330 max.	volts
GRID VOLTAGE:		
Positive-bias value . . . . .	0 max.	volts
PLATE DISSIPATION . . . . .	1.1 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	100 max.	volts
Heater positive with respect to cathode . . . . .	100 max.	volts

## Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART No. 7  
at front of this Section

## DIODE UNITS — Three

## Maximum Ratings, Design-Maximum Values:

PLATE CURRENT (For each diode) . . . . .	5.5 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	100 max.	volts
Heater positive with respect to cathode . . . . .	100 max.	volts

## Characteristics (Each Unit):

Plate Voltage . . . . .	5	volts
Plate Current . . . . .	20	ma

## Diode Considerations:

Diode No.1, diode No.3, and the triode have a common cathode, and diode No.2 has a separate cathode. Diode No.2 (pins 2 & 3) and diode No.3 (pins 1 & 7) are recommended for use in FM detector applications, while diode No.1 (pins 6 & 7) is recommended for use as an AM detector.



6T8-A

6T8-A

## TRIPLE DIODE—HIGH-MU TRIODE

- With external shield JEDEC No.315 connected to pin 7 except as noted.
- With external shield JEDEC No.315 connected to pin 3.
- With external shield JEDEC No.315 connected to pins 4 and 5.

6T8-A



# 6T8-A AVERAGE PLATE CHARACTERISTICS TRIODE UNIT

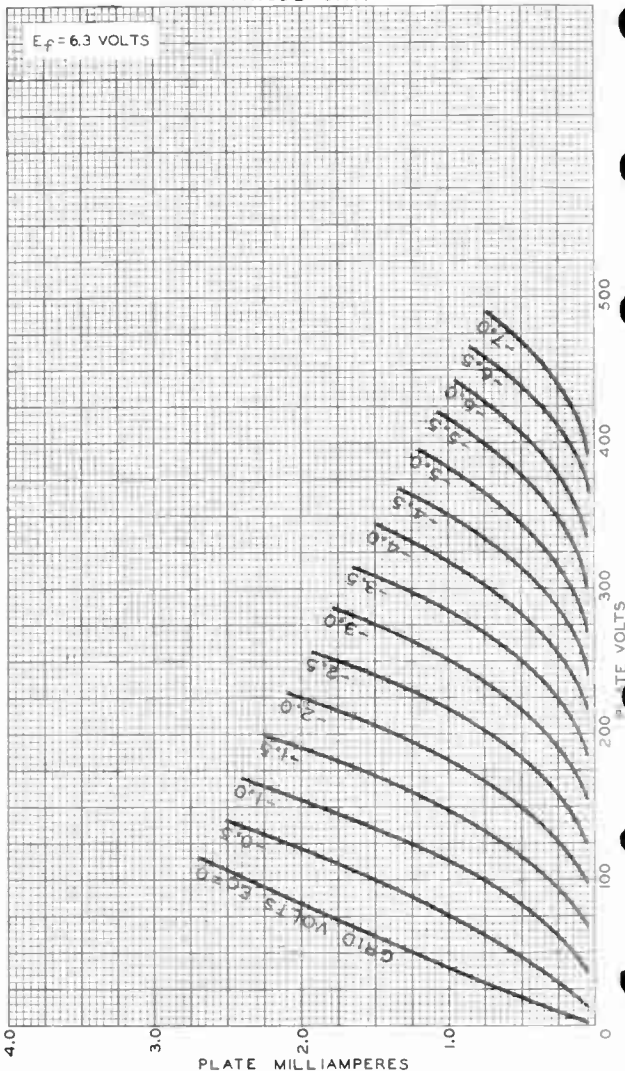


PLATE MILLIAMPERES

PLATE VOLTS

ELECTRON TUBE DIVISION

92CM-7063

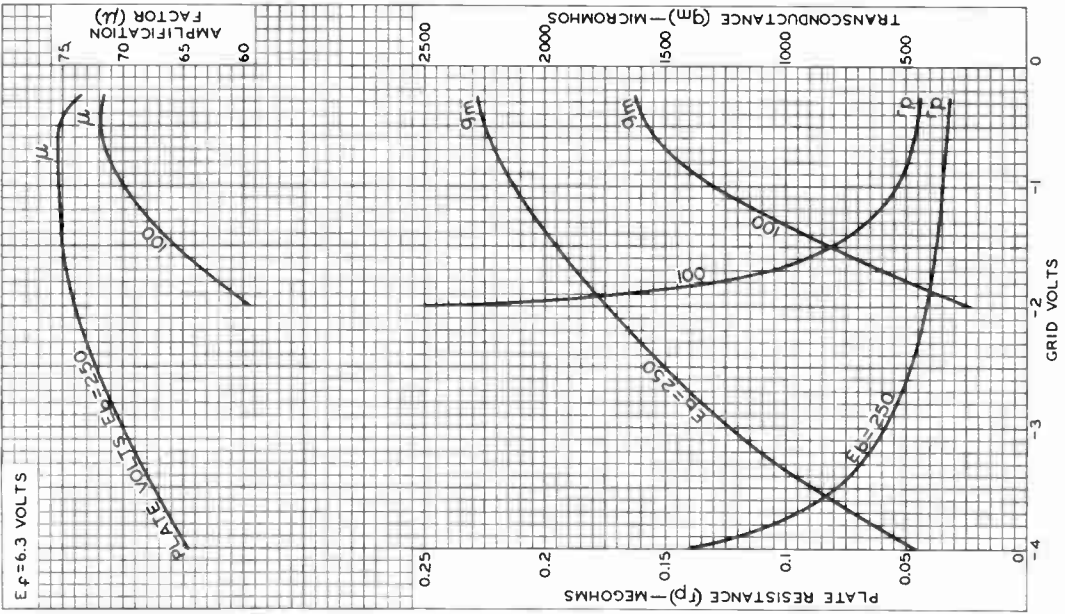
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY





6T8-A

# 6T8-A AVERAGE CHARACTERISTICS TRIODE UNIT



$E_f = 6.3$  VOLTS

PLATE VOLTS  $E_b = 250$

AMPLIFICATION FACTOR ( $\mu$ )

PLATE RESISTANCE ( $r_p$ ) — MEGOHMS

TRANSCONDUCTANCE ( $g_m$ ) — MICROMHOS

GRID VOLTS

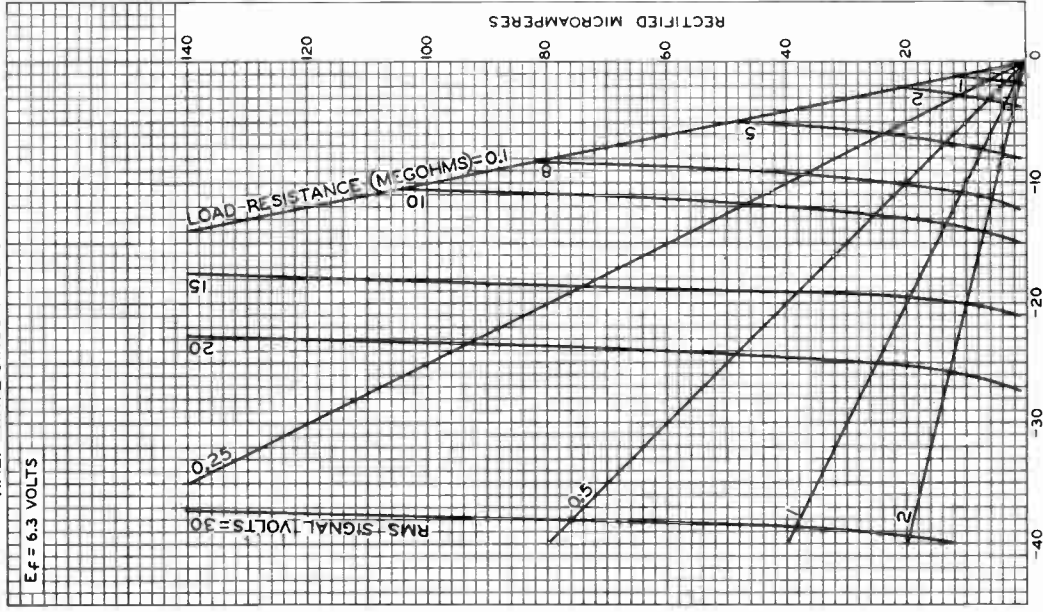
6T8-A



6T8-A

### AVERAGE CHARACTERISTICS HALF-WAVE CIRCUIT—EACH DIODE UNIT

$E_f = 6.3$  VOLTS



DC VOLTS DEVELOPED BY DIODE

92CM-9610

ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



6U5

6U5

# ELECTRON-RAY TUBE

INDICATOR TYPE WITH REMOTE-CUTOFF TRIODE UNIT

## GENERAL DATA

### Electrical:

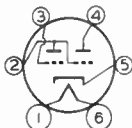
Heater, for Unipotential Cathode:

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

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	4-3/16"
Seated Length . . . . .	3-3/8 ± 3/16"
Maximum Diameter . . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Small-Shell Small 6-Pin (JETEC No. A6-7)
Basing Designation for BOTTOM VIEW . . . . .	6R

Pin 1 - Heater  
 Pin 2 - Triode Plate,  
 Ray-Control  
 Electrode



Pin 3 - Triode Grid  
 Pin 4 - Target  
 Pin 5 - Cathode  
 Pin 6 - Heater

## INDICATOR SERVICE

### Maximum Ratings, Design-Center Values:

TRIODE-PLATE SUPPLY VOLTAGE . . . . .	285 max.	volts
TARGET VOLTAGE . . . . .	{ 285 max.	volts
	{ 125 min.	volts
TRIODE-PLATE DISSIPATION . . . . .	1.0 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	90 max.	volts
Heater positive with respect to cathode .	90 max.	volts

### Typical Operation:

Plate Supply and Target Voltage . . .	200	250	volts
Series Triode-Plate Resistor . . . . .	1	1	megohm
Target Current†			
for zero grid voltage . . . . .	3	4	ma
Triode-Plate Current			
for zero grid voltage . . . . .	0.19	0.24	ma
Triode-Grid Voltage (Approx.):			
For 0° shadow angle . . . . .	-18.5	-22	volts
For 90° shadow angle . . . . .	0	0	volts

† subject to wide variations.

Refer to Type 6E5 for a discussion of the operation of the tube and also for the fundamental circuit.

← Indicates a change.

6U5

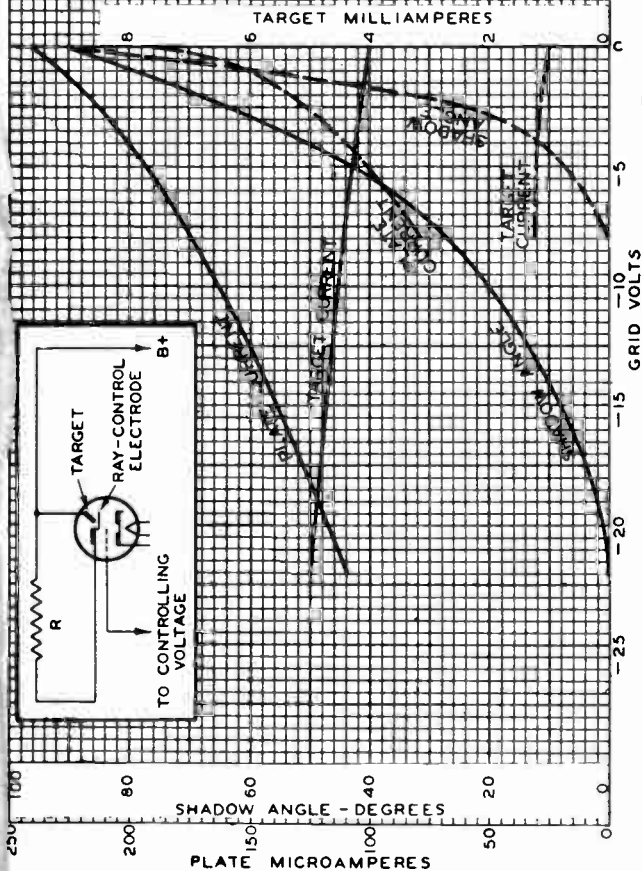


6U5

## AVERAGE CONTROL CHARACTERISTICS

 $E_f = 6.3$  VOLTS

CURVE	PLATE-SUPPLY VOLTS (B+)	SERIES PLATE RESISTOR (R)-MEG.
—	250	1.0
- - -	100	0.5



AUG. 9, 1954

TUBE DIVISION

92CM-4626R3

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



6U7-G

6U7-G



## TRIPLE-GRID SUPER-CONTROL AMPLIFIER

Heater	Coated Unipotential Cathode*	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances: <sup>0</sup>		
Grid to Plate	0.007 max.	0.007 max. $\mu\text{f}$
Input	5	5 $\mu\text{f}$
Output	9	9 $\mu\text{f}$
Overall Length		4-5/8" to 4-7/8" ←
Seated Height		4-1/16" to 4-5/16" ←
Maximum Diameter		1-9/16"
Bulb		ST-12
Cap		Skirted Miniature
Base		Small Shell Octal 7-Pin
Pin 1 - No Connection		Pin 5 - Suppressor
Pin 2 - Heater		Pin 7 - Heater
Pin 3 - Plate		Pin 8 - Cathode
Pin 4 - Screen		Cap - Grid
Mounting Position	BOTTOM VIEW (G-7R)	Any

AMPLIFIER

Plate Voltage	300 max.	volts
Screen Voltage	100 max.	volts
Screen Supply Voltage	300 max.	volts
Grid Voltage	0 min.	volts
Plate Dissipation	2.25 max.	watts
Screen Dissipation	0.25 max.	watt

**Typical Operation and Characteristics - Class A<sub>1</sub> Amplifier:**

Plate	100	250	volts
Screen	100	100	volts
Grid	-3	-3	volts
Suppressor	Connected to cathode at socket		
Plate Res.	0.25	0.8 approx.	ohms
Transcond.	1500	1600	$\mu\text{mhos}$
Grid Bias for			
Transcond. of 2 $\mu\text{mhos}$	-50	-50	volts
Plate Cur.	8	8.2	ma.
Screen Cur.	2.2	2	ma.

\* In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

# The internal shield in the dome of the 6U7-G is connected to the cathode within the tube.

<sup>0</sup> With close-fitting shield connected to cathode.

The Curve under Type 8D6 also applies to the 6U7-G.

← Indicates a change.

Sept. 2, 1941

RCA RADOTRON DIVISION  
RCA MANUFACTURING COMPANY INC

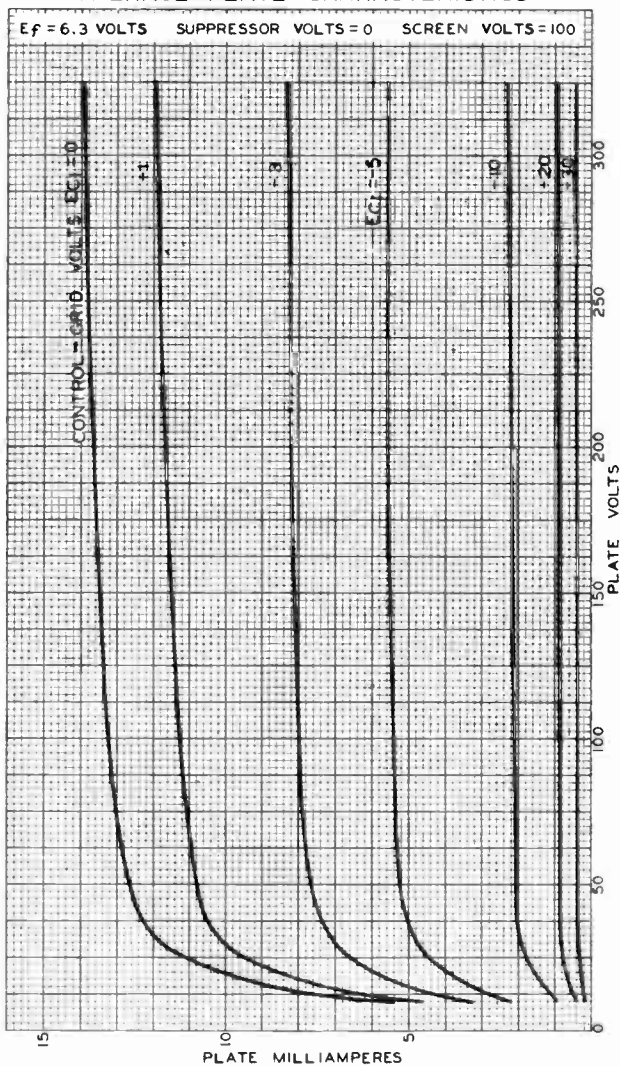
DATA

6U7-G



6U7-G

## AVERAGE PLATE CHARACTERISTICS



AUG. 20, 1941

RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY INC

92C-6011R1

World Radio History



6U8

6U8

# MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3 . . . . .	ac or dc volts
Current . . . . .	0.45 . . . . .	amp

Direct Interelectrode Cap.: With Shield<sup>A</sup> Without Shield

#### Triode Unit:

Grid to Plate . . . . .	1.8	1.8	$\mu$ f
Input . . . . .	2.5	2.5	$\mu$ f
Output . . . . .	1.0	0.4	$\mu$ f

#### Pentode Unit:

Grid No.1 to Plate . . . . .	0.006 max.	0.010 max.	$\mu$ f
Input . . . . .	5	5	$\mu$ f
Output . . . . .	3.5	2.6	$\mu$ f

Heater to Cathode

(Approx., Each Unit) . . . . .	3	3	$\mu$ f
--------------------------------	---	---	---------

### Characteristics:

	Triode Unit	Pentode Unit	
Plate Supply Voltage . . . . .	150	250	volts
Grid-No.2 Voltage . . . . .	—	110	volts
Cathode-Bias Resistor . . . . .	56	68	ohms
Amplification Factor . . . . .	40	—	
Plate Resistance (Approx.) . . . . .	5000	400000	ohms
Transconductance . . . . .	8500	5200	$\mu$ hos
Grid-No.1 Bias (Approx.) for Plate Cur. of 10 $\mu$ amp	-12	-10	volts
Plate Current . . . . .	18	10	ma
Grid-No.2 Current . . . . .	—	3.5	ma

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" $\pm$ 3/32"
Maximum Diameter . . . . .	7/8"
Bulb . . . . .	T-6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JETEC No. E9-1)

Basing Designation for BOTTOM VIEW . . . . . 9AE

Pin 1 - Triode Plate

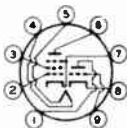
Pin 2 - Pentode  
Grid No.1

Pin 3 - Pentode  
Grid No.2

Pin 4 - Heater

Pin 5 - Heater

Pin 6 - Pentode Plate



Pin 7 - Pentode

Cathode,

Pentode

Grid No.3,

Internal

Shield

Pin 8 - Triode Cathode

Pin 9 - Triode Grid

<sup>A</sup> according to RTMA Standard ET-109A with external shield no. 315 tied to cathode of unit under test.

6U8



6U8

## MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

### CONVERTER SERVICE

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

	Triode Unit	Pentode Unit	
PLATE VOLTAGE . . . . .	300 max.	300 max.	volts
GRID-No.2 SUPPLY VOLTAGE . .	-	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE .	-	} See Rating Curve at front of this Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive bias value . . . . .	0 max.	0 max.	volts
PLATE DISSIPATION . . . . .	2.7 max.	2.8 max.	watts
GRID-No.2 INPUT . . . . .	-	0.5 max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . .	90 max.	90 max.	volts
Heater positive with respect to cathode . .	90 max.	90 max.	volts

APRIL 1, 1953

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA



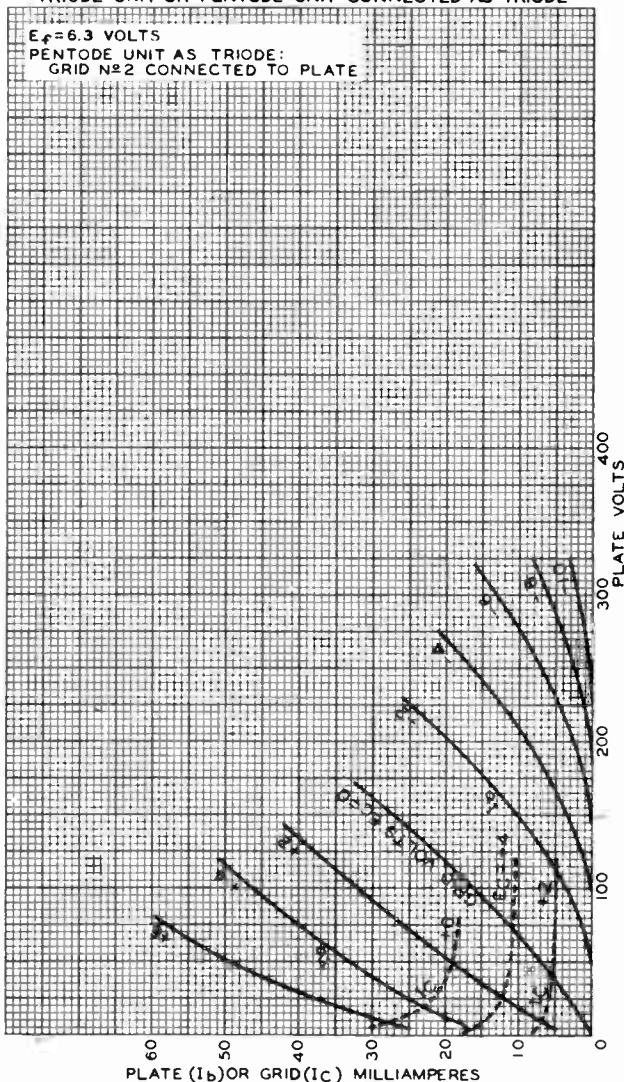


6U8

6U8

# AVERAGE PLATE CHARACTERISTICS TRIODE UNIT OR PENTODE UNIT CONNECTED AS TRIODE

$E_f = 6.3$  VOLTS  
PENTODE UNIT AS TRIODE:  
GRID No 2 CONNECTED TO PLATE



NOV. 12, 1952

TUBE DEPARTMENT

92CM-7873

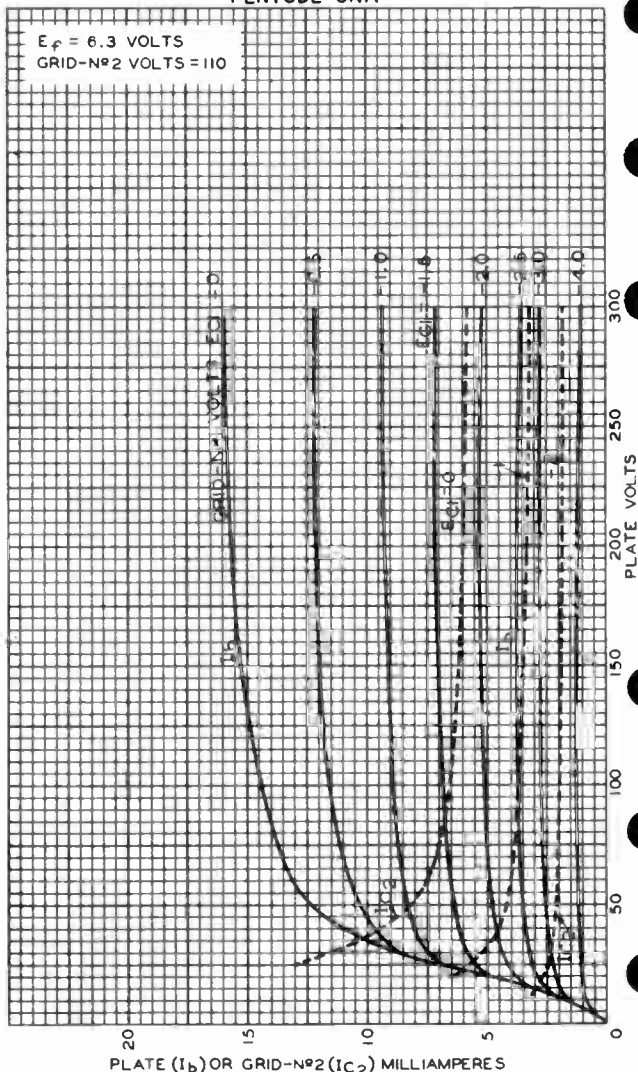
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6U8



6U8

# AVERAGE PLATE CHARACTERISTICS PENTODE UNIT



NOV. 11, 1952

TUBE DEPARTMENT

92CM-7869

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

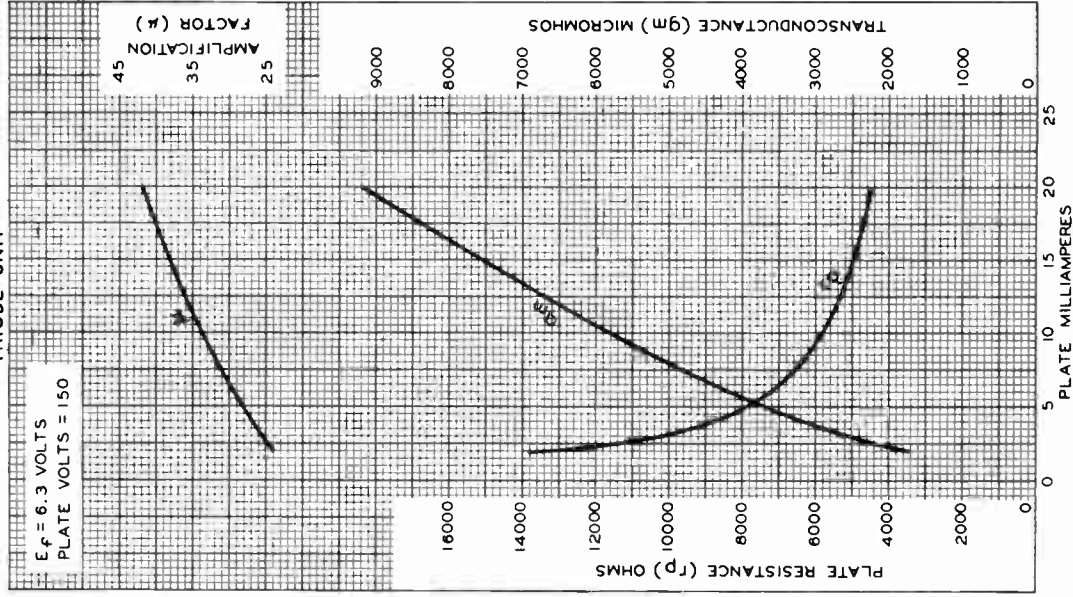


6U8

6U8

# AVERAGE CHARACTERISTICS TRIODE UNIT

$E_f = 6.3$  VOLTS  
PLATE VOLTS = 150



NOV. 12, 1952

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARTFORD, NEW JERSEY

92CM-7871





6U8-A

# 6U8-A MEDIUM-MU TRIODE — SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having  
series heater-string arrangement

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3	. . . . . ac or dc volts
Current . . . . .	0.45	. . . . . amp
Warm-up time (Average). . . . .	11	. . . . . sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield <sup>o</sup>	
<i>Triode Unit:</i>			
Grid to plate . . . . .	1.8	1.8	$\mu\text{f}$
Grid to cathode and heater. . . . .	2.5	2.5	$\mu\text{f}$
Plate to cathode and heater. . . . .	0.4	1	$\mu\text{f}$
<i>Pentode Unit:</i>			
Grid No.1 to plate. . . . .	0.010 max.	0.006 max.	$\mu\text{f}$
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater. . . . .	5	5	$\mu\text{f}$
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater . .	2.6	3.5	$\mu\text{f}$
Heater to cathode (Each unit) . . . . .	3	3*	$\mu\text{f}$

### Characteristics:

	Triode Unit	Pentode Unit	
Plate-Supply Voltage. . . . .	150	250	volts
Grid-No.2 (Screen-Grid) Supply Voltage. . . . .	—	110	volts
Cathode Resistor. . . . .	56	68	ohms
Amplification Factor. . . . .	40	—	
Plate Resistance (Approx.). . .	5000	400000	ohms
Transconductance. . . . .	8500	5200	$\mu\text{mhos}$
Plate Current . . . . .	18	10	ma
Grid-No.2 Current . . . . .	—	3.5	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 $\mu\text{amp}$ . . . . .	-12	-10	volts

<sup>o</sup> with external shield JETEC No.315 connected to cathode of unit under test except as noted.

\* with external shield JETEC No.315 connected to ground.



6U8-A

## MEDIUM-MU TRIODE — SHARP-CUTOFF PENTODE

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-9/16" ± 3/32"
Maximum Diameter . . . . .	7/8"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JETEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9AE

Pin 1 - Triode Plate  
 Pin 2 - Pentode  
           Grid No. 1  
 Pin 3 - Pentode  
           Grid No. 2  
 Pin 4 - Heater  
 Pin 5 - Heater  
 Pin 6 - Pentode Plate



Pin 7 - Pentode  
           Cathode,  
           Pentode  
           Grid No. 3,  
           Internal  
           Shield  
 Pin 8 - Triode Cathode  
 Pin 9 - Triode Grid

### CONVERTER SERVICE

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

	Triode Unit as Osc.	Pentode Unit as Mixer	
PLATE VOLTAGE . . . . .	300 max.	300 max.	volts
GRID-No. 2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	-	300 max.	volts
GRID-No. 2 VOLTAGE . . . . .	-	See Grid-No. 2 Input	
<i>Rating Chart at front of Receiving Tube Section</i>			
GRID-No. 1 (CONTROL-GRID) VOLTAGE:			
Positive bias value . . . . .	0 max.	0 max.	volts
GRID-No. 2 INPUT:			
For grid-No. 2 voltages up to 150 volts . . . . .	-	0.5 max.	watt
For grid-No. 2 voltages between 150 and 300 volts . . . . .	-	See Grid-No. 2 Input	
<i>Rating Chart at front of Receiving Tube Section</i>			
PLATE DISSIPATION . . . . .	2.7 max.	2.8 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200 max.	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	200 <sup>▲</sup> max.	volts

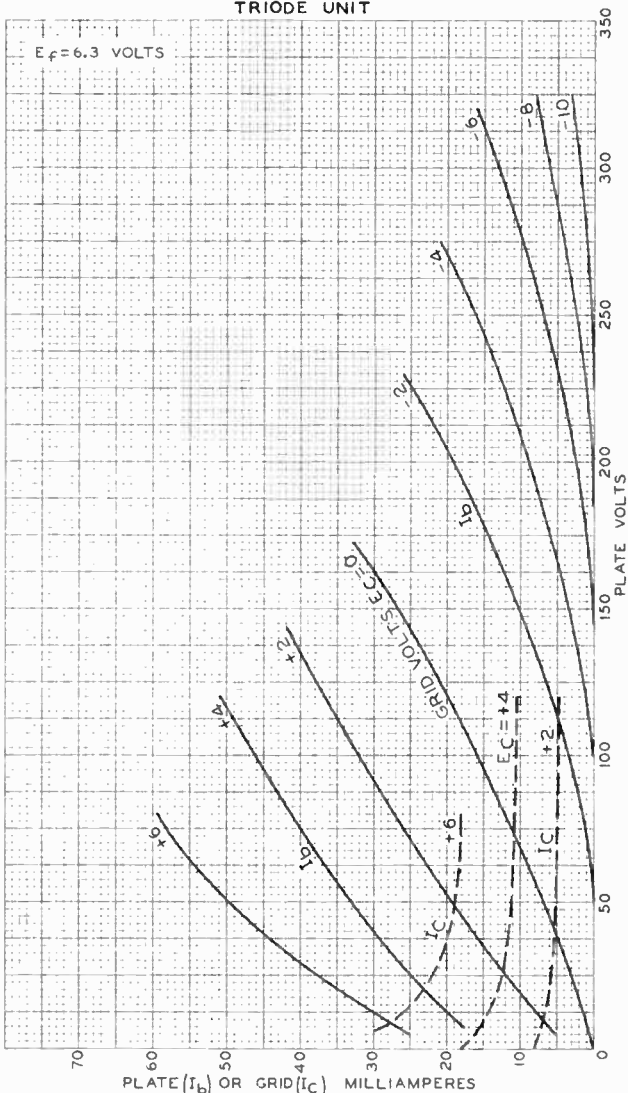
<sup>▲</sup> The dc component must not exceed 100 volts.



6U8-A

6U8-A

# AVERAGE CHARACTERISTICS TRIODE UNIT



TUBE DIVISION

92CM-7873R1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

6U8-A



6U8-A

# AVERAGE CHARACTERISTICS PENTODE UNIT

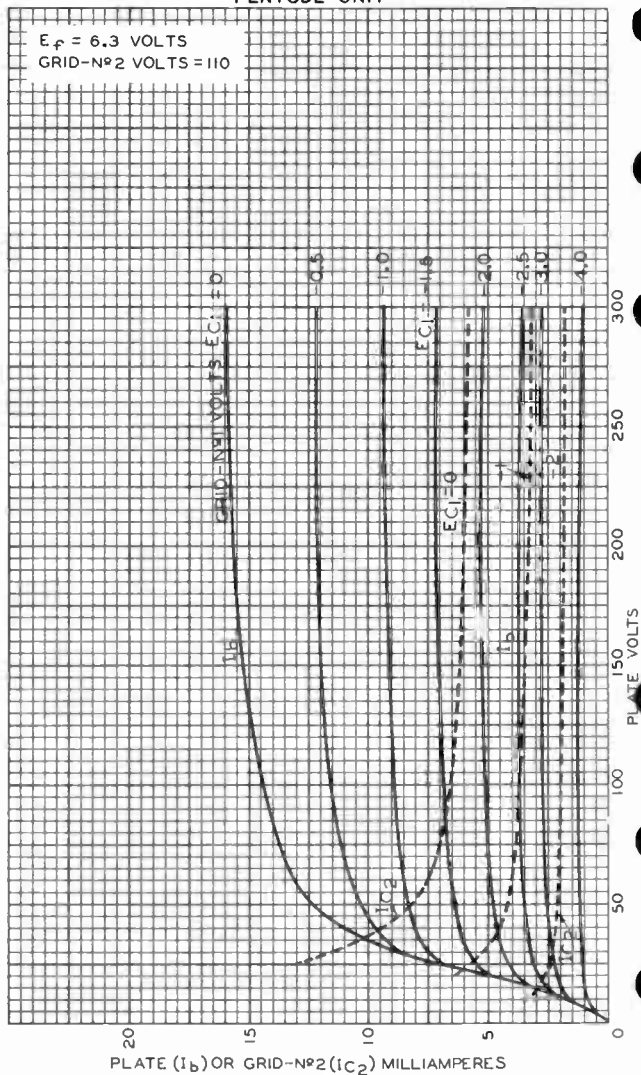


PLATE ( $I_b$ ) OR GRID-Nº2 ( $I_{c2}$ ) MILLIAMPERES

TUBE DIVISION

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-7869

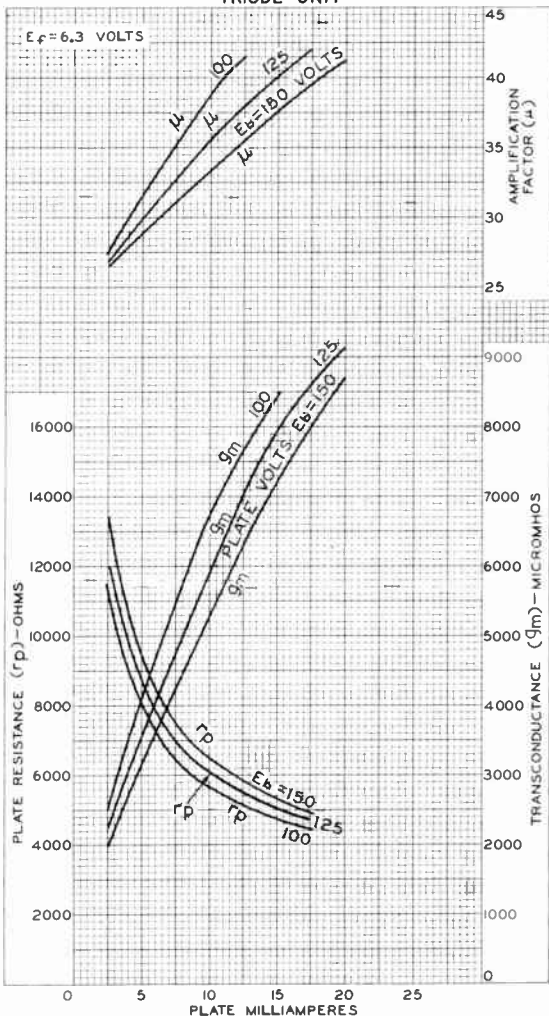




6U8-A

6U8-A

### AVERAGE CHARACTERISTICS TRIODE UNIT



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7871RI





6V3-A

# 6V3-A

## HALF-WAVE VACUUM RECTIFIER

9-PIN MINIATURE TYPE

For Television Damper Service

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	. . . . .	ac or dc volts
Current . . . . .	1.75	. . . . .	amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Heater to cathode . . . . .	1.5	μμf
Plate to cathode and heater . . . . .	8	μμf
Cathode to plate and heater . . . . .	9	μμf

#### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	3-1/16"
Seated Length . . . . .	2-21/32" ± 1/8"
Maximum Diameter . . . . .	7/8"
Bulb . . . . .	T-6-1/2
Cap . . . . .	Skirted Miniature (JETEC No. C1-2 or C1-33)
Base . . . . .	Small-Button Noval 9-Pin (JETEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9B0

Pin 1 - No Connection	Pin 6 - Same as Pin 1
Pin 2 - Plate	Pin 7 - Plate
Pin 3 - Same as Pin 1	Pin 8 - Same as Pin 1
Pin 4 - Heater	Pin 9 - Plate
Pin 5 - Heater	Cap - Cathode



### DAMPER SERVICE

Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system<sup>0</sup>

#### PEAK INVERSE PLATE VOLTAGE

(Absolute maximum)<sup>#</sup> . . . . . 6000<sup>■</sup> max. volts

PEAK PLATE CURRENT . . . . . 800 max. ma

DC PLATE CURRENT . . . . . 135 max. ma

#### PEAK HEATER-CATHODE VOLTAGE:

heater negative with respect to cathode

(Absolute maximum)<sup>#</sup> . . . . . 6750<sup>▲</sup> max. volts

Heater positive with respect to cathode . 300<sup>●</sup> max. volts

<sup>0</sup> Without external shield.

<sup>0</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

<sup>#</sup> This rating is applicable where the duty cycle of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

<sup>■</sup> Under no circumstances should this absolute value be exceeded.

<sup>▲</sup> The dc component must not exceed 750 volts.

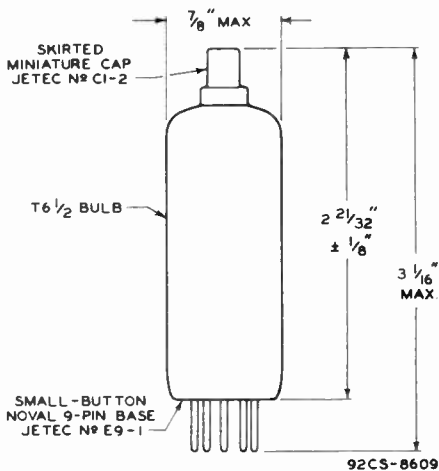
<sup>●</sup> The dc component must not exceed 100 volts.

6V3-A



6V3-A

# HALF-WAVE VACUUM RECTIFIER



MAY 1, 1955

TUBE DIVISION

CE-8609

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History



6V6  
6V6-GT

# 6V6, 6V6-GT BEAM POWER AMPLIFIER

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3 . . . . .	ac or dc volts
Current . . . . .	0.45 . . . . .	amp

Direct Interelectrode Capacitances (Approx.):

	6V6 <sup>o</sup>	6V6-GT <sup>oo</sup>	
Grid No.1 to Plate . . .	0.3	0.7	μf
Input . . . . .	10	9	μf
Output . . . . .	11	7.5	μf

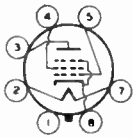
### Mechanical:

	6V6	6V6-GT
Mounting Position . . .	Any	Any
Maximum Overall Length.	3-1/4"	3-5/16"
Maximum Seated Length .	2-11/16"	2-3/4"
Maximum Diameter . . .	1-5/16"	1-9/32"
Bulb . . . . .	Metal Shell, MT-8	T-9
Base . . . . .	Small-Wafer Octal 7-Pin (JETEC No. B7-22)	Intermed.-Shell Octal 7-Pin (JETEC No. B7-7)
Basing Designation	7AC	G-7AC

Pin 1 - { 6V6, Shell  
6V6-GT, No  
          Connection

Pin 2 - Heater

Pin 3 - Plate



BOTTOM VIEW

Pin 4 - Grid No.2

Pin 5 - Grid No.1

Pin 7 - Heater

Pin 8 - Cathode,  
Grid No.3

## AF POWER AMPLIFIER—Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	315 max.	volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE . . . . .	315 max.	volts
GRID-No.2 VOLTAGE . . . . .	285 max.	volts
PLATE DISSIPATION . . . . .	12 max.	watts
GRID-No.2 INPUT . . . . .	2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	90 max.	volts
Heater positive with respect to cathode .	90 max.	volts

### Typical Operation and Characteristics:

Plate Voltage . . . . .	180	250	315	volts
Grid-No.2 voltage . . . . .	180	250	225	volts
Grid-No.1 Voltage . . . . .	-8.5	-12.5	-13	volts
Peak AF Grid-No.1 Voltage . .	8.5	12.5	13	volts

<sup>o</sup> with shell connected to cathode.

<sup>oo</sup> with no external shield.

← indicates a change

JAN. 1, 1953

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA

6V6  
6V6-GT



## 6V6, 6V6-GT

### BEAM POWER AMPLIFIER

Zero-Signal Plate Current . . .	29	45	34	ma
Max.-Signal Plate Current . . .	30	47	35	ma
Zero-Signal Grid-No.2 Current (Approx.) . . . . .	3	4.5	2.2	ma
Max.-Signal Grid-No.2 Current (Approx.) . . . . .	4	7	6	ma
→ Plate Resistance (Approx.) . .	50000	50000	80000	ohms
Transconductance . . . . .	3700	4100	3750	μmhos
Load Resistance . . . . .	5500	5000	8500	ohms
Total Harmonic Distortion . . .	8	8	12	per cent
Max.-Signal Power Output . . .	2	4.5	5.5	watts

#### AF POWER AMPLIFIER—Class AB<sub>1</sub>

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

PLATE VOLTAGE . . . . .	315 max.	volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE .	315 max.	volts
GRID-No.2 VOLTAGE . . . . .	285 max.	volts
PLATE DISSIPATION . . . . .	12 max.	watts
GRID-No.2 INPUT . . . . .	2 max.	watts
→ PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	90 max.	volts
Heater positive with respect to cathode . . . . .	90 max.	volts

##### Typical Operation:

*Values are for 2 tubes*

Plate Voltage . . . . .	250	285	volts
Grid-No.2 Voltage . . . . .	250	285	volts
Grid-No.1 Voltage* . . . . .	-15	-19	volts
Peak AF Grid-No.1-to-			
Grid-No.1 Voltage . . . . .	30	38	volts
Zero-Signal Plate Current . . . . .	70	70	ma
Max.-Signal Plate Current . . . . .	79	92	ma
Zero-Sig. Grid-No.2 Cur. (Approx.)	5	4	ma
Max.-Sig. Grid-No.2 Cur. (Approx.)	13	13.5	ma
→ Plate Resistance (Approx.) . . . . .	60000	70000	ohms
Transconductance . . . . .	3750	3600	μmhos
Effective Load Resistance . . . . .	10000	8000	ohms
Total Harmonic Distortion . . . . .	5	3.5	per cent
Max.-Signal Power Output . . . . .	10	14	watts

##### Maximum Circuit Values:

Grid-No.1-Circuit Resistance:▲			
For fixed-bias operation . . . . .	0.1 max.	megohm	
For cathode-bias operation . . . . .	0.5 max.	megohm	

▲ The type of input coupling used should not introduce too much resistance in the grid-no.1 circuit. Transformer- or impedance-coupling devices are recommended.

→ indicates a change

JAN. 1, 1953

TUBE DEPARTMENT

DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History



6V6

6V6

# AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS

GRID-N $\circ$ 2 VOLTS = 250

GRID-N $\circ$ 1 ( $I_{c1}$ ) MILLIAMPERES

30  
20  
10  
0

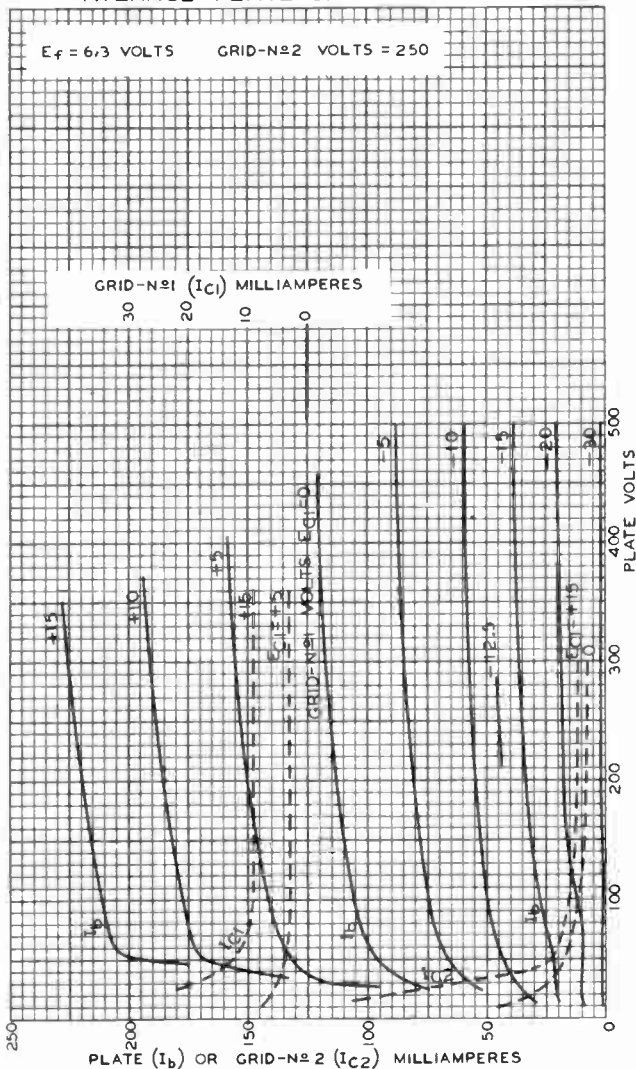


PLATE ( $I_b$ ) OR GRID-N $\circ$ 2 ( $I_{c2}$ ) MILLIAMPERES

DEC. 18, 1952

TUBE DEPARTMENT

92CM-4207R2

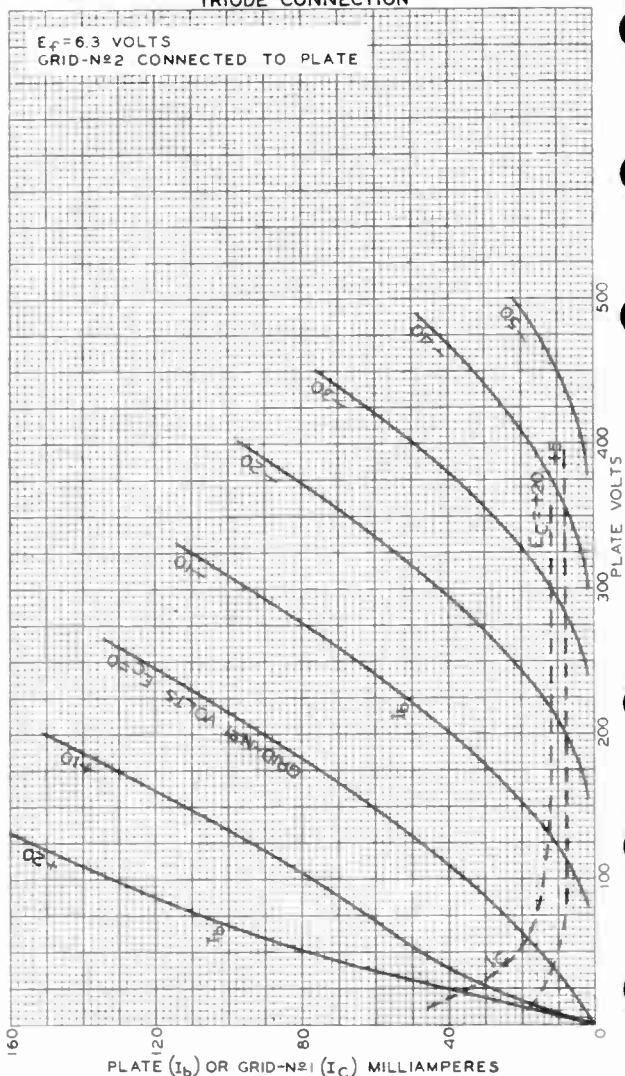
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

6V6



6V6

# AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION



DEC. 18, 1952

TUBE DEPARTMENT

92CM-6333RI

RADIO CORPORATION OF AMERICA • HARRISON, NEW JERSEY



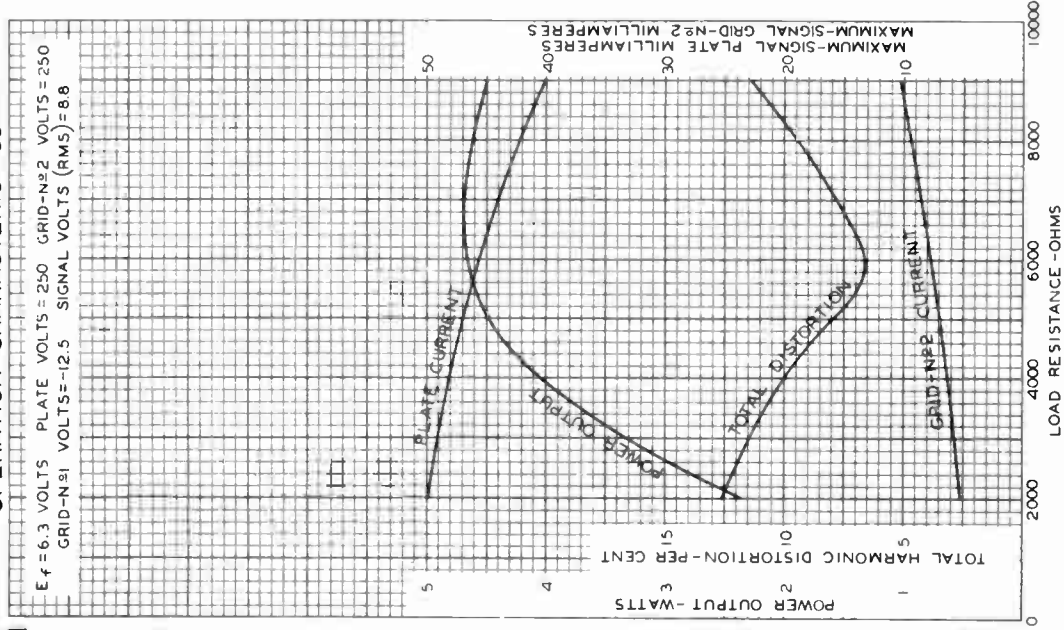


6V6

6V6

# OPERATION CHARACTERISTICS

$E_f = 6.3$  VOLTS    PLATE VOLTS = 250    GRID-N<sub>2</sub> VOLTS = 250  
 GRID-N<sub>1</sub> VOLTS = -12.5    SIGNAL VOLTS (RMS) = 8.8



MAXIMUM-SIGNAL PLATE MILLIAMPERES  
 MAXIMUM-SIGNAL GRID-N<sub>2</sub> MILLIAMPERES

DEC. 18, 1952

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

92CM-6339RI





6W4-GT

6W4-GT

# HALF-WAVE VACUUM RECTIFIER

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	ac volts
Current . . . . .	1.2	amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

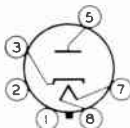
Heater to Cathode . . . . .	7.0	$\mu\mu\text{f}$
Plate to Heater and Cathode . . . . .	5.3	$\mu\mu\text{f}$

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	3-5/16"
Maximum Seated Length . . . . .	2-3/4"
Maximum Diameter . . . . .	1-9/32"
Bulb . . . . .	T-9
Base . . . . .	Intermediate-Shell Octal 6-Pin
Basing Designation for BOTTOM VIEW . . . . .	4CG

Pin 1-No  
Connection

Pin 2-No  
Connection



Pin 3-Cathode

Pin 5-Plate

Pin 7-Heater

Pin 8-Heater

## DAMPER SERVICE

Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE . . . . .	3500*	max. volts
PEAK PLATE CURRENT . . . . .	600	max. ma
DC PLATE CURRENT . . . . .	125	max. ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	2100**	max. volts
Heater positive with respect to cathode.	100	max. volts

## RECTIFIER SERVICE

Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE . . . . .	1250	max. volts
PEAK PLATE CURRENT . . . . .	600	max. ma
HOT-SWITCHING TRANSIENT PLATE CURRENT		
For duration of 0.2 second maximum . . . . .	3.5	max. amp
DC OUTPUT CURRENT . . . . .	125	max. ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	450	max. volts
Heater positive with respect to cathode.	100	max. volts

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

\* This rating is applicable where the duty cycle of the voltage pulse does not exceed 15 percent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 microseconds.

\*\* The dc component must not exceed more than 450 volts.

← Indicates a change.

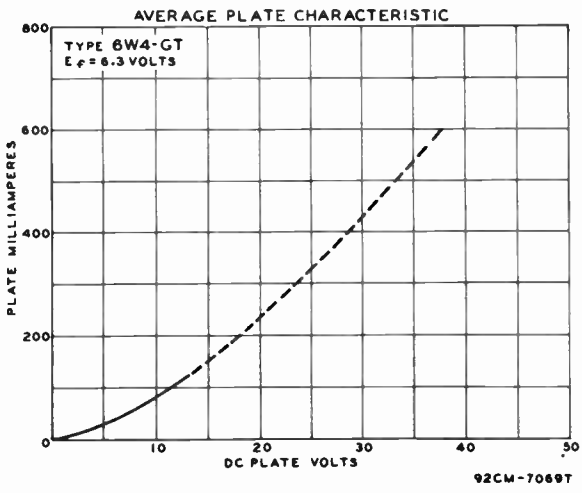
6W4-GT



# 6W4-GT

## HALF-WAVE VACUUM RECTIFIER

Typical Operation:	Half-Wave	Full-Wave		
	Rectifier (One Tube)	Rectifier (Two Tubes)		
AC Plate-Supply Voltage (RMS) . . . . .	350	-	volts	
AC Plate-to-Plate Supply Voltage (RMS) . . . . .	-	700	volts	
Filter-Input Capacitor . . . . .	20	20	$\mu$ f	
Minimum Total Effective Plate-Supply Impedance Per Plate . . . . .	145	145	ohms	
DC Output Current . . . . .	125	250	ma	
DC Output Voltage at Input to Filter (Approx.):				
At half-load cur. of	$\left\{ \begin{array}{l} 62.5 \text{ ma.} \\ 125 \text{ ma.} \end{array} \right.$	390	-	volts
		-	395	volts
At full-load cur. of	$\left\{ \begin{array}{l} 125 \text{ ma.} \\ 250 \text{ ma.} \end{array} \right.$	335	-	volts
		-	350	volts
Voltage Regulation (Approx.):				
Half-load to full-load current . . . . .	55	45	volts	



MARCH 1, 1951

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY  
[World Radio History](#)

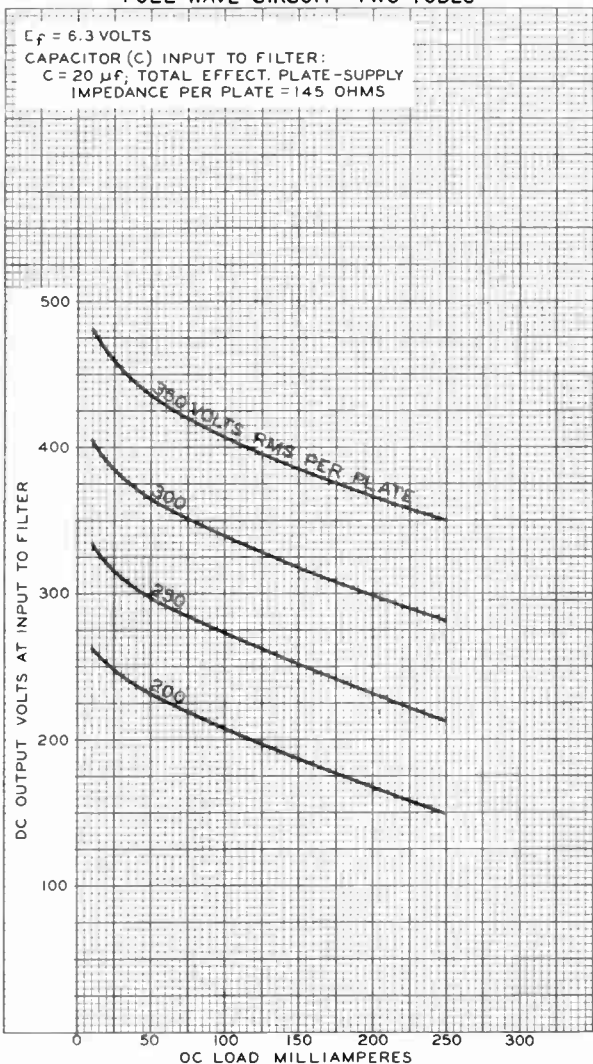
DATA



6W4-GT

6W4-GT

### OPERATION CHARACTERISTICS FULL-WAVE CIRCUIT—TWO TUBES







6W6-GT

# 6W6-GT

## BEAM POWER AMPLIFIER

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 6.3 . . . . . ac or dc volts  
Current . . . . . 1.2 . . . . . amp

Direct Interelectrode Capacitances (Approx.):

Grid No.1 to Plate . . . . . 0.5 max. . . . .  $\mu\mu\text{f}$   
Input . . . . . 15 . . . . .  $\mu\mu\text{f}$   
Output . . . . . 9 . . . . .  $\mu\mu\text{f}$

Characteristics as Beam Power Amplifier:

See AMPLIFIER—Class A<sub>1</sub> below:

Characteristics as Triode-Connected Amplifier:

(Grid No.2 connected to plate)

Plate Voltage . . . . . 225 volts  
Grid-No.1 Voltage . . . . . -30 volts  
Amplification Factor . . . . . 6.2  
Plate Resistance . . . . . 1600 ohms  
Transconductance . . . . . 3800  $\mu\text{mhos}$   
Plate Current . . . . . 22 ma  
Grid-No.1 Voltage (Approx.) for  
plate current of 0.5 ma . . . . . -42 volts ←

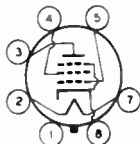
#### Mechanical:

Mounting Position . . . . . Any  
Maximum Overall Length . . . . . 3-5/16"  
Maximum Seated Length . . . . . 2-3/4"  
Maximum Diameter . . . . . 1-9/32"  
Bulb . . . . . T-9

Base. . . . . Intermediate-Shell Octal 6-Pin (JETEC No. B6-8) ←  
or Intermediate-Shell Octal 7-Pin (JETEC No. B7-7)  
or Short Intermediate-Shell Octal 6-Pin with Ex-  
ternal Barriers (JETEC No. B6-60)  
or Short Intermediate-Shell Octal 7-Pin with Ex-  
ternal Barriers (JETEC No. B7-59)

Basing Designation for BOTTOM VIEW . . . . . G-7AC

Pin 1 - No Connection  
Pin 2 - Heater  
Pin 3 - Plate  
Pin 4 - Grid No.2  
Pin 5 - Grid No.1  
Pin 7 - Heater  
Pin 8 - Cathode,  
Grid No.3



### AMPLIFIER--Class A<sub>1</sub>

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . . 300 max. volts  
GRID-No.2 (SCREEN) VOLTAGE . . . . . 150 max. volts  
PLATE DISSIPATION . . . . . 10 max. watts  
GRID-No.2 INPUT . . . . . 1.25 max. watts

← indicates a change.

OCT. 1, 1953

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

6W6-GT



6W6-GT

BEAM POWER AMPLIFIER

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode .	200 max.	volts
Heater positive with respect to cathode .	200 <sup>▲</sup> max.	volts

Typical Operation and Characteristics:

Plate Supply Voltage . . . . .	110	200	volts
Grid-No.2 Voltage . . . . .	110	125	volts
Grid-No.1 (Control-Grid) Voltage . .	-7.5	-	volts
Cathode-Bias Resistor . . . . .	-	180	ohms
Peak AF Grid-No.1 Voltage . . . . .	7.5	8.5	volts
Zero-Signal Plate Current . . . . .	49	46	ma
Max.-Signal Plate Current . . . . .	50	47	ma
Zero-Signal Grid-No.2 Current . . . .	4	2.2	ma
Max.-Signal Grid-No.2 Current . . . .	10	8.5	ma
Plate Resistance (Approx.) . . . . .	13000	28000	ohms
Transconductance . . . . .	8000	8000	μmhos
Load Resistance . . . . .	2000	4000	ohms
Total Harmonic Distortion (Approx.) .	10	10	%
Max.-Signal Power Output . . . . .	2.1	3.8	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

VERTICAL DEFLECTION AMPLIFIER

*Triode Connected--Grid No.2 Connected to Plate*

Maximum Ratings, Design-Center Values Except As Noted:

*For operation in a 525-line, 30-frame system\**

DC PLATE VOLTAGE . . . . .	300 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE <sup>○</sup> . . . .	1200 <sup>▲</sup> max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE . . . . .	-250 max.	volts
CATHODE CURRENT:		
Peak . . . . .	140 max.	ma
DC . . . . .	40 max.	ma
PLATE DISSIPATION . . . . .	7.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	200 max.	volts
Heater positive with respect to cathode .	200 <sup>▲</sup> max.	volts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For cathode-bias operation . . . . .	2.2 max.	megohms
--------------------------------------	----------	---------

- ▲ The dc component must not exceed 100 volts.
- As described in "Standards of Good Engineering Practice for Television Broadcast Stations", Federal Communications Commission.
- The duration of the voltage pulse must not exceed 15 per cent of one scanning cycle. In a 525-line, 30-frame system, 15 per cent of one scanning cycle is 2.5 milliseconds.
- under no circumstances should this absolute value be exceeded.

OCT. 1, 1953

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

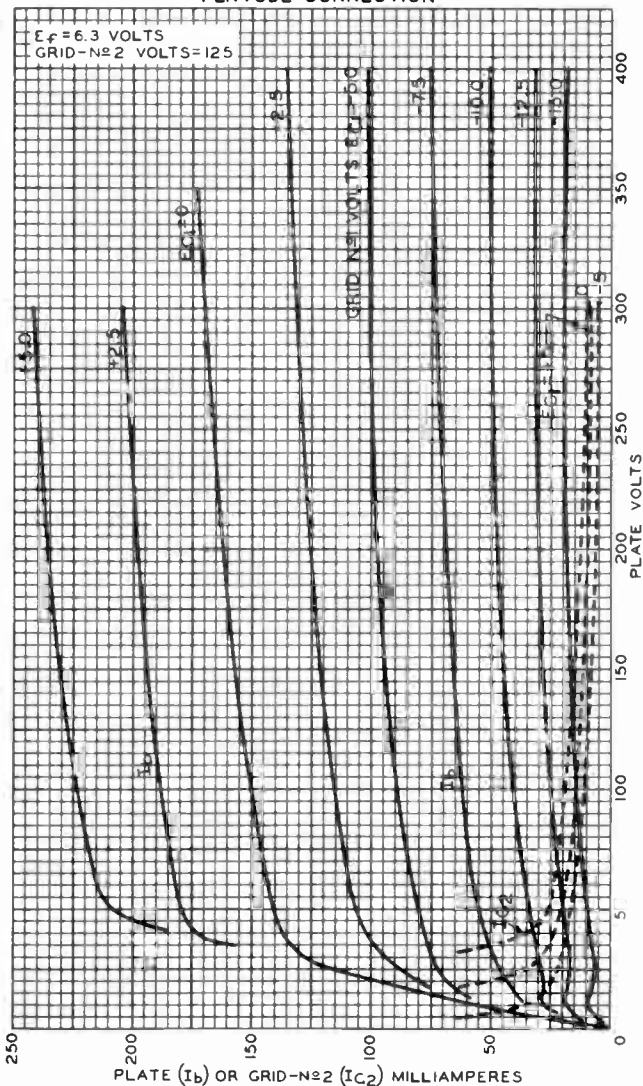




6W6-GT

6W6-GT

### AVERAGE PLATE CHARACTERISTICS PENTODE CONNECTION



MAR. 20. 1953

TUBE DEPARTMENT

92CM-7942

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

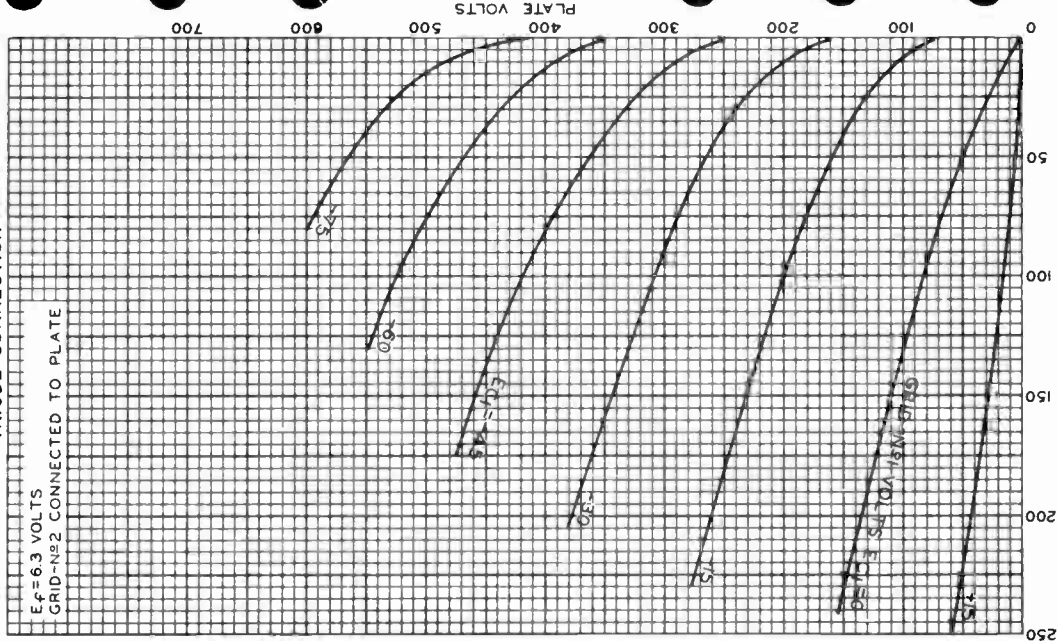
6W6-GT



6W6-GT

# AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION

$E_f = 6.3$  VOLTS  
GRID-NO 2 CONNECTED TO PLATE



MAR. 11, 1953

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7943



6X4

6X4

# FULL-WAVE VACUUM RECTIFIER

MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	. . . . .	ac or dc volts
Current . . . . .	0.6	. . . . .	amp

### Mechanical:

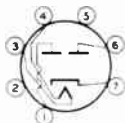
Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-5/8"
Maximum Seated Length . . . . .	2-3/8"
Length from Base Seat to Bulb Top (Excluding tip) . . . . .	2" ± 3/32"
Maximum Diameter . . . . .	3/4"
Bulb . . . . .	T-5-1/2
Base . . . . .	Small-Button Miniature 7-Pin (JEDEC No. E7-1)
Basing Designation for BOTTOM VIEW . . . . .	7CF

Pin 1 - Plate No. 2

Pin 2 - No Connection

Pin 3 - Heater

Pin 4 - Heater



Pin 5 - No

Connection

Pin 6 - Plate No. 1

Pin 7 - Cathode

## RECTIFIER SERVICE

### Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE . . . . .	1250 max.	volts
PEAK PLATE CURRENT PER PLATE . . . . .	210 max.	ma
AC PLATE SUPPLY VOLTAGE (RMS) PER PLATE . . . . .	See Rating Chart I	
DC OUTPUT CURRENT PER PLATE . . . . .	See Rating Chart I	

### HOT-SWITCHING CURRENT:

If hot-switching is regularly required in operation, the use of choke-input circuits is recommended. Such circuits limit the hot-switching current to a value no higher than that of the peak plate current. When capacitor-input circuits are used, a maximum peak current value per plate of 1 ampere during the initial cycles of the hot-switching transient should not be exceeded.

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . .	450 max.	volts
Heater positive with respect to cathode . . . . .	450 max.	volts

### Typical Operation as Full-Wave Rectifier

#### with Capacitor-Input to Filter:

AC Plate-to-Plate Supply Voltage (RMS) . . . . .	650	volts
Filter Input Capacitor . . . . .	10	μf
Effective Plate-Supply Impedance per Plate* . . . . .	520	ohms

\* Higher values of capacitance than indicated may be used but the effective plate-supply impedance should be increased to prevent exceeding the maximum rating for peak plate current.

← Indicates a change

6X4



6X4

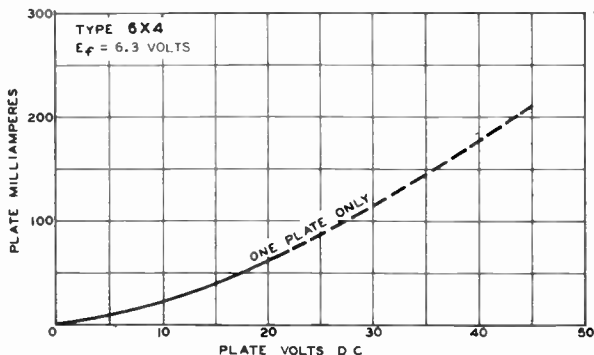
## FULL-WAVE VACUUM RECTIFIER

DC Output Voltage at Input to	Filter (Approx.):		
At half-load current of 35 ma. . . . .	360	volts	
At full-load current of 70 ma. . . . .	300	volts	
Voltage Regulation (Approx.):			
Half-load to full-load current . . . . .	60	volts	

### → Typical Operation as Full-Wave Rectifier with Choke-Input to Filter:

AC Plate-to-Plate Supply Voltage (RMS) . . .	900	volts	
Minimum Filter Input Choke . . . . .	10	henries	
DC Output Voltage at Input to	Filter (Approx.):		
At half-load current of 35 ma. . . . .	385	volts	
At full-load current of 70 ma. . . . .	370	volts	
Voltage Regulation (Approx.):			
Half-load to full-load current . . . . .	15	volts	

### AVERAGE PLATE CHARACTERISTIC



92CM-6106TI

### RATING CHARTS AND OPERATION CHARACTERISTICS

*Rating Chart I* represents graphically the relationships between maximum ac voltage input and maximum dc output current derived from the fundamental ratings for conditions of capacitor-input and choke-input filters. This graphical presentation gives the equipment designer considerable latitude in choice of operating conditions.

*Rating Chart II* represents graphically the relationship between maximum rectification efficiency and maximum dc output current per plate for conditions of capacitor input to filter.

→ Indicates a change

OCT. 1, 1953

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA 1

World Radio History



6X4

6X4

## FULL-WAVE VACUUM RECTIFIER

*Rating Chart III* represents graphically the relationships between minimum plate-supply resistance per plate and maximum ac plate-supply voltage per plate under no-load conditions for conditions of capacitor input to filter when occasional hot-switching is employed.

The *Operation Characteristics for Full-Wave Circuit with Capacitor-Input Filter* show not only the typical operating curves for such a circuit, but also show by means of boundary-lines "DEA" the limiting current and voltage relationships presented on *Rating Chart I*.

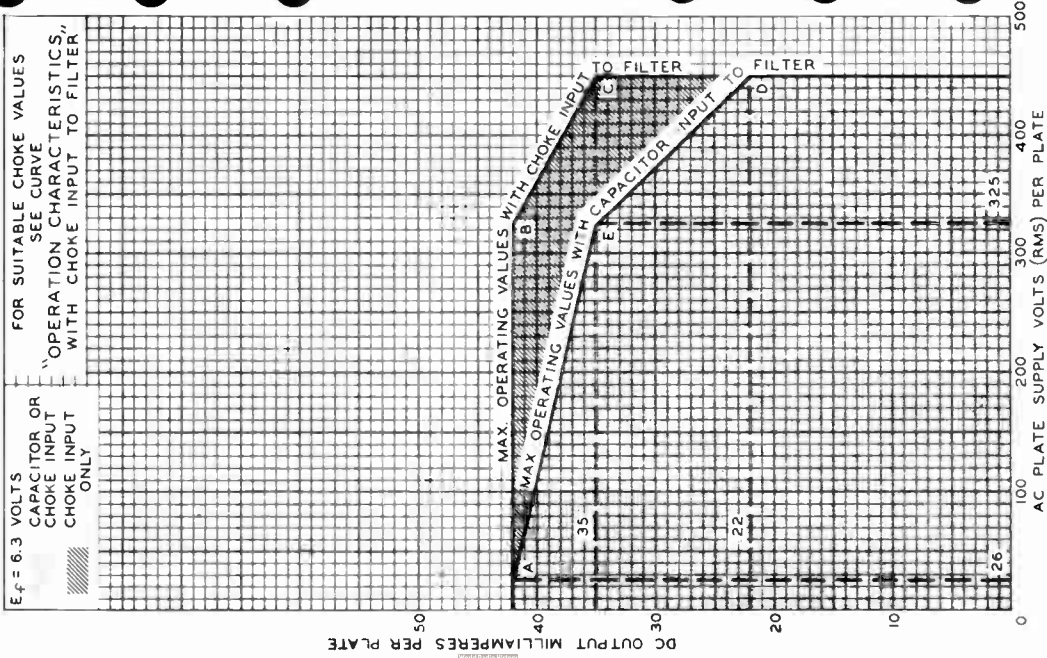
The *Operation Characteristics for Full-Wave Circuit with Choke-Input Filter* show the typical operating curves for such a circuit. They not only show by means of boundary line "ABC" the limiting current and voltage relationships presented on *Rating Chart I*, but also give information as to the effect on regulation of various sizes of chokes. The solid-line curves show the dc voltage outputs which would be obtained if the filter chokes had infinite inductance. The long-dash lines radiating from the zero position are boundary lines for various sizes of chokes as indicated. The intersection of one of these lines with a solid-line curve indicates the point on the curve at which the choke no longer behaves as though it had infinite inductance. To the left of the choke boundary line, the regulation curves depart from the solid-line curves as shown by the representative short-dash regulation curves.

6X4



6X4

## RATING CHART I



JUNE 29, 1953

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISBURG, NEW JERSEY

92CM-8025



6X4

6X4

### RATING CHART II CAPACITOR INPUT TO FILTER

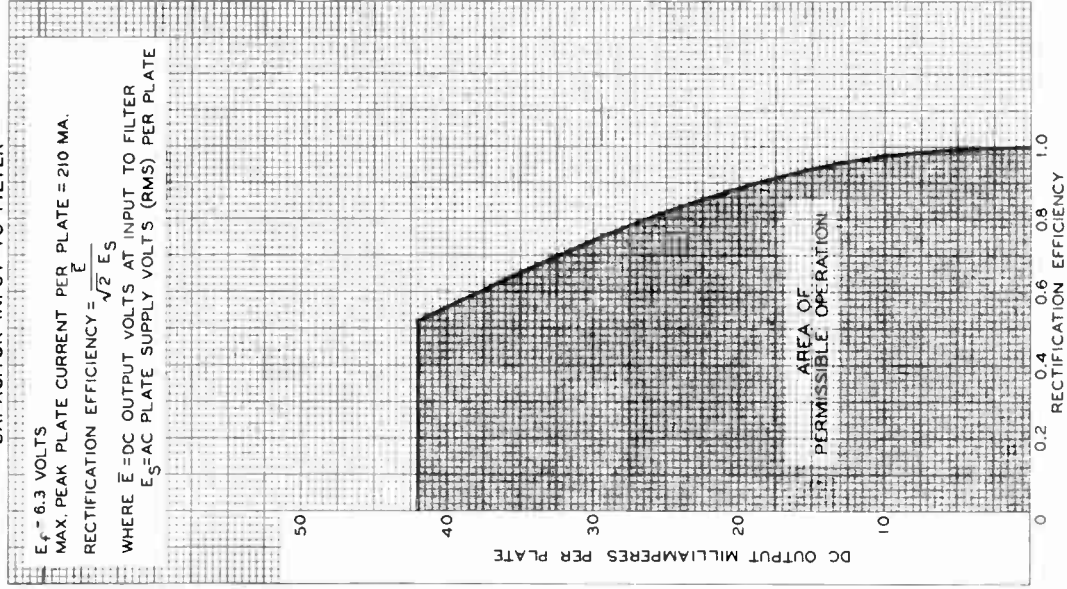
$E_f = 6.3$  VOLTS

MAX. PEAK PLATE CURRENT PER PLATE = 210 MA.

RECTIFICATION EFFICIENCY =  $\frac{E}{\sqrt{2} E_s}$

WHERE  $E$  = DC OUTPUT VOLTS AT INPUT TO FILTER

$E_s$  = AC PLATE SUPPLY VOLTS (RMS) PER PLATE



JUNE 26, 1953

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

92CM-8024

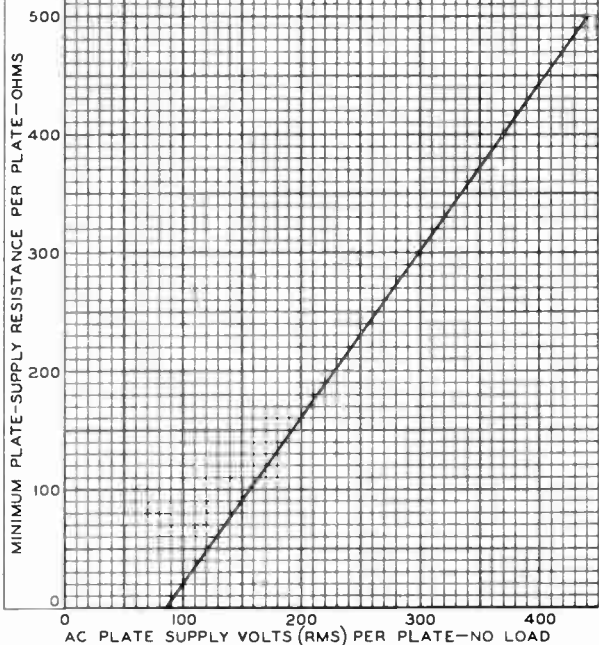
6X4



6X4

### RATING CHART III CAPACITOR INPUT TO FILTER

$E_f = 6.3$  VOLTS                      MAX. HOT SWITCHING CUR. = 1 AMP.  
 PLATE-SUPPLY RESISTANCE PER PLATE =  $R_{SEC} + N^2 R_{PRI} + R_A$   
 WHERE  $R_{SEC}$  = DC RESISTANCE OF TRANSFORMER  
                   SECONDARY PER SECTION  
 $R_{PRI}$  = DC RESISTANCE OF TRANSFORMER  
                   PRIMARY  
 $R_A$  = DC RESISTANCE OF ADDED SERIES  
                   RESISTANCE PER PLATE  
 $N$  = TRANSFORMER VOLTAGE STEP-UP  
                   RATIO PER SECTION



JUNE 29, 1953

TUBE DEPARTMENT

92CM-8026

RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY





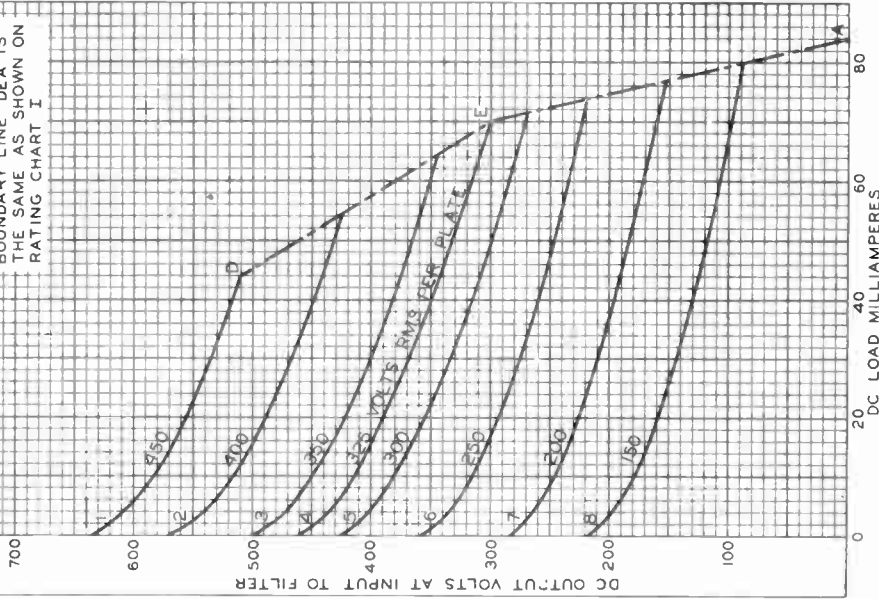
6X4

6X4

# OPERATION CHARACTERISTICS FULL-WAVE CIRCUIT, CAPACITOR INPUT TO FILTER

$E_f = 6.3$  VOLTS  
 CAPACITOR (C) INPUT TO FILTER:  $C = 10\mu f$   
 TOTAL EFFECTIVE PLATE-SUPPLY RESISTANCE  
 PER PLATE  $\begin{cases} 520 \text{ OHMS FOR CURVES 1-5} \\ 400 \text{ OHMS FOR CURVES 6-8} \end{cases}$   
 SUPPLY FREQUENCY = 60 CPS

CURRENT-AND VOLTAGE -  
 BOUNDARY LINE 'DE' IS  
 THE SAME AS SHOWN ON  
 RATING CHART I



JULY 3, 1953

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

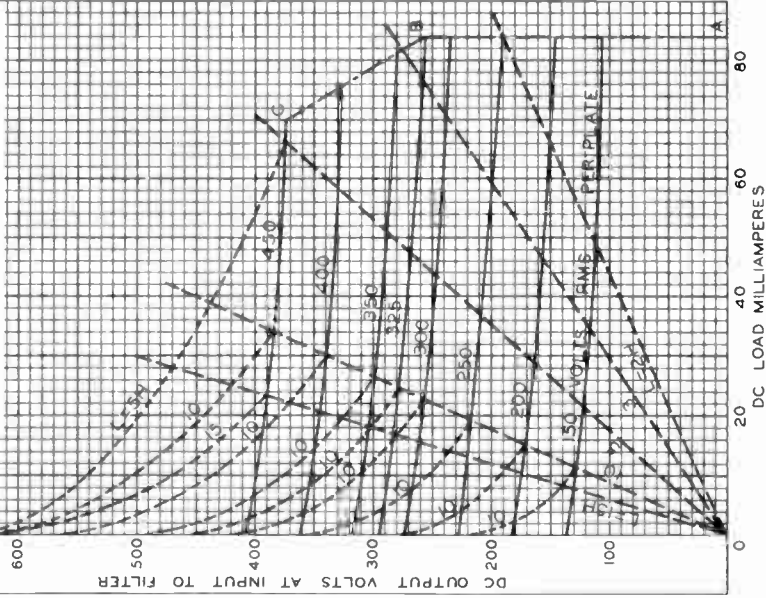
92CM-8031



6X4

# OPERATION CHARACTERISTICS FULL-WAVE CIRCUIT, CHOKE INPUT TO FILTER

$E_f = 6.3$  VOLTS      SUPPLY FREQ. = 60 CPS  
 SOLID-LINE CURVE = CHOKES OF INFINITE  
 INDUCTANCE  
 LONG-DASH LINES = BOUNDARY LINES FOR  
 CHOKE SIZES AS SHOWN  
 SHORT-DASH CURVES = REGULATION CURVES  
 FOR REPRESENTATIVE  
 CHOKE SIZES  
 CURRENT-AND-VOLTAGE BOUNDARY LINE 'CBA'  
 IS THE SAME AS SHOWN ON RATING  
 CHART I



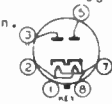


6X5  
6X5-GT/G

# 6X5, 6X5-GT/G

## FULL-WAVE HIGH-VACUUM RECTIFIER

		Coated Unipotential Cathode	
Heater Voltage		6.3	a-c or d-c volts
Heater Current		0.6	amp.
		6X5	6X5-GT/G
Maximum Overall Length		3-1/4"	3-5/16"
Maximum Seated Height		2-11/16"	2-3/4"
Maximum Diameter		1-5/16"	1-5/16"
Bulb		Metal Shell, HT-8	T-9
Base		{ Small Wafer Octal 6-Pin	{ Intermed. Sh. Octal 6-Pin
Basing Designation		6S	G-6S
Pin 1 { 6X5, Shell			Pin 5 - Plate #1
Pin 1 { 6X5-GT/G, No Con.			Pin 7 - Heater
Pin 2 - Heater			Pin 8 - Cathode
Pin 3 - Plate #2			
Mounting Position			{ 6X5: Vertical 6X5-GT/G: Any



BOTTOM VIEW

Maximum Ratings Are Design-Center Values

### FULL-WAVE RECTIFIER

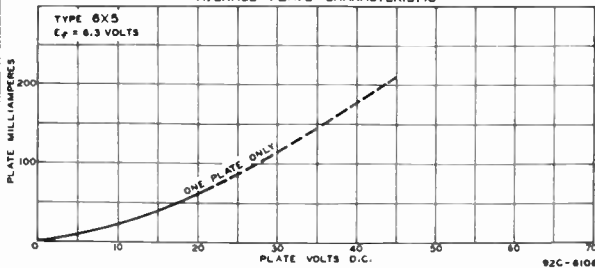
Peak Inverse Plate Voltage	1250 max. volts
Peak Plate Current per Plate	210 max. ma.
D-C Output Current:	
With condenser input to filter	70 max. ma.
With choke input to filter	70 max. ma.
D-C Heater-Cathode Potential	450 max. volts

#### Typical Operation:

	Condenser- Input Filter	Choke- Input Filter
A-C Plate-to-Plate		
Supply Voltage (RMS)	650	900 volts
Filter Input Condenser	4	- μf
Min. Total Effect. Plate- Supply Imped. per Plate	150	- ohms
Filter Input Choke	-	8 henries
D-C Output Current	70	70 ma.
D-C Voltage (At input to filter):*		
At half-load current (35 ma.)	405	385 volts
At full-load current (70 ma.)	370	380 volts
Difference (Voltage Regulation)	35	5 volts
Percentage Regulation	8.5	1.3 %

- ◇ Horizontal operation permitted if pins 3 & 5 are in a horizontal plane.
- For choke not less than 8 henries.
- \* Approximate values.

#### AVERAGE PLATE CHARACTERISTIC



Mar. 20, 1943

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

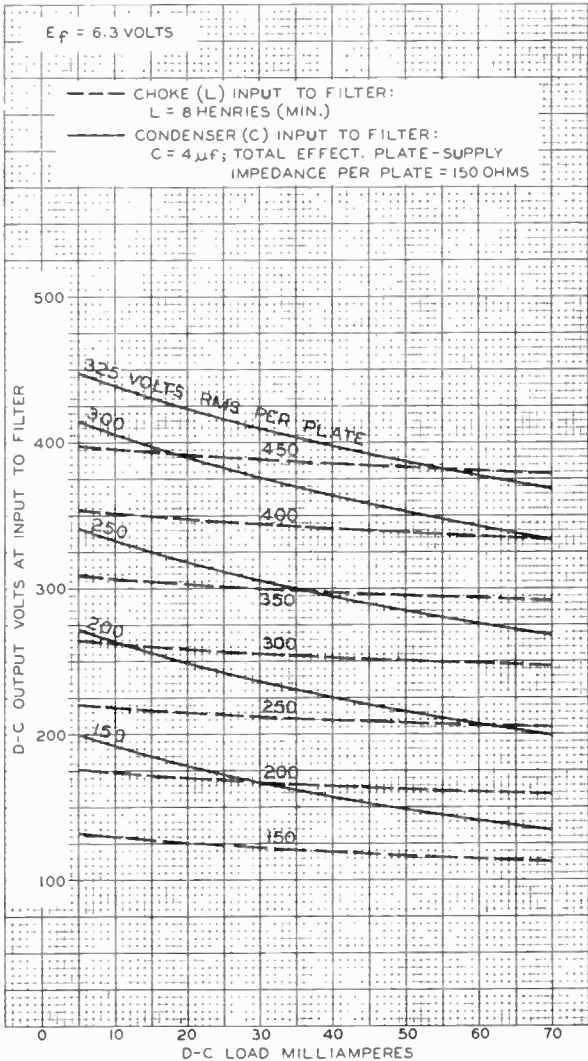
DATA

6X5



6X5

## OPERATION CHARACTERISTICS



NOV. 15, 1939

RCA VICTOR DIVISION  
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92C-4576RI

World Radio History



6X8

6x8

# TRIODE-PENTODE CONVERTER

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	. . . . .	ac or dc volts
Current . . . . .	0.45	. . . . .	amp

Direct Interelectrode Capacitances:

	<i>Without External Shield</i>	<i>With External Shield<sup>0</sup></i>	
<i>Triode Unit:</i>			
Grid to plate . . . . .	1.4	1.4	$\mu\mu\text{f}$
Grid to cathode and heater. . . . .	2	2.6	$\mu\mu\text{f}$
Plate to cathode and heater. . . . .	0.5	1	$\mu\mu\text{f}$
<i>Pentode Unit:</i>			
Grid No.1 to plate. . . . .	0.09 max.	0.06 max.	$\mu\mu\text{f}$
Grid No.1 to cathode, grid No.3, grid No.2, and heater. . . . .	4.3	4.5	$\mu\mu\text{f}$
Plate to cathode, grid No.3, grid No.2, and heater. . . . .	0.7	1.4	$\mu\mu\text{f}$
Pentode grid No.1 to triode plate. . . . .	0.045 max.	0.035 max.	$\mu\mu\text{f}$
Pentode plate to triode plate. . . . .	0.040 max.	0.008 max.	$\mu\mu\text{f}$
Heater to cathode . . . . .	6	6 <sup>*</sup>	$\mu\mu\text{f}$ ←
<i>Pentode Unit Connected as Triode:</i>			
Grid No.1 to plate and grid No.2 . . . . .	1.4	1.3	$\mu\mu\text{f}$
Grid No.1 to cathode, grid No.3, and heater . . . . .	3	3.2	$\mu\mu\text{f}$
Plate and grid No.2 to cathode, grid No.3, and heater. . . . .	1.6	2	$\mu\mu\text{f}$

### Characteristics:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
Plate-Supply Voltage. . . . .	100	250	volts
Grid-No.3 (Suppressor-Grid) . . . . .	-	<i>Connected to cathode at socket</i>	
Grid-No.2 (Screen-Grid) Voltage . . . . .	-	150	volts
Cathode Resistor. . . . .	100	200	ohms

<sup>0</sup> with external shield JETEC No.315 connected to cathode, except as noted.

\* with external shield JETEC No.315 connected to ground.

■ : See next page.

← Indicates a change.

6X8



6X8

## TRIODE-PENTODE CONVERTER

	Triode Unit	Pentode Unit	
Amplification Factor. . . . .	40	-	
Plate Resistance (Approx.). . .	6900	75000	ohms
Transconductance. . . . .	5800	4600	$\mu$ mhos
Plate Current . . . . .	8.5	7.7	ma
Grid-No.2 Current . . . . .	-	1.6	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 $\mu$ amp . . . . .	-10	-10	volts

### Pentode Unit Connected as Triode<sup>■</sup>

Plate-Supply Voltage. . . . .	150	volts
Cathode Resistor. . . . .	250	ohms
Amplification Factor. . . . .	42	
Plate Resistance (Approx.). . . . .	7900	ohms
Transconductance. . . . .	4000	$\mu$ mhos
Plate Current . . . . .	7.8	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 $\mu$ amp. . . . .	-10	volts

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length. . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-9/16" $\pm$ 3/32"
Maximum Diameter. . . . .	7/8"
Dimensional Outline . . . . .	See General Section
Bulb. . . . .	T6-1/2
Base. . . . .	Small-Button Noval 9-Pin (JETEC No. E9-1)
Basing Designation for BOTTOM VIEW. . . . .	9AK

- Pin 1 - Pentode  
Grid No.3
- Pin 2 - Triode Grid
- Pin 3 - Triode Plate
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Cathode
- Pin 7 - Pentode  
Grid No.1
- Pin 8 - Pentode  
Grid No.2
- Pin 9 - Pentode Plate

### CONVERTER SERVICE

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

	Triode Unit as Osc.	Pentode Unit as Mixer	
PLATE VOLTAGE . . . . .	250 max.	250 max.	volts
GRID-No.3 (SUPPRESSOR- GRID) VOLTAGE . . . . .	-	0 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE. . . . .	-	250 max.	volts
GRID-No.2 VOLTAGE . . . . .	-	See Grid-No.2 Input	

Rating Chart at front of Receiving Tube Section

■: See next page.



6X8

6X8

## TRIODE-PENTODE CONVERTER

	<i>Triode Unit as Osc.</i>	<i>Pentode Unit as Mixer</i>	
GRID-No.1 (CONTROL-GRID)			
VOLTAGE:			
Negative bias value. . . . .	40 max.	40 max.	volts
Positive bias value. . . . .	0 max.	0 max.	volts
GRID-No.2 INPUT:			
For grid-No.2 voltages			
up to 125 volts. . . . .	-	0.4 max.	watt
For grid-No.2 voltages			
between 125 and			
250 volts. . . . .	-	<i>See Grid-No.2 Input</i>	
<i>Rating Chart at front of Receiving Tube Section</i>			
GRID INPUT . . . . .	0.5 max.	-	watt
PEAK HEATER-CATHODE			
VOLTAGE:			
Heater negative with			
respect to cathode . . . . .	100 max.	100 max.	volts
Heater positive with			
respect to cathode . . . . .	100 max.	100 max.	volts
<i>Pentode Unit as Triode-Connected Mixer<sup>■</sup></i>			
PLATE VOLTAGE. . . . .		250 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Negative bias value. . . . .		40 max.	volts
Positive bias value. . . . .		0 max.	volts
PLATE DISSIPATION. . . . .		2.4 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .			
		100 max.	volts
Heater positive with respect to cathode . . . . .			
		100 max.	volts
<b>Typical Operation:</b>			
	<i>Triode Unit as 250-Mc Osc. *</i>	<i>Pentode Unit as Mixer *</i>	
Plate Voltage. . . . .	150	150	volts
Grid No.3. . . . .	-	<i>Connected to cathode at socket</i>	
Grid-No.2 Voltage. . . . .	-	150	volts
Mixer Grid-No.1			
Supply Voltage . . . . .	-	-3.5	volts
Oscillator Voltage (rms)			
at mixer grid No.1 . . . . .	-	2.6	volts
Mixer Grid-No.1-Circuit			
Resistance . . . . .	-	120000	ohms
Oscillator Grid Resistor. . . . .	2700	-	ohms
Conversion Transcon-			
ductance . . . . .	-	2100	μmhos
Plate Current. . . . .	13	6.2	ma
Grid-No.2 Current. . . . .	-	1.8	ma
Grid Current . . . . .	3.6	-	ma

■, •, \* : See next page.

← Indicates a change.

6X8



6X8

## TRIODE-PENTODE CONVERTER

	<i>Triode Unit as 250-Mc Osc.*</i>	<i>Pentode Unit as Mixer*</i>	
Grid-No.1 Current . . . . .	-	2	$\mu$ amp
Oscillator Power Output (Approx.) . . . . .	0.5	-	watt
<i>Pentode Unit as Triode-Connected Mixer<sup>■</sup></i>			
Plate Voltage . . . . .	150		volts
Grid-No.1 Supply Voltage . . . . .	-3.5		volts
Oscillator Voltage (rms) at grid No.1 . . . . .	2.6		volts
Grid-No.1-Circuit Resistance . . . . .	120000		ohms
Conversion Transconductance . . . . .	2800		$\mu$ mhos
Plate Current . . . . .	7.8		ma
Grid-No.1 Current . . . . .	2		$\mu$ amp

### Maximum Circuit Values:

#### Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max. megohm
For cathode-bias operation . . . . .	0.5 max. megohm

- Grid No.3 connected to cathode, and grid No.2 connected to plate.
- In TV or FM receivers, it is generally desirable to operate the oscillator with less power input than shown in the tabulated data in order to avoid over-excitation and excessive oscillator radiation.
- With separate excitation and triode unit connected to ground.

### OPERATING CONSIDERATIONS

When the 6X8 is used as the converter in AM broadcast receivers, it is important that the tuned plate-load impedance of the first if coil not exceed 75000 ohms. Any higher value will cause excessive degeneration due to feedback in the pentode mixer unit.

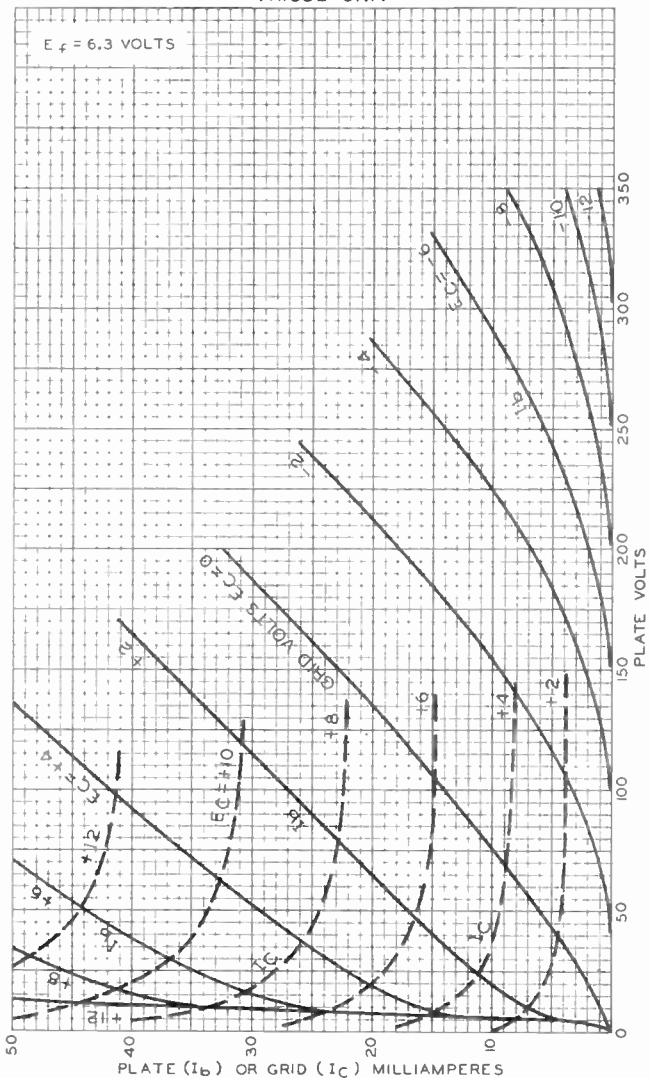




6X8

# AVERAGE CHARACTERISTICS TRIODE UNIT

6X8



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7531

6X8



6X8

# AVERAGE CHARACTERISTICS PENTODE UNIT

$E_f = 6.3$  VOLTS  
 GRID-N $\circ$ 3 VOLTS = 0  
 GRID-N $\circ$ 2 VOLTS = 150

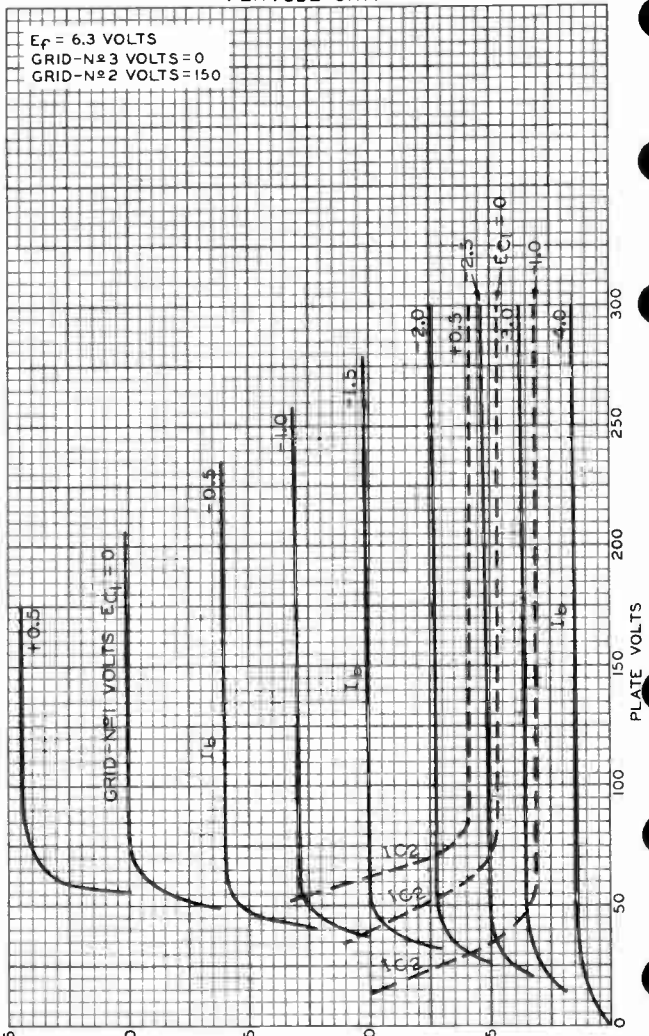


PLATE ( $I_b$ ) OR GRID-N $\circ$ 2 ( $I_{c2}$ ) MILLIAMPERES

PLATE VOLTS

TUBE DIVISION

92CM-7532

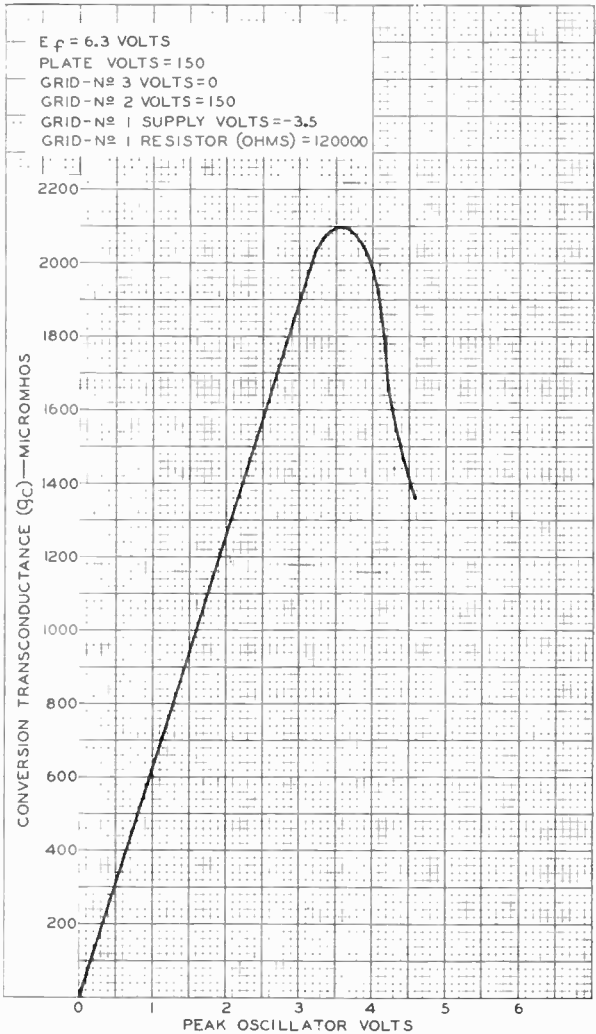
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



6X8

6X8

### OPERATION CHARACTERISTIC WITH SEPARATE OSCILLATOR EXCITATION PENTODE UNIT



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7546R1

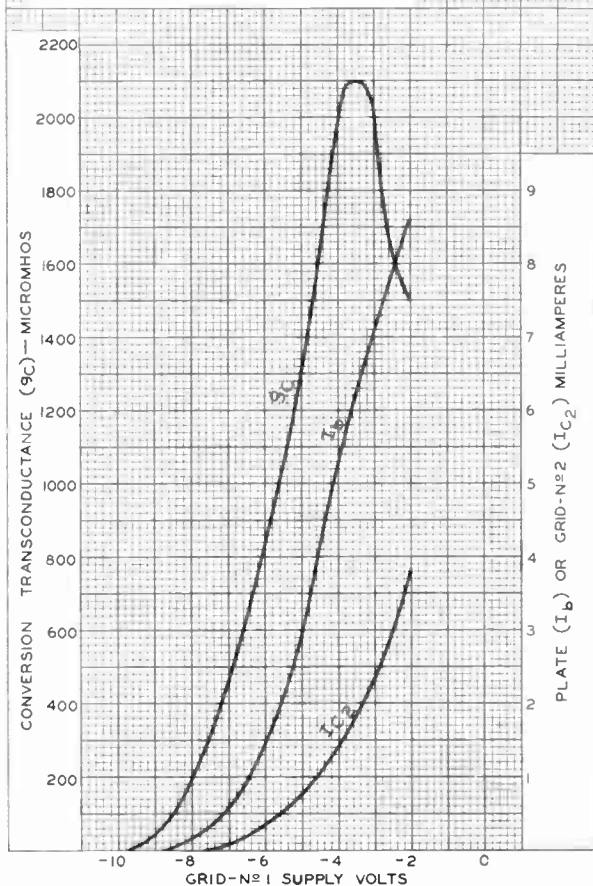
6X8



6X8

OPERATION CHARACTERISTICS  
WITH SEPARATE OSCILLATOR EXCITATION  
PENTODE UNIT

$E_f = 6.3$  VOLTS  
PLATE VOLTS = 150  
GRID-N<sup>o</sup> 3 VOLTS = 0  
GRID-N<sup>o</sup> 2 VOLTS = 150  
GRID-N<sup>o</sup> 1 RESISTOR (OHMS) = 120000  
OSCILLATOR VOLTS (RMS) AT GRID N<sup>o</sup> 1 = 2.6



TUBE DIVISION

92CM-7547R1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

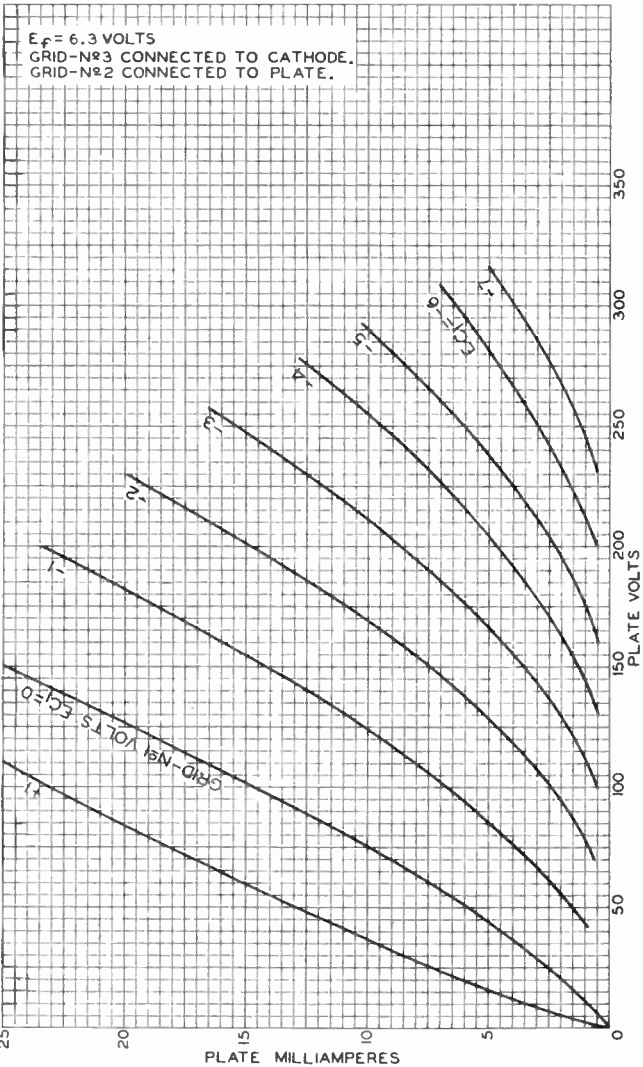
World Radio History



6X8

6X8

### AVERAGE PLATE CHARACTERISTICS PENTODE UNIT CONNECTED AS TRIODE

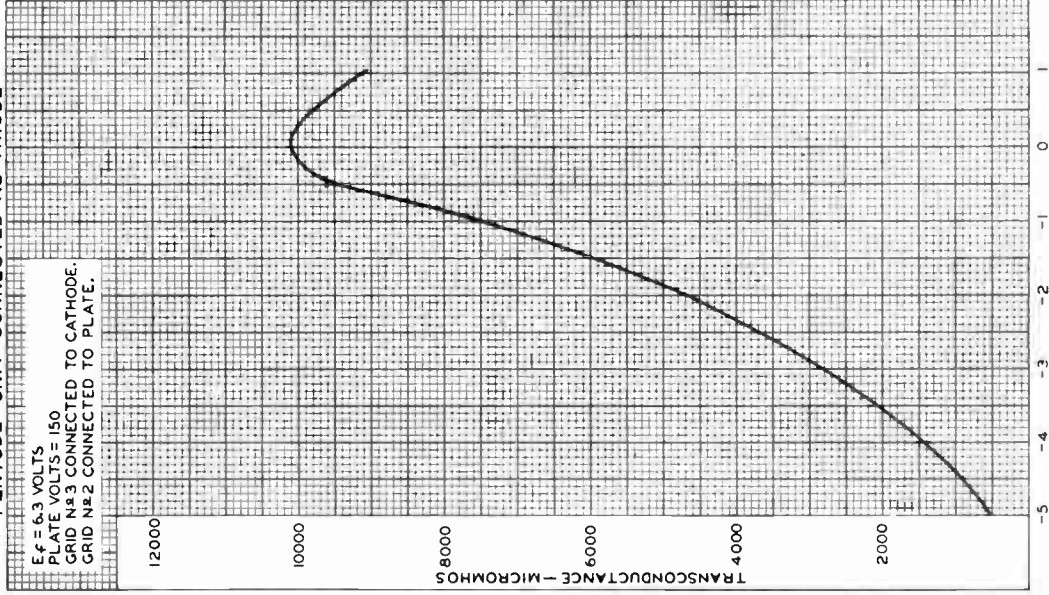




6X8

# AVERAGE CHARACTERISTIC PENTODE UNIT CONNECTED AS TRIODE

$E_f = 6.3$  VOLTS  
PLATE VOLTS = 150  
GRID N<sub>3</sub> 3 CONNECTED TO CATHODE.  
GRID N<sub>2</sub> 2 CONNECTED TO PLATE.



GRID VOLTS

TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7844



6Y6-G

6Y6-G

# BEAM POWER AMPLIFIER

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	ac or dc volts
Current . . . . .	1.25	amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid No.1 to Plate . . . . .	0.7	$\mu$ f
Input . . . . .	15	$\mu$ f
Output . . . . .	11	$\mu$ f

<sup>0</sup> with no external shield.

### Mechanical:

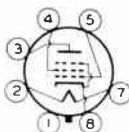
Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	4-5/8"
Seated Length . . . . .	3-7/8" + 3/16" - 5/16"
Maximum Diameter . . . . .	1-13/16"
Eulb. . . . .	ST-14
Base . . . . .	Medium-Shell Octal 7-Pin
Basing Designation for BOTTOM VIEW . . . . .	G-7AC

Pin 1 - No  
Connection

Pin 2 - Heater

Pin 3 - Plate

Pin 4 - Grid No.2



Pin 5 - Grid No.1

Pin 7 - Heater

Pin 8 - Cathode,  
Grid No.3

## AF POWER AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	200 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	135 max.	volts
PLATE DISSIPATION . . . . .	12.5 max.	watts
GRID-No.2 DISSIPATION . . . . .	1.75 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	180 max.	volts
Heater positive with respect to cathode	180 max.	volts

### Typical Operation and Characteristics:

Plate Voltage . . . . .	135	200	volts
Grid-No.2 Voltage . . . . .	135	135	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	-13.5	-14	volts
Peak AF Grid-No.1 Voltage . . . . .	13.5	14	volts
Zero-Signal Plate Current . . . . .	58	61	ma
Max.-Signal Plate Current . . . . .	60	66	ma
Zero-Signal Grid-No.2 Current . . . . .	3.5	2.2	ma
Max.-Signal Grid-No.2 Current . . . . .	11.5	9.0	ma
Plate Resistance (Approx.) . . . . .	9300	18300	ohms
Transconductance . . . . .	7000	7100	$\mu$ hos
Load Resistance . . . . .	2000	2600	ohms

←Indicates a change.

6Y6-G



6Y6-G

## BEAM POWER AMPLIFIER

Total Harmonic Distortion. . . . .	10	10	%
Max.-Signal Power Output . . . . .	3.6	6.0	watts

### Maximum Circuit Values (for maximum rated conditions):

Grid-No.1-Circuit Resistance:

For fixed bias . . . . .	0.1	megohm
For cathode bias . . . . .	0.5	megohm

### OSCILLATOR - Class C

For Television High-Voltage RF Supplies

### Maximum Ratings, Design-Center Values:

DC PLATE VOLTAGE . . . . .	350 max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE. . . . .	135 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE. . . . .	-90 max.	volts
DC PLATE CURRENT . . . . .	80 max.	ma
DC GRID-No.1 CURRENT . . . . .	1.5 max.	ma
PLATE INPUT. . . . .	23 max.	watts
GRID-No.2 INPUT. . . . .	0.6 max.	watt
PLATE DISSIPATION. . . . .	8 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	180 max.	volts
Heater positive with respect to cathode	180 max.	volts

### Typical Operation:

DC Plate Voltage . . . . .	350	volts
DC Grid-No.2 Voltage <sup>□□</sup> . . . . .	{ 115	volts
	{ 5000	ohms
DC Grid-No.1 Voltage† . . . . .	{ -40	volts
	{ 30000	ohms
	{ 600	ohms
Peak RF Grid-No.1 Voltage. . . . .	48	volts
DC Plate Current . . . . .	60	ma
DC Grid-No.2 Current . . . . .	5.1	ma
DC Grid-No.1 Current (Approx.) . . . . .	1.4	ma
Driving Power (Approx.) . . . . .	0.1	watt
Power Output (Approx.) . . . . .	14	watts

<sup>□□</sup> obtained from a separate source, from the plate-voltage supply with a potentiometer, or through a series resistor of value shown.

† obtained from a fixed supply, by grid resistor (30000), by cathode resistor (600) or by combination methods.





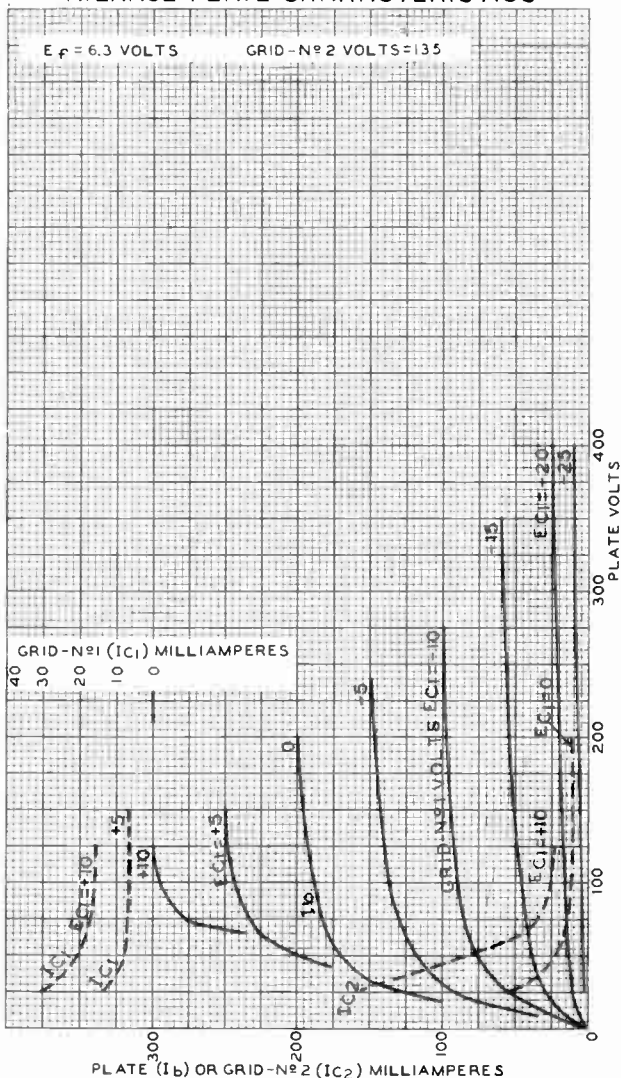
6Y6-G

6Y6-G

### AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS

GRID-Nº 2 VOLTS = 135



SEPT. 11, 1946

TUBE DEPARTMENT

92CM-6127RI

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

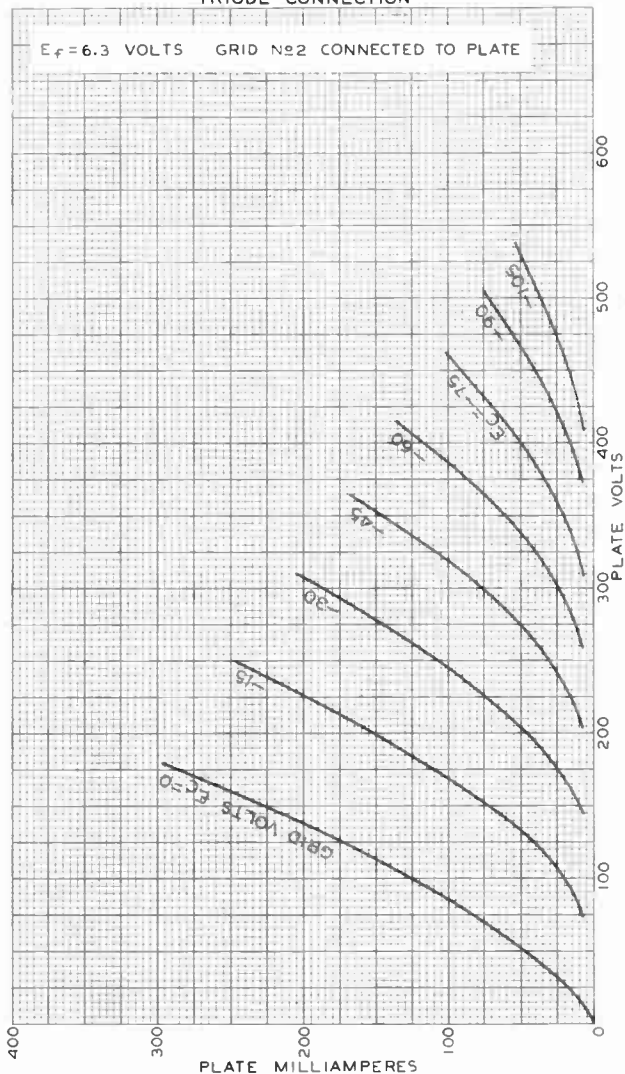
6Y6-G



6Y6-G

# AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION

$E_f = 6.3$  VOLTS    GRID No2 CONNECTED TO PLATE



FEB. 8, 1944

PLATE MILLIAMPERES

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6538



6Y6-GA

# 6Y6-GA BEAM POWER TUBE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3	volts
Current . . . . .	1.25	amp

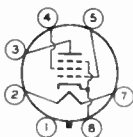
Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid No.1 to plate . . . . .	0.66	$\mu$ f
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	12	$\mu$ f
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	7.5	$\mu$ f

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	3-7/8"
Maximum Seated Length . . . . .	3-5/16"
Diameter . . . . .	1.438" to 1.562"
Bulb . . . . .	T12
Base . . . . .	Medium-Shell Octal 7-Pin (JEDEC Group 1, No.B7-12), or Short Medium-Shell Octal 7-Pin with External Barriers, Style B (JEDEC Group 1, No.B7-119)
Basing Designation for BOTTOM VIEW . . . . .	.7S

- Pin 1 - No Connection
- Pin 2 - Heater
- Pin 3 - Plate
- Pin 4 - Grid No.2



- Pin 5 - Grid No.1
- Pin 7 - Heater
- Pin 8 - Cathode,  
Grid No.3

## AMPLIFIER — Class A<sub>1</sub>

### Maximum Ratings. Design-Center Values:

PLATE VOLTAGE . . . . .	200 max.	volts
GRID-No.2 (SCREEN-GRID)		
SUPPLY VOLTAGE . . . . .	200 max.	volts
GRID-No.2 VOLTAGE . . . . .	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 100 volts . . . . .	1.75 max.	watts
For grid-No.2 voltages between 100 and 200 volts . . . . .	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
PLATE DISSIPATION . . . . .	12.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	180 max.	volts
Heater positive with respect to cathode . . . . .	180 max.	volts

<sup>o</sup> Without external shield.

6Y6-GA



6Y6-GA

## BEAM POWER TUBE

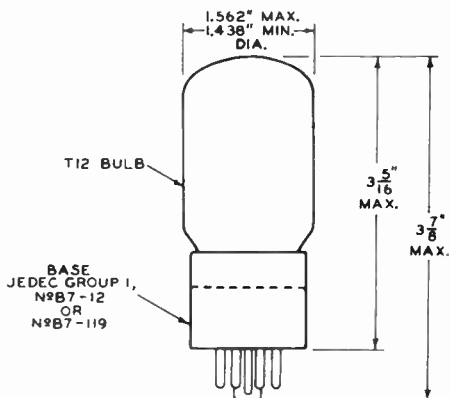
## Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation. . . . .	1 max.	megohm
For cathode-bias operation. . . . .	0.5 max.	megohm

## Typical Operation and Characteristics:

Plate Voltage . . . . .	135	200	volts
Grid-No.2 Voltage . . . . .	135	135	volts
Grid-No.1 Voltage . . . . .	-13.5	-14	volts
Peak AF Grid-No.1 Voltage . . . . .	13.5	14	volts
Zero-Signal Plate Current . . . . .	58	61	ma
Max.-Signal Plate Current . . . . .	60	66	ma
Zero-Signal Grid-No.2 Current . . . . .	3.5	2.2	ma
Max.-Signal Grid-No.2 Current . . . . .	11.5	9	ma
Plate Resistance (Approx.) . . . . .	9300	18300	ohms
Transconductance. . . . .	7000	7100	$\mu$ hos
Load Resistance . . . . .	2000	2600	ohms
Total Harmonic Distortion . . . . .	10	10	%
Max.-Signal Power Output. . . . .	3.6	6	watts



92CS-10248




7A4



7A4

# DETECTOR AMPLIFIER TRIODE

Heater	Coated Unipotential Cathode	
Voltage	6.3 <sup>□</sup>	a-c or d-c volts
Current	0.3 <sup>○○</sup>	amp.
Direct Interelectrode Capacitances: <sup>○</sup>		
Grid to Plate		4.0 μf
Grid to Cathode		3.4 μf
Plate to Cathode		3.0 μf
Maximum Overall Length		2-25/32"
Maximum Seated Height		2-1/4"
Maximum Diameter		1-3/16"
Bulb		T-9
Base		Lock-in 8-Pin
Pin 1 - Heater		Pin 6 - Grid
Pin 2 - Plate		Pin 7 - Cathode
Pin 3 - No Connection		Pin 8 - Heater
Pin 4 - No Connection		Plug - Base Shell
Pin 5 { Internal Con. Do Not Use		

Mounting Position BOTTOM VIEW (5AC<sub>2</sub>) Any

Maximum Ratings, Typical Operating Conditions, and Curves for Type 7A4 are the same as for Type 6J5.

- In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
- Nominal voltage = 7.0 volts.
- Nominal current = 0.32 ampere.
- with close-fitting shield connected to cathode. Values are approximate.



## BEAM POWER AMPLIFIER

Heater <sup>■</sup>	Coated Unipotential Cathode	
Voltage	6.3 <sup>□</sup>	a-c or d-c volts
Current	0.75 <sup>□□</sup>	amp.
Maximum Overall Length		3-5/32"
Maximum Seated Height		2-5/8"
Maximum Diameter		1-3/16"
Bulb		T-9
Base		Lock-in 8-Pin
Pin 1 - Heater		Pin 6 - Grid
Pin 2 - Plate		Pin 7 - Cathode
Pin 3 - Screen		Pin 8 - Heater
Pin 4 - No Connection		Plug - Base Shell
Pin 5 - No Connection		
Mounting Position		Any



BOTTOM VIEW (6AA)

### AMPLIFIER

Plate Voltage	125 max. volts
Screen Voltage	125 max. volts
Plate Dissipation	5.5 max. watts
Screen Dissipation	1.2 max. watts

#### Typical Operation and Characteristics—Class A<sub>1</sub> Amplifier:

Heater <sup>■</sup>	6.3 <sup>□</sup>	6.3 <sup>□</sup>	volts
Plate	110	125	volts
Screen	110	125	volts
Grid <sup>▲</sup>	-7.5	-9	volts
Peak A-F Grid Voltage	7.5	9	volts
Zero-Sig. Plate Cur.	40	44	ma.
Max.-Sig. Plate Cur.	41	45	ma.
Zero-Sig. Screen Cur. (Approx.)	3	3.3	ma.
Max.-Sig. Screen Cur. (Approx.)	7	9.5	ma.
Plate Res. (Approx.)	14000	17000	ohms
Transcond.	5800	6000	μmhos
Load Res.	2500	2700	ohms
Total Harmonic Dist.	10	10	%
Max.-Sig. Power Output	1.5	2.2	watts

<sup>■</sup> In circuits where the cathode is not connected directly to the heater, the potential difference between heater and cathode should be kept as low as possible.

<sup>□</sup> Nominal voltage = 7 volts.

<sup>□□</sup> Nominal current = 0.80 ampere.

<sup>▲</sup> The type of input coupling should not introduce too much resistance in the grid circuit. Transformer- or impedance-input coupling devices are recommended. When the grid circuit has a resistance not higher than 0.1 megohm, fixed bias may be used; for higher values, cathode bias is required. With cathode bias, the grid circuit may have a resistance not to exceed 0.5 megohm.



7A6

# 7A6 TWIN DIODE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . . 6.3<sup>□</sup> . . . . . ac or dc volts

Current . . . . . 0.15<sup>□□</sup> . . . . . amp

Direct Interelectrode Capacitances (Approx.):<sup>○</sup>

Plate to Cathode

(Diode No.1) . . . . . 2.0 . . . . .  $\mu$ f

Plate to Cathode

(Diode No.2) . . . . . 2.6 . . . . .  $\mu$ f

Plate of Diode No.1 to

Plate of Diode No.2 . . . . . 0.1 max. . . . .  $\mu$ f

<sup>○</sup> with external shield connected to cathodes.

### Mechanical:

Mounting Position . . . . . Any

Maximum Overall Length . . . . . 2-25/32"

Maximum Seated Length . . . . . 2-1/4"

Maximum Diameter . . . . . 1-3/16"

Bulb . . . . . T-9

Base . . . . . Lock-in 8-Pin

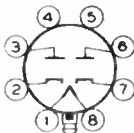
Basing Designation for BOTTOM VIEW . . . . . 7A6

Pin 1 - Heater

Pin 2 - Cathode of  
Diode No.2

Pin 3 - Plate of  
Diode No.2

Pin 4 - No  
Connection



Pin 5 - Internal  
Shield

Pin 6 - Plate of  
Diode No.1

Pin 7 - Cathode of  
Diode No.1

Pin 8 - Heater  
Plug - Base Shell

### Maximum Ratings, Design-Center Values (Each Diode):

RMS PLATE VOLTAGE . . . . . 150 max. volts

PEAK PLATE CURRENT . . . . . 45 max. ma.

DC OUTPUT CURRENT . . . . . 8 max. ma.

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. 330 max. volts

Heater positive with respect to cathode. 330 max. volts

<sup>□</sup> Nominal voltage = 7.0 volts.

<sup>□□</sup> Nominal current = 0.160 ampere.

7A7



7A7

## REMOTE-CUTOFF PENTODE

## GENERAL DATA

## Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 6.3<sup>□</sup> . . . . . ac or dc voltsCurrent . . . . . 0.3<sup>□□</sup> . . . . . ampDirect Interelectrode Capacitances:<sup>○</sup>Grid No.1 to Plate . . . . . 0.005 max. . . . .  $\mu$ fInput . . . . . 5.5 . . . . .  $\mu$ fOutput . . . . . 7.0 . . . . .  $\mu$ f<sup>○</sup> With no external shield.

## Mechanical:

Mounting Position . . . . . Any

Maximum Overall Length . . . . . 2-25/32"

Maximum Seated Length . . . . . 2-1/4"

Maximum Diameter . . . . . 1-3/16"

Bulb . . . . . T-9

Base . . . . . Lock-in 8-Pin

Easing Designation for BOTTOM VIEW . . . . . 8V

Pin 1 - Heater

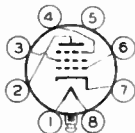
Pin 2 - Plate

Pin 3 - Grid No.2

Pin 4 - Grid No.3

Pin 5 - Internal

Shield



Pin 6 - Grid No.1

Pin 7 - Cathode

Pin 8 - Heater

Plug - Base

Shell

Maximum Ratings, Characteristics, and Typical Operating Conditions are the same as those for Type 6SK7

<sup>○</sup> nominal voltage = 7.0 volts.<sup>□□</sup> nominal current = 0.32 ampere.





7A8

7A8



## OCTODE CONVERTER

Heater	Coated Unipotential Cathode	a-c or d-c volts
Voltage	5.3 $\square$	
Current	0.15 $\square$	amp.
Direct Interelectrode Capacitances: <sup>o</sup>		
Grid No. 4 to Plate	0.15	max. uuf
Grid No. 4 to Grid No. 2	0.15	uuf
Grid No. 4 to Grid No. 1	0.15	uuf
Grid No. 1 to Grid No. 2	0.60	uuf
Grid No. 4 to All Other Electrodes = R-F Input	7.5	uuf
Grid No. 2 to All Other Electrodes Except Grid No. 1 (Osc. Output)	3.4	uuf
Grid No. 1 to All Other Electrodes Except Grid No. 2 (Osc. Input)	3.8	uuf
Plate to All Other Electrodes	0	uuf
Maximum Overall Length	2-25/32"	
Maximum Seated Height	2-1/4"	
Maximum Diameter	1-3/16"	
Bulb	T-9	
Base	Lock-in 8-Pin	
Pin 1 - Heater	Pin 6 - Grid #4	
Pin 2 - Plate	Pin 7 - Cathode	
Pin 3 - Grid #2	Pin 8 - Heater	
Pin 4 - Grid #1	Plug - Base Shell	
Pin 5 - Grids #3 & #5		



Mounting Position BOTTOM VIEW (8U) Any

### CONVERTER SERVICE

Plate Voltage	300 max.	volts
Screen (Grids #3 & #5) Voltage	100 max.	volts
Screen Supply Voltage	300 max.	volts
Anode-Grid (Grid #2) Voltage	200 max.	volts
Anode-Grid Supply Voltage	300 max.	volts
Control-Grid (Grid #4) Voltage	0 min.	volts
Plate Dissipation	1.0 max.	watt
Screen Dissipation	0.3 max.	watt
Anode-Grid Dissipation	0.75 max.	watt
Total Cathode Current	13 max.	ma.
<b>Typical Operation and Characteristics:</b>		
Plate Voltage	250	volts
Screen Voltage	75	volts
Anode-Grid Voltage	100	volts
Anode-Grid Supply Voltage $\Delta$	-	250 volts
Control-Grid Voltage	-3	-3 volts
Oscillator-Grid (Grid #1) Res.	50000	50000 ohms
Plate Resistance	0.65	0.7 approx. megohm
Conversion Transconductance	375	550 $\mu$ mhos
Conversion Transconductance for Grid Bias of -30 volts	-	2 approx. $\mu$ mhos
Plate Current	1.8	3.0 ma.
Screen Current	2.7	3.2 ma.
Anode-Grid Current	2.8	4.2 ma.
Oscillator-Grid Current	0.2	0.4 ma.
Total Cathode Current	8.5	10.8 ma.

NOTE: The transconductance between Grid #1 and Grid #2 (not oscillating) is approximately 1600  $\mu$ mhos under the following conditions: plate volts, 250; screen volts, 100; anode-grid volts, 180; oscillator-grid volts, 0; and control-grid connected to cathode.

- $\blacksquare$  In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
  - $\square$  With close-fitting shield connected to cathode.
  - $\square$  Nominal voltage = 7.0 volts.
  - $\square$  Nominal current = 0.16 ampere.
  - $\Delta$  Applied through a properly by-passed 20000-ohm voltage-dropping resistor.
- $\leftarrow$  Indicates a change.





7AD7

7AD7

# POWER PENTODE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3 <sup>□</sup>	ac or dc volts
Current . . . . .	0.6 <sup>□□</sup>	amp

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

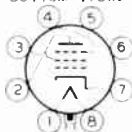
Grid No.1 to Plate. . . . .	0.030 max.	μf
Input . . . . .	11.5	μf
Output. . . . .	7.5	μf

<sup>○</sup> with external shield connected to cathode.

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length. . . . .	3-5/32"
Maximum Seated Length . . . . .	2-5/8"
Maximum Diameter. . . . .	1-3/16"
Bulb. . . . .	T-9
Base. . . . .	Lock-In 8-Pin
Basing Designation for BOTTOM VIEW. . . . .	8V

Pin 1 - Heater  
 Pin 2 - Plate  
 Pin 3 - Grid No.2  
 Pin 4 - Grid No.3  
 Pin 5 - Internal Shield



Pin 6 - Grid No.1  
 Pin 7 - Cathode  
 Pin 8 - Heater  
 Plug - Base Shell

### AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE. . . . .	150 max.	volts
GRID-No.2 SUPPLY VOLTAGE. . . . .	300 max.	volts
PLATE DISSIPATION . . . . .	10 max.	watts
GRID-No.2 DISSIPATION . . . . .	1.2 max.	watts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
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

### Typical Operation and Characteristics:

Plate Voltage . . . . .	300	volts
Grid No.3 (Suppressor). . . . .	Connected to cathode at socket	
Grid-No.2 Voltage . . . . .	150	volts
Cathode-Bias Resistor . . . . .	68	ohms
Plate Resistance (Approx.). . . . .	0.3	megohm
Transconductance. . . . .	9500	μmhos
Plate Current . . . . .	28	ma
Grid-No.2 Current . . . . .	7	ma

<sup>□</sup> Nominal voltage = 7.0 volts.

<sup>□□</sup> Nominal current = 0.16 ampere.

MAY 20, 1949

TUBE DEPARTMENT

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY





7AF7  
7AG7

# 7AF7

## MEDIUM-MU TWIN TRIODE

Heater, for Unipotential Cathode:

Voltage. . . . . 6.3<sup>□</sup> . . . . . ac or dc volts  
Current. . . . . 0.3<sup>□□</sup> . . . . . amp

*The 7AF7 is the same as the 14AF7 except for heater rating.*

□ Nominal voltage = 7.0 volts.      □□ Nominal current = 0.32 ampere.

# 7AG7

## SHARP-CUTOFF PENTODE

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage. . . . . 6.3<sup>□</sup> . . . . . ac or dc volts  
Current. . . . . 0.15<sup>□□</sup> . . . . . amp

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

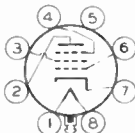
Grid No.1 to Plate . . . 0.005 max. . . . . μmf  
Input . . . . . 7 . . . . . μmf  
Output . . . . . 6 . . . . . μmf

○ with external shield connected to cathode.

#### Mechanical:

Mounting Position. . . . . Any  
Maximum Overall Length . . . . . 2-25/32"  
Maximum Seated Length. . . . . 2-1/4"  
Maximum Diameter . . . . . 1-3/16"  
Bulb . . . . . T-9  
Base . . . . . Lock-in 8-Pin  
Basing Designation for BOTTOM VIEW . . . . . 8V

Pin 1 - Heater  
Pin 2 - Plate  
Pin 3 - Grid No.2  
Pin 4 - Grid No.3  
Pin 5 - Internal  
Shield



Pin 6 - Grid No.1  
Pin 7 - Cathode  
Pin 8 - Heater  
  
Plug - Base  
Shell

### AMPLIFIER - Class A<sub>1</sub>

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

PLATE VOLTAGE. . . . . 300 max. volts  
GRID-No.2 (SCREEN) VOLTAGE . . . . . 300 max. volts  
PLATE DISSIPATION. . . . . 2 max. watts  
GRID-No.2 DISSIPATION. . . . . 0.75 max. watt  
GRID-No.1 (CONTROL-GRID) VOLTAGE:  
Negative bias value. . . . . 1 min. volt  
PEAK HEATER-CATHODE VOLTAGE:  
Heater negative with respect to cathode. 90 max. volts  
Heater positive with respect to cathode. 90 max. volts

□ Nominal voltage = 7.0 volts.      □□ Nominal current = 0.16 ampere.

7AG7



7AG7

## SHARP-CUTOFF PENTODE

## Typical Operation and Characteristics:

Plate Voltage. . . . .	250	. .	volts
Grid No.3 (Suppressor) . . . . .	Connected to cathode at socket		
Internal Shield. . . . .	Connected to cathode at socket		
Grid-No.2 Voltage. . . . .	250	. .	volts
Cathode-Bias Resistor* . . . . .	250	. .	ohms
Plate Resistance (Approx.) . . . . .	0.75	. .	megohm
Transconductance . . . . .	4200	. .	$\mu$ mhos
Grid-No.1 Bias (Approx.) for plate current of 10 $\mu$ a . . . . .	-10	. .	volts
Plate Current. . . . .	6	. .	ma
Grid-No.2 Current. . . . .	2	. .	ma

\* Fixed-bias operation is not recommended.



7AH7

7AH7

# REMOTE-CUTOFF PENTODE

## GENERAL DATA

### Electrical:

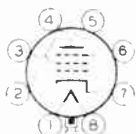
Heater, for Unipotential Cathode:		
Voltage . . . . .	6.3 <sup>□</sup>	ac or dc volts
Current . . . . .	0.15 <sup>□□</sup>	amp
Direct Interelectrode Capacitances: <sup>○</sup>		
Grid No.1 to Plate . . . . .	0.005 max.	μμf
Input . . . . .	/	μμf
Output . . . . .	6.5	μμf

<sup>□</sup> with external shield connected to cathode.

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-25/32"
Maximum Seated Length . . . . .	2-1/4"
Maximum Diameter . . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Lock-in 8-Pin
Base Designation for BOTTOM VIEW . . . . .	8V

- Pin 1 - Heater
- Pin 2 - Plate
- Pin 3 - Grid No.2
- Pin 4 - Grid No.3
- Pin 5 - Internal Shield



- Pin 6 - Grid No.1
- Pin 7 - Cathode
- Pin 8 - Heater
- Plug - Base Shell

## AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	300 max.	volts
PLATE DISSIPATION . . . . .	2 max.	watts
GRID-No.2 DISSIPATION . . . . .	0.7 max.	watt
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative bias value . . . . .	-1 min.	volt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	90 max.	volts
Heater positive with respect to cathode . . . . .	90 max.	volts

### Typical Operation and Characteristics:

Plate Voltage . . . . .	250	volts
Grid No.3 (Suppressor) . . . . .	Connected to cathode at socket	
Internal Shield . . . . .	Connected to cathode at socket	
Grid-No.2 Voltage . . . . .	250	volts
Cathode-Bias Resistor * . . . . .	250	ohms
Plate Resistance (Approx.) . . . . .	1	megohm
Transconductance . . . . .	3300	μmhos
Grid-No.1 Bias (Approx.) for transconductance of 35 μmhos . . . . .	-20	volts

\* Fixed bias not recommended.

□ Nominal voltage = 7.0 volts.

□□ Nominal current = 0.16 ampere.

7AH7



7AH7

# REMOTE-CUTOFF PENTODE

Plate Current. . . . .	6.8	ma
Grid-No.2 Current. . . . .	1.9	ma

FEB. 1, 1949

**TUBE DEPARTMENT**  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA





7AU7

7AU7

# MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

*The 7AU7 is the same as the 12AU7 except for the following items:*

Heater, for Unipotential Cathodes:

Heater arrangement	Series	Parallel	
Voltage. . . . .	7.0	3.5	ac or dc volts
Current. . . . .	0.3	0.6	. . . . .amp
Warm-up time (Average) .	-	11	. . . . .sec

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*





7B4

# HIGH-MU TRIODE

7B4

## GENERAL DATA

### Electrical:

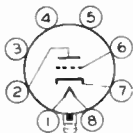
Heater, for Unipotential Cathode:

Voltage. . . . .	6.3 <sup>□</sup>	ac or dc volts
Current. . . . .	0.3 <sup>□□</sup>	amp

### Mechanical:

Mounting Position. . . . .	Any
Maximum Overall Length . . . . .	2-25/32"
Maximum Seated Length. . . . .	2-1/4"
Maximum Diameter . . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW . . . . .	5AC

Pin 1 - Heater  
 Pin 2 - Plate  
 Pin 3 - No  
 Connection  
 Pin 4 - No  
 Connection



Pin 5 - No  
 Connection  
 Pin 6 - Grid  
 Pin 7 - Cathode  
 Pin 8 - Heater  
 Plug - Base Shell

*Maximum Ratings, Characteristics, and Typical Operating Conditions are the same as those for type 6SF5*

- Nominal voltage = 7.0 volts.
- Nominal current = 0.32 ampere.

7B5



7B5

## POWER PENTODE

GENERAL DATA**Electrical:**

Heater, for Unipotential Cathode:

Voltage. . . . . 6.3<sup>□</sup> . . . . . ac or dc volts  
 Current. . . . . 0.4<sup>□□</sup> . . . . . amp

**Mechanical:**

Mounting Position. . . . . Any  
 Maximum Overall Length . . . . . 3-5/32"  
 Maximum Seated Length. . . . . 2-5/8"  
 Maximum Diameter . . . . . 1-3/16"  
 Bulb . . . . . T-9  
 Base . . . . . Lock-in 8-Pin  
 Basing Designation for BOTTOM VIEW . . . . . 6AE

Pin 1 - Heater

Pin 2 - Plate

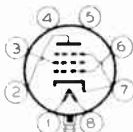
Pin 3 - Grid No.2

Pin 4 - No

Connection

Pin 5 - No

Connection



Pin 6 - Grid No.1

Pin 7 - Cathode,  
Grid No.3

Pin 8 - Heater

Plug - Base  
Shell

*Maximum Ratings, Characteristics, and Typical Operating  
 Conditions are the same as those for Type 6X6-GT*

□ Nominal voltage = 7.0 volts.

□□ Nominal current = 0.43 ampere.



7B6

7B6

## TWIN DIODE—HIGH-MU TRIODE

GENERAL DATA**Electrical:**

Heater, for Unipotential Cathode:

Voltage. . . . . 6.3<sup>0</sup> . . . . . ac or dc voltsCurrent. . . . . 0.3<sup>00</sup> . . . . . ampDirect Interelectrode Capacitances — Triode Unit:<sup>0</sup>Grid to Plate. . . . . 1.6 . . . . .  $\mu\mu\text{f}$ Grid to Cathode. . . . . 3.0 . . . . .  $\mu\mu\text{f}$ Plate to Cathode . . . . . 2.4 . . . . .  $\mu\mu\text{f}$ <sup>0</sup> with external shield connected to cathode**Mechanical:**

Mounting Position . . . . . Any

Maximum Overall Length . . . . . 2-25/32"

Maximum Seated Length. . . . . 2-1/4"

Maximum Diameter . . . . . 1-3/16"

Bulb . . . . . T-9

Base . . . . . Lock-in 8-Pin

Basing Designation for BOTTOM VIEW . . . . . 8W.

Pin 1 - Heater

Pin 2 - Triode Plate

Pin 3 - Triode Grid

Pin 4 - Internal

Connection

Pin 5 - Diode Plate

No.2



Pin 6 - Diode

Plate No.1

Pin 7 - Cathode,

Internal

Shield

Pin 8 - Heater

Plug - Base Shell

## TRIODE UNIT

AMPLIFIER - Class A<sub>1</sub>**Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE. . . . . 300 max. volts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. 90 max. volts

Heater positive with respect to cathode. 90 max. volts

**Typical Operation and Characteristics:**

Plate Voltage. . . . . 100 250 . . volts

Grid Voltage . . . . . -1 -2 . . volts

Amplification Factor . . . . . 100 100

Plate Resistance . . . . . 110000 91000 . . ohms

Transconductance . . . . . 900 1100 . .  $\mu\text{mhos}$ 

Plate Current. . . . . 0.4 0.9 . . ma.

DIODE UNITS - Two

Consideration of these units, including typical circuits and diode curves, is given at the front of this Section.

<sup>0</sup> Nominal voltage = 7.0 volts.<sup>00</sup> Nominal current = 0.32 ampere.

7B7



7B7

## REMOTE-CUTOFF PENTODE

## GENERAL DATA

## Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 6.3<sup>o</sup> . . . . . ac or dc voltsCurrent . . . . . 0.15<sup>o</sup> . . . . . ampDirect Interelectrode Capacitances:<sup>o</sup>Grid No.1 to Plate . . . . . 0.007 max. . . . .  $\mu\mu\text{f}$ Input . . . . . 5.0 . . . . .  $\mu\mu\text{f}$ Output . . . . . 6.0 . . . . .  $\mu\mu\text{f}$ <sup>o</sup> with external shield connected to cathode.

## Mechanical:

Mounting Position . . . . . Any

Maximum Overall Length . . . . . 2-25/32"

Maximum Seated Length . . . . . 2-1/4"

Maximum Diameter . . . . . 1-3/16"

Bulb . . . . . T-9

Base . . . . . Lock-in 8-Pin

Basing Designation for BOTTOM VIEW . . . . . 8V

Pin 1 - Heater

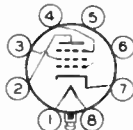
Pin 2 - Plate

Pin 3 - Grid No.2

Pin 4 - Grid No.3

Pin 5 - Internal

Shield



Pin 6 - Grid No.1

Pin 7 - Cathode

Pin 8 - Heater

Plug - Base  
ShellAMPLIFIER - Class A<sub>1</sub>

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . . 300 max. volts

GRID-No.2 (SCREEN) VOLTAGE . . . . . 100 max. volts

PLATE DISSIPATION . . . . . 2.25 max. watts

GRID-No.2 DISSIPATION . . . . . 0.25 max. watt

GRID-No.1 (CONTROL-GRID) VOLTAGE:

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

## Typical Operation and Characteristics:

Plate Voltage . . . . . 100 250 . . volts

Grid No.3 (Suppressor) . . . . . Connected to cathode at socket

Grid-No.2 Voltage . . . . . 100 100 . . volts

Grid-No.1 Voltage . . . . . -3 -3 . . volts

Plate Resistance (Approx.) . . . . . 0.3 0.75 . . megohm

Transconductance . . . . . 1675 1750 . .  $\mu\text{mhos}$ 

Grid-No.1 Bias (Approx.) for

transconductance of 10  $\mu\text{mhos}$  . . . . . -40 -40 . . volts

Plate Current . . . . . 8.2 8.5 . . ma.

Grid-No.2 Current . . . . . 1.8 1.7 . . ma.

<sup>o</sup> Nominal voltage = 7.0 volts.<sup>o</sup> Nominal current = 0.160 ampere.

JUNE 20, 1947

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA



7B8

7B8

# PENTAGRID CONVERTER

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage. . . . . 6.3<sup>□</sup> . . . . . ac or dc volts

Current. . . . . 0.3<sup>□□</sup> . . . . . amp

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

Grid No.4 to All Other Electrodes (RF Input) 10.0 . . μmf

Plate to All Other Electrodes (Mixer Output) 9.0 . . μmf

Grid No.1 to All Other Electrodes except  
Grid No.2 (Osc. Input) . . . . . 5.0 . . μmf

Grid No.2 to All Other Electrodes except  
Grid No.1 (Osc. Output) . . . . . 3.4 . . μmf

Grid No.4 to Plate . . . . . 0.2 max. μmf

Grid No.4 to Grid No.2 . . . . . 0.2 max. μmf

Grid No.4 to Grid No.1 . . . . . 0.2 max. μmf

Grid No.1 to Grid No.2 . . . . . 0.9 . . μmf

<sup>○</sup> With external shield connected to cathode.

### Mechanical:

Mounting Position. . . . . Any

Maximum Overall Length . . . . . 2-25/32"

Maximum Seated Length. . . . . 2-1/4"

Maximum Diameter . . . . . 1-3/16"

Bulb . . . . . T-9

Base . . . . . Lock-in 8-Pin

Basing Designation for BOTTOM VIEW . . . . . 8X

Pin 1 - Heater

Pin 2 - Plate

Pin 3 - Grid No.2

Pin 4 - Grid No.1

Pin 5 - Grid No.3,

Grid No.5



Pin 6 - Grid No.4

Pin 7 - Cathode

Pin 8 - Heater

Plug - Base

Shell

*Maximum Ratings and Typical Operating Conditions for the 7B8 are the same as those for Type 6A8*

<sup>□</sup> Nominal voltage = 7.0 volts.

<sup>□□</sup> Nominal current = 0.320 ampere.

7C5



7C5

## BEAM POWER AMPLIFIER

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage. . . . . 6.3<sup>□</sup> . . . . . ac or dc volts

Current. . . . . 0.45<sup>□□</sup> . . . . . amp

Direct Interelectrode Capacitances (Approx.):<sup>○</sup>

Grid No.1 to Plate . . . . . 0.4 . . . . .  $\mu\text{f}$

Input. . . . . 9.5 . . . . .  $\mu\text{f}$

Output. . . . . 9.0 . . . . .  $\mu\text{f}$

<sup>○</sup> With no external shield.

#### Mechanical:

Mounting Position. . . . . Any

Maximum Overall Length . . . . . 3-5/32"

Maximum Seated Length. . . . . 2-5/8"

Maximum Diameter . . . . . 1-3/16"

Bulb . . . . . T-9

Base . . . . . Lock-in 8-Pin

Basing Designation for BOTTOM VIEW . . . . . 6AA

Pin 1 - Heater

Pin 2 - Plate

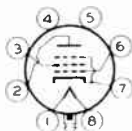
Pin 3 - Grid No.2

Pin 4 - No

Connection

Pin 5 - No

Connection



Pin 6 - Grid No.1

Pin 7 - Cathode,  
Grid No.3

Pin 8 - Heater

Plug - Base  
Shell

*Maximum Ratings and Typical Operating Conditions for the 7C5 are the same as those for Type 6V6*

<sup>□</sup> Nominal voltage = 7.0 volts.

<sup>□□</sup> Nominal current = 0.48 ampere.





7C6

7C6

**DUPLEX-DIODE HIGH-MU TRIODE**

Heater*	Coated Unipotential Cathode	
Voltage	6.3 <sup>□</sup>	a-c or d-c volts
Current	0.15 <sup>□□</sup>	amp.
Direct Interelectrode Capacitances - Triode Unit: <sup>○</sup>		
Grid to Plate	1.4	μf
Grid to Cathode	2.4	μf
Plate to Cathode	3.0	μf
Maximum Overall Length		2-25/32"
Maximum Seated Height		2-1/4"
Maximum Diameter		1-3/16"
Bulb		T-9
Base		Lock-in 8-Pin
Pin 1 - Heater		Pin 6 - Diode Plate #1
Pin 2 - Triode Plate		Pin 7 - Cathode
Pin 3 - Triode Grid		Pin 8 - Heater
Pin 4 - Cathode		Plug - Base Shell
Pin 5 - Diode Plate #2		
Mounting Position	BOTTOM VIEW (8W)	Any

TRIODE UNIT

Plate Voltage	250 max.	volts
<i>Characteristics - Class A<sub>1</sub> Amplifier:</i>		
Heater	6.3	volts
Plate	250	volts
Grid	-1	volt
Amp. Fact.	100	
Plate Res.	0.1	megohm
Transcond.	1000	μmhos
Plate Cur.	1.3	ma.
<i>Typical Operation—Resistance-Coupled Amplifier:</i>		
Plate Supply	250	volts
Load Resistance	0.25	megohm
Grid Resistor	10	megohms

DIODE UNITS - Two

Consideration of these units is given under Type 85. Circuits will be similar to those shown for the 55 with fixed bias. Diode biasing of the triode unit of the 7C6 is not suitable. Diode curves under Type 6B7 apply to the 7C6.

□ Nominal voltage = 7.0 volts.

□□ Nominal current = 0.16 ampere.

\* In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

○ Values are approximate.

← Indicates a change.

April 15, 1940

RCA RADIODRON DIVISION  
RCA MANUFACTURING COMPANY INC

TENTATIVE DATA

7C7



7C7

## TRIPLE-GRID DETECTOR AMPLIFIER

Heater <sup>■</sup>	Coated Unipotential Cathode	
Voltage	6.3 <sup>□</sup>	a-c or d-c volts
Current	0.15 <sup>□□</sup>	amp.
Direct Interelectrode Capacitances: <sup>○</sup>		
Grid to Plate	0.007 max.	μf
Input	5.5	μf
Output	6.5	μf
Maximum Overall Length		2-25/32"
Maximum Seated Height		2-1/4"
Maximum Diameter		1-3/16"
Bulb		T-9
Base		Lock-in 8-Pin
Pin 1 - Heater		Pin 6 - Grid
Pin 2 - Plate		Pin 7 - Cathode
Pin 3 - Screen		Pin 8 - Heater
Pin 4 - Suppressor		Plug - Base Shell
Pin 5 - Internal Shield		
Mounting Position	BOTTOM VIEW (8V)	Any

### AMPLIFIER

Plate Voltage	300 max. volts
Screen Voltage	100 max. volts
Screen Supply Voltage	300 max. volts
Grid Voltage	0 min. volts
Plate Dissipation	1.0 max. watt
Screen Dissipation	0.1 max. watt

#### Typical Operation and Characteristics - Class A<sub>1</sub> Amplifier:

Plate	100	250	volts
Screen	100	100	volts
Grid	-3	-3	volts
Suppressor	Connected to cathode at socket		
Internal Shield	Connected to cathode at socket		
Plate Res. (approx.)	1.2	2	megohms
Transconductance	1225	1300	μmhos
Plate Cur.	1.8	2	ma.
Screen Cur.	0.4	0.5	ma.

■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

□ Nominal voltage = 7 volts.

□□ Nominal current = 0.16 ampere.

○ with close-fitting shell connected to cathode.

May 15, 1940

RCA RADOTRON DIVISION  
RCA MANUFACTURING COMPANY INC

TENTATIVE DATA



7E7

7E7

# TWIN DIODE-REMOTE-CUTOFF PENTODE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3 <sup>□</sup>	ac or dc volts
Current . . . . .	0.3 <sup>□□</sup>	amp

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

Pentode Unit:

Grid No.1 to Plate . . . . .	0.005 max.	μf
Input . . . . .	4.6	μf
Output . . . . .	5.5	μf
Diode-No.1 Plate to Grid No.1 . . . . .	0.013 max.	μf
Diode-No.2 Plate to Grid No.1 . . . . .	0.003 max.	μf

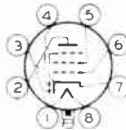
<sup>○</sup> with external shield connected to cathode.

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-25/32"
Maximum Seated Length . . . . .	2-1/4"
Maximum Diameter . . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Lock-In 8 Pin

Basing Designation for BOTTOM VIEW . . . . . 8A E

Pin 1 - Heater	Pin 6 - Pentode Grid No.1
Pin 2 - Pentode Plate	Pin 7 - Cathode, Pentode Grid No.3
Pin 3 - Diode-No.2 Plate	Pin 8 - Heater
Pin 4 - Diode-No.1 Plate	Plug - Base Shell
Pin 5 - Pentode Grid No.2	



## PENTODE UNIT AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	100 max.	volts
GRID-No.2 SUPPLY VOLTAGE . . . . .	300 max.	volts
PLATE DISSIPATION . . . . .	2 max.	watts
GRID-No.2 DISSIPATION . . . . .	0.3 max.	watt
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
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

(continued on next page)

<sup>□</sup> nominal voltage = 7.0 volts.

<sup>□□</sup> nominal current = 0.32 ampere.

← indicates a change.

7E7



7E7

## TWIN DIODE—REMOTE-CUTOFF PENTODE

### Typical Operation and Characteristics:

Plate Voltage. . . . .	100	250	. .	volts
Grid-No.2 Voltage. . . . .	100	100	. .	volts
Cathode-Bias Resistor. . . . .	80	330	. .	ohms
Plate Resistance (Approx.) . . . . .	0.15	0.7	. .	megohm
Transconductance . . . . .	160i	1300	. .	$\mu$ mhos
Grid-No.1 Bias (Approx.) for transconductance of 2 $\mu$ mhos . . . . .	-36	-42.5	. .	volts
Plate Current. . . . .	10	7.5	. .	ma
Grid-No.2 Current. . . . .	2.7	1.6	. .	ma

### DIODE UNITS = Two

### Maximum Ratings, Design-Center Values:

PLATE CURRENT (For Each Diode) . . . . .	1 max.	ma
--	--------	----

SEPT. 30, 1948

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA



7F7

# HIGH-MU TWIN TRIODE

7F7

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage. . . . .	6.3 <sup>□</sup>	ac or dc volts
Current. . . . .	0.3 <sup>□□</sup>	amp

Direct Interelectrode Capacitances:\*

Each Unit:

Grid to Plate. . . . .	1.6	μuf
Grid to Cathode. . . . .	2.4	μuf
Plate to Cathode . . . . .	2.0	μuf
Grid to Grid . . . . .	0.2 max.	μuf
Plate to Plate . . . . .	1.0 max.	μuf

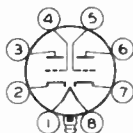
\* with external shield connected to cathode.

### Mechanical:

Mounting Position. . . . .	Any
Maximum Overall Length . . . . .	2-25/32"
Maximum Seated Length. . . . .	2-1/4"
Maximum Diameter . . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Lock-in 8-Pin

Basing Designation for BOTTOM VIEW . . . . . 8AC

- |                              |                              |
|------------------------------|------------------------------|
| Pin 1 - Heater               | Pin 6 - Plate of Unit No.1   |
| Pin 2 - Cathode of Unit No.2 | Pin 7 - Cathode of Unit No.1 |
| Pin 3 - Plate of Unit No.2   | Pin 8 - Heater               |
| Pin 4 - Grid of Unit No.2    | Plug - Base Shell            |
| Pin 5 - Grid of Unit No.1    |                              |



### AMPLIFIER - Class A<sub>1</sub>

Values are for each unit

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	300 max.	volts
PLATE DISSIPATION. . . . .	1.0 max.	watt
GRID VOLTAGE:		
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:

Plate Voltage. . . . .	100	250	volts
Grid Voltage . . . . .	-1	-2	volts
Amplification Factor . . . . .	70	70	
Plate Resistance (Approx.) . . . . .	62000	44000	ohms
Transconductance . . . . .	1125	1600	μmhos
Plate Current. . . . .	0.65	2.3	ma

□ Nominal voltage = 7.0 volts.

□□ Nominal current = 0.32 ampere.

← Indicates a change.





7F8

7F8

## MEDIUM-MU TWIN TRIODE

GENERAL DATA**Electrical:**

Heater, for Unipotential Cathodes:

Voltage. . . . . 6.3<sup>□</sup> . . . . . ac or dc volts  
 Current. . . . . 0.3<sup>□□</sup> . . . . . amp

Direct Interelectrode Capacitances:

Each Unit:

Grid to Plate. . . . . 1.2\* . . . . .  $\mu\mu\text{f}$   
 Grid to Cathode. . . . . 2.8\* . . . . .  $\mu\mu\text{f}$   
 Plate to Cathode . . . . . 1.4\* . . . . .  $\mu\mu\text{f}$   
 Heater to Cathode. . . . . 2.8\*\* . . . . .  $\mu\mu\text{f}$   
 Grid to Grid . . . . . 0.1 max. . . . .  $\mu\mu\text{f}$   
 Plate to Plate . . . . . 0.5 max. . . . .  $\mu\mu\text{f}$

\* with external shield connected to cathode.

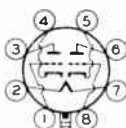
\*\* with external shield connected to ground.

**Mechanical:**

Mounting Position. . . . . Any  
 Maximum Overall Length . . . . . 2-9/32"  
 Maximum Seated Length. . . . . 1-3/4"  
 Maximum Diameter . . . . . 1-3/16"  
 Bulb . . . . . T-9  
 Base . . . . . Lock-in 8-Pin  
 Basing Designation for BOTTOM VIEW . . . . . 8BW

Pin 1 - Grid of  
Unit No. 2

Pin 2 - Heater

Pin 3 - Plate of  
Unit No. 2Pin 4 - Cathode of  
Unit No. 2Pin 5 - Cathode of  
Unit No. 1Pin 6 - Plate of  
Unit No. 1

Pin 7 - Heater

Pin 8 - Grid of  
Unit No. 1Plug - Base  
ShellAMPLIFIER - Class A<sub>1</sub>

Values are for each unit

**Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE. . . . . 300 max. volts  
 PLATE DISSIPATION (Total for both units) . . . . . 3.5 max. watts  
 GRID VOLTAGE:  
 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:**

Plate Voltage. . . . . 250 . . . volts  
 Cathode-Bias Resistor. . . . . 500 . . . ohms  
 Amplification Factor . . . . . 48

□ nominal voltage = 7.0 volts.

□□ nominal current = 0.32 ampere.

DEC. 30, 1947

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA

7F8



7F8

## MEDIUM-MU TWIN TRIODE

Plate Resistance (Approx.) . . . . .	14500	..	ohms
Transconductance . . . . .	3300	..	$\mu$ mhos
Plate Current. . . . .	6	..	ma
Grid Bias for plate current of 10 $\mu$ a (Approx.). . . . .	-11	..	volts

**Maximum Circuit Values (for maximum rated conditions):**

Grid-Circuit Resistance:

For cathode-bias operation . . . . . 0.5 max. megohm

DEC. 30, 1947

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA





7G7

7G7

# SHARP-CUTOFF PENTODE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 6.3<sup>□</sup> . . . . . ac or dc volts

Current . . . . . 0.45<sup>□□</sup> . . . . . amp

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

Grid No.1 to Plate . . . . . 0.007 max. . . . . μmf

Input . . . . . 9 . . . . . μmf

Output . . . . . 7 . . . . . μmf

<sup>○</sup> with external shield connected to cathode.

### Mechanical:

Mounting Position . . . . . Any

Maximum Overall Length . . . . . 2-25/32"

Maximum Seated Length . . . . . 2-1/4"

Maximum Diameter . . . . . 1-3/16"

Bulb . . . . . T-9

Base . . . . . Lock-in 8-Pin

Basing Designation for BOTTOM VIEW . . . . . 8V

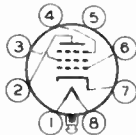
Pin 1 - Heater

Pin 2 - Plate

Pin 3 - Grid No.2

Pin 4 - Grid No.3

Pin 5 - Internal Shield



Pin 6 - Grid No.1

Pin 7 - Cathode

Pin 8 - Heater

Plug - Base Shell

## AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . . 300 max. volts ←

GRID-No.2 (SCREEN) VOLTAGE . . . . . 100 max. volts

GRID-No.2 SUPPLY VOLTAGE . . . . . 300 max. volts ←

PLATE DISSIPATION . . . . . 1.5 max. watts

GRID-No.2 DISSIPATION . . . . . 0.3 max. watt ←

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . . 90 max. volts ←

Heater positive with respect to cathode . . . . . 90 max. volts ←

### Typical Operation and Characteristics:

Plate Voltage . . . . . 250 . . . volts

Grid No.3 . . . . . Connected to cathode at socket

Internal Shield . . . . . Connected to cathode at socket

Grid-No.2 Voltage . . . . . 100 . . . volts

Grid-No.1 Voltage . . . . . -2 . . . volts

Cathode-Bias Resistor . . . . . 250 . . . ohms

Plate Resistance (Approx.) . . . . . 0.8 . . . megohm

Transconductance . . . . . 4500 . . . μmhos

(continued on next page)

<sup>□</sup> Nominal voltage = 7.0 volts.

<sup>□□</sup> Nominal current = 0.48 ampere.

← indicates a change.

7G7



7G7

## SHARP-CUTOFF PENTODE

→ Grid-No.1 Bias (Approx.) for Cathode Current Cutoff . . . . .	-7 . .	volts
Plate Current. . . . .	6 . .	ma
Grid-No.2 Current. . . . .	2 . .	ma

→ indicates a change.

DEC. 30, 1947

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA

World Radio History



7H7

7H7

## REMOTE-CUTOFF PENTODE

GENERAL DATA**Electrical:**

Heater, for Unipotential Cathode:

Voltage. . . . . 6.3<sup>□</sup> . . . . . ac or dc voltsCurrent. . . . . 0.3<sup>□□</sup> . . . . . ampDirect Interelectrode Capacitances:<sup>○</sup>Grid No.1 to Plate . . . . . 0.007 max. . . . .  $\mu$ fInput . . . . . 8 . . . . .  $\mu$ fOutput . . . . . 7 . . . . .  $\mu$ f<sup>○</sup> with external shield connected to cathode.**Mechanical:**

Mounting Position. . . . . Any

Maximum Overall Length . . . . . 2-25/32"

Maximum Seated Length. . . . . 2-1/4"

Maximum Diameter . . . . . 1-3/16"

Bulb . . . . . T-9

Base . . . . . Lock-in 8-Pin

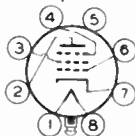
Basing Designation for BOTTOM VIEW . . . . . 8V

Pin 1 - Heater

Pin 2 - Plate

Pin 3 - Grid No.2

Pin 4 - Grid No.3

Pin 5 - Internal  
Shield

Pin 6 - Grid No.1

Pin 7 - Cathode

Pin 8 - Heater

Plug - Base  
ShellAMPLIFIER - Class A<sub>1</sub>**Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE. . . . . 300 max. volts

GRID-No.2 (SCREEN) VOLTAGE . . . . . 150 max. volts

GRID-No.2 SUPPLY VOLTAGE . . . . . 300 max. volts

GRID-No.1 (CONTROL-GRID) VOLTAGE:

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

PLATE DISSIPATION. . . . . 2.5 max. watts

GRID-No.2 DISSIPATION. . . . . 0.5 max. watt

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . . 90 max. volts

Heater positive with respect to cathode . . . . . 90 max. volts

**Typical Operation and Characteristics:**

Plate Voltage. . . . . 100 250 volts

Grid No.3 . . . . . Connected to cathode at socket

Internal Shield . . . . . Connected to cathode at socket

Grid-No.2 Voltage . . . . . 100 150 volts

Grid-No.1 Voltage . . . . . -1 - volt

Cathode-Bias Resistor. . . . . 80 180 ohms

(continued on next page)

<sup>□</sup> Nominal voltage = 7.0 volts.<sup>□□</sup> Nominal current = 0.32 ampere.

← Indicates a change.

DEC. 30, 1947

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA

7H7



7H7

# REMOTE-CUTOFF PENTODE

Plate Resistance (Approx.) . . . . .	0.25	0.8	megohm
Transconductance . . . . .	4800	4200	$\mu$ mhos
Grid-No.1 Bias (Approx.) for transconductance of 35 $\mu$ mhos . . .	-12	-19	volts
Plate Current. . . . .	8.2	10	ma
Grid-No.2 Current. . . . .	3.3	3.2	ma

DEC. 30, 1947

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA



7J7

7J7

# TRIODE-HEPTODE CONVERTER

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage. . . . .	6.3 <sup>□</sup>	ac or dc volts
Current. . . . .	0.3 <sup>□□</sup>	amp

Direct Interelectrode Capacitances:<sup>0</sup>

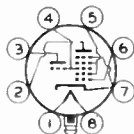
Heptode Grid No.1 to Heptode Plate . . .	0.03 max.	μuf
Heptode Grid No.1 to Triode Plate. . . .	0.1 max.	μuf
Heptode Grid No.1 to Triode Grid & Heptode Grid No.3. . . . .	0.3 max.	μuf
Triode Grid & Heptode Grid No.3 to Triode Plate . . . . .	0.9 . .	μuf
Heptode Grid No.1 to All Other Electrodes (RF Input). . . . .	4.6 . .	μuf
Heptode Plate to All Other Electrodes (Mixer Output) . . . . .	3.2 . .	μuf
Triode Grid & Heptode Grid No.3 to All Other Electrodes Except Triode Plate (Oscillator Input) . . . . .	7.5 . .	μuf
Triode Plate to All Other Electrodes Except Triode Grid & Heptode Grid No.3 (Oscillator Output). . . . .	7.5 . .	μuf

<sup>0</sup> With external shield connected to cathode.

### Mechanical:

Mounting Position. . . . .	Any
Maximum Overall Length . . . . .	2-25/32"
Maximum Seated Length. . . . .	2-1/4"
Maximum Diameter . . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW . . . . .	8BL

- Pin 1 - Heater
- Pin 2 - Heptode Plate
- Pin 3 - Triode Plate
- Pin 4 - Triode Grid,  
Heptode  
Grid No.3
- Pin 5 - Heptode  
Grids No.2  
& No.4



- Pin 6 - Heptode  
Grid No.1
- Pin 7 - Cathode,  
Heptode  
Grid No.5,  
Internal  
Shield
- Pin 8 - Heater  
Plug - Base Shell

## CONVERTER

### Maximum Ratings, Design-Center Values:

HEPTODE PLATE VOLTAGE. . . . .	300 max.	volts
HEPTODE GRIDS-No.2 & No.4 (SCREEN) VOLTAGE . . . . .	100 max.	volts

□ Nominal voltage = 7.0 volts.

□□ Nominal current = 0.32 ampere.

← Indicates a change.

7J7



7J7

# TRIODE-HEPTODE CONVERTER

HEPTODE GRIDS—No.2 & No.4 SUPPLY VOLTAGE . . . . .	300 max.	volts
HEPTODE GRID—No.1 (CONTROL- GRID) VOLTAGE:		
Positive bias value. . . . .	0 max.	volts
HEPTODE PLATE DISSIPATION. . . . .	0.5 max.	watt
HEPTODE GRIDS—No.2 & No.4 DISSIPATION. . .	0.3 max.	watt
TRIODE PLATE VOLTAGE . . . . .	150 max.	volts
TRIODE PLATE—SUPPLY VOLTAGE. . . . .	300 max.	volts
TRIODE PLATE DISSIPATION . . . . .	1.25 max.	watts
TOTAL CATHODE CURRENT. . . . .	14 max.	ma
→ PEAK HEATER—CATHODE VOLTAGE:		
Heater negative with respect to cathode. .	90 max.	volts
Heater positive with respect to cathode. .	90 max.	volts
→ <b>Typical Operation:</b>		
Heptode Plate Voltage. . . . .	100	250 volts
Heptode Grids—No.2 & No.4 Voltage. . .	100	100 volts
Heptode Grid—No.1 Voltage. . . . .	-3	-3 volts
Triode (Oscillator) Plate—Supply Volt.	100	250 <sup>†</sup> volts
Triode Grid & Heptode		
Grid—No.3 Resistor . . . . .	50000	50000 ohms
Heptode Plate Resistance . . . . .	0.5	1.5 megohms
Heptode Plate Current. . . . .	1.5	1.4 ma
Heptode Grids—No.2 & No.4 Current. . .	2.6	2.8 ma
Triode Plate Current . . . . .	3.2	5 ma
Triode Grid & Heptode		
Grid—No.3 Current. . . . .	0.3	0.4 ma
Conversion Conductance . . . . .	280	290 μmhos
Conversion Conductance (Approx.) for heptode grid—No.1 bias of -20 volts .	2	2 μmhos
Total Cathode Current. . . . .	7.7	9.6 ma

<sup>†</sup> Applied through a 20000-ohm dropping resistor, properly bypassed.

NOTE: The transconductance of the triode section, not oscillating, is approximately 1400 μmhos under the following conditions: triode plate voltage = 150; triode-grid & heptode grid—No.3 volts = -3. Under the same conditions, triode plate current is 6.6 ma., triode plate resistance is 10700 ohms, and amplification factor is 15.

→ Indicates a change.

DEC. 30, 1947

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA



7K7

7K7

# TWIN DIODE-HIGH-MU TRIODE

## GENERAL DATA

### Electrical:

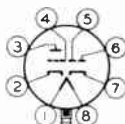
Heater, for Unipotential Cathodes:

Voltage. . . . .	6.3 <sup>□</sup>	ac or dc volts
Current. . . . .	0.3 <sup>□□</sup>	amp

### Mechanical:

Mounting Position. . . . .	Any
Maximum Overall Length . . . . .	2-25/32"
Maximum Seated Length. . . . .	2-1/4"
Maximum Diameter . . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW . . . . .	8BF

Pin 1 - Heater  
 Pin 2 - Triode  
           Cathode  
 Pin 3 - Triode Plate  
 Pin 4 - Triode Grid  
 Pin 5 - Diode-No. 2  
           Plate



Pin 6 - Diode-No. 1  
           Plate  
 Pin 7 - Cathode of  
           Diode-No. 1 &  
           Diode-No. 2  
 Pin 8 - Heater  
           Plug - Base Shell

## TRIODE UNIT AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	250 max.	volts
------------------------	----------	-------

### Typical Operation and Characteristics:

Plate Voltage. . . . .	250	volts
Grid Voltage . . . . .	-2	volts
Amplification Factor . . . . .	70	
Plate Resistance . . . . .	44000	ohms
Transconductance . . . . .	1600	μmhos
Plate Current. . . . .	2.3	ma

## DIODE UNITS - Two

The two diode units have a common cathode and are independent of the triode unit. Further consideration of the diode units including diode curves is given at the front of this Section.

□ Nominal voltage = 7.0 volts

□□ Nominal current = 0.32 amperes.

MAY 20, 1949

TUBE DEPARTMENT

DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY







7L7

7L7

## SHARP-CUTOFF PENTODE

## GENERAL DATA

## Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 6.3<sup>□</sup> . . . . . ac or dc voltsCurrent . . . . . 0.3<sup>□□</sup> . . . . . ampDirect Interelectrode Capacitances:<sup>○</sup>

Grid No.1 to Plate . . . . . 0.01 max. . . . . μmf

Input . . . . . 8.0 . . . . . μmf

Output . . . . . 6.5 . . . . . μmf

○ with external shield connected to cathode and base shell.

## Mechanical:

Mounting Position . . . . . Any

Maximum Overall Length . . . . . 2-25/32"

Maximum Sealed Length . . . . . 2-1/4"

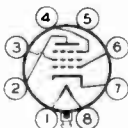
Maximum Diameter . . . . . 1-3/16"

Bulb . . . . . T-9

Base . . . . . Lock-in 8-Pin

Basing Designation for BOTTOM VIEW . . . . . 8V

- Pin 1 - Heater
- Pin 2 - Plate
- Pin 3 - Grid No.2
- Pin 4 - Grid No.3
- Pin 5 - Internal Shield



- Pin 6 - Grid No.1
- Pin 7 - Cathode
- Pin 8 - Heater

Plug - Base  
Shell

AMPLIFIER - Class A<sub>1</sub>

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . . 300 max. volts

GRID-No.2 (SCREEN) VOLTAGE . . . . . 125 max. volts

GRID-No.2 SUPPLY VOLTAGE . . . . . 300 max. volts

PLATE DISSIPATION . . . . . 4.0 max. watts

GRID-No.2 DISSIPATION . . . . . 0.4 max. watt

GRID-No.1 (CONTROL-GRID) VOLTAGE:

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

## Typical Operation and Characteristics:

Plate Voltage . . . . . 100 250 volts

Grid No.3 &amp; Internal Shield . . Connected to cathode at socket

Grid No.2 Voltage . . . . . 100 100 volts

Grid No.1 Voltage . . . . . -1 -1.5 volts

Cathode-Bias Resistor . . . . . 125 250 ohms

Plate Resistance (Approx.) . . . . . 0.1 1.0 megohm

Transconductance . . . . . 3000 3100 μmhos

□ Nominal voltage = 7.0 volts.

□□ Nominal current = 0.32 ampere.

OCTOBER 15, 1947

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA

7L7  
7N7



7L7

**SHARP-CUTOFF PENTODE**

(continued from preceding page)

Grid-No.1 Bias (Approx.) for cathode-current cutoff . . .	-6	-6	volts
Plate Current. . . . .	5.5	4.5	ma
Grid-No.2 Current. . . . .	2.4	1.5	ma

7N7

**MEDIUM-MU TWIN TRIODE**

GENERAL DATA

**Electrical:**

Heater, for Unipotential Cathodes:

Voltage. . . . .	6.3 <sup>□</sup>	ac or dc	volts
Current. . . . .	0.6 <sup>□□</sup>		amp

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

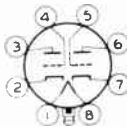
	<u>Triode No.1</u>	<u>Triode No.2</u>	
Grid to Plate. . . . .	3.0	3.0	μf
Input. . . . .	3.4	2.9	μf
Output . . . . .	2.0	2.4	μf

<sup>○</sup> with external shield connected to cathode.

**Mechanical:**

Mounting Position. . . . .	Any
Maximum Overall Length . . . . .	3-5/32"
Maximum Seated Length. . . . .	2-5/8"
Maximum Diameter . . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW . . . . .	8AC

- Pin 1 - Heater
- Pin 2 - Cathode of Triode No.2
- Pin 3 - Plate of Triode No.2
- Pin 4 - Grid of Triode No.2



- Pin 5 - Grid of Triode No.1
- Pin 6 - Plate of Triode No.1
- Pin 7 - Cathode of Triode No.1
- Pin 8 - Heater Plug - Base Shell

*Maximum Ratings, Characteristics, and Typical Operating Conditions are the same as those for Type 6SN7-GT*

<sup>□</sup> Nominal voltage = 7.0 volts.  
<sup>□□</sup> Nominal current = 0.64 ampere.



7Q7



7Q7

**PENTAGRID CONVERTER**

Heater	Coated Unipotential Cathode	
Voltage	6.3 <sup>□</sup>	a c or d-c volts
Current	0.3 <sup>□□</sup>	amp.
Direct Interelectrode Capacitances: <sup>○</sup>		
Grid #3 to All Other Electrodes & Base Shell (R-F Input)	9.0	μf
Plate to All Other Electrodes & Base Shell (Mixer Output)	9.0	μf
Grid #1 to All Other Electrodes & Base Shell	7.0	μf
Grid #3 to Plate	0.20 max.	μf
Grid #1 to Grid #3	0.20 max.	μf
Grid #1 to Plate	0.15 max.	μf
Grid #1 to All Other Electrodes & Base Shell Except Cathode	5.0	μf
Grid #1 to Cathode	2.2	μf
Cathode to All Other Electrodes & Base Shell Except Grid #1	6.0	μf
Maximum Overall Length	2-25/32"	
Maximum Seated Height	2-1/4"	
Maximum Diameter	1-3/16"	
Bulb	T-9	
Base	Lock-in 8-Pin	
Pin 1 - Heater	Pin 6 - Grid #3	
Pin 2 - Plate	Pin 7 - Cathode	
Pin 3 - Grids #2 & #4	Pin 8 - Heater	
Pin 4 - Grid #1	Plug - Base Shell	
Pin 5 - Grid #5		
Mounting Position	BOTTOM VIEW (RAL)	Any
<u>CONVERTER SERVICE</u>		
Plate Voltage	300 max.	volts
Grids #2 & #4 Voltage	100 max.	volts
Grids #2 & #4 Supply Voltage	300 max.	volts
Grid #3 Voltage	0 min.	volts
Plate & Grids #2 & #4 Dissipation (total)	2.0 max.	watts
Grids #2 & #4 Dissipation	1.0 max.	watt
Total Cathode Current	14 max.	ma.
Characteristics with Separate Excitation: <sup>*</sup>		
Plate Voltage	100	250 volts
Grids #2 & #4 Voltage	100	100 volts
Grid #3 (Control) Voltage	-2	-2 volts
Grid #5 Voltage	0	0 volts
Grid #1 Resistor	20000	20000 ohms
Plate Resistance	0.5	1 approx. megohm
Conversion Transcond.	525	550 μmhos
Conversion Transcond. with Grid #3 Bias of -35 volts	2	2 approx. μmhos
Plate Current	3.3	3.5 ma.
Grids #2 & #4 Current	8.5	8.5 ma.
Grid #1 Current	0.5	0.5 ma.
Total Cathode Current	12.3	12.5 ma.

□, □□, ○, ○○, ○○○ See next page.

May 1, 1941

RCA RADIODRON DIVISION  
RCA MANUFACTURING COMPANY INC

TENTATIVE DATA

7Q7



7Q7

## PENTAGRID CONVERTER

(continued from preceding page)

NOTE: The transconductance between Grid #1 and Grids #2 & #4 connected to plate (not oscillating) is approximately 4500  $\mu$ mhos under the following conditions: Grids #1, #3, and #5 at 0 volts; Grids #2 & #4 and plate at 100 volts.

■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

□ Nominal voltage = 7.0 volts.

□ Nominal current = 0.32 ampere.

○ With shield-can connected to cathode.

● With self-excited oscillator.

\* These characteristics correspond very closely to those obtained with zero bias in a self-excited oscillator circuit.

*A typical self-excited converter circuit is shown under type 6347.*

May 1, 1941

TENTATIVE DATA

RCA RADOTRON DIVISION  
RCA MANUFACTURING COMPANY INC.



7R7

7R7

# TWIN DIODE—REMOTE-CUTOFF PENTODE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3 <sup>□□</sup>	ac or dc volts
Current . . . . .	0.3 <sup>□□</sup>	amp

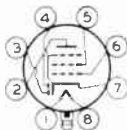
Direct Interelectrode Capacitances:\*

Grid No.1 to Plate . . . . .	0.004 max.	μf
Input to Cathode . . . . .	5.6 . . . .	μf
Output to Cathode . . . . .	5.3 . . . .	μf
Plate of Diode No.1 to Pentode Grid No.1 . . . . .	0.005 max.	μf
Plate of Diode No.2 to Pentode Grid No.1 . . . . .	0.002 max.	μf

\* with external shield connected to cathode.

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-25/32"
Maximum Seated Length . . . . .	2-1/4"
Maximum Diameter . . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW . . . . .	8AE
Pin 1 - Heater	Pin 6 - Pentode Grid No.1
Pin 2 - Pentode Plate	Pin 7 - Cathode, Pentode Grid No.3
Pin 3 - Diode No.2 Plate	Pin 8 - Heater
Pin 4 - Diode No.1 Plate	Plug - Base Shell
Pin 5 - Pentode Grid No.2	



## AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	100 max.	volts
GRID-No.2 SUPPLY VOLTAGE . . . . .	300 max.	volts
PLATE DISSIPATION . . . . .	2.0 max.	watts
GRID-No.2 DISSIPATION . . . . .	0.25 max.	watt
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
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

### Typical Operation and Characteristics:

Plate Voltage . . . . .	100	100	250	250	volts
Grid-No.2 Voltage . . . . .	10C	100	100	100	volts

□, □□: See next page.

7R7



7R7

## TWIN DIODE—REMOTE-CUTOFF PENTODE

Grid-No.1 Voltage. . . . .	-2.0	-1.0	-2.0	-1.0	volts
Cathode-Bias Resistor. . . . .	450	130	450	130	ohms
Plate Resistance (Approx.) . .	0.5	0.35	1.8	1	megohm
Transconductance . . . . .	2100	3000	2200	3400	$\mu$ mhos
Grid-No.1 Bias (Approx.) for transconductance of 2 $\mu$ mhos	-16	-16	-20	-20	volts
Plate Current. . . . .	3.4	5.5	3.5	6.2	ma
Grid-No.2 Current. . . . .	1.0	2.2	1.0	1.6	ma

□ Nominal voltage = 7.0 volts.

□□ Nominal current = 0.32 ampere.

OCTOBER 15, 1947

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA



7V7

7V7

# SHARP-CUTOFF PENTODE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 6.3<sup>□</sup> . . . . . ac or dc volts

Current . . . . . 0.45<sup>□□</sup> . . . . . amp

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

Grid No.1 to Plate . . . 0.004 max. . . . . μmf

Input . . . . . 9.5 . . . . . μmf

Output . . . . . 6.5 . . . . . μmf

<sup>○</sup> With external shield connected to cathode.

### Mechanical:

Mounting Position . . . . . Any

Maximum Overall Length . . . . . 2-25/32"

Maximum Seated Length . . . . . 2-1/4"

Maximum Diameter . . . . . 1-3/16"

Bulb . . . . . T-9

Base . . . . . Lock-in 8-Pin

Basing Designation for BOTTOM VIEW . . . . . BV

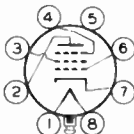
Pin 1 - Heater

Pin 2 - Plate

Pin 3 - Grid No.2

Pin 4 - Grid No.3

Pin 5 - Internal  
Shield



Pin 6 - Grid No.1

Pin 7 - Cathode

Pin 8 - Heater

Plug - Base  
Shell

## AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . . 300 max. volts

GRID-No.2 (SCREEN) VOLTAGE . . . . . 150 max. volts

GRID-No.2 SUPPLY VOLTAGE . . . . . 300 max. volts

PLATE DISSIPATION . . . . . 4 max. watts

GRID-No.2 DISSIPATION . . . . . 0.8 max. watt

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . 90 max. volts

Heater positive with respect to cathode . . . 90 max. volts

### Typical Operation and Characteristics:

	Condition I*	Condition II**
Plate Voltage . . . . .	300	300 . . . volts
Grid No.3 (Suppressor)	Connected to cathode at socket	
Internal Shield . . . . .	Connected to cathode at socket	
Grid-No.2 Supply -		
Voltage# . . . . .	150	300 . . . volts
Grid-No.2 Resistor . . .	-	40000 . . ohms
Min. Cathode-Bias		
Resistor . . . . .	160	160 . . . ohms

<sup>□</sup> Nominal voltage = 7.0 volts.

<sup>□□</sup> Nominal current = 0.48 ampere.

\*, \*\*, #: See next page.

7V7  
7W7



7V7

**SHARP-CUTOFF PENTODE**

Plate Current . . . . .	10	10	ma
Grid-No.2 Current . . .	3.9	3.9	ma
Plate Resistance . . . .	0.3	0.3	megohm
Transconductance . . . .	5800	5800	μmhos
Grid-No.1 Bias (Approx.) for plate current of 10 μa . . . . .	-8	-16	volts

- Condition I with fixed grid-No.2 supply gives a sharp-cutoff characteristic.
- Condition II with series grid-No.2 resistor gives an extended-cutoff characteristic.
- \* When grid-No.2 supply voltage in excess of 150 volts is used, a series grid-No.2 resistor must be used to limit grid-No.2 voltage to 150 volts when the plate current is at its normal value of 10 ma.

7W7

**SHARP-CUTOFF PENTODE**

GENERAL DATA

**Electrical:**

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3 <sup>□</sup>	ac or dc volts
Current . . . . .	0.45 <sup>□□</sup>	amp

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

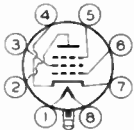
Grid No.1 to Plate . . . . .	0.0025 max.	μμf
Input . . . . .	9.5	μμf
Output . . . . .	7	μμf

○ with external shield connected to cathode.

**Mechanical:**

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-25/32"
Maximum Seated Length . . . . .	2-1/4"
Maximum Diameter . . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW . . . . .	8BJ

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



- Pin 6-Grid No.1
- Pin 7-Cathode
- Pin 8-Heater
- Plug - Base  
Shell

*Maximum Ratings, Typical Operation, and Characteristics are the same as for Type 7V7*

□ nominal voltage = 7.0 volts.      □□ nominal current = 0.48 ampere.





7X7

7X7

# DOUBLE DIODE-HIGH-MU TRIODE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

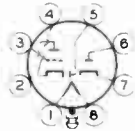
Voltage . . . . .	6.3 <sup>D</sup>	ac or dc volts
Current . . . . .	0.3 <sup>DD</sup>	amp

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-25/32"
Maximum Seated Length . . . . .	2-1/4"
Maximum Diameter . . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Lock-in 8-Pin

Easing Designation for BOTTOM VIEW . . . . . 8E2

Pin 1 - Heater  
 Pin 2 - Triode Plate  
 Pin 3 - Triode Grid  
 Pin 4 - Cathode  
 (Triode &  
 Diode No. 1)  
 Internal  
 Shield



Pin 5 - Diode Plate  
 No. 1  
 Pin 6 - Diode Plate  
 No. 2  
 Pin 7 - Cathode  
 (Diode No. 2)  
 Pin 8 - Heater  
 Plug - Base Shell

## TRIODE UNIT AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	90 max.	volts
Heater positive with respect to cathode . . . . .	90 max.	volts

### Typical Operation and Characteristics:

Plate Voltage . . . . .	100	250	volts
Grid Voltage . . . . .	0	-1	volt
Amplification factor . . . . .	85	100	
Plate Resistance . . . . .	85000	67000	ohms
Transconductance . . . . .	1000	1500	μmhos
Plate Current . . . . .	1.2	1.9	ma

## DIODE UNITS - Two

The 7X7 differs from the usual twin-diode-triode in that diode No. 2 has its own cathode, separate from that used for the triode and diode No. 1.

<sup>D</sup> Nominal voltage = 7.0 volts.  
<sup>DD</sup> Nominal current = 0.32 ampere.





7Y4

7Y4

# FULL-WAVE VACUUM RECTIFIER

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage. . . . . 6.3<sup>□</sup> . . . . . ac or dc volts

Current. . . . . 0.5<sup>□□</sup> . . . . . amp

### Mechanical:

Mounting Position. . . . . Any

Maximum Overall Length. . . . . 2-25/32"

Maximum Seated Length. . . . . 2-1/4"

Maximum Diameter. . . . . 1-3/16"

Bulb . . . . . T-9

Base . . . . . Lock-in 8-Pin

Basing Designation for BOTTOM VIEW . . . . . 5AB

Pin 1 - Heater

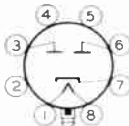
Pin 2 - No

Connection

Pin 3 - Plate No. 2

Pin 4 - No

Connection



Pin 5 - No

Connection

Pin 6 - Plate No. 1

Pin 7 - Cathode

Pin 8 - Heater

Plug - Base Shell

## FULL-WAVE RECTIFIER

### Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE . . . . . 1250 max. volts

PEAK PLATE CURRENT PER PLATE . . . . . 180 max. ma

DC OUTPUT CURRENT. . . . . 70 max. ma ←

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . . 450 max. volts

Heater positive with respect to cathode . . . . . 450 max. volts ←

### Typical Operation:

	<u>Capacitor-</u>	<u>Choke-</u>	
	<u>Input</u>	<u>Input</u>	
	<u>to Filter</u>	<u>to Filter</u>	

AC Plate-to-Plate Supply Voltage (RMS) . . . . . 650 . . . . . 900 . . . . . volts

Filter-Input Capacitor . . . . . 4 . . . . . μf

Min. Total Effective Plate-Supply Impedance per Plate\* . . . . . 150 . . . . . ohms

Min. Filter-Input Choke. . . . . 10 . . . . . henries

DC Output Current. . . . . 70 . . . . . ma

DC Output Voltage at Input to Filter (Approx.):

At half-load (35 ma.) . . . . . 390 . . . . . 385 . . . . . volts

At full-load (70 ma.) . . . . . 355 . . . . . 375 . . . . . volts

### Voltage Regulation (Approx.):

Half-load to full load current . . . . . 35 . . . . . 10 . . . . . volts

\* Indicated value for conditions shown will limit peak plate current to maximum rated value. When a filter-input capacitor larger than 4μf is used, it may be necessary to use more plate-supply impedance than the value shown to limit the peak plate current to the rated value.

□ Nominal voltage = 7.0 volts. □□ Nominal current = 0.53 ampere.

← Indicates a change.

724



724

# FULL-WAVE VACUUM RECTIFIER

## GENERAL DATA

### Electrical:

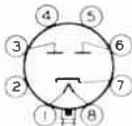
Heater, for Unipotential Cathode:

Voltage. . . . . 6.3<sup>□</sup> . . . . . ac or dc volts  
 Current. . . . . 0.9<sup>□□</sup> . . . . . amp

### Mechanical:

Mounting Position. . . . . Any  
 Maximum Overall Length . . . . . 3-5/32"  
 Maximum Seated Length. . . . . 2-5/8"  
 Maximum Diameter . . . . . 1-3/16"  
 Bulb . . . . . T-9  
 Base . . . . . Lock-in 8-Pin  
 Basing Designator for BOTTOM VIEW . . . . . 5AB

Pin 1 - Heater  
 Pin 2 - No  
           Connection  
 Pin 3 - Plate No. 2  
 Pin 4 - No  
           Connection



Pin 5 - No  
           Connection  
 Pin 6 - Plate No. 1  
 Pin 7 - Cathode  
 Pin 8 - Heater  
 Plug - Base Shell

## FULL-WAVE RECTIFIER

### Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE . . . . . 1250 max. volts  
 PEAK PLATE CURRENT PER PLATE . . . . . 300 max. ma  
 DC OUTPUT CURRENT. . . . . 100 max. ma  
 PEAK HEATER-CATHODE VOLTAGE:  
   Heater negative with respect to cathode. 450 max. volts  
   Heater positive with respect to cathode. 450 max. volts

### Typical Operation:

	Capacitor- Input to Filter	Choke- Input to Filter	
AC Plate-to-Plate Supply Voltage (RMS) . . . . .	650	900	volts
Min. Total Effective Plate- Supply Impedance per Plate*	75	-	ohms
Min. Filter-Input Choke. . . . .	-	6	henries
DC Output Current. . . . .	100	100	ma
DC Output Voltage at Input to Filter (Approx.):			
At half-load (50 ma.) . . . . .	400	365	volts
At full-load (100 ma.) . . . . .	365	350	volts
Voltage Regulation (Approx.):			
Half-load to full load current	35	15	volts

\* When a filter-input capacitor larger than 40  $\mu$ f is used, it may be necessary to use more plate-supply impedance than the minimum value shown to limit the peak plate current to the rated value.

□ Nominal voltage = 7.0 volts.

□□ Nominal current = 0.96 ampere.

DEC. 30, 1947

TUBE DEPARTMENT  
 RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA



8AU8  
TO  
8BH8

## 8AU8

### MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

*The 8AU8 is the same as the 6AU8 except for the following items:*

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	8.4	volts
Current . . . . .	0.45	amp

## 8AW8-A

### HIGH-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

*The 8AW8-A is the same as the 6AW8-A except for the following items:*

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	8.4	volts
Current . . . . .	0.45	amp

## 8BH8

### MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

*The 8BH8 is the same as the 6BH8 except for the following items:*

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	8.4	volts
Current . . . . .	0.45	amp

8BN8  
TO  
8CG7



## 8BN8 TWIN DIODE-HIGH-MU TRIODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

*The 8BN8 is the same as the 6BN8 except for the following items:*

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	8.4	volts
Current . . . . .	0.45 ± 6%	amp

## 8BQ5 POWER PENTODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

*The 8BQ5 is the same as the 6BQ5 except for the following items:*

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	8	volts
Current . . . . .	0.6	amp
Warm-up time (Average) . . . . .	11	sec

## 8CG7 MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

*The 8CG7 is the same as the 6CG7 except for the following items:*

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	8.4	volts
Current . . . . .	0.45	amp



## 8CM7

### MEDIUM-MU DUAL TRIODE

With Dissimilar Units

9-PIN MINIATURE TYPE

*Intended for use in equipment having series heater-string arrangement*

8CM7  
TO  
8CX8

*The 8CM7 is the same as the 6CM7 except for the following items:*

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	8.4	volts
Current . . . . .	0.45	amp

## 8CN7

### TWIN DIODE—HIGH-MU TRIODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having series heater-string arrangement*

*The 8CN7 is the same as the 6CN7 except for the following items:*

Heater, for Unipotential Cathodes:

Heater arrangement	Series	Parallel	
Voltage (AC or DC) . . . . .	8.4	4.2	volts
Current . . . . .	0.225	0.45 ± 6%	amp

## 8CX8

### MEDIUM-MU TRIODE— SHARP-CUTOFF TETRODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having series heater-string arrangement*

*The 8CX8 is the same as the 6CX8 except for the following items:*

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	8	volts
Current . . . . .	0.6 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

8EB8  
8EM5



## 8EB8

### HIGH-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

*The 8EB8 is the same as the 6EB8 except for the following items:*

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	8	volts
Current . . . . .	0.6 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

## 8EM5

### BEAM POWER TUBE

9-PIN MINIATURE TYPE

*For vertical-deflection-amplifier service in 110°  
systems having series heater-string arrangement*

*The 8EM5 is the same as the 6EM5 except for the following items:*

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	8.4	volts
Current . . . . .	0.6	amp
Warm-up time (Average) . . . . .	11	sec





9AU7

# MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

9AU7

*The 9AU7 is the same as the 12AU7 except for the following items:*

Heater, for Unipotential Cathodes:

Heater arrangement	Series	Parallel	
Voltage (AC or DC) . . . . .	9.4	4.7	volts
Current . . . . .	0.225	0.45	amp
Warm-up time (Average) . . . . .	-	11	sec





9BR7

9BR7

# TWIN DIODE-HIGH-MU TRIODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having series heater-string arrangement*

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

	Series	Parallel	
Heater arrangement			
Voltage (AC or DC) . . . . .	9.4	4.7	volts
Current . . . . .	0.3	0.6 ± 6%	amp
Warm-up time (Average) . . . . .	--	11	sec

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	With External Shield <sup>o</sup>	
<i>Triode Unit:</i>			
Grid to plate . . . . .	1.9	1.9	μf
Grid to cathode, cathode of diodes No.1 and No.2 & internal shield, and heater . .	2.6	2.8	μf
Plate to cathode, cathode of diodes No.1 and No.2 & internal shield, and heater . .	0.3	1	μf
<i>Diode Units:</i>			
Diode-No.1 plate to cathode of diodes No.1 and No.2 & internal shield, and heater . .	1.8	2	μf
Diode-No.2 plate to cathode of diodes No.1 and No.2 & internal shield, and heater . .	1.8	2	μf

### Characteristics, Class A<sub>1</sub> Amplifier (Triode Unit):

Plate Supply voltage . . . . .	250	volts
Cathode Resistor . . . . .	200	ohms
Amplification Factor . . . . .	60	
Plate Resistance (Approx.) . . . . .	10900	ohms
Transconductance . . . . .	4000	μmhos
Plate Current . . . . .	10	ma
Grid Voltage (Approx.) for plate $\mu_a = 10$ . . . . .	-12	volts

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" ± 3/32"
Maximum Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2

9BR7

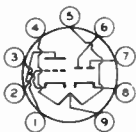


9BR7

## TWIN DIODE—HIGH-MU TRIODE

Base . . . . . Small-Button Noval 9-Pin (JEDEC No. E9-1)  
 Basing Designation for BOTTOM VIEW. . . . . 9CF

Pin 1—Triode Plate  
 Pin 2—Triode Grid  
 Pin 3—Triode  
           Cathode  
 Pin 4—Heater  
 Pin 5—Heater  
 Pin 6—Diode-No.2  
           Plate



Pin 7—Diode-No.1  
           Plate  
 Pin 8—Cathode of  
           Diodes No.1  
           & No.2,  
           Internal  
           Shield  
 Pin 9—Heater  
           Mid-Tap

### TRIODE UNIT — Amplifier — Class A<sub>1</sub>

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

PLATE VOLTAGE. . . . . 300 max. volts  
 GRID VOLTAGE:  
   Negative-bias value. . . . . 50 max. volts  
 PLATE DISSIPATION. . . . . 2.5 max. watts  
 PEAK HEATER-CATHODE VOLTAGE:  
   Heater negative with respect to cathode. . 300 max. volts  
   Heater positive with respect to cathode. . 200<sup>▲</sup> max. volts

### DIODE UNITS — Two

*Values are for Each Unit*

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

PEAK INVERSE PLATE VOLTAGE . . . . . 300 max. volts  
 PEAK PLATE CURRENT . . . . . 60 max. ma  
 PEAK HEATER-CATHODE VOLTAGE:  
   Heater negative with respect to cathode. . 300 max. volts  
   Heater positive with respect to cathode. . 200<sup>▲</sup> max. volts

#### Characteristics:

Plate Current for plate  
 volts = 5 . . . . . 17 ma

○ with external shield JEDEC No.315 connected to cathode of unit under test.

▲ The dc component must not exceed 100 volts.



9CL8

9CL8

# MEDIUM-MU TRIODE— SHARP-CUTOFF TETRODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	9.5	volts
Current . . . . .	0.3 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

Direct Interelectrode Capacitances  
(Aprox.):

	Without External Shield	With External Shield <sup>o</sup>	
<i>Triode Unit:</i>			
Grid to plate . . . . .	1.8	1.8	μmf
Grid to cathode and heater. . . . .	2.7	2.7	μmf
Plate to cathode and heater . . . . .	0.4	1.2	μmf
<i>Tetrode Unit:</i>			
Grid No.1 to plate. . . . .	0.028	0.016	μmf
Grid No.1 to cathode, grid No.2, and heater. . . . .	5	5	μmf
Plate to cathode, grid No.2, and heater. . . . .	2	3	μmf
Heater to cathode (Each unit) . . . . .	2.5	2.5	μmf

### Characteristics, Class A<sub>1</sub> Amplifier:

	Triode Unit	Tetrode Unit	
Plate Supply Voltage. . . . .	125	125	volts
Grid-No.2 Supply Voltage. . . . .	-	125	volts
Grid-No.1 Voltage . . . . .	0	-1	volt
Cathode Resistor. . . . .	56	-	ohms
Amplification Factor. . . . .	40	-	
Plate Resistance (Approx.) . . . . .	5000	10000	ohms
Transconductance. . . . .	8000	5800	μmhos
Plate Current . . . . .	15	12	ma
Grid-No.2 Current . . . . .	-	4	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10 . . . . .	-9	-10	volts

### Mechanical:

Operating Position. . . . .	Any
Maximum Overall Length. . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" ± 3/32"
Diameter. . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb. . . . .	T6-1/2

9CL8



9CL8

## MEDIUM-MU TRIODE— SHARP-CUTOFF TETRODE

Base . . . . . Small-Button Noval 9-Pin (JEDEC No. E9-1)  
 Basing Designation for BOTTOM VIEW. . . . . 9FX

- Pin 1 - Triode Grid
- Pin 2 - Triode Plate
- Pin 3 - Triode Cathode
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Tetrode Plate



- Pin 7 - Tetrode Grid No. 2
- Pin 8 - Tetrode Cathode
- Pin 9 - Tetrode Grid No. 1

### CONVERTER

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

	<i>Triode Unit as Osc.</i>	<i>Tetrode Unit as Mixer</i>	
PLATE VOLTAGE . . . . .	300 max.	300 max.	volts
GRID-No. 2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	-	300 max.	volts
GRID-No. 2 VOLTAGE . . . . .	-	<i>See Grid-No. 2 Input Rating Chart at front of Receiving Tube Section</i>	
GRID-No. 1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value . . . . .	0 max.	0 max.	volts
GRID-No. 2 INPUT:			
For grid-No. 2 voltages up to 150 volts . . . . .	-	0.5 max.	watt
For grid-No. 2 voltages between 150 and 300 volts . . . . .	-	<i>See Grid-No. 2 Input Rating Chart at front of Receiving Tube Section</i>	
PLATE DISSIPATION . . . . .	2.7 max.	2.8 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200 max.	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	200 <sup>▲</sup> max.	volts

#### Maximum Circuit Values:

	<i>Triode Unit</i>	<i>Tetrode Unit</i>	
Grid-No. 1-Circuit Resistance:			
For fixed-bias operation . . . . .	0.5 max.	0.25 max.	megohm
For cathode-bias operation . . . . .	1 max.	1 max.	megohm

○ with external shield JEDEC No. 315 connected to cathode of unit under test except as noted.  
 ● with external shield JEDEC No. 315 connected to ground.  
 ▲ The dc component must not exceed 100 volts.



9U8-A

9U8-A

# MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

*The 9U8-A is the same as the 6U8-A except for the following items:*

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	9.45	volts
Current . . . . .	0.3 ± 6%	amp







10C8

# 10C8 HIGH-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE  
Intended for use in equipment having  
series heater-string arrangement

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	10.5	volts
Current . . . . .	0.3 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

Direct Interelectrode Capacitances:<sup>0</sup>

Triode Unit:

Grid to plate . . . . .	1.6	μf
Grid to cathode and heater . . . . .	2.4	μf
Plate to cathode and heater . . . . .	0.2	μf

Pentode Unit:

Grid No.1 to plate . . . . .	0.04 max.	μf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater . . . . .	7	μf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater . . . . .	2.2	μf
Triode grid to pentode plate . . . . .	0.006 max.	μf
Pentode grid No.1 to triode plate . . . . .	0.008 max.	μf
Pentode plate to triode plate . . . . .	0.06 max.	μf

### Characteristics, Class A<sub>1</sub> Amplifier:

	Triode Unit	Pentode Unit	Pentode Unit (Triode Connection)	
Plate Supply Voltage . . . . .	250	135	135	volts
Grid-No.2 Supply Voltage . . . . .	-	135	-	volts
Grid-No.1 Voltage . . . . .	-	-	0	volts
Cathode Resistor . . . . .	390	100	-	ohms
Amplification Factor . . . . .	53	40	-	
Plate Resistance (Approx.) . . . . .	0.012	0.19	-	megohm
Transconductance . . . . .	4400	8000	-	μmhos
Plate Current . . . . .	7.3	11.5	33	ma
Grid-No.2 Current . . . . .	-	3.2	-	ma
Grid Voltage (Approx.) for plate $\mu_a = 10$ . . . . .	-10	-	-	volts
Grid-No.1 Voltage (Approx.) for plate $\mu_a = 50$ . . . . .	-	-6	-	volts



## HIGH-MU TRIODE— SHARP-CUTOFF PENTODE

### Mechanical:

Operating Position. . . . .	Any
Maximum Overall Length. . . . .	2-3/16"
Maximum Seated Length. . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-9/16" ± 3/32"
Diameter. . . . .	0.750" to 0.875"
Dimensional Outline. . . . .	See General Section
Bulb. . . . .	T6-1/2
Base. . . . .	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW. . . . .	9DA

Pin 1 - Triode Plate

Pin 2 - Triode Grid

Pin 3 - Triode  
Cathode

Pin 4 - Heater

Pin 5 - Heater

Pin 6 - Pentode Plate

Pin 7 - Pentode  
Grid No. 2

Pin 8 - Pentode

Grid No. 1

Pin 9 - Pentode

Grid No. 3,

Pentode

Cathode,

Internal

Shield

### AMPLIFIER — Class A<sub>1</sub>

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

	Triode Unit	Pentode Unit	
PLATE VOLTAGE . . . . .	300 max.	300 max.	volts
GRID-No. 2 (SCREEN-GRID) SUPPLY VOLTAGE. . . . .	-	300 max.	volts
GRID-No. 2 VOLTAGE . . . . .	-	See Grid-No. 2 Input Rating Chart at front of Receiving Tube Section	
GRID-No. 1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value . . . . .	0 max.	0 max.	volts
GRID-No. 2 INPUT:			
For grid-No. 2 voltages up to 150 volts . . . . .	-	0.55 max.	watt
For grid-No. 2 voltages between 150 and 300 volts . . . . .	-	See Grid-No. 2 Input Rating Chart at front of Receiving Tube Section	
PLATE DISSIPATION . . . . .	2 max.	2.2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode. . . . .	200 max.	200 max.	volts
Heater positive with respect to cathode. . . . .	200 <sup>▲</sup> max.	200 <sup>▲</sup> max.	volts



10C8

10C8

## HIGH-MU TRIODE— SHARP-CUTOFF PENTODE

### Maximum Circuit Values:

	Triode Unit	Pentode Unit	
Grid-No.1-Circuit Resistance:			
For fixed-bias operation. . . . .	0.5 max.	0.25 max.	megohm
For cathode-bias operation. . . . .	1 max.	1 max.	megohm

### VERTICAL-DEFLECTION OSCILLATOR

*Triode Unit*

### Maximum Ratings, Design-Maximum Values:

*For operation in a 525-line, 30-frame system<sup>□</sup>*

DC PLATE VOLTAGE . . . . .	300 max.		volts
PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	400 max.		volts
CATHODE CURRENT:			
Peak . . . . .	35 max.		ma
Average. . . . .	12 max.		ma
PLATE DISSIPATION. . . . .	1 max.		watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200 max.		volts
Heater positive with respect to cathode.	200 <sup>▲</sup> max.		volts

### Maximum Circuit Values:

Grid-Circuit Resistance:			
For fixed-bias, grid-resistor-bias, or cathode-bias operation. . . . .	2.2 max.		megohms

### VERTICAL-DEFLECTION AMPLIFIER

*Pentode Unit (Triode Connection)<sup>◆</sup>*

### Maximum Ratings, Design-Maximum Values:

*For operation in a 525-line, 30-frame system<sup>□</sup>*

DC PLATE VOLTAGE . . . . .	300 max.		volts
PEAK POSITIVE-PULSE PLATE VOLTAGE* . . . . .	1000 max.		volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE. . . . .	250 max.		volts
CATHODE CURRENT:			
Peak . . . . .	55 max.		ma
Average. . . . .	18 max.		ma
PLATE DISSIPATION. . . . .	2.5 max.		watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200 max.		volts
Heater positive with respect to cathode.	200 max.		volts

### Maximum Circuit Values:

Grid-No.1 Circuit Resistance:			
For grid-resistor-bias or cathode-bias operation . . . . .	2.2 max.		megohms

10C8



10C8

## HIGH-MU TRIODE— SHARP-CUTOFF PENTODE

- Without external shield.
- ◆ Grid No.2 connected to plate.
- This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.
- ▲ The dc component must not exceed 100 volts.
- As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.
- \* This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.



**10DE7**

**10DE7  
11CY7**

**DUAL TRIODE**

**With Medium-Mu Unit and Low-Mu Unit**

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

*The 10DE7 is the same as the 6DE7 except for the following items:*

Heater, for Unipotential Cathodes:		
Voltage (AC or DC) . . . . .	9.7	volts
Current . . . . .	0.6 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

**11CY7**

**DUAL TRIODE**

**With High-Mu Unit and Low-Mu Unit**

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

*The 11CY7 is the same as the 6CY7 except for the following items:*

Heater, for Unipotential Cathodes:		
Voltage (AC or DC) . . . . .	11	volts
Current . . . . .	0.45 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec





12A8-GT

# 12A8-GT

## PENTAGRID CONVERTER

*The 12A8-GT is the same as the 6A8-GT except for the following items:*

Heater, for Unipotential Cathode:

Voltage. . . . .	12.6	. . . . .	ac or dc volts
Current. . . . .	0.15	. . . . .	amp







12AB5

12AB5

# BEAM POWER TUBE

9-PIN MINIATURE TYPE

For use in automobile radio receivers  
operating from 12-volt storage batteries

## GENERAL DATA

### Electrical:

Heater<sup>o</sup>, for Unipotential Cathode:

Voltage range. . . . . 10.0 to 15.9 . . . . . dc volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.),  
at 12.6 volts. . . . . 0.2 . . . . . amp

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

Grid No.1 to plate . . . . . 0.7 max.  $\mu$ f

Grid No.1 to cathode & grid No.3,  
grid No.2, and heater. . . . . 8  $\mu$ f

Plate to cathode & grid No.3,  
grid No.2, and heater. . . . . 8.5  $\mu$ f

### 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"

Dimensional Outline. . . . . See General Section

Bulb . . . . . T-6-1/2

Base . . . . . Small-Button Noval 9-Pin (JEDEC No.E9-1)

Basing Designation for BOTTOM VIEW . . . . . 9EU

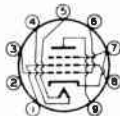
Pin 1 - Grid No.2

Pin 2 - No Connection

Pin 3 - Grid No.1

Pin 4 - Heater

Pin 5 - Heater



Pin 6 - Grid No.1

Pin 7 - Cathode,  
Grid No.3

Pin 8 - Grid No.2

Pin 9 - Plate

## AF POWER AMPLIFIER - Class A<sub>1</sub>

Maximum Ratings, Design-Center Values:

*For application of these design-center ratings to storage-battery operation, see Operating Considerations*

PLATE VOLTAGE. . . . . 315 max. volts

GRID-No.2 (SCREEN) VOLTAGE . . . . . 285 max. volts

PLATE DISSIPATION. . . . . 12 max. watts

GRID-No.2 INPUT. . . . . 2 max. watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . . . . 90 max. volts

Heater positive with respect to cathode. . . . . 90 max. volts

BULB TEMPERATURE (At hottest point  
on bulb surface) . . . . . 250 max. °C

<sup>o</sup>: see next page.

SEPT. 1, 1955

TUBE DIVISION

TENTATIVE DATA 1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

12AB5



12AB5

## BEAM POWER TUBE

## Characteristics with 12.6 volts on heater:

Plate Voltage. . . . .	250	250	volts
Grid-No.2 Voltage. . . . .	200	250	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	-	-12.5	volts
Cathode-Bias Resistor. . . . .	270	-	ohms
Peak AF Grid-No.1 Voltage. . . . .	10.5	12.5	volts
Zero-Signal Plate Current. . . . .	33.5	45	ma
Max.-Signal Plate Current. . . . .	36	47	ma
Zero-Signal Grid-No.2 Current (Approx.) . . . . .	1.6	4.5	ma
Max.-Signal Grid-No.2 Current (Approx.) . . . . .	3.2	7	ma
Plate Resistance (Approx.) . . . . .	75000	50000	ohms
Transconductance . . . . .	4000	4100	$\mu$ mhos
Load Resistance. . . . .	6000	5000	ohms
Total Harmonic Distortion. . . . .	8	8	%
Max.-Signal Power Output . . . . .	3.3	4.5	watts

## Maximum Circuit Values:

## Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohms
For cathode-bias operation . . . . .	0.5 max.	megohms

PUSH-PULL AF POWER AMPLIFIER - Class AB<sub>1</sub>

## Maximum Ratings, Design-Center Values:

For application of these design-center ratings to storage-battery operation, see Operating Considerations

PLATE VOLTAGE. . . . .	315 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	285 max.	volts
PLATE DISSIPATION. . . . .	12 max.	watts
GRID-No.2 INPUT. . . . .	2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	90 max.	volts
Heater positive with respect to cathode. . . . .	90 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface) . . . . .	250 max.	°C

## Characteristics with 12.6 volts on heater:

Values are for 2 tubes

Plate Voltage. . . . .	250	volts
Grid-No.2 Voltage. . . . .	250	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	-15	volts
Peak Af Grid-No.1-to- Grid-No.1 Voltage . . . . .	30	volts
Zero-Signal Plate Current. . . . .	70	ma
Max.-Signal Plate Current. . . . .	79	ma

- operation of heater in series with other heaters is not recommended.
- without external shield.

SEPT. 1, 1955

TUBE DIVISION

TENTATIVE DATA 1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History



12AB5

12AB5

### BEAM POWER TUBE

Zero-Signal Grid-No.2 Current (Approx.) . .	5	ma
Max.-Signal Grid-No.2 Current (Approx.) . .	13	ma
Effective Load Resistance (Plate to plate) . . . . .	10000	ohms
Total Harmonic Distortion . . . . .	5	%
Max.-Signal Power Output . . . . .	10	watts

#### Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

#### OPERATING CONSIDERATIONS

The *maximum ratings* in the tabulated data for the 12AB5 are working design-center maximums established according to the standard design-center system of rating electron tubes. Tubes so rated will give satisfactory performance in storage-battery-operated equipment provided the following stipulations are observed:

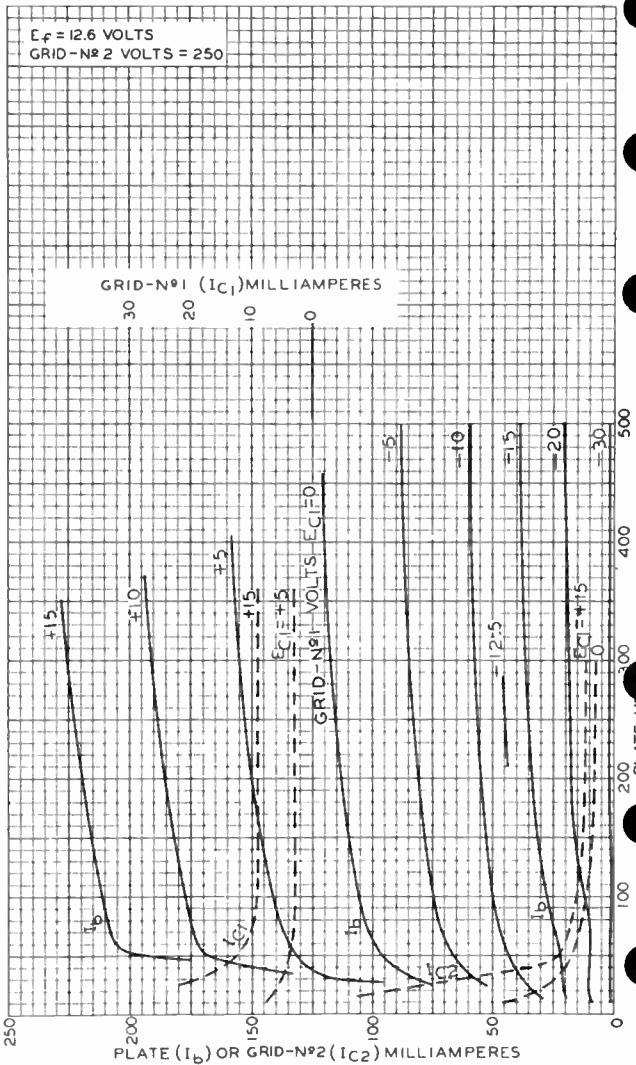
In the case of storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. This fluctuation imposes severe operating conditions on tubes. Under these conditions, the equipment should be designed so that 90 per cent of the design-center maximum values of plate voltage, grid-No.2 voltage, plate dissipation, and grid-No.2 input is never exceeded for a battery terminal potential of 13.2 volts. Although the operating voltages of the 12AB5 in this service will, at times, exceed the design-center maximum values, satisfactory performance with probable sacrifice in life will be obtained.

12AB5



12AB5

AVERAGE CHARACTERISTICS



AUGUST 18, 1955

TUBE DIVISION

92CM-8754

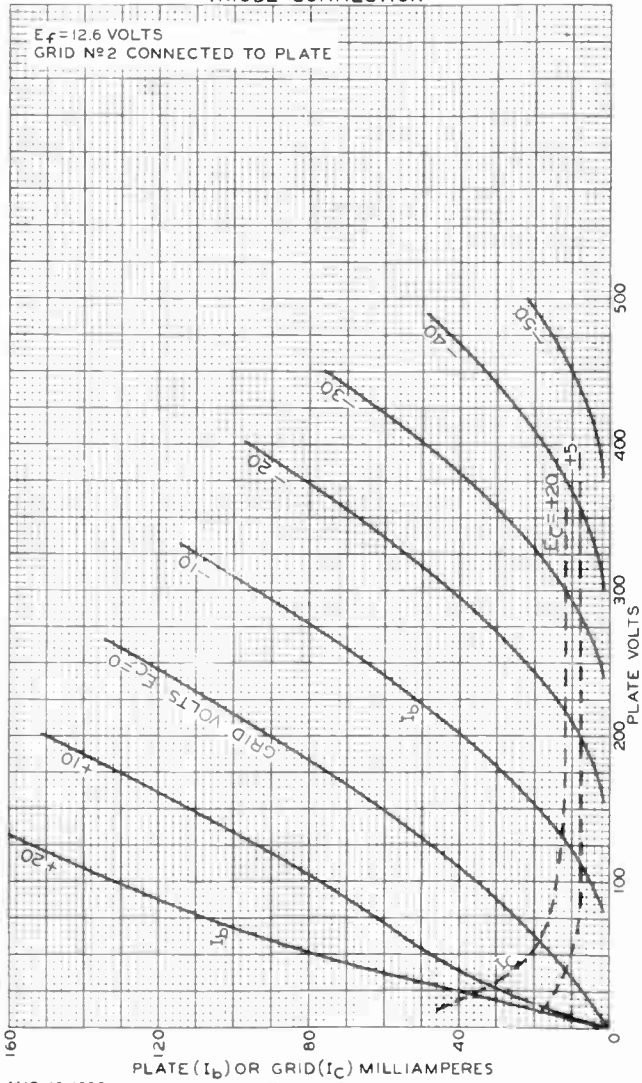
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



12AB5

### AVERAGE CHARACTERISTICS TRIODE CONNECTION

12AB5



AUG. 19, 1955

PLATE ( $I_b$ ) OR GRID ( $I_c$ ) MILLIAMPERES

TUBE DIVISION

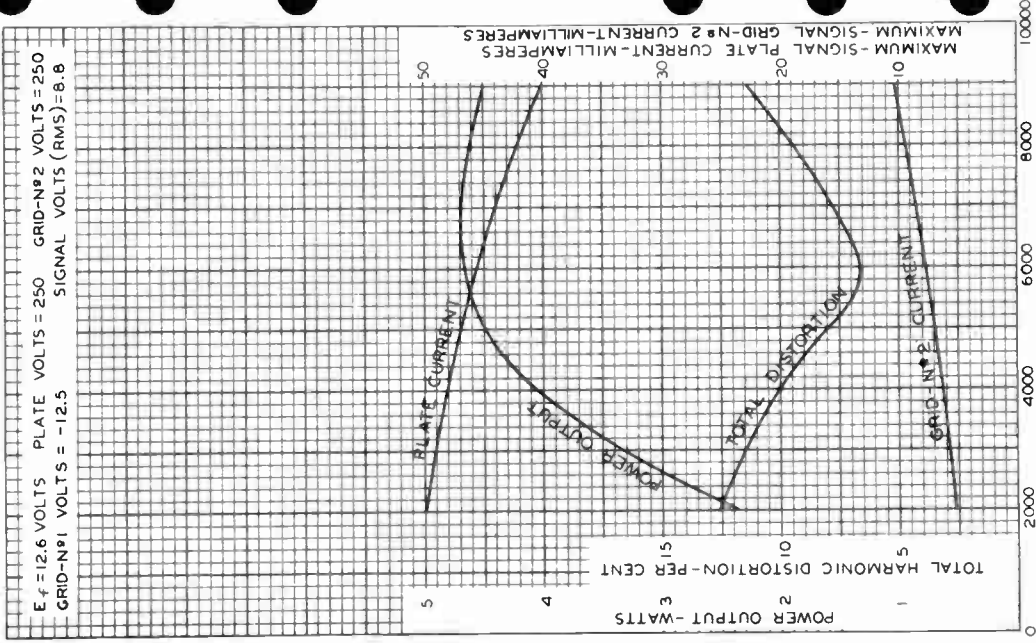
92CM-8756

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY



12AB5

## OPERATION CHARACTERISTICS





12AC6

# 12AC6

## REMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

For use in automobile radio receivers operating directly from 6-cell storage-battery systems

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage range (AC or DC) . . . . . 10 to 15.9 volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts*

Current (Approx.)  
at 12.6 volts . . . . . 0.15 amp

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	With External Shield <sup>o</sup>	
Grid No.1 to plate . . . . .	0.005	0.004	$\mu$ f
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . .	4.3	4.3	$\mu$ f
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . .	5	5	$\mu$ f

#### Characteristics, Class A<sub>1</sub> Amplifier:

Heater Voltage . . . . .	12.6	volts
Plate Voltage . . . . .	12.6	volts
Grid No.3 . . . . .	Connected to cathode at socket	
Grid-No.2 Voltage . . . . .	12.6	volts
Grid-No.1 Voltage . . . . .	0	volts
Grid-No.1 Resistor (Bypassed) . . . . .	2.2	megohms
Plate Resistance (Approx.) . . . . .	0.5	megohm
Transconductance, Grid No.1 to Plate . . . . .	730	$\mu$ hos
Plate Current . . . . .	550	$\mu$ a
Grid-No.2 Current . . . . .	200	$\mu$ a
Grid-No.1 Voltage (Approx.) for transconductance ( $\mu$ hos) = 10 . . . . .	-5.2	volts
Grid-No.3 Voltage (Approx.) for transconductance ( $\mu$ hos) = 10 . . . . .	-3.7	volts

#### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-1/2" $\pm$ 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)

<sup>o</sup> with external shield JEDEC No.316 connected to cathode.

12AC6

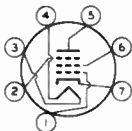


12AC6

# REMOTE-CUTOFF PENTODE

Basing Designation for BOTTOM VIEW. . . . . 7BK

- Pin 1 - Grid No.1
- Pin 2 - Grid No.3,  
Internal  
Shield
- Pin 3 - Heater



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

### AMPLIFIER — Class A<sub>1</sub>

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

PLATE VOLTAGE. . . . .	30 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . .	30 max.	volts
CATHODE CURRENT. . . . .	20 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	30 max.	volts
Heater positive with respect to cathode .	30 max.	volts

#### Maximum Circuit Values:

Grid-No.1-Circuit Resistance . . . . .	10 max.	megohms
--	---------	---------





12AD6

# 12AD6

## PENTAGRID CONVERTER

7-PIN MINIATURE TYPE

For use in automobile radio receivers operating directly from 12-volt storage batteries

### GENERAL DATA

#### Electrical:

Heater\*, for Unipotential Cathode:

Voltage range. . . . 10.0 to 15.9 . . . . . dc volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.)

at 12.6 volts. . . . . 0.15 . . . . . amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield <sup>o</sup>	
Grid No.3 to all other electrodes (RF input). . .	8	8	$\mu\mu\text{f}$
Plate to all other electrodes (Mixer input). . .	8	13	$\mu\mu\text{f}$
Grid No.1 to all other electrodes (Oscillator input). . .	5.5	5.5	$\mu\mu\text{f}$
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 & grid No.5 . . . . .	3	3	$\mu\mu\text{f}$
Cathode & grid No.5 to all other electrodes except grid No.1 . . . . .	15	20	$\mu\mu\text{f}$

#### Mechanical:

Operating Position . . . . . Any

Maximum Overall Length . . . . . 2-1/8"

Maximum Seated Length. . . . . 1-7/8"

Length, Base Seat to Bulb Top (Excluding tip). . . 1-1/2"  $\pm$  3/32"

Maximum Diameter . . . . . 3/4"

Dimensional Outline. . . . . See General Section

Bulb . . . . . T5-1/2

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

<sup>o</sup>: See next page.



12AD6

## PENTAGRID CONVERTER

### CONVERTER SERVICE

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

PLATE VOLTAGE. . . . .	30 max.	volts
GRID-No.3 (CONTROL-GRID) VOLTAGE:		
Negative bias value. . . . .	-30 max.	volts
Positive bias value. . . . .	0 max.	volts
GRIDS-No.2 & No.4 (SCREEN-GRIDS) VOLTAGE .	30 max.	volts
TOTAL CATHODE CURRENT. . . . .	20 max.	ma
PEAK-HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	30 max.	volts
Heater positive with respect to cathode .	30 max.	volts

#### Characteristics with 12.6 Volts on Heater:

##### Separate Excitation\*

Plate Voltage. . . . .	12.6	volts
Grids-No.2 & No.4 Voltage. . . . .	12.6	volts
Grid-No.3 Voltage. . . . .	0	volts
Grid-No.1 (Oscillator-Grid) Voltage (RMS).	1.6	volts
Grid-No.3 Resistor . . . . .	2.2	megohms
Grid-No.1 Resistor . . . . .	33000	ohms
Plate Resistance (Approx.) . . . . .	1	megohm
Conversion Transconductance. . . . .	260	$\mu$ hos
Grid-No.3 Voltage (Approx.) for conversion transconductance of:		
5 $\mu$ hos. . . . .	-2.2	volts
20 $\mu$ hos . . . . .	-1.8	volts
Plate Current. . . . .	450	$\mu$ a
Grids-No.2 & No.4 Current. . . . .	1.5	ma
Grid-No.1 Current. . . . .	50	$\mu$ a
Total Cathode Current. . . . .	2	ma

##### Self Excitation

Plate Voltage. . . . .	12.6	volts
Grids-No.2 & No.4 Voltage. . . . .	12.6	volts
Grid-No.3 Voltage. . . . .	0	volts
Grid-No.1 Voltage. . . . .	0	volts
Transconductance, Grid-No.1 to Plate and Grids-No.2 & No.4. . . . .	3800	$\mu$ hos
Amplification Factor, Grid-No.1 to Plate and Grids-No.2 & No.4. . . . .	9	
Cathode Current. . . . .	5	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 $\mu$ a . . . . .	-4	volts

#### Maximum Circuit Values:

Grid-No.3-Circuit Resistance . . . . .	10 max.	megohms
--	---------	---------

• operation of heater in series with other heaters is not recommended.

○ with external shield JETEC No.316 connected to cathode.

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



12AD6

12AD6

## PENTAGRID CONVERTER

### OPERATING CONSIDERATIONS

The *maximum ratings* in the tabulated data for the 12AD6 are working design-center maximums established according to the standard design-center system of rating electron tubes. Tubes so rated will give satisfactory performance in storage-battery-operated equipment provided the following stipulations are observed:

In the case of storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. This fluctuation imposes severe operating conditions on tubes. Under these conditions, the equipment should be designed so that 90 per cent of the design-center maximum value of plate voltage and grid-No.2 voltage is never exceeded for a battery-terminal potential of 13.2 volts. Although the operating voltages of the 12AD6 in this service will, at times, exceed the design-center maximum values, satisfactory performance with probable sacrifice in life will be obtained.





12AE6-A

# 12AE6-A

## TWIN DIODE—MEDIUM-MU TRIODE

7-PIN MINIATURE TYPE

For use in automobile-radio receivers operating directly from 12-volt storage batteries

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage range. . . . . 10 to 15.9 . . . . . dc volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.)

at 12.6 volts. . . . . 0.15 . . . . . amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Triode grid to triode plate. . . . . 2  $\mu\mu$ f

Triode grid to cathode and heater. . . . . 1.8  $\mu\mu$ f

Triode plate to cathode and heater . . . . . 1.1  $\mu\mu$ f

Plate of diode unit No.1 to plate of diode unit No.2. . . . . 0.9  $\mu\mu$ f

#### Characteristics, Class A<sub>1</sub> Amplifier (Triode Unit):

Heater Voltage . . . . . 12.6 12.6 volts

Plate Voltage. . . . . 12.6 12.6 volts

Grid Voltage . . . . . - 0 volts

Grid Resistor. . . . . 10 - megohms

Amplification Factor . . . . . 14.3 16.7

Plate Resistance (Approx.) . . . . . 20000 13000 ohms

Transconductance . . . . . 715 1300  $\mu$ hos

Plate Current. . . . . 0.32 1 ma

#### Mechanical:

Operating Position . . . . . Any

Maximum Overall Length . . . . . 2-1/8"

Maximum Seated Length. . . . . 1-7/8"

Length, Base Seat to Bulb Top (Excluding tip). . . 1-1/2"  $\pm$  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)

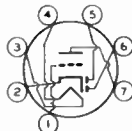
Basing Designation for BOTTOM VIEW . . . . . 7BT

Pin 1—Grid of Triode Unit

Pin 2—Cathode of Triode Unit and Diode Units No.1 and No.2

Pin 3—Heater

Pin 4—Heater



Pin 5—Plate of Diode Unit No.2

Pin 6—Plate of Diode Unit No.1

Pin 7—Plate of Triode Unit

<sup>0</sup>: without external shield.

12AE6-A



12AE6-A

## TWIN DIODE—MEDIUM-MU TRIODE

TRIODE UNIT — AMPLIFIER — Class A<sub>1</sub>

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	30 max.	volts
CATHODE CURRENT. . . . .	20 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	30 max.	volts
Heater positive with respect to cathode.	30 max.	volts

## Maximum Circuit Values:

Grid-Circuit Resistance. . . . .	10 max.	megohms
----------------------------------	---------	---------

## DIODE UNITS — Two

## Maximum Ratings, Design-Center Values:

*Values are for Each Unit*

PLATE CURRENT. . . . .	1 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	30 max.	volts
Heater positive with respect to cathode.	30 max.	volts

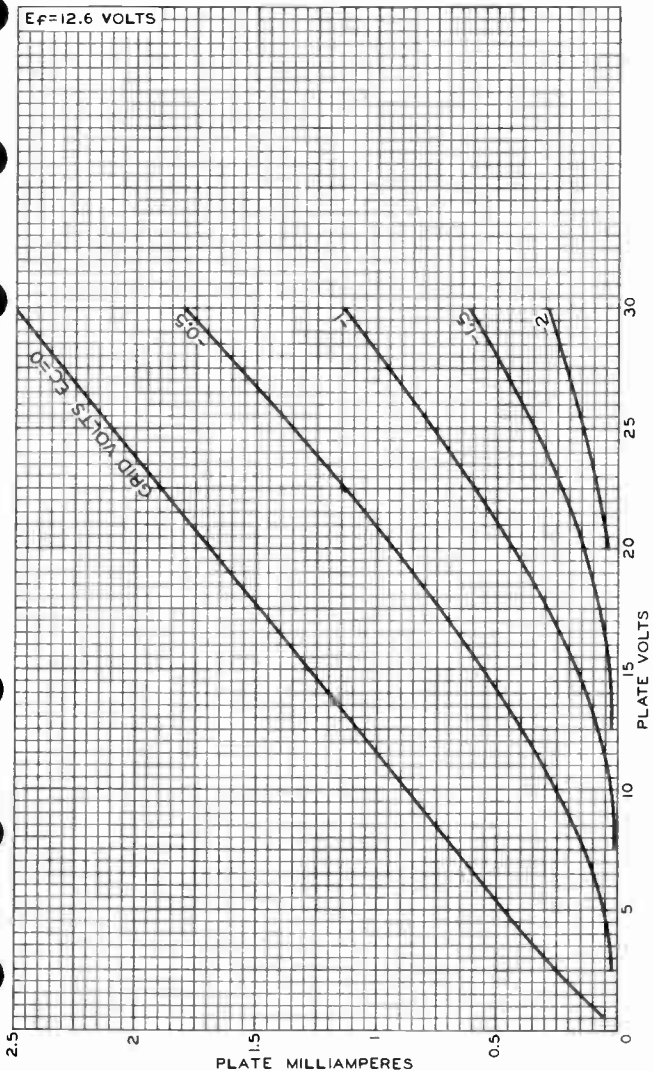
## Characteristics:

Heater Voltage . . . . .	12.6	volts
Plate Voltage. . . . .	10	volts
Plate Current. . . . .	2	ma



12AE6-A

# 12AE6-A AVERAGE PLATE CHARACTERISTICS TRIODE UNIT

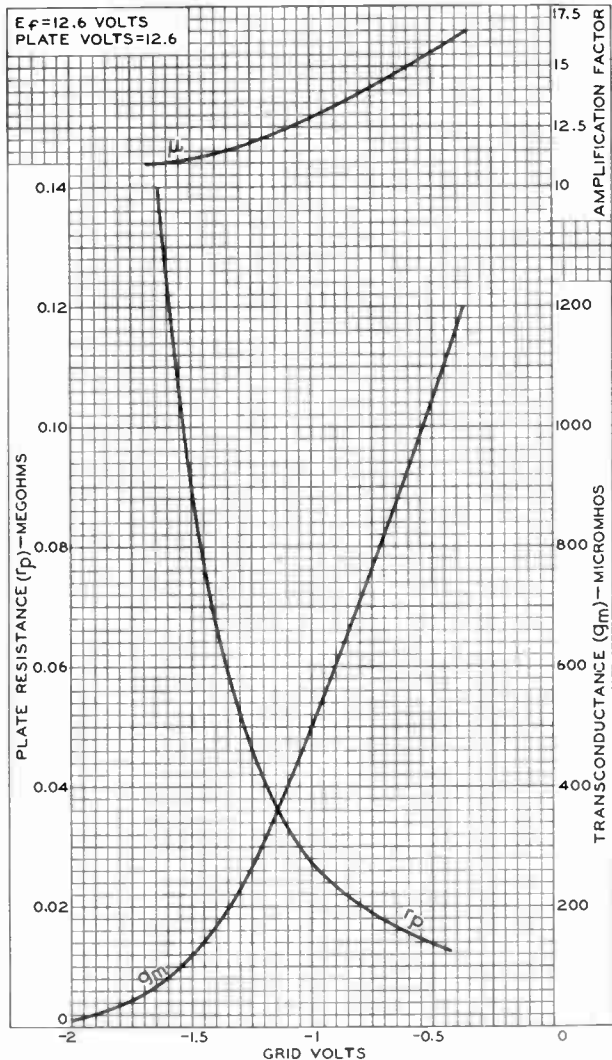


12AE6-A



12AE6-A

### AVERAGE CHARACTERISTICS TRIODE UNIT







12AF3

# 12AF3 HALF-WAVE VACUUM RECTIFIER

9-PIN MINIATURE TYPE

*For damper service in TV receivers  
having series heater-string arrangement*

*The 12AF3 is the same as the 6AF3 except for the following items:*

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.6 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec





12AF6

12AF6

# REMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

For use in automobile radio receivers  
operating directly from 12-volt storage batteries

## GENERAL DATA

### Electrical:

Heater<sup>•</sup>, for Unipotential Cathode:

Voltage range. . . . 10.0 to 15.9 . . . . . dc volts  
*This voltage range is on an absolute basis. For long-  
est life, it is recommended that the heater be operated  
within the voltage range of 11 to 13 volts.*

Current (Approx.)

at 12.6 volts. . . . . 0.15 . . . . . amp

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

Grid No.1 to plate . . . . . 0.006 max.  $\mu\mu\text{f}$

Grid No.1 to cathode, grid No.3 &  
internal shield, grid No.2, and heater . . . . . 5.5  $\mu\mu\text{f}$

Plate to cathode, grid No.3 & internal  
shield, grid No.2, and heater. . . . . 4.8  $\mu\mu\text{f}$

### Mechanical:

Operating Position . . . . . Any

Maximum Overall Length . . . . . 2-1/8"

Maximum Seated Length. . . . . 1-7/8"

Length, Base Seat to Bulb Top (Excluding tip) . 1-1/2"  $\pm$  3/32"

Maximum Diameter . . . . . 3/4"

Dimensional Outline. . . . . See General Section

Bulb . . . . . T5-1/2

Base . . . . . Small-Button Miniature 7-Pin (JETEC No.E7-1)

Basing Designation for BOTTOM VIEW . . . . . 7BK

Pin 1 - Grid No.1

Pin 2 - Grid No.3,  
Internal  
Shield

Pin 3 - Heater



Pin 4 - Heater

Pin 5 - Plate

Pin 6 - Grid No.2

Pin 7 - Cathode

## AMPLIFIER — Class A<sub>1</sub>

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . . 16 max. volts

GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . . 16 max. volts

GRID-No.1 (CONTROL-GRID) VOLTAGE:

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

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . . 16 max. volts

Heater positive with respect to cathode. . . 16 max. volts

<sup>o</sup>: See next page.

12AF6



12AF6

## REMOTE-CUTOFF PENTODE

### Characteristics with 12.6 Volts on Heater:

Plate Voltage . . . . .	12.6	volts
Grid-No.3 (Suppressor-Grid) Voltage. . . . .	0	volts
Grid-No.2 Voltage . . . . .	12.6	volts
Grid-No.1 Supply Voltage. . . . .	0	volts
Grid-No.1 Resistor (Bypassed) . . . . .	2.2	megohms
Plate Resistance (Approx.) . . . . .	0.3	megohm
Transconductance. . . . .	1250	$\mu$ mhos
Plate Current . . . . .	0.8	ma
Grid-No.2 Current . . . . .	0.3	ma
Grid-No.1 Voltage (Approx.) for transconductance of 40 $\mu$ mhos. . . . .	-2.7	volts

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance. . . . . 2.2 max. megohms

<sup>o</sup> Without external shield.

• Operation of heater in series with other heaters is not recommended.

### OPERATING CONSIDERATIONS

The *maximum ratings* in the tabulated data for the 12AF6 are working design-center maximums established according to the standard design-center system of rating electron tubes. Tubes so rated will give satisfactory performance in storage-battery-operated equipment provided the following stipulations are observed:

In the case of storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. This fluctuation imposes severe operating conditions on tubes. Under these conditions, the equipment should be designed so that 90 per cent of the design-center maximum values of plate voltage, grid-No.2 voltage, plate dissipation, and grid-No.2 input is never exceeded for a battery-terminal potential of 13.2 volts. Although the operating voltages of the 12AF6 in this service will, at times, exceed the design-center maximum values, satisfactory performance with probable sacrifice in life will be obtained.



12AH7-GT

# 12AH7-GT

## MEDIUM-MU TWIN TRIODE

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathodes:

Voltage. . . . .	12.6	ac or dc volts
Current. . . . .	0.15	amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

	Unit No. 1	Unit No. 2	
Grid to plate. . . . .	3	2.2	$\mu\text{f}$
Grid to cathode and heater . . . . .	2.8	3.2	$\mu\text{f}$
Plate to cathode and heater . . . . .	2.6	3	$\mu\text{f}$
Plate of unit No.1 to plate of unit No.2 . . . . .	0.4		$\mu\text{f}$
Grid of unit No.1 to grid of unit No.2. . . . .	0.06		$\mu\text{f}$

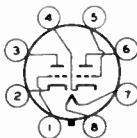
#### Characteristics, Class A<sub>1</sub> Amplifier (Each unit):

Plate Voltage. . . . .	100	180	volts
Grid Voltage . . . . .	-3.6	-6.5	volts
Amplification Factor . . . . .	16	16	
Plate Resistance (Approx.) . . . . .	10300	8400	ohms
Transconductance . . . . .	1550	1900	$\mu\text{mhos}$
Plate Current. . . . .	3.7	7.6	ma
Grid Voltage (Approx.) for plate current of 10 $\mu\text{amp}$ . . . . .	-8.5	-16	volts

#### Mechanical:

Mounting Position. . . . .	Any
Maximum Overall Length . . . . .	3-1/16"
Maximum Seated Length. . . . .	2-1/2"
Maximum Diameter . . . . .	1-9/32"
Dimensional Outline. . . . .	See General Section
Bulb . . . . .	T-9
Base . . . . .	Intermediate-Shell Octal 8-Pin (JETEC No.88-6)
Basing Designation for BOTTOM VIEW . . . . .	8BE

Pin 1 - Grid of Unit No.2	Pin 5 - Grid of Unit No.1
Pin 2 - Cathode of Unit No.2	Pin 6 - Plate of Unit No.1
Pin 3 - Plate of Unit No.2	Pin 7 - Heater
Pin 4 - Cathode of Unit No.1	Pin 8 - Heater



<sup>0</sup> with external shield JETEC No.308 connected to cathode of unit under test.

← Indicates a change.

12AH7-GT



# 12AH7-GT MEDIUM-MU TWIN TRIODE

## AMPLIFIER - Class A<sub>1</sub>

Values are for Each Unit

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	180 max.	volts
PLATE-SUPPLY VOLTAGE . . . . .	300 max.	volts
PLATE DISSIPATION . . . . .	1.5 max.	watts
→ PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup> max.	volts

▲ The dc component must not exceed 100 volts.

→ Indicates a change.

SEPT. 1, 1955

DATA



12AJ6

12AJ6

**TWIN DIODE—MEDIUM-MU TRIODE**

7-PIN MINIATURE TYPE

For use in automobile radio receivers operating directly  
from 12-volt storage batteries

**GENERAL DATA****Electrical:**Heater<sup>•</sup>, for Unipotential Cathode:

Voltage range. . . . . 10.0 to 15.9 . . . . . dc volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.)

at 12.6 volts. . . . . 0.15 . . . . . amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>Triode grid to triode plate. . . . . ?  $\mu\text{f}$ Triode grid to cathode and heater. . . . . 2.2  $\mu\text{f}$ Triode plate to cathode and heater . . . . . 0.8  $\mu\text{f}$ Plate of diode unit No.1 to plate of  
diode unit No.2. . . . . 0.9  $\mu\text{f}$ **Mechanical:**

Operating Position . . . . . Any

Maximum Overall Length . . . . . 2-1/8"

Maximum Seated Length. . . . . 1-7/8"

Length, Base Seat to Bulb Top (Excluding tip). 1-1/2"  $\pm$  3/32"

Maximum Diameter . . . . . 3/4"

Dimensional Outline. . . . . See General Section

Bulb . . . . . T5-1/2

Base . . . . . Small-Button Miniature 7-Pin (JETEC No. E7-1)

Basing Designation for BOTTOM VIEW . . . . . 7BT

Pin 1—Triode Grid

Pin 2—Cathode

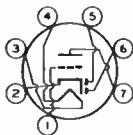
Pin 3—Heater

Pin 4—Heater

Pin 5—Plate of

Diode

Unit No.2



Pin 6—Plate of

Diode

Unit No.1

Pin 7—Triode Plate

**TRIODE UNIT — AMPLIFIER — Class A<sub>1</sub>****Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE. . . . . 30 max. volts

CATHODE CURRENT. . . . . 20 max. ma

**PEAK HEATER—CATHODE VOLTAGE:**

Heater negative with respect to cathode. 30 max. volts

Heater positive with respect to cathode. 30 max. volts

**Characteristics with 12.6 Volts on Heater:**

Plate Voltage. . . . . 12.6 volts

Grid Voltage . . . . . 0 volts

Amplification Factor . . . . . 55

<sup>o</sup> : See next page.

12AJ6



12AJ6

## TWIN DIODE—MEDIUM-MU TRIODE

Plate Resistance (Approx.) . . . . .	45000	ohms
Transconductance . . . . .	1200	$\mu$ hos
Plate Current . . . . .	750	$\mu$ a

### Typical Operation as Resistance-Coupled Amplifier with 12.6 Volts on Heater:

Plate-Supply Voltage . . . . .	12.6	volts
Grid Voltage . . . . .	0	volts
Plate Load Resistor . . . . .	1	megohm
Grid Resistor . . . . .	1	megohm
Grid Resistor of Following Stage . . . . .	2	megohms
Input Capacitor . . . . .	0.02	$\mu$ f
Output Capacitor . . . . .	0.01	$\mu$ f
Voltage Gain at 400 cps with RMS output volts = 1 . . . . .	16	

### Maximum Circuit Values:

Grid-Circuit Resistance . . . . .	10 max.	megohms
-----------------------------------	---------	---------

### DIODE UNITS — Two

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

*Values are for Each Unit*

PLATE CURRENT . . . . .	1 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	30 max.	volts
Heater positive with respect to cathode.	30 max.	volts

#### Characteristics with 12.6 Volts on Heater:

Plate Current for plate volts = 10 . . . . .	2	ma
--	---	----

- operation of heater in series with other heaters is not recommended.
- ◊ without external shield.

### OPERATING CONSIDERATIONS

The *maximum ratings* in the tabulated data for the 12AJ6 are working design-center maximums established according to the standard design-center system of rating electron tubes. Tubes so rated will give satisfactory performance in storage-battery-operated equipment provided the following stipulations are observed:

In the case of storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. This fluctuation imposes severe operating conditions on tubes. Under these conditions, the equipment should be designed so that 90 per cent of the design-center maximum value of plate voltage is never exceeded for a battery-terminal potential of 13.2 volts. Although the operating voltages of the 12AJ6 in this service will, at times, exceed the design-center maximum values, satisfactory performance with probable sacrifice in life will be obtained.





12AL5

12AL5

TWIN DIODE

MINIATURE TYPE

Heater, for Unipotential Cathodes:

Voltage . . . . . 12.6 . . . . . ac or dc volts

Current . . . . . 0.15 . . . . . amp

*The 12AL5 is the same as the 6AL5 except for heater rating.*





12AL8

12AL8

# MEDIUM-MU TRIODE-POWER TETRODE

9-PIN MINIATURE TYPE

For use in automobile radio receivers operating directly from 12-volt storage batteries

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . . 10 to 15.9 . . . . . ac or dc volts

*This voltage is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.) at

12.6 volts . . . . . 0.55 . . . . . amp

Direct Interelectrode Capacitances:<sup>0</sup>

#### Triode Unit:

Grid to plate . . . . . 5.7  $\mu\mu\text{f}$

Grid to cathode and heater . . . . . 1.8  $\mu\mu\text{f}$

Plate to cathode and heater . . . . . 0.4  $\mu\mu\text{f}$

#### Tetrode Unit:

Grid No.2 to plate . . . . . 14  $\mu\mu\text{f}$

Grid No.2 to cathode, grid No.1,  
and heater . . . . . 13  $\mu\mu\text{f}$

Plate to cathode, grid No.1,  
and heater . . . . . 1.6  $\mu\mu\text{f}$

Tetrode grid No.2 to triode grid . . . . . 0.01 max.  $\mu\mu\text{f}$

### Characteristics, Class A<sub>1</sub> Amplifier:

	Triode Unit	Tetrode Unit	
Heater Voltage . . . . .	12.6	12.6	volts
Plate Voltage . . . . .	12.6	12.6	volts
Control-Grid Voltage (Developed across 2.2-megohm resistor):			
Grid . . . . .	-0.9	-	volt
Grid-No.2 . . . . .	-	-0.5	volt
Grid-No.1 (Space-Charge- Grid) Voltage . . . . .	-	12.6	volts
Amplification Factor:			
Grid to plate . . . . .	13	-	
Grid No.2 to plate . . . . .	-	7.2	
Plate Resistance (Approx.) . . . . .	13000	480	ohms
Transconductance:			
Grid to plate . . . . .	1000	-	$\mu\text{mhos}$
Grid No.2 to plate . . . . .	-	15000	$\mu\text{mhos}$
Plate Current . . . . .	0.5	40	ma
Grid-No.1 Current . . . . .	-	75	ma

### Mechanical:

Operating Position . . . . . Any

Maximum Overall Length . . . . . 2-5/8"

Maximum Seated Length . . . . . 2-3/8"

<sup>0</sup>: See next page.

12AL8



12AL8

## MEDIUM-MU TRIODE-POWER TETRODE

Length, Base Seat to Bulb Top (Excluding tip) . . . . . 2"  $\pm$  3/32"  
 Diameter . . . . . 0.750" to 0.875"  
 Dimensional Outline. . . . . See *General Section*  
 Bulb . . . . . T6-1/2  
 Base . . . . . Small-Button Noval 9-Pin (JEDEC No. E9-1)  
 Basing Designation for BOTTOM VIEW . . . . . 9GS

Pin 1 - Triode Plate  
 Pin 2 - Tetrode  
           Grid No. 2  
 Pin 3 - Tetrode  
           Grid No. 1  
 Pin 4 - Heater  
 Pin 5 - Heater



Pin 6 - Tetrode Plate  
 Pin 7 - Tetrode  
           Cathode  
 Pin 8 - Triode Grid  
 Pin 9 - Triode  
           Cathode

### AMPLIFIER — Class A<sub>1</sub>

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

	Triode Unit	Tetrode Unit	
PLATE VOLTAGE. . . . .	30 max.	30 max.	volts
GRID-No. 2 (CONTROL-GRID) VOLTAGE. . . . .	-	-20 max.	volts
GRID-No. 1 (SPACE-CHARGE-GRID) VOLTAGE (Absolute maximum) . . . . .	-	16 max.	volts
CATHODE CURRENT. . . . .	20 max.	-	ma
PEAK-HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	30 max.	30 max.	volts
Heater positive with respect to cathode . . . . .	30 max.	30 max.	volts

#### Maximum Circuit Values:

	Triode Unit	Tetrode Unit	
Grid-No. 2-Circuit Resistance . . . . .	-	10 max.	megohms
Grid-Circuit Resistance. . . . .	10 max.	-	megohms

○ Without external shield.

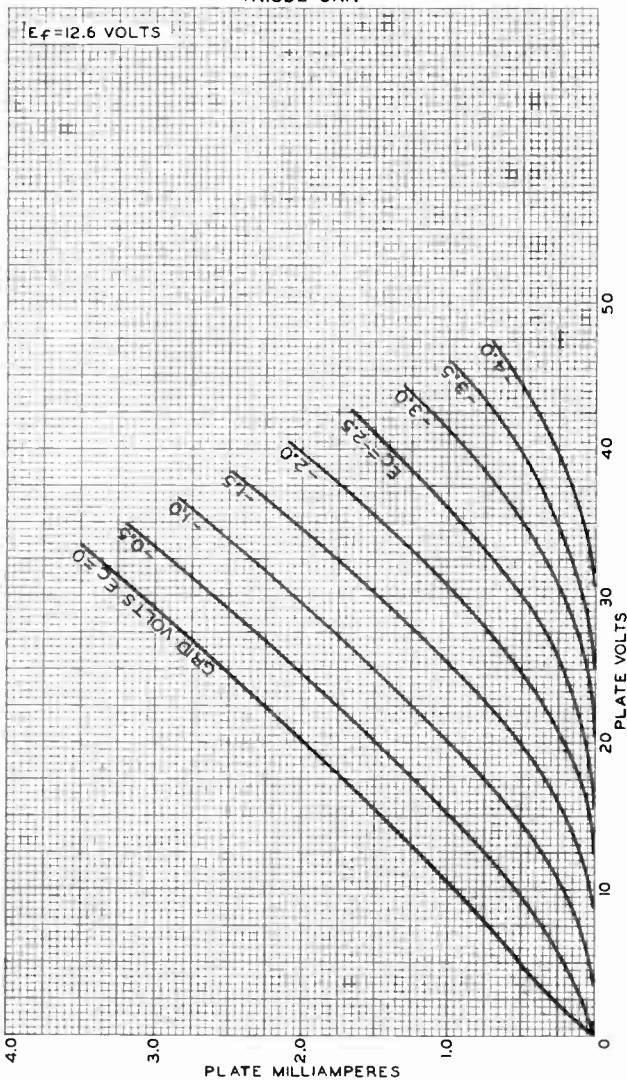
● Under no circumstances should this absolute value be exceeded.



12AL8

12AL8

AVERAGE PLATE CHARACTERISTICS  
TRIODE UNIT



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-9432

12AL8



12AL8

AVERAGE PLATE CHARACTERISTICS  
TETRODE UNIT

$E_f = 12.6$  VOLTS

GRID-№1 (SPACE-CHARGE-GRID) VOLTS = 12.6

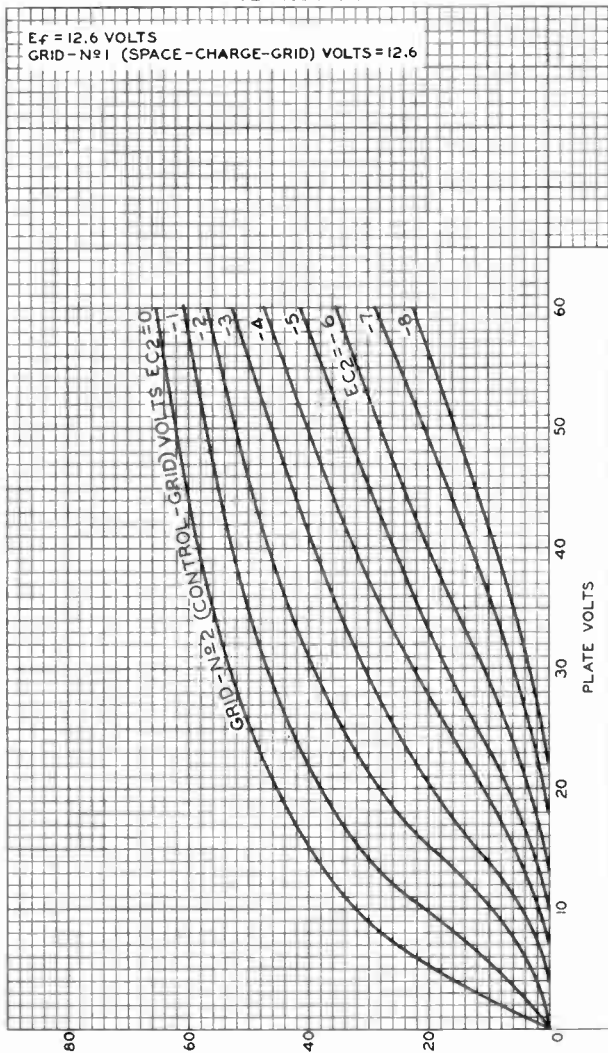


PLATE MILLIAMPERES

PLATE VOLTS

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9422



12AL8

12AL8

AVERAGE PLATE CHARACTERISTICS  
TETRODE UNIT

$E_f = 12.6$  VOLTS

GRID-N<sup>o</sup> 2 (CONTROL-GRID) VOLTS = 0

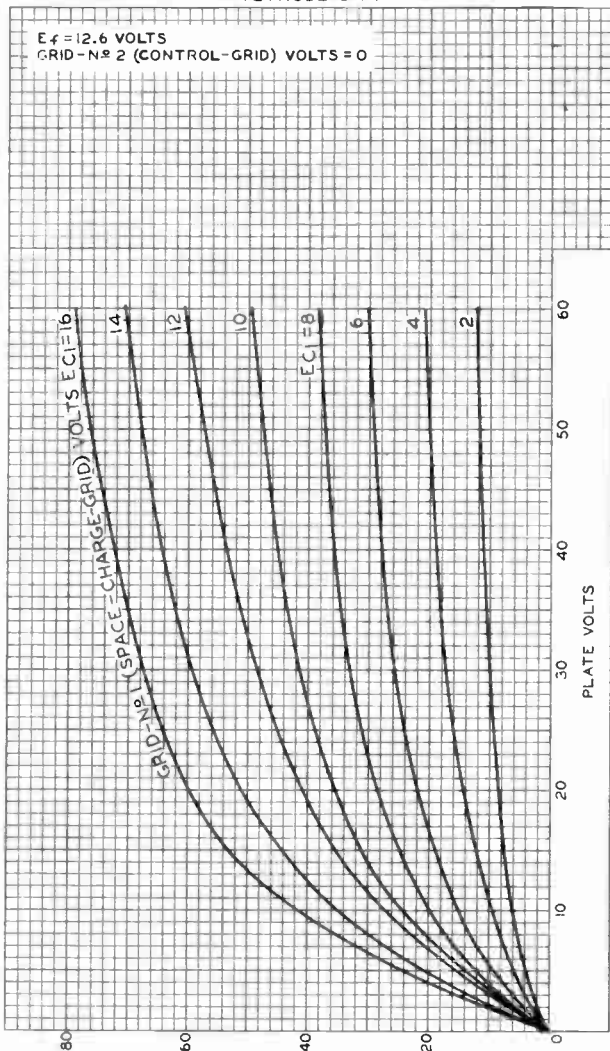


PLATE MILLIAMPERES

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9423







12AQ5

# 12AQ5

## BEAM POWER AMPLIFIER

MINIATURE TYPE

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	12.6 . . . . .	ac or dc volts
Current . . . . .	0.225 . . . . .	amp

Direct Interelectrode Capacitances

(Approx., without external shield):

Grid No.1 to Plate . . . . .	0.35 . . . . .	$\mu\mu\text{f}$
Input . . . . .	8.3 . . . . .	$\mu\mu\text{f}$
Output . . . . .	8.2 . . . . .	$\mu\mu\text{f}$

#### Mechanical:

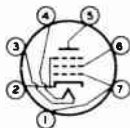
Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-5/8"
Maximum Seated Length . . . . .	2-3/8"
Length, Base Seat to Bulb Top (Excluding Tip) . . . . .	2" $\pm$ 3/32"
Maximum Diameter . . . . .	3/4"
Bulb . . . . .	T-5-1/2
Base . . . . .	Small-Button Miniature 7-Pin (JEDEC No.E7-1)

BOTTOM VIEW

Pin 1 - Grid No.1

Pin 2 - Grid No.3,  
Cathode

Pin 3 - Heater



Pin 4 - Heater

Pin 5 - Plate

Pin 6 - Grid No.2

Pin 7 - Grid No.1

### AF POWER AMPLIFIER - Class A<sub>1</sub>

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

PLATE VOLTAGE . . . . .	250 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	250 max.	volts
PLATE DISSIPATION . . . . .	12 max.	watts
GRID-No.2 INPUT . . . . .	2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	90 max.	volts
Heater positive with respect to cathode . . . . .	90 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface) * . . . . .	250 max.	$^{\circ}\text{C}$

#### Typical Operation and Characteristics:

Plate Voltage . . . . .	180	250	volts
Grid-No.2 Voltage . . . . .	180	250	volts
Grid-No.1 (Control- Grid) Voltage . . . . .	-8.5	-12.5	volts
Peak AF Grid-No.1 Voltage . . . . .	8.5	12.5	volts
Zero-Signal Plate Current . . . . .	29	45	ma
Max.-Signal Plate Current . . . . .	30	47	ma

\*: See next page.

12AQ5



12AQ5

## BEAM POWER AMPLIFIER

Zero-Signal Grid-No.2 Current (Approx.) . . . . .	3	4.5	ma
Max.-Signal Grid-No.2 Current (Approx.) . . . . .	4	7	ma
Plate Resistance (Approx.) . . .	58000	52000	ohms
Transconductance . . . . .	3700	4100	$\mu$ hos
Load Resistance . . . . .	5500	5000	ohms
Total Harmonic Distortion . . . .	8	8	per cent
Max.-Signal Power Output . . . . .	2.0	4.5	watts

**Maximum Circuit Values:**

## Grid-No.1-Circuit Resistance:

For fixed bias . . . . .	0.1 max.	megohm
For cathode bias . . . . .	0.5 max.	megohm

AF POWER AMPLIFIER - Class AB<sub>1</sub>**Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE . . . . .	250 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	250 max.	volts
PLATE DISSIPATION . . . . .	12 max.	watts
GRID-No.2 INPUT . . . . .	2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	90 max.	volts
Heater positive with respect to cathode .	90 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)*	250 max.	$^{\circ}$ C

**Typical Operation:**

*Unless otherwise indicated, values are for 2 tubes*

Plate Voltage . . . . .	250	volts
Grid-No.2 Voltage . . . . .	250	volts
Grid-No.1 (Control-Grid) Voltage# . . . . .	-15	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage . .	30	volts
Zero-Signal Plate Current . . . . .	70	ma
Max.-Signal Plate Current . . . . .	79	ma
Zero-Signal Grid-No.2 Current (Approx.) . .	5	ma
Max.-Signal Grid-No.2 Current (Approx.) . .	13	ma
Plate Resistance (Approx. per tube) . . . .	60000	ohms
Transconductance (Per tube) . . . . .	3750	$\mu$ hos
Effective Load Resistance (Plate to plate) .	10000	ohms
Total Harmonic Distortion . . . . .	5	per cent
Max.-Signal Power Output . . . . .	10	watts

\* High ambient temperature and shielding may necessitate a reduction in operating dissipation. When tube shields are used, it is advisable to paint the inside and outside surfaces of the tube shield a dull black and to provide ventilation slots to reduce operating temperature.

#: See next page.

AUG. 1, 1953

TUBE DEPARTMENT

TENTATIVE DATA 1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY •

World Radio History



12AQ5

12AQ5

# BEAM POWER AMPLIFIER

## Maximum Circuit Values Per Tube:▲

### Grid-No.1-Circuit Resistance:\*

For fixed bias . . . . .	0.1 max.	megohm
For cathode bias . . . . .	0.5 max.	megohm

\* The type of input coupling used should not introduce too much resistance in the grid-no.1 circuit. Transformer- or impedance-coupling devices are recommended.

▲ If the grid-no.1-circuit resistance is common to two tubes, the indicated maximum values per tube should be halved.

*Curves shown under Type 6V6 also apply to 12AQ5*

12AT6



12AT6

TWIN DIODE—HIGH-MU TRIODE

MINIATURE TYPE

Heater, for Unipotential Cathode:

Voltage . . . . . 12.6 . . . . . ac or dc volts

Current . . . . . 0.15 . . . . . amp

*The 12AT6 is the same as the 6AT6 except for heater rating.*



12AT7

# 12AT7 HIGH-MU TWIN TRIODE

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Heater Arrangement	Series	Parallel	
Voltage . . . . .	12.6	6.3	ac or dc volts
Current . . . . .	0.15	0.3	amp

Direct Interelectrode Capacitances (Approx.)<sup>o</sup>:

Unit No. 1    Unit No. 2

#### Grid-Drive Operation:

Grid to Plate . . . . .	1.5	1.5	μf
Grid to Cathode . . . . .	2.2	2.2	μf
Plate to Cathode . . . . .	0.5	0.4	μf
Heater to Cathode . . . . .	2.4	2.4	μf

#### Cathode-Drive Operation:

Plate to Cathode . . . . .	0.2	0.2	μf
Grid & Heater to Cathode . . . . .	4.6	4.6	μf
Grid & Heater to Plate . . . . .	1.8	1.8	μf
Grid to Grid . . . . .	0.005 max.		μf
Plate to Plate . . . . .	0.4 max.		μf

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

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" ± 3/32"
Maximum Diameter . . . . .	7/8"
Bulb . . . . .	T-6-1/2"
Base . . . . .	Small-Button Noval 9 Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9A

- Pin 1 - Plate of Unit No. 2
- Pin 2 - Grid of Unit No. 2
- Pin 3 - Cathode of Unit No. 2
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Plate of Unit No. 1
- Pin 7 - Grid of Unit No. 1
- Pin 8 - Cathode of Unit No. 1
- Pin 9 - Heater Center-Tap

### AMPLIFIER - Class A<sub>1</sub>

Values are for each unit

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
GRID VOLTAGE:		
Negative Bias Value . . . . .	-50 max.	volts
PLATE DISSIPATION . . . . .	2.5 max.	watts

← Indicates a change

MARCH 1, 1954

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA

12AT7



12AT7

## HIGH-MU TWIN TRIODE

## PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . .	90 max.	volts
Heater positive with respect to cathode . . .	90 max.	volts

## → Characteristics:

Plate Supply Voltage . . . . .	100	250	volts
Cathode-Bias Resistor . . . . .	270	200	ohms
Amplification Factor . . . . .	60	60	
Plate Resistance (Approx.) . . . . .	15000	10900	ohms
Transconductance . . . . .	4000	5500	$\mu$ mhos
Grid Voltage (Approx.)			
for plate current of 10 $\mu$ amp . . . . .	-5	-12	volts
Plate Current . . . . .	3.7	10	ma

→ Indicates a change

MARCH 1, 1954

TUBE DEPARTMENT  
 RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

DATA



12AT7

# 12AT7 AVERAGE PLATE CHARACTERISTICS EACH UNIT

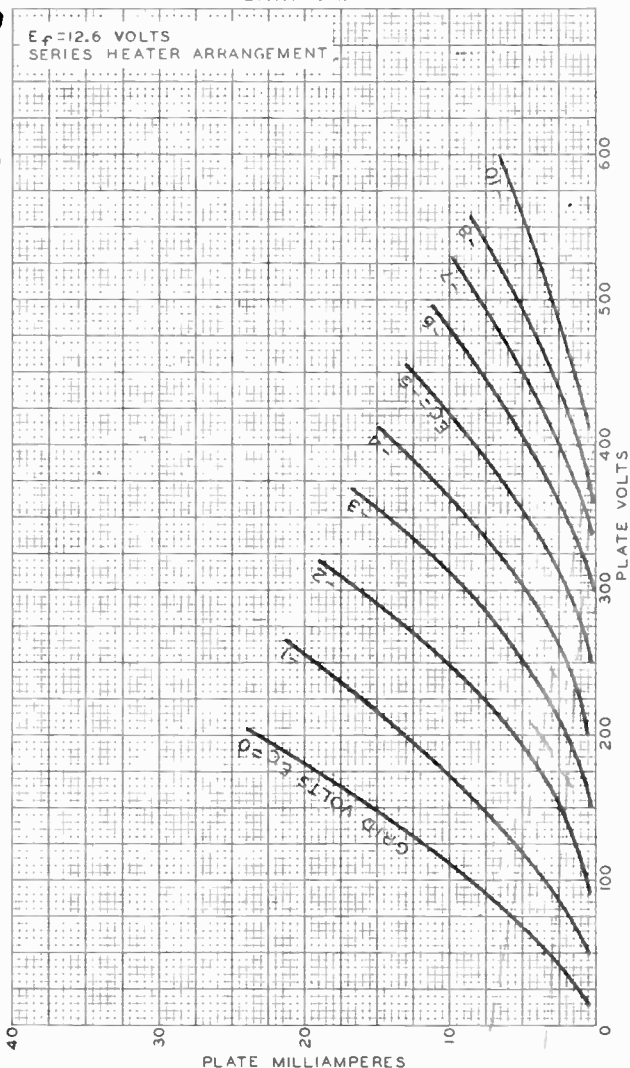


PLATE MILLIAMPERES

PLATE VOLTS

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7056

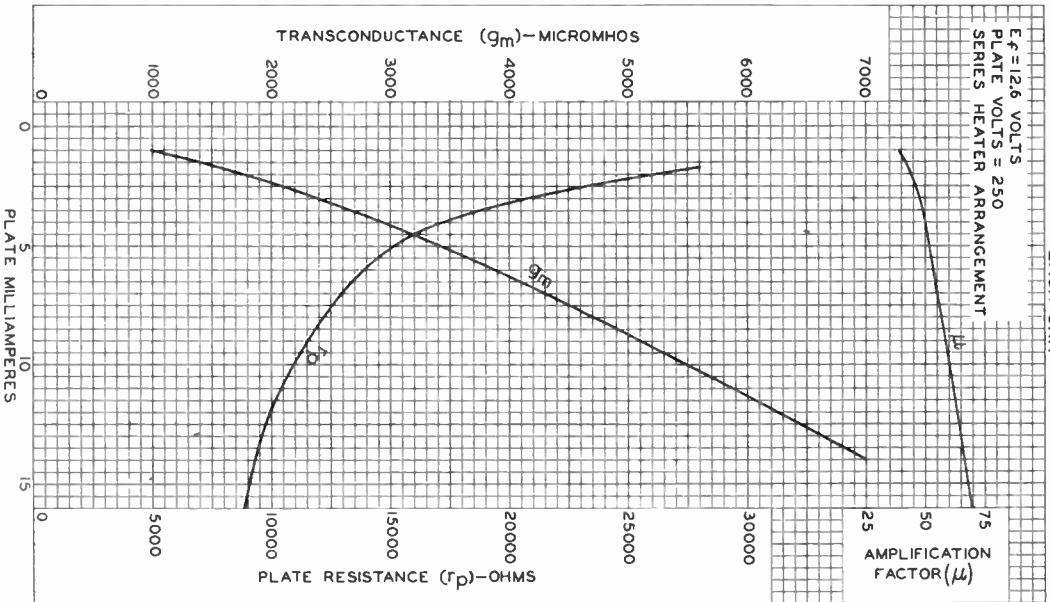
12AT7



12AT7

### AVERAGE CHARACTERISTICS EACH UNIT

$E_f = 12.6$  VOLTS  
 PLATE VOLTS = 250  
 SERIES HEATER ARRANGEMENT







12AU6

12AU6

**SHARP-CUTOFF PENTODE**

7-PIN MINIATURE TYPE

*The 12AU6 is the same as the 6AU6 except for the following items:*

Heater, for Unipotential Cathode:

Voltage . . . . .	12.6	. . . . .	ac or dc volts
Current . . . . .	0.15	. . . . .	amp





12AU7

# MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

12AU7

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Heater arrangement	Series	Parallel	
Voltage . . . . .	12.6	6.3	ac or dc volts
Current . . . . .	0.15	0.3	amp

Direct Interelectrode Capacitances (Approx.):

Unit No.1    Unit No.2

*Without external shield:*

Grid to plate . . . . .	1.5	1.5	μf
Grid to cathode and heater. . . . .	1.6	1.6	μf
Plate to cathode and heater . . . . .	0.4	0.32	μf

*With external shield, JETEC No.315, connected to cathode:*

Grid to plate . . . . .	1.5	1.5	μf
Grid to cathode and heater. . . . .	1.8	1.8	μf
Plate to cathode and heater . . . . .	2	?	μf

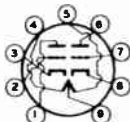
### Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):

Plate Voltage . . . . .	100	250	volts
Grid Voltage . . . . .	0	-8.5	volts
Amplification Factor. . . . .	20	17	
Plate Resistance (Approx.). . . . .	6500	7700	ohms
Transconductance. . . . .	3100	2200	μmhos
Plate Current . . . . .	11.8	10.5	ma
Grid Voltage (Approx.) for plate current of 10 μamp. . . . .	-	-24	volts

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length. . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-9/16" ± 3/32"
Maximum Diameter. . . . .	7/8"
Bulb. . . . .	T-6-1/2
Base. . . . .	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW. . . . .	9A

- Pin 1 - Plate of Unit No.2
- Pin 2 - Grid of Unit No.2
- Pin 3 - Cathode of Unit No.2
- Pins 4 & 9 - Heater of Unit No.2
- Pins 5 & 9 - Heater of Unit No.1



- Pin 6 - Plate of Unit No.1
- Pin 7 - Grid of Unit No.1
- Pin 8 - Cathode of Unit No.1
- Pin 9 - Heater Mid-Tap

← Indicates a change.

12AU7



12AU7

## MEDIUM-MU TWIN TRIODE

### AMPLIFIER - Class A<sub>1</sub>

Values are for Each Unit

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

PLATE VOLTAGE . . . . .	300 max.	volts
CATHODE CURRENT . . . . .	20 max.	ma
PLATE DISSIPATION . . . . .	2.75 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	200 max.	volts
Heater positive with respect to cathode .	200 <sup>▲</sup> max.	volts

#### Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation. . . . .	0.25 max.	megohm
For cathode-bias operation. . . . .	1.0 max.	megohm

#### Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART No.10  
at front of this Section

### HORIZONTAL DEFLECTION OSCILLATOR

Values are for Each Unit

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

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	300 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE <sup>♠</sup> . . . . .	600 max.	volts
CATHODE CURRENT:		
Peak . . . . .	300 max.	ma
Average . . . . .	20 max.	ma
PLATE DISSIPATION . . . . .	2.75 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	200 max.	volts
Heater positive with respect to cathode .	200 <sup>▲</sup> max.	volts

#### Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias, grid-resistor bias, or cathode-bias operation. . . . .	2.2 max.	megohms

### VERTICAL DEFLECTION OSCILLATOR

Values are for Each Unit

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

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	300 max.	volts
----------------------------	----------	-------

<sup>♠</sup> This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

<sup>▲</sup>, <sup>□</sup>: See next page.

→ Indicates a change.

MAR. 1, 1955

DATA 1



12AU7

12AU7

### MEDIUM-MU TWIN TRIODE

PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	400 max.	volts
CATHODE CURRENT:		
Peak . . . . .	60 max.	ma
Average. . . . .	20 max.	ma
PLATE DISSIPATION. . . . .	2.75 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup> max.	volts

**Maximum Circuit Values:**

Grid-Circuit Resistance:

For fixed-bias, grid-resistor bias, or  
cathode-bias operation . . . . . 2.2 max. megohms

### VERTICAL DEFLECTION AMPLIFIER

*Values are for Each Unit*

**Maximum Ratings, Design-Center Values Except as Noted:**

*For operation in a 525-line, 30-frame system<sup>□</sup>*

DC PLATE VOLTAGE . . . . .	300 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE <sup>#</sup> (Absolute maximum) . . . . .	1200 <sup>■</sup> max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	250 max.	volts
CATHODE CURRENT:		
Peak . . . . .	60 max.	ma
Average. . . . .	20 max.	ma
PLATE DISSIPATION. . . . .	2.75 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup> max.	volts

**Maximum Circuit Values:**

Grid-Circuit Resistance:

For cathode-bias operation . . . . . 2.2 max. megohms

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

<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

<sup>#</sup> This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

<sup>■</sup> Under no circumstances should this absolute value be exceeded.

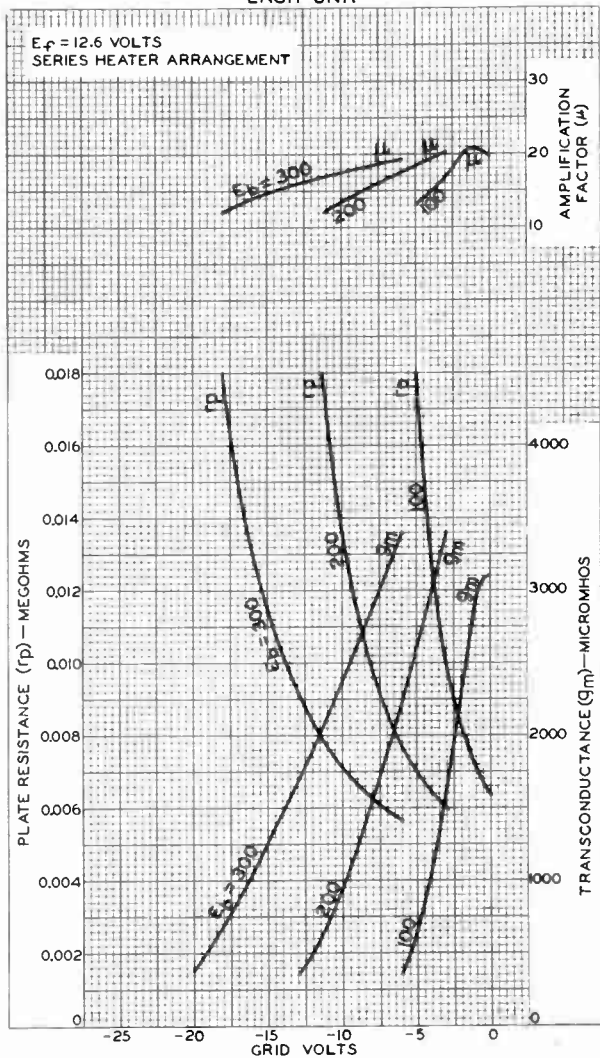
The curves under Type 6C4 also apply to each unit  
of the 12AU7

12AU7



# 12AU7

## AVERAGE CHARACTERISTICS EACH UNIT





12AU7-A

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

*For applications critical as to microphonics*

The 12AU7-A has the same *maximum ratings, characteristics, typical operation, mechanical data, and curves* as the 12AU7.

12AU7-A







12AV5-GA  
12AV6

# 12AV5-GA BEAM POWER TUBE

*Intended for use in equipment having  
series heater-string arrangement*

*The 12AV5-GA is the same as the 6AV5-GA except for the following items:*

Heater, for Unipotential Cathode:

Voltage . . . . .	12.6	. . . . . ac or dc volts
Current . . . . .	0.6	. . . . . amp
Warm-up time (Average) . . . . .	11	. . . . . sec

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*

# 12AV6 TWIN DIODE-HIGH-MU TRIODE

7-PIN MINIATURE TYPE

*The 12AV6 is the same as the 6AV6 except for the following items:*

Heater, for Unipotential Cathode:

Voltage . . . . .	12.6	. . . . . ac or dc volts
Current . . . . .	0.15	. . . . . amp





12AV7

12AV7

# MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Heater Arrangement	Series	Parallel	
Voltage . . . . .	12.6	6.3	ac or dc volts
Current . . . . .	0.225	0.45	amp

Direct Interelectrode Capacitances:

	Unit No. 1	Unit No. 2	
<i>Without external shield:</i>			
Grid to plate . . . . .	1.9	1.9	$\mu\mu\text{f}$
Grid to cathode and heater.	3.1	3.1	$\mu\mu\text{f}$
Plate to cathode. . . . .	0.24	0.24	$\mu\mu\text{f}$
Plate to cathode and heater	0.5	0.4	$\mu\mu\text{f}$
Plate to grid and heater. .	2	2	$\mu\mu\text{f}$
Cathode to grid and heater.	6.9	6.9	$\mu\mu\text{f}$
Cathode to heater . . . . .	3.8	3.8	$\mu\mu\text{f}$

*With external shield, JETEC No. 315, connected to cathode, except as noted:*

Grid to plate . . . . .	1.9	1.9	$\mu\mu\text{f}$
Grid to cathode and heater.	3.2	3.2	$\mu\mu\text{f}$
Plate to cathode. . . . .	0.24	0.23	$\mu\mu\text{f}$
Plate to cathode and heater	1.3	1.6	$\mu\mu\text{f}$
Plate to grid, heater, and external shield . . . . .	2.8	3.2	$\mu\mu\text{f}$
Cathode to grid, heater, and external shield . .	7	7	$\mu\mu\text{f}$
Heater to cathode . . . . .	4	4	$\mu\mu\text{f}$

### Mechanical:

- Mounting Position . . . . . Any
- Maximum Overall Length . . . . . 2-3/16"
- Maximum Seated Length . . . . . 1-15/16"
- Maximum Diameter . . . . . 7/8"
- Bulb . . . . . T-6-1/2
- Base . . . . . Small-Button Noval 9-Pin (JETEC No. E9-1)
- Basing Designation for BOTTOM VIEW . . . . . 9A

- |                                  |  |                               |
|----------------------------------|--|-------------------------------|
| Pin 1 - Plate of Unit No. 2      |  | Pin 6 - Plate of Unit No. 1   |
| Pin 2 - Grid of Unit No. 2       |  | Pin 7 - Grid of Unit No. 1    |
| Pin 3 - Cathode of Unit No. 2    |  | Pin 8 - Cathode of Unit No. 1 |
| Pins 4, 9 - Heater of Unit No. 2 |  | Pin 9 - Heater Mid-Tap        |
| Pins 5, 8 - Heater of Unit No. 1 |  |                               |

12AV7



12AV7

## MEDIUM-MU TWIN TRIODE

AMPLIFIER - Class A<sub>1</sub>

Values are for Each Unit

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
GRID VOLTAGE:		
Negative bias value . . . . .	-50 max.	volts
PLATE DISSIPATION . . . . .	2.7 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	90 max.	volts
Heater positive with respect to cathode .	90 max.	volts

## Typical Operation and Characteristics:

Plate Supply Voltage . . . . .	100	150	volts
Cathode-Bias Resistor . . . . .	120	56	ohms
Amplification Factor . . . . .	37	41	
Plate Resistance . . . . .	6100	4800	ohms
Transconductance . . . . .	6100	8500	$\mu$ mhos
Plate Current . . . . .	9	18	ma
Grid Voltage (Approx.) for plate current of 10 $\mu$ amp . . . . .	-8	-12	volts

JUNE 14, 1954

TUBE DIVISION

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History



12AW6

12AW6

# SHARP-CUTOFF PENTODE

MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	12.6	ac or dc volts
Current . . . . .	0.15	amp

Direct Interelectrode Capacitances (Approx.)<sup>o</sup>:

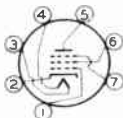
Grid to Plate . . . . .	0.025 max.	$\mu\mu\text{f}$
Input . . . . .	6.5	$\mu\mu\text{f}$
Output . . . . .	1.5	$\mu\mu\text{f}$

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

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length from Base Seat to Eulb Top (excluding tip) . . . . .	1-1/2" + 3/32"
Maximum Diameter . . . . .	3/4"
Eulb . . . . .	T-5-1/2
Base . . . . .	Small-Button Miniature 7-Pin
Basing Designation for BOTTOM VIEW . . . . .	7CM

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



Pin 6 - Grid No. 2  
 Pin 7 - Grid No. 3,  
 Internal  
 Shield

### AMPLIFIER - Class A<sub>1</sub> Pentode Connection

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
GRID-No. 2 (SCREEN) VOLTAGE . . . . .	150 max.	volts
GRID-No. 2 SUPPLY VOLTAGE . . . . .	300 max.	volts
GRID-No. 1 (CONTROL-GRID) VOLTAGE:		
Negative bias value . . . . .	50 max.	volts
Positive bias value . . . . .	0 max.	volts
PLATE DISSIPATION . . . . .	2 max.	watts
GRID-No. 2 DISSIPATION . . . . .	0.5 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	90 max.	volts
Heater positive with respect to cathode . . . . .	90 max.	volts

### Typical Operation and Characteristics:

Plate Voltage . . . . .	100	125	250	volts
Grid-No. 3 (Suppressor) Voltage <sup>o</sup> . . . . .	Connected to cathode at socket			
Grid-No. 2 Voltage . . . . .	100	125	150	volts
Cathode-Bias Resistor . . . . .	100	100	200	ohms

<sup>o</sup> See next page.

12AW6



12AW6

## SHARP-CUTOFF PENTODE

Plate Resistance (Approx.)	0.3	0.5	0.8	. . .	megohm
Transconductance . . . . .	4750	5100	5000	. . .	$\mu$ mhos
Grid-No.1 Voltage for plate current of 10 $\mu$ amp	-5	-6	-8	. . .	volts
Plate Current . . . . .	5.5	7.2	7	. . .	ma.
Grid-No.2 Current . . . . .	1.6	2.1	2	. . .	ma.

AMPLIFIER - Class A<sub>1</sub>Triode Connection<sup>▲</sup>**Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE. . . . .	300 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative bias value . . . . .	50 max.	volts
Positive bias value . . . . .	0 max.	volts
PLATE AND GRID-No.2 DISSIPATION (Total)	2.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

**Typical Operation and Characteristics:**

Plate Voltage. . . . .	180	250	. . .	volts
Cathode-Bias Resistor . . . . .	350	825	. . .	ohms
Plate Resistance . . . . .	7900	11000	. . .	ohms
Amplification Factor . . . . .	45	42		
Transconductance . . . . .	5700	3800	. . .	$\mu$ mhos
Plate Current. . . . .	7.0	5.5	. . .	ma.

□ Grid-No.3 is not suitable for use as a control or signal electrode.

▲ Grid-No.2 tied to plate and grid-No.3 tied to cathode.

APRIL 15, 1947

TUBE DEPARTMENT

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

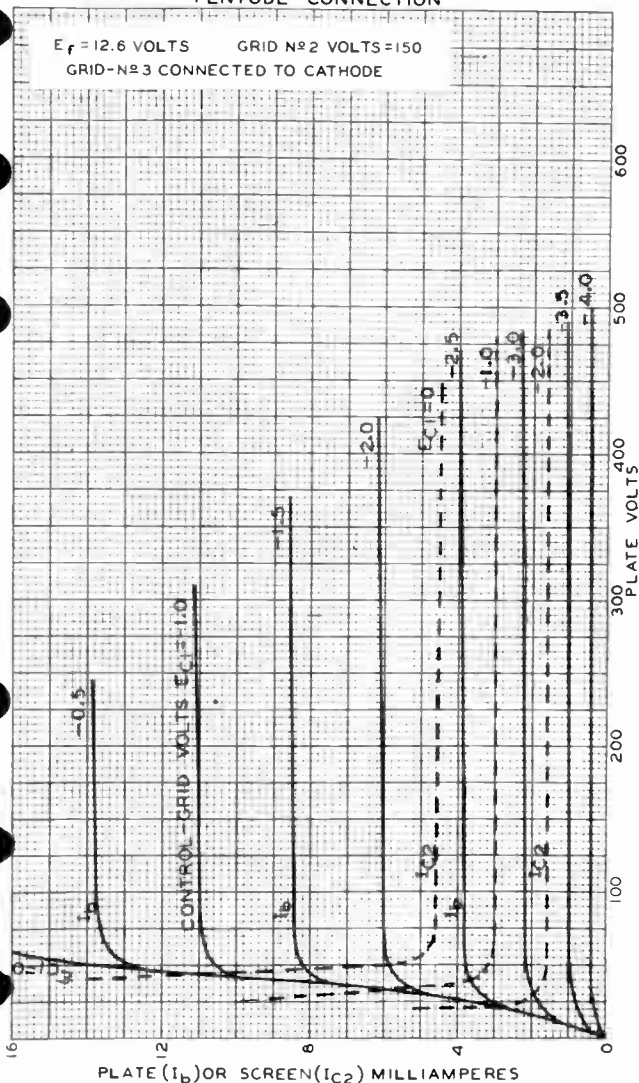
World Radio History



12AW6

# 12AW6 AVERAGE PLATE CHARACTERISTICS PENTODE CONNECTION

$E_f = 12.6$  VOLTS      GRID N<sup>o</sup>2 VOLTS = 150  
GRID-N<sup>o</sup>3 CONNECTED TO CATHODE



MARCH 26, 1947

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-6855

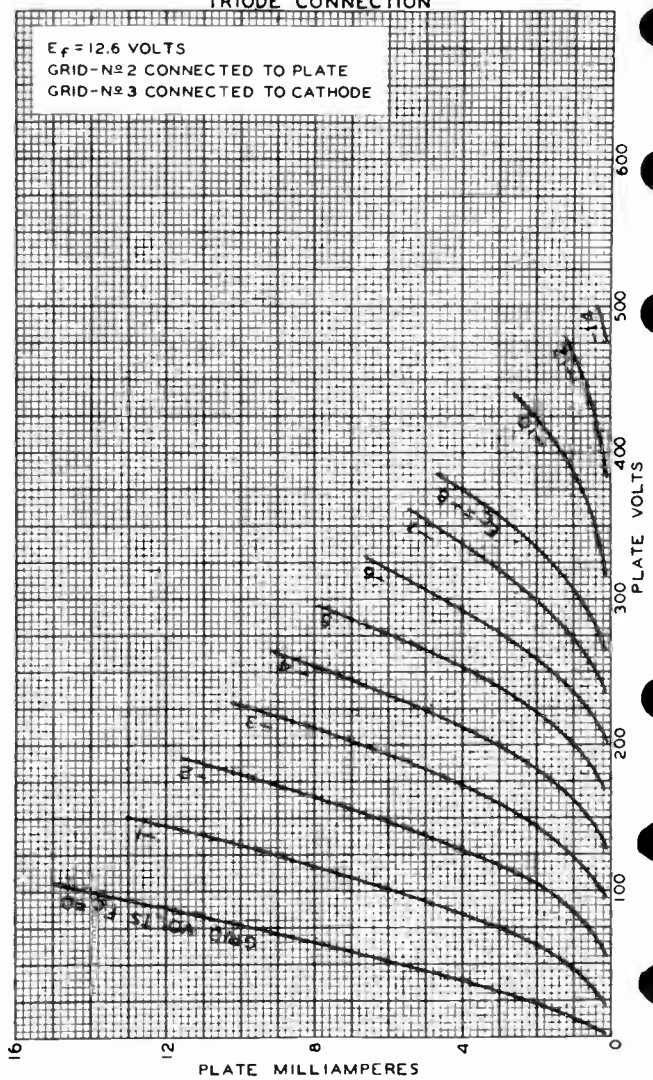
12AW6



12AW6

AVERAGE PLATE CHARACTERISTICS  
TRIODE CONNECTION

$E_f = 12.6$  VOLTS  
GRID-N<sup>o</sup>2 CONNECTED TO PLATE  
GRID-N<sup>o</sup>3 CONNECTED TO CATHODE



MARCH 26, 1947

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6856





12AX4-GT  
12AX4-GTA

## 12AX4-GT HALF-WAVE VACUUM RECTIFIER

*For Television Damper Service*

Heater, for Unipotential Cathode:

Voltage . . . . .	12.6	. . . . .	ac or dc volts
Current . . . . .	0.6	. . . . .	amp

*The 12AX4-GT is the same as the 6AX4-GT except for heater rating.*

## 12AX4-GTA

### HALF-WAVE VACUUM RECTIFIER

*Intended for TV damper service in equipment  
having series heater-string arrangement*

*The 12AX4-GTA is the same as the 6AX4-GT except for the following items:*

Heater, for Unipotential Cathode:

Voltage . . . . .	12.6	. . . . .	ac or dc volts
Current . . . . .	0.6	. . . . .	amp
Warm-up time (Average). . . . .	11	. . . . .	sec

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*





12AX7

12AX7

# HIGH-MU TWIN TRIODE

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Heater Arrangement	Series	Parallel	
Voltage . . . . .	12.6	6.3	ac or dc volts
Current . . . . .	0.15	0.3	amp

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

	Unit No. 1	Unit No. 2	
Grid to plate . . . . .	1.7	1.7	μf
Grid to cathode and heater . . . . .	1.6	1.6	μf ←
Plate to cathode and heater . . . . .	0.46	0.34	μf ←

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-5/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" ± 3/32"
Maximum Diameter . . . . .	7/8"
Bulb . . . . .	T-6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JETEC No. E9-1) ←

Basing Designation for BOTTOM VIEW . . . . . 9A

Pin 1 - Plate of Unit No. 2	Pin 6 - Plate of Unit No. 1
Pin 2 - Grid of Unit No. 2	Pin 7 - Grid of Unit No. 1
Pin 3 - Cathode of Unit No. 2	Pin 8 - Cathode of Unit No. 1
Pins 4 & 9 - Heater of Unit No. 2	Pin 9 - Heater Mid-Tap ←
Pins 5 & 9 - Heater of Unit No. 1	



### AMPLIFIER—Class A<sub>1</sub>

Values are for Each Unit

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
GRID VOLTAGE:		
Negative bias value . . . . .	50 max.	volts
Positive bias value . . . . .	0 max.	volts
PLATE DISSIPATION . . . . .	1 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	180 max.	volts
Heater positive with respect to cathode . . . . .	180 max.	volts

### Characteristics:

Plate Voltage . . . . .	100	250	volts
-------------------------	-----	-----	-------

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

← Indicates a change.

12AX7



12AX7

## HIGH-MU TWIN TRIODE

Grid Voltage . . . . .	-1	-2	. . . . .	volts
Amplification Factor . . . .	100	100		
Plate Resistance . . . . .	80000	62500	. . . . .	ohms
Transconductance . . . . .	1250	1600	. . . . .	$\mu$ mhos
Plate Current. . . . .	0.5	1.2	. . . . .	ma

→ **Typical Operation as Resistance-Coupled Amplifier:**

See *RESISTANCE-COUPLED AMPLIFIER CHART No. 25*  
at front of this Section

→ Indicates a change.

NOV. 5, 1954

TUBE DIVISION

DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

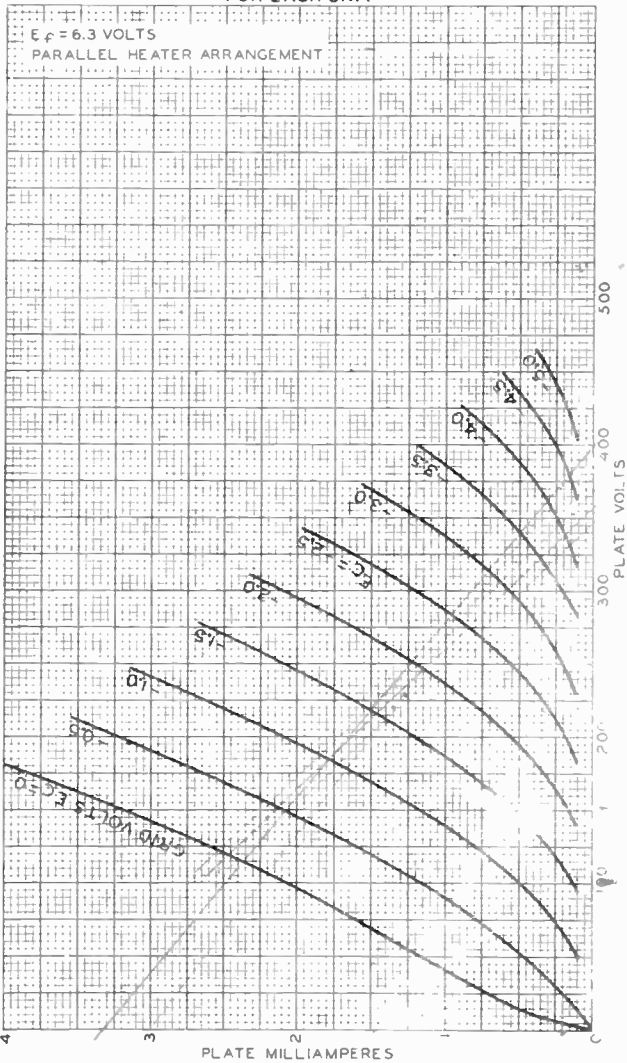
World Radio History



12AX7

AVERAGE PLATE CHARACTERISTICS  
FOR EACH UNIT

12AX7



JULY 30, 1947

TUBE DEPARTMENT

92CM-6879

RAD O CORPORATION OF AMERICA, HARRISON, NEW JERSEY

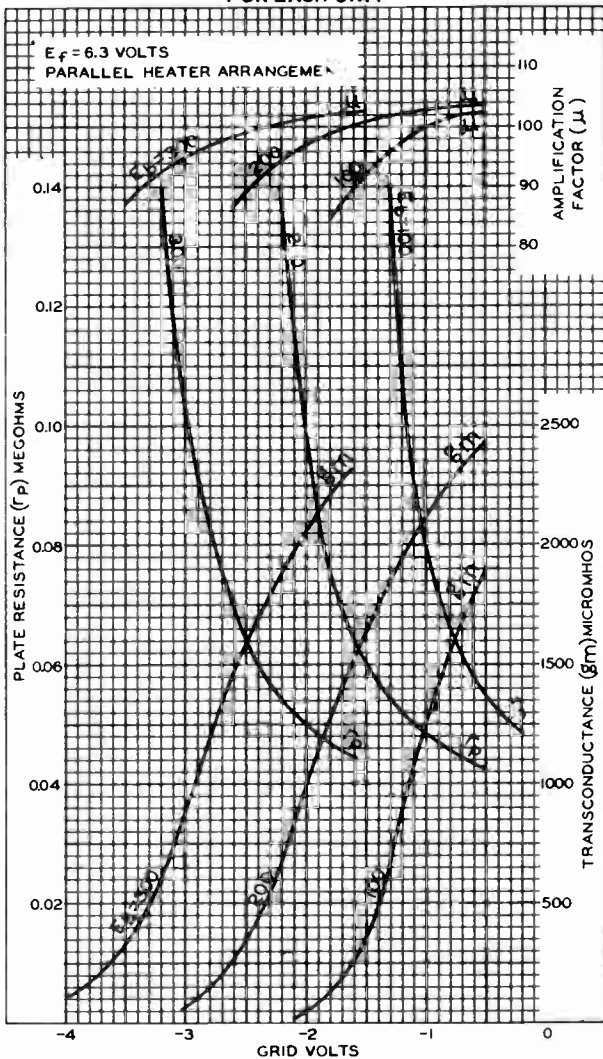
World Radio History

12AX7



12AX7

### AVERAGE CHARACTERISTICS FOR EACH UNIT



JULY 30, 1947

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6880



12AY7

12AY7

# MEDIUM-MU TWIN TRIODE

MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Heater Arrangement	Series	Parallel
Voltage . . . . .	12.6*	6.3 ac or dc volts
Current . . . . .	0.15	0.3 . . . . . amp

Direct Interelectrode Capacitances (Without External Shield)—Each Unit:

Grid to Plate . . . . .	1.3	$\mu\text{f}$
Input . . . . .	1.3	$\mu\text{f}$
Output . . . . .	0.6	$\mu\text{f}$

### Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):

Plate Voltage . . . . .	250	volts
Grid Voltage . . . . .	-4	volts
Amplification Factor . . . . .	40	
Plate Resistance (Approx.) . . . . .	22800	ohms
Transconductance . . . . .	1750	$\mu\text{mhos}$
Plate Current . . . . .	3	ma
Grid Voltage (Approx.) for plate current of 10 $\mu\text{amp}$ . . . . .	-11	volts

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" $\pm$ 3/32"
Maximum Diameter . . . . .	7/8"
Bulb . . . . .	T-6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JETEC No. E9-1)

Basing Designation for BOTTOM VIEW . . . . . 9A

Pin 1 - Plate of Unit No.2		Pin 6 - Plate of Unit No.1
Pin 2 - Grid of Unit No.2		Pin 7 - Grid of Unit No.1
Pin 3 - Cathode of Unit No.2		Pin 8 - Cathode of Unit No.1
Pin 4 - Heater		Pin 9 - Heater
Pin 5 - Heater		Mid-Tap

\* Use of the 12.6-volt connection with an ac-heater supply is not recommended for applications involving low hum.

(continued on next page)

12AY7



12AY7

## MEDIUM-MU TWIN TRIODE

### AMPLIFIER-Class A<sub>1</sub>

*Values are for each unit*

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

PLATE VOLTAGE . . . . .	300 max.	volts
GRID VOLTAGE:		
Negative bias value . . . . .	50 max.	volts
Positive bias value . . . . .	0 max.	volts
PLATE DISSIPATION . . . . .	1.5 max.	watts
CATHODE CURRENT . . . . .	10 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	90 max.	volts
Heater positive with respect to cathode . . . . .	90 max.	volts

#### Typical Operation as Resistance-Coupled Amplifier:

*See RESISTANCE-COUPLED AMPLIFIER CHART No.28  
at front of Receiving Tube Section*

APRIL 1, 1953

TENTATIVE DATA

**TUBE DEPARTMENT**  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

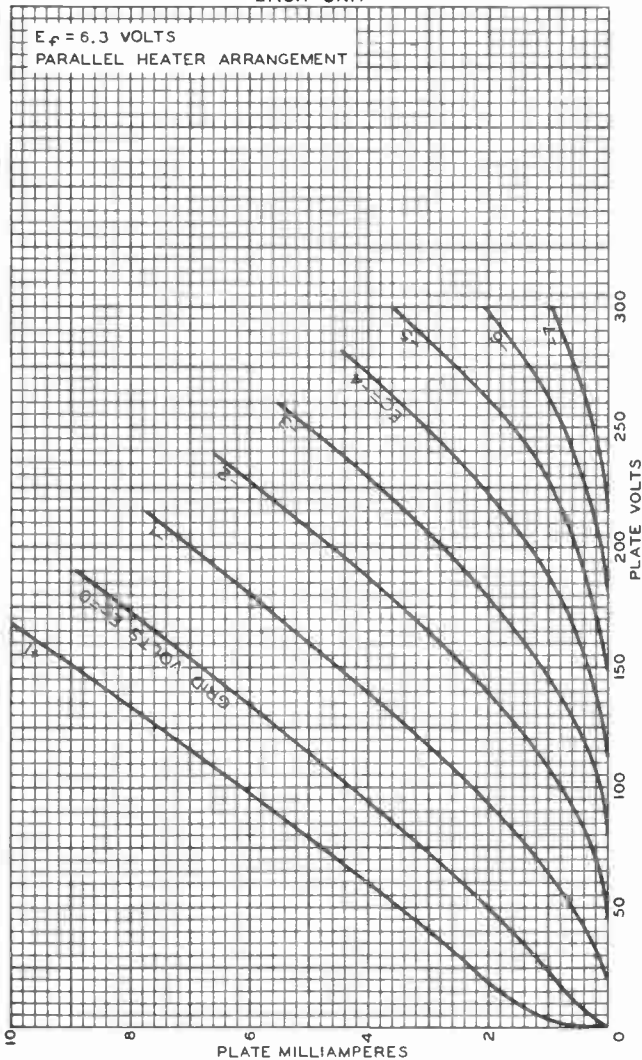




12AY7

### AVERAGE PLATE CHARACTERISTICS EACH UNIT

$E_f = 6.3$  VOLTS  
PARALLEL HEATER ARRANGEMENT



12AY7

NOV. 5, 1952

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-7861





12AZ7

# 12AZ7

## HIGH-MU TWIN TRIODE

9-PIN MINIATURE TYPE

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathodes:

Heater arrangement	Series	Parallel	
Voltage . . . . .	12.6	6.3	ac or dc volts
Current . . . . .	0.225	0.45	amp

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	With External Shield <sup>o</sup>	
--	-------------------------	-----------------------------------	--

#### Grid-Drive Operation:

Grid to plate (Each unit) . . . . .	1.9	1.9	$\mu\mu\text{f}$
Grid to heater and cathode (Each unit) . . . . .	3.1	3.2	$\mu\mu\text{f}$
Plate to heater and cathode (Unit No.1) . . . . .	0.5	1.3	$\mu\mu\text{f}$
Plate to heater and cathode (Unit No.2) . . . . .	0.4	1.6	$\mu\mu\text{f}$
Heater to cathode (Each unit) . . . . .	3.8	4	$\mu\mu\text{f}$

#### Cathode-Drive Operation:

Plate to cathode (Each unit). . . . .	0.24	0.23 <sup>o</sup>	$\mu\mu\text{f}$
Cathode to grid and heater (Each unit). . . . .	6.9	7 <sup>o</sup>	$\mu\mu\text{f}$
Plate to grid and heater (Unit No.1). . . . .	2	2.8 <sup>o</sup>	$\mu\mu\text{f}$
Plate to grid and heater (Unit No.2). . . . .	2	3.2 <sup>o</sup>	$\mu\mu\text{f}$

#### Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):

Plate-Supply Voltage. . . . .	100	250	volts
Cathode Resistor. . . . .	270	200	ohms
Amplification Factor. . . . .	60	60	
Plate Resistance (Approx.). . . . .	15000	10900	ohms
Transconductance. . . . .	4000	5500	$\mu\text{mhos}$
Plate Current . . . . .	3.7	10	ma
Grid Voltage (Approx.) for plate current of 10 $\mu\text{a}$ . . . . .	-5	-12	volts

#### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length. . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" $\pm$ 3/32"
Maximum Diameter. . . . .	7/8"
Dimensional Outline . . . . .	See General Section
Bulb. . . . .	T6-1/2

<sup>o</sup> with external shield JETEC No.315 connected to cathode of unit under test except as noted.

<sup>•</sup> with external shield JETEC No.315 connected to grid of unit under test.

← Indicates a change.

12AZ7



12AZ7

## HIGH-MU TWIN TRIODE

Base . . . . . Small-Button Noval 9-Pin (JETEC No.E9-1)  
 Basing Designation for BOTTOM VIEW . . . . . 9A

Pin 1 - Plate of  
 Unit No.2

Pin 2 - Grid of  
 Unit No.2

Pin 3 - Cathode of  
 Unit No.2

Pins 4 & 9 - Heater of  
 Unit No.2

Pins 5 & 9 - Heater of  
 Unit No.1



Pin 6 - Plate of  
 Unit No.1

Pin 7 - Grid of  
 Unit No.1

Pin 8 - Cathode of  
 Unit No.1

Pin 9 - Heater  
 Mid-Tap

AMPLIFIER - Class A<sub>1</sub>

Values are for Each Unit

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . . 300<sup>\*</sup> max. volts

## GRID VOLTAGE:

Negative bias value . . . . . 50 max. volts

PLATE DISSIPATION . . . . . 2.5 max. watts

## → PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. 200 max. volts

Heater positive with respect to cathode. 200<sup>▲</sup> max. volts

## → Maximum Circuit Values:

## Grid-Circuit Resistance:

For fixed-bias operation . . . . . 0.25 max. megohm

For cathode-bias operation . . . . . 1.0 max. megohm

▲ The dc component must not exceed 100 volts.

→ Curves shown under Type 12AT7 also apply to the 12AZ7

→ Indicates a change.



12B4-A

# 12B4-A LOW-MU TRIODE

9-PIN MINIATURE TYPE

Intended for use in equipment having  
series heater-string arrangement

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Heater arrangement	Series	Parallel	
Voltage . . . . .	12.6	6.3	ac or dc volts
Current . . . . .	0.300	0.600	amp
Warm-up time (Average) . . . . .	-	11	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid to plate . . . . .	4.8	$\mu\text{mf}$
Grid to cathode and heater . . . . .	5	$\mu\text{mf}$
Plate to cathode and heater . . . . .	1.5	$\mu\text{mf}$

### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	150	volts
Grid Voltage . . . . .	-17.5	volts
Amplification Factor . . . . .	6.5	
Plate Resistance (Approx.) . . . . .	1030	ohms
Transconductance . . . . .	6300	$\mu\text{mhos}$
Plate Current . . . . .	34	ma
Grid Voltage (Approx.) for plate current of 200 $\mu\text{amp}$ . . . . .	-32	volts
Plate Current for grid voltage of -23 volts . . . . .	9.6	ma

### 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 (JETEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9AG

- Pin 1 - Cathode
- Pin 2 - Grid
- Pin 3 - Heater  
Mid-Tap
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - No Connection
- Pin 7 - Grid
- Pin 8 - No Connection
- Pin 9 - Plate

<sup>o</sup> with external shield JETEC No. 315 connected to cathode.

MAY 1, 1955

TENTATIVE DATA



## 12B4-A

## LOW-MU TRIODE

AMPLIFIER - Class A<sub>1</sub>

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	550	max.	volts
GRID VOLTAGE:			
Negative bias value. . . . .	50	max.	volts
PLATE DISSIPATION. . . . .	5.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200	max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup>	max.	volts

## Maximum Circuit Values:

Grid-Circuit Resistance:			
For fixed-bias operation . . . . .	0.47	max.	megohm
For cathode-bias operation . . . . .	2.2	max.	megohms

## VERTICAL DEFLECTION AMPLIFIER

## Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	550	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum) <sup>#</sup> . . . . .	1000 <sup>■</sup>	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE . . .	250	max.	volts
CATHODE CURRENT:			
Peak . . . . .	105	max.	ma
Average . . . . .	30	max.	ma
PLATE DISSIPATION. . . . .	5.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200	max.	volts
Heater negative with respect to cathode . . . . .	200 <sup>▲</sup>	max.	volts

## Maximum Circuit Values:

Grid-Circuit Resistance:			
For cathode-bias operation . . . . .	2.2	max.	megohms

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

<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

<sup>#</sup> This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent. of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent. of one vertical scanning cycle is 2.5 milliseconds.

<sup>■</sup> Under no circumstances should this absolute value be exceeded.



12BA6  
TO  
12BF6

## 12BA6

### REMOTE-CUTOFF PENTODE

MINIATURE TYPE

Heater, for Unipotential Cathode:

Voltage. . . . . 12.6 . . . . . ac or dc volts

Current. . . . . 0.15 . . . . . amp

*The 12BA6 is the same as the 6BA6 except for heater rating.*

## 12BA7

### PENTAGRID CONVERTER

9-PIN MINIATURE TYPE

Heater, for Unipotential Cathode:

Voltage. . . . . 12.6 . . . . . ac or dc volts

Current. . . . . 0.15 . . . . . amp

*The 12BA7 is the same as the 6BA7 except for heater rating.*

## 12BD6

### REMOTE-CUTOFF PENTODE

MINIATURE TYPE

Heater, for Unipotential Cathode:

Voltage. . . . . 12.6 . . . . . ac or dc volts

Current. . . . . 0.15 . . . . . amp

*The 12BD6 is the same as the 6BD6 except for heater rating.*

## 12BE6

### PENTAGRID CONVERTER

MINIATURE TYPE

Heater, for Unipotential Cathode:

Voltage. . . . . 12.6 . . . . . ac or dc volts

Current. . . . . 0.15 . . . . . amp

*The 12BE6 is the same as the 6BE6 except for heater rating.*

## 12BF6

### TWIN DIODE—MEDIUM-MU TRIODE

MINIATURE TYPE

Heater, for Unipotential Cathode:

Voltage. . . . . 12.6 . . . . . ac or dc volts

Current. . . . . 0.15 . . . . . amp

*The 12BF6 is the same as the 6BF6 except for heater rating.*







12BH7-A

# 12BH7-A

## MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having series heater-string arrangement*

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathodes:

Heater arrangement	Series	Parallel	
Voltage . . . . .	12.6	6.3	ac or dc volts
Current . . . . .	0.3	0.6	amp
Warm-up time (Average) . . . . .	—	11	sec

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

	Unit No. 1	Unit No. 2	
Grid to plate . . . . .	2.6	2.6	$\mu\mu\text{f}$
Grid to cathode and heater . . . . .	3.2	3.2	$\mu\mu\text{f}$
Plate to cathode and heater . . . . .	0.5	0.4	$\mu\mu\text{f}$
Plate of unit No. 1 to plate of unit No. 2 . . . . .	0.8		$\mu\mu\text{f}$

#### 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 (JETEC No. E9-1)

Basing Designation for BOTTOM VIEW . . . . . 9A

- |                                   |  |                               |
|-----------------------------------|--|-------------------------------|
| Pin 1 - Plate of Unit No. 2       |  | Pin 6 - Plate of Unit No. 1   |
| Pin 2 - Grid of Unit No. 2        |  | Pin 7 - Grid of Unit No. 1    |
| Pin 3 - Cathode of Unit No. 2     |  | Pin 8 - Cathode of Unit No. 1 |
| Pins 4 & 9 - Heater of Unit No. 2 |  | Pin 9 - Heater Mid-Tap        |
| Pins 5 & 8 - Heater of Unit No. 1 |  |                               |

### AMPLIFIER - Class A<sub>1</sub>

Values are for Each Unit

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

PLATE VOLTAGE . . . . . 300 max. volts

<sup>o</sup> without external shield.

12BH7-A



12BH7-A

MEDIUM-MU TWIN TRIODE

GRID VOLTAGE:

Negative bias value . . . . .	50 max.	volts
Positive bias value . . . . .	0 max.	volts

CATHODE CURRENT . . . . .	20 max.	ma
PLATE DISSIPATION . . . . .	3.5 max.	watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode .	200 max.	volts
Heater positive with respect to cathode .	200 <sup>▲</sup> max.	volts

Characteristics:

Plate Voltage . . . . .	250	volts
Grid Voltage . . . . .	-10.5	volts
Amplification Factor . . . . .	16.5	
Plate Resistance (Approx.) . . . . .	5300	ohms
Transconductance . . . . .	3100	$\mu$ ms
Plate Current . . . . .	11.5	ma
Plate Current for grid voltage of -14 volts . . . . .	4	ma
Grid Voltage (Approx.) for plate current of 50 $\mu$ amp . . . . .	-23	volts

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation . . . . .	0.25 max.	megohms
For cathode-bias operation . . . . .	1.0 max.	megohms

HORIZONTAL DEFLECTION OSCILLATOR

Values are for Each Unit

Maximum Ratings, Design-Center Values:

<sup>□</sup> For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	450 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE <sup>♣</sup> . . . . .	600 max.	volts
CATHODE CURRENT:		
Peak . . . . .	300 max.	ma
Average . . . . .	20 max.	ma
PLATE DISSIPATION . . . . .	3.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	200 max.	volts
Heater positive with respect to cathode .	200 <sup>▲</sup> max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias, grid-resistor bias, or cathode-bias operation . . . . .	2.2 max.	megohms

<sup>♣</sup> This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

<sup>▲</sup>, <sup>□</sup>: See next page.



12BH7-A

12BH7-A

# MEDIUM-MU TWIN TRIODE

## VERTICAL DEFLECTION OSCILLATOR

Values are for Each Unit

### Maximum Ratings, Design-Center Values:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	450 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	400 max.	volts
CATHODE CURRENT:		
Peak . . . . .	70 max.	ma
Average. . . . .	20 max.	ma
PLATE DISSIPATION. . . . .	3.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup> max.	volts

### Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias, grid-resistor bias, or cathode-bias operation . . . . . 2.2 max. megohms

## VERTICAL DEFLECTION AMPLIFIER

Values are for Each Unit

### Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system<sup>□</sup>

DC PLATE VOLTAGE . . . . .	450 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE#		
(Absolute Maximum) . . . . .	1500 <sup>■</sup> max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE . . . . .	250 max.	volts
CATHODE CURRENT:		
Peak . . . . .	70 max.	ma
Average. . . . .	20 max.	ma
PLATE DISSIPATION. . . . .	3.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup> max.	volts

### Maximum Circuit Values:

Grid-Circuit Resistance:

For cathode-bias operation . . . . . 2.2 max. megohms

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

<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

<sup>#</sup> This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

<sup>■</sup> Under no circumstances should this absolute value be exceeded.

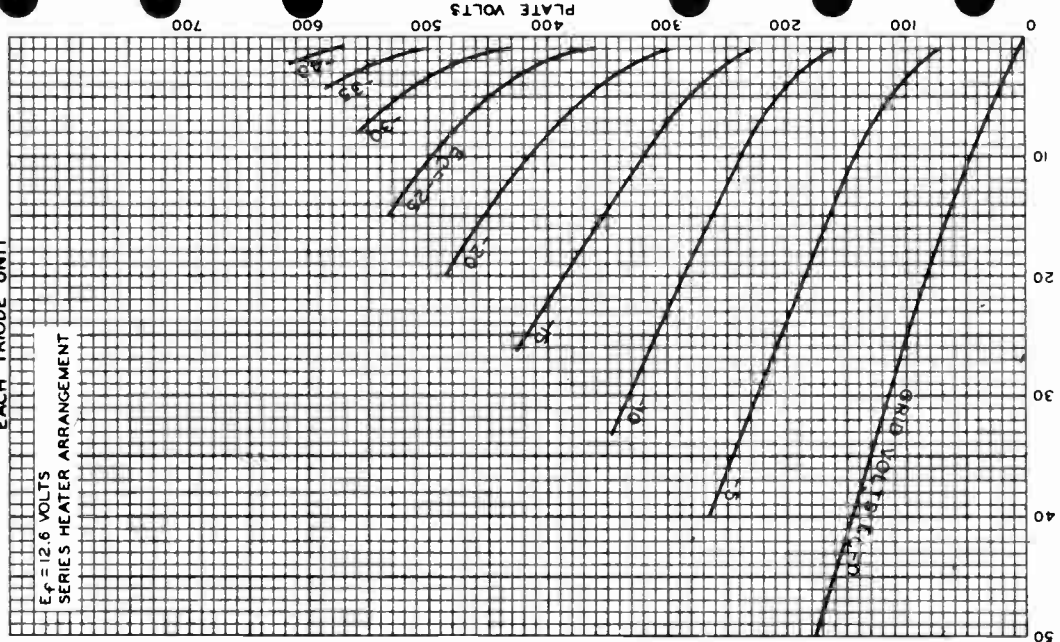
12BH7-A



12BH7-A

# AVERAGE PLATE CHARACTERISTICS EACH TRIODE UNIT

$E_f = 12.6$  VOLTS  
SERIES HEATER ARRANGEMENT



MAR. 1, 1955

PLATE MILLIAMPERES  
TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7742RI



12BK5

12BK5

# BEAM POWER TUBE

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

*The 12BK5 is the same as the 6BK5 except for the following items:*

Heater, for Unipotential Cathode:

Voltage . . . . .	12.6	. . . . .	ac or dc volts
Current . . . . .	0.6	. . . . .	amp
Warm-up time (Average) . . . . .	11	. . . . .	sec

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup>	max.	volts

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





12BL6

12BL6

# REMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

For use in automobile radio receivers operating directly from 12-volt storage batteries

## GENERAL DATA

### Electrical:

Heater<sup>•</sup>, for Unipotential Cathode:

Voltage range. . . . . 10.0 to 15.9 . . . . . dc volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.)

at 12.6 volts. . . . . 0.15 . . . . . amp

Direct Interelectrode Capacitances:<sup>0</sup>

Grid No.1 to plate . . . . . 0.006 max.  $\mu$ f

Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater. . . . . 5.5  $\mu$ f

Plate to cathode, grid No.3 & internal shield, grid No.2, and heater. . . . . 4.8  $\mu$ f

### Mechanical:

Operating Position . . . . . Any

Maximum Overall Length . . . . . 2-1/8"

Maximum Seated Length. . . . . 1-7/8"

Length, Base Seat to Bulb Top (Excluding tip). . . . . 1-1/2"  $\pm$  3/32"

Maximum Diameter . . . . . 3/4"

Dimensional Outline. . . . . See General Section

Bulb . . . . . T5-1/2

Base . . . . . Small-Button Miniature 7-Pin (JETEC No.E7-1)

Basing Designation for BOTTOM VIEW . . . . . 7BK

Pin 1 - Grid No.1

Pin 2 - Grid No.3,

Internal

Shield

Pin 3 - Heater



Pin 4 - Heater

Pin 5 - Plate

Pin 6 - Grid No.2

Pin 7 - Cathode

## AMPLIFIER — Class A<sub>1</sub>

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . . 30 max. volts

GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . . 30 max. volts

GRID-No.1 (CONTROL-GRID) VOLTAGE:

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

CATHODE CURRENT. . . . . 20 max. ma

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . . 30 max. volts

Heater positive with respect to cathode . . . . . 30 max. volts

### Characteristics with 12.6 Volts on Heater:

Plate Voltage. . . . . 12.6 volts

Grid-No.3 (Suppressor-Grid) Voltage. . . . . 0 volts

<sup>•</sup>, <sup>0</sup>: See next page.

12BL6



12BL6

## REMOTE-CUTOFF PENTODE

Grid-No.2 Voltage. . . . .	12.6	volts
Grid-No.1 Supply Voltage . . . . .	0	volts
Grid-No.1 Resistor (Bypassed). . . . .	2.2	megohms
Plate Resistance (Approx.) . . . . .	0.5	megohm
Transconductance . . . . .	1350	$\mu$ mhos
Plate Current. . . . .	1.35	ma
Grid-No.2 Current. . . . .	0.5	ma
Grid-No.1 Voltage (Approx.) for trans- conductance of 10 $\mu$ mhos. . . . .	-6	volts
Grid-No.1 and Grid-No.3 Voltage (Approx.) for transconductance of 10 $\mu$ mhos . . . . .	-5	volts

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance . . . . .	10 max.	megohms
--	---------	---------

- Operation of heater in series with other heaters is not recommended.
- With external shield JETEC No.316 connected to cathode.

### OPERATING CONSIDERATIONS

The *maximum ratings* in the tabulated data for the 12BL6 are working design-center maximums established according to the standard design-center system of rating electron tubes. Tubes so rated will give satisfactory performance in storage-battery-operated equipment provided the following stipulations are observed:

In the case of storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. This fluctuation imposes severe operating conditions on tubes. Under these conditions, the equipment should be designed so that 90 per cent of the design-center maximum value of plate voltage and grid-No.2 voltage is never exceeded for a battery-terminal potential of 13.2 volts. Although the operating voltages of the 12BL6 in this service will, at times, exceed the design-center maximum values, satisfactory performance with probable sacrifice in life will be obtained.





12BQ6-GTB

# 12BQ6-GTB/12CU6

## BEAM POWER TUBE

*Intended for use in equipment having  
series heater-string arrangement*

The 12BQ6-GTB/12CU6 is the same as the 6BQ6-GTB/6CU6 except for the following items:

Heater, for Unipotential Cathode:

Voltage. . . . .	12.6	. . . . .	ac or dc volts
Current. . . . .	0.6	. . . . .	.amp
Warm-up time (Average) .	11	. . . . .	.sec

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*





12BR7

12BR7

# TWIN DIODE-HIGH-MU TRIODE

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Heater arrangement	Series	Parallel	
Voltage . . . . .	12.6	6.3	ac or dc volts
Current . . . . .	0.225	0.45	amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Triode Unit:			
Grid to plate . . . . .	1.9		$\mu$ f
Grid to cathode and heater. . . . .	2.8		$\mu$ f
Plate to cathode and heater . . . . .	1		$\mu$ f
Diode-No.1 plate to cathode of diodes No.1 and No.2 & internal shield, and heater. . . .	2		$\mu$ f
Diode-No.2 plate to cathode of diodes No.1 and No.2 & internal shield, and heater. . . .	2		$\mu$ f

### Characteristics, Class A<sub>1</sub> Amplifier (Triode Unit):

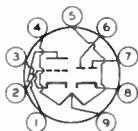
Plate-Supply Voltage. . . . .	100	250	volts
Cathode Resistor. . . . .	270	200	ohms
Amplification Factor. . . . .	60	60	
Plate Resistance (Approx.). . . . .	15000	10900	ohms
Transconductance. . . . .	4000	5500	$\mu$ mhos
Plate Current . . . . .	3.7	10	ma
Grid Voltage (Approx.) for plate current of 10 $\mu$ amp. . . . .	-5	-12	volts

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length. . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-9/16" $\pm$ 3/32"
Maximum Diameter. . . . .	7/8"
Dimensional Outline . . . . .	See General Section
Bulb. . . . .	T6-1/2
Base. . . . .	Small-Button Noval 9-Pin (JETEC No.E9-1)

Basing Designation for BOTTOM VIEW. . . . . 9CF

- |                          |  |
|--------------------------|--|
| Pin 1 - Triode Plate     | Pin 7 - Diode-No.1 Plate                               |
| Pin 2 - Triode Grid      | Pin 8 - Cathode of Diodes No.1 & No.2, Internal Shield |
| Pin 3 - Triode Cathode   | Pin 9 - Heater Mid-Tap                                 |
| Pin 4 - Heater           |  |
| Pin 5 - Heater           |  |
| Pin 6 - Diode-No.2 Plate |  |



<sup>o</sup> with external shield JETEC No.315 connected to cathode of unit under test.

12BR7



12BR7

TWIN DIODE—HIGH-MU TRIODE

TRIODE UNIT — Amplifier - Class A<sub>1</sub>

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300	max.	volts
GRID VOLTAGE:			
Negative bias value . . . . .	50	max.	volts
PLATE DISSIPATION . . . . .	2.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup>	max.	volts

DIODE UNITS - Two

Maximum Ratings, Design-Center Values:

Values are for Each Unit

PEAK INVERSE PLATE VOLTAGE . . . . .	300	max.	volts
PEAK PLATE CURRENT . . . . .	60	max.	ma
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 <sup>▲</sup>	max.	volts

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

Curve shown under Type 12AT7 also applies to the triode unit of the 12BR7



12BV7

# SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

12BV7

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Heater arrangement	Series	Parallel	
Voltage . . . . .	12.6	6.3	ac or dc volts
Current . . . . .	0.3	0.6	amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid No.1 to plate. . . . .	0.055	$\mu\text{f}$
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . .	11	$\mu\text{f}$
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . .	3	$\mu\text{f}$

### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	250	250	volts
Grid No.3 (Suppressor Grid) . . . . .	<i>Connected to cathode at socket</i>		
Grid-No.2 (Screen-Grid) Voltage . . . . .	180	150	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	-8	-	volts
Cathode Resistor . . . . .	-	68	ohms
Plate Resistance (Approx.) . . . . .	-	85000	ohms
Transconductance . . . . .	-	13000	$\mu\text{mhos}$
Plate Current . . . . .	0.5 <sup>†</sup>	27	ma
Grid-No.2 Current . . . . .	-	6	ma
Grid-No.1 Voltage (Approx.) for plate current of 20 $\mu\text{amp}$ . . . . .	-	-12	volts

### 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"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9BF

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



<sup>o</sup> without external shield.  
<sup>†</sup> Minimum value.

12BV7



12BV7

SHARP-CUTOFF PENTODE

AMPLIFIER - Class A<sub>1</sub>

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	300	max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE. . . . .	0	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . .	175	max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Negative bias value. . . . .	50	max.	volts
GRID-No.2 INPUT. . . . .	1	max.	watt
PLATE DISSIPATION. . . . .	6.25	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode .	200	max.	volts
Heater positive with respect to cathode .	200 <sup>▲</sup>	max.	volts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:			
For fixed-bias operation. . . . .	0.25	max.	megohm
For cathode-bias operation. . . . .	1.0	max.	megohm

▲ The dc component must not exceed 100 volts.



12BY7

12BY7

# SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Heater Arrangement	Series	Parallel	
Voltage . . . . .	12.6	6.3	ac or dc volts
Current . . . . .	0.3	0.6	amp

Direct Interelectrode Capacitances (Without external shield):

Grid No.1 to plate . . . . .	0.055	$\mu\text{mf}$
Grid No.1 to cathode, heater, grid No.2, and grid No.3 & internal shield . . . . .	11.1	$\mu\text{mf}$
Plate to cathode, heater, grid No.2, and grid No.3 & internal shield . . . . .	3	$\mu\text{mf}$

### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Supply Voltage . . . . .	250	volts
Grid-No.2 Voltage . . . . .	150	volts
Cathode-Bias Resistor . . . . .	68	ohms
Amplification Factor . . . . .	1200	
Plate Resistance . . . . .	90000	ohms
Transconductance . . . . .	12000	$\mu\text{mhos}$
Plate Current . . . . .	25	ma
Grid-No.2 Current . . . . .	6	ma
Grid Voltage (Approx.) for plate current of 20 $\mu\text{amp}$ . . . . .	-10	volts

### 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 (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9BF

Pin 1 - Cathode		Pin 6 - Heater
Pin 2 - Grid No.1,		- Mid-Tap
Pin 3 - Grid No.3,		Pin 7 - Plate
Int. Shield		Pin 8 - Grid No.2
Pin 4 - Heater		Pin 9 - Grid No.3,
Pin 5 - Heater		Int. Shield

## AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
GRID-No.3 (SUPPRESSOR) VOLTAGE . . . . .	0 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	175 max.	volts

12BY7



12BY7

## SHARP-CUTOFF PENTODE

## GRID-No.1 (CONTROL-GRID) VOLTAGE:

Negative bias value . . . . . 50 max. volts  
 Positive bias value . . . . . 0 max. volts

PLATE DISSIPATION . . . . . 6.25 max. watts

GRID-No.2 INPUT . . . . . 1 max. watt

## PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . 180 max. volts

Heater positive with respect to cathode . 180 max. volts

**Maximum Circuit Values:**

## Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . . 0.25 max. megohm

For cathode-bias operation . . . . . 1 max. megohm

JUNE 14, 1954

TUBE DIVISION

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History





12BY7-A

12BY7-A

# SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having series heater-string arrangement*

*The 12BY7-A is the same as the 12BY7 except for the following items:*

Heater, for Unipotential Cathode:

Heater arrangement      *Parallel*

Warm-up time (Average)      11 . . . . . sec

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . . 200 max. volts

Heater positive with respect to cathode. . . 200<sup>▲</sup>max. volts

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





12BZ7

# HIGH-MU TWIN TRIODE

9-PIN MINIATURE TYPE

12BZ7

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Heater arrangement	Series	Parallel	
Voltage . . . . .	12. <sup>A</sup>	6.3	ac or dc volts
Current . . . . .	0.3	0.6	amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

	Unit No.1	Unit No.2	
Grid to plate . . . . .	2.5	2.5	μf
Grid to cathode and heater . . . . .	6.5	6.5	μf
Plate to cathode and heater . . . . .	0.7	0.55	μf
Plate of unit No.1 to plate of unit No.2 . . . . .	1.3		μf

### Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):

Plate Voltage . . . . .	250	volts
Grid Voltage . . . . .	-2	volts
Amplification Factor . . . . .	100	
Plate Resistance (Approx.) . . . . .	31800	ohms
Transconductance . . . . .	3200	μmhos
Plate Current . . . . .	2.5	ma

### 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"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9A

Pin 1 - Plate of Unit No.2	Pin 6 - Plate of Unit No.1
Pin 2 - Grid of Unit No.2	Pin 7 - Grid of Unit No.1
Pin 3 - Cathode of Unit No.2	Pin 8 - Cathode of Unit No.1
Pins 4 & 9 - Heater of Unit No.2	Pin 9 - Heater Mid-Tap
Pins 5 & 9 - Heater of Unit No.1	



### AMPLIFIER - Class A<sub>1</sub>

Values are for Each Unit

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max. volts
-------------------------	----------------

<sup>o</sup> without external shield.

12BZ7



12BZ7

### HIGH-MU TWIN TRIODE

**GRID VOLTAGE:**

Negative bias value. . . . . 50 max. volts  
Positive bias value. . . . . 0 max. volts

**PLATE DISSIPATION.** . . . . . 1.5 max. watts

**PEAK HEATER-CATHODE VOLTAGE:**

Heater negative with respect to cathode . 180 max. volts  
Heater positive with respect to cathode . 180 max. volts

**Maximum Circuit Values:**

**Grid-Circuit Resistance:**

For contact-potential-bias operation . . 5 max. megohms



12C8

12C8

## TWIN DIODE-REMOTE-CUTOFF PENTODE

Heater, for Unipotential Cathode:

Voltage . . . . . 12.6 . . . . . ac or dc volts

Current . . . . . 0.15 . . . . . amp

*The 12C8 is the same as the 6B8 except for heater rating.*





12CA5

12CA5

# BEAM POWER TUBE

MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	12.6	ac or dc volts
Current . . . . .	0.6	amp
Warm-up time (Average) . . . . .	11	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

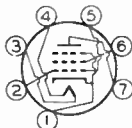
Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid No.1 to plate . . . . .	0.5	μf
Grid No.1 to cathode & grid No.3, grid No.2, and heater. . . . .	15	μf
Plate to cathode & grid No.3, grid No.2, and heater. . . . .	9	μf

### 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 . . . . .	3/4"
Bulb . . . . .	T-5-1/2
Base . . . . .	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW . . . . .	.7CV

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



Pin 4 - Heater  
Pin 5 - Grid No.1  
Pin 6 - Grid No.2  
Pin 7 - Plate

## AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	130 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	130 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value . . . . .	0 max.	volts
PLATE DISSIPATION . . . . .	5 max.	watts
GRID-No.2 INPUT . . . . .	1.4 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	200 max.	volts
Heater positive with respect to cathode. . . . .	200 <sup>▲</sup> max.	volts
BULB TEMPERATURE (At hottest point on bulb surface) . . . . .	180 max.	°C

<sup>o</sup> Without external shield.

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

MAR. 1, 1955

TUBE DIVISION

TENTATIVE DATA

12CA5



12CA5

## BEAM POWER TUBE

## Typical Operation and Characteristics:

Plate Voltage. . . . .	110	125	volts
Grid-No.2 Voltage. . . . .	110	125	volts
Grid-No.1 Voltage. . . . .	-4	-4.5	volts
Peak AF Grid-No.1 Voltage. . . . .	4	4.5	volts
Zero-Signal Plate Current. . . . .	32	37	ma
Max.-Signal Plate Current. . . . .	31	36	ma
Zero-Signal Grid-No.2 Current. . . . .	3.5	4	ma
Max.-Signal Grid-No.2 Current. . . . .	7.5	11	ma
Plate Resistance (Approx.) . . . . .	16000	15000	ohms
Transconductance . . . . .	8100	9200	$\mu$ mhos
Load Resistance. . . . .	3500	4500	ohms
Total Harmonic Distortion. . . . .	5	6	%
Max.-Signal Power Output . . . . .	1.1	1.5	watts

## Maximum Circuit Values:

## Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max. megohm
For cathode-bias operation . . . . .	0.5 max. megohm

MAR. 1, 1955

TUBE DIVISION

TENTATIVE DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

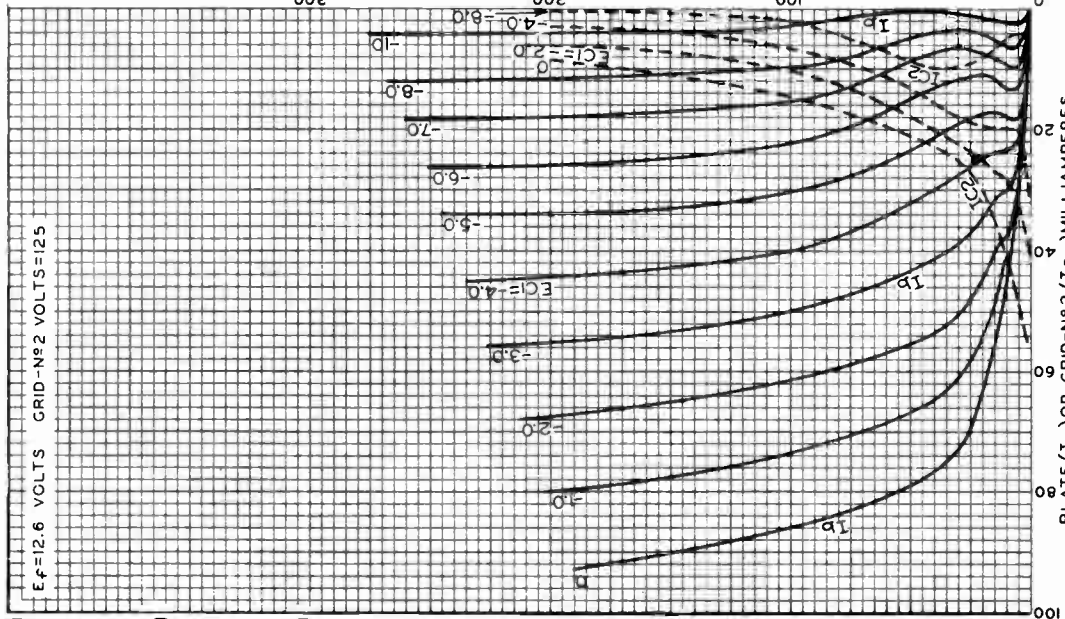




12CA5

12CA5

# AVERAGE PLATE CHARACTERISTICS



JAN. 24, 1955

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARTFORD, NEW JERSEY

PLATE ( $I_b$ ) OR GRID-NO 2 ( $I_{c2}$ ) MILLIAMPERES

92CM-8507

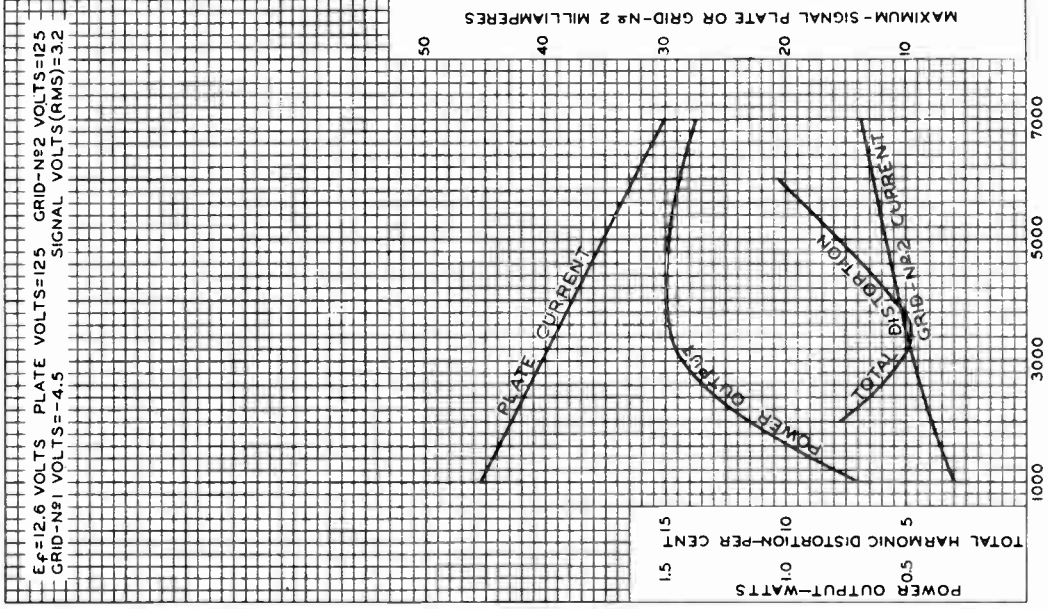
12CA5



12CA5

# OPERATION CHARACTERISTICS

$E_f = 12.6$  VOLTS PLATE VOLTS = 125 GRID-N<sup>o</sup>2 VOLTS = 125  
GRID-N<sup>o</sup>1 VOLTS = -4.5 SIGNAL VOLTS (RMS) = 3.2



World Precision

JAN. 20, 1955

LOAD RESISTANCE - OHMS

92CM-8506R1

TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



12CN5

# 12CN5

## REMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

For use in automobile radio receivers operating directly from 12-volt storage batteries

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage range. . . . . 10 to 15.9 . . . . . dc volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.)

at 12.6 volts. . . . . 0.45 . . . . . amp

Direct Interelectrode Capacitance:

	Without External Shield	With External Shield <sup>o</sup>	
Grid No.1 to plate . . . . .	0.25 max.	0.2 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"

Diameter . . . . . 0.650" to 0.750"

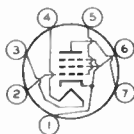
Dimensional Outline. . . . . See General Section

Bulb . . . . . T5-1/2

Base . . . . . Small-Button Miniature 7-Pin (JEDEC No. E7-1)

Basing Designation for BOTTOM VIEW . . . . . 7CV

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



Pin 4 - Heater  
Pin 5 - Grid No. 1  
Pin 6 - Grid No. 2  
Pin 7 - Plate

### AMPLIFIER ← Class A<sub>1</sub>

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

PLATE VOLTAGE. . . . . 16 max. volts

GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . . 16 max. volts

GRID-No.1 (CONTROL-GRID) VOLTAGE:  
Positive-bias value. . . . . 0 max. volts

PEAK HEATER-CATHODE VOLTAGE:  
Heater negative with respect to cathode. 16 max. volts  
Heater positive with respect to cathode. 16 max. volts

#### Characteristics with 12.6 Volts on Heater:

Plate Voltage. . . . . 12.6 volts

Grid-No.2 Voltage. . . . . 12.6 volts

<sup>o</sup> with external shield JEDEC No. 316 connected to pin 1.

12CN5



12CN5

REMOTE-CUTOFF PENTODE

Grid-No.1 Supply Voltage. . . . .	0	volts
Grid-No.1 Resistor (Bypassed) . . . . .	2.2	megohms
Plate Resistance (Approx.) . . . . .	40000	ohms
Transconductance. . . . .	3800	$\mu$ mhos
Plate Current . . . . .	4.5	ma
Grid-No.2 Current . . . . .	3.5	ma

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance. . . . .	2.2 max.	megohms
---------------------------------------	----------	---------



12CR6

# 12CR6

## DIODE-REMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage. . . . .	12.6	. . . . .	ac or dc volts
Current. . . . .	0.15	. . . . .	amp

#### Mechanical:

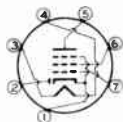
Mounting Position. . . . .	Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length. . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-1/2" ± 3/32"
Maximum Diameter . . . . .	3/4"
Dimensional Outline. . . . .	See General Section
Bulb . . . . .	T-5-1/2
Base . . . . .	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW . . . . .	7EA

Pin 1 - Cathode,  
Pentode  
Grid No.3

Pin 2 - Diode  
Plate

Pin 3 - Heater

Pin 4 - Heater



Pin 5 - Pentode  
Plate

Pin 6 - Pentode  
Grid No.2

Pin 7 - Pentode  
Grid No.1

### PENTODE UNIT - Class A<sub>1</sub> Amplifier

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

PLATE VOLTAGE. . . . .	300 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE. . . . .	300 max.	volts
GRID-No.2 VOLTAGE. . . . .	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value. . . . .	0 max.	volts
PLATE DISSIPATION. . . . .	2.5 max.	watts
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 150 volts. . . . .	0.3 max.	watt
For grid-No.2 voltages between 150 and 300 volts. . . . .	<i>See Grid-No.2 Input Rating Chart at front of Receiving Tube Section</i>	
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	100 max.	volts
Heater positive with respect to cathode. . . . .	100 max.	volts

#### Characteristics:

Plate Voltage. . . . .	250	volts
Grid-No.2 Voltage. . . . .	100	volts
Grid-No.1 Voltage. . . . .	-2	volts
Plate Resistance (Approx.) . . . . .	0.8	megohm
Transconductance . . . . .	2200	μmhos

12CR6



12CR6

## DIODE-REMOTE-CUTOFF PENTODE

Plate Current. . . . .	9.6	ma
Grid-No.2 Current. . . . .	2.6	ma
Grid-No.1 Voltage (Approx.) for transconductance of 10 $\mu$ hos . . . . .	-32	volts

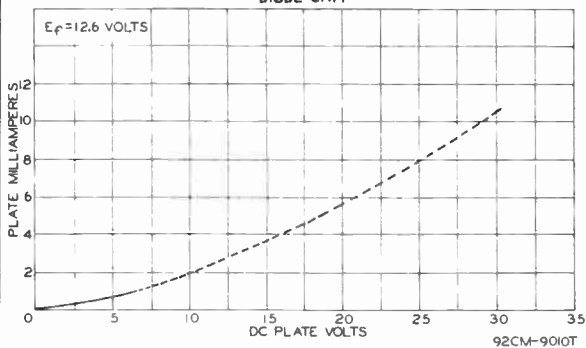
**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:		
For cathode-bias operation . . . . .	1.0 max.	megohm
For fixed-bias operation . . . . .	0.25 max.	megohm

## DIODE UNIT

**Maximum Ratings, Design-Center Values:**

PLATE CURRENT. . . . .	1.0 max.	ma
------------------------	----------	----

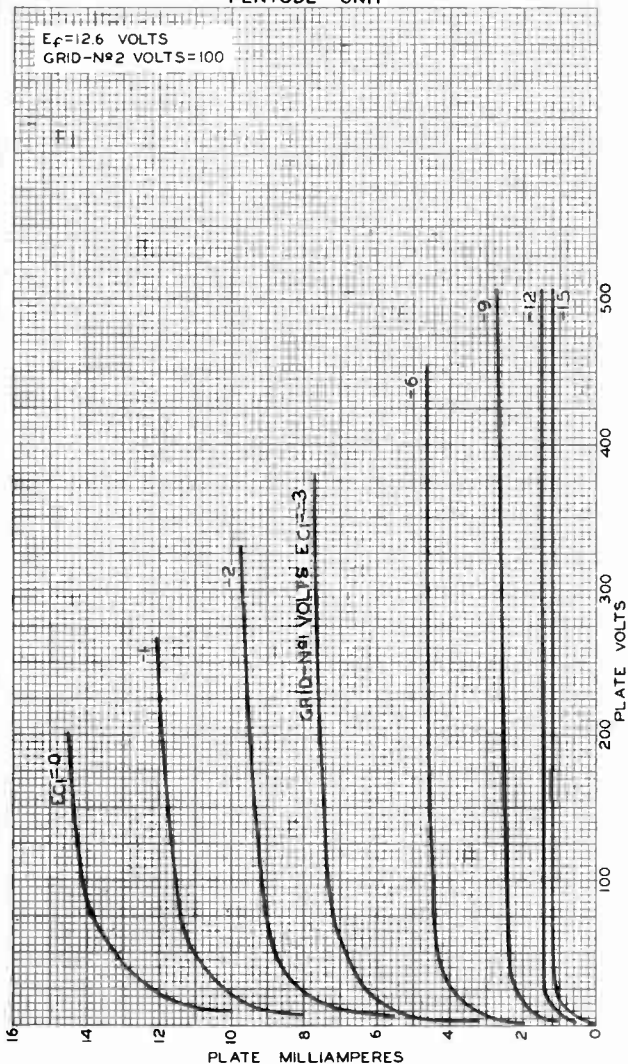
AVERAGE PLATE CHARACTERISTIC  
DIODE UNIT



12CR6

12CR6

### AVERAGE PLATE CHARACTERISTICS PENTODE UNIT



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

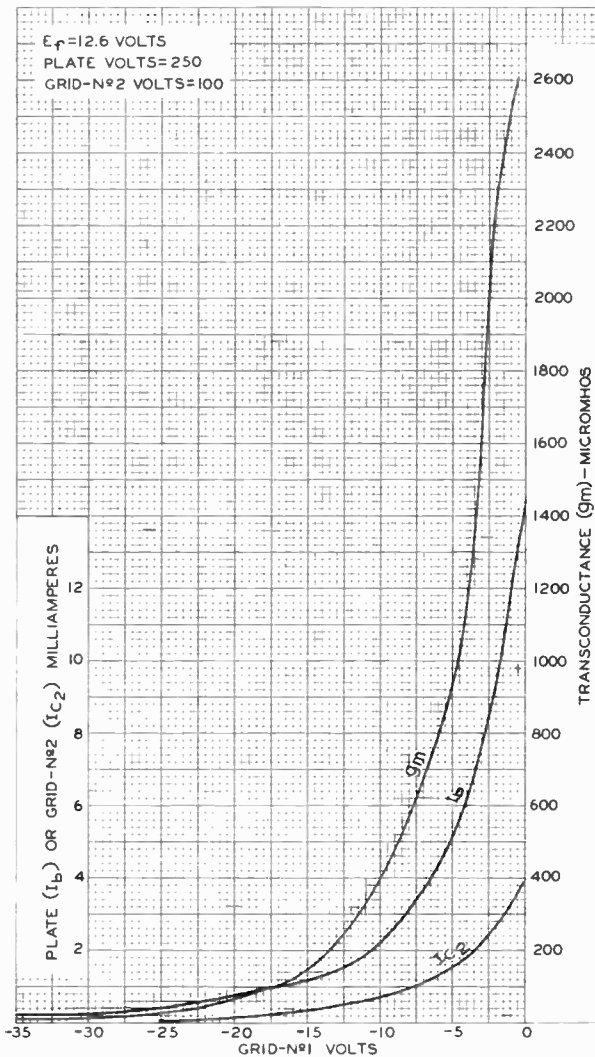
92CM-9006

12CR6



12CR6

### AVERAGE CHARACTERISTICS PENTODE UNIT







12CT8

# MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

12CT8

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.3 ± 6%	amp
Warm up time (Average) . . . . .	11	sec

Direct Interelectrode Capacitances:<sup>0</sup>

#### Triode Unit:

Grid to plate . . . . .	2.2	μf
Grid to cathode and heater . . . . .	2.4	μf
Plate to cathode and heater . . . . .	0.19	μf

#### Pentode Unit:

Grid No.1 to plate . . . . .	0.044	μf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater . . . . .	7.5	μf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater . . . . .	2.4	μf
Triode grid to pentode plate . . . . .	0.016 max.	μf
Pentode grid No.1 to triode plate . . . . .	0.01 max.	μf
Pentode plate to triode plate . . . . .	0.16 max.	μf

### Characteristics, Class A<sub>1</sub> Amplifier:

	Triode Unit	Pentode Unit	
Plate Supply Voltage . . . . .	150	200	volts
Grid-No.2 Supply Voltage . . . . .	-	125	volts
Cathode Resistor . . . . .	150	82	ohms
Amplification Factor . . . . .	40	-	
Plate Resistance (Approx.) . . . . .	8200	150000	ohms
Transconductance . . . . .	4900	7000	μmhos
Plate Current . . . . .	9	15	ma
Grid-No.2 Current . . . . .	-	3.4	ma
Grid-No.1 Voltage (Approx.) for plate $\mu_a = 100$ . . . . .	-6.5	-8	volts

### 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"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2

12CT8



12CT8

## MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

Base . . . . . Small-Button Noval 9-Pin (JEDEC No.E9-1)  
 Basing Designation for BOTTOM VIEW . . . . . 9DA

Pin 1 - Triode Plate  
 Pin 2 - Triode Grid  
 Pin 3 - Triode  
           Cathode  
 Pin 4 - Heater  
 Pin 5 - Heater  
 Pin 6 - Pentode Plate  
 Pin 7 - Pentode  
           Grid No.2



Pin 8 - Pentode  
           Grid No.1  
 Pin 9 - Pentode  
           Grid No.3,  
           Pentode  
           Cathode,  
           Internal  
           Shield

### AMPLIFIER — Class A<sub>1</sub>

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

	Triode Unit	Pentode Unit	
PLATE VOLTAGE . . . . .	300 max.	300 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	-	300 max.	volts
GRID-No.2 VOLTAGE . . . . .	-	See Grid-No.2 Input	
<i>Rating Chart at front of Receiving Tube Section</i>			
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value . . . . .	0 max.	0 max.	volts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts . . . . .	-	0.9 max.	watt
For grid-No.2 voltages between 150 and 300 volts . . . . .	-	See Grid-No.2 Input	
<i>Rating Chart at front of Receiving Tube Section</i>			
PLATE DISSIPATION . . . . .	2.5 max.	2.75 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200 max.	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	200 <sup>▲</sup> max.	volts

#### Maximum Circuit Values:

	Triode Unit	Pentode Unit	
Grid-No.1-Circuit Resistance:			
For fixed-bias operation . . . . .	0.5 max.	0.25 max.	megohm
For cathode-bias operation . . . . .	1 max.	1 max.	megohm

○ without external shield.

▲ The dc component must not exceed 100 volts.



12CU5

# 12CU5/12C5 BEAM POWER TUBE

7-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

*The 12CU5/12C5 is the same as the 6CU5 except for the following items:*

Heater, for Unipotential Cathode:

Voltage. . . . .	12.6	. . . . .	ac or dc volts
Current. . . . .	0.6	. . . . .	amp
Warm-up time (Average) .	11	. . . . .	sec

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*





12CX6

# 12CX6

## SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

For use in automobile radio receivers operating directly from 12-volt storage batteries

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage range. . . . . 10 to 15.9 . . . . . dc volts  
*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.)  
at 12.6 volts. . . . . 0.15 . . . . . amp

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

Grid No.1 to plate . . . . . 0.05 max.  $\mu$ f  
Grid No.1 to cathode, grid No.3,  
grid No.2, and heater. . . . . 7.6  $\mu$ f  
Plate to cathode, grid No.3,  
grid No.2, and heater. . . . . 6.2  $\mu$ f

#### Mechanical:

Operating Position . . . . . Any  
Maximum Overall Length . . . . . 2-1/8"  
Maximum Seated Length. . . . . 1-7/8"  
Length, Base Seat to Bulb Top (Excluding tip). . . 1-1/2"  $\pm$  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 . . . . . 7BK

Pin 1 - Grid No.1  
Pin 2 - Grid No.3  
Pin 3 - Heater  
Pin 4 - Heater



Pin 5 - Plate  
Pin 6 - Grid No.2  
Pin 7 - Cathode

### AMPLIFIER — Class A<sub>1</sub>

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

PLATE VOLTAGE. . . . . 33 max. volts  
GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . . 33 max. volts  
GRID-No.1 (CONTROL-GRID) VOLTAGE:  
Positive-bias value. . . . . 0 max. volts  
PEAK HEATER-CATHODE VOLTAGE:  
Heater negative with respect to cathode. 30 max. volts  
Heater positive with respect to cathode. 30 max. volts

#### Characteristics:

Heater Voltage . . . . . 12.6 volts  
Plate Voltage. . . . . 12.6 volts

<sup>o</sup> without external shield.

12CX6



12CX6

## SHARP-CUTOFF PENTODE

Grid-No.3 (Suppressor-Grid) Voltage . . .	0	volts
Grid-No.2 Voltage . . . . .	12.6	volts
Grid-No.1 Supply Voltage. . . . .	0	volts
Grid-No.1 Resistor (Bypassed) . . . . .	2.2	megohms
Plate Resistance (Approx.) . . . . .	40000	ohms
Transconductance. . . . .	3100	$\mu$ mhos
Plate Current . . . . .	3	ma
Grid-No.2 Current . . . . .	1.4	ma
Grid-No.1 Voltage (Approx.) for plate $\mu$ a = 10 . . . . .	-4.5	volts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance. . . . .	10 max.	megohms
---------------------------------------	---------	---------



12D4

12D4

# HALF-WAVE VACUUM RECTIFIER

*Intended for TV damper service in equipment having series heater-string arrangement*

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage. . . . .	12.6	ac or dc volts
Current. . . . .	0.6	amp
Warm-up time (Average). . . . .	11	sec

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*

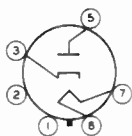
Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Plate to cathode and heater. . . . .	6	$\mu$ f
Cathode to plate and heater. . . . .	8	$\mu$ f
Heater to cathode. . . . .	3	$\mu$ f

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	3-5/16"
Maximum Seated Length. . . . .	2-3/4"
Maximum Diameter . . . . .	1-9/32"
Dimensional Outline. . . . .	<i>See General Section</i>
Bulb . . . . .	T9
Base . . . . .	Intermediate-Shell Octal 5-Pin, Arrangement 2 (JEDEC Group 1, No. B5-82), Intermediate-Shell Octal 6-Pin, Arrangement 1 (JEDEC Group 1, No. B6-8), Short Intermediate-Shell Octal 5-Pin with External Barriers, Arrangement 2 (JEDEC Group 1, No. B5-85), or Short Intermediate-Shell Octal 6-Pin with External Barriers, Arrangement 1 (JEDEC Group 1, No. B6-60)
Basing Designation for BOTTOM VIEW . . . . .	.4CG

Pin 1  $\blacklozenge$  - Same as Pin 2  
 Pin 2  $\square$  - Internal Connection - Do Not Use  $\bullet$



Pin 3 - Cathode  
 Pin 5 - Plate  
 Pin 7 - Heater  
 Pin 8 - Heater

## DAMPER SERVICE

### Maximum Ratings, Design-Maximum Values:

*For operation in a 525-line, 30-frame system  $\square$*

PEAK INVERSE PLATE VOLTAGE $\bullet$ . . . . .	4400	max.	volts
PEAK PLATE CURRENT. . . . .	900	max.	ma
DC PLATE CURRENT. . . . .	155	max.	ma

$\circ, \blacklozenge, \bullet, \square, \triangle$ : See next page.

12D4



12D4

## HALF-WAVE VACUUM RECTIFIER

PLATE DISSIPATION. . . . . 5.5 max. watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. 4400<sup>▲</sup> max. volts

Heater positive with respect to cathode. 300<sup>#</sup> max. volts

□ Without external shield.

◆ On the 5-pin bases, pin 1 as well as pins 4 and 6 is omitted.

● Socket terminals 1, 2, 4 and 6 should not be used as tie points.

□ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

■ This rating is applicable when the duty cycle of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

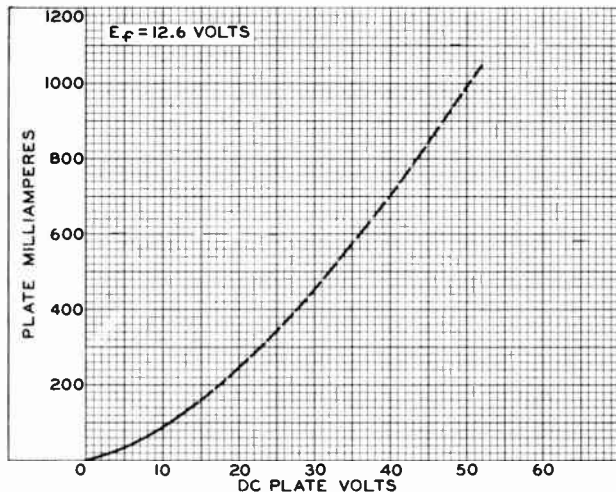
▲ The dc component must not exceed 900 volts.

# The dc component must not exceed 100 volts.

4-59

TENTATIVE DATA

### AVERAGE PLATE CHARACTERISTIC



ELECTRON TUBE DIVISION

92CS-9757

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY





12DB5

# BEAM POWER TUBE

9-PIN MINIATURE TYPE

*Intended for use in equipment having series heater-string arrangement*

12DB5

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.6 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid No.1 to plate . . . . .	0.2	μf
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	13	μf
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	8	μf

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/4"
Maximum Seated Length . . . . .	2-1/2"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	2-1/8" ± 3/32"
Diameter . . . . .	0.750" to 0.875"
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9GR

- Pin 1 - Grid No.2
- Pin 2 - Cathode, Grid No.3
- Pin 3 - Grid No.1
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Grid No.1



- Pin 7 - Cathode, Grid No.3
- Pin 8 - Internal Connection — Do Not Use
- Pin 9 - Plate

## AMPLIFIER — Class A<sub>1</sub>

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	150 max.	volts
GRID-No.2 INPUT . . . . .	1.25 max.	watts
PLATE DISSIPATION . . . . .	10 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	volts

### Typical Operation and Characteristics:

Plate Supply Voltage . . . . .	110	200	volts
Grid-No.2 Supply Voltage . . . . .	110	125	volts
Grid-No.1 (Control-grid) Voltage . . . . .	-7.5	-	volts
Cathode Resistor . . . . .	-	180	ohms

12DB5



12DB5

## BEAM POWER TUBE

Peak AF Grid-No.1 Voltage. . . . .	7.5	8.5	volts
Zero-Signal Plate Current. . . . .	49	46	ma
Max.-Signal Plate Current. . . . .	50	47	ma
Zero-Signal Grid-No.2 Current. . . . .	4	2.2	ma
Max.-Signal Grid-No.2 Current. . . . .	10	8.5	ma
Plate Resistance (Approx.) . . . . .	13000	28000	ohms
Transconductance . . . . .	8000	8000	μmhos
Load Resistance. . . . .	2000	4000	ohms
Total Harmonic Distortion. . . . .	10	10	%
Max.-Signal Power Output . . . . .	2.1	3.8	watts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	2.2 max.	megohms

## VERTICAL-DEFLECTION AMPLIFIER

**Maximum Ratings, Design-Center Values Except as Noted:***For operation in a 525-line, 30-frame system<sup>□</sup>*

DC PLATE VOLTAGE . . . . .	300 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum) <sup>#</sup> . . . . .	2000 <sup>■</sup> max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	150 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE . . . . .	250 max.	volts
CATHODE CURRENT:		
Peak . . . . .	200 max.	ma
Average. . . . .	55 max.	ma
GRID-No.2 INPUT. . . . .	1.25 max.	watts
PLATE DISSIPATION. . . . .	10 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	volts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	2.2 max.	megohms

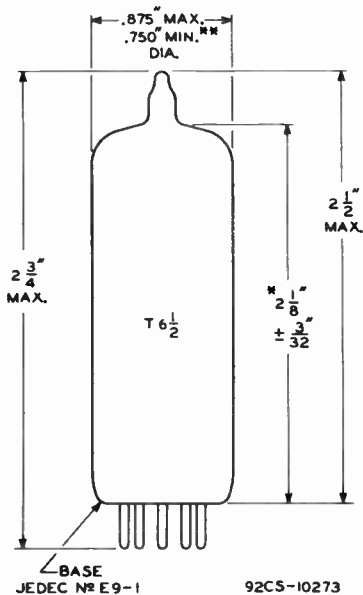
<sup>○</sup> without external shield.<sup>▲</sup> The dc component must not exceed 100 volts.<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.<sup>#</sup> This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.<sup>■</sup> under no circumstances should this absolute value be exceeded.



12DB5

BEAM POWER TUBE

12DB5



- \* Measured from base seat to bulb-top line as determined by ring gauge of  $7/16''$  inside diameter.
- \*\* Applies in zone starting  $0.375''$  from seat.





12DL8

# 12DL8 TWIN DIODE—POWER TETRODE

9-PIN MINIATURE TYPE

For use in automobile radio receivers  
operating directly from 12-volt storage batteries

## GENERAL DATA

### Electrical:

Heater<sup>•</sup>, for independent C-thodes:

Voltage range. . . . . 10.0 to 15.9 . . . . . dc volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.) at

12.6 volts . . . . . 0.55 . . . . . amp

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

*Tetrode Unit:*

Grid No.2 to plate . . . . . 14  $\mu$ f

Grid No.2 to cathode, grid No.1,  
and heater . . . . . 12  $\mu$ f

Plate to cathode, grid No.1, and  
heater . . . . . 1.3  $\mu$ f

*Diode Units:*

Diode plate No.1 to diode  
cathode and heater . . . . . 1.6  $\mu$ f

Diode plate No.2 to diode  
cathode and heater . . . . . 1.6  $\mu$ f

Diode plate No.1 to diode plate  
No.2 . . . . . 0.03  $\mu$ f

Tetrode grid No.2 to diode plate No.1. . . . . 0.02 max.  $\mu$ f

Tetrode grid No.2 to diode plate No.2. . . . . 0.006 max.  $\mu$ f

### Characteristics. Class A<sub>1</sub> Amplifier with 12.6 Volts on Heater (Tetrode Unit):

Plate Voltage. . . . . 12.6 volts

Grid-No.2 (Control-Grid) Voltage:

Developed across a 2.2-megohm  
resistor . . . . . -0.5 volt

Grid-No.1 (Space-Charge-Grid)

Voltage. . . . . 12.6 volts

Plate Resistance (Approx.) . . . . . 480 ohms

Amplification Factor, Grid No.2

to Plate . . . . . 7.2

Transconductance, Grid No.2 to Plate . . . . . 15000  $\mu$ mhos

Plate Current. . . . . 40 ma

Grid-No.1 Current. . . . . 75 ma

### 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"  $\pm$  3/32"

Maximum Diameter . . . . . 7/8"

Dimensional Outline. . . . . See General Section

Bulb . . . . . T6-1/2

<sup>•,o</sup>: see next page.

I2DL8



I2DL8

## TWIN DIODE—POWER TETRODE

Base . . . . . Small-Button Noval 9-Pin (JETEC No.F9-1)  
 Pinning Designation for BOTTOM VIEW . . . . . 9HR

Pin 1—Plate of Diode

Unit No.2

Pin 2—Cathode of

Tetrode Unit

Pin 3—Grid No.1 of

Tetrode Unit

Pin 4—Heater

Pin 5—Heater



Pin 6—Plate of

Tetrode Unit

Pin 7—Grid No.2 of

Tetrode Unit

Pin 8—Cathode of

Diode Units

No.1 &amp; No.2

Pin 9—Plate of Diode

Unit No.1

## TETRODE UNIT — AUDIO DRIVER

**Maximum Ratings, Design-Center Values Except as Noted:**

PLATE VOLTAGE. . . . . 30 max. volts

GRID-No.2 (CONTROL-GRID) VOLTAGE:

Negative bias value. . . . . -20 max. volts

GRID-No.1 (SPACE-CHARGE-GRID) VOLTAGE

(Absolute maximum) . . . . . 16<sup>■</sup> max. volts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with

respect to cathode . . . . . 30 max. volts

Heater positive with

respect to cathode . . . . . 30 max. volts

**Typical Operation with 12.6 Volts on Heater:**

Plate Voltage. . . . . 12.6 volts

Grid-No.2 Voltage:

Obtained by rectification through

2.2-megohm resistor. . . . . -2 volts

Peak AF Grid-No.2 Voltage:

Obtained from 100000-ohm source. . . . . 2.5 volts

Grid-No.1 Voltage. . . . . 12.6 volts

Zero-Signal Plate Current (Approx.) . . . . . 40 ma

Max.-Signal Plate Current. . . . . 8 ma

Grid-No.1 Current. . . . . 75 ma

Load Resistance. . . . . 800 ohms

Total Harmonic Distortion. . . . . 10 %

Max.-Signal Power Output . . . . . 40 mw

**Maximum Circuit Values:**

Grid-No.2-Circuit Resistance . . . . . 10 max. megohms

**DIODE UNITS — Two**

**Maximum Ratings, Design-Center Values:**

*Values are for Each Unit*

PLATE CURRENT. . . . . 5 max. ma

•, °, ■: See next page.



12DL8

12DL8

## TWIN DIODE—POWER TETRODE

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . .	30 max.	volts
Heater positive with respect to cathode . . . . .	30 max.	volts

### Characteristics with 12.6 Volts on Heater:

Plate Current for plate volts = 10. . . . . 3 ma

- Operation of heater in series with other heaters is not recommended.
- Without external shield.
- Under no circumstances should this absolute value be exceeded.

### OPERATING CONSIDERATIONS

The maximum ratings in the tabulated data for the 12DL8, except the rating for grid-No.1 (space-charge-grid) voltage, are working design-center maximums established according to the standard design-center system of rating electron tubes. Tubes so rated will give satisfactory performance in storage-battery-operated equipment provided the following stipulations are observed:

In the case of storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. This fluctuation imposes severe operating conditions on tubes. Under these conditions, the equipment should be designed so that 90 per cent of the design-center maximum value of plate voltage is never exceeded for a battery terminal potential of 13.2 volts. Although the operating voltages of the 12DL8 in this service will, at times, exceed the design-center maximum values, satisfactory performance with probable sacrifice in life will be obtained.

12DL8

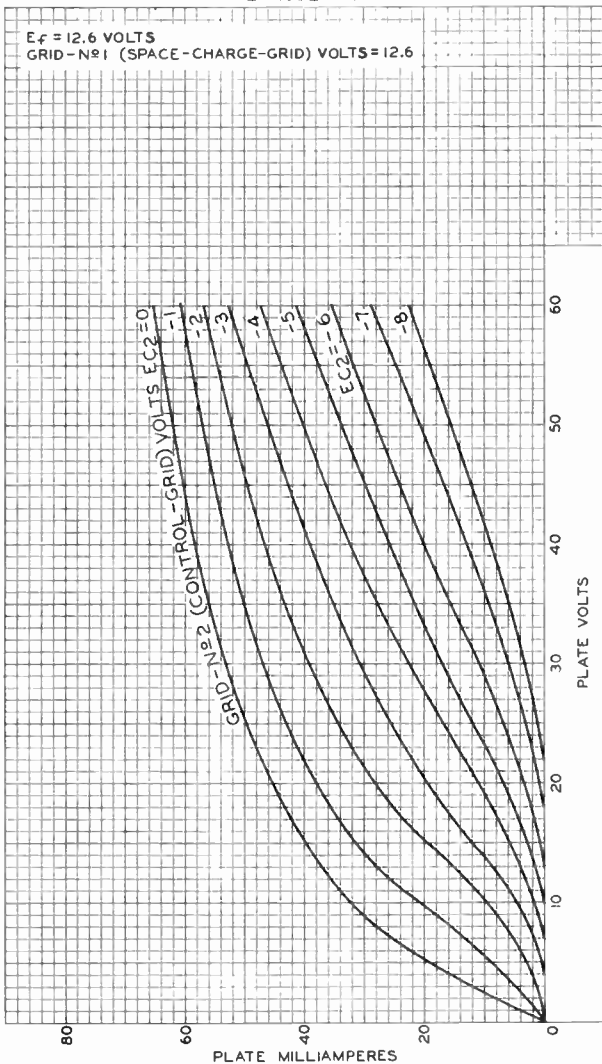


12DL8

### AVERAGE PLATE CHARACTERISTICS TETRODE UNIT

$E_f = 12.6$  VOLTS

GRID-№1 (SPACE-CHARGE-GRID) VOLTS = 12.6







12DL8

# AVERAGE PLATE CHARACTERISTICS TETRODE UNIT

12DL8

$E_f = 12.6$  VOLTS  
GRID-№ 2 (CONTROL-GRID) VOLTS = 0

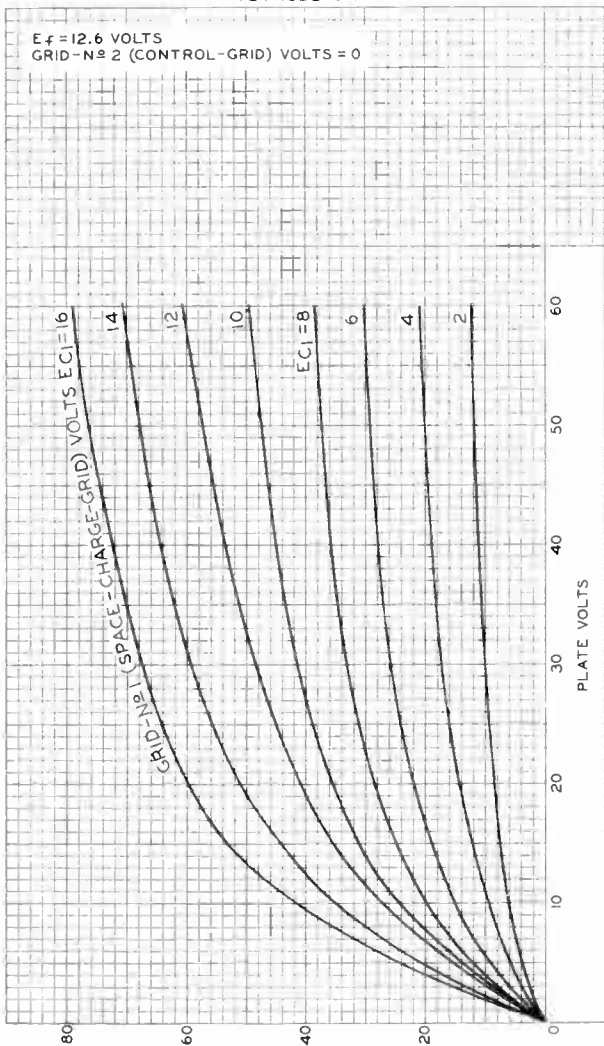


PLATE MILLIAMPERES

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-9423





12DQ6-A

# 12DQ6-A BEAM POWER TUBE

*Intended for use in equipment having  
series heater-string arrangement*

The 12DQ6-A is the same as the 6DQ6-A except for the following items:

Heater, for Unipotential Cathode:

Voltage . . . . .	12.6	. . . . .	ac or dc volts
Current . . . . .	0.6	. . . . .	amp
Warm-up time (Average) . . . . .	11	. . . . .	sec

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*





12DQ7

# 12DQ7

## POWER PENTODE

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Heater arrangement	Series	Parallel	
Voltage . . . . .	12.6 ± 10%	6.3	volts
Current . . . . .	0.3	0.6 ± 6%	amp
Warm-up time (Average) . . . . .	-	11	sec

Direct Interelectrode

Capacitances:		
Grid No.1 to plate . . . . .	0.1 max.	μf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . .	10	μf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . .	3.8	μf

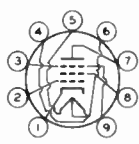
#### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Supply Voltage . . . . .	40	200	volts
Grid No.3 . . . . .	Connected to cathode at socket		
Grid-No.2 Supply Voltage . . . . .	125	125	volts
Grid-No.1 Voltage . . . . .	0	-	volts
Cathode Resistor . . . . .	-	68	ohms
Plate Resistance (Approx.) . . . . .	-	53000	ohms
Transconductance . . . . .	-	10500	μmhos
Plate Current . . . . .	45	26	ma
Grid-No.2 Current . . . . .	16	5.6	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100 . . . . .	-	-9	volts

#### 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"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW . . . . .	.9BF

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



- Pin 6 - Heater Mid-Tap
- Pin 7 - Plate
- Pin 8 - Grid No.2
- Pin 9 - Grid No.3, Internal Shield

12DQ7



12DQ7

## POWER PENTODE

AMPLIFIER — Class A<sub>1</sub>

## Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE. . . . . 330 max. volts  
 GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . 330 max. volts  
 GRID-No.2 VOLTAGE. . . . . See Grid-No.2 Input

*Rating Chart at front of Receiving Tube Section*

## GRID-No.1 (CONTROL-GRID) VOLTAGE:

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

## GRID-No.2 INPUT:

For grid-No.2 voltages up to 165 volts . 1.1 max. watts

For grid-No.2 voltages between 165 and

330 volts. . . . . See Grid-No.2 Input

*Rating Chart at front of Receiving Tube Section*

PLATE DISSIPATION. . . . . 6.5 max. watts

## PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. 200 max. volts

Heater positive with respect to cathode. 200<sup>▲</sup> max. volts

## Maximum Circuit Values:

## Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . . 0.25 max. megohm

For cathode-bias operation . . . . . 1 max. megohm

<sup>○</sup> Without external shield.

\* These values can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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



12DS7

# 12DS7

## TWIN DIODE—POWER TETRODE

9-PIN MINIATURE TYPE

For use in automobile radio receivers  
operating directly from 12-volt storage batteries

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage range. . . . . 10 to 15.9 . . . . . dc volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.) at

12.6 volts . . . . . 0.4 . . . . . amp

Direct Interelectrode Capacitances:<sup>0</sup>

#### Tetrode Unit:

Grid No.2 to plate . . . . . 12.5  $\mu$ f

Grid No.2 to cathode, grid No.1,  
and heater . . . . . 13  $\mu$ f

Plate to cathode, grid No.1, and heater. . . . . 2  $\mu$ f

#### Diode Units:

Diode plate No.1 to cathode and  
heater . . . . . 0.5  $\mu$ f

Diode plate No.2 to cathode and  
heater . . . . . 0.5  $\mu$ f

Diode plate No.1 to diode plate No.2 . . . . . 0.1  $\mu$ f

Tetrode grid No.2 to diode plate No.1. . . . . 0.15 max.  $\mu$ f

Tetrode grid No.2 to diode plate No.2. . . . . 0.15 max.  $\mu$ f

#### Characteristics, Class A<sub>1</sub> Amplifier (Tetrode Unit):

Heater Voltage . . . . . 12.6 volts

Plate Voltage. . . . . 12.6 volts

Grid-No.2 (Control-Grid) Voltage:

Developed across a 2.2-megohm resistor . . . . . -0.5 volt

Grid-No.1 (Space-Charge-Grid) Voltage. . . . . 12.6 volts

Plate Resistance (Approx.) . . . . . 480 ohms

Amplification Factor, Grid No.2 to Plate . . . . . 7.2

Transconductance, Grid No.2 to Plate . . . . . 15000  $\mu$ hos

Plate Current. . . . . 40 ma

Grid-No.1 Current. . . . . 75 ma

#### 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"  $\pm$  3/32"

Diameter . . . . . 0.750" to 0.875"

Dimensional Outline. . . . . See General Section

Bulb . . . . . T6-1/2

<sup>0</sup>: See next page.

12DS7



12DS7

## TWIN DIODE—POWER TETRODE

Base. . . . . Small-Button Noval 9-Pin (JETEC No. E9-1)  
 Basing Designation for BOTTOM VIEW. . . . . 9JU

Pin 1—Plate of Diode  
 Unit No.2  
 Pin 2—No Connec-  
 tion  
 Pin 3—Grid No.1 of  
 Tetrode Unit  
 Pin 4—Heater  
 Pin 5—Heater



Pin 6—Plate of  
 Tetrode Unit  
 Pin 7—Grid No.2 of  
 Tetrode Unit  
 Pin 8—Cathode  
 Pin 9—Plate of Diode  
 Unit No.1

### TETRODE UNIT — AUDIO DRIVER

**Maximum Ratings, Design-Center Values Except as Noted:**

PLATE VOLTAGE . . . . .	16	max.	volts
GRID-No.2 (CONTROL-GRID) VOLTAGE:			
Negative-bias value . . . . .	-16	max.	volts
GRID-No.1 (SPACE-CHARGE-GRID) VOLTAGE			
(Absolute maximum) . . . . .	16	max.	volts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode .	16	max.	volts
Heater positive with respect to cathode .	16	max.	volts

### Typical Operation:

#### Cathode Bias

Heater Voltage. . . . .	12.6	volts
Plate-Supply Voltage. . . . .	12.6	volts
Plate Voltage . . . . .	Obtained from indicated plate supply through series 100-henry choke having dc resistance of 150 ohms	
Grid-No.1 Supply Voltage. . . . .	12.6	volts
Grid-No.2 Supply Voltage. . . . .	0	volts
Grid-No.2 Resistor. . . . .	1.8	megohms
Cathode Resistor. . . . .	18	ohms
Peak AF Grid-No.2 Supply Voltage (Approx.):		
From 3.3-megohm signal source. . . . .	2.85	volts
Zero-Signal Plate Current (Approx.) . . . .	23	ma
Max.-Signal Plate Current . . . . .	13	ma
Grid-No.1 Current . . . . .	77	ma
Load Resistance . . . . .	1250	ohms
Total Harmonic Distortion . . . . .	8	%
Max.-Signal Power Output. . . . .	10	mW

#### Grid-No.2-Resistor Bias

Heater Voltage. . . . .	12.6	volts
Plate Voltage . . . . .	12.6	volts
Grid-No.1 Voltage . . . . .	12.6	volts

○, ■: See next page.





12DS7

12DS7

# TWIN DIODE-POWER TETRODE

Grid-No. 2 Voltage:		
Obtained by rectification through 100,000-ohm resistor . . . . .	-2	volts
Peak AF Grid-No. 2 Voltage (Approx.):		
From 0.1-megohm signal source . . . . .	2.5	volts
Zero-Signal Plate Current (Approx.) . . . . .	40	ma
Max.-Signal Plate Current . . . . .	8	ma
Grid-No. 1 Current . . . . .	75	ma
Load Resistance . . . . .	800	ohms
Total Harmonic Distortion . . . . .	10	%
Max.-Signal Power Output . . . . .	40	mw

### Maximum Circuit Values:

Grid-No. 2-Circuit Resistance . . . . .	10 max.	megohms
---	---------	---------

### DIODE UNITS — Two

Values are for Each Unit

### Maximum Ratings, Design-Center Values:

PLATE CURRENT . . . . .	5 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	16 max.	volts
Heater positive with respect to cathode . . . . .	16 max.	volts

### Characteristics:

Heater Voltage . . . . .	12.6	volts
Plate Current for plate volts = 10 . . . . .	3	ma

○ without external shield.

■ Under no circumstances should this absolute value be exceeded.

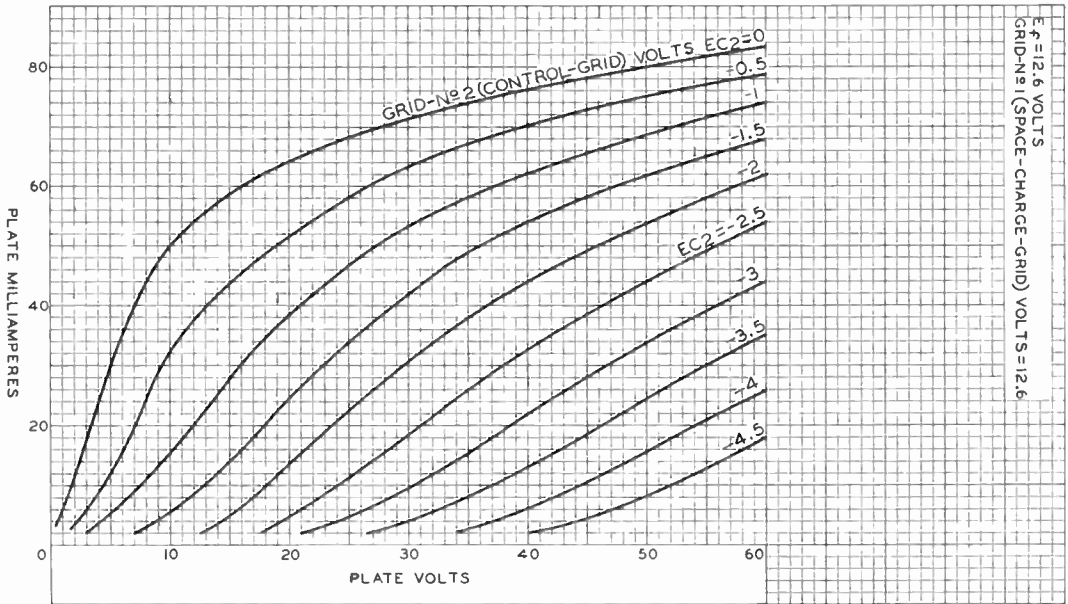
12DS7



12DS7

# AVERAGE PLATE CHARACTERISTICS TETRODE UNIT

$E_f = 12.6$  VOLTS  
GRID-№1 (SPACE-CHARGE-GRID) VOLTS = 12.6



ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9670

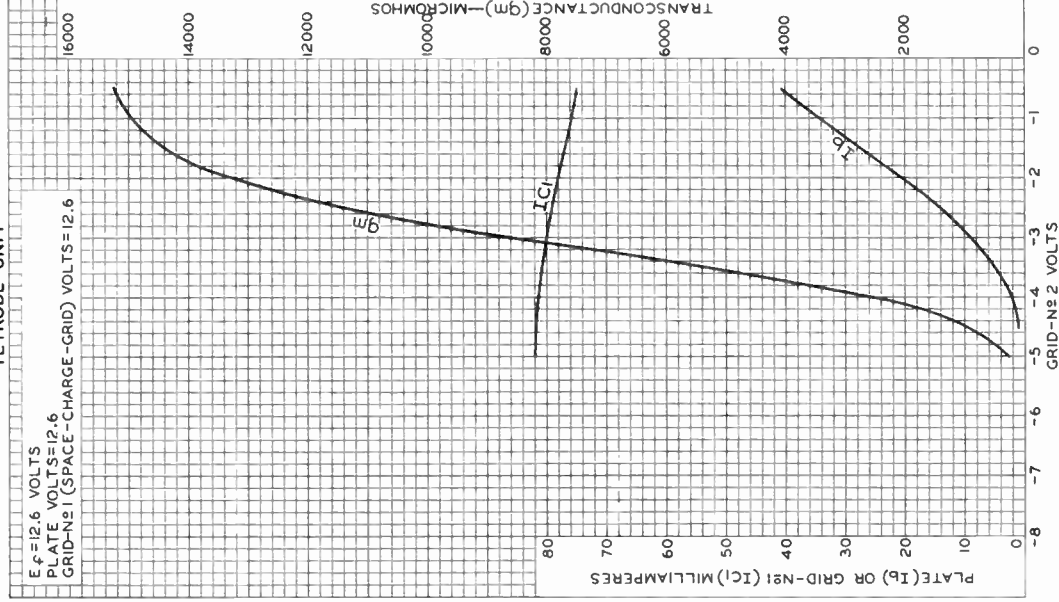


12DS7

12DS7

### AVERAGE CHARACTERISTICS TETRODE UNIT

$E_f = 12.6$  VOLTS  
PLATE VOLTS = 12.6  
GRID-No 1 (SPACE-CHARGE-GRID) VOLTS = 12.6







12DS7-A

# 12DS7-A TWIN DIODE-POWER TETRODE

9-PIN MINIATURE TYPE

For use in automobile radio receivers  
operating directly from 6-cell storage-battery systems

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage range (AC or DC) . . . . . 10 to 15.9 volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.) at 12.6 volts . . . . . 0.4 amp

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

#### Tetrode Unit:

Grid No.2 to plate . . . . . 13.8  $\mu$ f

Grid No.2 to grid No.1, cathode,  
and heater . . . . . 12.7  $\mu$ f

Plate to grid No.1, cathode,  
and heater . . . . . 2.2  $\mu$ f

#### Diode Units:

Diode plate No.1 to cathode  
and heater . . . . . 0.5  $\mu$ f

Diode plate No.2 to cathode  
and heater . . . . . 0.5  $\mu$ f

Diode plate No.1 to diode plate No.2 . . . . . 0.1  $\mu$ f

Tetrode grid No.2 to diode plate No.1 . . . . . 0.3  $\mu$ f

Tetrode grid No.2 to diode plate No.2 . . . . . 0.3  $\mu$ f

### Characteristics, Class A<sub>1</sub> Amplifier (Tetrode Unit):

Heater Voltage . . . . . 12.6 volts

Plate Voltage . . . . . 12.6 volts

Grid-No.2 Voltage:

Developed across a 2.2-megohm resistor . . . . . -0.5 volt

Grid-No.1 voltage . . . . . 12.6 volts

Plate Resistance (Approx.) . . . . . 500 ohms

Amplification Factor, Grid No.2 to Plate . . . . . 9.1

Transconductance, Grid No.2 to Plate . . . . . 19000  $\mu$ hos

Plate Current . . . . . 35 ma

Grid-No.1 Current . . . . . 75 ma

### 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"  $\pm$  3/32"

Diameter . . . . . 0.750" to 0.875"

Dimensional Outline . . . . . See General Section

Bulb . . . . . T6-1/2

Base . . . . . Small-Button Noval 9-Pin (JEDEC No. E9-1)

12DS7-A



12DS7-A

## TWIN DIODE-POWER TETRODE

Basing Designation for BOTTOM VIEW. . . . . 9JU

Pin 1 - Plate of Diode  
Unit No.2Pin 2 - No Con-  
nectionPin 3 - Grid No.1 of  
Tetrode Unit

Pin 4 - Heater

Pin 5 - Heater

Pin 6 - Plate of  
Tetrode UnitPin 7 - Grid No.2 of  
Tetrode Unit

Pin 8 - Cathode

Pin 9 - Plate of Diode  
Unit No.1

## TETRODE UNIT AUDIO DRIVER

## Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE . . . . .	16 max.	volts
GRID-No.2 (CONTROL-GRID) VOLTAGE:		
Negative-bias value . . . . .	16 max.	volts
GRID-No.1 (SPACE-CHARGE-GRID) VOLTAGE . . . . .	16 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	16 max.	volts
Heater positive with respect to cathode. . . . .	16 max.	volts

## Typical Operation:

## Cathode Bias

Heater Voltage. . . . .	12	volts
Plate Supply Voltage. . . . .	11.2	volts
Plate Voltage . . . . .	Obtained from indicated plate supply through series 100-henry choke having dc resistance of 150 ohms	
Grid-No.2 Supply Voltage. . . . .	0	volts
Grid-No.2 Resistor. . . . .	1.8	megohms
Grid-No.1 Supply Voltage. . . . .	11.2	volts
Cathode Resistor. . . . .	18	ohms
Peak AF Grid-No.2 Supply Voltage (Approx.):		
From 3.3-megohm signal source . . . . .	4.25	volts
Zero-Signal Plate Current (Approx.) . . . . .	20	ma
Indicated-Signal Plate Current. . . . .	7	ma
Grid-No.1 Current . . . . .	58	ma
Load Resistance . . . . .	1250	ohms
Total Harmonic Distortion at power output of 2.5 mw. . . . .	5	%
Indicated-Signal Power Output . . . . .	10	mw

## Grid-No.2-Resistor Bias

Heater Voltage. . . . .	12.6	volts
Plate Voltage . . . . .	12.6	volts
Grid-No.2 Voltage:		
Obtained by rectification through a 2.2-megohm resistor . . . . .	-2.5	volts



# I2DS7-A

I2DS7-A

## TWIN DIODE-POWER TETRODE

Peak AF Grid-No.2 Voltage (Approx.):		
From 0.22-megohm signal source . . . . .	2.5	volts
Grid-No.1 Voltage . . . . .	12.6	volts
Zero-Signal Plate Current (Approx.) . . . . .	35	ma
Max.-Signal Plate Current . . . . .	11	ma
Grid-No.1 Current . . . . .	80	ma
Load Resistance . . . . .	700	ohms
Total Harmonic Distortion . . . . .	10	%
Max.-Signal Power Output . . . . .	45	mw

### Maximum Circuit Values:

Grid-No.2-Circuit Resistance . . . . .	10 max.	megohms
--	---------	---------

### DIODE UNITS — Two

Values are for Each Unit

### Maximum Ratings, Design-Maximum Values:

PLATE CURRENT . . . . .	5 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	16 max.	volts
Heater positive with respect to cathode . . . . .	16 max.	volts

### Characteristics:

Heater Voltage . . . . .	12.6	volts
Plate Current for plate volts = 10. . . . .	3	ma

° without external shield.

12DS7-A

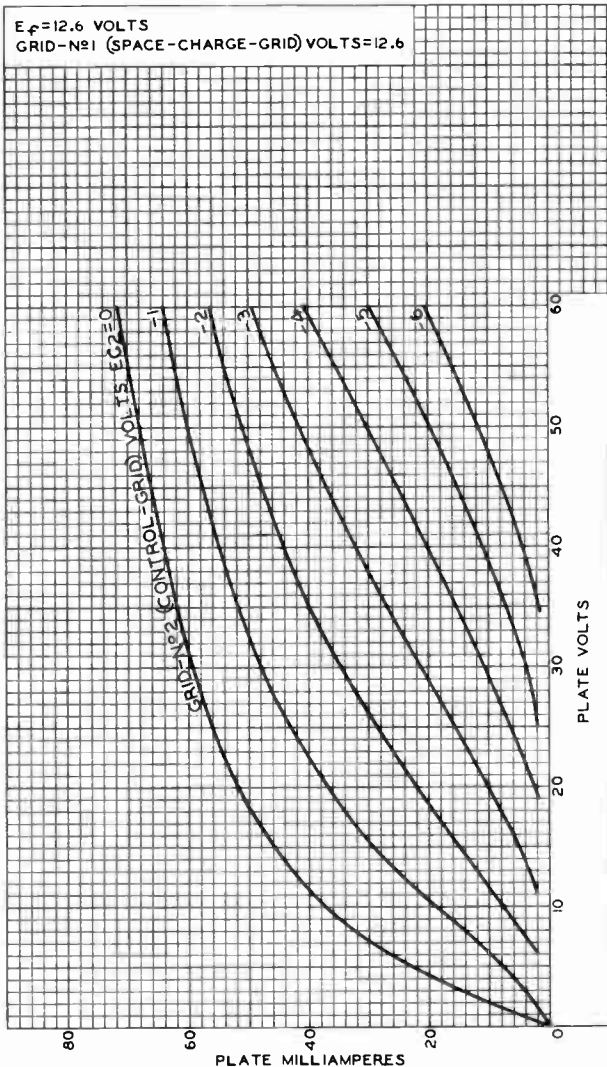


12DS7-A

AVERAGE PLATE CHARACTERISTICS  
TETRODE UNIT

$E_f = 12.6$  VOLTS

GRID-№1 (SPACE-CHARGE-GRID) VOLTS = 12.6





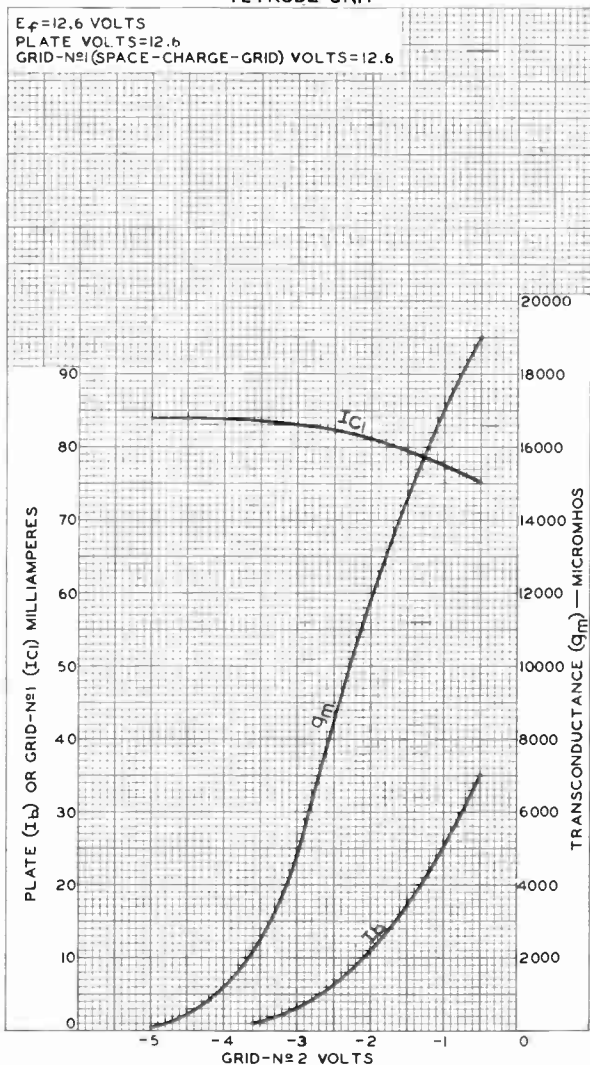


12DS7-A

12DS7-A

### AVERAGE CHARACTERISTICS TETRODE UNIT

$E_f = 12.6$  VOLTS  
PLATE VOLTS = 12.6  
GRID-N<sub>2</sub> (SPACE-CHARGE-GRID) VOLTS = 12.6



ELECTRON TUBE DIVISION

92CM-10134

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History





12DT5  
12DT8

# 12DT5 BEAM POWER TUBE

9-PIN MINIATURE TYPE

*Intended for use in equipment having  
series heater-string arrangement*

*The 12DT5 is the same as the 6DT5 except for the following items:*

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.6 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

# 12DT8 HIGH-MU TWIN TRIODE

9-PIN MINIATURE TYPE

*The 12DT8 is the same as the 6DT8 except for the following items:*

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.15	amp





12DV8

12DV8

## TWIN DIODE-POWER TETRODE

9-PIN MINIATURE TYPE

For use in automobile radio receivers operating directly  
from 6-cell storage-battery systems

## GENERAL DATA

## Electrical:

Heater, for Unipotential Cathodes:

Voltage range (DC) . . . . . 10 to 15.9 volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.) at 12.6 volts . . . . . 0.375 amp

Direct Interelectrode Capacitances:<sup>0</sup>

## Tetrode Unit:

Grid No.2 to plate . . . . . 12  $\mu\mu\text{f}$ Grid No.2 to cathode, grid No.1,  
and heater . . . . . 9  $\mu\mu\text{f}$ Plate to cathode, grid No.1,  
and heater . . . . . 1  $\mu\mu\text{f}$ 

## Diode Units:

Plate of unit No.1 to cathode &  
internal shield, and heater . . . . . 1.7  $\mu\mu\text{f}$ Plate of unit No.2 to cathode &  
internal shield, and heater . . . . . 1.6  $\mu\mu\text{f}$ Plate of unit No.1 to plate of  
unit No.2 . . . . . 0.1 max.  $\mu\mu\text{f}$ Tetrode grid No.2 to either  
diode plate . . . . . 0.015 max.  $\mu\mu\text{f}$ Characteristics, Class A<sub>1</sub> Amplifier (Tetrode Unit):

Heater Voltage . . . . . 12.6 volts

Plate Supply Voltage . . . . . 12.6 volts

Grid-No.2 (Control-grid) Resistor . . . . . 4.7 megohms

Grid-No.1 (Space-charge-grid)

Supply Voltage . . . . . 12.6 volts

Cathode Resistor . . . . . 18 ohms

Plate Resistance (Approx.) . . . . . 900 ohms

Amplification Factor, Grid No.2

to Plate . . . . . 7.6

Transconductance, Grid No.2 to Plate . . . . . 8500  $\mu\text{mhos}$ 

Plate Current . . . . . 9 ma

Grid-No.1 Current . . . . . 53 ma

## 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"  $\pm$  3/32"

Diameter . . . . . 0.750" to 0.875"

Dimensional Outline . . . . . See General Section

Bulb . . . . . T6-1/2

<sup>0</sup> without external shield.

12DV8



12DV8

## TWIN DIODE-POWER TETRODE

Base . . . . . Small-Button Noval 9-Pin (JEDEC No. E9-1)

Basing Designation for BOTTOM VIEW. . . . . 9HR

Pin 1 - Plate of Diode

Unit No.2

Pin 2 - Cathode of

Tetrode Unit

Pin 3 - Grid No.1 of

Tetrode Unit

Pin 4 - Heater

Pin 5 - Heater

Pin 6 - Plate of

Tetrode Unit



Pin 7 - Grid No.2 of  
Tetrode Unit

Pin 8 - Cathode of  
Diode Units  
No.1 & No.2,  
Internal  
Shield

Pin 9 - Plate of Diode  
Unit No.1

### TETRODE UNIT — AUDIO DRIVER

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

PLATE VOLTAGE . . . . .	16 max.	volts
GRID-No.2 (CONTROL-GRID) VOLTAGE:		
Negative-bias value . . . . .	16 max.	volts
GRID-No.1 (SPACE-CHARGE-GRID) VOLTAGE . . . . .	16 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	16 max.	volts
Heater positive with respect to cathode. . . . .	16 max.	volts

#### Typical Operation:

Heater Voltage. . . . .	12.6	volts
Plate Supply Voltage. . . . .	12.6	volts
Grid-No.1 Supply Voltage. . . . .	12.6	volts
Grid-No.2 Resistor. . . . .	4.7	megohms
Cathode Resistor. . . . .	18	ohms
Peak AF Grid-No.2 Supply Voltage (Approx.):		
From 0.3-megohm signal source . . . . .	1.2	volts
Indicated-Signal Plate Current. . . . .	6.8	ma
Grid-No.1 Current . . . . .	54	ma
Load Resistance . . . . .	1250	ohms
Total Harmonic Distortion . . . . .	3	%
Indicated-Signal Power Output . . . . .	5	mW

#### Maximum Circuit Values:

Grid-No.2-Circuit Resistance. . . . .	10 max.	megohms
---------------------------------------	---------	---------

### DIODE UNITS — Two

Values are for Each Unit

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

PLATE CURRENT . . . . .	5 max.	ma
-------------------------	--------	----



12DV8

12DV8

## TWIN DIODE-POWER TETRODE

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . . . .	16 max.	volts
Heater positive with respect to cathode. . . . .	16 max.	volts

### Characteristics:

Heater Voltage. . . . .	12.6	volts
Plate Current for plate volts = 10. . .	3	ma







12EA6

# 12EA6

## SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

For use in automobile radio receivers operating directly from 6-cell storage-battery systems

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage range (DC) . . . . . 10 to 15.9 volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.) at 12.6 volts . . . . . 0.19 amp

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

Grid No.1 to plate. . . . . 0.04 max.  $\mu\text{f}$

Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater. . . . . 11  $\mu\text{f}$

Plate to cathode, grid No.3 & internal shield, grid No.2, and heater. . . . . 4  $\mu\text{f}$

#### Characteristics, Class A<sub>1</sub> Amplifier:

Heater Voltage . . . . . 12.6 volts

Plate Voltage . . . . . 12.6 volts

Grid-No.3 Voltage . . . . . 0 volts

Grid-No.2 Voltage . . . . . 12.6 volts

Grid-No.1 Resistor (Bypassed) . . . . . 10 megohms

Plate Resistance (Approx.) . . . . . 32000 ohms

Transconductance. . . . . 3800  $\mu\text{mhos}$

Plate Current . . . . . 3.2 ma

Grid-No.2 Current . . . . . 1.4 ma

Grid-No.1 Voltage (Approx.) for plate  $\mu\text{a} = 10$  . . . . . -3.4 volts

#### Mechanical:

Operating Position. . . . . Any

Maximum Overall Length. . . . . 2-1/8"

Maximum Seated Length. . . . . 1-7/8"

Length, Base Seat to Bulb Top (Excluding tip). . . . . 1-1/2"  $\pm$  3/32"

Diameter. . . . . 0.650" to 0.750"

Dimensional Outline . . . . . See General Section

Bulb. . . . . T5-1/2

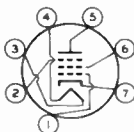
Base. . . . . Small-Button Miniature 7-Pin (JEDEC No.E7-1)

Basing Designation for BOTTOM VIEW. . . . . 7BK

Pin 1 - Grid No.1

Pin 2 - Grid No.3,  
Internal  
Shield

Pin 3 - Heater



Pin 4 - Heater

Pin 5 - Plate

Pin 6 - Grid No.2

Pin 7 - Cathode

<sup>o</sup> Without external shield.

12EA6



12EA6

## SHARP-CUTOFF PENTODE

AMPLIFIER — Class A<sub>1</sub>

## Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE . . . . .	16 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	16 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive-bias value . . . . .	0 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with		
respect to cathode. . . . .	16 max.	volts
Heater positive with		
respect to cathode. . . . .	16 max.	volts

## Maximum Circuit Values:

Grid-No.1-Circuit Resistance. . . . .	12 max.	megohms
---------------------------------------	---------	---------



12ED5

12ED5

# BEAM POWER TUBE

7-PIN MINIATURE TYPE

*Intended for use in equipment having series heater-string arrangement*

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.45 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid No.1 to plate . . . . .	0.26	μf
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	14	μf
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	8.5	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"
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 . . . . .	7CV

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



Pin 4 - Heater  
Pin 5 - Grid No.1  
Pin 6 - Grid No.2  
Pin 7 - Plate

## AMPLIFIER — Class A<sub>1</sub>

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE . . . . .	150	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	150	max.	volts
GRID-No.2 INPUT . . . . .	1.5	max.	watts
PLATE DISSIPATION . . . . .	6.25	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	300	max.	volts
Heater positive with respect to cathode . . . . .	200	max.	volts

### Typical Operation and Characteristics:

Plate Voltage . . . . .	110	125	volts
Grid-No.2 Voltage . . . . .	110	125	volts
Grid-No.1 Voltage . . . . .	-4	-4.5	volts
Peak AF Grid-No.1 Voltage . . . . .	4	4.5	volts

12ED5



12ED5

BEAM POWER TUBE

Zero-Signal Plate Current. . . . .	32	37	ma
Max.-Signal Plate Current. . . . .	31	36	ma
Zero-Signal Grid-No.2 Current. . . . .	4	7	ma
Max.-Signal Grid-No.2 Current. . . . .	8	11	ma
Plate Resistance (Approx.) . . . . .	14000	14000	ohms
Transconductance . . . . .	8100	8500	$\mu$ mhos
Load Resistance. . . . .	4500	4500	ohms
Total Harmonic Distortion. . . . .	5	5	%
Max.-Signal Power Output . . . . .	1.1	1.5	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

○ Without external shield.

● The dc component must not exceed 200 volts.

▲ The dc component must not exceed 100 volts.



12EG6

# 12EG6

## PENTAGRID AMPLIFIER

7-PIN MINIATURE TYPE

For use in automobile radio receivers operating directly from 12-volt storage batteries

### GENERAL DATA

#### Electrical:

heater, for Unipotential Cathode:

voltage range . . . . . 10 to 15.9 . . . . . dc volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.)

at 12.6 volts . . . . . 0.15 . . . . . amp

Direct Interelectrode Capacitances:<sup>0</sup>

Grid No.3 to all other electrodes

except plate . . . . . 6.5  $\mu$ f

Plate to all other electrodes . . . . . 12  $\mu$ f

Grid No.1 to all other electrodes

except plate . . . . . 5.7  $\mu$ f

Grid No.3 to plate . . . . . 0.25 max.  $\mu$ f

Grid No.3 to grid No.1 . . . . . 0.15 max.  $\mu$ f

Grid No.1 to plate . . . . . 0.04 max.  $\mu$ f

Grid No.1 to cathode & grid No.5 . . . . . 3.2  $\mu$ f

Cathode & grid No.5 to all other

electrodes except grid No.1 . . . . . 23  $\mu$ f

#### Characteristics, Class A<sub>1</sub> Amplifier:

*With grid No.3 connected to grid No.1 through 100,000-ohm resistor*

Heater Voltage . . . . . 12.6 volts

Plate Voltage . . . . . 12.6 volts

Grids No.2 & 4 (Screen-Grids) Voltage . . . . . 12.6 volts

Grid-No.1 (Control-Grid) Voltage:

Developed across 2.2-megohm resistor . . . . . -0.6 volt

Plate Resistance (Approx.) . . . . . 0.15 megohm

Transconductance, Grid No.3 to Plate . . . . . 800  $\mu$ hos

Plate Current . . . . . 0.55 ma

Grids-No.2 & 4 Current . . . . . 2.8 ma

Grid-No.1 Voltage (Approx.) for grid-to-plate

transconductance of 20  $\mu$ hos. . . . . -3 volts

#### Mechanical:

Operating Position . . . . . Any

Maximum Overall Length . . . . . 2-1/8"

Maximum Seated Length . . . . . 1-7/8"

Length, Base Seat to Bulb Top (Excluding tip) . . . . . 1-1/2"  $\pm$  3/32"

Diameter . . . . . 0.650" to 0.750"

Dimensional Outline . . . . . See General Section

Bulb . . . . . T<sub>9</sub>-1/2

<sup>0</sup>: See next page.

12EG6



12EG6

PENTAGRID AMPLIFIER

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

AMPLIFIER — Class A<sub>1</sub>

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	16 max.	volts
GRID-No.3 (CONTROL-GRID) VOLTAGE:		
Negative-bias value . . . . .	16 max.	volts
Positive-bias value . . . . .	0 max.	volts
GRIDS-No.2 & 4 (SCREEN-GRIDS)		
SUPPLY VOLTAGE. . . . .	16 max.	volts
GRIDS-No.2 & 4 VOLTAGE. . . . .	16 max.	volts
CATHODE CURRENT . . . . .	20 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	16 max.	volts
Heater positive with respect to cathode .	16 max.	volts

Maximum Circuit Values:

Grid-No.3-Circuit Resistance. . . . .	10 max.	megohms
---------------------------------------	---------	---------

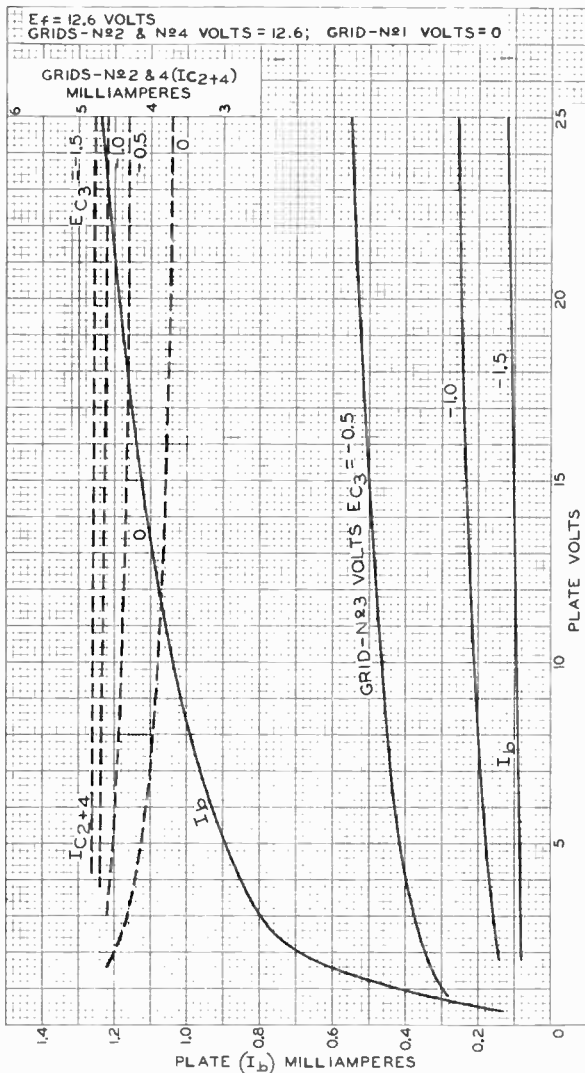
<sup>o</sup> With external shield JETEC No.316 connected to cathode.



12EG6

12EG6

### AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

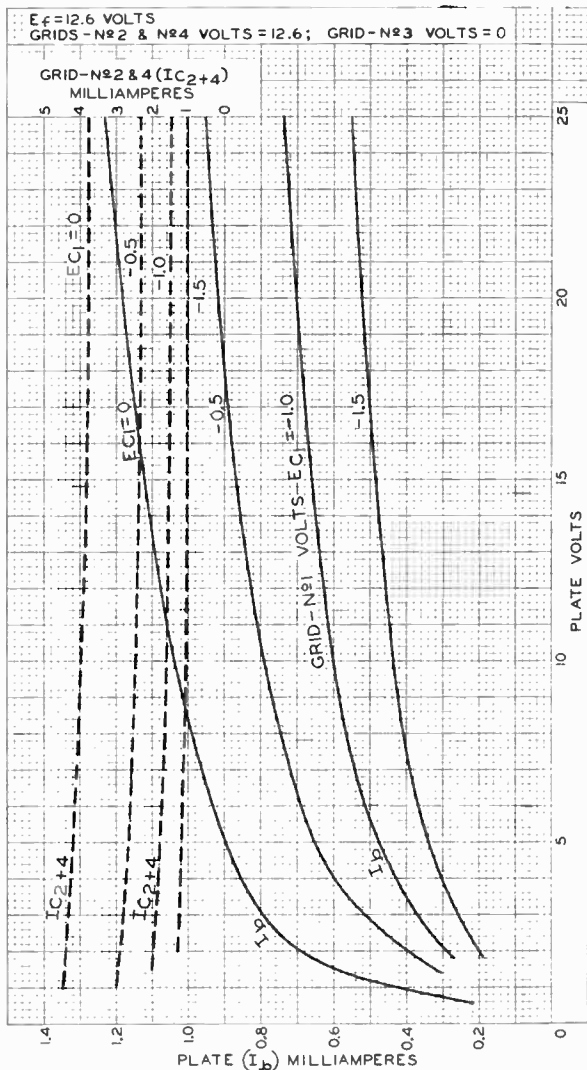
92CM-9643

12EG6



12EG6

## AVERAGE CHARACTERISTICS

ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9642

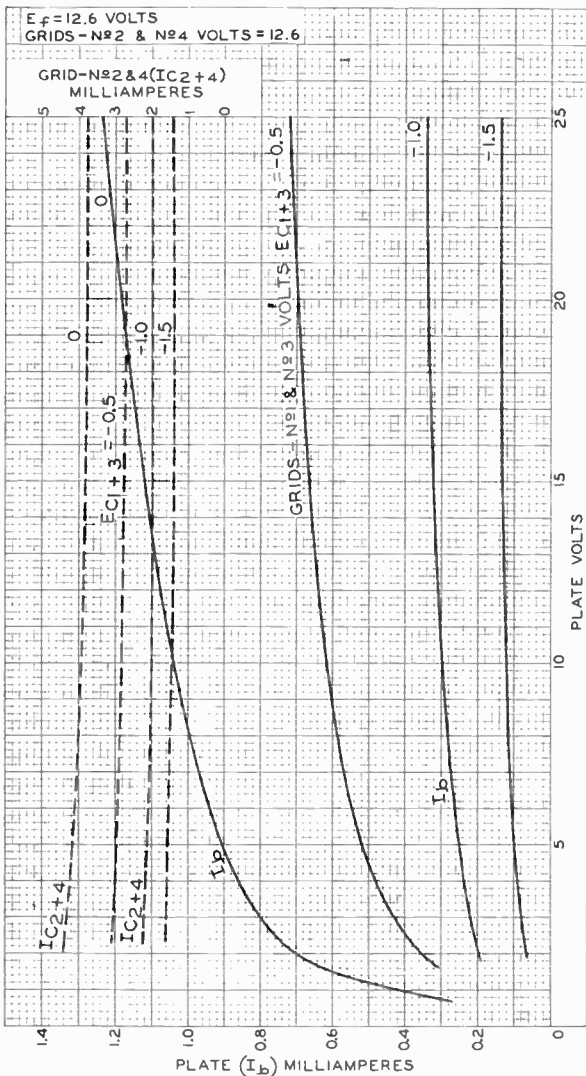




12EG6

12EG6

### AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9641





12EH5

POWER PENTODE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

12EH5

The 12EH5 is the same as the 6EH5 except for the following items:

Heater, for Unipotential Cathode:

Voltage. . . . .	12.6	. . . . .	ac or dc volts
Current. . . . .	0.6	. . . . .	amp
Warm-up time (Average) . . . . .	11	. . . . .	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode.	300	max. volts
Heater positive with respect to cathode.	200 <sup>▲</sup>	max. volts

▲ The dc component must not exceed 100 volts.



-



**12EK6****12EK6****SHARP-CUTOFF PENTODE**

7-PIN MINIATURE TYPE

*For use in automobile radio receivers operating directly from 12-volt storage batteries***GENERAL DATA****Electrical:**

Heater, for Unipotential Cathode:

Voltage range . . . . . 10 to 15.9 . . . . . dc volts  
*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.)

at 12.6 volts . . . . . 0.19 . . . . . amp

Direct Interelectrode Capacitances:<sup>0</sup>Grid No.1 to plate . . . . . 0.032 max.  $\mu$ fGrid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . . 10  $\mu$ fPlate to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . . 5.5  $\mu$ f**Characteristics, Class A<sub>1</sub> Amplifier:**

Heater Voltage . . . . . 12.6 volts

Plate Voltage . . . . . 12.6 volts

Grid No.3 . . . . . Connected to cathode at socket

Grid-No.2 Voltage . . . . . 12.6 volts

Grid-No.1 Supply Voltage . . . . . 0 volts

Grid-No.1 Resistor (Bypassed) . . . . . 2.2 megohms

Plate Resistance (Approx.) . . . . . 40000 ohms

Transconductance . . . . . 4200  $\mu$ hos

Plate Current . . . . . 4.4 ma

Grid-No.2 Current . . . . . 2 ma

Grid-No.1 Voltage (Approx.) for plate  $\mu$ a = 10 . . . . . -4 volts**Mechanical:**

Operating Position . . . . . Any

Maximum Overall Length . . . . . 2-1/8"

Maximum Seated Length . . . . . 1-7/8"

Length, Base Seat to Bulb Top (Excluding tip) . 1-1/2"  $\pm$  3/32"

Diameter . . . . . 0.650" to 0.750"

Dimensional Outline . . . . . See General Section

Bulb . . . . . T5-1/2

Base . . . . . Small-Button Miniature 7-Pin (JETEC No.E7-1)

Basing Designation for BOTTOM VIEW . . . . . 7BK

Pin 1 - Grid No.1

Pin 2 - Grid No.3

Internal

Shield

Pin 3 - Heater



Pin 4 - Heater

Pin 5 - Plate

Pin 6 - Grid No.2

Pin 7 - Cathode

<sup>0</sup>: See next page.

12EK6



12EK6

## SHARP-CUTOFF PENTODE

AMPLIFIER — Class A<sub>1</sub>

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	16 max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE. . . . .	0 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . .	16 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive-bias value. . . . .	0 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	16 max.	volts
Heater positive with respect to cathode.	16 max.	volts

## Maximum Circuit Values:

Grid-No.1-Circuit Resistance . . . . .	10 max.	megohms
--	---------	---------

<sup>o</sup> without external shield.

12EK6



12EK6

### AVERAGE CHARACTERISTICS

$E_f = 12.6$  VOLTS  
GRID N $\phi$ 3 CONNECTED TO CATHODE.  
GRID-N $\phi$ 2 VOLTS = 12.6

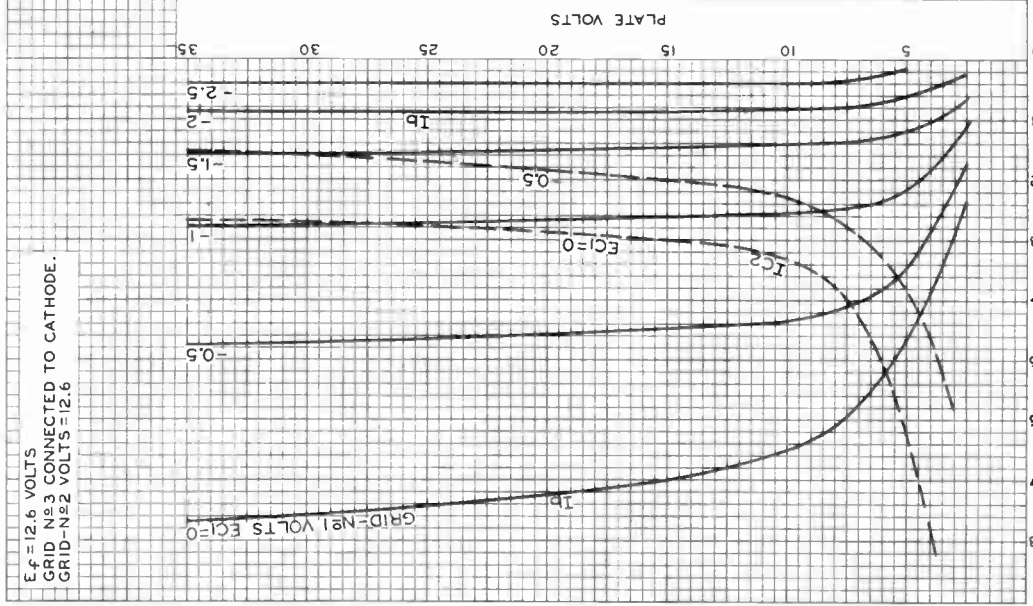


PLATE ( $I_b$ ) OR GRID-N $\phi$ 2 ( $I_{c2}$ ) MILLIAMPERES

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

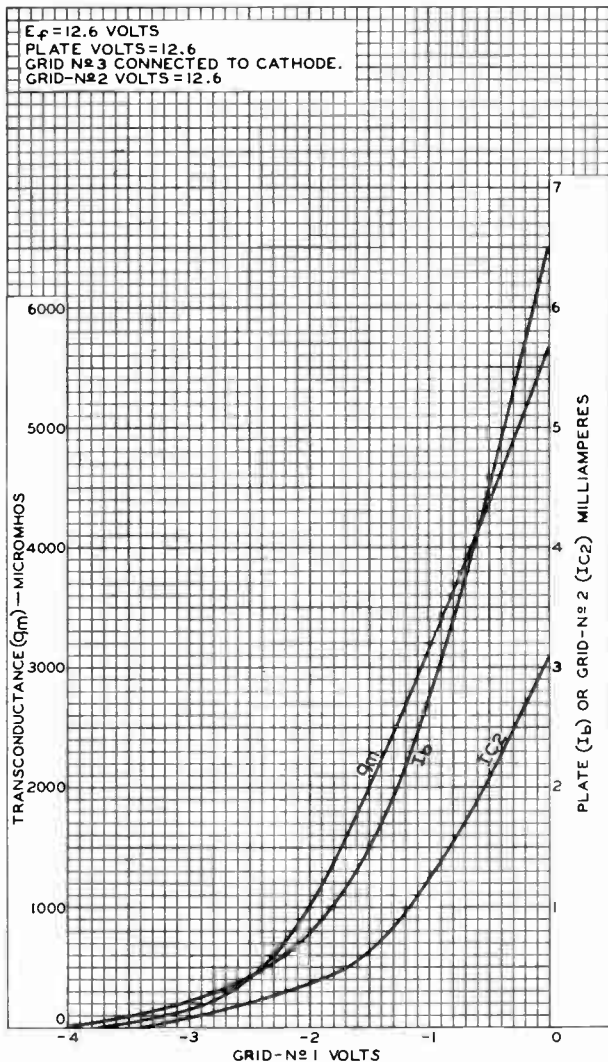
92CM-9632

12EK6



12EK6

## AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9633





12EL6

12EL6

# TWIN DIODE—HIGH-MU TRIODE

7-PIN MINIATURE TYPE

For use in automobile radio receivers operating directly from 6-cell storage-battery systems

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage range (DC) . . . . . 10 to 15.9 volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.)

at 12.6 volts . . . . . 0.15 amp

Direct Interelectrode Capacitances

(Approx.):<sup>0</sup>

Triode grid to triode plate . . . . . 1.8  $\mu\text{f}$

Triode grid to cathode and heater . . . . . 2.2  $\mu\text{f}$

Triode plate to cathode and heater. . . . . 1  $\mu\text{f}$

Diode-No.1 plate to diode-No.2 plate. . . . . 1  $\mu\text{f}$

### Characteristics, Class A<sub>1</sub> Amplifier (Triode Unit):

Heater Voltage. . . . . 12.6 volts

Plate Voltage . . . . . 12.6 volts

Grid Voltage. . . . . 0 volts

Amplification Factor. . . . . 55

Plate Resistance (Approx.). . . . . 45000 ohms

Transconductance. . . . . 1200  $\mu\text{mhos}$

Plate Current . . . . . 750  $\mu\text{a}$

### Mechanical:

Operating Position. . . . . Any

Maximum Overall Length. . . . . 2-1/8"

Maximum Seated Length . . . . . 1-7/8"

Length, Base Seat to Bulb Top (Excluding tip). . . . . 1-1/2"  $\pm$  3/32"

Diameter. . . . . 0.650" to 0.750"

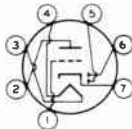
Dimensional Outline . . . . . See General Section

Bulb. . . . . T5-1/2

Base. . . . . Small-Button Miniature 7-Pin (JEDEC No.E7-1)

Basing Designation for BOTTOM VIEW. . . . . 7FB

- Pin 1—Triode Grid
- Pin 2—Triode Plate
- Pin 3—Heater
- Pin 4—Heater



- Pin 5—Diode-No.2 Plate
- Pin 6—Diode-No.1 Plate
- Pin 7—Cathode

## TRIODE UNIT — AMPLIFIER — Class A<sub>1</sub>

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . . 30 max. volts

CATHODE CURRENT . . . . . 20 max. ma

<sup>0</sup> without external shield.

12EL6



12EL6

## TWIN DIODE—HIGH-MU TRIODE

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . .	30 max.	volts
Heater positive with respect to cathode. . .	30 max.	volts

### Typical Operation:

*As resistance-coupled amplifier*

Heater Voltage . . . . .	12.6	volts
Plate Supply Voltage . . . . .	12.6	volts
Grid Voltage . . . . .	0	volts
Plate Load Resistor. . . . .	1	megohm
Grid Resistor. . . . .	1	megohm
Grid Resistor of Following Stage . . . . .	2	megohms
Input Capacitor. . . . .	0.02	$\mu$ f
Output Capacitor . . . . .	0.01	$\mu$ f
Voltage Gain at 400 cps with RMS output volts = 1. . . . .	16	

### Maximum Circuit Values:

Grid-Circuit Resistance. . . . .	10 max.	megohms
----------------------------------	---------	---------

### DIODE UNITS — Two

*Values are for Each Unit*

### Maximum Ratings, Design-Center Values:

PLATE CURRENT. . . . .	1 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . .	30 max.	volts
Heater positive with respect to cathode. . .	30 max.	volts

### Characteristics:

Heater Voltage . . . . .	12.6	volts
Plate Current for plate volts = 10 . . . . .	2	ma



12EM6

# 12EM6

## DIODE-POWER TETRODE

9-PIN MINIATURE TYPE

For use in automobile radio receivers operating directly from 6-cell storage-battery systems

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage range (DC) . . . . . 10 to 15.9 volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.) at 12.6 volts . . . . . 0.5 amp

#### Characteristics, Class A<sub>1</sub> Amplifier (Tetrode Unit):

Heater Voltage . . . . . 12.6 volts

Plate Voltage . . . . . 12.6 volts

Grid-No.2 Voltage . . . . . 12.6 volts

Grid-No.1 Resistor (Bypassed) . . . . . 2.2 megohms

Plate Resistance (Approx.) . . . . . 4000 ohms

Transconductance . . . . . 5000  $\mu$ mhos

Plate Current . . . . . 6 ma

Grid-No.2 Current . . . . . 1 ma

#### 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"  $\pm$  3/32"

Diameter . . . . . 0.750" to 0.875"

Dimensional Outline . . . . . See General Section

Bulb . . . . . T6-1/2

Base . . . . . Small-Button Noval 9-Pin (JEDEC No. E9-1)

Basing Designation for BOTTOM VIEW . . . . . 9HV

Pin 1 - Tetrode  
Grid No.1

Pin 2 - Cathode

Pin 3 - Tetrode  
Grid No.2

Pin 4 - Heater

Pin 5 - Heater



Pin 6 - Tetrode Plate

Pin 7 - Internal Connection—  
Do Not Use

Pin 8 - Same as Pin 7

Pin 9 - Diode Plate

### TETRODE UNIT — AUDIO DRIVER

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

PLATE VOLTAGE . . . . . 30 max. volts

GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . . 30 max. volts

PLATE DISSIPATION . . . . . 0.5 max. watt

#### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . . 30 max. volts

Heater positive with respect to cathode . . . . . 30 max. volts

12EM6



12EM6

## DIODE-POWER TETRODE

## Typical Operation:

Heater Voltage. . . . .	12.6	volts
Plate Voltage . . . . .	12.6	volts
Grid-No.2 Voltage . . . . .	12.6	volts
Grid-No.1 Voltage . . . . .	<i>Obtained by rectification through 15-megohm resistor</i>	

## Peak AF Grid-No.1 Voltage:

From 0.2-megohm signal source . . . . .	1.4	volts
Zero-Signal Plate Current . . . . .	6	ma
Max.-Signal Plate Current . . . . .	2.5	ma
Load Resistance . . . . .	3500	ohms
Total Harmonic Distortion . . . . .	10	%
Max.-Signal Power Output. . . . .	10	mw

## Maximum Circuit Values:

Grid-No.1-Circuit Resistance. . . . .	15 max.	megohms
---------------------------------------	---------	---------

## DIODE UNIT

## Maximum Ratings, Design-Center Values:

PLATE CURRENT . . . . .	10 max.	ma
-------------------------	---------	----

## Characteristics:

Heater Voltage. . . . .	12.6	volts
Plate Current for plate volts = 10. . . . .	1	ma



12EN6

12EN6

### BEAM POWER TUBE

Intended for use in equipment having series heater-string arrangement

#### GENERAL DATA

##### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.6 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

Direct Interelectrode Capacitances

(Approx.):<sup>0</sup>

Grid No.1 to plate . . . . .	0.65	μmf
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	14	μmf
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	8	μmf

##### Characteristics, Class A<sub>1</sub> Amplifier:

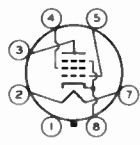
Plate Voltage . . . . .	50	200	volts
Grid-No.2 Voltage . . . . .	110	110	volts
Grid-No.1 Voltage . . . . .	0	-9.5	volts
Plate Resistance (Approx.) . . . . .	-	28000	ohms
Transconductance . . . . .	-	8000	μmhos
Plate Current . . . . .	140	50	ma
Grid-No.2 Current . . . . .	17	2.2	ma
Grid-No.1 Voltage (Approx.) for plate $\mu a = 100$ . . . . .	-	-35	volts

##### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	3-5/16"
Maximum Seated Length . . . . .	2-3/4"
Maximum Diameter . . . . .	1-9/32"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T9
Base . . . . .	Intermediate-Shell Octal 7-Pin (JEDEC Group 1, No.87-7), Short Intermediate-Shell Octal 7-Pin with External Barriers (JEDEC Group 1, No.87-59), Intermediate-Shell Octal 6-Pin, Arrangement 2 (JEDEC Group 1, No.86-81), or Short Intermediate-Shell Octal 6-Pin with External Barriers, Arrangement 2 (JEDEC Group 1, No.86-84)

Basing Designation for BOTTOM VIEW. . . . . 7S

- Pin 1 - No Connection
- Pin 2 - Heater
- Pin 3 - Plate
- Pin 4 - Grid No.2



- Pin 5 - Grid No.1
- Pin 7 - Heater
- Pin 8 - Cathode, Grid No.3



12EN6

## BEAM POWER TUBE

## VERTICAL-DEFLECTION AMPLIFIER

## Maximum Ratings, Design-Maximum Values:

For operation in a 525-line, 30-frame system<sup>□</sup>

	Pentode Unit	Pentode Unit (Triode Connection <sup>†</sup> )	
DC PLATE VOLTAGE . . . . .	300 max.	300 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE* . . . . .	1200 max.	1200 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	150 max.	-	volts
PEAK NEGATIVE-PULSE GRID- No.1 (CONTROL-GRID) VOLTAGE . . . . .	250 max.	250 max.	volts
CATHODE CURRENT:			
Peak . . . . .	175 max.	175 max.	ma
Average . . . . .	50 max.	50 max.	ma
GRID-No.2 INPUT . . . . .	1.25 max.	-	watts
PLATE DISSIPATION . . . . .	7 max.	7.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	300 <sup>•</sup> max.	300 <sup>•</sup> max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	200 <sup>▲</sup> max.	volts

## Maximum Circuit Values:

	Pentode Unit	Pentode Unit (Triode Connection <sup>†</sup> )	
Grid-No.1-Circuit Resistance . . . . .	2.2 max.	2.2 max.	megohms

<sup>○</sup> Without external shield.

<sup>•</sup> This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

<sup>◆</sup> On the 6-pin bases, pin 1 as well as pin 6 is omitted.

<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

<sup>†</sup> Grid No.2 connected to plate.

<sup>\*</sup> This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

<sup>•</sup> The dc component must not exceed 200 volts.

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



12F8

12F8

# TWIN DIODE-REMOTE-CUTOFF PENTODE

9-PIN MINIATURE TYPE

For use in automobile radio receivers operating directly from 12-volt storage batteries

## GENERAL DATA

### Electrical:

Heater<sup>•</sup> for Unipotential Cathode:

Voltage range . . . . . 10.0 to 15.9 . . . . . dc volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 11 volts.*

Current (Approx.)  
at 12.6 volts . . . . . 0.15 . . . . . amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid No.1 to plate . . . . . 0.06  $\mu$ mf

Grid No.1 to cathode, grid No.3,  
grid No.2, and heater . . . . . 4.5  $\mu$ mf

Plate to cathode, grid No.3,  
grid No.2, and heater . . . . . 3  $\mu$ mf

Plate of diode unit No.1 to plate  
of diode unit No.2 . . . . . 0.3  $\mu$ mf

### Mechanical:

Operating Position . . . . . Any

Maximum Overall Length . . . . . 2-3/16"

Maximum Seated Length . . . . . 1-15/16"

Length, Base Seat to Bulb Top (Excluding Tip) . . . . . 1-9/16"  $\pm$  3/32"

Maximum Diameter . . . . . 7/8"

Dimensional Outline . . . . . See General Section

Bulb . . . . . TF-112

Base . . . . . Small-Button Noval 9-Pin (JFTC No. 9-1)

Basing Designation for BOTTOM VIEW . . . . . 9F1

Pin 1 - Plate of  
Diode  
Unit No.2

Pin 2 - Pentode  
Grid No.2

Pin 3 - Pentode Plate

Pin 4 - Heater

Pin 5 - Heater

Pin 6 - Plate of  
Diode  
Unit No.1

Pin 7 - Cathode of  
Pentode Unit  
and Diode  
Units

No.1 and 2

Pin 8 - Pentode  
Grid No.1

Pin 9 - Pentode  
Grid No.3



## PENTODE UNIT — AMPLIFIER — Class A<sub>1</sub>

Maximum Ratings, Design Center Values:

PLATE VOLTAGE . . . . . 30 max. volts

GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . . 30 max. volts

GRID-No.1 (CONTROL-GRID) VOLTAGE:

Positive bias value . . . . . 0 max. volt

<sup>•</sup>, <sup>0</sup>: See next page.

12F8



12F8

## TWIN DIODE-REMOTE-CUTOFF PENTODE

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode.	30 max.	volts
Heater positive with respect to cathode.	30 max.	volts

### Characteristics with 12.6 Volts on Heater:

Plate Voltage . . . . .	12.6	volts
Grid-No.3 (Suppressor-Grid) Voltage . . . . .	0	volts
Grid No.2 Voltage . . . . .	12.6	volts
Grid-No.1 Voltage . . . . .	0	volts
Plate Resistance (Approx.) . . . . .	0.33	megohm
Transconductance . . . . .	1000	$\mu$ mhos
Plate Current . . . . .	1	ma
Grid-No.2 Current . . . . .	0.38	ma
Grid-No.1 Voltage (Approx.) for trans- conductance of 10 $\mu$ mhos . . . . .	-5	volts

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance . . . . .	10 max.	megohms
--	---------	---------

### DIODE UNITS — Two

### Maximum Ratings, Design-Center Values:

*Values are for Each Unit*

PLATE CURRENT . . . . .	1 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	30 max.	volts
Heater positive with respect to cathode.	30 max.	volts

### Characteristics with 12.6 Volts on Heater:

Plate Current for plate volts = 10 . . . . .	2	ma
--	---	----

- Operation of heater in series with other heaters is not recommended.
- without external shield.

### OPERATING CONSIDERATIONS

The maximum ratings in the tabulated data for the 12F8 are working design-center maximums established according to the standard design-center system of rating electron tubes. Tubes so rated will give satisfactory performance in storage-battery-operated equipment provided the following stipulations are observed:

In the case of storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. This fluctuation imposes severe operating conditions on tubes. Under these conditions, the equipment should be designed so that 90 per cent of the design-center maximum value of plate voltage and grid-No.2 voltage is never exceeded for a battery-terminal potential of 13.2 volts. Although the operating voltages of the 12F8 in this service will, at times, exceed the design-center maximum values, satisfactory performance with probable sacrifice in life will be obtained.





12FK6

12FK6

# TWIN DIODE—MEDIUM-MU TRIODE

7-PIN MINIATURE TYPE

For use in automobile radio receivers operating directly from 12-volt storage batteries

## GENERAL DATA

### Electrical:

Heater\*, for Unipotential Cathode:

Voltage range. . . . . 10 to 15.9 . . . . . ac or dc volts  
*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.)  
at 12.6 volts. . . . . 0.15 . . . . . amp

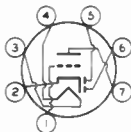
Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Triode grid to triode plate. . . . .	1.6	μf
Triode grid to cathode and heater. . . . .	1.8	μf
Triode plate to cathode and heater . . . . .	0.7	μf
Plate of diode unit No.1 to plate of diode unit No.2. . . . .	0.9	μf

### Mechanical:

Operating Position . . . . . Any  
 Maximum Overall Length . . . . . 2-1/8"  
 Maximum Seated Length. . . . . 1-7/8"  
 Length, Base Seat to Bulb Top (Excluding tip). 1-1/2" ± 3/32"  
 Diameter . . . . . 0.650" to 0.750"  
 Dimensional Outline. . . . . See General Section  
 Bulb . . . . . T5-1/2  
 Base . . . . . Small-Button Miniature 7-Pin (JETEC No.E7-1)  
 Basing Designation for BOTTOM VIEW . . . . . 7BT

Pin 1 - Triode Grid  
 Pin 2 - Cathode  
 Pin 3 - Heater  
 Pin 4 - Heater



Pin 5 - Diode-No.2 Plate  
 Pin 6 - Diode-No.1 Plate  
 Pin 7 - Triode Plate

## TRIODE UNIT — AMPLIFIER — Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	16 max.	volts
GRID VOLTAGE:		
Positive-bias value. . . . .	0 max.	volts
Negative-bias value. . . . .	16 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	16 max.	volts
Heater positive with respect to cathode . . . . .	16 max.	volts

\*<sup>o</sup>: See next page.

12FK6



12FK6

## TWIN DIODE—MEDIUM-MU TRIODE

**Characteristics:**

Heater Voltage . . . . .	12.6	volts
Plate Voltage. . . . .	12.6	volts
Grid-Supply Voltage. . . . .	0	volts
Grid Resistor (Bypassed) . . . . .	2.2	megohms
Amplification Factor . . . . .	7.4	
Plate Resistance (Approx.) . . . . .	6200	ohms
Transconductance . . . . .	1200	$\mu$ hos
Plate Current. . . . .	1.3	ma
Grid Voltage (Approx.) for plate $\mu$ = 10. . . . .	-4	volts

**Maximum Circuit Values:**

Grid-Circuit Resistance . . . . .	10 max.	megohms
-----------------------------------	---------	---------

**DIODE UNITS — Two****Maximum Ratings, Design-Center Values:**

PLATE CURRENT (Each unit). . . . .	1 max.	ma
------------------------------------	--------	----

**Characteristics:**

Heater Voltage . . . . .	12.6	volts
Plate Voltage (Each unit). . . . .	10	volts
Plate Current (Each unit). . . . .	2	ma

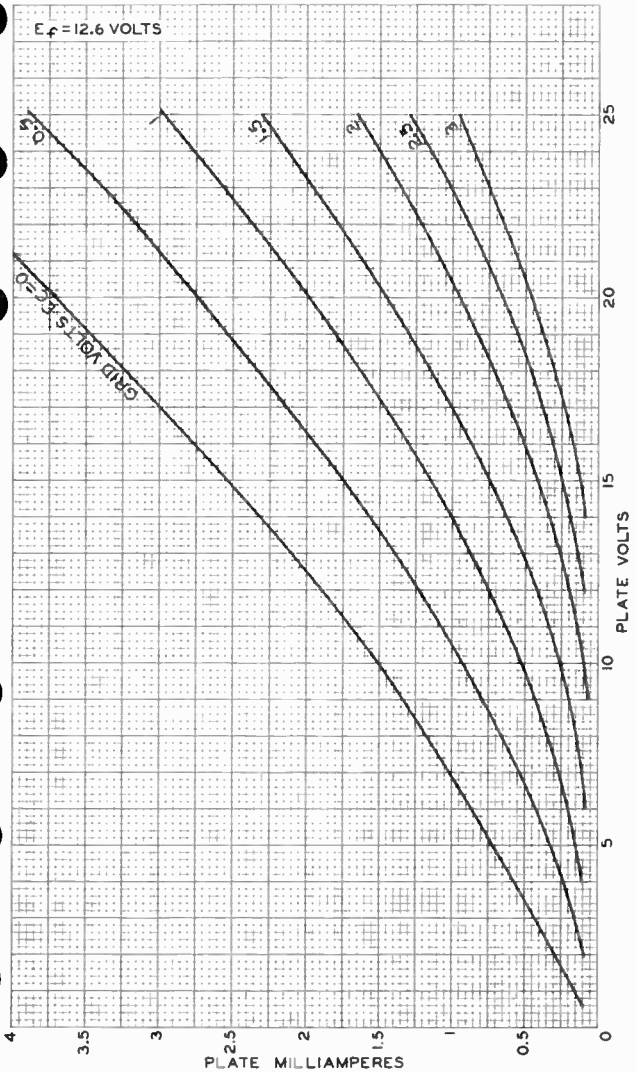
- Operation of heater in series with other heaters is not recommended.
- without external shield.



12FK6

AVERAGE PLATE CHARACTERISTICS  
TRIODE UNIT

12FK6



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

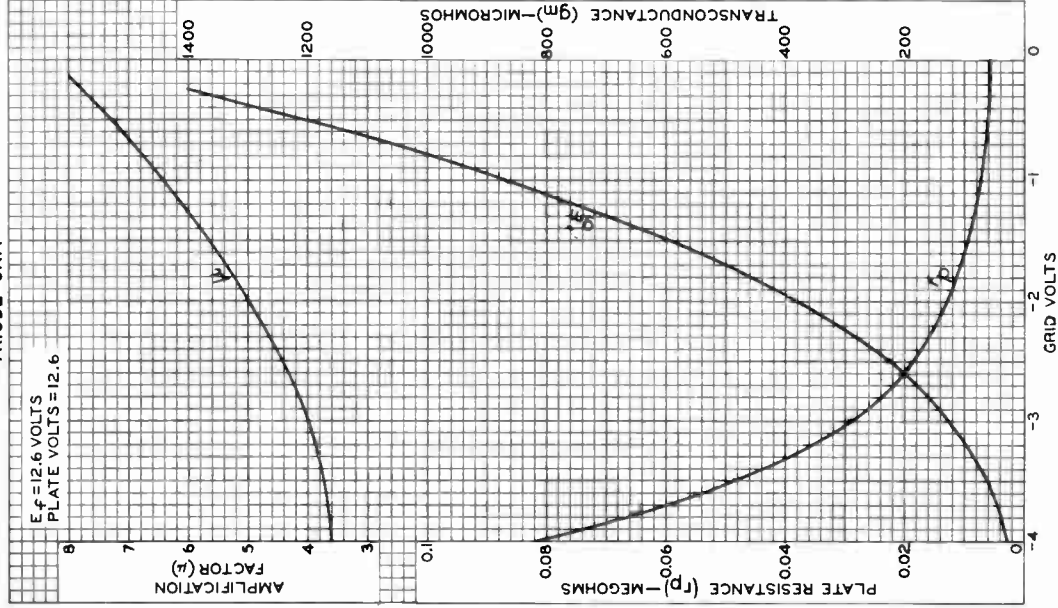
92CM-9799



12FK6

# AVERAGE CHARACTERISTICS TRIODE UNIT

$E_f = 12.6$  VOLTS  
PLATE VOLTS = 12.6



12FK6

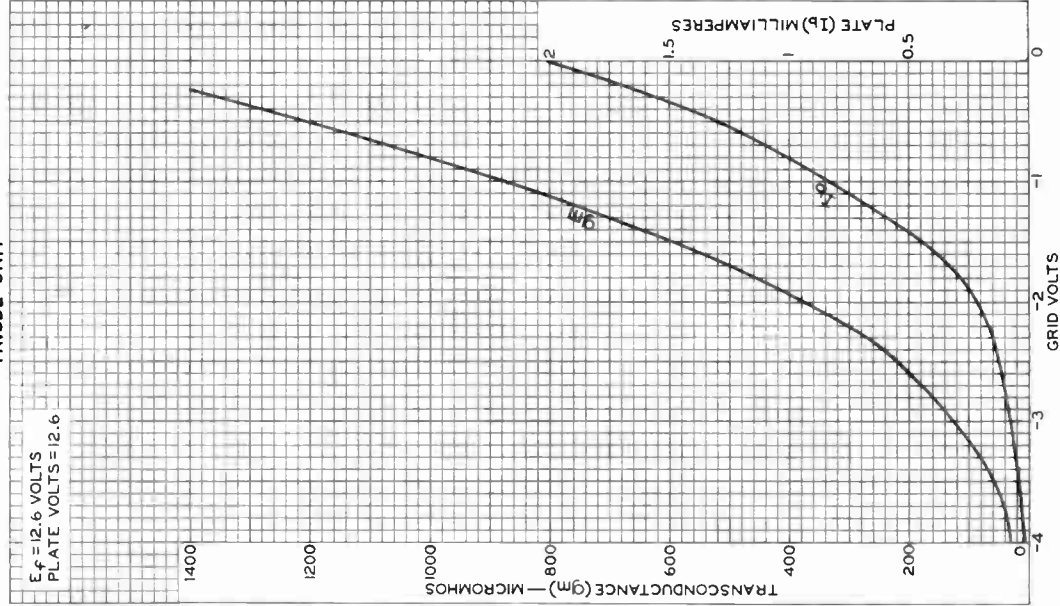
World Precision



12FK6

# 12FK6 AVERAGE CHARACTERISTICS TRIODE UNIT

$E_f = 12.6$  VOLTS  
PLATE VOLTS = 12.6



World Precision Instrument





12FM6

12FM6

# TWIN DIODE-MEDIUM-MU TRIODE

7-PIN MINIATURE TYPE

For use in automobile radio receivers operating directly from 6-cell storage-battery systems

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage range (AC or DC) . . . . . 10 to 15.9 volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.)

at 12.6 volts . . . . . 0.15 amp

Direct Interelectrode Capacitances

(Approx.):<sup>0</sup>

Triode grid to triode plate . . . . . 1.7  $\mu\mu\text{f}$

Triode grid to cathode and heater . . . . . 2.7  $\mu\mu\text{f}$

Triode plate to cathode and heater. . . . . 1.7  $\mu\mu\text{f}$

Diode-No.1 plate to diode-No.2 plate. . . . . 1.1  $\mu\mu\text{f}$

### Characteristics, Class A<sub>1</sub> Amplifier (Triode Unit):

Heater Voltage. . . . . 12.6 12.6 volts

Plate Voltage . . . . . 12.6 12.6 volts

Grid Voltage. . . . . 0 - volts

Grid Resistor (Bypassed). . . . . 0 2.2 megohms

Amplification Factor. . . . . 13.5 10

Plate Resistance (Approx.). . . . . 5600 7700 ohms

Transconductance. . . . . 2400 1300  $\mu\text{mhos}$

Plate Current . . . . . 1.8 1 ma

### Mechanical:

Operating Position. . . . . Any

Maximum Overall Length. . . . . 2-1/8"

Maximum Seated Length . . . . . 1-7/8"

Length, Base Seat to Bulb Top (Excluding tip) 1-1/2"  $\pm$  3/32"

Diameter. . . . . 0.650" to 0.750"

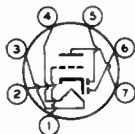
Dimensional Outline . . . . . See General Section

Bulb. . . . . T5-1/2

Base. . . . . Small-Button Miniature 7-Pin (JEDEC No. E7-1)

Basing Designation for BOTTOM VIEW. . . . . 7BT

- Pin 1 - Triode Grid
- Pin 2 - Cathode
- Pin 3 - Heater
- Pin 4 - Heater



- Pin 5 - Diode-No.2 Plate
- Pin 6 - Diode-No.1 Plate
- Pin 7 - Triode Plate

<sup>0</sup> Without external shield.

12FM6



12FM6

## TWIN DIODE—MEDIUM-MU TRIODE

TRIODE UNIT — AMPLIFIER — Class A<sub>1</sub>

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	30 max.	volts
CATHODE CURRENT. . . . .	20 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	30 max.	volts
Heater positive with respect to cathode.	30 max.	volts

## Maximum Circuit Values:

Grid-Circuit Resistance. . . . .	10 max.	megohms
----------------------------------	---------	---------

## DIODE UNITS — Two

Values are for Each Unit

## Maximum Ratings, Design-Center Values:

PLATE CURRENT. . . . .	1 max.	ma
------------------------	--------	----

## Characteristics:

Heater Voltage . . . . .	12.6	volts
Plate Current for plate volts = 10 . . . . .	2	ma





12H6  
TO  
12J7-GT

## 12H6

### TWIN DIODE

Heater, for Unipotential Cathodes:

Voltage . . . . .	12.6	. . . . .	ac or dc volts
Current . . . . .	0.15	. . . . .	amp

*The 12H6 is the same as the 6H6 except for heater rating.*

## 12J5-GT

### MEDIUM-MU TRIODE

Heater, for Unipotential Cathode:

Voltage . . . . .	12.6	. . . . .	ac or dc volts
Current . . . . .	0.15	. . . . .	amp

*The 12J5-GT is the same as the 6J5-GT except for heater rating and base. Base and connections for the 12J5-GT are the same as for the 6P5-GT.*

## 12J7-GT

### SHARP-CUTOFF PENTODE

Heater, for Unipotential Cathode:

Voltage . . . . .	12.6	. . . . .	ac or dc volts
Current . . . . .	0.15	. . . . .	amp

*The 12J7-GT is the same as the 6J7-GT except for heater rating.*





12J8

12J8

**TWIN DIODE—POWER TETRODE**

9-PIN MINIATURE TYPE

For use in automobile radio receivers  
operating directly from 12-volt storage batteries

**GENERAL DATA****Electrical:**

Heater, for Unipotential Cathodes:

Voltage range. . . . . 10 to 15.9 . . . . . dc volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.) at

12.6 volts . . . . . 0.325 . . . . . amp

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

Tetrode Unit:

Grid No.1 to plate . . . . . 0.7  $\mu\mu\text{f}$ Grid No.1 to cathode, grid No.2, and heater . . . . . 10.5  $\mu\mu\text{f}$ Plate to cathode, grid No.2, and heater . . . . . 4.4  $\mu\mu\text{f}$ Tetrode grid No.1 to plate of diode unit No.1. 0.04 max.  $\mu\mu\text{f}$ Tetrode grid No.1 to plate of diode unit No.2. 0.015 max.  $\mu\mu\text{f}$ **Mechanical:**

Operating Position . . . . . Any

Maximum Overall Length . . . . . 2-3/16"

Maximum Seated Length . . . . . 1-15/16"

Length, Base Seat to Bulb Top (Excluding tip) 1-9/16"  $\pm$  3/32"

Diameter . . . . . 0.750" to 0.875"

Dimensional Outline . . . . . See General Section

Bulb . . . . . T6-1/2

Base . . . . . Small-Button Noval 9-Pin (JEDEC No.E9-1)

Basing Designation for BOTTOM VIEW . . . . . 9GC

Pin 1—Grid No.1 of Tetrode Unit

Pin 2—Cathode of Tetrode Unit

Pin 3—Grid No.2 of Tetrode Unit

Pin 4—Heater

Pin 5—Heater

Pin 6—Plate of Tetrode Unit

Pin 7—Cathode of Diode Units No.1 &amp; No.2

Pin 8—Plate of Diode unit No.2

Pin 9—Plate of Diode Unit No.1

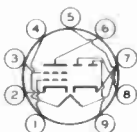
**TETRODE UNIT — AUDIO DRIVER****Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE. . . . . 30 max. volts

GRID—No.2 (SCREEN—GRID) VOLTAGE. . . . . 30 max. volts

PEAK HEATER—CATHODE VOLTAGE:

Heater negative with respect to cathode. 30 max. volts

Heater positive with respect to cathode. 30 max. volts

<sup>o</sup> without external shield.

12J8



12J8

## TWIN DIODE—POWER TETRODE

### Typical Operation with 12.6 Volts on Heater:

Plate Voltage. . . . .	12.6	volts
Grid-No.2 Voltage. . . . .	12.6	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	0	volts
AF Grid-No.1 Voltage (RMS) . . . . .	1.6	volts
Grid-No.1 Resistor . . . . .	2.2	megohms
Grid-No.1-Resistor Bypass Capacitor. . . . .	1	$\mu$ f
Zero-Signal Plate Current. . . . .	12	ma
Zero-Signal Grid-No.2 Current. . . . .	1.5	ma
Transconductance. . . . .	5500	$\mu$ mhos
Plate Resistance (Approx.) . . . . .	6000	ohms
Load Resistance. . . . .	2700	ohms
Total Harmonic Distortion. . . . .	5	%
Max.-Signal Power Output . . . . .	20	mw

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance . . . . .	10 max.	megohms
--	---------	---------

### DIODE UNITS — Two

### Maximum Ratings, Design-Center Values:

*Values are for Each Unit*

PLATE CURRENT. . . . .	5 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. .	30 max.	volts
Heater positive with respect to cathode. .	30 max.	volts

### Characteristics with 12.6 Volts on Heater:

	Diode Unit No.1	Diode Unit No.2	
Plate Current for plate volts = 5. .	8.5	12	ma



12K5

12K5

# POWER TETRODE

7-PIN MINIATURE, SPACE-CHARGE-GRID TYPE

For use in automobile radio receivers operating directly from 12-volt storage batteries

## GENERAL DATA

### Electrical:

Heater\*, for Unipotential Cathode:

Voltage range. . . . 10.0 to 15.9 . . . . . dc volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.*

Current (Approx.)

at 12.6 volts. . . . . 0.4 . . . . . amp

Characteristics, Class A<sub>1</sub> Amplifier with 12.6 Volts on Heater:

Plate Voltage. . . . . 12.6 volts

Grid-No.2 (Control-Grid) Voltage . . . . . -0.5 volt

Grid-No.1 (Space-Charge-Grid) Voltage. . . . . 12.6 volts

Plate Resistance (Approx.) . . . . . 480 ohms

Amplification Factor, Grid No.2 to Plate. . . . . 7.2

Transconductance, Grid No.2 to Plate . . . . . 15000  $\mu$ hos

Plate Current. . . . . 40 ma

Grid-No.1 Current. . . . . 75 ma

### 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"  $\pm$  3/32"

Maximum Diameter . . . . . 3/4"

Dimensional Outline. . . . . See General Section

Bulb . . . . . T5-1/2

Base . . . . . Small-Button Miniature 7-Pin (JETEC No. E7-1)

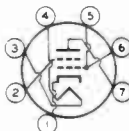
Basing Designation for BOTTOM VIEW . . . . . 7FD

Pin 1 - Cathode

Pin 2 - Grid No.2

Pin 3 - Heater

Pin 4 - Heater



Pin 5 - Grid No.1

Pin 6 - Grid No.1

Pin 7 - Plate

## AUDIO-DRIVER SERVICE

Maximum Ratings, Design-Center Values Except as Noted:

PLATE VOLTAGE. . . . . 30 max. volts

GRID-No.2 (CONTROL-GRID) VOLTAGE:

Negative bias value. . . . . -20 max. volts

GRID-No.1 (SPACE-CHARGE-GRID) VOLTAGE

(Absolute maximum) . . . . . 16<sup>■</sup> max. volts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . . . . 30 max. volts

Heater positive with respect to cathode. . . . . 30 max. volts

\*<sup>■</sup>: See next page.

12K5



12K5

## POWER TETRODE

### Typical Operation with 12.6 Volts on Heater:

Plate Voltage. . . . .	12.6	volts
Grid-No.2 Voltage:		
Obtained by rectification through 2.2- megohm resistor. . . . .	-2	volts
Peak AF Grid-No.2 Voltage:		
Obtained from 100000-ohm source. . . . .	2.5	volts
Grid-No.1 Voltage. . . . .	12.6	volts
Zero-Signal Plate Current. . . . .	40	ma
Max.-Signal Plate Current. . . . .	8	ma
Grid-No.1 Current. . . . .	75	ma
Load Resistance. . . . .	800	ohms
Total Harmonic Distortion. . . . .	10	%
Max.-Signal Power Output . . . . .	40	mw

### Maximum Circuit Values:

Grid-No.2-Circuit Resistance . . . . .	10 max.	megohms
--	---------	---------

- Operation of heater in series with other heaters is not recommended.
- Under no circumstances should this absolute value be exceeded.

### OPERATING CONSIDERATIONS

The maximum ratings in the tabulated data for the 12K5, except the rating for grid-No.1 (space-charge-grid) voltage, are working design-center maximums established according to the standard design-center system of rating electron tubes. Tubes so rated will give satisfactory performance in storage-battery-operated equipment provided the following stipulations are observed:

In the case of storage-battery-with-charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. This fluctuation imposes severe operating conditions on tubes. Under these conditions, the equipment should be designed so that 90 per cent of the design-center maximum values of plate voltage, grid-No.2 voltage, plate dissipation, and grid-No.2 input is never exceeded for a battery-terminal potential of 13.2 volts. Although the operating voltages of the 12K5 in this service will, at times, exceed the design-center maximum values, satisfactory performance with probable sacrifice in life will be obtained.



## 12K7-GT

### REMOTE-CUTOFF PENTODE

12K7-GT  
TO  
12Q7-GT

Heater, for Unipotential Cathode:

Voltage . . . . . 12.6 . . . . . ac or dc volts  
Current . . . . . 0.15 . . . . . amp

*The 12K7-GT is the same as the 6K7-GT except for heater rating.*

## 12K8

### TRIODE-HEXODE CONVERTER

Heater, for Unipotential Cathode:

Voltage . . . . . 12.6 . . . . . ac or dc volts  
Current . . . . . 0.15 . . . . . amp

*The 12K8 is the same as the 6K8 except for heater rating.*

## 12L6-GT

### BEAM POWER TUBE

*Intended for use in equipment having  
series heater-string arrangement*

*The 12L6-GT is the same as the 25L6-GT except for the following items:*

Heater, for Unipotential Cathode:

Voltage . . . . . 12.6 . . . . . ac or dc volts  
Current . . . . . 0.6 . . . . . amp  
Warm-up time (Average) . . . . . 11 . . . . . sec

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . . 300 max. volts  
Heater positive with respect to cathode . . . . . 200<sup>▲</sup>max. volts

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

## 12Q7-GT

### TWIN DIODE-HIGH-MU TRIODE

Heater, for Unipotential Cathode:

Voltage . . . . . 12.6 . . . . . ac or dc volts  
Current . . . . . 0.15 . . . . . amp

*The 12Q7-GT is the same as the 6Q7-GT except for heater rating.*







12R5

12R5

# BEAM POWER TUBE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	12.6 . . . . .	ac or dc volts
Current . . . . .	0.6 . . . . .	amp
Warm-up time (Average) . . . . .	11 . . . . .	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid No.1 to plate . . . . .	0.55	$\mu$ f
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	13	$\mu$ f
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	9	$\mu$ f

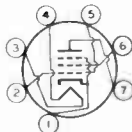
### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	45	110	volts
Grid-No.2 (Screen-Grid) Voltage . . . . .	110	110	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	0	-8.5	volts
Plate Resistance (Approx.) . . . . .	-	13000	ohms
Transconductance . . . . .	-	7000	$\mu$ hos
Plate Current . . . . .	120*	40	ma
Grid-No.2 Current . . . . .	17*	3.3	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 0.5 . . . . .	-	-22	volts

### 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" $\pm$ 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 . . . . .	7CV

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



Pin 4 - Heater  
Pin 5 - Grid No.1  
Pin 6 - Grid No.2  
Pin 7 - Plate

<sup>o</sup>, \* : See next page.

12R5



12R5

## BEAM POWER TUBE

### VERTICAL-DEFLECTION AMPLIFIER

**Maximum Ratings, Design-Center Values Except as Noted:**

*For operation in a 525-line, 30-frame system<sup>□</sup>*

DC PLATE VOLTAGE . . . . .	150 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)* . . . . .	1500 <sup>■</sup> max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	150 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL- GRID) VOLTAGE . . . . .	150 max.	volts
CATHODE CURRENT:		
Peak . . . . .	155 max.	ma
DC . . . . .	45 max.	ma
GRID-No.2 INPUT . . . . .	1 max.	watt
PLATE DISSIPATION . . . . .	4.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	300 max.	volts
Heater positive with respect to cathode	200 <sup>▲</sup> max.	volts

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For cathode-bias operation . . . . . 2.2 max. megohms

<sup>□</sup> without external shield.

<sup>■</sup> This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

<sup>\*</sup> This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

<sup>■</sup> Under no circumstances should this absolute value be exceeded.

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



12S8-GT  
12SF5-GT

## 12S8-GT

### TRIPLE DIODE—HIGH-MU TRIODE

Heater, for Unipotential Cathodes:

Voltage . . . . .	12.6	. . . . .	ac or dc volts
Current . . . . .	0.15	. . . . .	amp

*The 12S8-GT is the same as the 6S8-GT except for heater rating.*

## 12SA7, 12SA7-GT

### PENTAGRID CONVERTER

Heater, for Unipotential Cathode:

Voltage . . . . .	12.6	. . . . .	ac or dc volts
Current . . . . .	0.15	. . . . .	amp

*The 12SA7 and 12SA7-GT are the same as the 6SA7 and 6SA7-GT, respectively, except for heater rating.*

## 12SC7

### HIGH-MU TWIN TRIODE

Heater, for Unipotential Cathode:

Voltage . . . . .	12.6	. . . . .	ac or dc volts
Current . . . . .	0.15	. . . . .	amp

*The 12SC7 is the same as the 6SC7 except for heater rating.*

## 12SF5, 12SF5-GT

### HIGH-MU TRIODE

Heater, for Unipotential Cathode:

Voltage . . . . .	12.6	. . . . .	ac or dc volts
Current . . . . .	0.15	. . . . .	amp

*The 12SF5 and 12SF5-GT are the same as the 6SF5 and 6SF5-GT, respectively, except for heater rating.*

12SF7  
TO  
12SJ7-GT



## 12SF7

### DIODE—REMOTE-CUTOFF PENTODE

Heater, for Unipotential Cathode:			
Voltage . . . . .	12.6	. . . . .	ac or dc volts
Current . . . . .	0.15	. . . . .	amp
<i>The 12SF7 is the same as the 6SF7 except for heater rating.</i>			

## 12SG7

### REMOTE-CUTOFF PENTODE

Heater, for Unipotential Cathode:			
Voltage . . . . .	12.6	. . . . .	ac or dc volts
Current . . . . .	0.15	. . . . .	amp
<i>The 12SG7 is the same as the 6SG7 except for heater rating.</i>			

## 12SH7

### SHARP-CUTOFF PENTODE

Heater, for Unipotential Cathode:			
Voltage . . . . .	12.6	. . . . .	ac or dc volts
Current . . . . .	0.15	. . . . .	amp
<i>The 12SH7 is the same as the 6SH7 except for heater rating.</i>			

## 12SJ7, 12SJ7-GT

### SHARP-CUTOFF PENTODE

Heater, for Unipotential Cathode:			
Voltage . . . . .	12.6	. . . . .	ac or dc volts
Current . . . . .	0.15	. . . . .	amp
<i>The 12SJ7 and 12SJ7-GT are the same as the 6SJ7 and 6SJ7-GT, respectively, except for heater rating.</i>			



**12SK7**

**REMOTE-CUTOFF PENTODE**

**12SK7  
TO  
12SN7-GT**

*The 12SK7 is the same as the 6SK7 except for the following items:*

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.15	amp

**12SK7-GT**

**REMOTE-CUTOFF PENTODE**

*The 12SK7-GT is the same as the 6SK7-GT except for the following items:*

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.15	amp

**12SL7-GT**

**HIGH-MU TWIN TRIODE**

*The 12SL7-GT is the same as the 6SL7-GT except for the following items:*

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.15	amp

**12SN7-GT**

**MEDIUM-MU TWIN TRIODE**

*The 12SN7-GT is the same as the 6SN7-GT except for the following items:*

Heater, for Unipotential Cathodes:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.3	amp

12SQ7  
TO  
12SR7



## 12SQ7

### TWIN DIODE—HIGH-MU TRIODE

*The 12SQ7 is the same as the 6SQ7 except for the following items:*

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.15	amp

## 12SQ7-GT

### TWIN DIODE—HIGH-MU TRIODE

*The 12SQ7-GT is the same as the 6SQ7-GT except for the following items:*

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.15	amp

## 12SR7

### TWIN DIODE—MEDIUM-MU TRIODE

*The 12SR7 is the same as the 6SR7 except for the following items:*

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.15	amp



12U7

12U7

**MEDIUM-MU TWIN TRIODE**

9-PIN MINIATURE TYPE

For use in automobile radio receivers operating directly from 6-cell storage-battery systems

**GENERAL DATA****Electrical:**

Heater, for Unipotential Cathodes:

Voltage range (DC) . . . . . 10 to 15.9 volts

*This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts*

Current (Approx.) at 12.6 volts . . . . . 0.15 amp

Direct Interelectrode Capacitances

(Approx.):

	Without External Shield	With External Shield <sup>o</sup>	
Grid to plate (Each unit) . . . . .	1.5	1.5	$\mu\text{f}$
Grid to cathode and heater (Each unit) . . . . .	1.6	1.8	$\mu\text{f}$
Plate to cathode and heater:			
Unit No.1 . . . . .	0.4	2	$\mu\text{f}$
Unit No.2 . . . . .	0.32	2	$\mu\text{f}$

**Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):**

Heater Voltage . . . . .	12.6	volts
Plate Voltage . . . . .	12.6	volts
Grid Voltage . . . . .	0	volts
Amplification Factor . . . . .	20	
Plate Resistance (Approx.) . . . . .	12500	ohms
Transconductance . . . . .	1600	$\mu\text{mhos}$
Plate Current . . . . .	1	ma
Grid Voltage (Approx.) for plate $\mu\text{a} = 10$ . . . . .	-1.5	volts

**Mechanical:**

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length . . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-9/16" $\pm$ 3/32"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No. E9-1)

<sup>o</sup> with external shield JEDEC No. 315 connected to cathode of unit under test.

12U7



12U7

## MEDIUM-MU TWIN TRIODE

Basing Designation for BOTTOM VIEW. . . . .9A

Pin 1 - Plate of  
Unit No.2  
Pin 2 - Grid of  
Unit No.2  
Pin 3 - Cathode of  
Unit No.2  
Pin 4 - Heater  
Pin 5 - Heater



Pin 6 - Plate of  
Unit No.1  
Pin 7 - Grid of  
Unit No.1  
Pin 8 - Cathode of  
Unit No.1  
Pin 9 - Heater  
Mid-Tap

### AMPLIFIER — Class A<sub>1</sub>

*Values are for Each Unit*

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

PLATE VOLTAGE. . . . .	30 max.	volts
CATHODE CURRENT. . . . .	15 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	30 max.	volts
Heater positive with respect to cathode.	30 max.	volts

#### Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation . . . . .	0.25 max.	megohm
For cathode-bias operation . . . . .	1 max.	megohm





12V6-GT  
TO  
12X4

## 12V6-GT BEAM POWER TUBE

The 12V6-GT is the same as the 6V6-GT except for the following items:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.225	amp

## 12W6-GT

### BEAM POWER TUBE

*Intended for use in equipment having series heater-string arrangement*

The 12W6-GT is the same as the 6W6-GT except for the following items:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.6	amp
Warm-up time (Average) . . . . .	11	sec

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode .	300	max. volts
Heater positive with respect to cathode .	200 <sup>▲</sup>	max. volts

## 12X4

### FULL-WAVE VACUUM RECTIFIER

The 12X4 is the same as the 6X4 except for the following items:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	12.6	volts
Current . . . . .	0.3	amp

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





13DE7

13DE7

DUAL TRIODE

With Medium-Mu Unit and Low-Mu Unit

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 13DE7 is the same as the 6DE7 except for the following items:

Heater, for Unipotential Cathodes:

Voltage (AC or DC). . . . .	13	volts
Current . . . . .	0.45 ± 6%	amp
Warm-up time (Average). . . . .	11	sec





14A4  
14A5

# 14A4

## MEDIUM-MU TRIODE

Heater, for Unipotential Cathode:

Voltage. . . . . 12.6<sup>□</sup> . . . . . ac or dc volts  
Current. . . . . 0.15<sup>□□</sup> . . . . . amp

*The 14A4 is the same as the 7A4 except for heater rating.*

<sup>□</sup> Nominal voltage = 14.0 volts.

<sup>□□</sup> Nominal current = 0.16 ampere.

# 14A5

## BEAM POWER AMPLIFIER

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage. . . . . 12.6<sup>□</sup> . . . . . ac or dc volts  
Current. . . . . 0.15<sup>□□</sup> . . . . . amp

Direct Interelectrode Capacitances (Approx.):<sup>○</sup>

Grid No.1 to Plate . . . . . 0.4 . . . . .  $\mu\text{f}$   
Input. . . . . 6.8 . . . . .  $\mu\text{f}$   
Output . . . . . 7.0 . . . . .  $\mu\text{f}$

<sup>○</sup> with external shield connected to cathode.

#### Mechanical:

Mounting Position. . . . . Any  
Maximum Overall Length . . . . . 2-25/32"  
Maximum Seated Length. . . . . 2-1/4"  
Maximum Diameter . . . . . 1-3/16"  
Bulb . . . . . T-9  
Base . . . . . Lock-in 8-Pin  
Basing Designation for BOTTOM VIEW . . . . . 6AA

Pin 1 - Heater

Pin 2 - Plate

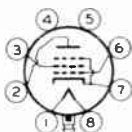
Pin 3 - Grid No.2

Pin 4 - No

Connection

Pin 5 - No

Connection



Pin 6 - Grid No.1

Pin 7 - Cathode,  
Grid No.3

Pin 8 - Heater

Plug - Base

Shell

### AF POWER AMPLIFIER - Class A<sub>1</sub>

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

PLATE VOLTAGE. . . . . 300 max. volts  
GRID-No.2 (SCREEN) VOLTAGE . . . . . 300 max. volts  
PLATE DISSIPATION. . . . . 7.5 max. watts  
GRID-No.2 DISSIPATION. . . . . 1.5 max. watts  
PEAK HEATER-CATHODE VOLTAGE:  
Heater negative with respect to cathode . . . . . 90 max. volts  
Heater positive with respect to cathode . . . . . 90 max. volts

<sup>□</sup> Nominal voltage = 14.0 volts.

<sup>□□</sup> Nominal current = 0.16 ampere.

14A5  
14A7  
14B6



## 14A5 BEAM POWER AMPLIFIER

(continued from preceding page)

### Typical Operation and Characteristics:

Plate Voltage. . . . .	250	..	volts
Grid-No.2 Voltage. . . . .	250	..	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	-12.5	..	volts
Cathode-Bias Resistor. . . . .	370	..	ohms
Peak AF Grid-No.1 Voltage. . . . .	12.5	..	volts
Zero-Signal Plate Current. . . . .	30	..	ma
Max.-Signal Plate Current. . . . .	32	..	ma
Zero-Signal Grid-No.2 Current. . . . .	3.5	..	ma
Max.-Signal Grid-No.2 Current. . . . .	5.5	..	ma
Plate Resistance (Approx.) . . . . .	70000	..	ohms
Transconductance . . . . .	3000	..	$\mu$ hos
Load Resistance. . . . .	7500	..	ohms
Total Harmonic Distortion. . . . .	7	..	%
Max.-Sig. Power Output . . . . .	2.8	..	watts

### Maximum Circuit Values (for maximum rated conditions):

#### Grid-No.1-Circuit Resistance:

For fixed bias . . . . .	0.1	..	megohm
For cathode bias . . . . .	0.5	..	megohm

## 14A7 REMOTE-CUTOFF PENTODE

### Heater, for Unipotential Cathode:

Voltage. . . . .	12.6 <sup>□</sup>	..	ac or dc volts
Current. . . . .	0.15 <sup>□□</sup>	..	amp

*The 14A7 is the same as the 7A7 except for heater rating.*

<sup>□</sup> Nominal voltage = 14.0 volts.      <sup>□□</sup> Nominal current = 0.16 ampere.

## 14B6 TWIN DIODE—HIGH-MU TRIODE

### Heater, for Unipotential Cathode:

Voltage. . . . .	12.6 <sup>□</sup>	..	ac or dc volts
Current. . . . .	0.15 <sup>□□</sup>	..	amp

*The 14B6 is the same as the 7B6 except for heater rating.*

<sup>□</sup> Nominal voltage = 14.0 volts.      <sup>□□</sup> Nominal current = 0.16 ampere.



14AF7

# MEDIUM-MU TWIN TRIODE

14AF7

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	12.6 <sup>□</sup>	ac or dc volts
Current . . . . .	0.15 <sup>□□</sup>	amp

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

Each Unit:

Grid to Plate . . . . .	2.3	μuf
Grid to Cathode . . . . .	2.2	μuf
Plate to Cathode . . . . .	1.6	μuf
Grid of Unit No.1 to Grid of Unit No.2 . . . . .	0.20 max.	μuf
Plate of Unit No.1 to Plate of Unit No.2 . . . . .	0.60 max.	μuf
Grid of Unit No.1 to Plate of Unit No.2 . . . . .	0.06 max.	μuf
Grid of Unit No.2 to Plate of Unit No.1 . . . . .	0.10 max.	μuf

<sup>○</sup> Without external shield.

### Mechanical:

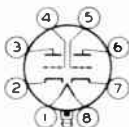
Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-25/32"
Maximum Seated Length . . . . .	2-1/4"
Maximum Diameter . . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW . . . . .	8AC

Pin 1 - Heater

Pin 2 - Cathode of Triode No.2

Pin 3 - Plate of Triode No.2

Pin 4 - Grid of Triode No.2



Pin 5 - Grid of Triode No.1

Pin 6 - Plate of Triode No.1

Pin 7 - Cathode of Triode No.1

Pin 8 - Heater Plug - Base Shell

## AMPLIFIER - Class A<sub>1</sub>

Values are for each unit

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
PLATE DISSIPATION . . . . .	2.5 max.	watts
GRID VOLTAGE:		
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

### Typical Operation and Characteristics:

Plate Voltage . . . . .	100	100	250	volts
Grid Voltage . . . . .	0	-	-	volts
Cathode-Bias Resistor . . . . .	-	600	1100	ohms

<sup>□</sup> Nominal voltage = 14.0 volts.

<sup>□□</sup> Nominal current = 0.16 ampere.

14AF7  
TO  
14C5



## 14AF7 MEDIUM-MU TWIN TRIODE

(continued from preceding page)

Amplification Factor . . . . .	17	16	16	
Plate Resistance . . . . .	6500	8400	7600	ohms
Transconductance . . . . .	2600	1900	2100	$\mu$ hos
Plate Current . . . . .	10.8	5	9	ma

## 14B6 TWIN DIODE—HIGH-MU TRIODE

Heater, for Unipotential Cathode:  
 Voltage . . . . . 12.6<sup>□</sup> . . . . . ac or dc volts  
 Current . . . . . 0.15<sup>□□</sup> . . . . . amp

*The 14B6 is the same as the 7B6 except for heater rating.*

<sup>□</sup> Nominal voltage = 14.0 volts.      <sup>□□</sup> Nominal current = 0.16 ampere.

## 14B8 PENTAGRID CONVERTER

Heater, for Unipotential Cathode:  
 Voltage . . . . . 12.6<sup>□</sup> . . . . . ac or dc volts  
 Current . . . . . 0.15<sup>□□</sup> . . . . . amp

*The 14B8 is the same as the 7B8 except for heater rating.*

<sup>□</sup> Nominal voltage = 14.0 volts.      <sup>□□</sup> Nominal current = 0.16 ampere.

## 14C5 BEAM POWER AMPLIFIER

Heater, for Unipotential Cathode:  
 Voltage . . . . . 12.6<sup>□</sup> . . . . . ac or dc volts  
 Current . . . . . 0.225<sup>□□</sup> . . . . . amp

*The 14C5 is the same as the 7C5 except for heater rating.*

<sup>□</sup> Nominal voltage = 14.0 volts.      <sup>□□</sup> Nominal current = 0.240 ampere.





14C7

## SHARP-CUTOFF PENTODE

14C7

## GENERAL DATA

## Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 12.6<sup>□</sup> . . . . . ac or dc voltsCurrent . . . . . 0.15<sup>□□</sup> . . . . . ampDirect Interelectrode Capacitances:<sup>○</sup>Grid No.1 to Plate . . . . . 0.007 max. . . . .  $\mu$ mfInput . . . . . 6.0 . . . . .  $\mu$ mfOutput . . . . . 6.5 . . . . .  $\mu$ mf<sup>○</sup> with external shield connected to cathode.

## Mechanical:

Mounting Position . . . . . Any

Maximum Overall Length . . . . . 2-25/32"

Maximum Seated Length . . . . . 2-1/4"

Maximum Diameter . . . . . 1-3/16"

Bulb . . . . . T-9

Base . . . . . Lock-in 8-Pin

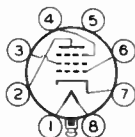
Basing Designation for BOTTOM VIEW . . . . . 8V

Pin 1 - Heater

Pin 2 - Plate

Pin 3 - Grid No.2

Pin 4 - Grid No.3

Pin 5 - Internal  
Shield

Pin 6 - Grid No.1

Pin 7 - Cathode

Pin 8 - Heater

Plug - Base  
ShellAMPLIFIER - Class A<sub>1</sub>

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . . 300 max. volts

GRID-No.2 (SCREEN) VOLTAGE . . . . . 100 max. volts

GRID-No.2 SUPPLY VOLTAGE . . . . . 300 max. volts

GRID-No.1 (CONTROL-GRID) VOLTAGE:

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

PLATE DISSIPATION . . . . . 1 max. watt

GRID-No.2 DISSIPATION . . . . . 0.1 max. watt

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . . 90 max. volts

Heater positive with respect to cathode . . . . . 90 max. volts

## Typical Operation and Characteristics:

Plate Voltage . . . . . 100 250 volts

Grid No.3 . . . . . Connected to cathode at socket

Internal Shield . . . . . Connected to cathode at socket

Grid-No.2 Voltage . . . . . 100 100 volts

Grid-No.1 Voltage . . . . . -1 -3 volts

Cathode-Bias Resistor . . . . . 130 100 ohms

Plate Resistance (Approx.) . . . . . 0.1 # megohm

<sup>□</sup> Nominal voltage = 14.0 volts.<sup>□□</sup> Nominal current = 0.16 ampere.

# Greater than 1 megohm.

14C7  
TO  
14H7



## 14C7 SHARP-CUTOFF PENTODE

(continued from preceding page)

Transconductance . . . . .	2275	1575	μmhos
Grid-No.1 Bias (Approx.) for cathode-current cutoff. . . . .	-7	-7	volts
Plate Current. . . . .	5.7	2.2	ma
Grid-No.2 Current. . . . .	1.8	0.7	ma

## 14E6 TWIN DIODE—MEDIUM-MU TRIODE

Heater, for Unipotential Cathode:  
 Voltage. . . . . 12.6<sup>□</sup> . . . . . ac or dc volts  
 Current. . . . . 0.15<sup>□□</sup> . . . . . amp  
*The 14E6 is the same as the 7E6 except for heater rating.*  
 □ Nominal voltage = 14.0 volts.      □□ Nominal current = 0.16 ampere.

## 14E7 TWIN DIODE—REMOTE-CUTOFF PENTODE

Heater, for Unipotential Cathodes:  
 Voltage. . . . . 12.6<sup>□</sup> . . . . . ac or dc volts  
 Current. . . . . 0.15<sup>□□</sup> . . . . . amp  
*The 14E7 is the same as the 7E7 except for heater rating.*  
 □ Nominal voltage = 14.0 volts.      □□ Nominal current = 0.16 ampere.

## 14F7 HIGH-MU TWIN TRIODE

Heater, for Unipotential Cathodes:  
 Voltage. . . . . 12.6<sup>□</sup> . . . . . ac or dc volts  
 Current. . . . . 0.15<sup>□□</sup> . . . . . amp  
*The 14F7 is the same as the 7F7 except for heater rating.*  
 □ Nominal voltage = 14.0 volts.      □□ Nominal current = 0.16 ampere.

## 14F8 MEDIUM-MU TWIN TRIODE

Heater, for Unipotential Cathode:  
 Voltage. . . . . 12.6<sup>□</sup> . . . . . ac or dc volts  
 Current. . . . . 0.15<sup>□□</sup> . . . . . amp  
*The 14F8 is the same as the 7F8 except for heater rating.*  
 □ Nominal voltage = 14.0 volts.      □□ Nominal current = 0.16 ampere.

## 14H7 REMOTE-CUTOFF PENTODE

Heater, for Unipotential Cathode:  
 Voltage. . . . . 12.6<sup>□</sup> . . . . . ac or dc volts  
 Current. . . . . 0.15<sup>□□</sup> . . . . . amp  
*The 14H7 is the same as the 7H7 except for heater rating.*  
 □ Nominal voltage = 14.0 volts.      □□ Nominal current = 0.16 ampere.



14J7

### TRIODE-HEPTODE CONVERTER

14J7  
TO  
14R7

Heater, for Unipotential Cathode:

Voltage . . . . . 12.6<sup>□</sup> . . . . . ac or dc volts  
Current . . . . . 0.15<sup>□□</sup> . . . . . amp

*The 14J7 is the same as the 7J7 except for heater rating.*

□ nominal voltage = 14.0 volts.      □□ nominal current = 0.16 ampere.

14N7

### MEDIUM-MU TWIN TRIODE

Heater, for Unipotential Cathodes:

Voltage . . . . . 12.6<sup>□</sup> . . . . . ac or dc volts  
Current . . . . . 0.3<sup>□□</sup> . . . . . amp

*The 14N7 is the same as the 7N7 except for heater rating.*

□ nominal voltage = 14.0 volts.      □□ nominal current = 0.32 ampere.

14Q7

### PENTAGRID CONVERTER

Heater, for Unipotential Cathode:

Voltage . . . . . 12.6<sup>□</sup> . . . . . ac or dc volts  
Current . . . . . 0.15<sup>□□</sup> . . . . . amp

*The 14Q7 is the same as the 7Q7 except for heater rating.*

□ nominal voltage = 14.0 volts.      □□ nominal current = 0.16 ampere.

14R7

### TWIN DIODE—REMOTE-CUTOFF PENTODE

Heater, for Unipotential Cathode:

Voltage . . . . . 12.6<sup>□</sup> . . . . . ac or dc volts  
Current . . . . . 0.15<sup>□□</sup> . . . . . amp

*The 14R7 is the same as the 7R7 except for heater rating.*

□ nominal voltage = 14.0 volts.      □□ nominal current = 0.16 ampere.



17DE4  
17DQ6-A



## 17DE4

### HALF-WAVE VACUUM RECTIFIER

*Intended for TV damper service in equipment  
having series heater-string arrangement*

*The 17DE4 is the same as the 6DE4 except for the following items:*

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	17	volts
Current . . . . .	0.6 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

## 17DQ6-A

### BEAM POWER TUBE

*Intended for use in equipment having  
series heater-string arrangement*

*The 17DQ6-A is the same as the 6DQ6-A except for the following items:*

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	16.8	volts
Current . . . . .	0.45	amp
Warm-up time (Average) . . . . .	11	sec



17AX4-GT  
TO  
17D4

## 17AX4-GT

### HALF-WAVE VACUUM RECTIFIER

*Intended for TV damper service in equipment  
having series heater-string arrangement*

The 17AX4-GT is the same as the 6AX4-GT except for the following items:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	16.8	volts
Current . . . . .	0.45	amp
Warm-up time (Average) . . . . .	11	sec

## 17BQ6-GTB

### BEAM POWER TUBE

*Intended for use in equipment having  
series heater-string arrangement*

The 17BQ6-GTB is the same as the 6BQ6-GTB/6CU6 except for the following items:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	16.8	volts
Current . . . . .	0.45	amp
Warm-up time (Average) . . . . .	11	sec

## 17D4

### HALF-WAVE VACUUM RECTIFIER

*Intended for TV damper service in equipment  
having series heater-string arrangement*

The 17D4 is the same as the 6DA4 except for the following items:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	16.8	volts
Current . . . . .	0.45 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec



17H3

17H3

# HALF-WAVE VACUUM RECTIFIER

9-PIN MINIATURE TYPE

*Intended for TV damper service in equipment having series heater-string arrangement*

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	17.5	volts
Current . . . . .	0.3 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

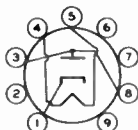
Direct Interelectrode Capacitances (Approx.):<sup>□</sup>

Plate to cathode and heater . . . . .	4	μuf
Cathode to plate and heater . . . . .	5.5	μuf
Heater to cathode . . . . .	2	μuf

### 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"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9FK

- Pin 1 - Cathode
- Pin 2 - Internal Connection - Do Not Use
- Pin 3 - Plate



- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Same as Pin 2
- Pin 7 - Same as Pin 2
- Pin 8 - Plate
- Pin 9 - Same as Pin 2

## DAMPER SERVICE

Maximum Ratings, Design-Maximum Values:

*For operation in a 525-line, 30-frame system<sup>□</sup>*

PEAK INVERSE PLATE VOLTAGE . . . . .	2000 <sup>■</sup> max.	volts
PEAK PLATE CURRENT . . . . .	450 max.	ma
DC PLATE CURRENT . . . . .	75 max.	ma
PLATE DISSIPATION . . . . .	3 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	2000 <sup>■</sup> max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>†</sup> max.	volts

### Characteristics:

Tube-Voltage Drop for plate ma. = 140 . . . . .	22	volts
---	----	-------

17H3



17H3

## HALF-WAVE VACUUM RECTIFIER

- without external shield.
- ◆ Socket terminals 2,6,7, and 9 should not be used as tie points.
- As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.
- This rating is applicable where the duty cycle of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.
- \* The dc component must not exceed 500 volts.
- † The dc component must not exceed 100 volts.





18A5

18A5

### BEAM POWER TUBE

*Intended for use in equipment having series heater-string arrangement*

#### GENERAL DATA

##### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	18.5	volts
Current . . . . .	0.3 ± 6%	amp
Warm-up time (Average) . . . . .	11	sec

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid No.1 to plate . . . . .	0.7	μmf
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	13	μmf
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	7	μmf

##### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	60	200	volts
Grid-No.2 Voltage . . . . .	125	125	volts
Grid-No.1 Voltage . . . . .	0	-17	volts
Plate Resistance (Approx.) . . . . .	-	27000	ohms
Transconductance . . . . .	-	4800	μmhos
Plate Current . . . . .	165	40	ma
Grid-No.2 Current . . . . .	15	1.1	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 1 . . . . .	-	-36	volts

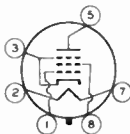
##### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	3-7/16"
Maximum Seated Length . . . . .	2-7/8"
Maximum Diameter . . . . .	1-9/32"

Bulb . . . . . T9  
 Base . . . . . Intermediate-Shell Octal 6-Pin, Arrangement 1 (JEDEC Group 1, No.B6-8), or Short Intermediate-Shell Octal 6-Pin with External Barriers, Arrangement 1 (JEDEC Group 1, No.B6-60)

Basing Designation for BOTTOM VIEW . . . . . 6CK

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



Pin 5-Plate  
 Pin 7-Heater  
 Pin 8-Grid No.2

#### HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values:

*For operation in a 525-line, 30-frame system<sup>□</sup>*

DC PLATE VOLTAGE . . . . .	350 max.	volts
----------------------------	----------	-------

18A5



18A5

## BEAM POWER TUBE

PEAK POSITIVE-PULSE PLATE VOLTAGE*	3000	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE . . . . .	600	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . .	160	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 {CONTROL-GRID} VOLTAGE. . . . .	250	max.	volts
CATHODE CURRENT:			
Peak. . . . .	310	max.	ma
Average . . . . .	90	max.	ma
GRID-No.2 INPUT . . . . .	2.5	max.	watts
PLATE DISSIPATION†. . . . .	9	max.	watts
PEAK-HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface). . . . .	190	max.	°C

## Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For grid-resistor-bias operation† . . . 1 max. megohm

□ without external shield.

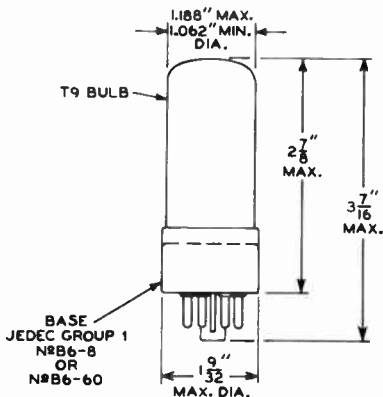
\* This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

□ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

\* This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

† An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

▲ The dc component must not exceed 100 volts.



92CS-10242



18FW6

# 18FW6

## SEMIREMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	18 ± 10%	volts
Current . . . . .	0.1	amp

Direct Interelectrode Capacitances:<sup>0</sup>

Grid No.1 to plate . . . . .	0.0035	max.	μf
Grid No.1 to cathode, grid No.3, grid No.2, and heater . . . . .	5.5		μf
Plate to cathode, grid No.3, grid No.2, and heater . . . . .	5		μf

#### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Supply Voltage . . . . .	100	volts
Grid No.3 . . . . .	<i>Connected to cathode at socket</i>	
Grid-No.2 Supply Voltage . . . . .	100	volts
Cathode Resistor . . . . .	68	ohms
Plate Resistance (Approx.) . . . . .	0.25	megohm
Transconductance . . . . .	4400	μmhos
Plate Current . . . . .	11	ma
Grid-No.2 Current . . . . .	4.4	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 25 . . . . .	-20	volts

#### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-1/2" ± 3/32"
Diameter . . . . .	0.650" to 0.750"
Dimensional Outline . . . . .	<i>See General Section</i>
Bulb . . . . .	T5-1/2
Base . . . . .	Small-Button Miniature 7-Pin (JEDEC No.E7-1)
Basing Designation for BOTTOM VIEW . . . . .	7CC

Pin 1 - Grid No.1  
 Pin 2 - Grid No.3  
 Pin 3 - Heater



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

### AMPLIFIER — Class A<sub>1</sub>

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE . . . . .	150 max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE . . . . .	0 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	150 max.	volts

<sup>0</sup> With external shield JEDEC No.316 connected to cathode.

18FW6



18FW6

### SEMIREMOTE-CUTOFF PENTODE

GRID-No.2 VOLTAGE. . . . . See Grid-No.2 Input Rating Chart  
at front of Receiving Tube Section

GRID-No.1 (CONTROL-GRID) VOLTAGE:  
Positive-bias value. . . . . 0 max. volts

GRID-No.2 INPUT:  
For grid-No.2 voltages up to 75 volts. . . 0.6 max. watt  
For grid-No.2 voltages between 75  
and 150 volts. . . . . See Grid-No.2 Input Rating Chart  
at front of Receiving Tube Section

PLATE DISSIPATION. . . . . 2.5 max. watts

PEAK HEATER-CATHODE VOLTAGE:  
Heater negative with respect to cathode. . 100 max. volts  
Heater positive with respect to cathode. . 100 max. volts



18FX6

18FX6

# PENTAGRID CONVERTER

7-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	18 ± 10%	volts
Current . . . . .	0.1	amp

Direct Interelectrode Capacitances:

	<i>Without External Shield</i>	<i>With External Shield<sup>o</sup></i>	
Grid No.3 to all other electrodes (RF input) . . . . .	7	7	μμf
Plate to all other electrodes (Mixer input) . . . . .	8	13	μμf
Grid No.1 to all other electrodes (Oscillator input) . . . . .	5.5	5.5	μμf
Grid No.3 to plate . . . . .	0.30 max.	0.25 max.	μμf
Grid No.3 to grid No.1 . . . . .	0.15 max.	0.15 max.	μμf
Grid No.1 to plate . . . . .	0.1	0.05	μμf
Grid No.1 to cathode & grid No.5 . . . . .	3	3	μμf
Cathode & grid No.5 to all other electrodes except grid No.1 . . . . .	15	20	μμf

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	1-1/2" ± 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 . . . . .	150 max.	volts
GRIDS-No.2 & No.4 (SCREEN-GRIDS) SUPPLY VOLTAGE . . . . .	150 max.	volts
GRIDS-No.2 & No.4 VOLTAGE . . . . .	110 max.	volts
GRIDS-No.2 & No.4 INPUT . . . . .	1.2 max.	watts
PLATE DISSIPATION . . . . .	1 max.	watt

18FX6



18FX6

## PENTAGRID CONVERTER

## PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . . . .	100 max.	volts
Heater positive with respect to cathode. . . . .	100 max.	volts

## Characteristics:

*With Separate Excitation\**

Plate Voltage . . . . .	100	volts
Grids-No.2 & No.4 Voltage . . . . .	100	volts
Grid-No.3 Voltage . . . . .	-1.5	volts
Grid-No.1 Resistor. . . . .	20000	ohms
Plate Resistance (Approx.). . . . .	0.4	megohm
Conversion Transconductance . . . . .	480	$\mu$ mhos
Plate Current . . . . .	2.3	ma
Grids-No.2 & No.4 Current . . . . .	6.2	ma
Grid-No.1 Current . . . . .	0.5	ma
Total Cathode Current . . . . .	9	ma
Grid-No.3 Voltage (Approx.) for conversion transconductance ( $\mu$ mhos) = 10. . . . .	-21	volts

Oscillator Characteristics (Not Oscillating):<sup>■</sup>

Plate & Grids-No.2 & No.4 Voltage . . .	100	volts
Grid-No.3 Voltage . . . . .	0	volts
Grid-No.1 Voltage . . . . .	0	volts
Amplification Factor <sup>†</sup> . . . . .	22	
Oscillator Transconductance <sup>†</sup> . . . . .	7000	$\mu$ mhos
Cathode Current . . . . .	24	ma
Grid-No.1 Voltage (Approx.) for plate $\mu$ a = 20 . . . . .	-9.2	volts

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

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

■ With grids No.2 & No.4 connected to plate.

† Between grid No.1 and grids No.2 & No.4 connected to plate.



18FY6

18FY6

# TWIN DIODE-HIGH-MU TRIODE

7-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	18 ± 10%	volts
Current . . . . .	0.1	amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield <sup>o</sup>	
Triode grid to triode plate	1.8	1.8	μμf
Triode grid to cathode and heater. . . . .	2.4	2.4	μμf
Triode plate to cathode and heater. . . . .	0.22	2	μμf
Plate of diode unit No.2 to triode grid. . . . .	0.2 max.	0.2 max.	μμf

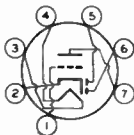
### Characteristics, Class A<sub>1</sub> Amplifier (Triode Unit):

Plate Voltage . . . . .	100	volts
Grid Voltage. . . . .	-1	volt
Amplification Factor. . . . .	100	
Plate Resistance (Approx.). . . . .	77000	ohms
Transconductance. . . . .	1300	μmhos
Plate Current . . . . .	0.6	ma

### Mechanical:

Operating Position. . . . .	Any
Maximum Overall Length. . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-1/2" ± 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 . . . . .	7BT

- Pin 1 - Grid of Triode Unit
- Pin 2 - Cathode of Triode Unit and Diode Units No.1 and No.2
- Pin 3 - Heater
- Pin 4 - Heater



- Pin 5 - Plate of Diode Unit No.2
- Pin 6 - Plate of Diode Unit No.1
- Pin 7 - Plate of Triode Unit

<sup>o</sup> With external shield JEDEC NO.316 connected to cathode.

18FY6



18FY6

# TWIN DIODE—HIGH-MU TRIODE

## TRIODE UNIT — AMPLIFIER — Class A<sub>1</sub>

### Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE. . . . .	150 max.	volts
GRID VOLTAGE:		
Positive-bias value. . . . .	0 max.	volts
PLATE DISSIPATION. . . . .	0.5 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. .	100 max.	volts
Heater positive with respect to cathode. .	100 max.	volts

## DIODE UNITS — Two

### Maximum Ratings, Design-Maximum Values:

*Values are for Each Unit*

PLATE CURRENT. . . . .	1 max.	ma
------------------------	--------	----

### Characteristics:

Plate Current for plate volts = 10 . . . . .	2	ma
--	---	----





19AU4

# 19AU4

## HALF-WAVE VACUUM RECTIFIER

*Intended for TV damper service in equipment having series heater-string arrangement*

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	18.9 . . . . .	ac or dc volts
Current . . . . .	0.6 . . . . .	amp
Warm-up time (Average) . . . . .	11 . . . . .	sec

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

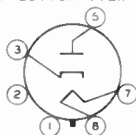
Plate to heater and cathode . . . . .	8.5	μf
Cathode to heater and plate . . . . .	11.5	μf
Heater to cathode . . . . .	4	μf

#### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	3-13/16"
Maximum Seated Length . . . . .	3-1/4"
Maximum Diameter . . . . .	1-9/32"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T-9
Base . . . . .	Short Intermediate-Shell Octal 5-Pin with External Barriers (JETEC No. B5-85), or Short Intermediate-Shell Octal 6-Pin with External Barriers (JETEC No. B6-60)
Basing Designation for BOTTOM VIEW . . . . .	.4CG

Pin 1 ♦ - Same as Pin 2

Pin 2 - No Connection - Do Not use •



Pin 3 - Cathode  
Pin 5 - Plate  
Pin 7 - Heater  
Pin 8 - Heater

### DAMPER SERVICE

**Maximum Ratings, Design-Center Values Except as Noted:**  
*For operation in a 525-line, 30-frame system<sup>o</sup>*

PEAK INVERSE PLATE VOLTAGE		
(Absolute maximum)* . . . . .	4500 <sup>■</sup>	max. volts
PEAK PLATE CURRENT . . . . .	1050	max. ma
DC PLATE CURRENT . . . . .	175	max. ma
PLATE DISSIPATION . . . . .	6	max. watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode		
(Absolute maximum) . . . . .	4500 <sup>■▲</sup>	max. volts
Heater positive with respect to cathode.	300 <sup>*</sup>	max. volts

<sup>o</sup> without external shield.

♦ on the 5-pin base, pin 1 as well as pins 4 and 6 is omitted.

•, □, \*, ▲, #: See next page.

19AU4

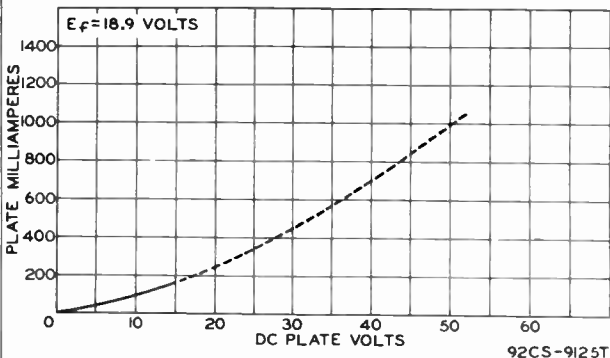


19AU4

## HALF-WAVE VACUUM RECTIFIER

- Socket terminals 1, 2, 4, and 6 should not be used as tie points.
- As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- This rating is applicable when the duty cycle of the voltage pulse does not exceed 15 percent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.
- Under no circumstances should this absolute value be exceeded.
- ▲ The dc component must not exceed 900 volts (Absolute maximum).
- \* The dc component must not exceed 100 volts.

### AVERAGE PLATE CHARACTERISTIC





19BG6-GA

# 19BG6-GA

## BEAM POWER TUBE

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	18.9	. . . . .	ac or dc volts
Current . . . . .	0.3	. . . . .	amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid No.1 to plate . . . . .	0.8		$\mu$ f
Grid No.1 to cathode & grid No.3, grid No.2, and heater. . . . .	11		$\mu$ f
Plate to cathode & grid No.3, grid No.2, and heater. . . . .	6		$\mu$ f

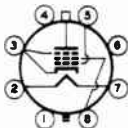
#### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	60	250	volts
Grid-No.2 Voltage . . . . .	250	250	volts
Grid-No.1 Voltage . . . . .	0	-15	volts
Mu-Factor, Grid No.2 to Grid No.1 . . . . .	-	8	
Plate Resistance (Approx.) . . . . .	-	25000	ohms
Transconductance . . . . .	-	6000	$\mu$ mhos
Plate Current . . . . .	180*	75	ma
Grid-No.2 Current . . . . .	18*	4	ma
Grid-No.1 Voltage (Approx.) for plate current of 1 ma . . . . .	-	-45	volts

#### Mechanical:

- Mounting Position . . . . . Vertical, base up or down, or  
Horizontal with pins 2 and 7 in vertical plane
- Maximum Overall Length . . . . . 5"
- Seated Length . . . . . 4-1/4"  $\pm$  3/16"
- Maximum Diameter . . . . . 1-9/16"
- Bulb . . . . . T-12
- Cap. . . . . Small (JETEC No.C1-1)
- Base . . . . . Short Medium-Shell Octal 8-Pin  
with External Barriers, Style A (JETEC No.B8-110),  
or Short Medium-Shell Octal 8-Pin  
with External Barriers, Style B (JETEC No.B8-118)
- Basing Designation for BOTTOM VIEW . . . . . .5BT

- Pin 1 - No Connec-  
tion
- Pin 2 - Heater
- Pin 3 - Cathode,  
Grid No.3
- Pin 4 - Same as Pin 1



- Pin 5 - Grid No.1
- Pin 6 - Same as Pin 1
- Pin 7 - Heater
- Pin 8 - Grid No.2
- Cap - Plate

<sup>0</sup> Without external shield.

\* These values can be measured by a method involving a recurrent wave form such that the cathode current and grid-No.2 input will be kept within ratings in order to prevent damage to the tube.

19BG6-GA



# 19BG6-GA BEAM POWER TUBE

## HORIZONTAL DEFLECTION AMPLIFIER

**Maximum Ratings, Design-Center Values Except as Noted:**

*For operation in a 525-line, 30-frame system<sup>□</sup>*

DC PLATE VOLTAGE . . . . .	700	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)* . . . . .	5600 <sup>■</sup>	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE . . . . .	1500	max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE . . . . .	350	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE . . . . .	300	max.	volts
CATHODE CURRENT:			
Peak . . . . .	400	max.	ma
Average . . . . .	110	max.	ma
GRID-No.2 INPUT . . . . .	3.2	max.	watts
PLATE DISSIPATION† . . . . .	20	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200	max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup>	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface) . . . . .	210	max.	°C

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For grid-resistor-bias operation† . . . . 0.47 max. megohm

- As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.
- under no circumstances should this absolute value be exceeded.
- The duration of the voltage pulse must not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.
- † It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value should be employed.
- ▲ The dc component must not exceed 100 volts.

### CURVES

for Type 19BG6-GA are the same as those shown for Type 6BG6-G



19J6

# 19J6 MEDIUM-MU TWIN TRIODE

MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	18.9 . . . . .	ac or dc volts
Current . . . . .	0.15 . . . . .	amp

Direct Interelectrode Capacitances (Each unit, approx.):<sup>0</sup>

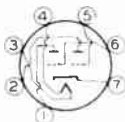
Grid to Plate . . . . .	1.5 . . . . .	$\mu\mu\text{f}$
Grid to Cathode . . . . .	2.0 . . . . .	$\mu\mu\text{f}$
Plate to Cathode . . . . .	0.4 . . . . .	$\mu\mu\text{f}$

<sup>0</sup> with no external shield.

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to 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
Basing Designation for BOTTOM VIEW . . . . .	7BF

Pin 1 - Plate of Triode No.2  
 Pin 2 - Plate of Triode No.1  
 Pin 3 - Heater  
 Pin 4 - Heater



Pin 5 - Grid of Triode No.1  
 Pin 6 - Grid of Triode No.2  
 Pin 7 - Cathode

### AMPLIFIER - Class A<sub>1</sub>

Values are for each unit

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
PLATE DISSIPATION . . . . .	1.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	90 max.	volts
Heater positive with respect to cathode . . . . .	90 max.	volts

### Characteristics:

Plate Voltage . . . . .	100 . . . . .	volts
Cathode-Bias Resistor <sup>▲</sup> . . . . .	50 <sup>◆</sup> . . . . .	ohms
Amplification Factor . . . . .	38 . . . . .	
Plate Resistance . . . . .	7100 . . . . .	ohms
Transconductance . . . . .	5300 . . . . .	$\mu\text{mhos}$
Plate Current . . . . .	8.5 . . . . .	ma

### Maximum Circuit Values (for maximum rated conditions):

Grid-Circuit Resistance:  
 For cathode-bias operation . . . . . 0.5 max. megohm

<sup>▲</sup>, <sup>◆</sup>: see next page.

19J6



19J6

## MEDIUM-MU TWIN TRIODE

## MIXER SERVICE

Values are for each unit

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
PLATE DISSIPATION . . . . .	1.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	90 max.	volts
Heater negative with respect to cathode. . . . .	90 max.	volts

## Characteristics:

Plate Voltage . . . . .	150 . .	volts
Cathode-Bias Resistor <sup>▲</sup> . . . . .	810 <sup>†</sup> . .	ohms
Oscillator Peak Voltage . . . . .	3 . .	volts
Plate Resistance . . . . .	10200 . .	ohms
Conversion Transconductance . . . . .	1900 . .	μmhos
Short-Circuit Input Conductance		
at 100 Mc . . . . .	96 . .	μmhos
Plate Current . . . . .	4.8 . .	ma

## Maximum Circuit Values (for maximum rated conditions):

## Grid-Circuit Resistance:

For cathode-bias operation . . . . . 0.5 max. megohm

<sup>▲</sup> operation with fixed bias is not recommended.<sup>◆</sup> value is for both units operating at the specified conditions.<sup>†</sup> For one unit, with other unit not operating. When both units are operating, the value of cathode-bias resistor is determined by the total cathode current of both units.

NOV. 15, 1948

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

TENTATIVE DATA

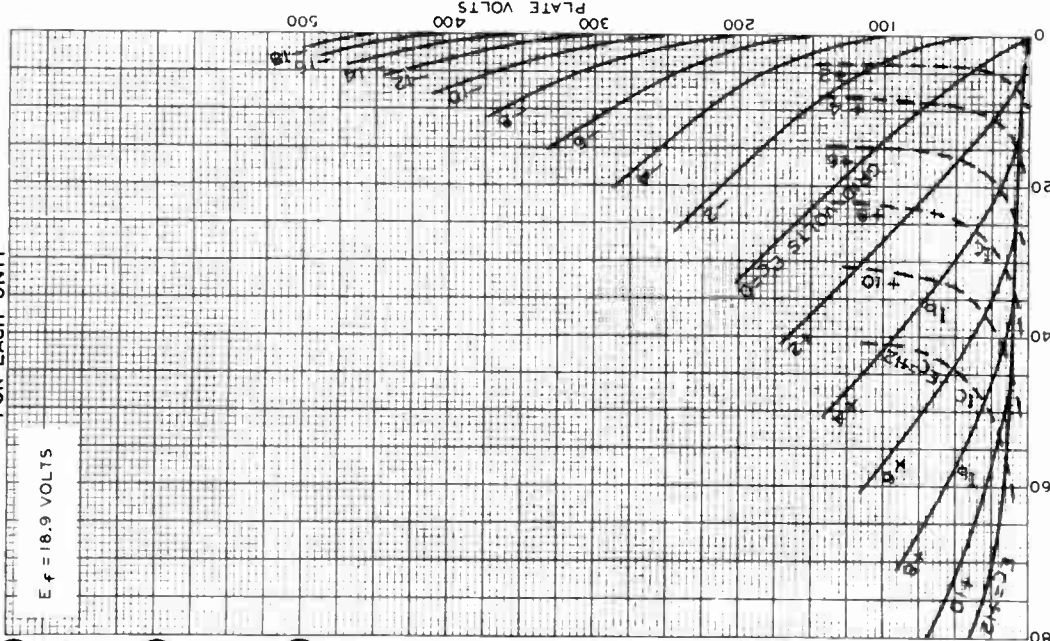


19J6

19J6

# AVERAGE PLATE CHARACTERISTICS FOR EACH UNIT

$E_f = 18.9$  VOLTS



AUG. 18, 1948

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7061

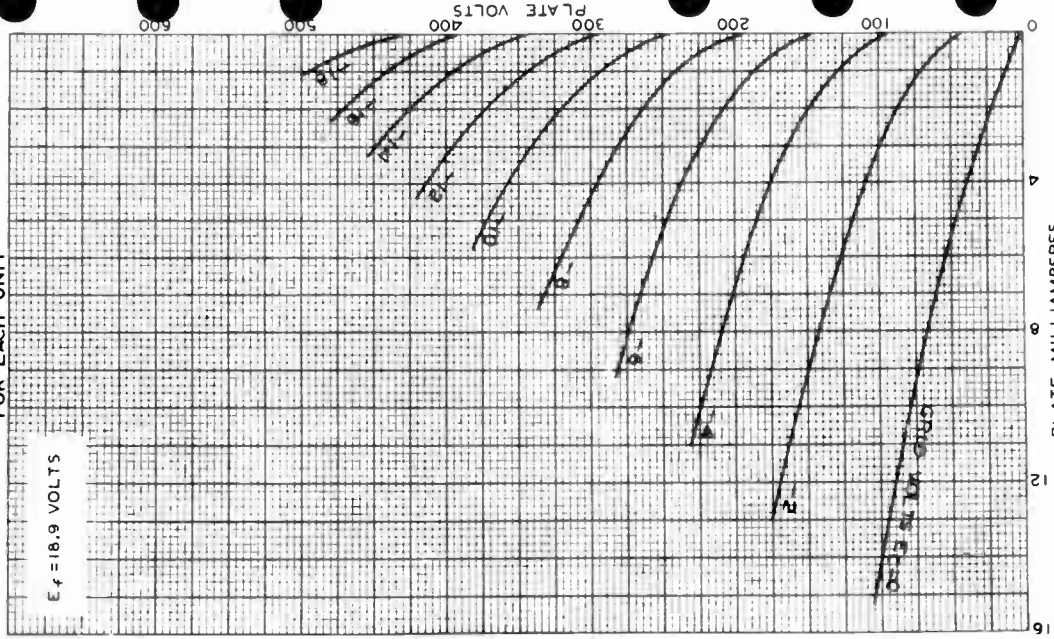
19J6



19J6

# AVERAGE PLATE CHARACTERISTICS FOR EACH UNIT

$E_f = 18.9$  VOLTS



AUG. 18, 1948

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARTSON, NEW JERSEY

92CM-7060





19T8

19T8  
19X8

## TRIPLE DIODE—HIGH-MU TRIODE

9-PIN MINIATURE TYPE

*The 19T8 is the same as the 6T8-A except for the following items:*

Heater, for Unipotential Cathodes:

Voltage. . . . .	18.9 ± 10%	. . . . . ac or dc volts
Current. . . . .	0.15	. . . . . amp
Warm-up time (Average) .	♦	. . . . . sec

♦ The heater for the 19T8 does not have controlled warm-up time.

19X8

## TRIODE-PENTODE CONVERTER

9-PIN MINIATURE TYPE

*The 19X8 is the same as the 6X8 except for the following items:*

Heater, for Unipotential Cathode:

Voltage. . . . .	18.9	. . . . . ac or dc volts
Current. . . . .	0.15	. . . . . amp

*The 19X8 is intended primarily for use in "transformerless" AM/FM receivers whereas the 6X8 is intended for use in AM/FM receivers and in television receivers utilizing an intermediate frequency in the order of 40 Mc. Therefore, reference in the note (•) under the 6X8 to TV receivers does not apply to the 19X8.*





24-A

24-A

## SCREEN GRID R-F AMPLIFIER

Heater	Coated Unipotential Cathode	
Voltage	2.5	a-c or d-c volts
Current	1.75	amp.
Direct Interelectrode Capacitances:		
Grid to Plate	0.007 max.	$\mu$ f
Input	5.3	$\mu$ f
Output	10.5	$\mu$ f
Overall Length	4-25/32" to 5-1/32"	
Maximum Diameter	1-13/16"	
Bulb	ST-14	
Cap	Small Metal	
Base	Medium 5-Pin	
Pin 1 - Heater		Pin 4 - Cathode
Pin 2 - Plate		Pin 5 - Heater
Pin 3 - Screen		Cap - Grid
Mounting Position		Any ←



BOTTOM VIEW

AMPLIFIER - Class A<sub>1</sub>

## Operating Conditions and Characteristics:

Heater*	2.5	2.5	volts
Plate	180	250 $\square$	volts
Screen	90	90	max. volts
Grid	-3	-3	volts
Amp. Fact.	400	630	
Plate Res.	400000	600000	ohms
Transcond.	1000	1050	$\mu$ hos
Plate Cur.	4	4	ma.
Screen Cur.	1.7	1.7	max. ma.

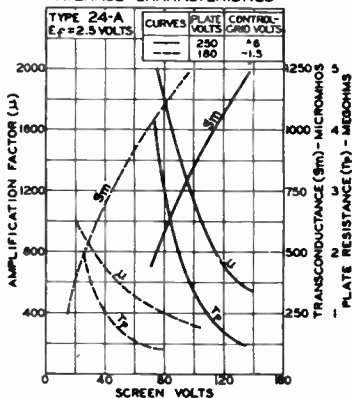
## DETECTOR

## Typical Operation:

	Biased	Grid-Leak	
Heater*	2.5	2.5	volts
Plate	250 $\square$	180 max.	volts
Screen	20 to 45	20 to 45	volts
Grid	-5 approx.	Return to Cathode $\nabla$	volts
Plate Load	0.25 $\Delta$	0.25 $\Delta$	megohm
Plate Cur.	adjusted to 0.1 ma. with no input signal $\blacksquare$	-	

- $\square$  Max. plate volts = 275.  
 $\nabla$  Conventional grid leak and condenser.  
 $\Delta$  Or 500 h. choke shunted by 0.25 megohm. For resistance load, plate-supply voltage will be voltage at plate plus voltage drop in load caused by specified plate current.  
 $\blacksquare$  with shield-can.  
Average plate current with normal maximum signal should be limited to 4.0 ma., as measured with a d-c meter.  
\* In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.  
← indicates a change.

## AVERAGE CHARACTERISTICS



APRIL 3, 1939

RCA RADITRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

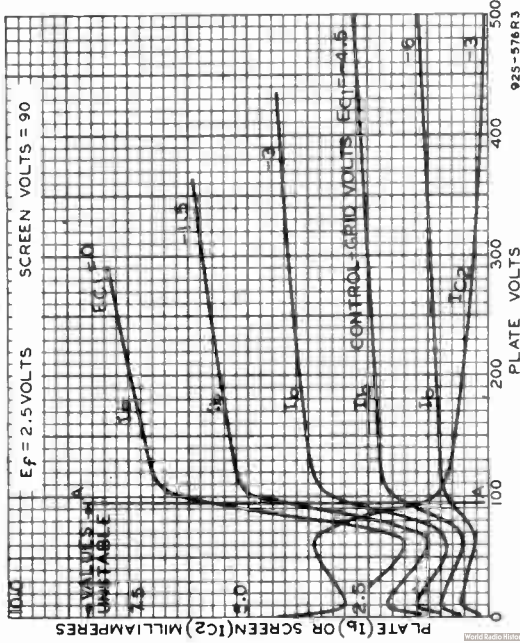
DATA

24-A

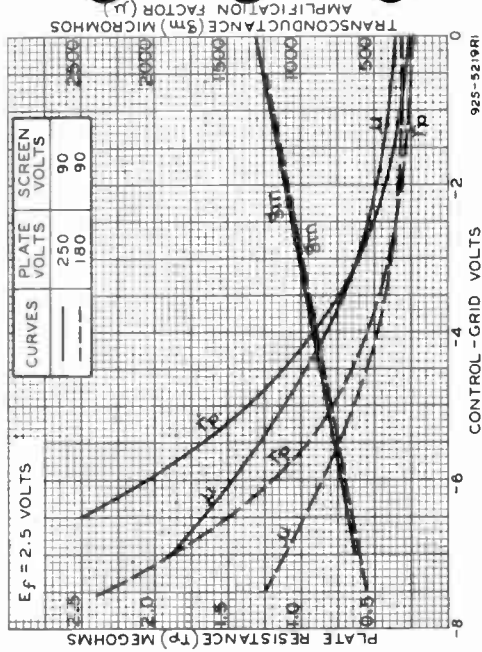


24-A

## AVERAGE PLATE CHARACTERISTICS



## AVERAGE CHARACTERISTICS



FEB. 14, 1939

RCA RADIODIODE DIVISION  
RCA MANUFACTURING COMPANY, INC.

92C-6027



25A6  
25A6-GT/G

# 25A6, 25A6-GT/G

## POWER AMPLIFIER PENTODE

Heater	Coated Unipotential Cathode	
Voltage	25	a-c or d-c volts
Current	0.3	amp.
	<u>25A6</u>	<u>25A6-GT/G</u>
Direct Interelectrode Cap.	▲	
Grid to Plate	0.2	- μf
Input	8.5	- μf
Output	12.5	- μf
Maximum Overall Length	3-1/4"	3-5/16"
Maximum Scribed Height	2-11/16"	2-3/4"
Maximum Diameter	1-5/16"	1-5/16"
Bulb	Metal Shell, MT-8	T-9
Base	{ Small Wafer { Octal 7-Pin	{ Intermed. Sh. { Octal 7-Pin
Basing Designation	7S	G-7S
Pin 1	{ 25A6, Shell { 25A6-GT/G, No Con.	Pin 5 - Grid
Pin 2 - Heater		Pin 7 - Heater
Pin 3 - Plate		Pin 8 - Cathode, Grid #3
Pin 4 - Screen		
Mounting Position		Any



BOTTOM VIEW

### Maximum Ratings Are Design-Center Values AMPLIFIER

Plate Voltage	160 max. volts
Screen Voltage	135 max. volts
Plate Dissipation	5.3 max. watts
Screen Dissipation	1.9 max. watts

### Typical Operation and Characteristics - Class A Amplifier:

Plate Voltage	95	135	160	volts
Screen Voltage	95	135	120	volts
Grid Voltage*	-15	-20	-18	volts
Peak A-F Grid Voltage	15	20	18	volts
Zero-Sig. Plate Current	20	37	33	ma.
Max.-Sig. Plate Current	22	39	36	ma.
Zero-Sig. Screen Current	4	8	6.5	ma.
Max.-Sig. Screen Current	8	14	12	ma.
Plate Resistance	45000	35000	42000	ohms
Transconductance	2000	2450	2375	μmhos
Load Resistance	4500	4000	5000	ohms
Total Harmonic Distortion	11	9	10	%
Max.-Sig. Power Output	0.9	2	2.2	watts

■ Heater-cathode bias should not exceed 90 volts d.c. as measured between negative heater terminal and cathode.

▲ with shell connected to cathode. Values are approximate.

\* The d-c resistance in the grid circuit should not exceed 0.5 megohm with cathode bias. With fixed bias, the d-c resistance may be as high as 0.5 megohm for the 95-volt condition, but should be limited to 0.1 megohm for the 135-volt and 160-volt conditions.

Curves under Type 43 also apply to the 25A6 and 25A6-GT/G.

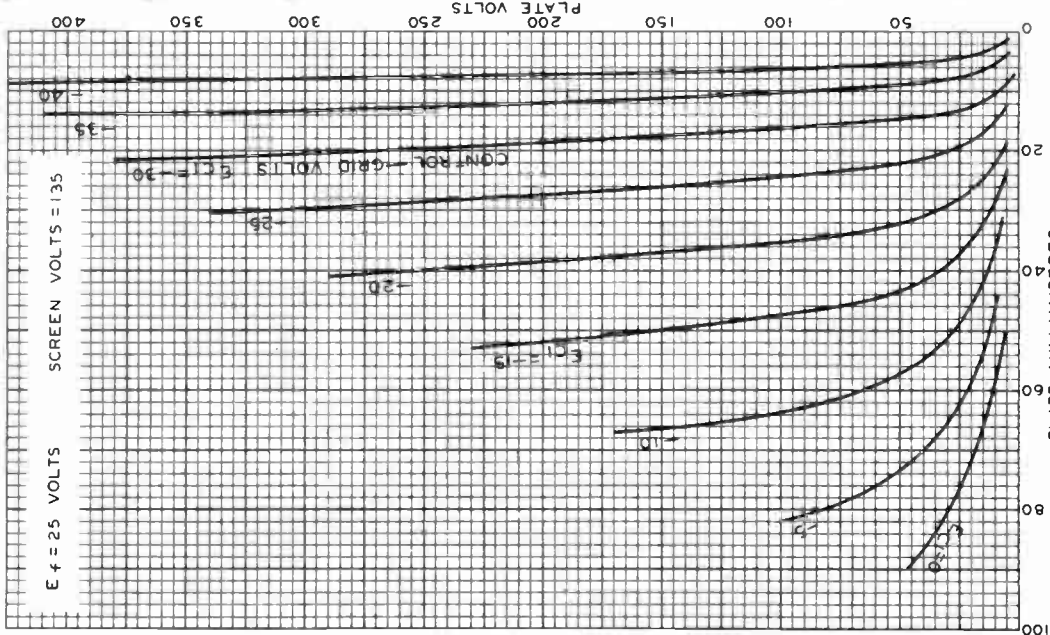
- Indicates a change.

25A6



25A6

# AVERAGE PLATE CHARACTERISTICS



World Precision

JAN. 8, 1940

RCA VICTOR DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92 C-4559RI



25AV5-GA  
TO  
25BQ6-GTB

## 25AV5-GA BEAM POWER TUBE

The 25AV5-GA is the same as the 6AV5-GA except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC) . . . . .	25	volts
Current . . . . .	0.3	amp

## 25AX4-GT HALF-WAVE VACUUM RECTIFIER

*For television damper service*

The 25AX4-GT is the same as the 6AX4-GT except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC) . . . . .	25	volts
Current . . . . .	0.3	amp

## 25BK5 BEAM POWER TUBE

9-PIN MINIATURE TYPE

The 25BK5 is the same as the 6BK5 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC) . . . . .	25	volts
Current . . . . .	0.3	amp

## 25BQ6-GTB/25CU6 BEAM POWER TUBE

The 25BQ6-GTB/25CU6 is the same as the 6BQ6-GTB/6CU6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC) . . . . .	25	volts
Current . . . . .	0.3	amp







25C5

# BEAM POWER TUBE

7-PIN MINIATURE TYPE

25C5

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	25	. . . . .	ac or dc volts
Current . . . . .	0.3	. . . . .	amp

Direct Interelectrode Capacitances (Approx.)<sup>0</sup>:

Grid No.1 to plate. . . . .	0.6	μf
Grid No.1 to cathode & grid No.3, grid No.2 and heater. . . . .	13	μf
Plate to cathode & grid No.3, grid No.2 and heater. . . . .	8.5	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. . . . .	3/4"
Dimensional Outline . . . . .	See General Section
Bulb. . . . .	T5-1/2
Base. . . . .	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW. . . . .	7CV

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



Pin 4 - Heater  
Pin 5 - Grid No.1  
Pin 6 - Grid No.2  
Pin 7 - Plate

## AMPLIFIER — Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	135	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	117	max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive bias value . . . . .	0	max.	volts
GRID-No.2 INPUT . . . . .	1.25	max.	watts
PLATE DISSIPATION . . . . .	6	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode. . . . .	200	max.	volts
Heater positive with respect to cathode. . . . .	200*	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface). . . . .	220	max.	°C

### Typical Operation and Characteristics:

Plate Voltage . . . . .	120	volts
Grid-No.2 Voltage . . . . .	110	volts
Grid-No.1 Voltage . . . . .	-8	volts

<sup>0</sup> \*: See next page.

25C5



25C5

## BEAM POWER TUBE

Peak AF Grid-No.1 Voltage. . . . .	8	volts
Zero-Signal Plate Current. . . . .	49	ma
Max.-Signal Plate Current. . . . .	50	ma
Zero-Signal Grid-No.2 Current. . . . .	4	ma
Max.-Signal Grid-No.2 Current. . . . .	8.5	ma
Plate Resistance (Approx.) . . . . .	10000	ohms
Transconductance . . . . .	7500	$\mu$ mhos
Load Resistance. . . . .	2500	ohms
Total Harmonic Distortion. . . . .	10	%
Max.-Signal Power Output . . . . .	2.3	watts

**Maximum Circuit Values:**

## Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

<sup>o</sup> Without external shield.

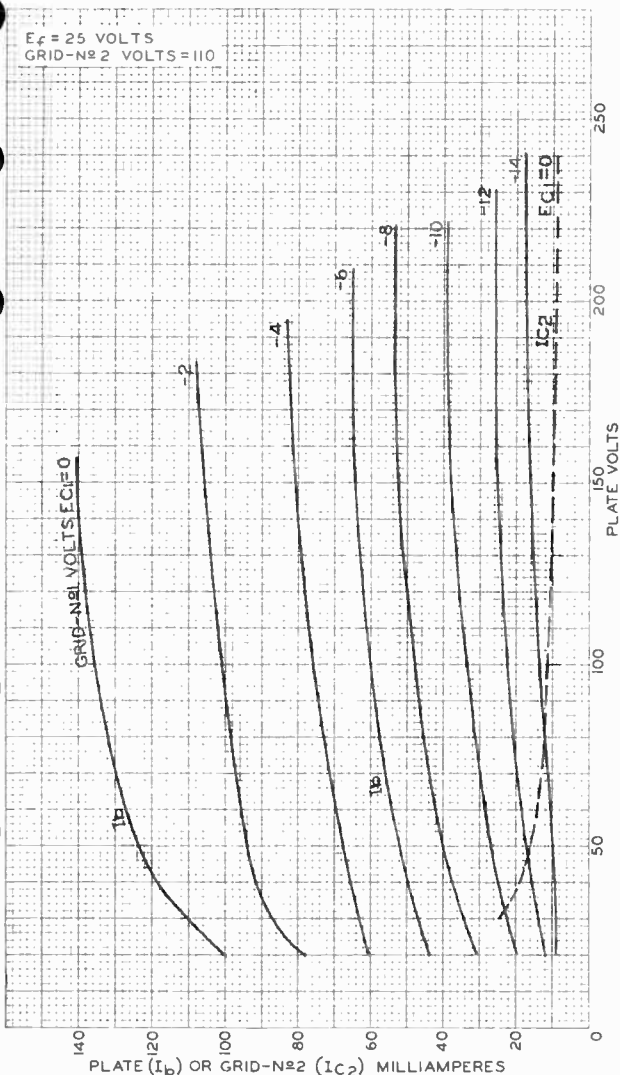
\* The dc component must not exceed 100 volts.



25C5

25C5

### AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION

92CM-8908R2

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

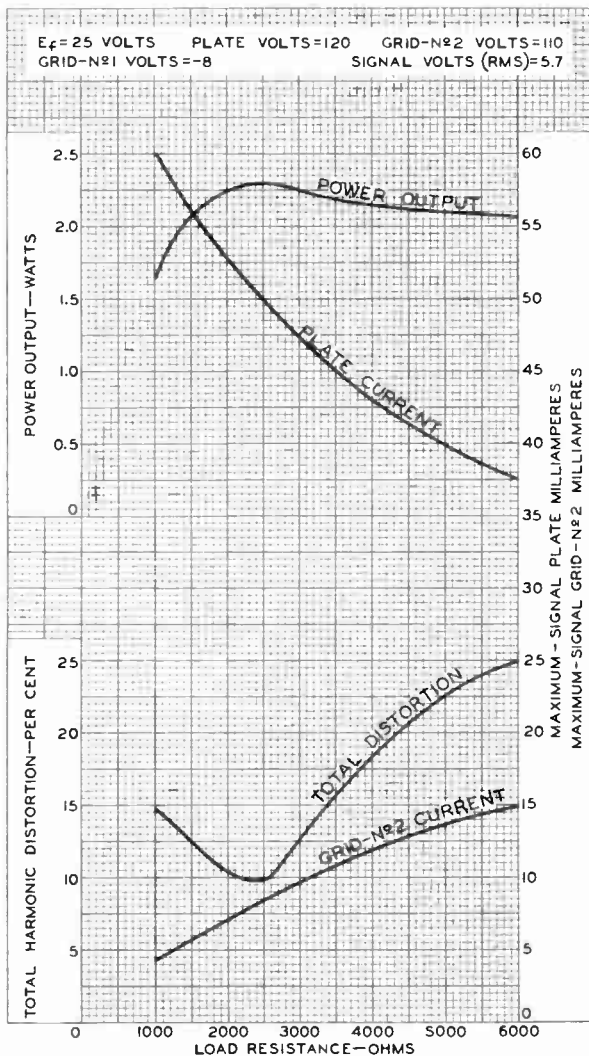
World Radio History

25C5



25C5

## OPERATION CHARACTERISTICS





25CA5

BEAM POWER TUBE

7-PIN MINIATURE TYPE

25CA5

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	25	volts
Current . . . . .	0.3	amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid No.1 to plate . . . . .	0.5	$\mu$ f
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	15	$\mu$ f
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	9	$\mu$ f

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" $\pm$ 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 Designiation for BOTTOM VIEW . . . . .	7CV

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



- Pin 4 - Heater
- Pin 5 - Grid No.1
- Pin 6 - Grid No.2
- Pin 7 - Plate

AMPLIFIER — Class A<sub>1</sub>

Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	130	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	130	max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value . . . . .	0	max.	volts
GRID-No.2 INPUT . . . . .	1.4	max.	watts
PLATE DISSIPATION . . . . .	5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200	max.	volts
Heater positive with respect to cathode . . . . .	200	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface) . . . . .	180	max.	°C

Typical Operation and Characteristics:

Plate Voltage . . . . .	110	125	volts
Grid-No.2 Voltage . . . . .	110	125	volts
Grid-No.1 Voltage . . . . .	-4	-4.5	volts
Peak AF Grid-No.1 Voltage . . . . .	4	4.5	volts
Zero-Signal Plate Current . . . . .	32	37	ma

25CA5



25CA5

## BEAM POWER TUBE

Max.-Signal Plate Current. . . . .	31	36	ma
Zero-Signal Grid-No.2 Current. . . . .	3.5	4	ma
Max.-Signal Grid-No.2 Current. . . . .	7.5	11	ma
Plate Resistance (Approx.) . . . . .	16000	15000	ohms
Transconductance . . . . .	8100	9200	μmhos
Load Resistance. . . . .	3500	4500	ohms
Total Harmonic Distortion. . . . .	5	6	%
Max.-Signal Power Output . . . . .	1.1	1.5	watts

**Maximum Circuit Values:**

## Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

○ Without external shield.

▲ The dc component must not exceed 100 volts.



25CD6-GB

# 25CD6-GB BEAM POWER TUBE

*Intended for use in equipment having  
series heater-string arrangement*

*The 25CD6-GB is the same as the 6CD6-GA except for the following items:*

Heater, for Unipotential Cathode:

Voltage . . . . .	25	. . . . .	ac or dc volts
Current . . . . .	0.6	. . . . .	amp
Warm-up time (Average) . . . . .	11	. . . . .	sec

*For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.*







25DN6

25DN6

### BEAM POWER TUBE

Intended for use in equipment having series heater-string arrangement

#### GENERAL DATA

##### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	25	ac or dc volts
Current . . . . .	0.6	amp
Warm-up time (Average) . . . . .	11	sec

For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid No.1 to plate . . . . .	0.8	$\mu\mu\text{f}$
Grid No.1 to cathode & grid No.3, grid No.2, and heater. . . . .	22	$\mu\mu\text{f}$
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	11.5	$\mu\mu\text{f}$

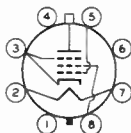
##### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	50	125	volts
Grid-No.2 (Screen-Grid) Voltage . . . . .	100	125	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	0	-18	volts
Mu Factor, Grid No.2 to Grid No.1 . . . . .	-	4.35	
Plate Resistance (Approx.) . . . . .	-	4000	ohms
Transconductance . . . . .	-	9000	$\mu\text{mhos}$
Plate Current . . . . .	240*	70	ma
Grid-No.2 Current . . . . .	30*	6.3	ma
Grid-No.1 Voltage (Approx.) for plate current of 0.5 ma. . . . .	-	-36	volts

##### Mechanical:

Operating Position . . . . .	Vertical, base up or down, or Horizontal with pins 1 and 3 in vertical plane
Maximum Overall Length . . . . .	5"
Seated Length . . . . .	4-1/4" $\pm$ 3/16"
Maximum Diameter . . . . .	1-9/16"
Bulb . . . . .	T12
Cap. . . . .	Small (JETEC No.C1-1)
Base . . . . .	Short Medium-Shell Octal 8-Pin with External Barriers, Style B (JETEC No.B8-118)
Basing Designation for BOTTOM VIEW . . . . .	5BT

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



- Pin 5 - Grid No.1
- Pin 6 - No Connection
- Pin 7 - Heater
- Pin 8 - Grid No.2
- Cap - Plate

<sup>0</sup> : See next page.

25DN6



25DN6

## BEAM POWER TUBE

## HORIZONTAL DEFLECTION AMPLIFIER

Maximum Ratings, Design-Center Values Except as Noted:

For operation in a 525-line, 30-frame system<sup>o</sup>

DC PLATE VOLTAGE . . . . .	700	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum) <sup>•</sup> . . . . .	6600 <sup>■</sup>	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE . . . . .	1500	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	175	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE . . . . .	200	max.	volts
CATHODE CURRENT:			
Peak . . . . .	700	max.	ma
Average . . . . .	200	max.	ma
GRID-No.2 INPUT . . . . .	3	max.	watts
PLATE DISSIPATION <sup>†</sup> . . . . .	15	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200	max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup>	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface) . . . . .	225	max.	°C

## Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

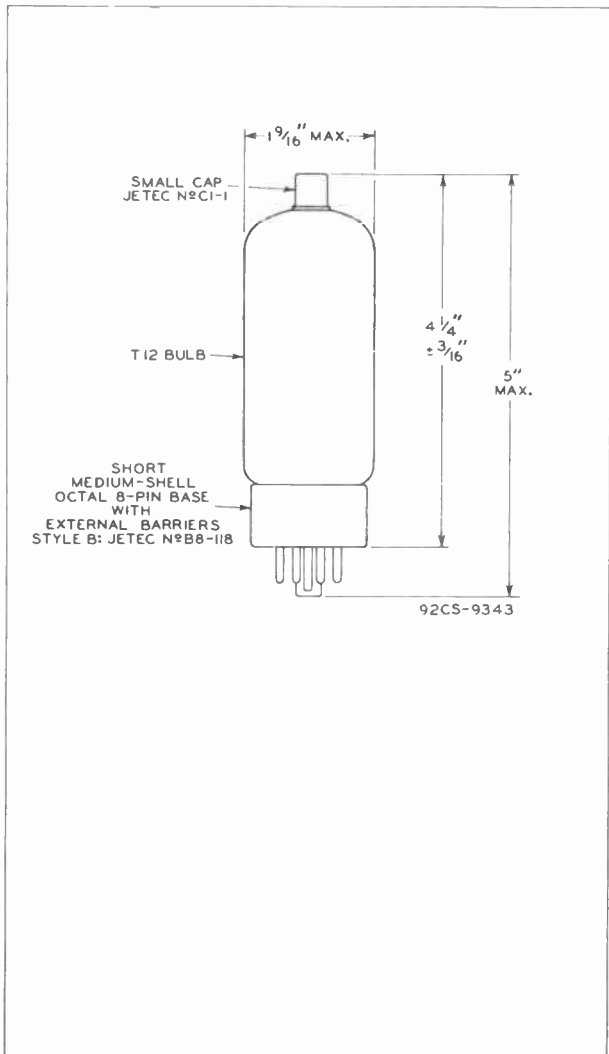
For grid-resistor-bias operation<sup>†</sup> . . . . . 0.47 max. megohm<sup>o</sup> Without external shield.<sup>•</sup> These values can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.<sup>□</sup> As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.<sup>•</sup> This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.<sup>■</sup> Under no circumstances should this absolute value be exceeded.<sup>†</sup> It is essential that the plate dissipation be limited in the event of loss of grid-No.1 signal. For this purpose, some protective means such as a cathode resistor of suitable value should be employed.<sup>▲</sup> The dc component must not exceed 100 volts.



25DN6

BEAM POWER TUBE

25DN6







25EH5

# 25EH5 POWER PENTODE

7-PIN MINIATURE TYPE

*The 25EH5 is the same as the 6EH5 except for the following items:*

Heater, for Unipotential Cathode:

Voltage. . . . .	25	. . . . .	ac or dc volts
Current. . . . .	0.3	. . . . .	amp





25L6

25L6

# BEAM POWER AMPLIFIER

## GENERAL DATA

### Electrical:

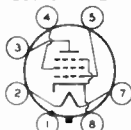
Heater; for Unipotential Cathode:		
Voltage . . . . .	25	ac or dc volts
Current . . . . .	0.3	amp
Direct Interelectrode Capacitances (Approx.): <sup>o</sup>		
Grid No.1 to Plate . . . . .	0.3	$\mu\text{mf}$
Input . . . . .	16.0	$\mu\text{mf}$
Output . . . . .	13.5	$\mu\text{mf}$

<sup>o</sup> with shell connected to cathode

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	3-1/4"
Maximum Seated Length . . . . .	2-11/16"
Maximum Diameter . . . . .	1-5/16"
Bulb . . . . .	Metal Shell, MT-8
Base . . . . .	Small-Wafer Octal 7-Pin
Basing Designation for BOTTOM VIEW . . . . .	7AC

- Pin 1 - Shell
- Pin 2 - Heater
- Pin 3 - Plate
- Pin 4 - Grid No.2



- Pin 5 - Grid No.1
- Pin 7 - Heater
- Pin 8 - Cathode, Grid No.3

### AF POWER AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	200 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	117 max.	volts
PLATE DISSIPATION . . . . .	10 max.	watts
GRID-No.2 INPUT . . . . .	1.25 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	90 max.	volts
Heater positive with respect to cathode.	90 max.	volts

### Typical Operation and Characteristics:

Plate Voltage . . . . .	110	200	volts
Grid-No.2 Voltage . . . . .	110	110	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	-7.5	-8	volts
Peak AF Grid-No.1 Voltage . . . . .	7.5	8	volts
Zero-Signal Plate Current . . . . .	49	50	ma
Max.-Signal Plate Current . . . . .	50	55	ma
Zero-Sig. Grid-No.2 Cur. (Approx.) . . . . .	4	2	ma
Max.-Sig. Grid-No.2 Cur. (Approx.) . . . . .	11	7	ma
Plate Resistance (Approx.) . . . . .	13000	30000	ohms
Transconductance . . . . .	9000	9500	$\mu\text{mhos}$
Load Resistance . . . . .	2000	3000	ohms
Total Harmonic Distortion . . . . .	10	10	%

← Indicates a change.

FEB. 1, 1950

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA

25L6



25L6

# BEAM POWER AMPLIFIER

Max.-Signal Power Output . . . . . 2.1 4.3 watts

**Maximum Circuit Values (for maximum rated conditions):**

**Grid-No.1-Circuit Resistance:**

For fixed bias . . . . . 0.1 megohm  
For cathode bias . . . . . 0.5 megohm

*Curves shown under Type 50L6-GT also apply to the 25L6.*





25L6-GT

# 25L6-GT BEAM POWER TUBE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	25	ac or dc volts
Current . . . . .	0.3	amp

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

Grid No.1 to plate . . . . .	0.6	$\mu$ f
Grid No.1 to cathode & grid No.3, grid No.2, and heater. . . . .	15	$\mu$ f
Plate to cathode & grid No.3, grid No.2, and heater. . . . .	10	$\mu$ f

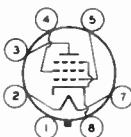
### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	3-5/16"
Maximum Seated Length . . . . .	2-3/4"
Maximum Diameter . . . . .	1-9/32"

Bulb . . . . .	T-9
Base . . . . .	Intermediate-Shell Octal 7-Pin (JETEC No. B7-7), or Short Intermediate-Shell Octal 7-Pin with External Barriers (JETEC No. B7-59)

Basing Designation for BOTTOM VIEW . . . . . 7AC

Pin 1 - No Connection  
Pin 2 - Heater  
Pin 3 - Plate  
Pin 4 - Grid No.2



Pin 5 - Grid No.1  
Pin 7 - Heater  
Pin 8 - Cathode,  
Grid No.3

## AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	200 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	125 max.	volts
PLATE DISSIPATION . . . . .	10 max.	watts
GRID-No.2 INPUT . . . . .	1.25 max.	watts

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . . . .	150 max.	volts
Heater positive with respect to cathode. . . . .	150 max.	volts

### Typical Operation and Characteristics:

Plate Voltage . . . . .	110	200	volts
Grid-No.2 Voltage . . . . .	110	125	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	-7.5	0	volts
Peak AF Grid-No.1 Voltage . . . . .	7.5	8.5	volts
Cathode Resistor . . . . .	0	180	ohms
Zero-Signal Plate Current . . . . .	49	46	ma
Max.-Signal Plate Current . . . . .	50	47	ma
Zero-Signal Grid-No.2 Current . . . . .	4	2.2	ma

<sup>o</sup> without external shield.

← Indicates a change.

MAY 1, 1955

TUBE DIVISION

DATA

RADIO CORPORATION OF AMERICA - HARRISON, NEW JERSEY

World Radio History

25L6-GT



# 25L6-GT BEAM POWER TUBE

Max.-Signal Grid-No.2 Current. . . . .	10	8.5	ma
Plate Resistance (Approx.) . . . . .	13000	28000	ohms
Transconductance . . . . .	8000	8000	$\mu$ mhos
Load Resistance. . . . .	2000	4000	ohms
Total Harmonic Distortion. . . . .	10	10	%
Max.-Signal Power Output . . . . .	2.1	3.8	watts

### Maximum Circuit Values (For maximum rated conditions):

Grid-No.1-Circuit Resistance:

- For fixed-bias operation . . . . . 0.1 max. megohm
- For cathode-bias operation . . . . . 0.5 max. megohm

*Curves shown under Type 50L6-GT also apply to the 25L6-GT*



25W4-GT

# 25W4-GT

## HALF-WAVE VACUUM RECTIFIER

### GENERAL DATA

#### Electrical:

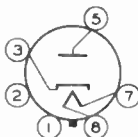
Heater, for Unipotential Cathode:

Voltage. . . . .	25	ac volts
Current. . . . .	0.3	amp

#### Mechanical:

Mounting Position. . . . .	Any
Maximum Overall Length . . . . .	3-5/16"
Maximum Seated Length. . . . .	2-3/4"
Maximum Diameter . . . . .	1-9/32"
Bulb . . . . .	T-9
Base . . . . .	Intermediate-Shell Octal 6-Pin
Basing Designation for BOTTOM VIEW . . . . .	4CG

Pin 1 - No	Pin 3 - Cathode
Connection	Pin 5 - Plate
Pin 2 - No	Pin 7 - Heater
Connection	Pin 8 - Heater



### CAMPER SERVICE

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

PEAK INVERSE PLATE VOLTAGE . . . . .	2000*	max.	volts
PEAK PLATE CURRENT . . . . .	600	max.	ma
DC PLATE CURRENT . . . . .	125	max.	ma
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	450	max.	volts
Heater positive with respect to cathode.	100	max.	volts

### RECTIFIER SERVICE

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

PEAK INVERSE PLATE VOLTAGE . . . . .	1250	max.	volts
PEAK PLATE CURRENT . . . . .	600	max.	ma
HOT-SWITCHING TRANSIENT PLATE CURRENT			
For duration of 0.2 second maximum . . . . .	3.5	max.	amp
DC OUTPUT CURRENT. . . . .	125	max.	ma
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	450	max.	volts
Heater positive with respect to cathode.	100	max.	volts

\* This rating is applicable where the duty cycle of the voltage pulse does not exceed 15 percent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15% of one horizontal scanning cycle is 10 microseconds.

25W4-GT



# 25W4-GT

## HALF-WAVE VACUUM RECTIFIER

Typical Operation:	Half-Wave	Full-Wave	
	Rectifier (One Tube)	Rectifier (Two Tubes)	
AC Plate-Supply Voltage (RMS) . .	350	-	volts
AC Plate-to-Plate Supply Voltage (RMS) . . . . .	-	700	volts
Filter-Input Capacitor . . . . .	20	20	$\mu$ f
Minimum Total Effective Plate- Supply Impedance Per Plate.	145	145	ohms
DC Output Current . . . . .	125	250	ma
DC Output Voltage at Input to Filter (Approx.):			
At half-load cur. of	390	-	volts
{ 62.5 ma.		-	volts
{ 125 ma.	-	395	volts
At full-load cur. of	335	-	volts
{ 125 ma.		-	volts
{ 250 ma.	-	350	volts
Voltage Regulation (Approx.):			
Half-load to full-load current . . . . .	55	45	volts

Curves shown under Type 6W4-GT also apply to the 25W4-GT



25Z5

25Z5



# HIGH-VACUUM RECTIFIER-DOUBLER

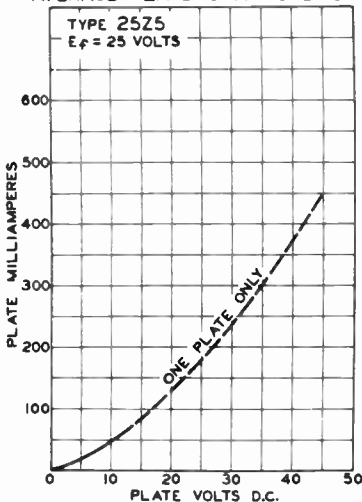
Heater	Coated Unipotential Cathodes	
Voltage	25	a-c or d-c volts
Current	0.3	amp.
Maximum Overall Length		4-3/16"
Maximum Seated Height		3-9/16"
Maximum Diameter		1-9/16"
Bulb		ST-12
Base		Small 6-Pin
Pin 1 - Heater		Pin 4 - Cathode #1
Pin 2 - Plate #2		Pin 5 - Plate #1
Pin 3 - Cathode #2		Pin 6 - Heater
Mounting Position	BOTTOM VIEW (6E)	Any



Maximum Ratings, Typical Operating Conditions, and Curves are the same as those for Type 2588.

In the design of "transformerless" receivers, a filter of condenser-input type is recommended for use with the 25Z5 in order to obtain a d-c output voltage as high as possible. A larger input capacitance, i.e., 16  $\mu$ f, is desirable for half-wave rectifier service, while a higher value is advantageous for voltage-doubler circuits. Since the peak voltage applied to the input condenser(s) is relatively low, it is possible to use condensers having moderate voltage rating (sufficient only for the line voltage). For rectifier and voltage-doubler circuits, see next page.

### AVERAGE PLATE CHARACTERISTIC



92C-4458RI

← Indicates a change.

Sept. 2, 1941

RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY INC

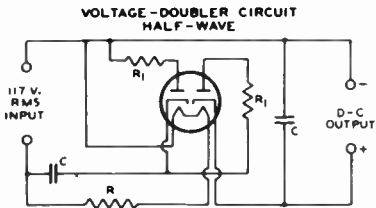
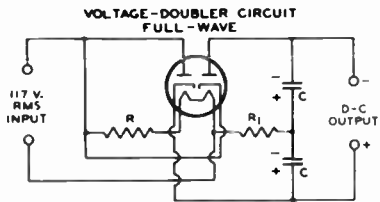
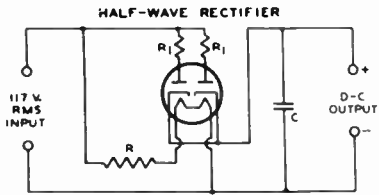
DATA

25Z5



25Z5

TYPICAL RECTIFIER-DOUBLER CIRCUITS



- R = HEATERS OF OTHER TUBES IN SERIES WITH VOLTAGE-DROPPING RESISTOR
- R<sub>1</sub> = PROTECTIVE RESISTOR
- C = CONDENSERS

The license extended to the purchaser of tubes appears in the License Notice accompanying them. Information contained herein is furnished without assuming any obligations.

2526  
2526-GT/G

## 2526, 2526-GT/G

## HIGH-VACUUM RECTIFIER-DOUBLER

Heater Voltage Current Coated Unipotential Cathodes 15 0.3 a-c or d-c volts amp.

	2526	2526-GT/G
Maximum Overall Length	3-1/4"	3-5/16"
Maximum Seated Height	2-11/16"	2-3/4"
Maximum Diameter	1-5/16"	1-5/16"
Bulb	Metal Shell, MT-8	T-9
Base	{ Small Wafer Octal 7-Pin 7Q	{ Intermed. Sh. Octal 7-Pin G-7Q
Basing Designation		Pin 4 - Cathode #2
Pin 1	{ 2526, Shell 2526-GT/G, No Con.	Pin 5 - Plate #1
Pin 2	Heater	Pin 7 - Heater
Pin 3	Plate #2	Pin 8 - Cathode #1
Mounting Position		An.



BOTTOM VIEW

Maximum Ratings Are Design-Center Values  
RECTIFIER OR DOUBLER

Peak Inverse Plate Voltage	700 max. volts
Peak Plate Current per Plate	450 max. ma.
D-C Output Current per Plate	75 max. ma.
D-C Heater-Cathode Potential	350 max. volts

Typical Operation as Half-Wave Rectifier  
with Condenser-Input Filter:\*

Unless otherwise indicated, values are for both plates in parallel.

A-C Plate Supply Voltage per Plate (RMS)	117	150	235	volts
Filter Input Condenser	16	16	16	µf
Min. Total Effect. Plate-Supply Imped. per Plate	15	40	100	ohms
D-C Output Current per Plate	75	75	75	ma.
D-C Voltage (At input to filter):*				
At half-load current (75 ma.)	115	-	255	volts
At full-load current (150 ma.)	80	-	200	volts
Difference (voltage Regulation)	35	-	55	volts
Percentage Regulation	30	-	22	%

Typical Operation as Voltage Doubler:

	Half-Wave	Full-Wave	
A-C Plate Supply Voltage per Plate (RMS)	117	117	volts
Filter Input Condenser (Each)	16	16	µf
Min. Total Effect. Plate-Supply Imped. per Plate	30	15	ohms
D-C Output Current	75	75	ma.
D-C Voltage (At input to filter):*			
At half-load current (37.5 ma.)	-	250	volts
At full-load current (75 ma.)	-	205	volts
Difference (voltage Regulation)	-	45	volts
Percentage Regulation	-	18	%

- \* In half-wave rectifier service, the two units may be used separately or in parallel.
- \* Approximate values.

Circuits and Plate Characteristic Curve for the 2526 and 2526-GT/G are the same as for Type 2525.

Mar. 20, 1943

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

DATA





## RCA-27 DETECTOR, AMPLIFIER

Heater		Coated Uni-potential Cathode		
Voltage	2.5			a-c or d-c volts
Current	1.75			amp.
Direct Interelectrode Capacitances:				
Grid to Plate	3.3			μmf
Grid to Cathode	3.1			μmf
Plate to Cathode	2.3			μmf
Maximum Overall Length	(3)			4-1/4"
Maximum Diameter				1-9/16"
Bulb				ST-12
Base	(2) (4)			Medium 5-Pin
Pin 1-Heater				Pin 4-Cathode
Pin 2-Plate	(1) (5)			Pin 5-Heater
Pin 3-Grid				

### BOTTOM VIEW AMPLIFIER (Class A)

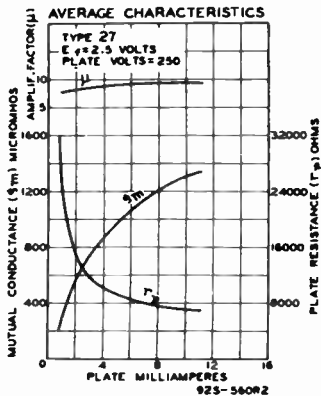
Operating Conditions and Characteristics:						
Heater *	2.5	2.5	2.5	2.5		volts
Plate	90	135	180	250	275 max.	volts
Grid	-6	-9	-13.5	-21		volts
Amp. Fact.	9	9	9	9		
Plate Res.	11000	9000	9000	9250		ohms
Mut. Cond.	820	1000	1000	975		μmhos
Plate Cur.	2.7	4.5	5.0	5.2		ma.

Grid-coupling resistor, if used, should not exceed 1.0 megohm.

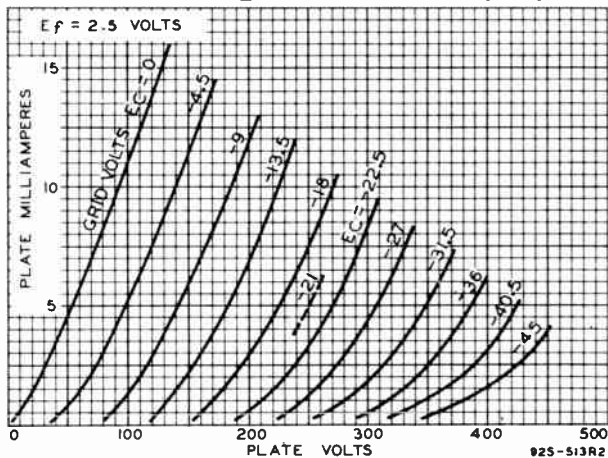
### DETECTOR

Typical Operation:	<u>Biased</u>		<u>Grid-Leak</u>	
	2.5	2.5	2.5	volts
Heater *	250*	275 max.	45	volts
Plate	-30*	-33*	Return to Cathode	volts
Grid	Adjusted to 0.2 ma. with no input signal		-	
Plate Cur. <sup>o</sup>			-	
Grid Leak	-	-	1 to 5	megohms
Grid Condenser	-	-	0.00025	μf

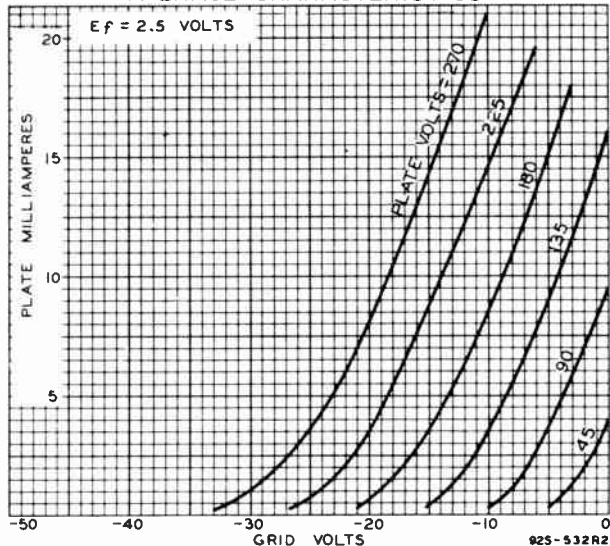
- \* Max-Signal d-c plate current should be limited to 5.0 ma.
  - ° Recommended practice is to connect the cathode directly to a mid-tap on the heater winding. If this practice is not followed, the potential difference between heater and cathode should be kept as low as possible.
- \* Approximate.



## AVERAGE PLATE CHARACTERISTICS



## AVERAGE CHARACTERISTICS





32ET5

# 32ET5 POWER PENTODE 7-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .  $32 \pm 10\%$  volts  
Current . . . . . 0.1 amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid No.1 to plate. . . . . 0.6  $\mu\text{f}$   
Grid No.1 to cathode & grid No.3,  
grid No.2, and heater . . . . . 12  $\mu\text{f}$   
Plate to cathode & grid No.3,  
grid No.2, and heater . . . . . 6  $\mu\text{f}$

### 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"  $\pm$  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. . . . . 7CV

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



Pin 4 - Heater  
Pin 5 - Grid No.1  
Pin 6 - Grid No.2  
Pin 7 - Plate

## AMPLIFIER — Class A<sub>1</sub>

### Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE. . . . . 150 max. volts  
GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . . 130 max. volts  
GRID-No.2 INPUT. . . . . 1.2 max. watts  
PLATE DISSIPATION. . . . . 5.4 max. watts  
PEAK HEATER-CATHODE VOLTAGE:  
Heater negative with respect to cathode. . . . . 200 max. volts  
Heater positive with respect to cathode. . . . . 200<sup>▲</sup> max. volts

### Typical Operation and Characteristics:

Plate Voltage. . . . . 110 volts  
Grid-No.2 Voltage. . . . . 110 volts  
Grid-No.1 Voltage. . . . . -7.5 volts  
Peak AF Grid-No.1 Voltage. . . . . 7.5 volts  
Zero-Signal Plate Current. . . . . 30 ma  
Zero-Signal Grid-No.2 Current. . . . . 2.8 ma  
Plate Resistance (Approx.) . . . . . 21500 ohms  
Transconductance . . . . . 5500  $\mu\text{mhos}$   
Load Resistance. . . . . 2800 ohms

32ET5



32ET5

POWER PENTODE

Total Harmonic Distortion. . . . .	10	%
Max.-Signal Power Output . . . . .	1.2	watts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1	max.	megohm
For cathode-bias operation . . . . .	0.5	max.	megohm

○ without external shield.

▲ The dc component must not exceed 100 volts.



35A5

35A5

# BEAM POWER AMPLIFIER

## GENERAL DATA

### Electrical:

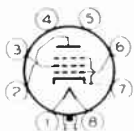
Heater, for Unipotential Cathode:

Voltage. . . . .	35.0 . . . . .	ac or dc volts
Current. . . . .	0.15 . . . . .	amp

### Mechanical:

Mounting Position. . . . .	Any
Maximum Overall Length . . . . .	3-5/32"
Maximum Seated Length. . . . .	2-5/8"
Maximum Diameter . . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW . . . . .	6AA

Pin 1 - Heater	Pin 6 - Grid No. 1
Pin 2 - Plate	Pin 7 - Cathode, Grid No. 3
Pin 3 - Grid No. 2	Pin 8 - Heater
Pin 4 - No Connection	Plug - Base Shell
Pin 5 - No Connection	



## AF POWER AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	200 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	125 max.	volts
PLATE DISSIPATION. . . . .	8.5 max.	watts
GRID-No.2 DISSIPATION. . . . .	1.0 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	90 max.	volts
Heater positive with respect to cathode.	90 max.	volts

### Typical Operation and Characteristics:

Plate Voltage. . . . .	110	200	volts
Grid-No.2 Voltage . . . . .	110	110	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	-7.5	-8	volts
Zero-Signal Plate Current. . . . .	40	41	ma.
Max.-Signal Plate Current. . . . .	41	44	ma.
Zero-Signal Grid-No.2 Current. . . . .	3.0	2.0	ma.
Max.-Signal Grid-No.2 Current. . . . .	7.0	7.0	ma.
Plate Resistance (Approx.) . . . . .	16000	40000	ohms
Transconductance . . . . .	5800	5900	μmhos
Load Resistance. . . . .	2500	4500	ohms
Total Harmonic Distortion. . . . .	10	10	%
Max.-Sig. Power Output . . . . .	1.5	3.3	watts

### Maximum Circuit Values (for maximum rated conditions):

Grid-No.1-Circuit Resistance:

For fixed bias . . . . .	0.1	megohm
For cathode bias . . . . .	0.5	megohm





35B5

35B5

# BEAM POWER AMPLIFIER

MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 35 . . . . . ac or dc volts

Current . . . . . 0.15 . . . . . amp

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid No.1 to Plate . . . . . 0.4 . . . . .  $\mu\mu\text{f}$

Input . . . . . 11 . . . . .  $\mu\mu\text{f}$

Output . . . . . 6.5 . . . . .  $\mu\mu\text{f}$

<sup>0</sup> with no external shield.

### Mechanical:

Mounting Position . . . . . Any

Maximum Overall Length . . . . . 2-5/8"

Maximum Seated Length . . . . . 2-3/8"

Length from Base Seat to Bulb Top (excluding tip) . . 2"  $\pm$  3/32"

Maximum Diameter . . . . . 3/4"

Bulb . . . . . T-5-1/2"

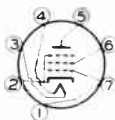
Base . . . . . Miniature Button 7-Pin

Basing Designation for BOTTOM VIEW . . . . . 7BZ

Pin 1 - Grid No.1

Pin 2 - Cathode,  
Grid No.3

Pin 3 - Heater



Pin 4 - Heater

Pin 5 - Plate

Pin 6 - Grid No.2

Pin 7 - Grid No.1

## AF POWER AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . . 117 max. volts

GRID-NO.2 (SCREEN) VOLTAGE . . . . . 117 max. volts

PLATE DISSIPATION . . . . . 4.5 max. watts

GRID-NO.2 DISSIPATION . . . . . 1.0 max. watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . . 150 max. volts

Heater positive with respect to cathode . . . . . 150 max. volts

### Typical Operation and Characteristics:

Plate Voltage . . . . . 110 . . . . . volts

Grid-No.2 Voltage . . . . . 110 . . . . . volts

Grid-No.1 (Control-Grid) Voltage . . . . . -7.5 . . . . . volts

Peak AF Grid-No.1 Voltage . . . . . 7.5 . . . . . volts

Zero-Signal Plate Current . . . . . 40 . . . . . ma.

Max.-Signal Plate Current . . . . . 41 . . . . . ma.

Zero-Signal Grid-No.2 Current . . . . . 3 . . . . . ma.

Max.-Signal Grid-No.2 Current . . . . . 7 . . . . . ma.

35B5



35B5

# BEAM POWER AMPLIFIER

Transconductance . . . . .	5800	. . .	$\mu$ mhos
Load Resistance. . . . .	2500	. . .	ohms
Total Harmonic Distortion. . . . .	10	. . .	%
Max.-Signal Power Output . . . . .	1.5	. . .	watts

**Maximum Circuit Values** (for maximum rated conditions):

Grid-No.1-Circuit Res. {	fixed bias . .	0.1	. . .	megohm
	cathode bias . .	0.5	. . .	megohm

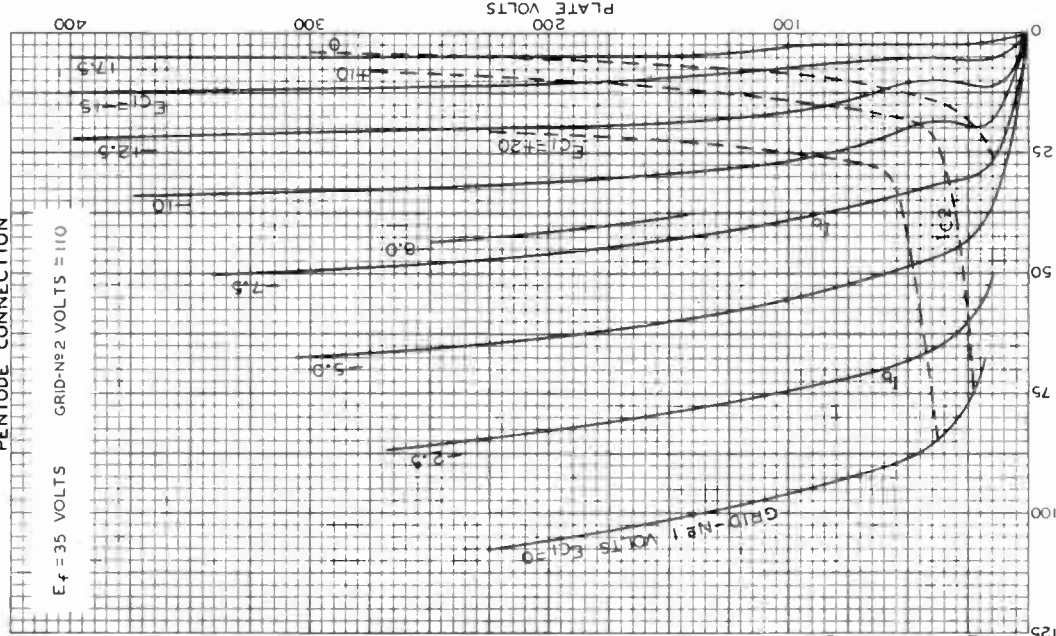




35B5

# AVERAGE PLATE CHARACTERISTICS PENTODE CONNECTION

$E_f = 35$  VOLTS      GRID-#2 VOLTS = 110



AUG. 15, 1941

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA HARTFORD NEW JERSEY

PLATE ( $I_b$ ) OR GRID-#2 ( $I_{c2}$ ) MILLIAMPERES

92CM-6312R1

35B5

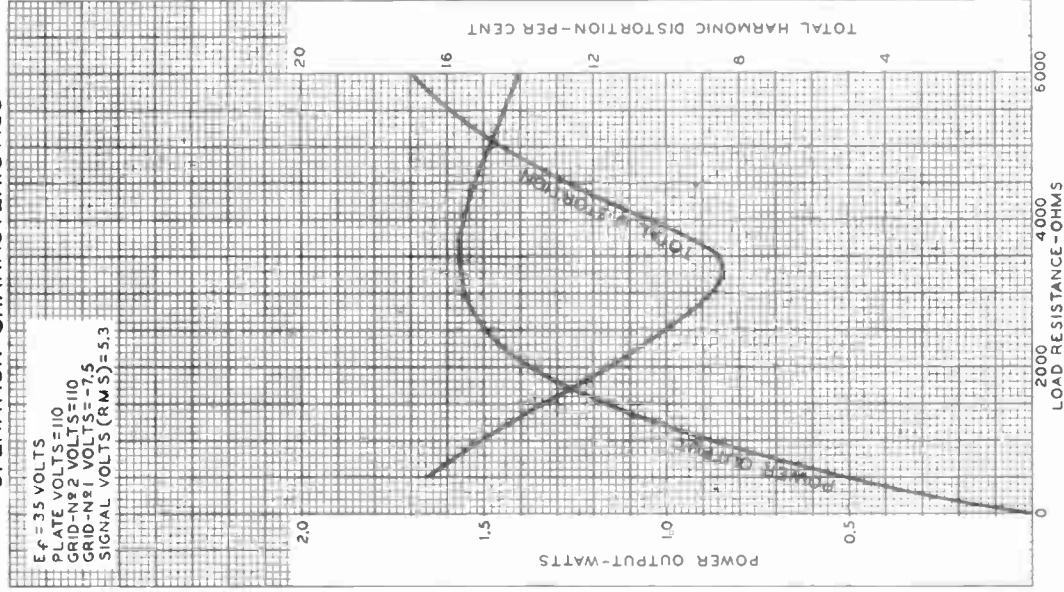
35B5



35B5

## OPERATION CHARACTERISTICS

$E_f = 35$  VOLTS  
 PLATE VOLTS = 110  
 GRID-N $\times$ 2 VOLTS = 110  
 GRID-N $\times$ 1 VOLTS = -7.5  
 SIGNAL VOLTS (RMS) = 5.3



SEPT. 20, 1946

 TUBE DEPARTMENT  
 RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6794



35C5

35C5

# BEAM POWER TUBE

MINIATURE TYPE

Except for a different basing arrangement, which simplifies the problem of meeting Underwriters' Laboratories requirements in the design of ac/dc receivers, the 35C5 is similar to the miniature type 35B5.

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . . 35 . . . . . ac or dc volts

Current . . . . . 0.15 . . . . . amp

Direct Interelectrode Capacitances (Approx.)<sup>o</sup>

Grid No.1 to plate . . . . . 0.60 . . . . .  $\mu$ f

Grid No.1 to cathode & grid No.3,  
grid No.2, and heater. . . . . 12 . . . . .  $\mu$ f

Plate to cathode & grid No.3,  
grid No.2, and heater. . . . . 9 . . . . .  $\mu$ f

### 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 . . . . . 3/4"

Bulb . . . . . T-5-1/2

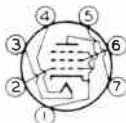
Base . . . . . Small-Button Miniature 7-Pin (JEDEC No.E7-1)

Basing Designation for BOTTOM VIEW . . . . . 7CV

Pin 1 - Cathode,  
Grid No.3

Pin 2 - Grid No.1

Pin 3 - Heater



Pin 4 - Heater

Pin 5 - Grid No.1

Pin 6 - Grid No.2

Pin 7 - Plate

## AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . . 135 max. volts

GRID-No.2 (SCREEN) VOLTAGE . . . . . 117 max. volts

PLATE DISSIPATION . . . . . 4.5 max. watts

GRID-No.2 INPUT . . . . . 1 max. watt

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . . . . 180 max. volts

Heater positive with respect to cathode. . . . . 180 max. volts

BULB TEMPERATURE (At hottest point)<sup>♦</sup> . . . . . 250 max. °C

<sup>o</sup> without external shield.

<sup>♦</sup> High ambient temperature and shielding may necessitate a reduction in operating dissipation. When tube shields are used it is advisable to paint both inside and outside surfaces of tube shield a dull black and to provide ventilation slots to reduce operating temperature.

→ Indicates a change.

35C5



35C5

## BEAM POWER TUBE

## Typical Operation and Characteristics:

Plate Voltage. . . . .	110	volts
Grid-No.2 Voltage. . . . .	110	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	-7.5	volts
Peak AF Grid-No.1 Voltage. . . . .	7.5	volts
Zero-Signal Plate Current. . . . .	40	ma
Max.-Signal Plate Current (Approx.). . . . .	41	ma
Zero-Signal Grid-No.2 Current. . . . .	3	ma
Max.-Signal Grid-No.2 Current. . . . .	7	ma
Plate Resistance (Approx.) . . . . .	13000	ohms
Transconductance . . . . .	5800	$\mu$ mhos
Load Resistance . . . . .	2500	ohms
Total Harmonic Distortion. . . . .	10	%
Max.-Signal Power Output . . . . .	1.5	watts

## Maximum Circuit Values (For maximum rated conditions):

## Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max. megohm
For cathode-bias operation . . . . .	0.5 max. megohm

*Curves shown under type 35B5 also apply to the 35C5*



35L6-GT

# 35L6-GT BEAM POWER AMPLIFIER

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage. . . . . 35 . . . . . ac or dc volts

Current. . . . . 0.15 . . . . . amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

Grid No.1 to Plate . . . . . 0.8 . . . . .  $\mu\mu\text{f}$

Input . . . . . 13 . . . . .  $\mu\mu\text{f}$

Output . . . . . 9.5 . . . . .  $\mu\mu\text{f}$

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

### Mechanical:

Mounting Position. . . . . Any

Maximum Overall Length . . . . . 3-5/16"

Maximum Seated Length. . . . . 2-3/4"

Maximum Diameter . . . . . 1-5/16"

Bulb . . . . . T-9

Base . . . . . Intermediate-Shell Octal 7-Pin

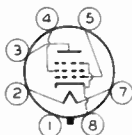
Basing Designation for BOTTOM VIEW . . . . . G-7AC

Pin 1 - No  
Connection

Pin 2 - Heater

Pin 3 - Plate

Pin 4 - Grid No.2



Pin 5 - Grid No.1

Pin 7 - Heater

Pin 8 - Cathode,  
Grid No.3

## AF POWER AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . . 200 max. volts

GRID-No.2 (SCREEN) VOLTAGE . . . . . 117 max. volts

PLATE DISSIPATION. . . . . 8.5 max. watts

GRID-No.2 DISSIPATION. . . . . 1.0 max. watt

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . . 90 max. volts

Heater positive with respect to cathode . . . . . 90 max. volts

### Typical Operation and Characteristics:

Plate Voltage. . . . . 110 200 . . . volts

Grid-No.2 Voltage . . . . . 110 110 . . . volts

Grid-No.1 (Control-Grid) Voltage . . . . . -7.5 -8 . . . volts

Peak AF Grid-No.1 Voltage. . . . . 7.5 8 . . . volts

Zero-Signal Plate Current. . . . . 40 41 . . . ma.

Max.-Signal Plate Current. . . . . 41 44 . . . ma.

Zero-Signal Grid-No.2 Current. . . . . 3 2 . . . ma.

Max.-Signal Grid-No.2 Current. . . . . 7 7 . . . ma.

Plate Resistance (Approx.) . . . . . 14000 40000 . . . ohms

Transconductance . . . . . 5800 5900 . . .  $\mu\text{mhos}$

Load Resistance. . . . . 2500 4500 . . . ohms

Total Harmonic Distortion. . . . . 10 10 . . . %

Max.-Sig. Power Output . . . . . 1.5 3.3 . . . watts

JUNE 20, 1947

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA

35L6-GT



# 35L6-GT BEAM POWER AMPLIFIER

## Maximum Circuit Values (for maximum rated conditions):

Grid-No.1-Circuit Resistance:

For fixed bias . . . . .	0.1 . . . . .	megohm
For cathode bias . . . . .	0.5 . . . . .	megohm

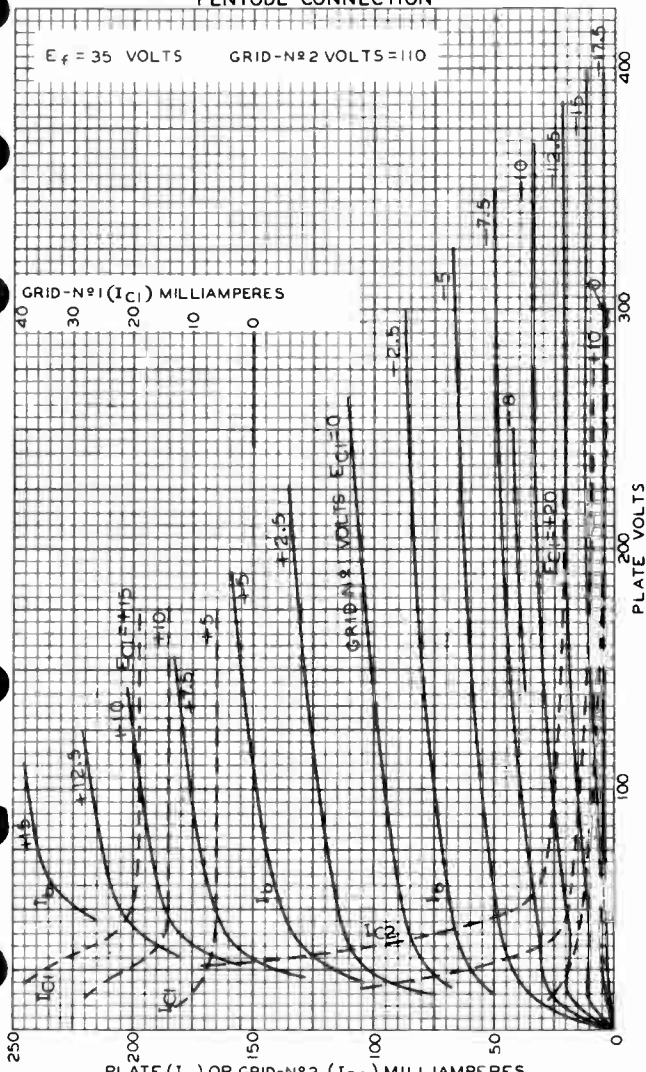
Curves shown under Type 35B5 are also applicable  
to the 35L6-GT.



35L6-GT

35L6-GT

### AVERAGE PLATE CHARACTERISTICS PENTODE CONNECTION



AUG. 11, 1941

TUBE DEPARTMENT

92CM - 6309

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

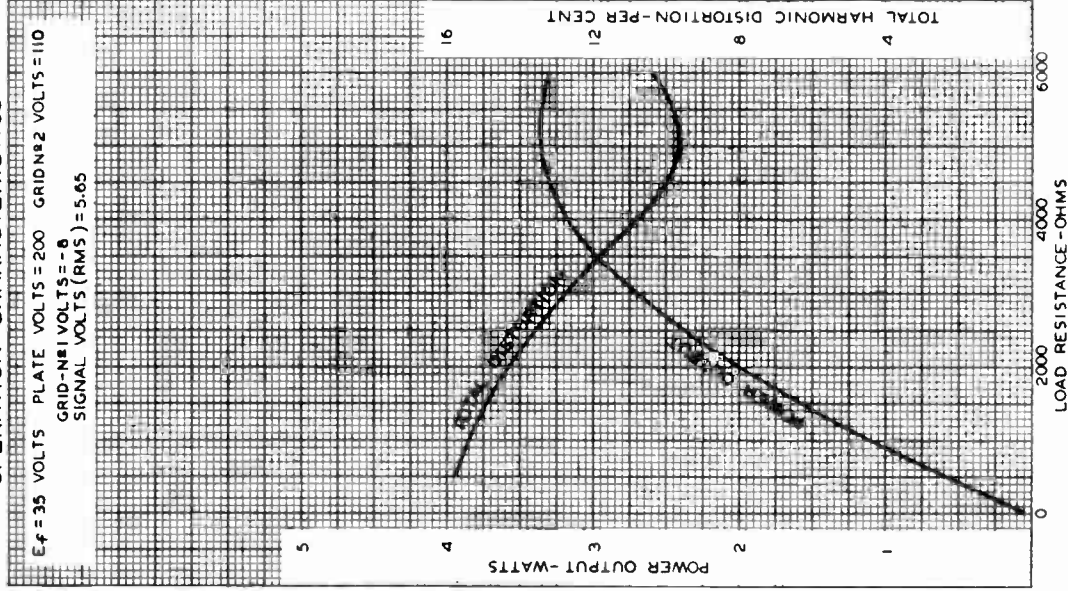
35L6-GT



35L6-GT

### OPERATION CHARACTERISTICS

$E_f = 35$  VOLTS PLATE VOLTS = 200 GRID #2 VOLTS = 110  
GRID - #1 VOLTS = -8  
SIGNAL VOLTS (RMS) = 5.65



AUG. 21, 1941

LOAD RESISTANCE - OHMS

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM - 6315

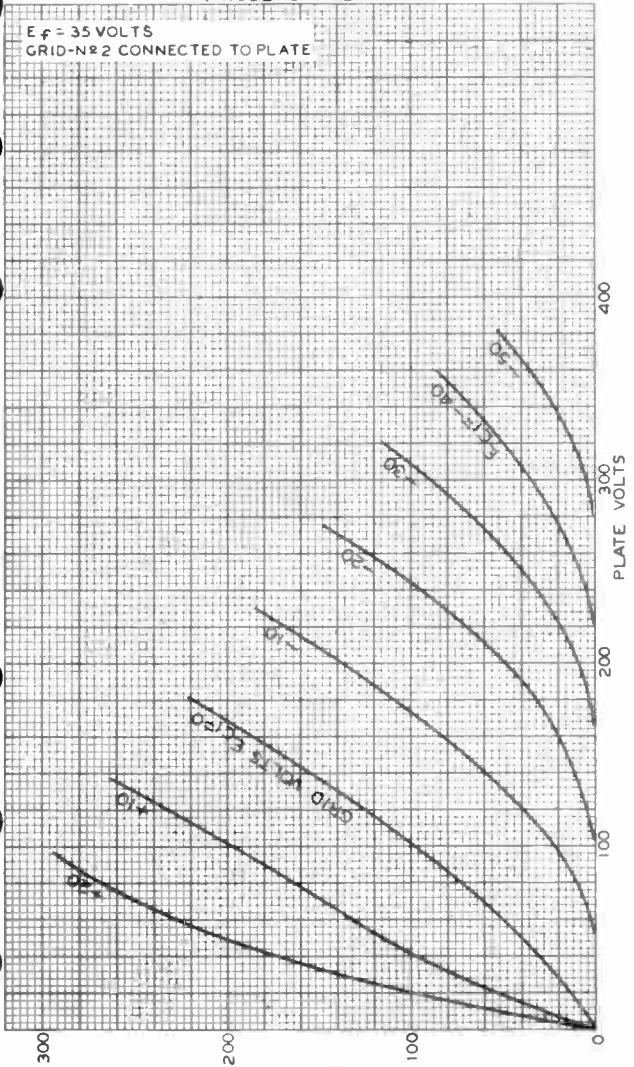




35L6-GT

# 35L6-GT AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION

$E_f = 35$  VOLTS  
GRID-N $\#$ 2 CONNECTED TO PLATE



AUG. 6, 1941

PLATE MILLIAMPERES  
TUBE DEPARTMENT

92CM - 6307R1

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

World Radio History





35W4

35W4

# HALF-WAVE VACUUM RECTIFIER

MINIATURE TYPE

## GENERAL DATA

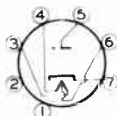
<b>Electrical:</b>		<i>Without</i>	<i>With No. 40</i>	
		<i>Panel</i>	<i>or No. 47</i>	
Heater, for Unipotential Cathode:		<i>Lamp</i>	<i>Panel Lamp</i>	
Voltage (AC or DC):				
Entire Heater (pins 3 & 4) . . . . .	35		32	volts
Panel-Lamp Section (pins 4 & 6) . . . . .	7.5		5.5	volts
Current { between pins 3 & 4 . . . . .	0.15		-	amp
{ between pins 3 & 6 . . . . .	-		0.15	amp

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	2-5/8"
Maximum Seated Length . . . . .	2-3/8"
Length from Base Seat to Bulb Top (Excluding tip) . . . . .	2" ± 3/32"
Maximum Diameter . . . . .	3/4"
Bulb . . . . .	T-5-1/2

Base . . . . . Small-Button Miniature 7-Pin 59Q

- Basing Designation for BOTTOM VIEW . . . . .
- Pin 1 - No Connection
- Pin 2 - No Connection
- Pin 3 - Heater
- Pin 4 - Heater
- Pin 5 - Plate
- Pin 6 - Heater Tap
- Pin 7 - Cathode
- Panel-Lamp Heater Section is between pins 4 & 6



## HALF-WAVE RECTIFIER

### Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE . . . . .	330 max.	volts
PEAK PLATE CURRENT . . . . .	600 max.	ma
DC OUTPUT CURRENT:		
With Panel Lamp & { No Shunting Resistor . . . . .	60 max.	ma
{ Shunting Resistor . . . . .	90 max.	ma
Without Panel Lamp . . . . .	100 max.	ma
PANEL-LAMP-SECTION VOLTAGE (RMS):		
When panel lamp fails . . . . .	15 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	330 max.	volts
Heater positive with respect to cathode . . . . .	330 max.	volts

### Typical Operation with No.40 or No.47 Panel Lamp in Accompanying Half-Wave Circuit with Capacitor-Input Filter:

AC Plate-Supply Volt. (RMS) . . . . .	117	117	117	117	volts
Filter-Input Capacitor . . . . .	40	40	40	40	μf
Min. Total Effective					
Plate-Supply Impedance . . . . .	15	15	15	15	ohms
Panel-Lamp Shunting Res. . . . .	-	300	150	100	ohms
DC Output Current . . . . .	60	70	80	90	ma

← Indicates a change.

35W4



35W4

## HALF-WAVE VACUUM RECTIFIER

Typical Operation without Panel Lamp in Conventional  
Half-wave Circuit with Capacitor-Input Filter:

AC Plate-Supply Voltage (RMS) . . . . .	117	volts
Filter-Input Capacitor . . . . .	40	$\mu$ f
Min. Total Effective Plate-Supply Imped. . . . .	15	ohms
DC Output Current . . . . .	100	ma
DC Output Voltage at Input to Filter (Approx.):		
→ At half-load current (50 ma.) . . . . .	135	volts
At full-load current (100 ma.) . . . . .	120	volts
Voltage Regulation (Approx.):		
→ Half-load to full-load current . . . . .	15	volts

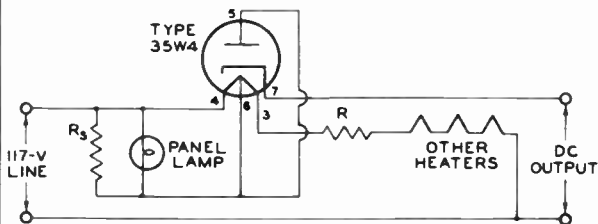
### Maximum Circuit Values:

Panel-Lamp Shunting Resistor:\*

For dc output current of	70 ma. . . . .	800 max.	ohms
	80 ma. . . . .	400 max.	ohms
	90 ma. . . . .	250 max.	ohms

\* Required when dc output current is greater than 60 ma.

### HALF-WAVE CIRCUIT with No.4J or No.47 Panel Lamp



DROP ACROSS R AND ALL HEATERS (WITH  
PANEL LAMP) SHOULD EQUAL 117 VOLTS AT  
0.15 AMPERE.  $R_3$  = SHUNTING RESISTOR  
REQUIRED WHEN DC OUTPUT CURRENT  
EXCEEDS 60 MILLIAMPERES

92CS-6626

Devices and arrangements shown or described herein may  
use patents of RCA or others. Information contained  
herein is furnished without responsibility by RCA for  
its use and without prejudice to RCA's patent rights.

→ Indicates a change.

35W4



35W4

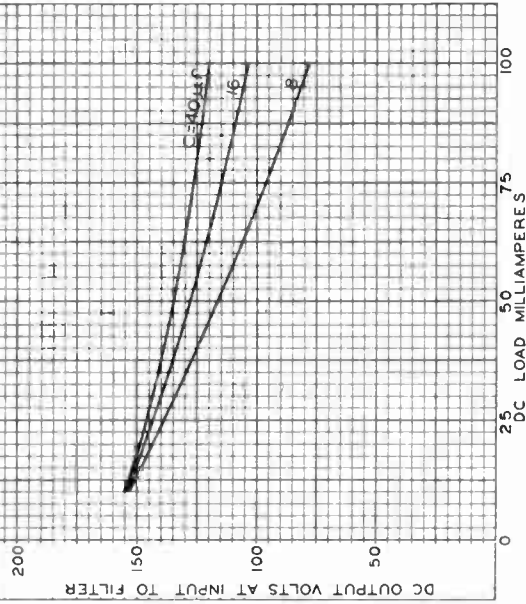
# OPERATION CHARACTERISTICS HALF-WAVE RECTIFIER

$E_f = 35$  VOLTS BETWEEN PINS No 3 & No 4  
(NO TAP CONNECTION)

PLATE VOLTS = 117 RMS

TOTAL EFFECTIVE PLATE - SUPPLY  
IMPEDANCE = 15 OHMS

C = CAPACITOR INPUT TO FILTER



MAY 19, 1950

TUBE DEPARTMENT

RAD. CO. CORPORATION OF AMERICA, HARRISON, NEW JERSEY

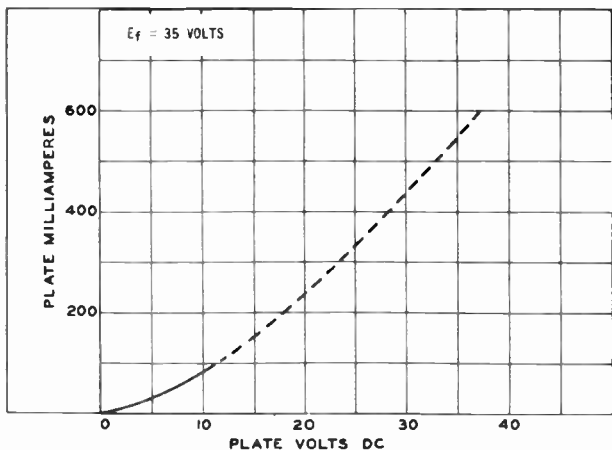
92CM-6615RI

35W4



35W4

AVERAGE PLATE CHARACTERISTIC



92CM-6305TV



35Y4

35Y4

# HALF-WAVE VACUUM RECTIFIER

## GENERAL DATA

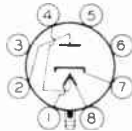
Electrical:	Without Panel Lamp		With No. 40 or No. 47 Panel Lamp <sup>▲</sup>	
	Heater, for Unipotential Cathode:			
Voltage (AC or DC):				
Entire Heater (pins 1 & 8) . . .	35	32	..	volts
Panel-Lamp Section (pins 1 & 4) . . .	7.5	5.5	..	volts
Current {	between pins 1 & 8 . . .	0.15	-	.. amp
	between pins 4 & 8 . . .	-	0.15	.. amp

▲ under typical operating conditions shown below.

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	3-5/32"
Maximum Seated Length . . . . .	2-5/8"
Maximum Diameter . . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW . . . . .	5AL

- Pin 1 - Heater
- Pin 2 - Plate
- Pin 3 - No Connection
- Pin 4 - Heater Tap
- Pin 5 - No Connection
- Pin 6 - No Connection



- Pin 7 - Cathode
- Pin 8 - Heater
- Plug - Base Shell
- Panel-Lamp Heater Section is between pins 1 & 4

## HALF-WAVE RECTIFIER

### Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE . . . . .	700 max.	volts
PEAK PLATE CURRENT . . . . .	600 max.	ma
DC OUTPUT CURRENT:		
With Panel Lamp & {		
No Shunting Resistor . . . . .	60 max.	ma
Shunting Resistor . . . . .	90 max.	ma
Without Panel Lamp . . . . .	100 max.	ma
PANEL-LAMP-SECTION VOLTAGE (RMS):		
When panel lamp fails . . . . .	15 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	300 max.	volts
Heater positive with respect to cathode . . . . .	300 max.	volts

### Typical Operation with No.40 or No.47 Panel Lamp in Circuit Below with Capacitor-Input Filter:

AC Plate-Supply Volt. (RMS)	117	117	117	117	235	volts
Filter-Input Capacitor . . . . .	40	40	40	40	40	μf
Min. Total Effective Plate-Supply Impedance . . . . .	15	15	15	15	100	ohms
Panel-Lamp Shunting Res. . . . .	-	300	150	100	-	ohms
DC Output Current . . . . .	60	70	80	90	60	ma

35Y4



35Y4

## HALF-WAVE VACUUM RECTIFIER

### Typical Operation Without Panel Lamp in Conventional Half-Wave Circuit with Capacitor-Input Filter:

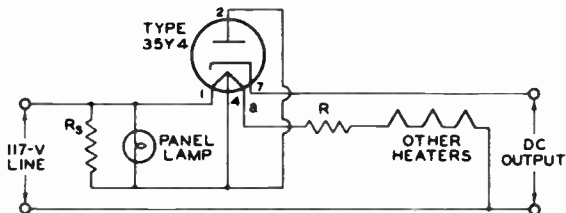
AC Plate-Supply Voltage (RMS)	117	235	volts
Filter-Input Capacitor	40	40	$\mu$ f
Min. Total Effective Plate-Supply Imped.	15	100	ohms
DC Output Current	100	100	ma
DC Output Voltage at Input to Filter (Approx.):			
At half-load current (50 ma.)	140	280	volts
At full-load current (100 ma.)	120	235	volts
Voltage Regulation (Approx.):			
Half-load to full-load current	20	45	volts

### Maximum Circuit Values:

#### Panel-Lamp Shunting Resistor:\*

For dc output current of	70 ma.	800 max.	ohms
	80 ma.	400 max.	ohms
	90 ma.	250 max.	ohms

\* Required when dc output current is greater than 60 ma.



DROP ACROSS R AND ALL HEATERS (WITH PANEL LAMP) SHOULD EQUAL 117 VOLTS AT 0.15 AMPERE.  $R_s$  = SHUNTING RESISTOR REQUIRED WHEN DC OUTPUT CURRENT EXCEEDS 60 MILLIAMPERES

92CS-6626

Many of the devices and arrangements shown or described herein use inventions of patents owned by RCA or others. Information contained herein is furnished without assuming any responsibility for its use.





35Z3

# 35Z3 HALF-WAVE VACUUM RECTIFIER

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage. . . . .	35	. . . . .	ac or dc volts
Current. . . . .	0.15	. . . . .	amp

### Mechanical:

Mounting Position. . . . .	Any
Maximum Overall Length. . . . .	3-5/32"
Maximum Seated Length. . . . .	2-5/8"
Maximum Diameter. . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW . . . . .	4Z

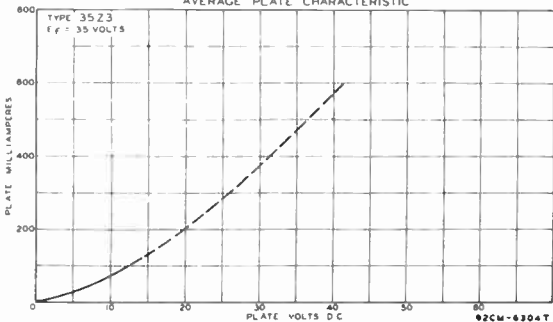
Pin 1 - Heater  
 Pin 2 - Plate  
 Pin 3 - No  
 Connection  
 Pin 4 - No  
 Connection  
 Pin 5 - No  
 Connection



Pin 6 - No  
 Connection  
 Pin 7 - Cathode  
 Pin 8 - Heater  
 Plug - Base  
 Shell

Maximum Ratings and Typical Operating Conditions for the 35Z3 are the same as for Type 35Z4-GT.

AVERAGE PLATE CHARACTERISTIC



35Z4-GT



# 35Z4-GT HALF-WAVE VACUUM RECTIFIER

## GENERAL DATA

### Electrical:

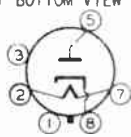
Heater, for Unipotential Cathode:

Voltage . . . . .	35	ac or dc volts
Current . . . . .	0.15	amp

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	3-5/16"
Maximum Seated Length . . . . .	2-3/4"
Maximum Diameter . . . . .	1-5/16"
Bulb . . . . .	T-9
Base . . . . .	Intermediate-Shell Octal 6-Pin
Basing Designation for BOTTOM VIEW . . . . .	G-5AA

- Pin 1 - No Connection
- Pin 2 - Heater
- Pin 3 - No Connection



- Pin 5 - Plate
- Pin 7 - Heater
- Pin 8 - Cathode

## HALF-WAVE RECTIFIER

### Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE . . . . .	700 max.	volts
PEAK PLATE CURRENT . . . . .	500 max.	ma.
DC OUTPUT CURRENT . . . . .	100 max.	ma.

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . .	350 max.	volts
Heater positive with respect to cathode . . . . .	350 max.	volts

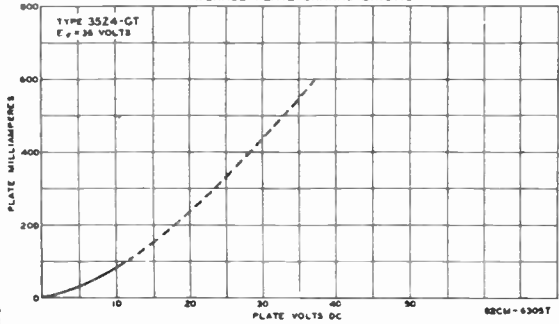
### Typical Operation with Capacitor-Input Filter:

AC Plate-Supply Voltage (RMS) . . . . .	117	235	volts
Min. Total Effective Plate-Supply Imped. <sup>▲</sup> . . . . .	15	100	ohms
DC Output Current . . . . .	100	100	ma.

<sup>▲</sup> When a filter-input capacitor larger than 40  $\mu$ f is used, it may be necessary to use more plate-supply impedance than the minimum value shown to limit the peak plate current to the rated value.

Curves under Type 35Z5-GT also apply to the 35Z4-GT

AVERAGE PLATE CHARACTERISTIC





35Z5-GT/G

35Z5-GT/G

## HALF-WAVE HIGH-VACUUM RECTIFIER

Heater	Coated Unipotential Cathode	
Voltage	{ Entire Heater (pins 2 & 7) Panel Lamp Section (pins 2 & 3) with 0.15 amp. between pins 2 & 7	35 a-c or d-c volts 7.5 a-c or d-c volts
Current		0.15 amp.
Maximum Overall Length		3-5/16"
Maximum Seated Height		2-3/4"
Maximum Diameter		1-5/16"
Bulb		T-9
Base	Intermediate Shell	Octal 6-Pin
Pin 1 - No Connection		Pin 5 - Plate
Pin 2 - Heater		Pin 7 - Heater
Pin 3 - Heater Tap		Pin 8 - Cathode
Mounting Position		Any



BOTTOM VIEW (G-6AD)

Maximum Ratings Are Design-Center Values

## HALF-WAVE RECTIFIER

Peak Inverse Plate Voltage	700 max. volts
Peak Plate Current	600 max. ma.
D-C Output Current:	
With Panel Lamp and { No Shunting Resistor	60 max. ma.
{ Shunting Resistor*	90 max. ma.
Without Panel Lamp	100 max. ma.
D-C Heater-Cathode Potential	350 max. volts
Panel-Lamp-Sect. Volt. (RMS) when panel lamp fails	15 max. volts

Typical Operation with #4a or #47 Panel Lamp in Circuit  
on Next Page with Condenser-Input Filter:

Heater Cur. between Pins 3 & 7	0.15	0.15	0.15	0.15	0.15	amp.
Heater Volt. between Pins 2 & 7	32	32	32	32	32	volts
Section Volt. between Pins 2 & 3	5.5	5.5	5.5	5.5	5.5	volts
A-C Plate-Supply Voltage (RMS)	117	117	117	117	235	volts
Filter Input Condenser	40	40	40	40	40	μf
Min. Total Effec. Plate-Supply Imped.	15	15	15	15	100	ohms
D-C Output Current	60	70	80	90	60	ma.
Shunting Resistance	-	300	150	100	-	ohms

Typical Operation Without Panel Lamp in Conventional

Half-Wave Circuit with Condenser-Input Filter:

Heater Cur. between Pins 3 & 7	0.15	0.15	amp.
Heater Volt. between Pins 2 & 7	35	35	volts
Section Volt. between Pins 2 & 3	7.5	7.5	volts
A-C Plate-Supply Voltage (RMS)	117	235	volts
Filter Input Condenser	40	40	μf
Min. Total Effec. Plate-Supply Imped.	15	100	ohms
D-C Output Current	100	100	ma.
D-C Voltage (At input to filter):**			
At half-load current (50 ma.)	140	280	volts
At full-load current (100 ma.)	120	235	volts
Difference (voltage Regulation)	20	45	volts
Percentage Regulation	14	16	%

\* A pilot lamp shunting resistor is required for a d-c output current greater than 60 ma. See Typical Operation for representative values. Maximum values are as follows: for 70 ma., 800 ohms; for 80 ma., 400 ohms; for 90 ma., 250 ohms.

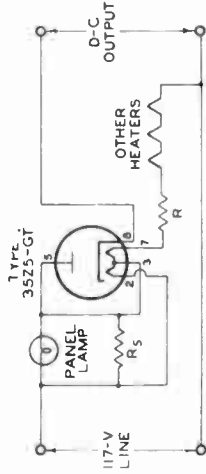
\*\* Values are approximate.

The Curve under Type 35Z4-GT also applies to the 35Z5-GT/G.



35Z5-GT

## HALF-WAVE HIGH-VACUUM RECTIFIER

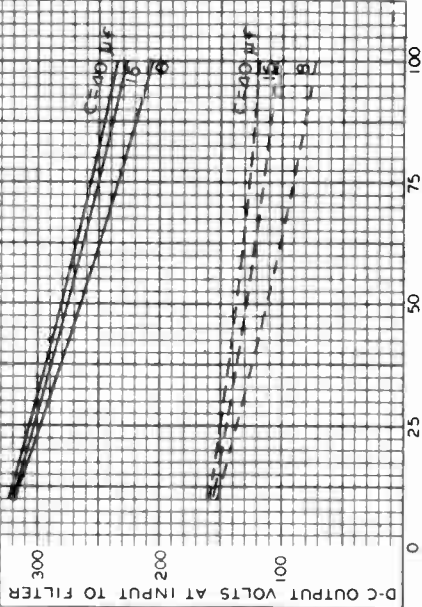


DROP ACROSS R AND ALL HEATERS (WITH PANEL LAMP) SHOULD EQUAL 117 VOLTS AT 0.15 AMPERE.  $R_S$  = SHUNTING RESISTOR REQUIRED WHEN D C OUTPUT CURRENT EXCEEDS 60 MILLIAMPERES

The license extended to the purchaser of tubes appears in the License Notice accompanying them. Information contained herein is furnished without assuming any obligations.

### OPERATION CHARACTERISTICS HALF-WAVE RECTIFIER

- $E_f$  = 35 VOLTS BETWEEN PINS NO 2 & NO 7  
 C = CONDENSER INPUT TO FILTER  
 ———— { PLATE VOLTS = 235 RMS  
 TOTAL EFFECTIVE PLATE-SUPPLY IMPEDANCE = 100 OHMS  
 — — — { PLATE VOLTS = 117 RMS  
 TOTAL EFFECTIVE PLATE-SUPPLY IMPEDANCE = 15 OHMS





36AM3

# 36AM3 HALF-WAVE VACUUM RECTIFIER

7-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC):

Entire heater (Pins 3 and 4) . . . . . 36 ± 10% volts

Tap-section (Pins 3 and 6) . . . . . 32 ± 10% volts

Current:

Tap-section (Pins 3 and 6) . . . . . 0.1 amp

### 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"

Diameter . . . . . 0.650" to 0.750"

Dimensional Outline . . . . . See General Section

Bulb . . . . . T5-1/2

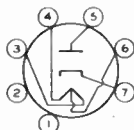
Base . . . . . Small-Button Miniature 7-Pin (JEDEC No. E7-1)

Basing Designation for BOTTOM VIEW . . . . . 5BQ

Pin 1 - No Connection

Pin 2 - No Connection

Pin 3 - Heater



Pin 4 - Heater

Pin 5 - Plate

Pin 6 - Heater Tap

Pin 7 - Cathode

## HALF-WAVE RECTIFIER

### Maximum Ratings, Design-Maximum Values:

PEAK INVERSE PLATE VOLTAGE . . . . . 365 max. volts

PEAK PLATE CURRENT . . . . . 530 max. ma

DC OUTPUT CURRENT . . . . . 82 max. ma

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . 350<sup>†</sup> max. volts

Heater positive with respect to cathode . 200<sup>▲</sup> max. volts

### Typical Operation:

*In accompanying typical half-wave circuit with capacitor input to filter*

AC Plate Supply Voltage (RMS) . . . . . 117 volts

Filter-Input Capacitor . . . . . 40 μf

Total Effective Plate

Supply Resistance . . . . . ♦

DC Output Current . . . . . 75 ma

DC Output Voltage . . . . . 105 volts

### Characteristics:

Tube-Voltage Drop for plate ma. = 150 . . . 20 volts



## 36AM3

## HALF-WAVE VACUUM RECTIFIER

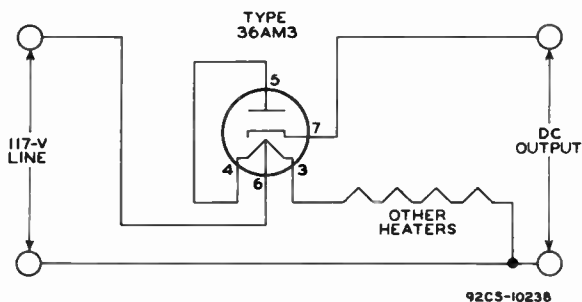
- ♦ See Operating Considerations.
- † The dc component must not exceed 350 volts.
- ▲ The dc component must not exceed 100 volts.

## OPERATING CONSIDERATIONS

The heater of the 36AM3 is designed so that the heater section between pins 4 and 6 is used as a limiting resistance in the rectifier plate circuit (See accompanying *Typical Half-Wave Circuit*).

This type is not designed for use with a panel lamp where the heater section between pins 4 and 6 is used as a panel-lamp shunt.

## TYPICAL HALF-WAVE CIRCUIT



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.



41

## POWER PENTODE

Heater <sup>■</sup>	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.4	amp.
Direct Interelectrode Capacitances (Approx.): <sup>∪</sup>		
Grid to Plate	0.6	μuf ←
Input	6.0	μuf
Output	7.5	μuf
Maximum Overall Length		4-3/16"
Maximum Seated Height		3-9/16"
Maximum Diameter		1-9/16"
Bulb		5T-12
Base		Small-Shell Small 6-Pin
Pin 1 - Heater		Pin 4 - Grid
Pin 2 - Plate		Pin 5 - Cathode
Pin 3 - Screen		Pin 6 - Heater
Mounting Position		Any



BOTTOM VIEW (6B)

Maximum ratings are design-center values

SINGLE-TUBE AMPLIFIER

Plate Voltage	315 max.	volts
Screen Voltage	285 max.	volts
Plate Dissipation	8.5 max.	watts
Screen Dissipation	2.8 max.	watts

Typical Operation and Characteristics - Class A<sub>1</sub> Amplifier:

Plate	100	250	315 <sup>1</sup>	volts
Screen	100	250	250	volts
Grid <sup>*</sup>	-7	-18	-21	volts
Peak A-F Grid Voltage	7	18	21	volts
Zero-Sig. Plate Cur.	9	32	25.5	ma.
Max.-Sig. Plate Cur.	9.5	33	28	ma.
Zero-Sig. Screen Cur.	1.6	5.5	4.0	ma.
Max.-Sig. Screen Cur.	3	10	9	ma.
Plate Resistance	104000	68000	75000	approx. ohms
Transconductance	1500	2300	2100	μmhos
Load Resistance	12000	7600	9000	ohms
Total Harmonic Dist.	11	11	15	%
Max.-Sig. Power Output	0.35	3.4	4.5	watts

PUSH-PULL AMPLIFIER

Plate Voltage	315 max.	volts
Screen Voltage	285 max.	volts
Plate Dissipation	8.5 max.	watts
Screen Dissipation	2.8 max.	watts

Typical Operation - Class A<sub>1</sub> Amplifier:

Unless otherwise specified, values are for 2 tubes

	<u>Fixed Bias</u>	<u>Cathode Bias</u>	
Plate Voltage	285	285	volts
Screen Voltage	285	285	volts

- In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
- ∪ With no external shield.

See next page.

← indicates a change.

OCTOBER 1, 1951

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA



41

## POWER PENTODE

	<u>Fixed Bias</u>	<u>Cathode Bias</u>	
Grid*	-25.5	-	volts
Cathode Resistor	-	400	ohms
Peak A-F Grid to Grid Volt.	51	51	volts
Zero-Sig. Plate Cur.	55	55	ma.
Max.-Sig. Plate Cur.	72	61	ma.
Zero-Sig. Screen Cur.	9	9	ma.
Max.-Sig. Screen Cur.	17	13	ma.
Effective Load Resistance (plate to plate)	12000	12000	ohms
Total Harmonic Dist.	6	4	%
Max.-Sig. Power Output	10.5	9.8	watts

\* The type of input coupling should not introduce too much resistance in the grid circuit. Transformer- or impedance-coupling devices are recommended. When the grid circuit has a resistance not higher than 0.1 megohm, fixed bias may be used; for higher values, cathode bias is required. With cathode bias, the grid circuit may have a resistance not to exceed 0.5 megohm.

*Curves for Type 41 are the same as those shown for Type 6K6-GT.*





42

42

**POWER AMPLIFIER PENTODE**

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.7	amp.
Maximum Overall Length		4-11/16"
Maximum Diameter		1-13/16"
Bulb		ST-14
Base		Medium 6-Pin
Pin 1-Heater		Pin 4-Grid
Pin 2-Plate		Pin 5-Cathode
Pin 3-Screen		Pin 6-Heater



BOTTOM VIEW

For additional data, refer to Type 6F6; and to Types 6F6 and 2A5 for additional curves. ←

← Indicates a change.



OPERATION CHARACTERISTICS  
TRIODE CONNECTION—CLASS AB OPERATION

$E_f = 6.3$  VOLTS

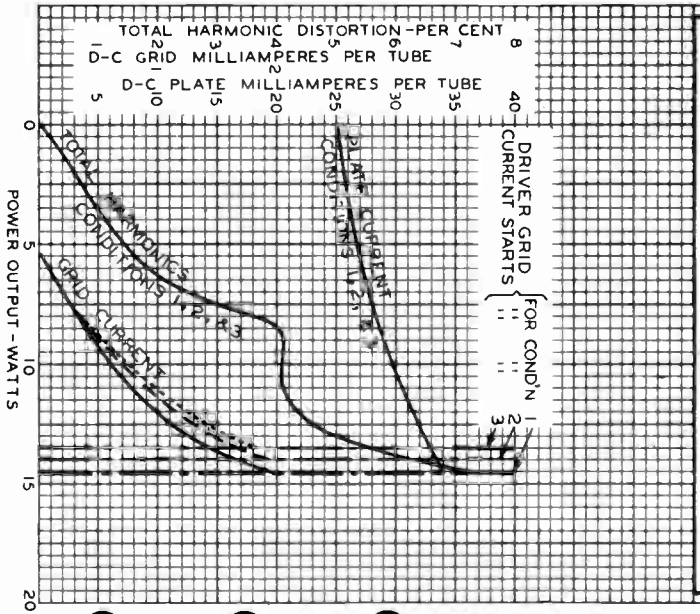
INPUT STAGE : CLASS A DRIVER—ONE TYPE 42 AS TRIODE  
 PLATE VOLTS = 250  
 SELF-BIAS RESISTOR = 650 OHMS  
 OUTPUT STAGE : CLASS AB—TWO TYPE 42'S AS TRIODES  
 ZERO-SIGNAL PLATE VOLTS = 350, FROM  
 SUPPLY HAVING RESISTANCE ( $R_b$ )

SHOWN IN TABLE  
 ZERO-SIGNAL BIAS VOLTS = VALUE FROM  
 GRID-BIAS RESISTOR ( $R_c$ ) OF  
 730 OHMS

OUTPUT LOAD, PLATE TO PLATE = 10000 OHMS

CONDIT- TION	CURVE	$R_b$ Ohms	DRIVER STAGE		INTERSTAGE TRANSFORMER	
			Input-Signal Volts* (RMS)	Plate Load Ohms	Voltage Ratio Prim.:1/2 Sec.	Peak Power Efficiency - %
1	---	0	14	15600	1.29	76.7
2	---	500	14	17400	1.29	76.0
3	.....	1000	14	17000	1.29	76.7

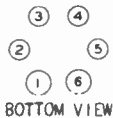
\* For maximum output



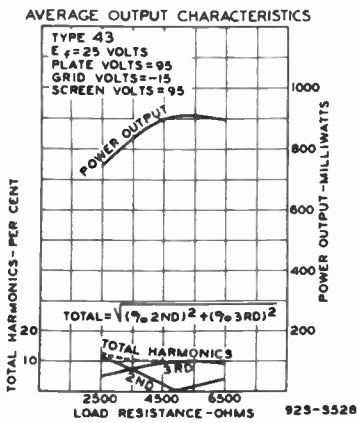
## RCA-43

### POWER AMPLIFIER PENTODE

Heater	Coated Unipotential Cathode	
Voltage	25.0	a-c or d-c volts
Current	0.3	amp.
Maximum Overall Length		4-11/16"
Maximum Diameter		1-13/16"
Bulb		ST-14
Base		Medium 6-Pin
Pin 1-Heater	(2)	Pin 4-Grid
Pin 2-Plate	(1)	Pin 5-Cathode
Pin 3-Screen	(6)	Pin 6-Heater



*For data and additional curve, refer to Type 25A6. The 43 and 25A6 are identical electrically.*

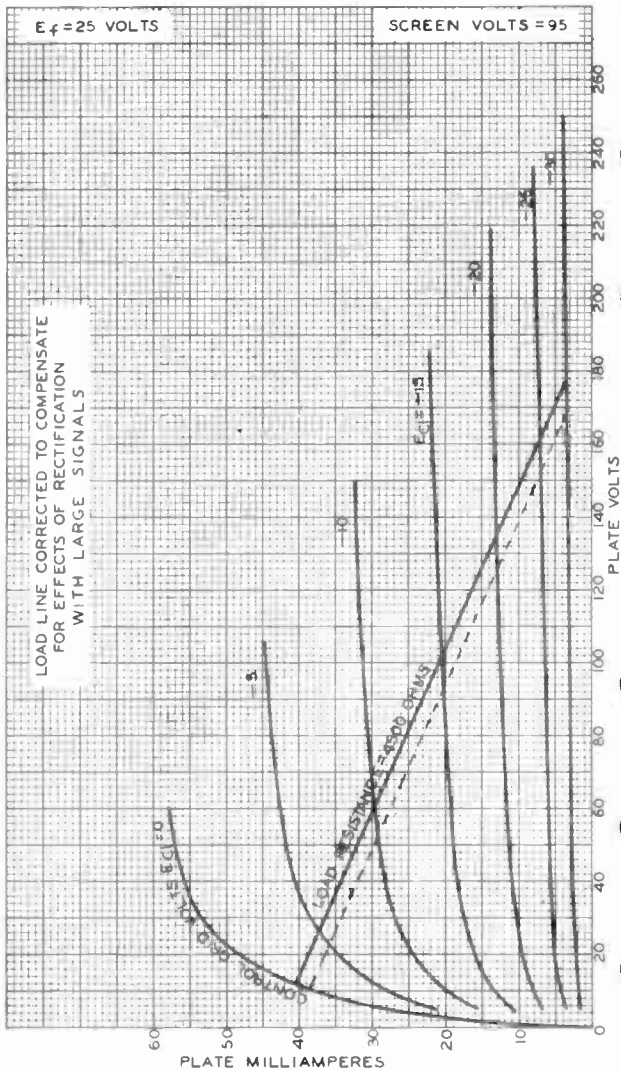


43



RCA-43

# AVERAGE PLATE CHARACTERISTICS



JULY 27, 1936

RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY

925-5231R1

## POWER AMPLIFIER PENTODE

Filament	Coated	
Voltage	2.5	a-c or d-c volts
Current	1.75	amp.
Direct Interelectrode Capacitances:		
Grid to Plate	1.2	μμf
Input	8.6	μμf
Output	13.0	μμf
Maximum Overall Length	(3)	5-3/8"
Maximum Diameter		2-1/16"
Bulb	(2)      (4)	ST-16
Base		Medium 5-Pin
Pin 1-Filament	(1)      (5)	Pin 4-Screen
Pin 2-Plate		Pin 5-Filament
Pin 3-Grid		

BOTTOM VIEW

### AMPLIFIER - Class A

**Operating Conditions and Characteristics:**

Filament	2.5	a-c volts
Plate	250 maximum	volts
Screen	250 maximum	volts
Grid #	-16.5	volts
Amp. Fact.	150	
Plate Res.	60000	ohms
Transcond.	2500	μmhos
Plate Cur.	31	ma.
Screen Cur.	6	ma.
Load Res.	7000	ohms
Power Output	2.7 <sup>o</sup>	watts

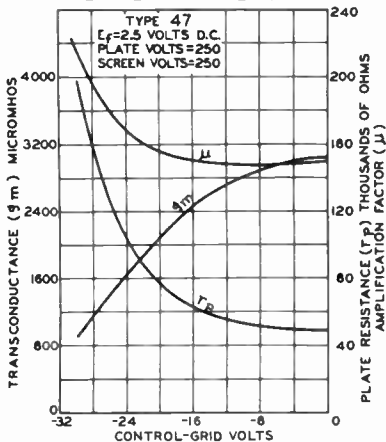
<sup>o</sup> 6% total harmonic distortion.

\* Grid volts measured from mid-point of a-c operated filament.

If a single 47 is self-biased, the self-biasing resistor (450 ohms) should be shunted by a suitable filter network to avoid degenerative effects at low audio frequencies. With two 47's in push-pull, the filter network may be omitted across the resistor (225 ohms).

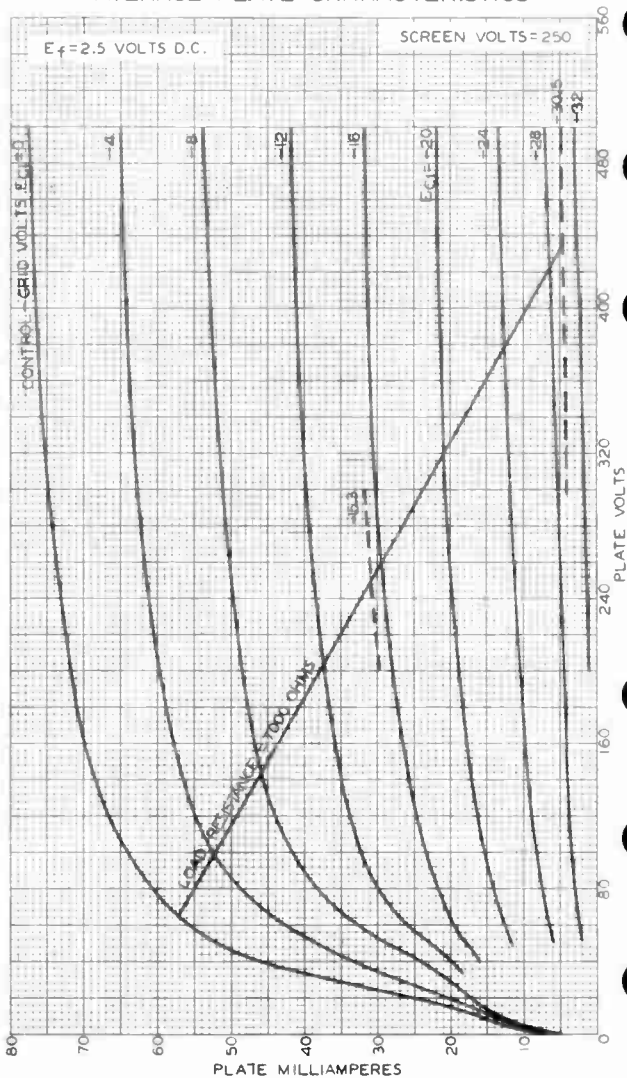
Transformer or impedance input-coupling devices are recommended. If, however, resistance coupling is employed, a grid resistor limited to 0.5 megohm may be used under self-bias conditions. Without self-bias, the grid resistor should not exceed 50000 ohms.

### AVERAGE CHARACTERISTICS



92C-5136

## AVERAGE PLATE CHARACTERISTICS





50A5

# 50A5

## BEAM POWER AMPLIFIER

### GENERAL DATA

#### Electrical:

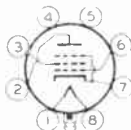
Heater, for Unipotential Cathode:

Voltage. . . . .	50	ac or dc volts
Current. . . . .	0.15	amp

#### Mechanical:

Mounting Position. . . . .	Any
Maximum Overall Length . . . . .	3-5/32"
Maximum Seated Length. . . . .	2-5/8"
Maximum Diameter . . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW . . . . .	6AA

Pin 1 - Heater	Pin 6 - Grid No.1
Pin 2 - Plate	Pin 7 - Cathode,
Pin 3 - Grid No.2	Grid No.3
Pin 4 - No	Pin 8 - Heater
Connection	Plug - Base
Pin 5 - No Connection	Shell



### AMPLIFIER - Class A<sub>1</sub>

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

PLATE VOLTAGE. . . . .	200 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	117 max.	volts
PLATE DISSIPATION. . . . .	10	watts
GRID-No.2 DISSIPATION. . . . .	1.25 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	90 max.	volts
Heater positive with respect to cathode.	90 max.	volts

#### Typical Operation and Characteristics:

Plate voltage . . . . .	110	200	volts
Grid-No.2 Voltage. . . . .	110	110	volts
Grid-No.1 Voltage. . . . .	-7.5	-8	volts
Peak A-F Grid No.1 Voltage . . . . .	7.5	8	volts
Zero-Signal Plate Current. . . . .	49	50	ma
Max.-Signal Plate Current. . . . .	50	55	ma
Zero-Signal Grid-No.2 Current. . . . .	4	1.5	ma
Max.-Signal Grid-No.2 Current. . . . .	8.5	6.0	ma
Plate Resistance (Approx.) . . . . .	13000	35000	ohms
Transconductance . . . . .	8000	8250	μmhos
Load Resistance. . . . .	2000	3000	ohms
Total Harmonic Distortion. . . . .	10	10	%
Max.-Sig. Power Output . . . . .	2.1	4.3	watts

#### Maximum Circuit Values (for maximum rated conditions):

Grid-No.1-Circuit Res. . . . .	{	fixed bias	0.1	megohm
		cathode bias	0.5	megohm

1







50B5

50B5

# BEAM POWER AMPLIFIER

MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage. . . . . 50 . . . . . ac or dc volts

Current. . . . . 0.15 . . . . . amp.

Direct Interelectrode Capacitances (Approx.):<sup>0</sup>

Grid-No.1 to Plate . . . . . 0.5 . . . . .  $\mu\text{f}$

Input. . . . . 13 . . . . .  $\mu\text{f}$

Output . . . . . 6.5 . . . . .  $\mu\text{f}$

### Mechanical:

Mounting Position. . . . . Any

Maximum Overall Length . . . . . 2-5/8"

Maximum Seated Length. . . . . 2-3/8"

Length from Base Seat  
to Bulb Top (excluding tip). . . . . 2"  $\pm$  3/32"

Maximum Diameter . . . . . 3/4"

Bulb . . . . . T-5-1/2

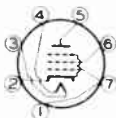
Base . . . . . Miniature Button 7-Pin

Basing Designation for BOTTOM VIEW . . . . . 7BZ

Pin 1 - Grid No.1

Pin 2 - Cathode,  
Grid No.3

Pin 3 - Heater



Pin 4 - Heater

Pin 5 - Plate

Pin 6 - Grid No.2

Pin 7 - Grid No.1

## CLASS A<sub>1</sub> AMPLIFIER

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . . 117 max. volts

GRID-No.2 (SCREEN) VOLTAGE . . . . . 117 max. volts

PLATE DISSIPATION. . . . . 5.5 max. watts

GRID-No.2 DISSIPATION. . . . . 1.25 max. watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . . . . 90 max. volts

Heater positive with respect to cathode. . . . . 90 max. volts

### Typical Operation and Characteristics:

Plate Voltage. . . . . 110 . . . volts

Grid-No.2 Voltage. . . . . 110 . . . volts

Grid-No.1 Voltage. . . . . -7.5 . . . volts

Peak A-F Grid-No.1 Voltage . . . . . 7.5 . . . volts

Zero-Signal Plate Current. . . . . 49 . . . ma.

Max.-Signal Plate Current. . . . . 50 . . . ma.

<sup>0</sup> with no external shield.

JAN. 2, 1946

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

TENTATIVE DATA

50B5



50B5

## BEAM POWER AMPLIFIER

Zero-Signal Grid-No.2 Current (Approx.) . . . . .	4	. . . . .	ma.
Max.-Signal Grid-No.2 Current (Approx.) . . . . .	8.5	. . . . .	ma.
Plate Resistance (Approx.) . . . . .	14000	. . . . .	ohms
Transconductance . . . . .	7500	. . . . .	μmhos
Load Resistance . . . . .	2500	. . . . .	ohms
Total Harmonic Distortion . . . . .	9	. . . . .	%
Max.-Sig. Power Output . . . . .	1.9	. . . . .	watts

## Maximum Circuit Values (for maximum rated conditions):

Grid-No.1-Circuit Res. . . . .	{	fixed bias . . . . .	0.1	. . . . .	megohm
		cathode bias . . . . .	0.5	. . . . .	megohm

JAN. 2, 1946

RCA VICTOR DIVISION

TENTATIVE DATA

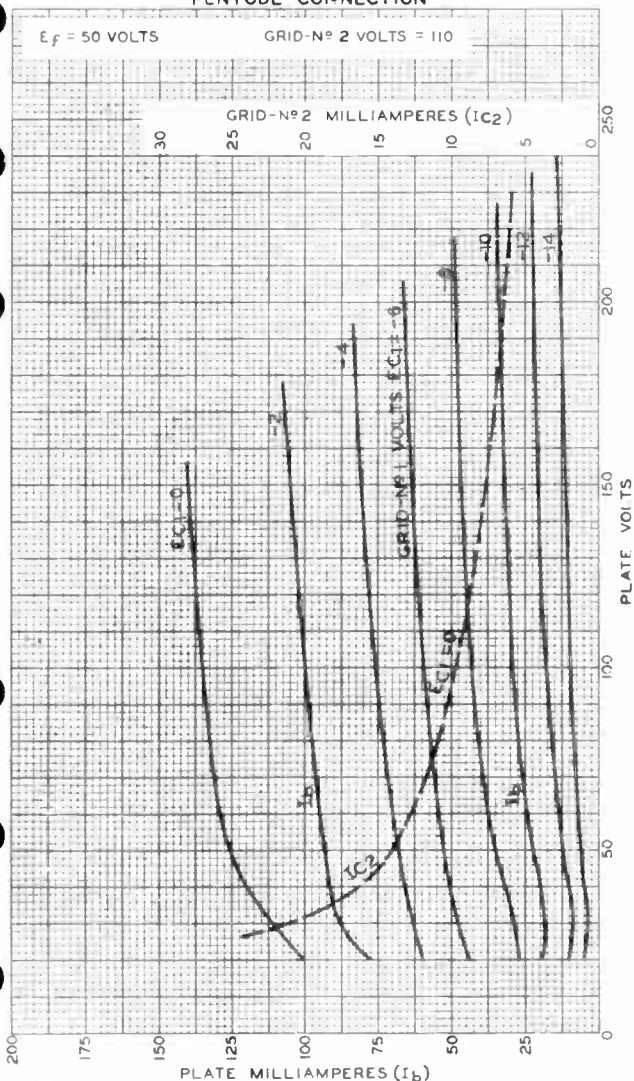
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



50B5

# AVERAGE PLATE CHARACTERISTICS PENTODE CONNECTION

50B5



OCT. 8, 1948

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

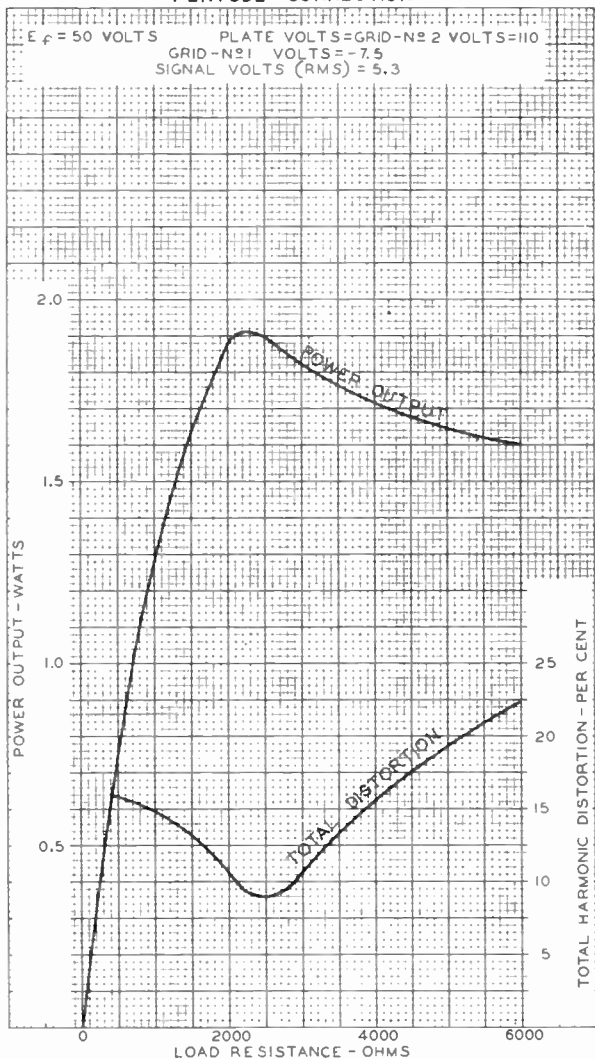
92CM-6603

50B5



50B5

# OPERATION CHARACTERISTICS PENTODE CONNECTION



OCT. 24, 1945

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

92CM · 6612

World Radio History



50C5

# BEAM POWER TUBE

7-PIN MINIATURE TYPE

50C5

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	50 + 10%	volts
Current . . . . .	0.15	amp

Direct Interelectrode Capacitances

(Approx.):<sup>o</sup>

Grid No.1 to plate. . . . .	0.6	$\mu$ f
-----------------------------	-----	---------

Grid No.1 to cathode & grid No.3, grid No.2 and heater . . . . .	13	$\mu$ f
---	----	---------

Plate to cathode & grid No.3, grid No.2, and heater . . . . .	8.5	$\mu$ f
--	-----	---------

### 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"  $\pm$  3/32"

Diameter. . . . . 0.650" to 0.750"

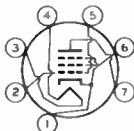
Dimensional Outline . . . . . See General Section

Bulb. . . . . T5-1/2

Base. . . . . Small Button Miniature 7-Pin (JEDEC No. E7-1)

Basing Designation for BOTTOM VIEW. . . . . 7CV

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



Pin 4 - Heater  
Pin 5 - Grid No.1  
Pin 6 - Grid No.2  
Pin 7 - Plate

## AMPLIFIER — Class A<sub>1</sub>

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE. . . . .	150	max.	volts
------------------------	-----	------	-------

GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . .	130	max.	volts
--	-----	------	-------

GRID-No.1 (CONTROL-GRID) VOLTAGE . . . . .	0	max.	volts
--	---	------	-------

GRID-No.2 INPUT. . . . .	1.4	max.	watts
--------------------------	-----	------	-------

PLATE DISSIPATION. . . . .	7	max.	watts
----------------------------	---	------	-------

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . . . .	200	max.	volts
--	-----	------	-------

Heater positive with respect to cathode. . . . .	200 <sup>▲</sup>	max.	volts
--	------------------	------	-------

BULB TEMPERATURE (At hottest point on bulb surface) . . . . .	220	max.	°C
--	-----	------	----

← Indicates a change.

50C5



50C5

## BEAM POWER TUBE

**Typical Operation and Characteristics:**

Plate Voltage. . . . .	120	volts
Grid-No.2 Voltage. . . . .	110	volts
Grid-No.1 Voltage. . . . .	-8	volts
Peak AF Grid-No.1 Voltage. . . . .	8	volts
Zero-Signal Plate Current. . . . .	49	ma
Max.-Signal Plate Current. . . . .	50	ma
Zero-Signal Grid-No.2 Current. . . . .	4	ma
Max.-Signal Grid-No.2 Current. . . . .	8.5	ma
Plate Resistance (Approx.) . . . . .	10000	ohms
Transconductance . . . . .	7500	$\mu$ mhos
Load Resistance. . . . .	2500	ohms
Total Harmonic Distortion. . . . .	10	%
Max.-Signal Power Output . . . . .	2.3	watts

**Maximum Circuit Values:**
**Grid-No.1-Circuit Resistance:**

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

○ without external shield.

▲ The dc component must not exceed 100 volts.

**NOTE:** Except for a different basing arrangement, which simplifies the problem of meeting Underwriters' Laboratories requirements in the design of ac/dc receivers, the 50C5 is similar to the miniature type 50B5.

→ Indicates a change.



50C5

50C5

### AVERAGE CHARACTERISTICS

$E_f = 50$  VOLTS  
GRID-№2 VOLTS = 110

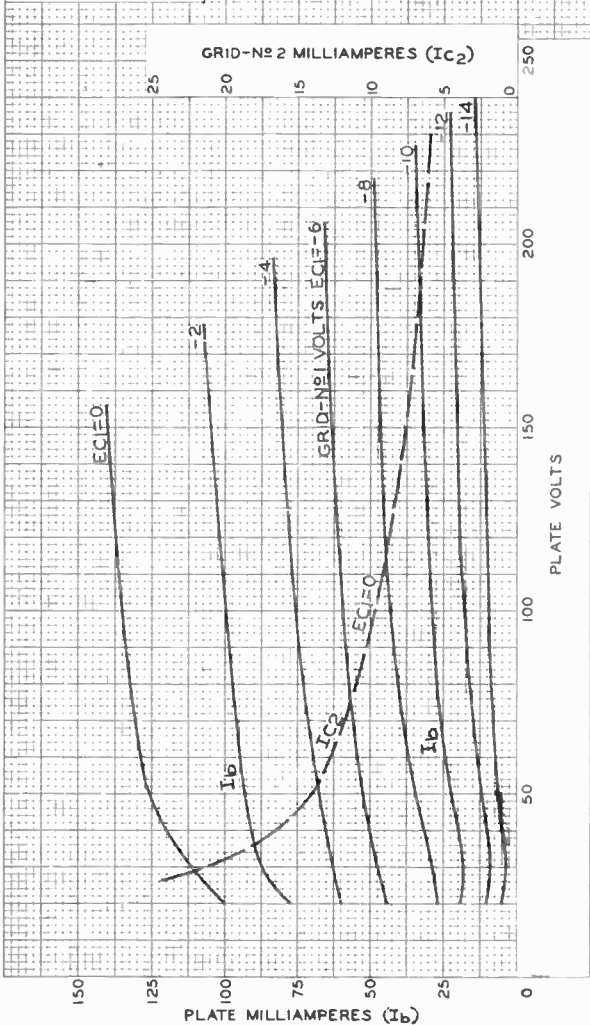


PLATE MILLIAMPERES ( $I_b$ )

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

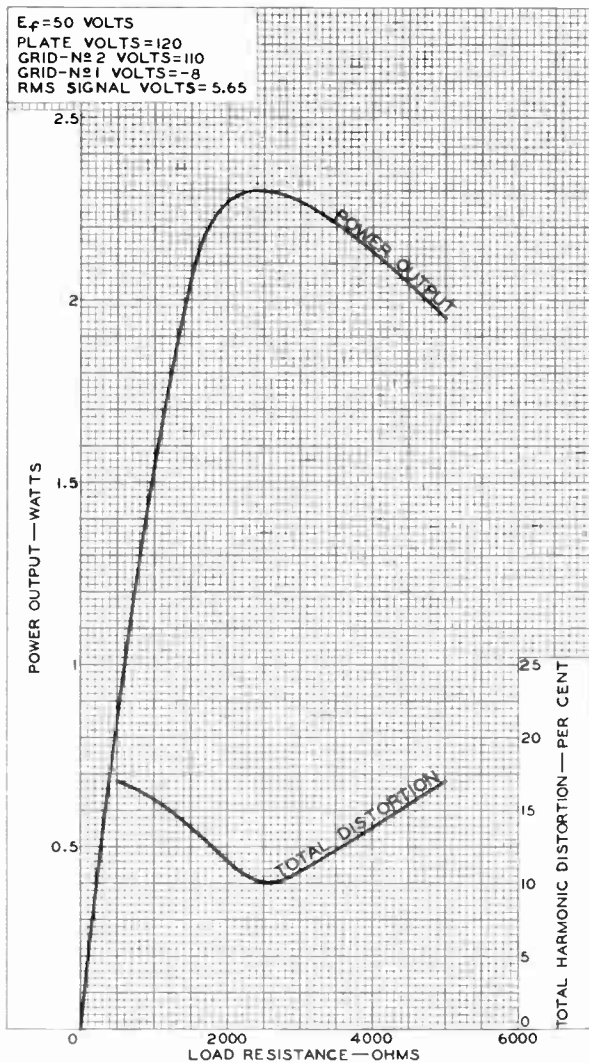
92CM-6603

50C5



50C5

## OPERATION CHARACTERISTICS



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6612R1





50C6-G

50C6-G

# BEAM POWER AMPLIFIER

## GENERAL DATA

### Electrical:

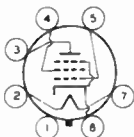
Heater, for Unipotential Cathode:

Voltage. . . . .	50	ac or dc volts
Current. . . . .	0.15	amp

### Mechanical:

Mounting Position. . . . .	Any
Maximum Overall Length . . . . .	4-5/8"
Seated Length. . . . .	3-7/8" + 3/16" - 5/16"
Maximum Diameter . . . . .	1-13/16"
Bulb . . . . .	ST-14
Base . . . . .	Medium-Shell Octal 7-Pin
Basing Designation for BOTTOM VIEW . . . . .	G-7AC

Pin 1 - No  
Connection  
Pin 2 - Heater  
Pin 3 - Plate  
Pin 4 - Grid No.2



Pin 5 - Grid No.1  
Pin 7 - Heater  
Pin 8 - Cathode,  
Grid No.3

## AF POWER AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	200 max.	volts
GRID-No.2 (SCREEN) VOLTAGE . . . . .	135 max.	volts
PLATE DISSIPATION. . . . .	12.5 max.	watts
GRID-No.2 INPUT. . . . .	1.75 max.	watts

### Typical Operation and Characteristics:

Plate Voltage. . . . .	135	200	volts
Grid-No.2 Voltage. . . . .	135	135	volts
Grid-No.1 (Control-Grid) Voltage . . .	-13.5	-14	volts
Peak AF Grid-No.1 Voltage. . . . .	13.5	14	volts
Zero-Signal Plate Current. . . . .	58	61	ma
Max.-Signal Plate Current. . . . .	60	66	ma
Zero-Signal Grid-No.2 Current. . . . .	3.5	2.2	ma
Max.-Signal Grid-No.2 Current. . . . .	11.5	9.0	ma
Plate Resistance (Approx.) . . . . .	9300	18300	ohms
Transconductance . . . . .	7000	7100	μmhos
Load Resistance. . . . .	2000	2600	ohms
Total Harmonic Distortion. . . . .	10	10	%
Max.-Signal Power Output . . . . .	3.6	6.0	watts

Curves shown under Type 6Y6-G also apply to the 50C6-G.





50DC4

50DC4

# HALF-WAVE VACUUM RECTIFIER

7-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Without Panel Lamp	With No. 40 or No. 47 Panel Lamp
--------------------	----------------------------------

Resistance, for 50-potential		
Grids:		
Voltage:		
Entire Heater (Pins 3 and 4) . . . . .	50 ± 2%	45 ± 10% var. or de volta
Heater-Lamp Section (Pins 4 and 6) . . . . .	7.5	6.5 var. or de volta
Current:		
Between pins 3 and 4 . . . . .	0.15	— amp
Between pins 4 and 6 . . . . .	—	0.15 amp

### Mechanical:

Coating Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/8"
Maximum Sealed Length . . . . .	2-3/8"
Length, Base to Top of Case (Excluding Pin) . . . . .	1" ± 3/32"
Diameter . . . . .	0.65" to 0.75"
Dimensional Outline . . . . .	See General Section
Base . . . . .	TS-142
Base Pin . . . . .	Mini-Button Miniature 7-Pin (JEDEC No. E7-1)
Sealing Designation for BOTTOM View . . . . .	5HQ

- Pin 1 - No Connection
- Pin 2 - No Connection
- Pin 3 - Heater
- Pin 4 - Heater
- Pin 5 - Plate



- Pin 6 - Heater Tap
  - Pin 7 - Extender
- Panel-lamp heater section is between pins 4 and 6.

## HALF-WAVE RECTIFIER

### Maximum Ratings, Design-Maximum Values:

PEP INVERSE PLATE VOLTAGE . . . . .	33 max.	volt
PEP PLATE CURRENT . . . . .	120 max.	ma
DC OUTPUT CURRENT:		
With panel lamp and 40-ohm loading resistor . . . . .	70 max.	ma
With panel lamp and 100-ohm loading resistor . . . . .	110 max.	ma
Without panel lamp . . . . .	120 max.	ma
PEP RMS-HEATER VOLTAGE (RMS):		
When panel lamp fails . . . . .	18.5 max.	volt

† Requires when the dc output current is greater than 30 milliamperes.



## 50DC4

## HALF-WAVE VACUUM RECTIFIER

## PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode.	330 max.	volts
Heater positive with respect to cathode.	330 max.	volts

## Typical Operation:

*With panel lamp in accompanying half-wave circuit with capacitor input to filter*

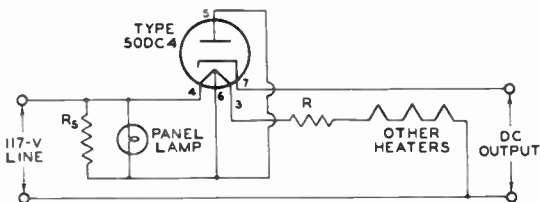
AC Plate-Supply Voltage (RMS)	117	117	117	117	volts
Filter-Input Capacitor	40	40	40	40	$\mu$ f
Minimum Total Effective Plate-Supply Impedance	15	15	15	15	ohms
Panel-Lamp Shunting Resistor	450	200	100	75	ohms
DC Output Current	70	80	90	100	ma

*Without panel lamp in half-wave circuit with capacitor input to filter*

AC Plate-Supply Voltage (RMS)	117	volts
Filter-Input Capacitor	40	$\mu$ f
Minimum Total Effective Plate-Supply Impedance	15	ohms
DC Output Current	110	ma
DC Output Voltage at Input to Filter (Approx.):		
At half-load current of 55 ma.	130	volts
At full-load current of 110 ma.	110	volts
Voltage Regulation (Approx.):		
Half-load to full-load current	20	volts

## HALF-WAVE CIRCUIT

*With panel lamp No.40 or No.47*



DROP ACROSS R AND ALL HEATERS (WITH PANEL LAMP) SHOULD EQUAL 117 VOLTS AT 0.15 AMPERE.  $R_5$  = SHUNTING RESISTOR REQUIRED WHEN DC OUTPUT CURRENT EXCEEDS 70 MILLIAMPERES

92CS-9923

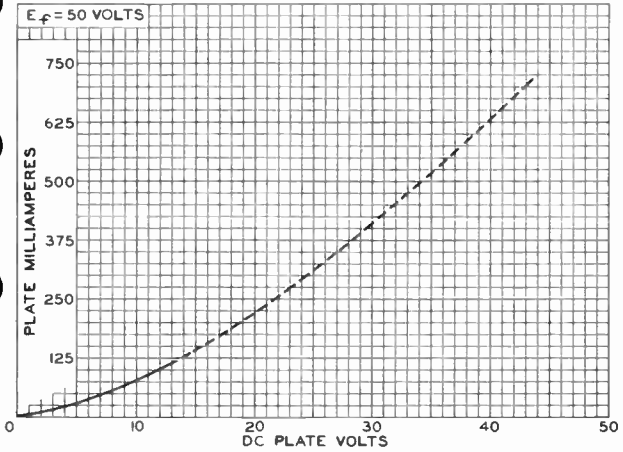
Information furnished by RCA is believed to be accurate and reliable. However, no responsibility is assumed by RCA for its use; nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent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



50DC4

50DC4

AVERAGE PLATE CHARACTERISTIC



92CS-9893





50EH5

# 50EH5 POWER PENTODE

7-PIN MINIATURE TYPE

The 50EH5 is the same as the 6EH5 except for the following items:

Heater, for Unipotential Cathode:

Voltage. . . . .	50	. . . . .	ac or dc volts
Current. . . . .	0.15	. . . . .	amp







50L6-GT



50L6-GT

**BEAM POWER AMPLIFIER**

Heater <sup>■</sup>	Coated Unipotential Cathode	
Voltage	50	a-c or d-c volts
Current	0.15	amp.
Maximum Overall Length		3-5/16"
Maximum Seated Height		2-3/4"
Maximum Diameter		1-5/16"
Bulb		T-9
Base	Intermediate Shell Octal 7-Pin	
Pin 1 - No Connection	Pin 5 - Grid	
Pin 2 - Heater	Pin 7 - Heater	
Pin 3 - Plate	Pin 8 - Cathode	
Pin 4 - Screen		
Mounting Position		Any



BOTTOM VIEW (G-7AC)

AMPLIFIER

Plate Voltage	200 max.	volts
Screen Voltage	117 max.	volts
Plate Dissipation	10 max.	watts
Screen Dissipation	1.25 max.	watts

**Typical Operation and Characteristics - Class A<sub>1</sub> Amplifier:**

Plate	110	200	volts
Screen	110	110	volts
Grid*	-7.5	-8	volts
Peak A-F Grid Voltage	7.5	8	volts
Zero-Sig. Plate Cur.	49	50	ma.
Max.-Sig. Plate Cur.	50	55	ma.
Zero-Sig. Screen Cur.	4	2 approx.	ma.
Max.-Sig. Screen Cur.	11	7 approx.	ma.
Plate Resistance	13000	30000	approx. ohms
Transconductance	9000	9500	μmhos
Load Resistance	2000	3000	ohms
Total Harmonic Dist.	10	10	%
Power Output	2.1	4.3	watts

- In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
- \* The type of input coupling should not introduce too much resistance in the grid circuit. Transformer- or impedance-coupling devices are recommended. When the grid circuit has a resistance not higher than 0.1 megohm, fixed bias may be used; for higher values, cathode bias is required. With cathode bias, the grid circuit may have a resistance not to exceed 0.5 megohm.

Curves under type 25L6-GT also apply to the 50L6-GT.

← Indicates a change.

Sept. 2, 1941

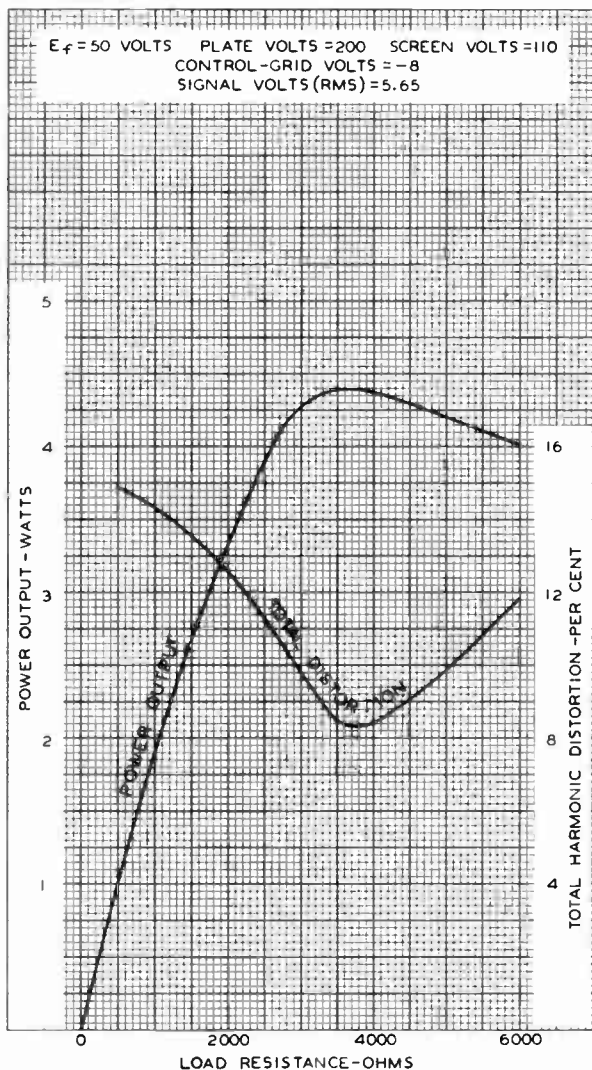
DATA

50L6-GT



50L6-GT

## OPERATION CHARACTERISTICS



AUG. 7, 1941

RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY INC.

92C-6308



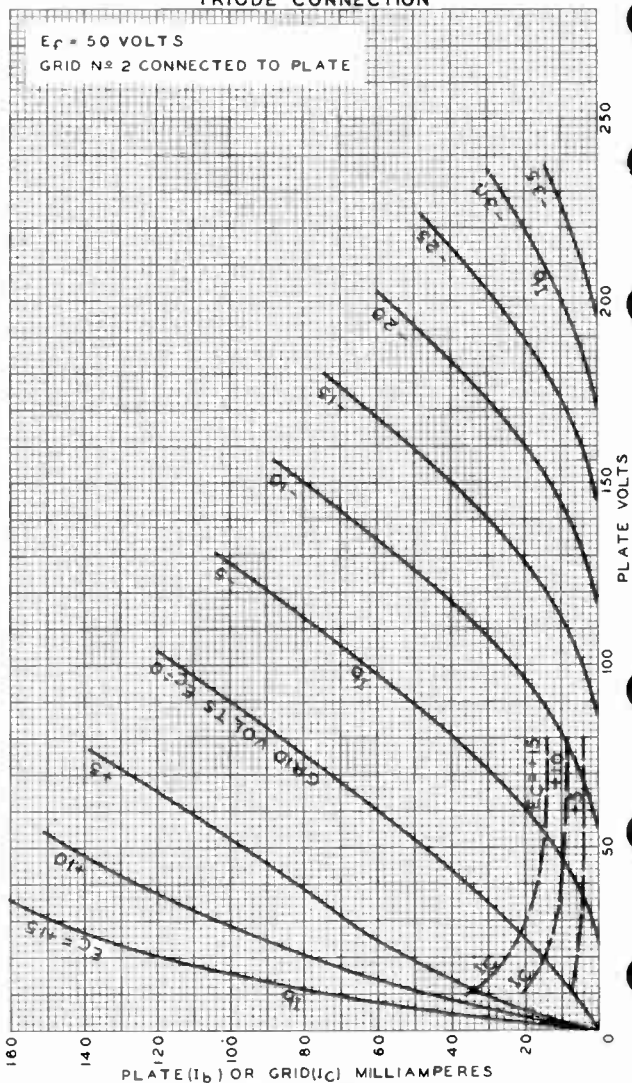
50L6-GT



# 50L6-GT

## AVERAGE PLATE CHARACTERISTICS

### TRIODE CONNECTION



APRIL 6, 1948

TUBE DEPARTMENT

92CM-6316R1

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY



50X6

50X6

# VACUUM RECTIFIER-DOUBLER

## GENERAL DATA

### Electrical:

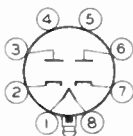
Heater, for Unipotential Cathodes:

Voltage. . . . .	50	ac or dc volts
Current. . . . .	0.150	amp

### Mechanical:

Mounting Position. . . . .	Any
Maximum Overall Length . . . . .	3-5/32"
Maximum Seated Length. . . . .	2-5/8"
Maximum Diameter . . . . .	1-3/16"
Bulb . . . . .	T-9
Base . . . . .	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW . . . . .	7AJ

Pin 1 - Heater	Pin 5 - No Connection
Pin 2 - Cathode of Unit No. 2	Pin 6 - Plate of Unit No. 1
Pin 3 - Plate of Unit No. 2	Pin 7 - Cathode of Unit No. 1
Pin 4 - No Connection	Pin 8 - Heater Plug - Base Shell



## RECTIFIER OR DOUBLER

### Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE . . . . .	700 max.	volts
PEAK PLATE CURRENT PER PLATE . . . . .	450 max.	ma
DC OUTPUT CURRENT PER PLATE. . . . .	75 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. . . . .	350 max.	volts
Heater positive with respect to cathode. . . . .	350 max.	volts

### Typical Operation as Half-Wave Rectifier with Capacitor-Input to Filter:<sup>0</sup>

AC Plate-Supply Voltage per Plate (RMS) . . . . .	117	150	235	volts
Filter-Input Capacitor . . . . .	16	16	16	μf
Min. Total Effective Plate-Supply Impedance per Plate . . . . .	15	40	100	ohms
DC Output Current per Plate. . . . .	75	75	75	ma

### Typical Operation as Voltage Doubler:

	<u>Half-Wave</u>	<u>Full-Wave</u>	
AC Plate-Supply Voltage per Plate (RMS) . . . . .	117	117	volts
Filter-Input Capacitor per Plate . . . . .	16	16	μf
Min. Total Effective Plate-Supply Impedance per Plate . . . . .	30	15	ohms
DC Output Current. . . . .	75	75	ma

<sup>0</sup> in half-wave rectifier service, the two units may be used separately or in parallel.

50Y6-GT



50Y6-GT

VACUUM RECTIFIER-DOUBLER

Heater, for Unipotential Cathodes:

Voltage. . . . . 50 . . . . . ac or dc volts

Current. . . . . 0.15 . . . . . amp

*The 50Y6-GT is the same as the 25Z6-GT except for  
heater rating.*



50Y7-GT

# 50Y7-GT

## VACUUM RECTIFIER-DOUBLER

### GENERAL DATA

Electrical:	Without Panel Lamp		With No. 40 or No. 47 Panel Lamp	
Heater, for Unipotential Cathode:				
Voltage (AC or DC):				
	Entire Heater (pins 2 & 7)	50	46	volts
	Panel-Lamp Section (pins 6 & 7)	7.5	5.5	volts
Current	between pins 2 & 7	0.15	-	amp
	between pins 2 & 6	-	0.15	amp

### Mechanical:

Mounting Position	Any
Maximum Overall Length	3-5/16"
Maximum Seated Length	2-3/4"
Maximum Diameter	1-9/32"
Bulb	T-9
Base	Intermediate-Shell Octal 8-Pin
Basing Designation for BOTTOM VIEW	G-BAN

- Pin 1 - No Connection
- Pin 2 - Heater
- Pin 3 - Plate No. 2
- Pin 4 - Cathode No. 2



- Pin 5 - Plate No. 1
- Pin 6 - Heater Tap
- Pin 7 - Heater
- Pin 8 - Cathode No. 1

### RECTIFIER OR DOUBLER

### Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE	700 max.	volts
PEAK PLATE CURRENT PER PLATE	450 max.	ma
DC OUTPUT CURRENT PER PLATE		
With Panel Lamp & { No Shunting Resistor	60 max.	ma
Shunting Resistor	65 max.	ma
Without Panel Lamp	75 max.	ma
PANEL-LAMP-SECTION VOLTAGE (RMS):		
When panel lamp fails	15 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	350 max.	volts
Heater positive with respect to cathode	350 max.	volts

### Typical Operation with No. 40 or No. 47 Panel Lamp in Half-Wave Rectifier Circuit with Capacitor-Input Filter:

AC Plate-Supply Volt. per Plate (RMS)	117	150	235	volts
Filter-Input Capacitor	16	16	16	μf
Min. Total Effect. Plate-Supply Imped. per Plate	15	40	100	ohms
Panel Lamp Shunting Resistor	250	250	250	ohms
DC Output Current per Plate	65	65	65	ma

\* Max. value of this resistor is 250 ohms for dc output current of 65 ma.

50Y7-GT



50Y7-GT

VACUUM RECTIFIER-DOUBLER

Typical Operation with No.40 or No.47 Panel Lamp in Voltage-Doubler Circuit:

	Half-Wave	Full-Wave	
AC Plate Supply Voltage per Plate (RMS) . . . . .	117	117	volts
Filter-Input Capacitor . . . . .	16	16	μf
Min. Total Effect. Plate-Supply Imped. per Plate . . . . .	30	15	ohms
Panel Lamp Shunting Resistor . . . . .	250	250	ohms
DC Output Current per Plate. . . . .	65	65	ma

Typical Operation Without Panel Lamp in Half-Wave Rectifier Circuit with Capacitor-Input Filter:  
*Values are for both units connected in parallel*

AC Plate Supply Voltage (RMS) . . . . .	117	150	235	volts
Filter-Input Capacitor . . . . .	16	16	16	μf
Min. Total Effect. Plate-Supply Imped. per Plate. . . . .	15	40	100	ohms
Total DC Output Current. . . . .	150	150	150	ma
DC Output Voltage at Input to Filter (Approx.):				
At half-load current (75 ma.) . . . . .	115	-	255	volts
At full-load current (150 ma.) . . . . .	80	-	200	volts
Voltage Regulation (Approx.):				
Half-load to full-load current . . . . .	35	-	55	volts

Typical Operation Without Panel Lamp in Full-Wave Voltage-Doubler Circuit:<sup>o</sup>

AC Plate Supply Voltage per Plate (RMS) . . . . .	117	volts
Filter-Input Capacitor . . . . .	16	μf
Min. Total Effective Plate-Supply Impedance per Plate . . . . .	15	ohms
DC Output Current. . . . .	75	ma
DC Output Voltage at Input to Filter (Approx.):		
At half-load current (37.5 ma.) . . . . .	250	volts
At full-load current (75 ma.) . . . . .	205	volts
Voltage Regulation (Approx.):		
Half-load to full-load . . . . .	45	volts

<sup>o</sup> Plate current must not flow through heater section between pins 6 and 7,



## CLASS B TWIN AMPLIFIER

Heater	Coated Unipotential Cathode	
Voltage	2.5	a-c or d-c volts
Current	2.0	amp.

For additional data and curves, see Types 6N7 and 6A6, and the *RESISTANCE-COUPLED AMPLIFIER CHART*. The operating conditions and characteristics of the 53 are identical with those of the 6N7 and 6A6 except for heater voltage and current. The physical characteristics of the 53 are the same as those of the 6A6.

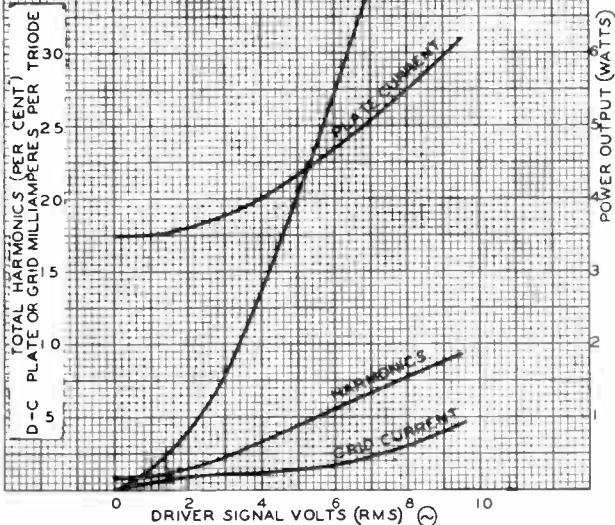
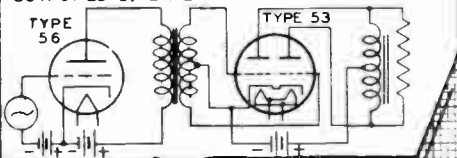
← Indicates a change

RCA-53

## OPERATION CHARACTERISTICS

 $E_f = 2.5$  VOLTS

INPUT-CLASS A-ONE TYPE 56  
 PLATE VOLTS=250 GRID VOLTS=-13.5  
 OUTPUT-CLASS B-ONE TYPE 53  
 PLATE VOLTS=300 GRID VOLTS=0  
 INPUT TRANSFORMER - OUR DESIGN NO 5-99  
 - VOLTAGE RATIO  $\frac{PRIM}{SEC} = 5.0$   
 - PEAK PLATE EFF. = 70 %  
 OUTPUT LOAD, PLATE TO PLATE=10000 OHMS





70L7-GT



70L7-GT

## RECTIFIER-BEAM POWER AMPLIFIER

Heater <sup>■</sup>	Coated Unipotential Cathodes	
Voltage	70	a-c or d-c volts
Current	0.15	amp.
Maximum Overall Length		3-7/16" →
Maximum Seated Height		2-7/8" →
Maximum Diameter		1-5/16" →
Bulb		T-9
Base		Intermed. Sh. Octal 8-Pin
Pin 1-Rectifier Cath.		Pin 5-Amplifier Grid
Pin 2-Heater		Pin 6-Amplifier Cath.
Pin 3-Amplifier Plate		Pin 7-Heater
Pin 4-Amplifier Screen		Pin 8-Rectifier Plate
Mounting Position		BOTTOM VIEW (8AA)

AMPLIFIER UNIT

Plate Voltage	117 max.	volts	→
Screen Voltage	117 max.	volts	→
Plate Dissipation	5.0 max.	watts	→
Screen Dissipation	1.0 max.	watt	→
<i>Typical Operation and Characteristics - Class A<sub>1</sub> Amplifier:</i>			
Plate	110	volts	→
Screen	110	volts	→
Grid <sup>■</sup>	-7.5	volts	→
Peak A-F Grid Voltage	7.5	volts	→
Zero-Signal Plate Cur.	40	ma.	→
Max.-Signal Plate Cur.	43	ma.	→
Zero-Signal Screen Cur.	3 approx.	ma.	→
Max.-Signal Screen Cur.	6 approx.	ma.	→
Plate Resistance	15000	ohms	→
Transconductance	7500	μmhos	→
Load Resistance	2000	ohms	→
Total Harmonic Distortion	10	%	→
Max.-Signal Power Output	1.8	watts	→

RECTIFIER UNIT

Peak Inverse Voltage	350 max.	volts	→
Peak Plate Current	420 max.	ma.	→
D-C Heater-Cathode Potential	175 max.	volts	→
<i>With Condenser-Input Filter:</i>			
A-C Plate Voltage (RMS)	117 max.	volts	→
Total Effective Plate-Supply Impedance <sup>▲</sup>	15 min.	ohms	→
D-C Output Current	70 max.	ma.	→

- It is recommended that the potential difference between heater and cathode of the amplifier unit be kept as low as possible by connecting pin #2 to the side of the line opposite that to which pins #7 & #8 are connected.
- The type of input coupling used should not introduce too much resistance in the grid circuit. Transformer- or impedance-coupling devices are recommended. When the grid circuit has a resistance not higher than 0.1 megohm, fixed bias may be used; for higher values, cathode bias is required. With cathode bias, the grid circuit may have a resistance not higher than 0.5 megohm.
- ▲ When a filter-input condenser larger than 40 μf is used, it may be necessary to use more plate-supply impedance than the minimum value shown to limit the peak plate current to the rated value.

→ Indicates a change.

Dec. 1, 1941

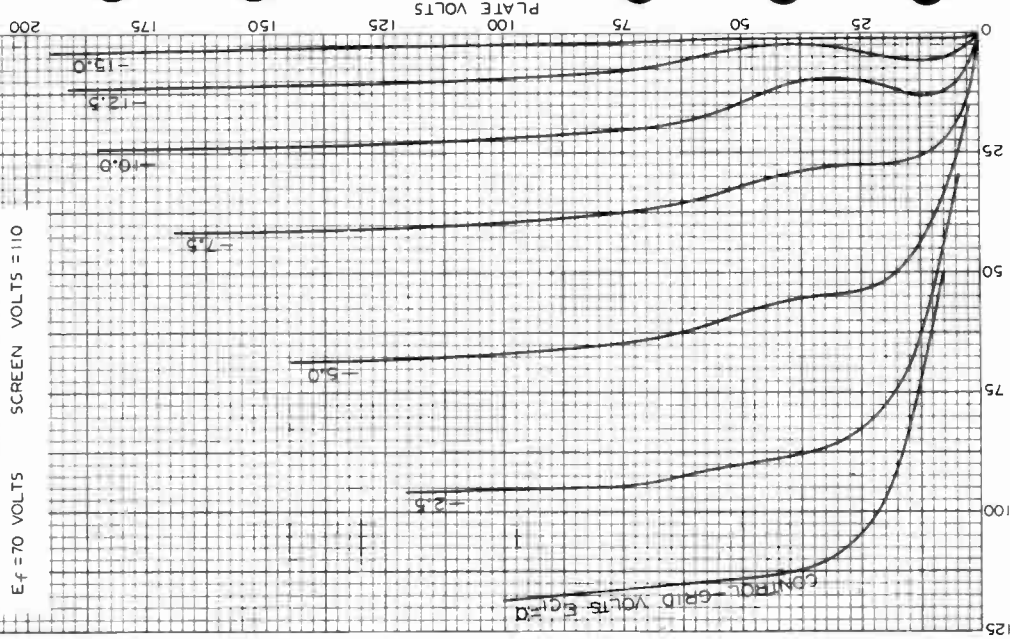
RCA RADOTRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

DATA



70L7-GT

# AVERAGE PLATE CHARACTERISTICS AMPLIFIER UNIT



SEPT. 26, 1941

PLATE MILLIAMPERES  
RCA RADIOTRON DIVISION  
PCA MANUFACTURING COMPANY INC.

92C-6323



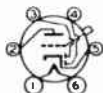
75



75

**DUPLEX-DIODE HIGH-MU TRIODE**

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances (approx.):		
<i>Triode Unit</i>		
Grid to Plate	1.7	$\mu\text{f}$
Grid to Cathode	1.7	$\mu\text{f}$
Plate to Cathode	3.8	$\mu\text{f}$
Overall Length	4-9/32" to 4-17/32"	
Seated Height	3-21/32" to 3-29/32"	
Maximum Diameter	1-9/16"	
Bulb	ST-12	
Cap	Small Metal	
Base	Small 6-Pin	
Pin 1-Heater		Pin 5-Cathode
Pin 2-Triode Plate		Pin 6-Heater
Pin 3-Diode Plate #2		Cap - Triode Grid
Pin 4-Diode Plate #1		
Mounting Position		Any



BOTTOM VIEW (6G)

AMPLIFIER

Plate Voltage	250 max. volts
---------------	----------------

*Characteristics and Curves are the same as for Type 6SQ7. For Typical Operating Conditions see RESISTANCE-COUPLED AMPLIFIER CHART. Diode Curves under Type 6B7 also apply to the 75.*

■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

← Indicates a change.

Sept. 2, 1941

RCA RADOTRON DIVISION  
RCA MANUFACTURING COMPANY INC

DATA

75

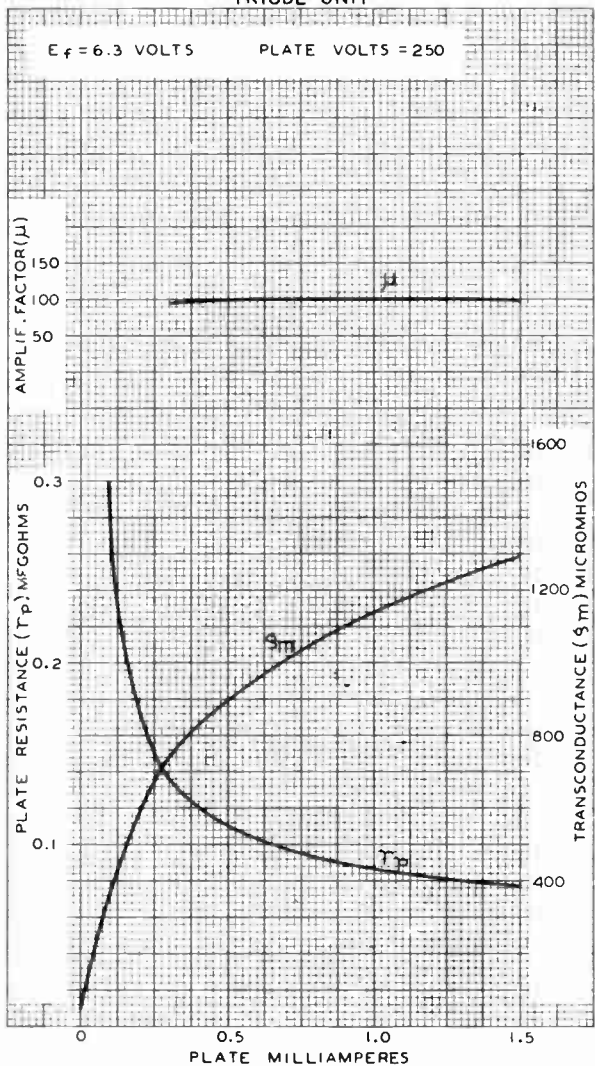


75

# AVERAGE CHARACTERISTICS TRIODE UNIT

 $E_f = 6.3$  VOLTS

PLATE VOLTS = 250



JULY 31, 1941

 RCA RADIODIVISION  
 RCA MANUFACTURING COMPANY INC

92C-5284R1

# TRIPLE-GRID SUPER-CONTROL AMPLIFIER

For additional data and curve, see Type 6K7. Except for capacitances, the characteristics of the 78 and 6K7 are identical. ←

Heater Coated Unipotential Cathode a-c or d-c volts

Voltage 6.3  
Current 0.3 amp.

Direct Interelectrode Capacitances: ⓪  
Grid to Plate 0.007 max.

Input 4.5  
Output 11.0

Overall Length

Maximum Diameter

Bulb

Cap

Base

Pin 1-Heater

Pin 2-Plate

Pin 3-Screen

Pin 4-Suppressor

③

④

⑤

①

⑥

4-9/32" to 4-17/32"

1-9/16"

ST-12

Small Metal

Pin 5-Cathode

Pin 6-Heater

Cap -Grid

⓪ With shield can.  
← Indicates a change

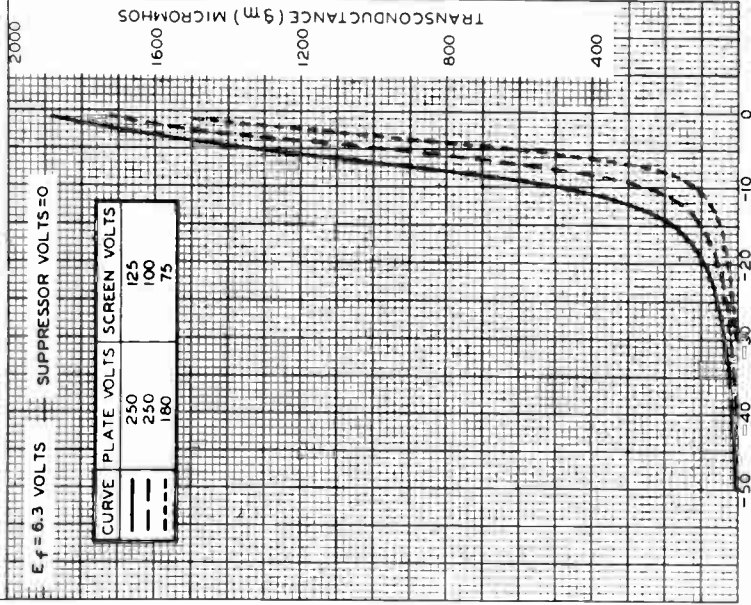
BOTTOM VIEW

## AVERAGE CHARACTERISTICS

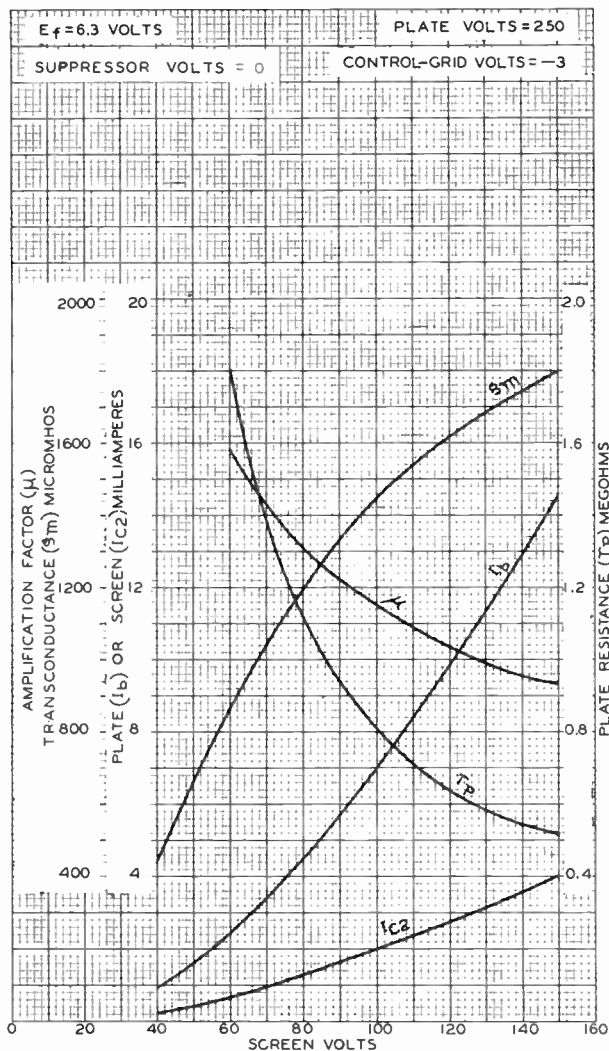
$E_f = 6.3$  VOLTS

SUPPRESSOR VOLTS = 0

CURVE	PLATE VOLTS	SCREEN VOLTS
—	250	125
- - -	250	100
- - - -	180	75



## AVERAGE CHARACTERISTICS





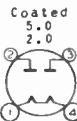


80

80, 81

**FULL-WAVE HIGH-VACUUM RECTIFIER**

Filament Voltage	Coated	
Current	5.0	a-c volts
Maximum Overall Length	2.0	amp.
Maximum Diameter		4-11/16"
Bulb		1-13/16"
Base		ST-14
Pin 1 - Filament		Medium 4-Pin
Pin 2 - Plate #2		Pin 3 - Plate #1
Mounting Position		Pin 4 - Filament
		Vertical ◊



BOTTOM VIEW (4C)

◊ Horizontal operation permitted if pins 1 and 4 are in horizontal plane.

*Maximum Ratings, Typical Operating Conditions, and Curves are the same as those for Type 5Y3-G.*

81

**HALF-WAVE HIGH-VACUUM RECTIFIER**

Filament Voltage	Coated	
Current	7.5	a-c volts
Maximum Overall Length	1.25	amp.
Maximum Diameter		6-1/4"
Bulb		2-7/16"
Base		ST-19
Pin 1 - Filament		Medium 4-Pin, Bay.
Pin 2 - Plate		Pin 3 - No Connection
Mounting Position		Pin 4 - Filament
		Vertical ◊

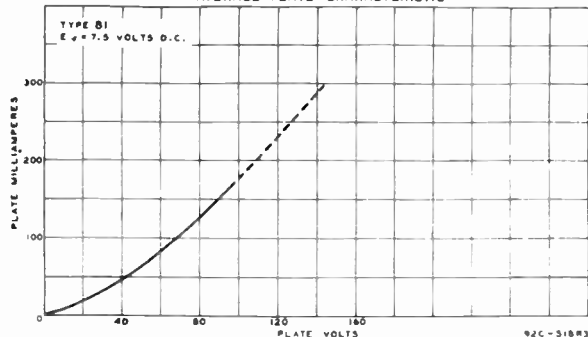


BOTTOM VIEW (4B)

HALF-WAVE RECTIFIER

Peak Inverse Voltage	2000 max. volts
Peak Plate Current	500 max. ma.
Typical Operation with Condenser- or Choke-Input Filter:	
A-C Plate Voltage (RMS)	700 max. volts
D-C Output Current	85 max. ma.

◊ Horizontal operation permitted if pins 1 and 4 are in vertical plane.

AVERAGE PLATE CHARACTERISTIC

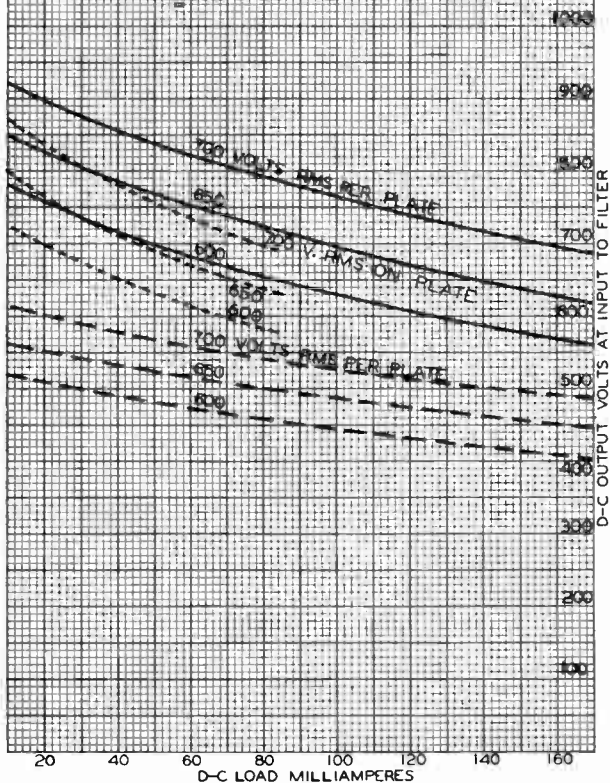
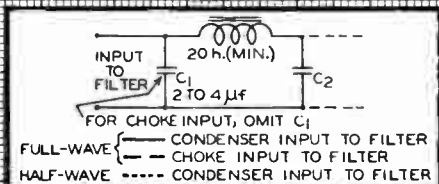
FEB. 2, 1940

RCA RADITRON DIVISION  
RCA MANUFACTURING COMPANY INC

DATA



## OPERATION CHARACTERISTICS

 $E_f = 7.5$  VOLTS A.C.




82

**FULL-WAVE MERCURY-VAPOR RECTIFIER**

Filament	Coated	
Voltage	2.5	a-c volts
Current	3.0	amp.
Maximum Overall Length		4-11/16" ←
Maximum Seated Height		4-1/16" ←
Maximum Diameter		1-13/16" ←
Bulb		ST-14
Base		Medium 4-Pin
Pin 1 - Filament		Pin 3 - Plate #1
Pin 2 - Plate #2		Pin 4 - Filament
Mnunting Position		Vertical, base down



BOTTOM VIEW (4C)

FULL-WAVE RECTIFIER

Peak Inverse Voltage	1550 max. volts
Peak Plate Current per Plate	600 max. ma.
Condenser Mercury Temperature Range	24° - 60°C
<i>With Condenser-Input Filter:</i>	
A-C Plate Voltage per Plate (RMS)	450 max. volts
Total Effective Plate-Supply Impedance per Plate <sup>▲</sup>	50 min. ohms
D-C Output Current	115 max. ma.
<i>With Choke-Input Filter:</i>	
A-C Plate Voltage per Plate (RMS)	550 max. volts
Input-Choke Inductance	6 min. henries
D-C Output Current	115 max. ma.
Tube Voltage Drop	15 approx. volts

HALF-WAVE RECTIFIER

As a half-wave rectifier, the 82 is operated with plates connected in parallel. Two 82's so connected in a full-wave circuit can supply twice the output current of a single tube. Both plates within the same tube should be connected to the same terminal of the plate transformer. To equalize the current distribution between plates, a resistor of not less than 100 ohms should be connected in series with each plate.

<sup>▲</sup> When a filter-input condenser larger than 40 uf is used, it may be necessary to use more plate-supply impedance than the minimum value shown to limit the peak plate current to the rated value.

← Indicates a change.

Sept. 2, 1941

DATA

RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY INC

World Radio History

83-v  
★



83

## FULL-WAVE MERCURY VAPOR RECTIFIER

Filament	Coated	
Voltage	5.0	a-c volts
Current	3.0	amp.
Maximum Overall Length		5-3/8"
Maximum Seated Height		4-3/4"
Maximum Diameter		2-1/16"
Bulb		ST-16
Base		Medium 4-Pin
Pin 1 - Filament		Pin 3 - Plate #1
Pin 2 - Plate #2		Pin 4 - Filament
Mounting Position		Vertical, base down



BOTTOM VIEW (4C)

### FULL-WAVE RECTIFIER

Peak Inverse Voltage	1550 max.	volts
Peak Plate Current per Plate	1.0 max.	amp.
Condensed Mercury Temperature Range	20° - 60°C	
<b>With Condenser-Input Filter:</b>		
A-C Plate Voltage per Plate (RMS)	450 max.	volts
Total Effective Plate-Supply Impedance per Plate*	50 min.	ohms
D-C Output Current	225 max.	ma.
<b>With Choke-Input Filter:</b>		
A-C Plate Voltage per Plate (RMS)	550 max.	volts
Input-Choke Inductance	3 min.	henries
D-C Output Current	225 max.	ma.
Tube Voltage Drop	15 approx.	volts

### HALF-WAVE RECTIFIER

As a half-wave rectifier, the 83 is operated with plates connected in parallel. Two 83's so connected in a full-wave circuit can supply twice the output current of a single tube. Both plates within the same tube should be connected to the same terminal of the plate transformer. To equalize the current distribution between plates, a resistor of not less than 50 ohms should be connected in series with each plate.

\* When a filter-input condenser larger than 40  $\mu$ f is used, it may be necessary to use more plate-supply impedance than the minimum value shown to limit the peak plate current to the rated value.

← Indicates a change.

★

83-v

## FULL-WAVE HIGH-VACUUM RECTIFIER

Heater	Coated Unipotential Cathode*	
Voltage	5.0	a-c volts
Current	2.0	amp.
Maximum Overall Length		4-11/16"
Maximum Seated Height		4-1/16"
Maximum Diameter		1-13/16"
Bulb		ST-14
Base		Medium 4-Pin
Pin 1 - Heater		Pin 3 - Plate #1
Pin 2 - Plate #2		Pin 4 - Heater & Cathode
Mounting Position		Any



BOTTOM VIEW (4AD)

For Curves and additional data, see Type 5F4-G.

\* The cathode of the 83-v is connected to the heater within the tube.

← Indicates a change.

Sept. 2, 1941

RCA RADOTRON DIVISION  
RCA MANUFACTURING COMPANY INC

DATA



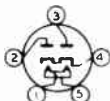
84/6Z4



84

**FULL-WAVE HIGH-VACUUM RECTIFIER**

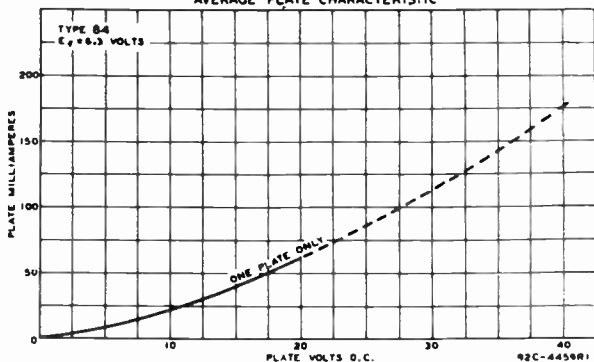
Heater <sup>■</sup>	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.5	amp.
Maximum Overall Length		4-3/16"
Maximum Diameter		1-9/16"
Bulb		ST-12
Base		Small 5-Pin
Pin 1 - Heater		Pin 4 - Cathode
Pin 2 - Plate		Pin 5 - Heater
Pin 3 - Plate		
Mounting Position	BOTTOM VIEW (5D)	Any

FULL-WAVE RECTIFIER

Peak Inverse Voltage	1250 max. volts
Peak Plate Current per Plate	180 max. ma.
D-C Heater-Cathode Potential	450 max. volts
<i>Typical Operation with Condenser-Input Filter:</i>	
A-C Plate Voltage per Plate (RMS)	325 max. volts
Total Effective Plate-Supply Impedance per Plate <sup>▲</sup>	65 min. ohms
D-C Output Current	60 max. ma.
<i>Typical Operation with Choke-Input Filter:</i>	
A-C Plate Voltage per Plate (RMS)	450 max. volts
Input-Choke Inductance	10 min. henries
D-C Output Current	60 max. ma.

- <sup>■</sup> The heater voltage should never fluctuate to exceed 7.5 volts.  
<sup>▲</sup> When a filter-input condenser larger than 40  $\mu$ f is used, it may be necessary to use more plate-supply impedance than the minimum value shown to limit the peak plate current to the rated value.

AVERAGE PLATE CHARACTERISTIC



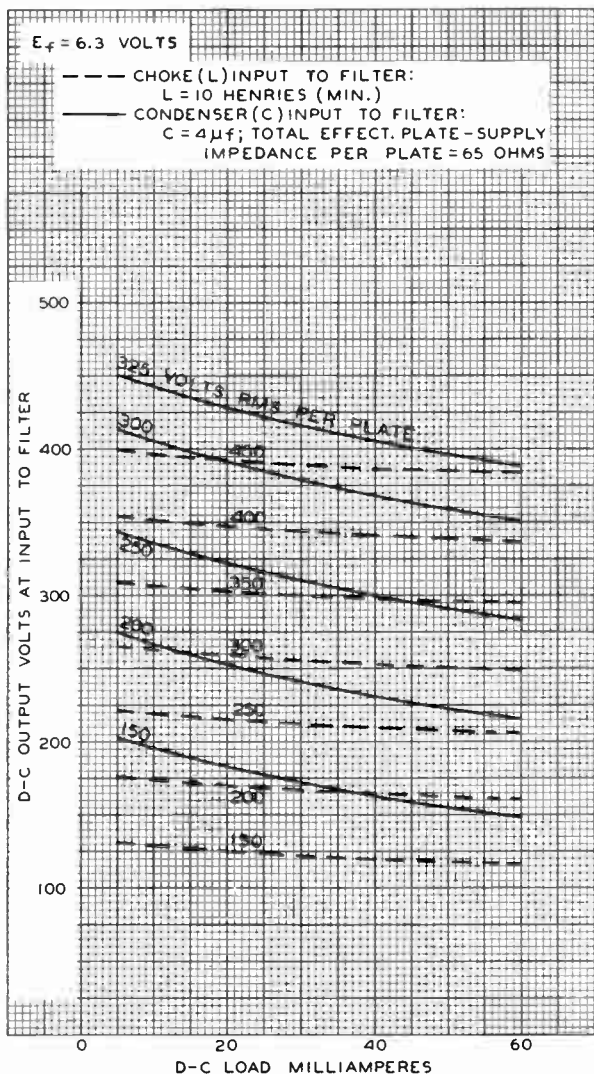
FEB. 2, 1940

RCA RADIODRON DIVISION  
 RCA MANUFACTURING COMPANY, INC.  
 World Radio History

DATA



## OPERATION CHARACTERISTICS





117L7-GT



117L7-GT/117M7-GT

## RECTIFIER-BEAM POWER AMPLIFIER

Heater	Coated Unipotential Cathodes	
Voltage	117	a-c or d-c volts
Current	0.09	amp.
Maximum Overall Length		3-7/16"
Maximum Seated Height		2-7/8"
Maximum Diameter		1-5/16"
Bulb		T-9
Base	Intermediate Shell Octal	8-Pin
Pin 1 - Rectifier Cathode		Pin 5 - Amplifier Screen
Pin 2 - Heater		Pin 6 - Rectifier Plate
Pin 3 - Amplifier Plate		Pin 7 - Heater
Pin 4 - Amplifier Grid		Pin 8 - Amplifier Cathode
Mounting Position		Any



BOTTOM VIEW (BAO)

RECTIFIER UNIT (Half-Wave)

Peak Inverse Voltage	350 max.	volts
Peak Plate Current	450 max.	volts
D-C Heater to Cathode Potential	175 max.	volts
<i>With Condenser-Input Filter:</i>		
A-C Plate Voltage (R.M.S.)	117 max.	volts
Total Effective Plate Supply		
Impedance	15 min.	ohms
D-C Output Current	75 max.	ma.

AMPLIFIER UNIT

Plate Voltage	117 max.	volts
Screen Voltage	117 max.	volts
Plate Dissipation	6.0 max.	watts
Screen Dissipation	1.0 max.	watt
<i>Typical Operation and Characteristics - Class A<sub>1</sub> Amplifier:</i>		
Plate	105	volts
Screen	105	volts
Grid	-5.2	volts
Peak A-F Grid Voltage	5.2	volts
Zero-Sig. Plate Cur.	43	ma.
Max.-Sig. Plate Cur.	43	ma.
Zero-Sig. Screen Cur.	4	ma.
Max.-Sig. Screen Cur.	5.5	ma.
Plate Resistance	17000 approx.	ohms
Transconductance	5300	μmhos
Load Resistance	4000	ohms
Total Harmonic Distortion	5	%
Max.-Sig. Power Output	0.85	watt

It is recommended that the potential difference between heater and cathode of the amplifier unit be kept as low as possible by connecting pin #2 to the side of the line opposite that to which pins #6 & #7 are connected.

May 1, 1941

RCA RADIONRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

World Radio History

TENTATIVE DATA

117N7-GT



117N7-GT

## RECTIFIER-BEAM POWER AMPLIFIER

Heater	Coated Unipotential Cathodes	
Voltage	117	a-c or d-c volts
Current	0.09	amp.
Maximum Overall Length		3-7/16"
Maximum Seated Height		2-7/8"
Maximum Diameter		1-5/16"
Bulb		T-9
Base	Intermediate Shell Octal 8-Pin	
Pin 1 - No Connection		Pin 6 - Amplifier Cathode
Pin 2 - Heater		Pin 7 - Rectifier Plate, Heater
Pin 3 - Amplifier Plate		Pin 8 - Rectifier Cathode
Pin 4 - Amplifier Grid		
Pin 5 - Amplifier Screen		
Mounting Position	BOTTOM VIEW (8AV)	Any

RECTIFIER UNIT (Half-Wave)

Peak Inverse Voltage	350 max.	volts
Peak Plate Current	450 max.	ma.
D-C Heater-Cathode Potential	175 max.	volts
<i>With Condenser-Input Filter:</i>		
A-C Plate Voltage (RMS)	117 max.	volts
Total Effective Plate-Supply Impedance <sup>▲</sup>	15 min.	ohms
D-C Output Current	75 max.	ma.

AMPLIFIER UNIT

Plate Voltage	117 max.	volts
Screen Voltage	117 max.	volts
Plate Dissipation	5.5 max.	watts
Screen Dissipation	1 max.	watt
<i>Typical Operation and Characteristics - Class A<sub>2</sub> Amplifier:</i>		
Plate Voltage	100	volts
Screen Voltage	100	volts
Grid Voltage <sup>□</sup>	-6	volts
Peak A-F Grid Voltage	6	volts
Zero-Signal Plate Current	51	ma.
Zero-Signal Screen Current	5	ma.
Plate Resistance	16000 approx.	ohms
Transconductance	7000	μmhos
Load Resistance	3000	ohms
Total Harmonic Distortion	6	%
Max.-Signal Power Output	1.2	watts

<sup>▲</sup> When a filter-input condenser larger than 40 μf is used, it may be necessary to use more plate-supply impedance than the minimum value shown to limit the peak plate current to the rated value.

<sup>□</sup> Type of input coupling used should not introduce too much resistance in the grid circuit. With fixed bias, the resistance should not exceed 0.25 megohm; with cathode bias, 1.0 megohm.

May 1, 1941

DATA

RCA RADOTRON DIVISION  
RCA MANUFACTURING COMPANY INC

World Radio History





117P7-GT

117P7-GT

**RECTIFIER—BEAM POWER AMPLIFIER**

Heater	Coated Unipotential Cathodes	
Voltage	117	a-c or d-c volts
Current	0.090	amp.
Maximum Overall Length		3-7/16"
Maximum Seated Height		2-7/8"
Maximum Diameter		1-5/16"
Bulb		T-9
Base	Intermediate Shell Octal 8-Pin	
Pin 1—No Connection		Pin 6—Amplifier Cathode
Pin 2—Heater		Pin 7—Rectifier Plate, Heater
Pin 3—Amplifier Plate		Pin 8—Rectifier Cathode
Pin 4—Amplifier Grid		
Pin 5—Amplifier Screen		
Mounting Position		Any



BOTTOM VIEW (8AV)

RECTIFIER UNIT (Half-Wave)

Peak Inverse Voltage	350 max.	volts
Peak Plate Current	450 max.	ma.
D-C Heater to Cathode Potential	175 max.	volts
<i>With Condenser-Input Filter:</i>		
A-C Plate Voltage (RMS)	117 max.	volts
Total Effective Plate-Supply Impedance	15 min.	ohms
D-C Output Current	75 max.	ma.

AMPLIFIER UNIT

Plate Voltage	117 max.	volts
Screen Voltage	117 max.	volts
Plate Dissipation	6.0 max.	watts
Screen Dissipation	1.0 max.	watt
<i>Typical Operation and Characteristics - Class A<sub>1</sub> Amplifier:</i>		
Plate Voltage	105	volts
Screen Voltage	105	volts
Grid Voltage #	-5.2	volts
Peak A-F Grid Voltage	5.2	volts
Zero-Sig. Plate Current	43	ma.
Max.-Sig. Plate Current	43	ma.
Zero-Sig. Screen Current	4	ma.
Max.-Sig. Screen Current	5.5	ma.
Plate Resistance	17000 approx.	ohms
Transconductance	5300	μmhos
Load Resistance	4000	ohms
Total Harmonic Distortion	5.0	%
Max.-Sig. Power Output	0.85	watt

# The type of input coupling used should not introduce too much resistance in the grid circuit. With fixed bias, the resistance should not exceed 0.25 megohm; with cathode bias, 0.5 megohm.





117Z3

117Z3

# HALF-WAVE VACUUM RECTIFIER

MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage. . . . . 117 . . . . . ac or dc volts

Current. . . . . 0.04 . . . . . amp

### Mechanical:

Mounting Position. . . . . Any

Maximum Overall Length . . . . . 2-5/8"

Maximum Sealed Length. . . . . 2-3/8"

Maximum Diameter . . . . . 3-4"

Bulb . . . . . T-5-1/2

Base . . . . . Miniature Button 7-Pin

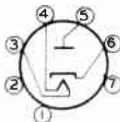
Basing Designation for BOTTOM VIEW . . . . . 4CB

Pin 1 - Internal Con.-

Do Not Use

Pin 2 - No Connection

Pin 3 - Heater



Pin 4 - Heater

Pin 5 - Plate

Pin 6 - Cathode

Pin 7 - No Con.-

## HALF-WAVE RECTIFIER

### Maximum Ratings, Design-Center Values:

PEAK INVERSE PLATE VOLTAGE . . . . . 330 max. volts

PEAK PLATE CURRENT . . . . . 540 max. ma

DC OUTPUT CURRENT. . . . . 90 max. ma

### HOT-SWITCHING TRANSIENT PLATE CURRENT

For duration of 0.2 second maximum . . . . . 2.5 max. amp

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. . . . . 175 max. volts

Heater positive with respect to cathode. . . . . 100 max. volts

### Typical Operation with Capacitor-Input to Filter:

AC Plate-Supply Voltage (RMS). . . . . 117 volts

Filter-Input Capacitor . . . . . 30  $\mu$ f

Min. Total Effective Plate-Supply Impedance. . . . . 20 ohms

DC Output Current. . . . . 90 ma

### DC Output Voltage at Input to Filter (Approx.):

At half-load current (45 ma.). . . . . 130 volts

At full-load current (90 ma.). . . . . 110 volts

### Voltage Regulation (Approx.):

Half-load to full-load current . . . . . 20 volts

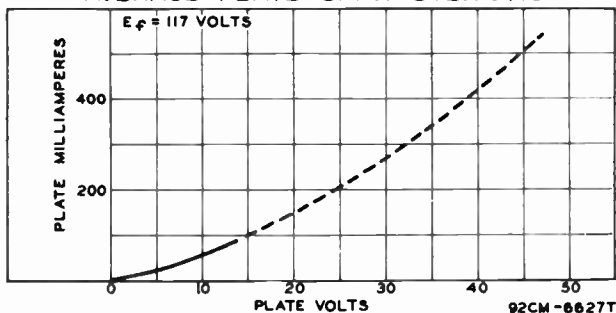
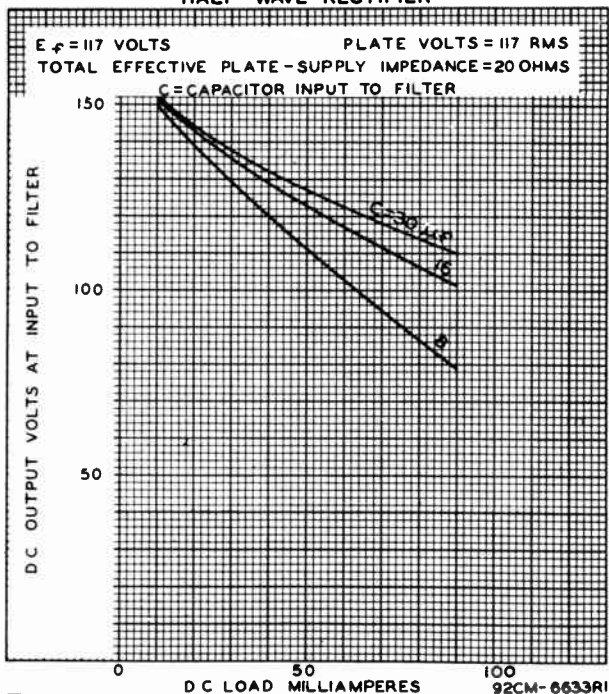
← Indicates a change.

117Z3



117Z3

## AVERAGE PLATE CHARACTERISTIC

OPERATION CHARACTERISTICS  
HALF-WAVE RECTIFIER

JULY 3, 1950

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

CE-6627T-6633R1

World Radio History



117Z6-GT/G

117Z6-GT/G

## HIGH-VACUUM RECTIFIER-DOUBLER

Heater	Coated Unipotential Cathodes	
Voltage	117	a-c or d-c volts
Current	0.075	amp.
Maximum Overall Length		3-5/16"
Maximum Seated Height		2-3/4"
Maximum Diameter		1-5/16"
Bulb		T-9
Base	Intermediate Shell Octal 7-Pin	
Pin 1 - No Connection	Pin 5 - Plate #1	
Pin 2 - Heater	Pin 7 - Heater	
Pin 3 - Plate #2	Pin 8 - Cathode #1	
Pin 4 - Cathode #2		
Mounting Position		Any



BOTTOM VIEW (G-7Q)

Maximum Ratings Are Design-Center Values

## RECTIFIER OR DOUBLER

Peak Inverse Plate Voltage	700 max. volts
Peak Plate Current per Plate	360 max. ma.
D-C Output Current per Plate	60 max. ma.
D-C Heater-Cathode Potential	350 max. volts

Typical Operation As Half-Wave Rectifier  
with Condenser-Input Filter:<sup>o</sup>

A-C Plate Supply Voltage				
per Plate (RMS)	117	150	235	volts
Filter Input Condenser	40	40	40	μf
Min. Total Effect. Plate-Supply Imped. per Plate	15	40	100	ohms
D-C Output Current per Plate	60	60	60	ma.

Typical Operation As Voltage Doubler:

	Half-Wave	Full-Wave	
A-C Plate Supply Voltage			
per Plate (RMS)	117	117	volts
Filter Input Condenser	40	40	μf
Min. Total Effect. Plate-Supply Imped. per Plate	30	15	ohms
D-C Output Current	60	60	ma.

<sup>o</sup> In half-wave rectifier service, the two units may be used separately or in parallel.

For Typical Rectifier-Doubler Circuits, see Type 25Z5.

← Indicates a change.

AUG. 2, 1943

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

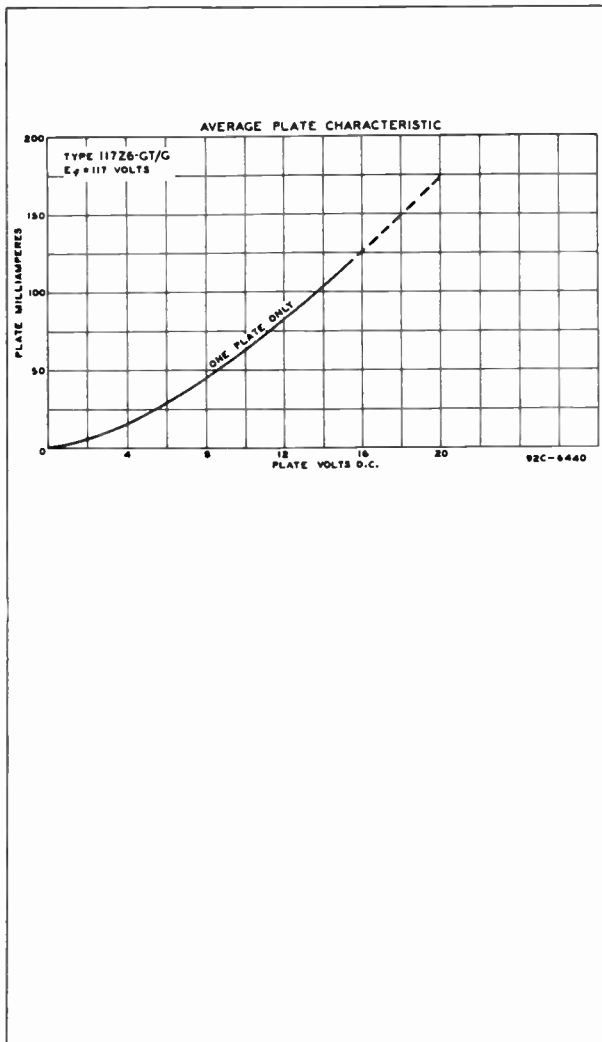
DATA

117Z6-GT/G



117Z6-GT/G

# HIGH-VACUUM RECTIFIER-DOUBLER



AUG. 2, 1943

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

CE-6440



5879

5879

# SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . .	6.3	. . . . .	ac or dc volts
Current . . . . .	0.15	. . . . .	amp

Direct Interelectrode Capacitances:<sup>0</sup>

*Pentode Connection:*

Grid No.1 to Plate. . .	0.15 max.	. . . . .	$\mu$ f
Input . . . . .	2.7	. . . . .	$\mu$ f
Output. . . . .	2.4	. . . . .	$\mu$ f

*Triode Connection* (Grids No.2 & No.3 connected to plate):

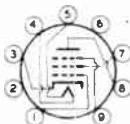
Grid No.1 to Plate. . .	1.4	. . . . .	$\mu$ f
Grid No.1 to Cathode & Heater. . . . .	1.4	. . . . .	$\mu$ f
Plate to Cathode & Heater. . . . .	0.85	. . . . .	$\mu$ f

<sup>0</sup> with no external shield.

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length. . . . .	2-3/16"
Maximum Seated Length. . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" $\pm$ 3/32"
Maximum Diameter. . . . .	7/8"
Bulb. . . . .	T-6-1/2
Base. . . . .	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9AD

Pin 1-Grid No.1	Pin 6-No Connection
Pin 2-No Connection	Pin 7-Grid No.2
Pin 3-Cathode	Pin 8-Plate
Pin 4-Heater	Pin 9-Grid No.3
Pin 5-Heater	



## AMPLIFIER - Class A<sub>1</sub>

*Pentode Connection*

### Maximum Rating, Design-Center Values:

PLATE VOLTAGE . . . . .	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE. . . . .	150 max.	volts
GRID-No.2 SUPPLY VOLTAGE. . . . .	300 max.	volts
GRID-No.2 INPUT . . . . .	0.25 max.	watt
PLATE DISSIPATION . . . . .	1.25 max.	watts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative Bias Value . . . . .	50 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

← Indicates a change

JAN. 1, 1953

DATA

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

5879



5879

## SHARP-CUTOFF PENTODE

### Characteristics:

Plate Voltage. . . . .	250	volts
Grid No.3 (Suppressor) . . . . .	Connected to cathode at socket	
Grid-No.2 Voltage. . . . .	100	volts
Grid-No.1 Voltage. . . . .	-3	volts
Plate Resistance (Approx.) . . . . .	2	megohms
Transconductance . . . . .	1000	$\mu$ hos
Grid-No.1 Bias (Approx.) for plate current of 10 $\mu$ amp . . . . .	-8	volts
→ Plate Current. . . . .	1.8	ma
Grid-No.2 Current. . . . .	0.4	ma

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance . . . . .	2.2 max.	megohms
--	----------	---------

### AMPLIFIER - Class A<sub>1</sub>

*Triode Connection - Grids No.2 & No.3 Connected to Plate*

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE. . . . .	250 max.	volts
TOTAL PLATE DISSIPATION. . . . .	1.5 max.	watts
GRID-No.1 VOLTAGE		
Negative Bias Value. . . . .	50 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:

Plate Voltage. . . . .	100	250	volts
Grid-No.1 Voltage. . . . .	-3	-8	volts
Amplification Factor . . . . .	21	21	
Plate Resistance (Approx.) . . . . .	17000	13700	ohms
Transconductance . . . . .	1240	1530	$\mu$ hos
Total Plate Current. . . . .	2.2	5.5	ma

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance . . . . .	2.2 max.	megohms
--	----------	---------

### Typical Operation as Resistance-Coupled Amplifier:

*See RESISTANCE-COUPLED AMPLIFIER CHARTS  
at front of Receiving Tube Section.*

→ indicates a change

JAN. 1, 1953

TUBE DEPARTMENT

DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History





5879

5879

### AVERAGE PLATE CHARACTERISTICS

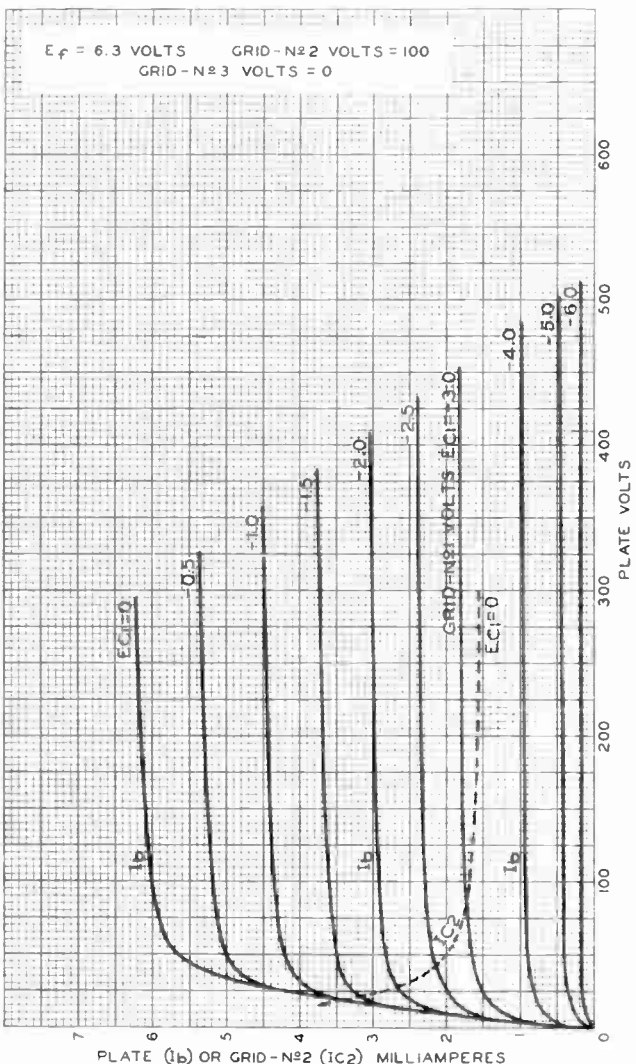


PLATE ( $I_b$ ) OR GRID-N<sup>o</sup>2 ( $I_{c2}$ ) MILLIAMPERES

FEB. 1, 1950

TUBE DEPARTMENT

92CM-7435

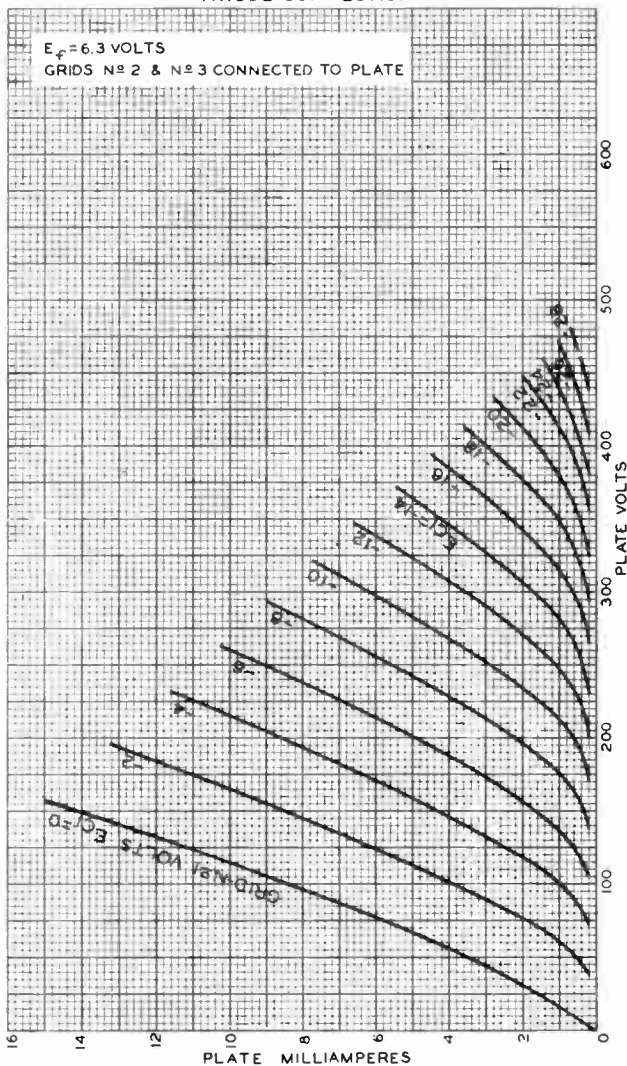
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

5879



5879

# AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION



FEB. 9, 1950

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-7448

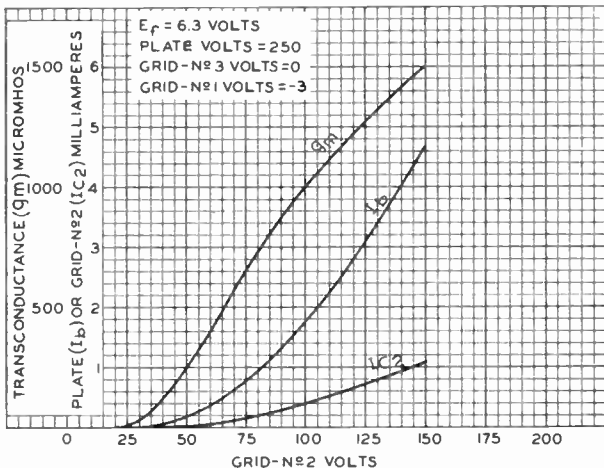
World Radio History



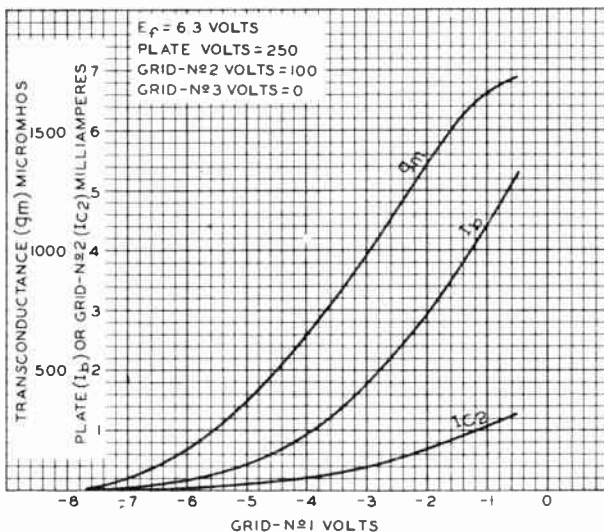
5879

5879

## AVERAGE CHARACTERISTICS



## AVERAGE CHARACTERISTICS



FEB. 1, 1950

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY  
World Radio History

92CM-7440





5881

5881

# BEAM POWER TUBE

For audio-frequency power amplifier applications

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage . . . . .	6.3	. . . . .	ac or dc volts
Current . . . . .	0.9	. . . . .	amp

### Mechanical:

Mounting Position . . . . .	Any
Maximum Overall Length . . . . .	3-15/32"
Maximum Serted Length . . . . .	2-29/32"
Maximum Diameter . . . . .	1-7/16"
Bulb . . . . .	T11
Base . . . . .	Short Intermediate-Shell Octal 7-Pin with External Barriers (JETEC No. B7-59)
Basing Designation for BOTTOM VIEW . . . . .	7AC

Pin 1 - No Connection  
 Pin 2 - Heater  
 Pin 3 - Plate  
 Pin 4 - Grid No. 2



Pin 5 - Grid No. 1  
 Pin 7 - Heater  
 Pin 8 - Cathode,  
 Grid No. 3

## AF POWER AMPLIFIER - Class A<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	400 max.	volts
GRID-No. 2 (SCREEN-GRID) VOLTAGE . . . . .	400 max.	volts
GRID-No. 2 INPUT . . . . .	3 max.	watts
PLATE DISSIPATION . . . . .	23 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 max.	volts

### Typical Operation and Characteristics:

Plate Voltage . . . . .	250	300	350	volts
Grid-No. 2 Voltage . . . . .	250	200	250	volts
Grid-No. 1 (Control-Grid) Voltage . . . . .	-14	-12.5	-18	volts
Peak AF Grid-No. 1 Voltage . . . . .	14	12.5	18	volts
Zero-Signal Plate Current . . . . .	75	48	53	ma
Max.-Signal Plate Current . . . . .	80	55	65	ma
Zero-Signal Grid-No. 2 Current . . . . .	4.3	2.5	2.5	ma
Max.-Signal Grid-No. 2 Current . . . . .	7.6	4.7	8.5	ma
Plate Resistance (Approx.) . . . . .	30000	35000	48000	ohms
Transconductance . . . . .	6100	5300	5200	μmhos
Load Resistance . . . . .	2500	4500	4200	ohms
Total Harmonic Distortion . . . . .	10	11	13	%
Max.-Signal Power Output . . . . .	6.7	6.5	11.3	watts



5881

## BEAM POWER TUBE

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

**AF POWER AMPLIFIER - Class A<sub>1</sub>***Triode Connection - Grid No.2 Connected to Plate***Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE. . . . .	400 max.	volts
PLATE DISSIPATION. . . . .	26 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 max.	volts

**Typical Operation and Characteristics:**

Plate Voltage. . . . .	250	300	volts
Grid-No.1 (Control-Grid) Voltage.	-18	-20	volts
Peak AF Grid-No.1 Voltage. . . . .	18	20	volts
Zero-Signal Plate Current. . . . .	52	78	ma
Max.-Signal Plate Current. . . . .	58	85	ma
Amplification Factor . . . . .	8	-	
Transconductance . . . . .	5250	-	μmhos
Load Resistance. . . . .	4000	4000	ohms
Total Harmonic Distortion. . . . .	6	5.5	%
Max.-Signal Power Output . . . . .	1.4	1.8	watts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

**PUSH-PULL AF POWER AMPLIFIER - Class A<sub>1</sub>****Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE. . . . .	400 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	400 max.	volts
GRID-No.2 INPUT. . . . .	3 max.	watts
PLATE DISSIPATION. . . . .	23 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 max.	volts

**Typical Operation:***Unless otherwise specified, values are for 2 tubes*

Plate Voltage. . . . .	250	270	volts
Grid-No.2 Voltage. . . . .	250	270	volts
Grid-No.1 (Control-Grid) Voltage.	-16	-17.5	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage. . . . .	32	35	volts



5881

5881

## BEAM POWER TUBE

Zero-Signal Plate Current. . .	120	134	ma
Max.-Signal Plate Current. . .	140	155	ma
Zero-Signal Grid-No.2 Current.	10	11	ma
Max.-Signal Grid-No.2 Current.	16	17	ma
Plate Resistance (Approx., per tube). . . . .	24500	23500	ohms
Transconductance (Per tube). .	5500	5700	μmhos
Effective Load Resistance (Plate to plate) . . . . .	5000	5000	ohms
Total Harmonic Distortion. . .	2	2	%
Max.-Signal Power Output . . .	14.5	17.5	watts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

**PUSH-PULL AF POWER AMPLIFIER - Class AB<sub>1</sub>****Maximum Ratings, Design-Center Values:**

PLATE VOLTAGE. . . . .	400 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE. . . . .	400 max.	volts
GRID-No.2 INPUT. . . . .	3 max.	watts
PLATE DISSIPATION. . . . .	23 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200 max.	volts

**Typical Operation:***Values are for 2 tubes*

Plate Voltage. . . . .	360	360	volts
Grid-No.2 Voltage. . . . .	270	270	volts
Grid-No.1 (Control-Grid) Voltage†	-22.5	-22.5	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage. . . . .	45	45	volts
Zero-Signal Plate Current. . . . .	88	88	ma
Max.-Signal Plate Current. . . . .	132	140	ma
Zero-Signal Grid-No.2 Current. . . . .	5	5	ma
Max.-Signal Grid-No.2 Current. . . . .	15	11	ma
Effective Load Resistance (Plate to plate) . . . . .	6600	3800	ohms
Total Harmonic Distortion. . . . .	2	2	%
Max.-Signal Power Output . . . . .	26.5	18	watts

**Maximum Circuit Values:**

Grid-No.1-Circuit Resistance:†

For fixed-bias operation . . . . .	0.1 max.	megohm
For cathode-bias operation . . . . .	0.5 max.	megohm

†: See next page.



5881

## BEAM POWER TUBE

PUSH-PULL AF POWER AMPLIFIER - Class AB<sub>1</sub>

Triode Connection - Grid No.2 Connected to Plate

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	400 max.	volts
PLATE DISSIPATION . . . . .	26 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 max.	volts

## Typical Operation:

Values are for 2 tubes

Plate Voltage . . . . .	400	volts
Grid-No.1 (Control-Grid) Voltage† . . . . .	-45	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage. . . . .	90	volts
Zero-Signal Plate Current . . . . .	65	ma
Max.-Signal Plate Current . . . . .	130	ma
Effective Load Resistance (Plate to plate). . . . .	4000	ohms
Total Harmonic Distortion . . . . .	4.4	%
Max.-Signal Power Output. . . . .	13.3	watts

## Maximum Circuit Values:

Grid-No.1-Circuit Resistance:†		
For fixed-bias operation. . . . .	0.1 max.	megohm
For cathode-bias operation. . . . .	0.5 max.	megohm

PUSH-PULL AF POWER AMPLIFIER - Class AB<sub>2</sub>

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	400 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	400 max.	volts
GRID-No.2 INPUT . . . . .	3 max.	watts
PLATE DISSIPATION . . . . .	23 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode . . . . .	200 max.	volts
Heater positive with respect to cathode . . . . .	200 max.	volts

## Typical Operation:

Values are for 2 tubes

Plate Voltage . . . . .	360	360	volts
Grid-No.2 Voltage . . . . .	225	270	volts
Grid-No.1 (Control-Grid) Voltage <sup>■</sup> . . . . .	-18	-22.5	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage . . . . .	52	72	volts
Zero-Signal Plate Current . . . . .	78	88	ma

† The type of input coupling used should not introduce too much resistance in the grid-no.1 circuit. Transformer- or impedance-coupling devices are recommended.

■: See next page.





5881

5881

### BEAM POWER TUBE

Max.—Signal Plate Current . . .	147	205	ma
Zero-Signal Grid-No.2 Current .	3.5	5	ma
Max.—Signal Grid-No.2 Current .	11	16	ma
Effective Load Resistance (Plate to plate) . . . . .	6000	3800	ohms
Total Harmonic Distortion . . .	2	2	%
Max.—Signal Power Output . . . .	31	47	watts

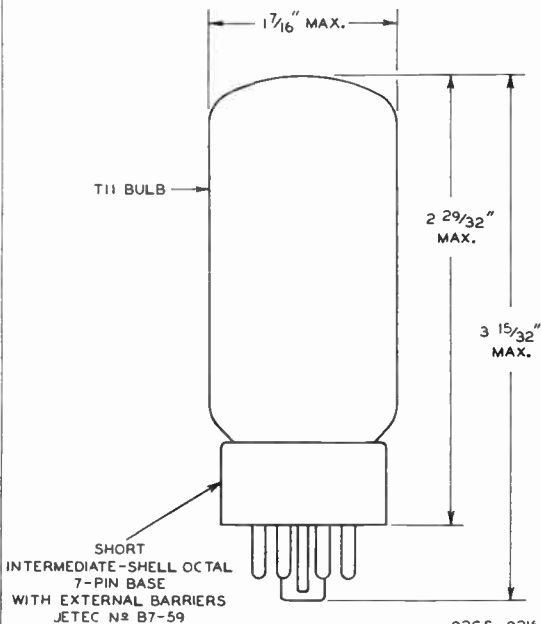
#### Maximum Circuit Values:

Grid-No.1-Circuit Resistance: ■

- For fixed-bias operation . . . . . 0.1 max. megohm
- For cathode-bias operation . . . . . Not recommended

■ Driver stage should be capable of supplying the specified driving power at low distortion to the No.1 grids of the AB<sub>2</sub> stage. To minimize distortion, the effective resistance per grid-No.1 circuit of the AB<sub>2</sub> stage should be held at a low value. For this purpose, the use of transformer coupling is recommended.

Curves shown under Types 6L6, 6L6-G also apply to the 5881



92CS-9216





6973

6973

# BEAM POWER TUBE

9-PIN MINIATURE TYPE

For high-fidelity audio-amplifier applications

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:		
Voltage . . . . .	6.3	ac or dc volts
Current . . . . .	0.45	amp
Direct Interelectrode Capacitances: <sup>0</sup>		
Grid No.1 to plate . . . . .	0.7 max.	$\mu$ f
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	8	$\mu$ f
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	8.5	$\mu$ f

### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	250	volts
Grid-No.2 (Screen-Grid) Voltage . . . . .	250	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	-15	volts
Plate Resistance (Approx.) . . . . .	73000	ohms
Transconductance . . . . .	4800	$\mu$ hos
Plate Current . . . . .	46	ma
Grid-No.2 Current . . . . .	3.5	ma
Grid-No.1 Voltage (Approx.) for plate current of 100 $\mu$ a. . . . .	-40	volts

### 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" $\pm$ 3/32"
Maximum Diameter . . . . .	7/8"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9EU

Pin 1 - Grid No.2		Pin 6 - Grid No.1
Pin 2 - No Connection		Pin 7 - Grid No.3, Cathode
Pin 3 - Grid No.1		Pin 8 - Grid No.2
Pin 4 - Heater		Pin 9 - Plate
Pin 5 - Heater		

## PUSH-PULL AF POWER AMPLIFIER — Class AB<sub>1</sub>

### Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	400 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	300 max.	volts
GRID-No.2 INPUT . . . . .	2 max.	watts
PLATE DISSIPATION . . . . .	12 max.	watts

<sup>0</sup>: See next page.

6973



6973

## BEAM POWER TUBE

### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . .	200	max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup>	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface) . . . . .	250	max.	°C

### Typical Operation with Fixed Bias:

*Values are for 2 tubes*

Plate Voltage. . . . .	250	350	400	volts
Grid-No.2 Voltage. . . . .	250	280	290	volts
Grid-No.1 (Control-Grid) Voltage <sup>●</sup> . . . . .	-15	-22	-25	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage. . . . .	30	44	50	volts
Zero-Signal Plate Current. . . . .	92	58	50	ma
Max.-Signal Plate Current. . . . .	105	106	107	ma
Zero-Signal Grid-No.2 Current. . . . .	7	3.5	2.5	ma
Max.-Signal Grid-No.2 Current. . . . .	16	14	13.7	ma
Effective Load Resistance (Plate to plate). . . . .	8000	7500	8000	ohms
Total Harmonic Distortion. . . . .	2	1.5	2	%
Max.-Signal Power Output . . . . .	12.5	20	24	watts

### Typical Operation with Cathode Bias:

*Values are for 2 tubes*

Plate-Supply Voltage . . . . .	300	310	volts
Grid-No.2 Supply Voltage . . . . .	300	310	volts
Cathode Resistor . . . . .	230	270	ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage . . . . .	48	55	volts
Zero-Signal Plate Current. . . . .	80	77	ma
Max.-Signal Plate Current. . . . .	96	92	ma
Zero-Signal Grid-No.2 Current. . . . .	6	5	ma
Max.-Signal Grid-No.2 Current. . . . .	14	14	ma
Effective Load Resistance (Plate to plate). . . . .	5500	6000	ohms
Total Harmonic Distortion. . . . .	2	4	%
Max.-Signal Power Output . . . . .	15	17	watts

### Maximum Circuit Values:

#### Grid-No.1-Circuit Resistance:<sup>●</sup>

For fixed-bias operation . . . . .	0.5	max.	megohm
For cathode-bias operation . . . . .	1	max.	megohm

### PUSH-PULL AF POWER AMPLIFIER — Class AB<sub>1</sub>

*Grid No.2 of each tube connected to tap on plate winding of output transformer*

### Maximum Ratings, Design-Center Values:

PLATE AND GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	375	max.	volts
--	-----	------	-------

○, ▲, ●: See next page.



6973

6973

## BEAM POWER TUBE

GRID-No.2 INPUT. . . . .	1.75	max.	watts
PLATE DISSIPATION. . . . .	12	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200	max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup>	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface) . . . . .	250	max.	°C

**Typical Operation:***Values are for 2 tubes*

	Fixed Bias	Cathode Bias	
Plate-Supply Voltage . . . . .	375	370	volts
Grid-No.2 Supply Voltage . . . . .	*	#	volts
Grid-No.1 (Control-Grid) Voltage . . . . .	-33.5	-	volts
Cathode Resistor . . . . .	-	355	ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage. . . . .	67	62	volts
Zero-Signal Cathode Current. . . . .	62	74	ma
Max.-Signal Cathode Current. . . . .	95	84	ma
Effective Load Resistance (Plate to plate). . . . .	12500	13000	ohms
Total Harmonic Distortion. . . . .	1.5	1.2	%
Max.-Signal Power Output . . . . .	18.5	15	watts

**Maximum Circuit Values:**

## Grid-No.1-Circuit Resistance:•

For fixed-bias operation . . . . .	0.5 max.	megohm
For cathode-bias operation . . . . .	1 max.	megohm

○ Without external shield.

▲ The dc component must not exceed 100 volts.

● The type of input coupling network used should not introduce too much resistance in the grid-No.1 circuit. Transformer- or impedance-coupling devices are recommended.

\* Obtained from taps on the primary winding of the output transformer. The taps are located on each side of the center tap (B+) so as to apply 50 per cent of the plate signal voltage to grid No.2 of each output tube.

# Obtained from taps on the primary winding of the output transformer. The taps are located on each side of the center tap (B+) so as to supply 43 per cent of the plate signal voltage to grid No.2 of each output tube.

6973



6973

# AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID - No 1 VOLTS = 0

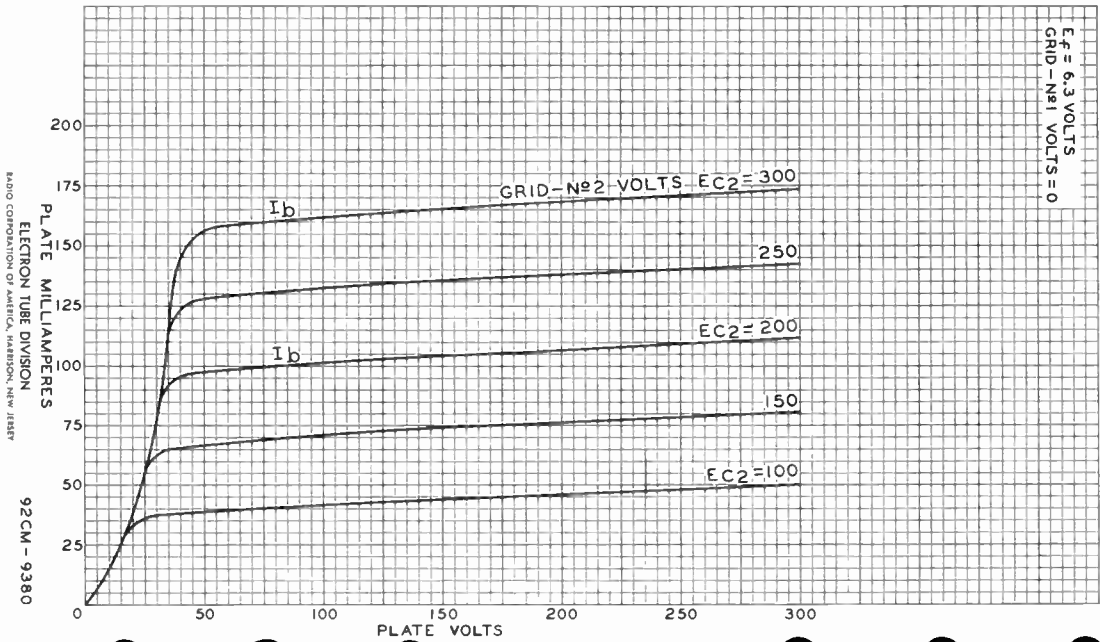


PLATE MILLIAMPERES  
ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM - 9380



6973

6973

### AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID-N<sup>o</sup>2 VOLTS = 250

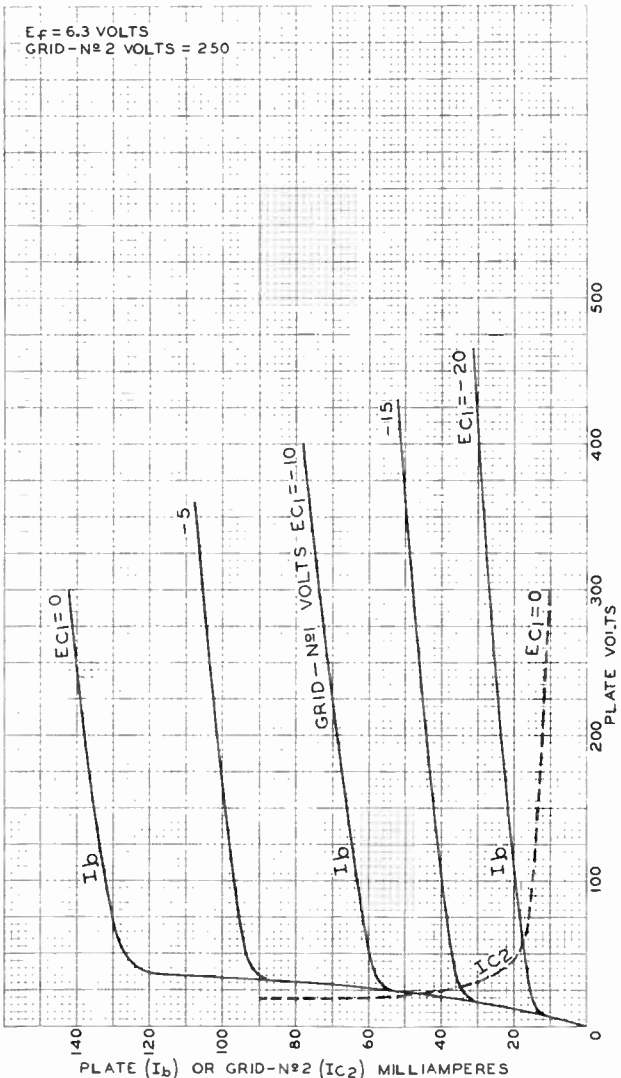


PLATE ( $I_b$ ) OR GRID-N<sup>o</sup>2 ( $I_{c2}$ ) MILLIAMPERES

ELECTRON TUBE DIVISION  
RADIO CORPORATION OF AMERICA, HARRISON NEW JERSEY

92CM - 9389

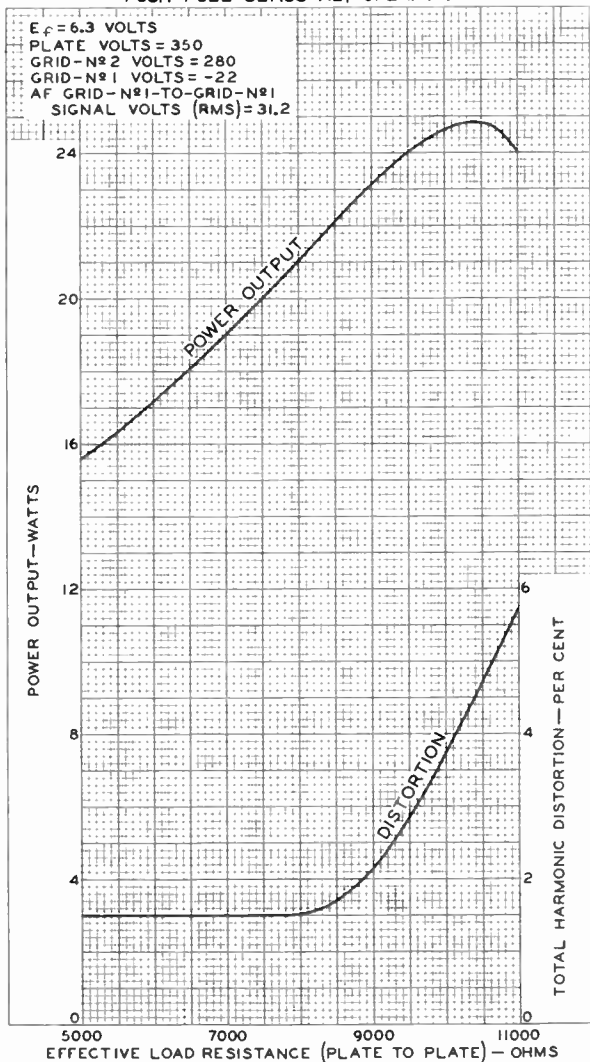
6973



6973

### OPERATION CHARACTERISTICS PUSH-PULL CLASS AB<sub>1</sub> OPERATION

$E_f = 6.3$  VOLTS  
 PLATE VOLTS = 350  
 GRID-N<sup>o</sup>2 VOLTS = 280  
 GRID-N<sup>o</sup>1 VOLTS = -22  
 AF GRID-N<sup>o</sup>1-TO-GRID-N<sup>o</sup>1  
 SIGNAL VOLTS (RMS) = 31.2



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

92CM-9381





7025

7025

**HIGH-MU TWIN TRIODE**

9-PIN MINIATURE TYPE

*For high-fidelity audio-amplifier applications critical as to noise and hum. In other respects, the 7025 is similar to the 12AX7.*

**GENERAL DATA****Electrical:**

Heater, for Unipotential Cathodes:

Heater arrangement	Series	Parallel	
Voltage. . . . .	12.6	6.3	ac or dc volts
Current. . . . .	0.15	0.3	. . . . . amp

Direct Interelectrode Capacitances (Approx.):<sup>o</sup>

	Unit No. 1	Unit No. 2	
Grid to plate. . .	1.7	1.7	. . . . . $\mu\mu\text{f}$
Grid to cathode and heater . . .	1.6	1.6	. . . . . $\mu\mu\text{f}$
Plate to cathode and heater . . .	0.46	0.34	. . . . . $\mu\mu\text{f}$

**Equivalent-Noise and Hum Voltage (Referenced to Grid):***Values are for Each Unit*

Average Value (RMS). . . . . 1.8 microvolts

Measured in "true rms" units under the following conditions: heater volts = 6.3 ac (parallel connection), center-tap of heater transformer connected to ground, dc plate-supply volts = 250, plate load resistor (megohms) = 0.1, cathode resistor (ohms) = 2700, cathode-bypass capacitor ( $\mu\text{f}$ ) = 100, grid resistor (ohms) = 0, and amplifier covering frequency range between 25 and 10,000 cps.

Maximum Value (RMS). . . . . 7 microvolts

Measured in "true rms" units under the same conditions as for "Average Value" except that the cathode resistor is unbypassed, and grid resistor (megohms) = 0.05.

**Characteristics, Class A<sub>1</sub> Amplifier (Each Unit):**

Plate Voltage. . . . .	100	250	volts
Grid Voltage . . . . .	-1	-2	volts
Amplification Factor . . . . .	100	100	
Plate Resistance (Approx.) . . . . .	80000	62500	ohms
Transconductance . . . . .	1250	1600	$\mu\text{mhos}$
Plate Current . . . . .	0.5	1.2	ma

**Mechanical:**

Operating Position . . . . .	. . . . .	Any
Maximum Overall Length . . . . .	. . . . .	2-3/16"
Maximum Seated Length. . . . .	. . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	. . . . .	1-9/16" $\pm$ 3/32"
Diameter . . . . .	. . . . .	0.750" to 0.875"
Dimensional Outline. . . . .	. . . . .	See General Section
Bulb . . . . .	. . . . .	T6-1/2

<sup>o</sup>: See next page.



7025

## HIGH-MU TWIN TRIODE

Base . . . . . Small-Button Noval 9-Pin (JEDEC No.E9-1)  
 Basing Designation for BOTTOM VIEW . . . . . 9A

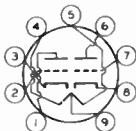
Pin 1 - Plate of  
 Unit No.2

Pin 2 - Grid of  
 Unit No.2

Pin 3 - Cathode of  
 Unit No.2

Pins 4 & 9 - Heater of  
 Unit No.2

Pins 5 & 9 - Heater of  
 Unit No.1



Pin 6 - Plate of  
 Unit No.1

Pin 7 - Grid of  
 Unit No.1

Pin 8 - Cathode of  
 Unit No.1

Pin 9 - Heater  
 Mid-Tap

AMPLIFIER — Class A<sub>1</sub>

Values are for Each Unit

## Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE. . . . . 330 max. volts

## GRID VOLTAGE:

Negative-bias value. . . . . 55 max. volts

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

PLATE DISSIPATION. . . . . 1.2 max. watts

## PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. 200 max. volts

Heater positive with respect to cathode. 200<sup>▲</sup> max. volts

## Typical Operation as Resistance-Coupled Amplifier (Each Unit):

See RESISTANCE-COUPLED AMPLIFIER CHART No. 25  
 at front of Receiving Tube Section

<sup>○</sup> Without external shield.

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

## OPERATING CONSIDERATIONS

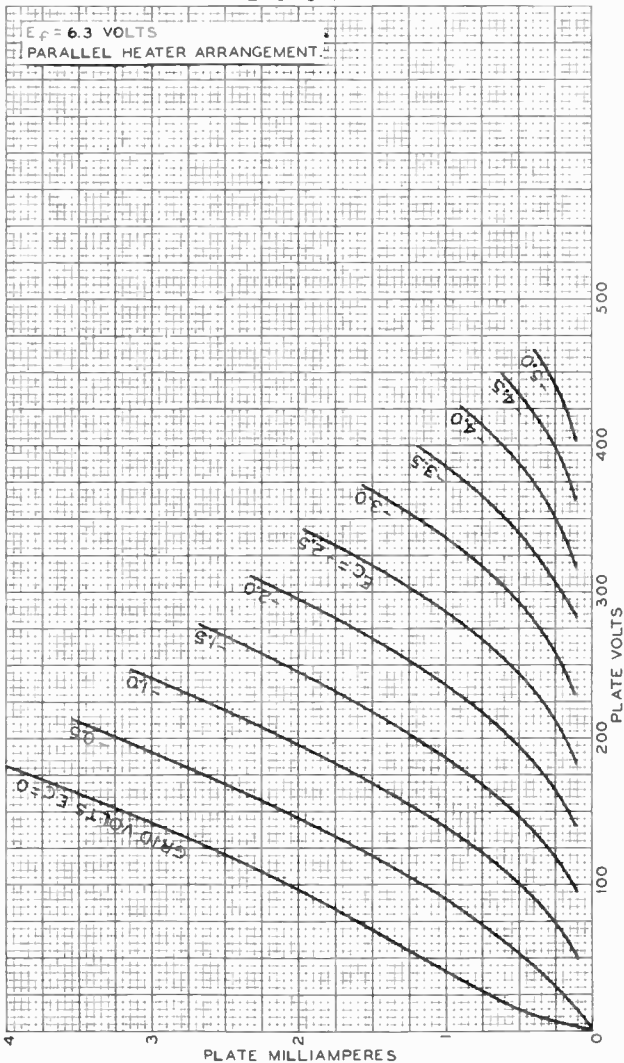
*Parallel heater arrangement* is recommended for use in high-gain, resistance-coupled-amplifier applications such as in the preamplifier stages of phonographs, microphones, and tape recorders. With closely paired, electrostatically shielded heater leads, a hum-balance control is unnecessary when the center-tap of the heater transformer is connected to ground. In applications where the heater-transformer winding does not have a center-tap, a 100-ohm hum-balancing potentiometer should be connected across the heater leads with the slider connected to ground.



7025

# AVERAGE PLATE CHARACTERISTICS EACH UNIT

7025



ELECTRON TUBE DIVISION

92CM-6879

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

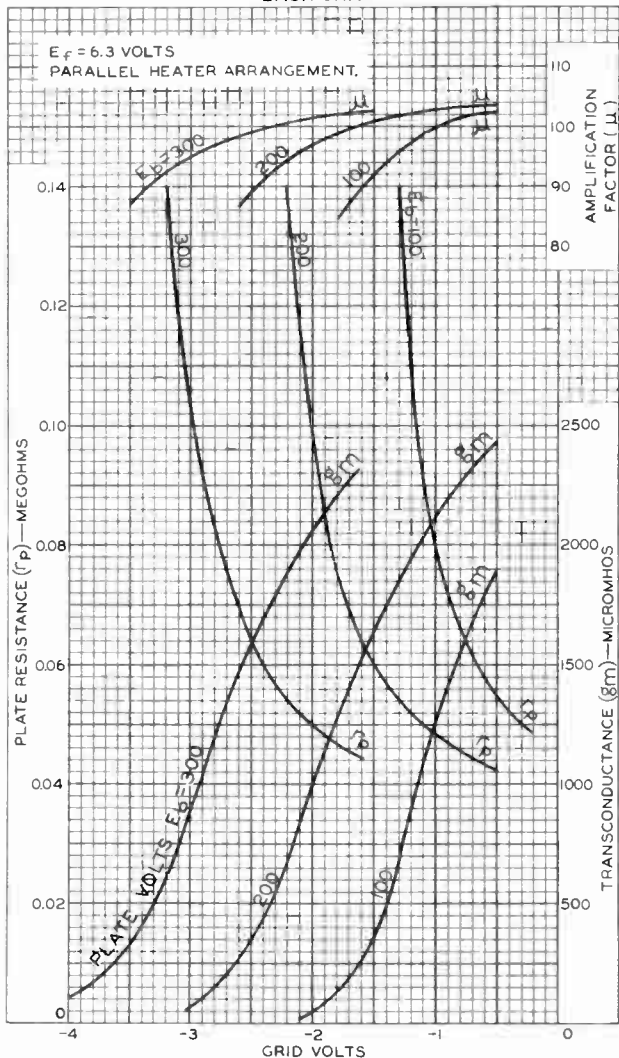
World Radio History

7025



7025

# AVERAGE CHARACTERISTICS EACH UNIT



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

World Radio History

92CM-6880



7027-A

# 7027-A

## BEAM POWER TUBE

For high-fidelity audio-amplifier applications

Supersedes Type 7027

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3	volts
Current . . . . .	0.9	amp

Direct Interelectrode Capacitances:<sup>0</sup>

Grid No.1 to plate . . . . .	1.5	$\mu\mu\text{f}$
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	10	$\mu\mu\text{f}$
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	7.5	$\mu\mu\text{f}$

#### Characteristics, Class A<sub>1</sub> Amplifier:

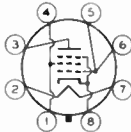
Plate Voltage . . . . .	250	volts
Grid-No.2 Voltage . . . . .	250	volts
Grid-No.1 Voltage . . . . .	-14	volts
Plate Resistance (Approx.) . . . . .	22500	ohms
Transconductance . . . . .	6000	$\mu\text{mhos}$
Plate Current . . . . .	72	ma
Grid-No.2 Current . . . . .	5	ma

#### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	4.62"
Maximum Seated Length . . . . .	4.06"
Maximum Diameter . . . . .	1.63"
Bulb . . . . .	T12
Base . . . . .	Small-Wafer Octal 8-Pin with "950" Sleeve (JEDEC Group 1, No. B8-191)

Basing Designation for BOTTOM VIEW . . . . . 8HY

- Pin 1 - Grid No.2
- Pin 2 - Heater
- Pin 3 - Plate
- Pin 4 - Grid No.2
- Pin 5 - Grid No.1



- Pin 6 - Grid No.1
- Pin 7 - Heater
- Pin 8 - Cathode,  
Grid No.3

### PUSH-PULL AF POWER AMPLIFIER — Class AB<sub>1</sub>

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE . . . . .	600	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE . . . . .	500	max.	volts
GRID-No.2 INPUT . . . . .	5	max.	watts
PLATE DISSIPATION . . . . .	35	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200	max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup>	max.	volts

7027-A



7027-A

## BEAM POWER TUBE

## Typical Operation with Fixed Bias:

Values are for 2 tubes

Plate Voltage . . . . .	400	450	540	volts
Grid-No.2 Voltage . . . . .	300	350	400	volts
Grid-No.1 (Control-Grid) Voltage* . . . . .	-25	-30	-38	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage . . . . .	50	60	76	volts
Zero-Signal Plate Current . . . . .	102	95	100	ma
Max.-Signal Plate Current . . . . .	152	194	220	ma
Zero-Signal Grid-No.2 Current . . . . .	6	3.4	5	ma
Max.-Signal Grid-No.2 Current . . . . .	17	19.2	21.4	ma
Effective Load Resistance (Plate to plate). . . . .	6600	6000	6500	ohms
Total Harmonic Distortion . . . . .	2	1.5	2	%
Max.-Signal Power Output. . . . .	34	50	76	watts

## Typical Operation with Cathode Bias:

Values are for 2 tubes

Plate Supply Voltage. . . . .	400	380	425	volts
Grid-No.2 Supply Voltage. . . . .	300	380	425	volts
Cathode Resistor. . . . .	200	180	200	ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage . . . . .	57	68.5	86	volts
Zero-Signal Plate Current . . . . .	112	138	150	ma
Max.-Signal Plate Current . . . . .	128	170	196	ma
Zero-Signal Grid-No.2 Current . . . . .	7	5.6	8	ma
Max.-Signal Grid-No.2 Current . . . . .	16	20	20	ma
Effective Load Resistance (Plate to plate). . . . .	6600	4500	3800	ohms
Total Harmonic Distortion . . . . .	2	3.5	4	%
Max.-Signal Power Output. . . . .	32	36	44	watts

## Maximum Circuit Values:

Grid-No.1-Circuit Resistance:\*

For fixed-bias operation. . . . .	0.1 max.	megohms
For cathode-bias operation. . . . .	0.5 max.	megohms

PUSH-PULL AF POWER AMPLIFIER — Class AB<sub>1</sub>

Grid No.2 of each tube connected to tap on  
plate winding of output transformer

## Maximum Ratings, Design-Maximum Values:

PLATE AND GRID-No.2 (SCREEN-GRID)			
SUPPLY VOLTAGE. . . . .	600	max.	volts
GRID-No.2 INPUT . . . . .	4.5	max.	watts
PLATE DISSIPATION . . . . .	35	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode. . . . .	200	max.	volts
Heater positive with respect to cathode. . . . .	200 <sup>▲</sup>	max.	volts



7027-A

7027-A

### BEAM POWER TUBE

#### Typical Operation:

*Values are for 2 tubes*

Plate Supply Voltage. . . . .	410	volts
Grid-No.2 Supply Voltage. . . . .	*	volts
Cathode Resistor. . . . .	220	ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage. .	68	volts
Zero-Signal Cathode Current . . . . .	134	ma
Max.-Signal Cathode Current . . . . .	155	ma
Effective Load Resistance (Plate to plate). . . . .	8000	ohms
Total Harmonic Distortion . . . . .	1.6	%
Max.-Signal Power Output. . . . .	24	watts

#### Maximum Circuit Values:

Grid-No.1-Circuit Resistance: •  
 For cathode-bias operation. . . . . 0.5 max. megohm

- without external shield.
- ▲ The dc component must not exceed 100 volts.
- The type of input coupling network used should not introduce too much resistance in the grid-No.1 circuit. Transformer- or impedance-coupling devices are recommended.
- \* Obtained from taps on the primary winding of the output transformer. The taps are located on each side of the center-tap (B<sup>+</sup>) so as to apply 43 per cent of the plate signal voltage to grid No.2 of each output tube.

#### OPERATING CONSIDERATIONS

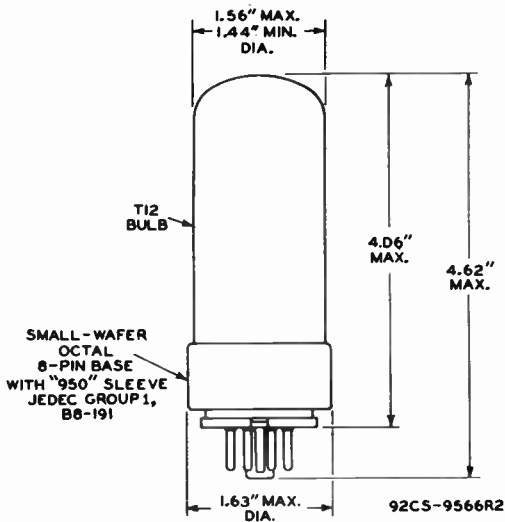
The *bulb* becomes hot during operation. To insure adequate cooling, therefore, it is essential that free circulation of air be provided around the 7027-A.

7027-A



7027-A

BEAM POWER TUBE





7027-A



7027-A

# AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
GRID-N#1 VOLTS=0

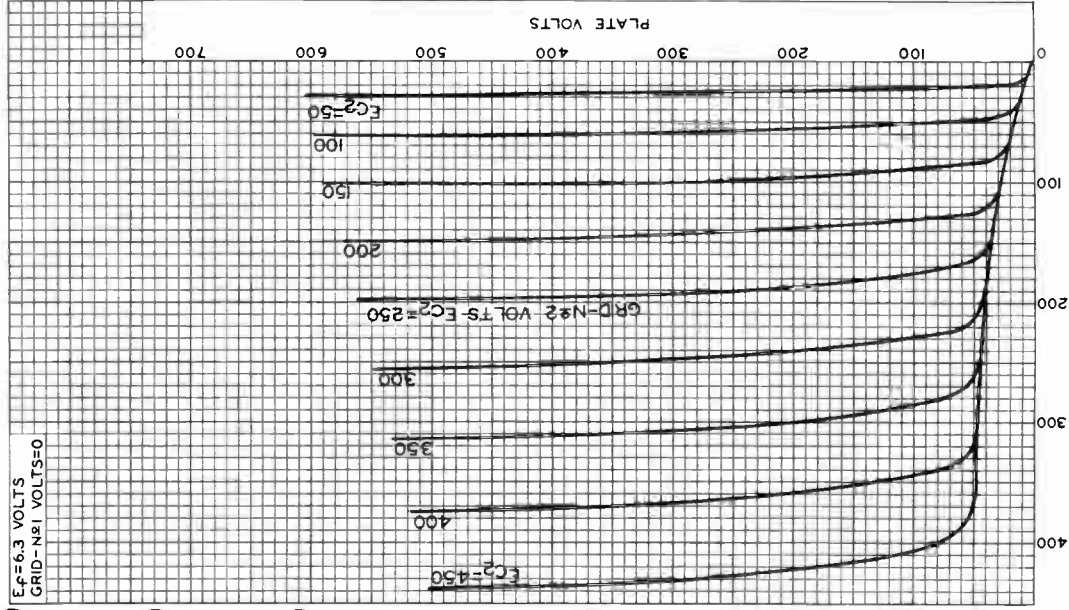


PLATE MILLIAMPERES

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

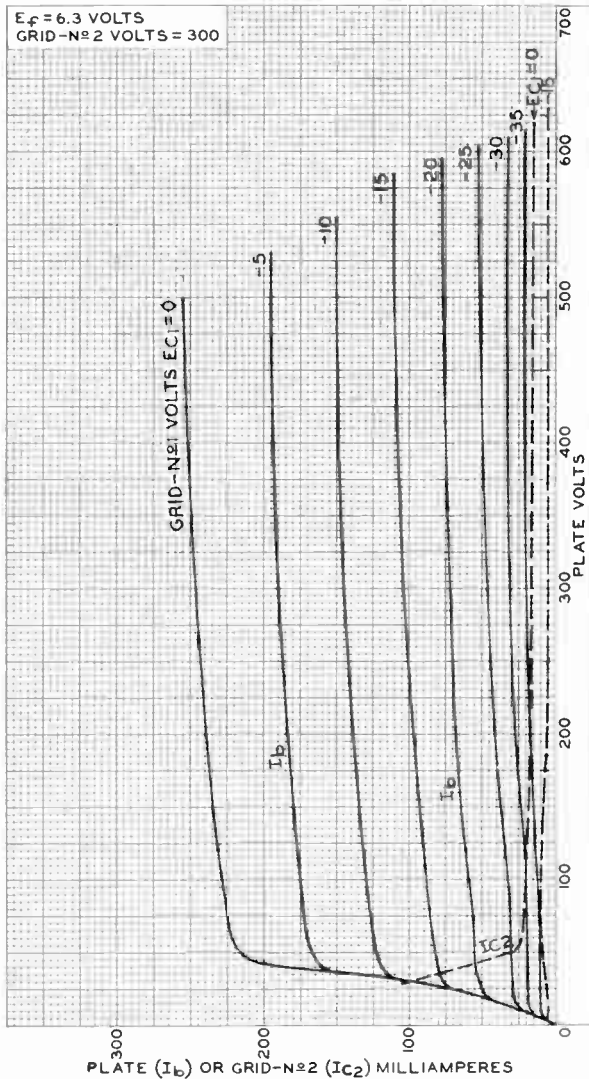
92CM-10132

7027-A



7027-A

## AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION

92CM-10133

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

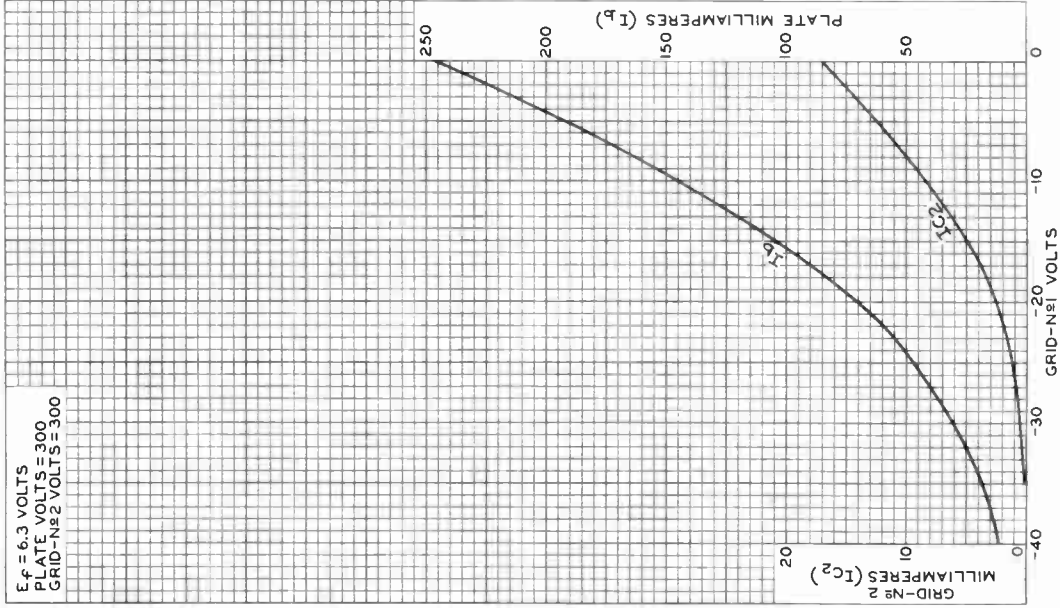
World Radio History



7027-A

### AVERAGE CHARACTERISTICS

$E_f = 6.3$  VOLTS  
PLATE VOLTS = 300  
GRID-No2 VOLTS = 300



7027-A

7027-A



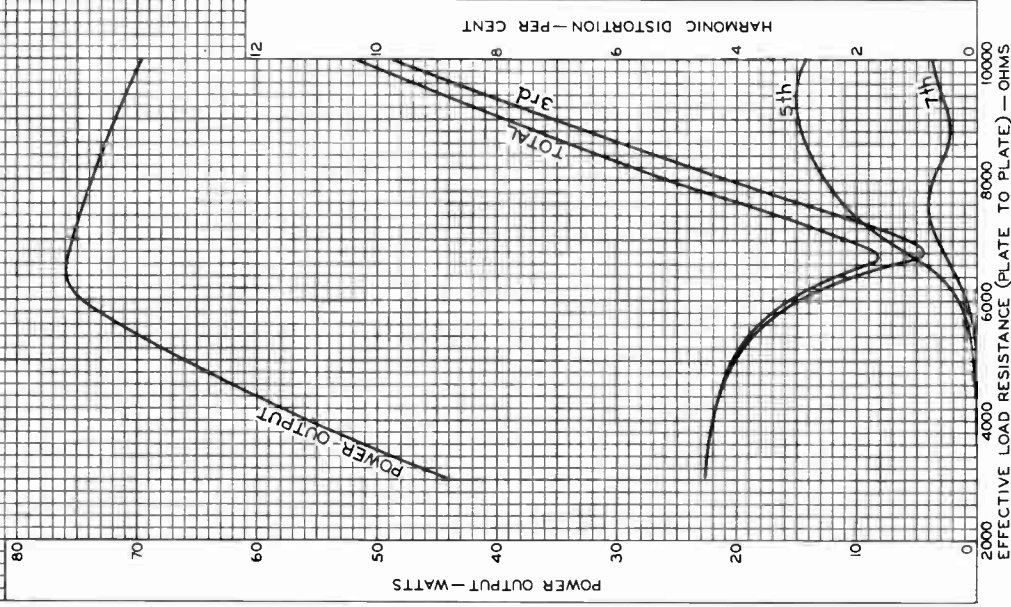
7027-A

### OPERATION CHARACTERISTICS PUSH-PULL CLASS AB<sub>1</sub>

$E_f = 6.3$  VOLTS  
PLATE VOLTS = 540

GRID-N<sub>2</sub> VOLTS = 400  
GRID-N<sub>2</sub> VOLTS = -38

AF GRID-N<sub>01</sub>-TO-GRID-N<sub>01</sub> VOLTS (RMS) = 53.7

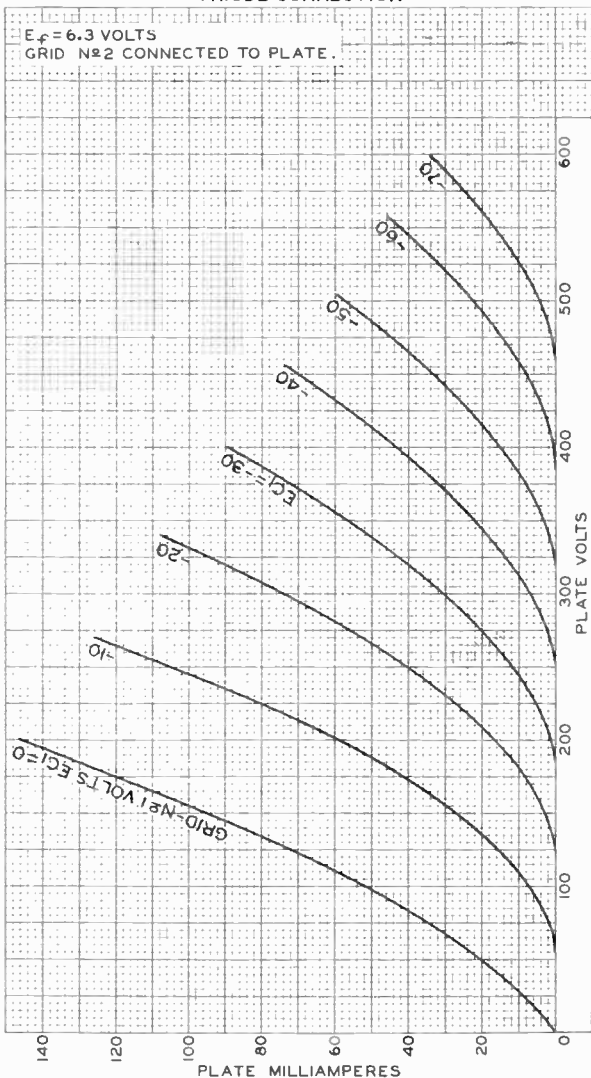




7027-A

7027-A

### AVERAGE PLATE CHARACTERISTICS TRIODE CONNECTION



ELECTRON TUBE DIVISION

92CM-9568

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

World Radio History





7189

# POWER PENTODE

9-PIN MINIATURE TYPE

7189

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC) . . . . .	6.3	volts
Current . . . . .	0.76	amp
Direct Interelectrode Capacitances (Approx.): <sup>o</sup>		
Grid No.1 to plate. . . . .	0.5	$\mu$ f
Grid No.1 to cathode & grid No.3, grid No.2, and heater . . . . .	10.8	$\mu$ f
Plate to cathode & grid No.3, grid No.2, and heater . . . . .	6.5	$\mu$ f
Grid No.1 to heater . . . . .	0.25	$\mu$ f

### Characteristics, Class A<sub>1</sub> Amplifier:

Plate Voltage . . . . .	250	volts
Grid-No.2 Voltage . . . . .	250	volts
Grid-No.1 Voltage . . . . .	-7.3	volts
Mu-Factor, Grid No.2 to Grid No.1 . . . . .	19.5	
Plate Resistance (Approx.) . . . . .	40000	ohms
Transconductance . . . . .	11300	$\mu$ mhos
Plate Current . . . . .	48	ma
Grid-No.2 Current . . . . .	5.5	ma

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	3-1/16"
Maximum Seated Length . . . . .	2-13/16"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	2-7/16" $\pm$ 3/32"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline . . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9CV

Pin 1 - Internal Connection—  
Do Not Use  
Pin 2 - Grid No.1  
Pin 3 - Cathode,  
Grid No.3



Pin 4 - Heater  
Pin 5 - Heater  
Pin 6 - Same as Pin 1  
Pin 7 - Plate  
Pin 8 - Same as Pin 1  
Pin 9 - Grid No.2

### PUSH-PULL AF POWER AMPLIFIER — Class AB<sub>1</sub>

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

PLATE VOLTAGE . . . . .	400 max.	volts
GRID-No.2 VOLTAGE . . . . .	300 max.	volts
CATHODE CURRENT . . . . .	65 max.	ma
PLATE DISSIPATION . . . . .	12 max.	watts
ZERO-SIGNAL GRID-No.2 INPUT . . . . .	2 max.	watts
MAX.-SIGNAL GRID-No.2 INPUT . . . . .	4 max.	watts

7189



7189

## POWER PENTODE

## PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode.	100 max.	volts
Heater positive with respect to cathode.	100 max.	volts

## Typical Operation:

*Values are for 2 tubes*

Plate Voltage. . . . .	400	volts
Grid-No.2 Voltage. . . . .	300	volts
Grid-No.1 Voltage. . . . .	-15	volts
Peak AF Grid-No.1 Voltage. . . . .	14.8	volts
Zero-Signal Plate Current. . . . .	15	ma
Max.-Signal Plate Current. . . . .	105	ma
Zero-Signal Grid-No.2 Current. . . . .	1.6	ma
Max.-Signal Grid-No.2 Current. . . . .	25	ma
Effect Load Resistance (Plate to plate) . . . . .	8000	ohms
Total Harmonic Distortion. . . . .	4	%
Max.-Signal Power Output . . . . .	24	watts

## Maximum Circuit Values:

## Grid-No.1-Circuit Resistance:

For fixed-bias operation . . . . .	0.3 max.	megohm
------------------------------------	----------	--------

PUSH-PULL AF POWER AMPLIFIER — Class AB<sub>1</sub>

*Grid No.2 of each tube connected to tap  
on plate winding of output transformer*

## Maximum Ratings, Design-Center Values:

PLATE VOLTAGE . . . . .	375 max.	volts
CATHODE CURRENT . . . . .	65 max.	ma
PLATE DISSIPATION . . . . .	12 max.	watts
ZERO-SIGNAL GRID-No.2 INPUT . . . . .	2 max.	watts
MAX.-SIGNAL GRID-No.2 INPUT . . . . .	4 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	100 max.	volts
Heater positive with respect to cathode.	100 max.	volts

## Typical Operation:

*Values are for 2 tubes*

Plate Supply Voltage. . . . .	375	volts
Grid-No.2 Supply Voltage. . . . .	♦	
Cathode Resistor. . . . .	220	ohms
Peak AF Grid-No.1 Voltage . . . . .	17.7	volts
Zero-Signal Plate Current . . . . .	70	ma
Max.-Signal Plate Current . . . . .	81	ma
Effective Load Resistance (Plate to plate). . . . .	11000	ohms
Total Harmonic Distortion . . . . .	3	%
Max.-Signal Power Output. . . . .	16.5	watts





7189

7189

## POWER PENTODE

### Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For cathode-bias operation. . . . . 1 max. megohm

○ Without external shield.

◆ Obtained from taps on the primary winding of the output transformer. The taps are located on each side of the center-tap (B+) so as to supply 43 per cent of the plate signal voltage to grid No.2 of each output tube.





7199

7199

## MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

For high-fidelity audio-amplifier applications critical as to noise and hum

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathodes:

Voltage . . . . . 6.3 ± 10% . . . . ac or dc volts  
Current . . . . . 0.45 . . . . . amp

Direct Interelectrode Capacitances:<sup>0</sup>

#### Triode Unit:

Grid to plate . . . . .	2	μf
Grid to cathode and heater . . . . .	2.3	μf
Plate to cathode and heater . . . . .	0.3	μf

#### Pentode Unit:

Grid No.1 to plate . . . . .	0.06 max.	μf
Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater . . . . .	5	μf
Plate to cathode & internal shield & grid No.3, grid No.2, and heater . . . . .	2	μf

#### Equivalent-Hum and Noise Voltage (Referenced to Grid):

##### Triode Unit

Median Value (RMS) . . . . . 10 microvolts  
Maximum Value (RMS) . . . . . 150 microvolts

Measured in "true rms" units under the following conditions:  
heater volts = 6.3 ac, center-tap of heater transformer connected to ground, plate-supply volts = 250, plate load resistor (megohms) = 0.1, cathode resistor (ohms) = 1500, grid resistor (megohms) = 0.05, and amplifier covering frequency range between 25 and 10,000 cps.

##### Pentode Unit

Median Value (RMS) . . . . . 35 microvolts  
Maximum Value (RMS) . . . . . 100 microvolts

Measured in "true rms" units under the following conditions:  
heater volts = 6.3 ac, center-tap of heater transformer connected to ground, plate-supply volts = 250, plate-load resistor (megohms) = 0.1, grid-No.2 supply volts = 250, grid-No.2 resistor (megohms) = 0.33, grid-No.2-bypass capacitor (μf) = 0.22, cathode resistor (ohms) = 1200, grid-No.1 resistor (megohms) = 0.05, and amplifier covering frequency range between 25 and 10,000 cps.

#### Characteristics, Class A<sub>1</sub> Amplifier:

	Triode Unit	Pentode Unit	
Plate-Supply Voltage . . . . .	215	100 220	volts

0: See next page.

7199



7199

## MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

	Triode Unit	Pentode Unit		
Grid-No.2 Supply voltage . . . . .	-	50	130	volts
Grid-No.1 Voltage. . . . .	-8.5	-	-	volts
Cathode Resistor . . . . .	-	1000	62	ohms
Amplification Factor . . . . .	17	-	-	
Plate Resistance (Approx.) . . . . .	0.0081	1	0.4	megohm
Transconductance . . . . .	2100	1500	7000	$\mu$ mhos
Plate Current. . . . .	9	1.1	12.5	ma
Grid-No.2 Current. . . . .	-	0.35	3.5	ma
Grid-No.1 Voltage (Approx.) for plate $\mu$ a = 10. . . . .	-40	-4	-	volts

### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-3/16"
Maximum Seated Length. . . . .	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-9/16" $\pm$ 3/32"
Diameter . . . . .	0.750" to 0.875"
Dimensional Outline. . . . .	See General Section
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	.9JT

Pin 1 - Triode  
Plate  
Pin 2 - Pentode  
Plate  
Pin 3 - Pentode  
Grid No.2  
Pin 4 - Heater  
Pin 5 - Heater



Pin 6 - Pentode  
Cathode,  
Grid No.3,  
Internal  
Shield  
Pin 7 - Pentode  
Grid No.1  
Pin 8 - Triode  
Cathode  
Pin 9 - Triode  
Grid

### AMPLIFIER — Class A<sub>1</sub>

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

	Triode Unit	Pentode Unit	
PLATE VOLTAGE. . . . .	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . . . . .	-	330 max.	volts
GRID-No.2 VOLTAGE. . . . .	-	See Grid-No.2 Input Rating Chart at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value. . . . .	0 max.	0 max.	volts

0: see next page.



7199

7199

## MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

	Triode Unit	Pentode Unit	
GRID-NO.2 INPUT:			
For grid-No.2 voltages up to 165 volts. . . . .	-	0.6 max.	watt
For grid-No.2 voltages between 165 and 330 volts. . . . .			See Grid-No.2 Input Rating Chart at front of Receiving Tube Section
PLATE DISSIPATION. . . . .	2.4 max.	3 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200 max.	200 max.	volts
Heater positive with respect to cathode . . . . .	200 <sup>▲</sup> max.	200 <sup>▲</sup> max.	volts

### Maximum Circuit Values:

	Triode Unit	Pentode Unit	
Grid-No.1-Circuit Resistance: <sup>*</sup>			
For fixed-bias operation. . . . .	0.5 max.	0.25 max.	megohm
For cathode-bias operation. . . . .	1 max.	1 max.	megohm

<sup>○</sup> Without external shield.

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

<sup>\*</sup> If either unit is operated at maximum rated conditions, grid-No.1-circuit resistances for both units should not exceed the stated values.

### DEFINITIONS

*Median.* That value in a series such that half of the tubes in the series are on one side of it, and half on the other.



7199

7199

# AVERAGE PLATE CHARACTERISTICS TRIODE UNIT

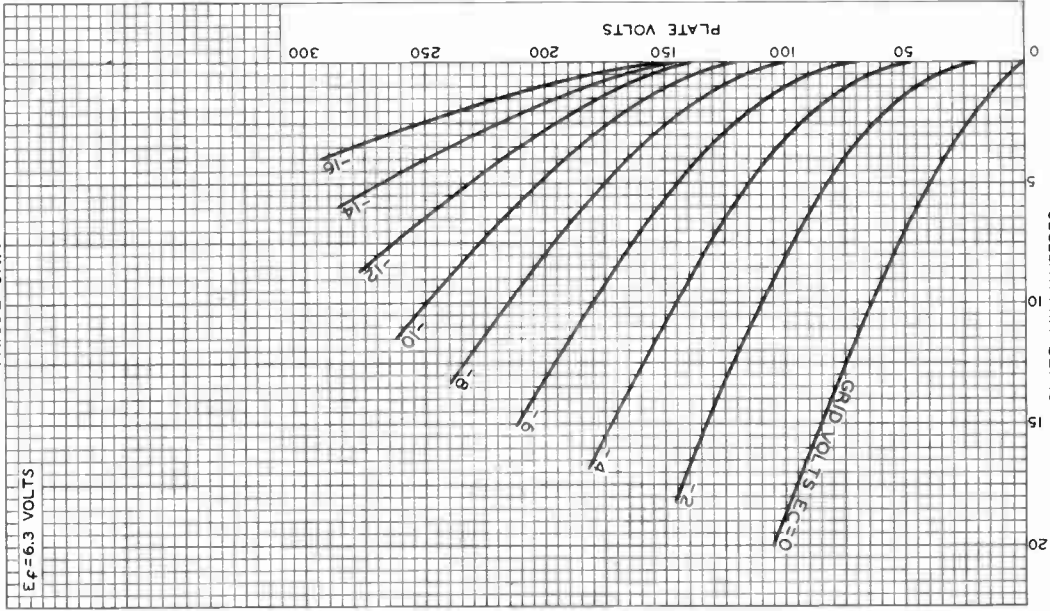


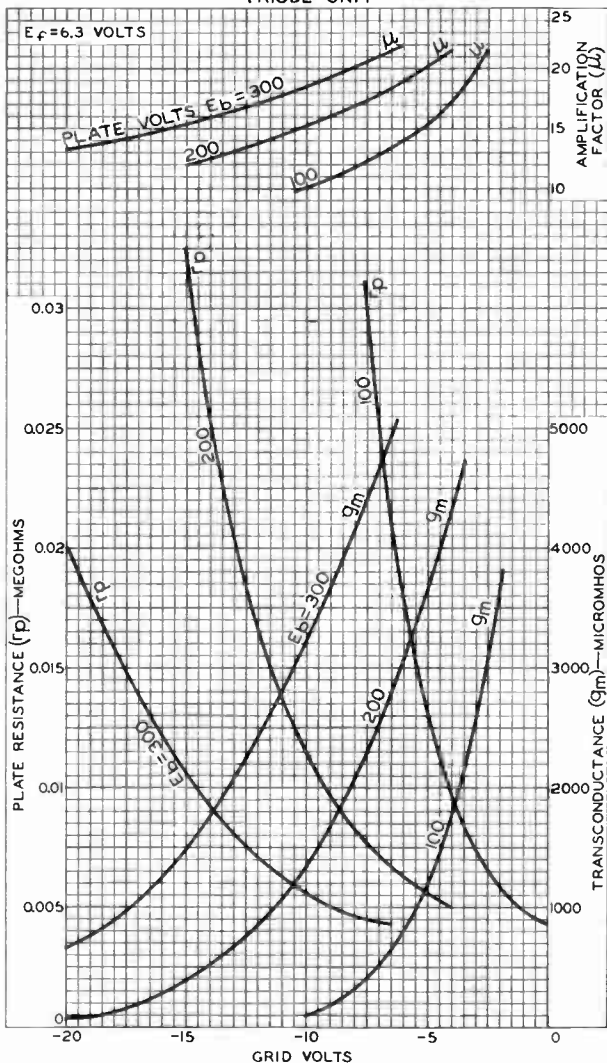
PLATE MILLIAMPERES



7199

7199

### AVERAGE CHARACTERISTICS TRIODE UNIT



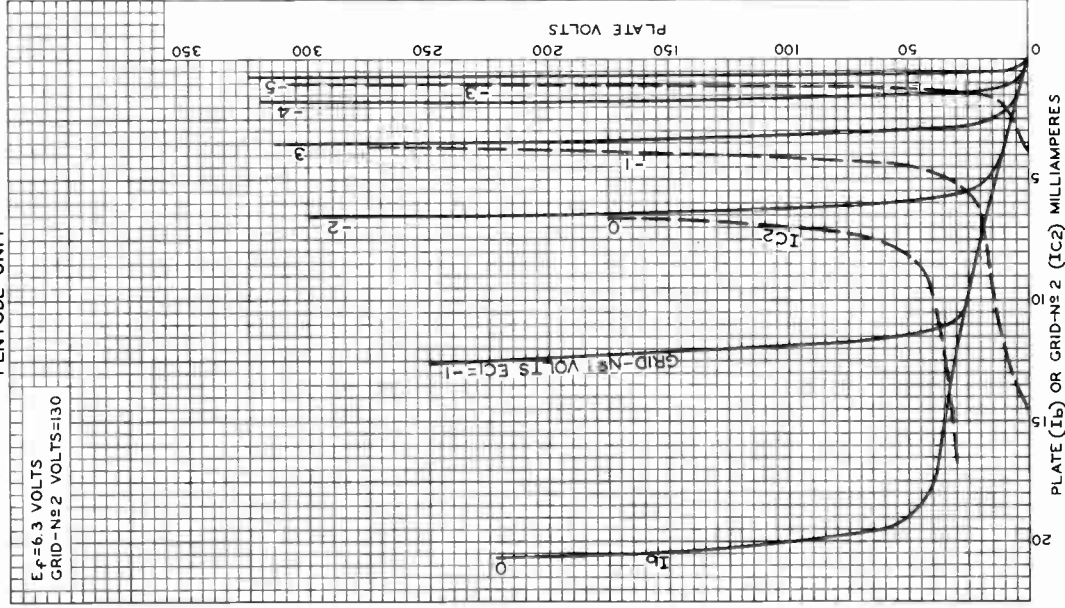
7199



7199

# AVERAGE CHARACTERISTICS PENTODE UNIT

$E_f = 6.3$  VOLTS  
GRID-N $\approx$ 2 VOLTS=130

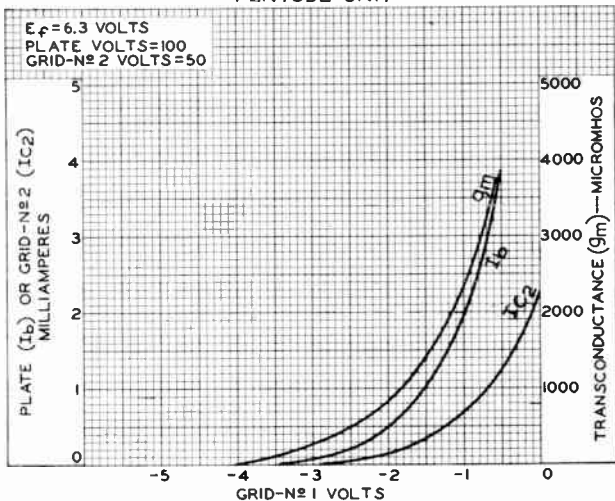




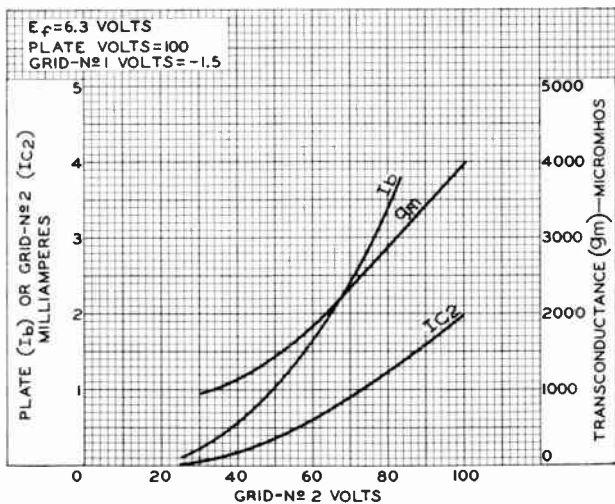


7199

7199

AVERAGE CHARACTERISTICS  
PENTODE UNIT

92CS-9702



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

World Radio History

92CS-9703





# EM84/6FG6

EM84

## ELECTRON-RAY TUBE

9-PIN MINIATURE INDICATOR TYPE WITH TRIODE UNIT

### GENERAL DATA

#### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3	volts
Current . . . . .	0.27	amp

#### Mechanical:

Operating Position . . . . .	Any
Maximum Overall Length . . . . .	2-27/32"
Maximum Seated Length . . . . .	2-13/32"
Length, Base Seat to Bulb Top (Excluding tip) . . . . .	2-7/32" ± 3/32"
Diameter . . . . .	0.750" to 0.875"
Bulb . . . . .	T6-1/2
Base . . . . .	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW . . . . .	9GA

- Pin 1 - Triode Grid
- Pin 2 - Internal Connection—  
Do Not Use
- Pin 3 - Cathode
- Pin 4 - Heater
- Pin 5 - Heater



- Pin 6 - Fluorescent Target\*
- Pin 7 - Ray-Control Electrode
- Pin 8 - Internal Connection—  
Do Not Use
- Pin 9 - Triode Plate

\* Fluorescent target is on inner surface of glass envelope above pin 7.

### INDICATOR SERVICE

#### Maximum and Minimum Ratings, Design-Center Values:

##### RAY-CONTROL-ELECTRODE VOLTAGE:

Without current flowing through series triode-plate resistor . . . . .	550 max.	volts
With current flowing through series triode-plate resistor . . . . .	300 max.	volts

##### FLUORESCENT-TARGET VOLTAGE:

Without current flowing through series triode-plate resistor . . . . .	550 max.	volts
With current flowing through series triode-plate resistor . . . . .	{ 300 max. volts 150 min. volts	volts

CATHODE CURRENT . . . . .	3 max.	ma
TRIODE-PLATE DISSIPATION . . . . .	0.5 max.	watt

##### PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode . . . . .	100 max.	volts
Heater positive with respect to cathode . . . . .	100 max.	volts

##### BULB TEMPERATURE (At hottest point on bulb surface).

	120 max.	°C
--	----------	----

#### Typical Operation:

*With ray-control electrode connected to triode plate*

Triode-Plate Supply Voltage . . . . .	250	250	volts
Fluorescent-Target Voltage . . . . .	250	250	volts

EM84



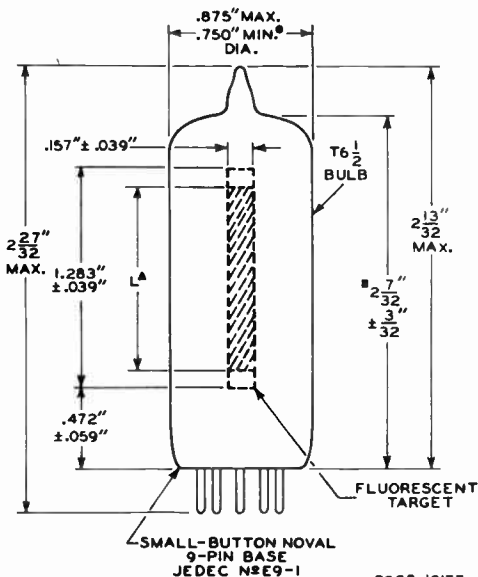
EM84/6FG6

## ELECTRON-RAY TUBE

Series Triode-Plate Resistor . . .	0.47	0.47	megohm
Triode-Grid Supply Voltage . . . .	0	-22	volts
Triode-Grid Resistor . . . . .	3	3	megohms
Triode-Plate Current . . . . .	0.45	0.06	ma
Fluorescent-Target Current . . . .	1.1	1.6	ma
Length of Dark Part of Fluorescent Target (Dimension "L" on Dimensional Outline) . . . . .	$0.83 \pm 0.20$	0	inch
Length of Dark Part of Fluorescent Target when triode-grid resistor = 0 . . . . .	$0.94 \pm 0.20$	-	inch

## Maximum Circuit Values:

Triode-Grid-Circuit Resistance . . . . .	3 max.	megohms
--	--------	---------

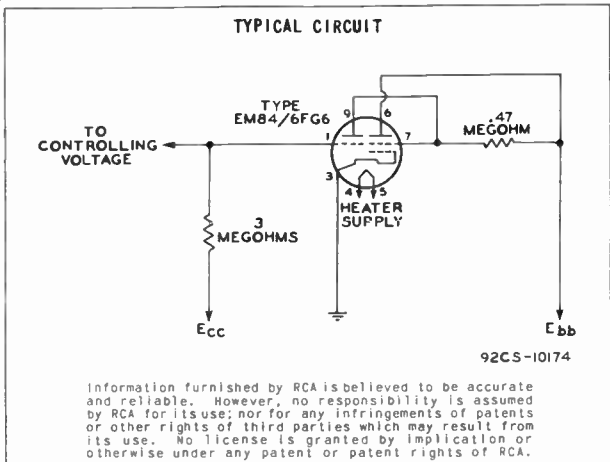


- APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.
- MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY RING GAUGE OF 7/16" INSIDE DIAMETER.
- ▲ "L" = LENGTH OF DARK PART OF FLUORESCENT TARGET.



EM84

# EM84/6FG6 ELECTRON-RAY TUBE



8-59

CE-10174

## TYPICAL OPERATION CHARACTERISTIC

