RCA TUBE
HANDBOOK
HB-3

RECEIVING TUBE SECTION—Part 2

Type 6A3 and beyond

In this section, data are given for those types of RCA tubes employed primarily in broadcast and home-television receivers. These types are also used in many other applications.

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

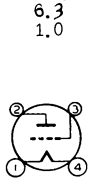
7-52

RECEIVING TUBES—PART 2

6A3

POWER AMPLIFIER TRIODE

Filament	Coated	
Voltage	6.3	a-c or d-c volts
Current	1.0	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 - Grid
Pin 2 - Plate		Pin 4 - Filament
Mounting Position		Any



BOTTOM VIEW (4D)

SINGLE-TUBE AMPLIFIER

Typical Operation and Characteristics - Class A_1 Amplifier:

Plate	250 max.	volts
Grid*	-45	volts
Plate Cur.	60	ma.
Amp. Factor	4.2	
Plate Res.	800	ohms
Transcond.	5250	umh[illegible]
Load Res.	2500	
Second Har. Dist.	5	
Power Output	3.2	

PUSH-PULL AMPLIFIER

Unless otherwise specified, values are for two [illegible]

Typical Operation:	*Fixed Bias*	*Cathode-Bias*	
Plate	325 max.	325 max.	volts
Grid*	-68	--	volts
Cathode-Bias Resistor	-	850	ohms
Zero-Sig. Plate Cur.	80	80	ma.
Load Res. (per tube)	750	1250	ohms
Effective Load Res. (plate to plate)	3000	5000	ohms
Total Har. Dist.	2.5	5.0	%
Power Output	15	10	watts

If a single 6A3 is operated cathode-biased, the cathode-biasing resistor should be 750 ohms approx.

The type of 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 0.05 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.

* Grid voltage referred to mid-point of a-c operated filament.

Curves for the 6A3 are essentially the same as those shown for type 2A3.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

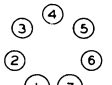
Cunningham Radiotron

RCA-6A6

CLASS B TWIN AMPLIFIER

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.8	amp.
Maximum Overall Length		4-11/16"
Maximum Diameter		1-13/16"
Bulb		ST-14
Base		Medium 7-Pin

Pin 1-Heater
Pin 2-Plate (Triode T_2)
Pin 3-Grid (Triode T_2)
Pin 4-Cathode



BOTTOM VIEW

Pin 5-Grid (Triode T_1)
Pin 6-Plate (Triode T_1)
Pin 7-Heater

For convenience, one triode unit is identified as T_1; the other as T_2.

For additional curves and data, see Types 6N7 and 53, and the RESISTANCE-COUPLED AMPLIFIER CHART. The operating conditions and characteristics of the 6A6 are identical with those of the 6N7 and 53. ←

← Indicates a change

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

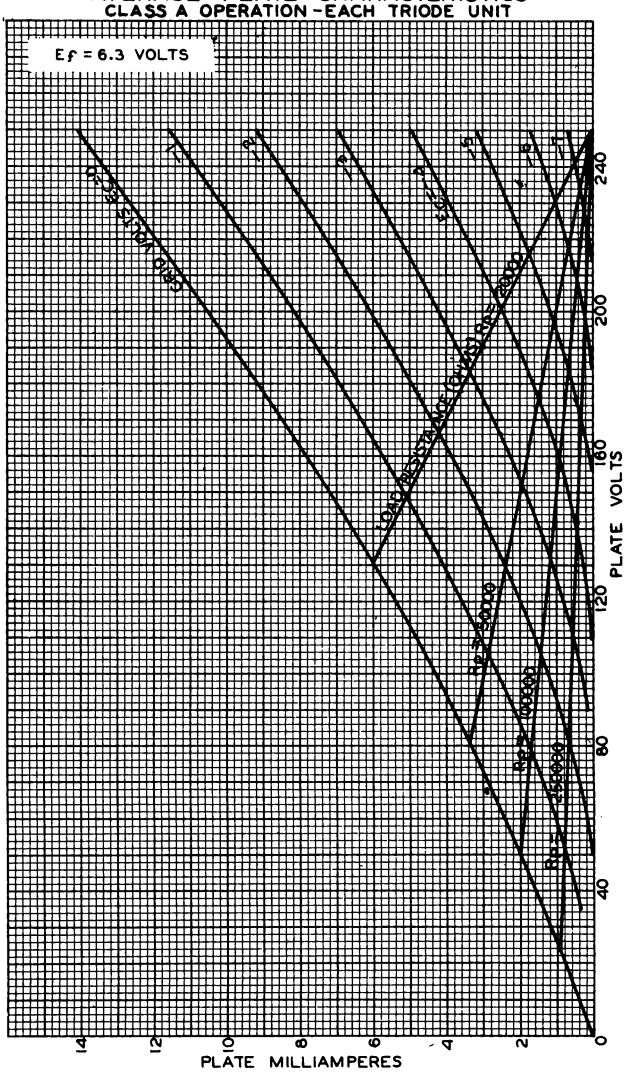
6A6

Cunningham Radiotron

RCA-6A6

AVERAGE PLATE CHARACTERISTICS

CLASS A OPERATION-EACH TRIODE UNIT



FEB. 5, 1935

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4375

6A7

PENTAGRID CONVERTER

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances:		
Grid #4 to Plate	0.3°	μμf
Grid #4 to Grid #2	0.15°	μμf
Grid #4 to Grid #1	0.15°	μμf
Grid #1 to Grid #2	1.0	μμf
Grid #4 to All Other Electrodes (R-F Input)	8.5	μμf
Grid #2 to All Other Electrodes (Osc. Output)	5.5	μμf
Grid #1 to All Other Electrodes (Osc. Input)	7.0	μμf
Plate to All Other Electrodes (Mixer Output)	9.0	μμf
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 7-Pin▲	
Pin 1 - Heater	Pin 5 - Grid #1	
Pin 2 - Plate	Pin 6 - Cathode	
Pin 3 - Grids #3 & #5	Pin 7 - Heater	
Pin 4 - Grid #2	Cap - Grid #4	
Mounting Position	Any	

BOTTOM VIEW (7C)

Maximum Ratings, Typical Operating Conditions, and Curves are the same as for Type 6A8.

■ 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 shield-can connected to cathode.
▲ Requires different socket than medium 7-pin base.

◄ Indicates a change.

6A7S

PENTAGRID CONVERTER

RENEWAL TYPE FOR MAJESTIC RECEIVERS

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Overall Length		4-9/32" to 4-17/32"
Seated Height		3-21/32" to 3-29/32"
Maximum Diameter (without shield)		1-9/16"
Bulb (with form-fitting shield)		ST-12
Cap		Small Metal
Base ▲*		Small 7-Pin

■ 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 a different socket than the medium 7-pin base.
* Basing arrangement is the same as for the 6A7, except that the external shield on the 6A7S is connected to cathode.

Typical Operating Conditions and Curves for the 6A7S are the same as for Type 6A8.

6A8, 6A8-G, 6A8-GT

PENTAGRID CONVERTER

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.

Direct Interelectrode Cap.°	6A8	6A8-G	6A8-GT	
Grid #4 to Plate	0.06	0.26	0.26	μμf
Grid #4 to Grid #2	0.1	0.19	0.19	μμf
Grid #4 to Grid #1	0.09	0.16	0.16	μμf
Grid #1 to Grid #2	0.8	1.1	1.1	μμf
Grid #4 to All Other Electrodes (R-F Input)	12	9.5	9.5	μμf
Grid #2 to All Other Electrodes Except Grid #1 (Osc. Output)	5	4.6	4.6	μμf
Grid #1 to All Other Electrodes Except Grid #2 (Osc. Input)	6.5	6	6	μμf
Plate to All Other Electrodes (Mixer Output)	12	12	12	μμf
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.	Skirted Min. Style C	

■ 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 6A8 connected to cathode, and with close-fitting shield on 6A8-G and 6A8-GT connected to cathode.

← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6A8, 6A8-G, 6A8-GT

PENTAGRID CONVERTER

(continued from preceding page)

	6A8	6A8-G	6A8-GT
Base	Small Wafer, Octal 8-Pin	Small Shell, Octal 8-Pin	Small Wafer, Octal 8-Pin, Sleeve
Basing Designation	8A	G-8A	GT-8A

Pin 1 – 6A8, Shell; 6A8-G, No Con.; 6A8-GT, Base Sleeve
Pin 2 – Heater
Pin 3 – Plate
Pin 4 – Grids #3 & #5
Pin 5 – Grid #1
Pin 6 – Grid #2
Pin 7 – Heater
Pin 8 – Cathode
Cap – Grid #4

BOTTOM VIEW

Mounting Position: 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		14 max.	ma.
Typical Operation:			
Plate Voltage	100	250	volts
Screen Voltage	50	100	volts
Anode-Grid Voltage	100	–	volts
Anode-Grid Supply Voltage	–	250*	volts
Control-Grid Voltage	-1.5	-3	volts
Osc.-Grid (Grid #1) Resistor	50000	50000	ohms
Plate Resistance	0.6	0.36 approx.	ohms
Conversion Transconductance	360	550	µmhos
Conver. Transcond. (approx.) with Control-Grid Bias of -20 volts	3	–	µmhos
Conver. Transcond. (approx.) with Control-Grid Bias of -35 volts	–	6	µmhos
Plate Current	1.1	3.5	ma.
Screen Current	1.3	2.7	ma.
Anode-Grid Current	2	4	ma.
Oscillator-Grid Current	0.25	0.4	ma.
Total Cathode Current	4.6	10.6	ma.

NOTE: The transconductance of the oscillator portion (not oscillating) is 1150 micromhos under the following conditions: plate volts, 250; screen volts, 55; control-grid volts, -2; anode-grid volts, 100; and oscillator-grid volts, -1. ◄

* Anode-grid supply voltages in excess of 200 volts require use of 20000-ohm voltage-dropping resistor by-passed by 0.1 µf condenser.

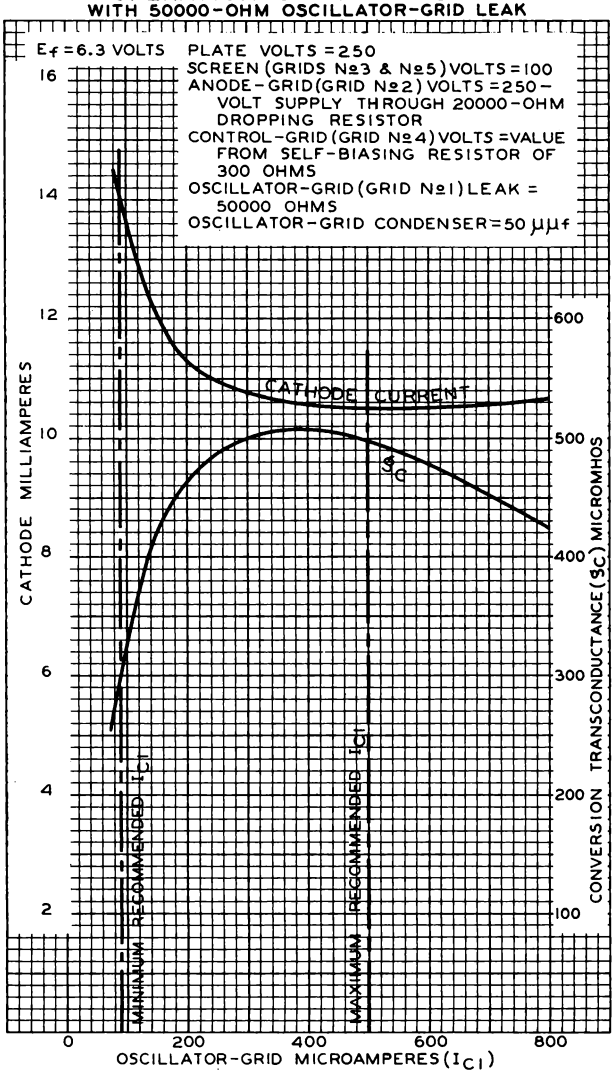
For Typical Circuit and Coil Design Details, refer to Type 2A7.

◄ Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6A8

OPERATION CHARACTERISTICS
WITH 50000-OHM OSCILLATOR-GRID LEAK



6AB4

HIGH-MU TRIODE

MINIATURE TYPE PARTICULARLY SUITABLE FOR CATHODE-DRIVE CIRCUITS

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3		ac or dc volts
Current	0.15		amp
Direct Interelectrode Capacitances:	*Without External Shield*	*With External Shield No. 316 Tied to Cathode*	
Grid to Plate	1.5	1.5	μμf
Grid to Heater and Cathode	2.2	2.2	μμf
Plate to Heater and Cathode	0.5	1.4	μμf
Heater to Cathode	2.9	2.9	μμf
Plate to Cathode	0.24	0.2	μμf
Cathode to Heater and Grid	5.0	5.2	μμf
Plate to Heater and Grid	1.7	2.6	μμf

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	5CE

Pin 1 - Plate
Pin 2 - Internal Shield
Pin 3 - Heater
Pin 4 - Heater

Pin 5 - No Connection
Pin 6 - Grid
Pin 7 - Cathode

AMPLIFIER - Class A_1

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	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

Characteristics:

Plate Voltage	100	250	volts
Cathode-bias Resistor	270	200	ohms
Internal Shield	Connected to ground		
Amplification Factor	60	60	

← Indicates a change

6AB4

HIGH-MU TRIODE

Plate Resistance (Approx.). .	15000	10900	ohms
Transconductance.	4000	5500	μmhos
Grid Bias (Approx.) for plate current of 10 μamp. .	-5	-12	volts
Plate Current	3.7	10	ma

CURVES
for the 6AB4 are the same
as those for each unit of Type 12AT7

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AB5

6AB5/6N5

ELECTRON-RAY TUBE

INDICATOR TYPE WITH TRIODE UNIT

Heater■	Coated Unipotential Cathode		
Voltage	6.3	a-c or d-c	volts
Current	0.15		amp.
Overall Length		3-13/16" to 4-3/16"	
Maximum Seated Height		3-9/16"	←
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 RATINGS and TYPICAL OPERATING CONDITIONS

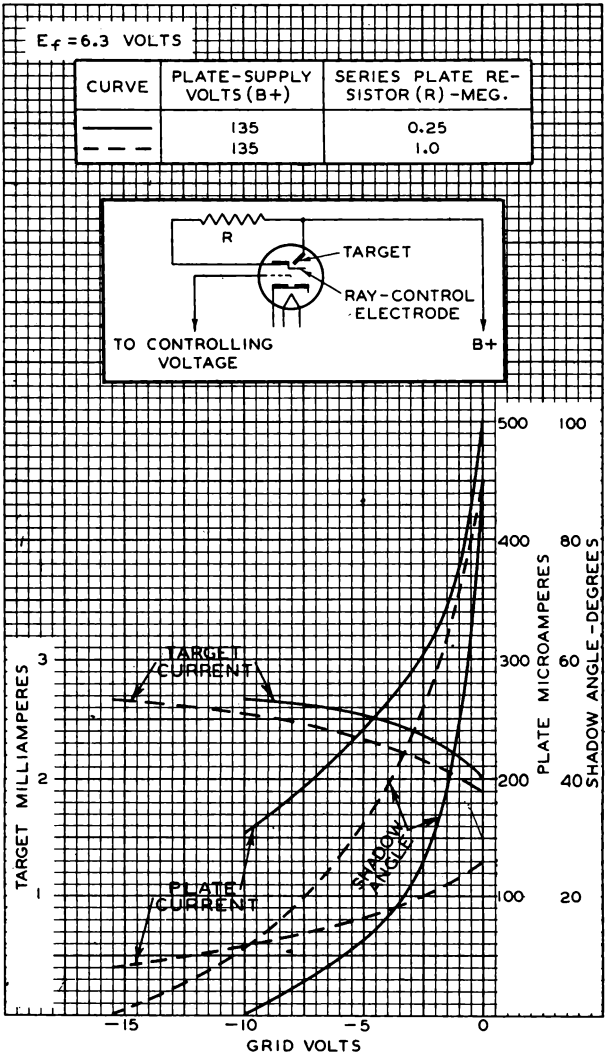
Plate-Supply Voltage		180 max.	volts
Target Voltage		180 max. 100 min.	volts volts
Typical Operation:			
Plate and Target Supply	135	135	volts
Series Triode-Plate Resistor□	0.25	1.0	megohm
Target Current †Δ	2	1.9	ma.
Triode-Plate Current△	0.5	0.13	ma.
Triode-Grid Voltage (approx.)			
For shadow angle of 0°	-10	-15.5	volts ←
For shadow angle of 90°	0	0	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.
□ Designated as R in circuit diagram under Type 6E5.
† Subject to wide variations.
△ For triode-grid bias of 0 volts.
← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6AB5

AVERAGE CONTROL CHARACTERISTICS



6AB7/1853

TELEVISION AMPLIFIER PENTODE

SINGLE-ENDED METAL TYPE

Heater★	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.45	amp.
Direct Interelectrode Capacitances:°		
Grid to Plate	0.015 max.	μμf
Input	8	μμf
Output	5	μμf
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	BOTTOM VIEW (8N)	Any

AMPLIFIER

Plate Voltage	300 max.	volts
Screen Voltage	200 max.	volts
Screen-Supply Voltage	300 max.	volts
Plate Dissipation ⊕	3.75 max.	watts ←
Screen Dissipation	0.65 max.	watt

Typical Operation and Characteristics - Class A_1 Amplifier:

	Condition I*	Condition II**	
Heater★	6.3	6.3	volts
Plate	300	300	volts
Suppressor □	0	0	volts
Screen-Supply #	200	300	volts
Series Screen Resistor	-	30000	ohms
Grid ## ●	-3	-3	min.volts
Plate Res.	0.7	0.7	approx.megohm
Transcond.	5000	5000	μmhos
Grid Bias for transcond. = 50 μmhos	-15	-22.5	volts
Plate Cur.	12.5	12.5	ma.
Screen Cur.	3.2	3.2	ma.

° With shell connected to cathode.
* Condition I is with fixed screen supply.
** Condition II is with series screen resistor.
\# Screen-supply voltages in excess of 200 volts require the use of a series-dropping resistor to limit the voltage at the screen to 200 volts when the plate current is at its normal value of 12.5 milliamperes.
● May be obtained with cathode-bias resistor having a minimum value of 190 ohms.
\#\# The d-c resistance in the grid circuit should not exceed 0.25 megohm with fixed bias, or 0.5 megohm with full cathode bias and a series screen resistor.
⊕ Precautions should be taken to insure that dissipation rating is not exceeded with expected line-voltage fluctuations, expecially in the case of fixed-bias operation.
□ The suppressor should be connected in r-f and i-f stages directly to ground to minimize feedback.
★ The potential difference between heater and cathode should be kept as low as possible.
Note: It is characteristic of a high gm tube to show appreciable changes of input capacitance and input conductance with plate current. In high-frequency circuits, it is necessary to take precautions to minimize this effect.

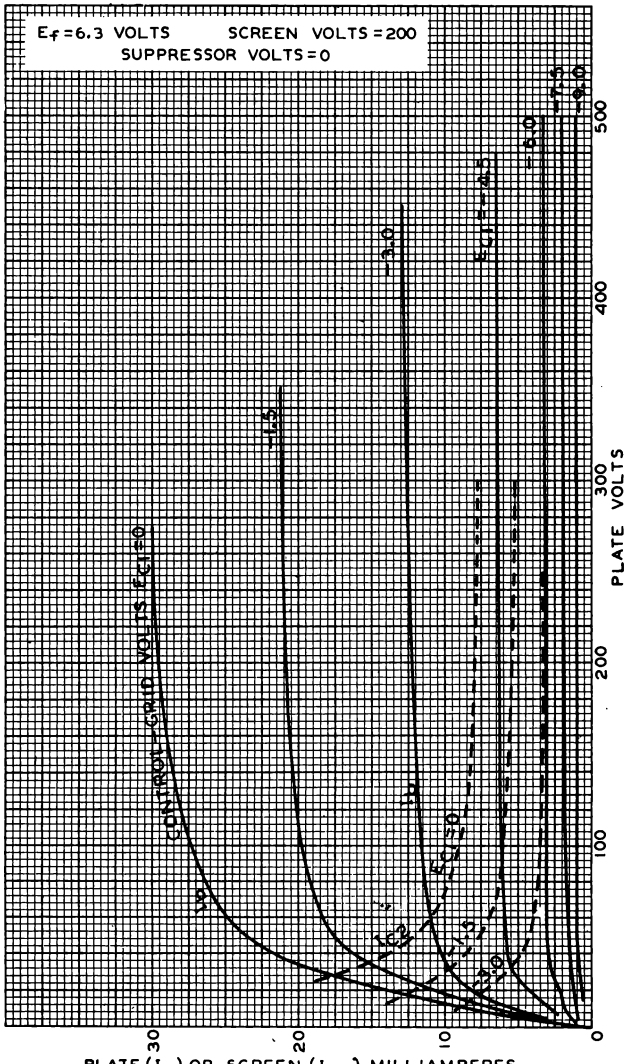
← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6AB7

6AB7

AVERAGE PLATE CHARACTERISTICS



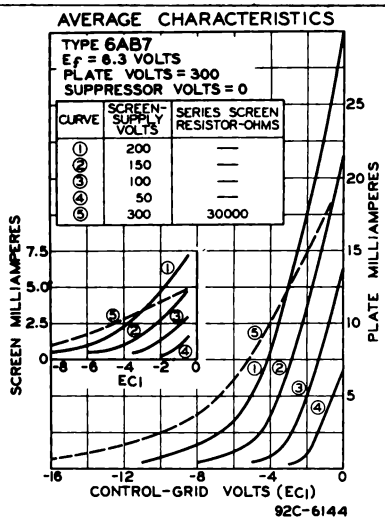
JUNE 21, 1938

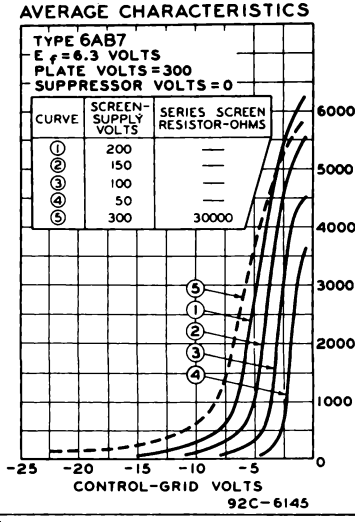
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6140

6AB7

TELEVISION AMPLIFIER PENTODE

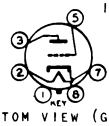




6AC5-GT/6AC5-G

HIGH-MU POWER AMPLIFIER TRIODE

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.4	amp.
Maximum Overall Length		3-5/16"
Maximum Seated Height		2-3/4" ←
Maximum Diameter		1-5/16"
Bulb		T-9
Base		Intermed.Shell Octal 6-Pin
Pin 1 - No Connection		Pin 5 - Grid
Pin 2 - Heater		Pin 7 - Heater
Pin 3 - Plate		Pin 8 - Cathode
Mounting Position		Any



BOTTOM VIEW (G-6Q)

Characteristics

Plate Voltage	250 max.	volts
Grid Voltage	+13	volts
Amplification Factor	125	
Plate Resistance	36700	ohms
Transconductance	3400	µmhos
Plate Current	32	ma.
Grid Current	5	ma.

Amplifier

Plate Voltage	250 max.	volts
Peak Plate Current (per tube)	110 max.	ma.
Average Plate Dissipation	10 max.	watts
Typical Operation - Class B Power Amplifier:		
Unless otherwise specified, values are for 2 tubes		
Plate Voltage	250	volts
Grid Voltage	0	volts
Peak A-F Grid-to-Grid Voltage	70	volts
Zero-Signal D-C Plate Current	5	ma.
Effective Load Res. (plate to plate)	10000	ohms
Peak Power Input	950	mw.
Power Output	8 approx.	watts
Dynamic-Coupled Class A_1 Amplifier - With Type 76 as Driver:		
Plate-Supply Voltage	250	volts
Grid Voltage	▲	volts
Average Plate Current	32	ma.
Average Plate Current of Driver	5.5	ma.
Input Signal to Driver (RMS)	16.5	volts
Driver Grid Resistor	1.0 max.	megohm
Load Resistance	7000	ohms
Harmonic Distortion	10	%
Power Output *	3.7	watts

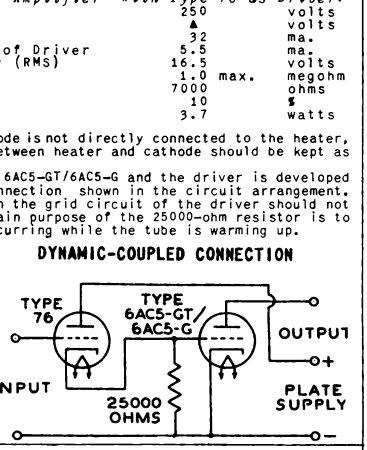
■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

▲ Bias voltage for both the 6AC5-GT/6AC5-G and the driver is developed by the Dynamic-Coupled connection shown in the circuit arrangement. The total d-c resistance in the grid circuit of the driver should not exceed 1.0 megohm. The main purpose of the 25000-ohm resistor is to prevent a current surge occurring while the tube is warming up.

* When driver is operated up to the grid-current point, it is possible to obtain a power output of 4.3 watts with approximately 16% distortion.

← Indicates a change.

DYNAMIC-COUPLED CONNECTION

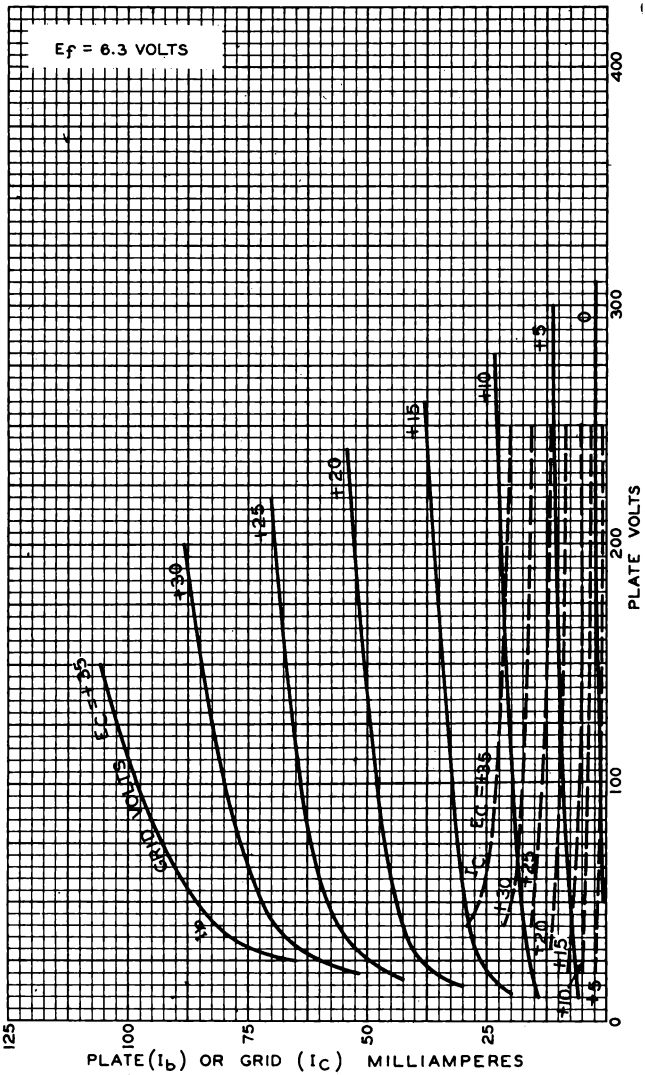


The license extended to the purchaser of tubes appears in the License Notice accompanying them. Information contained herein is furnished without assuming any obligations.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6AC5-GT

AVERAGE PLATE CHARACTERISTICS



OCT. 18, 1937

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4840

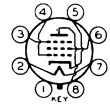
6AC7

6AC7/1852

TELEVISION AMPLIFIER PENTODE

SINGLE-ENDED METAL TYPE

Heater★	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.45	amp.
Direct Interelectrode Capacitances:°		
Grid to Plate	0.015 max.	μμf
Input	11	μμf
Output	5	μμf
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	BOTTOM VIEW (8N)	Any



AMPLIFIER

Plate Voltage	300 max.	volts
Screen Voltage	150 max.	volts
Screen-Supply Voltage	300 max.	volts
Plate Dissipation	3.02 max.	watts ←
Screen Dissipation	0.38 max.	watt

Typical Operation and Characteristics - Class A_1 Amplifier:

	Condition I*	Condition II**	
Plate Voltage	300	300	volts
Suppressor □	0	0	volts
Screen-Supply #	150	300	volts
Screen Series Resistor	-	60000	ohms
Cathode-Bias Resistor ##	160	160	min. ohms
Plate Res.	1.0	1.0	approx. megohm ←
Transcond.	9000	9000	μmhos
Plate Cur.	10	10	ma.
Screen Cur.	2.5	2.5	ma.

° With shell connected to cathode.

Screen-supply voltages in excess of 150 volts require the use of a series-dropping resistor to limit the voltage at the screen to 150 volts when the plate current is at its normal value of 10 milliamperes.

* Condition I with fixed screen supply gives a sharp cut-off characteristic.

** Condition II with series screen resistor gives an extended cut-off characteristic for applications where gain is controlled by variation of grid bias.

Cathode-bias resistor should be adjusted to give a plate current of 10 ma. The d-c resistance in the grid circuit should not exceed 0.25 megohm when the screen voltage is obtained from a fixed source. When a series screen resistor is used with full cathode bias, the d-c resistance in the grid circuit may be as high as 0.5 megohm.

★ The potential difference between heater and cathode should be kept as low as possible.

□ The suppressor should be connected in r-f and i-f stages directly to ground to minimize feedback.

NOTE: It is characteristic of a high gm tube to show appreciable changes of input capacitance and input conductance with plate current. In high-frequency circuits, it will be necessary to take precautions to minimize this effect. The use of the 6AC7 as a high-gain audio amplifier is not recommended unless the heater is operated from a battery source.

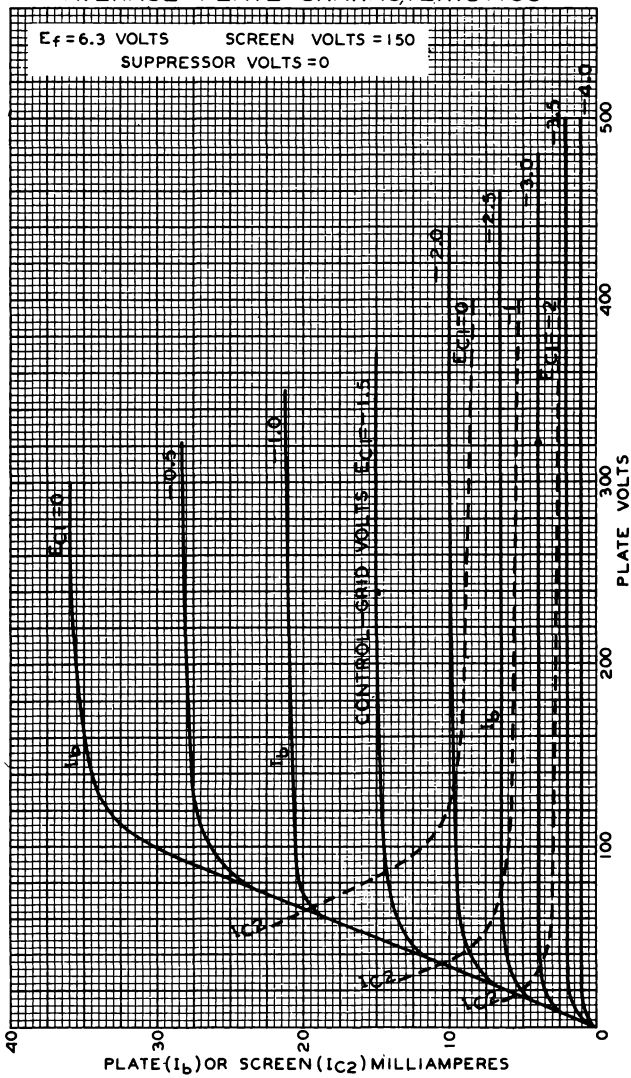
←Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6AC7

6AC7

AVERAGE PLATE CHARACTERISTICS



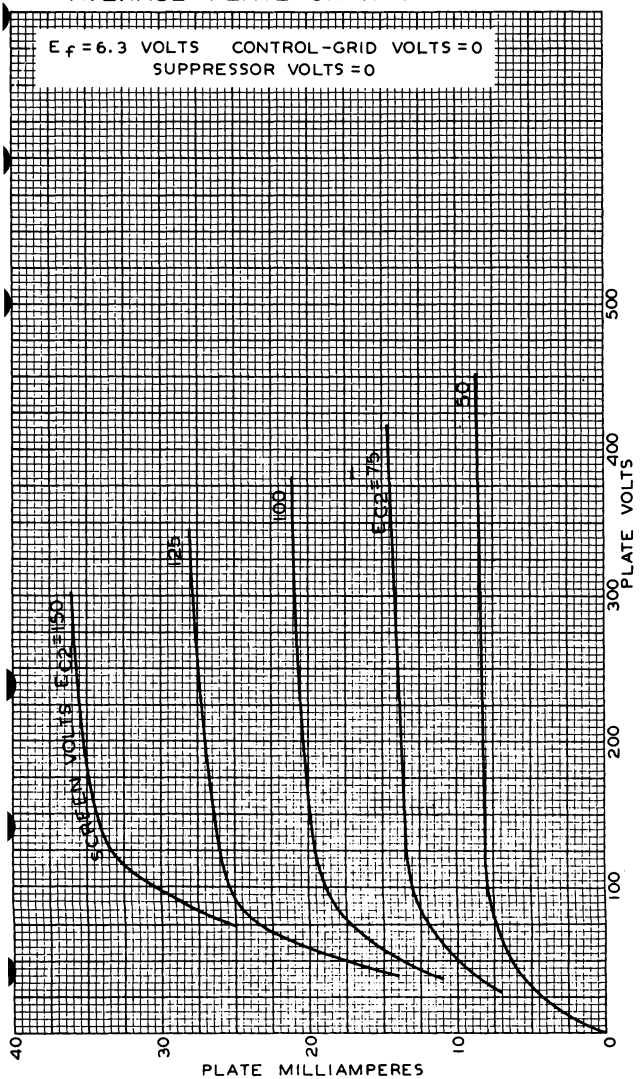
JUNE 17, 1938

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6139

6AC7

AVERAGE PLATE CHARACTERISTICS



DEC. 5 1942

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

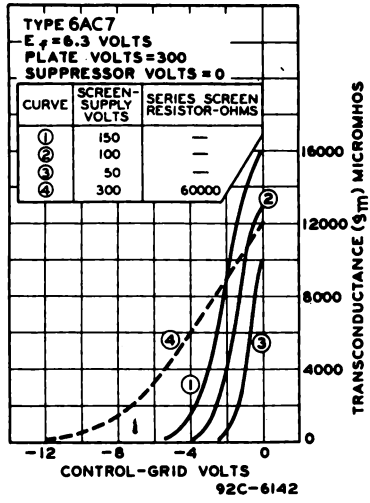
92C-6146R1

6AC7

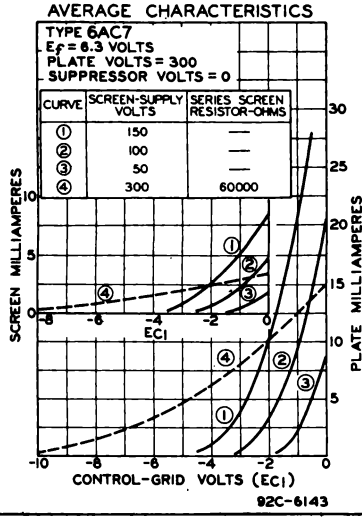
6AC7

TELEVISION AMPLIFIER PENTODE

AVERAGE CHARACTERISTICS



AVERAGE CHARACTERISTICS



6AD7-G

TRIODE–POWER AMPLIFIER PENTODE

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.85	amp.
Maximum Overall Length		4-5/8"
Maximum Seated Height		4-1/16"
Maximum Diameter		1-13/16"
Bulb		ST-14
Base		Medium Shell Octal 8-Pin
Pin 1 - Triode Grid		Pin 5 - Pentode Grid
Pin 2 - Heater		Pin 6 - Triode Plate
Pin 3 - Pentode Plate		Pin 7 - Heater
Pin 4 - Pentode Screen		Pin 8 - Cathode
Mounting Position		Any

BOTTOM VIEW (8AY)

TRIODE UNIT

Plate Voltage	285 max.	volts ←
Plate Dissipation	1.0 max.	watt
Characteristics - Class A_1 Amplifier:		
Plate Voltage	250	volts
Grid Voltage	-25	volts
Amp. Factor	6	
Plate Res.	19000 approx.	ohms
Transcond.	325	μmhos
Plate Current	4	ma.

PENTODE UNIT

Plate Voltage	375 max.	volts ←
Screen Voltage	285 max.	volts ←
Plate Dissipation	8.5 max.	watts
Screen Dissipation	2.7 max.	watts
Typical Operation and Characteristics - Class A_1 Amplifier:		
Plate Voltage	250	volts
Screen Voltage	250	volts
Grid Voltage	-16.5	volts
Peak A-F Grid Voltage	16.5	volts
Zero-Sig. Plate Current	34	ma.
Max.-Sig. Plate Current	36	ma.
Zero-Sig. Screen Current	6.5	ma.
Max.-Sig. Screen Current	10.5	ma.
Plate Resistance	80000 approx.	ohms
Transconductance	2500	μmhos
Load Resistance	7000	ohms
Total Harmonic Distortion	8	%
Max.-Signal Power Output	3.2	watts

PUSH-PULL AMPLIFIER ←

Pentode Unit of 6AD7-G and a separate 6F6-G

Plate Voltage	375 max.	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.

← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6AD7-G

TRIODE-POWER AMPLIFIER PENTODE

(continued from preceding page)

Screen Voltage	285 max.	volts
Plate Dissipation	8.5 max.	watts
Screen Dissipation	2.7 max.	watts

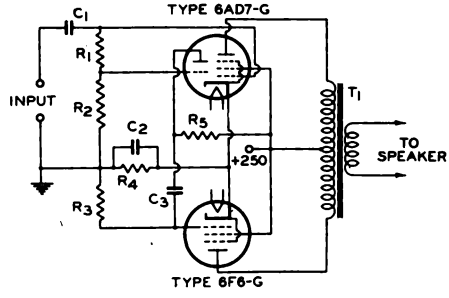
→ *Typical Operation with Cathode Bias - Class AB_1 Amplifier:*

Values are for pentode unit of 6AD7-G and 6F6-G together

Plate Voltage	250	285	375	volts
Screen Voltage	250	285	250	volts
Cathode Resistor	560	470	470	ohms
Peak A-F Grid to Grid Volt.	59	64	55	volts
Zero-Sig. Plate Current	36	47.5	41	ma.
Max.-Sig. Plate Current	41	54.5	50	ma.
Zero-Sig. Screen Current	6.7	8.2	6.7	ma.
Max.-Sig. Screen Current	11.7	13.7	9.2	ma.
Effec. Load Resistance (plate to plate)	14000	12000	16000	ohms
Total Harmonic Dist.	4	4	2	%
Max.-Sig. Power Output	6	8.5	9	watts

For curves of the pentode unit, refer to Type 6F6.

TYPICAL PUSH-PULL CIRCUIT WITH PHASE INVERTER USING 6AD7-G AND 6F6-G



R_1 = 330000 OHMS
R_2 = 120000 OHMS
R_3 = 470000 OHMS
R_4 = 560 OHMS
R_5 = 150000 OHMS

C_1 = 0.01 μf
C_2 = 25 μf
C_3 = 0.01 μf
T_1 = OUTPUT TRANSFORMER: PLATE-TO-PLATE LOAD, 14000 OHMS

← Indicates a change.

The license extended to the purchaser of tubes appears in the License Notice accompanying them. Information contained herein is furnished without assuming any obligations.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6AD7-G

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT

APRIL 17, 1940

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

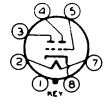
92C-6153

6AE6-G

TWIN-PLATE CONTROL TUBE

Heater□	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.15	amp.
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 2 - Heater
Pin 3 - Plate (Remote Cut-off Triode)
Pin 4 - Plate (Sharp Cut-off Triode)
Pin 5 - Grid
Pin 6 - Heater
Pin 7 - Cathode



Mounting Position BOTTOM VIEW (7AH) Any

REMOTE CUT-OFF TRIODE

Plate Voltage				250 max.	volts
Characteristics:					
Plate	250	250	250	250	volts
Grid	-35	-15	-6	-1.5	volts
Amp. Fact.				25	
Plate Res. (approx.)				25000	ohms
Transcond.				1000	μmhos
Plate Current	0.01	0.8	2.8	6.5	ma.

SHARP CUT-OFF TRIODE

Plate Voltage				250 max.	volts
Characteristics:					
Plate			250	250	volts
Grid			-9.5	-1.5	volts
Amp. Fact.				33	
Plate Res. (approx.)				35000	ohms
Transcond.				950	μmhos
Plate Current			0.01	4.5	ma.

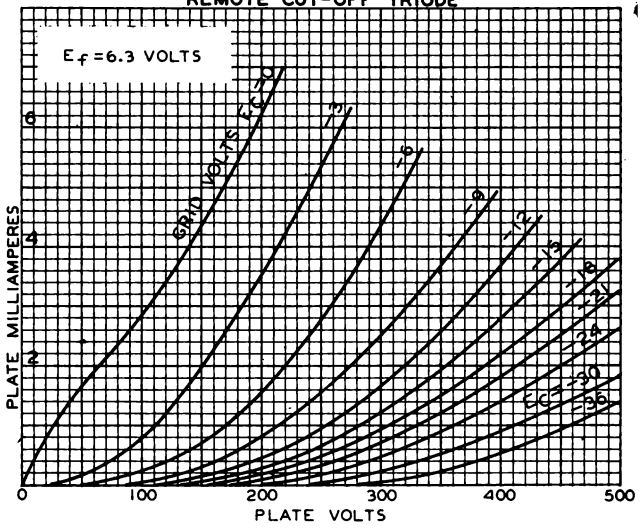
□ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

The 6AE6-G provides in effect two triodes with different cut-off characteristics and is intended for use as a control tube for twin-type electron-ray tubes, such as the 6AF6-G. With avc voltage applied to the common grid in suitable circuits, one ray-control electrode serves for strong signals and the other for weak signals.

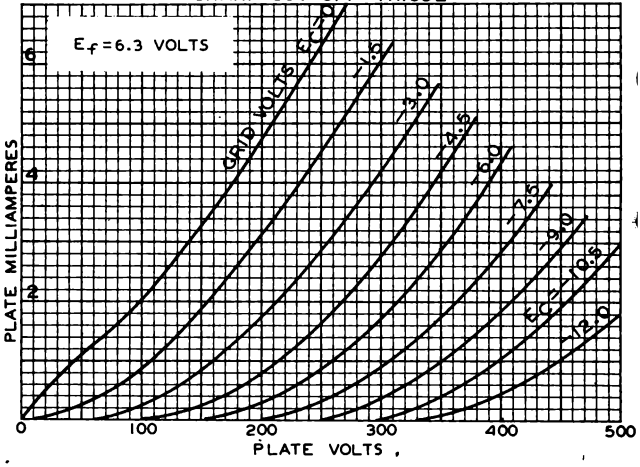
6AE6-G

6AE6-G

AVERAGE PLATE CHARACTERISTICS
REMOTE CUT-OFF TRIODE



AVERAGE PLATE CHARACTERISTICS
SHARP CUT-OFF TRIODE



6AF4

6AF4

MEDIUM-MU TRIODE

MINIATURE TYPE

For UHF TV service

The 6AF4 is the same as the 6AF4-A except for the following mechanical dimensions:

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"

6AF4-A

MEDIUM-MU TRIODE

MINIATURE TYPE

For UHF TV service

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.225	amp
Resonant Frequency (Approx.)	1000	Mc
Direct Interelectrode Capacitances (No external shield):		
Grid to Plate	1.9	μμf
Grid to Cathode and Heater	2.2	μμf
Plate to Cathode and Heater	0.45	μμf

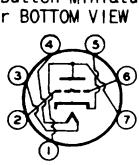
Characteristics - Class A_1 Amplifier:

Plate Voltage	80	100	volts
Cathode-Bias Resistor	150	150	ohms
Amplification Factor	15	16	
Plate Resistance	2270	2130	ohms
Transconductance	6600	7500	μmhos
Plate Current	16	20	ma

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" ± 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	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:***

DC PLATE VOLTAGE	150 max.	volts
DC GRID VOLTAGE	-50 max.	volts
DC GRID CURRENT	8 max.	ma
PLATE INPUT	2.5 max.	watts
PLATE DISSIPATION	2.25 max.	watts
DC CATHODE CURRENT	28 max.	ma
PEAK HEATER-CATHODE VOLTAGE:♦		
Heater negative with respect to cathode	50 max.	volts
Heater positive with respect to cathode	50▲max.	volts

▲,♦: See next page.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AF4-A

6AF4-A

MEDIUM-MU TRIODE

Typical Operation as Oscillator at 950 Mc:

DC Plate Voltage	100	volts
DC Grid Voltage	-4	volts
From a grid resistor of	10000	ohms
DC Plate Current	22	ma
DC Grid Current (Approx.)	400	μamp
Useful Power Output	160	mw

Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias operation	Not recommended
For cathode-bias operation	0.5 max. megohm

♦ It is recommended that the heater be kept at cathode potential to minimize the effects of variation in the heater-to-cathode capacitance between tubes.

▲ The dc component must not exceed 25 volts.

OPERATING CONSIDERATIONS

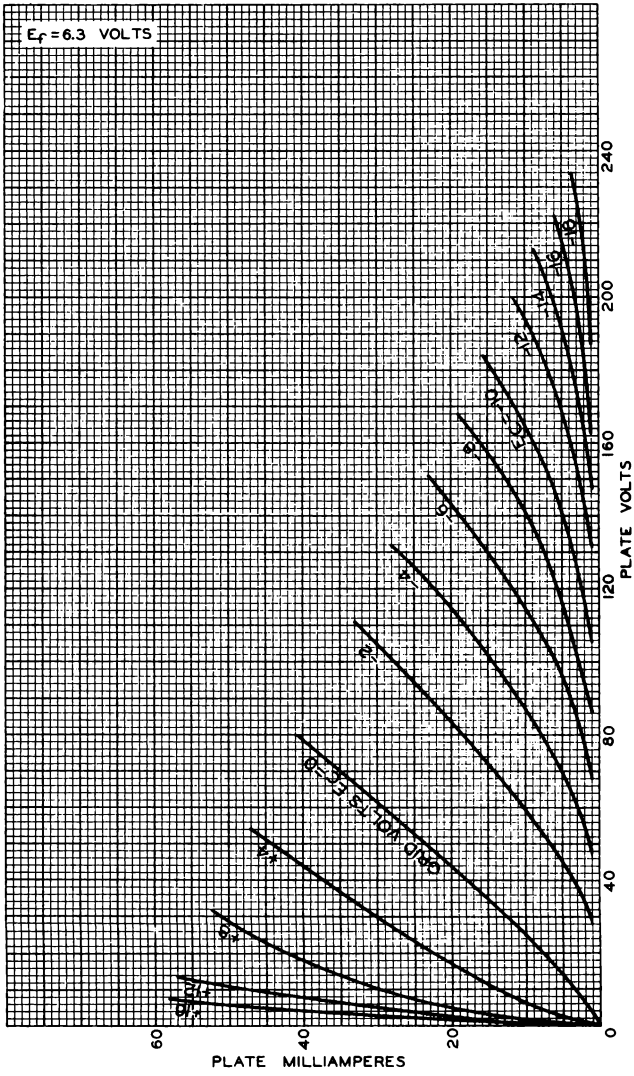
The *mounting arrangement* should insure that the tube is held secure by its socket. Unless this recommendation is followed, the generated frequency may change by as much as 10 megacycles per second. A conventional miniature tube shield and an external clamping arrangement are recommended.

The *base pins* of the 6AF4-A fit the miniature 7-contact socket. The *socket* should be of the mica-filled, rubber, or ceramic type

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AF4-A

AVERAGE PLATE CHARACTERISTICS



FEB. 20, 1952

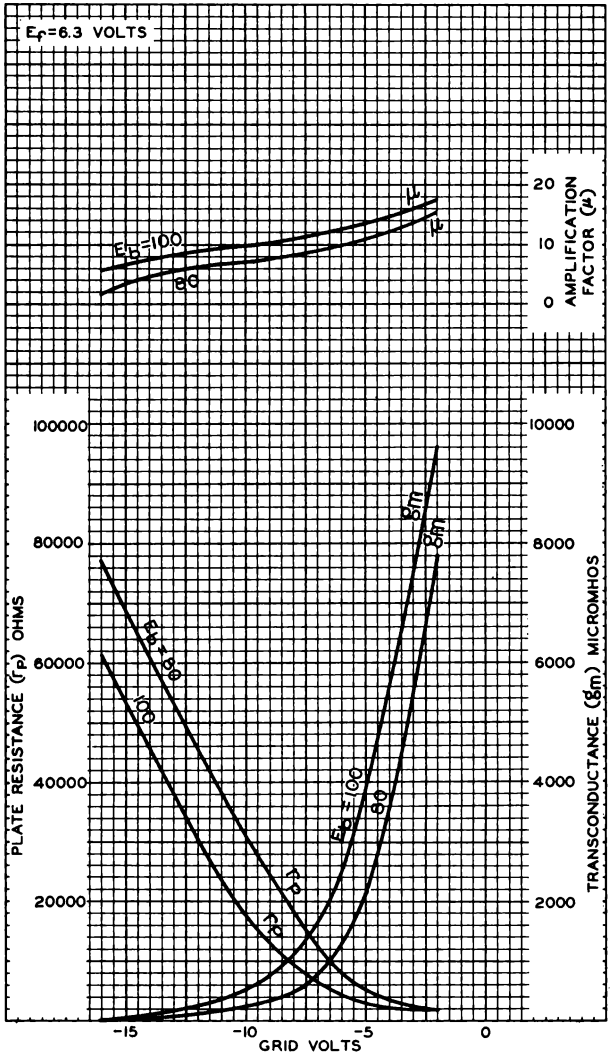
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7756

6AF4-A

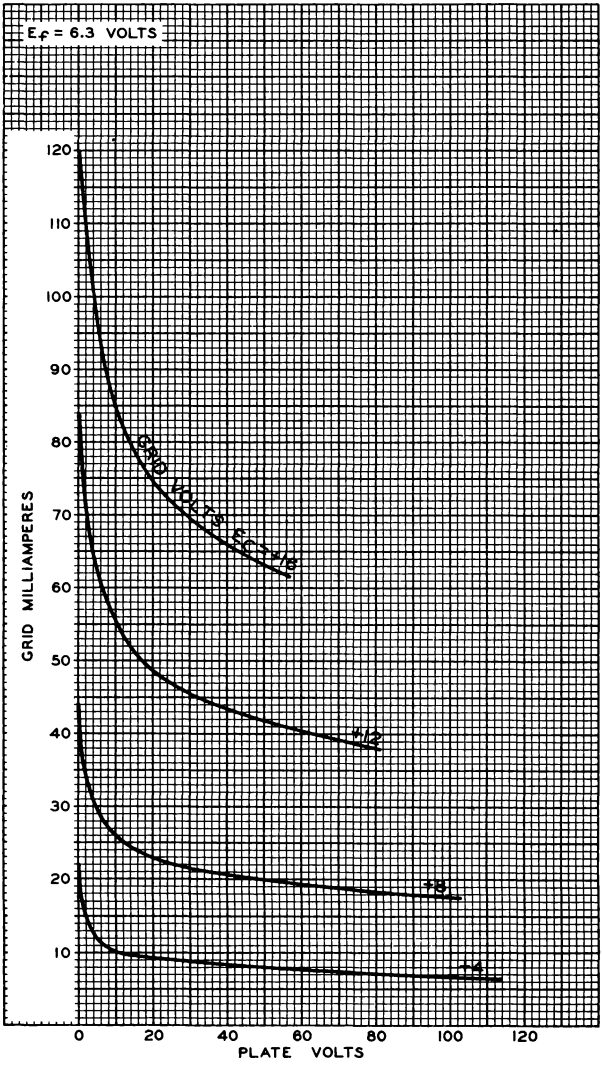
6AF4-A

AVERAGE CHARACTERISTICS



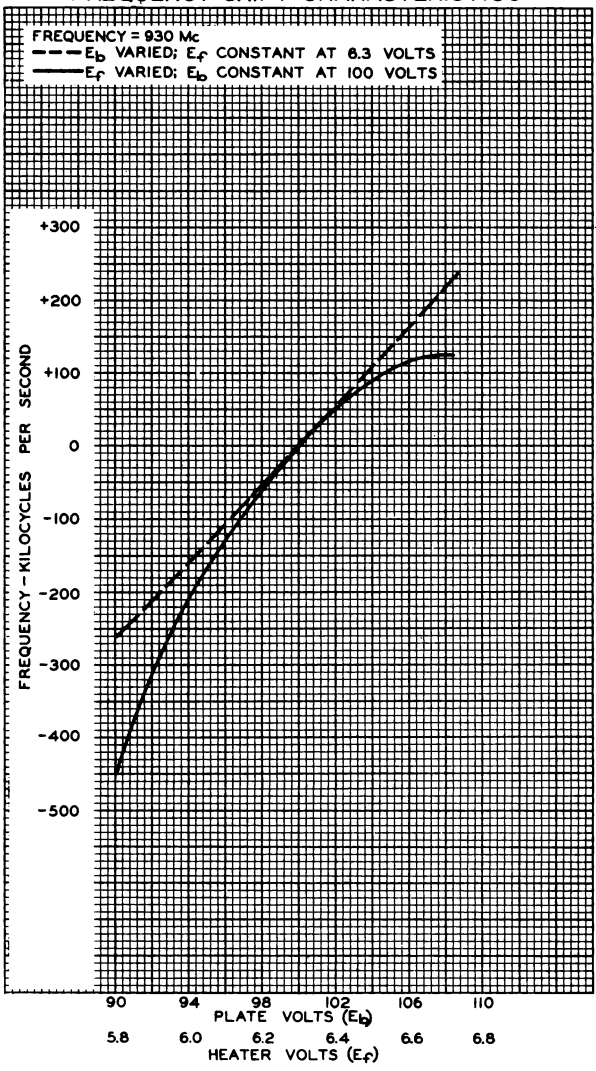
6AF4-A

AVERAGE CHARACTERISTICS



6AF4-A

FREQUENCY SHIFT CHARACTERISTICS



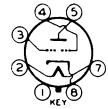
6AF6-G

6AF6-G

ELECTRON-RAY TUBE

TWIN-INDICATOR TYPE

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.15	amp.
Overall Length		2-1/4" {+1/16", -1/4"} ←
Seated Height		1-11/16" {+1/16", -1/4} ←
Maximum Diameter		1-5/16"
Bulb		T-9
Base		Intermed. Sh. Octal 7-Pin
Pin 1 - No Connection		Pin 4 - Ray-Control Electrode, Unit No. 1
Pin 2 - Heater		Pin 5 - Target
Pin 3 - Ray-Control Electrode, Unit No. 2		Pin 7 - Heater
		Pin 8 - Cathode
Mounting Position	BOTTOM VIEW (7AG)	Any**



Maximum and Minimum Ratings Are Design-Center Values

INDICATOR SERVICE

Target Voltage		250 max.	volts ←
		125 min.	volts ←
Ray-Control Electrode Supply Voltage		250 max.	volts ←
D-C Heater-Cathode Potential		90 max.	volts ←
Typical Operation:			←
Target Voltage	125	250	volts
Series Resistor □	0.5	1.0	megohm
Target Current*	0.65	2.2	ma.
Ray-Control Electrode Voltage †	80	160	approx. volts
Ray-Control Electrode Voltage ††	0	0	approx. volts

** The plane of the ray-control electrodes passes through pins No. 3 and No. 7.

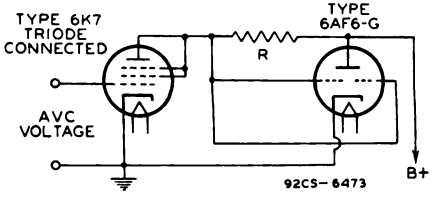
□ Designated R in circuit diagram below.

* With 0 volts on ray-control electrodes. Subject to wide variations.

† For shadow angle of 0° produced by either ray-control electrode.

†† For shadow angle of 95° produced by either ray-control electrode.

TYPICAL CIRCUIT USING TYPE 6AF6-G WITH RAY-CONTROL ELECTRODES IN PARALLEL

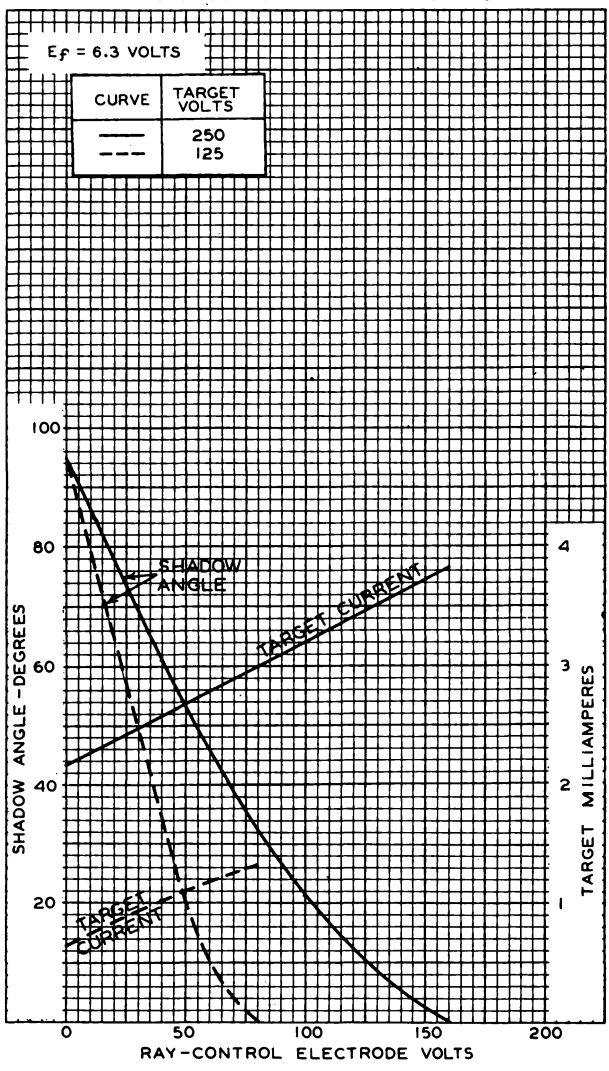


The license extended to the purchaser of tubes appears in the License Notice accompanying them. Information contained herein is furnished without assuming any obligations. ← Indicates a change.

6AF6-G

6AF6-G

AVERAGE CHARACTERISTICS



6AG5

SHARP-CUTOFF PENTODE

MINIATURE TYPE

Useful at Frequencies up to 400 Mc

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.3	amp

Direct Interelectrode Capacitances:	*Without Shield*	*With Shield°*	
Pentode Connection:			
Grid No.1 to plate	0.030 max.	0.020 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	6.5	6.6	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	1.8	3.1	μμf
Triode Connection, Grid No.2 tied to Plate:			
Grid No.1 to plate and grid No.2	2.5	2.5	μμf
Grid No.1 to cathode & grid No.3 & internal shield, and heater	3.6	3.6	μμf
Plate and grid No.2 to cathode & grid No.3 & internal shield, and heater	3	4.3	μμf

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	7BD

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

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

° With external shield JETEC No.316 connected to pin No.7.

← Indicates a change.

6AG5

SHARP-CUTOFF PENTODE

AMPLIFIER - Class A_1

Pentode Connection

→ **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*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
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*	
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.2 Voltage	100	125	150	volts
Cathode-Bias Resistor	180	100	180	ohms
Plate Resistance (Approx.)	0.6	0.5	0.8	megohm
Transconductance	4500	5100	5000	μmhos
Plate Current	4.5	7.2	6.5	ma
Grid-No.2 Current	1.4	2.1	2.0	ma
Grid-No.1 Voltage (Approx.) for plate current = 10 μamp	-5	-6	-8	volts

AMPLIFIER - Class A_1

Triode Connection - Grid No.2 Connected to Plate

→ **Maximum Ratings,** *Design-Center Values:*

PLATE VOLTAGE	300 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
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

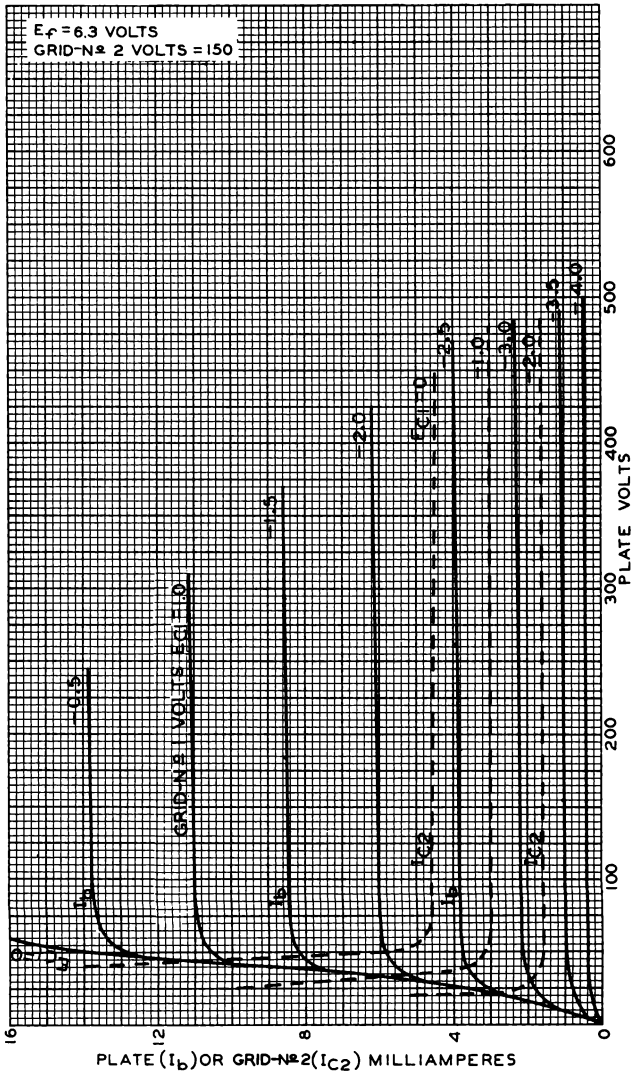
Typical Operation and Characteristics:

Plate Voltage	180	250	volts
→ Cathode-Bias Resistor	330	820	ohms
→ Plate Resistance (Approx.)	0.008	0.01	megohm
Amplification Factor	45	42	
Transconductance	5700	3800	μmhos
Plate & Grid-No.2 Current (Total)	7	5.5	ma

→ indicates a change.

6AG5

AVERAGE PLATE CHARACTERISTICS



DEC. 27, 1954

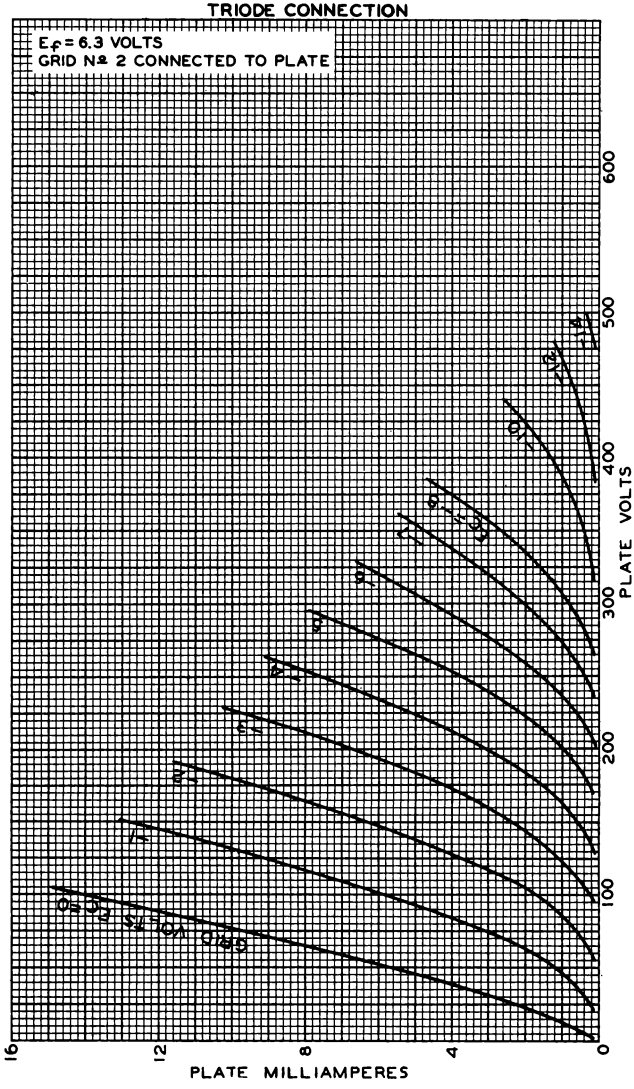
TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6399R2

6AG5

6AG5
AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



DEC. 28, 1954

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6464R1

6AG7
POWER PENTODE

SINGLE-ENDED METAL TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.65	amp
Direct Interelectrode Capacitances:		
With Pin No.1 and Pin No.3 connected to Pin No.5		
Grid No.1 to Plate	0.06 max.	μμf
Input	13	μμf
Output	7.5	μμf

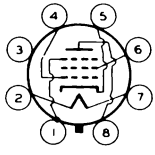
Characteristics, Amplifier Class A_1

Plate Voltage	300	volts
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	30.5	ma
Zero-Signal DC Grid-No.2 Current	7	ma
Max.-Signal DC Grid-No.2 Current	9	ma
Plate Resistance (Approx.)	0.13	megohm
Transconductance	11000	μmhos
Load Resistance	10000	ohms
Total Harmonic Distortion	7	per cent
Max.-Signal Power Output	3	watts

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-1/4"
Seated Length	2-19/32" ± 3/32" ←
Maximum Diameter	1-5/16"
Bulb	Metal Shell, MT-8
Base	Small-Wafer Octal 8-Pin (JETEC No.B8-21)
Basing Designation for BOTTOM VIEW	8Y ←

Pin 1 - Shell, Grid No.3
Pin 2 - Heater
Pin 3 - No Connection
Pin 4 - Grid No.1



Pin 5 - Cathode
Pin 6 - Grid No.2
Pin 7 - Heater
Pin 8 - Plate

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	300 max.	volts

← Indicates a change

6AG7

6AG7
POWER PENTODE

GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
PLATE DISSIPATION	9 max.	watts
GRID-No.2 INPUT	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

Typical Operation in 4-Mc Bandwidth Video Amplifier
Circuit of Fig. 1:

With Grid-Resistor Bias

Used where dc restoration is accomplished in grid-No.1 circuit of the 6AG7

Plate Supply Voltage	300	volts
Grid-No.2 Voltage†	115	volts
Zero-Signal Grid-No.1 Voltage	0	volts
Grid-No.1 Resistor	0.25 to 0.5	megohm
Grid-No.1 Signal Voltage (Peak to Peak)	4	volts
Zero-Signal Plate Current	45	ma
Zero-Signal Grid-No.2 Current	13	ma
Load Resistor	3500	ohms
Voltage Output (Peak to Peak)	135	volts

With Cathode-Resistor Bias

Plate Supply Voltage	300	volts
Grid-No.2 Voltage°	125	volts
from series resistor of	25000	ohms
Grid-No.1 Voltage	-2	volts
Cathode Resistor (Bypassed with capacitor of 250 μf, approx.)	57	ohms
Grid-No.1 Signal Voltage (Peak to Peak)	4	volts
Zero-Signal Plate Current	28	ma
Zero-Signal Grid-No.2 Current	7	ma
Load Resistor	3500	ohms
Voltage Output (Peak to Peak)	140	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

† obtained from supply having good regulation.
° obtained preferably from 300-volt plate supply through resistor of value shown.

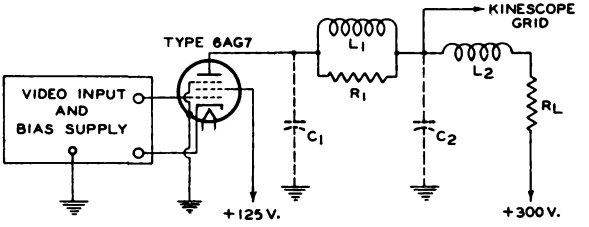
→ indicates a change

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AG7

POWER PENTODE

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



C_1 = 9.5 $\mu\mu f$ = Tube Output Capacitance + Socket Capacitance + Wiring Capacitance + Coil Capacitance

C_2 = 19 $\mu\mu f$ = Kinescope Capacitance + Socket Capacitance + Wiring Capacitance + Coil Capacitance

L_1 = 250 μh Filter Inductor

L_2 = 125 μh Filter Inductor

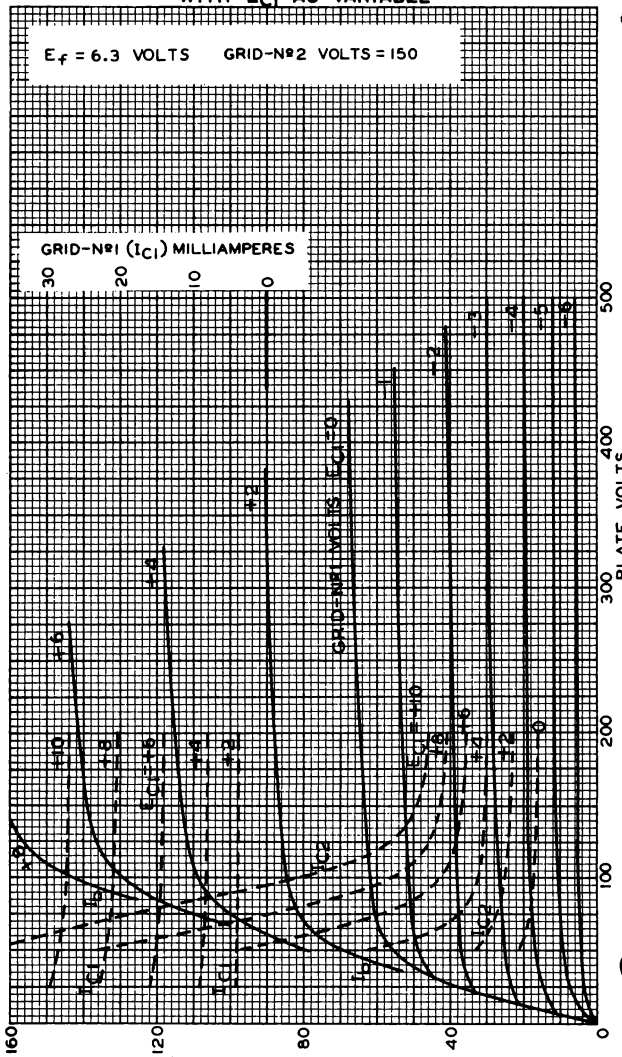
R_1 = 20000-Ohm, Non-Reactive Resistor

R_L = 3500-Ohm, 10-Watt, Non-Reactive Resistor

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.

6AG7

6AG7
AVERAGE PLATE CHARACTERISTICS
WITH E_{C1} AS VARIABLE



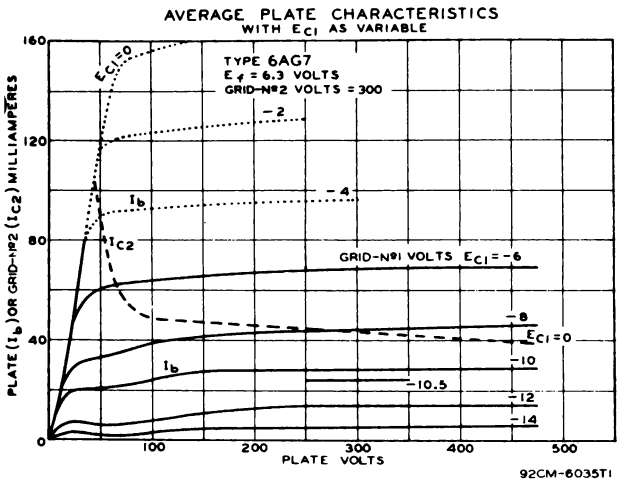
OCT. 2, 1952

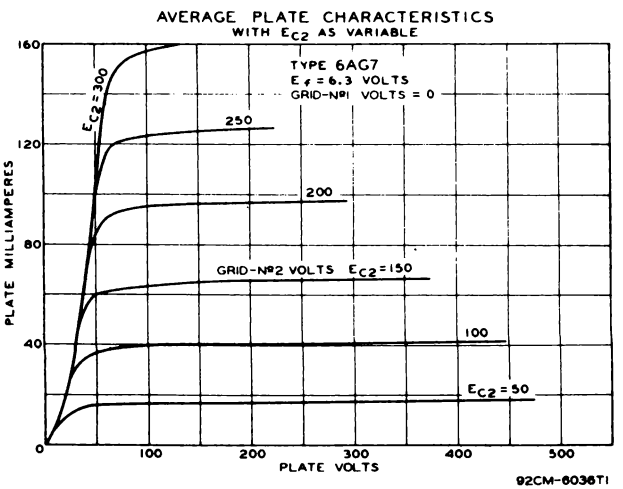
TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6034R2

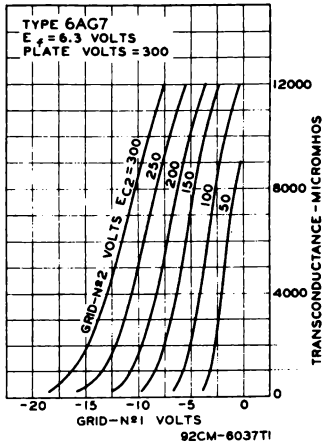
6AG7
POWER PENTODE



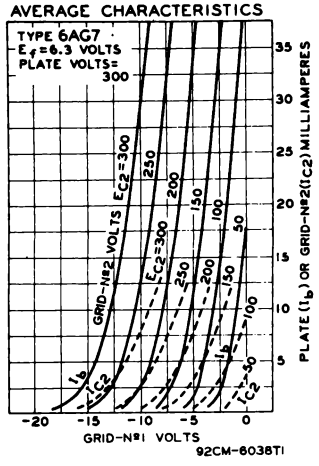


6AG7
POWER PENTODE

AVERAGE CHARACTERISTICS



AVERAGE CHARACTERISTICS



6AH4-GT

MEDIUM-MU TRIODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.75	amp
Direct Interelectrode Capacitances (No external shield):		
Grid to Plate	4.4	μμf
Input	7	μμf
Output	1.7	μμf

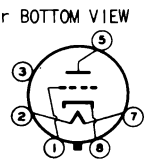
Characteristics, Amplifier Class A_1:

Plate Voltage	250	volts
Grid Voltage	-23	volts
Amplification Factor	8	
Plate Resistance	1780	ohms
Transconductance	4500	μmhos
Plate Current	30	ma
Grid Volts (Approx.) for plate current of 0.5 ma	-40	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 6-Pin (JETEC No.B6-60)
Basing Designation for BOTTOM VIEW	8EL

Pin 1 - Grid
Pin 2 - Heater
Pin 3 - No Conn.



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

VERTICAL DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Center Values Except As Noted:*

For operation in a 525-line, 30-frame system□

DC PLATE VOLTAGE	500 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE*	2000♦max.	volts
DC POSITIVE GRID VOLTAGE	0 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	-200 max.	volts

□ 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% of one vertical scanning cycle. In a 525-line, 30-frame system, 15% of one vertical scanning cycle is 2.5 milliseconds.

♦ Under no circumstances should this absolute value be exceeded.

6AH4-GT

6AH4-GT

MEDIUM-MU TRIODE

CATHODE CURRENT:		
DC	180 max.	ma
Peak	60 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▲max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance	2.2 max.	megohms

▲ The dc component must not exceed 100 volts.

6AH6

6AH6

SHARP-CUTOFF PENTODE

MINIATURE TYPE

GENERAL DATA

Electrical:

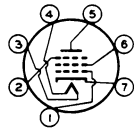
Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.45	amp
Direct Interelectrode Capacitances:°		
Grid No.1 to Plate	0.030 max	μμf
Input	10	μμf
Output	2	μμf

° 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" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin
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_1

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

PLATE VOLTAGE	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	150 max.	volts
TOTAL CATHODE CURRENT	13 max.	ma
PLATE DISSIPATION	3.2 max.	watts
GRID-No.2 DISSIPATION	0.4 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:

Pentode Connection

Plate Voltage	300	volts
Grid No.3 (Suppressor)	Tied to cathode at socket	
Grid-No.2 Voltage	150	volts
Cathode Resistor	160	ohms
Plate Resistance (Approx.)	0.5	megohm
Transconductance	9000	μmhos
Grid-No.1 Bias (Approx.) for plate current of 10 μamp	-7	volts
Plate Current	10	ma
Grid-No.2 Current	2.5	ma

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AH6

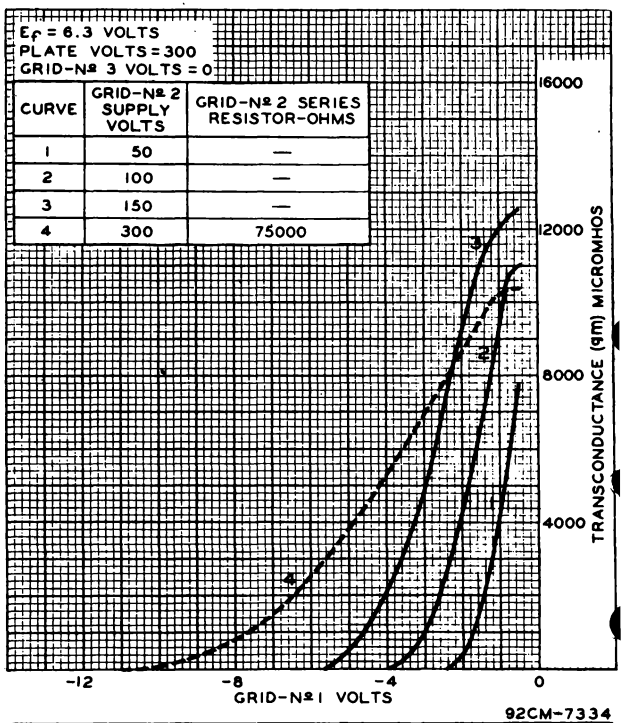
6AH6

SHARP-CUTOFF PENTODE

Triode Connection
Grid No.2 and Grid No.3 Tied to Plate

Plate Voltage	150	volts
Cathode Resistor	160	ohms
Amplification Factor	40	
Plate Resistance (Approx.)	3600	ohms
Transconductance	11000	μmhos
Grid-No.1 Bias (Approx.) for plate current of 10 μamp	-7	volts
Plate Current	12.5	ma

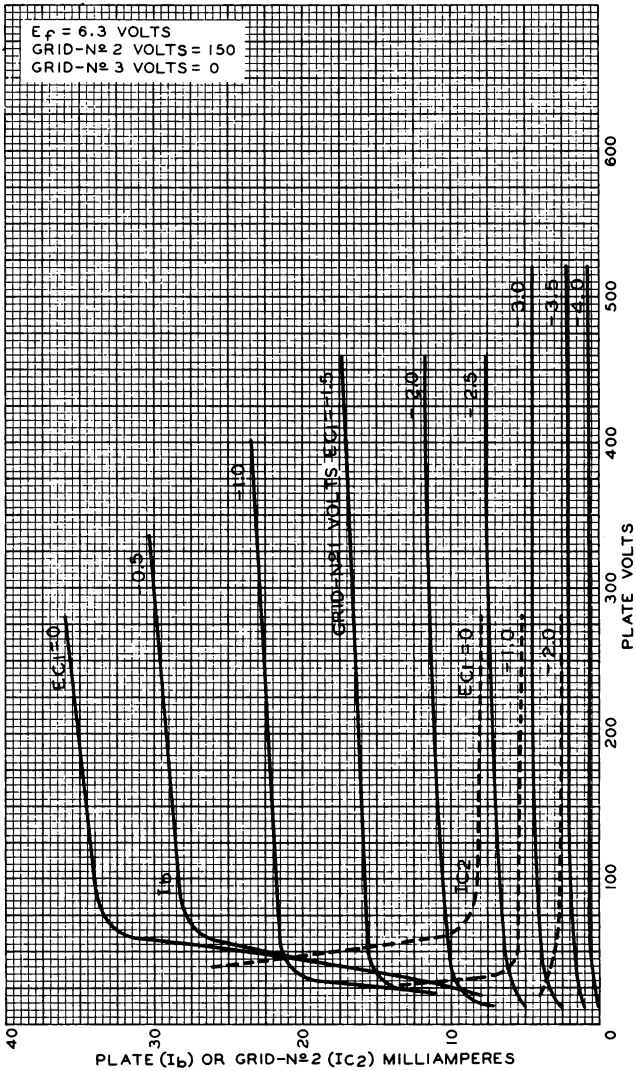
AVERAGE CHARACTERISTICS



92CM-7334

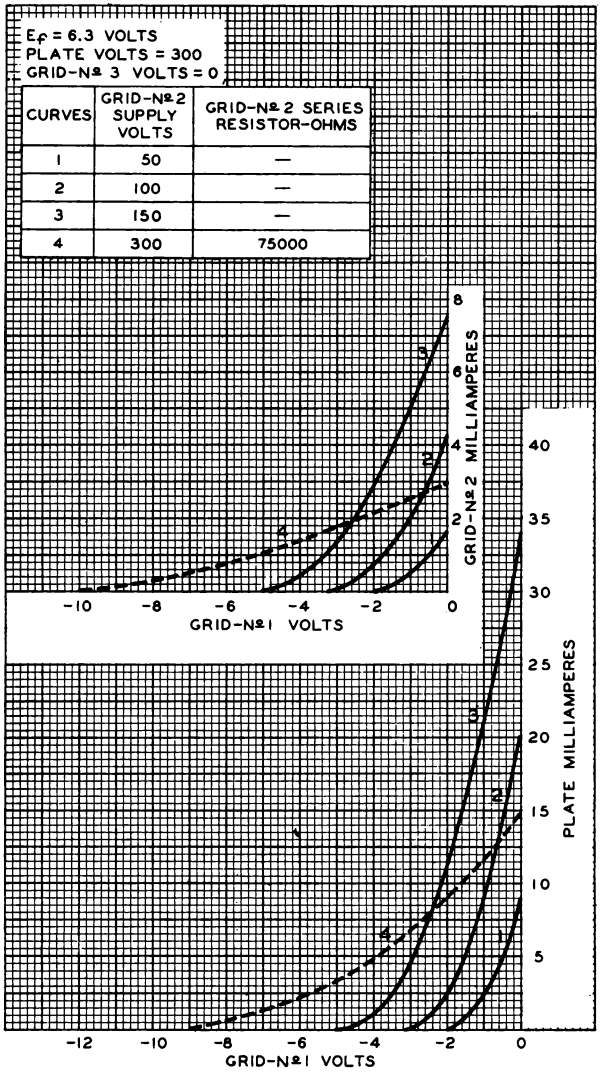
6AH6

AVERAGE PLATE CHARACTERISTICS



6AH6

AVERAGE CHARACTERISTICS



CURVES	GRID-No 2 SUPPLY VOLTS	GRID-No 2 SERIES RESISTOR-OHMS
1	50	—
2	100	—
3	150	—
4	300	75000

6AK5

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

Useful at frequencies up to 400 Mc

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.175	amp

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield*[o]	
Grid No.1 to plate	0.03 max.	0.02 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	4	4	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.1	2.8	μμf

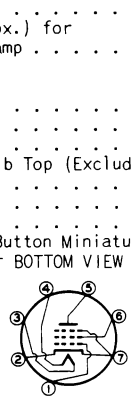
Characteristics, Class A_1 Amplifier:

Plate Voltage	120	180	volts
Grid-No.2 (Screen) Voltage	120	120	volts
Cathode-Bias Resistor	180	180	ohms
Plate Resistance (Approx.)	0.30	0.50	megohm
Transconductance	5000	5100	μmhos
Plate Current	7.5	7.7	ma
Grid-No.2 Current	2.5	2.4	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp	-8.5	-8.5	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" ±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	7BD

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



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

[o] With external shield JETEC No.316 connected to cathode.

← indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AK5

6AK5

SHARP-CUTOFF PENTODE

AMPLIFIER - Class A_1

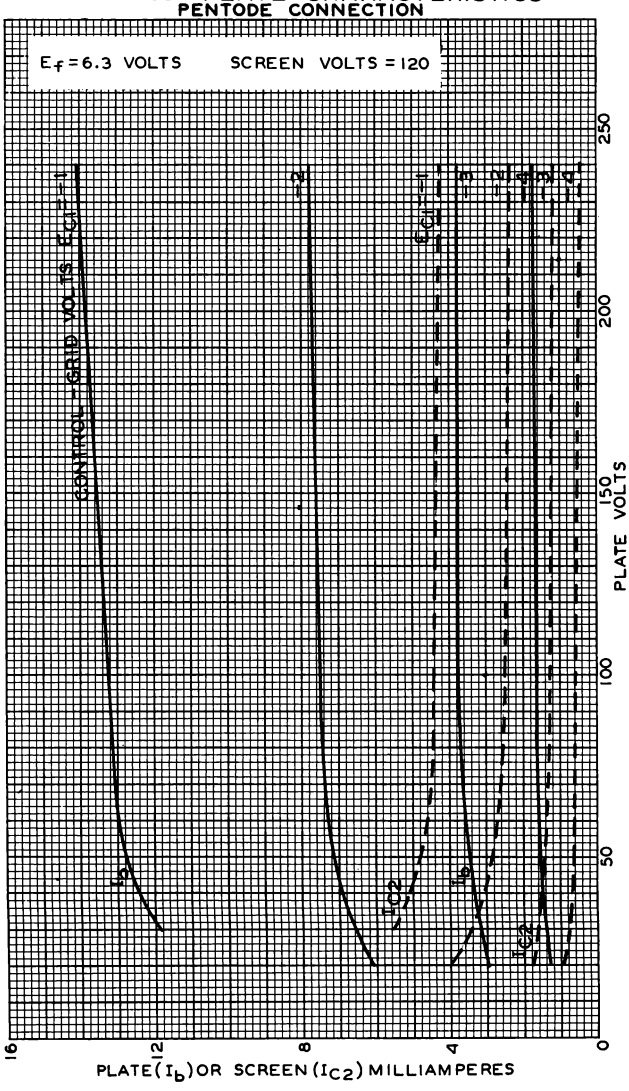
→ **Maximum Ratings,** *Design-Center Values:*

PLATE VOLTAGE.	180 max.	volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE.	180 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
PLATE DISSIPATION.	1.7 max.	watts
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*	
CATHODE CURRENT.	18 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	120 max.	volts
Heater positive with respect to cathode.	120 max.	volts

→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

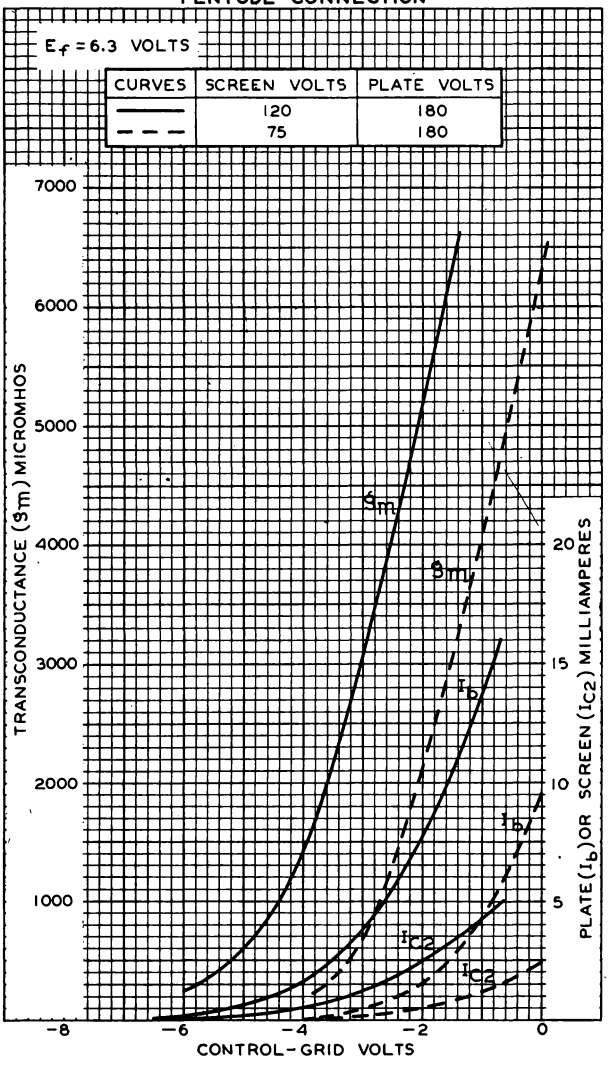
6AK5
AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



6AK5

6AK5

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



FEB. 19, 1945

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6505

6AK6

6AK6

POWER AMPLIFIER PENTODE

MINIATURE TYPE

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.15	amp.
Direct Interelectrode Capacitances (Approx.):●		
Grid to Plate	0.12	μμf
Input	3.6	μμf
Output	4.2	μμf
Maximum Overall Length		2-1/8"
Maximum Seated Height		1-7/8"
Length from Base Seat to Bulb Top (excluding tip)		1-1/2" ± 3/32"
Maximum Diameter		3/4"
Bulb		T-5-1/2
Base ▲		Miniature Button 7-Pin
Pin 1 - Grid No. 1		Pin 5 - Plate
Pin 2 - Grid No. 3		Pin 6 - Grid No. 2
Pin 3 - Heater		Pin 7 - Cathode
Pin 4 - Heater		
RCA Socket		Stock No. 9914
Mounting Position	BOTTOM VIEW (7BK)	Any

Maximum Ratings Are Design-Center Values

A-F AMPLIFIER

Plate Voltage	300 max.	volts
Screen Voltage (Grid No. 2)	250 max.	volts
Plate Dissipation	2.75 max.	watts
Screen Dissipation	0.75 max.	watt
D-C Heater-Cathode Potential	100 max.	volts
Typical Operation and Characteristics - Class A_1 Amplifier:		
Plate Voltage	180	volts
Suppressor (Grid No. 3)	Connected to cathode at	socket
Screen Voltage	180	volts
Grid Voltage (Grid No. 1) ♦	-9	volts
Peak A-F Grid Voltage	9	volts
Zero-Signal Plate Current	15	ma.
Zero-Signal Screen Current	2.5	ma.
Plate Resistance	0.2	megohm
Transconductance	2300	μmhos
Load Resistance	10000	ohms
Total Harmonic Distortion	10	%
Max.-Sig. Power Output	1.1	watts

● With no external shield.

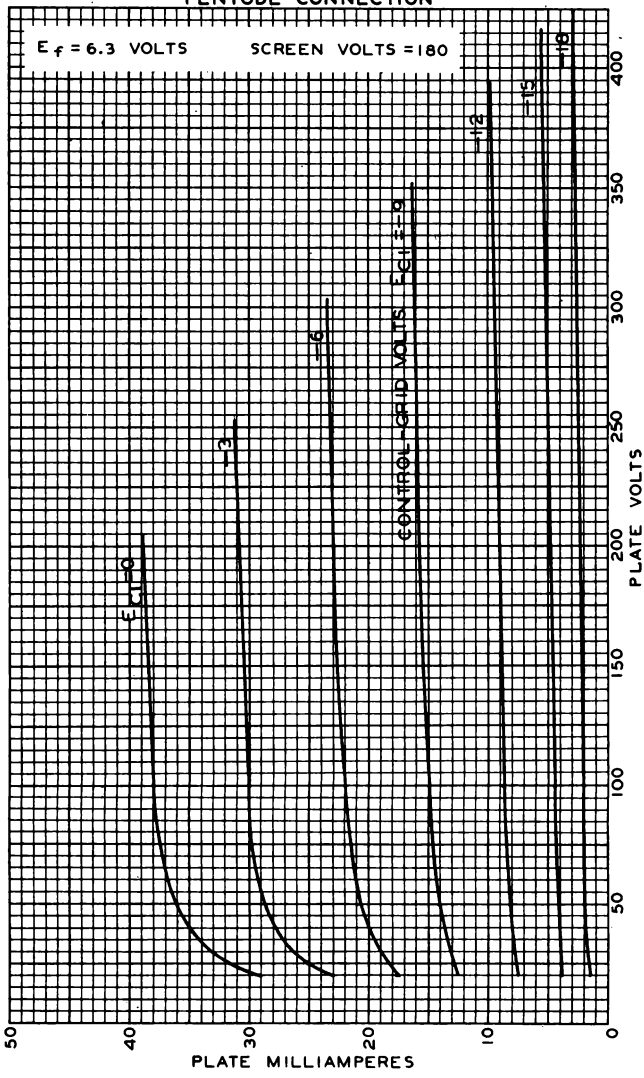
♦ The d-c resistance in the grid circuit under maximum rated conditions should not exceed 0.5 megohm for cathode-bias operation and 0.1 megohm for fixed-bias operation.

▲ *The center hole in sockets designed for this base provides for the possibility that this tube type may be manufactured with the exhaust-tube tip at the base end. For this reason, it is recommended that in equipment employing this tube type, no material be permitted to obstruct the socket hole.*

6AK6

6AK6

AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



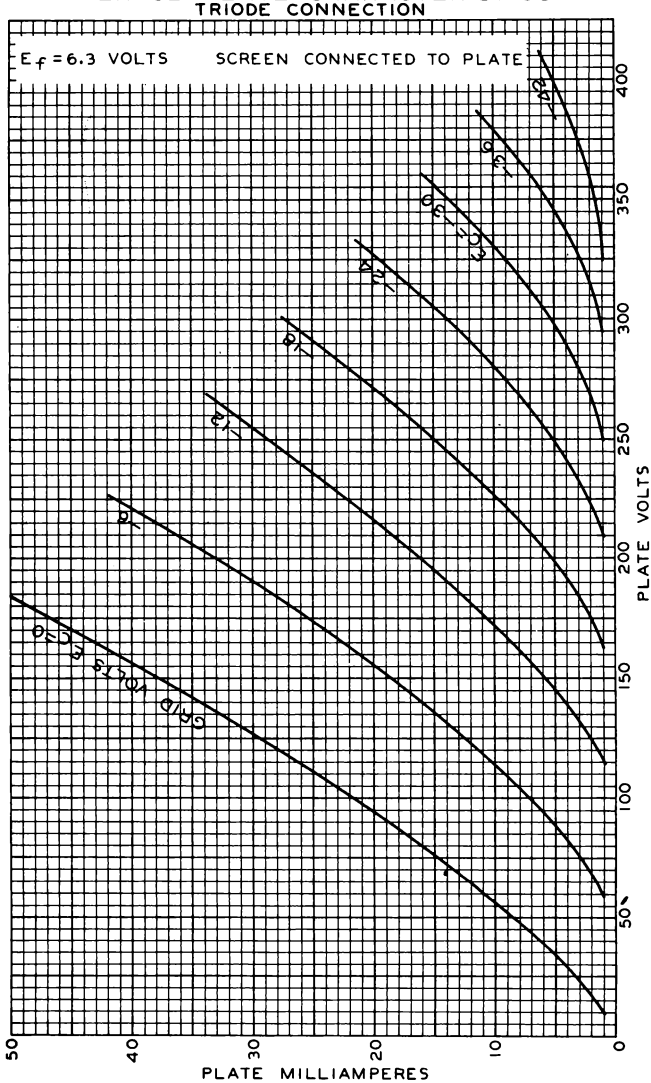
AUG. 11, 1943

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92C-6450

6AK6

AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



AUG. 11, 1943

RCA VICTOR DIVISION

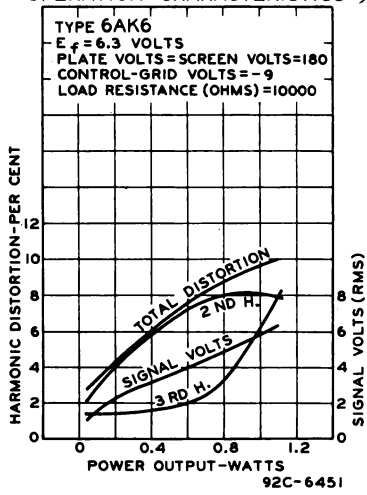
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92C-6449

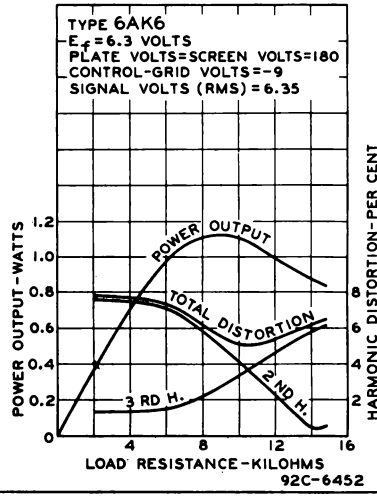
6AK6

6AK6
POWER AMPLIFIER PENTODE

OPERATION CHARACTERISTICS



OPERATION CHARACTERISTICS



6AL5

TWIN DIODE

MINIATURE TYPE

GENERAL DATA

Electrical:

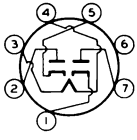
Heater, for Unipotential Cathodes:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances (Approx.):°		
Plate No. 1 to Cathode No. 1, Heater, and Internal Shield*	2.5	μμf
Plate No. 2 to Cathode No. 2, Heater, and Internal Shield●	2.5	μμf
Cathode No. 1 to Plate No. 1, Heater, and Internal Shield*	3.4	μμf
Cathode No. 2 to Plate No. 2, Heater, and Internal Shield●	3.4	μμf
Plate No. 1 to Plate No. 2□	0.068 max.	μμf
Cold Resonant Frequency (Each Unit, Approx.)	700	Mc

° With no external shield.
* With plate and cathode of unit No.2 grounded.
● With plate and cathode of unit No.1 grounded.
□ With all other electrodes and internal shield grounded.

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" ± 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	6BT

Pin 1 - Cathode of Diode No.1
Pin 2 - Plate of Diode No.2
Pin 3 - Heater
Pin 4 - Heater



Pin 5 - Cathode of Diode No.2
Pin 6 - Internal Shield
Pin 7 - Plate of Diode No.1

RECTIFIER

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

PEAK INVERSE PLATE VOLTAGE	330 max.	volts
PEAK PLATE CURRENT PER PLATE	54 max.	ma
DC OUTPUT CURRENT PER PLATE	9 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	330 max.	volts
Heater positive with respect to cathode	330 max.	volts

← Indicates a change.

6AL5

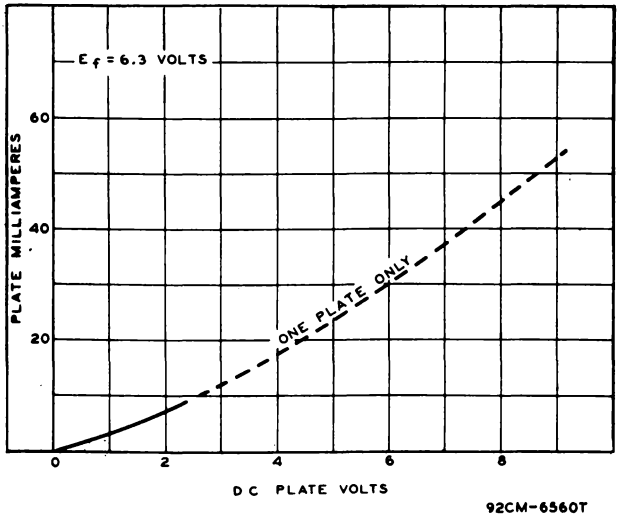
TWIN DIODE

Typical Operation as Half-Wave Rectifier:

The Two Units May Be Used Separately or in Parallel

AC Plate Voltage per Plate (RMS)	117	volts
Min. Total Effect. Plate-Supply Impedance per Plate	300	ohms
DC Output Current per Plate	9	ma

AVERAGE PLATE CHARACTERISTIC

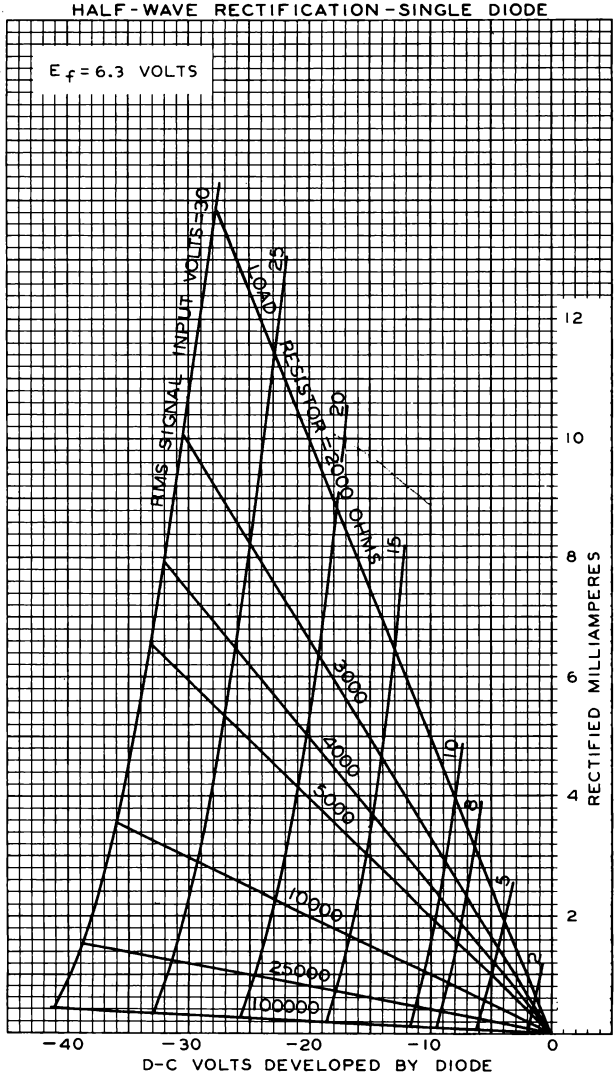


92CM-6560T

6AL5

AVERAGE CHARACTERISTICS

HALF-WAVE RECTIFICATION-SINGLE DIODE



6AL7-GT
ELECTRON-RAY TUBE

INDICATOR TYPE

GENERAL DATA

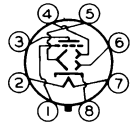
Electrical:

Heater, for Unipotential Cathode:
- Voltage . . . . . 6.3 . . . . . ac or dc volts
- Current . . . . . 0.15 . . . . . amp

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-1/16"
Maximum Seated Length	2-1/2"
Maximum Diameter	1-9/32"
Bulb	T-9
Base	Intermediate-Shell Octal 8-Pin
Basing Designation for BOTTOM VIEW	8CH

Pin 1 - Grid
Pin 2 - Heater
Pin 3 - Target
Pin 4 - Deflecting Electrode No.2



Pin 5 - Deflecting Electrode No.3
Pin 6 - Deflecting Electrode No.1
Pin 7 - Heater
Pin 8 - Cathode

INDICATOR SERVICE

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

TARGET VOLTAGE	365 max.	volts
	220 min.	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:

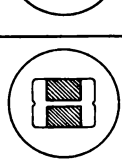
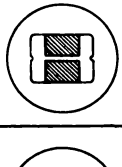
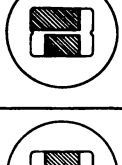
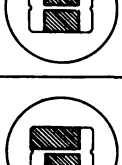
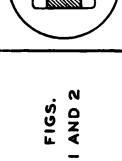
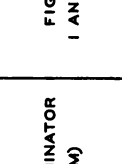
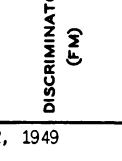
Target Voltage	315	volts
Deflecting-Electrode-No.1 Voltage*	0	volts
Deflecting-Electrode-No.2 Voltage*	0	volts
Deflecting-Electrode-No.3 Voltage*	0	volts
Grid Voltage	0	volts
Cathode-Bias Resistor (Approx.)	3300	ohms
Grid Voltage for Pattern cutoff (Approx.)	-7	volts
Deflection Sensitivity (Approx.)#	1	mm/volt

* With tube mounted horizontally and pins 4 & 8 in vertical plane (Pin 4 on top), deflecting electrode No.1 controls top left-hand section of pattern, deflecting electrode No.2 controls top right-hand section of pattern, deflecting electrode No.3 controls bottom section of pattern.

\# For first mm deflection (Deflecting Electrodes No.1 & No.2).

6AL7-GT
ELECTRON-RAY TUBE

PATTERN SEQUENCE DURING TUNING

CONTROL VOLTAGE SOURCE	CIRCUIT (NEXT PAGE)	OFF CHANNEL (-)	ON CHANNEL OFF TUNE (-)	ON TUNE	ON CHANNEL OFF TUNE (+)	OFF CHANNEL (+)
DISCRIMINATOR (FM)	FIGS. 1 AND 2					
DISCRIMINATOR AND SQUELCH (FM)	FIG. 3					
DISCRIMINATOR AND LIMITER (FM)	FIG. 4					
AVC (FM)	FIG. 5					

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AL7-GT
ELECTRON-RAY TUBE

TYPICAL CIRCUITS

FIG. 1

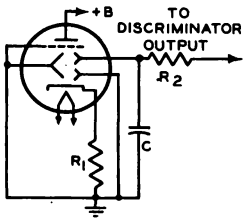


FIG. 2

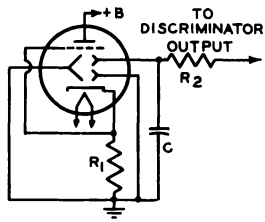


FIG. 3

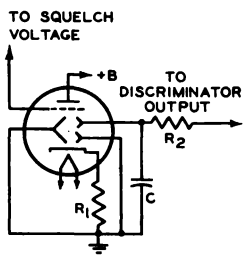


FIG. 4

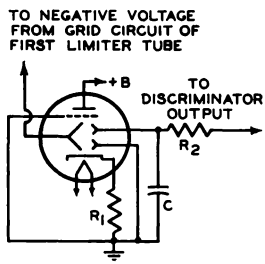
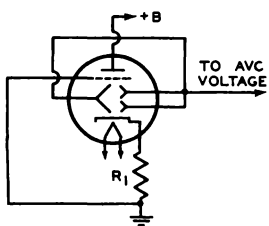


FIG. 5



+B = 315 VOLTS APPROX.
C = 0.05 μf

R1 = 3300 OHMS
R2 = 1.0 MEGOHM

92CS-7169

6AM8

DIODE–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**	
Diode Unit:			
Plate to cathode, internal shield, and heater . . .	1.7	2.3	μμf
Cathode to plate, internal shield, and heater . . .	4	4	μμf
Pentode Unit:			
Grid No.1 to plate	0.015 max.	0.015 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	6	6	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	2.6	3.4	μμf
Pentode grid No.1 to diode plate	0.006 max.	0.005 max.	μμf
Pentode plate to diode cathode	0.15 max.	0.15 max.	μμf
Pentode plate to diode plate	0.1 max.	0.035 max.	μμf

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.E1-9)
Basing Designation for BOTTOM VIEW 9CY

Pin 1 – Pentode Cathode
Pin 2 – Pentode Grid No.1
Pin 3 – Pentode Grid No.2
Pin 4 – Heater
Pin 5 – Heater

Pin 6 – Pentode Plate
Pin 7 – Diode Cathode
Pin 8 – Diode Plate
Pin 9 – Pentode Grid No.3, Internal Shield

* With external shield JETEC No.315 connected to cathode of unit under test.

6AM8

DIODE–SHARP-CUTOFF PENTODE

PENTODE UNIT - Class A_1 Amplifier

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300	max.	volts
GRID-No.3 (SUPPRESSOR) VOLTAGE	0	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*		
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive bias value	0	max.	volts
PLATE DISSIPATION	2.8	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▲	max.	volts

Typical Operation and Characteristics:

Plate-Supply Voltage	200	volts
Grid No.3	*Connected to cathode at socket*	
Grid-No.2 Supply Voltage	150	volts
Cathode-Bias Resistor	120	ohms
Plate Resistance (Approx.)	600000	ohms
Transconductance	7000	μmhos
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp	-8	volts
Plate Current	11.5	ma
Grid-No.2 Current	2.7	ma

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:*

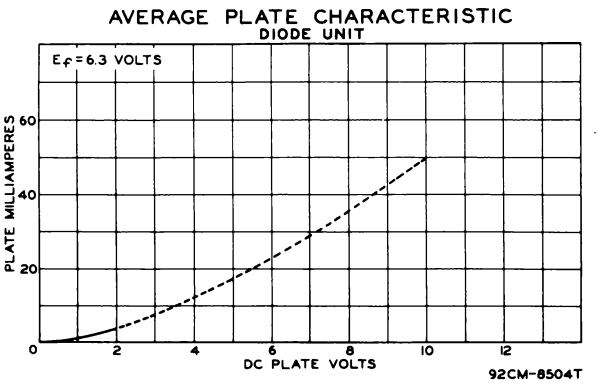
DC PLATE CURRENT	5	max.	ma
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AM8

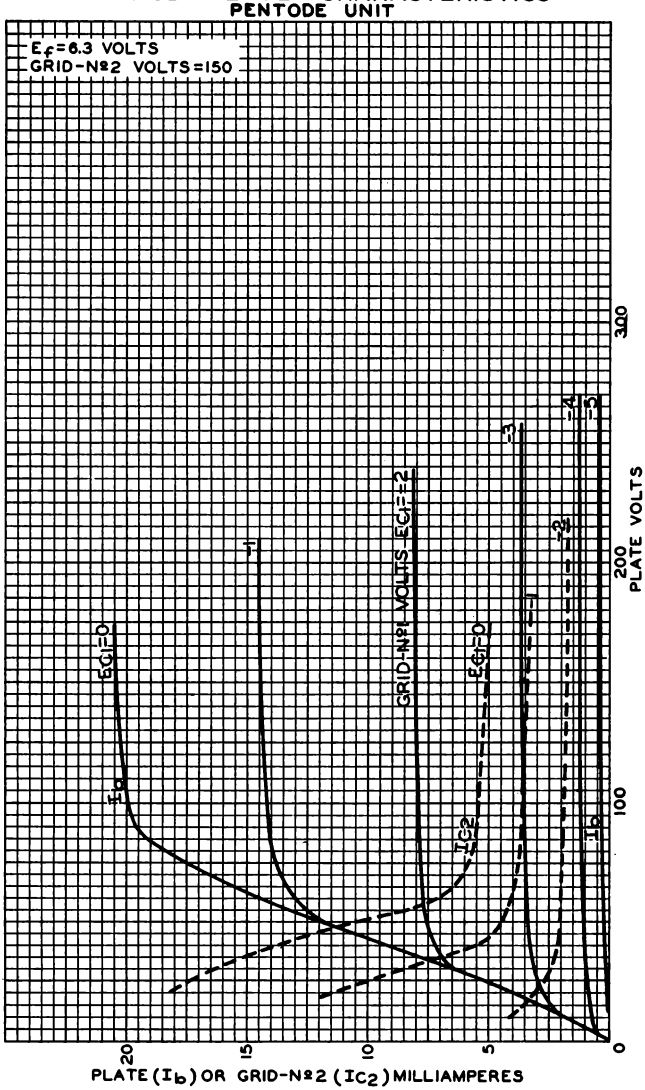
DIODE—SHARP-CUTOFF PENTODE



6AM8

6AM8

AVERAGE PLATE CHARACTERISTICS
PENTODE UNIT



JAN. 14, 1954 TUBE DIVISION 92CM-8505

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AN8

6AN8

MEDIUM-MU TRIODE–SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

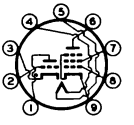
Heater, for Unipotential Cathodes:		
Voltage	6.3	ac or dc volts
Current	0.45	amp
Direct Interelectrode Capacitances (Without external shield):		
Triode Unit:		
Grid to Plate	1.5	μμf
Input	2.0	μμf
Output	0.27	μμf
Pentode Unit:		
Grid No.1 to Plate	0.04 max.	μμf
Input	7	μμf
Output	2.3	μμf
Triode Grid to Pentode Plate	0.005	μμf
Pentode Grid No.1 to Triode Plate	0.006	μμf
Pentode Plate to Triode Plate	0.045	μμf

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)

BOTTOM VIEW

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, Int. Shield

Characteristics:

	Triode Unit	*Pentode Unit*	
Plate Supply Voltage	200	200	volts
Grid-No.2 Supply Voltage	–	150	volts
Grid-No.1 Voltage	-6	–	volts
Cathode-Bias Resistor	–	180	ohms
Amplification Factor	19	–	
Plate Resistance (Approx.)	5750	300000	ohms

6AN8

MEDIUM-MU TRIODE–SHARP-CUTOFF PENTODE

	Triode Unit	*Pentode Unit*	
Transconductance	3300	6200	μmhos
Grid-No.1 Bias (Approx.) for Plate Current of 10 μamp . . .	-19	-8	volts
Plate Current	13	9.5	ma
Grid-No.2 Current	-	2.8	ma

AMPLIFIER - Class A_1

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	2.5	max.	2	max.	watts
GRID-No.2 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▲	max.	200▲	max.	volts

Maximum Circuit Values:

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

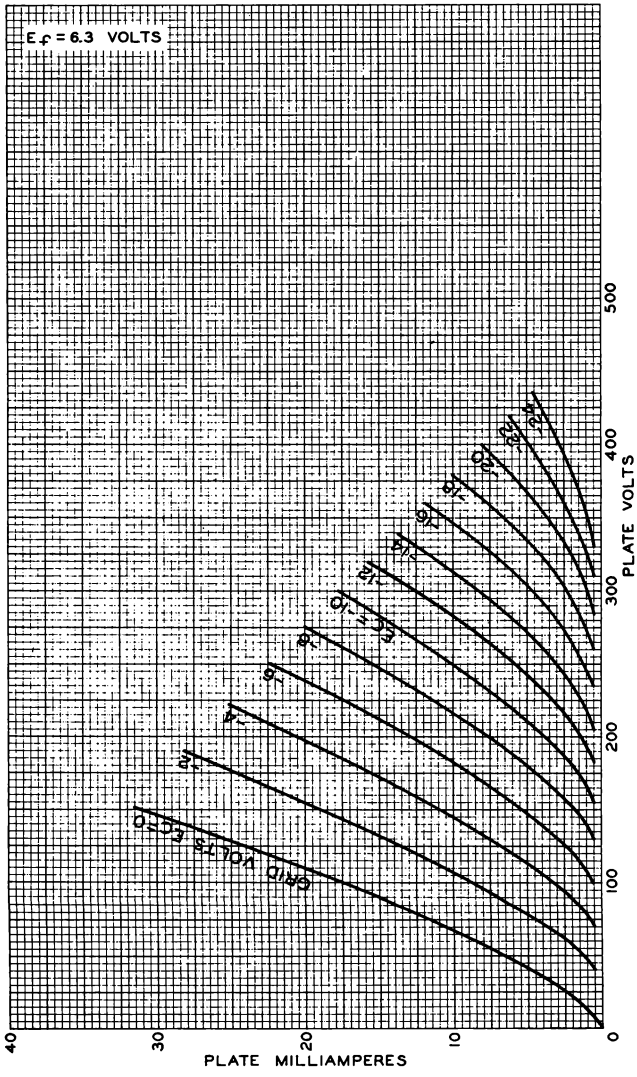
* If *either* unit is operating at maximum rated conditions, grid-No.1-circuit resistances for *both* units should not exceed the stated values.

▲ The dc component must not exceed 100 volts.

6AN8

AVERAGE PLATE CHARACTERISTICS

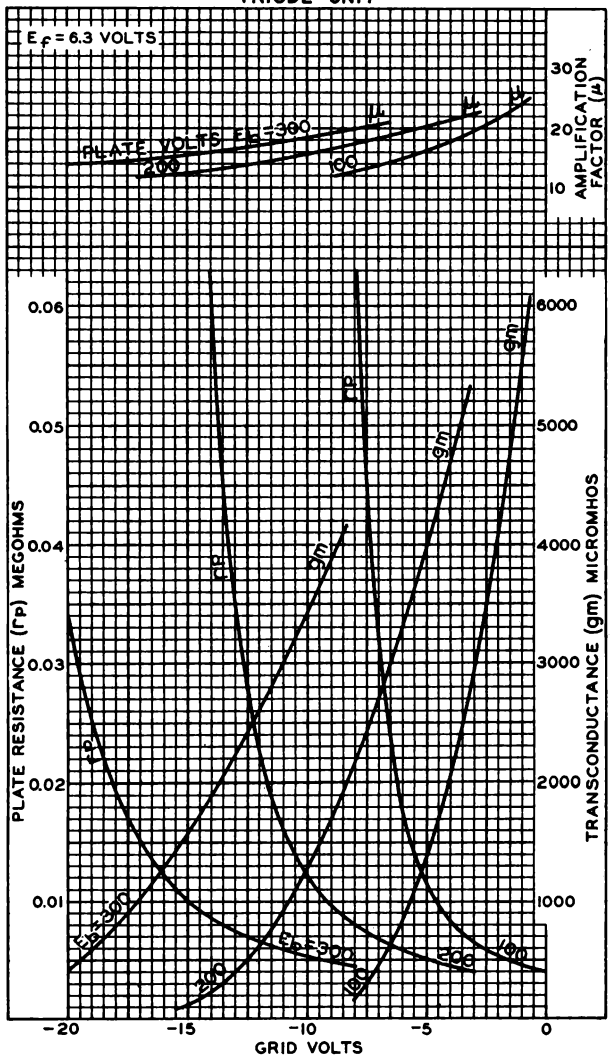
TRIODE UNIT



6AN8

6AN8

AVERAGE CHARACTERISTICS
TRIODE UNIT

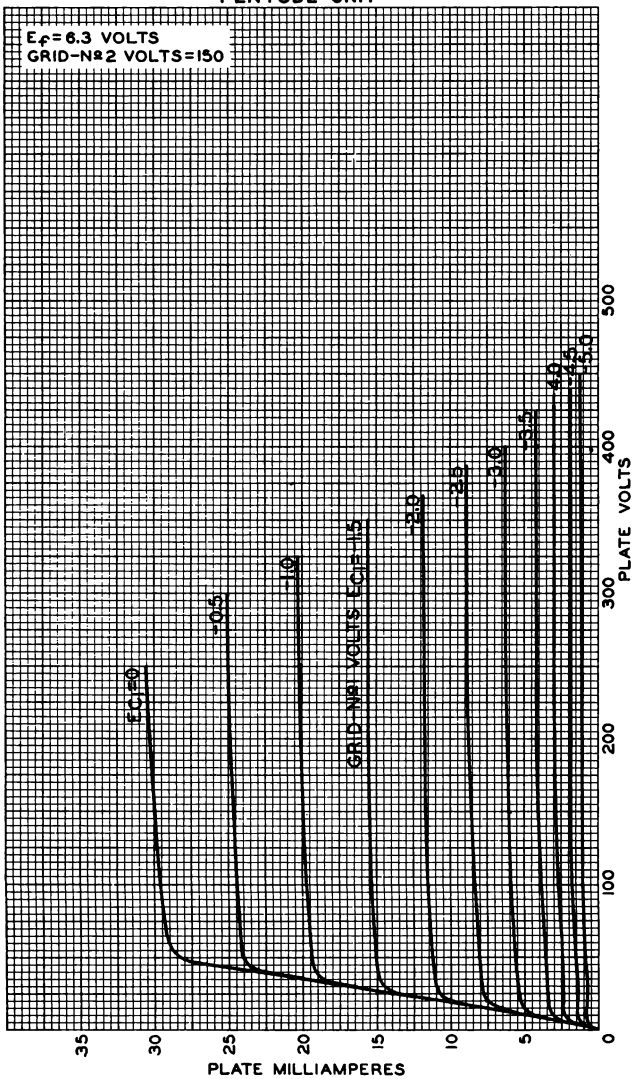


DEC. 23, 1953 TUBE DEPARTMENT 92CM-8207

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AN8

AVERAGE PLATE CHARACTERISTICS
PENTODE UNIT



DEC.23,1953

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

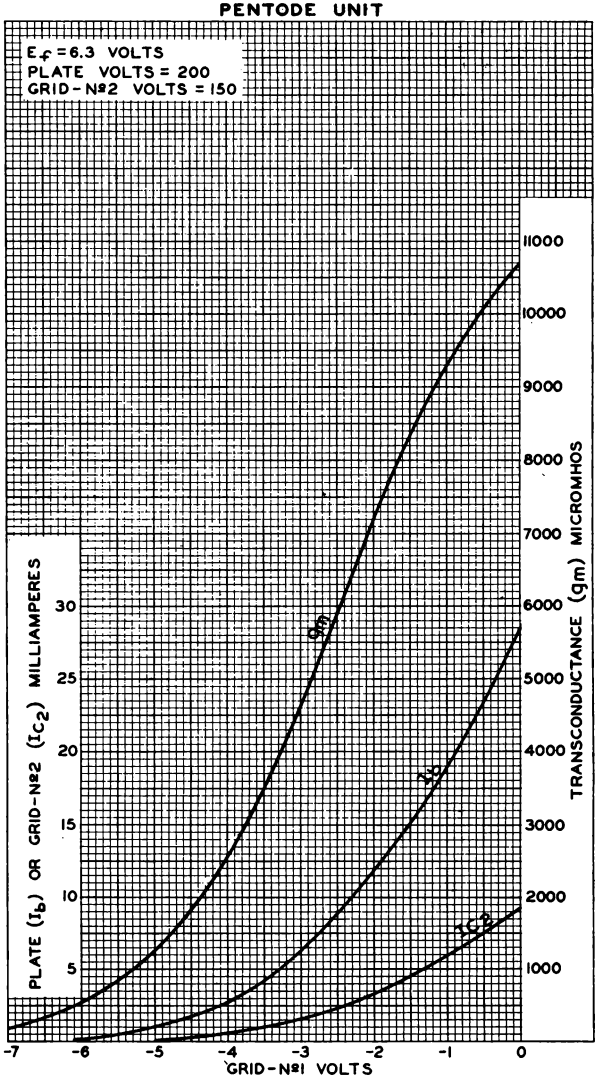
92CM-8206

6AN8

6AN8

AVERAGE CHARACTERISTICS

PENTODE UNIT



DEC. 23, 1953

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8208

6AQ5
BEAM POWER AMPLIFIER

MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

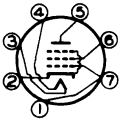
Voltage	6.3	ac or dc volts
Current	0.45	amp
Direct Interelectrode Capacitances (Approx.):**		
Grid No.1 to Plate	0.35	μμf ←
Input	8.3	μμf
Output	8.2	μμf

**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" ±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	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 A1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	250 max.	volts
GRID-No.2 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)*	250 max.	°C ←

Typical Operation and Characteristics:

Plate Voltage	180	250	volts
Grid-No.2 (Screen) 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

*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.

← Indicates a change

6AQ5

BEAM POWER AMPLIFIER

Zero-Sig. Plate Current	29	45	ma.
Max.-Sig. Plate Current	30	47	ma.
Zero-Sig. Grid-No.2 Cur. (Approx.)	3	4.5	ma.
Max.-Sig. Grid-No.2 Cur. (Approx.)	4	7	ma.
Plate Resistance (Approx.)	58000	52000	ohms
Transconductance	3700	4100	µmhos
Load Resistance	5500	5000	ohms
Total Harmonic Distortion	8	8	%
Max.-Sig. Power Output	2.0	4.5	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

AF POWER AMPLIFIER - Class AB_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	250 max.	volts
GRID-No.2 VOLTAGE	250 max.	volts
PLATE DISSIPATION	12 max.	watts
GRID-No.2 DISSIPATION	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)●	250 max.	°C

Typical Operation and Characteristics:

Unless otherwise specified, values are for 2 tubes

Plate Voltage	250	volts
Grid-No.2 (Screen) Voltage	250	volts
Grid-No.1 (Control-Grid) Voltage	-15	volts
Peak AF Grid-to-Grid Voltage	30	volts
Zero-Signal Plate Current	70	ma.
Max.-Signal Plate Current	79	ma.
Zero-Signal Grid-No.2 Current	5	ma.
Max.-Signal Grid-No.2 Current	13	ma.
Plate Resistance (per tube)	60000	ohms
Transconductance (per tube)	3750	µmhos
Effective Load Resistance (Plate to plate)	10000	ohms
Total Harmonic Distortion	5	%
Max.-Signal Power Output	10	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 for the 6AQ5, within its ratings, are the same as those shown for type 6V6.

● See preceding page.

→ Indicates a change

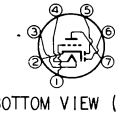
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AQ6

DUPLEX-DIODE HIGH-MU TRIODE

MINIATURE TYPE

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.15	amp.
Direct Interelectrode Capacitances - Triode Unit:°		
Grid to Plate	1.8	μμf
Grid to Cathode & Heater	1.7	μμf
Plate to Cathode & Heater	1.5	μμf
Maximum Overall Length		2-1/8"
Maximum Seated Height		1-7/8"
Length from Base Seat to Bulb Top (excluding tip)		1-1/2" ± 3/32"
Maximum Diameter		3/4"
Bulb		T-5½
Base▲		Miniature Button 7-Pin
Pin 1 - Triode Grid		Pin 5 - Diode Plate No.2
Pin 2 - Cathode		Pin 6 - Diode Plate No.1
Pin 3 - Heater		Pin 7 - Triode Plate
Pin 4 - Heater		
RCA Socket		Stock No.9914
Mounting Position		Any



BOTTOM VIEW (7BT)

Maximum Ratings Are Design-Center Values

TRIODE UNIT

Plate Voltage		300 max.	volts
D-C Heater-Cathode Potential		90 max.	volts
Characteristics - Class A_1 Amplifier:			
Plate Voltage	100	250	volts
Grid Voltage	-1	-3	volts
Amplification Factor	70	70	
Plate Resistance	61000	58000	ohms
Transconductance	1150	1200	μmhos
Plate Current	0.8	1.0	ma.

Typical Operation with Resistance Coupling:

Same as for Type 6T7-G in RESISTANCE-COUPLED AMPLIFIER CHART.

DIODE UNITS - Two

For consideration of these units, see Type 6ST7.

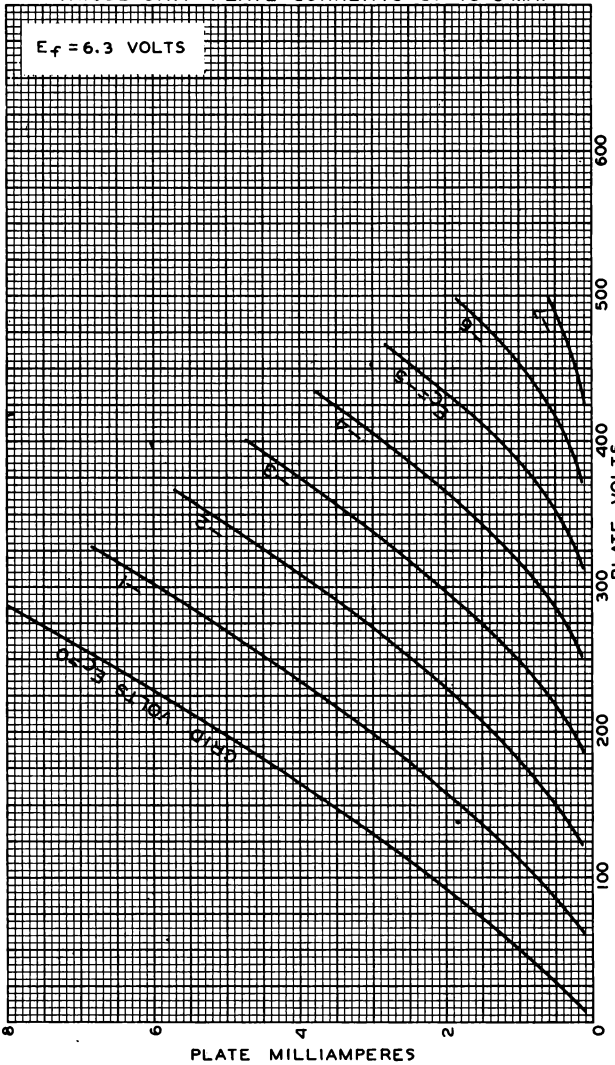
° With close-fitting shield connected to cathode.

▲ *The center hole in sockets for this base provides for the possibility that this tube type may be manufactured with the exhaust-tube tip at the base end. For this reason, it is recommended that in equipment employing this tube type, no material be permitted to obstruct the socket hole.*

6AQ6

6AQ6

AVERAGE PLATE CHARACTERISTICS
TRIODE UNIT—PLATE CURRENTS UP TO 8 MA.

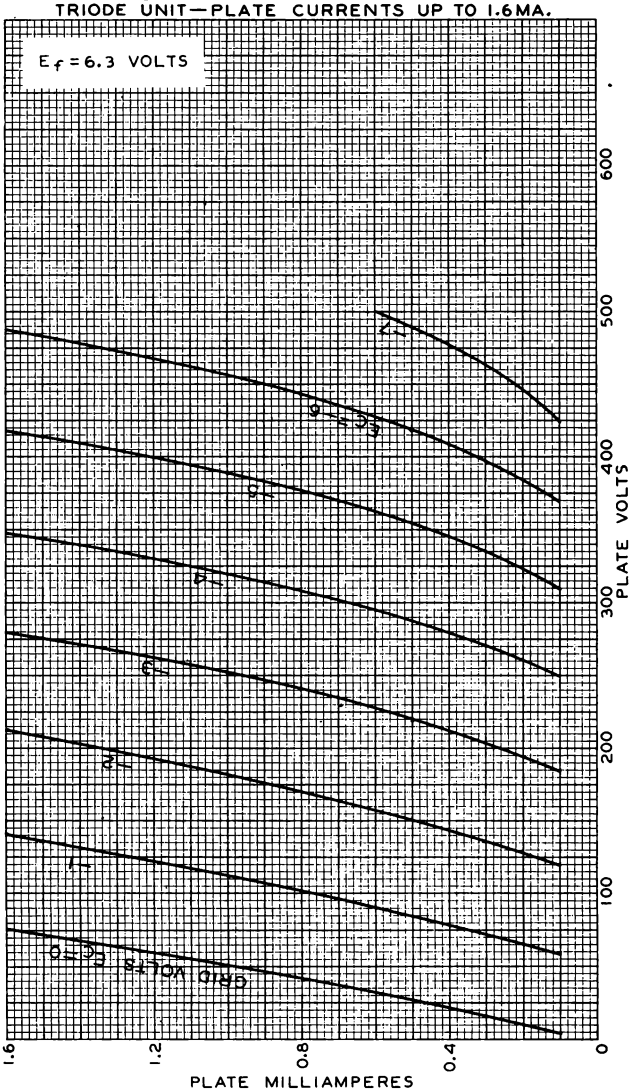


APR. 7, 1944

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6551

6AQ6
AVERAGE PLATE CHARACTERISTICS
TRIODE UNIT—PLATE CURRENTS UP TO 1.6MA.



APR. 8, 1944

RCA VICTOR DIVISION

92CM—6552

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AQ7-GT
TWIN DIODE—HIGH-MU TRIODE

GENERAL DATA

Electrical:

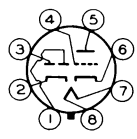
Heater, for Unipotential Cathodes:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances:		
Triode Unit:°		
Grid to Plate	3.0	μμf
Grid to Cathode	2.8	μμf
Plate to Cathode	3.2	μμf
Grid to Diode Cathode°	0.25 max.	μμf
Diode-No.1 Plate to Diode Cathode*	2.2	μμf
Diode-No.2 Plate to Diode Cathode*	2.4	μμf
Diode-No.1 Plate to Diode-No.2 Plate*	0.5	μμf

° with external shield No.308 connected to Pin No.6.
* with external shield No.308 connected to Pin No.2.

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	8CK

Pin 1 - Diode-No.2 Plate
Pin 2 - Cathode of Diode Units
Pin 3 - Diode-No.1 Plate



Pin 4 - Triode Grid
Pin 5 - Triode Plate
Pin 6 - Cathode of Triode Unit
Pin 7 - Heater
Pin 8 - Heater

TRIODE UNIT
AMPLIFIER - Class A_1

Maximum Ratings. *Design-Center Values:*

PLATE VOLTAGE	250 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 and Characteristics:

Plate Voltage	100	250	volts
Grid Voltage	-1	-2	volts

6AQ7-GT
TWIN DIODE—HIGH-MU TRIODE

Amplification Factor	79	70		
Plate Resistance (Approx.) . . .	64000	44000	. .	ohms
Transconductance	1250	1600	. .	μmhos
Plate Current.	1.1	2.3	. .	ma

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHARTS at front of this Section.

DIODE UNITS - Two

Maximum Ratings, *Design-Center Values:*

PLATE CURRENT (For Each Diode)	0.9 max.	ma

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AR5
POWER PENTODE

MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.4	amp

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
Basing Designation for BOTTOM VIEW	6CC

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 - No Connection

AF POWER AMPLIFIER - Class A_1

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

PLATE VOLTAGE	250 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	250 max.	volts
PLATE DISSIPATION	8.5 max.	watts
GRID-No.2 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	250	250	volts
Grid-No.2 Voltage	250	250	volts
Grid-No.1 (Control-Grid) Voltage	-16.5	-18	volts
Peak AF Grid-No.1 Voltage	16.5	18	volts
Zero-Signal Plate Current	34	32	ma
Max.-Signal Plate Current	35	33	ma
Zero-Signal Grid-No.2 Current	5.7	5.5	ma
Max.-Signal Grid-No.2 Current	10	10	ma
Plate Resistance (Approx.)	65000	68000	ohms
Transconductance	2400	2300	μmhos
Load Resistance	7000	7600	ohms
Total Harmonic Distortion	7	11	%
Max.-Sig. Power Output	3.2	3.4	watts

(continued on next page)

6AR5

POWER PENTODE

Maximum Circuit Values (for maximum rated conditions):

Grid-No.1-Circuit Resistance:

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

Curves for the 6AR5 are the same as those shown for type 6K6-GT.

6AS5

6AS5
BEAM POWER AMPLIFIER

MINIATURE TYPE

GENERAL DATA

Electrical:

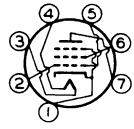
Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.8	amp
Direct Interelectrode Capacitances (Approx.):[o]		
Grid No.1 to Plate	0.6	μμf
Input	12	μμf
Output	6.2	μμf

[o] With no external shield.

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (excluding tip)	2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin
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

AF POWER AMPLIFIER - Class A_1

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

PLATE VOLTAGE	150 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	117 max.	volts
PLATE DISSIPATION	5.5 max.	watts
GRID-No.2 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 and Characteristics:

Plate Voltage	150	volts
Grid-No.2 Voltage	110	volts
Grid-No.1 (Control-Grid) Voltage	-8.5	volts
Peak AF Grid-No.1 Voltage	8.5	volts
Zero-Signal Plate Current	35	ma
Max.-Signal Plate Current	36	ma
Zero-Signal Grid-No.2 Current	2	ma
Max.-Signal Grid-No.2 Current	6.5	ma
Transconductance	5600	μmhos
Load Resistance	4500	ohms

6AS5
BEAM POWER AMPLIFIER

Total Harmonic Distortion.	10	%
Max.-Sig. Power Output	2.2	watts

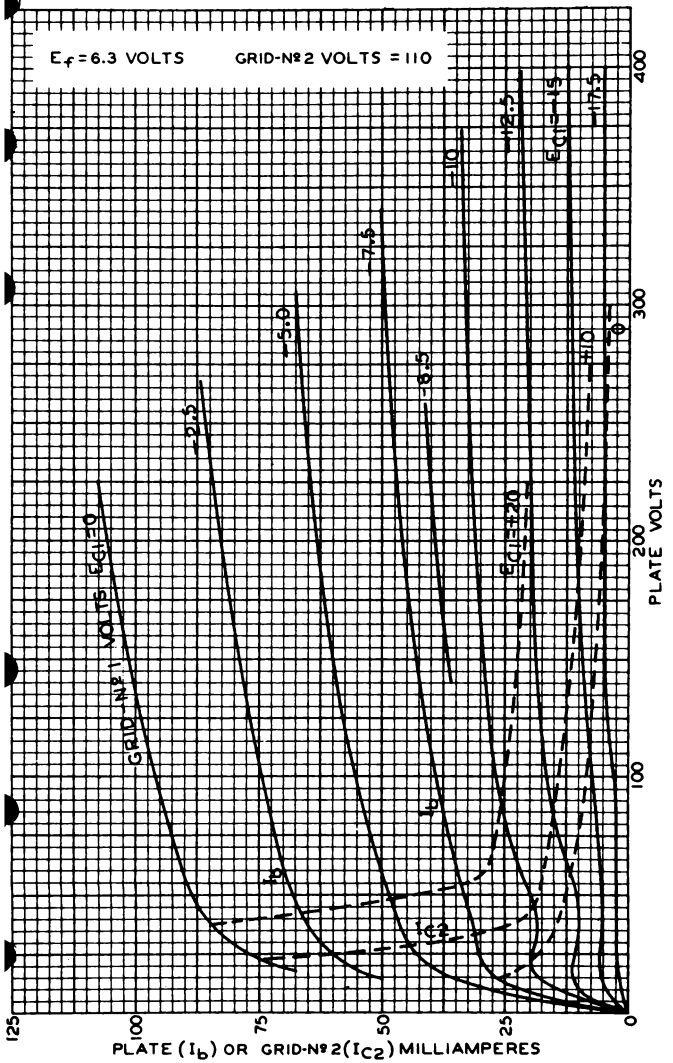
Maximum Circuit Values (for maximum rated conditions):

Grid-No.1-Circuit Resistance:		
For fixed bias	0.1	megohm
For cathode bias	0.5	megohm

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AS5

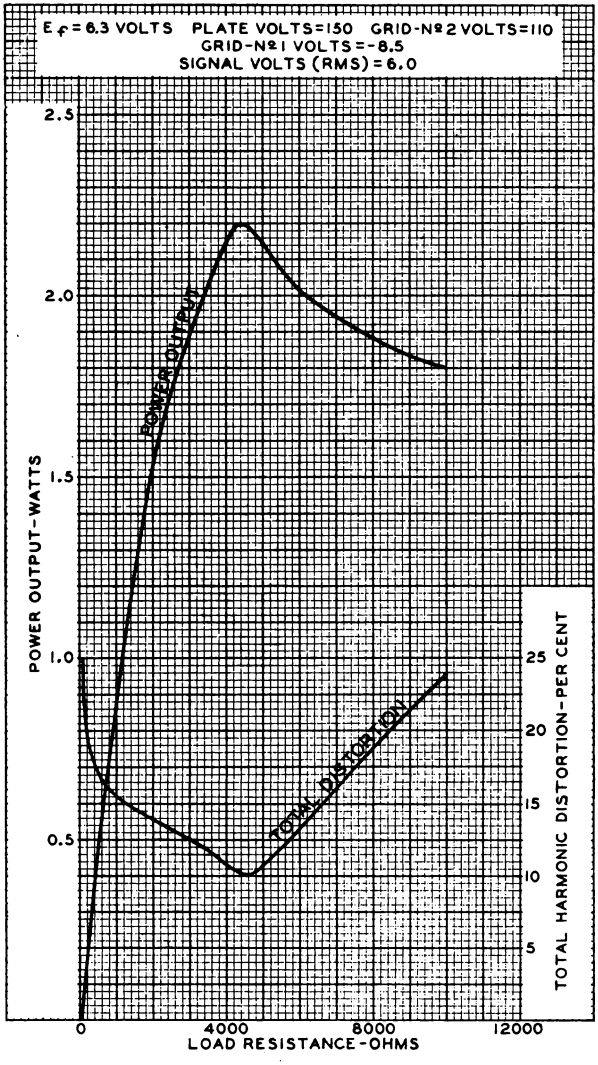
AVERAGE PLATE CHARACTERISTICS



6AS5

6AS5

OPERATION CHARACTERISTICS



6AS8

DIODE-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 (Approx.):*

Diode Unit:		
Plate to heater and cathode and internal shield	3.0	μμf
Pentode Unit:		
Grid No.1 to plate	0.04 max.	μμf
Input	7	μμf
Output	2.2	μμf
Pentode grid to diode plate	0.005 max.	μμf
Pentode plate to diode cathode	0.15 max.	μμf
Pentode plate to diode plate	0.10 max.	μμf

Characteristics, Class A_1:

Plate-Supply Voltage	200	volts
Grid No.3	Connected to cathode at socket	
Grid-No.2 Supply Voltage	150	volts
Cathode-Bias Resistor	180	ohms
Plate Resistance (Approx.)	300000	ohms
Transconductance	6200	μmhos
Grid-No.1 Bias (Approx.) for Plate Current of 10 μamp	-8	volts
Plate Current	9.5	ma
Grid-No.2 Current	3	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" ± 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	9DS

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

Pin 6 - Diode Plate
Pin 7 - Pentode Grid No.3, Int.Shield
Pin 8 - Diode Cathode
Pin 9 - Pentode Plate

* With no external shield.

6AS8

6AS8

DIODE—SHARP-CUTOFF PENTODE

PENTODE UNIT - Class A_1 Amplifier

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	2.5 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• max.	volts

Maximum Circuit Values (For maximum rated conditions):

Grid-No.1-Circuit Resistance:		
For cathode-bias operation	1.0 max.	megohm
For fixed-bias operation	0.25 max.	megohm

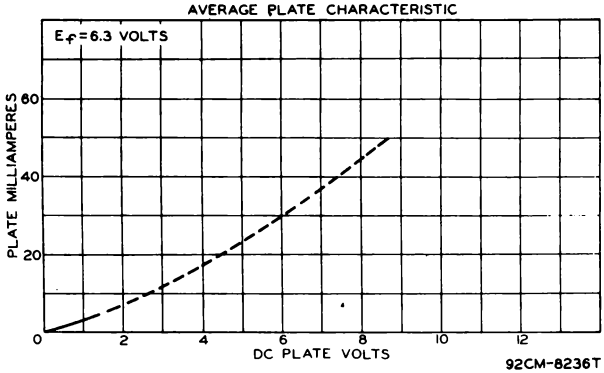
DIODE UNIT

Maximum Ratings, *Design-Center Values*:

PEAK INVERSE PLATE VOLTAGE	330 max.	volts
PEAK PLATE CURRENT	50 max.	ma
DC 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• max.	volts

• The dc component must not exceed 100 volts.

AVERAGE PLATE CHARACTERISTIC

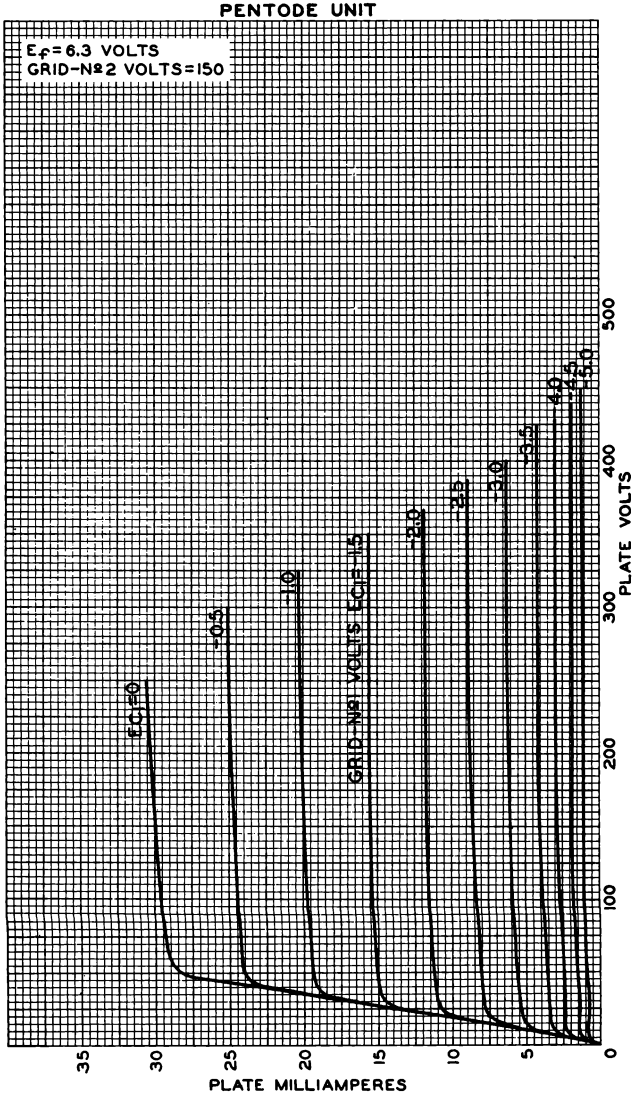


92CM-8236T

6AS8

AVERAGE PLATE CHARACTERISTICS

PENTODE UNIT



DEC.23,1953

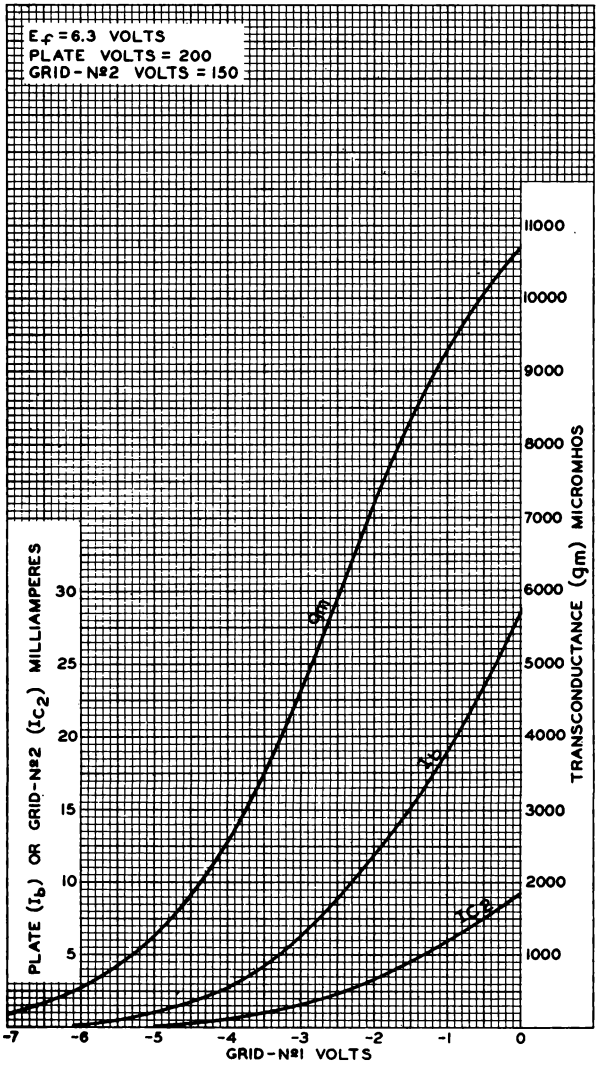
TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8206

6AS8

AVERAGE CHARACTERISTICS
PENTODE UNIT



DEC. 23, 1953

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8208

6AT6
TWIN DIODE—HIGH-MU TRIODE

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:

	Without External Shield	*With External Shield°*	
Grid to triode plate	2.0	2.0	μμf
Grid to cathode and heater	2.2	2.2	μμf
Plate to cathode and heater	0.8	1.2	μμf
Plate of diode unit No.2 to triode grid	0.04 max.		μμf

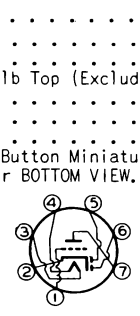
Characteristics, Class A_1 Amplifier (Triode Unit):

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:

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	7BT

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



Pin 5 - Diode Plate No.2
Pin 6 - Diode Plate No.1
Pin 7 - Triode Plate

TRIODE UNIT—AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300 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	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

° With external shield JETEC No.316 connected to cathode.

← Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AT6

TWIN DIODE—HIGH-MU TRIODE

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

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

→ **DIODE UNITS**

Maximum Ratings, *Design-Center Values:*

PLATE CURRENT (For each diode). . . . . 1.0 max. ma

Diode Considerations:

Consideration of these units, including typical circuits and diode curves, is given at the front of this Section. Diode biasing of the triode unit of the 6AT6 is not suitable.

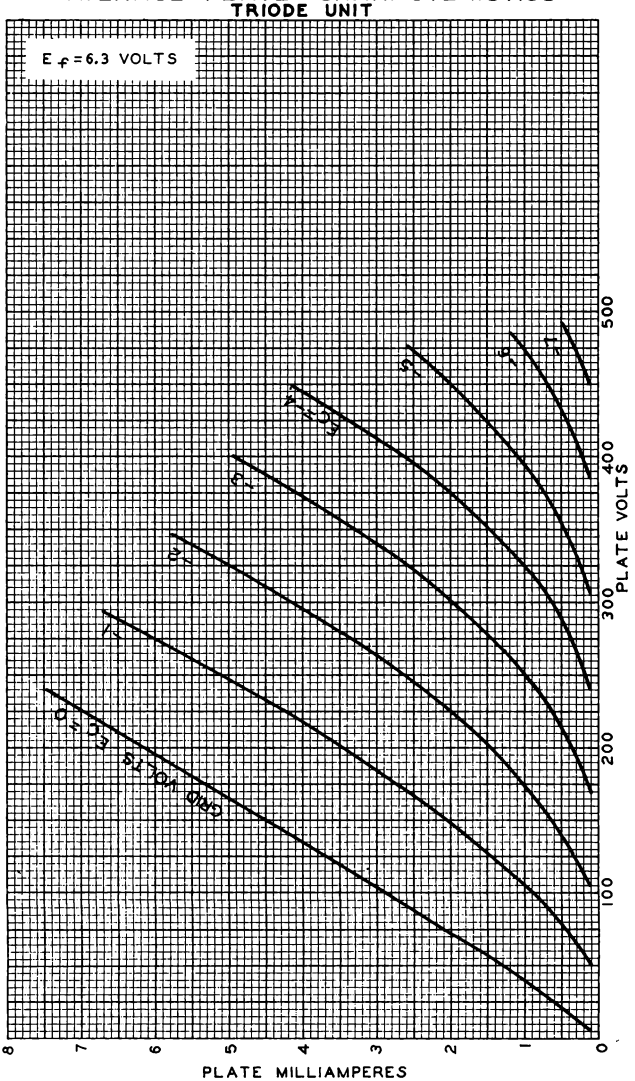
→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AT6

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



OCT. 19, 1945

RCA VICTOR DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6610

6AT8
TRIODE-PENTODE CONVERTER

9-PIN MINIATURE TYPE

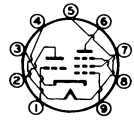
The 6AT8 is the same as the 6X8 except for the following items:

Direct Interelectrode Capacitances: ←

	Without External Shield	*With External Shield°*	
Triode Unit:			
Grid to plate.	1.5	1.5	μμf
Grid to cathode and heater	2	2.4	μμf
Plate to cathode and heater	0.5	1	μμf
Pentode Unit:			
Grid No.1 to plate . .	0.025 max.	0.016 max.	μμf
Grid No.1 to cathode, grid No.3, grid No.2, and heater	4.5	4.7	μμf
Plate to cathode, grid No.3, grid No.2, and heater	0.9	1.6	μμf
Pentode grid No.1 to triode plate	0.05 max.	0.04 max.	μμf
Pentode plate to triode plate.	0.05 max.	0.007 max.	μμf
Heater to cathode. . . .	6.5	6.5●	μμf
Pentode Unit Connected as Triode:▲			
Grid No.1 to plate and grid No.2.	1.3	1.3	μμf
Grid No.1 to cathode, grid No.3, and heater	3	3.3	μμf
Plate to cathode, grid No.3, and heater . .	1.7	2.5	μμf

Basing Designation for BOTTOM VIEW . . . . . .9DW ←

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
Pin 9 - Pentode Grid No.1

° With external shield JETEC No.316 connected to pin No.3, except as noted.

● With external shield JETEC No.316 connected to ground.

▲ Grid No.3 connected to cathode, and grid No.2 connected to plate.

Curves shown under Type 6X8 also apply to the 6AT8

← Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AU4-GT

HALF-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

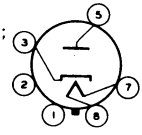
Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	1.8	amp
Direct Interelectrode Capacitances (Approx.):°		
Plate to Heater and Cathode	8.5	μμf
Cathode to Heater and Plate	11.5	μμf
Heater to Cathode	4.0	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-13/16"
Maximum Seated Length	3-1/4"
Maximum Diameter	1-9/32"
Bulb	T-9
Base	Short Intermediate-Shell Octal 5- or 6-Pin with External Barriers (JETEC Nos.B5-85 or B6-60)
Basing Designation for BOTTOM VIEW	4CG

Pin 1: No Connection-Do Not Use; or Omitted

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▲

PEAK INVERSE PLATE VOLTAGE (Absolute Maximum)#	4500● max.	volts
PEAK PLATE CURRENT	1050 max.	ma
DC PLATE CURRENT	175 max.	ma
PLATE DISSIPATION	6.0 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode (Absolute Maximum)	4500●* max.	volts
Heater positive with respect to cathode	300† max.	volts

° With no external shield.

▲ 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.

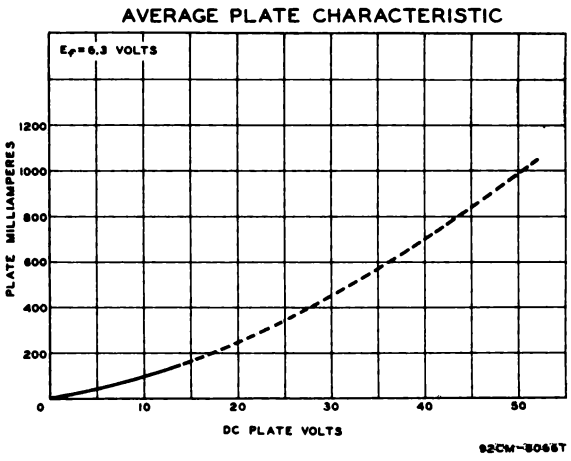
● Under no circumstances should this absolute value be exceeded.

* The dc component must not exceed 900 volts.

† The dc component must not exceed 100 volts.

6AU4-GT

6AU4-GT
HALF-WAVE VACUUM RECTIFIER



6AU4-GTA
HALF-WAVE VACUUM RECTIFIER

For Television Damper Service

GENERAL DATA

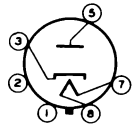
Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	1.8	amp
Direct Interelectrode Capacitances (Approx.):°		
Plate to heater and cathode	8.5	μμf
Cathode to heater and plate	11.5	μμf
Heater to cathode	4	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-13/16"
Maximum Seated Length	3-1/4"
Maximum Diameter	1-9/32"
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□

PEAK INVERSE PLATE VOLTAGE (Absolute maximum)*	4500■	max.	volts
PEAK PLATE CURRENT	1150	max.	ma
DC PLATE CURRENT	190	max.	ma
PLATE DISSIPATION	6	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode (Absolute maximum)	4500■▲	max.	volts
Heater positive with respect to cathode	300#	max.	volts

° Without external shield.

♦ On the 5-pin base, 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.

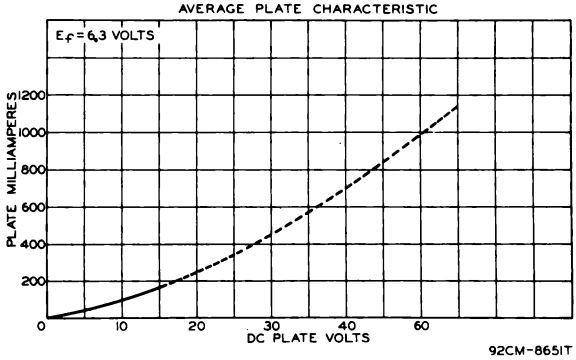
* This rating is applicable when the duty cycle of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

■, ▲, #: See next page.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AU4-GTA
HALF-WAVE VACUUM RECTIFIER

■ 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.



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AT8

TRIODE-PENTODE CONVERTER

9-PIN MINIATURE TYPE

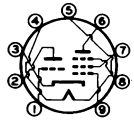
The 6AT8 is the same as the 6X8 except for basing arrangement and capacitances, as indicated below:

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield**	
Triode Unit:			
Grid to plate	1.6	1.6	μμf
Input	2.0	2.4	μμf
Output	0.45	0.9	μμf
Pentode Unit:			
Grid No.1 to plate	0.08 max.	0.06 max.	μμf
Input	4.3	4.5	μμf
Output	0.8	1.5	μμf
Pentode grid No.1 to triode plate	0.05 max.	0.04 max.	μμf
Pentode plate to triode plate	0.05 max.	0.007 max.	μμf
Heater to cathode	5.5	5.5●	μμf
Pentode Unit Connected as triode:▲			
Grid No.1 to plate	1.3	1.25	μμf
Input	3.1	3.4	μμf
Output	1.5	2.3	μμf

Basing Designation for BOTTOM VIEW 9AK

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
Pin 9 - Pentode Grid No.1

* JETEC shield No.315 connected to cathode except as noted.
● JETEC shield No.315 connected to ground.
▲ Grid No.3 connected to cathode; grid No.2 connected to plate.

Curves for the 6AT8 are the same as those shown for Type 6X8.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AU5-GT

BEAM POWER TUBE

GENERAL DATA

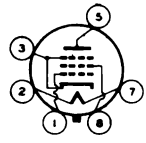
Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	1.25	amp
Direct Interelectrode Capacitances (Approx.):°		
Grid No.1 to plate	0.5	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	11.3	μμf
Plate to cathode & grid No.3, grid No.2, and heater	7	μμf
Transconductance#	5600	μmhos ←
Mu-Factor, Grid No.2 to Grid No.1■	5.9	

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 Short Intermediate-Shell Octal 6-Pin (JETEC 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

For operation in a 525-line, 30-frame system□

Maximum Ratings, *Design-Center Values:* ←

DC PLATE VOLTAGE	550 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE* (Absolute maximum)	5500● max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE*	-1250 max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE†	200 max.	volts

° With no external shield.

For plate volts = 115, grid-No.2 volts = 175, grid-No.1 volts = -20.

■ For plate volts = 100, grid-No.2 volts = 100, grid-No.1 volts = -4.5.

□ 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.

● Under no circumstances should this absolute value be exceeded.

† Preferably obtained through a series dropping resistor of sufficient magnitude to limit the grid-No.2 input to the rated maximum value.

← Indicates a change.

6AU5-GT

BEAM POWER TUBE

PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE	-300 max.	volts
CATHODE CURRENT:		
Peak	400 max.	ma
Average	110 max.	ma
GRID-No.2 INPUT	2.5 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♦max.	volts
BULB TEMPERATURE (At hottest point)▲	210 max.	°C

Maximum Circuit Values:

→ Grid-No.1-Circuit Resistance	0.47 max.	megohm

→ **VOLTAGE REGULATOR SERVICE**

Triode Connection--Grid No.2 Connected to Plate

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative bias value	125 max.	volts
Positive bias value	0 max.	volts
CATHODE CURRENT	110 max.	ma
PLATE & GRID-No.2 DISSIPATION (Total)	10 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200♦max.	volts

◇ An adequate cathode-bias resistor or other suitable means is required to protect the tube in the absence of excitation.

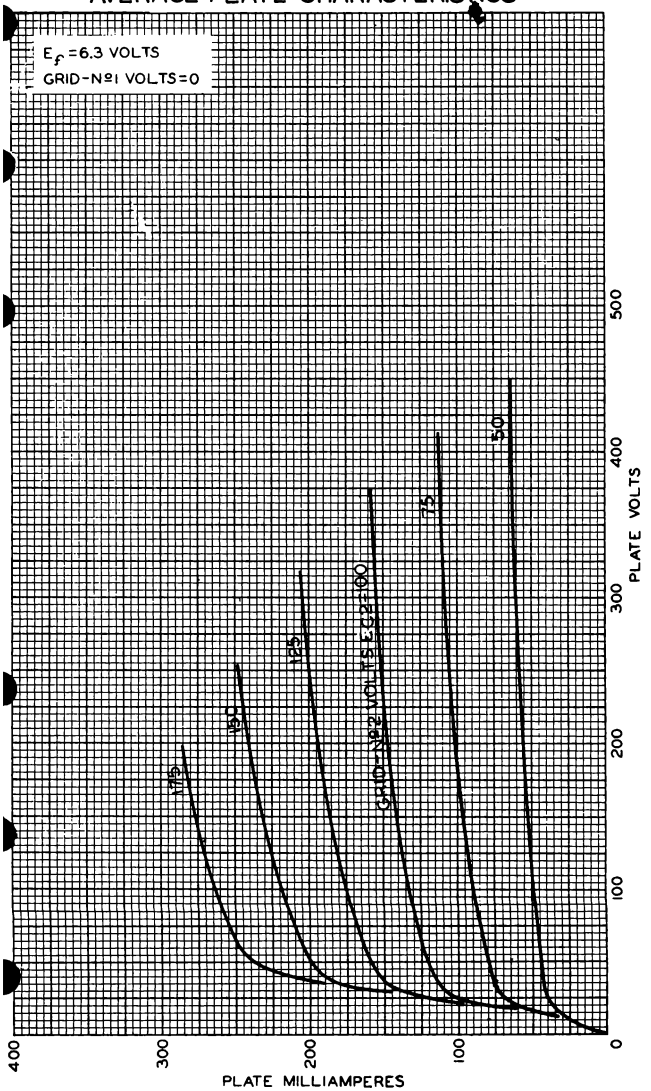
♦ The dc component must not exceed 100 volts.

▲ For tube in vertical position with base down in free space and with natural ventilation, the hottest point on the bulb is in the center of the dome just above open end of cathode sleeve.

→ Indicates a change.

6AU5-GT

AVERAGE PLATE CHARACTERISTICS



SEPT. 8, 1949

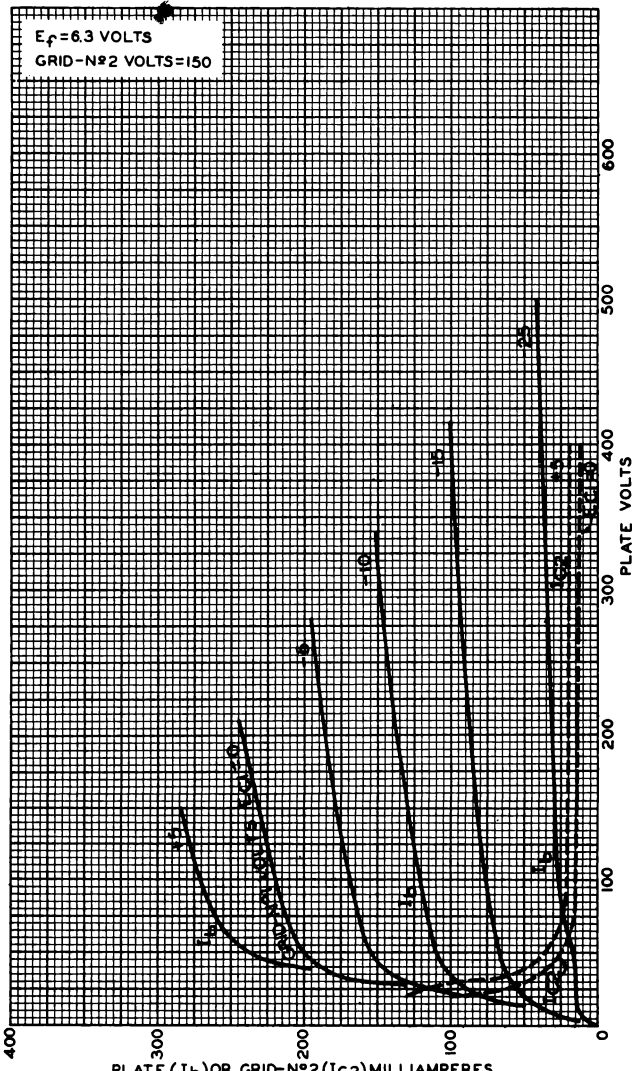
TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7355

6AU5-GT

AVERAGE PLATE CHARACTERISTICS



6AU6

SHARP-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):

Pentode Connection:

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

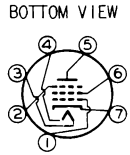
Triode Connection, Grids No.2 & No.3 tied to plate:

Grid No.1 to plate, grid No.2, and grid No.3 & internal shield	2.6	μμf ←
Grid No.1 to cathode and heater	3.2	μμf ←
Plate, grid No.2, and grid No.3 & internal shield to cathode and heater	1.7	μμf

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	7BK1

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_1

Pentode Connection

Maximum Ratings, *Design-Center Values:* ←

PLATE VOLTAGE	300 max.	volts
GRID-No.3 (SUPPRESSOR) VOLTAGE	0 max.	volts
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:		
Positive bias value	0 max.	volts
PLATE DISSIPATION	3 max.	watts
GRID-No.2 INPUT	0.65 max.	watt

← Indicates a change.

6AU6

SHARP-CUTOFF PENTODE

→ PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode	180 max.	volts
Heater positive with respect to cathode	100 max.	volts

→ **Typical Operation and Characteristics:**

Plate Supply Voltage	100	250	250	volts
Grid-No.3 (Suppressor)	Connected to cathode at socket			
Grid-No.2 Voltage	100	125	150	volts
Cathode-Bias Resistor	150	100	68	ohms
Plate Resistance (Approx.)	0.5	1.5	1.0	megohms
Transconductance	3900	4500	5200	μmhos
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp	-4.2	-5.5	-6.5	volts
Plate Current	5.0	7.6	10.6	ma
Grid-No.2 Current	2.1	3.0	4.3	ma

AMPLIFIER - Class A_1

Triode Connection - Grids No.2 and No.3 tied to Plate

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	250 max.	volts
→ GRID-No.1 (Control-Grid) VOLTAGE: Positive bias value	0 max.	volts
PLATE DISSIPATION (Total)	3.2 max.	watts
→ PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	180 max.	volts
Heater positive with respect to cathode	100 max.	volts

Typical Operation and Characteristics:

Plate Supply Voltage	250	volts
→ Cathode-Bias Resistor	330	ohms
Amplification Factor	36	
Plate Resistance (Approx.)	7500	ohms
Transconductance	4800	μmhos
Plate Current (Total)	12.2	ma

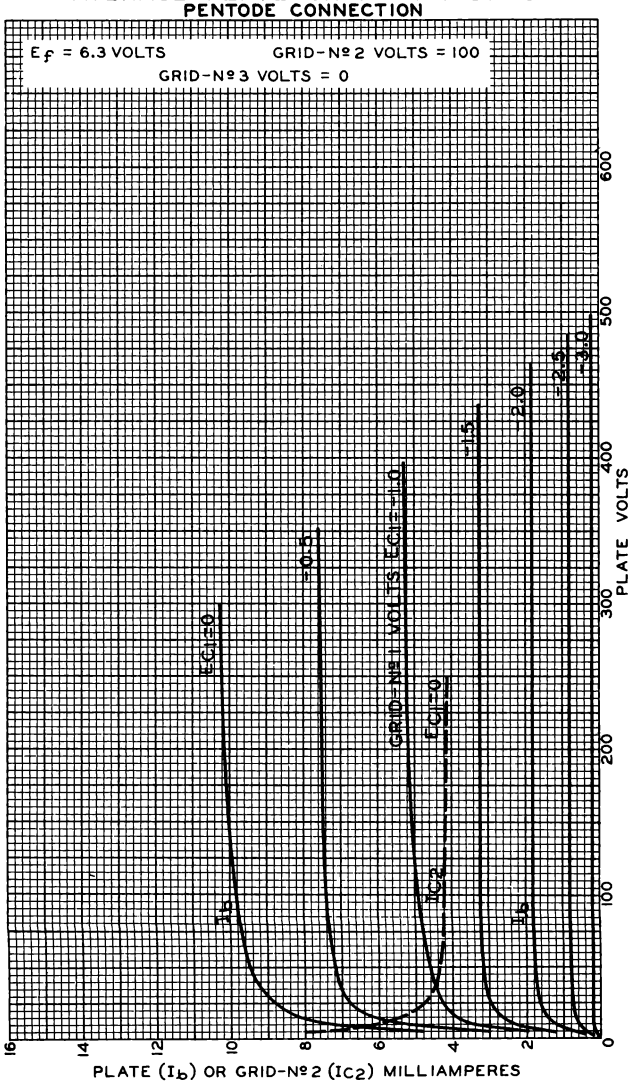
→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AU6

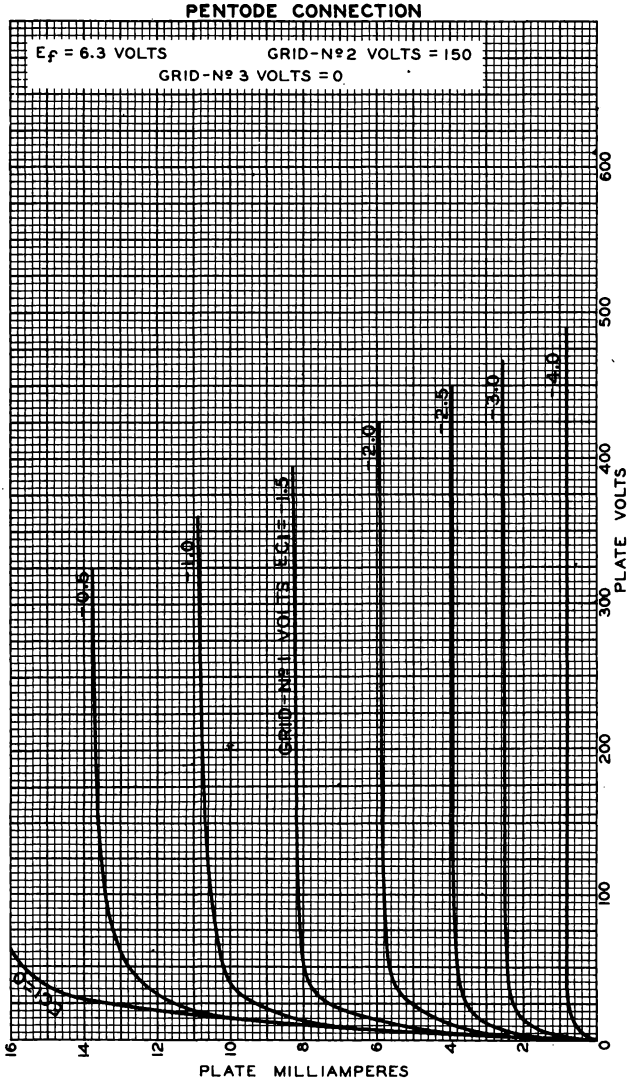
AVERAGE PLATE CHARACTERISTICS

PENTODE CONNECTION



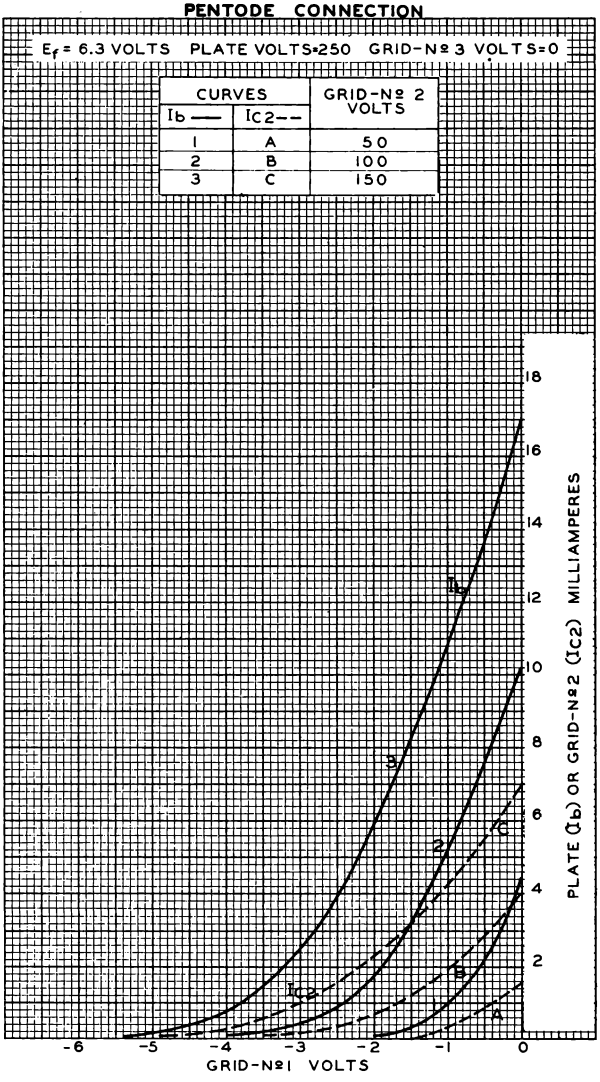
6AU6

6AU6
AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



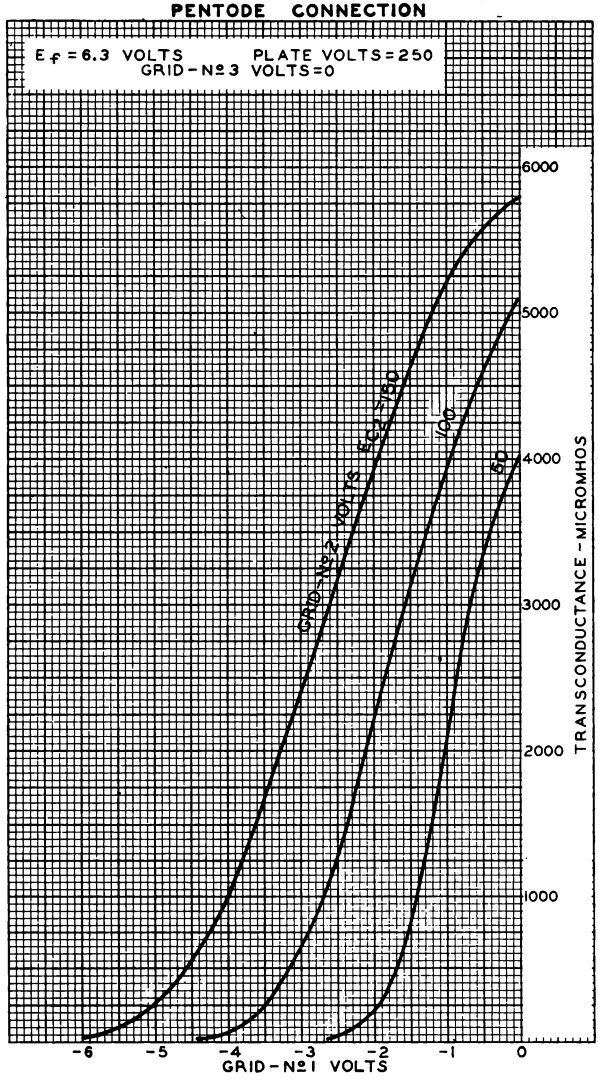
6AU6

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



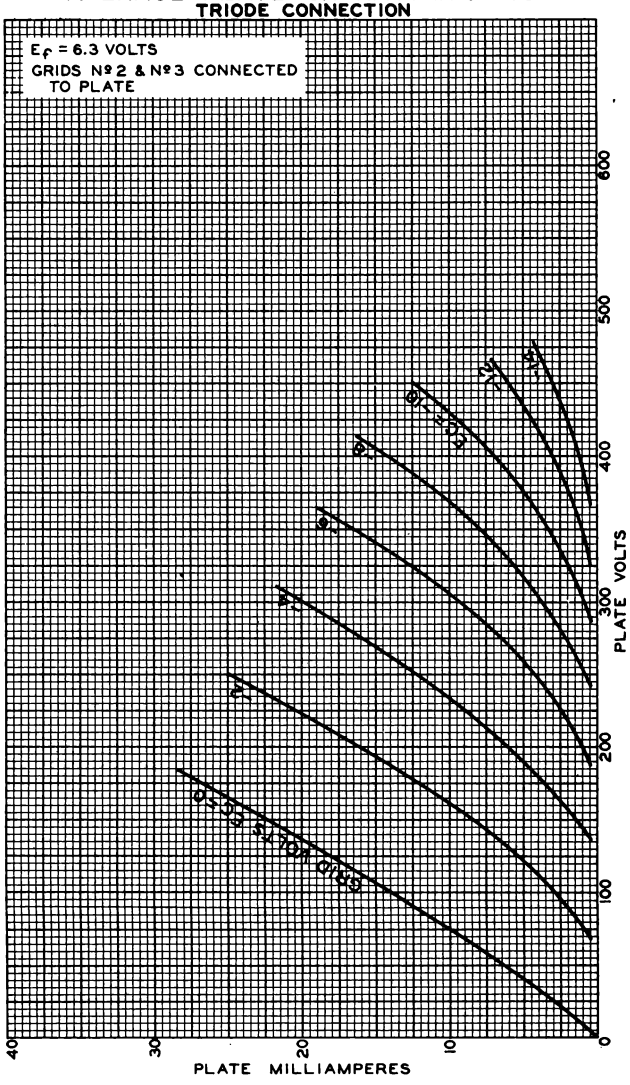
6AU6

6AU6
AVERAGE CHARACTERISTICS
PENTODE CONNECTION



6AU6

AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



MAR. 26, 1947 TUBE DEPARTMENT 92CM-6854

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AU8
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	0.6	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:°

Triode Unit:		
Grid to plate	2.2	μμf
Grid to cathode and heater	2.6	μμf
Plate to cathode and heater	0.34	μμf
Pentode Unit:		
Grid No.1 to plate	0.044	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	7.5	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.4	μμf
Triode grid to pentode plate	0.022 max.	μμf
Pentode grid No.1 to triode plate	0.006 max.	μμf
Pentode plate to triode plate	0.12 max.	μμf

Characteristics, Class A_1 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 current of 100 μamp	-6.5	-8	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"

° Without external shield.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

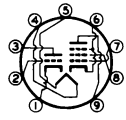
6AU8

6AU8

MEDIUM-MU TRIODE – SHARP-CUTOFF PENTODE

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 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_1

Maximum Ratings, *Design-Center Values:*

	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE.	300 max.	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*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive bias value. . .	0 max.	0 max.	volts
PLATE DISSIPATION.	2.5 max.	3 max.	watts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts. . . .	–	1 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.	200 max.	volts
Heater positive with respect to cathode . .	200▲max.	200▲max.	volts

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AU8

MEDIUM-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.	1.0 max.	1.0 max.	megohm

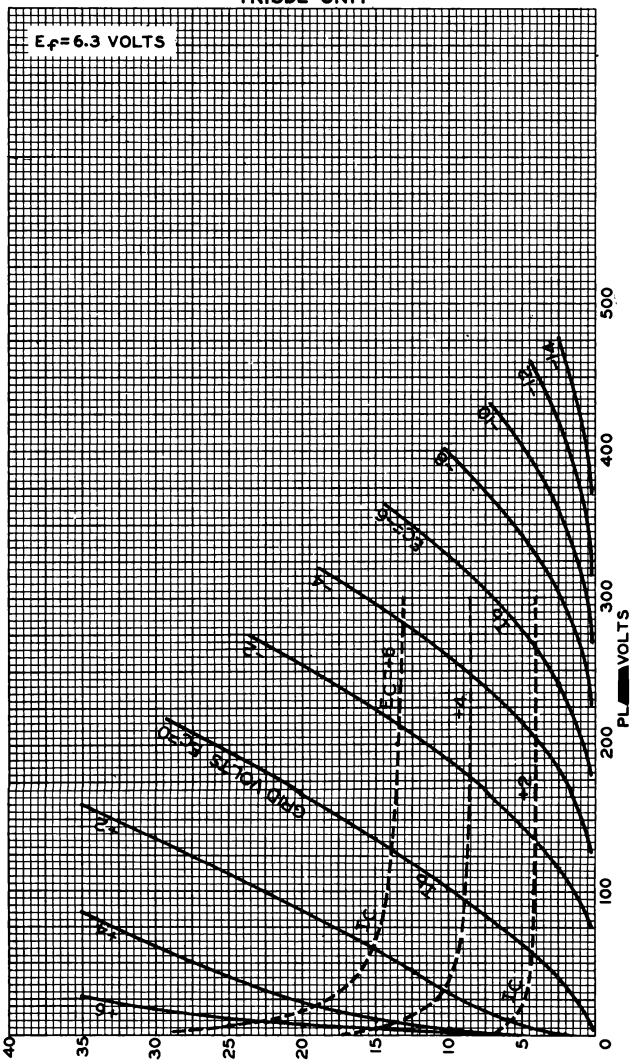
OPERATING CONSIDERATIONS

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.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AU8

AVERAGE CHARACTERISTICS
TRIODE UNIT



TUBE DIVISION

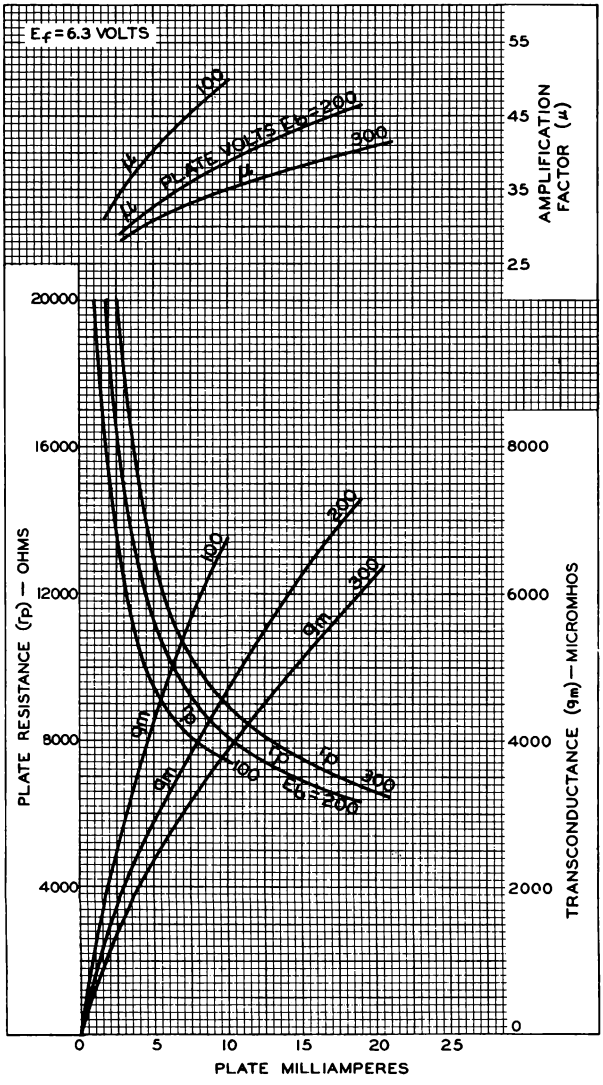
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8796

6AU8

AVERAGE CHARACTERISTICS

TRIODE UNIT



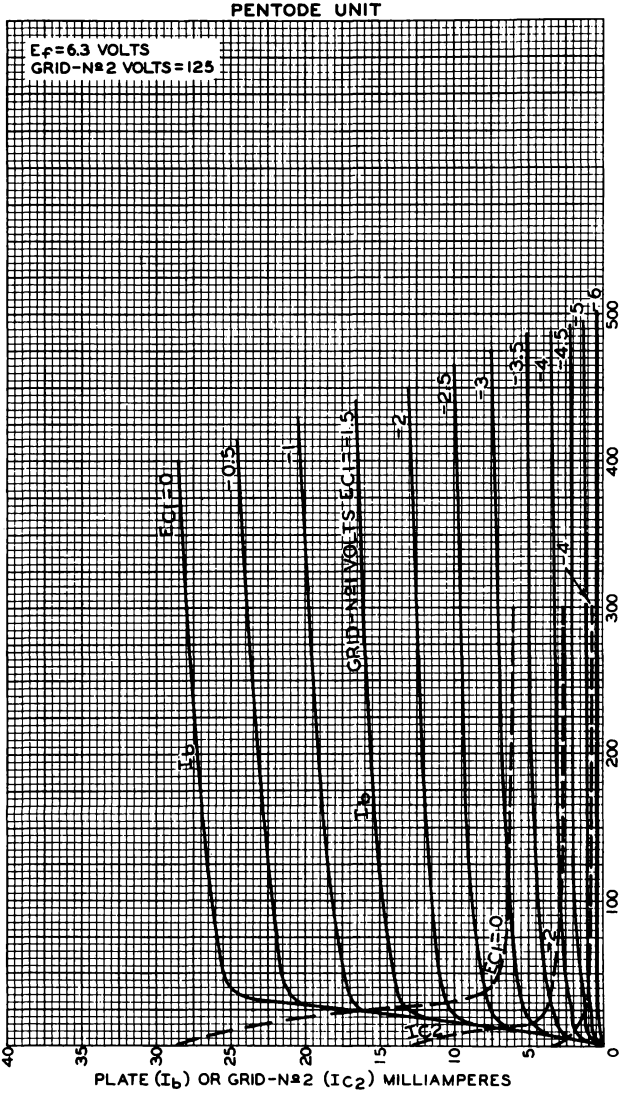
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8801R1

6AU8

6AU8

AVERAGE CHARACTERISTICS
PENTODE UNIT

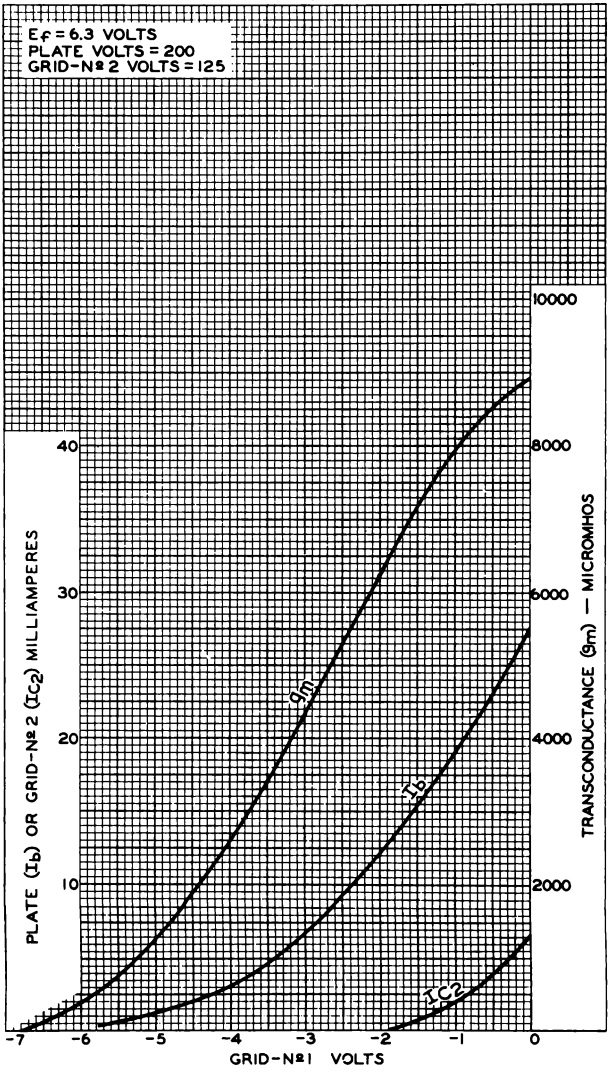


TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8804

6AU8

AVERAGE CHARACTERISTICS
FOR PENTODE UNIT



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8803

6AV5-GA

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.):[o]			
Grid No.1 to plate		0.5	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater		14	μμf
Plate to cathode & grid No.3, grid No.2, and heater		7	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	60	150	250	volts
Grid-No.2 Voltage	150	150	150	volts
Grid-No.1 Voltage	0	-22.5	-22.5	volts
Mu-Factor, Grid No.2 to Grid No.1	-	4.3	-	
Plate Resistance (Approx.)	-	-	20000	ohms
Transconductance	-	-	5500	μmhos
Plate Current	225*	-	55	ma
Grid-No.2 Current	25*	-	2.1	ma
Grid-No.1 Voltage (Approx.) for plate current of 1 ma.	-	-	-4.6	volts

Mechanical:

Mounting Position	Any
Maximum Overall Length	4"
Maximum Seated Length	3-7/16"
Maximum Diameter	1-9/16"
Bulb	T-11, or T-12

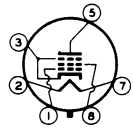
Base:

For T-11 bulb. . . . . Short Medium-Shell Octal 6-Pin with External Barriers, Style A (JETEC No.B6-112)

For T-12 bulb. . . . . Short Medium-Shell Octal 6-Pin with External Barriers, Style B (JETEC No.B6-120)

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

[o] Without external shield.

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

6AV5-GA

BEAM POWER TUBE

HORIZONTAL DEFLECTION AMPLIFIER

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

For operation in a 525-line, 30-frame system□

DC PLATE VOLTAGE	550	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)●	5500■	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1250	max.	volts
DC. GRID-No.2 (SCREEN) VOLTAGE	175	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	2.5	max.	watts
PLATE DISSIPATION†	11	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)	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.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AV5-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:°		
Grid No.1 to Plate	0.7	μμf
Input	14	μμf
Output	7	μμf

° With no external shield.

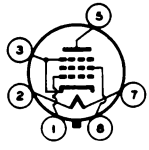
Characteristics, Amplifier Class A_1:

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	-	-	20000	ohms
Transconductance	-	-	5500	μmhos
Plate Current	225	-	55	ma
Grid-No.2 Current	25	-	2.1	ma
Grid-No.1 Voltage (Approx.) for plate current of 1 ma	-	-	-46	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 Short Intermediate-Shell Octal 6-Pin (JETEC 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-Center Values Except as Noted:*

For operation in a 525-line, 30-frame system●

DC PLATE SUPPLY VOLTAGE (Including Boost Voltage)	550 max.	volts

* Applied for very short interval so as not to damage tube.

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

6AV5-GT

6AV5-GT

BEAM POWER AMPLIFIER

PEAK POSITIVE-PULSE PLATE VOLTAGE*	5500♦ max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE*	1250 max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE	175 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE* . .	300 max.	volts
CATHODE CURRENT:		
Peak	400 max.	ma
DC	110 max.	ma
GRID-No.2 INPUT	2.5 max.	watts
PLATE DISSIPATION#	11 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) . . .	210 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	0.47 max.	megohm

♦ 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.

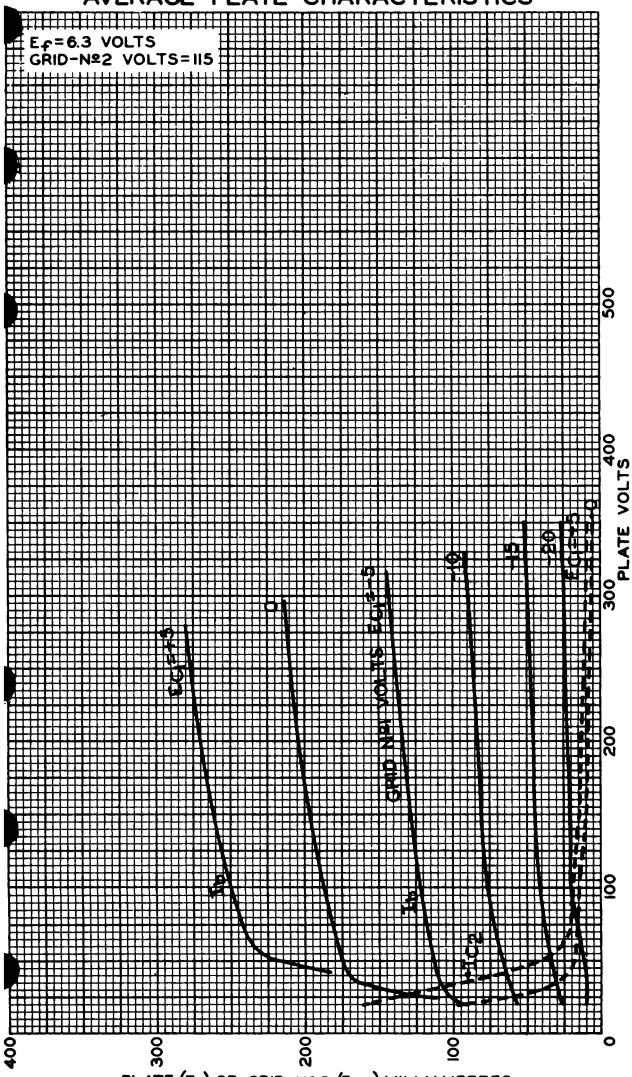
\# It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value should be employed.

▲ The dc component must not exceed 100 volts.

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AV5-GT

AVERAGE PLATE CHARACTERISTICS



6AV6
TWIN DIODE—HIGH-MU TRIODE

MINIATURE TYPE

GENERAL DATA

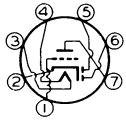
Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances (No external shield):		
Grid to plate	2	μμf
Grid to cathode and heater	2.2	μμf
Plate to cathode and heater	0.8	μμf
Plate of diode unit No.2 to triode grid	0.04 max.	μμf

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	7BT

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



Pin 5 - Diode Plate No.2
Pin 6 - Diode Plate No.1
Pin 7 - Triode Plate

TRIODE UNIT — AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300 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	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	80000	62500	ohms
Transconductance	1250	1600	μmhos
Plate Current	0.5	1.2	ma

← Indicates a change

6AV6

TWIN DIODE—HIGH-MU TRIODE

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART at front of this Section

DIODE UNITS

Maximum Ratings, *Design-Center Values:*

PLATE CURRENT (For each diode) . . . . . 1.0 max. ma

Diode Considerations:

Consideration of these units, including typical circuits and diode curves, is given at the front of this section. Diode biasing of the triode unit of the 6AV6 is not suitable.

Curves for the Triode Unit of the 6AV6 are the same as those shown for Type 12AX7.

6AW8

6AW8

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	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:

	Without External Shield	*With External Shield°*	
Triode Unit:			
Grid to plate	2.2	2.2	μμf
Grid to cathode and heater	3.2	3.4	μμf
Plate to cathode and heater	0.32	1.7	μμf
Pentode Unit:			
Grid No.1 to plate	0.036 max.	0.03 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	11	11	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.8	3.6	μμf
Triode grid to pentode plate	0.03 max.	0.008 max.	μμf
Pentode grid No.1 to triode plate	0.008 max.	0.005 max.	μμf
Pentode plate to triode plate	0.2 max.	0.05 max.	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Maximum Diameter	7/8"
Bulb	T-6-1/2

° With external shield JETEC No.315 connected to cathode of unit under test.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

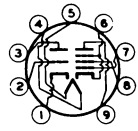
6AW8

6AW8

HIGH-MU TRIODE—
SHARP-CUTOFF PENTODE

Base . . . . . Small-Button Noval 9-Pin (JETEC 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 - Pent. Cath., Grid No.3, Internal Shield
Pin 7 - Pentode Grid No.1
Pin 8 - Pentode Grid No.2
Pin 9 - Pent. Plate

TRIODE UNIT - Class A_1 Amplifier

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE.	300	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

Typical Operation and Characteristics:

Plate Voltage.	200	volts
Grid Voltage	-2	volts
Amplification Factor	70	
Plate Resistance (Approx.)	17500	ohms
Transconductance	4000	μmhos
Grid Voltage (Approx.) for plate current of 10 μamp	-5	volts
Plate Current.	4	ma

Maximum Circuit Values:

Grid-Circuit Resistance:			
For fixed-bias operation	0.5	max.	megohm
For cathode-bias operation	1.0	max.	megohm

PENTODE UNIT - Class A_1 Amplifier

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*		
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Negative bias value.	50	max.	volts
Positive bias value.	0	max.	volts
PLATE DISSIPATION.	3	max.	watts

▲: See next page.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AW8

HIGH-MU TRIODE—
SHARP-CUTOFF PENTODE

GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts .	1	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▲	max.	volts

Typical Operation and Characteristics:

Plate Voltage.	200	volts
Grid-No.2 Voltage.	150	volts
Grid-No.1 Voltage.	0	volts
Cathode-Bias Resistor.	180	ohms
Plate Resistance (Approx.)	0.4	megohm
Transconductance	9000	μmhos
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp	-10	volts
Plate Current.	13	ma
Grid-No.2 Current.	3.5	ma

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.

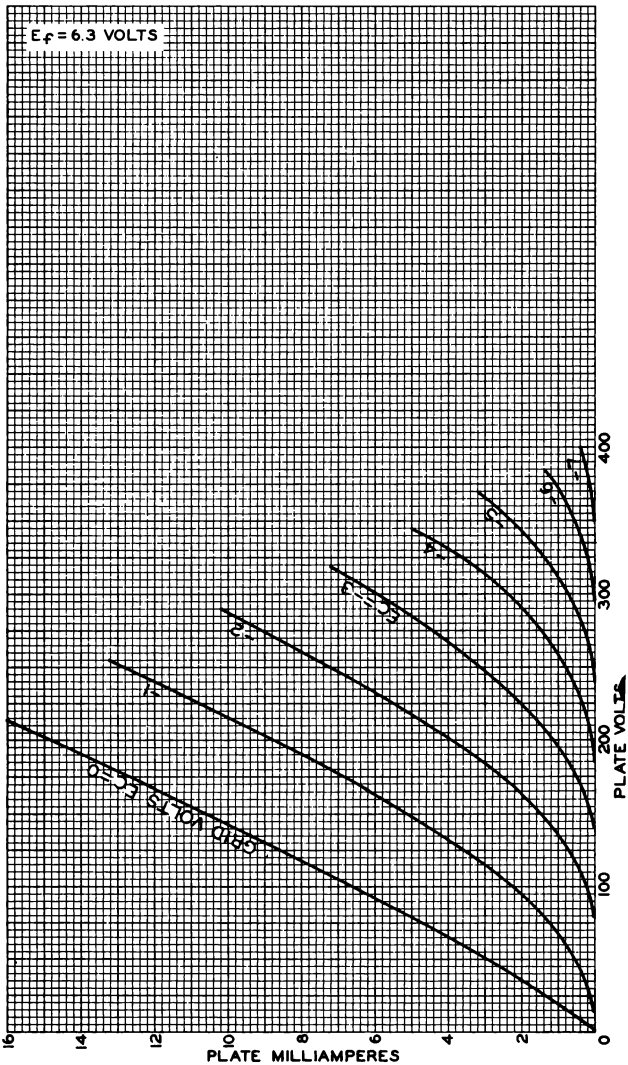
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AW8

6AW8

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



JUNE 14, 1955

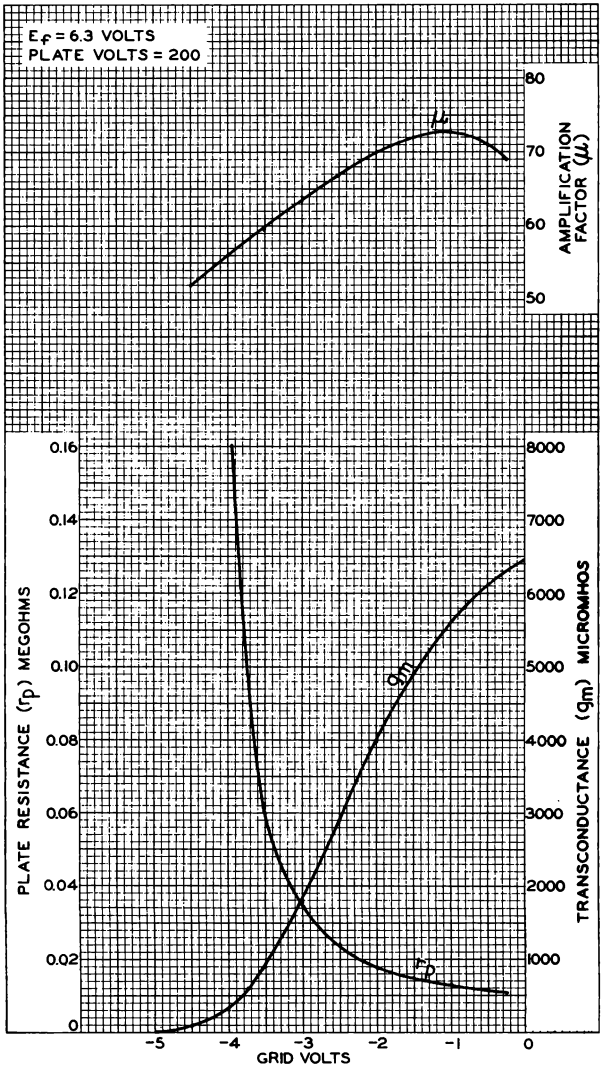
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8644

6AW8

AVERAGE CHARACTERISTICS

TRIODE UNIT

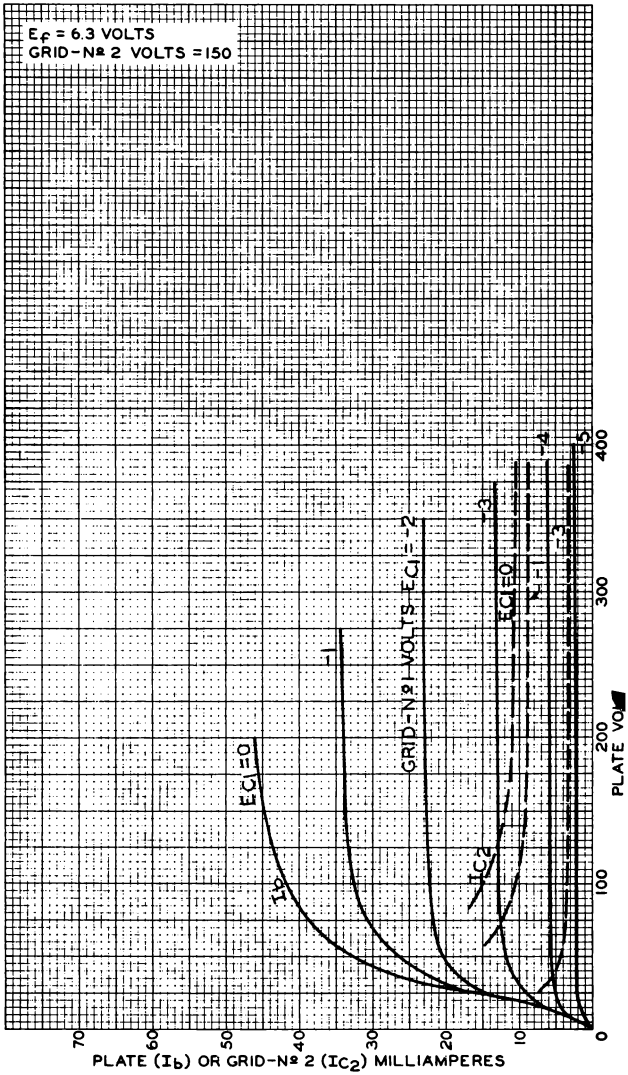


6AW8

6AW8

AVERAGE CHARACTERISTICS

PENTODE UNIT



JUNE 14, 1955

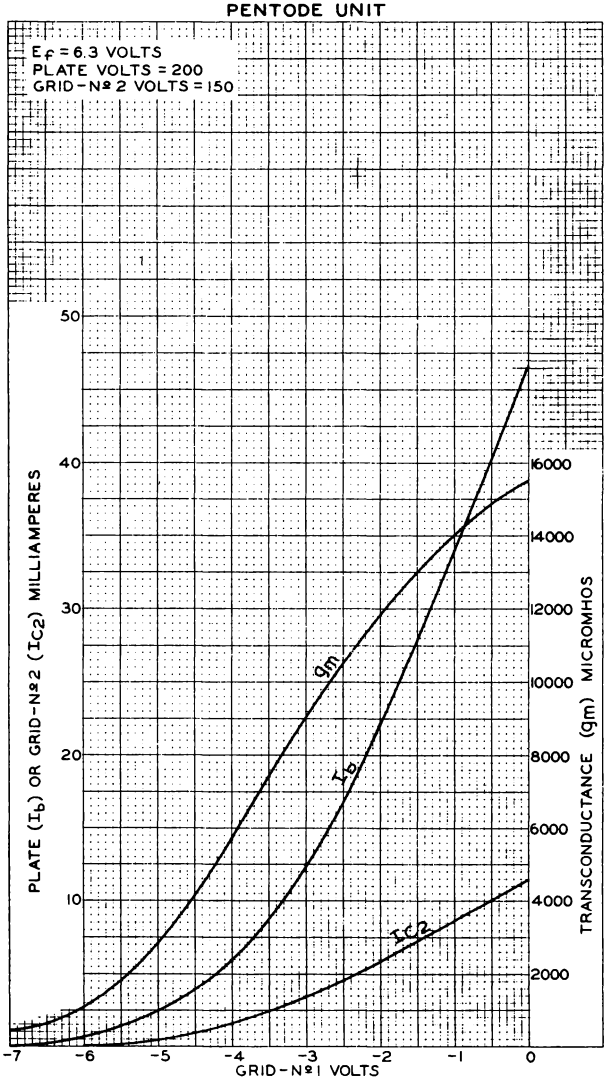
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8645

6AW8

AVERAGE CHARACTERISTICS

PENTODE UNIT



6AX4-GT
HALF-WAVE VACUUM RECTIFIER

For Television Damper Service

GENERAL DATA

Electrical:

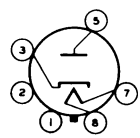
Heater, for Unipotential Cathode:
- Voltage. . . . . 6.3 . . . . . ac or dc volts
- Current. . . . . 1.2 . . . . . amp

Direct Interelectrode Capacitances (Approx.):°
- Cathode to plate and heater. . . . . 8.5 . . . . μμf
- Plate to cathode and heater. . . . . 5 . . . . μμf
- Heater to cathode. . . . . 4 . . . . μμf

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), Short Intermediate-Shell Octal 6-Pin (JETEC No.B6-48), Intermediate-Shell Octal 5-Pin (JETEC No.B5-82), or Short Intermediate-Shell Octal 5-Pin with External Barriers (JETEC No.B5-85)
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□

PEAK INVERSE PLATE VOLTAGE (Absolute maximum)*	4400■	max.	volts
PEAK PLATE CURRENT	750	max.	ma
DC PLATE CURRENT	125	max.	ma
PLATE DISSIPATION	4.8	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode (Absolute maximum)	4400■▲	max.	volts
Heater positive with respect to cathode	300#	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.

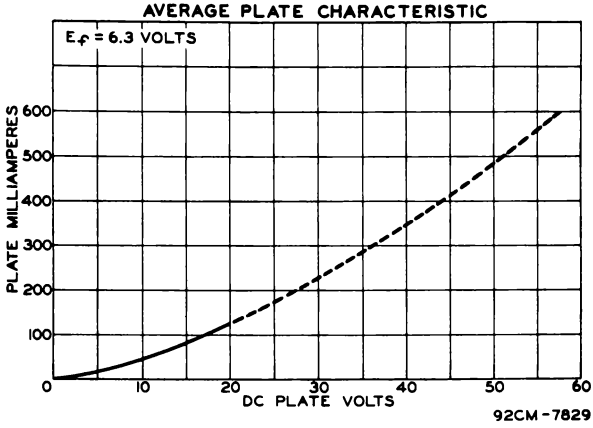
■,▲,#: See next page. ← Indicates a change.

6AX4-G

6AX4-GT

HALF-WAVE VACUUM RECTIFIER

■ 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.



6AX5-GT

FULL-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac volts
Current	1.2	amp

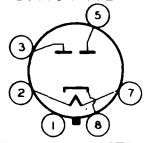
Mechanical:

Mounting Position	Any
Maximum Overall Length	3-5/16"
Maximum Seated Length	2-3/4"
Maximum Diameter	1-9/32"
Bulb	T-9
Base	Short-Intermediate-Shell Octal 6-Pin
Basing Designation for BOTTOM VIEW	G-6S

Pin 1 - No Connection

Pin 2 - Heater

Pin 3 - Plate of Diode No.2



Pin 5 - Plate of Diode No.1

Pin 7 - Heater

Pin 8 - Cathode

FULL-WAVE RECTIFIER

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

PEAK INVERSE PLATE VOLTAGE	1250 max.	volts
PEAK PLATE CURRENT PER PLATE	375 max.	ma
HOT-SWITCHING TRANSIENT PLATE CURRENT For duration of 0.2 second maximum	2.6 max.	amp
AC PLATE SUPPLY VOLTAGE (RMS) PER PLATE	See Rating Chart	
DC OUTPUT CURRENT PER PLATE	See Rating Chart	
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	450 max.	volts
Heater positive with respect to cathode	450 max.	volts

Typical Operation with Capacitor-Input Filter:

AC Plate-to-Plate Supply Voltage (RMS)	700	900	volts
Filter-Input Capacitor▲	10	10	μf
Effective Plate-Supply Impedance Per Plate	50	105	ohms
DC Output Voltage at Input to Filter (Approx.):			
At half-load cur. of 62.5 ma.	395	–	volts
At half-load cur. of 40 ma.	–	540	volts
At full-load cur. of 125 ma.	350	–	volts
At full-load cur. of 80 ma.	–	490	volts
Voltage Regulation (Approx.): Half-load to full-load current	45	50	volts

▲ Higher values of capacitance than indicated may be used but the effective plate supply impedance may have to be increased to prevent exceeding the maximum rating for hot-switching transient plate current.

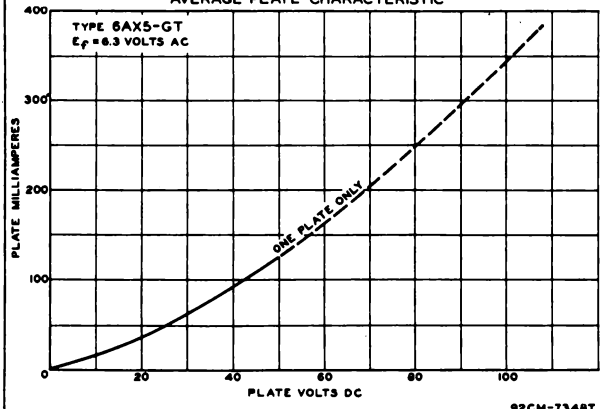
6AX5-GT

FULL-WAVE VACUUM RECTIFIER

Typical Operation with Choke-Input Filter:

AC Plate-to-Plate Supply Voltage (RMS)	700	900	volts
Filter-Input Choke	10	10	henries
DC Output Voltage at Input to Filter (Approx.):			
At half-load cur. of 75 ma.	270	–	volts
At half-load cur. of 62.5 ma.	–	365	volts
At full-load cur. of 150 ma.	250	–	volts
At full-load cur. of 125 ma.	–	350	volts
Voltage Regulation (Approx.):			
Half-load to full-load Current	20	15	volts

AVERAGE PLATE CHARACTERISTIC



92CM-7348T

RATING CHART and OPERATION CHARACTERISTICS

The *Rating Chart* presents 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.

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 "ADK" the limiting current and voltage relationships presented on the Rating Chart.

6AX5-GT

FULL-WAVE VACUUM RECTIFIER

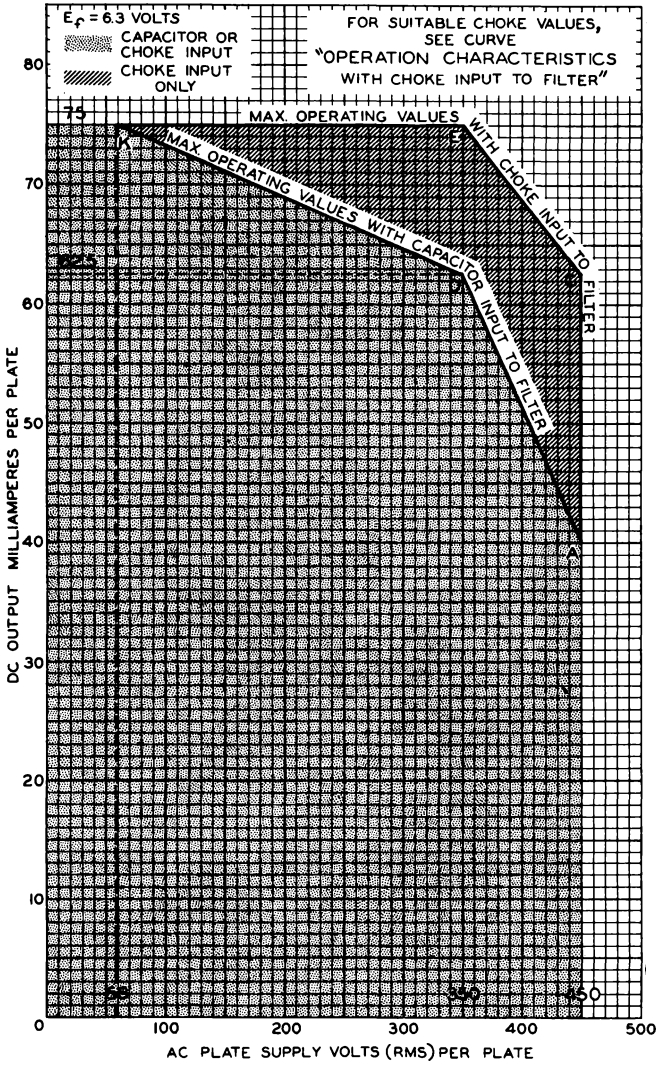
The *Operation Characteristics for Full-Wave Circuit with Choke-Input Filter* show the typical operating curves for such a circuit. They not only show by means of boundary line "CEK" the limiting current and voltage relationships presented on the *Rating Chart*, but also give information as to the effect 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 has 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.

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AX5-GT

6AX5-GT

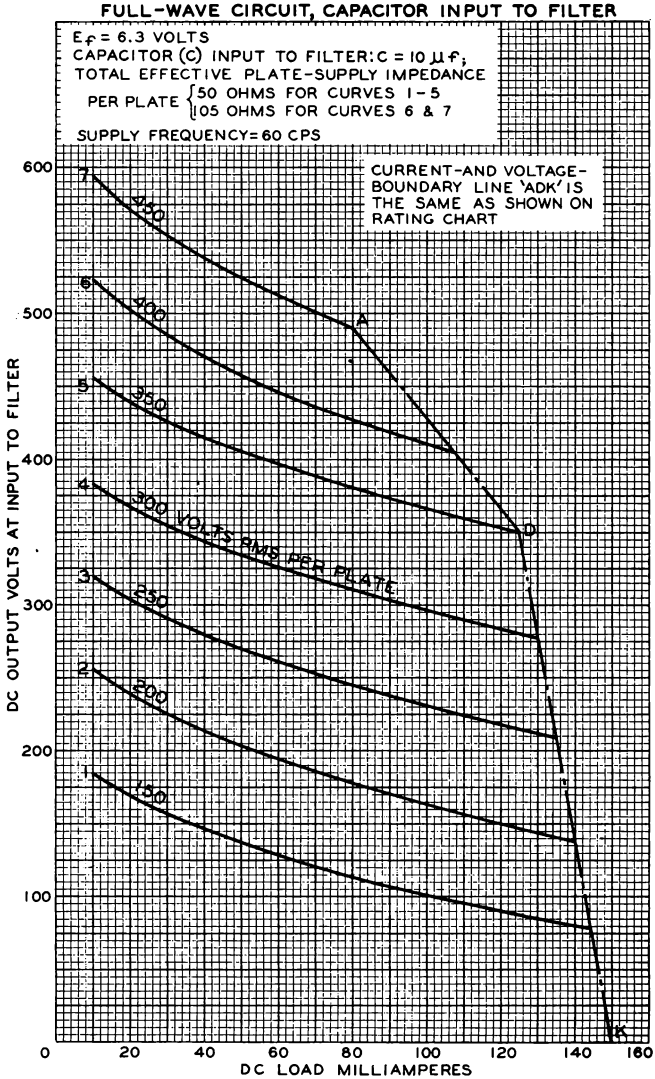
RATING CHART



6AX5-GT

OPERATION CHARACTERISTICS

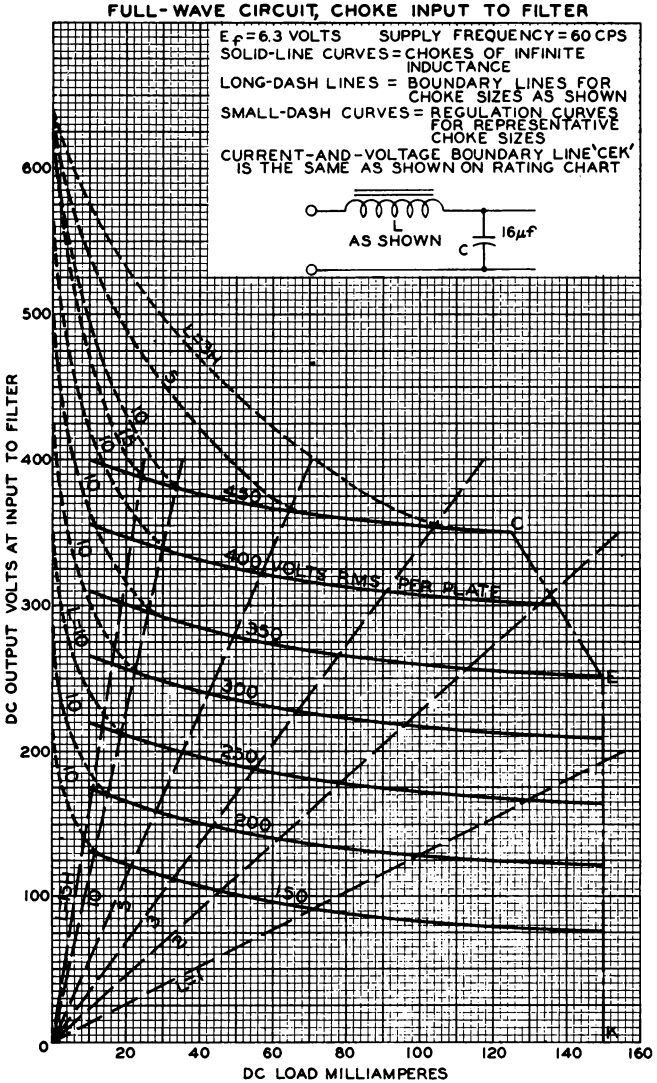
FULL-WAVE CIRCUIT, CAPACITOR INPUT TO FILTER



6AX5-GT

OPERATION CHARACTERISTICS

FULL-WAVE CIRCUIT, CHOKE INPUT TO FILTER



OCT. 11, 1949 TUBE DEPARTMENT 92CM-7379

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AZ8

6AZ8
MEDIUM-MU TRIODE—
SEMIREMOTE-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:°

Triode Unit:		
Grid to plate	1.7	μμf
Grid to cathode, internal shield & heater	2	μμf
Plate to cathode, internal shield & heater	1.7	μμf
Pentode Unit:●		
Grid No.1 to plate	0.02	μμf
Grid No.1 to cathode, grid No.2, grid No.3 & internal shield & heater	6.5	μμf
Plate to cathode, grid No.2, grid No.3 & internal shield & heater	2.2	μμf
Triode grid to pentode plate	0.027 max.	μμf
Pentode grid No.1 to triode plate	0.020 max.	μμf
Pentode plate to triode plate	0.045 max.	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Plate Supply Voltage	200	200	volts
Grid-No.2 Supply Voltage	-	150	volts
Grid-No.1 Voltage	-6	-	volts
Cathode-Bias Resistor	-	180	ohms
Amplification Factor	19	-	
Plate Resistance (Approx.)	5750	300000	ohms
Transconductance	3300	6000	μmhos
Plate Current	13	9.5	ma
Grid-No.2 Current	-	3	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp	-19	-	volts
Grid-No.1 Voltage (Approx.) for transconductance of 10 μmhos	-	-12.5	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"

° Without external shield.

●: See next page.

6AZ8

6AZ8

MEDIUM-MU TRIODE—
SEMIREMOTE-CUTOFF PENTODE

Maximum Diameter . . . . . 7/8"
Bulb T-6-1/2
Base . . . . . Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW 9ED

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

Pin 6 - Pentode Grid No.1
Pin 7 - Triode Cathode
Pin 8 - Triode Plate
Pin 9 - Triode Grid

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

	Triode Unit	*Pentode Unit●*	
PLATE VOLTAGE.	300 max.	300 max.	volts
GRID-No.3 (SUPPRESSOR) VOLTAGE.	–	*See Operating Considerations*	
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*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive bias value. .	0 max.	0 max.	volts
PLATE DISSIPATION. . . .	2.5 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*	
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode .	200 max.	▲	volts
Heater positive with respect to cathode .	200# max.	▲	volts

● The pentode unit is provided with a separate base pin for the cathode and for grid No.3 and internal shield which are connected internally to one of the heater leads. This arrangement facilitates the use of an unbypassed cathode resistor to minimize changes in input resistance and input capacitance with bias without causing oscillation which otherwise might occur if grid No.3 were internally connected to the cathode.

The dc component must not exceed 100 volts.

▲: See next page.

6AZ8
MEDIUM-MU TRIODE—
SEMIREMOTE-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. .	1.0 max.	1.0 max.	megohm

OPERATING CONSIDERATIONS

Because *grid No.3* is connected within the tube to one side of the heater (pin No.5), it is important that pin No.5 be connected to ground to maintain grid No.3 at ground potential. If this precaution is not observed and pin No.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.

▲ The heater-cathode voltage should not exceed the value of the operating cathode bias. If the heater-cathode voltage exceeds the operating cathode bias value, grid No.3 will be made negative with respect to cathode, and thus possibly cause a change in tube characteristics.

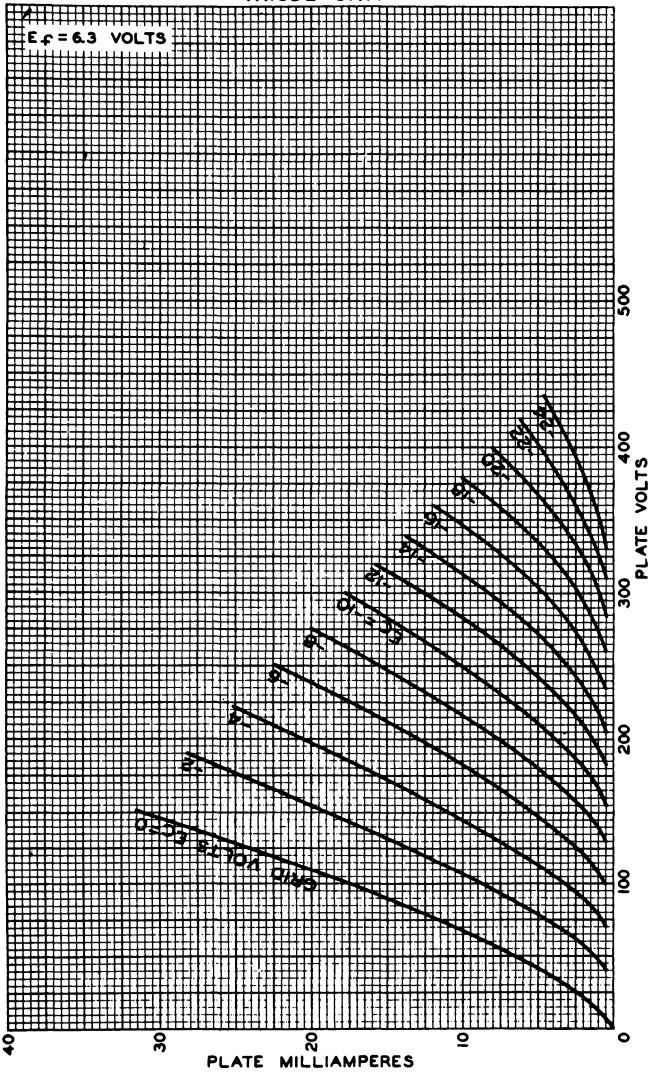
* If either unit is operated at maximum rated conditions, grid-No.1-circuit resistances for both units should not exceed the stated values.

6AZ8

6AZ8

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



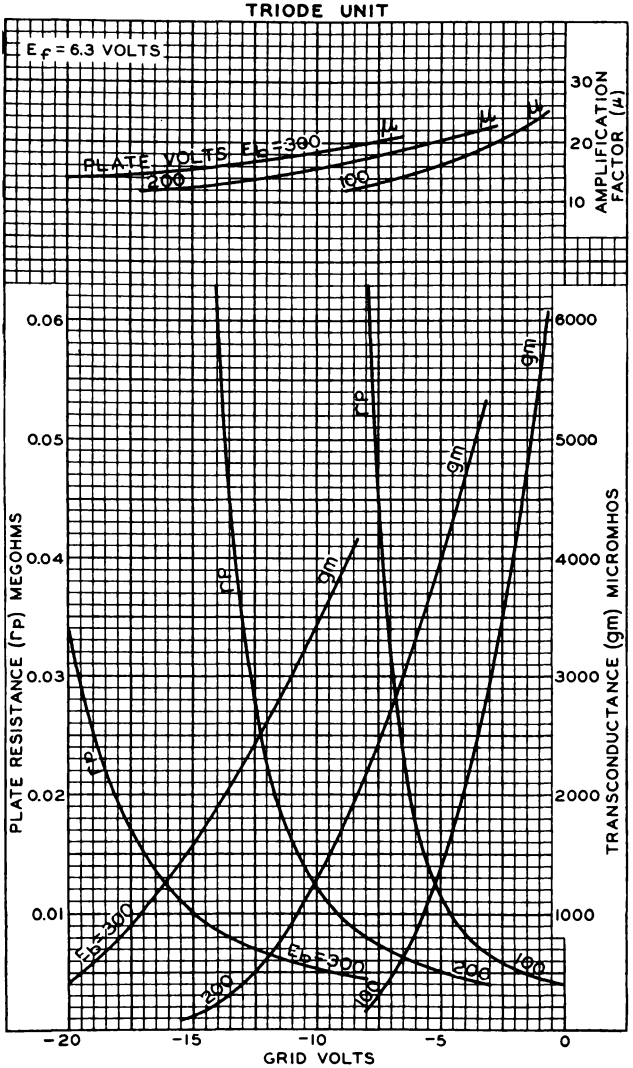
FEB. 2, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8520

6AZ8

AVERAGE CHARACTERISTICS
TRIODE UNIT



FEB. 2, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

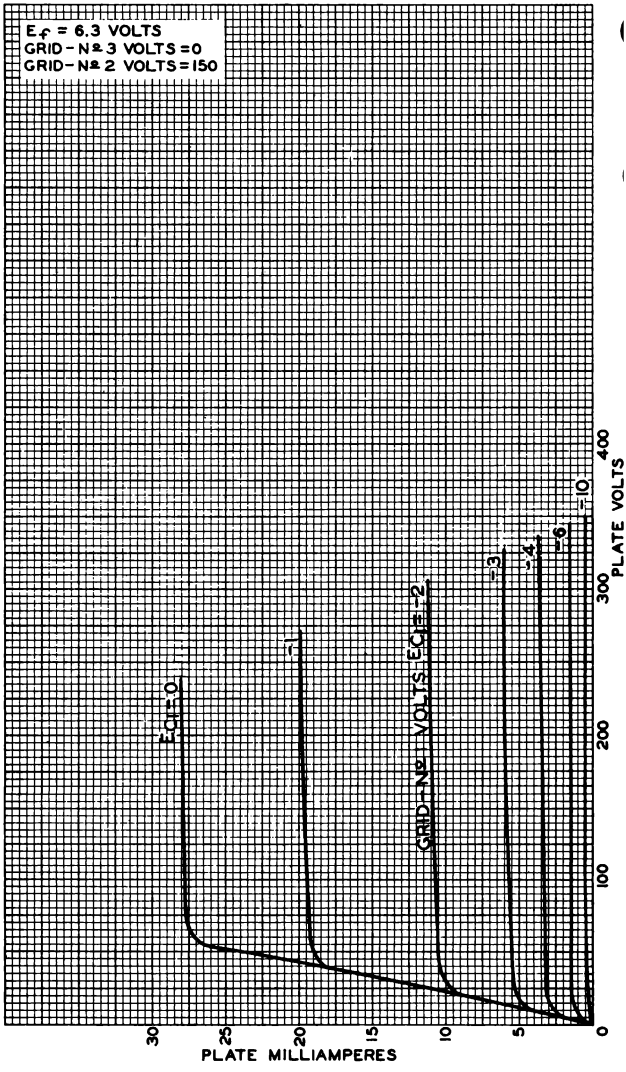
92CM-8519

6AZ8

6AZ8

AVERAGE PLATE CHARACTERISTICS

PENTODE UNIT



FEB. 3, 1955

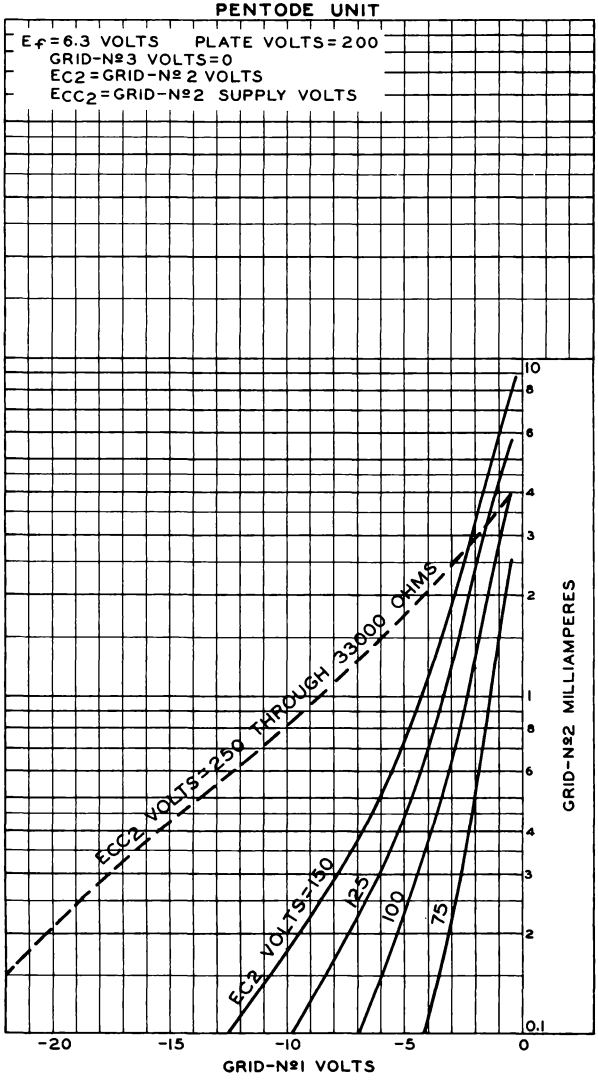
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8525

6AZ8

AVERAGE CHARACTERISTICS

PENTODE UNIT

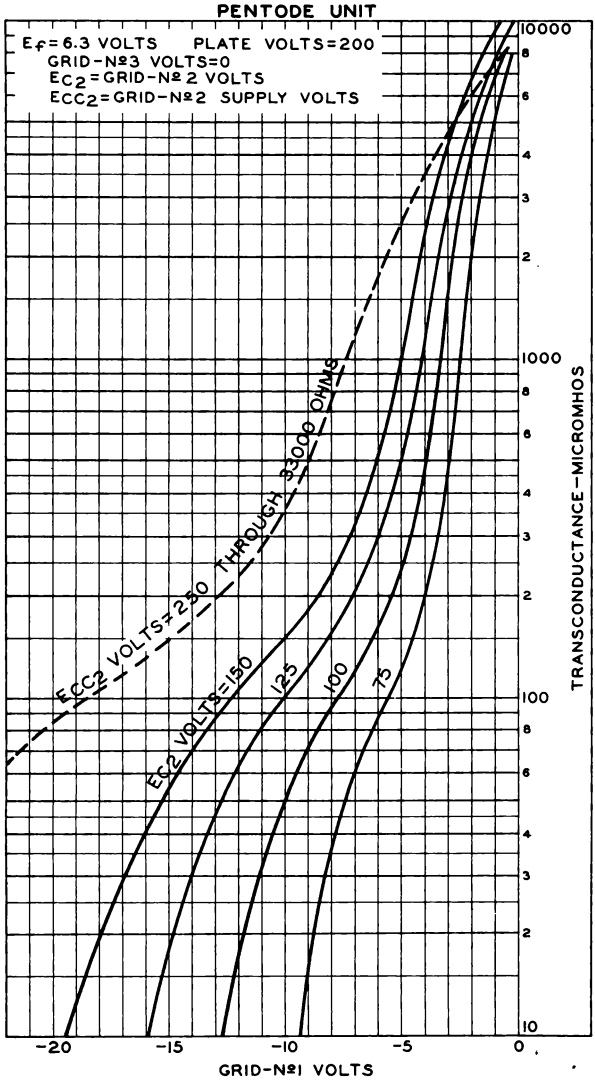


6AZ8

6AZ8

AVERAGE CHARACTERISTICS

PENTODE UNIT



FEB. 2, 1955

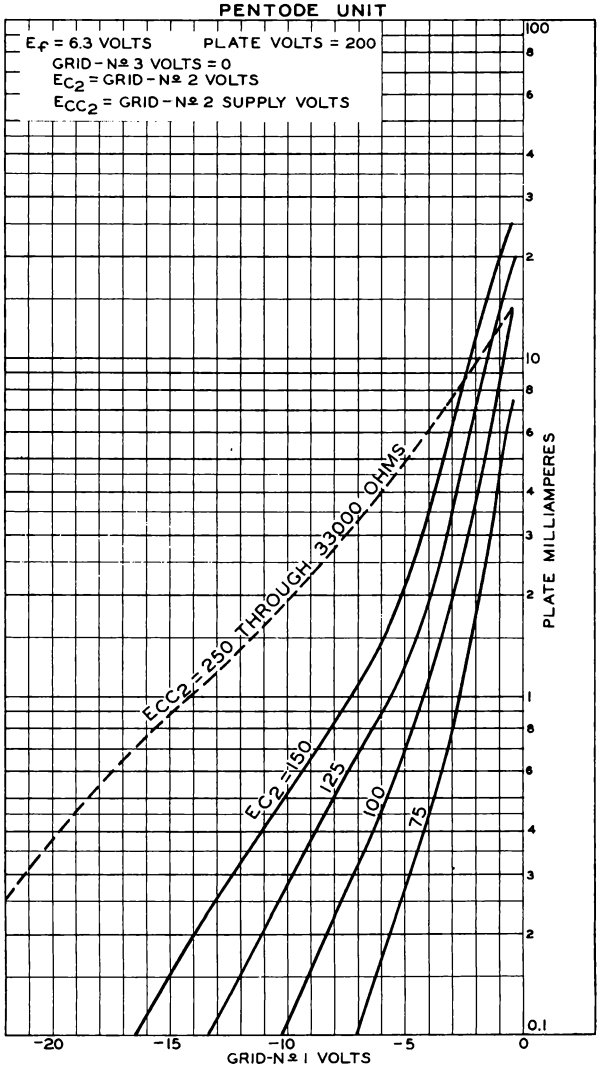
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8522

6AZ8

AVERAGE CHARACTERISTICS

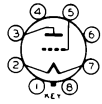
PENTODE UNIT



6B4-G

POWER AMPLIFIER TRIODE

Filament	Coated	
Voltage	6.3	a-c or d-c volts
Current	1.0	amp.
Maximum Overall Length		5-5/16"
Maximum Seated Height		4-3/4" ←
Maximum Diameter		2-1/16"
Bulb		ST-16
Base		Medium Shell Octal 8-Pin
Pin 1 - No Connection		Pin 5 - Grid
Pin 2 - Filament		Pin 6 - No Connection
Pin 3 - Plate		Pin 7 - Filament
Pin 4 - No Connection		Pin 8 - No Connection
Mounting Position		Any



BOTTOM VIEW ($G-5S_B$)

Maximum Ratings, and Typical Operating Conditions for the 6B4-G are the same as for the Type 6A3.

Curves for the 6B4-G are essentially the same as those shown for Type 2A3.

6B5

DIRECT-COUPLED POWER AMPLIFIER

Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.8	amp.
Maximum Overall Length		4-11/16"
Maximum Seated Height		4-1/16" ←
Maximum Diameter		1-13/16"
Bulb		ST-14
Base		Medium 6-Pin
Pin 1 - Heater		Pin 4 - Input-Triode Grid
Pin 2 - Output-Triode Plate		Pin 5 - Cathode
Pin 3 - Input-Triode Plate		Pin 6 - Heater
Mounting Position		Any

BOTTOM VIEW (6AS)

For additional data, refer to Type 6N6-G.

← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6B7

TWIN DIODE—REMOTE-CUTOFF PENTODE

GENERAL DATA

Electrical:

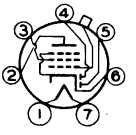
Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances (Pentode Unit):		
Grid No.1 to Plate°	0.007 max.	μμf
Input	3.5	μμf
Output	9.5	μμf

° With external shield connected to cathode.

Mechanical:

Mounting Position	Any
Maximum Overall Length	4-17/32"
Seated Length	3-25/32" ± 1/8" ←
Maximum Diameter	1-9/16"
Bulb	ST-12
Cap	Small
Base	Small-Shell Small 7-Pin
Basing Designation for BOTTOM VIEW	7D

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



Pin 5 - Diode No.1 Plate
Pin 6 - Cathode, Pentode Grid No.3
Pin 7 - Heater
Cap - Pentode Grid No.1

PENTODE UNIT
AMPLIFIER - Class A_1

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
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
PLATE DISSIPATION	2.25 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

Characteristics:

Plate Voltage	100	180	250	250	volts
Grid-No.2 Voltage	100	75	100	125	volts
Grid-No.1 Voltage	-3	-3	-3	-3	volts
Plate Resistance (Approx.)	0.3	1.0	0.8	0.6	megohm
Transconductance	950	840	1000	1125	μmhos

(continued on next page)

←Indicates a change.

6B7
TWIN DIODE—REMOTE-CUTOFF PENTODE

Grid-No.1 Bias (Approx.) for Cathode-Current Cutoff . .	-17	-13	-17	-21	volts
Plate Current.	5.8	3.4	6	9	ma
Grid-No.2 Current.	1.7	0.9	1.5	2.3	ma

DIODE UNITS

Maximum Ratings, *Design-Center Values*:

→ PLATE CURRENT (For Each Diode) . . . . . 1.0 max. ma

Diode Considerations:

See front of this Section.

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

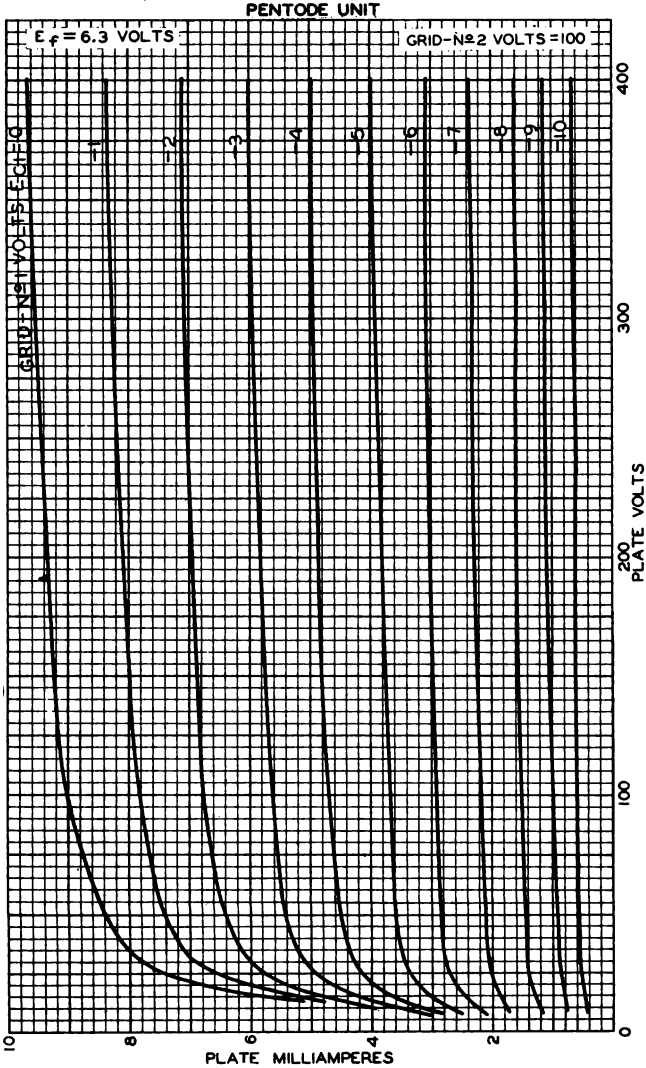
The curve shown under type 2B7 also applies to the pentode unit of the 6B7.

→ Indicates a change.

6B7

AVERAGE PLATE CHARACTERISTICS

PENTODE UNIT



FEB. 17, 1938

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

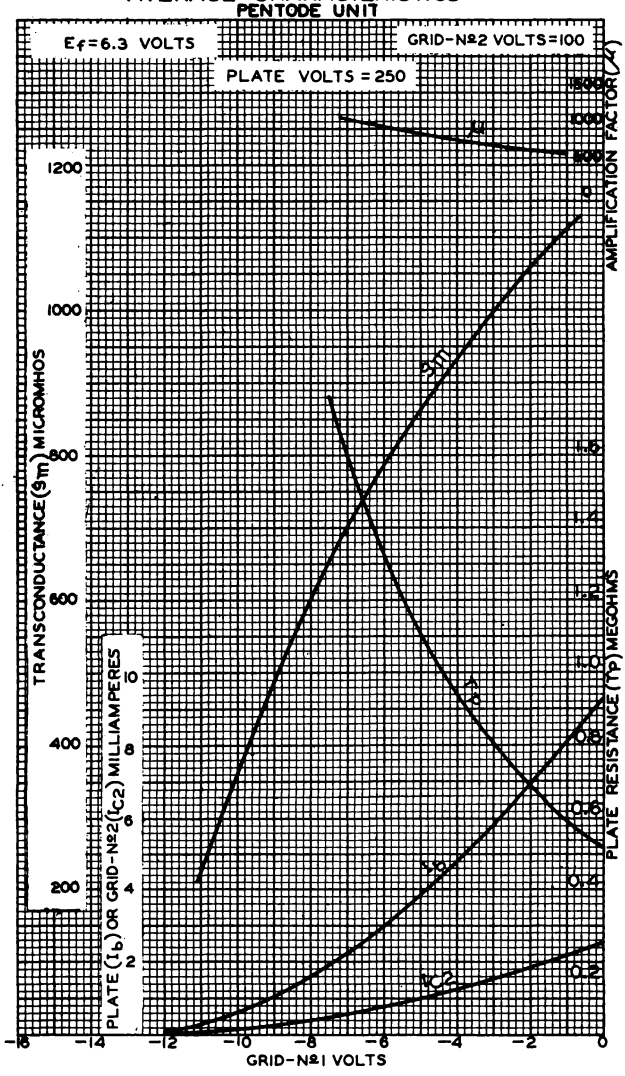
92CM-4880

6B7

6B7

AVERAGE CHARACTERISTICS

PENTODE UNIT



FEB. 25, 1937 TUBE DEPARTMENT 92CM-4745

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6B8

DUPLEX-DIODE PENTODE

Heater■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances:○		
Pentode Unit:		
Grid to Plate	0.005 max.	μμf
Input	6	μμf
Output	9	μμf
Maximum Overall Length		3-1/8"
Maximum Seated Height		2-9/16" ←
Maximum Diameter		1-5/16"
Bulb		Metal Shell, MT-8
Cap		Miniature
Base		Small Wafer Octal 8-Pin
Pin 1 - Shell		Pin 6 - Screen
Pin 2 - Heater		Pin 7 - Heater
Pin 3 - Plate		Pin 8 - Cathode
Pin 4 - Diode Plate #2		Cap - Grid
Pin 5 - Diode Plate #1		
Mounting Position		Any

BOTTOM VIEW (8E)

PENTODE UNIT

Plate Voltage	300 max.	volts
Screen Voltage	125 max.	volts
Screen Supply Voltage	300 max.	volts
Grid Voltage	0 min.	volts
Plate Dissipation	2.25 max.	watts
Screen Dissipation	0.3 max.	watt
Typical Operation and Characteristics - Class A_1 Amplifier: ←		
Plate	250	volts
Screen	125	volts
Grid	-3	volts
Plate Res.	0.6 approx.	megohm
Transcond.	1325	μmhos
Grid Bias for cathode-current cut-off	-21 approx.	volts
Plate Cur.	10	ma.
Screen Cur.	2.3	ma.

DIODE UNITS - Two

Consideration of these units is given under Type 6B8-G. Circuits will be similar to those shown for Type 2B7.

■ 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.

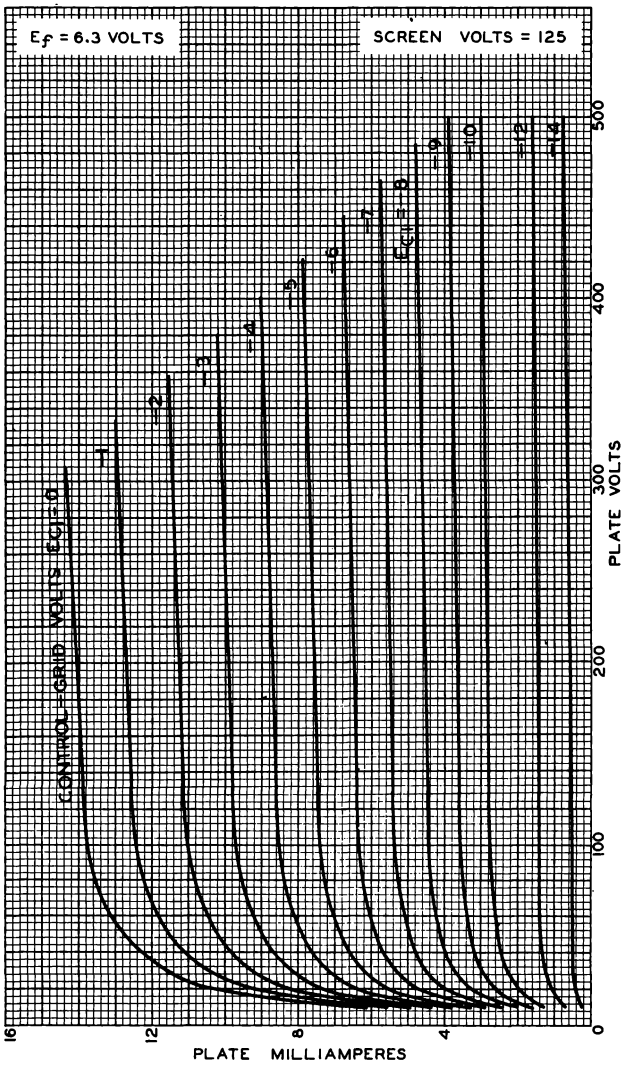
For Diode Curves, see Type 6B7. For additional data, see RESISTANCE-COUPLED AMPLIFIER CHART.

← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6B8

AVERAGE PLATE CHARACTERISTICS



AUG. 14, 1936

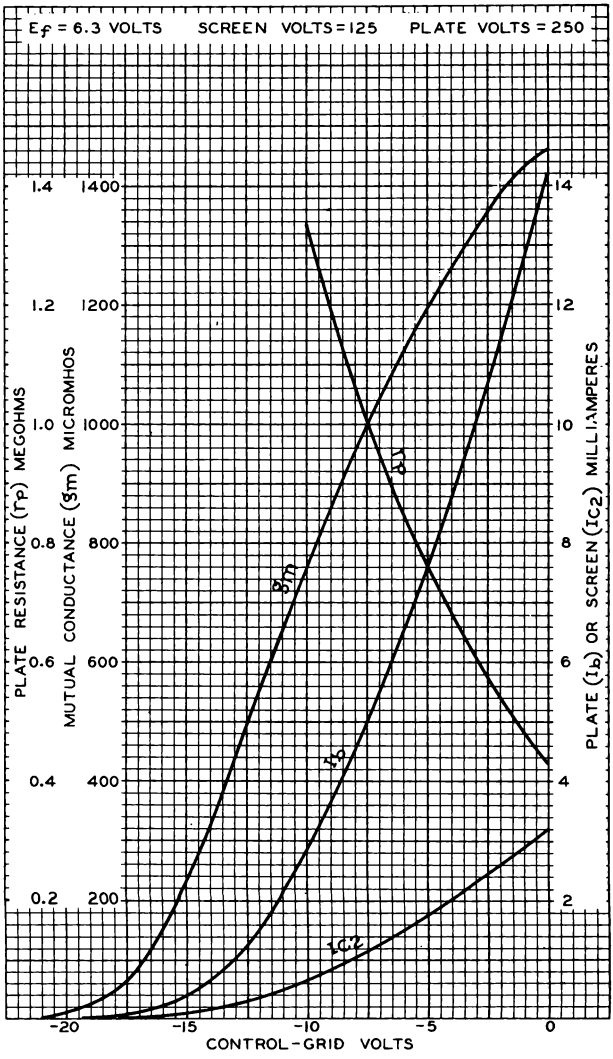
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4657

Cunningham Radiotron

RCA-6B8

AVERAGE CHARACTERISTICS

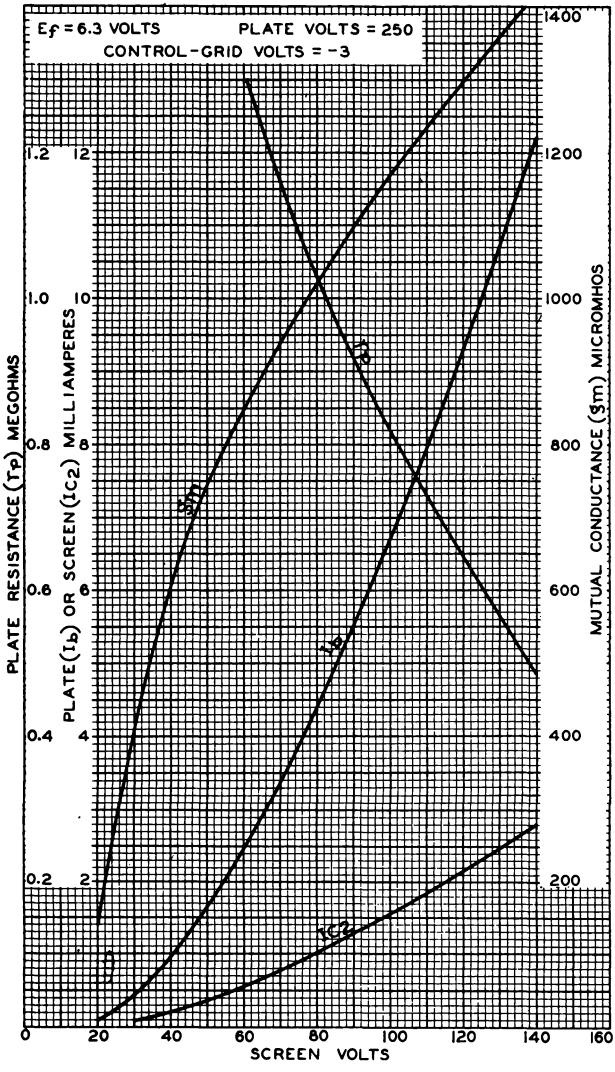


6B8

Cunningham Radiotron

RCA-6B8

AVERAGE CHARACTERISTICS



AUG. 18, 1936

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4661

6BA6

REMOTE-CUTOFF PENTODE

MINIATURE TYPE

GENERAL DATA

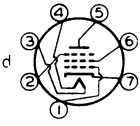
Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.3	amp.
Direct Interelectrode Capacitances:°		
Grid No.1 to Plate	0.0035 max.	μμf
Input	5.5	μμf
Output	5.0	μμf

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" ± 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	7BK1

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

CLASS A_1 AMPLIFIER

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	*See Rating Curve at front of this Section*	←
GRID-No.2 SUPPLY VOLTAGE	300 max.	volts
PLATE DISSIPATION	3 max.	watts
GRID-No.2 DISSIPATION	0.6 max.	watt
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

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
Cathode-Bias Resistor	68	68	ohms

° With no external shield.

← Indicates a change

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BA6

REMOTE-CUTOFF PENTODE

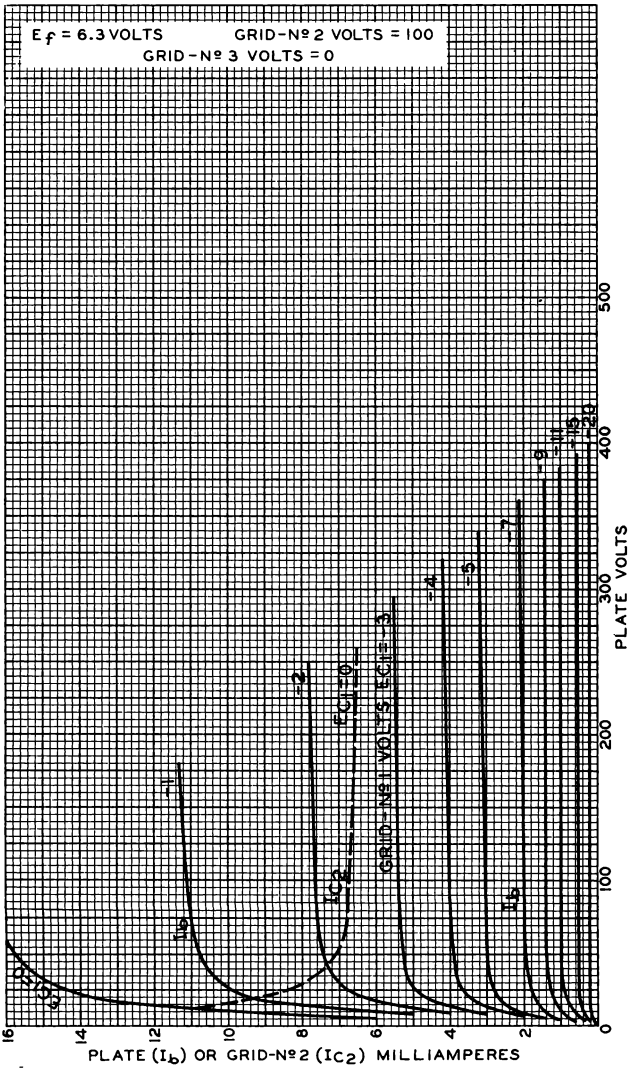
→ Plate Resistance (Approx.) . . .	0.25	1	. .	megohm
Transconductance	4300	4400	. . .	μmhos
Grid-No.1 Bias (Approx.) for transconductance of 40 μmhos .	-20	-20	. . .	volts
Plate Current.	10.8	11	. . .	ma.
Grid-No.2 Current.	4.4	4.2	. . .	ma.

→ Indicates a change

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

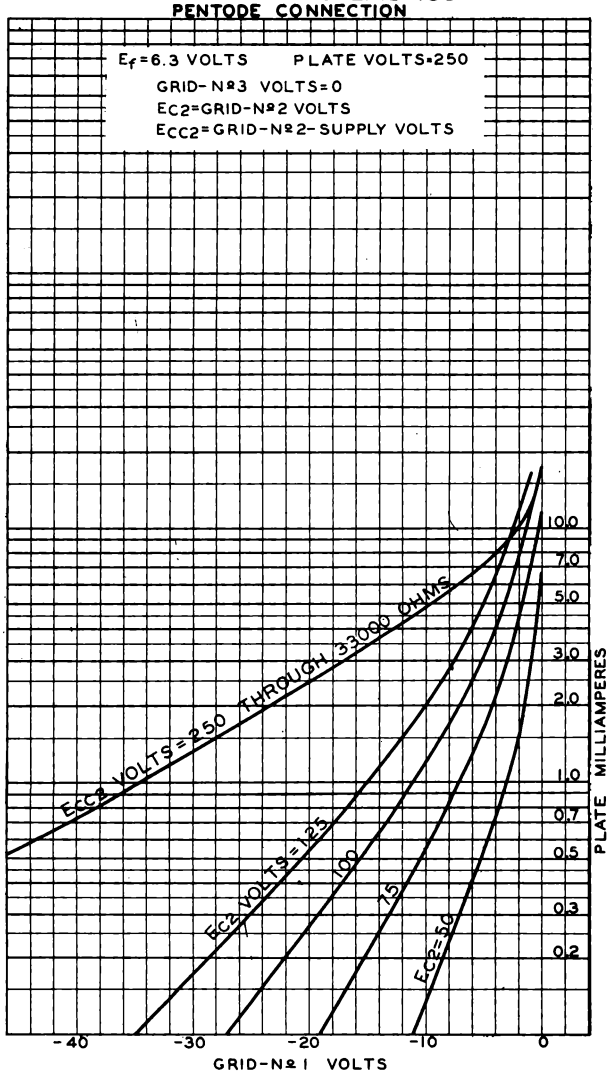
6BA6

AVERAGE PLATE CHARACTERISTICS



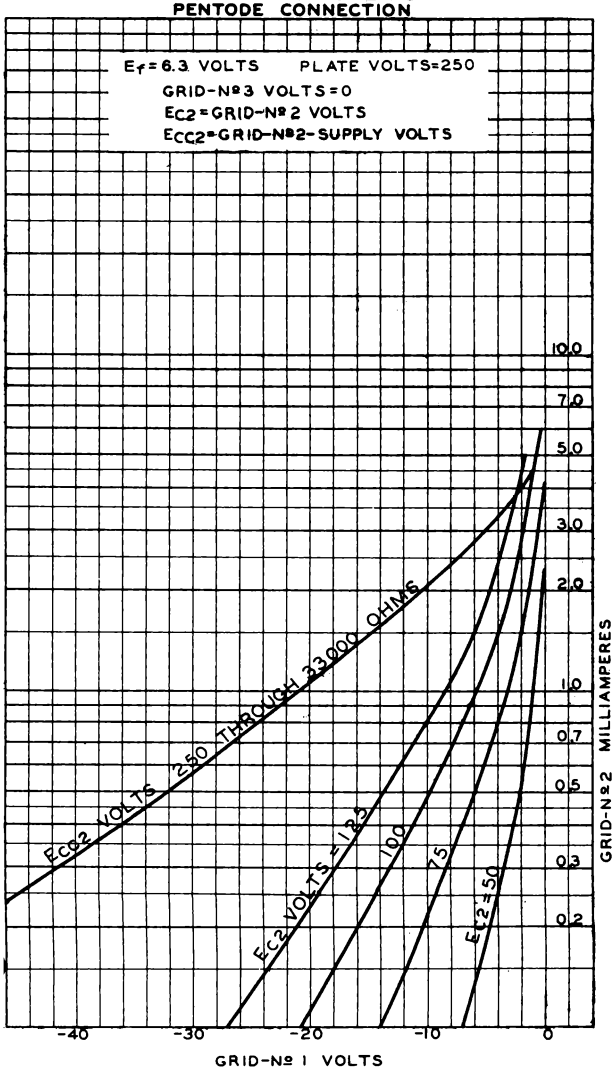
6BA6

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



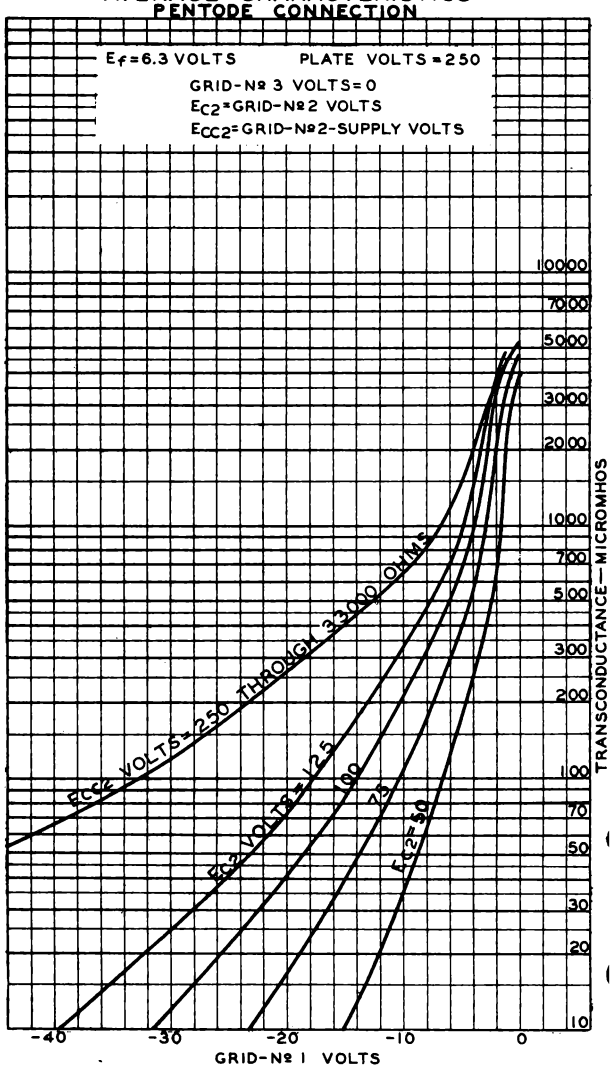
6BA6

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



6BA6

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BA7

6BA7
PENTAGRID CONVERTER

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances:o		
Grid No.3 to All Other Electrodes (RF Input)	9.5	μμf
Plate to All Other Electrodes (Mixer Output)	8.3	μμf
Grid No.1 to All Other Electrodes (Osc. Input)	6.7	μμf
Grid No.3 to Plate	0.19 max.	μμf
Grid No.3 to Grid No.1	0.1 max.	μμf
Grid No.1 to Plate	0.05 max.	μμf
Grid No.1 to All Other Electrodes Except Cathode	3.4	μμf
Grid No.1 to Cathode	3.3	μμf
Cathode to All Other Electrodes Except Grid No.1	4.0	μμf

o With no external shield.

Mechanical:

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

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

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

CONVERTER SERVICE

Maximum Ratings, *Design-Center Values*:

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

▲ See next page.

6BA7
PENTAGRID CONVERTER

GRID-No.3 VOLTAGE:			
Negative bias value.	100 max.		volts
Positive bias value.	0 max.		volts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	90 max.		volts
Heater positive with respect to cathode.	90 max.		volts

Characteristics - ***Separate Excitation:****

Plate Voltage.	100	250	volts
Grid-No.5 & Internal Shield. .	Connected directly to ground		
Grids-No.2 & No.4 (Screen) Voltage . . .	100	100	volts
Grid-No.3 (Control Grid) Voltage	-1	-1	volt
Grid-No.1 (Oscillator Grid) Resistor . .	20000	20000	ohms
Plate Resistance (Approx.)	0.5	1	megohm
Conversion Transconductance	900	950	μmhos
Conversion Transconductance (Approx.)# .	3.5	3.5	μmhos
Plate Current.	3.6	3.8	ma
Grids-No.2 & No.4 Current.	10.2	10	ma
Grid-No.1 Current.	0.35	0.35	ma
Total Cathode Current.	14.2	14.2	ma

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

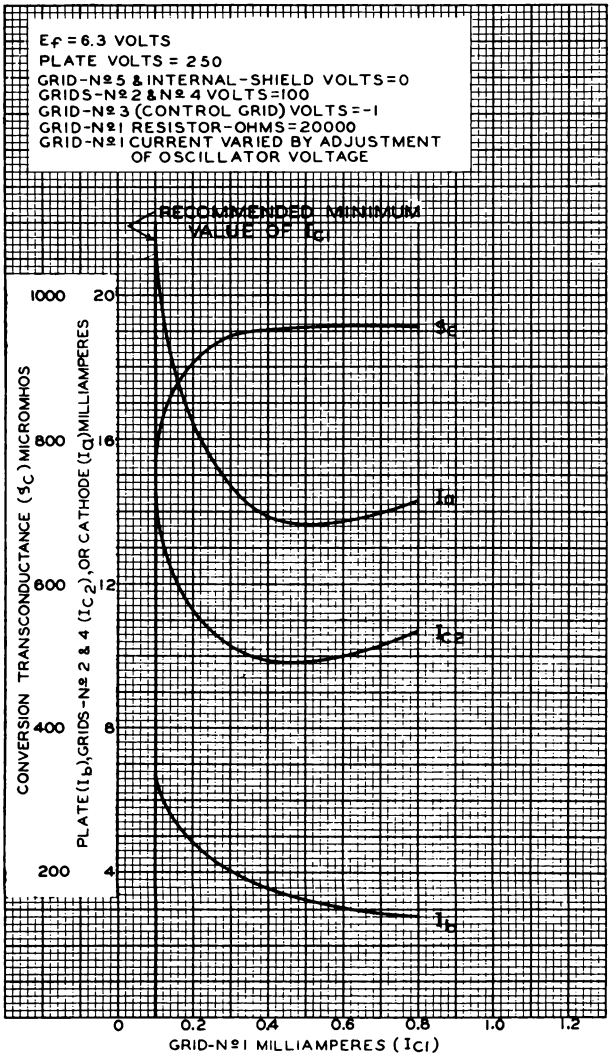
▲ Internal shield (Pins No.6 and No.8) connected directly to ground.

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

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

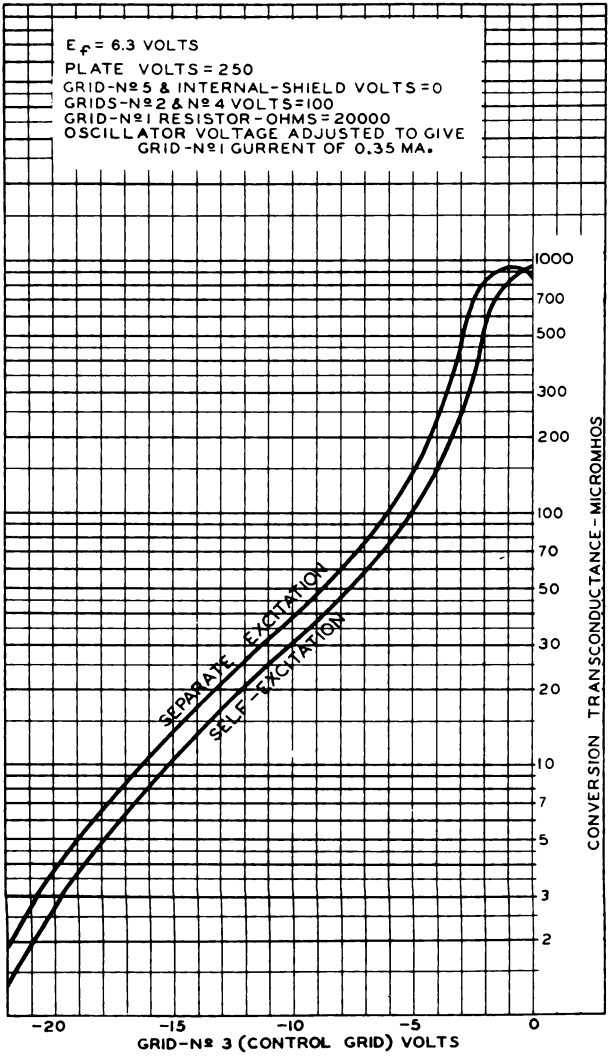
6BA7

OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION



6BA7

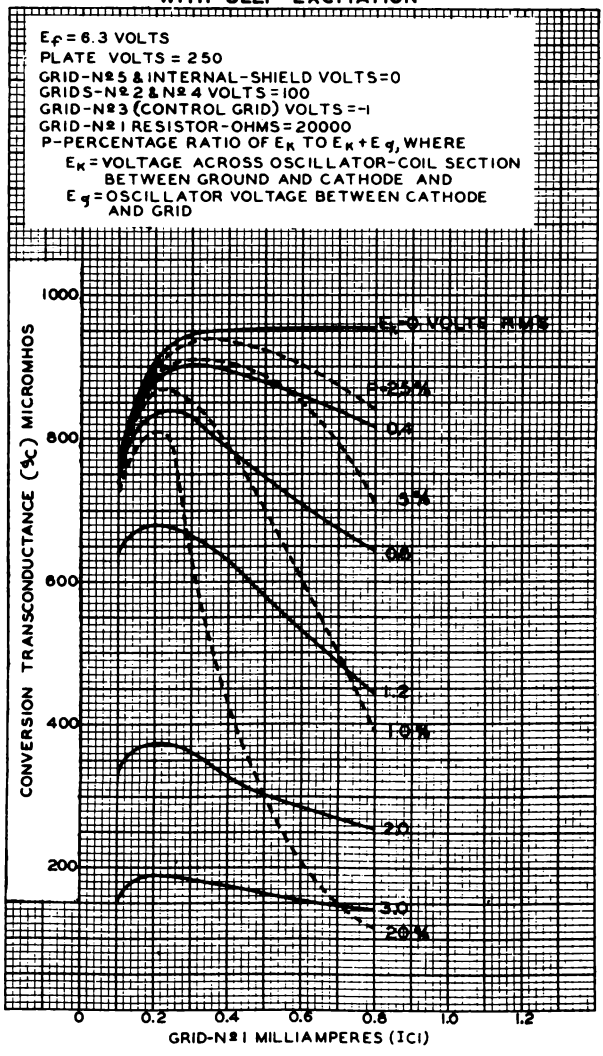
OPERATION CHARACTERISTICS



6BA7

6BA7

OPERATION CHARACTERISTICS
WITH SELF-EXCITATION



6BC4

6BC4

MEDIUM-MU TRIODE

9-PIN MINIATURE TYPE

For use as rf amplifier in cathode-drive circuits of TV tuners covering range of 470-890 Mc

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.225	amp
Direct Interelectrode Capacitances (Approx.):*		
Grid to plate	1.6	μμf
Grid to heater and cathode	2.9	μμf
Plate to heater and cathode	0.26	μμf
Heater to cathode	2.7	μμf

Characteristics - Class A_1 Amplifier:

Plate Supply Voltage	150	volts
Cathode-Bias Resistor	100	ohms
Amplification Factor	48	
Plate Resistance	4800	ohms
Transconductance	10000	μmhos
Grid Voltage (Approx.) for plate current of 10 μamp	-10	volts
Plate Current	14.5	ma

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" ± 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	9DR

Pin 1 - Plate
Pin 2 - Grid
Pin 3 - Grid
Pin 4 - Heater
Pin 5 - Heater

Pin 6 - Cathode
Pin 7 - Grid
Pin 8 - Grid
Pin 9 - Plate

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	250 max.	volts
PLATE DISSIPATION	2.5 max.	watts
CATHODE CURRENT	25 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	75 max.	volts
Heater positive with respect to cathode	75 max.	volts

* With no external shield.

6BC4

MEDIUM-MU TRIODE

Maximum Circuit Values (For maximum rated conditions):

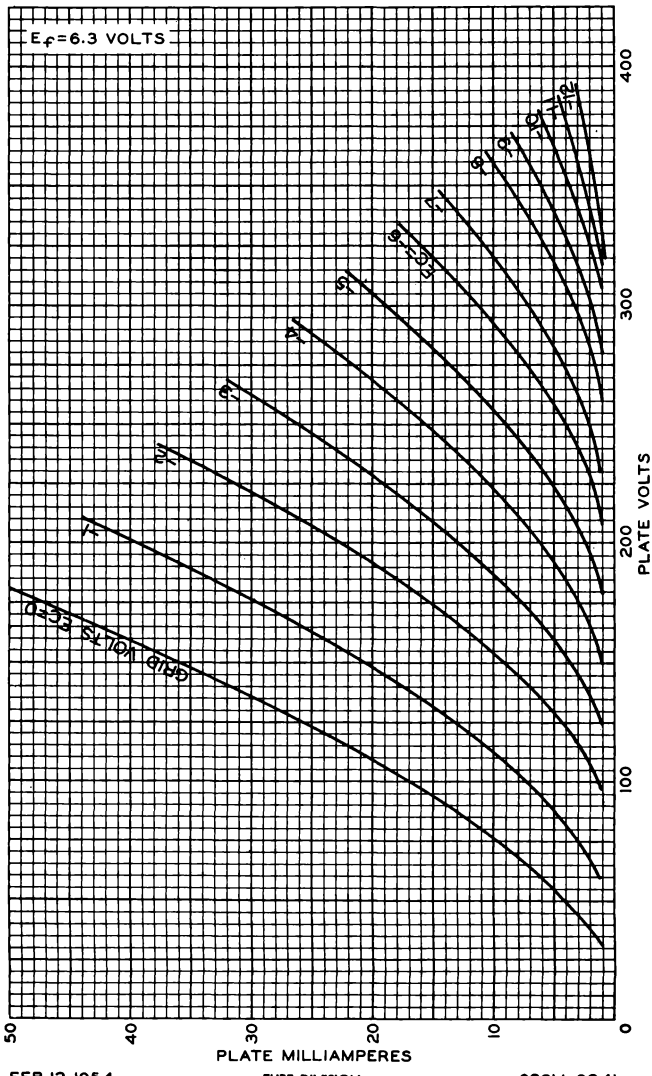
Grid-Circuit Resistance:

For cathode-bias operation	0.5 max. megohm
For fixed-bias operation	not recommended

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

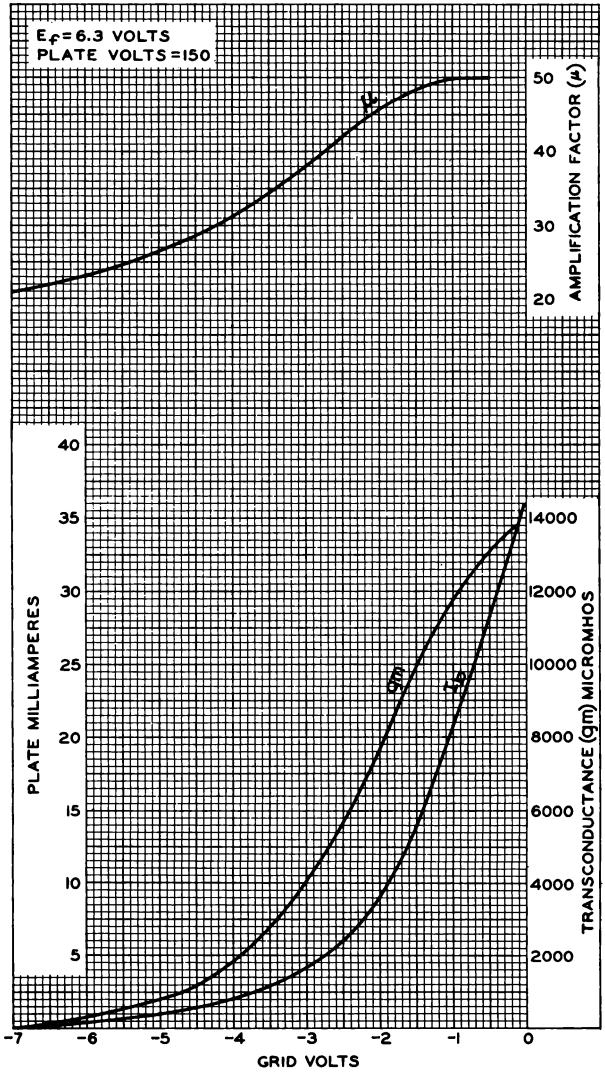
6BC4

AVERAGE PLATE CHARACTERISTICS



6BC4

AVERAGE CHARACTERISTICS



6BC5

6BC5

SHARP-CUTOFF PENTODE

MINIATURE TYPE

Useful at Frequencies up to 400 Mc

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.3	amp

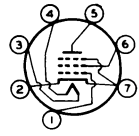
Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield°*	
Pentode Connection:			
Grid No.1 to plate	0.030 max.	0.020 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	6.5	6.6	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	1.8	2.6	μμf
Triode Connection, Grid No.2 connected to plate:			
Grid No.1 to plate and grid No.2	2.5	2.5	μμf
Grid No.1 to cathode & grid No.3 & internal shield, and heater	3.9	4.0	μμf
Plate and grid No.2 to cathode & grid No.3 & internal shield, and heater	3.0	4.3	μμf

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	7BD

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



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

° With external shield JETEC No.316 connected to cathode.

← Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BC5

SHARP-CUTOFF PENTODE

AMPLIFIER - Class A_1

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*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
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*	
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.2 Voltage	100	125	150	volts
Cathode-Bias Resistor	180	100	180	ohms
Plate Resistance (Approx.)	0.6	0.5	0.8	megohm
Transconductance	4900	6100	5700	μmhos
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp	-5	-6	-8	volts
Plate Current	4.7	8	7.5	ma
Grid-No.2 Current	1.4	2.4	2.1	ma

AMPLIFIER - Class A_1

Triode Connection - Grid No.2 Connected to Plate

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
PLATE & 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	330	820	ohms
Amplification Factor	42	40	
Plate Resistance (Approx.)	6000	9000	ohms
Transconductance	6000	4400	μmhos
Plate & Grid-No.2 Current (Total)	8	6	ma

→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BC7
TRIPLE DIODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:
- Voltage . . . . . 6.3 . . . . . ac or dc volts
- Current . . . . . 0.450 . . . . . amp

Direct Interelectrode Capacitances (Approx.):°
- Plate No.1 to Cathode No.1, Heater, and Internal Shield . . . . . 3.5 μμf
- Plate No.2 to Cathode No.2, Heater, and Internal Shield . . . . . 5.5 μμf
- Plate No.3 to Cathode No.3, Heater, and Internal Shield . . . . . 3.5 μμf

° 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 (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW 9R

Pin 1 - Cathode of Diode No.3
Pin 2 - Plate of Diode No.3
Pin 3 - Internal Shield
Pin 4 - Heater
Pin 5 - Heater

Pin 6 - Plate of Diode No.2
Pin 7 - Cathode of Diode No.2
Pin 8 - Plate of Diode No.1
Pin 9 - Cathode of Diode No.1

EACH DIODE

Maximum Ratings, *Design-Center Values:*

PEAK INVERSE PLATE VOLTAGE	330 max.	volts
PEAK PLATE CURRENT□	54 max.	ma
DC OUTPUT CURRENT	12 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	200 max.	volts
Heater positive with respect to cathode .	200 max.	volts

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	*Min.*	*Av.*	*Max.*	
Heater Current	1	0.410	0.450	0.490	amp
Plate Current (1) (Each Unit)	1,2	-	15	21	μamp

□ In rectifier service, the minimum total effective plate-supply impedance per plate is 560 ohms.

6BC7

TRIPLE DIODE

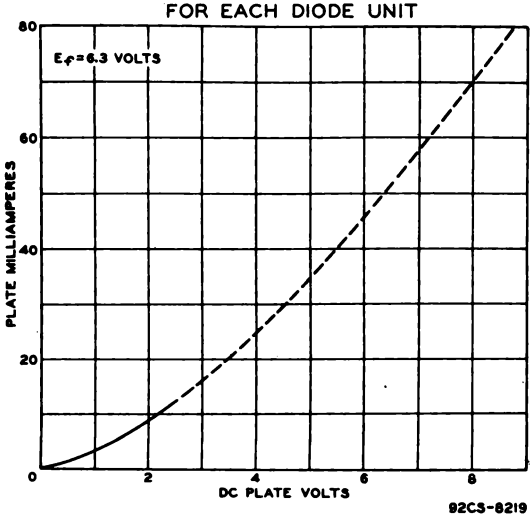
	Note	Min.	Av.	Max.	
Plate Current (2) (Each Unit)	1,3	18	35	65	ma
Ratio of Plate Current of Unit No.3 to Plate Current of Unit No.1 .	1,3	0.77	1	1.3	

Note 1: With 6.3 volts ac or dc on heater.

Note 2: With plate voltage of 0 volts, and plate load resistance of 40000 ohms. Each unit tested separately.

Note 3: With plate voltage of 5 volts and no plate load resistance. Each unit tested separately.

AVERAGE PLATE CHARACTERISTIC FOR EACH DIODE UNIT



6BC8

MEDIUM-MU TWIN TRIODE

With Semiremote-Cutoff Characteristic

9-PIN MINIATURE TYPE

For use in cascode-type circuits of VHF TV tuners

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage	6.3	ac or dc volts
Current	0.4	amp

Direct Interelectrode Capacitances:[o]

	Unit No.1	*Unit No.2*	
Grid to plate	1.4	1.4	μμf
Grid to cathode, heater, and internal shield	2.5	2.5	μμf
Plate to cathode, heater, and internal shield	1.3	1.3	μμf
Heater to cathode[●]	2.3	2.3	μμf
Grid of unit No.1 to grid of unit No.2	0.007 max.		μμf
Plate of unit No.1 to plate of unit No.2	0.015 max.		μμf

Characteristics, Class A1 Amplifier (Each Unit):

Plate Voltage	150	volts
Cathode Resistor	220	ohms
Amplification Factor	35	
Transconductance	6200	μmhos
Plate Current	10	ma
Grid Voltage (Approx.) for transconductance of 50 μmhos	-13	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"
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	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

[o] 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.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

6BC8

MEDIUM-MU TWIN TRIODE
With Semiremote-Cutoff Characteristic

AMPLIFIER - Class A_1

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	250 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

Maximum Circuit Values:

Grid-Circuit Resistance:		
For cathode-bias operation	0.5 max.	megohm

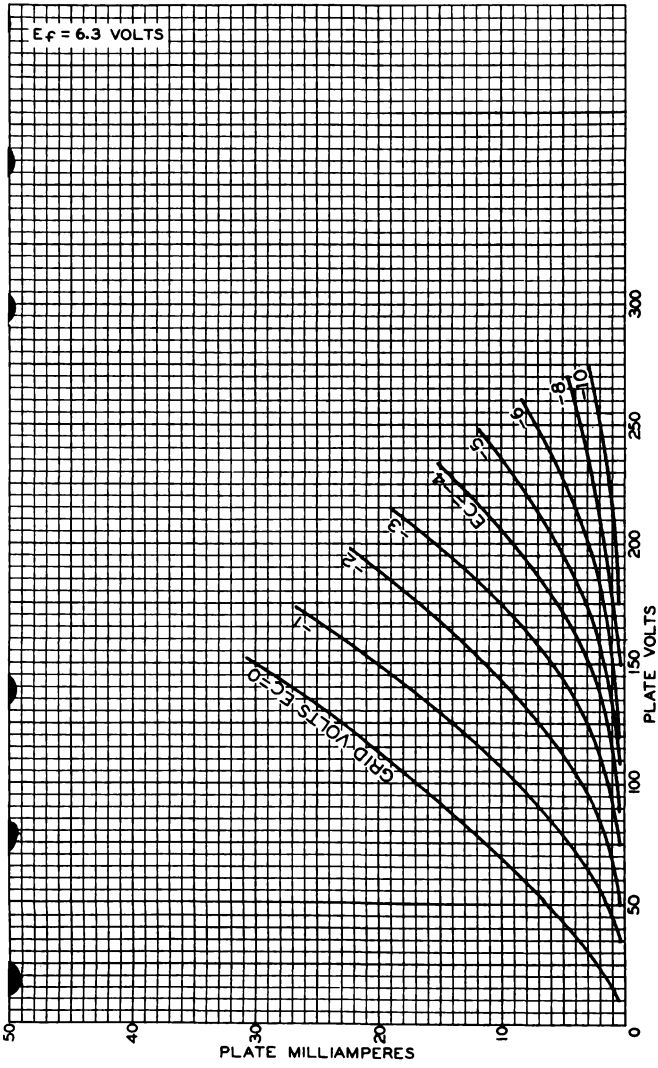
▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BC8

AVERAGE PLATE CHARACTERISTICS

FOR EACH UNIT



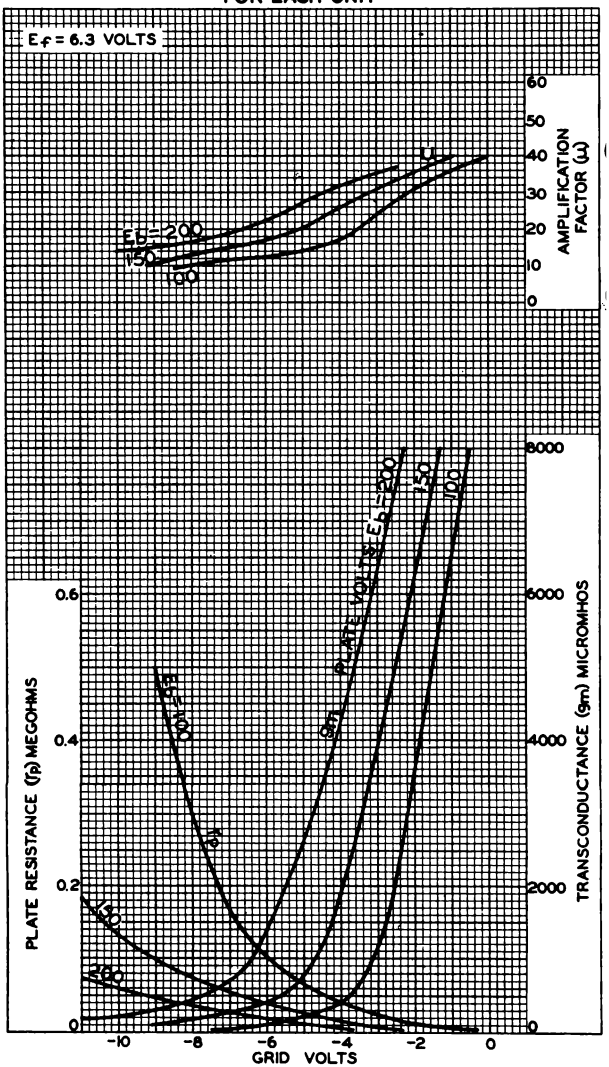
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8789

6BC8

6BC8

AVERAGE CHARACTERISTICS
FOR EACH UNIT

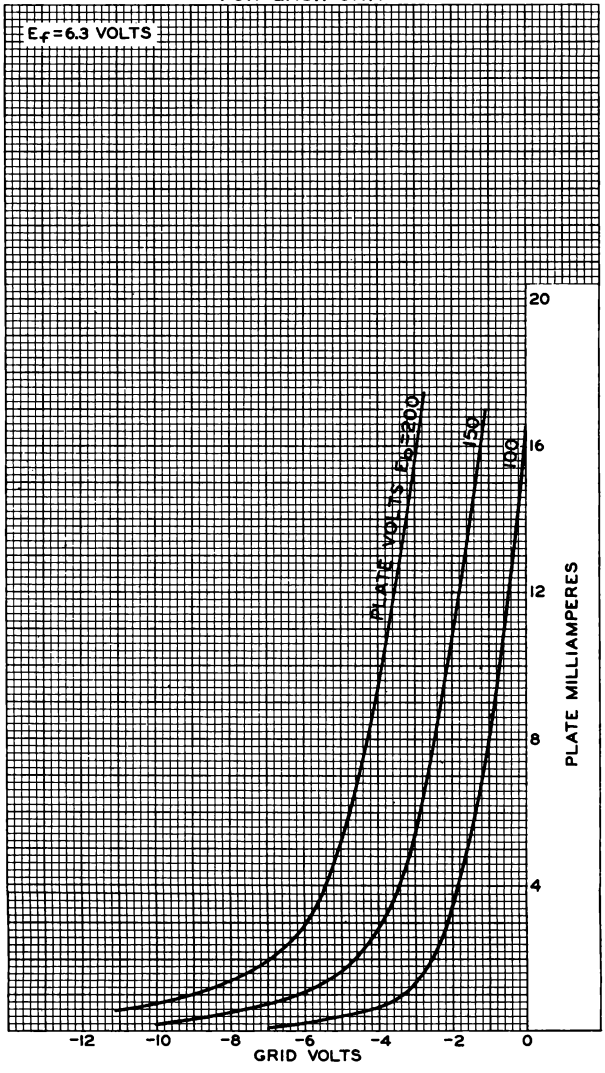


TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8790R1

6BC8

AVERAGE CHARACTERISTICS
FOR EACH UNIT



6BD4-A

SHARP-CUTOFF BEAM TRIODE

HIGH-VOLTAGE, LOW-CURRENT, REGULATOR TYPE

Supersedes Type 6BD4

GENERAL DATA

Electrical:

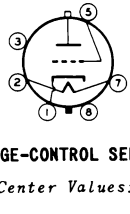
Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.6	amp
Direct Interelectrode Capacitances:		
Grid to Plate	1.0	μμf
Input	3.8	μμf
Output	0.04 max.	μμf
Amplification Factor	1650	

Mechanical:

Mounting Position	Any
Maximum Overall Length	5-1/8"
Seated Length	4-1/2" ± 1/8"
Maximum Diameter	1-23/32"
Weight (Approx.)	2.7 oz
Bulb	T-12
Cap	Small (JETEC No.C1-1)
Base	Short Jumbo-Shell Octal 6-Pin (JETEC No.B6-73)

BOTTOM VIEW

Pin 1 - Cathode
Pin 2 - Heater
Pin 3 - No Connection
Pin 5 - Grid



Pin 7 - Heater
Pin 8 - No Connection
Cap - Plate

VOLTAGE-CONTROL SERVICE

Maximum Ratings, *Design-Center Values:*

DC PLATE VOLTAGE	27000 max.	volts
UNREGULATED DC SUPPLY VOLTAGE	55000 max.	volts
GRID VOLTAGE:		
DC value	-125 max.	volts
Peak value	-550 max.	volts
DC PLATE CURRENT	1.5 max.	ma
PLATE DISSIPATION	25 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 As Shunt Voltage-Regulator Tube In Accompanying Circuit:

Unregulated Supply:			
DC voltage	29800	36300	volts
Equivalent resistance	8	8	megohms

6BD4-A

SHARP-CUTOFF BEAM TRIODE

Voltage Divider Values:*			
R_1 (5 watts)	120	220	megohms
R_2 (2 watts)	1	1	megohm
R_3 (1/2 watt)	2	3	megohms
Reference Voltage Supply:			
DC value	500	500	volts
Equivalent resistance	1000	1000	ohms
Effective Grid-Plate Transconductance	138	116	μmhos
DC Plate Current:			
For load current of 0 ma	1055	1035	μamp
For load current of 1 ma	100	100	μamp
Regulated DC Output Voltage:			
For load current of 0 ma	20000	27000	volts
For load current of 1 ma	19700	26500	volts

Maximum Circuit Values:

Grid-Circuit Resistance:		
With unregulated supply having an equivalent resistance of at least 8 megohms	4 max.	megohms
With unregulated supply having an equivalent resistance less than 8 megohms . .	*See accompanying curve*	

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	*Min.*	*Max.*	
Heater Current	1	0.54	0.66	amp
Grid Voltage (1)	1,2	-7	-	volts
Grid Voltage (2)	1,3	-	-40	volts
Grid-Voltage Change	1,4	-	9	volts

Note 1: With heater voltage of 6.3 volts ac or dc.

Note 2: With dc plate voltage of 30000 volts and dc plate current of 1 ma.

Note 3: With dc plate voltage of 30000 volts and dc plate current of 0.1 ma.

Note 4: Difference between grid voltage (1) and grid voltage (2).

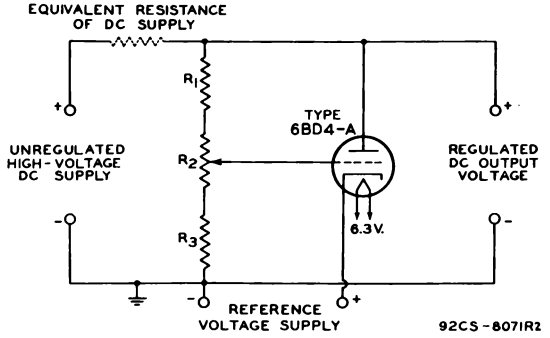
OPERATING NOTES

Operation of the 6BD4-A 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.

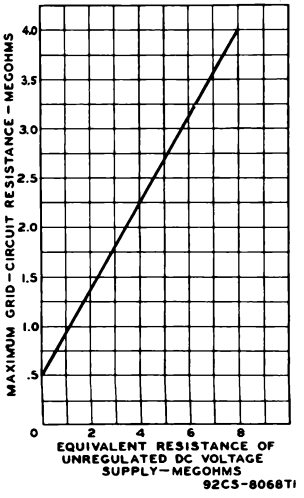
6BD4-A

SHARP-CUTOFF BEAM TRIODE

SHUNT VOLTAGE-REGULATOR CIRCUIT



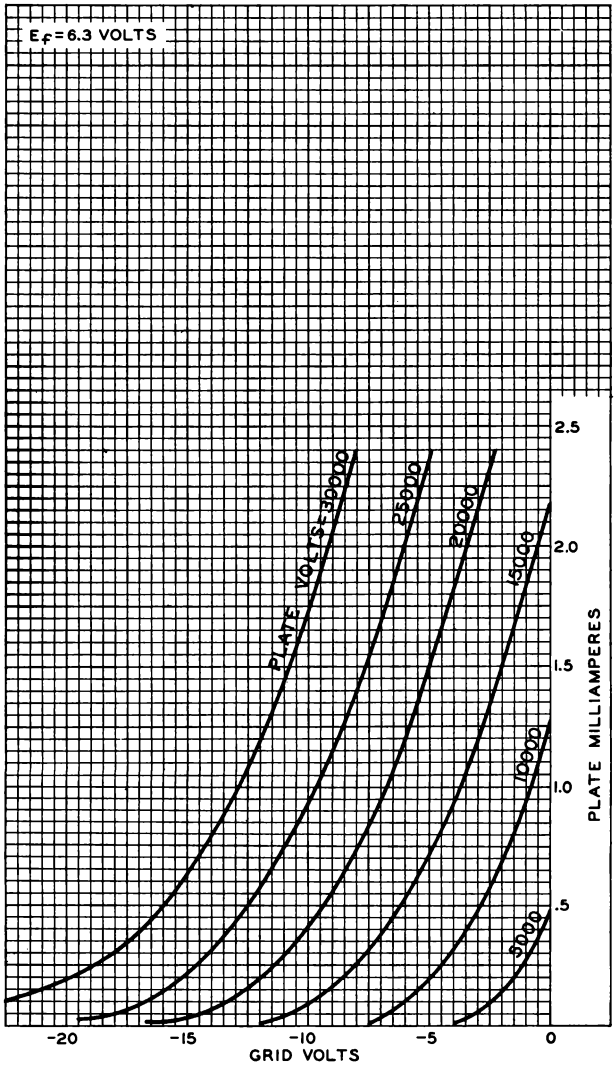
Typical performance data for this basic circuit with certain characteristics of the unregulated dc supply and related voltage-divider values are given in the above tabulated data. Other combinations are feasible within the maximum ratings and the maximum circuit values for the 6BD4-A.



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.

6BD4-A

AVERAGE TRANSFER CHARACTERISTICS



6BD6

REMOTE-CUTOFF PENTODE

MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.3	amp

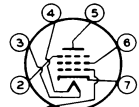
Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield No.316*	
Grid No.1 to Plate	0.005 max.	0.004 max.	μμf
Input	4.3	4.3	μμf
Output	5.0	5.0	μμf

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
Basing Designation for BOTTOM VIEW	7BK1

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_1

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

PLATE VOLTAGE	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	125 max.	volts
PLATE DISSIPATION	3 max.	watts
GRID-No.2 INPUT	0.65 max.	watt
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

Typical Operation and Characteristics:

Plate Voltage	100	125	250	volts
Grid No.3 (Suppressor)	Connected to cathode at socket			
Grid-No.2 Voltage	100	125	100	volts
Grid-No.1 (Control Grid) Voltage	-1	-3	-3	volts
Plate Resistance	0.15	0.18	0.8	megohm
Transconductance	2550	2350	2000	μmhos

6BD6

REMOTE-CUTOFF PENTODE

Grid-No.1 Bias (Approx.) for transconductance of 10 μmhos . .	-35	-45	-35	volts
Plate Current.	13	13	9	ma
Grid-No.2 Current.	5	5	3	ma

6BE6

PENTAGRID CONVERTER

MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.3	amp

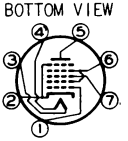
Direct Interelectrode Capacitances:	*Without Shield*	*With Shield*°	
Grid No.3 to All Other Electrodes (RF Input)	7 max.	7 max.	μμf
Plate to All Other Electrodes (Mixer Input)	8	13	μμf
Grid No.1 to All Other Electrodes (Osc. Input)	5.5 max.	5.5 max.	μμf
Grid No.3 to Plate	0.30 max.	0.25 max.	μμf
Grid No.3 to Grid No.1	0.15 max.	0.15 max.	μμf
Grid No.1 to Plate	0.1 max.	0.05 max.	μμf
Grid No.1 to Cathode and Grid No.5	3	3	μμf
Cathode and Grid No.5 to All Other Electrodes Except Grid No.1	15	20	μμf

° JETEC No.316 connected to pin No.2.

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" ± 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	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-Center Values:*

PLATE VOLTAGE	300 max.	volts
GRID-No.3 (CONTROL-GRID) VOLTAGE:		
Negative Bias Value	50 max.	volts
Positive Bias Value	0 max.	volts
GRIDS-No.2 & No.4 (SCREEN) VOLTAGE	100 max.	volts
GRIDS-No.2 & No.4 SUPPLY VOLTAGE	300 max.	volts

←Indicates a change

6BE6

PENTAGRID CONVERTER

TOTAL CATHODE CURRENT	14 max.	ma
PLATE DISSIPATION	1 max.	watt
GRIDS-No.2 & No.4 INPUT	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** - *Separate Excitation:**

Plate Voltage	100	250	volts
Grids-No.2 & No.4 Voltage	100	100	volts
Grid-No.3 Voltage	-1.5	-1.5	volts
Grid-No.1 (Oscillator Grid) Voltage (rms)	10	10	volts
Grid-No.1 Resistor	20000	20000	ohms
Plate Resistance (Approx.)	0.4	1	megohm
Conversion Transconductance	455	475	μmhos
Grid-No.3 Voltage (Approx.) for conversion transconductance of:			
10 μmhos	-30	-30	volts
100 μmhos	-6	-6	volts
Plate Current	2.6	2.9	ma
Grids-No.2 & No.4 Current	7	6.8	ma
Grid-No.1 Current	0.5	0.5	ma
Total Cathode Current	10.1	10.2	ma

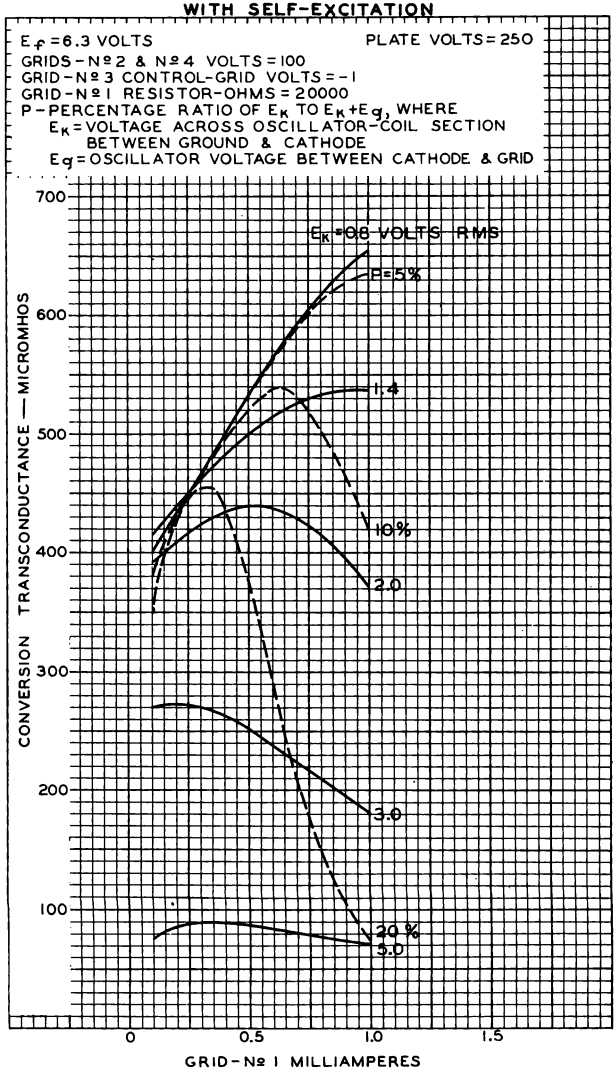
NOTE: With grids-No.2 & No.4 and plate at 100 volts, grids-No.1 & No.3 at zero volts, and signal applied to grid No.1, the oscillator transconductance (not oscillating) is 7250 micromhos; the cathode current is 25 milliamperes; and the amplification factor is 20. Grid-No.1 voltage (approx.) for plate current of 10 microamperes is -11 volts.

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

→ Indicates a change

6BE6

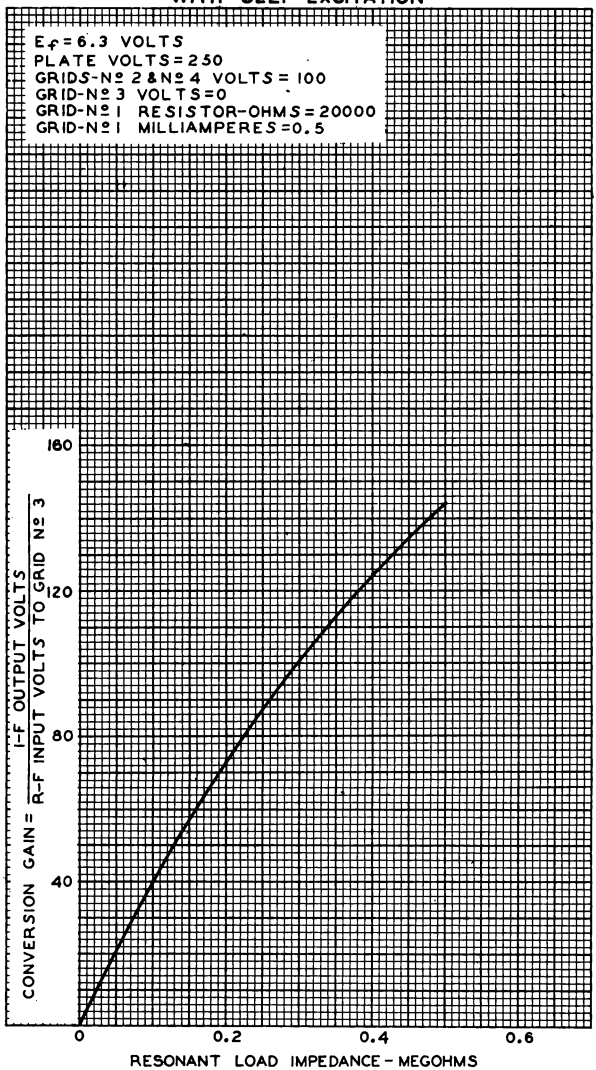
OPERATION CHARACTERISTICS
WITH SELF-EXCITATION



6BE6

6BE6

OPERATION CHARACTERISTIC
WITH SELF-EXCITATION

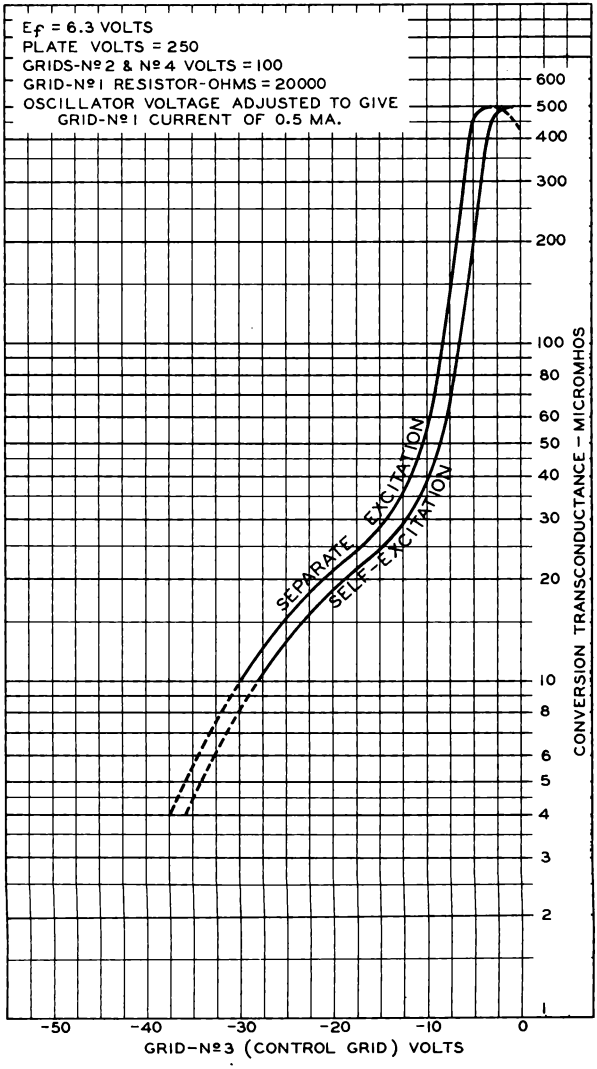


OCT. 16, 1945 RCA VICTOR DIVISION 92CM - 6605

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BE6

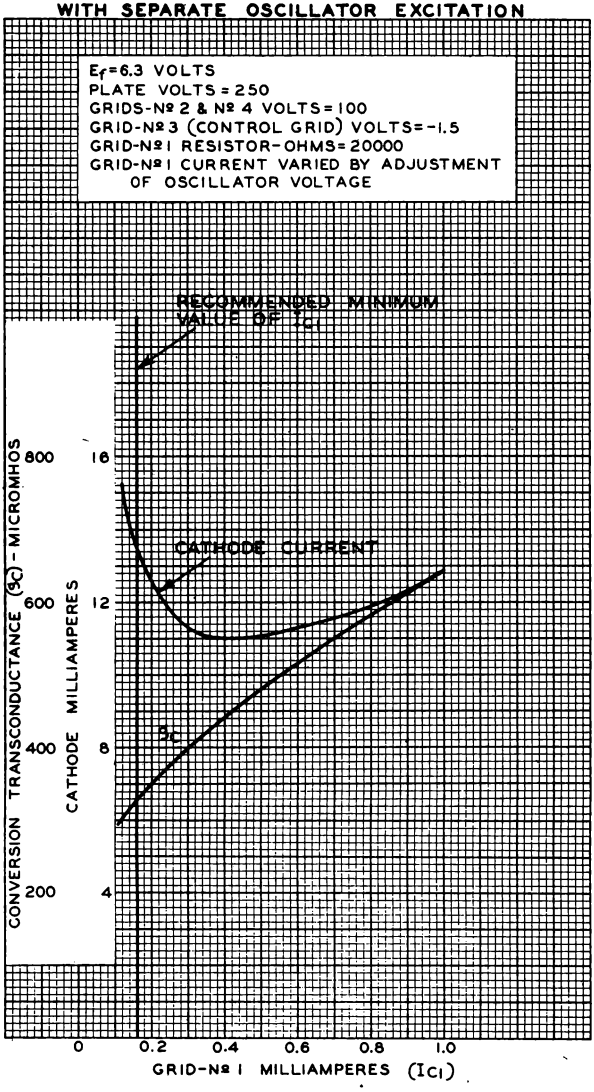
OPERATION CHARACTERISTICS



6BE6

6BE6

OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION



NOV. 12, 1945

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6624

6BF5
BEAM POWER AMPLIFIER

MINIATURE TYPE

GENERAL DATA

Electrical:

Heater for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	1.2	amp

Direct Interelectrode Cap. (Approx.; no external shield):

As Beam Power Amplifier:

Grid No.1 to Plate	0.65	μμf
Input	14	μμf
Ouput	6	μμf

Characteristics as Beam Power Amplifier:

See AMPLIFIER--Class A_1

Characteristics as Triode-Connected Amplifier - Class A_1:

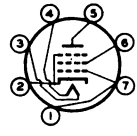
(Grid No.2 connected to plate)

Plate Voltage	225	volts
Grid Voltage	-30	volts
Amplification Factor	6.7	
Plate Resistance	2500	ohms
Transconductance	2700	μmhos
Plate Current	10	ma
Grid Voltage (Approx.) for plate current of 0.5 ma	-40	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	3/4"
Bulb	T-5-1/2
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_1

Maximum Ratings, *Design - Center Values:*

PLATE VOLTAGE	250 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	117 max.	volts
PLATE DISSIPATION	5.5 max.	watts
GRID-No.2 INPUT	1.25 max.	watts

6BF5

BEAM POWER AMPLIFIER

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	110	volts
Grid-No.2 (Screen) 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	36	ma
Maximum-Signal Plate Current	39	ma
Zero-Signal Grid-No.2 Current	4	ma
Maximum-Signal Grid-No.2 Current	10.5	ma
Plate Resistance (Approx.)	12000	ohms
Transconductance	7500	μmhos
Plate Load Resistance	2500	ohms
Total Harmonic Distortion	10	per cent
Maximum-Signal Power Output	1.9	watts

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	250 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE†	900○max.	volts
CATHODE CURRENT:		
DC	40 max.	ma
Peak	120 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■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 7 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 7 per cent of one vertical scanning cycle is 1.2 milliseconds.

○ 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.

6BF6

TWIN DIODE—MEDIUM-MU TRIODE

MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.3	amp

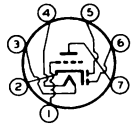
Direct Interelectrode Capacitances (Approx.):

	With External Shield▲	*Without External Shield*	
Triode Unit:			
Grid to Plate	2.0	2.0	μμf
Input	1.8	1.8	μμf
Output	1.1	0.8	μμf
Plate of Diode Unit No.1 to Cathode	1.4	0.7	μμf
Plate of Diode Unit No.2 to Cathode	1.5	0.1	μμf
Plate of Diode Unit No.1 to Triode Grid	0.06 max.	0.07 max.	μμf
Plate of Diode Unit No.2 to Triode Grid	0.05 max.	0.06 max.	μμf

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" ± 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	7BT

Pin 1 – Triode Grid
Pin 2 – Cathode
Pin 3 – Heater
Pin 4 – Heater



Pin 5 – Diode Plate No.2
Pin 6 – Diode Plate No.1
Pin 7 – Triode Plate

TRIODE UNIT – Class A_1 Amplifier

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	300 max.	volts
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

▲ According to RTMA Standard ET-109A with External Shield No.315 tied to cathode.

← Indicates a change.

6BF6

TWIN DIODE—MEDIUM-MU TRIODE

Typical Operation with Transformer Coupling:

Plate Voltage	250	volts
Grid Voltage	−9	volts
Amplification Factor	16	
Plate Resistance (Approx.)	8500	ohms
Transconductance	1900	μmhos
Plate Current	9.5	ma
Load Resistance	10000	ohms
Total Harmonic Distortion	6.5	%
Power Output	300	mw

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART at front of this Section

DIODE UNITS

Maximum Ratings, *Design-Center Values*:

PLATE CURRENT (For each diode)	1.0 max.	ma

Diode Considerations:

Consideration of these units, including typical circuits and diode curves, is given at the front of this section. Diode biasing of the triode unit of the 6BF6 is not suitable.

Curves shown under Types 6R7 and 6SR7 also apply to the triode unit of the 6BF6

6BG6-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.):°

Grid No.1 to plate	0.34	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	12	μμf
Plate to cathode & grid No.3, grid No.2, and heater	6.5	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	60	250	volts
Grid-No.2 (Screen) Voltage	250	250	volts
Grid-No.1 (Control-Grid) Voltage	0	-15	volts
Mu-Factor, Grid No.2 to Grid No.1	-	8	
Plate Resistance (Approx.)	-	25000	ohms
Transconductance	-	6000	μmhos
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 . . . . . 5-11/16"

Seated Length . . . . . 4-31/32" ± 5/32"

Maximum Diameter . . . . . 2-1/16"

Dimensional Outline . . . . . *See General Section*

Bulb ST-16

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

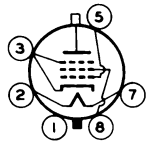
Base . . . . . Medium-Shell Octal 6-Pin (JETEC No.B6-13)

Basing Designation for BOTTOM VIEW 5BT

Pin 1 - No Connection

Pin 2 - Heater

Pin 3 - Cathode, Grid No.3



Pin 5 - Grid No.1

Pin 7 - Heater

Pin 8 - Grid No.2

Cap - Plate

° 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.

← Indicates a change.

6BG6-G

BEAM POWER TUBE

HORIZONTAL DEFLECTION AMPLIFIER

→ **Maximum Ratings,** *Design-Center Values Except as Noted:*

For operation in a 525-line, 30-frame system□

DC PLATE VOLTAGE	700	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)●	6600■	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500	max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE	350	max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-50	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▲	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.

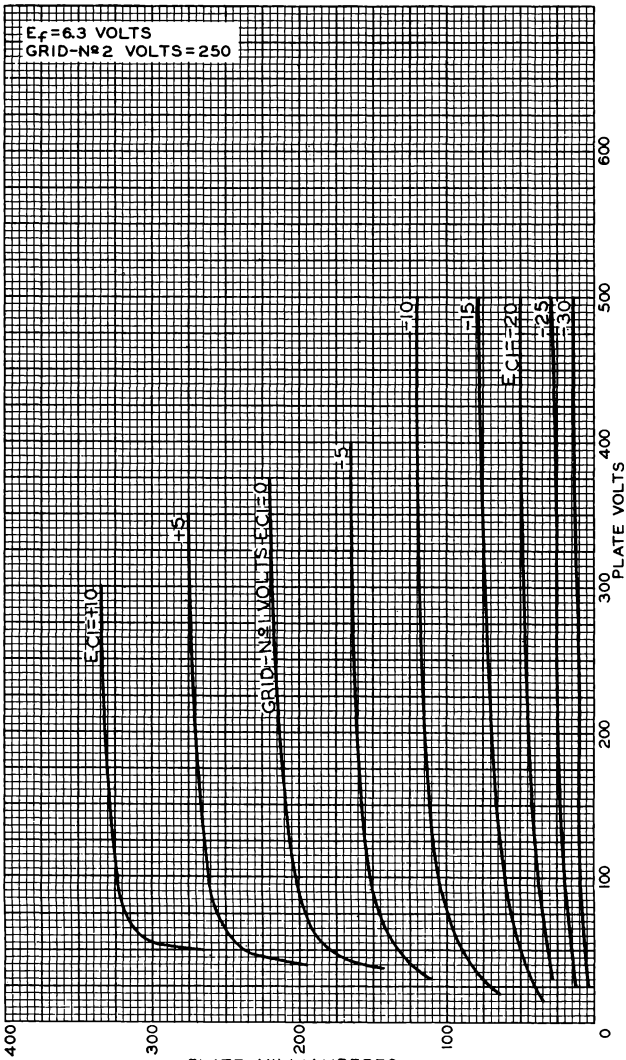
▲ The dc component must not exceed 100 volts.

→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BG6-G

AVERAGE PLATE CHARACTERISTICS



JUNE 18,1947

TUBE DIVISION

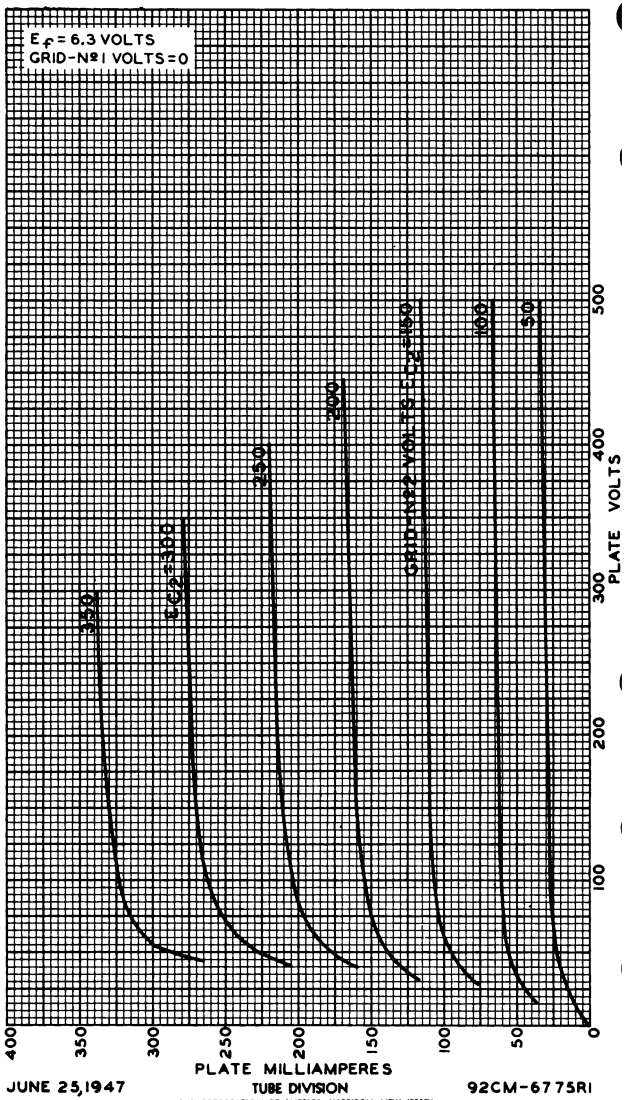
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6774R1

6BG6-G

6BG6-G

AVERAGE PLATE CHARACTERISTICS



JUNE 25,1947

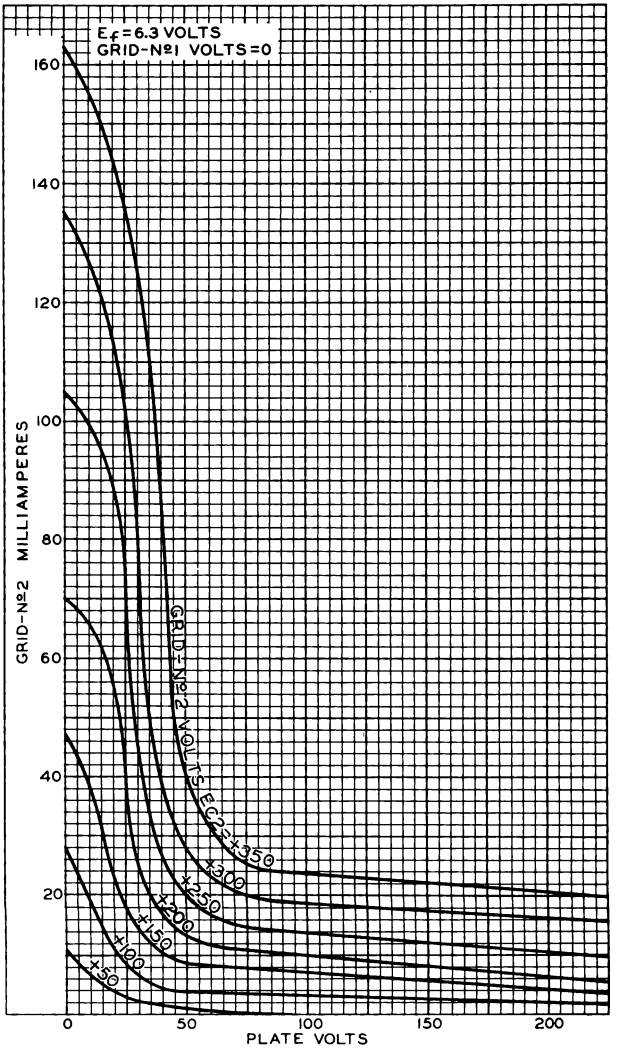
TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6775R1

6BG6-G

AVERAGE CHARACTERISTICS



6BH6
SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:
Voltage. . . . . 6.3 . . . . . ac or dc volts
Current. . . . . 0.15 . . . . . .amp ←

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield°*	
Grid No.1 to plate	0.0035 max.	0.0035 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	5.4	5.4	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	4.4	4.4	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage.	100	250	volts
Grid No.3 (Suppressor)	*Connected to cathode at socket*		
Grid-No.2 Voltage.	100	150	volts
Grid-No.1 Voltage.	-1	-1	volt
Plate Resistance (Approx.) . . .	0.7	1.4	megohm
Transconductance	3400	4600	μmhos
Plate Current.	3.6	7.4	ma
Grid-No.2 Current.	1.4	2.9	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp . . .	-5	-7.7	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" ±3-3/32"
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 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

° With external shield JETEC No.316 connected to cathode.

← Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BH6

SHARP-CUTOFF PENTODE

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

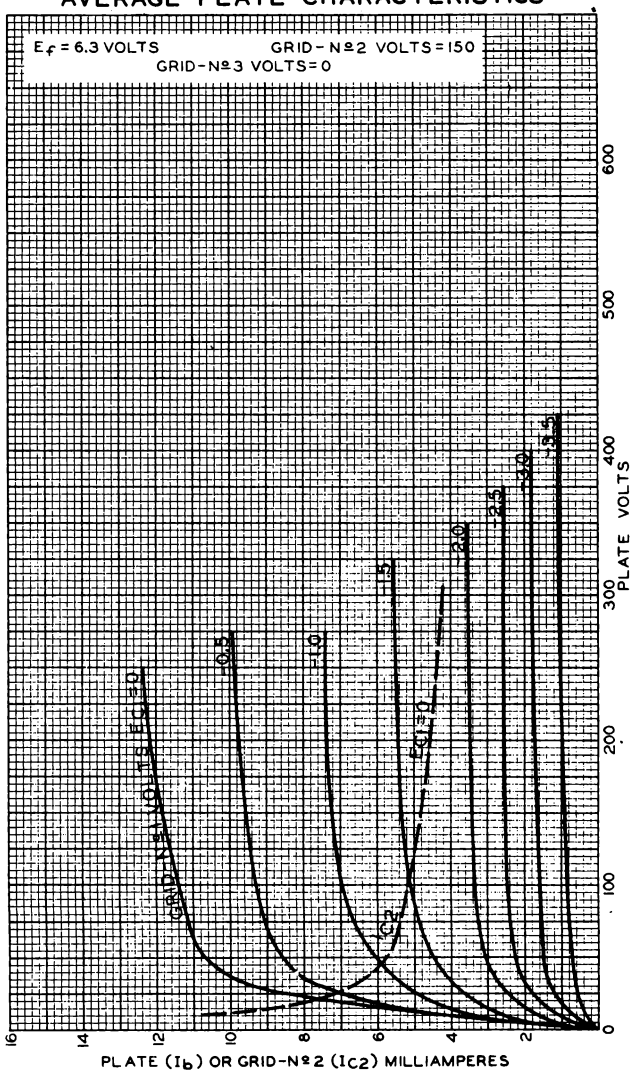
PLATE VOLTAGE	300 max.	volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE	300 max.	volts
→ GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative bias value	50 max.	volts
Positive bias value	0 max.	volts
PLATE DISSIPATION	3 max.	watts
→ 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	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BH6

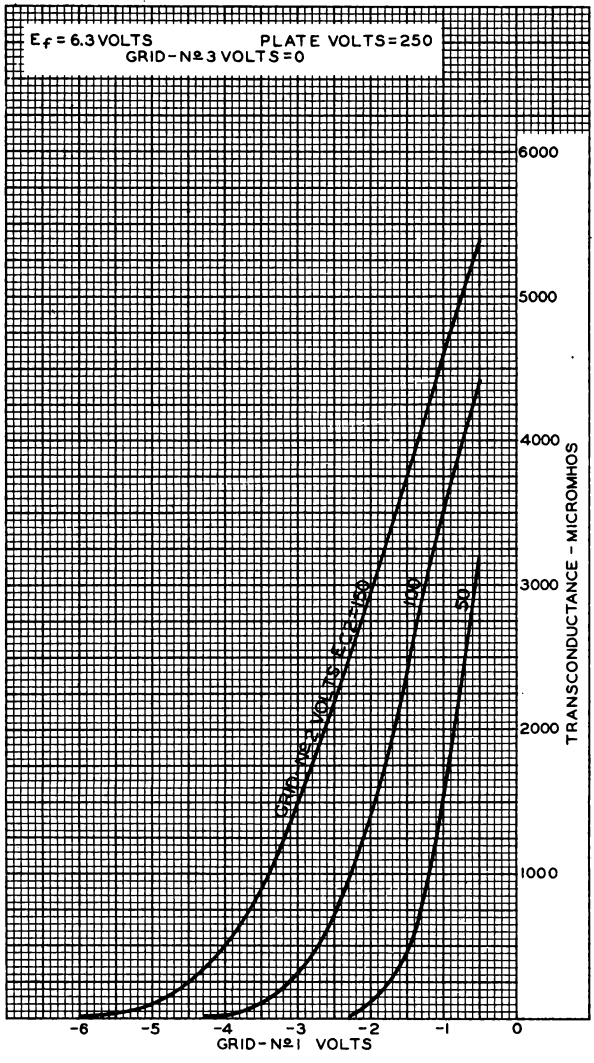
AVERAGE PLATE CHARACTERISTICS



6BH6

6BH6

AVERAGE CHARACTERISTICS



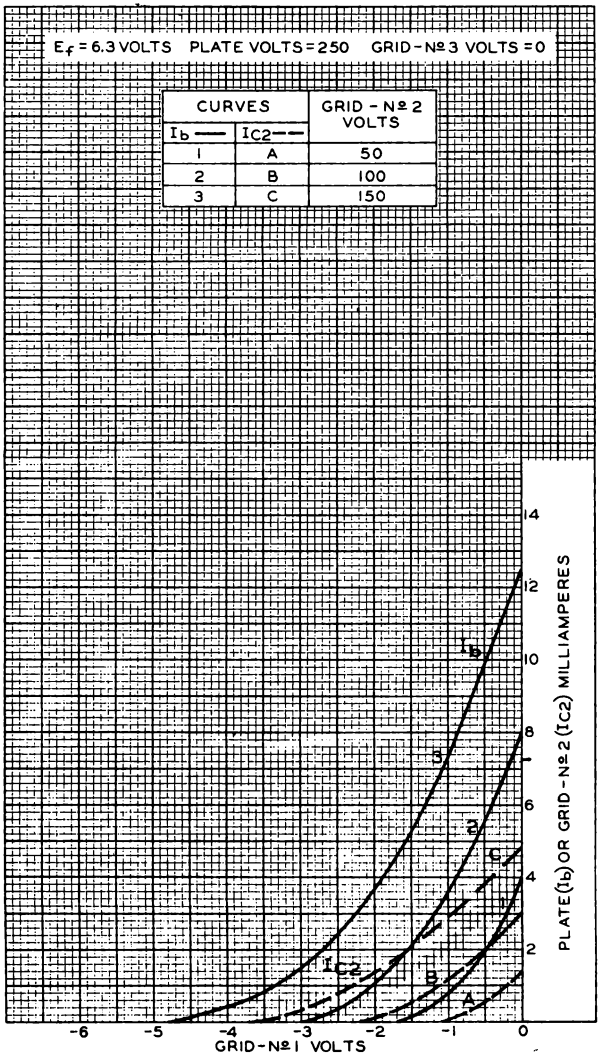
AUG. 21.1947

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6891

6BH6

AVERAGE CHARACTERISTICS

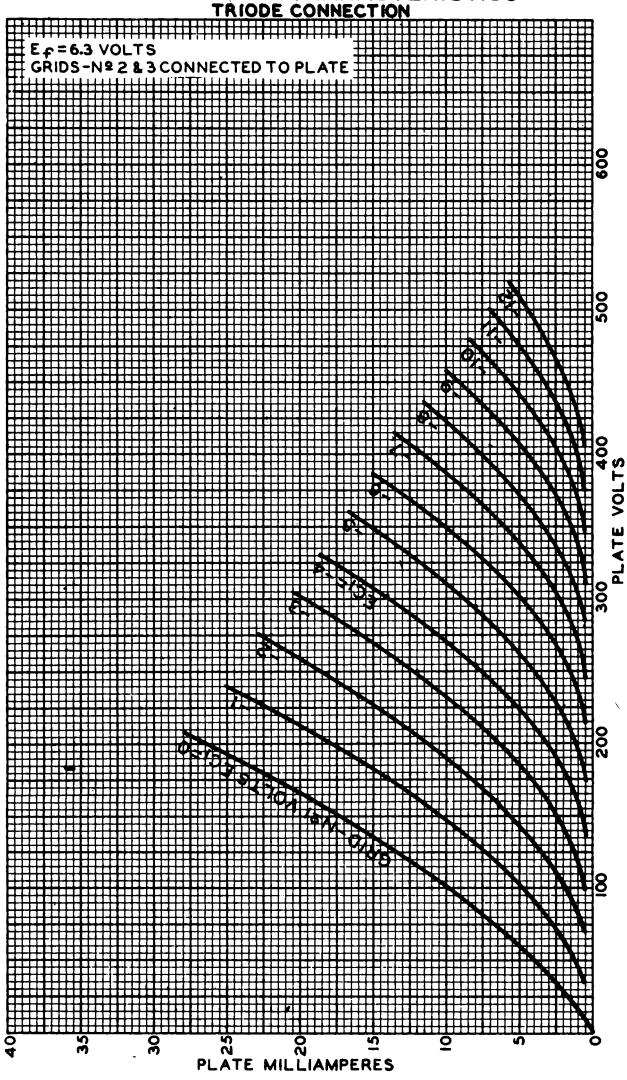


6BH6

6BH6

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION



DEC.10,1947

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6896

6BH8
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	0.6	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.):°

Triode Unit:		
Grid to plate	2.4	μμf
Grid to cathode and heater	2.6	μμf
Plate to cathode and heater	0.38	μμf
Pentode Unit:		
Grid No.1 to plate	0.046	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	7	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.4	μμf
Triode grid to pentode plate	0.016	μμf
Pentode grid No.1 to triode plate	0.004	μμf
Pentode plate to triode plate	0.095	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Plate Voltage	150	200	volts
Grid-No.2 Voltage	–	125	volts
Grid-No.1 Voltage	-5	–	volts
Cathode Resistor	–	82	ohms
Amplification Factor	17	–	
Plate Resistance (Approx.)	5150	150000	ohms
Transconductance	3300	7000	μmhos
Plate Current	9.5	15	ma
Grid-No.2 Current	–	3.4	ma
Grid-No.1 Voltage (Approx.) for plate current of 100 μamp	-14	-8	volts

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"

° Without external shield.

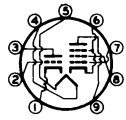
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BH8

MEDIUM-MU TRIODE–SHARP-CUTOFF PENTODE

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
Base . . . . . Small-Button Noval 9-Pin (JETEC 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_1

Maximum Ratings, *Design-Center Values:*

	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE.	300 max.	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*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive bias value . . .	0 max.	0 max.	volts
PLATE DISSIPATION.	2.5 max.	3 max.	watts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts.	-	1 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.	200 max.	volts
Heater positive with respect to cathode . . .	200▲max.	200▲max.	volts

▲ The dc component must not exceed 100 volts

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BH8

MEDIUM-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.	1.0 max.	1.0 max.	megohm

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.

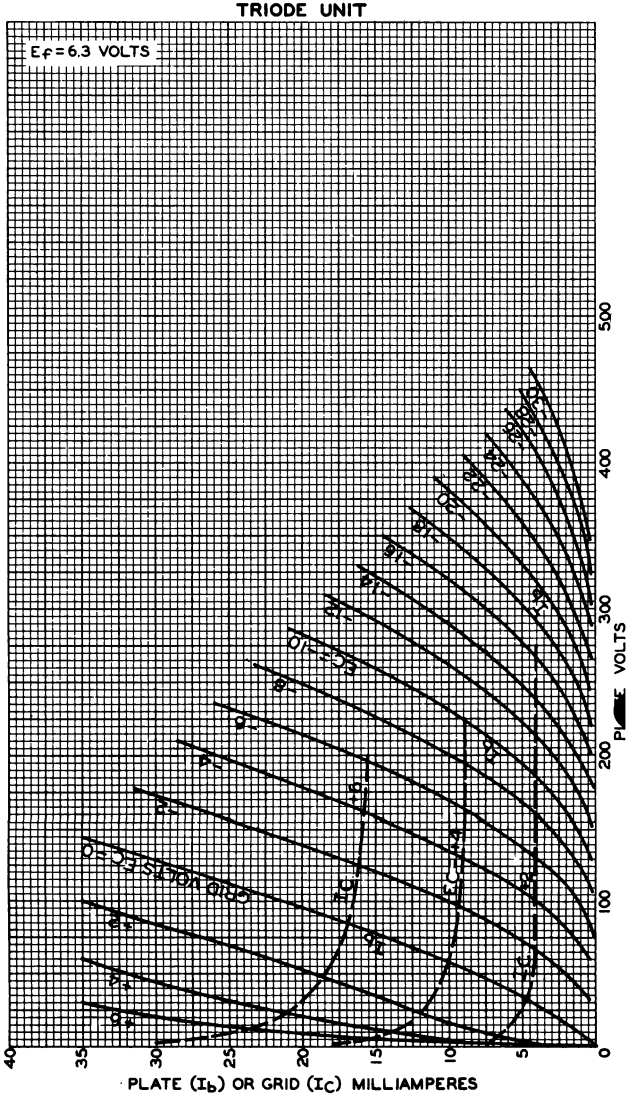
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BH8

6BH8

AVERAGE CHARACTERISTICS

TRIODE UNIT



TUBE DIVISION

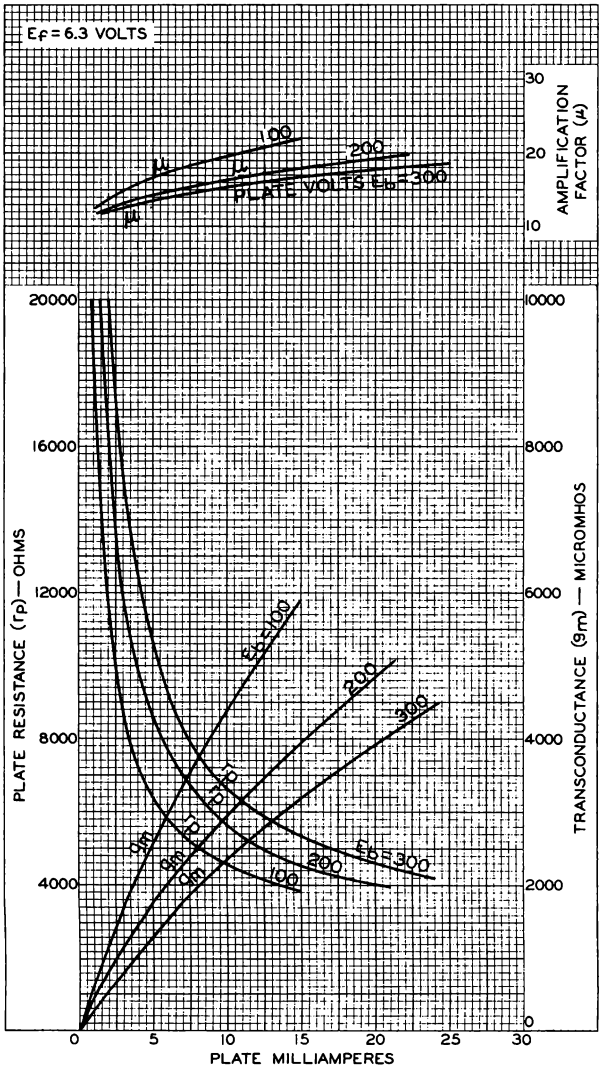
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8799

6BH8

AVERAGE CHARACTERISTICS

TRIODE UNIT

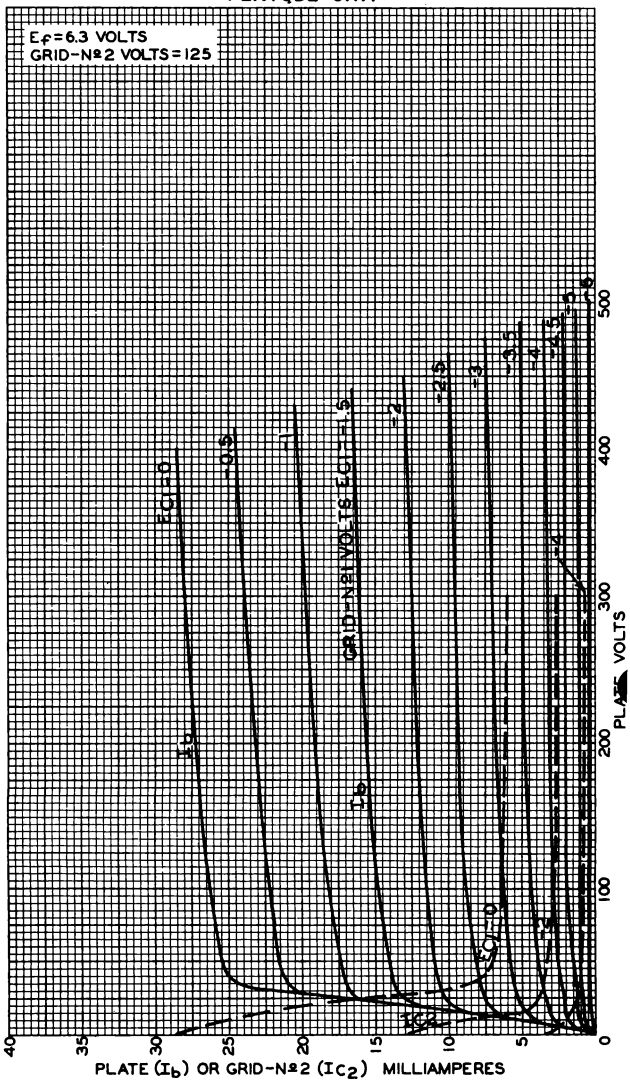


6BH8

6BH8

AVERAGE CHARACTERISTICS

PENTODE UNIT



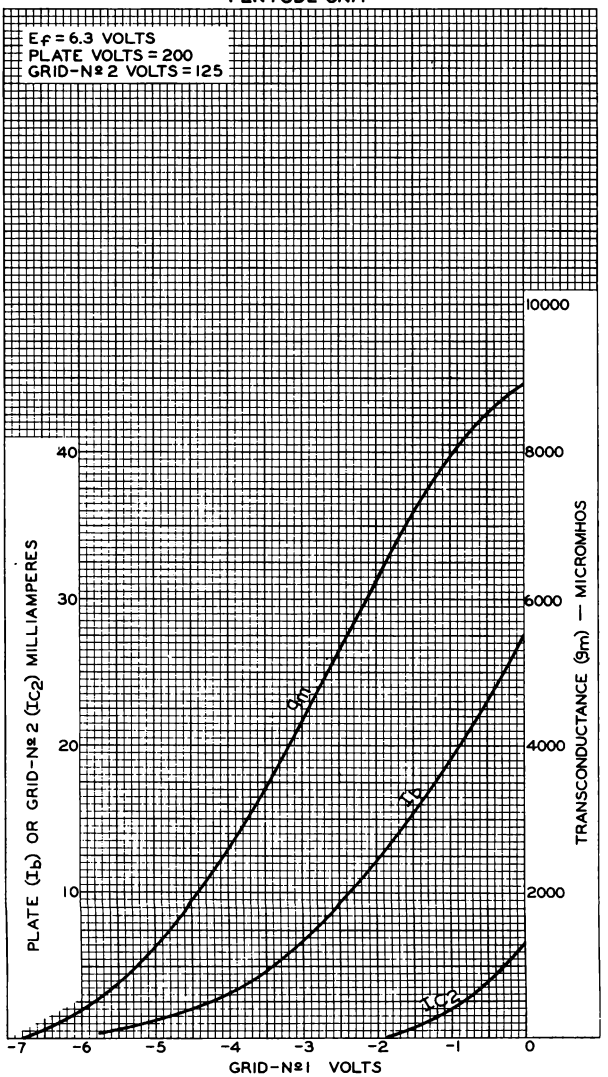
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8797

6BH8

AVERAGE CHARACTERISTICS

PENTODE UNIT



6BJ6
REMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.15	amp

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield°*	
Grid No.1 to plate	0.0035 max.	0.0035 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	4.5	4.5	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	5.5	5.5	μμf

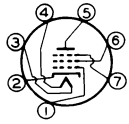
Characteristics, Class A_1 Amplifier:

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	-1	-1	volt
Plate Resistance (Approx.)	0.25	1.3	megohm
Transconductance	3650	3600	μmhos
Plate Current	9	9.2	ma
Grid-No.2 Current	3.5	3.3	ma
Grid-No.1 Voltage (Approx.) for transconductance of 10 μmhos	-20	-20	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" ± 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	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

° With external shield JETEC No.316 connected to cathode.

← Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BJ6

6BJ6

REMOTE-CUTOFF PENTODE

AMPLIFIER - Class A1

Maximum Ratings, *Design-Center Values:*

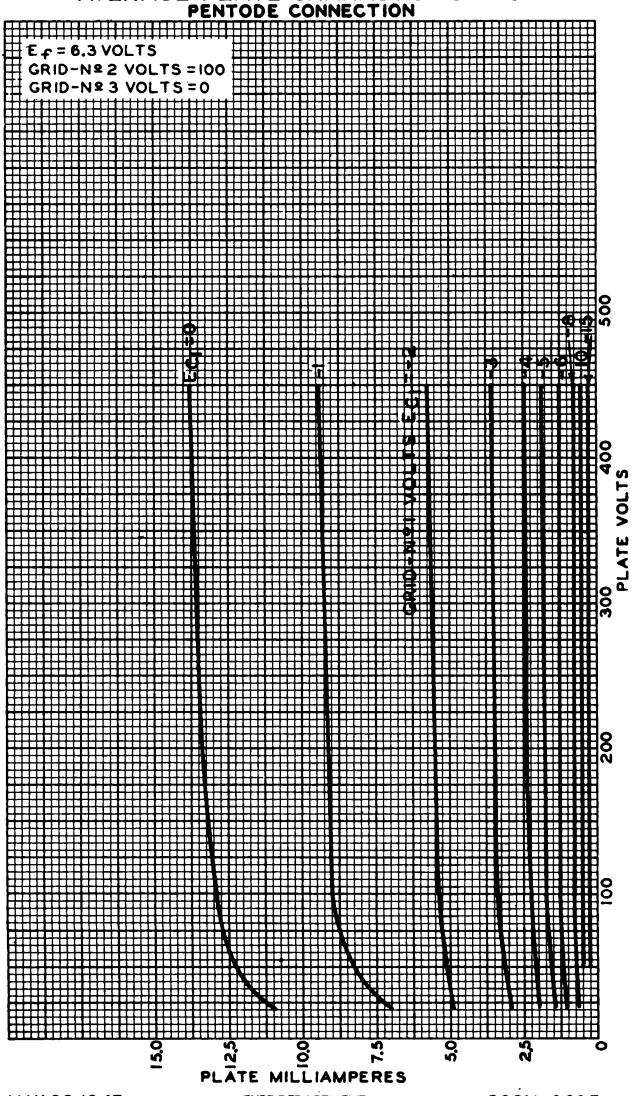
PLATE VOLTAGE	300 max.	volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE	300 max.	volts
→ GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative bias value	50 max.	volts
Positive bias value	0 max.	volts
PLATE DISSIPATION	3 max.	watts
→ 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*	
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.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BJ6

AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



MAY 29, 1947

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

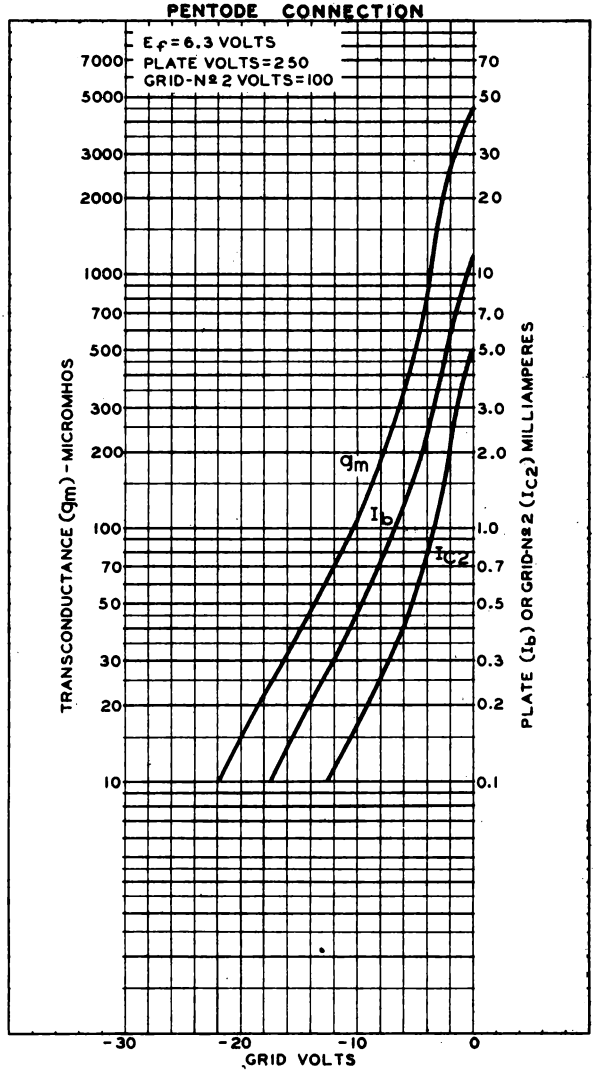
92CM-6867

6BJ6

6BJ6

AVERAGE CHARACTERISTICS

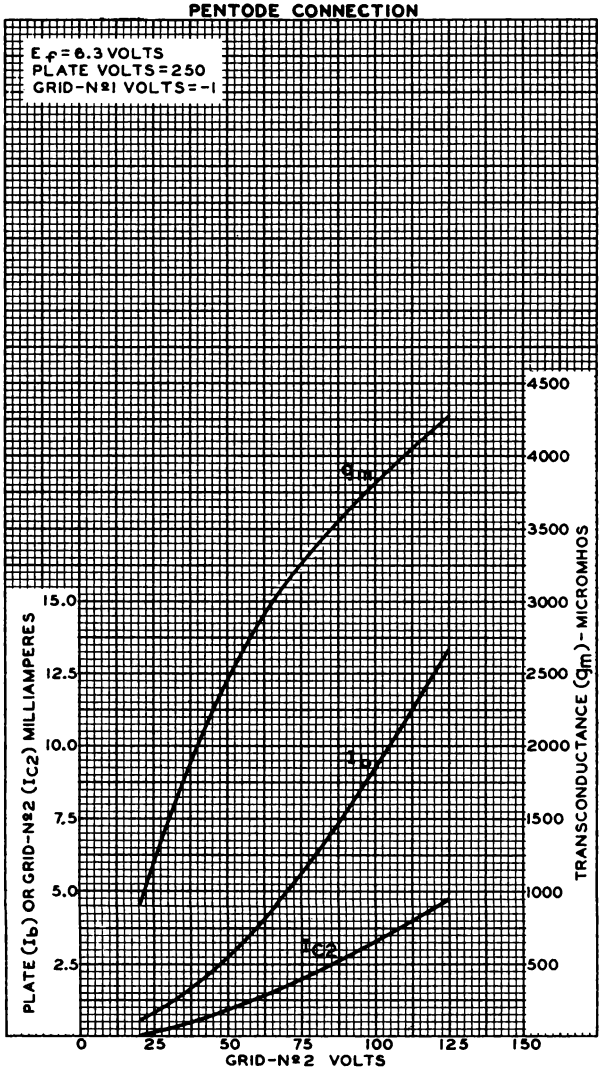
PENTODE CONNECTION



6BJ6

AVERAGE CHARACTERISTICS

PENTODE CONNECTION



6BK4

SHARP-CUTOFF BEAM TRIODE

HIGH-VOLTAGE, LOW-CURRENT, REGULATOR TYPE

GENERAL DATA

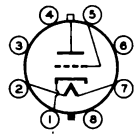
Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.2	amp
Direct Interelectrode Capacitances:		
Grid to plate	0.03	μμf
Grid to cathode and heater	2.6	μμf
Plate to cathode and heater	1	μμf
Amplification Factor (Approx.)	2000	

Mechanical:

Mounting Position	Any
Maximum Overall Length	5-7/32"
Seated Length	4-1/2" ± 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■	-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

■ For interval of 20 seconds maximum duration during equipment warm-up period.

6BK4

6BK4

SHARP-CUTOFF BEAM TRIODE

Voltage Divider Values:		
R_1 (5 watts)	220	megohms
R_2 (2 watts)	1	megohm
R_3 (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

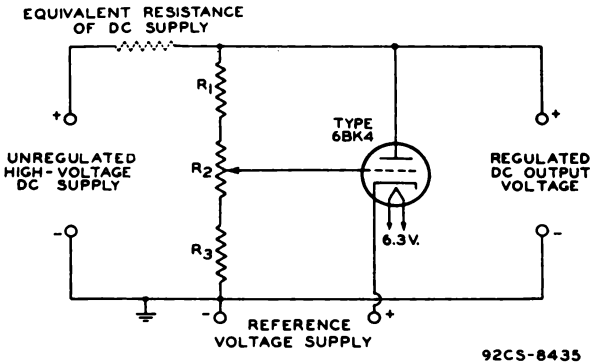
Operation of the 6BK4 with a plate voltage above approximately 16000 volts (absolute value) results in the production of X-rays which can constitute a health hazard on prolonged exposure at close range unless the tube is adequately shielded. Relatively simple shielding should prove adequate, but the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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BK4

SHARP-CUTOFF BEAM TRIODE

SHUNT VOLTAGE-REGULATOR CIRCUIT



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.

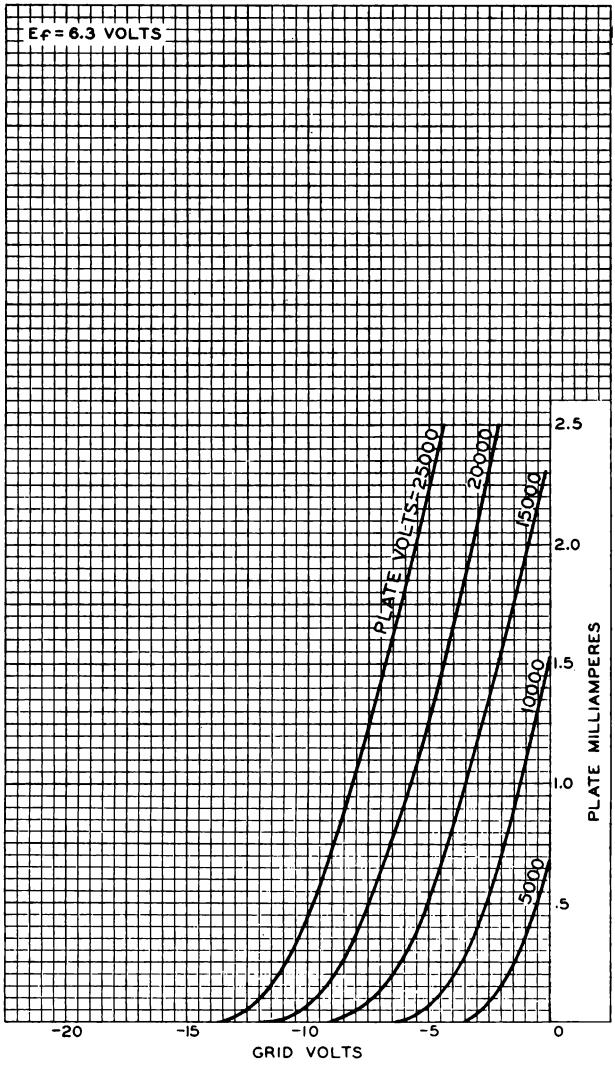
Devices and arrangements shown or described herein may use patents of RCA or others. Information contained herein is furnished without responsibility by RCA for its use and without prejudice to RCA's patent rights.

TUBE DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

6BK4

6BK4

AVERAGE TRANSFER CHARACTERISTICS



OCT. 18, 1954

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8432R1

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:°		
Grid No.1 to plate	0.6	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	13	μμf
Plate to cathode & grid No.3, grid No.2, and heater	5	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Maximum Diameter	7/8"
Bulb	T-6-1/2
Base	Small-Button Noval 9-Pin (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_1

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

° Without external shield.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BK5

6BK5
BEAM POWER TUBE

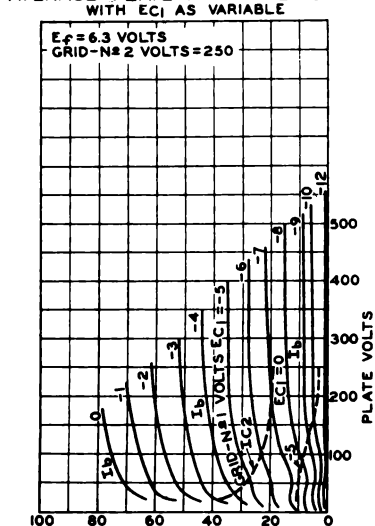
Max.-Signal Grid-No.2 Current (Approx.) . .	10	ma
Plate Resistance (Approx.)	0.1	megohm
Transconductance	8500	μmhos
Load Resistance.	6500	ohms
Total Harmonic Distortion (Approx.). . . .	7	%
Power Output	3.5	watts

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



92CS-8611T

MAY 1, 1955 TENTATIVE DATA

6BL4
HALF-WAVE VACUUM RECTIFIER

For Television Damper Service

GENERAL DATA

Electrical:

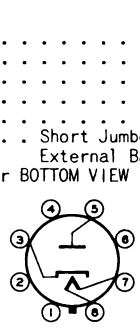
Heater, for Unipotential Cathode:
- Voltage. . . . . 6.3 . . . . . ac or dc volts
- Current. . . . . 3.0 . . . . . .amp

Direct Interelectrode Capacitances (Approx.):°
- Plate to heater and cathode. . . . . 11.5 μμf
- Cathode to heater and plate. . . . . 16 μμf
- Heater to cathode. . . . . 5 μμf

Mechanical:

Mounting Position. . . . . Any
Maximum Overall Length . . . . . 4-5/8"
Maximum Seated Length. . . . . 4-1/16"
Maximum Diameter . . . . . 1-23/32"
Bulb T-12
Base . . . . . Short Jumbo-Shell Octal 8-Pin with External Barriers (JETEC No.B8-71)
Basing Designation for BOTTOM VIEW 8GB

Pin 1 - Internal Connection-Do Not Use
Pin 2 - Same As Pin 1
Pin 3 - Cathode



Pin 4 - Same as Pin 1
Pin 5 - Plate
Pin 6 - Same as Pin 1
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□

PEAK INVERSE PLATE VOLTAGE (Absolute value)#	4500●	max.	volts
PEAK PLATE CURRENT	1200	max.	ma
DC PLATE CURRENT	200	max.	ma
PLATE DISSIPATION	8	max.	ma
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode (Absolute value)	4500●▲	max.	volts
Heater positive with respect to cathode	300■	max.	volts

° Without external shield.

□ 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.

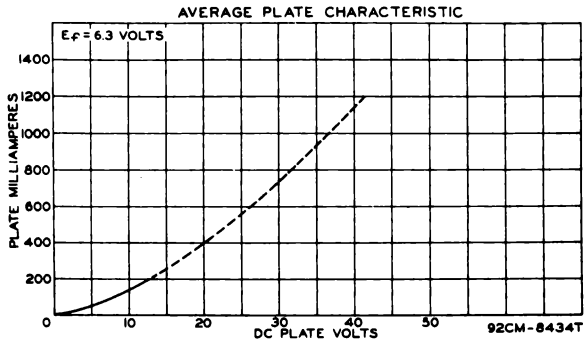
▲ The dc component must not exceed 900 volts.

■ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BL4

HALF-WAVE VACUUM RECTIFIER



6BK7-A

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 (Without external shield):

	Unit No.1	*Unit No.2*	
Grid to plate	1.8	1.8	μμf
Grid to cathode, heater, and internal shield	3	3	μμf
Plate to cathode	0.22	0.22	μμf
Plate to cathode, heater, and internal shield	1	0.9	μμf
Plate to grid, heater, and internal shield	2.4	2.4	μμf
Cathode to grid, heater, and internal shield	6	6	μμf
Cathode to heater	2.8	3	μμf
Grid of unit No.1 to grid of unit No.2	0.004 max.		μμf
Plate of unit No.1 to plate of unit No.2	0.075 max.		μμf

Characteristics, Class A_1 Amplifier (Each Unit):

Plate Supply Voltage	150	volts
Cathode-Bias Resistor	56	ohms
Amplification Factor	43	
Plate Resistance (Approx.)	4600	ohms
Transconductance	9300	μmhos
Plate Current	18	ma
Grid Volts (Approx.) for plate current of 10 μamp	-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

6BK7-A

MEDIUM-MU TWIN TRIODE

AMPLIFIER - Class A_1

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

● In cathode-drive circuits with direct-coupled drive, it is permissible for this voltage to be as high as 250 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BL7-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:	*Without External Shield*	*With External Shield No.308 Tied to Cathode*	
Unit No.1:			
Grid to Plate	4.2	4.2	μμf
Input	4.4	5.0	μμf
Output	1.1	3.4	μμf
Unit No.2:			
Grid to Plate	4.0	4.0	μμf
Input	4.8	5.0	μμf
Output	1.2	3.2	μμf
Grid of Unit No.1 to Grid of Unit No.2	0.11	0.10	μμf
Plate of Unit No.1 to Plate of Unit No.2	1.5	1.2	μμf

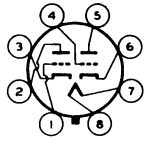
Characteristics, Amplifier Class A_1 (Each Unit):

Plate Voltage	250	volts
Grid Voltage	-9	volts
Plate Current	40	ma
Amplification Factor	15	
Plate Resistance	2150	ohms
Transconductance	6200	μmhos ←
Grid-No.1 Bias (Approx.) for plate current of 25 μamp	-25	volts
Grid-No.1 Bias (Approx.) for plate voltage of 600 volts and plate current of 50 μamp.	-60	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 (JETEC No.B8-46)	
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

← Indicates a change

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BL7-GT

6BL7-GT

MEDIUM-MU TWIN TRIODE

VERTICAL DEFLECTION AMPLIFIER

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

*For operation in a 525-line, 30-frame system**

DC PLATE SUPPLY VOLTAGE	600 max.	volts
DC PLATE VOLTAGE	500 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE°	1800 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	500 max.	volts
DC CATHODE CURRENT	60 max.	ma
PLATE DISSIPATION	10 max.	watts
Total for Both Units	12 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 in a Vertical Deflection Circuit:

DC Plate Voltage	450	volts
Cathode-Bias Resistor	1200	ohms
Grid-Input Voltage, Approx. (See Fig.1):		
Peak-to-peak sawtooth component	36	volts
Negative peaking component	44	volts
DC Plate Current	11	ma
Plate-Output Voltage, Approx. (See Fig.2):		
Peak-to-peak sawtooth component	270	volts
Peak positive pulse component	600	volts

Maximum Circuit Values:

Grid-Circuit Resistance	4.7 max.	megohms

* 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.

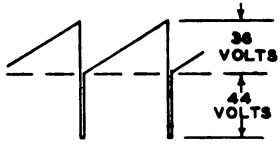


Fig.1 - Waveform at Grid of 6BL7-GT

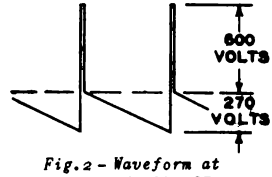
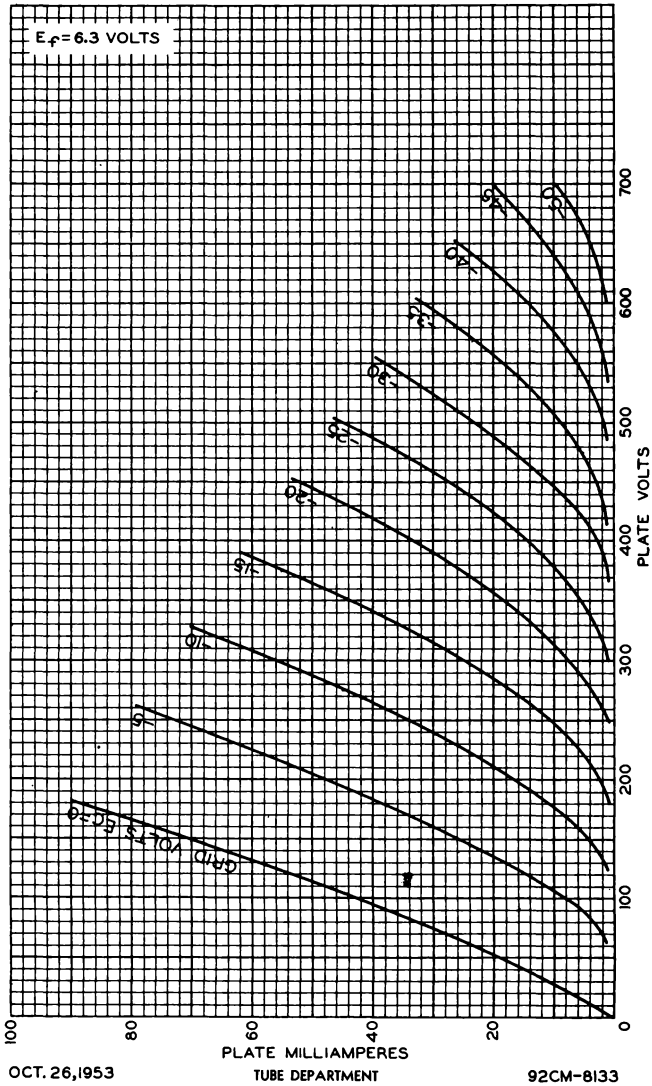


Fig.2 - Waveform at Plate of 6BL7-GT

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BL7-GT

AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT



OCT. 26,1953

92CM-8133

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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:°		
Grid No.1 to cathode & internal shields, plate, grid No.3, grid No.2, and heater	4.2	μμf
Grid No.3 to cathode & internal shields, plate, grid No.2, grid No.1, and heater	3.3	μμf
Grid No.1 to grid No.3	0.004 max.	μμf

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"
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

° Without external shield.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BQ6-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.; No external shield): ←

Grid No.1 to plate	0.6	μμf
Grid No.1 to cathode & grid No.3, heater, and grid No.2	15	μμf
Plate to cathode & grid No.3, heater, and grid No.2	7.5	μμf

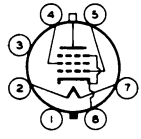
Characteristics, Class A_1 Amplifier:

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	-	-	20000	ohms
Transconductance	-	-	5500	μmhos
Plate Current	225	-	55	ma
Grid-No.2 Current	25	-	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" ± 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.B6-81),
Short Intermediate-Shell Octal 7-Pin (JETEC No.B7-59),
or Short Intermediate-Shell Octal 6-Pin (JETEC No.B6-84)
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

* Applied for very short interval so as not to damage tube.

♦ On the 6-pin bases, pin No.1 as well as pin No.6 is omitted.

← Indicates a change

6BQ6-GT

BEAM POWER TUBE

HORIZONTAL DEFLECTION AMPLIFIER

→ **Maximum Ratings,** *Design-Center Values Except as Noted:*

For operation in a 525-line, 30-frame system●

DC PLATE SUPPLY VOLTAGE (Including Boost Voltage)	550 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE*	5500♦ max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE*	1250 max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE	175 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE*	300 max.	volts
CATHODE CURRENT:		
Peak	400 max.	ma
DC	110 max.	ma
GRID-No.2 INPUT	2.5 max.	watts
PLATE DISSIPATION#	11 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

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	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.

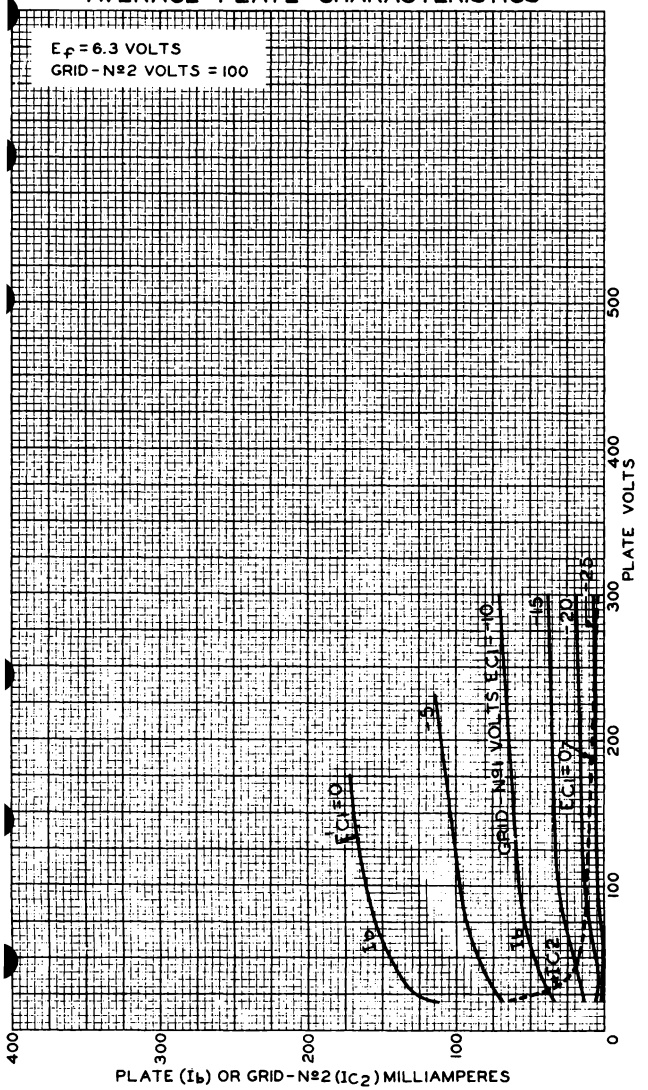
\# It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value should be employed.

▲ The dc component must not exceed 100 volts.

→ indicates a change

6BQ6-GT

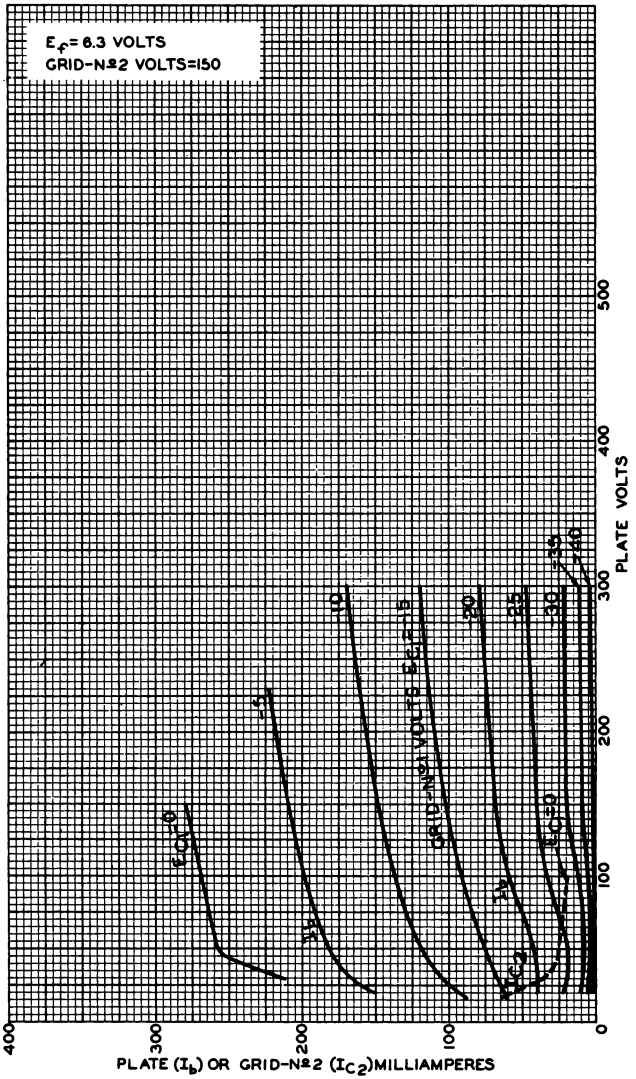
AVERAGE PLATE CHARACTERISTICS



6BQ6-GT

6BQ6-GT

AVERAGE PLATE CHARACTERISTICS



MAR. 7, 1950 TUBE DEPARTMENT 92CM-7460

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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.):°

Grid No.1 to plate	0.6	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	15	μμf
Plate to cathode & grid No.3, grid No.2, and heater	7.5	μμf

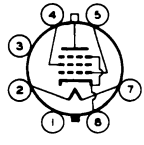
Characteristics, Class A_1 Amplifier:

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	μmhos
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" ± 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.B6-81), 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♦ - 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

° 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.

♦ On the 6-pin bases, pin 1 as well as pin 6 is omitted.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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□

DC PLATE VOLTAGE	600	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)⊕	6000■	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†	11	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

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:			
For grid resistor-bias operation†	1.0	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.

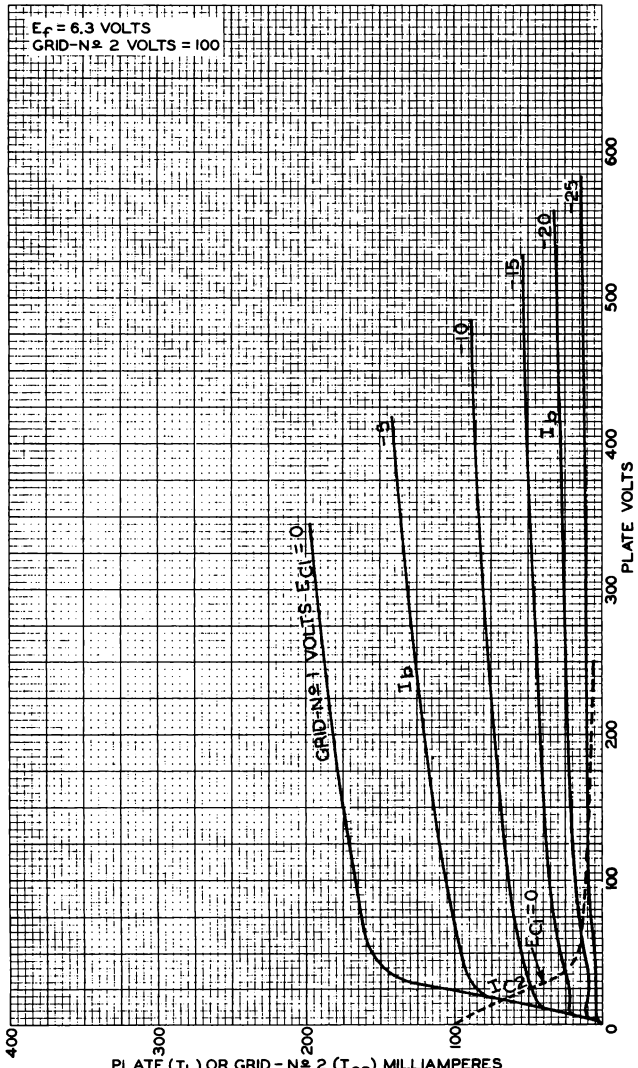
† It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value should be employed.

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BQ6-GTB

AVERAGE PLATE CHARACTERISTICS

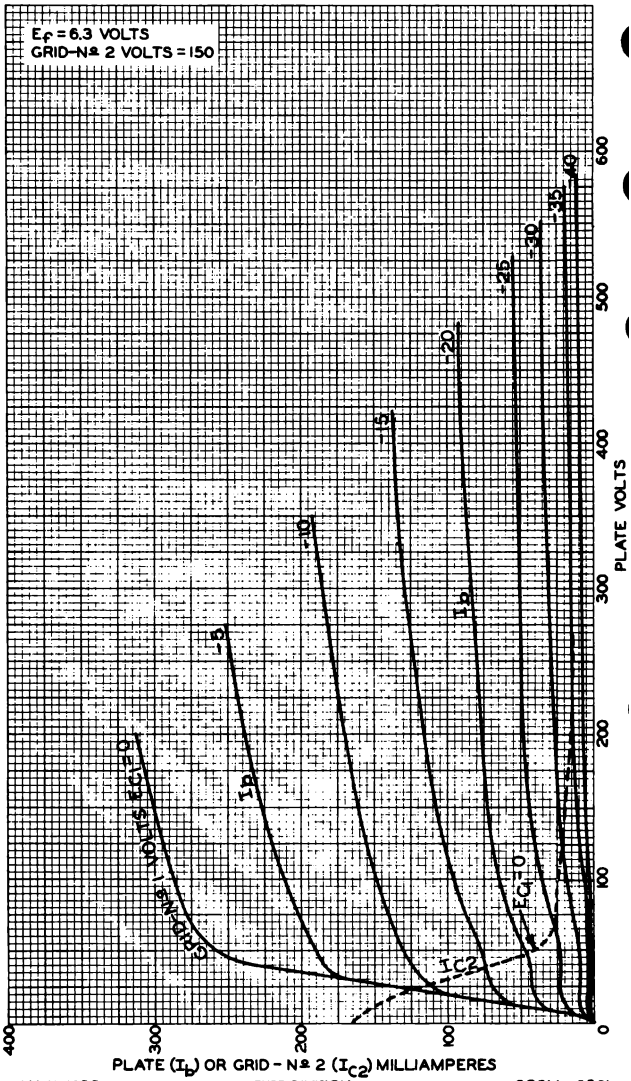


JAN. 11, 1955 TUBE DIVISION 92CM-8500

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BQ6-GTB

AVERAGE PLATE CHARACTERISTICS



JAN. 11, 1955

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8501

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.315):

	Unit No.1	*Unit No.2*	
Grid to Plate	1.15	1.15	μμf
Input	2.85	–	μμf
Input *(Grounded Grid)*	–	4.95	μμf
Output	1.35	–	μμf
Output *(Grounded Grid)*	–	2.27	μμf
Plate to Cathode	0.15 max.	0.15 max.	μμf
Heater to Cathode	2.65	2.70	μμf
Plate of Unit No.1 to Plate of Unit No.2	0.010 max.		μμf
Plate of Unit No.2 to Plate & Grid of Unit No.1	0.024 max.		μμf

Characteristics, Amplifier Class A:

Plate Voltage	150	volts
Cathode-Bias Resistor	220	ohms
Amplification Factor	39	
Plate Resistance	6100	ohms
Transconductance	6400	μmhos
Plate Current	9	ma
Grid Volts (Approx.) for plate current of 10 μamp	-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 (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW	9AJ

Pin 1 - Plate of Triode No.2

Pin 2 - Grid of Triode No.2

Pin 3 - Cathode of Triode No.2

Pin 4 - Heater

Pin 5 - Heater

Pin 6 - Plate of Triode No.1

Pin 7 - Grid of Triode No.1

Pin 8 - Cathode of Triode No.1

Pin 9 - Internal Shield

6BQ7-A

MEDIUM-MU TWIN TRIODE

AMPLIFIER - Class A

Values are for Each Unit

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	250▲	max.	volts
PLATE DISSIPATION	2	max.	watts
CATHODE CURRENT	20	max.	ma
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200▲	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 μamp	-14	-	volt
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.

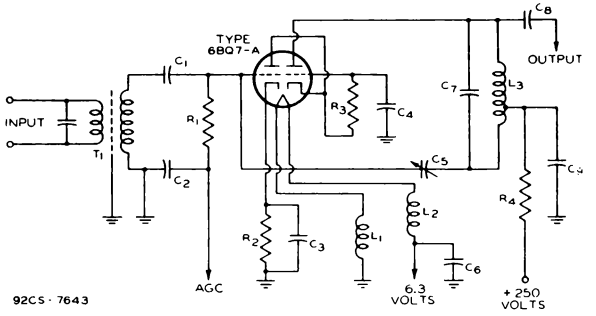
▲ Under cutoff conditions in rf-grounded-grid circuit with direct-coupled drive, it is permissible for this voltage to be as high as 300 volts.

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BQ7-A

MEDIUM-MU TWIN TRIODE

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



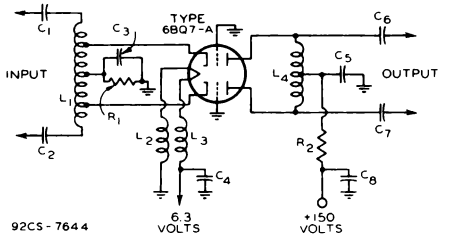
C1: 33 μμf, 400 volts
C2: 1000 μμf, 400 volts
C3: 1000 μμf, 400 volts
C4: 1000 μμf, 400 volts
C5: 0.5 to 1.5 μμf, 400 volts
C6: 1000 μμf, 400 volts
C7: 2 μμf, 400 volts
C8: 33 μμf, 400 volts
C9: 1000 μμf, 400 volts
R1: 10000 ohms, 0.5 watt
R2: 100 ohms, 0.5 watt
R3: 50000 ohms, 0.5 watt
R4: 100 ohms, 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



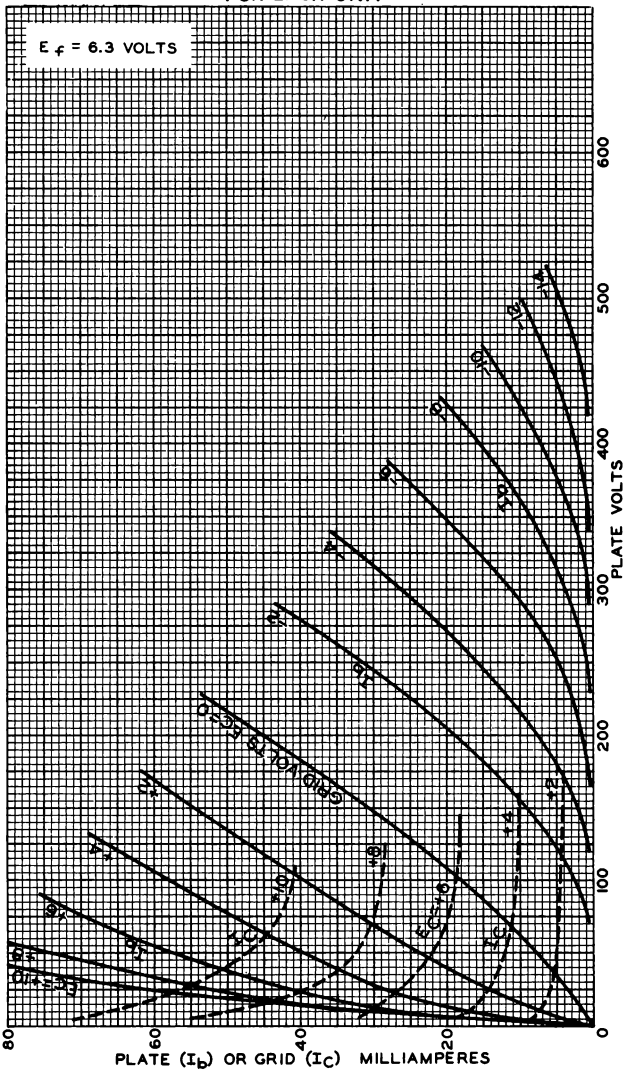
C1 C2 C3 C4 C5: 1000 μμf, 400 volts
C6 C7: 100 μμf, 400 volts
C8: 1000 μμf, 400 volts
R1 R2: 100 ohms, 0.5 watt

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.

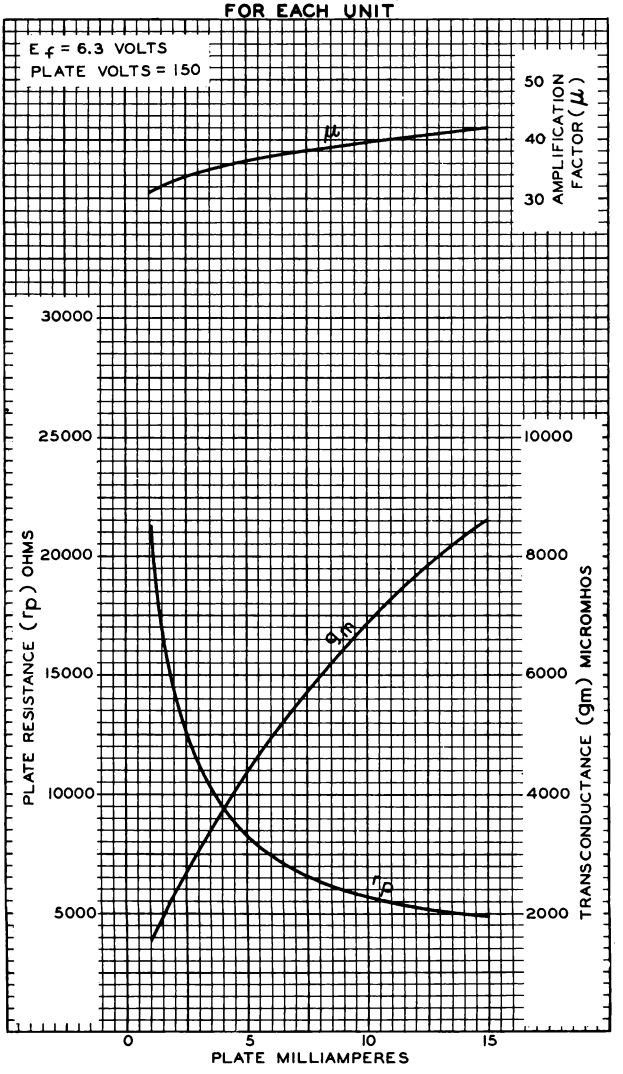
6BQ7-A

AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT



6BQ7-A

AVERAGE CHARACTERISTICS
FOR EACH UNIT



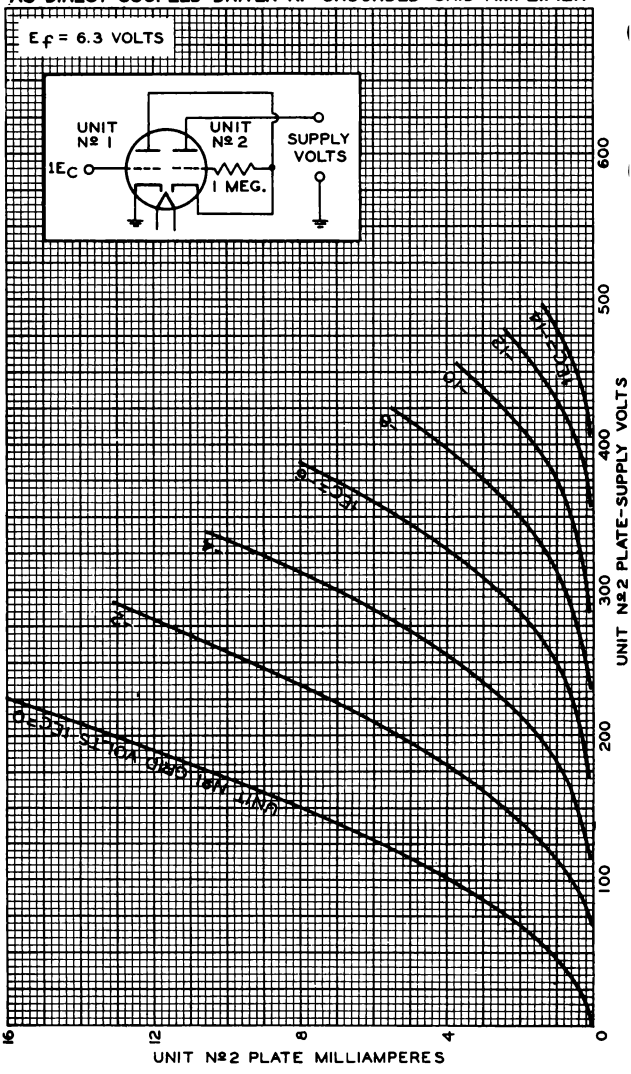
AUG. 27, 1952

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7538R1

6BQ7-A

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



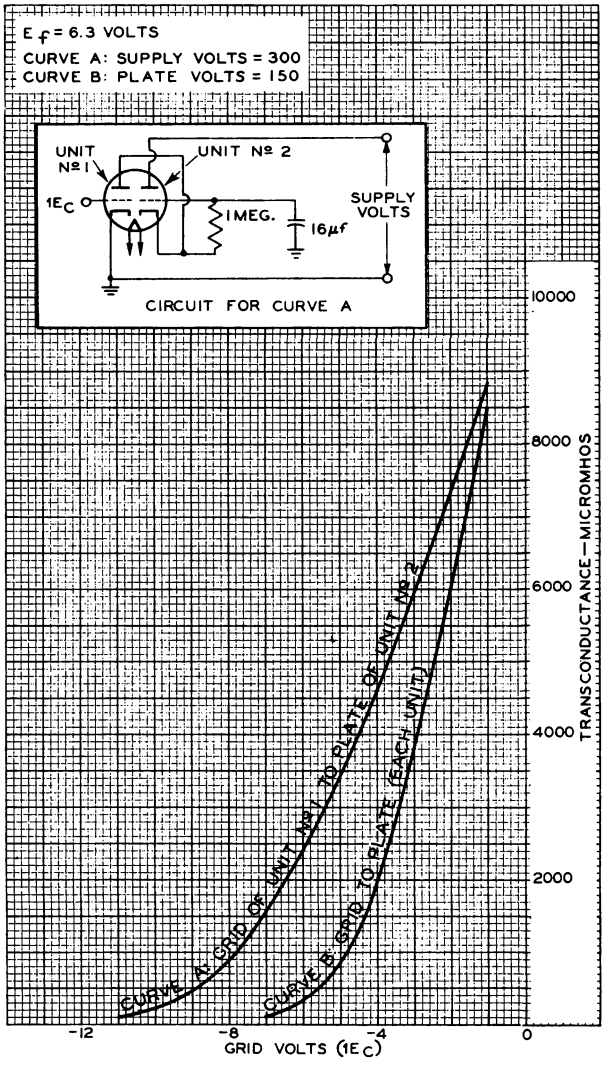
OCT. 3, 1950

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7549R1

6BQ7-A

AVERAGE CHARACTERISTICS



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°*	
Triode Unit:			
Grid to plate	1.8	1.8	μμf
Grid to cathode and heater	2.5	2.5	μμf
Plate to cathode and heater	0.4	1	μμf
Pentode Unit:			
Grid No.1 to plate	0.015 max.	0.008 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	5	5	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.6	3.5	μμf
Heater to cathode (Each unit)	3	3•	μμf

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	μmhos
Plate Current	18	10	ma
Grid-No.2 Current	–	3.5	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-12	-10	volts

Mechanical:

Operating Position . . . . . Any

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

°,•: See next page.

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

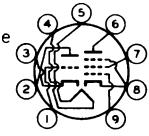
TENTATIVE DATA

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" ± 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▲ max.	200▲ 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.

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

6BY5-GA
FULL-WAVE VACUUM RECTIFIER

For Television Damper Service

GENERAL DATA

Electrical:

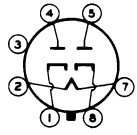
Heater, for Unipotential Cathodes:

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)
Basing 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□

PEAK INVERSE PLATE VOLTAGE (Absolute maximum)#	3000■ 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.

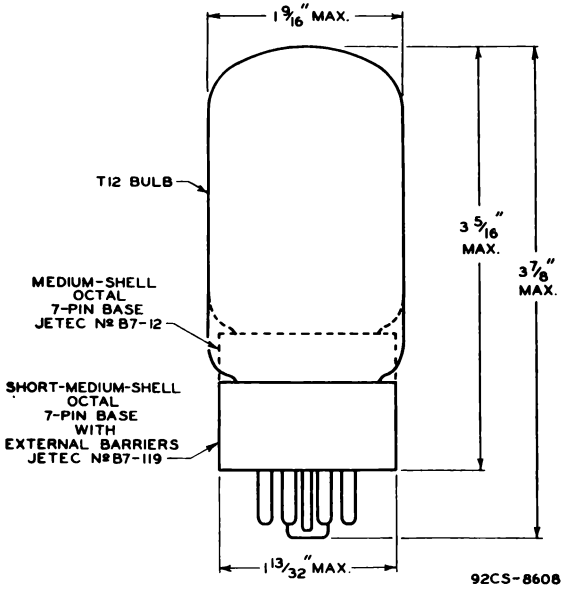
□ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

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

FULL-WAVE VACUUM RECTIFIER



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.	μμf
Grid No.3 to Plate	0.35 max.	μμf
Grid No.1 to Grid No.3	0.15 max.	μμf
Grid No.1 to All Other Electrodes and Heater	5.4	μμf
Grid No.3 to All Other Electrodes and Heater	6.9	μμf
Plate to All Other Electrodes and Heater	7.6	μμf

Characteristics, Class A_1 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	μmhos
Grid-No.1-to-Plate Transconductance	1900	μmhos
Plate Current	6.5	ma
Grids-No.2-and-No.4 Current	9	ma
Grid-No.3 Volts (Approx.) for plate current of 35 μamp and grid-No.1 volts = -4	-15	volts
Grid-No.1 Volts (Approx.) for plate current of 35 μamp 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" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)

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

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# max.	volts

Characteristics as Sync Separator and Sync Clipper:

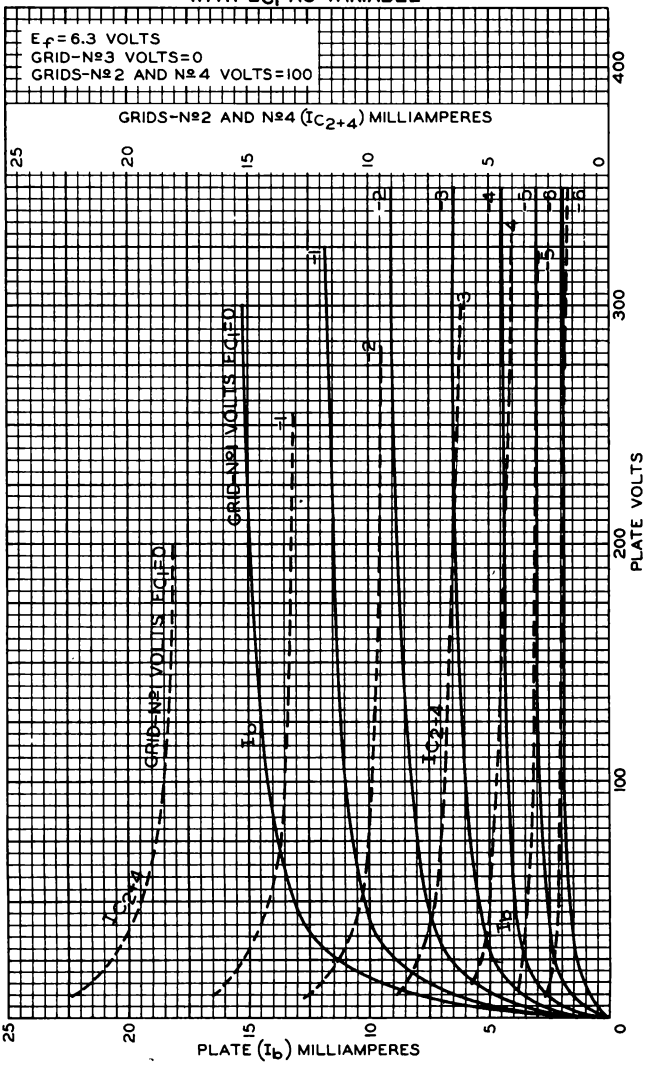
Plate Voltage	10	volts
Grid-No.3 Voltage	0	volts
Grids-No.2-and-No.4 Voltage	25	volts
Grid-No.1 Voltage	0	volts
Plate Current	1.4	ma
Grids-No.2-and-No.4 Current	3.5	ma
Grid-No.3 Bias Volts (Approx.) for plate voltage of 25 volts, grids-No.2-and-No.4 voltage of 25 volts, grid-No.1 voltage of 0 volts,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

The dc component must not exceed 100 volts.

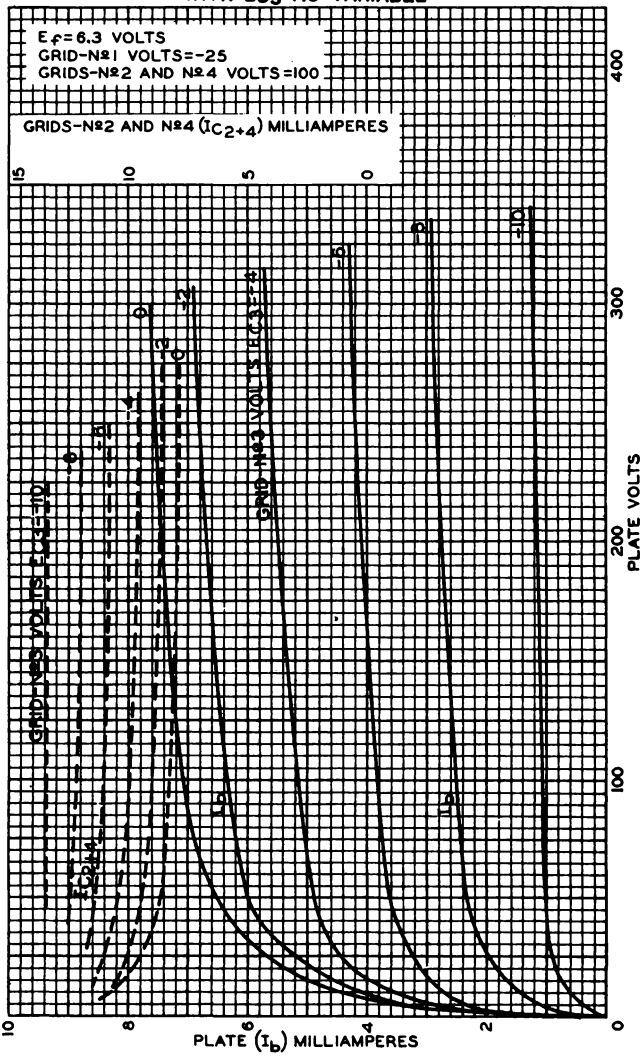
6BY6
AVERAGE OPERATION CHARACTERISTICS
WITH E_{C1} AS VARIABLE



6BY6

6BY6

AVERAGE OPERATION CHARACTERISTICS
WITH E_{C3} AS VARIABLE



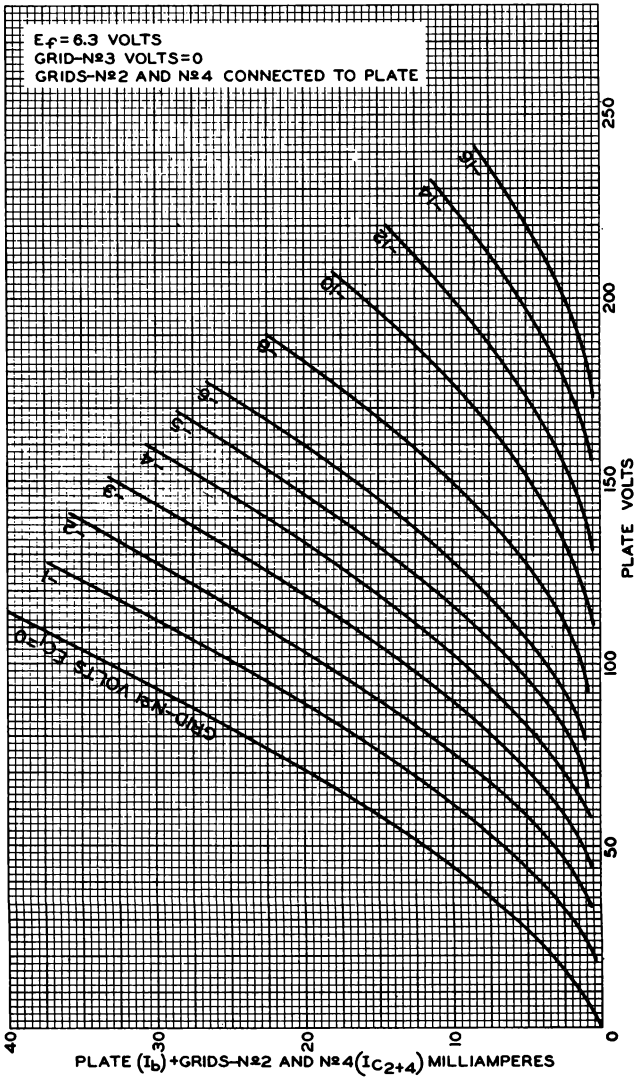
NOV.5,1953

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8139

6BY6

AVERAGE PLATE CHARACTERISTICS



NOV.5,1953 TUBE DEPARTMENT 92CM-8138

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BZ6

SEMIREMOTE-CUTOFF PENTODE

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:

	Without External Shield	*With External Shield*[o]	
Grid No.1 to plate	0.02 max.	0.015 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	7.5	7.5	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	1.8	2.8	μμf

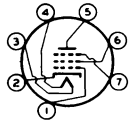
Characteristics, Class A_1 Amplifier:

Plate 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.)	0.6	megohm
Transconductance	6100	μmhos
Plate Current	11	ma
Grid-No.2 Current	2.6	ma
Grid-No.1 Voltage (Approx.) for transconductance of 50 μmhos	-23	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" ± 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

[o] With external shield JETEC No.316 connected to cathode.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BZ6

6BZ6

SEMIREMOTE-CUTOFF PENTODE

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE.	300	max.	volts
GRID-No.3 (SUPPRESSOR) VOLTAGE	0	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*		
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	0.5	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▲	max.	volts

Maximum Circuit Values:

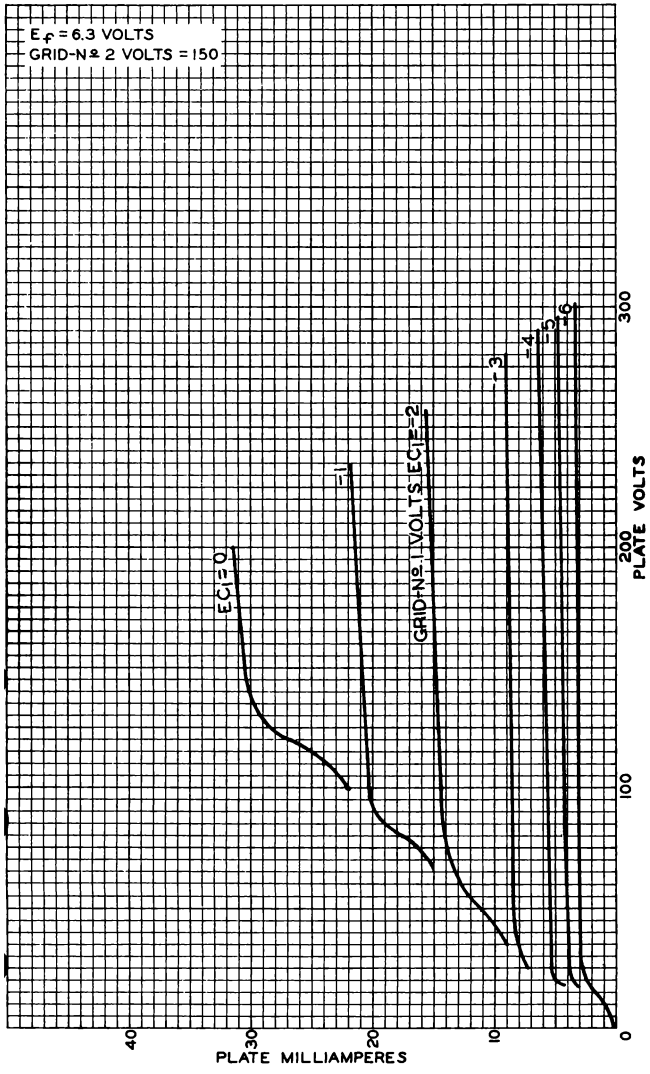
Grid-No.1-Circuit Resistance:			
For fixed-bias operation	0.25	max.	megohm
For cathode-bias operation	1.0	max.	megohm

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BZ6

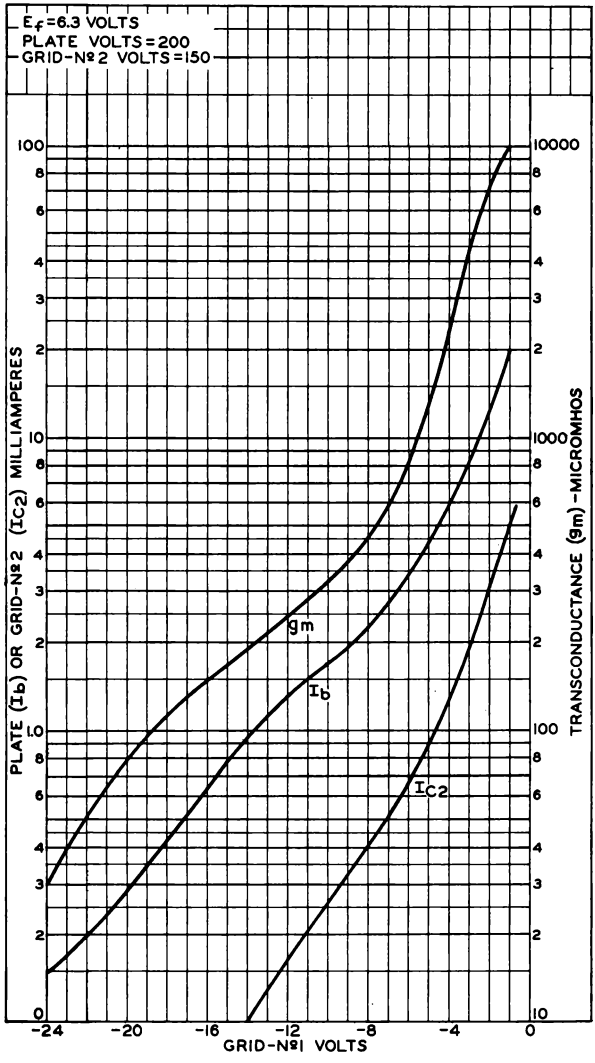
AVERAGE PLATE CHARACTERISTICS



6BZ6

6BZ6

AVERAGE CHARACTERISTICS



JAN. 26, 1955 TUBE DIVISION 92CM-8509

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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	μμf
Grid to cathode, heater, and internal shield	2.5	-	μμf
Plate to cathode	0.15 max.	0.15 max.	μμf
Plate to cathode, heater, and internal shield	1.35	-	μμf
Plate to grid, heater, and internal shield	-	2.27	μμf
Cathode to grid, heater, and internal shield	-	4.95	μμf
Cathode to heater	2.6	2.7	μμf
Plate of unit No.1 to plate of unit No.2	0.010 max.		μμf
Plate of unit No.2 to plate & grid of unit No.1	0.024 max.		μμf

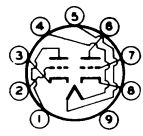
Characteristics, Class A_1 Amplifier (Each Unit):

Plate Supply Voltage	150	volts
Cathode-Bias Resistor	220	ohms
Amplification Factor	38	
Plate Resistance	5600	ohms
Transconductance	6800	μmhos
Plate Current	10	ma
Grid Volts (Approx.) for plate current of 10 μamp	-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

6BZ7

MEDIUM-MU TWIN TRIODE

AMPLIFIER - Class A_1

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

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

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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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

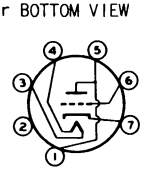
Direct Interelectrode Capacitances:°

Grid to plate	1.6	μμf
Grid to cathode and heater	1.8	μμf
Plate to cathode and heater	1.3	μμf

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_1

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■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	μmhos
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

° With no external shield.

■: See next page. ← Indicates a change.

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■ max.	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

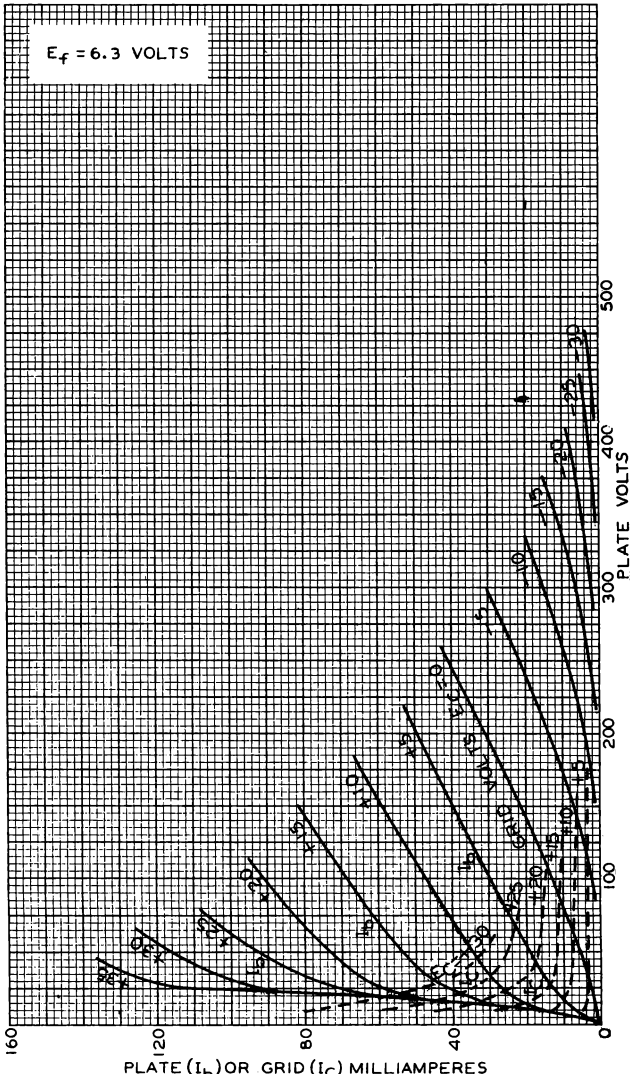
■ The dc component must not exceed 100 volts.

● 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

AVERAGE PLATE CHARACTERISTICS



MARCH 16, 1942

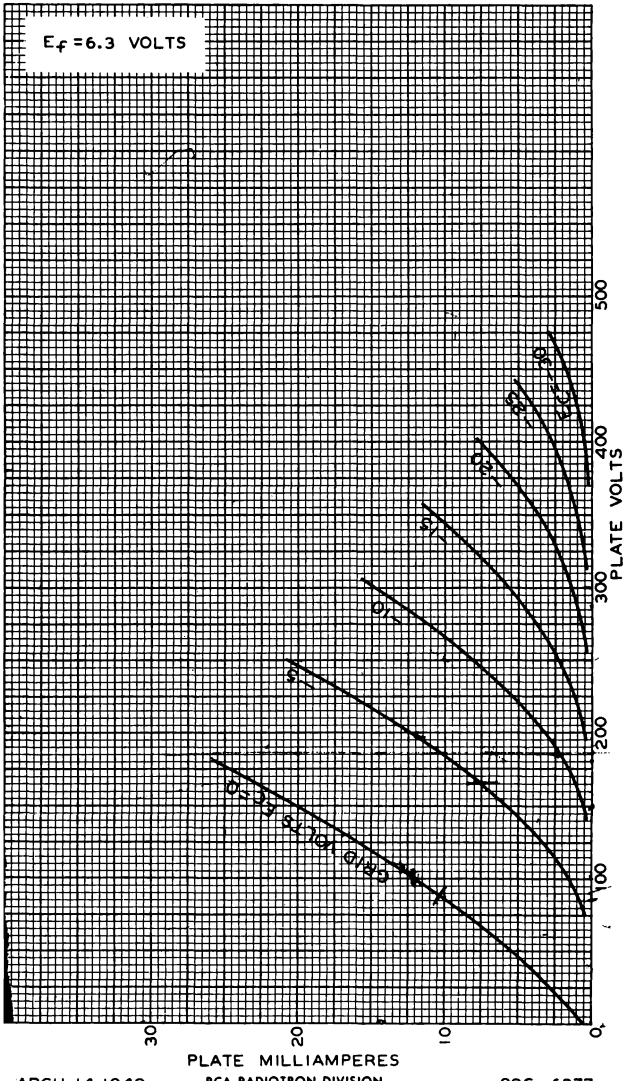
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6378

6C4

6C4

AVERAGE PLATE CHARACTERISTICS



ARCH 14, 1942

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6377

6C5, 6C5-GT/G

DETECTOR AMPLIFIER TRIODE

Heater ■	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	μμf
Grid to Cathode	3.0	4.4	μμf
Plate to Cathode	11	12	μμf
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
Characteristics - Class A_1 Amplifier:		
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

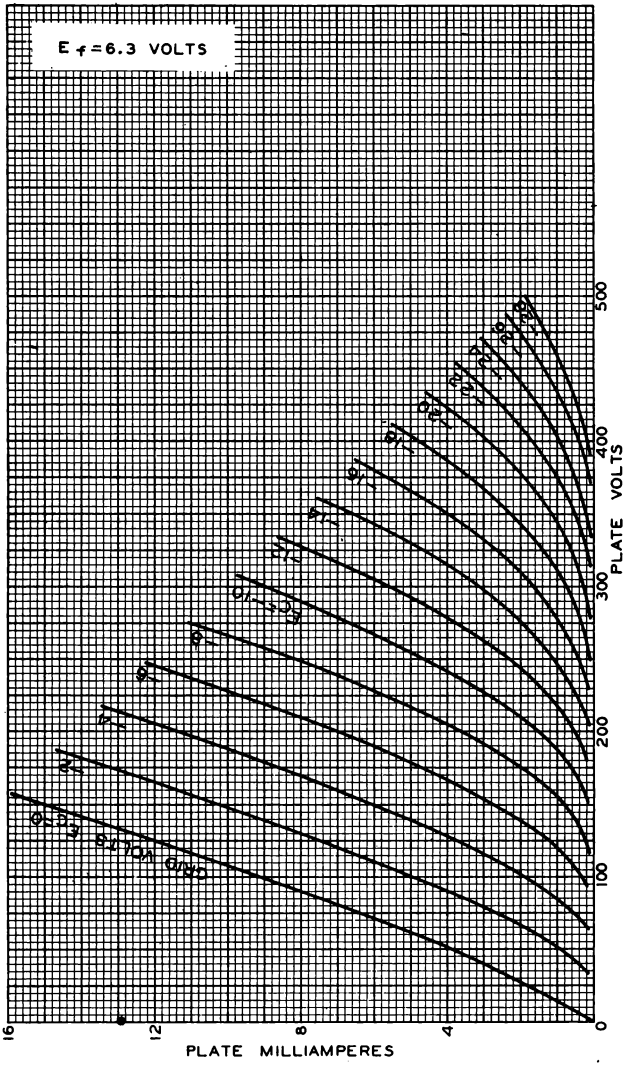
Typical Operation:	*Biased*	*Grid Leak*	
Plate Voltage	250	45 to 100	volts
Grid Voltage	-17 approx.	Return to cathode	volts
Plate Current	Adjusted to 0.2 ma. with no input signal	-	
Grid Leak	-	0.1 to 1.0	megohm
Grid Condenser	-	0.00005 to 0.0005	μf

■ 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



JULY 23, 1935

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

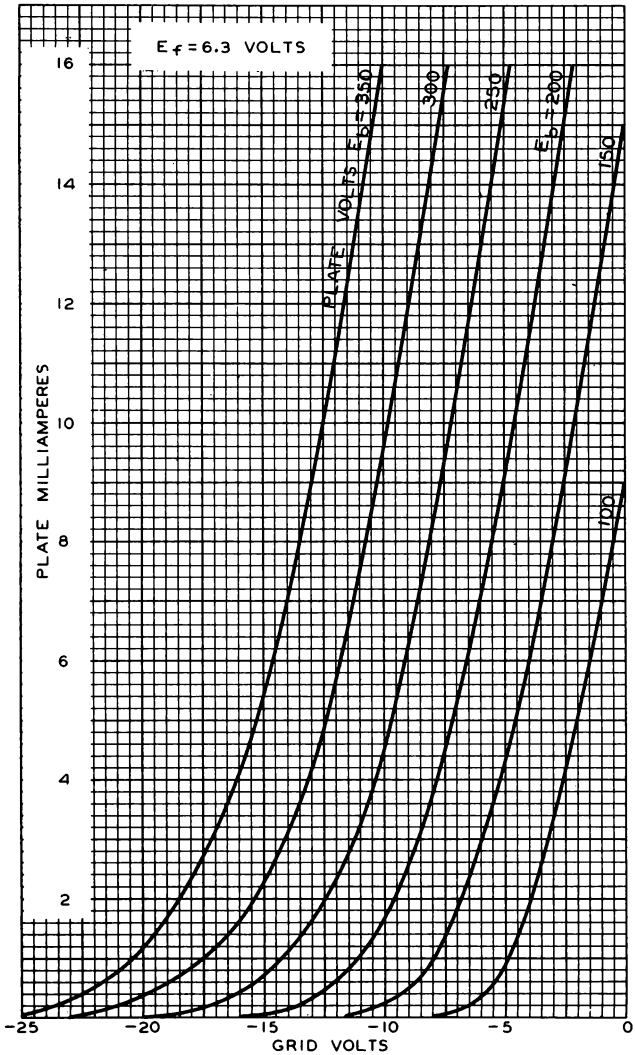
92C-4441

Cunningham Radiotron

RCA-6C5

6C5

AVERAGE CHARACTERISTICS



NOV. 12, 1935

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

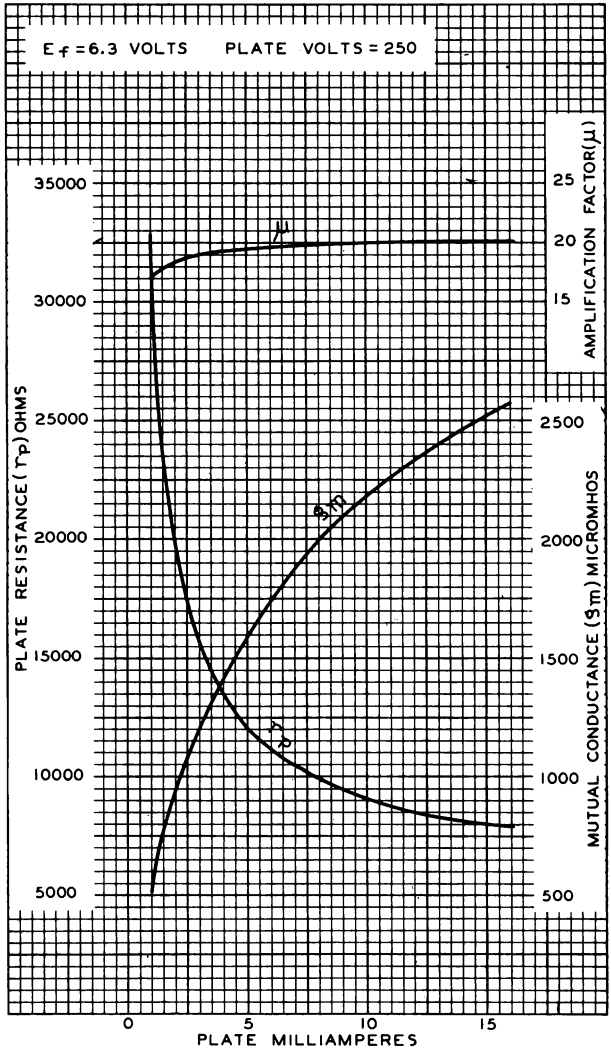
92C-4511

6C5

Cunningham Radiotron

RCA-6C5

AVERAGE CHARACTERISTICS



AUG. 23, 1935

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4462

6C6
SHARP-CUTOFF PENTODE

GENERAL DATA

Electrical:

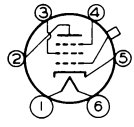
Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances:		
Pentode Connection:		
Grid No.1 to Plate[o]	0.007 max.	μμf
Input[oo]	5	μμf
Output[oo]	6.5	μμf
Triode Connection*[oo]:		
Grid No.1 to Plate	2	μμf
Grid No.1 to Cathode	3	μμf
Plate to Cathode	10.5	μμf

[o] With external shield connected to cathode.
[oo] 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" ± 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.

6C7

DUPLEX-DIODE TRIODE

RENEWAL TYPE FOR MAJESTIC RECEIVERS

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Overall Length		4-9/32" to 4-17/32"
Seated Height		3-21/32" to 3-29/32"
Maximum Diameter (without shield)		1-9/16"
Bulb (with form-fitting shield)		ST-12
Cap		Small Metal
Base ▲		Small 7-Pin

Pin 1 - Heater
Pin 2 - Plate
Pin 3 - External Shield
Pin 4 - Diode Plate #2
Pin 5 - Diode Plate #1
Pin 6 - Cathode
Pin 7 - Heater

BOTTOM VIEW (7G)

TRIODE UNIT

Characteristics:

Plate Voltage	250	volts
Grid Voltage	-9	volts
Amp. Factor	20	
Plate Res.*	16000	ohms
Transcond.	1250	µmhos
Plate Cur.	4.5	ma.

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.

■ 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 a different socket than the medium 7-pin base.

6C8-G

TWIN-TRIODE AMPLIFIER

Heater ■	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	μμf
Grid to Cathode	2.6	1.3	μμf
Plate to Cathode	2.0	2.2	μμf
Grid to Grid	0.1		μμf
Plate to Plate	2.0		μμf
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	μmhos
Plate Cur.	3.2	ma.

Typical Operation - Resistance-Coupled Amplifier:

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.

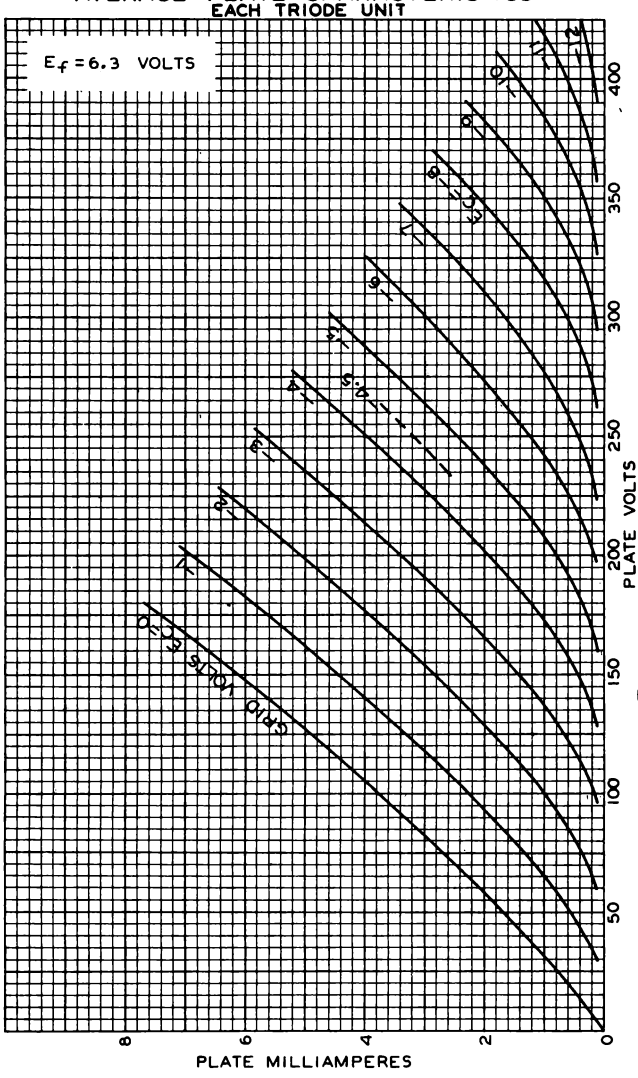
← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6C8-G

6C8-G

AVERAGE PLATE CHARACTERISTICS
EACH TRIODE UNIT



SEPT. 18, 1941

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4957R1

6CB5

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.):°		
Grid No.1 to plate	0.8	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	24	μμf
Plate to cathode & grid No.3, grid No.2, and heater	10	μμf

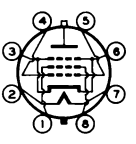
Characteristics, Class A_1 Amplifier:

Plate Voltage	75	175	volts
Grid-No.2 (Screen) Voltage	150	175	volts
Grid-No.1 (Control-Grid) 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 current of 1 ma.	-	-60	volts

Mechanical:

Mounting Position	Any
Maximum Overall Length	5-1/8"
Seated Length	4-7/16" ± 5/32"
Maximum Diameter	2-1/16"
Bulb	ST-16
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	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

° 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.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CB5

6CB5
BEAM POWER TUBE

HORIZONTAL DEFLECTION AMPLIFIER

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

For operation in a 525-line, 30-frame system□

DC PLATE VOLTAGE	700	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute Value)#	6800●	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500	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 VOLTAGE	200	max.	volts
DC PLATE CURRENT	200	max.	ma
GRID-No.2 INPUT	3.6	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
BULB TEMPERATURE (At hottest point on bulb surface)	210	max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	0.47	max.	megohm

□ 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.

● Under no circumstances should this absolute value be exceeded.

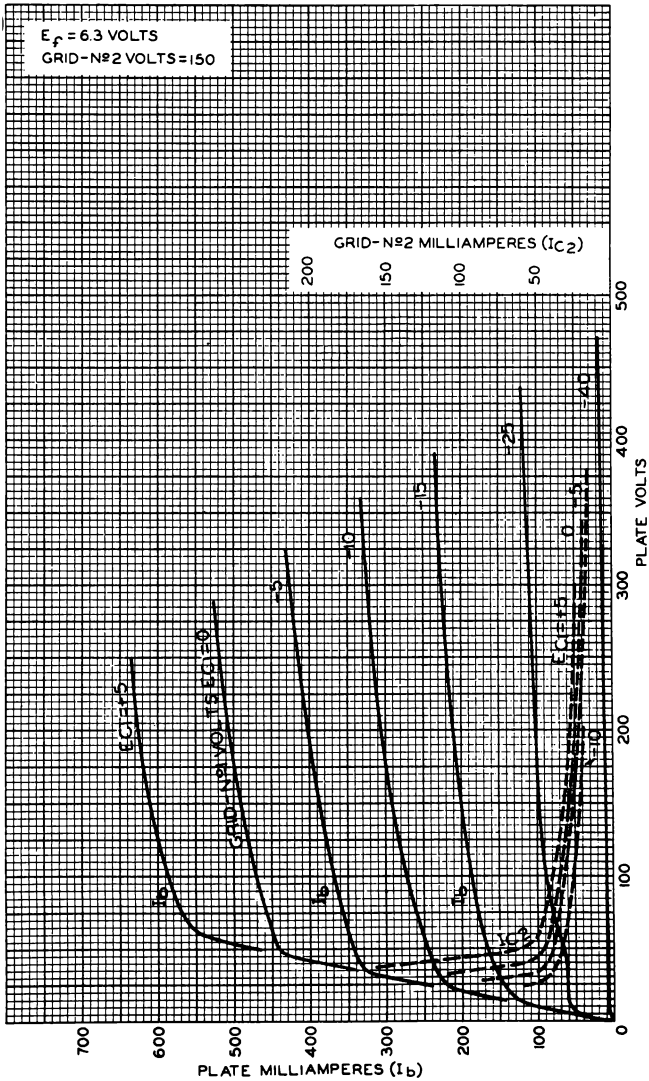
▲ The dc component must not exceed 100 volts.

† 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.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CB5

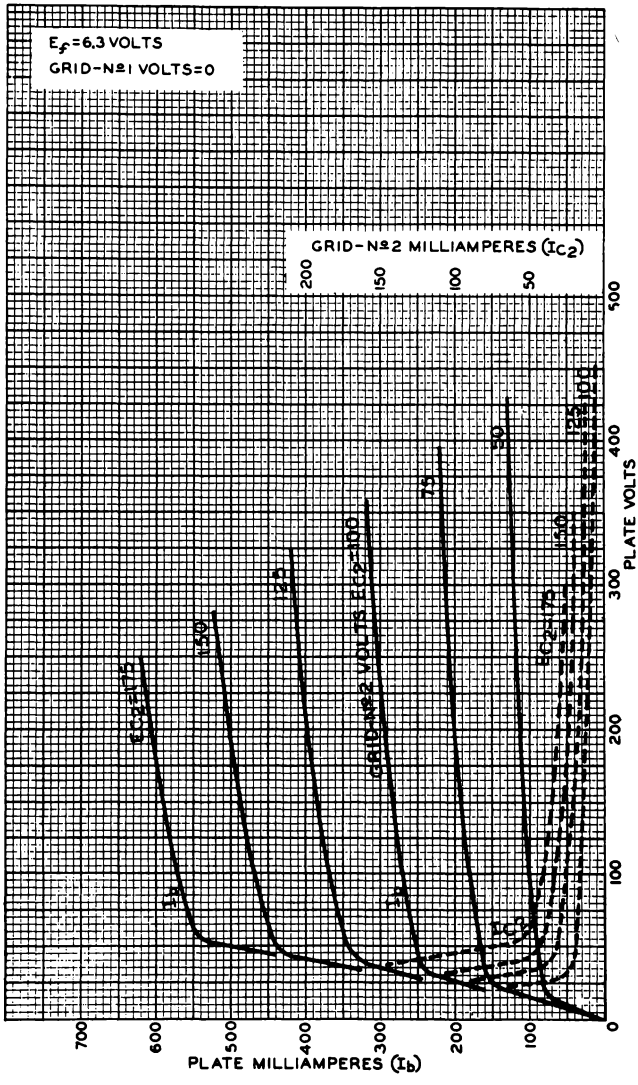
AVERAGE PLATE CHARACTERISTICS



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CB5

AVERAGE PLATE CHARACTERISTICS



6CB6
SHARP-CUTOFF PENTODE

MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.3	amp

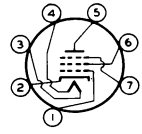
Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield°*	
Grid No.1 to plate	0.020 max.	0.010 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	6.5	6.5	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	1.9	3.0	μμf

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	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_1

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*	

° With external shield JETEC No.316 connected to cathode.

← Indicates a change.

6CB6

SHARP-CUTOFF PENTODE

→ 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	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

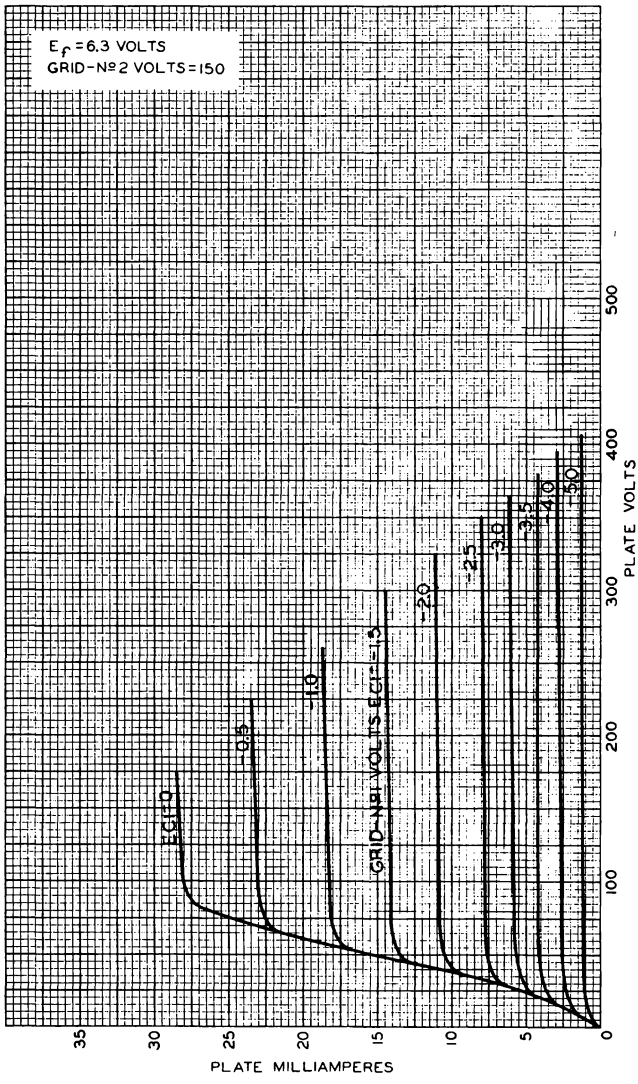
▲ The dc component must not exceed 100 volts.

→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

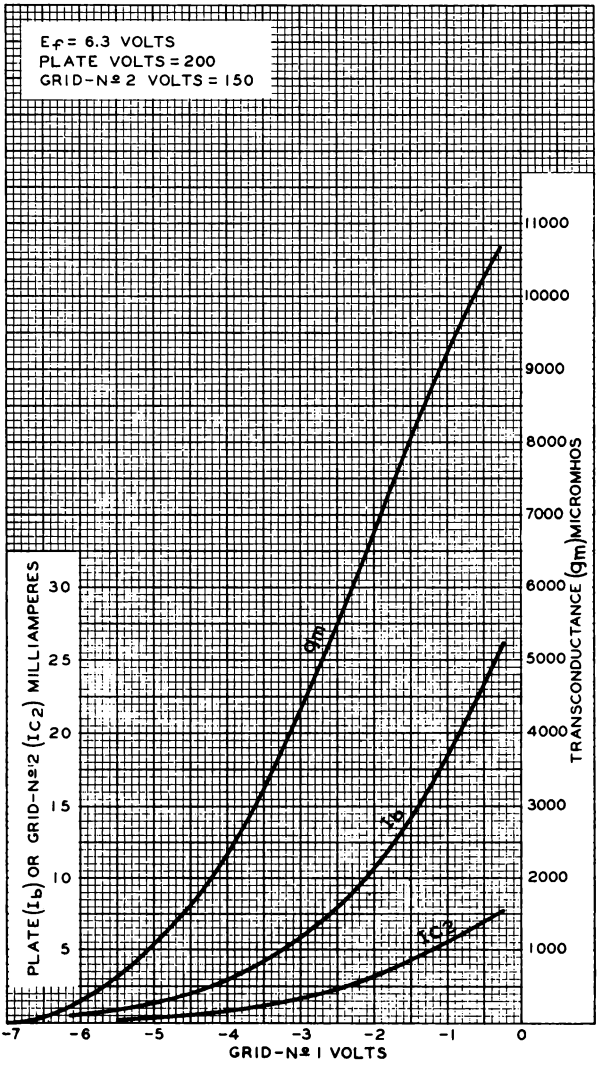
6CB6

AVERAGE PLATE CHARACTERISTICS



6CB6

AVERAGE CHARACTERISTICS



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°*	
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_1 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)

°,♦: See next page.

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

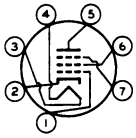
TENTATIVE DATA

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_1

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 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▲	max.	volts

Maximum Circuit Values:

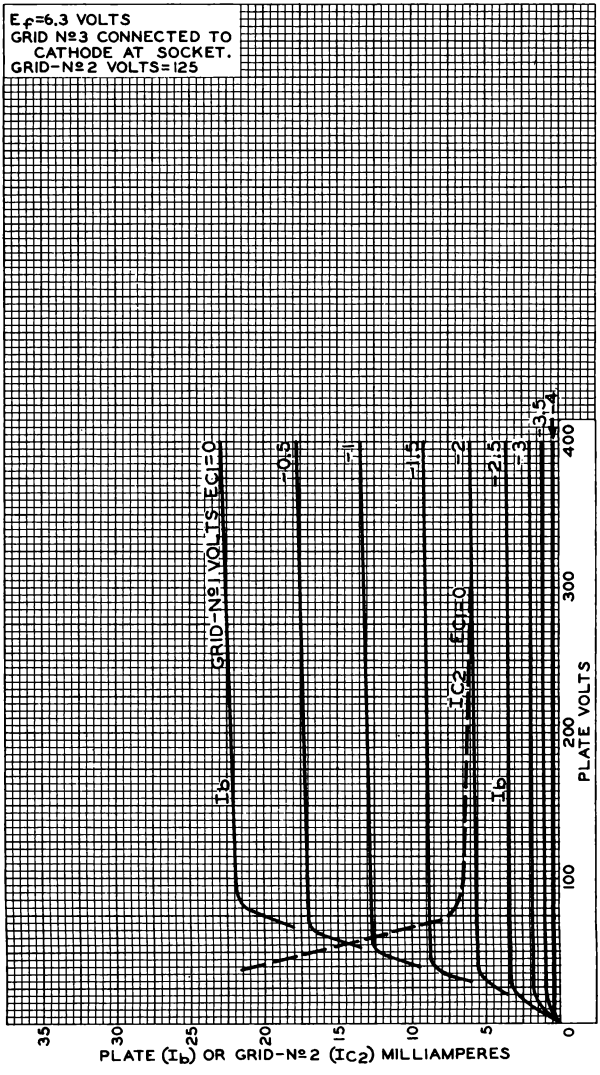
Grid-No.1-Circuit Resistance:			
For fixed-bias operation.	0.25	max.	megohm
For cathode-bias operation.	1	max.	megohm

○ With external shield JEDEC No.316 connected to cathode.
◆ Connected to cathode at socket.
▲ The dc component must not exceed 100 volts.

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

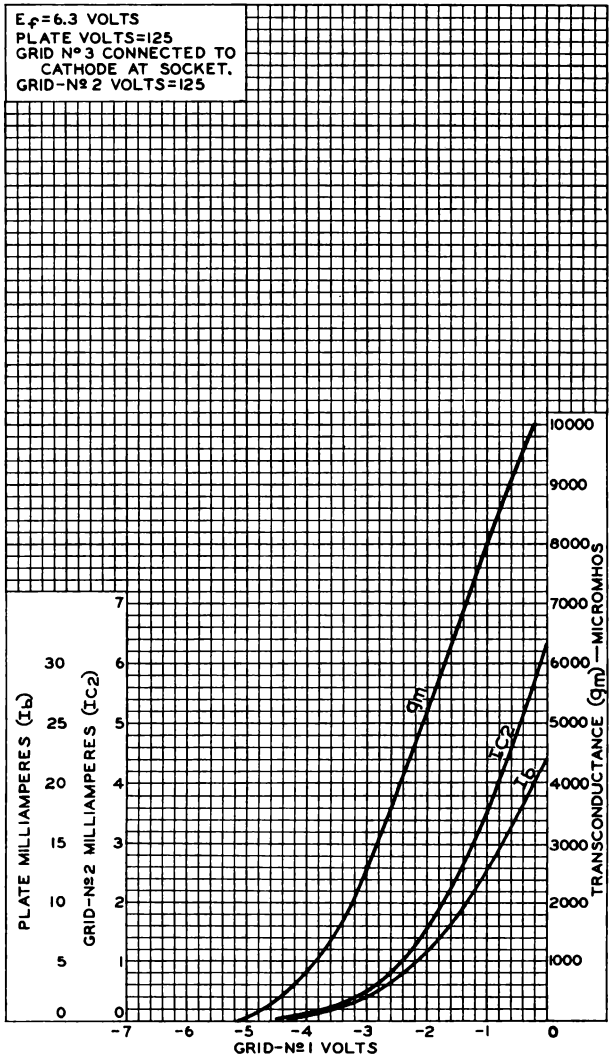
6CB6-A

AVERAGE CHARACTERISTICS



6CB6-A

AVERAGE CHARACTERISTICS



6CD6-G

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.):[o] ←

Grid No.1 to plate	0.8	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	24	μμf
Plate to cathode & grid No.3, grid No.2, and heater	9.5	μμf

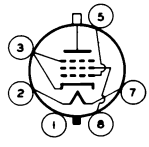
Characteristics, Class A_1 Amplifier: ←

Plate Voltage	60	175	volts
Grid-No.2 (Screen) 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	μmhos
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	5-11/16"
Seated Length	4-31/32" ± 5/32"
Maximum Diameter	2-1/16"
Dimensional Outline	*See General Section*
Bulb	ST-16
Cap	Small (JETEC No.C1-1)
Base	Medium-Shell Octal 6-Pin (JETEC No.B6-13)
Basing Designation for BOTTOM VIEW	5BT

Pin 1 - No Connection
Pin 2 - Heater
Pin 3 - Cathode, Grid No.3



Pin 5 - Grid No.1
Pin 7 - Heater
Pin 8 - Grid No.2
Cap - Plate

[o] 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.

← Indicates a change.

6CD6-G

BEAM POWER TUBE

HORIZONTAL DEFLECTION AMPLIFIER

→ **Maximum Ratings,** *Design-Center Values Except as Noted:*

For operation in a 525-line, 30-frame system□

DC PLATE VOLTAGE	700	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)●	6600■	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500	max.	volts
DC GRID-No.2 (SCREEN) 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†	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)	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.

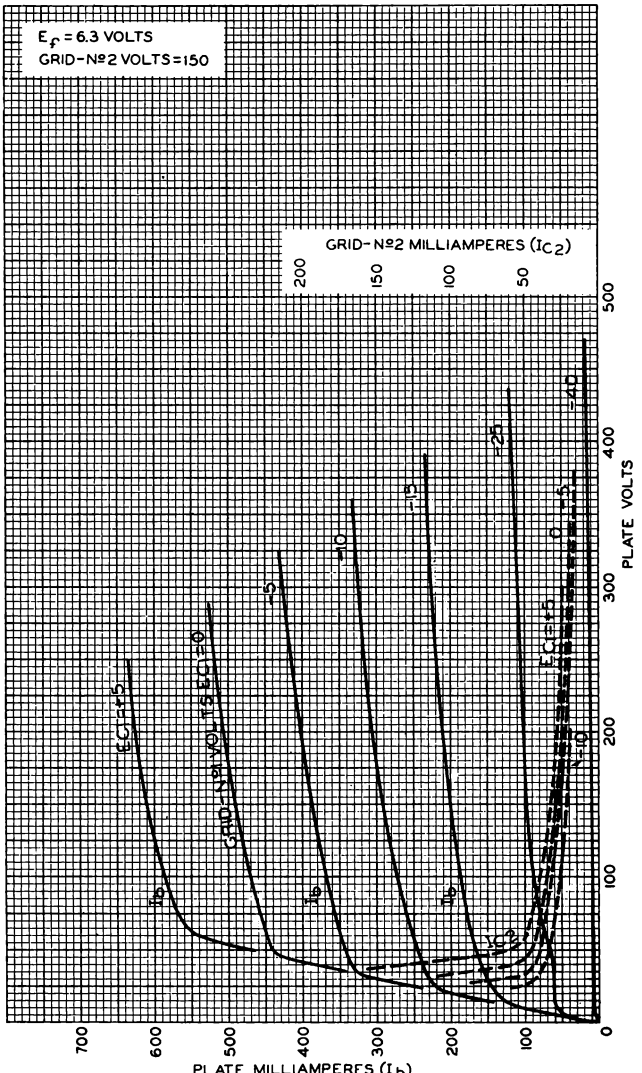
▲ The dc component must not exceed 100 volts.

→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CD6-G

AVERAGE PLATE CHARACTERISTICS



OCT. 26, 1949

TUBE DEPARTMENT

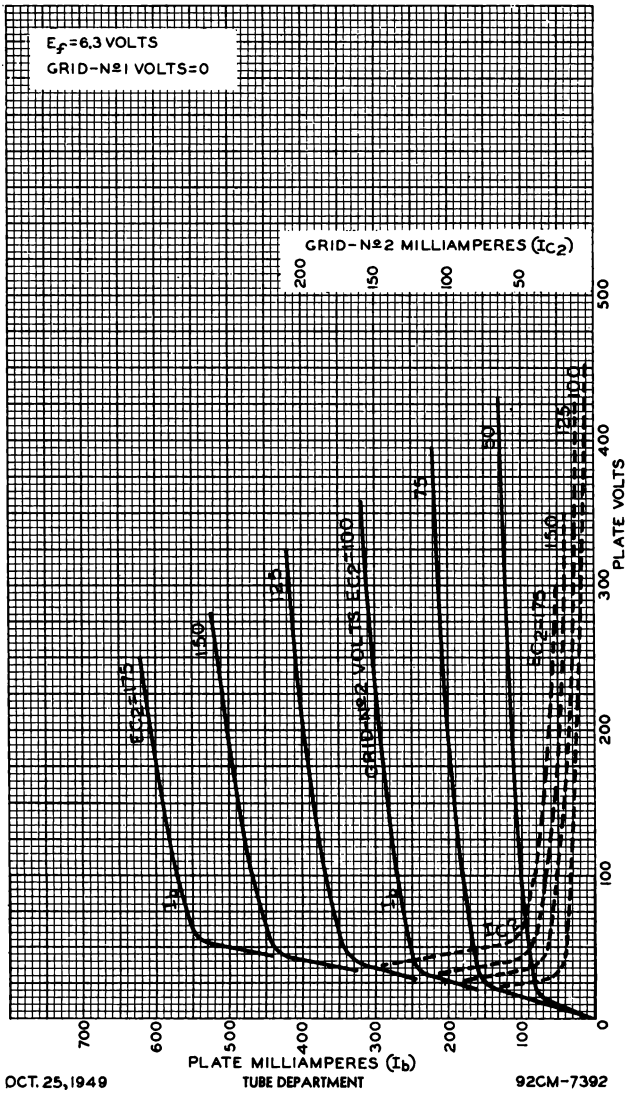
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7393

6CD6-G

6CD6-G

AVERAGE PLATE CHARACTERISTICS



OCT. 25, 1949

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7392

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.):°		
Grid No.1 to plate	1.1	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	22	μμf
Plate to cathode & grid No.3, grid No.2, and heater	8.5	μμf

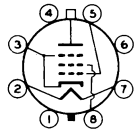
Characteristics, Class A_1 Amplifier:

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	μmhos
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" ± 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 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

° 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.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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□

DC PLATE VOLTAGE	700	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)⊕	7000■	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	175	max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-50	max.	volts
PEAK NFGATIVE-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†	20	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:			
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.

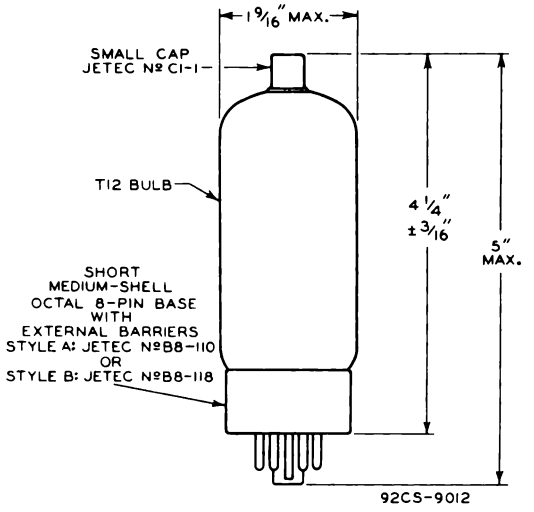
† It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value should be employed.

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CD6-GA

BEAM POWER TUBE

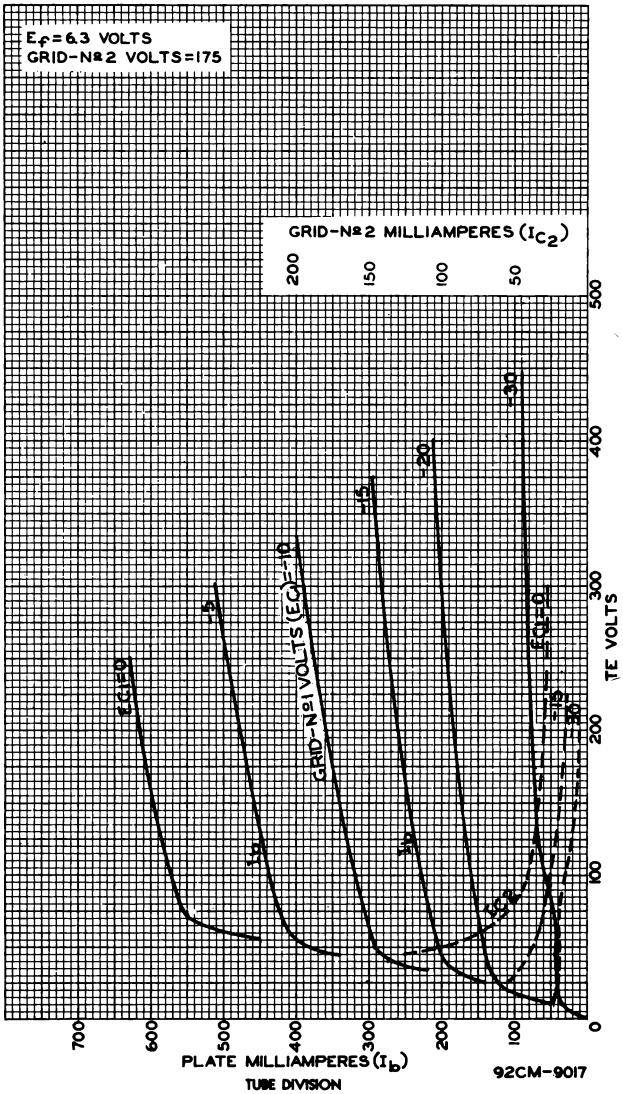


TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CD6-GA

6CD6-GA

AVERAGE CHARACTERISTICS



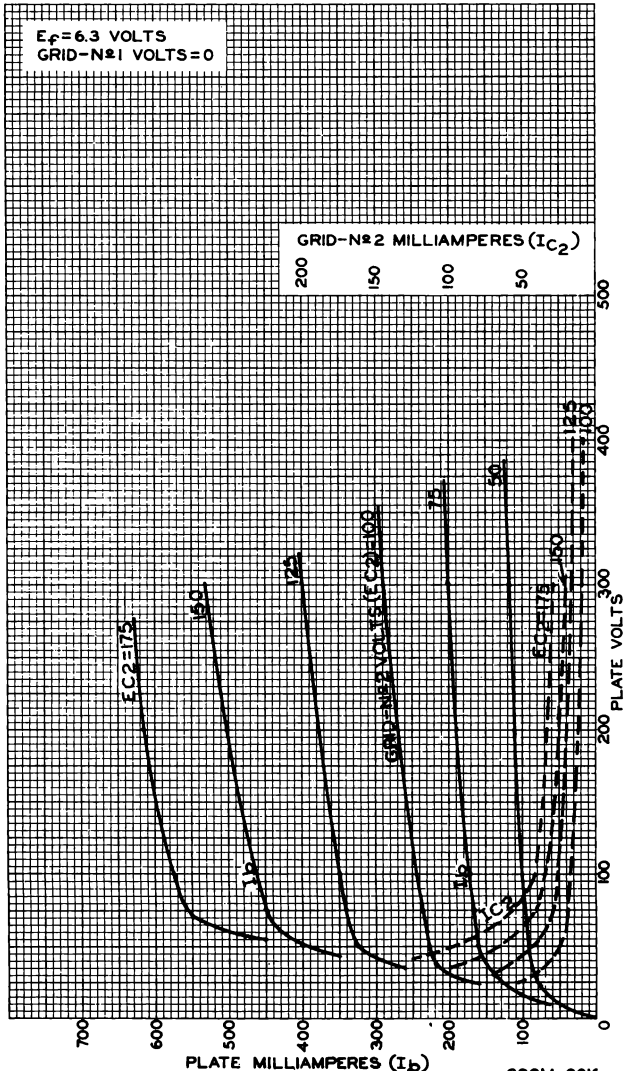
92CM-9017

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CD6-GA

AVERAGE CHARACTERISTICS



92CM-9016

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CF6

SHARP-CUTOFF PENTODE

MINIATURE TYPE

For use in gain-controlled video if stages operating at frequencies in the order of 40 megacycles

GENERAL DATA

Electrical:

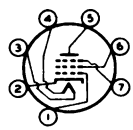
Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances:°		
Grid No.1 to Plate	0.020 max.	μμf
Input	6.3	μμf
Output	1.9	μμf

° 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" ±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_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	150 max.	volts
PLATE DISSIPATION	2.0 max.	watts
GRID-No.2 INPUT	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	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 Bias (Approx.) for plate current of 35 μamp	-6.5	volts

6CF6

6CF6

SHARP-CUTOFF PENTODE

Plate Current	9.5	ma
Grid-No.2 Current	2.8	ma

Curves shown under Type 6CB6 also apply to the 6CF6

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CG7

6CG7
MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

Intended for use in equipment with 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

Heater warm-up time is defined as the time required in the accompanying test circuit for the voltage (E) across the heater terminals to increase from zero to 5 volts.

Direct Interelectrode Capacitances (Approx.):[o]

	Unit No.1	*Unit No.2*	
Grid to plate	4	4	μμf
Grid to cathode, heater, and internal shield	2.3	2.3	μμf
Plate to cathode, heater, and internal shield	2.2	2.2	μμf

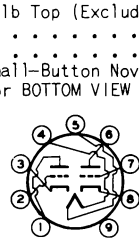
Characteristics. Class A_1 Amplifier (Each Unit):

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 voltage of -12.5 volts	-	1.3	ma
Grid Voltage (Approx.) for plate current of 10 μamp	-7	-18	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"
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

[o] Without external shield.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CG7

MEDIUM-MU TWIN TRIODE

AMPLIFIER - Class A_1

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300 max.	volts
GRID VOLTAGE:		
Positive bias value	0 max.	volts
CATHODE CURRENT	20 max.	ma
PLATE DISSIPATION:		
Either plate	3.5 max.	watts
Both plates (Both units operating)	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 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□

DC PLATE VOLTAGE	300 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE♦	600 max.	volts
CATHODE CURRENT:		
Peak	300 max.	ma
Average	20 max.	ma
PLATE DISSIPATION:		
Either plate	3.5 max.	watts
Both plates (Both units operating)	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 fixed-bias, grid-resistor bias, or cathode-bias operation	2.2 max.	megohms

♦ 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.

▲,□: See next page.

6CG7

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□

DC PLATE VOLTAGE	300 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE#	400 max.	volts
CATHODE CURRENT:		
Peak	70 max.	ma
Average	20 max.	ma
PLATE DISSIPATION:		
Either plate	3.5 max.	watts
Both plates (Both units operating)	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:

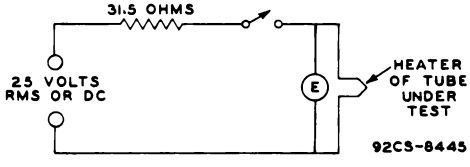
Grid-Circuit Resistance:		
For fixed-bias, grid-resistor bias, or cathode-bias operation	2.2 max.	megohms

▲ 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 per cent of one vertical scanning cycle is 2.5 milliseconds.

TEST CIRCUIT FOR DETERMINING HEATER WARM-UP TIME

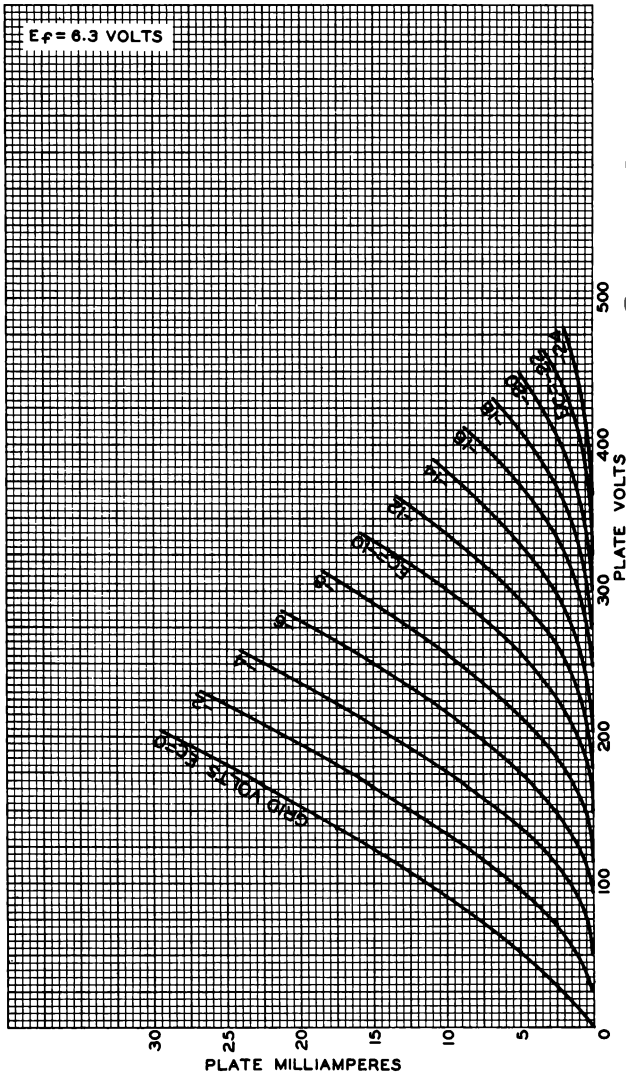


TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CG7

6CG7

AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT

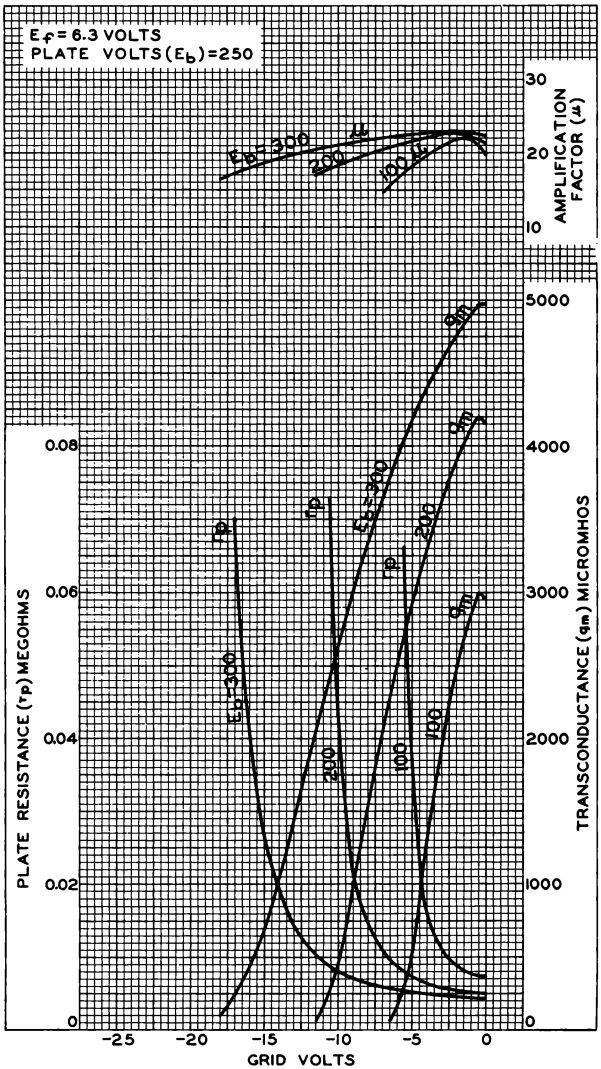


SEPT. 27, 1954

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8442

6CG7
AVERAGE CHARACTERISTICS
FOR EACH UNIT



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	μμf
Input	11	μμf
Output	5.5	μμf

Characteristics, Amplifier Class A_1:

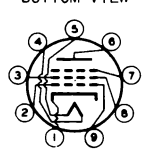
Plate Voltage	250	volts
Grid No.3	Connected to cathode at socket	
Grid-No.2 Voltage	150	volts
Grid-No.1 Voltage	-3	volts
Peak AF Grid-No.1 Signal Voltage	3	volts
Zero-Signal DC Plate Current	30	ma
Max.-Signal DC Plate Current	31	ma
Zero-Signal DC Grid-No.2 Current	7	ma
Max.-Signal DC Grid-No.2 Current	7.2	ma
Plate Resistance (Approx.)	0.15	megohm
Transconductance	11000	μmhos
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp	-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" ± 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_1

Maximum Ratings, *Design-Center Values:*

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

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:

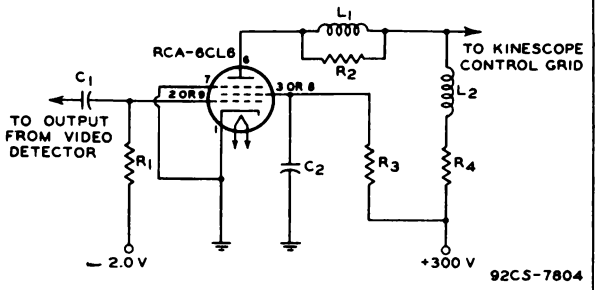
Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.1 max.	megohm
For cathode-bias operation	0.5 max.	megohm

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CL6

POWER PENTODE

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



C1: 0.1 μf, 400 volts
C2: 4 μf, 400 volts
L1: Peaking Coil, 180 μh
L2: Peaking Coil, 120 μh

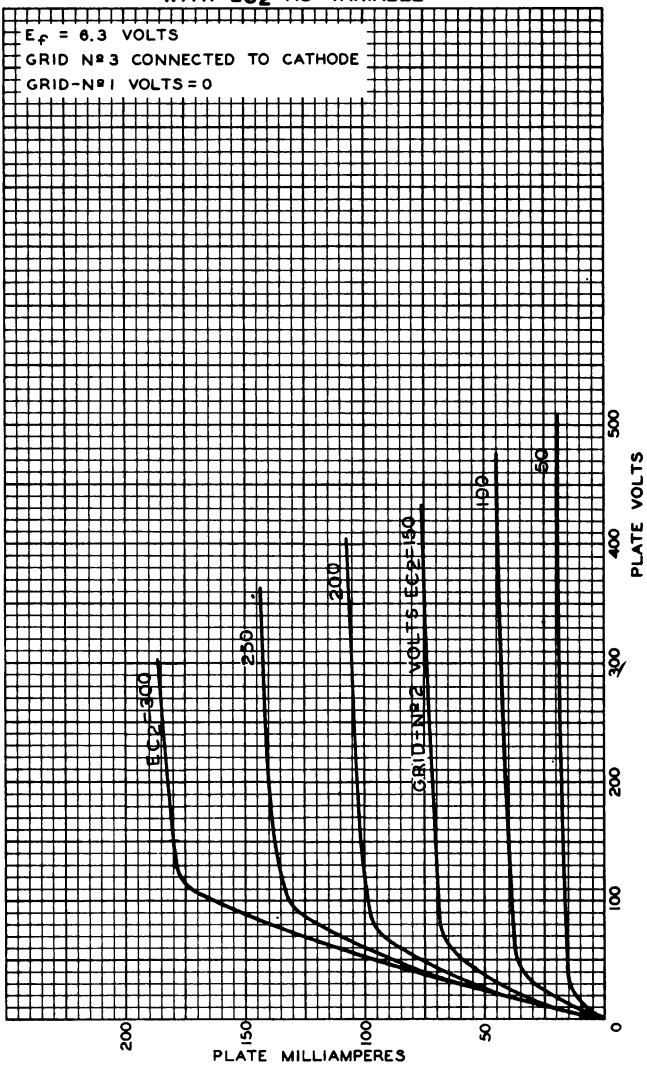
R1: 100000 ohms, 0.5 watt
R2: 47000 ohms, 0.5 watt
R3: 24000 ohms, 2 watts
R4: 3900 ohms, 5 watts non-inductive type

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

6CL6

AVERAGE PLATE CHARACTERISTICS
WITH E_{C2} AS VARIABLE



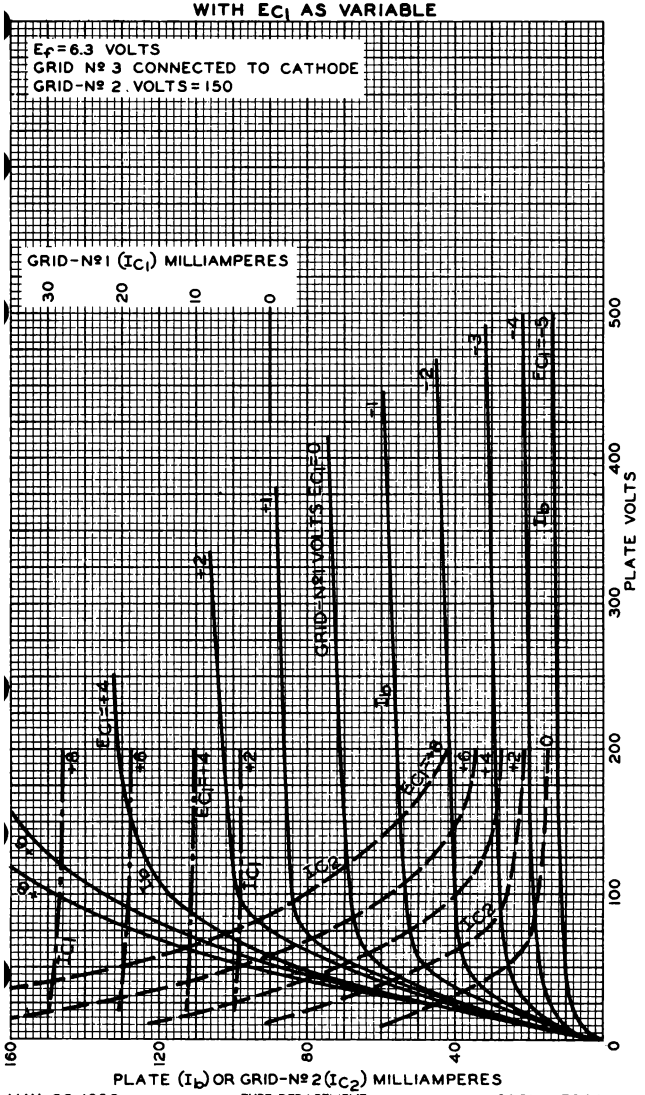
MAY 22, 1952

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7803

6CL6

AVERAGE PLATE CHARACTERISTICS
WITH E_{C1} AS VARIABLE



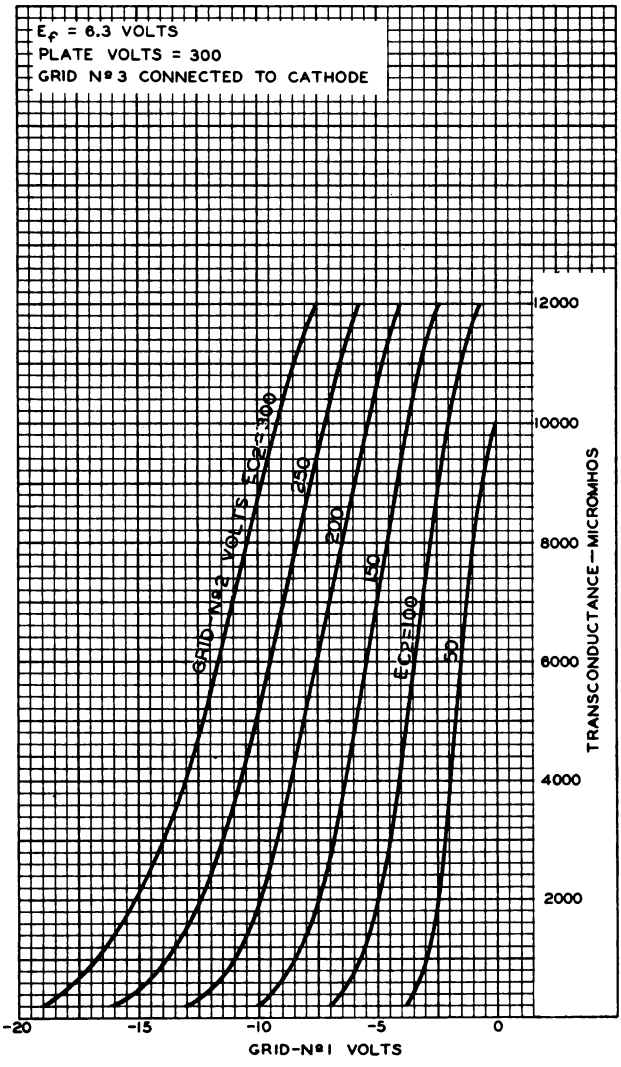
MAY 22, 1952 TUBE DEPARTMENT 92CM-7802

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CL6

6CL6

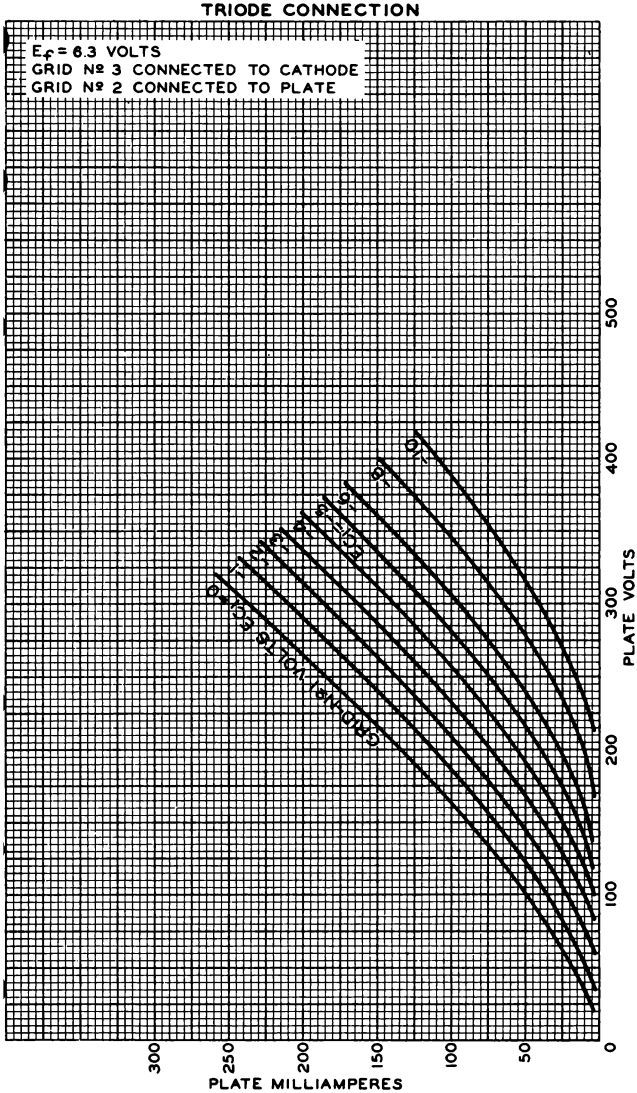
AVERAGE CHARACTERISTICS



6CL6

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION



MAY 26, 1952

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7808

6CL8-A

MEDIUM-MU TRIODE— SHARP-CUTOFF TETRODE

9-PIN MINIATURE TYPE

Intended for use as combined VHF oscillator and mixer tube in TV receivers. This type has a heater with 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°*	
Triode Unit:			
Grid to plate	1.8	1.8	μμf
Grid to cathode and heater	2.7	2.7	μμf
Plate to cathode and heater	0.4	1.2	μμf
Tetrode Unit:			
Grid No.1 to plate	0.02 max.	0.01 max.	μμf
Grid No.1 to cathode, grid No.2, and heater	5	5	μμf
Plate to cathode, grid No.2, and heater	2.4	3.4	μμf
Heater to cathode (Each Unit)	2.5	2.5•	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Tetrode Unit*		
Plate-Supply Voltage	125	100	125	volts
Grid-No.2 (Screen-grid) Supply Voltage	–	100	125	volts
Grid-No.1 (Control-grid) Voltage	–	0	-1	volt
Cathode Resistor	56	–	–	ohms
Amplification Factor	40	–	–	
Plate Resistance (Approx.)	5000	–	100000	ohms
Transconductance	8000	8200	6400	μmhos
Plate Current	15	-	12	ma
Grid-No.2 Current	–	–	4	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-9	–	-10	volts

°,•: See next page.

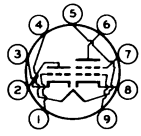
6CL8-A

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" ± 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
Pin 9 - Tetrode Grid No.1

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	-	0.5 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▲ max.	200▲ max.	volts

○, ●, ▲: See next page.

6CL8-A

MEDIUM-MU TRIODE—SHARP-CUTOFF TETRODE

Maximum Circuit Values:

	Triode Unit	*Tetrode 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

○ 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.

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

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.):[o]

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

Characteristics, Class A_1 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

[o] Without external shield.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

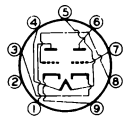
6CM7

6CM7

MEDIUM-MU DUAL TRIODE
With Dissimiliar 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 2 - No Connection
Pin 3 - Cathode of Unit No.1
Pin 4 - Heater
Pin 5 - Heater



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

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▲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□

DC PLATE VOLTAGE	500 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE# (Absolute maximum)	2200■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▲max.	volts

▲ The dc component must not exceed 100 volts.
□,#,■: See next page.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CM7

6CM7

MEDIUM-MU DUAL TRIODE
With Dissimiliar 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.

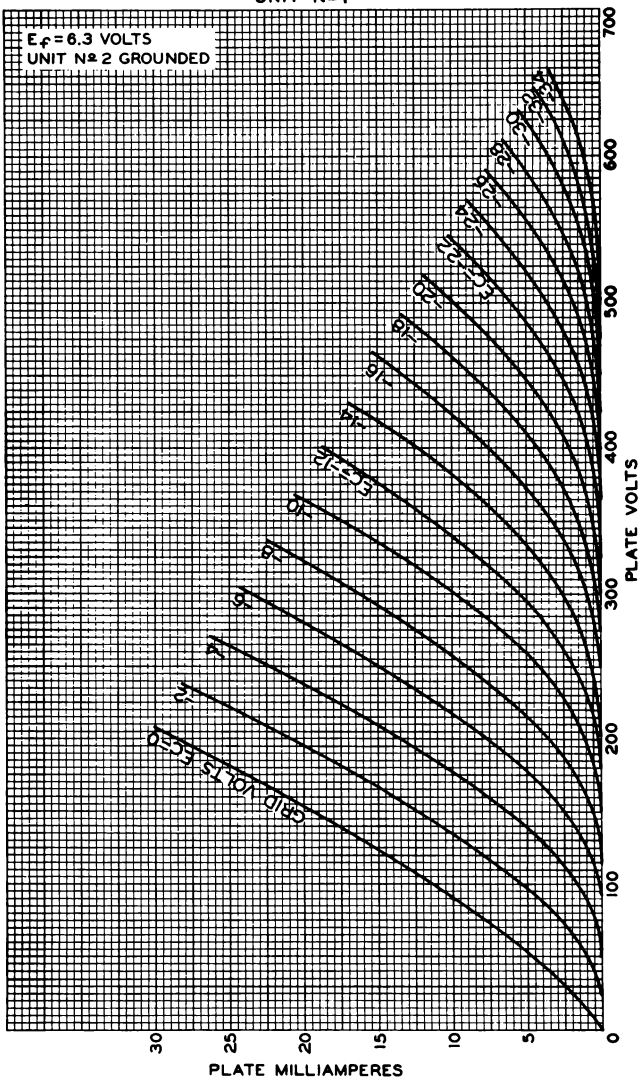
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CM7

6CM7

AVERAGE PLATE CHARACTERISTICS

UNIT Nº 1



MAY 17, 1955

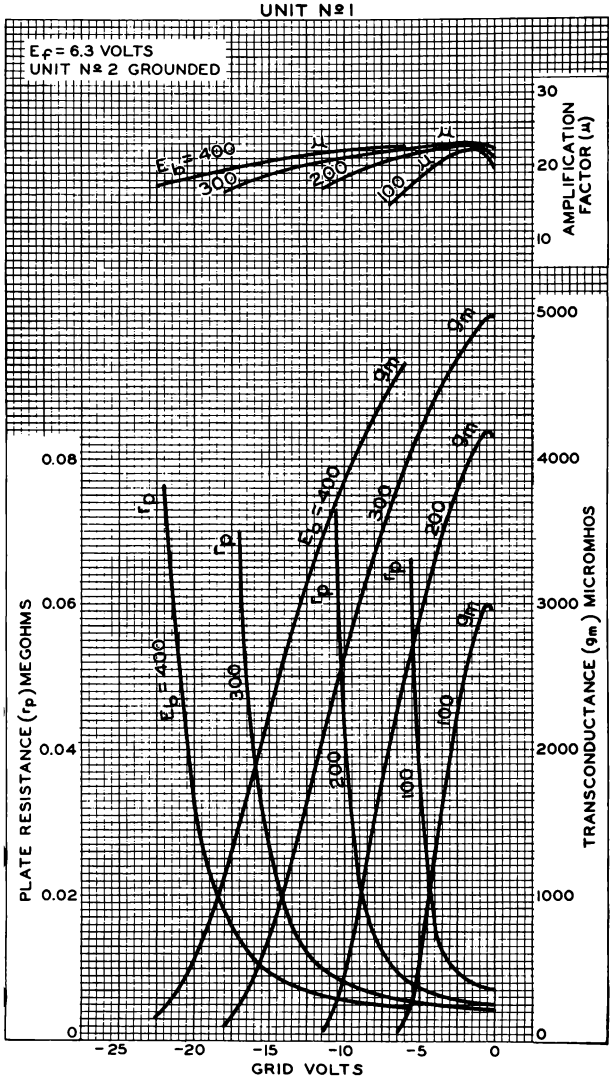
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8617

6CM7

AVERAGE CHARACTERISTICS

UNIT Nº1

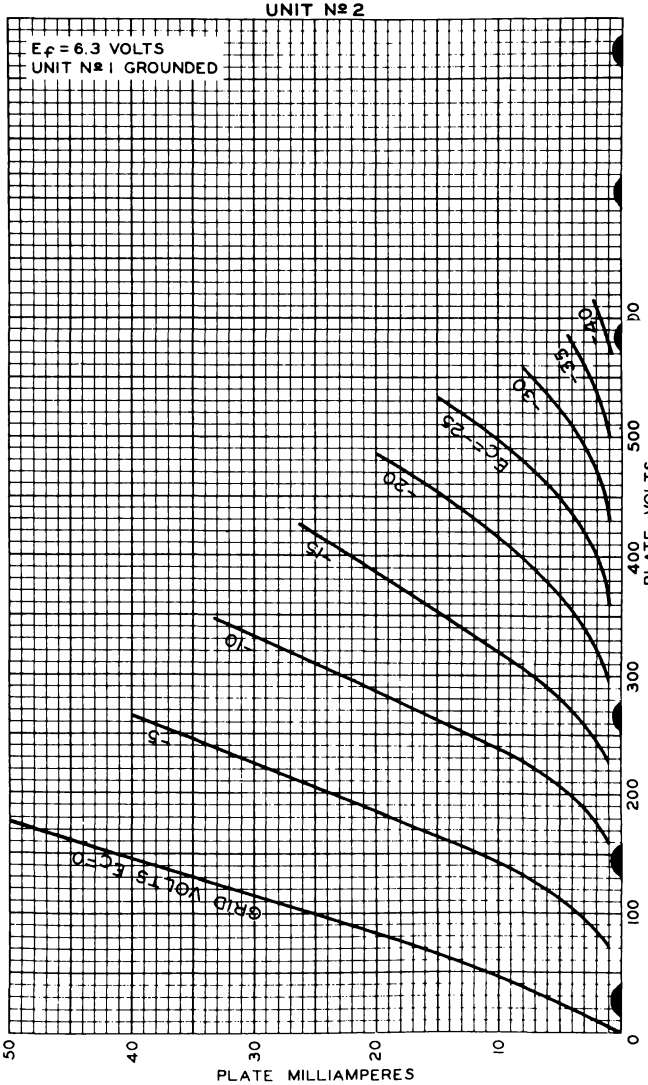


6CM7

6CM7

AVERAGE PLATE CHARACTERISTICS

UNIT № 2



MAY 16, 1955

TUBE DIVISION

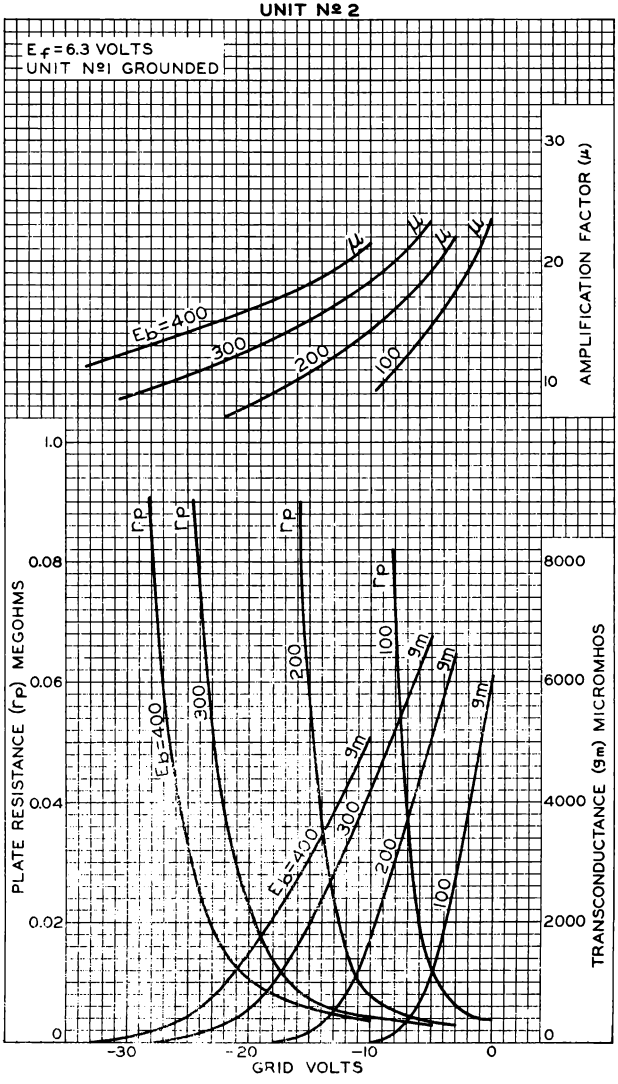
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8615

6CM7

AVERAGE CHARACTERISTICS

UNIT Nº 2



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.):[o]		
Grid No.1 to plate	0.05 max.	μμf
Grid No.3 to plate	0.36 max.	μμf
Grid No.1 to grid No.3	0.15 max.	μμf
Grid No.1 to cathode & grid No.5, grid No.4 & grid No.2, grid No.3, and heater	5.5	μμf
Grid No.3 to cathode & grid No.5, grid No.4 & grid No.2, grid No.1, and heater	7	μμf
Plate to cathode & grid No.5, grid No.4 & grid No.2, grid No.3, grid No.1, and heater	7.5	μμf

Characteristics, Class A_1 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	1250	-	μmhos
Grid-No.1-to-Plate Transconductance	-	950	μmhos
Plate Current	0.8	0.75	ma
Grid-No.2 & Grid-No.4 Current	4	1.1	ma
Grid-No.3 Voltage (Approx.) for plate current of 50 μamp	-2.2	-	volts
Grid-No.1 Voltage (Approx.) for plate current of 50 μamp	-	-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" ± 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	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

[o] Without external shield.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*		
PLATE DISSIPATION	1	max.	watt
GRID-No.2 & 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	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*		
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▲	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	1.2	ma
Grid-No.2 & Grid-No.4 Current	4.1	ma

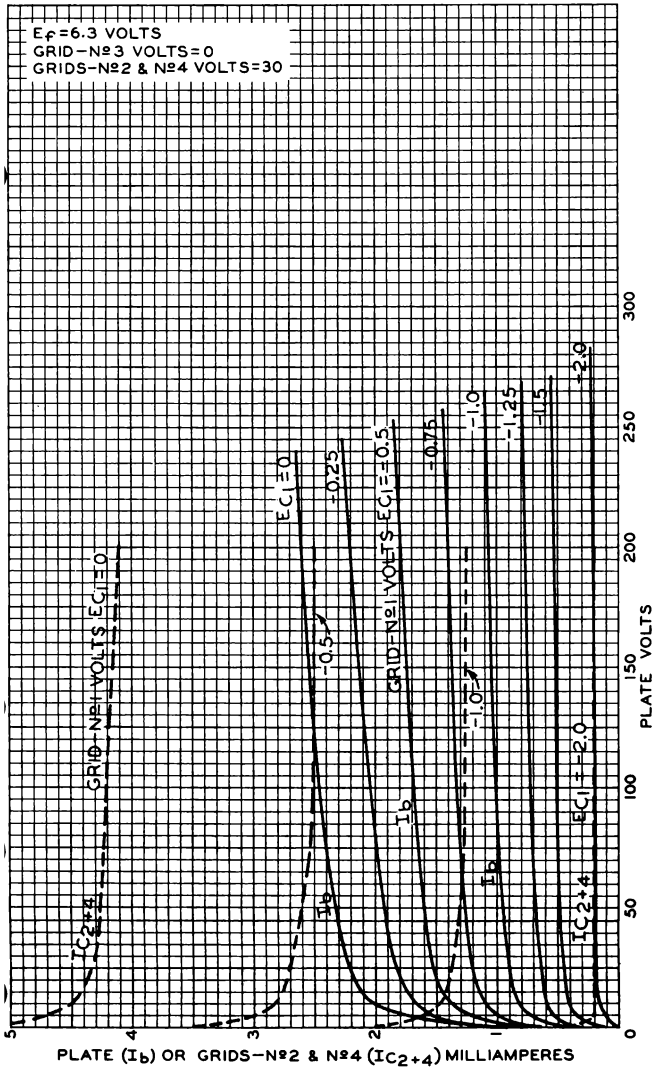
Maximum Circuit Values:

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.

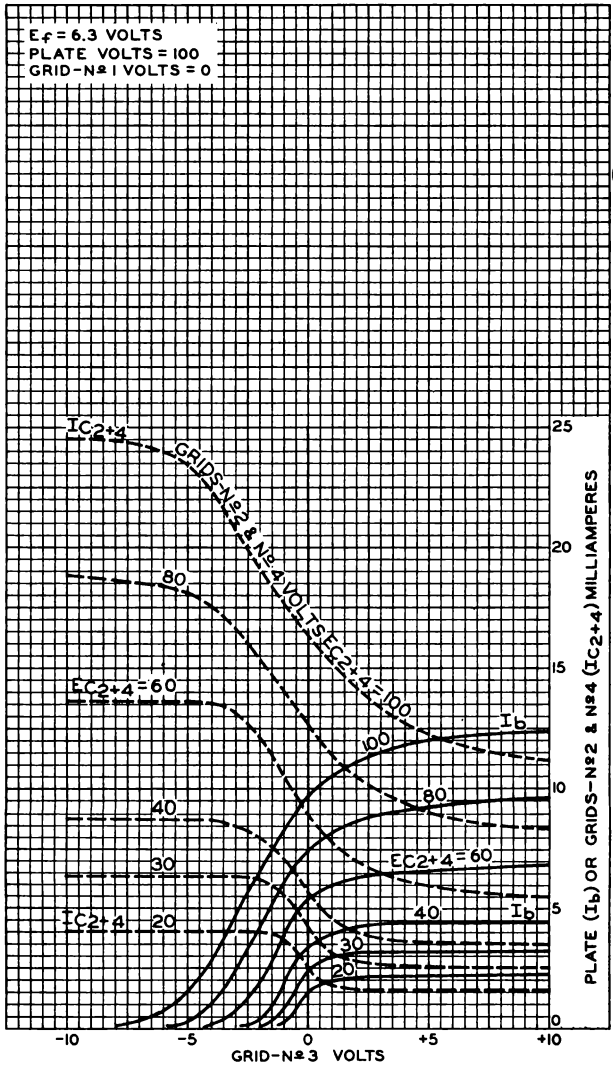
6CS6

AVERAGE CHARACTERISTICS



6CS6

AVERAGE CHARACTERISTICS



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.):°		
Grid No.1 to plate	0.7	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	13.2	μμf
Plate to cathode & grid No.3, grid No.2, and heater	8.6	μμf

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"
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_1

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▲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
Peak AF Grid-No.1 Voltage	8	volts

° Without external shield.
▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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	μmhos
Load Resistance	2500	ohms
Total Harmonic Distortion	10	%
Max.-Signal Power Output.	2.3	watts

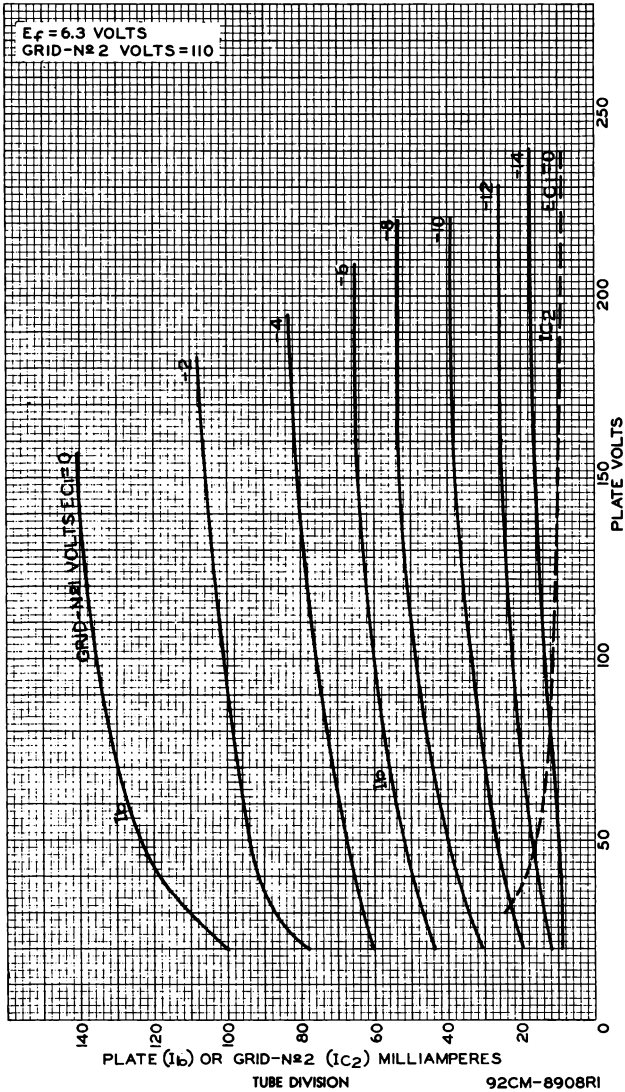
Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation.	0.1 max.	megohm
For cathode-bias operation.	0.5 max.	megohm

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CU5

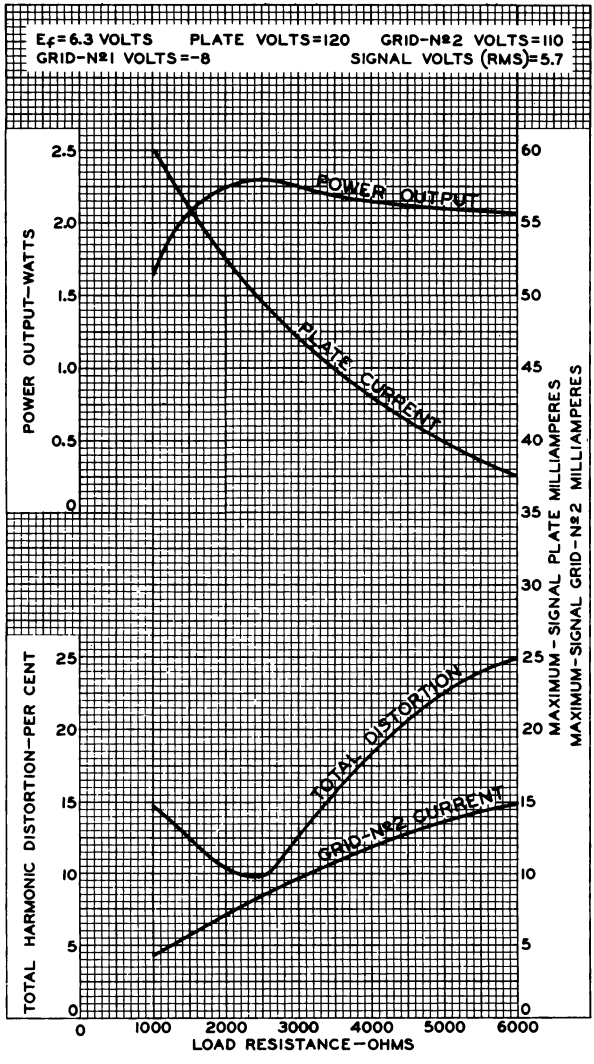
AVERAGE CHARACTERISTICS



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-8908R1

6CU5

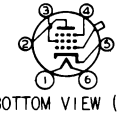
OPERATION CHARACTERISTICS



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.°	μμf
Input	4.7	μμf
Output	6.5	μμf
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		Any



BOTTOM VIEW (6F)

■ 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

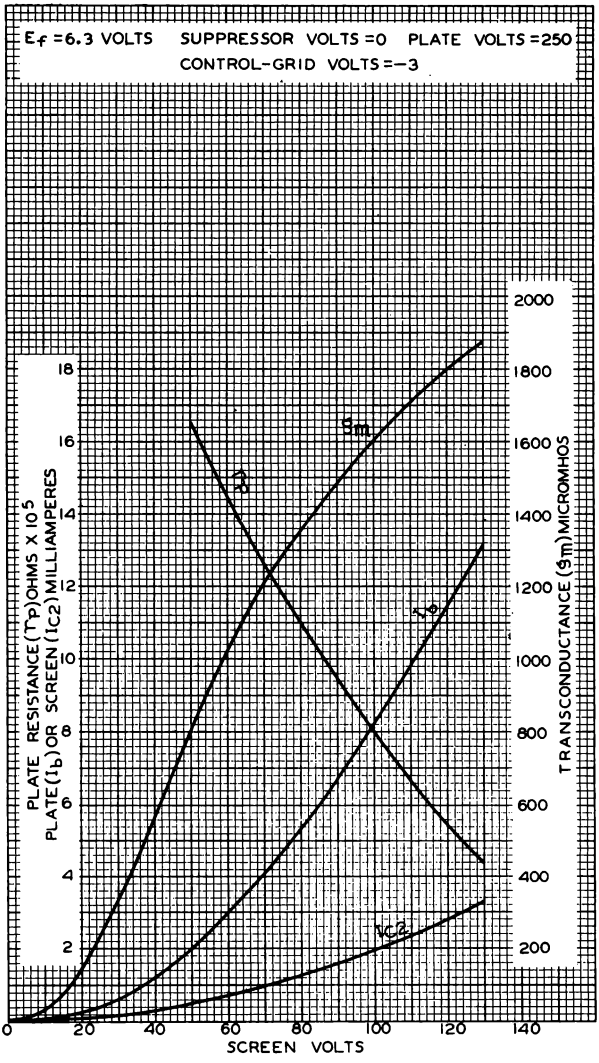
Maximum Ratings, Typical Operating Conditions and Curves are the same as for Type 6U7-G.

← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6D6

AVERAGE CHARACTERISTICS



6D7

TRIPLE-GRID DETECTOR AMPLIFIER

RENEWAL TYPE FOR MAJESTIC RECEIVERS

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Overall Length		4-11/16" to 4-15/16"
Seated Height		4-1/16" to 4-5/16"
Maximum Diameter (without shield)		1-9/16"
Bulb (with form-fitting shield)		ST-12
Cap		Small Metal
Base ▲		Small 7-Pin
Pin 1 - Heater		Pin 5 - External Shield
Pin 2 - Plate		Pin 6 - Cathode
Pin 3 - Screen		Pin 7 - Heater
Pin 4 - Suppressor		Cap - Grid

BOTTOM VIEW (7H)

■ 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 a different socket than the medium 7-pin base.

Typical Operating Conditions and Curves for the 6D7 are the same as for type 6J7.

6DC6

SEMIREMOTE-CUTOFF PENTODE

MINIATURE TYPE

GENERAL DATA

Electrical:

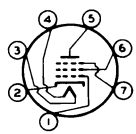
Heater, for Unipotential Cathode:
- Voltage . . . . . 6.3 . . . . . ac or dc volts
- Current . . . . . 0.3 . . . . . amp

Direct Interelectrode Capacitances (No external shield):
- Grid No.1 to plate . . 0.02 max. . . . . μμf
- Input . . . . . 6.5 . . . . . μμf
- Output . . . . . 2 . . . . . μμf

Mechanical:

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 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_1

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▲	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

▲ The dc component must not exceed 100 volts.

6DC6

SEMIREMOTE-CUTOFF PENTODE

Transconductance	5500	μmhos
Grid-No.1 Voltage (Approx.) for transconductance of 50 μmhos	-12.5	volts
Plate Current	9	ma
Grid-No.2 Current	3	ma

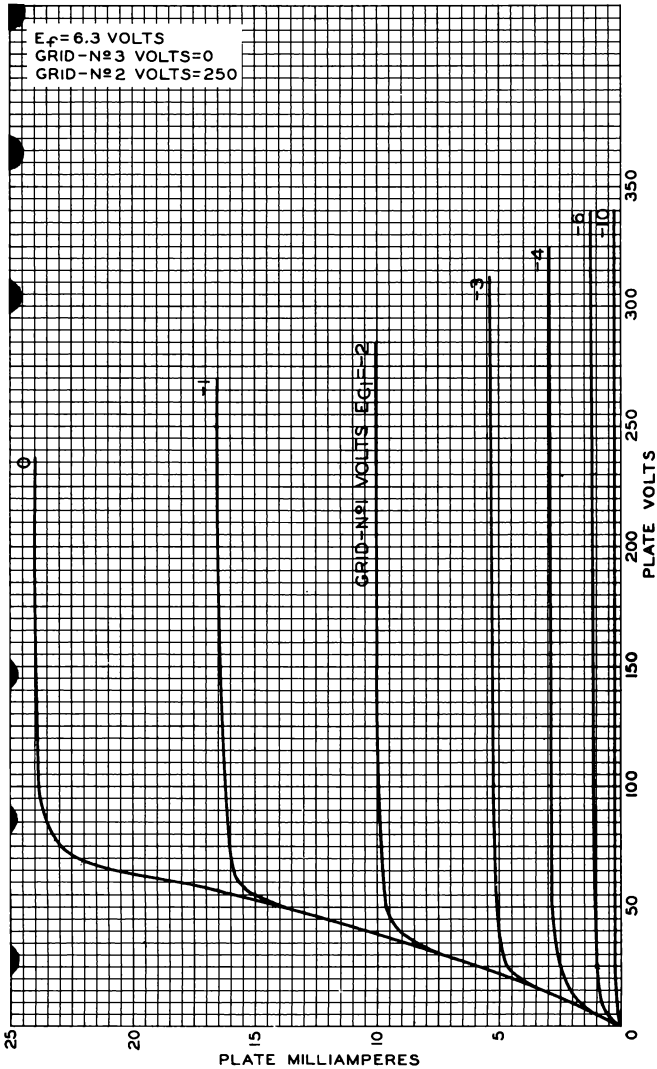
Maximum Circuit Values (For maximum rated conditions):

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.25 max.	megohm
For cathode-bias operation	1.0 max.	megohm

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6DC6

AVERAGE PLATE CHARACTERISTICS



MAY. 26, 1954

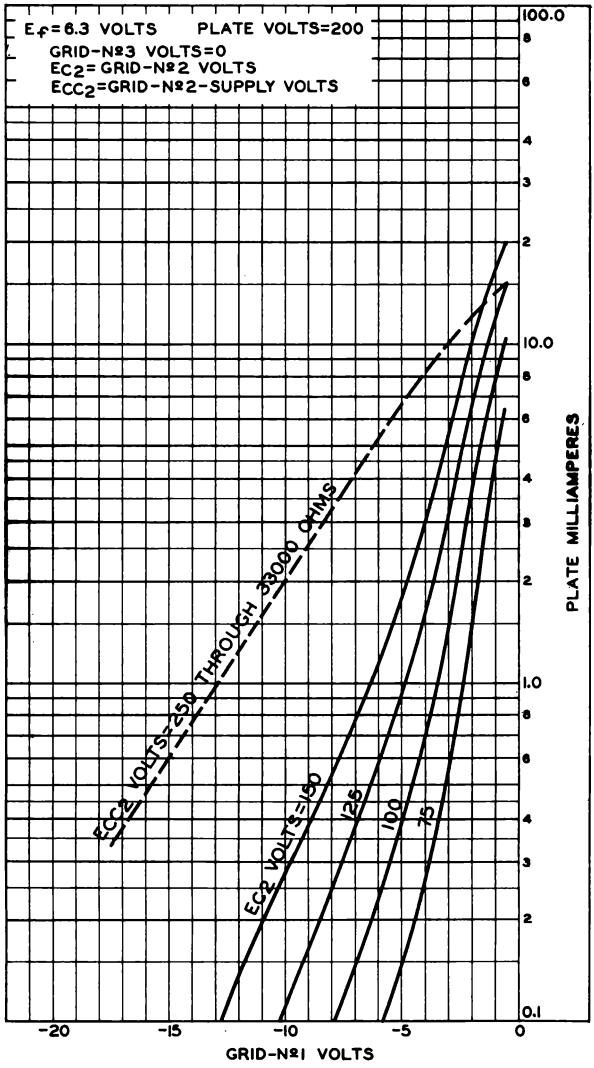
TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8330

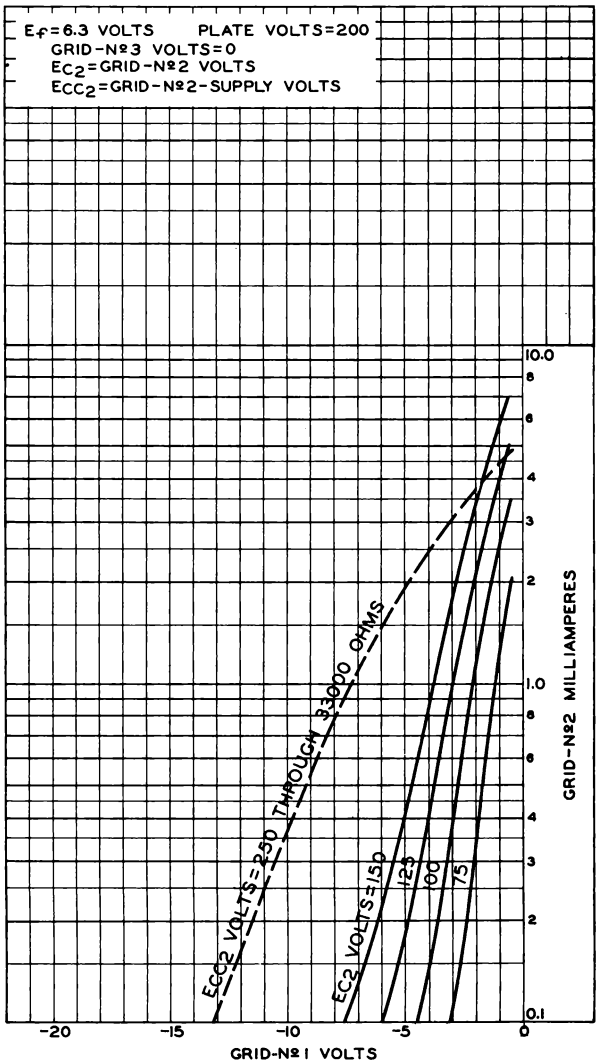
6DC6

AVERAGE CHARACTERISTICS



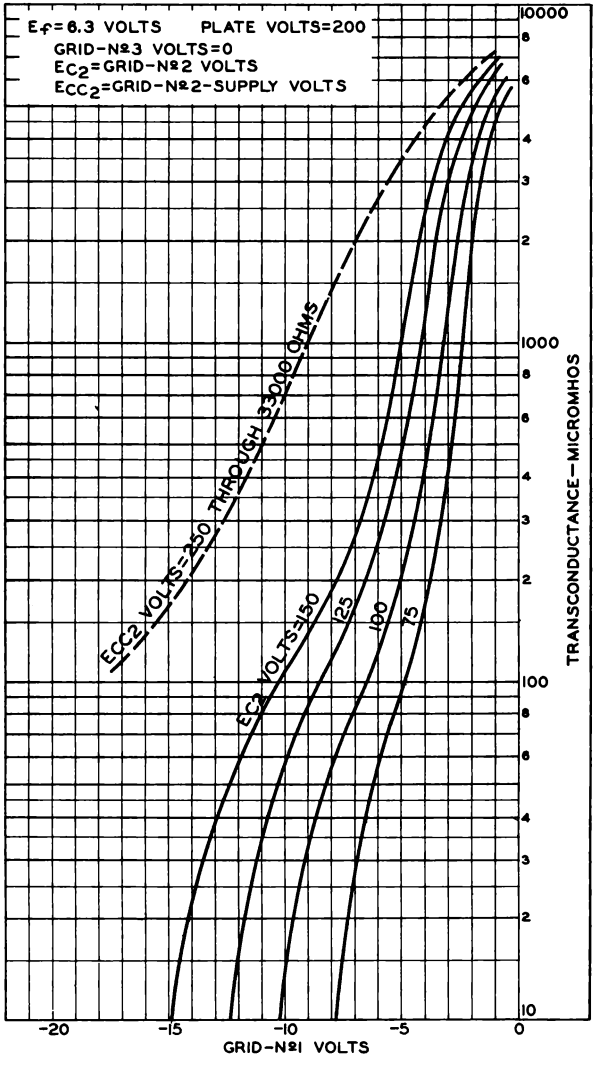
6DC6

AVERAGE CHARACTERISTICS



6DC6

AVERAGE CHARACTERISTICS



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.):°

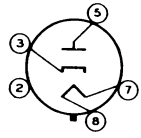
Plate to cathode and heater	8.5	μμf
Cathode to plate and heater	11.5	μμf
Heater to cathode	4	μμf

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#

PEAK INVERSE PLATE VOLTAGE	5000■	max.	volts
PEAK PLATE CURRENT	1100	max.	ma
DC PLATE CURRENT	175	max.	ma
PLATE DISSIPATION	6.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	5000*	max.	volts
Heater positive with respect to cathode	300†	max.	volts

° Without external shield.

\# 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 900 volts.

† The dc component must not exceed 100 volts.

TENTATIVE DATA

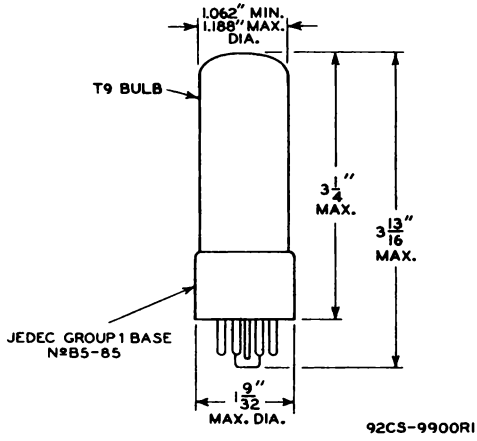
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6DE4

HALF-WAVE VACUUM RECTIFIER

OPERATING CONSIDERATIONS

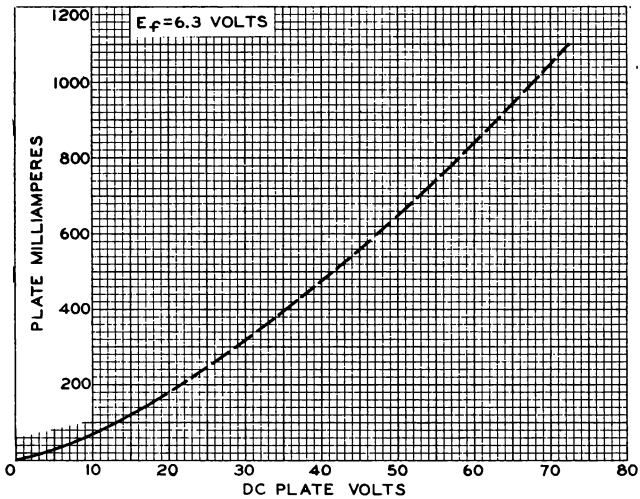
The *base pins* of the 6DE4 fit the standard Octal socket. Socket terminals for pins 1, 2, 4, and 6 should not be used for tie points. It is also recommended that socket clips for these pins be removed to reduce the possibility of arc-over and to minimize leakage.



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

6DE4

AVERAGE PLATE CHARACTERISTIC



92CS-9884

6DE6
SHARP-CUTOFF PENTODE

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:°
- Grid No.1 to plate . . . . . 0.020 max. μμf
- Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . . 6.3 μμf
- Plate to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . . 1.9 μμf

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 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 A1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE. . . . . 300 max. volts
GRID-No.3 (SUPPRESSOR) VOLTAGE . . . . . 0 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*
GRID-No.1 (CONTROL-GRID) VOLTAGE:
- Positive bias value . . . . . 0 max. volts

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*

° Without external shield.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6DE6

SHARP-CUTOFF PENTODE

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:

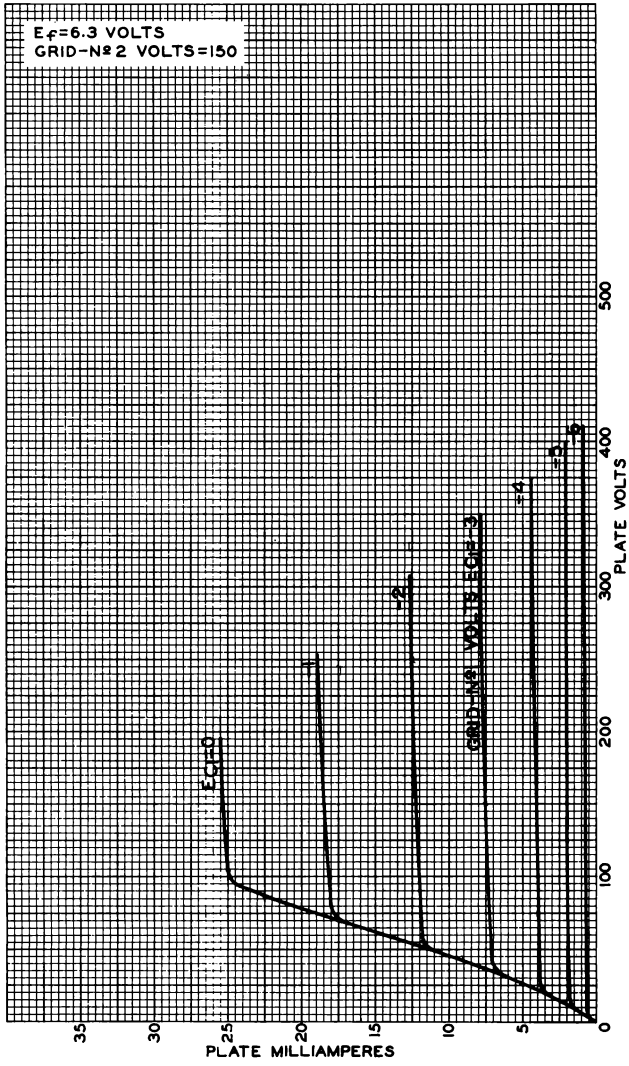
Plate Supply Voltage	200	volts
Grid No.3	*Connected to cathode at socket*	
Grid-No.2 Supply Voltage	150	volts
Cathode-Bias Resistor	180	ohms
Plate Resistance (Approx.)	0.6	megohm
Transconductance	6200	μmhos
Plate Current	9.5	ma
Grid-No.2 Current	2.8	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp	-10	volts
Grid-No.1 Voltage for transconductance of 600 μmhos (minimum) under condition with plate volts=150, grid-No.2 volts=150, and no cathode resistor	-5.5	volts

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

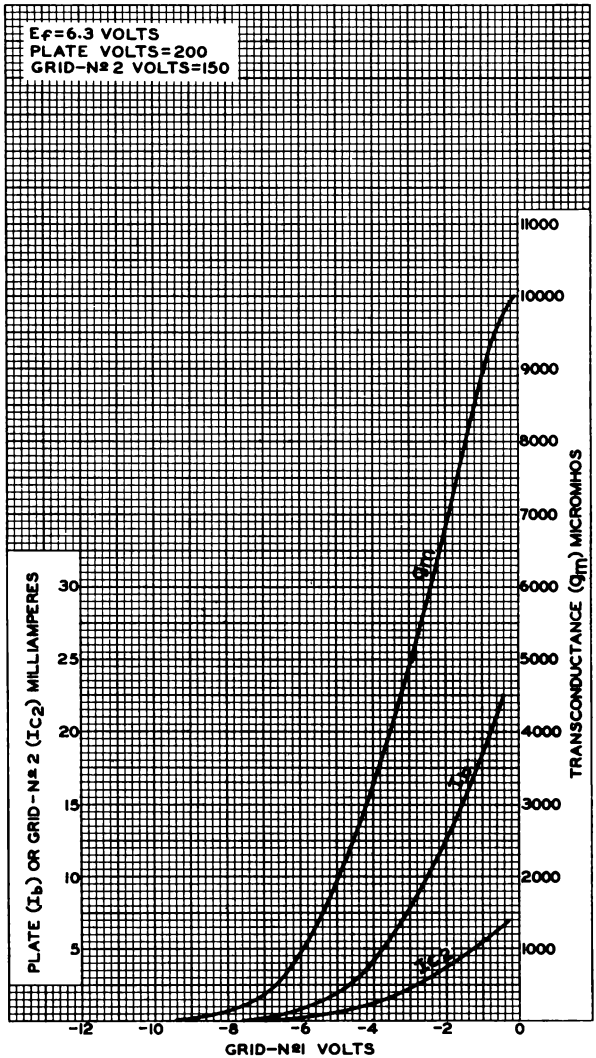
6DE6

AVERAGE PLATE CHARACTERISTICS



6DE6

AVERAGE CHARACTERISTICS



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.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	6.3	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	1.9	μμf

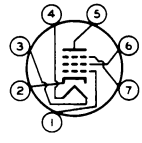
Characteristics, Class A_1 Amplifier:

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.)	0.35	megohm
Transconductance	9800	μmhos
Plate Current	12	ma
Grid-No.2 Current	3.8	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)
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_1

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.

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

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▲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

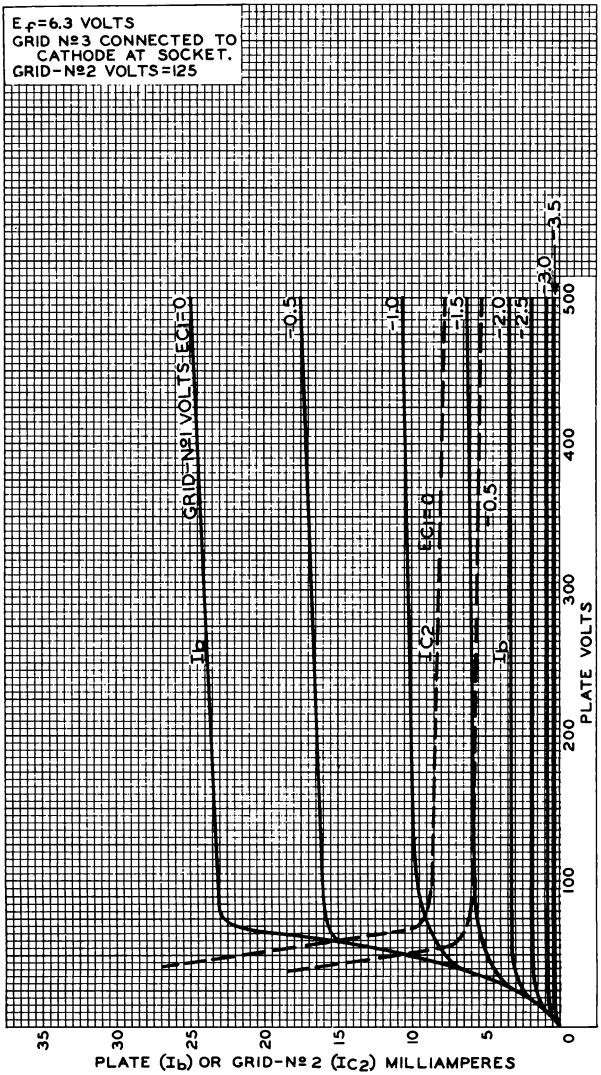
○ Without external shield.

▲ The dc component must not exceed 100 volts.

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

6DK6

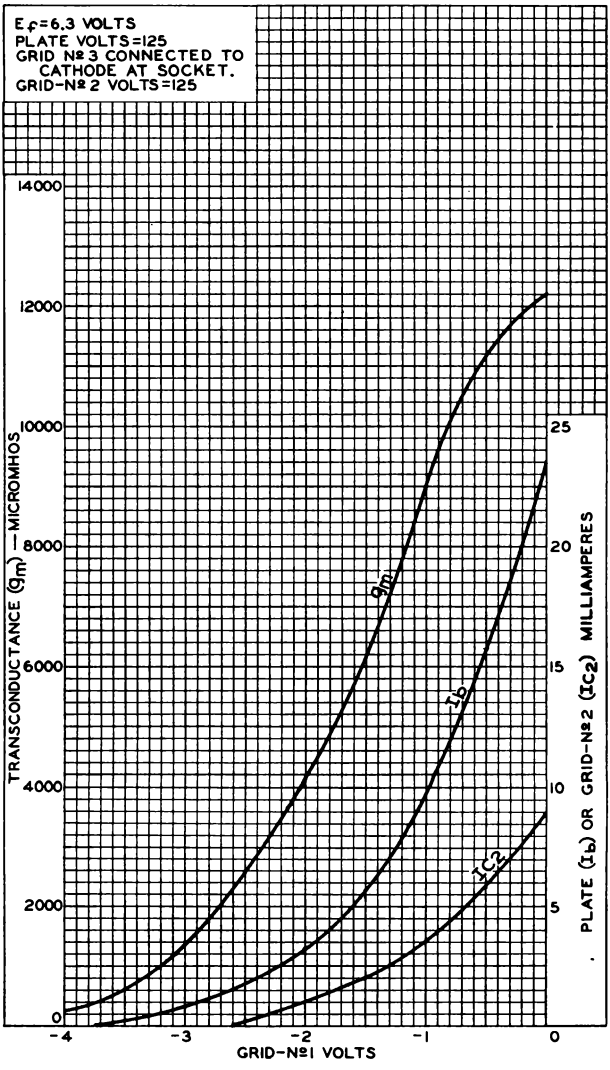
AVERAGE CHARACTERISTICS



6DK6

6DK6

AVERAGE CHARACTERISTICS



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

92CM-9852

6DT6

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

For FM detector service

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances (Approx.):°		
Grid No.1 to plate	0.02	μμf
Grid No.1 to cathode & internal shield, grid No.3, grid No.2, and heater	5.8	μμf
Grid No.3 to plate	1.4	μμf
Grid No.1 to grid No.3	0.1	μμf
Grid No.3 to cathode & internal shield, plate, grid No.2, grid No.1, and heater	6.1	μμf

Characteristics, Class A_1 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 current of 10 μamp	-4.5	volts
Grid-No.3 Voltage (Approx.) for plate current of 10 μamp	-3.5	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" ± 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	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

° With external shield JETEC No.316 connected to cathode.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6DT6

SHARP-CUTOFF PENTODE

FM DETECTOR SERVICE

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300 max.	volts
GRID-No.3 (SUPPRESSOR) VOLTAGE	25 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*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
PLATE DISSIPATION	1.5 max.	watts
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 150 volts	1 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▲max.	volts

Maximum Circuit Values:

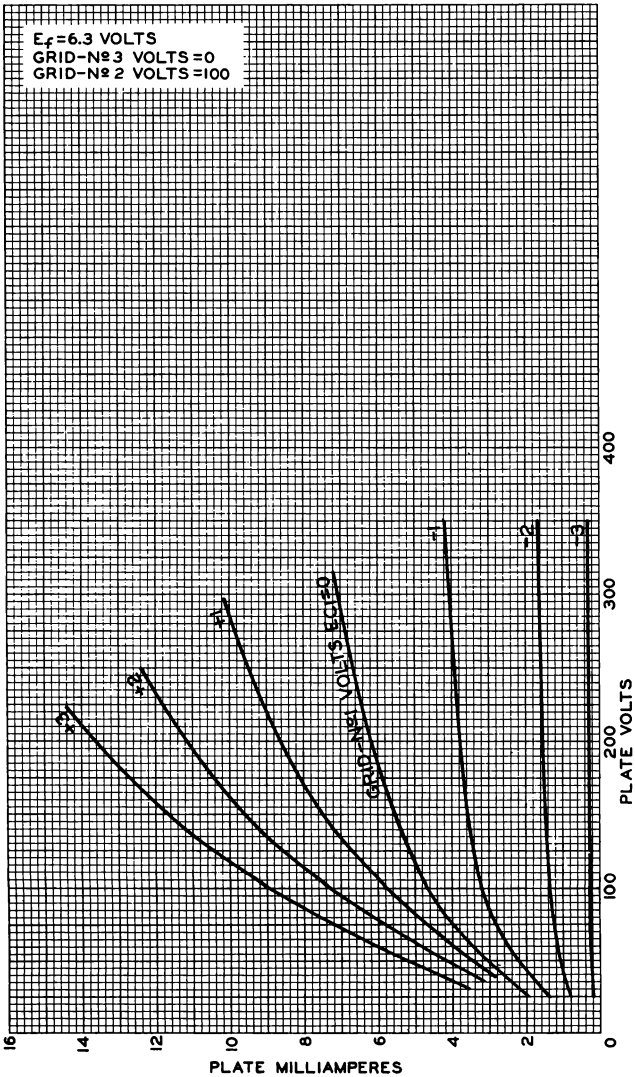
Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.25 max.	megohm
For cathode-bias operation	0.5 max.	megohm

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6DT6

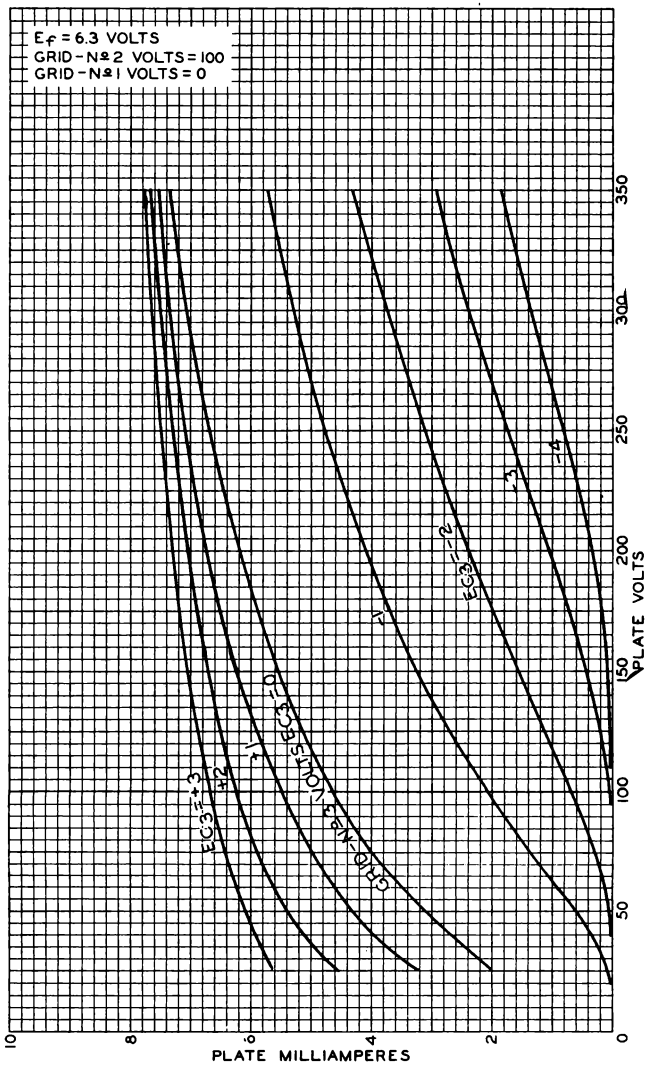
AVERAGE PLATE CHARACTERISTICS



6DT6

6DT6

AVERAGE PLATE CHARACTERISTICS

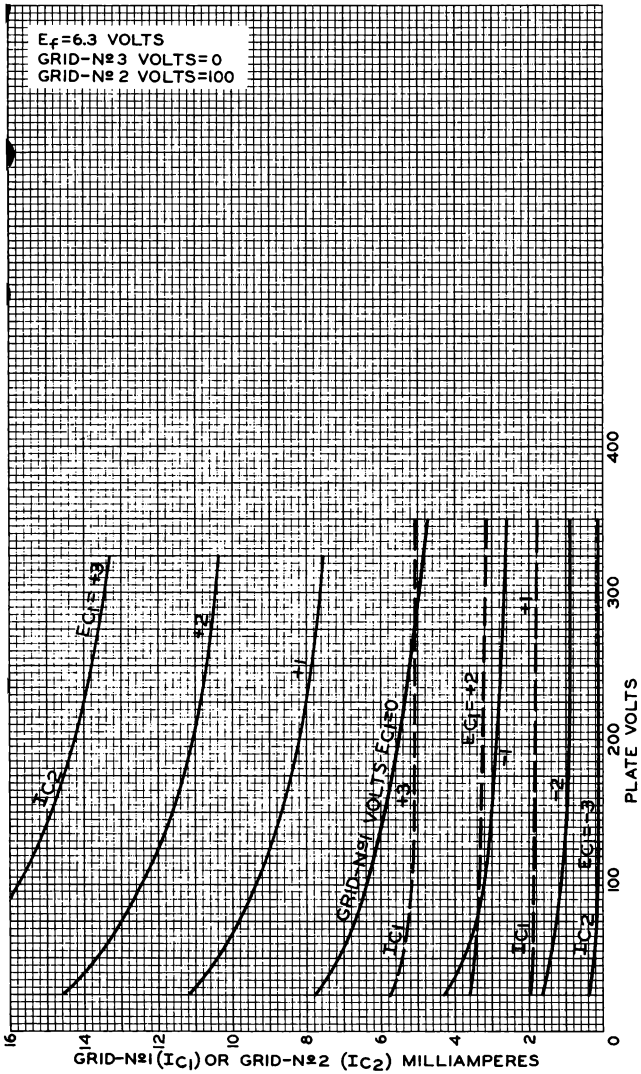


TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8830

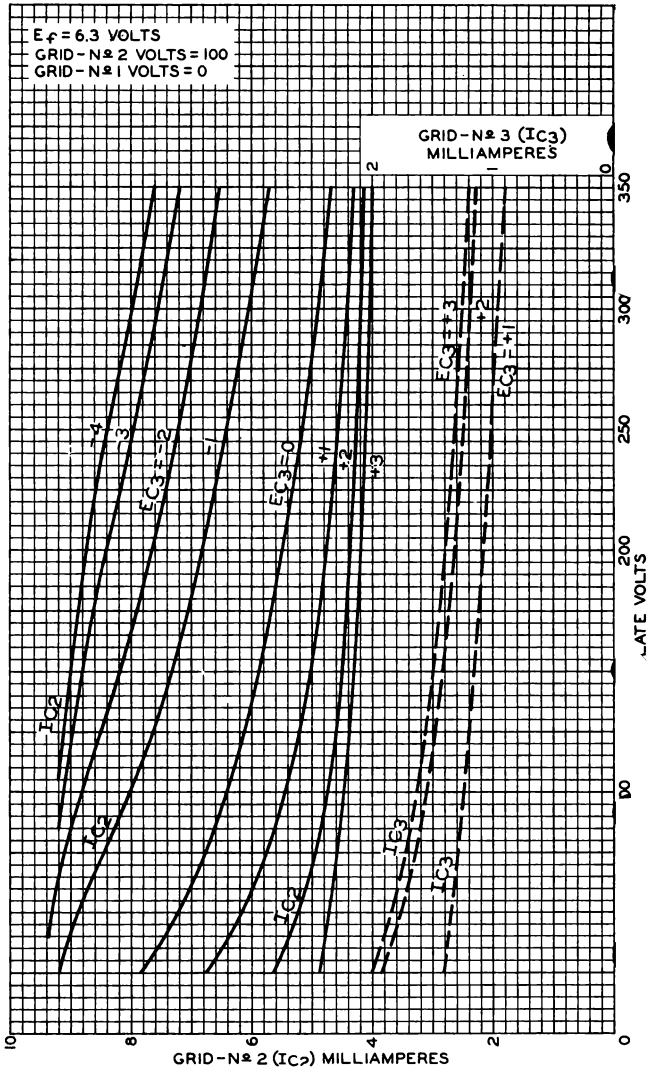
6DT6

AVERAGE CHARACTERISTICS



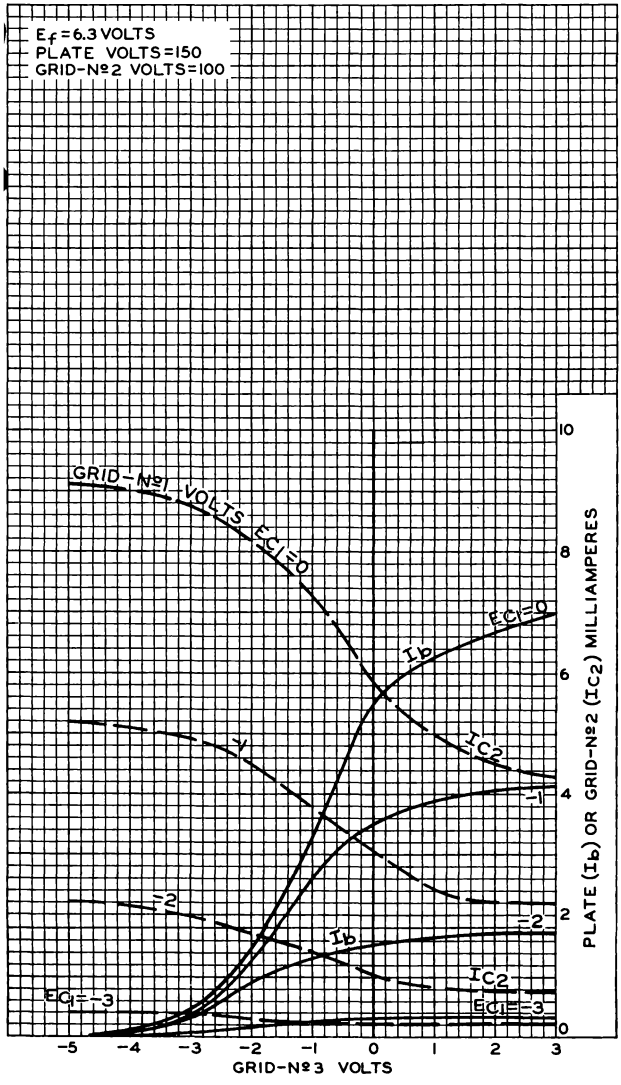
6DT6

AVERAGE CHARACTERISTICS



6DT6

AVERAGE CHARACTERISTICS

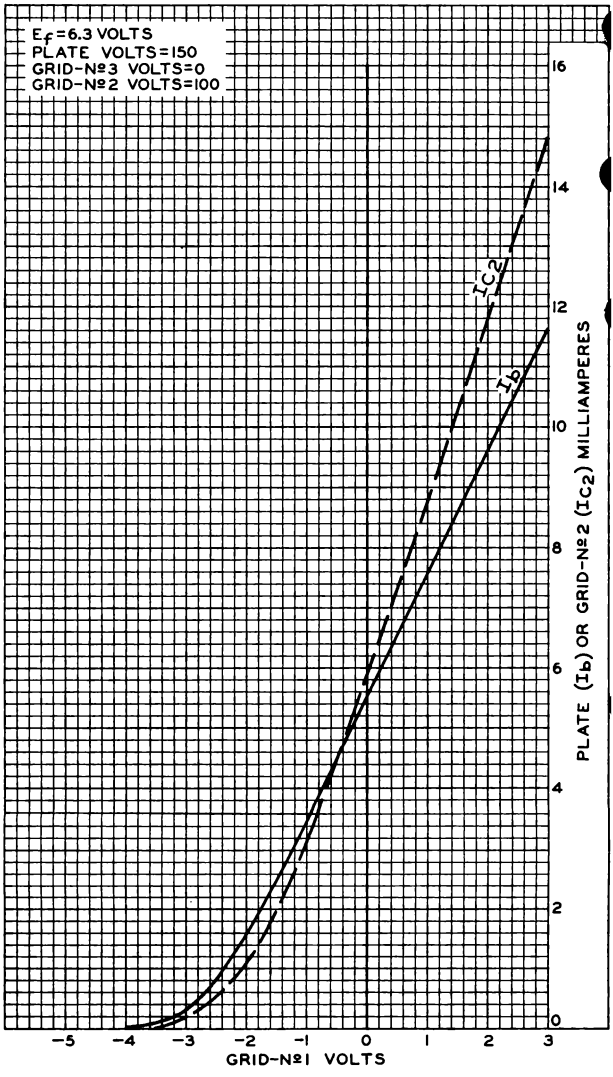


TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8826

6DT6

AVERAGE CHARACTERISTICS



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

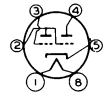
92CM-8825

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: ←

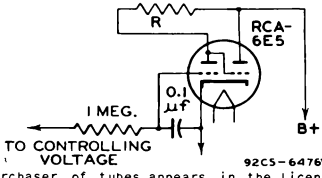
Plate and Target Supply	125	250	volts
Series Triode-Plate Resistor**	1	1	megohm
Target Current*** †	0.8	2	ma.
Triode-Plate Current***	0.1	0.2	ma.
Triode-Grid Voltage (Approx.):			
For shadow angle of 0°	-4.0	-7.5	volts
For shadow angle of 90°	0	0	volts

* 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.

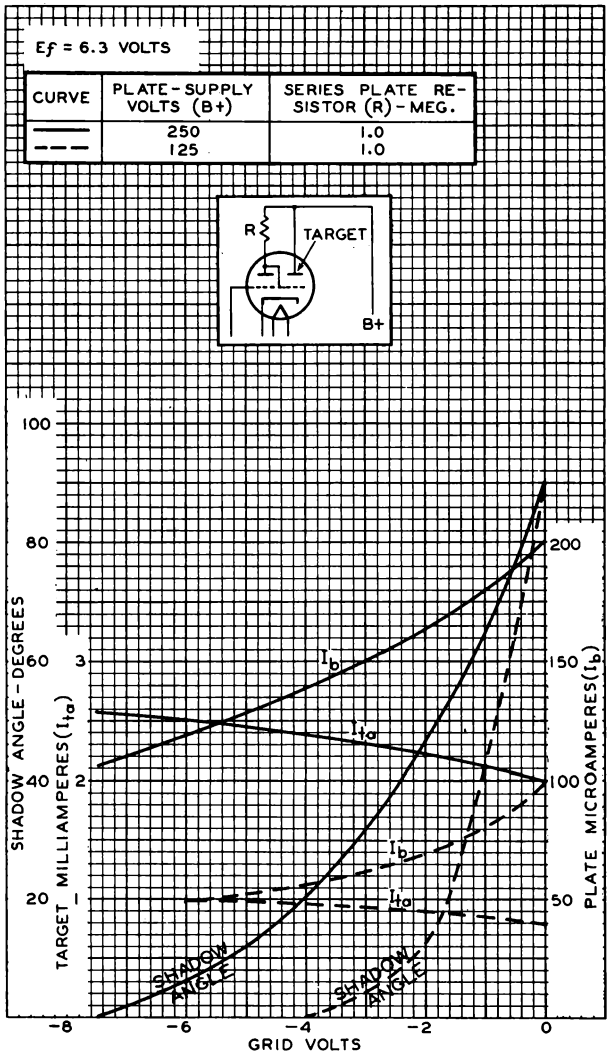


92CS-6476V

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.

6E5

AVERAGE CONTROL CHARACTERISTICS



6E6

TWIN-TRIODE POWER AMPLIFIER

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.6	amp.
Maximum Overall Length		4-11/16"
Maximum Seated Height		4-1/16"
Maximum Diameter		1-13/16"
Bulb		ST-14
Base		Medium 7-Pin
Pin 1 - Heater		Pin 5 - Grid T_1
Pin 2 - Plate T_2		Pin 6 - Plate T_1
Pin 3 - Grid T_2		Pin 7 - Heater
Pin 4 - Cathode		
Mounting Position		Any

BOTTOM VIEW (7B)

For convenience, one triode is identified as T_1; the other as T_2.

PUSH-PULL AMPLIFIER - Each Unit

Plate Voltage		250 max.	volts
Typical Operation and Characteristics-Class A_1 Amplifier:			
Plate	180	250	volts
Grid ▲	-20	-27.5	volts
Amp. Fact.	6	6	
Plate Res.	4300	3500	ohms
Transcond.	1400	1700	µmhos
Plate Cur.	11.5	18	ma.
Effec. Load Res. (plate-to-plate)	15000*	14000**	ohms
Max.-Sig. Power Output #	0.75	1.6	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-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.

* For parallel operation: load resistance = 3750 ohms.

** For parallel operation: load resistance = 3500 ohms.

\# For both triode units.

6E7

TRIPLE-GRID SUPER-CONTROL AMPLIFIER

RENEWAL TYPE FOR MAJESTIC RECEIVERS

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Overall Length		4-11/16" to 4-15/16"
Seated Height		4-1/16" to 4-5/16"
Maximum Diameter (without shield)		1-9/16"
Bulb (with form-fitting shield)		ST-12
Cap		Small Metal
Base ▲		Small 7-Pin
Pin 1 - Heater		Pin 5 - External Shield
Pin 2 - Plate		Pin 6 - Cathode
Pin 3 - Screen		Pin 7 - Heater
Pin 4 - Suppressor		Cap - Grid

BOTTOM VIEW (7H)

■ 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 a different socket than the medium 7-pin base.

Typical Operating Conditions and Curves for the 6E7 are the same as for type 6U7-G.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

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°*	
Triode Unit:			
Grid to plate	1.7	1.7	μμf
Grid to cathode and heater	3	3.2	μμf
Plate to cathode and heater	0.3	1.1	μμf
Pentode Unit:			
Grid No.1 to plate	0.02 max.	0.01 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid-No.2, and heater	5	5	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.6	3.4	μμf
Heater to cathode	3	3●	μμf

Characteristics, Class A_1 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	80000	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

°,●: See next page.

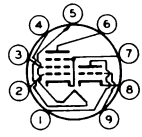
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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:*

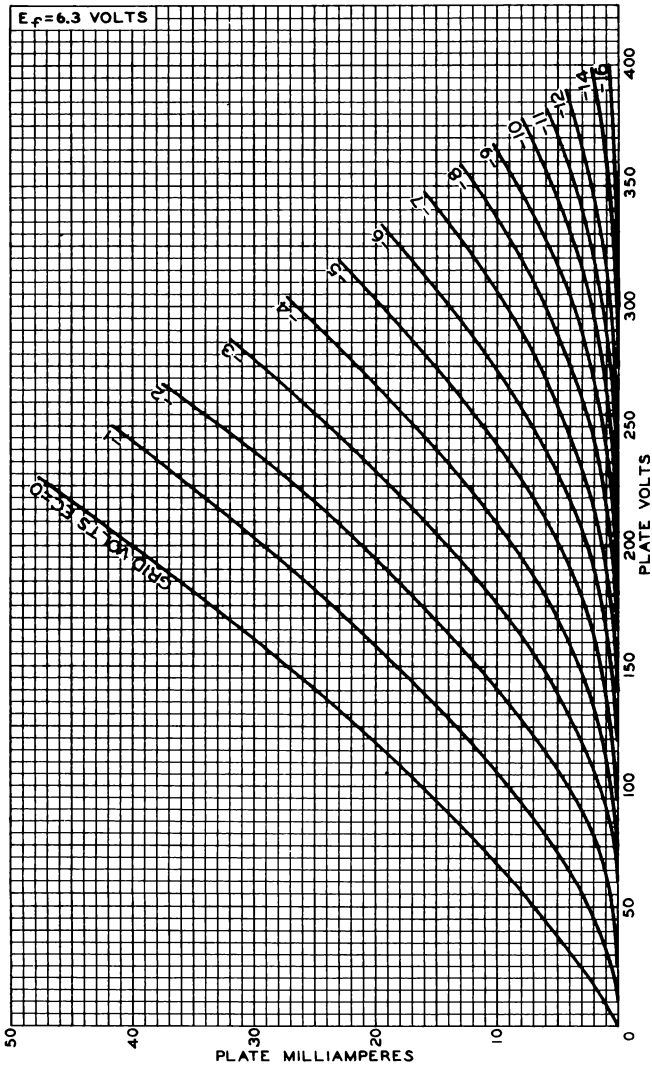
	Triode Unit as Osc.	*Pentode Unit as Mixer*	
PLATE VOLTAGE	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE.	–	330 max.	volts
GRID-No.2 VOLTAGE	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE: Positive-bias value . . .	0 max.	0 max.	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	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▲ max.	200▲ 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

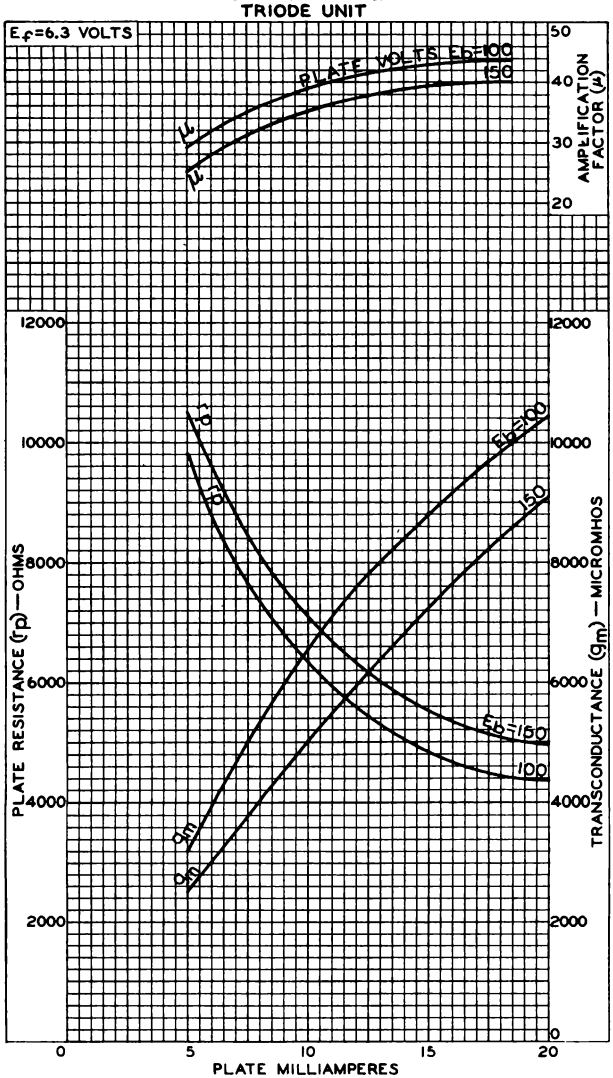


6EA8

6EA8

AVERAGE CHARACTERISTICS

TRIODE UNIT



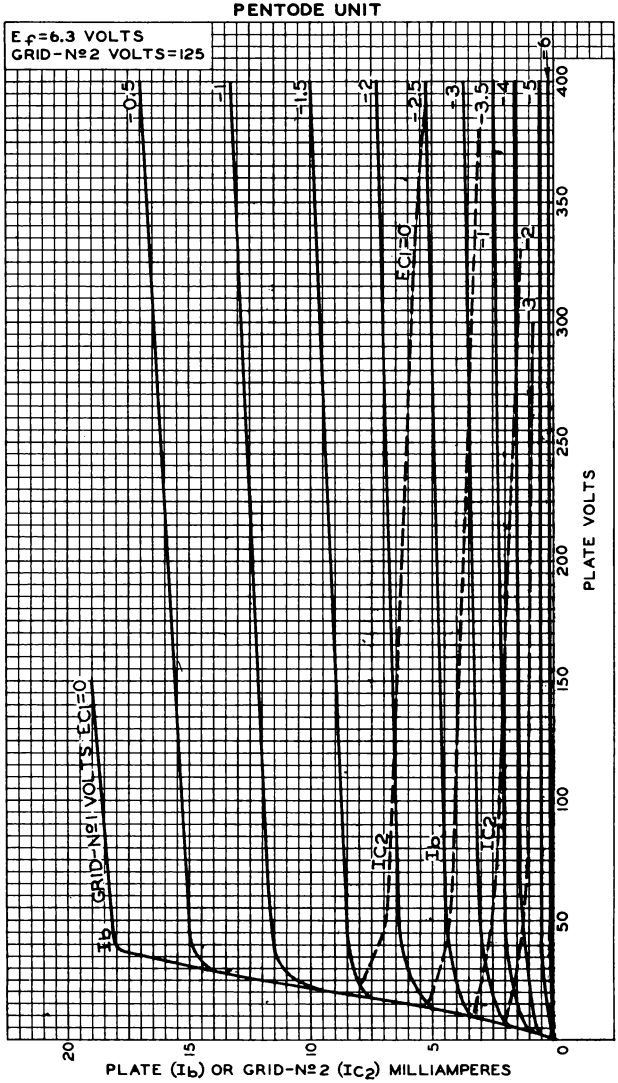
ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9882

6EA8

AVERAGE CHARACTERISTICS
PENTODE UNIT

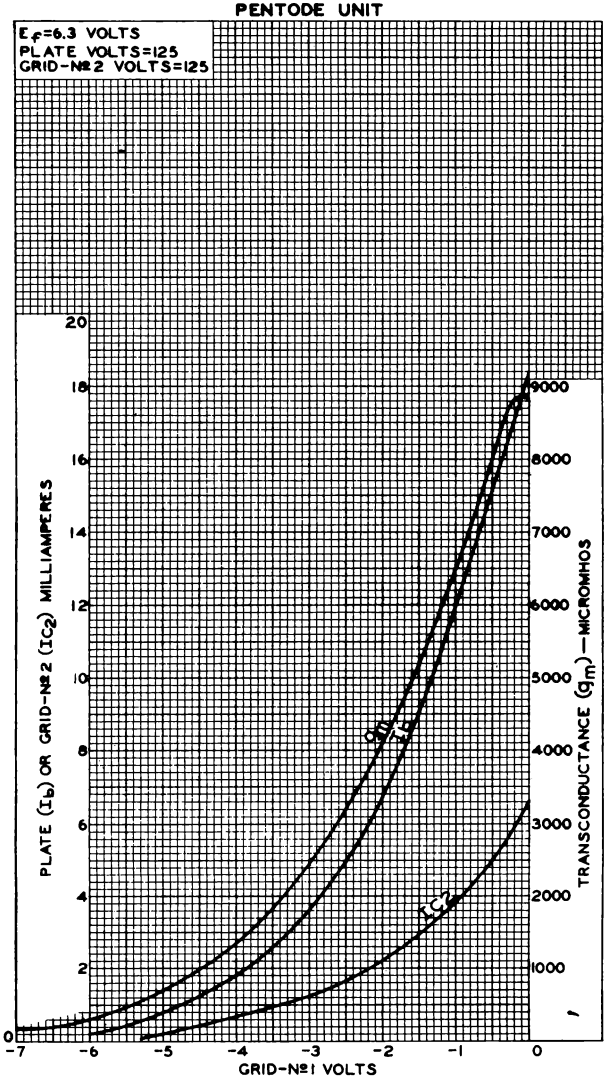


6EA8

6EA8

AVERAGE CHARACTERISTICS

PENTODE UNIT



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

92CM-9868

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°	6F5-GT°°	
Grid to Plate.	2.4	2.8 . .	μμf
Grid to Cathode.	5.5	2.2 . .	μμf
Plate to Cathode	4.0	3.2 . .	μμf

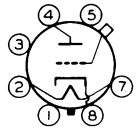
° With shell connected to cathode.
°° With no external shield.

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 .	$5M_1$	$G-5M_1$

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.

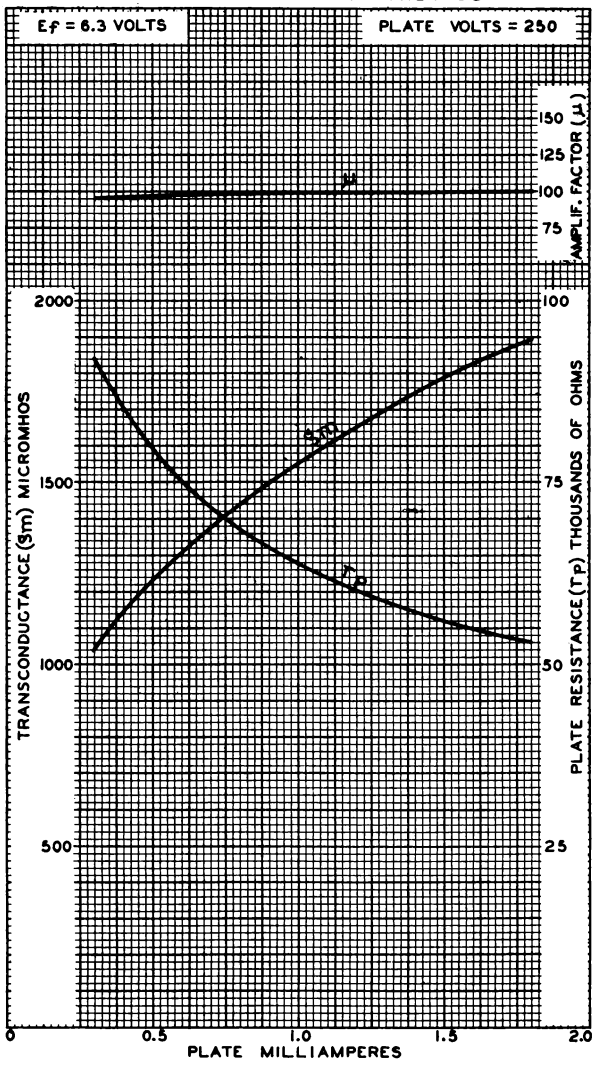
Curve under Type 6SF5 also applies to the 6F5 and 6F5-GT.

← Indicates a change.

6F5

6F5

AVERAGE CHARACTERISTICS



SEPT. 4, 1935

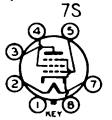
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-4470

6F6, 6F6-G

POWER AMPLIFIER PENTODE

Heater ■	Coated Unipotential Cathode		
Voltage	6.3		a-c or d-c volts
Current	0.7		amp.
Direct Interelectrode Capacitances (Approx.):			
	6F6	6F6-G	
Grid to Plate	0.2	0.5	μμf
Input	6.5	8.0	μμf
Output	13	6.5	μμf
Maximum Overall Length	3-1/4"	4-5/8"	
Maximum Seated Height •	2-11/16"	4-1/16"	
Maximum Diameter	1-5/16"	1-13/16"	
Bulb	Metal Shell, MT-8	ST-14	
Base	Small Wafer Octal 7-Pin	Medium Shell Octal 7-Pin	
Basing Designation	7S	G-7S	
Pin 1	6F6, Shell 6F6-G, No Con.		
Pin 2 - Heater			
Pin 3 - Plate			
Pin 4 - Screen			
Pin 5 - Grid			
Pin 7 - Heater			
Pin 8 - Cathode			
Mounting Position			Any



BOTTOM VIEW

Maximum Ratings Are Design-Center Values

SINGLE-TUBE AMPLIFIER (Pentode Connection)

Plate Voltage	375 max.	volts
Screen Voltage	285 max.	volts
Plate Dissipation	11 max.	watts
Screen Dissipation	3.75 max.	watts

Typical Operation and Characteristics - Class A_1 Amplifier:♣

	Fixed Bias		Cathode Bias		
Plate	250	285	250	285	volts
Screen	250	285	250	285	volts
Grid*	-16.5	-20	-	-	volts
Cathode Resistor	-	-	410	440	ohms
Peak A-F Grid Volt.	16.5	20	16.5	20	volts
Zero-Sig. Plate Cur.	34	38	34	38	ma.
Max.-Sig. Plate Cur.	36	40	35	38	ma.
Zero-Sig. Screen Cur.	6.5	7	6.5	7	ma.
Max.-Sig. Screen Cur.	10.5	13	9.7	12	ma.
Plate Res. (approx.)	80000	78000	-	-	ohms
Transconductance	2500	2550	-	-	μmhos
Load Resistance	7000	7000	7000	7000	ohms
Tot. Harmonic Dist.	8	9	8.5	9	%
Max.-Sig. Power Output	3.2	4.8	3.1	4.5	watts

SINGLE-TUBE AMPLIFIER (Triode Connection)†

Plate Voltage	350 max.	volts
Plate & Screen Dissipation (Total)	10 max.	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.

o With shell connected to cathode.

∞ With no external shield.

♣, *, †: See next page.

← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6F6, 6F6-G

POWER AMPLIFIER PENTODE

(continued from preceding page)

Typical Operation and Characteristics - Class A_1 Amplifier:♣

	Fixed Bias	Cathode Bias	
Plate	250	250	volts
Grid*	-20	-	volts
Cathode Resistor	-	650	ohms
Peak A-F Grid Voltage	20	20	volts
Zero-Sig.Plate Cur.	31	31	ma.
Max.-Sig.Plate Cur.	34	32	ma.
Plate Resistance	2600	-	ohms
Amp. Factor	6.8	-	
Transconductance	2600	-	µmhos
Load Resistance	4000	4000	ohms
Total Harmonic Dist.	6.5	6.5	%
Max.-Sig.Power Output	0.85	0.8	watt

PUSH-PULL AMPLIFIER (Pentode Connection)

Plate Voltage	375 max.	volts
Screen Voltage	285 max.	volts
Plate Dissipation	11 max.	watts
Screen Dissipation	3.75 max.	watts

Typical Operation - Class A_1 Amplifier:♣

Unless otherwise specified, values are for 2 tubes

	Fixed Bias	Cathode Bias	
Plate	315	315	volts
Screen	285	285	volts
Grid*	-24	-	volts
Cathode Resistor	-	320	ohms
Peak A-F Grid-to-Grid Voltage	48	58	volts
Zero-Sig.Plate Cur.	62	62	ma.
Max.-Sig.Plate Cur.	80	73	ma.
Zero-Sig.Screen Cur.	12	12	ma.
Max.-Sig.Screen Cur.	19.5	18	ma.
Effective Load Resistance (plate to plate)	10000	10000	ohms
Total Harmonic Dist.	4	3	%
Max.-Sig.Power Output	11	10.5	watts

PUSH-PULL AMPLIFIER (Pentode Connection)

Plate Voltage	375 max.	volts
Screen Voltage	285 max.	volts
Plate Dissipation	11 max.	watts
Screen Dissipation	3.75 max.	watts

Typical Operation - Class AB_2 Amplifier:●

Unless otherwise specified, values are for 2 tubes

	Fixed Bias	Cathode Bias	
Plate	375	375	volts

♣ Subscript 1 indicates that grid current does not flow during any part of input cycle.
● Subscript 2 indicates that grid current flows during some part of input cycle.

*, †: See next page.

POWER AMPLIFIER PENTODE

(continued from preceding page)

	Fixed Bias	*Cathode Bias*	
Screen	250	250	volts
Grid*	-26	-	volts
Cathode Resistor▲	-	340	ohms
Peak A-F Grid-to-Grid Voltage	82	94	volts
Zero-Sig. Plate Cur.	34	54	ma.
Max.-Sig. Plate Cur.	82	77	ma.
Zero-Sig. Screen Cur.	5	8	ma.
Max.-Sig. Screen Cur.	19.5	18	ma.
Effective Load Resistance (plate to plate)	10000	10000	ohms
Total Harmonic Dist.	3.5	5	%
Max.-Sig. Power Output	18.5	19	watts

PUSH-PULL AMPLIFIER (Triode Connection)†

Plate Voltage	350 max.	volts
Plate & Screen Dissipation (Total)	10 max.	watts

Typical Operation - Class AB_2 Amplifier:●

Unless otherwise specified, values are for 2 tubes

	Fixed Bias	*Cathode Bias*	
Plate	350	350	volts
Grid*	-38	-	volts
Cathode Resistor #	-	730	ohms
Peak A-F Grid-to-Grid Voltage	123	132	volts
Zero-Sig. Plate Cur.	48	50	ma.
Max.-Sig. Plate Cur.	92	60	ma.
Effective Load Resistance (plate to plate)	6000	10000	ohms
Total Harmonic Dist.	2	3	%
Max.-Sig. Power Output	13	9	watts

* 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 as high as, but not greater than 0.5 megohm.

▲ The value given for the cathode resistor is determined for a grid bias of -21 volts.

† Screen connected to plate.

● Subscript 2 indicates that grid current flows during some part of input cycle.

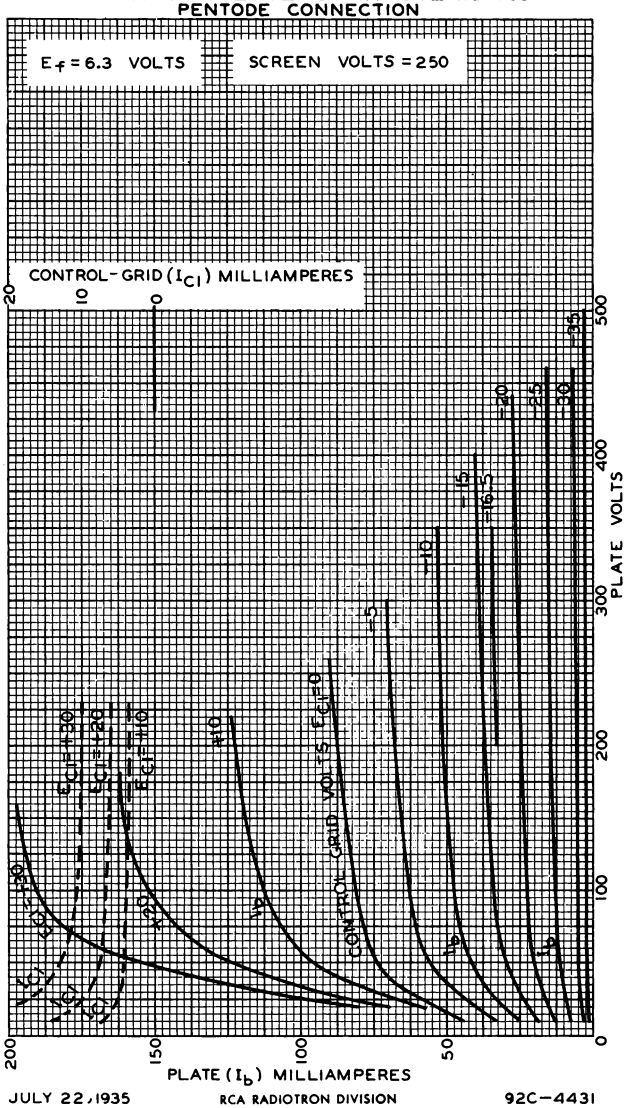
\# The value given for the cathode resistor is determined for a grid bias of -36.5 volts.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6F6

6F6

AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



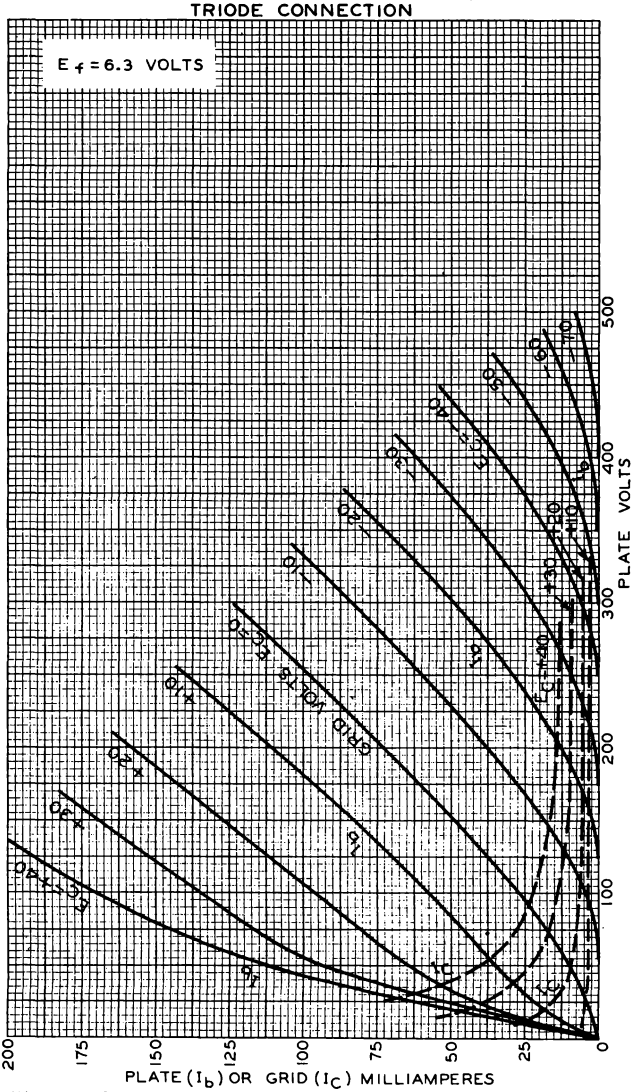
JULY 22, 1935

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4431

6F6

AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



6F6

6F6

OPERATION CHARACTERISTICS
PENTODE CONNECTION-CLASS AB OPERATION

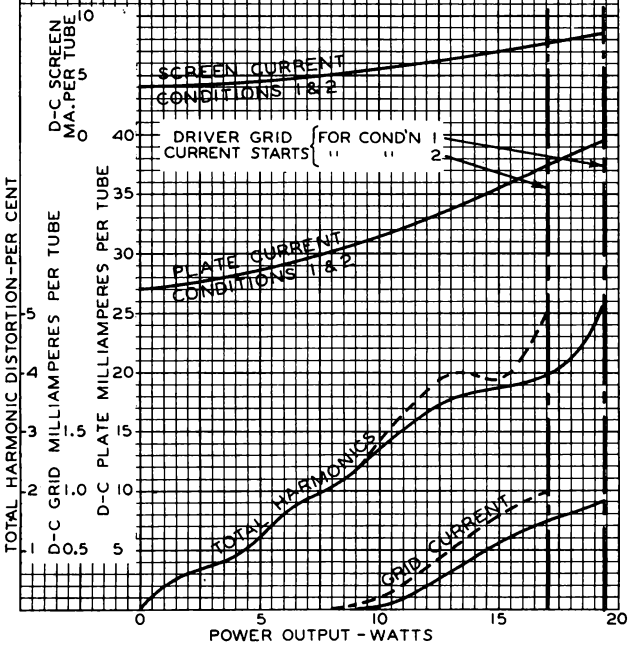
E_f = 6.3 VOLTS

INPUT STAGE : CLASS A DRIVER-ONE TYPE 6F6 AS TRIODE
PLATE VOLTS = 250
SELF-BIAS RESISTOR = 650 OHMS

OUTPUT STAGE : CLASS AB-TWO TYPE 6F6'S AS PENTODES
ZERO-SIGNAL PLATE VOLTS = 375, FROM SOURCE HAVING RESISTANCE (R_b) SHOWN IN TABLE
ZERO-SIGNAL SCREEN VOLTS = 250, FROM THE ABOVE 375-VOLT PLATE SUPPLY THROUGH RESISTANCE (R_d) SHOWN IN TABLE
ZERO-SIGNAL BIAS VOLTS = VALUE FROM GRID-BIAS RESISTOR (R_c) OF 340 OHMS
OUTPUT LOAD, PLATE TO PLATE = 10000 OHMS

CONDI-TION	CURVE	R_b Ohms	R_d Ohms	DRIVER STAGE Input-Sig. Volts* (RMS)	DRIVER STAGE Plate Load Ohms	INTERSTAGE TRANSFORMER Voltage Ratio Prim.:1/2 Sec.	INTERSTAGE TRANSFORMER Peak Power Efficiency %
1	———	0	0	14.6	51100	2.50:1	47.7
2	- - -	1000	2000	10.3	33100	1.74:1	64.4

* For maximum output



Cunningham Radiotron

6F7

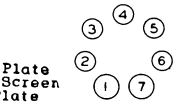
RCA-6F7
TRIODE-PENTODE

Heater *	Coated Uni-potential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.

Direct Interelectrode Capacitances:

Triode Unit:		
Grid to Plate	2.0	µµf
Grid to Cathode	2.5	µµf
Plate to Cathode	3.0	µµf
Pentode Unit:		
Grid to Plate	0.008 max.⊙	µµf
Input	3.2	µµf
Output	12.5	µµf

Overall Length	4-9/32" to 4-17/32"
Maximum Diameter	1-9/16"
Bulb	ST-12
Cap	Small Metal
Base	Small 7-Pin △
Pin 1-Heater	Pin 5-Triode Grid
Pin 2-Pentode Plate	Pin 6-Cathode
Pin 3-Pentode Screen	Pin 7-Heater
Pin 4-Triode Plate	Cap -Pentode Grid



BOTTOM VIEW

AMPLIFIER SERVICE

	Triode Unit	Pentode Unit		
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	2900000	8500000	ohms
Mut. Cond.	500	1050	1100	µmhos
Mut. Cond. at -35 volts bias	-	9	10	µmhos
Plate Cur.	3.5	6.3	6.5	ma.
Screen Cur.	-	1.6	1.5	ma.

CONVERTER SERVICE

	Triode Unit	Pentode Unit	
Plate Voltage	100 max.	250 max.	volts
Screen Voltage	-	100 max.	volts
Grid Voltage	##	-3 min.**	volts
Oscillator Plate Cur. (av.)	4 max.	-	ma.
Typical Operation:			
Plate	100 °	250	volts
Screen	-	100	volts
Grid Bias	##	-10 °°	volts
Plate Resistance	-	2	megohms
Conversion Conductance	-	300	µmhos
D-c Plate Current	2.4	2.8	ma.
D-c Grid Current	0.15	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.

6F7

Cunningham Radiotron

RCA-6F7

TYPICAL CIRCUITS

FREQUENCY CONVERTER

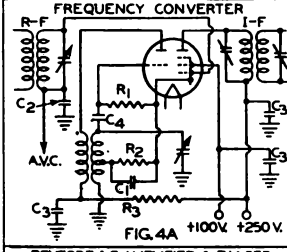


FIG. 4A

FREQUENCY CONVERTER

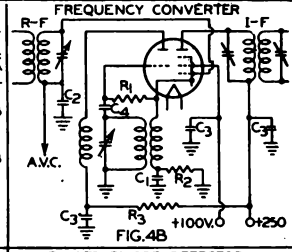


FIG. 4B

PENTODE I-F AMPLIFIER & BIASED TRIODE 2ND DETECTOR

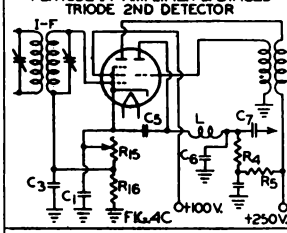


FIG. 4C

BIASED TRIODE DETECTOR & PENTODE AUDIO AMPLIFIER

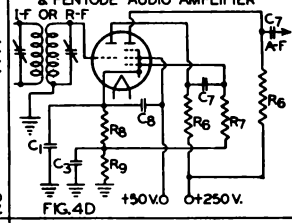


FIG. 4D

GRID-LEAK TRIODE DETECTOR & PENTODE AUDIO AMPLIFIER

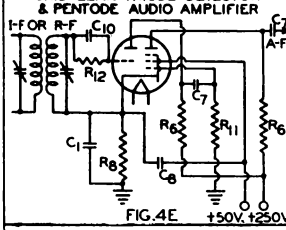


FIG. 4E

DIODE DETECTOR & PENTODE AUDIO AMPLIFIER WITH DELAYED A.V.C.

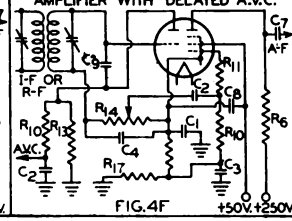


FIG. 4F

APPROXIMATE VALUES

C_1 = 5 µf
C_2 = 0.05 µf
C_3 = 0.1 µf
C_4 = 0.0002 µf
C_5 = 0.0024 µf
C_6 = 0.00016 µf
C_7 = 0.01 µf
C_8 = 0.5 µf
C_9 = 0.0005 TO 0.001 µf
C_{10} = 0.00025 µf
L = I-F CHOKE COIL
R_1 = OSCILLATOR GRID LEAK-0.1 MEGOHM

R_2 = PENTODE SELF-BIASING RESISTOR-1500 OHMS
R_3 = VOLTAGE DROPPING RESISTOR-50000 OHMS
R_4 = PLATE COUPLING RESISTOR-170000 OHMS
R_5 = FILTER RESISTOR-30000 OHMS
R_6 = PLATE COUPLING RESISTOR-300000 OHMS
R_7 = PENTODE GRID LEAK-0.5 MEGOHM
R_8 = PENTODE SELF-BIASING RESISTOR-5000 OHMS
R_9 = 10000 OHMS. R_9 + R_8 = TRIODE BIASING RESISTOR
R_{10} = FILTER RESISTOR-1.0 MEGOHM
R_{11} = GRID RESISTOR-500000 OHMS
R_{12} = TRIODE GRID LEAK-1.0 MEGOHM
R_{13} = A.V.C. DIODE LOAD-1.0 MEGOHM
R_{14} = A-F DIODE-LOAD POTENTIOMETER-0.5 MEGOHM
R_{15} = PENTODE SELF-BIASING RES. 4000 OHMS VAR.
R_{16} = 1500 OHMS. R_{16} + R_{15} = TRIODE BIASING RESISTOR

The license extended to the purchaser of tubes appears in the License Notice accompanying them. Information contained herein is furnished without assuming any obligations.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

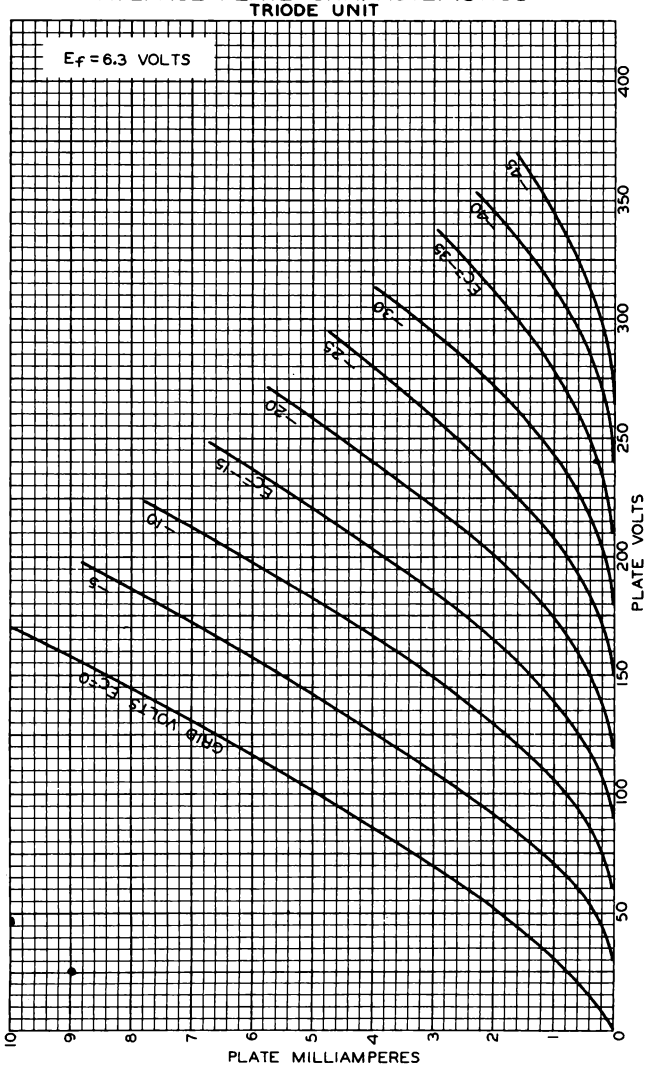
Radiotron RCA-6F7

Cunningham RADIO TUBES C-6F7

6F7

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



DEC. 5, 1933

925-5426

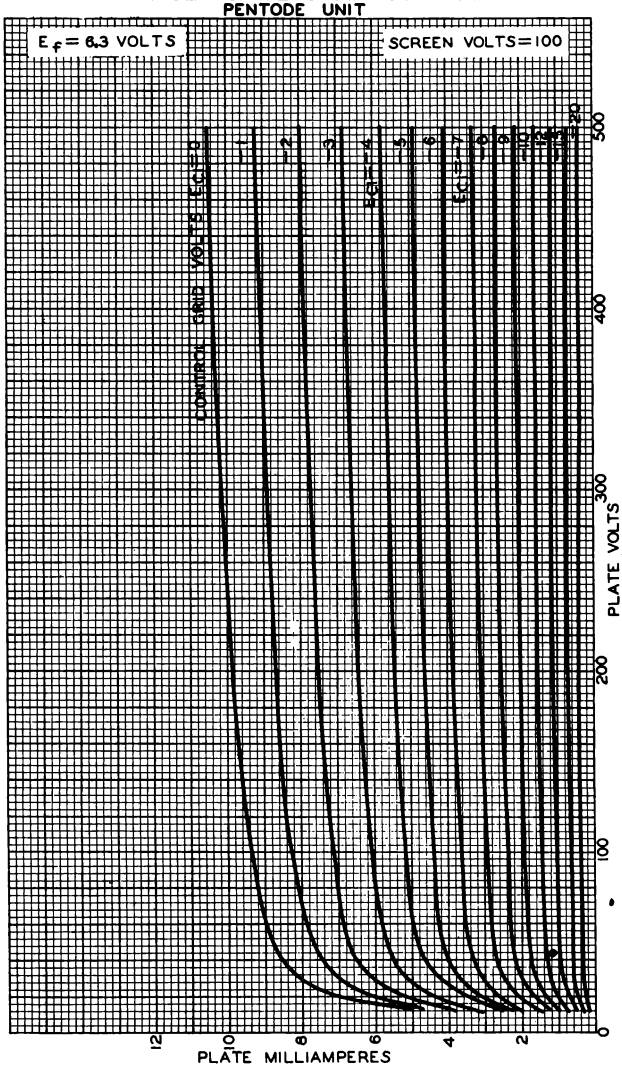
6F7

Radiotron RCA—6F7

Cunningham RADIO TUBES C—6F7

AVERAGE PLATE CHARACTERISTICS

PENTODE UNIT



AUG. 18, 1933

92S—5360

6F8-G

TWIN-TRIODE AMPLIFIFR

Heater■	Coated Unipotential Cathodes		
Voltage	6.3		a-c or d-c volts
Current	0.6		amp.
Direct Interelectrode Capacitances (Approx.):°			←
	Triode Unit f_1	*Triode Unit f_2*	
Grid to Plate	3.8	3.2	μμf
Grid to Cathode	3.2	1.9	μμf
Plate to Cathode	1.0	1.9	μμf
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_1
Pin 2 - Heater			Pin 7 - Heater
Pin 3 - Plate T_2			Pin 8 - Cathode T_1
Pin 4 - Cathode T_2			Cap - Grid T_2
Pin 5 - Grid T_1			
Mounting Position			Any

BOTTOM VIEW (G-8G)

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
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	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.

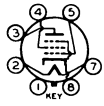
← Indicates a change.

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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.):°		
Grid to Plate	0.5	μμf
Input	5.5	μμf
Output	7.0	μμf
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_1 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	μmhos
Load Resistance	12000	10000	ohms
Total Harmonic Dist.	7.5	10	%
Max.-Sig. Power Output	0.6	1.1	watts

AMPLIFIER - Triode Connection▲

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_1 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	μmhos
Plate Current	11	ma.

← Indicates a change.

°, ▲, *: See next page.

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.

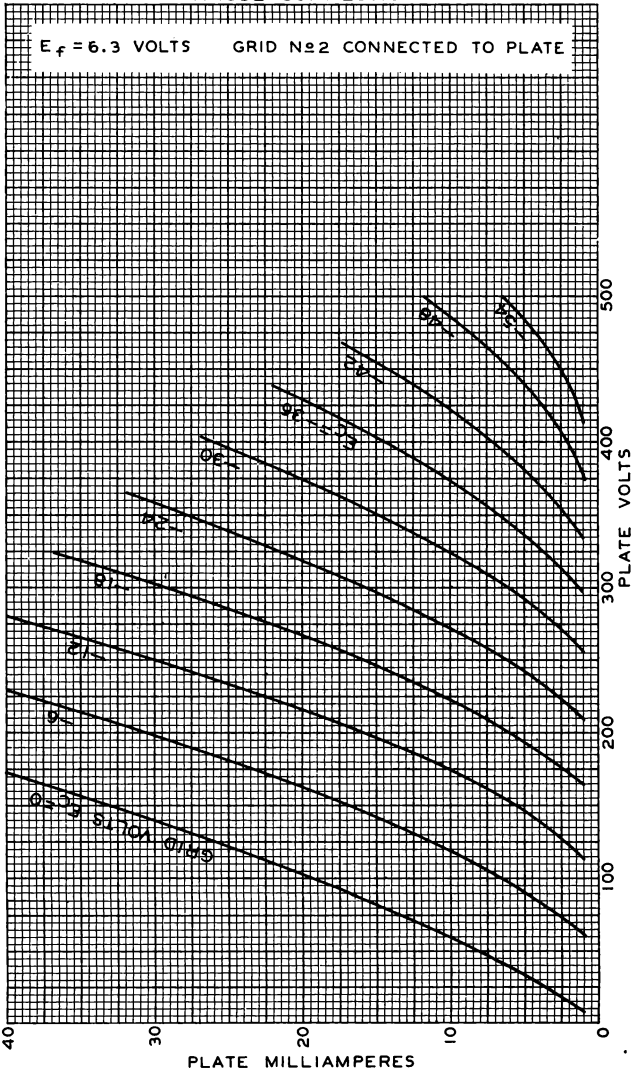
* Under maximum rated conditions, the d-c resistance in the grid circuit may be as high as 0.5 megohm with cathode bias or 0.1 megohm with fixed bias.

▲ With screen connected to plate.

6G6-G

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION



AUG. 12, 1943

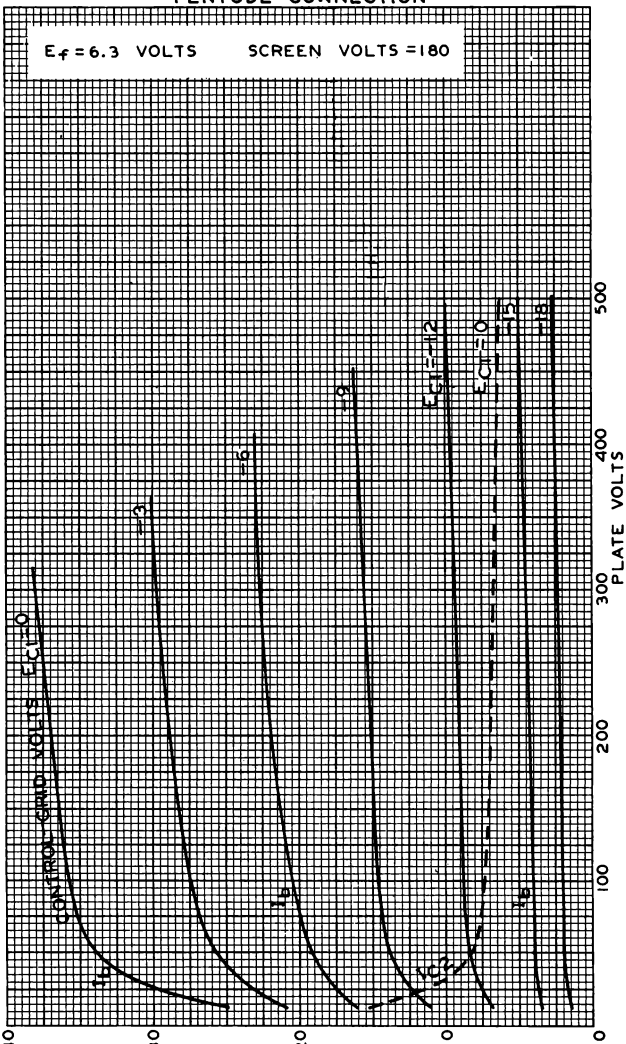
RCA VICTOR DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6122R1

6G6-G

6G6-G
AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



AUG. 19, 1943 RCA VICTOR DIVISION 92CM—4956R1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

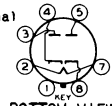
6H6, 6H6-GT/G

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.°			
Plate #1 to Cathode #1	3.0	3.0	μμf
Plate #2 to Cathode #2	3.4	4.0	μμf
Plate #1 to Plate #2	0.10 max.	0.10 max.	μμf
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	7Q	G-7Q	

Pin 1 — 6H6, Shell; 6H6-GT/G, Internal Shield
Pin 2 - Heater
Pin 3 - Plate #2



BOTTOM VIEW

Pin 4 - Cathode #2
Pin 5 - Plate #1
Pin 7 - Heater
Pin 8 - Cathode #1

RCA Socket — Stock No.9924 ←
Mounting Position — Any

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:**			←
A-C Plate Voltage per Plate (RMS)	117	150 max.	volts
Total Effect.Plate-Supply Impedance per Plate▲	15 min.	40 min.	ohms
D-C Output Current per Plate	8 max.	8 max.	ma.
As Voltage Doubler:			←

	Half-Wave	*Full-Wave*	
A-C Plate Voltage per Plate (RMS)	117	117	volts
Total Effect.Plate-Supply Impedance per Plate▲	30 min.	15 min.	ohms
D-C Output Current	8 max.	8 max.	ma.

° With shell or external and internal shields connected to cathodes.
* In half-wave service, the two units may be used separately or in parallel.
▲ 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.

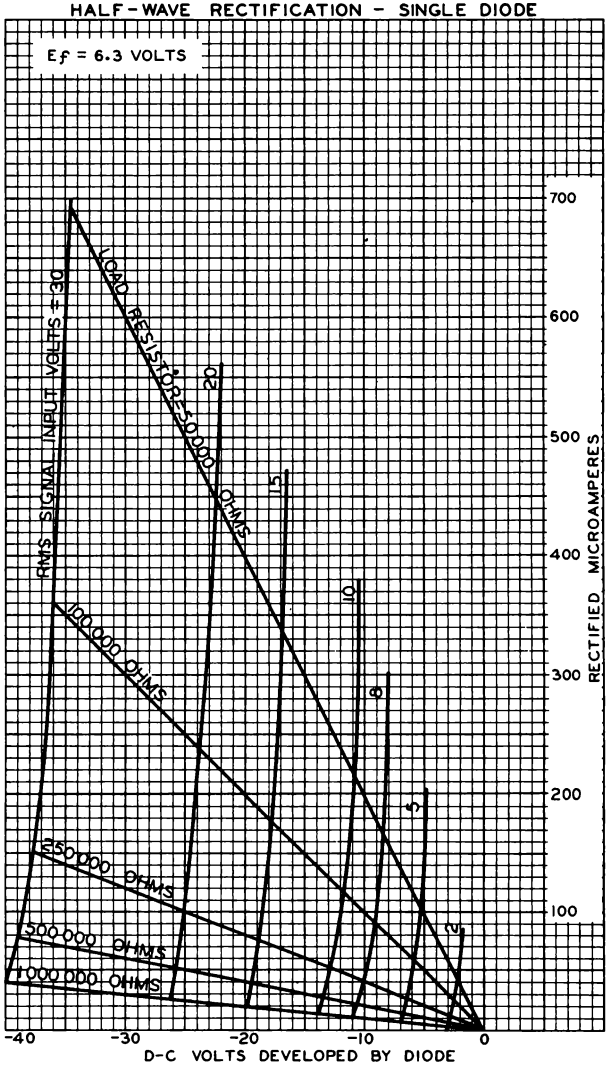
Circuits for the 6H6 and 6H6-GT/G are the same as those shown under Type 25Z5.

← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6H6

6H6
AVERAGE CHARACTERISTICS
HALF-WAVE RECTIFICATION - SINGLE DIODE



JULY 26, 1935

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4446

6J5, 6J5-GT
MEDIUM-MU TRIODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.3	amp

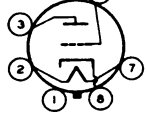
	6J5	6J5-GT	
Direct Interelectrode Cap. (Approx.):	–	▲▲	
Grid to Plate	3.4	3.8	μμf
Grid to Cathode	3.4	4.2	μμf
Plate to Cathode	3.6	5.0	μμf

▲▲ 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 A1

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

MEDIUM-MU TRIODE

Maximum Circuit Values:

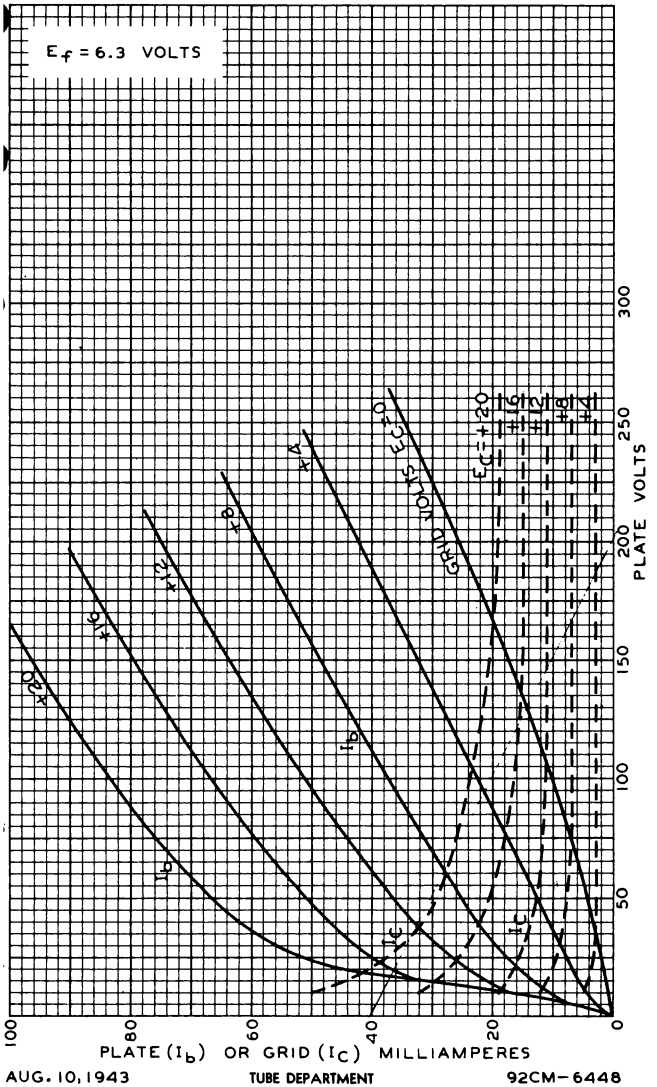
Grid-Circuit Resistance. . . . . 1.0 max. megohm

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART at the front of this Section.

6J5

AVERAGE PLATE CHARACTERISTICS

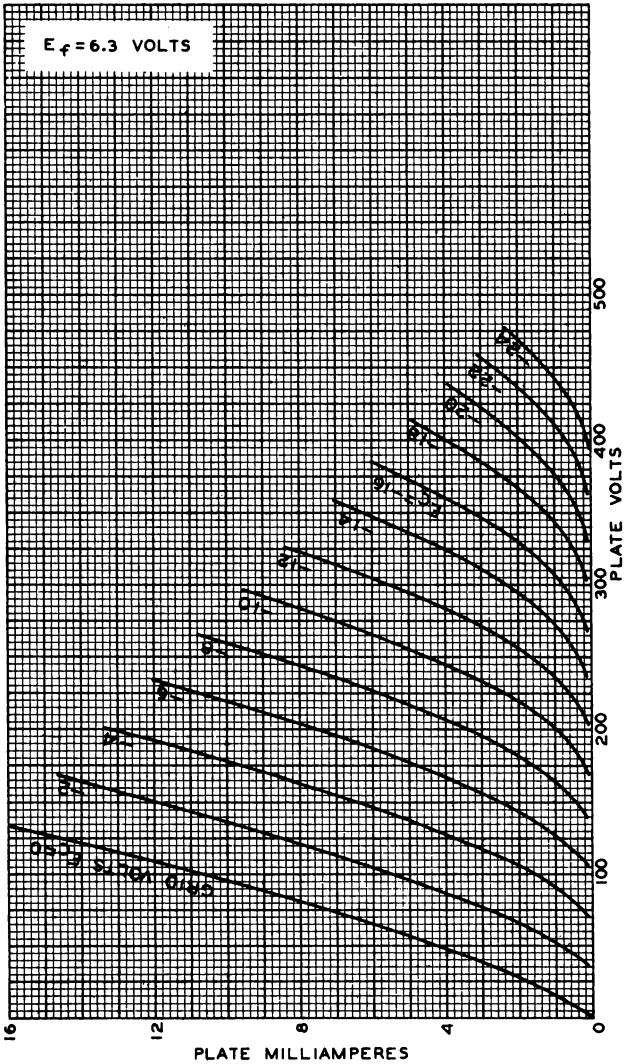


AUG. 10, 1943 TUBE DEPARTMENT 92CM-6448

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6J5

6J5
AVERAGE PLATE CHARACTERISTICS



APRIL 27, 1943

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-4771R1

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*°	
Unit No.1			
Grid to plate	1.6	1.5	μμf
Grid to cathode and heater	2.2	2.6	μμf
Plate to cathode and heater	0.4	1.6	μμf
Unit No.2			
Grid to plate	1.6	1.5	μμf
Grid to cathode and heater	2.2	2.6	μμf
Plate to cathode and heater	0.4	1.0	μμf

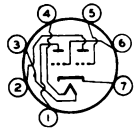
Characteristics, Class A1 Amplifier (Each Unit):

Plate Voltage	100	volts
Cathode-Bias Resistor■	50♦	ohms
Amplification Factor	38	
Plate Resistance	7100	ohms
Transconductance	5300	μmhos
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" ± 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	7BF

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



Pin 5 - Grid of Unit No.1
Pin 6 - Grid of Unit No.2
Pin 7 - Cathode

° With external shield JETEC No.316 connected to cathode.
■ Fixed-bias operation is not recommended.
♦ Value is for both units operating at the specified conditions.

← Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6J6

MEDIUM-MU TWIN TRIODE

AMPLIFIER - Class A_1

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

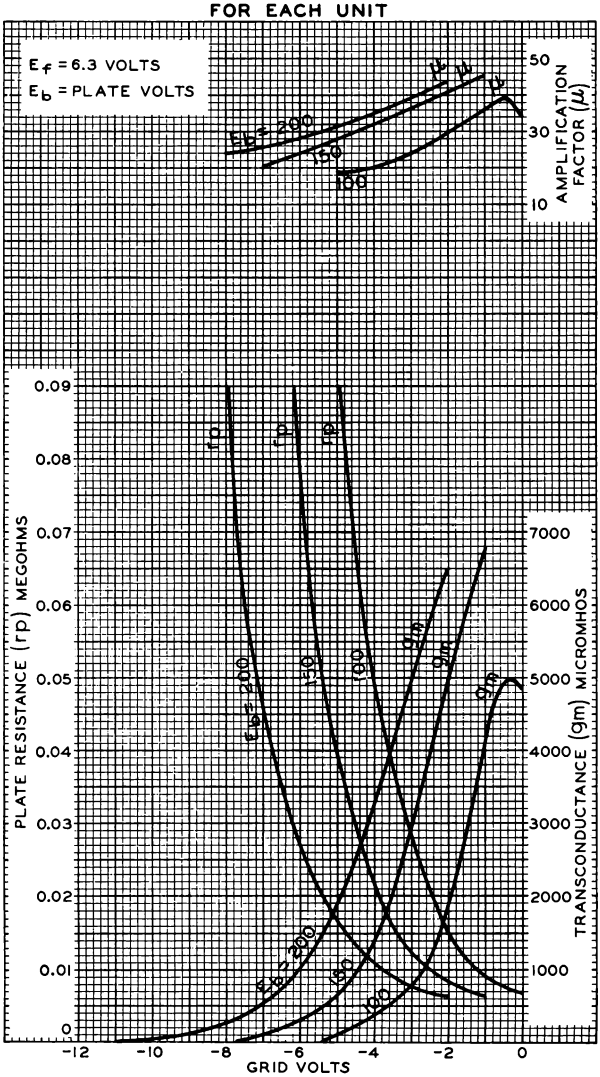
DC Plate Voltage	150	volts
DC Grid Voltage:		
From a fixed supply of	-10	volts
From a grid resistor of	625	ohms
From a cathode resistor of	220	ohms
DC Plate Current	30	ma
DC Grid Current (Approx.)*	16	ma
Driving Power (Approx.)*	0.35	watt
Useful Power Output (Approx.)	3.5	watts

● 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.

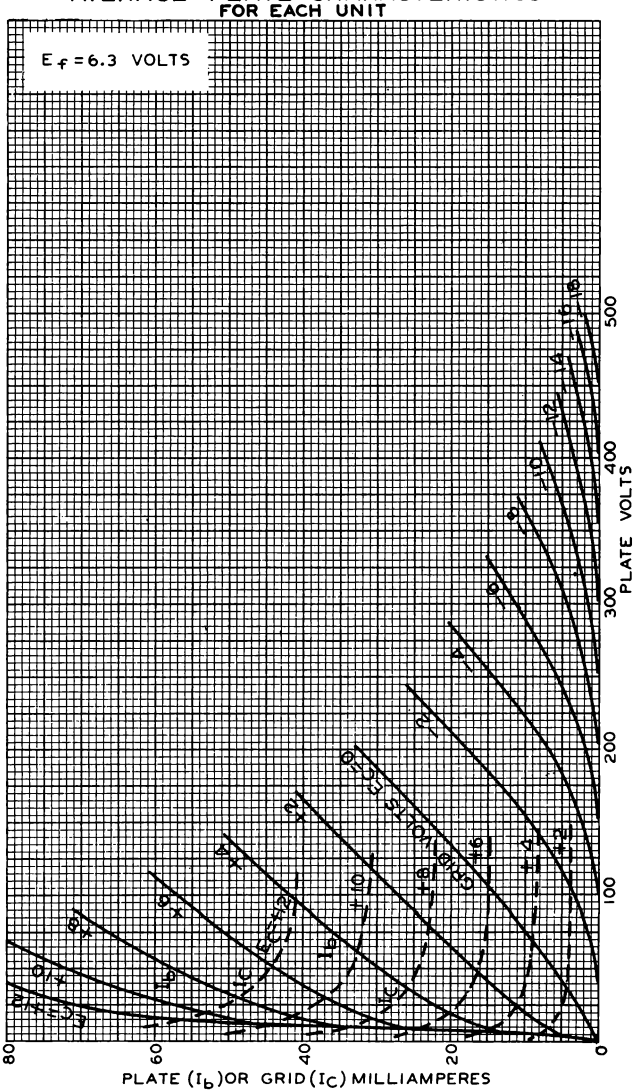
* For effect of load resistance on grid current and driving power, refer to *TUBE RATINGS-Grid Current and Driving Power* in the *General Section*.

→ Indicates a change.

6J6
AVERAGE CHARACTERISTICS
FOR EACH UNIT



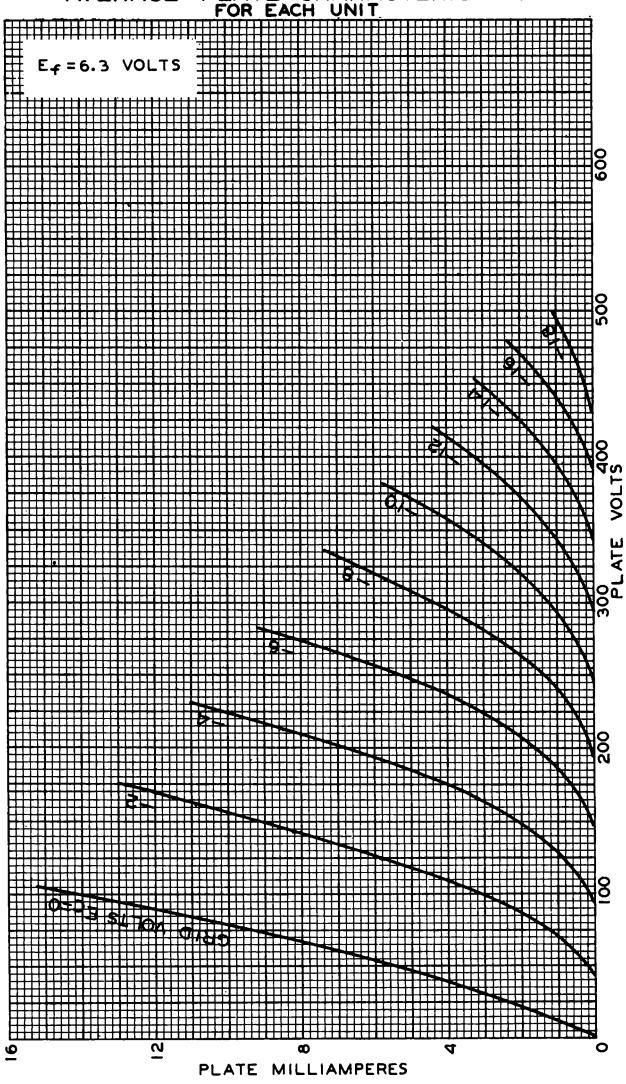
6J6
AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT


E_f = 6.3 VOLTS
PLATE VOLTS
0
100
200
300
400
500
PLATE (I_b) OR GRID (I_c) MILLIAMPERES
20
40
60
80
E_c = 0
E_c = -1
E_c = -2
E_c = -3
E_c = -4
E_c = -6
E_c = -9
E_c = -12
E_c = -16
E_c = -22
E_c = -32
E_c = -45
E_c = -64
E_c = -90
E_c = -128
E_c = -180
E_c = -256
E_c = -360
E_c = -512
E_c = -720
E_c = -1024
E_c = -1440
E_c = -2048
E_c = -2880
E_c = -4096
E_c = -5760
E_c = -8192
E_c = -11520
E_c = -16384
E_c = -23040
E_c = -32768
E_c = -46080
E_c = -65536
E_c = -92160
E_c = -131072
E_c = -184320
E_c = -262144
E_c = -368640
E_c = -524288
E_c = -737280
E_c = -1048576
E_c = -1474560
E_c = -2097152
E_c = -2949120
E_c = -4194304
E_c = -5898240
E_c = -8388608
E_c = -11796480
E_c = -16777216
E_c = -23592960
E_c = -33554432
E_c = -47185920
E_c = -67108864
E_c = -94371840
E_c = -134217728
E_c = -188743680
E_c = -268435456
E_c = -377487360
E_c = -536870912
E_c = -754974720
E_c = -1073741824
E_c = -1509949440
E_c = -2147483648
E_c = -3019898880
E_c = -4294967296
E_c = -6039797760
E_c = -8589934592
E_c = -12079595520
E_c = -17179869184
E_c = -24159191040
E_c = -34359738368
E_c = -48318382080
E_c = -68719476736
E_c = -96636764160
E_c = -137438953472
E_c = -193273528320
E_c = -274877906944
E_c = -386547056640
E_c = -549755813888
E_c = -773094113280
E_c = -1099511627776
E_c = -1546188226560
E_c = -2199023255552
E_c = -3092376453120
E_c = -4398046511104
E_c = -6184752906240
E_c = -8796093022208
E_c = -12369505812480
E_c = -17592186044416
E_c = -24739011624960
E_c = -35184372088832
E_c = -49478023249920
E_c = -70368744177664
E_c = -98956046499840
E_c = -140737488355328
E_c = -197912092999680
E_c = -281474976710656
E_c = -395824185999360
E_c = -562949953421312
E_c = -791648371998720
E_c = -1125899906842624
E_c = -1583296743997440
E_c = -2251799813685248
E_c = -3166593487994880
E_c = -4503599627370496
E_c = -6333186975989760
E_c = -9007199254740992
E_c = -12666373951979520
E_c = -18014398509481984
E_c = -25332747903959040
E_c = -36028797018963968
E_c = -50665495807918080
E_c = -72057594037927936
E_c = -101330991615836160
E_c = -144115188075855872
E_c = -202661983231672320
E_c = -288230376151711744
E_c = -405323966463344640
E_c = -576460752303423488
E_c = -810647932926689280
E_c = -1152921504606846976
E_c = -1621295865853378560
E_c = -2305843009213693952
E_c = -3242591731706757120
E_c = -4611686018427387904
E_c = -6485183463413514240
E_c = -9223372036854775808
E_c = -12970366926827028480
E_c = -18446744073709551616
E_c = -25940733853654056960
E_c = -36893488147419103232
E_c = -51881467707308113920
E_c = -73786976294838206464
E_c = -103762935414616227840
E_c = -147573952589676412928
E_c = -207525870829232455680
E_c = -295147905179352825856
E_c = -415051741658464911360
E_c = -590295810358705651712
E_c = -830103483316929822720
E_c = -1180591620717411303424
E_c = -1660206966633859645440
E_c = -2361183241434822606848
E_c = -3320413933267719290880
E_c = -4722366482869645213696
E_c = -6640827866535438581760
E_c = -9444732965739290427392
E_c = -13281655733070877163520
E_c = -18889465931478580854784
E_c = -26563311466141754327040
E_c = -37778931862957161709568
E_c = -53126622932283508654080
E_c = -75557863725914323419136
E_c = -106253245864567017308160
E_c = -151115727451828646838272
E_c = -212506491729134034616320
E_c = -302231454903657293676544
E_c = -425012983458268069232640
E_c = -604462909807314587353088
E_c = -850025966916536138465280
E_c = -1208925819614629174706176
E_c = -1700051933833072276930560
E_c = -2417851639229258349412352
E_c = -3400103867666144553861120
E_c = -4835703278458516698824704
E_c = -6800207735332289107722240
E_c = -9671406556917033397649408
E_c = -13600415470664578215444480
E_c = -19342813113834066795298816
E_c = -27200830941329156430889960
E_c = -38685626227668133590597632
E_c = -54401661882658312861779920
E_c = -77371252455336267181195264
E_c = -108803323765316625723559840
E_c = -154742504910672534362390528
E_c = -217606647530633251447119680
E_c = -309485009821345068724781056
E_c = -435213295061266502894239360
E_c = -618970019642690137449562112
E_c = -870426590122533005788478720
E_c = -1237940039285380274899124224
E_c = -1740853180245066011576957440
E_c = -2475880078570760549798248448
E_c = -3481706360490132023153914880
E_c = -4951760157141521099596496896
E_c = -6963412720980264046307829760
E_c = -9903520314283042199192993792
E_c = -13926825441960528092615659520
E_c = -19807040628566084398385987584
E_c = -27853650883921056185231318960
E_c = -39614081257132168796771975168
E_c = -55707301767842112370462637920
E_c = -79228162514264337593543950336
E_c = -111414603535684224740925275840
E_c = -158456325028528675187087900672
E_c = -222829207071368449481850551680
E_c = -316912650057057350374175801344
E_c = -445658414142736898963701103360
E_c = -633825300114114700748351602688
E_c = -891316828285473797927402206720
E_c = -1267650600228229401496703205376
E_c = -1782633656570947595854804413440
E_c = -2535301200456458802993406410752
E_c = -3565267313141895191709608826880
E_c = -5070602400912917605986812821504
E_c = -7130534626283790383419217653760
E_c = -10141204801825835211973625643008
E_c = -14261069252567580766838435307520
E_c = -20282409603651670423947251286016
E_c = -28522138505135161533676870615040
E_c = -40564819207303340847894502572032
E_c = -57044277010270323067353741230080
E_c = -81129638414606681695789005144064
E_c = -114088554020540646134707482460160
E_c = -162259276829213363391578010288128
E_c = -228177108041081292269414964920320
E_c = -324518553658426726783156020576256
E_c = -456354216082162584538829929840640
E_c = -649037107316853453566312041152512
E_c = -912708432164325169077659859681280
E_c = -1298074214633706907132624082305024
E_c = -1825416864328650338155319719362560
E_c = -2596148429267413814265248164610048
E_c = -3650833728657300676310639438725120
E_c = -5192296858534827628530496329220096
E_c = -7301667457314601352621278877450240
E_c = -10384593717069655257060992658440192
E_c = -14603334914629202705242557754900480
E_c = -20769187434139310514121985316880384
E_c = -29206669829258405410485115509800960
E_c = -41538374868278621028243970633760768
E_c = -58413339658516810820970231019601920
E_c = -83076749736557242056487941267521536
E_c = -116826679317033621641940462039203840
E_c = -166153499473114484112975882535043072
E_c = -233653358634067243283880924078407680
E_c = -332306998946228968225951765070086144
E_c = -467306717268134486567761848156815360
E_c = -664613997892457936451903530140172288
E_c = -934613434536268973135523696313630720
E_c = -1329227995784915872903807060280344576
E_c = -1869226869072537946271047392627261440
E_c = -2658455991569831745807614120560689152
E_c = -3738453738145075892542094785254522880
E_c = -5316911983139663491615228241121378304
E_c = -7476907476290151785084189570509045760
E_c = -10633823966279326983230456482242756608
E_c = -14953814952580303570168379141018091520
E_c = -21267647932558653966460912964485513216
E_c = -29907629905160607140336758282036183040
E_c = -42535295865117307932921825928971026432
E_c = -59815259810321214280673516564072366080
E_c = -85070591730234615865843651857942052864
E_c = -119630519620642428561347033128144732160
E_c = -170141183460469231731687303715884105728
E_c = -239261039241284857122694066256289464320
E_c = -340282366920938463463374607431768211456
E_c = -478522078482569714245388132512578928640
E_c = -680564733841876926926749214863536422912
E_c = -957044156965139428490776265025157857280
E_c = -1361129467683753853853498429727072845824
E_c = -1914088313930278856981552530050315714560
E_c = -2722258935367507707706996859454145691648
E_c = -3828176627860557713963105060100631429120
E_c = -5444517870735015415413993718908291383296
E_c = -7656353255721115427926210120201262858240
E_c = -10889035741470030830827987437816582766592
E_c = -15312706511442230855852420240402525716480
E_c = -21778071482940061661655974875633165533184
E_c = -30625412022884461711704840480805051432960
E_c = -43556142965880123323311949751266331066368
E_c = -61250824045768923423409680961610102865920
E_c = -87112285931760246646623899502532662132736
E_c = -122501648091537846846819361923220205731840
E_c = -174224571863520493293247799005065324265472
E_c = -245003296183075693693638723846440411463680
E_c = -348449143727040986586495598010130648530944
E_c = -490006592366151387387277447692880822927360
E_c = -696898287454081973172991196020261297061888
E_c = -980013184732302774774554895385761645854720
E_c = -1393796574908163946345982392040522594123776
E_c = -1960026369464605549549109790771523291709440
E_c = -2787593149816327892691964784081045188247552
E_c = -3920052738929211099098219581543046583418880
E_c = -5575186299632655785383929568162090376495104
E_c = -7840105477858422198196439163086093166837760
E_c = -11150372599265311570767859136324180752990208
E_c = -15680210955716844396392878326172186333675520
E_c = -22300745198530623141535718272648361505980416
E_c = -31360421911433688792785756652344372667351040
E_c = -44601490397061246283071436545296723011960832
E_c = -62720843822867377585571513304688745334702080
E_c = -89202980794122492566142873090593446023921664
E_c = -125441687645734755171143026609377490669404160
E_c = -178405961588244985132285746181186892047843328
E_c = -250883375291469510342286053218754981338808320
E_c = -356811923176489970264571492362373784095686656
E_c = -501766750582939020684572106437509962677616640
E_c = -713623846352979940529142984724747568191373312
E_c = -1003533501165878041369144212875019925355233280
E_c = -1427247692705959881058285969449495136382746624
E_c = -2007067002331756082738288425750039850710466560
E_c = -2854495385411919762116571938898990272765493248
E_c = -4014134004663512165476576851500079701420933120
E_c = -5708990770823839524233143877797980545530986496
E_c = -8028268009327024330953153703000159402841866240
E_c = -11417981541647679048466287755595961091061972992
E_c = -16056536018654048661906307406000318805683732480
E_c = -22835963083295358096932575511191922182123945984
E_c = -32113072037308097323812614812000637611367464960
E_c = -45671926166590716193865151022383844364247891968
E_c = -64226144074616194647625229624000275222734929920
E_c = -91343852333181432387730302044767688728495783936
E_c = -128452288149232389295250459248000550445469859840
E_c = -182687704666362864775460604089535377456991567872
E_c = -256904576298464778590500918496000900891939719680
E_c = -365375409332725729550921208179070754913983135744
E_c = -513809152596929557181001836992001801783879439360
E_c = -730750818665451459101842416358141509827966271488
E_c = -1027618305193859114362003673984003603567758878720
E_c = -1461501637330902918203684832716283019655932542976
E_c = -2055236610387718228724007347968007207135517757440
E_c = -2923003274661805836407369665432566039311865085952
E_c = -4110473220775436457448014695936014414271035514880
E_c = -5846006549323611672814739330865132078623730171904
E_c = -8220946441550872914896029391872028828542071029760
E_c = -11692013098647223345629478661730264157247460343808
E_c = -16441892883101745829792058783744057657084142059520
E_c = -23384026197294446691258957323460528314494920687616
E_c = -32883785766203491659584117567488115314168284119040
E_c = -46768052394588893382517914646921056628989841375232
E_c = -65767571532406983319168235134976230628336568238080
E_c = -93536104789177786765035829293842113257979682750464
E_c = -131535143064813966638336470269952461256673136476160
E_c = -187072209578355573530071658587684226515959365500928
E_c = -263070286129627933276672940539904922513346272952320
E_c = -374144419156711147060143317175368453031918731001856
E_c = -526140572259255866553345881079809845026692545904640
E_c = -748288838313422294120286634350736906063837462003712
E_c = -1052281144518511733106691762159619690053385091809280
E_c = -1496577676626844588240573268701472812127674924007424
E_c = -2104562289037023466213383524319239380106770183618560
E_c = -2993155353253689176481146537402945624255349848014848
E_c = -4209124578074046932426767048638478760213540367237120
E_c = -5986310706507378352962293074805891248510699696029696
E_c = -8418249156148093864853534097276957520427080734474240
E_c = -11972621413014756705924586149611782497021399392059392
E_c = -16836498312296187729707068194553915040854161468948480
E_c = -23945242826029513411849172299223564994042798784118784
E_c = -33672996624592375459414136389107830081708322937896960
E_c = -47890485652059026823698344598447129988085597568237568
E_c = -67345993249184750918828272778215660163416645875793920
E_c = -95780971304118053647396689196894259976171195136475136
E_c = -134691986498369501837656545556431320326833291751587840
E_c = -191561942608236107294793378393788519952342390272950272
E_c = -269383972996739003675313091112862640653666583503175680
E_c = -383123885216472214589586756787577039904684780545900544
E_c = -538767945993478007350626182225725281307333167006351360
E_c = -766247770432944429179173513575154079809369561091801088
E_c = -1077535891986956014701252364451450562614666334012702720
E_c = -1532495540865888858358347027150308159618739122183602176
E_c = -2155071783973912029402504728902901125229332668025405440
E_c = -3064991081731777716716694054300616319237478244367204352
E_c = -4310143567947824058805009457805802250458665336050810880
E_c = -6129982163463555433433388108601232638474956488734408704
E_c = -8620287135895648117610018915611604500917330672101621760
E_c = -12259964326927110866866776217202465276949912977468817408
E_c = -17240574271791296235220037831223209001834661344203243520
E_c = -24519928653854221733733552434404930553899825954937634816
E_c = -34481148543582592470440075662446418003669322688406487040
E_c = -49039857307708443467467104868809861107799651909875269632
E_c = -68962297087165184940880151324892836007338645376812974080
E_c = -98079714615416886934934209737619722215599303819750539264
E_c = -137924594174330369881760302649785672014677290753625948160
E_c = -196159429230833773869868419475239444431198607639501078528
E_c = -275849188348660739763520605299571344029354581507251896320
E_c = -392318858461667547739736838950478888862397215279002157056
E_c = -551698376697321479527041210599142688058709163014503792640
E_c = -784637716923335095479473677900957777724794430558004314112
E_c = -1103396753394642959054082421198285376117418326029007585280
E_c = -1569275433846670190958947355801915555449588861116008628224
E_c = -2206793506789285918108164842396570752234836652058015170560
E_c = -3138550867693340381917894711603831110899177722232017256448
E_c = -4413587013578571836216329684793141504469673304116030341120
E_c = -6277101735386680763835789423207662221798355444464034512896
E_c = -8827174027157143672432659369586283008939346608232060682240
E_c = -12554203470773361527671578846415324443596710888928069025792
E_c = -17654348054314287344865318739172566017878693216464121364480
E_c = -25108406941546723055343157692830648887193421777856138051584
E_c = -35308696108628574689730637478345132035757386432928242728960
E_c = -50216813883093446110686315385661297774386843555712276103168
E_c = -70617392217257149379461274956690264071514772865856485457920
E_c = -100433627766186892221372630771322595548773687111424552206336
E_c = -141234784434514298758922549913380528143029545731712970915840
E_c = -200867255532373784442745261542645191097547374222849104412672
E_c = -282469568869028597517845099826761056286059091463425941831680
E_c = -401734511064747568885490523085290382195094748445698208825344
E_c = -564939137738057195035690199653522112572118182926851883663360
E_c = -803469022129495137770981046170581301390189496891396417650688
E_c = -1129878275476114390071380399307044225144236365853703767326720
E_c = -1606938044258990275541962092341162602780378993782792835301376
E_c = -2259756550952228780142760798614088450288472731707407534653440
E_c = -3213876088517980551083924184682325205560757987565585670602752
E_c = -4519513101904457560285521597228176900576945463414815069306880
E_c = -6427752177035961102167848369364650411121515975131171341205504
E_c = -9039026203808915120571043194456353801153890926829630138613760
E_c = -12855504354071922204335696738729300822243031950262342682411008
E_c = -18078052407617830241142086388912707602307781853659260277227520
E_c = -25711008708143844408671393477458601644486063900524685364822016
E_c = -36156104815235660482284172777825415204615563707318520554455040
E_c = -51422017416287688817342786954917203288972127801049370729644032
E_c = -72312209630471320964568345555650830409231127414637041108910080
E_c = -102844034832575377634685573909834406577944255602098741459288064
E_c = -144624419260942641929136691111301660818462254829274082217820160
E_c = -205688069665150755269371147819668813155888511204197482918576128
E_c = -289248838521885283858273382222603321636924509658548164435640320
E_c = -411376139330301510538742295639337626311777022408394965837152256
E_c = -578497677043770567716546764445206643273849019317096328871280640
E_c = -822752278660603021077484591278675252623554044816789931674304512
E_c = -1156995354087541135433093528890413286547698038634192657742561280
E_c = -1645504557321206042154969182557350505247108089633579863348608024
E_c = -2313990708175082270866187057780826573095396077268385315485122560
E_c = -3291009114642412084309938365114701010494216179267159726697216048
E_c = -4627981416350164541732374115561653146190792154536770630970245120
E_c = -6582018229284824168619876730229402021988432358534319453394432096
E_c = -9255962832700329083464748231123306292381584309073541261940490240
E_c = -13164036458569648337239753460458804043976864717068638906788864192
E_c = -18511925665400658166929496462246612584763168618147082523881980480
E_c = -26328072917139296674479506920917608087953729434137277813577728384
E_c = -37023851330801316333858992924493225169526337236294165047763960960
E_c = -52656145834278593348959013841835216175907458868274555627155456768
E_c = -74047702661602632667717985848986450339052674472588330095527921920
E_c = -105312291668557186697918027683670432351814917736549111254310913536
E_c = -148095405323205265335435971697972900678105348945176660191055843840
E_c = -210624583337114373395836055367340864703629835473098222508621827072
E_c = -296190810646410530670871943395945801356210697890353320382111687680
E_c = -421249166674228746791672110734681729407259670946196445017243654144
E_c = -592381621292821061341743886791891602712421395780706640764223375360
E_c = -842498333348457493583344221469363458814519341892392890034487308288
E_c = -1184763242585642122683487773583783205424842791561413281528446750720
E_c = -1684996666696914987166688442938726917629038683784785780068974616576
E_c = -2369526485171284245366975547167566410849685583122826563056893501440
E_c = -3369993333393829974333376885877453835258077367569571560137949233152
E_c = -4739052970342568490733951094335132821699371166245653126113787002880
E_c = -6739986666787659948666753771754907670516154735139143120275898466304
E_c = -9478105940685136981467902188670265643398742332491306252227574005760
E_c = -13479973333575319897333507543509815341032309470278286240551796932608
E_c = -18956211881370273962935804377340531286797484664982612504455148011520
E_c = -26959946667150639794667015087019630682064618940556572481103593865216
E_c = -37912423762740547925871608754681062573594969329965225008910296023040
E_c = -53919893334301279589334030174039261364129237881113144962207187730432
E_c = -75824847525481095851743217509362125147189938659930450017820592046080
E_c = -107839786668602559178668060348078522728258475762226289924414375460864
E_c = -151649695050962191703486435018724250294379877319860900035641184092160
E_c = -215679573337205118357336120696157045456516951524452579848828750921728
E_c = -303299390101924383406972870037448500588759754639721800071282368184320
E_c = -431359146674410236714672241392314090913033903048905159697657501843456
E_c = -606598780203848766813945740074897000177519509279443600142564736368640
E_c = -862718293348820473429344482784628181826067806097810319395315003686912
E_c = -1213197560407697533627891480149794000355039018558887200285129472737280
E_c = -1725436586697640946858688965569256363652135612195620638790630007373824
E_c = -2426395120815395067255782960299588000710078037117774400570258945474560
E_c = -3450873173395281893717377931138512727304271224391241277581260014747648
E_c = -4852790241630790134511565920599176000420156074235548801140517890949120
E_c = -6901746346790563787434755862277025454608542448782482555162520029495296
E_c = -9705580483261580269023131841198352000840312148471097602281035781898240
E_c = -13803492693581127574869511724554050909217084897564965110325040058990592
E_c = -19411160966523160538046263682396704000680624296942195204562071563796480
E_c = -27606985387162255149739023449108101818434169795129930220650080117981184
E_c = -38822321933046321076092527364793408000361248593884390409124143127592960
E_c = -55213970774324510299478046898216203636868339590259860441300160235962368
E_c = -77644643866092642152185054729586816000722497187768780818248286255185920
E_c = -110427941548649020598956093796432407273736679180519720882600320471924736
E_c = -155289287732185284304370109458173632000444994375537561636496572510371840
E_c = -220855883097298041197912187592864814547473358361039441765200640943849472
E_c = -310578575464370568608740218916347264000889988751075123272993145020743680
E_c = -441711766194596082395824375185729629094946716722078883530401281887698944
E_c = -621157150928741137217480437832694528000779977502150246545986290041487360
E_c = -883423532389192164791648750371459258189893433444157767060802563775397888
E_c = -1242314301857482274434960875665389056000559955004300493091972580082974720
E_c = -1766847064778384329583297500742918516379786866888315534121605127550795776
E_c = -2484628603714964548869921751330778112000339910008600986183945160165949440
E_c = -3533694129556768659166595001485837032759573733776631068243210255101591552
E_c = -4969257207429929097739843502661556224000119820017201972367890320331898880
E_c = -7067388259113537318333190002971674065519147467553262136486420510203183104
E_c = -9938514414859858195479687005322112448000239640034403944735780640663797760
E_c = -14134776518227074636666380005943348131038294935106524272972841020406366208
E_c = -19877028829719716390959374010644224896000479280068807889471561281327595520
E_c = -28269553036454149273332760011886696262076589870213048545945682040812732416
E_c = -39754057659439432781918748021288449792000958560137615778943122562655191040
E_c = -56539106072908298546665520023773392524153179740426097091891364081625464832
E_c = -79508115318878865563837496042576899584001917120275231557886245125310382080
E_c = -113078212145816597093331040047546785048306359480852194183782728163250929664
E_c = -159016230637757731127674992085153799168003834240550463115772490250620764160
E_c = -226156424291633194186662080095093570096612718961704388367565456326501859328
E_c = -318032461275515462255349984170307598336007668481100926231544980501241528320
E_c = -452312848583266388373324160190187140193225437923408776735130912652003718656
E_c = -636064922551030924510699968340615196672015336962201852463089961002483056640
E_c = -904625697166532776746648320380374280386450875846817553470261825304007437312
E_c = -1272129845102061849021399936681230393344030673924403704926179922004966113280
E_c = -1809251394333065553493296640760748560772901751693635106940523650608014874624
E_c = -2544259690204123698042799873362460786688061347848807409852359844009932226560
E_c = -3618502788666131106986593281521497121545803503387270213881047301216029749248
E_c = -5088519380408247396085599746724921573376122695697614819704719688019864453120
E_c = -7237005577332262213973186563042994243091606986774540427762094602432059498496
E_c = -10177038760816494792171199493449843146752245391395229639409439376039728906240
E_c = -14474011154664524427946373126085988486183213973549080855524189204864118996992
E_c = -20354077521632989584342398986899686293504490782790459278818878752079457812480
E_c = -28948022309329048855892746252171976972366427947098161711048378409728237993984
E_c = -40708155043265979168684797973799372587008981565580918557637757504158915624960
E_c = -57896044618658097711785492504343953944732855894196323422096756819456475987968
E_c = -81416310086531958337369595947598745174017963131161837115275515008317831249920
E_c = -115792089237316195423570985008687907853465711788392646844193513638912951975936
E_c = -162832620173063916674739191895197490348035926262323674230551030016635662499840
E_c = -231584178474632390847141970017375815706931423576785293688387027277825903951872
E_c = -325665240346127833349478383790394980696071852524647348461102060033271324999680
E_c = -463168356949264781694283940034751631413862847153570587376774054555651807903744
E_c = -651330480692255666698956767580789961392143705049294696922204120066542649999360
E_c = -926336713898529563388567880069503262827725694307141174753548109111303615807488
E_c = -1302660961384511333397913535161579922784287410098589393844408240133085299998720
E_c = -1852673427797059126777135760139006525655451388614282349507096218222607231614976
E_c = -2605321922769022666795827070323159845568574820197178787688816480266170599997440
E_c = -3705346855594118253554271520278013051310902777228564699014192436445214463229952
E_c = -5210643845538045333591654140646319691137149640394357575377632960532341199994880
E_c = -7410693711188236507108543040556026102621805554457129398028384872890428926459904
E_c = -10421287691076090667183308281292639382274299280788715150755265921064682399989760
E_c = -14821387422376473014217086081112052205243611108914258796056769745780857852919808
E_c = -20842575382152181334366616562585278764548598561577430301510531842129364799979520
E_c = -29642774844752946028434172162224104410487222217828517592113539491561715705839616
E_c = -41685150764304362668733233125170557529097197123154860603021063684258729599959040
E_c = -59285549689505892056868344324448208820974444435657035184227078983123431411679232
E_c = -83370301528608725337466466250341115058194394246309721206042127368517459199918080
E_c = -118571099379011784113736688648896417641948888871314070368454157966246862823358464
E_c = -166740603057217450674932932500682230116388788492619442412084254737034918399836160
E_c = -237142198758023568227473377297792835283897777742628140736908315932493725646716928
E_c = -333481206114434901349865865001364460232777576985238884824168509474069836799672320
E_c = -474284397516047136454946754595585670567795555485256281473816631864987451293433856
E_c = -666962412228869802699731730002728920465555153970477769648337018948139673599344640
E_c = -948568795032094272909893509191171341135591110970512562947633263729974902586867712
E_c = -1333924824457739605399463460005457840931110307940955539296674037896279347198689280
E_c = -1897137590064188545819787018382342681270222221941025125895266527459949805173735424
E_c = -2667849648915479210798926920010915681862220615881911078593348075792558694397378560
E_c = -3794275180128377091639574036764685362540444443882050251790533054919899610347470848
E_c = -5335699297830958421597853840021831363724441231763822157186696151585117388794757120
E_c = -7588550360256754183279148073529370725080888887764100503581066109839799220694941696
E_c = -10671398595661916843195707680043662727448882463527644314373392303170234777589514240
E_c = -15177100720513508366558296147058741450161777775528201007162132219679598441389883392
E_c = -21342797191323833686391415360087325454897764927055288628746784606340469555179028480
E_c = -30354201441027016733116592294117482900323555551056402014324264439359196882779766784
E_c = -42685594382647667372782830720174650909795529854110577257493569212680939110358056960
E_c = -60708402882054033466233184588234965800647111102112804028648528878718393765559533568
E_c = -85371188765295334745565661440349301819591059708221154514987138425361878220716113920
E_c = -121416805764108066932466369176469931601294222204225608057297057757436787531119067136
E_c = -170742377530590669491131322880698603639182119416442309029974276850723756441432227840
E_c = -242833611528216133864932738352939863202588444408451216114594115514873575062238134272
E_c = -341484755061181338982262645761397207278364238832884618059948553701447512882864455680
E_c = -485667223056432267729865476705879726405176888817902432229188231029747150124476268544
E_c = -682969510122362677964525291522794414556728477665769236119897107402895025765728911360
E_c = -971334446112864535459730953411759452810353777635804864458376462059494300248952537088
E_c = -1365939020244725355929050583045588829113456955331538472239794214805790051531457822720
E_c = -1942668892225729070919461906823518905620707555271609728916752924118988600497905074176
E_c = -2731878040489450711858101166091177658226913910663076944479588429611580103062915645440
E_c = -3885337784451458141838923813647037810241415110543219457833505848237977200995810148352
E_c = -5463756080978901423716202332182355316453827821326153888959176859223160206125831290880
E_c = -7770675568902916283677847627294075620482830221086438915667011696475954401991620296704
E_c = -10927512161957802847432404664364710632907655642652307777918353718446320412251662581760
E_c = -15541351137805832567355695254588151240965660442172877831334023392951908803983240593408
E_c = -21855024323915605694864809328729421265815311285304615555836707436892640824503325163520
E_c = -31082702275611665134711390509176302481931320884345755662668046785903817607966481186816
E_c = -43710048647831211389729618657458843531630622570609231111673414873785281649006650327040
E_c = -62165404551223330269422781018352604963862641768691511325336093571807635215932962373632
E_c = -87420097295662422779459237314917687063261245141218462222346829747570563298013300654080
E_c = -124330809102446660538845562036705209927725283537383022650672187143615270431865924747264
E_c = -174840194591324845558918474629835374126522490282436924444693659495141126596026601308160
E_c = -248661618204893321077691124073410419855450567074766045301344374287230540863731849494528
E_c = -349680389182649691117836949259670748253044980564873848889387318990282253192053202616320
E_c = -497323236409786642155382248146820839710901134149532090602688748574461081727463698989056
E_c = -699360778365299382235673898519341496506089961129747697778774637980564506384106405232640
E_c = -994646472819573284310764496293641679421802268299064181205377497148922163454927397978112
E_c = -1398721556730598764471347797038682993012179922259495395557549275961128012768212810465280
E_c = -1989292945639146568621528992587283358843604536598128362410754994297844326909854795956224
E_c = -2797443113461197528942695594077365986024359844518990791115098551922256025536425620930560
E_c = -3978585891278293137243057985174566717687209073196256724821509988595688653819709591912448
E_c = -5594886226922395057885391188154731972048719689037981582230197103844512051072851241861120
E_c = -7957171782556586274486115970349133434375418146392513449642019977191377307639418183824896
E_c = -11189772453844790115770782376309463944097439378075963164460394207689024102145702483722240
E_c = -15914343565112172548972231940698266868750836292785026899284039954382754615278836367649792
E_c = -22379544907689580231541564752618927888194878756151926328920788415378048204291404967444480
E_c = -31828687130224345097944463881396533737501672585570053798568079908765509230557672735299584
E_c = -44759089815379160463083129505237855776389757512303852657841576830756096408582809934888960
E_c = -63657374260448690195888927762793067475003345171140107597136159817531018461115345470599168
E_c = -89518179630758320926166259010475711552779514024607705315683153661512192817165619869777920
E_c = -127314748520897380391777855525586134950006690342280215194272319635062036922230690941198336
E_c = -179036359261516641852332518020951423105559028049215410631366307322424385634331239738555840
E_c = -254629497041794760783555711051172269900013380684560430388544639270124073844461381882396672
E_c = -358072718523033283704665036041902846211118056098430821262732614644848771268662479477111680
E_c = -509258994083589521567111422102344539800026761369120860777089278540248147688922763764793344
E_c = -716145437046066567409330072083805692422236112196861642525465229289697542537324958954223360
E_c = -1018517988167179043134222844204689079600053522738241721554178557080496295377845527529586688
E_c = -1432290874092133134818660144167611384844472224393723285050930458579395085074649917908446720
E_c = -2037035976334358086268445688409378159200107045476483443108357114160992590755691055059173376
E_c = -2864581748184266269637320288335222769688944448787446570101860917158790170149299834816893440
E_c = -4074071952668716172536891376818756318400214090952966886216714228321985181511382110118346752
E_c = -5729163496368532539274640576670445539377888897574893140203721834317580340298599669633786880
E_c = -8148143905337432345073782753637512636800428181905933772433428456643970363022764220236693504
E_c = -11458326992737065078549281153340891078755777795149786280407443668635160680597199339267573760
E_c = -16296287810674864690147565507275025273600856363811867544866856913287940726045528440473387008
E_c = -22916653985474130157098562306681782157511555590299572560814887337270321361194398678535147520
E_c = -32592575621349729380295130014550050547201712727623735089733713826575881452091056880946774016
E_c = -45833307970948260314197124613363564315023111180599145121629774674540642722388797357070295040
E_c = -65185151242699458760590260029100101094403425455247470179467427652151762904182113761893548032
E_c = -91666615941896520628394249226727128630046222361198290243259549348081285444777594714140590080
E_c = -130370302485398917521180520058200202188806850910494940358934855304303525808364227523787096064
E_c = -183333231883793041256788498453454257260092444722396580486519098696162570889555189428281180160
E_c = -260740604970797835042361040116400404377613701820989880717869710608607051616728455047574192128
E_c = -366666463767586082513576996906908514520184889444793160973038197392325141779110378856562360320
E_c = -521481209941595670084722080232800808755227403641979761435739421217214103233456910095148384256
E_c = -733332927535172165027153993813817029040369778889586321946076394784650283558220757713124720640
E_c = -1042962419883191340169444160465601617510454807283959522871478842434428206466913820190296768512
E_c = -1466665855070344330054307987627634058080739557779172643892152789569300567116441515426249441280
E_c = -2085924839766382680338888320931203234020909614567919045742957684868856412933827640380593537024
E_c = -2933331710140688660108615975255268116161479115558345287784305579138601134232883030852498882560
E_c = -4171849679532765360677776641862406468041819229135838091485915369737712825867655280761187074048
E_c = -5866663420281377320217231950510536232322958231116690575568611158277202268465766061704997765120
E_c = -8343699359065530721355553283724812936083638458271676182971830739475425651735310561522374148096
E_c = -11733326840562754640434463901021072464645916462233381151137222316554404536931532123409995530240
E_c = -16687398718131

6J6

6J6

AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT



SEPT. 20, 1944

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6402R1

6J7, 6J7-G, 6J7-GT
SHARP-CUTOFF PENTODE

6J7
6J7-G
6J7-GT

Cathode-Bias Resistor.	18000	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	μf
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.

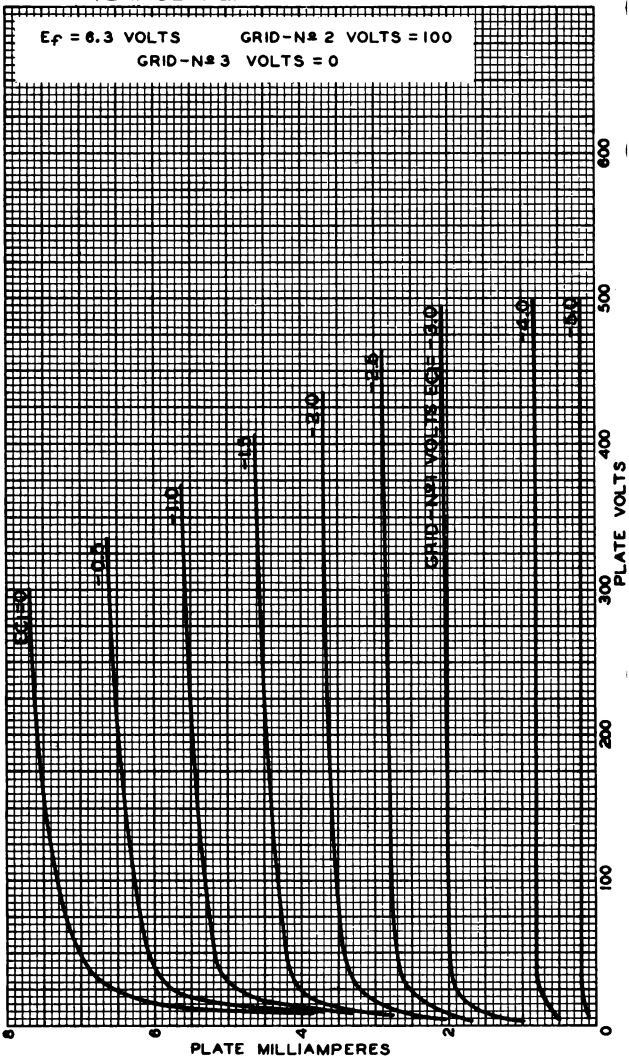
⊕ For the following amplifier tube.

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

6J7

6J7

AVERAGE PLATE CHARACTERISTICS

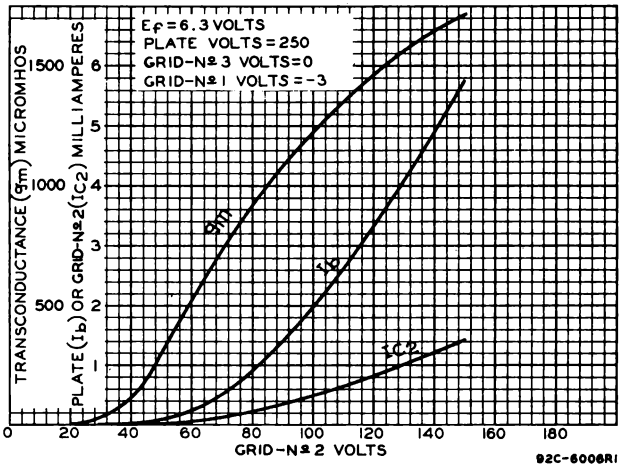


MAY 12, 1948 TUBE DEPARTMENT 92CM-4741R2

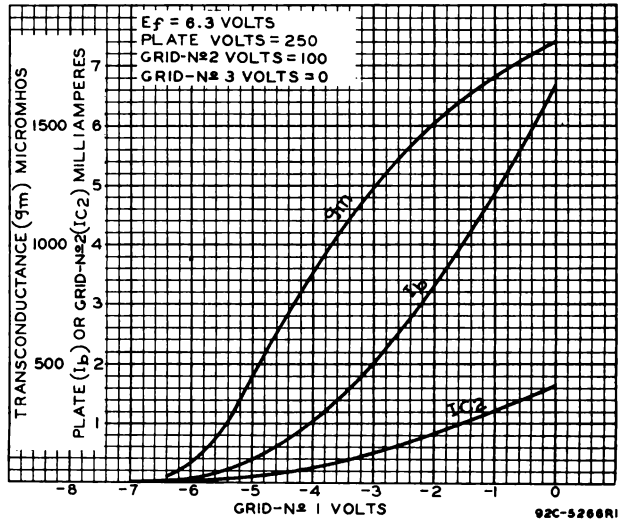
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6J7

AVERAGE CHARACTERISTICS



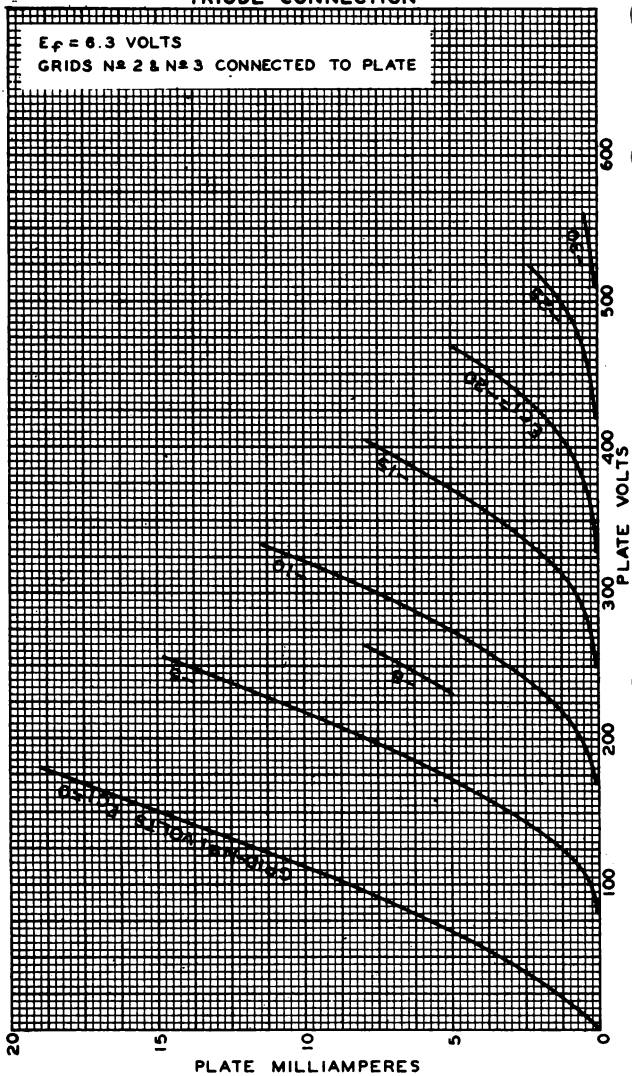
AVERAGE CHARACTERISTICS



6J7

6J7

AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



MAY 11, 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-4842R1

6J8-G

TRIODE-HEPTODE CONVERTER

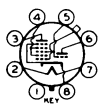
Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.

Direct Interelectrode Capacitances:

Heptode Grid #1 to Heptode Plate●	0.01 max.	μμf
Heptode Grid #1 to Triode Plate●	0.015 max.	μμf
Heptode Grid #1 to Triode Grid & Heptode Grid #3○	0.13	μμf
Triode Grid to Triode Plate	2.2	μμf
Heptode Grid #1 to All Other Electrodes (R-F Input)	4.4	μμf
Triode Plate to All Other Electrodes (Osc. Output)	5.5	μμf
Triode Grid & Heptode Grid #3 to All Other Electrodes (Osc. Input)	11.7	μμf
Heptode Plate to All Other Electrodes (Mixer Output)	8.8	μμf

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
Base	Small Shell Octal 8-Pin

Pin 1 - No Connection
Pin 2 - Heater
Pin 3 - Heptode Plate
Pin 4 - Heptode Grids #2 & #4



BOTTOM VIEW (G-8H)

Pin 5 - Triode Grid & Heptode Grid #3
Pin 6 - Triode Plate
Pin 7 - Heater
Pin 8 - Cathode

Mounting Position: Any

CONVERTER SERVICE

Heptode Plate Voltage		250 max.	volts
Heptode Screen (Grids #2 & #4) Voltage		100 max.	volts
Triode Plate Supply Voltage*		250 max.	volts
Typical Operation and Characteristics:			
Heptode Plate Voltage	100	250	volts
Heptode Screen Voltage	100	100	volts
Heptode Control-Grid Voltage (Grid #1)	-3	-3	volts
Triode Plate Voltage	100	-	volts
Triode Plate Supply Voltage*	-	250	volts
Triode Grid Resistor	50000	50000	ohms
Heptode Plate Resistance	0.9	4.0	approx. megohms
Conversion Transconductance	250	290	μmhos
Heptode Control-Grid Bias for Conversion Transcond. of 2 μmhos	-	-20	volts
Heptode Plate Current	1.4	1.3	ma.
Heptode Screen Current	3.0	2.9	ma.
Triode Plate Current	3.0	5.0	ma.
Triode Grid & Heptode Grid #3 Current	0.3	0.4	ma.

NOTE: The transconductance of the triode unit (not oscillating) is approximately 1600 μmhos under the following conditions: triode plate volts, 150; triode grid volts, -3.

■ 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.

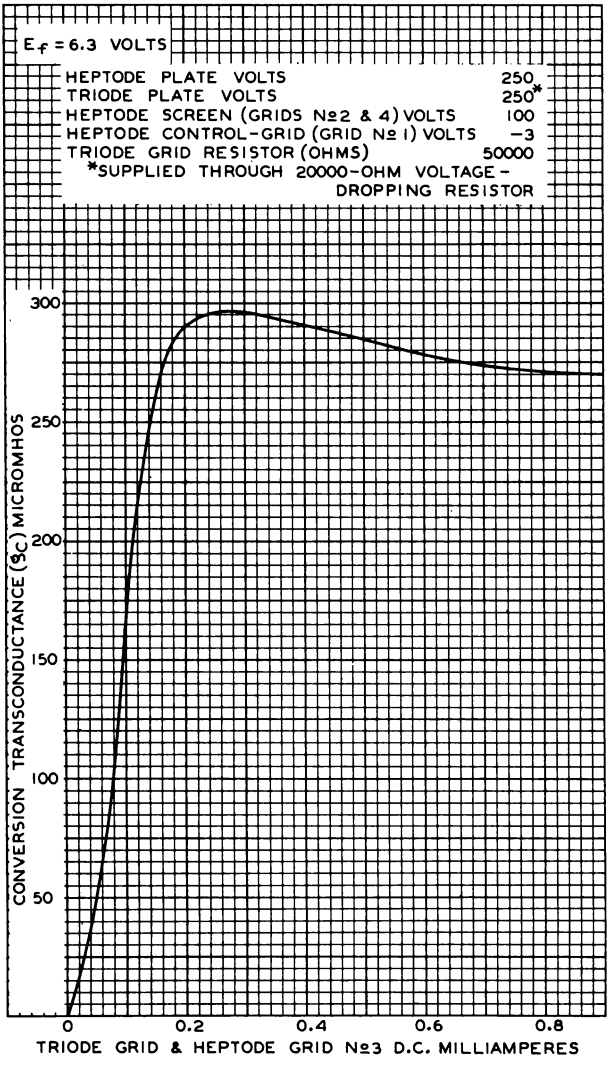
● With shield-can connected to cathode.

* Applied through 20000-ohm dropping resistor.

6J8-G

6J8-G

OPERATION CHARACTERISTIC



MAY 13, 1941

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6285

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.):°

Grid No.1 to Plate	0.5	μμf
Input	5.5	μμf
Output	6.0	μμf

°With no external shield.

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)	
Basing Designation for BOTTOM VIEW	G-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

SINGLE-TUBE AMPLIFIER

Pentode Connection

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	315 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	285 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		←
Positive bias value	0 max.	volts
PLATE DISSIPATION	8.5 max.	watts
GRID-No.2 INPUT	2.8 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		←
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Typical Operation and Characteristics--*Class A_1 Amplifier*:

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-Sig. Plate Current	9	32	25.5	ma
Max.-Sig. Plate Current	9.5	33	28	ma

*:See next page. ← Indicates a change

6K6-GT
POWER PENTODE

Zero-Sig. Grid-No.2 Cur. . .	1.6	5.5	4	ma
Max.-Sig. Grid-No.2 Cur. . .	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.-Sig. Power Output . . .	0.35	3.4	4.5	watts

Maximum Circuit Values (for maximum rated conditions):

Grid-No.1-Circuit Resistance:

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

→ **SINGLE-TUBE AMPLIFIER**

Triode Connection--Grid No.2 Connected to Plate

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

PLATE VOLTAGE	315 max.	volts
TOTAL PLATE AND GRID-No.2 DISSIPATION . .	6 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--*Class A_1 Amplifier*:

Plate Voltage.	315	volts
Grid-No.1 (Control-Grid) Voltage	-37.5	volts
Peak AF Grid-No.1 Voltage.	37.5	volts
Zero-Signal Plate Current.	18.5	ma
Max.-Signal Plate Current.	22	ma
Amplification Factor	5.7	
Plate Resistance (Approx.)	4700	ohms
Transconductance	1200	μmhos
Load Resistance.	13000	ohms
Total Harmonic Distortion.	10	%
Max.-Signal Power Output	1.2	watts

Maximum Circuit Values (for maximum rated conditions):

Grid-No.1-Circuit Resistance:

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

PUSH-PULL AMPLIFIER

Pentode Connection

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

PLATE VOLTAGE.	315 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	285 max.	volts
→ GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value.	0 max.	volts

→ Indicates a change

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6K6-GT
POWER PENTODE

PLATE DISSIPATION.	8.5 max.	watts
GRID-No.2 INPUT.	2.8 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	90 max.	volts
Heater positive with respect to cathode.	90 max.	volts

Typical Operation--*Class A_1 Amplifier*:

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	61	ma
Zero-Signal Grid-No.2 Current.	9	9	ma
Max.-Signal Grid-No.2 Current.	17	13	ma
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 (for maximum rated conditions):

Grid-No.1-Circuit Resistance:		
For fixed bias	0.1 max.	megohm
For cathode bias	0.5 max.	megohm

VERTICAL DEFLECTION AMPLIFIER

Maximum Ratings,*Design-Center Values*:

For operation in a 525-line, 30-frame system•

DC PLATE VOLTAGE	350 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE○ . . .	1500 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE. . .	-50 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE	-200 max.	volts
DC CATHODE CURRENT	20 max.	ma
PLATE DISSIPATION.	7 max.	watts

Circuit Values:

Grid-No.1-Circuit Resistance:		
For cathode bias	2.2 max.	megohms
Cathode-Bias Resistor.	330 min.	ohms

• 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.

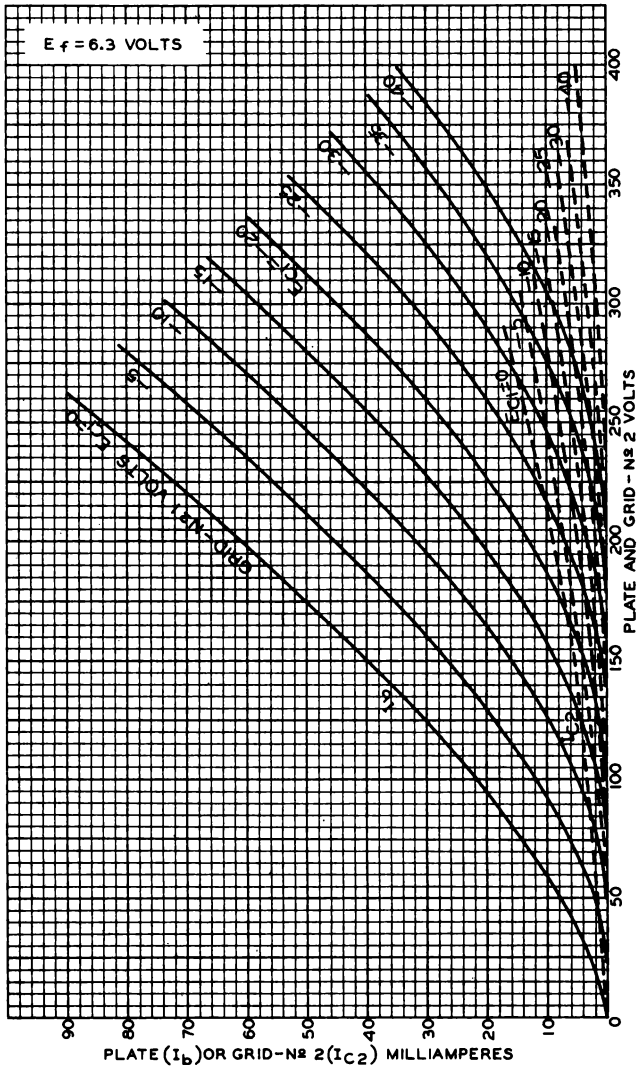
← Indicates a change

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6K6-GT

6K6-GT

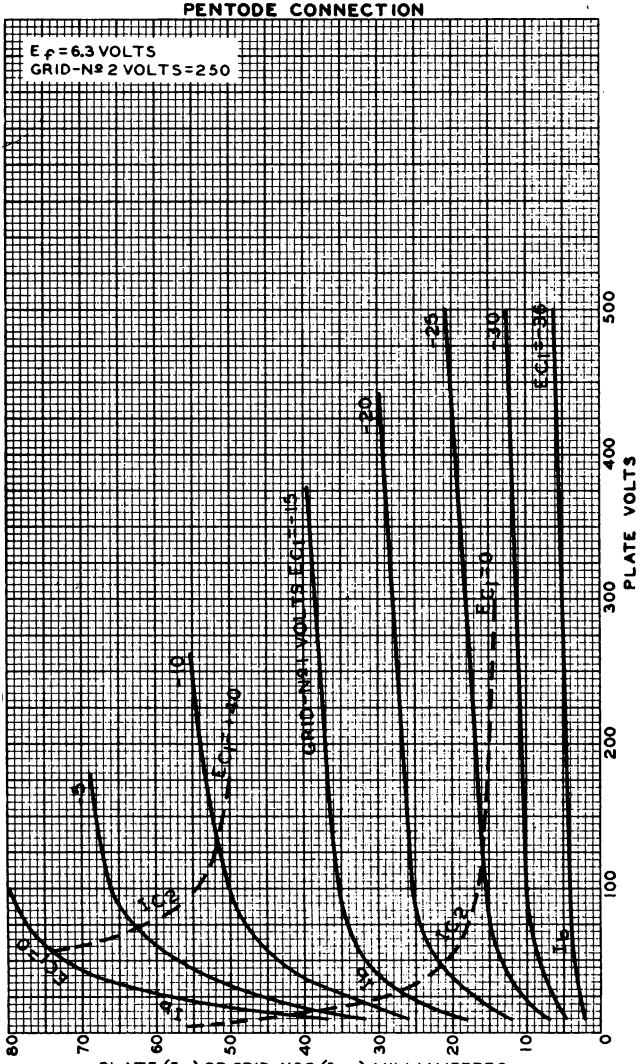
AVERAGE CHARACTERISTICS



6K6-GT

AVERAGE PLATE CHARACTERISTICS

PENTODE CONNECTION



FEB. 13, 1948

TUBE DEPARTMENT

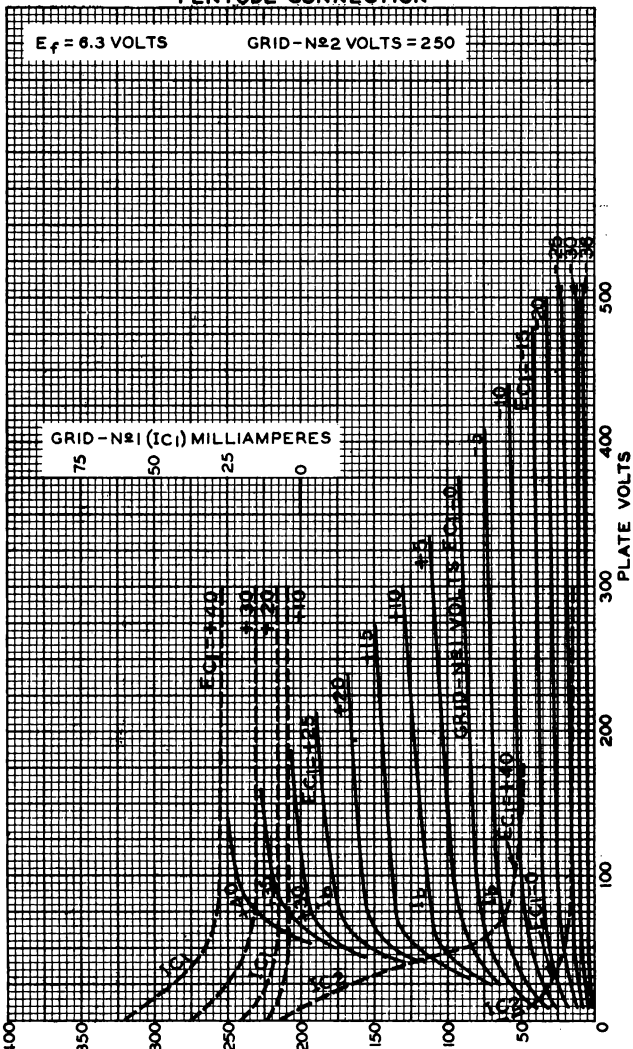
92CM-4881R2

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6K6-GT

6K6-GT

AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



FEB. 13, 1948

TUBE DEPARTMENT

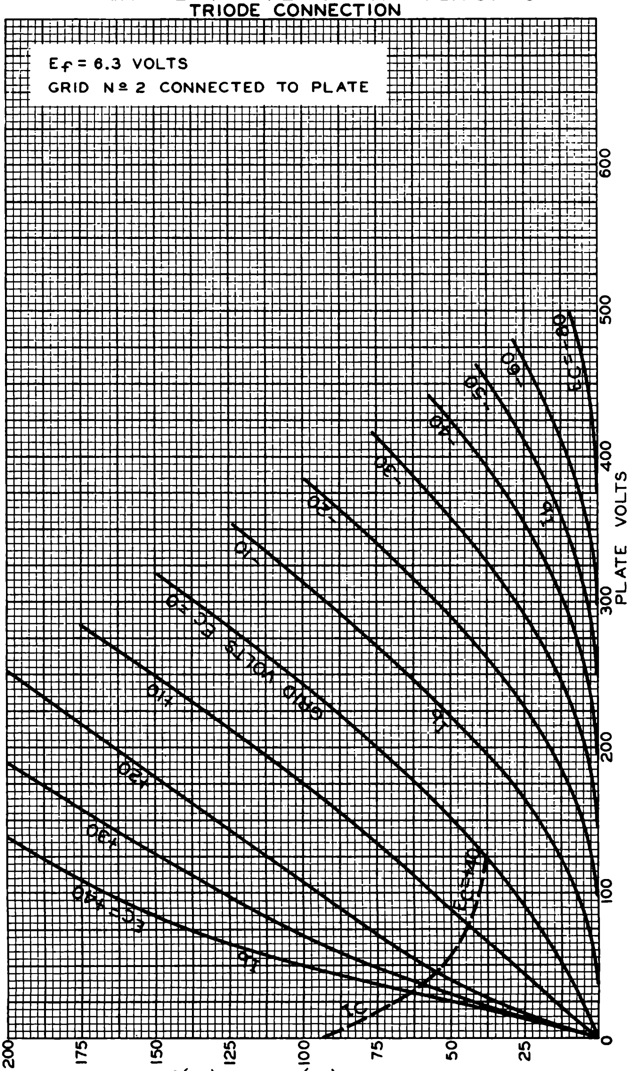
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6311R1

6K6-GT

6K6-GT

AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



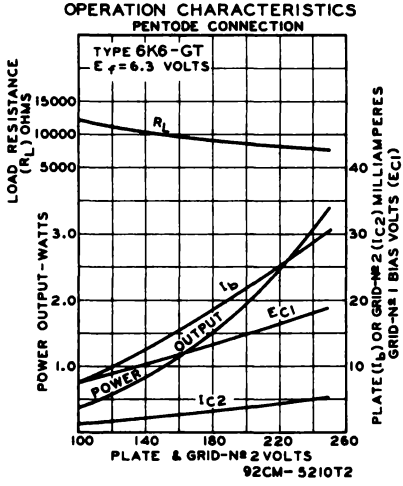
AUG. 18, 1941

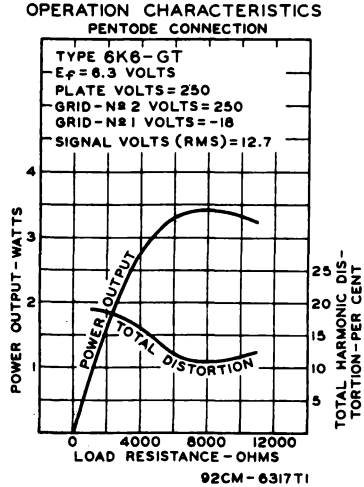
TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6313

6K6-GT
POWER PENTODE





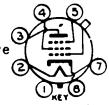
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6K7, 6K7-G, 6K7-GT

TRIPLE-GRID SUPER-CONTROL AMPLIFIER

Heater ■	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 μμf
Input	7	5	4.6 μμf
Output	12	12	12 μμf
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



BOTTOM VIEW

Pin 4 – Screen
Pin 5 – Suppressor
Pin 7 – Heater
Pin 8 – Cathode
Cap – Grid

Mounting Position: 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_1 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	μmhos
Grid Bias for transcond. of approx. 2 μmhos	-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.

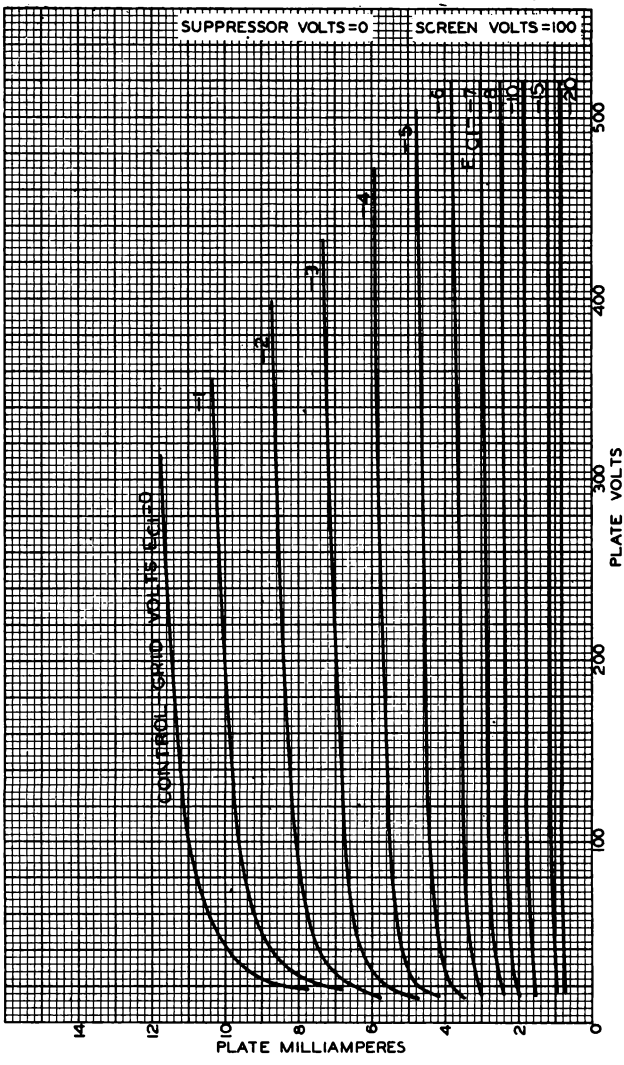
← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6K7

6K7

AVERAGE PLATE CHARACTERISTICS



6K8,6K8-G,6K8-GT

TRIODE—HEXODE CONVERTER

6K8
6K8-G
6K8-GT

Heater■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.

Direct Interelectrode Capacitances:

	6K8○	6K8-G▲	6K8-GT▲	
Hexode Grid #3 to Hexode Plate	0.03	0.08	0.08	max. μμf
Hexode Grid #3 to Triode Plate	0.02	0.05	0.05	max. μμf
Hexode Grid #3 to Triode Grid & Hexode Grid #1	0.2	0.2	0.2	max. μμf
Triode Grid & Hexode Grid #1 to Triode Plate	1.1	1.8	1.8	μμf
Triode Grid & Hexode Grid #1 to Hexode Plate	0.1	0.15	0.15	max. μμf
Hexode Grid #3 to All Other Electrodes (R-F Input)	6.6	4.6	4.6	μμf
Triode Plate to All Other Electrodes Except Triode Grid & Hexode Grid #1 (Osc. Output)	3.2	3.4	3.4	μμf
Triode Grid & Hexode Grid #1 to All Other Electrodes Except Triode Plate (Osc. Input)	6.0	6.5	6.5	μμf
Hexode Plate to All Other Electrodes (Mixer Output)	3.5	4.8	4.8	μμf
Overall Length	3-1/8" max.	4-7/32" to 4-15/32"	3-9/16" max.	
Seated Height	2-9/16" max.	3-21/32" to 3-29/32"	3" 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.	Skirted Min.	
Base	Small Wafer Octal 8-Pin	Sm. Shell Oct. 8-Pin	Sm. Wafer Oct. 8-Pin, Sleeve	
Basing Designation	8K	G-8K	GT-8K	

Pin 1 — 6K8, Shell; 6K8-G, No Con.; 6K8-GT, Sleeve
Pin 2 — Heater
Pin 3 — Hexode Plate
Pin 4 — Hexode Grids #2 & #4
Pin 5 — Hexode Grid #1 & Triode Grid
Pin 6 — Triode Plate
Pin 7 — Heater
Pin 8 — Cathode
Cap — Hexode Grid #3

Mounting Position: Any

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	μmhos
Conversion Transcond. with Hexode Grid #3 Bias of -30 volts (approx.)	2	2	μmhos
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 μmhos 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.

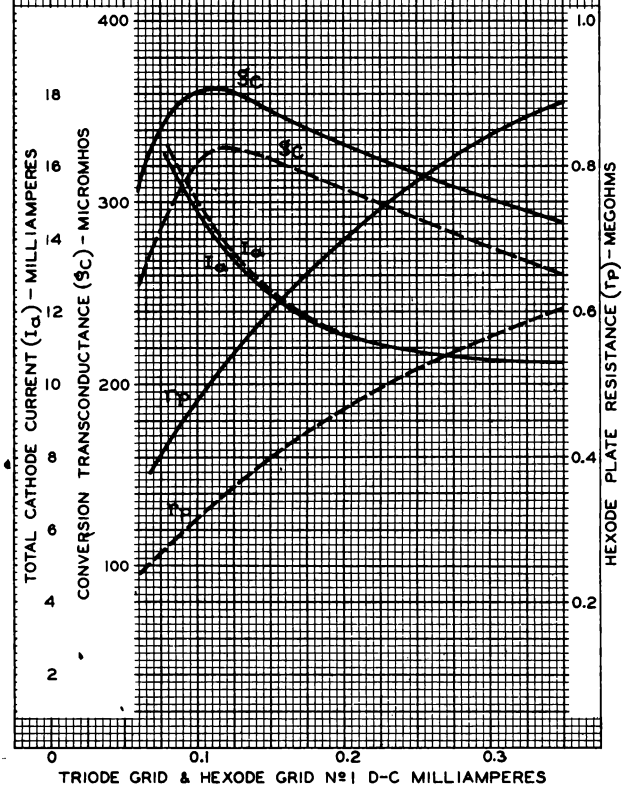
6K8

6K8

OPERATION CHARACTERISTICS

E_f = 6.3 VOLTS

CURVE	----	——
HEXODE PLATE VOLTS	100	250
TRIODE PLATE VOLTS	100	100
HEXODE SCREEN (GRIDS Nº 2 & 4) VOLTS	100	100
HEXODE CONTROL-GRID (GRID Nº 3) VOLTS	-3	-3
TRIODE GRID RESISTOR (OHMS)	50000	50000



6L6, 6L6-G

BEAM POWER TUBE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

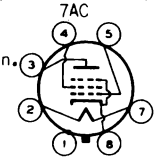
Voltage	6.3	ac or dc volts
Current	0.9	amp

Direct Interelectrode Capacitances (Approx.):

	6L6°	*6L6-G°°*	
Grid No.1 to plate	0.4	0.9	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	10	11.5	μμf
Plate to cathode & grid No.3, grid No.2, and heater	12	9.5	μμf

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_1 †

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

°, °°, †: See next page. ◄ Indicates a change.

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	–	μmhos
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_1 †

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	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 Voltage	200	250	300	volts
Grid-No.2 Voltage	200	250	200	volts

° With shell connected to cathode.
°° With no external shield.
†: See next page.

→ Indicates a change.

6L6, 6L6-G

BEAM POWER TUBE

Cathode-Bias 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	3.0	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_1 †

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	35.6	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 (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
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_1 †

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	-22.5	-22.5	-	volts
Cathode-Bias 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 (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_2 ♦

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
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	72	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_2 stage. To minimize distortion, the effective resistance per grid-No.1 circuit of the AB_2 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.

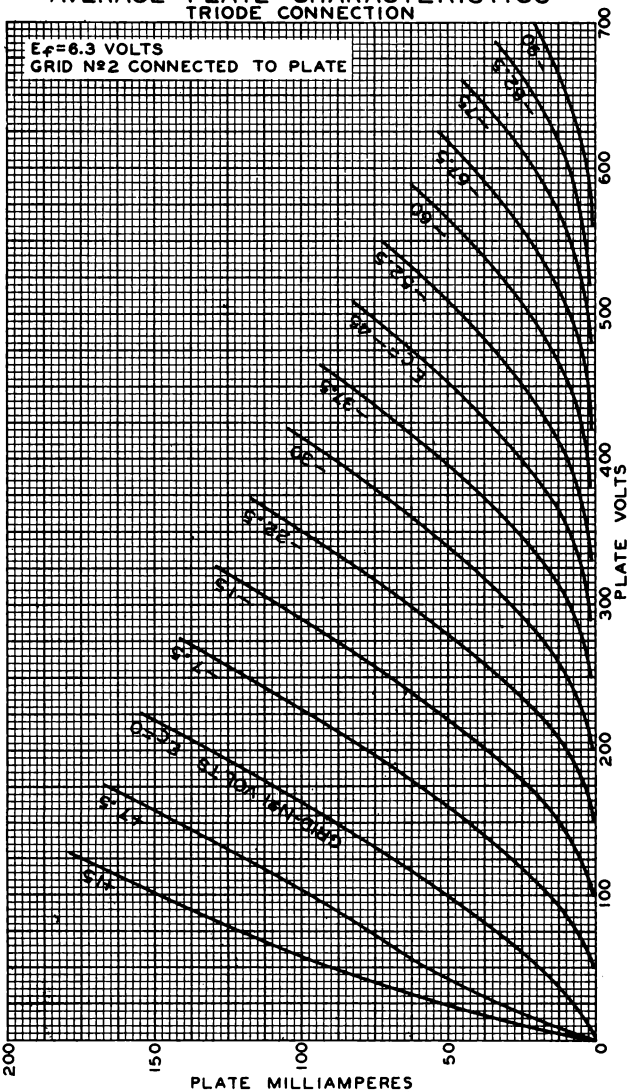
◄-Indicates a change.

6L6

6L6

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION



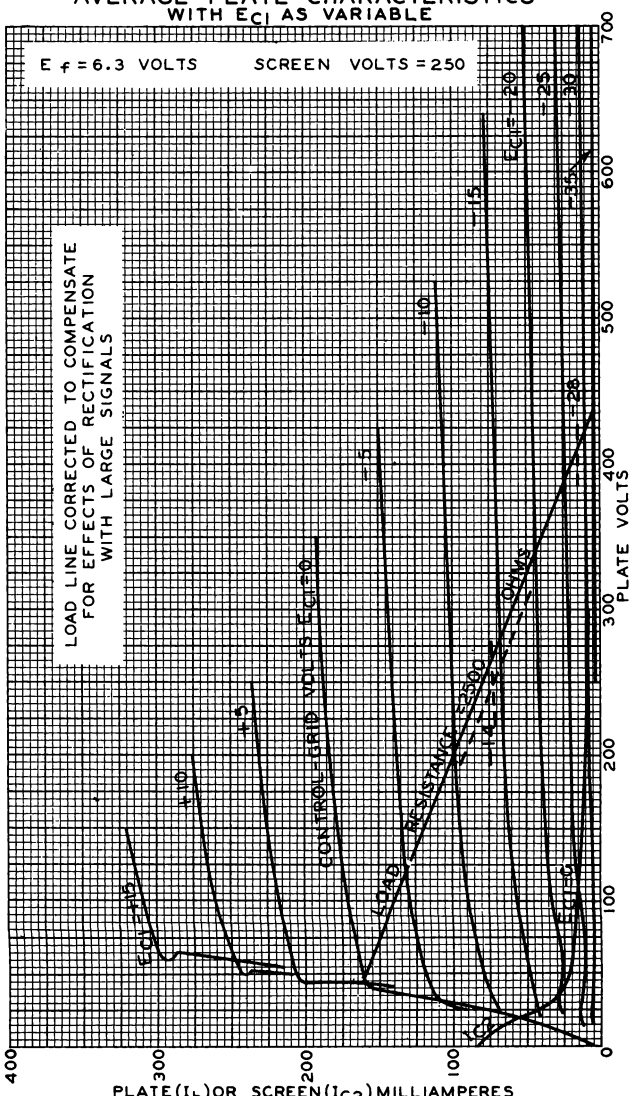
SEPT. 6 1938

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-4966R1

6L6
AVERAGE PLATE CHARACTERISTICS
WITH E_{C1} AS VARIABLE



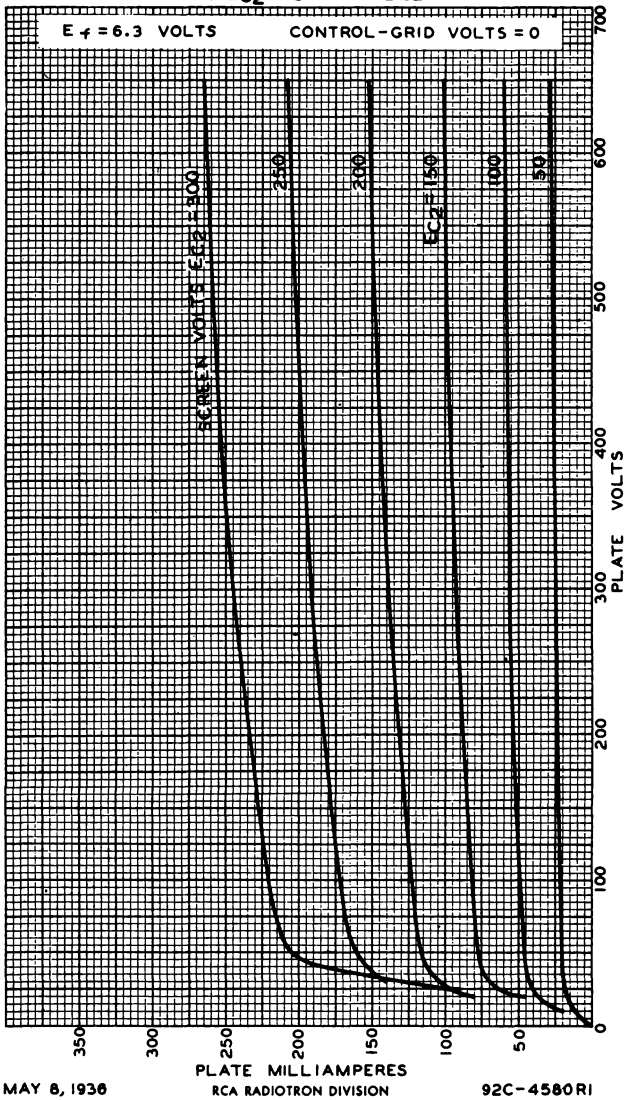
MAY 6, 1936

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4581R1

6L6

6L6
AVERAGE PLATE CHARACTERISTICS
WITH E_{C2} AS VARIABLE



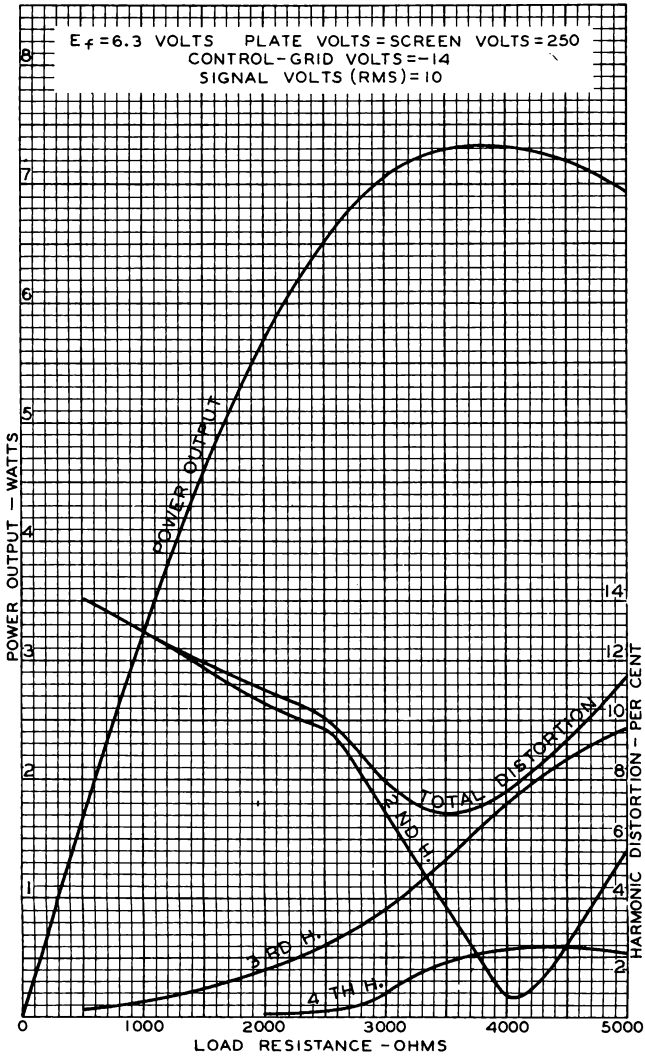
MAY 8, 1936

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4580R1

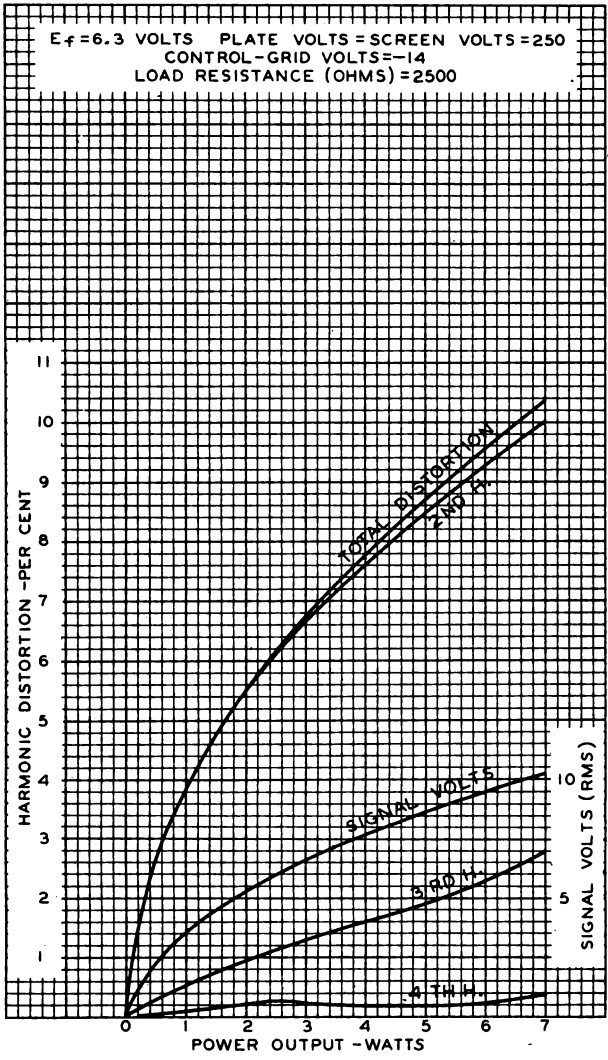
6L6

OPERATION CHARACTERISTICS



6L6

OPERATION CHARACTERISTICS



6L7, 6L7-G

PENTAGRID MIXER AMPLIFIER

Heater ■	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.	μμf
Grid #1 to Plate	0.001 max.	0.005 max.	μμf
Grid #3 to Plate	0.1	0.24	μμf
Grid #1 to All other Electrodes	7.5	6	μμf
Grid #3 to All other Electrodes	10	12	μμf
Plate to All Other Electrodes	11	10	μμf
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	7T	G-7T	
Pin 1	6L7, Shell / 6L7-G, No Con.	Pin 5 - Grid #3	
Pin 2 - Heater		Pin 7 - Heater	
Pin 3 - Plate		Pin 8 - Cathode & Grid #5	
Pin 4 - Grids #2 & #4		Cap - Grid #1	
Mounting Position	BOTTOM VIEW	Any	

AMPLIFIER - Class A_1

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	μmhos
Transcond., Grid #1 to Plate *	5 approx.	μmhos
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.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC

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	µmhos
Conversion Transcond.	5●	5△	µmhos
Plate Cur.	2.4	3.3	ma.
Screen Cur.	7.1	9.2	ma.

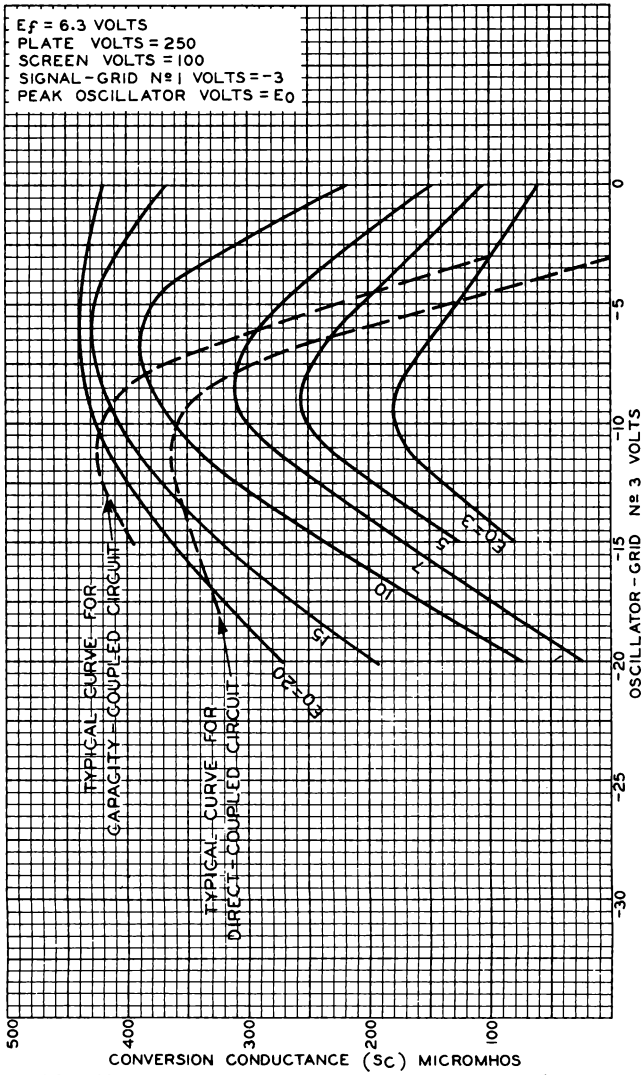
** The d-c resistance in grid #3 circuit should not exceed 50000 ohms.
● With grid #1 bias of -30 volts. △ With grid #1 bias of -45 volts.
These conditions are recommended for multi-range receiver applications.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

Cunningham Radiotron

RCA-6L7

OPERATION CHARACTERISTICS

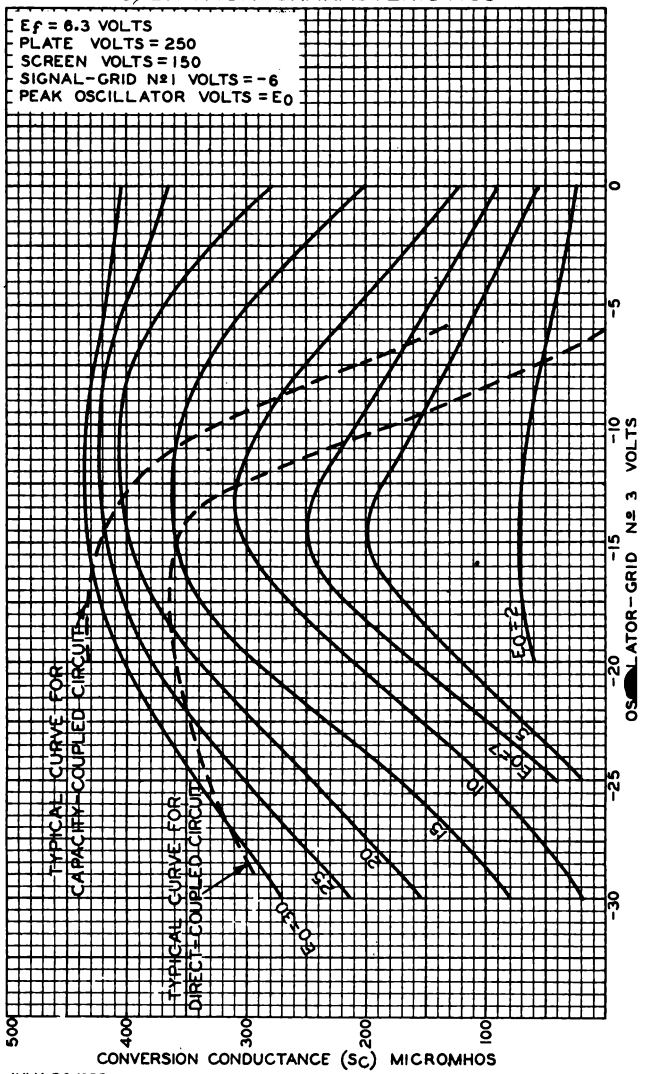


6L7

Cunningham Radiotron

RCA-6L7

OPERATION CHARACTERISTICS



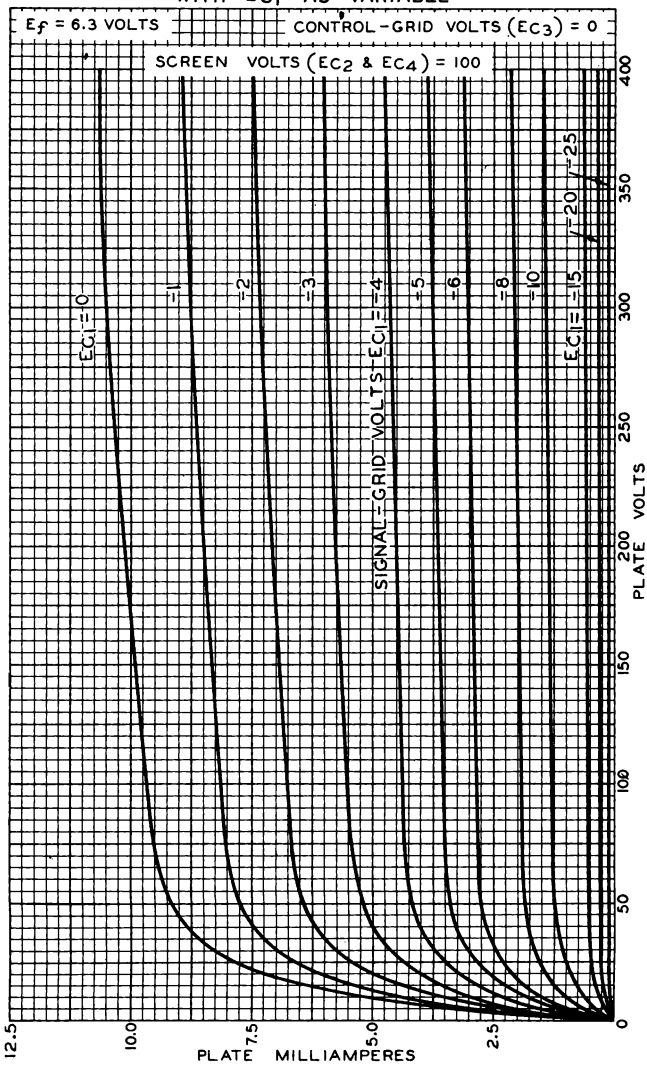
JULY 26,1935

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4445

6L7

AVERAGE PLATE CHARACTERISTICS
WITH E_{C1} AS VARIABLE



JAN. 3, 1936

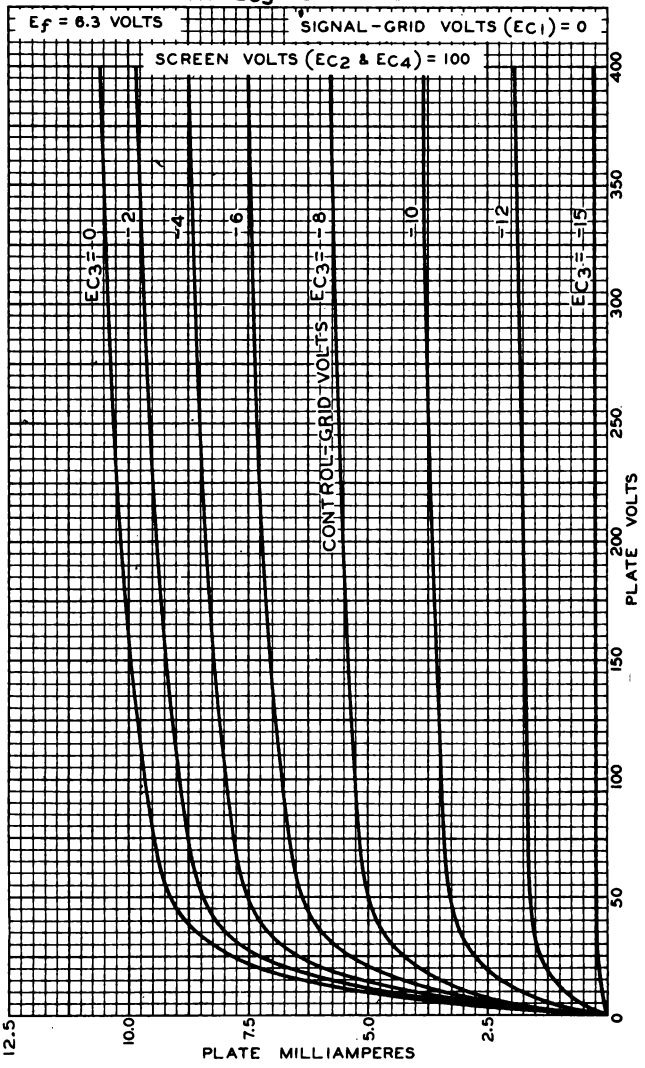
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4531

6L7

6L7

AVERAGE PLATE CHARACTERISTICS
WITH E_{C3} AS VARIABLE



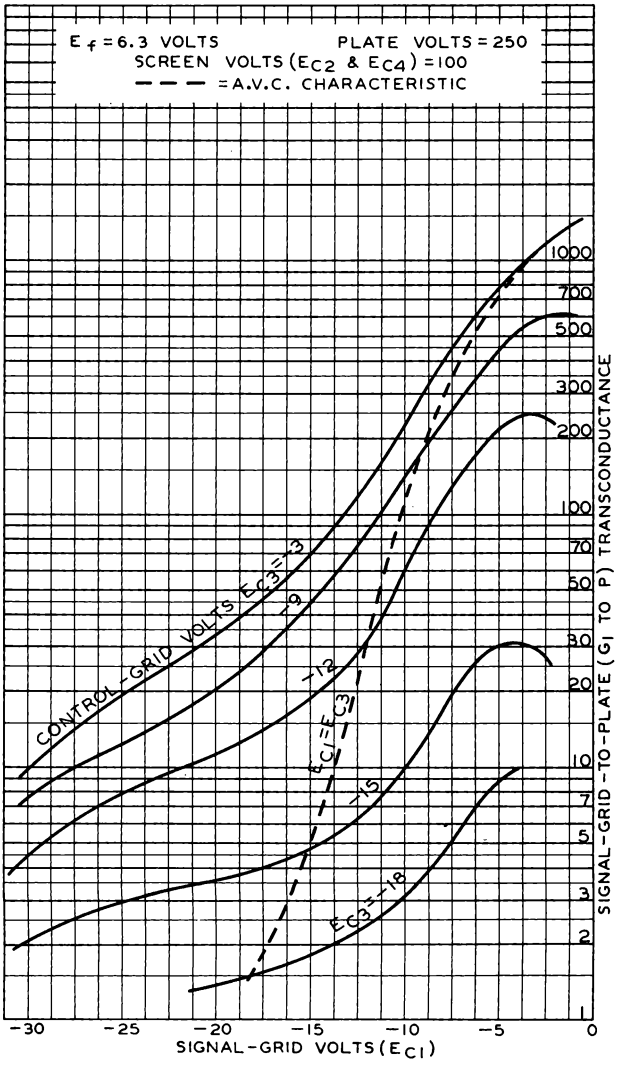
JAN. 7, 1936

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4534

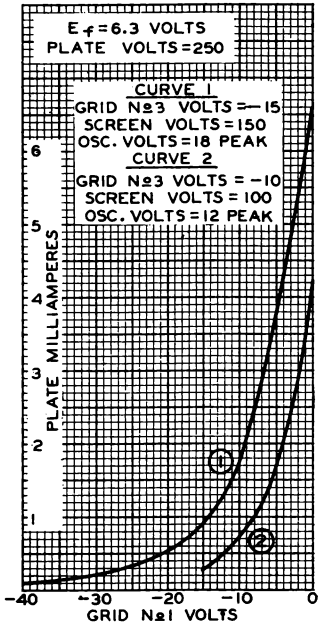
6L7

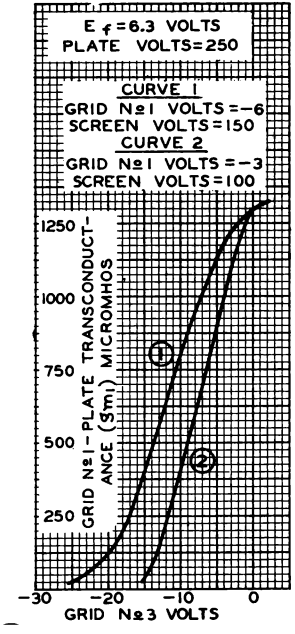
AVERAGE CHARACTERISTICS

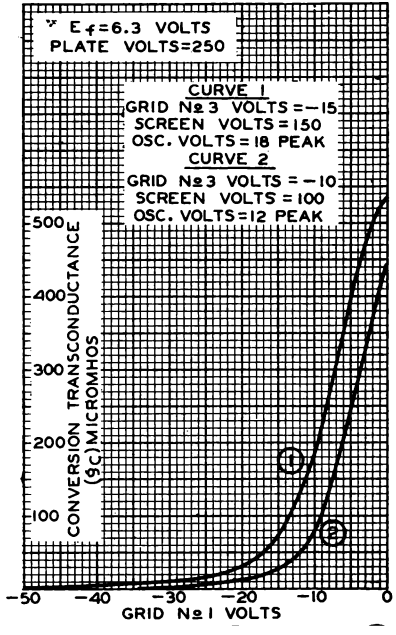


6L7

AVERAGE CHARACTERISTICS







6N6-G

DIRECT-COUPLED POWER AMPLIFIER

Heater *	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.8	amp.
Maximum Overall Length		4-11/16"
Maximum Diameter		1-13/16"
Bulb		ST-14
Base		Medium Shell Octal 7-Pin

Pin 1 - No Connection
Pin 2 - Heater
Pin 3 - Output-Triode Plate
Pin 4 - Input-Triode Plate
Pin 5 - Input-Triode Grid
Pin 7 - Heater
Pin 8 - Cathode

Mounting Position BOTTOM VIEW (G-7AU) Any

AMPLIFIER - Class A_1

Operating Conditions and Characteristics:

Heater *	6.3	volts
Output-Triode Plate	300 max.	volts
Input-Triode Plate	300 max.	volts
Input-Triode Grid ▲	0	volts
Peak A-F Grid Voltage	21	volts
Amp. Fact.	58	
Plate Res.	24000	ohms
Transcond. #	2400	µmhos
Output-Triode Plate Cur.	42	ma.
Input-Triode Plate Cur.	9	ma.
Load Res. □	7000	ohms
Total Harmonic Distortion	5	%
Power Output	4	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.

\# Input grid to output plate.

▲ The input triode serves as a driver for the output triode and is directly coupled to it. No external bias supply is required, but the input-triode grid does not draw grid current because a bias voltage is set up automatically in the tube.

□ If two tubes are operated in push-pull, the plate-to-plate load resistance should be 10000 ohms.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

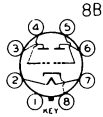
6N7, 6N7-GT/G

CLASS B TWIN AMPLIFIER

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.8	amp.

	6N7	6N7-GT/G
Maximum Overall Length	3-1/4"	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	T-9
Base	Small Wafer, Octal 8-Pin	Intermed. Sh., Octal 8-Pin
Basing Designation	8B	G-8B

Pin 1 - 6N7, Shell; 6N7-GT/G, No Conn.
Pin 2-Heater
Pin 3-Plate (Triode T_2)
Pin 4-Grid (Triode T_2)
Pin 5-Grid (Triode T_1)
Pin 6-Plate (Triode T_1)
Pin 7-Heater
Pin 8-Cathode



BOTTOM VIEW

Mounting Position: Any

For convenience, one triode unit is identified as T_1; the other as T_2.

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□	ohms
Effective Grid-Circuit Impedance (per unit)	0	516□□	ohms
Plate Voltage	300	300	volts
Grid Voltage	0	0	volts
Peak A-F Grid-to-Grid Voltage▲	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

□ 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.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6N7, 6N7-GT/G

CLASS B TWIN AMPLIFIER

(continued from preceding page)

CLASS A_1 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 ▲	-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 20000 and 40000 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.

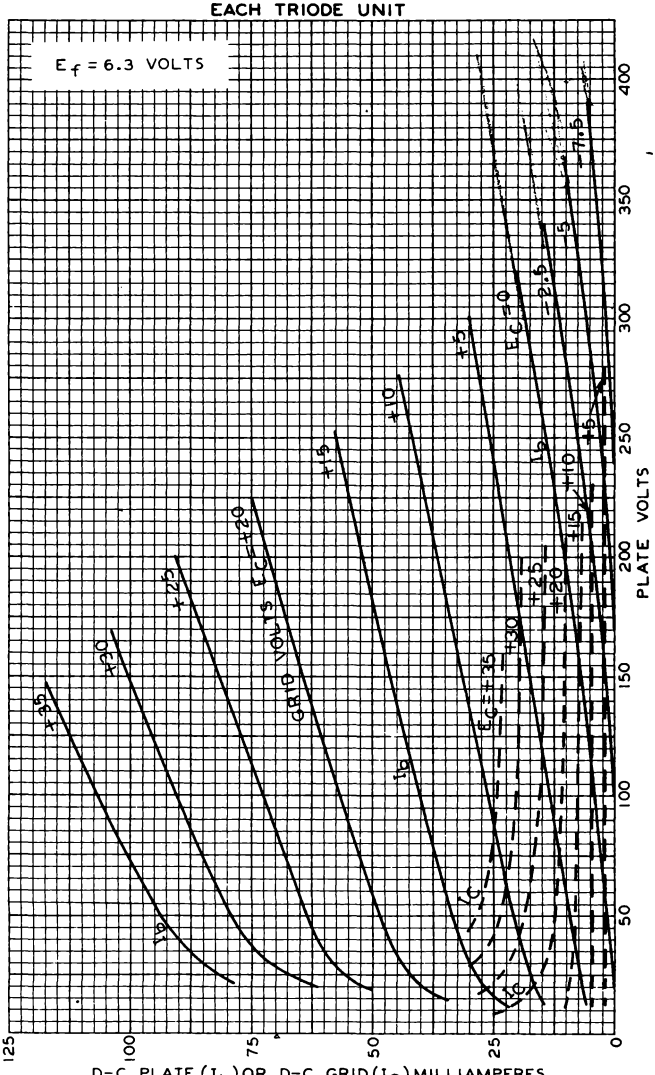
▲ The d-c resistance in the grid circuit of the 6N7 or 6N7-GT/G as a class A amplifier may be as high as 0.5 megohm with cathode bias. With fixed bias, the resistance should not exceed 0.1 megohm.

For additional curves, see Types 6A6 and 53; for data, see RESISTANCE-COUPLED AMPLIFIER CHART.

< Indicates a change.

6N7

AVERAGE PLATE CHARACTERISTICS
EACH TRIODE UNIT



DEC. 18, 1939

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4611

6P5-GT/G

6P5-GT/G

DETECTOR AMPLIFIER TRIODE

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances:°		
Grid to Plate	2.6	μμf
Grid to Cathode	3.4	μμf
Plate to Cathode	5.5	μμf
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 - Grid
Pin 2 - Heater		Pin 7 - Heater
Pin 3 - Plate		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_1 Amplifier:

Plate	100	250	volts
Grid #	-5	-13.5	volts
Amp. Fact.	13.8	13.8	
Plate Res.	12000	9500	ohms
Transcond.	1150	1450	μmhos
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.
° 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.

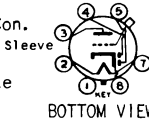
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6Q7, 6Q7-G, 6Q7-GT

DUPLEX-DIODE HIGH-MU TRIODE

Heater ■	Coated Unipotential Cathode		
Voltage	6.3		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 μμf
Grid to Cathode	5.0	3.2	2.2 μμf
Plate to Cathode	3.8	5.0	5.0 μμf
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 Miniature	Skirted Min. Style C
Base	Small Wafer Octal 7-Pin	Small Shell Octal 7-Pin	Sm. Wafer Octal 7-Pin, Sleeve
Basing Designation	7V	G-7V	GT-7V

Pin 1 {6Q7, Shell / 6Q7-G, No Con. / 6Q7-GT, Base Sleeve}
Pin 2 - Heater
Pin 3 - Triode Plate



BOTTOM VIEW

Pin 4 - Diode Plate #2
Pin 5 - Diode Plate #1
Pin 7 - Heater
Pin 8 - Cathode
Cap - Triode Grid

Mounting Position: Any

TRIODE UNIT

Plate Voltage: 300 max. volts

Characteristics - Class A_1 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 6B7 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.

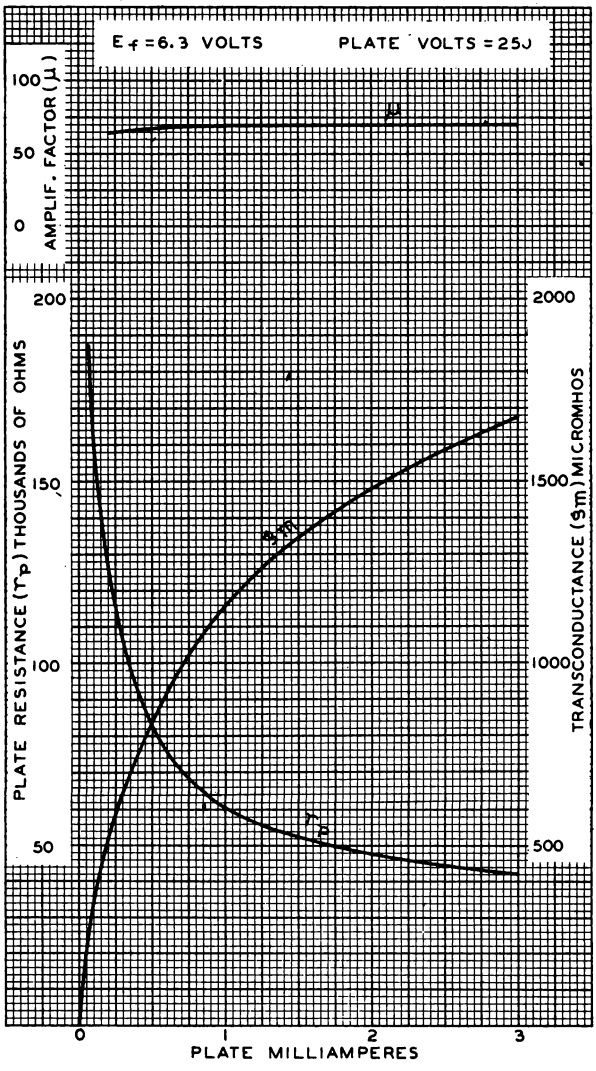
← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6Q7

6Q7

AVERAGE CHARACTERISTICS



JUNE 29, 1936

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4577

6Q7

AVERAGE PLATE CHARACTERISTICS
TRIODE UNIT

SEPT. 10, 1941 · RCA RADIOTRON DIVISION · RCA MANUFACTURING COMPANY, INC. · 92C-4522R2

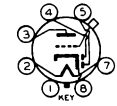
6R7, 6R7-GT/G

DUPLEX-DIODE TRIODE

Heater	Coated Unipotential 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	-	μμf
Grid to Cathode	4.8	-	μμf
Plate to Cathode	3.8	-	μμf
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 / Miniature	
Base	Small Wafer / Octal 7-Pin	Intermed. Shell / Octal 7-Pin	←
Basing Designation	7V	G-7V	←

Pin 1 — 6R7, Shell / 6R7-GT/G, No Connection
Pin 2 - Heater
Pin 3 - Triode Plate



BOTTOM VIEW

Pin 4 - Diode Plate #2
Pin 5 - Diode Plate #1
Pin 7 - Heater
Pin 8 - Cathode
Cap - Triode Grid

Mounting Position: Any

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 ←

Typical Operation and Characteristics-Class A_1 Amplifier:

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 6B7 apply to the 6R7 and 6R7-GT/G.

▲ Triode unit with shell connected to cathode. Values are approximate.

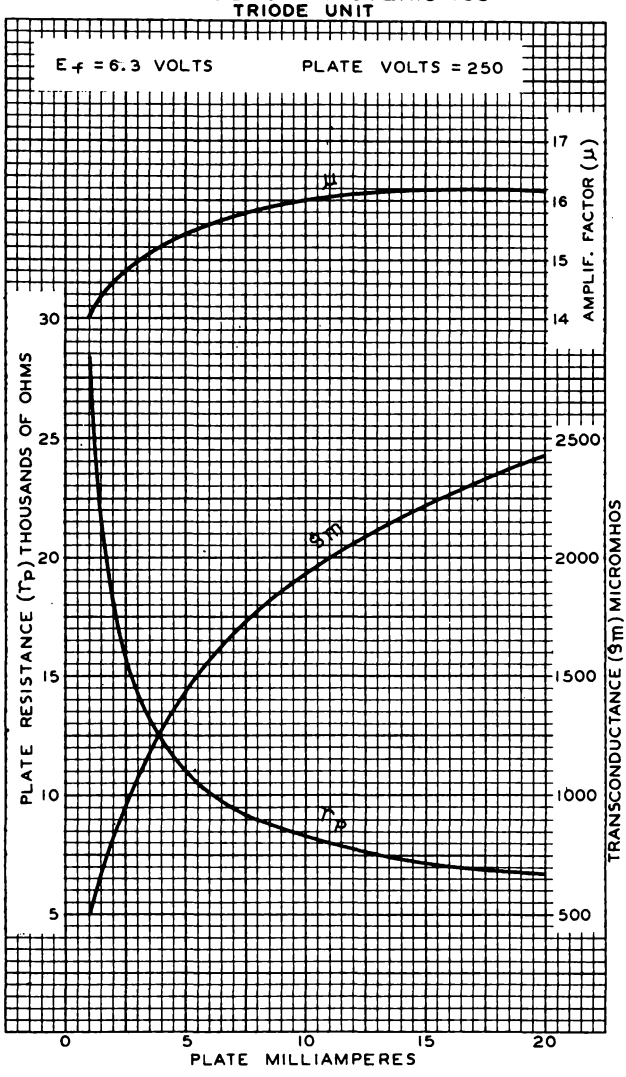
An additional curve applying to Types 6R7 and 6R7-GT/G is shown under Type 6SR7.

← Indicates a change.

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6R7

AVERAGE CHARACTERISTICS
TRIODE UNIT



6S4
MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

The 6S4 is the same as the 6S4-A except that the 6S4 does not have a controlled Heater Warm-up Time, and is not intended for use in equipment having series heater-string arrangement.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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.):[c]

Grid to plate	2.6	μμf
Grid to cathode and heater	4.2	μμf
Plate to cathode and heater	0.9	μμf

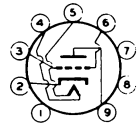
Characteristics, Class A_1 Amplifier:

Plate Voltage	250	volts
Grid Voltage	-8	volts
Amplification Factor	16	
Plate Resistance (Approx.)	3600	ohms
Transconductance	4500	μmhos
Plate Current	26	ma
Plate Current for grid voltage of -15 volts	4.5	ma
Grid Voltage (Approx.) for plate current of 50 μamp	-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" ± 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

[c] Without external shield.

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□

DC PLATE VOLTAGE	500 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE# (Absolute maximum)	2200■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▲max.	volts

Maximum Circuit Values:

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

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

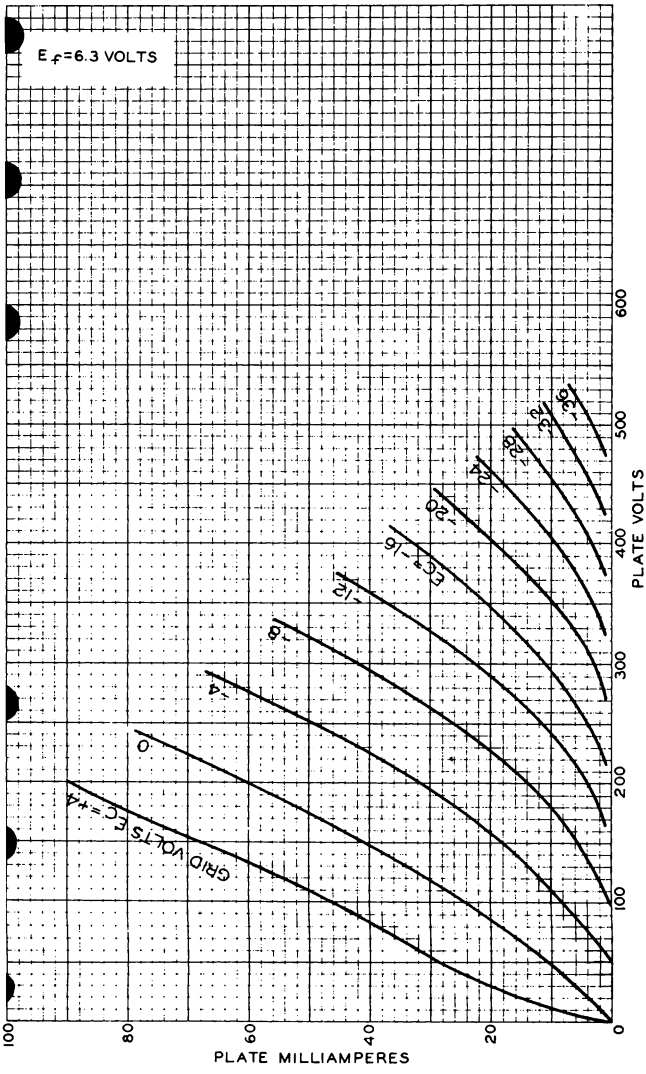
This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

■ Under no circumstances should this absolute value be exceeded.

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6S4-A
AVERAGE PLATE CHARACTERISTICS



6S7, 6S7-G

TRIPLE-GRID SUPER-CONTROL AMPLIFIER

Heater ■	Coated Unipotential Cathode		
Voltage	6.3		a-c or d-c volts
Current	0.15		amp.
	6S7	6S7-G	
Direct Interelectrode Cap.	▲	▲▲	
Grid to Plate	0.005 max.	0.008 max.	μμf
Input	6.5	4.4	μμf
Output	10.5	8	μμf
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_1

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●	10△	μmhos
Plate Cur.	3.7	8.5	ma.
Screen Cur.	0.9	2	ma.

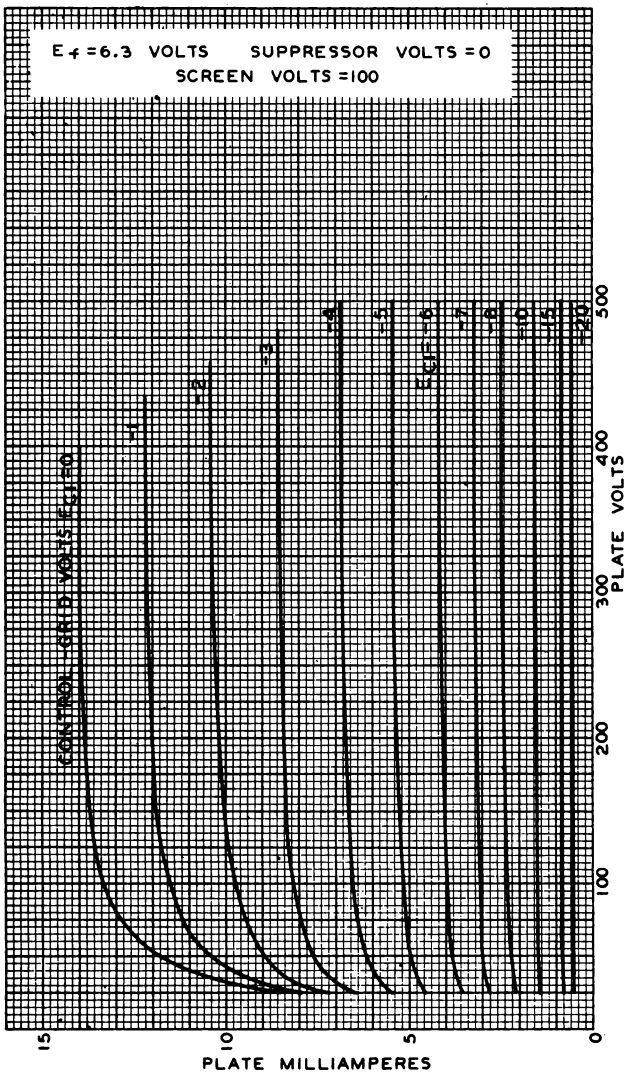
■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
▲ With shell connected to cathode.
▲▲ With close-fitting shield connected to cathode.
● With grid bias of -25 volts. △ With grid bias of -38.5 volts.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6S7

6S7

AVERAGE PLATE CHARACTERISTICS



JAN. 17, 1938

RCA RADIOTRON 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	μμf
Grid to Cathode	2.0	μμf
Plate to Cathode	3.8	μμf
Each Diode Unit:		
Plate to Cathode (Approx.)	1.0	μμf

* 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 A_1

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	μmhos
Plate Current	0.07	0.4	0.9	ma

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:

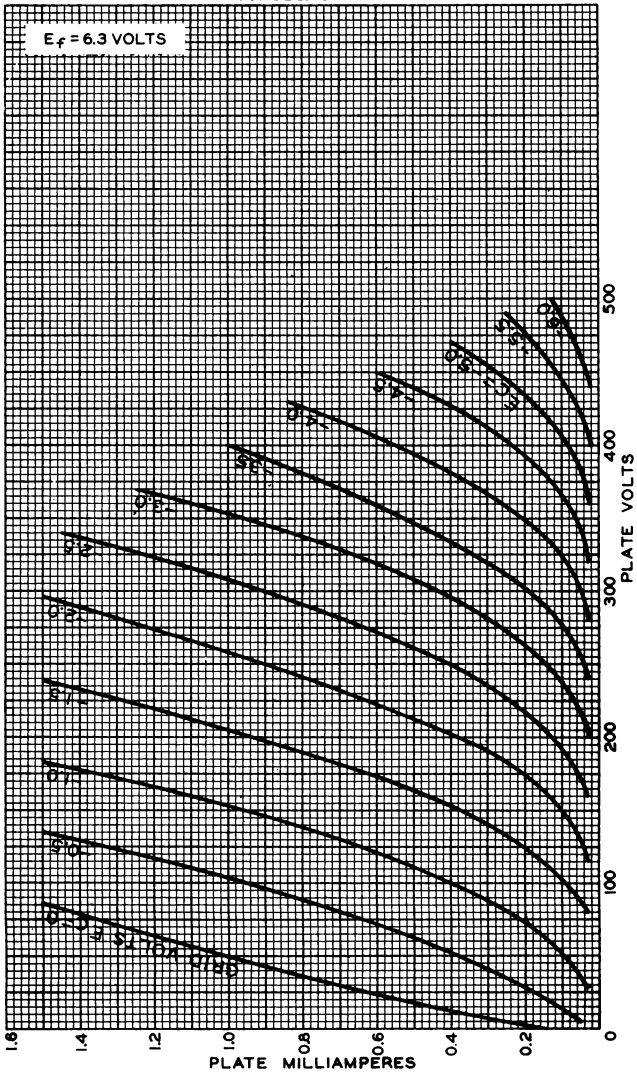
Diode units No.2 & No.3 and the triode unit have a common cathode, and diode unit No.1 has a separate cathode. Diodes No.1 (pins 3 & 5) and No.3 (pins 1 & 2) are recommended for use in FM detector applications, while diode No.2 (pins 4 & 2) is recommended for use as an AM detector.

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.

6S8-GT

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



JULY 25,1947

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6876

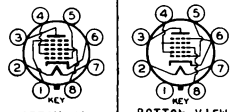
6SA7, 6SA7-GT/G

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▲	11▲▲	μμf
Plate to All Other Electrodes (Mixer Output)	12▲	11▲▲	μμf
Grid #1 to All Other Electrodes (Osc. Input)	7▲	8▲▲	μμf
Grid #3 to Plate	0.13 max.▲	0.5 max.▲▲	μμf
Grid #3 to Grid #1	0.15 max.▲	0.4 max.▲▲	μμf
Grid #1 to Plate	0.06 max.▲	0.2 max.▲▲	μμf
Grid #1 to Shell, Grid #5, and All Other Electrodes except Cathode	4.4	–	μμf
Grid #1 to All Other Electrodes except Cathode & Grid #5	–	5	μμf
Grid #1 to Cathode	2.6	–	μμf
Grid #1 to Cathode & Grid #5	–	3	μμf
Cathode to Shell, Grid #5, and All Other Electrodes except Grid #1	5	–	μμf
Cathode and Grid #5 to All Other Electrodes except Grid #1	–	14	μμf
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	Intermed. Sh. Octal 8-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



BOTTOM VIEW (8R) | BOTTOM VIEW (G-8AD)

Mounting Position	Any

Maximum And Minimum Ratings Are Design-Center Values

CONVERTER SERVICE

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.

6SA7, 6SA7-GT/G
PENTAGRID CONVERTER

(continued from preceding page)

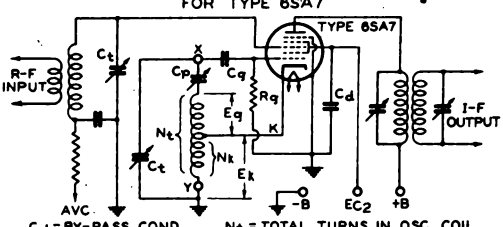
Characteristics:	*Self-excitation**		*Separate Excitation*		
Plate Voltage	100	250	100	250	volts
Grids #2 & #4 Volt.	100	100	100	100	volts
Grid #3 (Control) Volt.	0	0	-2	-2	volts
Grid #1 Resistor	20000	20000	20000	20000	ohms
Plate Res. (Approx.)	0.5	1.0	0.5	1.0	megohm
Conversion Transcond.	425	450	425	450	µmhos
Conversion Transcond. (Approx.) ‡	2	2	2	2	µmhos
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 µmhos 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



Cd = BY-PASS COND.
Cq = 50 µµf
Cp = PADDING COND.
Ct = TUNING COND.

Nt = TOTAL TURNS IN OSC. COIL
Nk = TURNS IN CATHODE SECTION OF OSC. COIL
Rq = 20000 OHMS

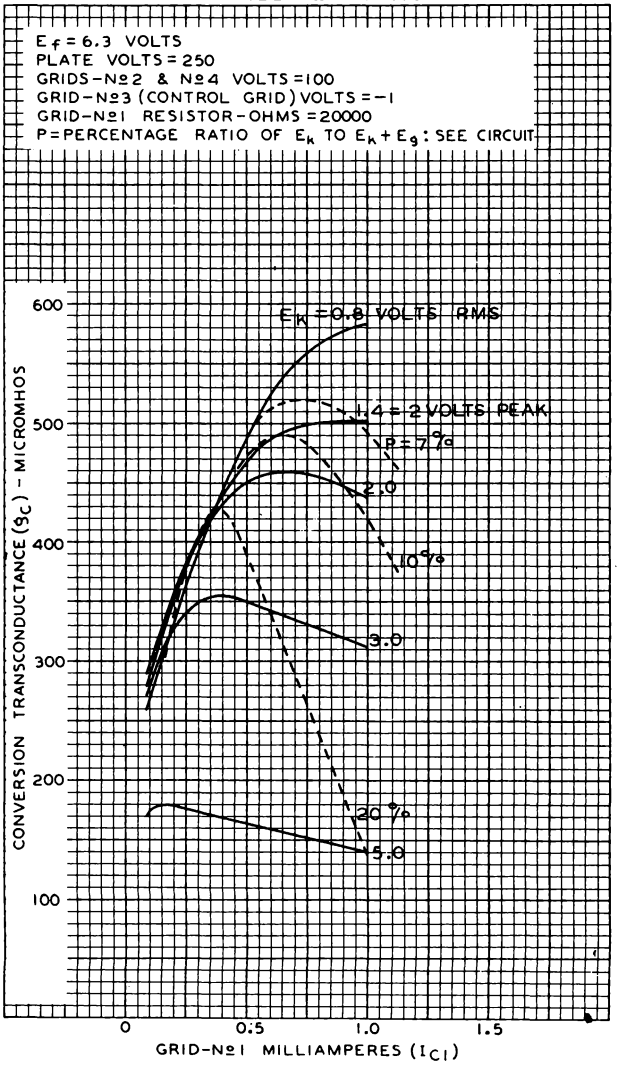
CE-4992

The license extended to the purchaser of tubes appears in the License Notice accompanying them. Information contained herein is furnished without assuming any obligations.

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6SA7

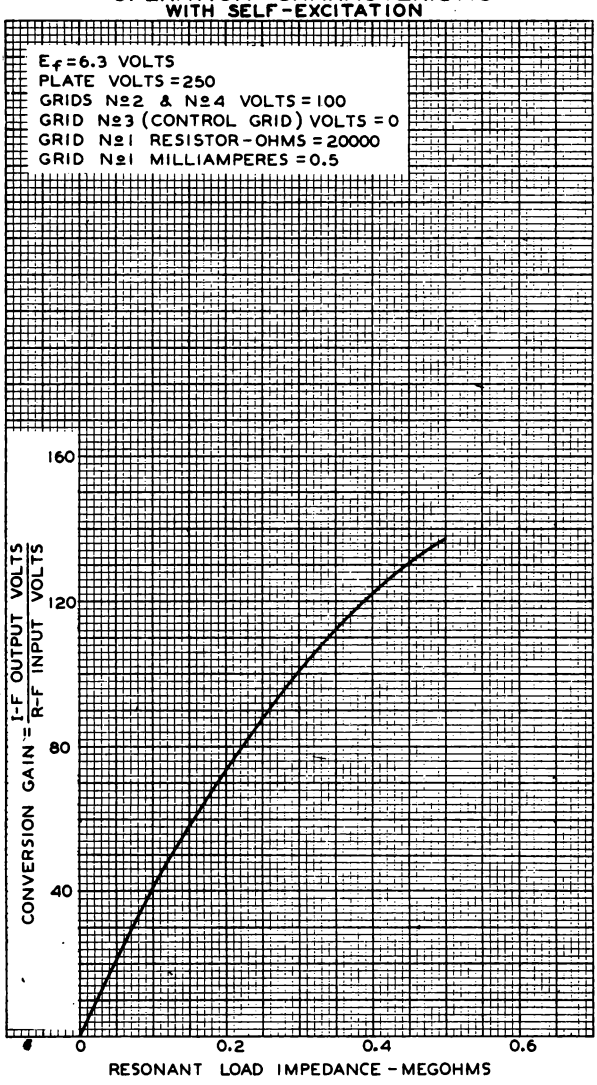
OPERATION CHARACTERISTICS
WITH SELF-EXCITATION



6SA7

6SA7

OPERATION CHARACTERISTIC
WITH SELF-EXCITATION



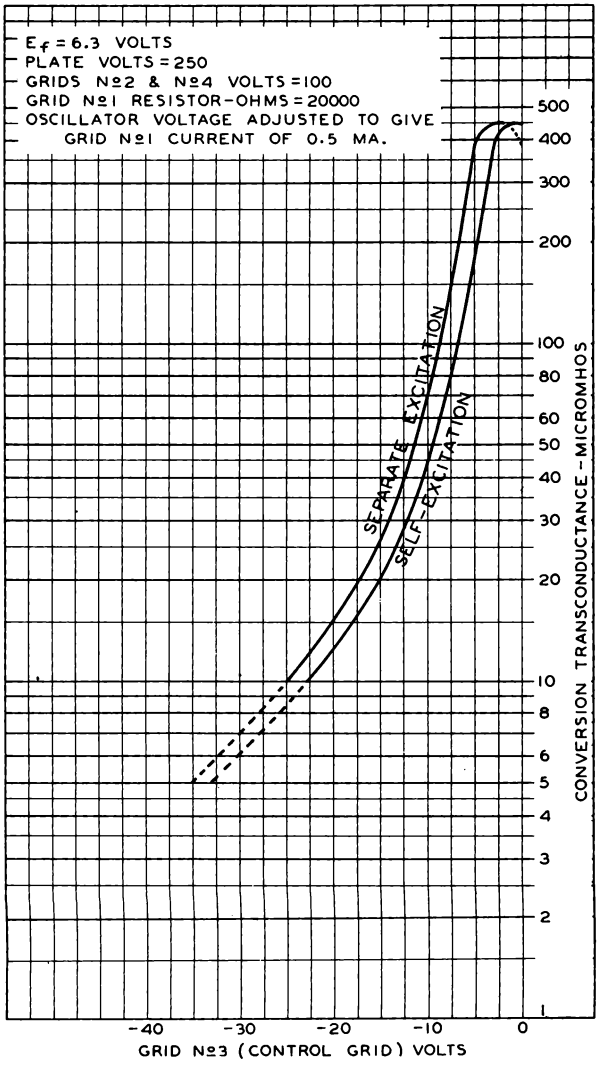
APR. 25, 1941

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

CE-4994

6SA7

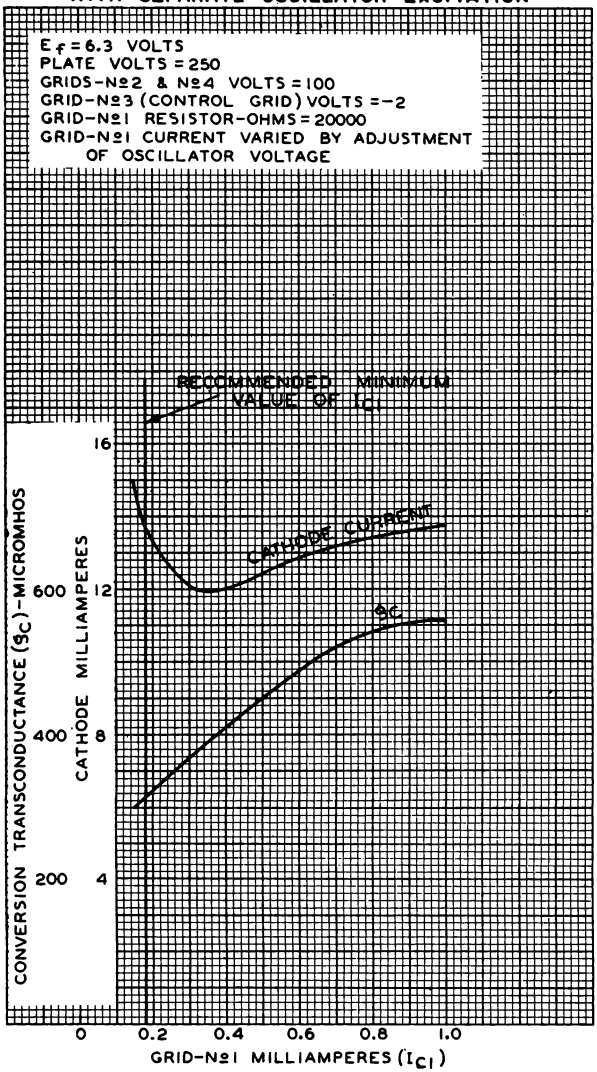
OPERATION CHARACTERISTICS



6SA7

6SA7

OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION



APR. 24, 1941

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4990R1

6SB7-Y

PENTAGRID CONVERTER

SINGLE-ENDED METAL TYPE

GENERAL DATA

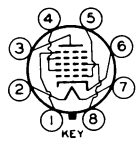
Electrical:

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

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 2 - Heater
Pin 3 - Plate
Pin 4 - Grids No.2 & No.4



Pin 5 - Grid No.1
Pin 6 - Cathode
Pin 7 - Heater
Pin 8 - Grid No.3

CONVERTER SERVICE

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

PLATE VOLTAGE	300 max.	volts
GRIDS - No.2 & No.4 VOLTAGE	100 max.	volts
GRIDS - No.2 & No.4 SUPPLY VOLTAGE	300 max.	volts
PLATE DISSIPATION	2.0 max.	watts
GRIDS - No.2 & No.4 DISSIPATION	1.5 max.	watts
TOTAL CATHODE CURRENT	22 max.	ma.
GRID - No.3 VOLTAGE:		
Negative Bias Voltage	100 max.	volts
Positive Bias Voltage	0 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

▲ with shell connected to cathode.

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.

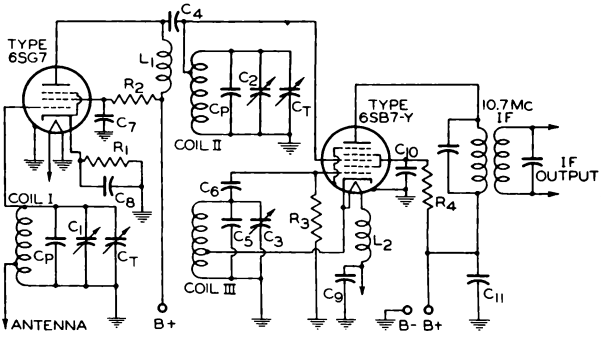
** With grid-No.3 bias of -20 volts.

6SB7-Y

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 μμf
C4 C5 C6 = 22 μμf
C7 C8 C9 C10 C11 = BY-PASS CONDENSERS
Cp = PADDING CONDENSERS
Ct = TRIMMER CONDENSERS

L1 L2 = RF CHOKES
R1 = 68 OHMS
R2 = 33000 OHMS
R3 = 22000 OHMS
R4 = 12000 OHMS

COIL I = ANTENNA COIL*: 2 TURNS No.14 WIRE + 1-1/4" LEAD No.20 WIRE. COIL TAPPED AT 1 TURN.
COIL II = INTERSTAGE COIL*: 2 TURNS No.14 WIRE + 1-1/4" LEAD No.20 WIRE. COIL TAPPED AT 1-1/4 TURN.
COIL III = OSCILLATOR COIL*: 1-7/8 TURNS No.14 WIRE, NO ADDED LEAD. COIL TAPPED AT 5/8 TURN.

* All coils 5/8" long, approx.

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

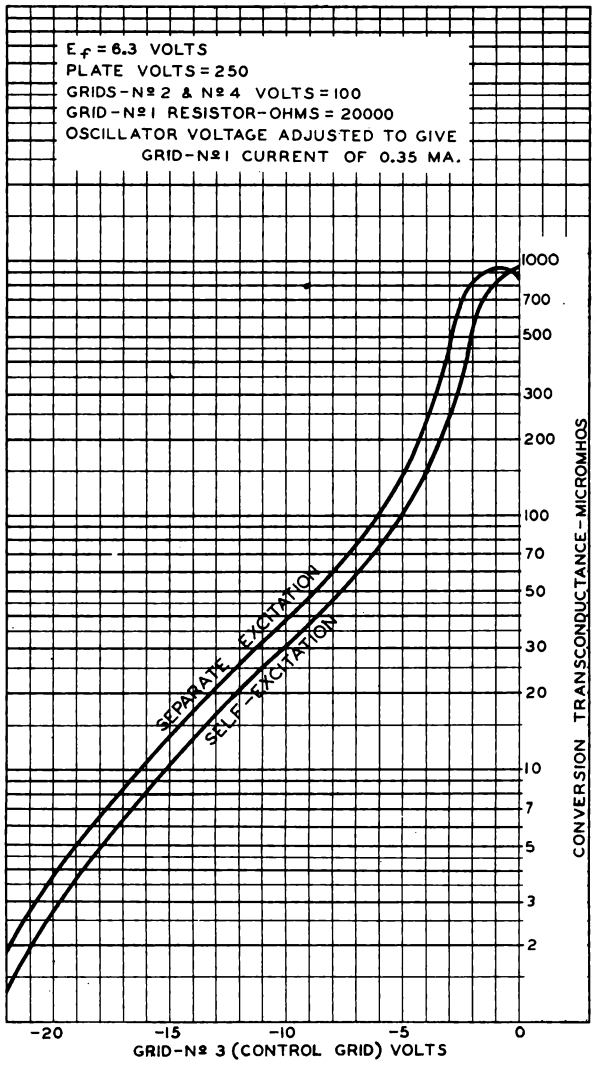
NOTE 2: Insertion of a small non-inductive resistor of about 3 ohms in the circuit at grid-No.3 terminal of the 6SB7-Y is helpful in preventing oscillation at the signal frequency.

92CM-6650

6SB7-Y

6SB7-Y

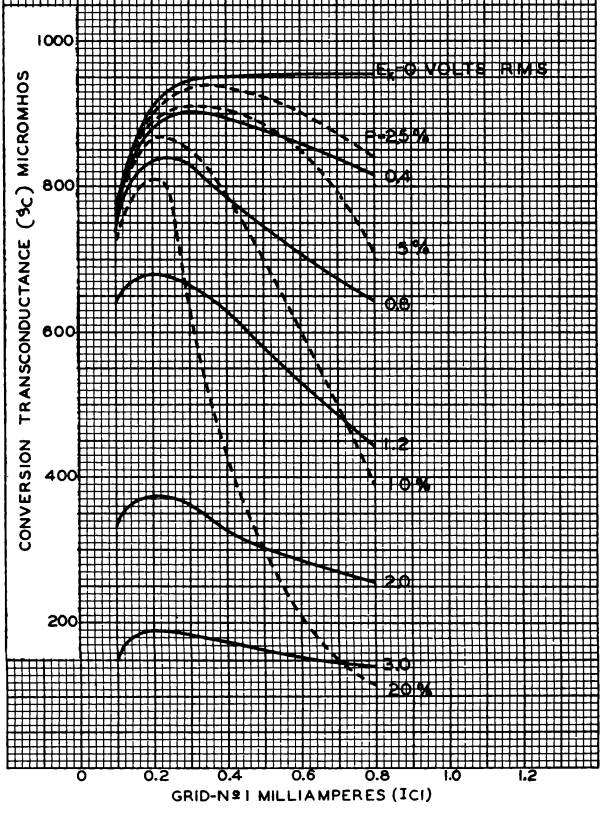
OPERATION CHARACTERISTICS



6SB7-Y

OPERATION CHARACTERISTICS
WITH SELF-EXCITATION

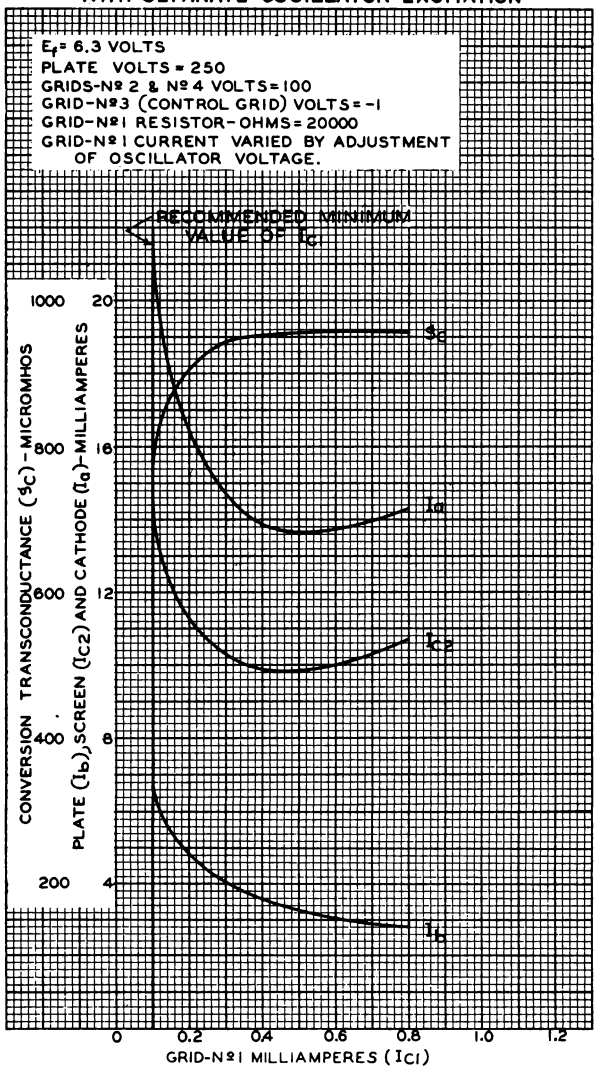
E_f = 6.3 VOLTS
PLATE VOLTS = 250
GRIDS-Nº 2 & Nº 4 VOLTS = 100
GRID-Nº 3 (CONTROL GRID) VOLTS = -1
GRID-Nº 1 RESISTOR-OHMS = 20000
P-PERCENTAGE RATIO OF E_k TO $E_k + E_g$, WHERE
E_k = VOLTAGE ACROSS OSCILLATOR-COIL SECTION BETWEEN GROUND AND CATHODE, AND
E_g = OSCILLATOR VOLTAGE BETWEEN CATHODE AND GRID



6SB7-Y

6SB7-Y

OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION



6SC7

HIGH-MU TWIN TRIODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.3	amp

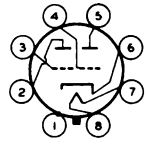
Direct Interelectrode Capacitances (Approx.):*

Grid to plate	2	μμf
Grid to cathode, heater, and shell	2	μμf ←
Plate to cathode, heater, and shell	3	μμf

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.B8-21)
Basing Designation for BOTTOM VIEW	8S

Pin 1 - Shell
Pin 2 - Plate of Unit No.2
Pin 3 - Grid of Unit No.2
Pin 4 - Grid of Unit No.1



Pin 5 - Plate of Unit No.1
Pin 6 - Cathode
Pin 7 - Heater
Pin 8 - Heater

AMPLIFIER - Class A_1

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	μmhos
Plate Current	2	ma

Typical Operation as Resistance-Coupled Amplifier: ←

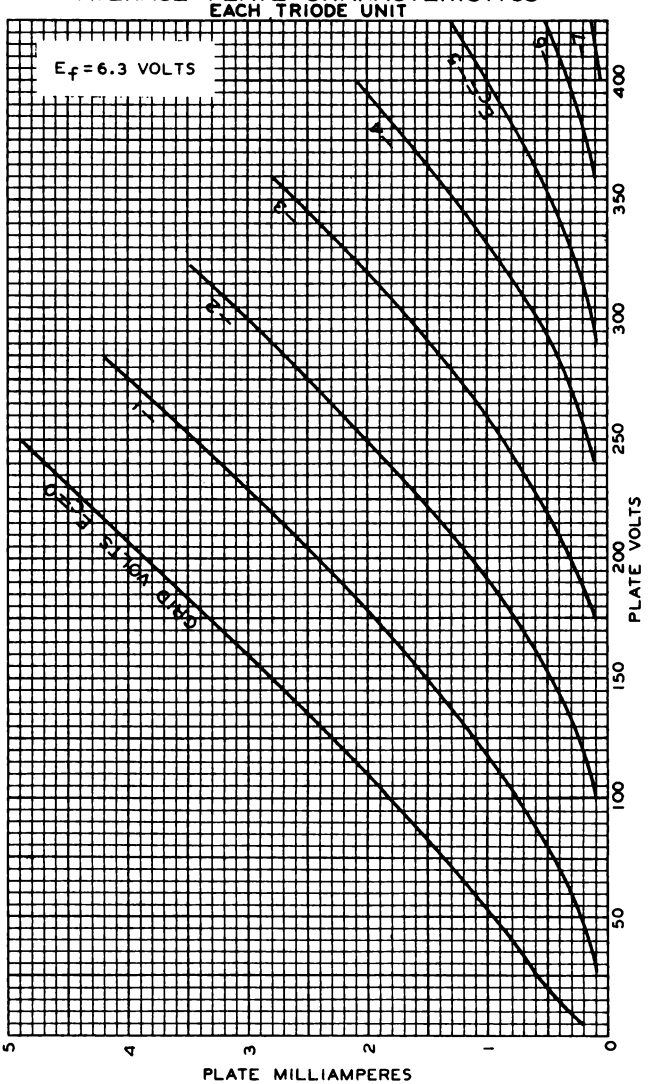
See RESISTANCE-COUPLED AMPLIFIER CHART No.17 at front of this Section

* Values for each unit with pin 1 connected to pin 6.

← indicates a change.

6SC7

AVERAGE PLATE CHARACTERISTICS
EACH TRIODE UNIT



OCT. 16, 1940

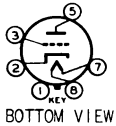
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6096R1

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* ▲	*6SF5-GT*	
Grid to Plate	2.4	-	μμf
Grid to Cathode	4.0	-	μμf
Plate to Cathode	3.6	-	μμf
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	6AB	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 ←
Characteristics - Class A_1 Amplifier:			
Plate	100	250	volts
Grid	-1	-2	volts
Amp. Fact.	100	100	
Plate Res.	85000	66000	ohms
Transcond.	1150	1500	μmhos
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.

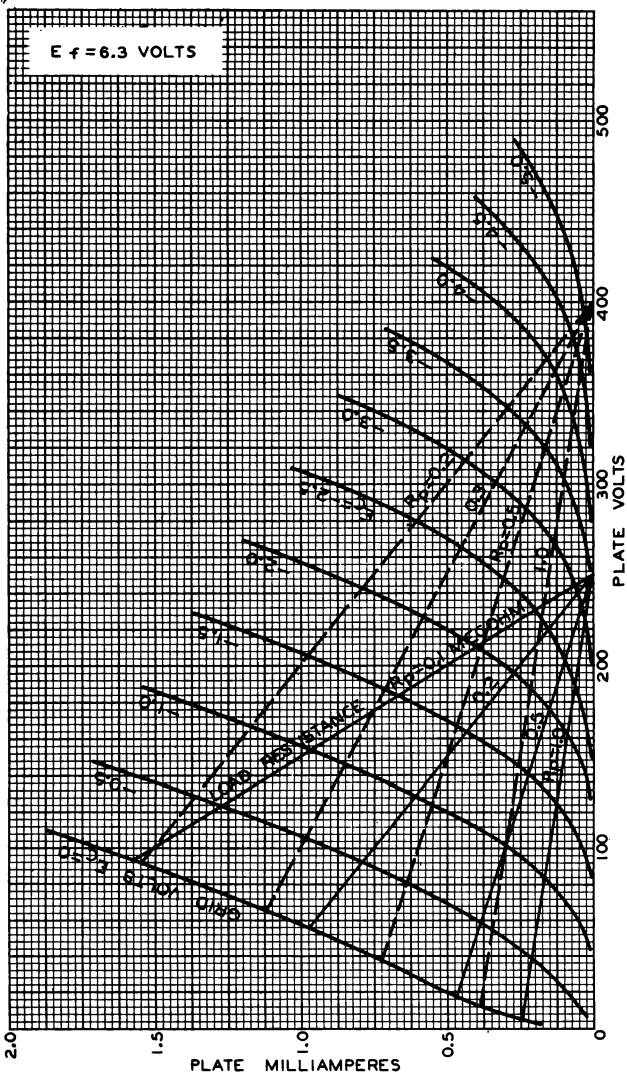
← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6SF5

6SF5

AVERAGE PLATE CHARACTERISTICS

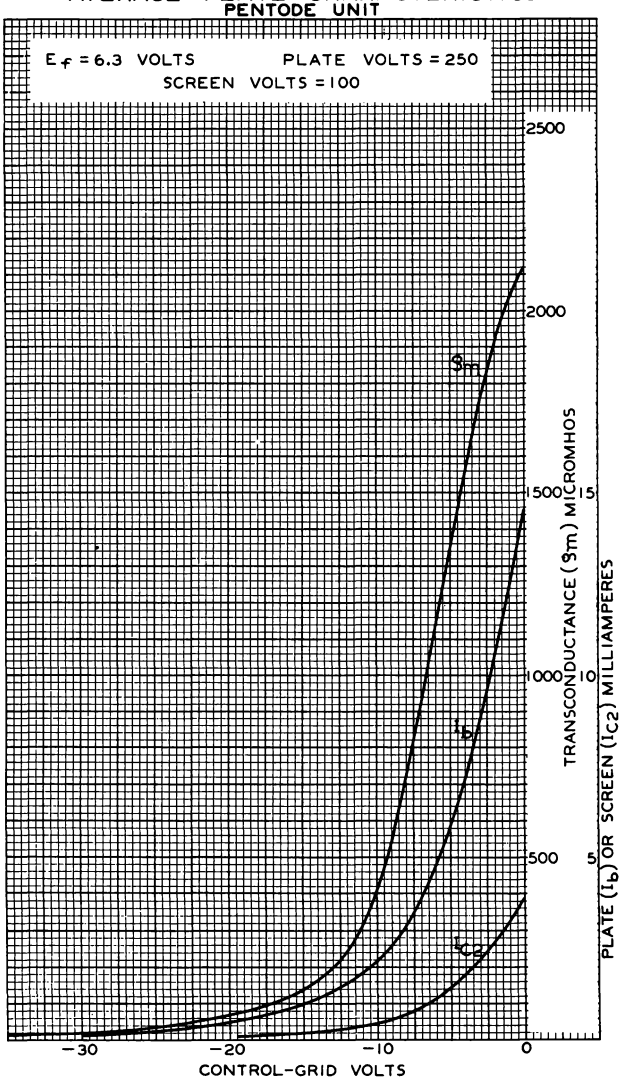


SEPT. 23 1938

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4974

6SF7
AVERAGE PLATE CHARACTERISTICS
PENTODE UNIT



FEB. 20, 1941

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

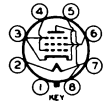
92C-6256

6SG7

H-F AMPLIFIER PENTODE

SINGLE-ENDED METAL TYPE WITH SEMI-REMOTE CUT-OFF

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances: °		
Grid to Plate	0.003 max.	μμf
Input	8.5	μμf
Output	7.0	μμf
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 - 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

Typical Operation and Characteristics-Class A_1 Amplifier:

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.

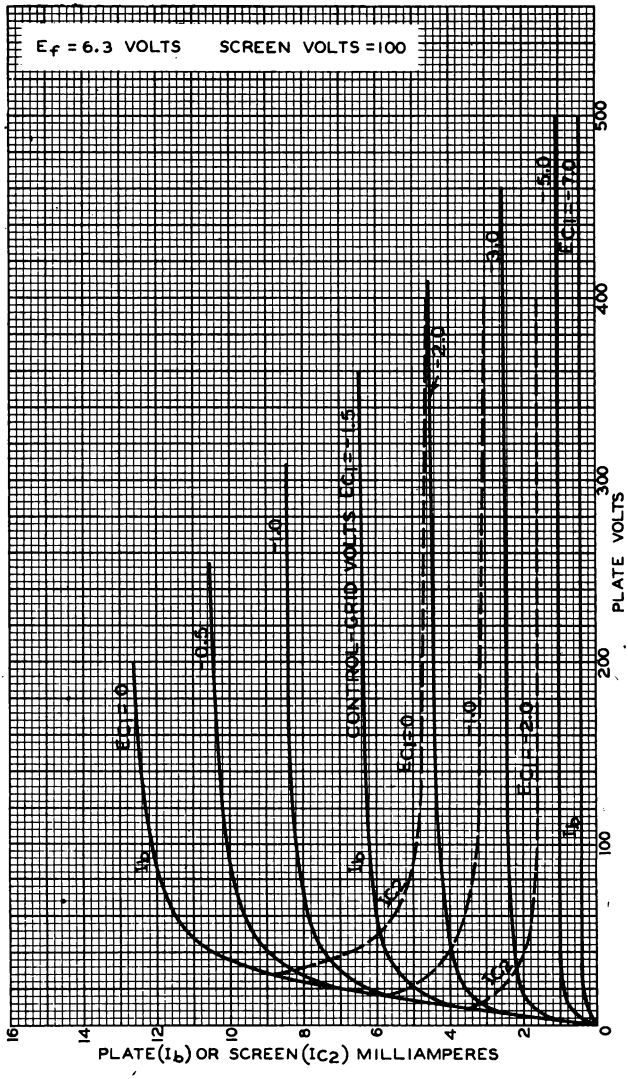
← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6SG7

6SG7

AVERAGE PLATE CHARACTERISTICS



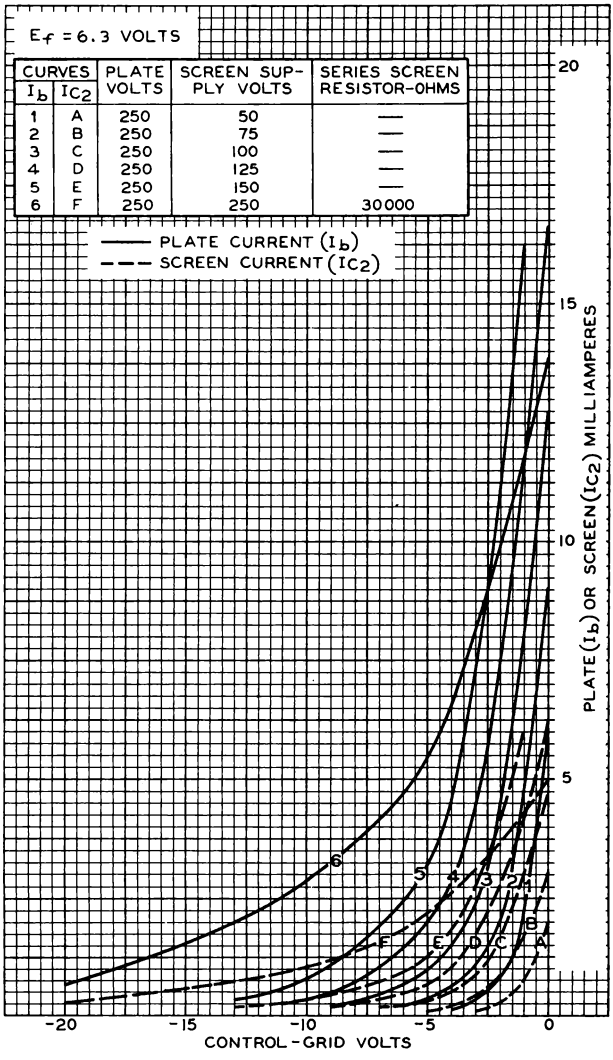
APRIL 16, 1942

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6253R2

6SG7

AVERAGE CHARACTERISTICS



CURVES I_b	CURVES I_{c2}	PLATE VOLTS	SCREEN SUPPLY 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

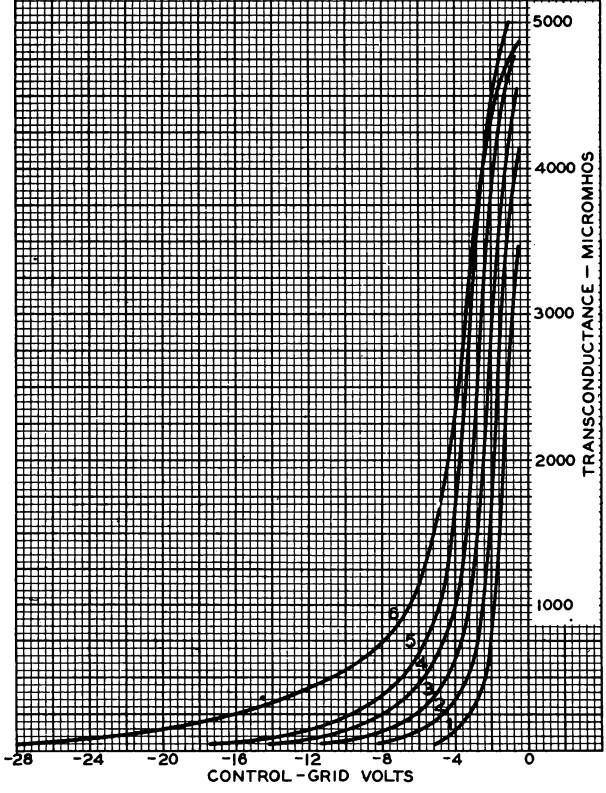
6SG7

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



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:°		
Grid to Plate	0.003 max.	μμf
Input	8.5	μμf
Output	7.0	μμf
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 - 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	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_1 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	μmhos
Grid Bias for Plate Current = 10 μamp.	-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.

° With shell connected to cathode.

←Indicates a change.

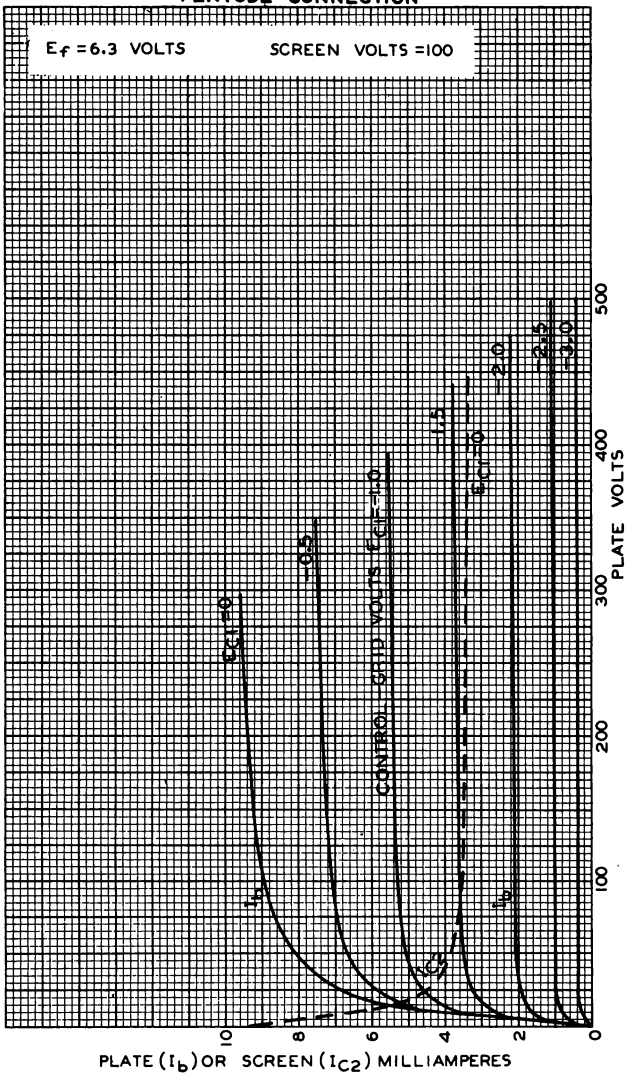
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6SH7

6SH7

AVERAGE PLATE CHARACTERISTICS

PENTODE CONNECTION



JULY 24, 1941

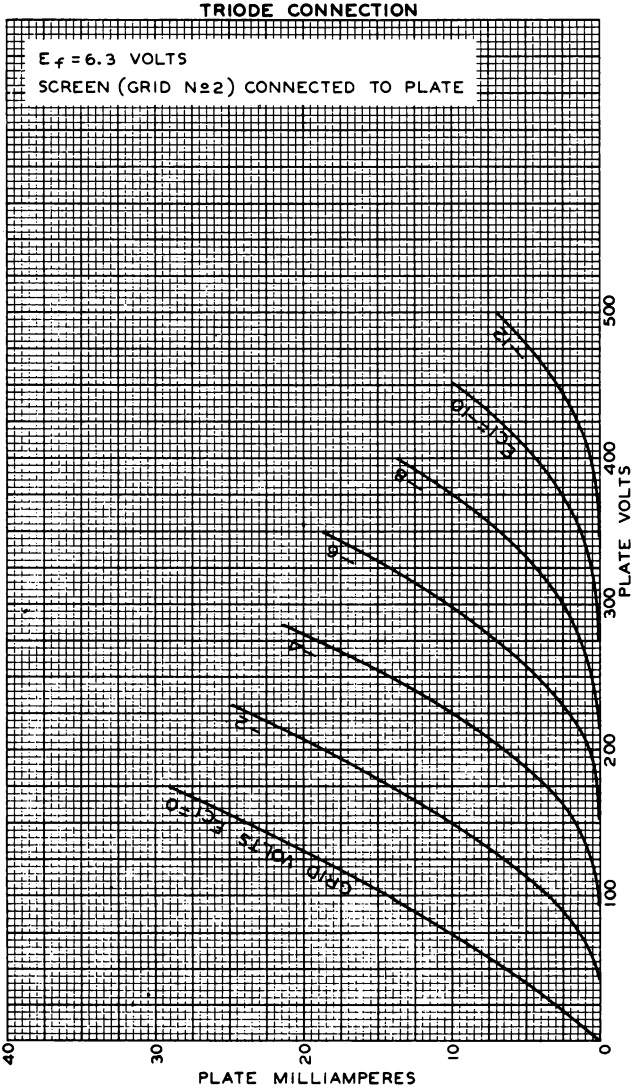
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6300

6SH7

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION



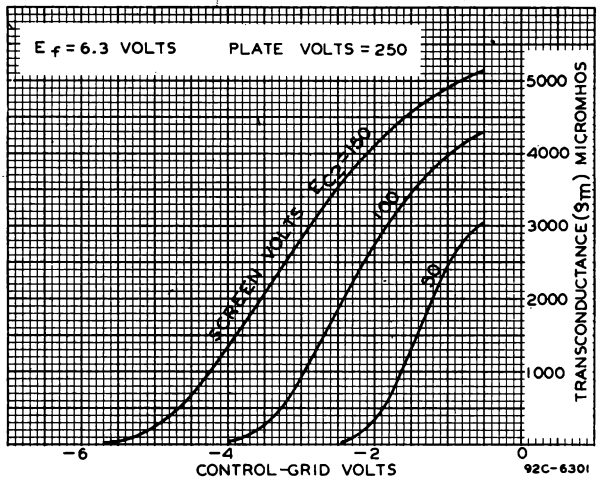
MAY 11, 1942

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

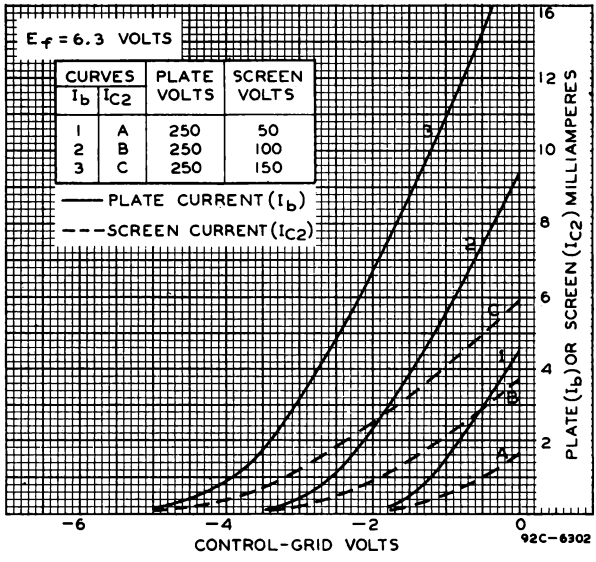
92C-6395

6SH7

AVERAGE CHARACTERISTICS



AVERAGE CHARACTERISTICS



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:

	6SJ7°	6SJ7-GT°°	
Pentode Connection:			
Grid No.1 to Plate	0.005 max.	0.005 max.	μμf
Input	6	7	μμf ←
Output	7	7	μμf ←
Triode Connection:*			
Grid No.1 to Plate	2.8	2.8	μμf
Grid No.1 to Cathode	3.4	3.4	μμf
Plate to Cathode	11	11	μμf

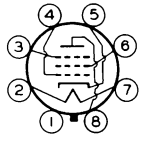
° With shell connected to cathode.
°° With external shield connected to cathode.
* With grid No.2 and grid No.3 connected to plate.

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
Basing Designation	8N	GT-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_1
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.

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	μmhos
Grid-No.1 Bias (Approx.) for plate current of 10 μamp	-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_1

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	μmhos
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

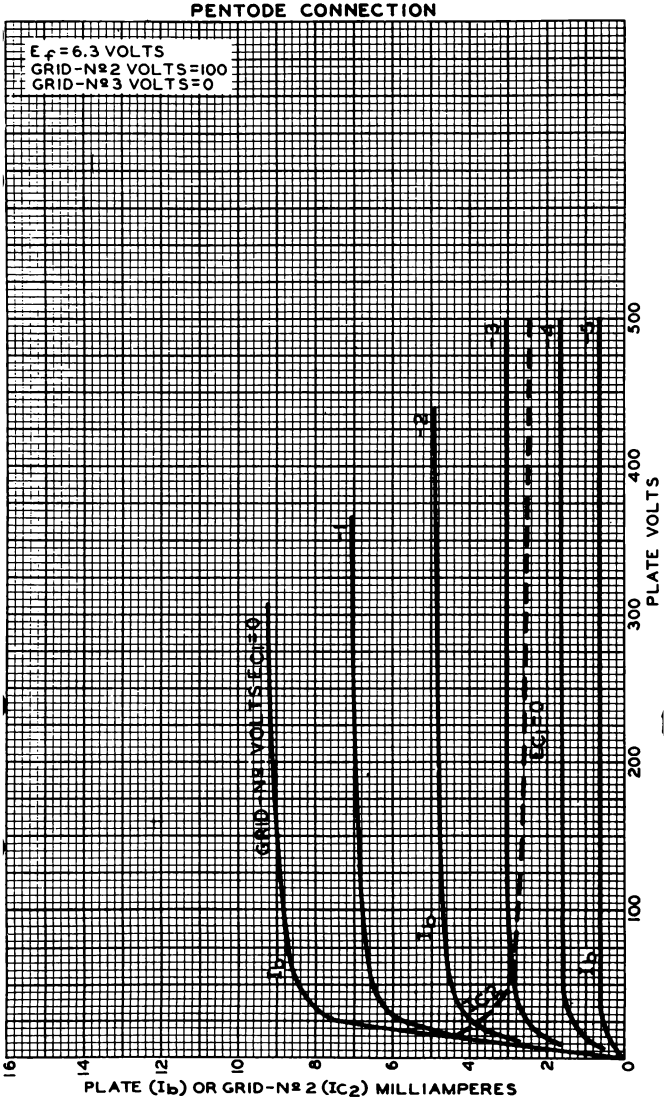
→Indicates a change.

6SJ7

6SJ7

AVERAGE PLATE CHARACTERISTICS

PENTODE CONNECTION



OCT. 16, 1947

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-4939R1

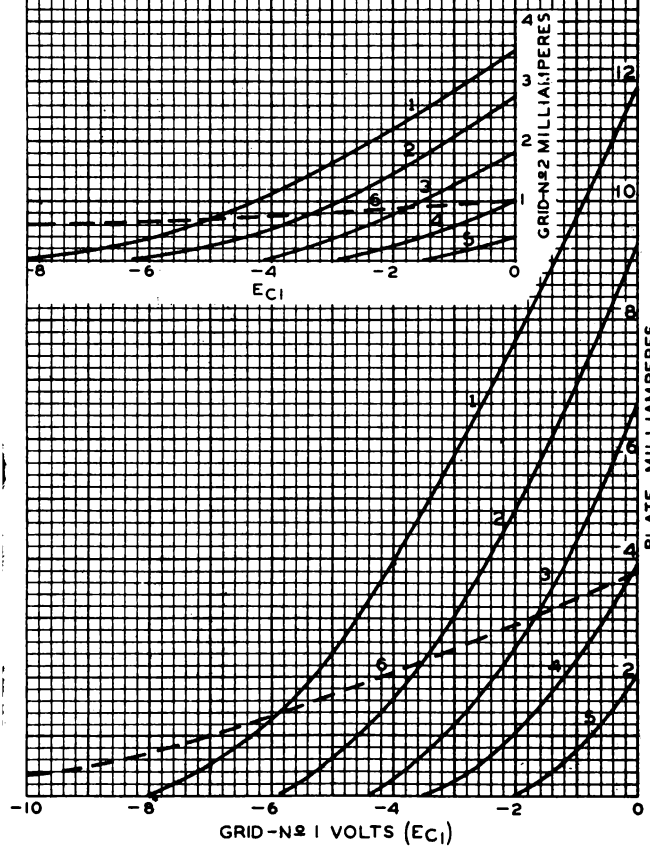
6SJ7

6SJ7

AVERAGE CHARACTERISTICS
PENTODE CONNECTION

E_f = 6.3 VOLTS PLATE VOLTS = 300 GRID-No 3 VOLTS = 0

CURVE	GRID-No 2 SUPPLY VOLTS	SERIES GRID-No 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-6443R1

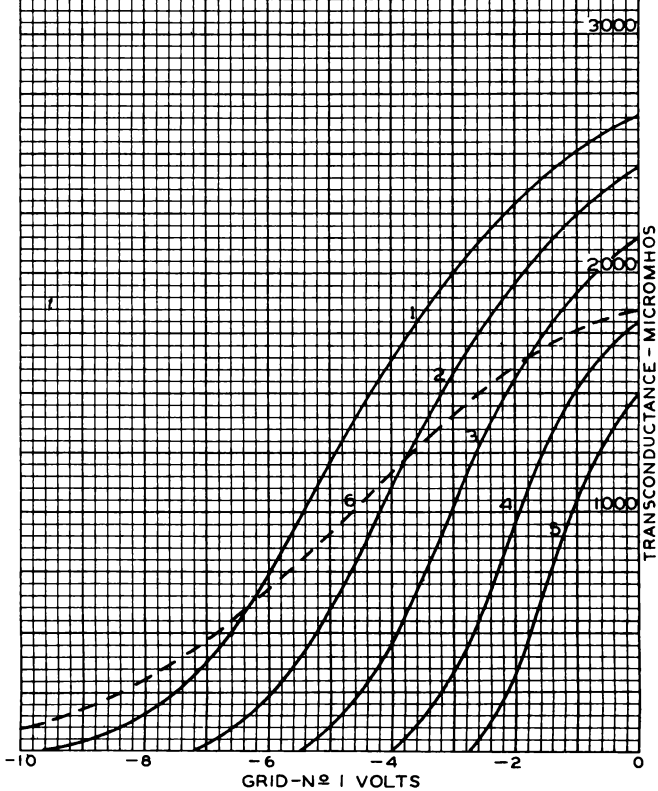
6SJ7

AVERAGE CHARACTERISTICS

PENTODE CONNECTION

E_f = 6.3 VOLTS PLATE VOLTS = 300 GRID-No 3 VOLTS = 0

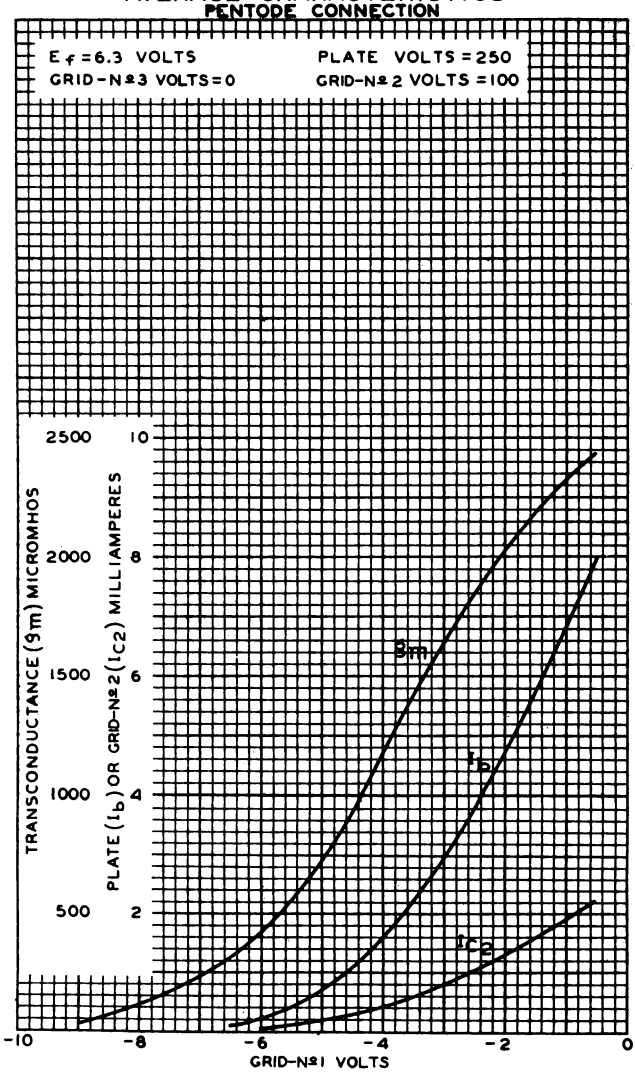
CURVE	GRID-No 2-SUPPLY VOLTS	SERIES GRID-No 2 RESISTOR-OHMS
1	125	——
2	100	——
3	75	——
4	50	——
5	25	——
6	300	250000



6SJ7

6SJ7

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



MARCH 5, 1948

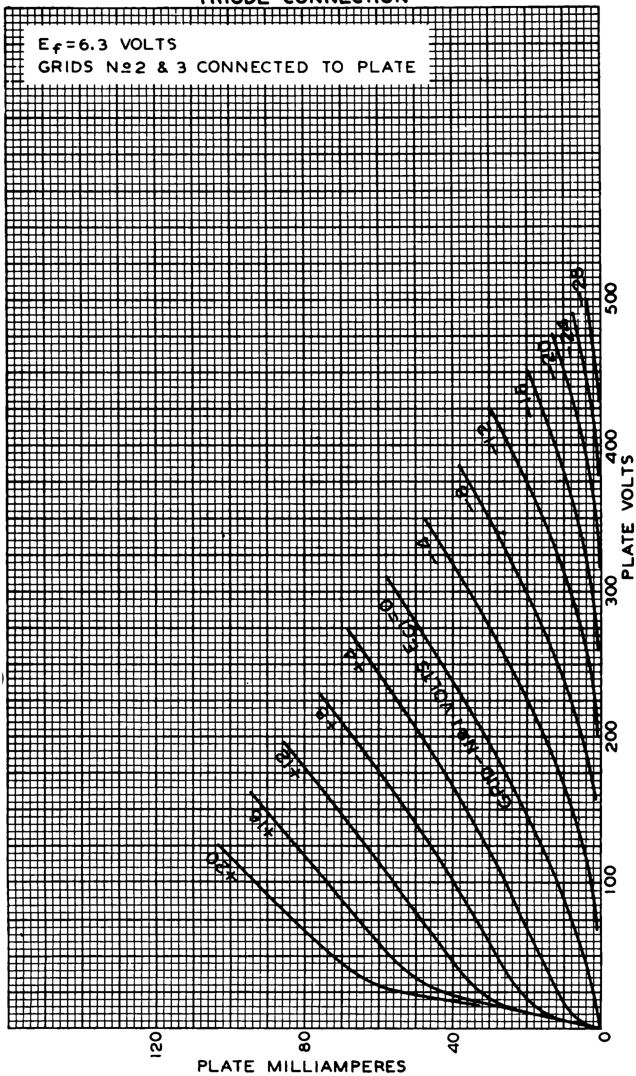
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-4937R1

RCA

6SJ7

6SJ7
AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



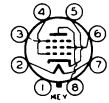
MAY 12, 1948 | TUBE DEPARTMENT | 92CM-6409R1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6SK7, 6SK7-GT/G

TRIPLE-GRID SUPER-CONTROL AMPLIFIER

Heater■	Coated Unipotential Cathode		
Voltage	6.3		a-c or d-c volts
Current	0.3		amp.
	6SK7	6SK7-GT/G	
Direct Interelectrode Cap.	▲	▲▲	
Grid to Plate	0.003 max.	0.005 max.	μμf
Input	6.0	6.5	μμf
Output	7.0	7.5	μμf
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	
		Pin 7 - Heater	
		Pin 8 - Plate	
Mounting Position			Any



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

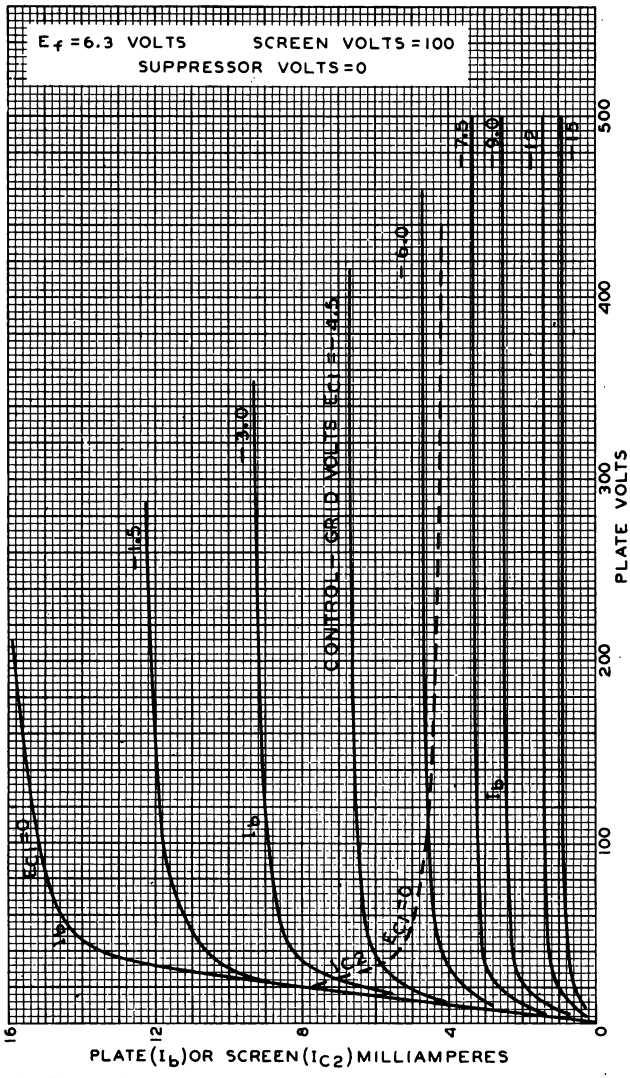
Typical Operation and Characteristics - Class A_1 Amplifier:

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
Transconc.	2350	2000	μmhos
Grid Bias for transcond. of 10 μmhos	-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



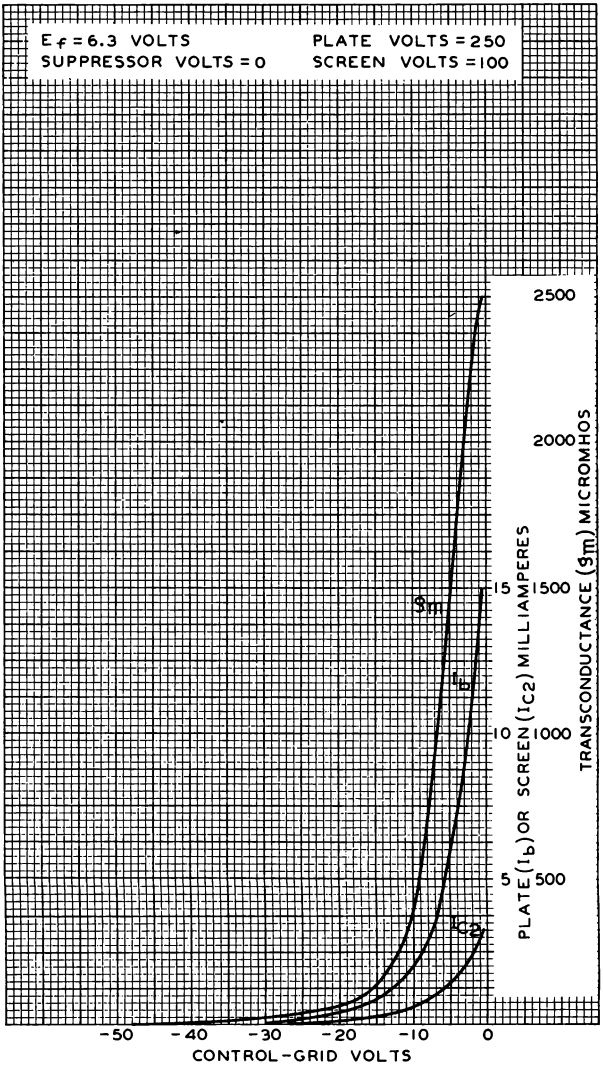
JUNE 24, 1938

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4940

6SK7

AVERAGE CHARACTERISTICS



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.):°

	Unit No.1	*Unit No.2*	
Grid to plate	2.8	2.8	. . . . μμf
Grid to cathode and heater . . .	3.0	3.4	. . . . μμf
Plate to cathode and heater . . .	3.8	3.2	. . . . μμf

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.B8-6) ←
or Short Intermediate-Shell Octal 8-Pin (JETEC No.B8-46)
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_1

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

° With close-fitting shield (JETEC No.308) connected to cathode. ←

←Indicates a change.

6SL7-GT

HIGH-MU TWIN TRIODE

Grid Voltage	-2	volts
Amplification Factor	70	
Plate Resistance (Approx.)	44000	ohms
Transconductance	1600	μmhos
Plate Current	2.3	ma

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

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

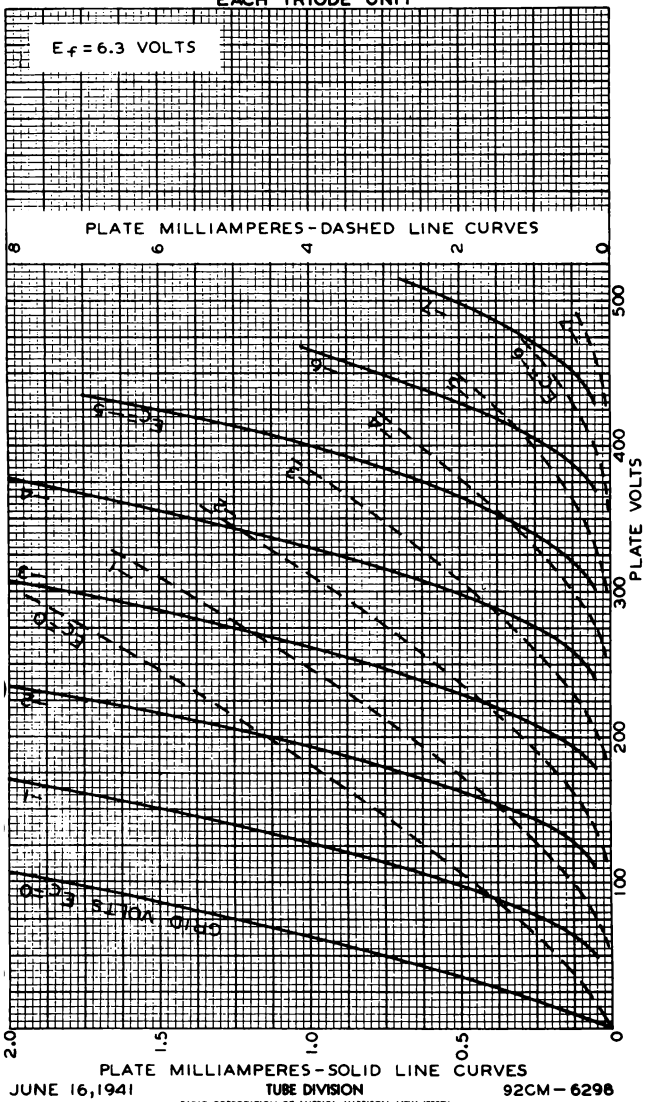
→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6SL7-GT

AVERAGE PLATE CHARACTERISTICS

EACH TRIODE UNIT



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.):°			
	Triode Unit T_1	*Triode Unit T_2*	
Grid to Plate	3.8	4.0	μμf
Grid to Cathode	2.8	3.0	μμf
Plate to Cathode	0.8	1.2	μμf
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 - Heater	
Pin 4 - Grid T_1		Pin 8 - Heater	
Mounting Position			Any

BOTTOM VIEW (8BD)

For convenience, one triode unit is identified as T_1; the other as T_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	μmhos
Plate Cur.	10	9	ma.

Typical Operation with Resistance Coupling:

Same as for Type 6F8-G in RESISTANCE-COUPLED AMPLIFIER CHAR

° With no external shield.

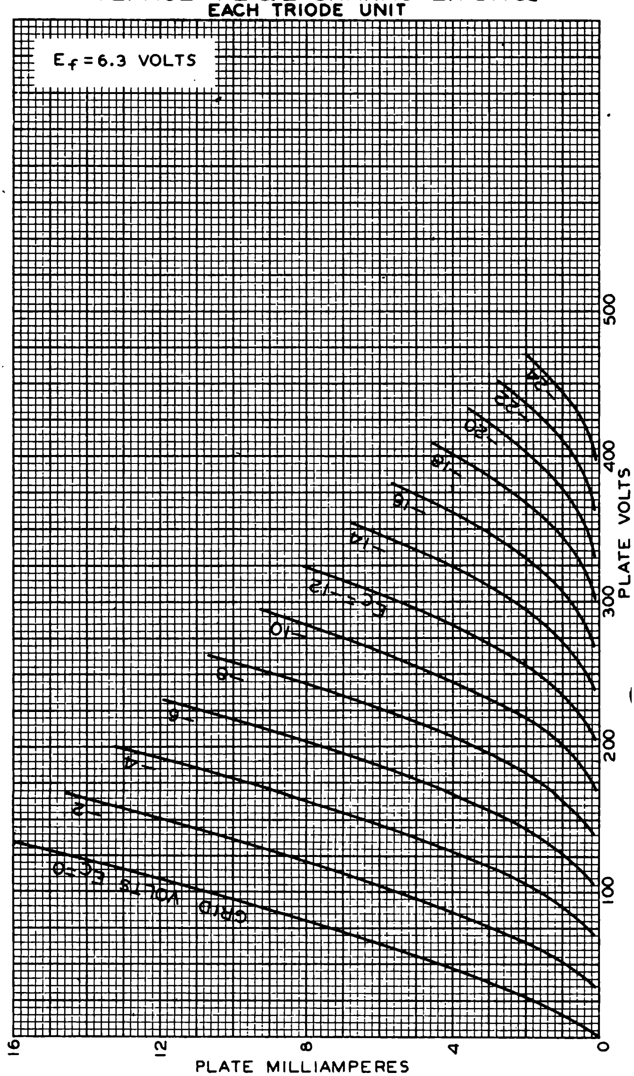
Under maximum rated conditions, the d-c resistance in the grid circuit should not exceed 1.0 megohm per unit.

The curves under Type 6J5 also apply to each unit of the 6SN7-GT.

◄ Indicates a change.

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6SN7-GT
AVERAGE PLATE CHARACTERISTICS
EACH TRIODE UNIT



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	μμf
Grid to cathode and heater	2.2	2.6	μμf
Plate to cathode and heater	0.7	0.7	μμf

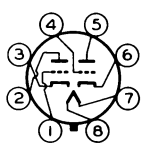
Characteristics, Class A_1 Amplifier (Each Unit):

Plate Voltage	90	250	volts
Grid Voltage	0	-8	volts
Amplification Factor	20	20	volts
Plate Resistance (Approx.)	6700	7700	ohms
Transconductance	3000	2600	μmhos
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 μamp	-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.B8-58)
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_1

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	450 max.	volts
CATHODE CURRENT	20 max.	ma

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▲	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□

DC PLATE VOLTAGE	450	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE♦	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▲	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□

DC PLATE VOLTAGE	450	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE#	400	max.	volts
CATHODE CURRENT:			
Peak	70	max.	ma
Average	20	max.	ma

▲,□,♦,#: See next page.

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▲	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□

DC PLATE VOLTAGE	450	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE# (Absolute Maximum) . .	1500■	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▲	max.	volts

Maximum Circuit Values:

Grid-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 horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

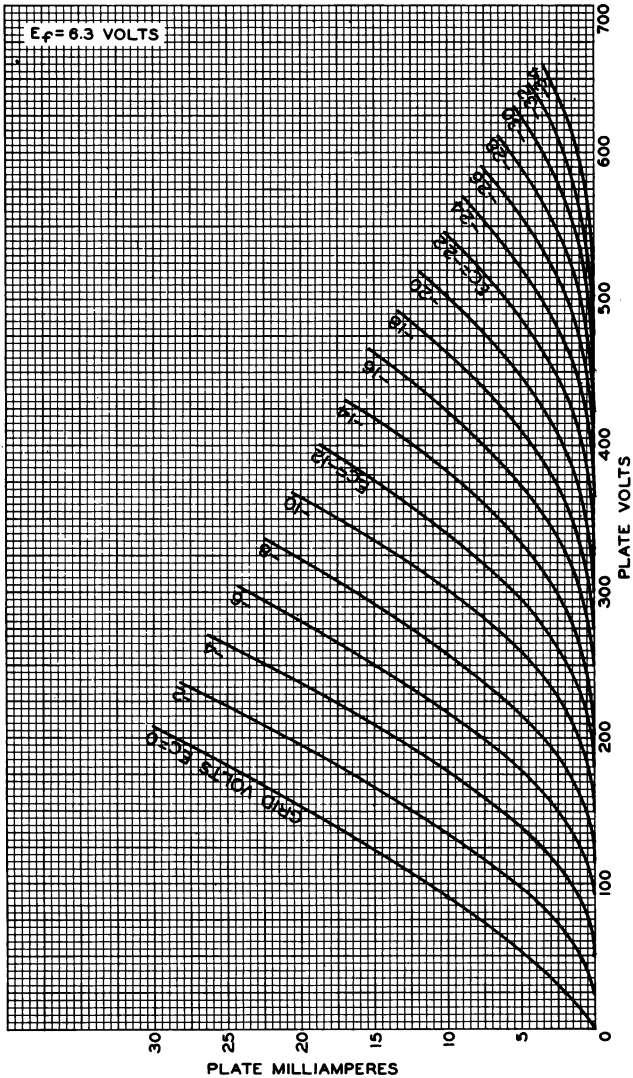
This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

■ Under no circumstances should this absolute value be exceeded.

6SN7-GTA

6SN7-GTA

AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT

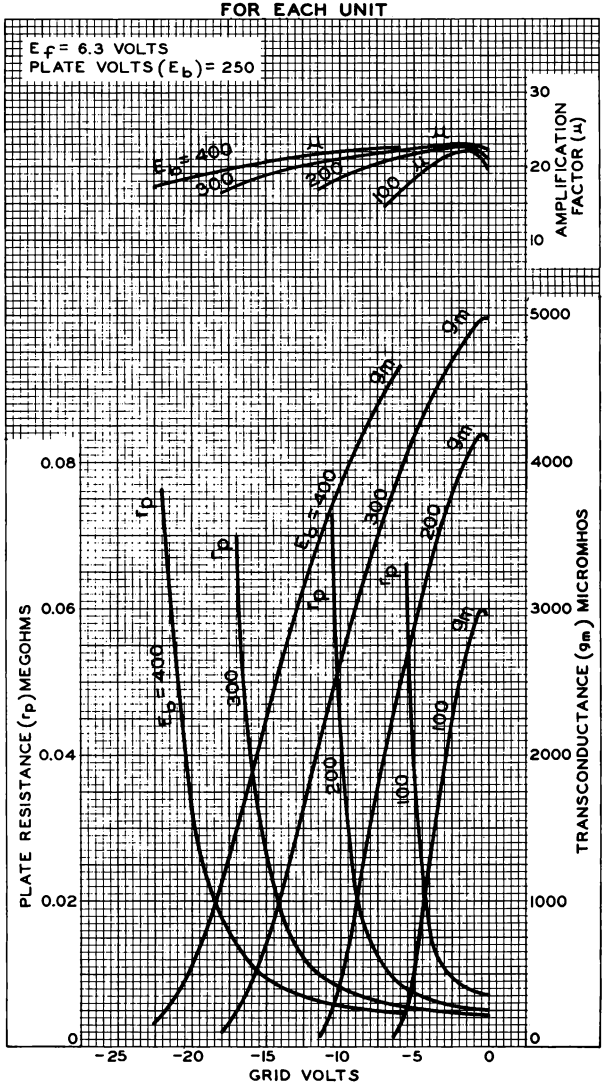


APRIL. 28, 1954 TUBE DIVISION 92CM-8322

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6SN7-GTA

AVERAGE CHARACTERISTICS
FOR EACH UNIT



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

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.	▲	●
Triode Unit:		
Grid to Plate	1.6	1.8 μμf
Grid to Cathode	3.2	4.2 μμf
Plate to Cathode	3.0	3.4 μμf
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	8Q	GT-8Q

Pin 1 – 6SQ7, Shell / 6SQ7-GT/G, Base Sleeve
Pin 2 – Triode Grid
Pin 3 – Cathode
Pin 4 – Diode Plate #2
Pin 5 – Diode Plate #1
Pin 6 – Triode Plate
Pin 7 – Heater
Pin 8 – Heater

BOTTOM VIEW

Mounting Position: 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_1 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	μmhos
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.

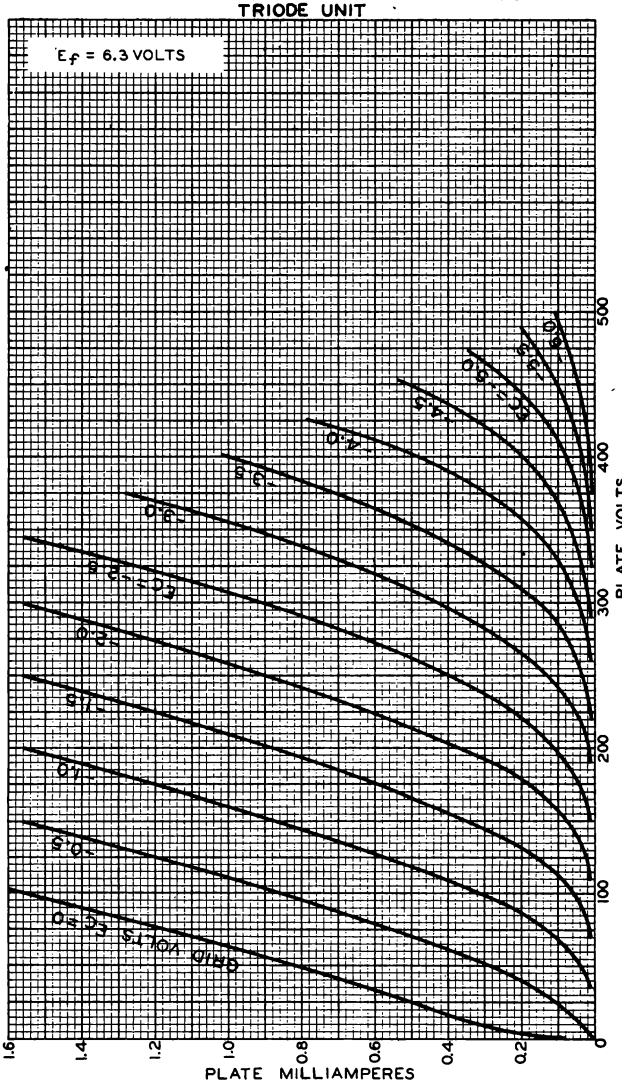
▲ With shell connected to cathode. Values are approximate.
● With no external shield. Values are approximate.

The curve under Type 75 also applies to the 6SQ7 and the 6SQ7-GT/G.

◄—Indicates a change.

6SQ7

6SQ7
AVERAGE PLATE CHARACTERISTICS
TRIODE UNIT



DEC. 14, 1943

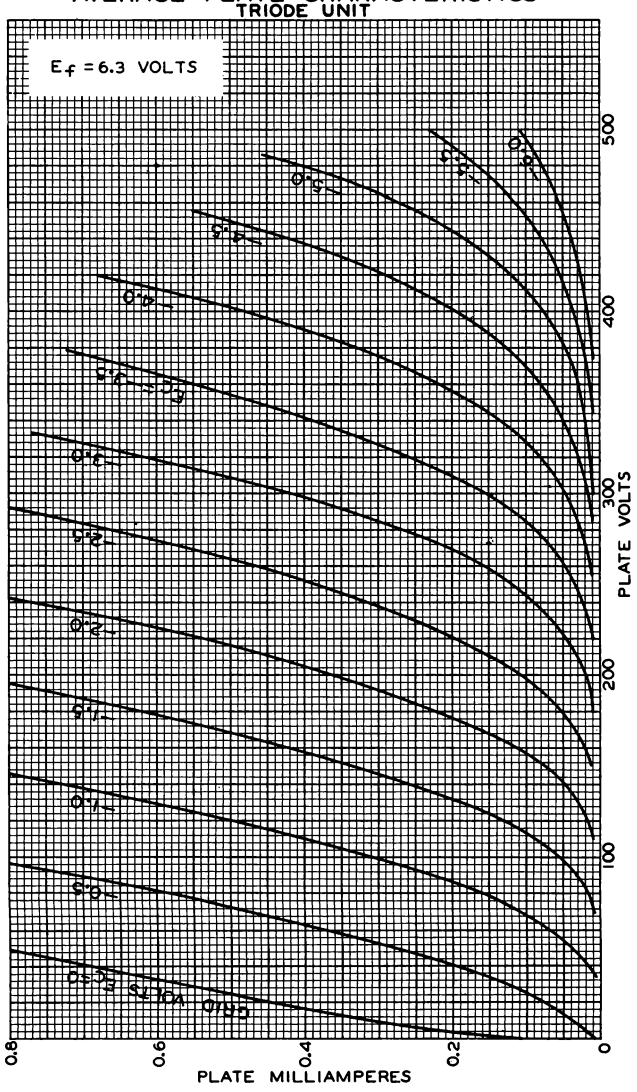
RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-4975R2

6SQ7

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



6SR7

6SR7

DUPLEX-DIODE TRIODE

SINGLE-ENDED METAL TYPE

Heater■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances-Triode Unit:°		
Grid to Plate	2.4	μμf
Grid to Cathode	3.6	μμf
Plate to Cathode	2.8	μμf
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 #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_1 Amplifier

Plate Voltage	250 max.	volts
Plate Dissipation	2.5 max.	watts
Typical Operation with Transformer Coupling:		
Plate	250	volts
Grid	-9	volts
Amp. Fact.	16	
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.

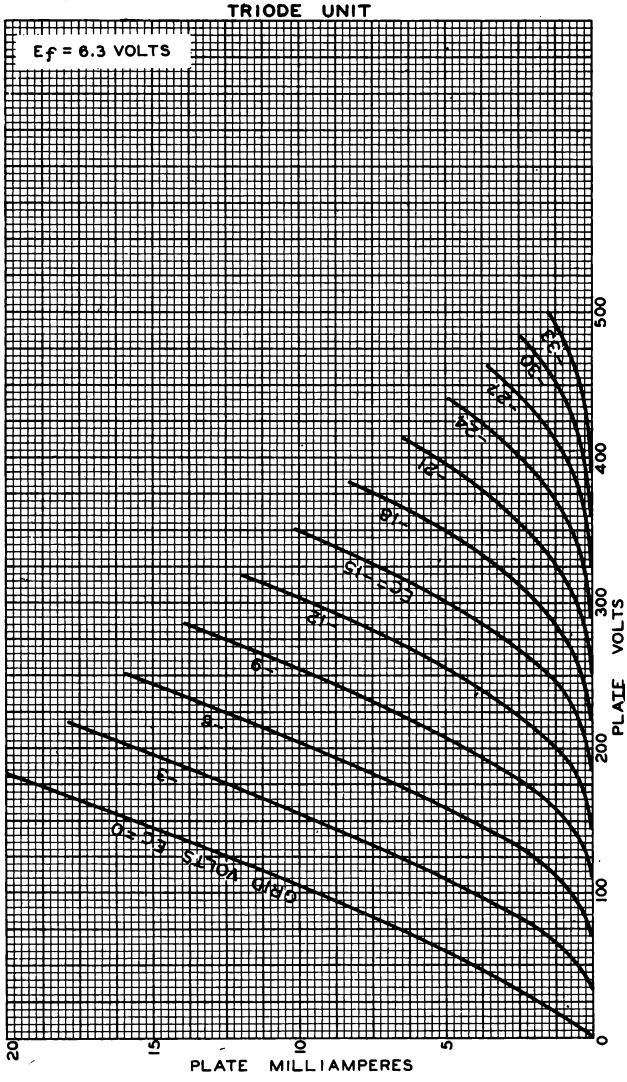
An additional curve applying to the 6SR7 is shown under Type 6R7.

6SR7

6SR7

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



JAN. 14, 1936

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6141

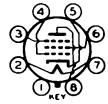
6SS7

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: ○		
Grid to Plate	0.004 max.	μμf
Input	5.5	μμf
Output	7.0	μμf
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_1 Amplifier:

Plate Voltage	100	250	volts
Screen Voltage	100	100	volts
Grid Voltage	-1	-3	volts
Suppressor	Connected to cathode at socket		
Plate Res.	0.12	1.0	approx. megohm
Transcond.	1930	1850	μmhos
Grid Bias for Transcond. of 10 μmhos (approx.)	-35	-35	volts
Plate Cur.	12.2	9	ma.
Screen Cur.	3.1	2	ma.

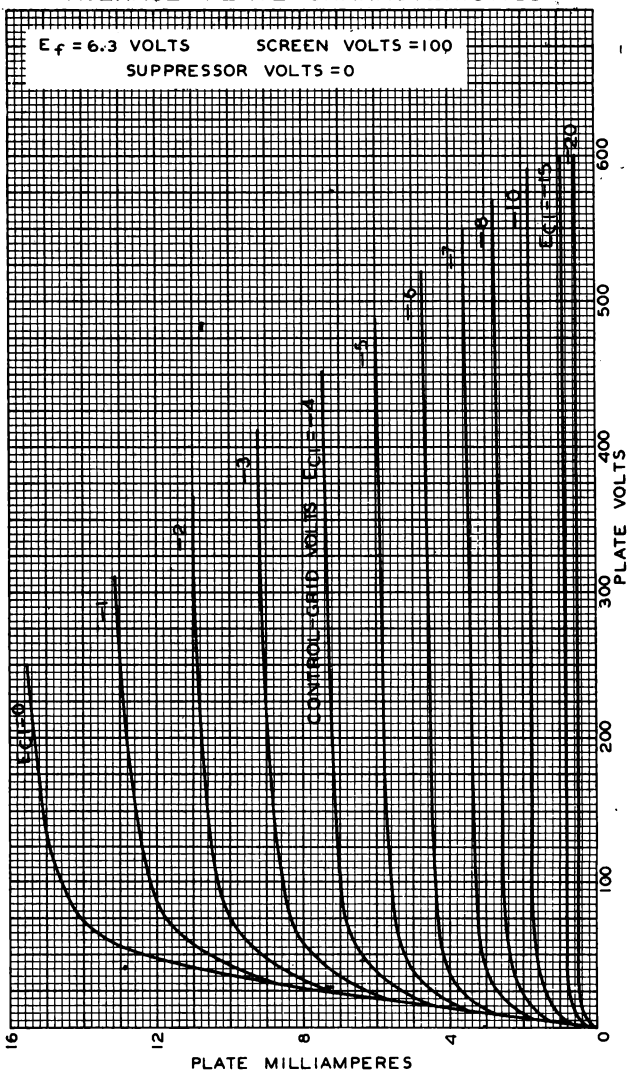
■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

○ With shell connected to cathode.

6SS7

6SS7

AVERAGE PLATE CHARACTERISTICS



APR. 3, 1941

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6270

6ST7

DUPLEX-DIODE TRIODE

SINGLE-ENDED METAL TYPE

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.15	amp.
Direct Interelectrode Capacitances (Approx.):°		
Triode Unit:		
Grid to Plate	1.5	μμf
Grid to Cathode	2.8	μμf
Plate to Cathode	3.0	μμf
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 #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 (BQ)

TRIODE UNIT

Plate Voltage	250 max.	volts
Plate Dissipation	2.5 max.	watts
Characteristics - Class A, Amplifier:		
Plate	250	volts
Grid	-9	volts
Amp. Fact.	16	
Plate Res.	8500	ohms
Transcond.	1900	μmhos
Plate Cur.	9.5	ma.

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 6ST7 is not suitable. Diode curves under Type 6B7 apply to the 6ST7.

° With shell connected to cathode.

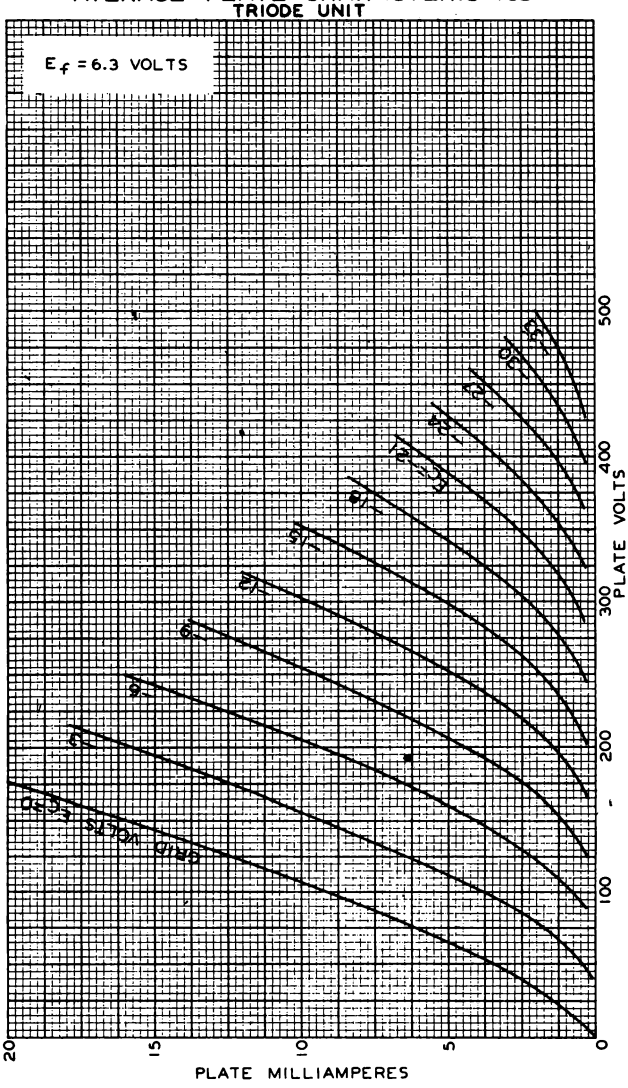
■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6ST7

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



DEC. 4, 1941

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6342

6SZ7

DUPLEX-DIODE HIGH-MU TRIODE

SINGLE-ENDED METAL TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.15	amp.

Direct Interelectrode Capacitances-Triode Unit (Approx.):°

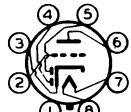
Grid to Plate	1.1	μμf
Grid to Cathode	2.6	μμf
Plate to Cathode	2.8	μμf

° with shell connected to cathode.

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
Basing Designation for BOTTOM VIEW	8Q

Pin 1 - Shell
Pin 2 - Triode Grid
Pin 3 - Cathode
Pin 4 - Diode Plate No.2



Pin 5 - Diode Plate No.1
Pin 6 - Triode Plate
Pin 7 - Heater
Pin 8 - Heater

TRIODE UNIT

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

Characteristics - Class A_1 Amplifier:

Plate Voltage	100	250	volts
Grid Voltage	-1	-3	volts
Amplification Factor	70	70	
Plate Resistance (Approx.)	61000	58700	ohms
Transconductance	1150	1200	μmhos
Plate Current	0.8	1	ma.

Typical Operation — Resistance-Coupled Amplifier:

Same as type 6Q7 in RESISTANCE-COUPLED AMPLIFIER CHART.

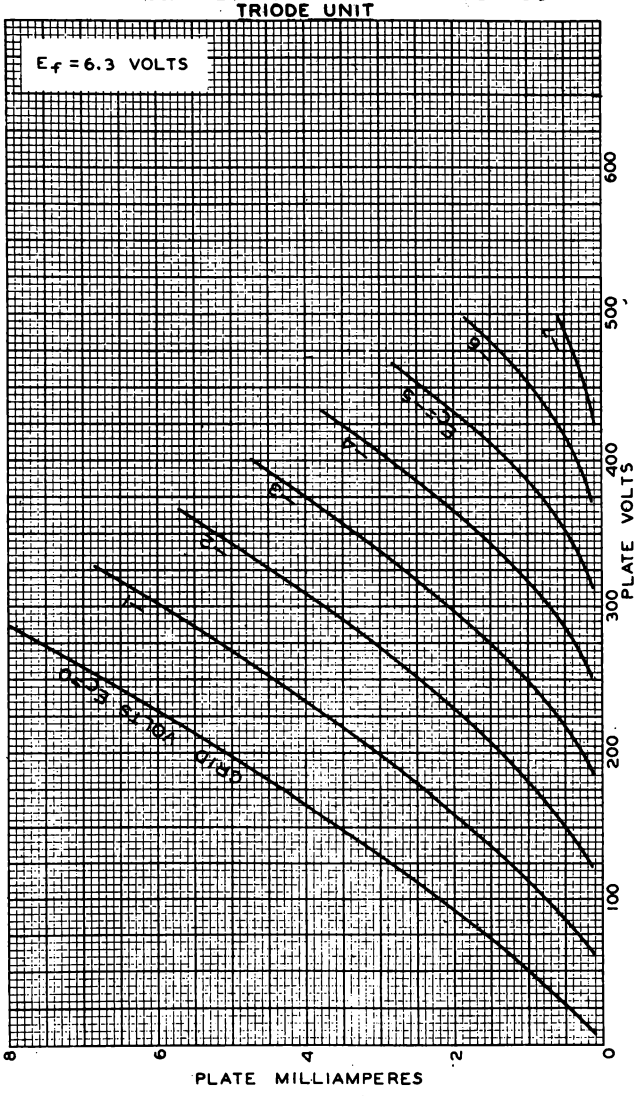
DIODE UNITS - Two

Consideration of these units, including typical circuits and diode curves is given at the front of this section. Diode biasing of the triode unit of the 6SZ7 is not suitable.

6SZ7

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



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°*	
Grid to plate	1.7	1.7	μμf
Grid to cathode and heater	2.6	3.2	μμf
Plate to cathode and heater	0.40	2.0	μμf
Heater to cathode	3.0	3.0●	μμf
Grid to cathode	2.4	2.4●	μμf
Plate to cathode	0.24	0.22	μμf

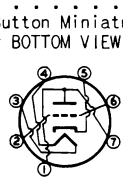
Characteristics, Class A_1 Amplifier:

Plate-Supply Voltage	80	volts
Cathode Resistor	150	ohms
Amplification Factor	13	
Transconductance	7000	μmhos
Plate Current	18	ma
Grid Voltage (Approx.) for plate current of 50 μamp	-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" ± 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	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

° With external shield JETEC No.316 connected to cathode, except as noted.
● With external shield JETEC No.316 connected to ground.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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▲	max.	volts

▲ The dc component must not exceed 25 volts.

TENTATIVE DATA

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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 Interelectrode Capacitances:[o]		
Triode unit:		
Grid to plate	1.8	μμf
Grid to cathode & internal shield (pin 7), and heater	1.6	μμf
Plate to cathode & internal shield (pin 7), and heater	1.1	μμf
Diode-No.1 plate to cathode & internal shield (pin 7), and heater	3.8	μμf
Diode-No.2 plate to cathode & internal shield (pin 3), and heater	4.5	μμf
Diode-No.3 plate to cathode & internal shield (pin 7), and heater	3.8	μμf
Diode-No.2 cathode & internal shield (pin 3) to all other electrodes	8.5	μμf
Triode grid to any diode plate	0.035 max.	μμf

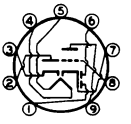
Characteristics, Class A_1 Amplifier (Triode Unit):

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:

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	9E

Pin 1 - Diode-No.3 Plate
Pin 2 - Diode-No.2 Plate
Pin 3 - Diode-No.2 Cathode, Internal Shield
Pin 4 - Heater
Pin 5 - Heater



Pin 6 - Diode-No.1 Plate
Pin 7 - Cathode of Triode & Diodes No.1 & No.3, Internal Shield
Pin 8 - Triode Grid
Pin 9 - Triode Plate

[o] Without external shield.

← Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6T8

TRIPLE DIODE—HIGH-MU TRIODE

TRIODE UNIT — AMPLIFIER - Class A_1

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

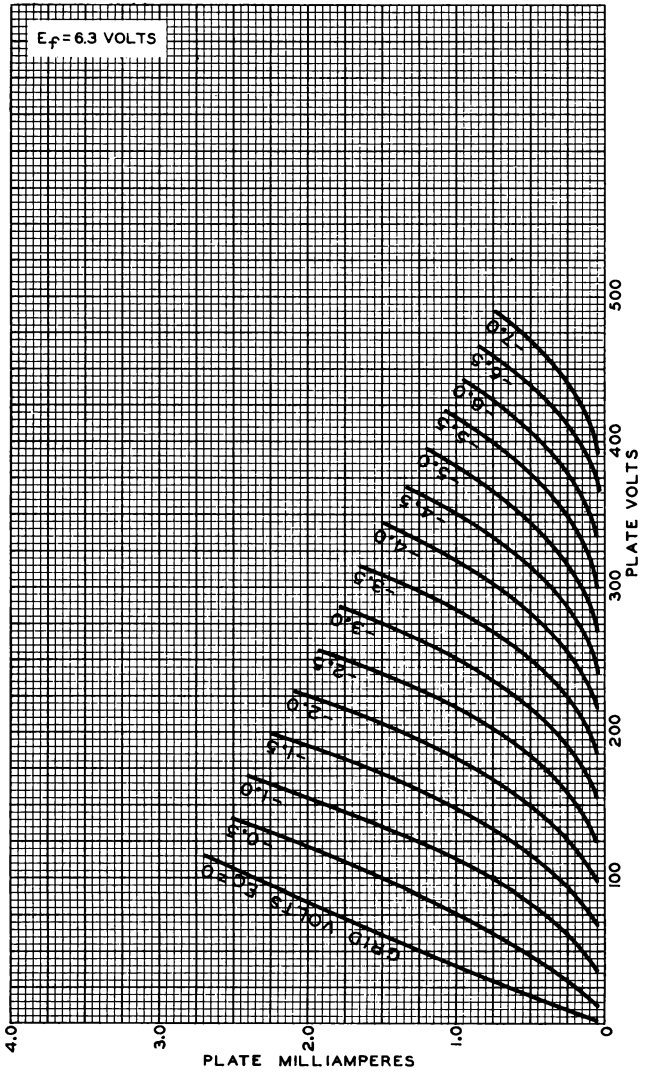
Diode Considerations:

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.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6T8
AVERAGE PLATE CHARACTERISTICS
TRIODE UNIT



AUG. 19, 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7063

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**	
Triode Unit:			
Grid to plate	1.7	1.7	μμf
Grid to cathode & internal shield (pin 7), and heater	1.6	1.7	μμf
Plate to cathode & internal shield (pin 7), and heater	1.2	2.4	μμf
Diode Units:			
Diode-No.1 plate to cathode & internal shield (pin 7), and heater	3.8	3.8	μμf
Diode-No.2 plate to cathode & internal shield (pin 3), and heater	3.8	3.8●	μμf
Diode-No.3 plate to cathode & internal shield (pin 7), and heater	3.4	3.6	μμf
Diode-No.2 cathode & internal shield (pin 3) to all other electrodes, and heater	7.5	8.5■	μμf
Triode grid to any diode plate	0.034 max.	0.034 max.	μμf

Characteristics, Class A_1 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.

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

6T8-A

TRIPLE DIODE—HIGH-MU TRIODE

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. 9E

Pin 1 - Diode-No.3 Plate
Pin 2 - Diode-No.2 Plate
Pin 3 - Diode-No.2 Cathode, Internal Shield
Pin 4 - Heater
Pin 5 - Heater

Pin 6 - Diode-No.1 Plate
Pin 7 - Cathode of Triode & Diodes No.1 & No.3, Internal Shield
Pin 8 - Triode Grid
Pin 9 - Triode Plate

TRIODE UNIT — AMPLIFIER — Class A_1

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

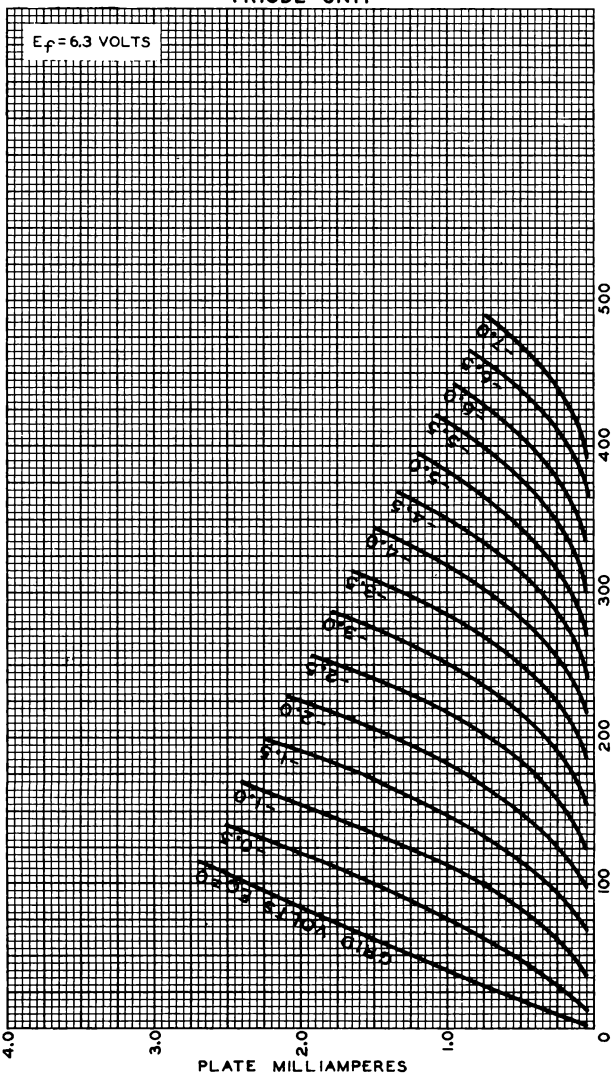
TRIPLE DIODE—HIGH-MU TRIODE

* 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.

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

6T8-A

6T8-A
AVERAGE PLATE CHARACTERISTICS
TRIODE UNIT

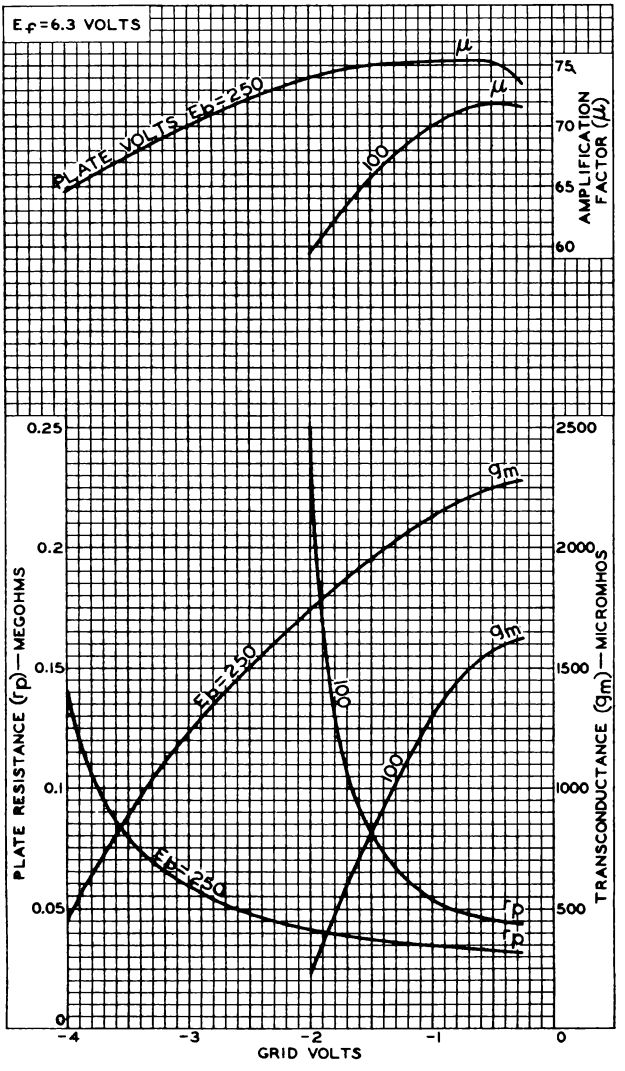


ELECTRON TUBE DIVISION

92CM-7063

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6T8-A
AVERAGE CHARACTERISTICS
TRIODE UNIT

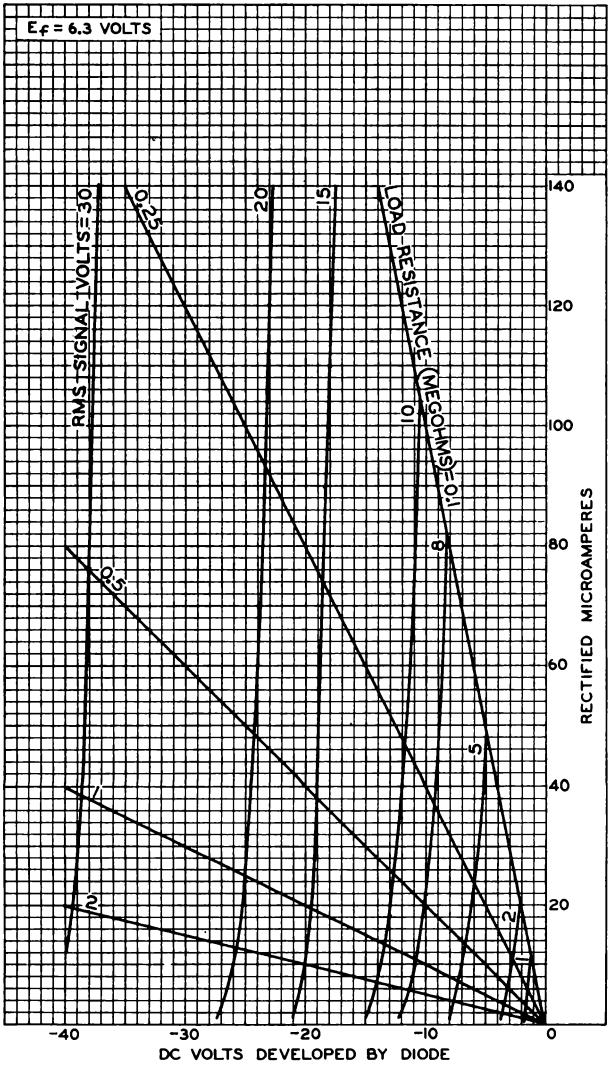


6T8-A

6T8-A

AVERAGE CHARACTERISTICS

HALF-WAVE CIRCUIT—EACH DIODE UNIT



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

92CM-9610

6U5

ELECTRON-RAY TUBE

INDICATOR TYPE WITH REMOTE-CUTOFF TRIODE UNIT

GENERAL DATA

Electrical:

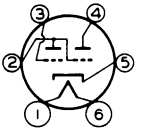
Heater, for Unipotential Cathode:

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

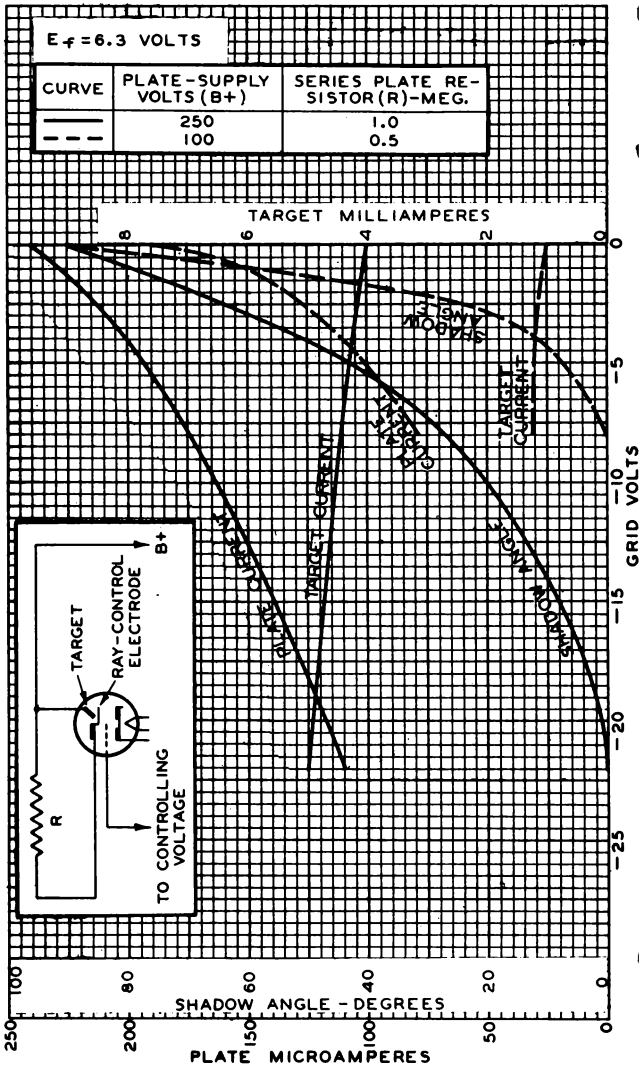
† Subject to wide variations.

Refer to Type 6E5 for a discussion of the operation of the tube and also for the fundamental circuit.

← Indicates a change.

6U5

AVERAGE CONTROL CHARACTERISTICS



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: ○			
Grid to Plate	0.007 max.	0.007 max.	μμf
Input	5	5	μμf
Output	9	9	μμf
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			Any

BOTTOM VIEW (G-7R)

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_1 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	μmhos
Grid Bias for Transcond. of 2 μmhos	-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.

○ With close-fitting shield connected to cathode.

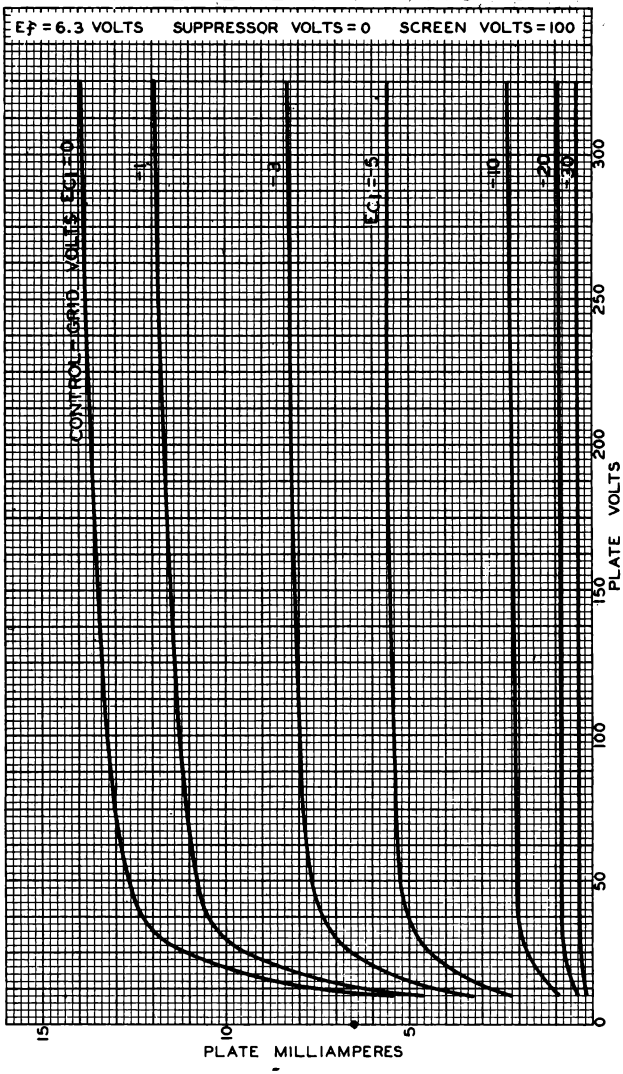
The Curve under Type 6D6 also applies to the 6U7-G.

← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

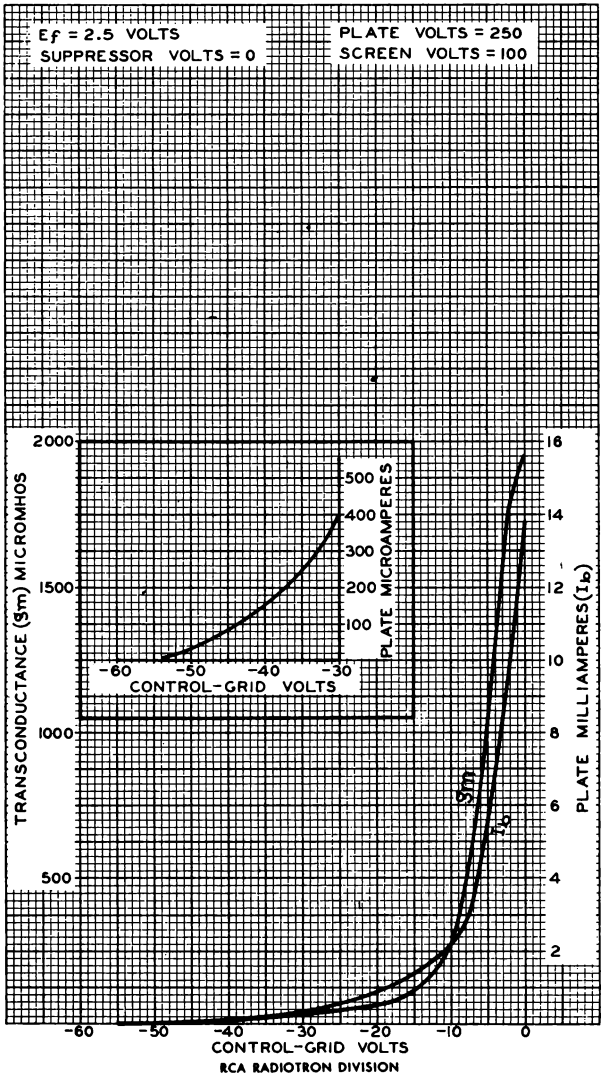
6U7-G

AVERAGE PLATE CHARACTERISTICS



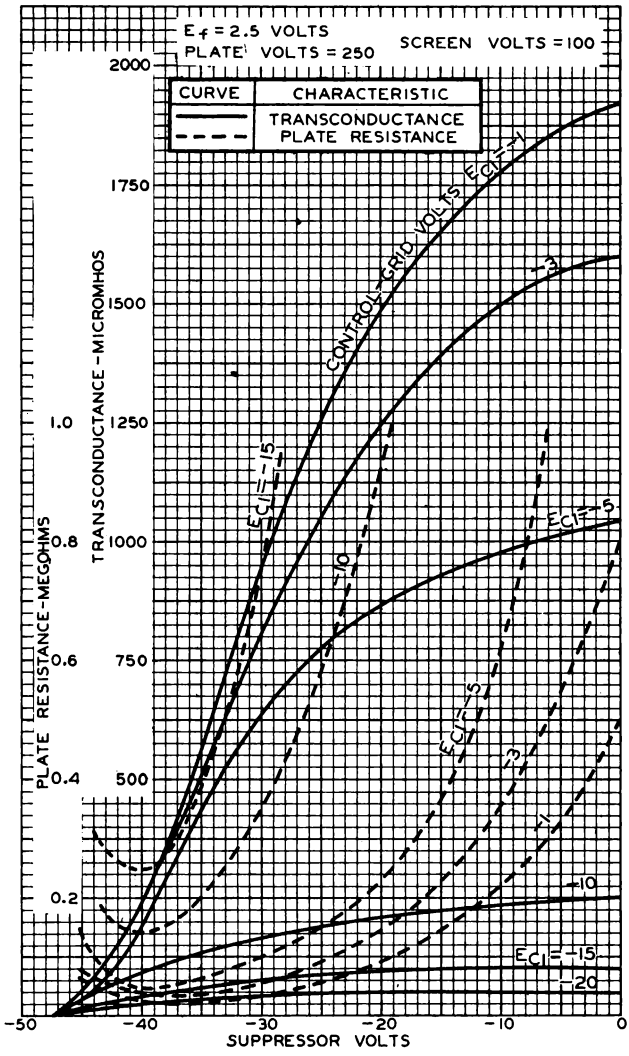
6U7-G

AVERAGE CHARACTERISTICS



6U7-G

AVERAGE CHARACTERISTICS



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

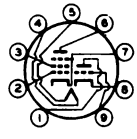
Direct Interelectrode Cap.:	*With Shield*▲	*Without Shield*	
Triode Unit:			
Grid to Plate	1.8	1.8	μμf
Input	2.5	2.5	μμf
Output	1.0	0.4	μμf
Pentode Unit:			
Grid No.1 to Plate	0.006 max.	0.010 max.	μμf
Input	5	5	μμf
Output	3.5	2.6	μμf
Heater to Cathode (Approx., Each Unit)	3	3	μμf

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	μmhos
Grid-No.1 Bias (Approx.) for Plate Cur. of 10 μamp	-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" ± 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

▲ 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:*

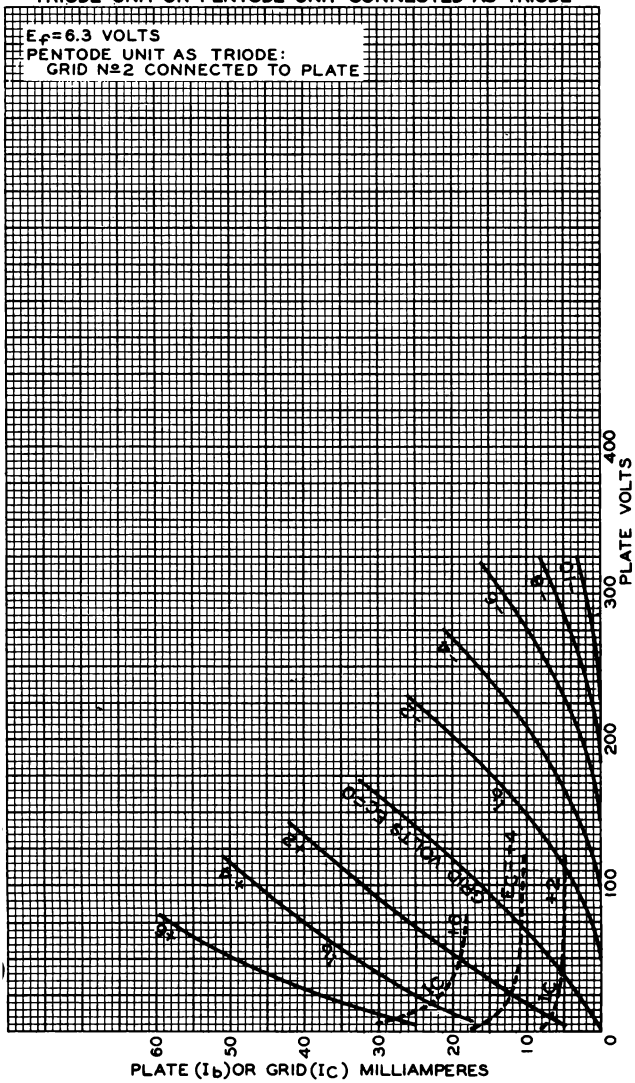
	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE	300 max.	300 max.	volts
GRID-No.2 SUPPLY VOLTAGE . .	–	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE .	–	*See Rating Curve at front of this Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive bias value	0 max.	0 max.	volts
PLATE DISSIPATION	2.7 max.	2.8 max.	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

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6U8

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT OR PENTODE UNIT CONNECTED AS TRIODE



NOV. 12, 1952

TUBE DEPARTMENT

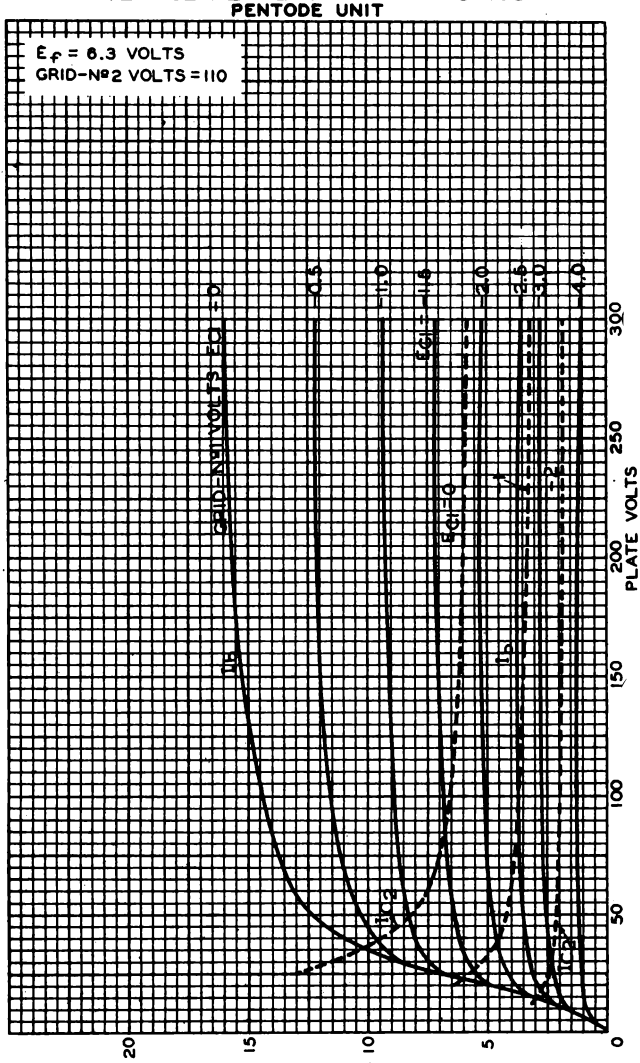
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7873

6U8

6U8

AVERAGE PLATE CHARACTERISTICS
PENTODE UNIT



NOV. 11, 1952

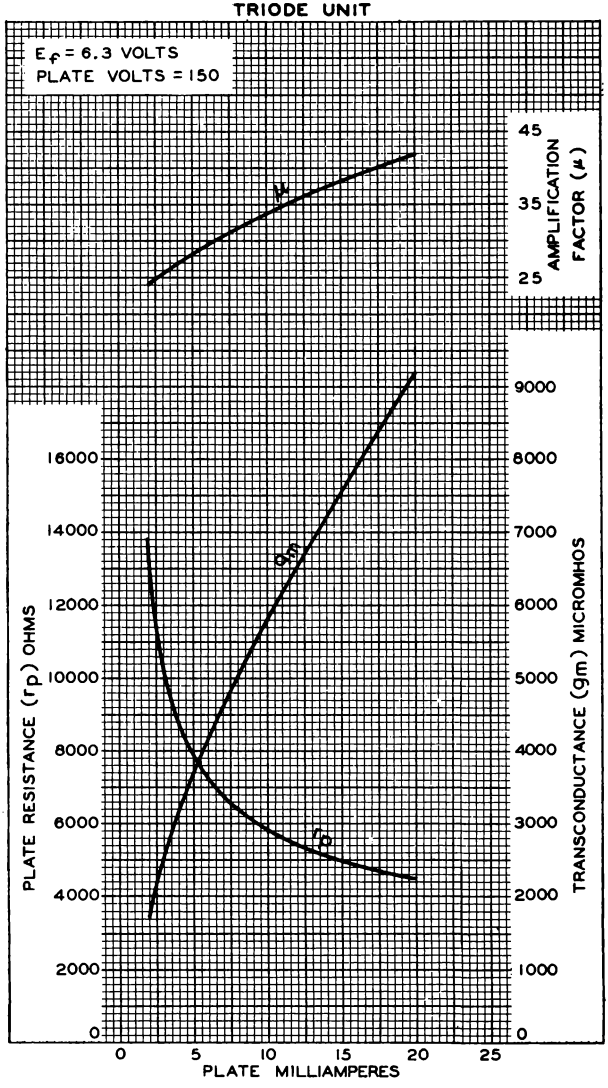
TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7869

6U8

AVERAGE CHARACTERISTICS
TRIODE UNIT



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.):°

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	9BD

Pin 1 - No Connection
Pin 2 - Plate
Pin 3 - Same as Pin 1
Pin 4 - Heater
Pin 5 - Heater

Pin 6 - Same as Pin 1
Pin 7 - Plate
Pin 8 - Same as Pin 1
Pin 9 - Plate
Cap - Cathode

DAMPER SERVICE

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

For operation in a 525-line, 30-frame system□

PEAK INVERSE PLATE VOLTAGE (Absolute maximum)#	6000■ 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)#	6750■▲max.	volts
Heater positive with respect to cathode	300● max.	volts

° Without external shield.

□ 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.

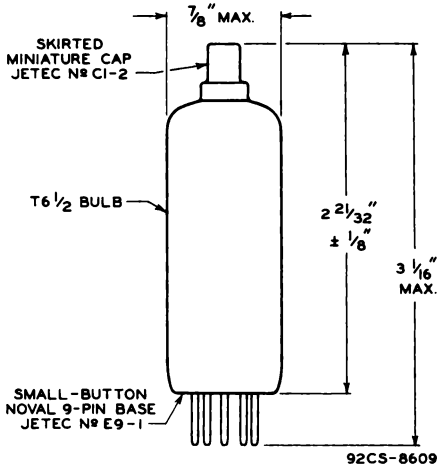
▲ The dc component must not exceed 750 volts.

● The dc component must not exceed 100 volts.

6V3-A

6V3-A

HALF-WAVE VACUUM RECTIFIER



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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°	*6V6-GT°°*	
Grid No.1 to Plate	0.3	0.7	μμf
Input	10	9	μμf ←
Output	11	7.5	μμf

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_1

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

° With shell connected to cathode.
°° With no external shield.

← Indicates a change

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_1

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:

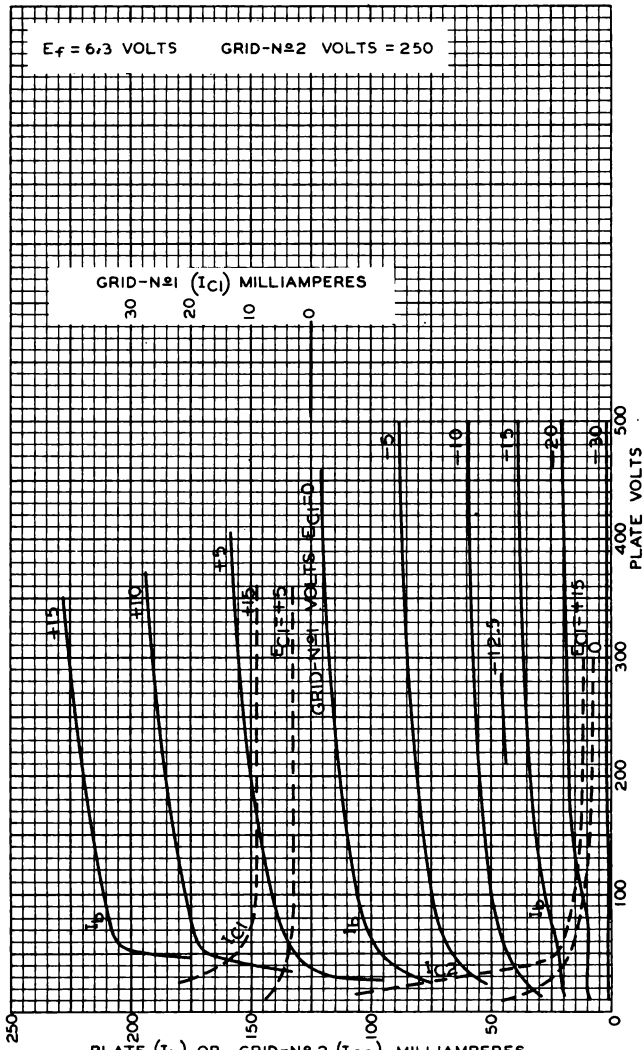
Grid-No.1-Circuit Resistance:▲		
For fixed-bias operation	0.1 max.	megohm
For cathode-bias operation	0.5 max.	megohm

▲ 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

6V6

AVERAGE PLATE CHARACTERISTICS



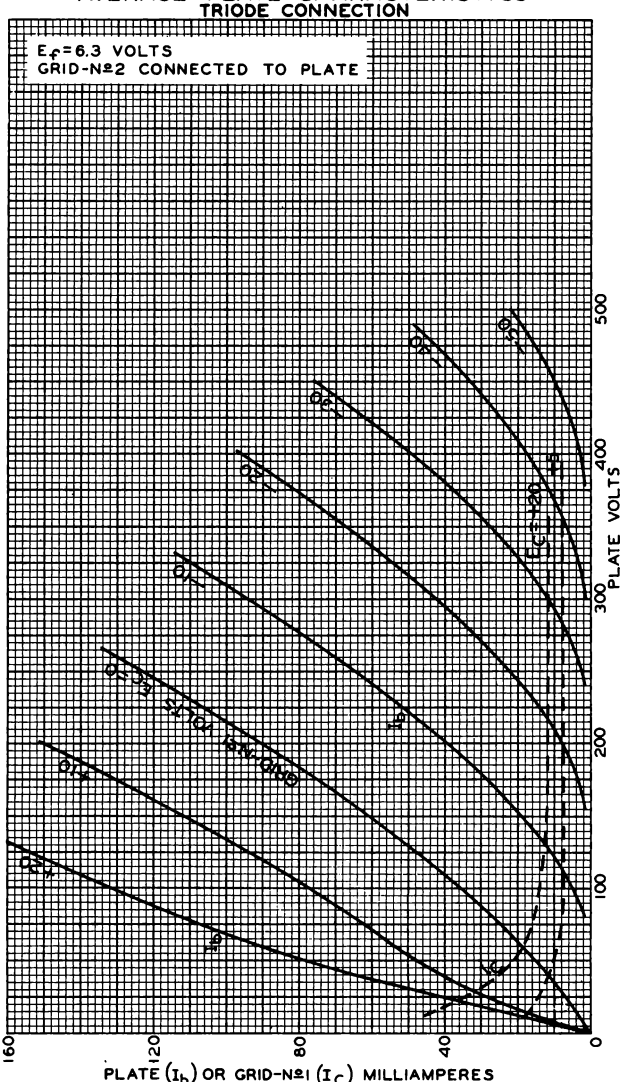
DEC. 18, 1952 TUBE DEPARTMENT 92CM-4807R2

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6V6

6V6

AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION

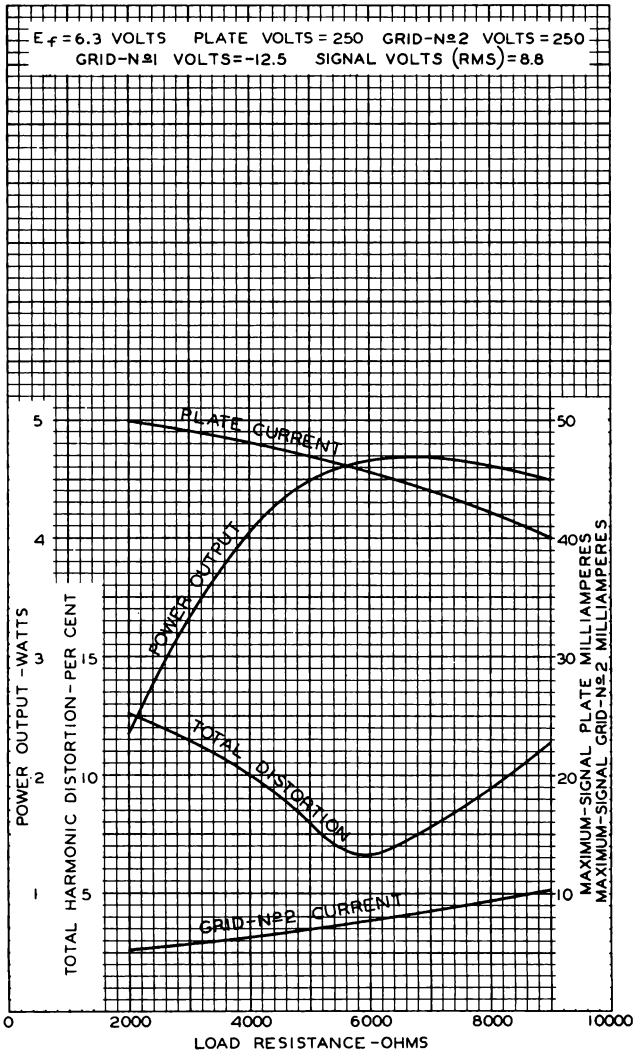


DEC. 18, 1952 TUBE DEPARTMENT 92CM-6333R1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6V6

OPERATION CHARACTERISTICS



DEC. 18, 1952

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6339R1

6W4-GT

HALF-WAVE VACUUM RECTIFIER

GENERAL DATA

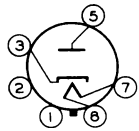
Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac volts
Current	1.2	amp
Direct Interelectrode Capacitances (Approx.):°		←
Heater to Cathode	7.0	μμf
Plate to Heater and Cathode	5.3	μμf

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

° 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.

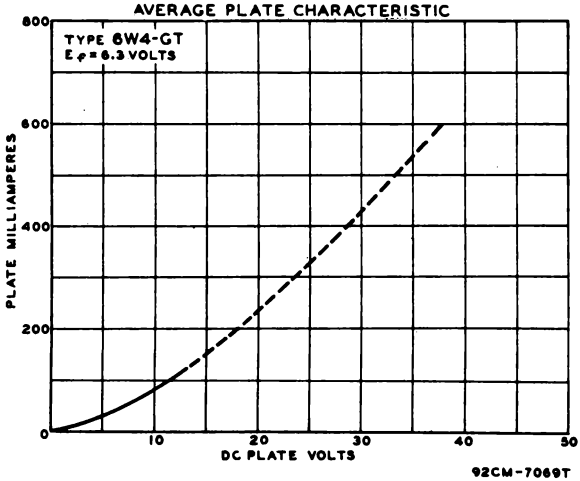
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6W4-GT

6W4-GT

HALF-WAVE VACUUM RECTIFIER

Typical Operation:	*Half-Wave Rectifier (One Tube)*	*Full-Wave Rectifier (Two Tubes)*	
AC Plate-Supply Voltage (RMS) . .	350	–	volts
AC Plate-to-Plate Supply Voltage (RMS)	–	700	volts
Filter-Input Capacitor	20	20	μf
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 62.5 ma.	390	–	volts
At half-load cur. of 125 ma.	–	395	volts
At full-load cur. of 125 ma.	335	–	volts
At full-load cur. of 250 ma.	–	350	volts
Voltage Regulation (Approx.):			
Half-load to full-load current	55	45	volts

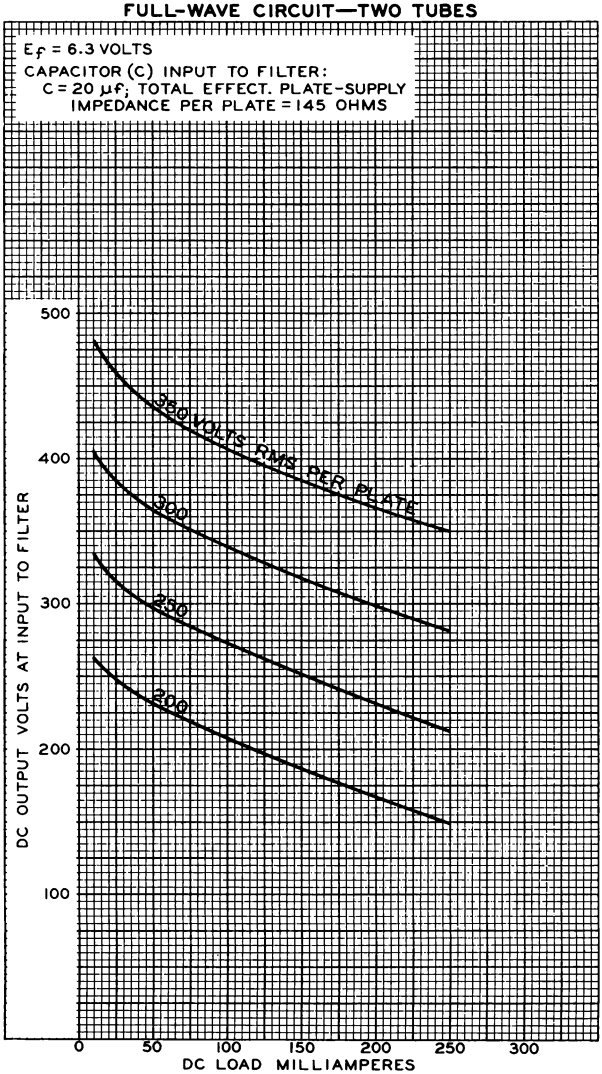


TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6W4-GT

OPERATION CHARACTERISTICS

FULL-WAVE CIRCUIT—TWO TUBES



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.	μμf
Input	15	μμf
Output	9	μμf

Characteristics as Beam Power Amplifier:

See AMPLIFIER—Class A_1 below:

Characteristics as Triode-Connected Amplifier:

(Grid No.2 connected to plate)

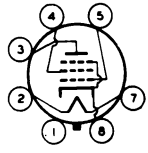
Plate Voltage	225	volts
Grid-No.1 Voltage	-30	volts
Amplification Factor	6.2	
Plate Resistance	1600	ohms
Transconductance	3800	μmhos
Plate Current	22	ma
Grid-No.1 Voltage (Approx.) for plate current of 0.5 ma	-42	volts ←

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 External Barriers (JETEC No.B6-60) or Short Intermediate-Shell Octal 7-Pin with External 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_1

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.

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▲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○	1200♦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▲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.

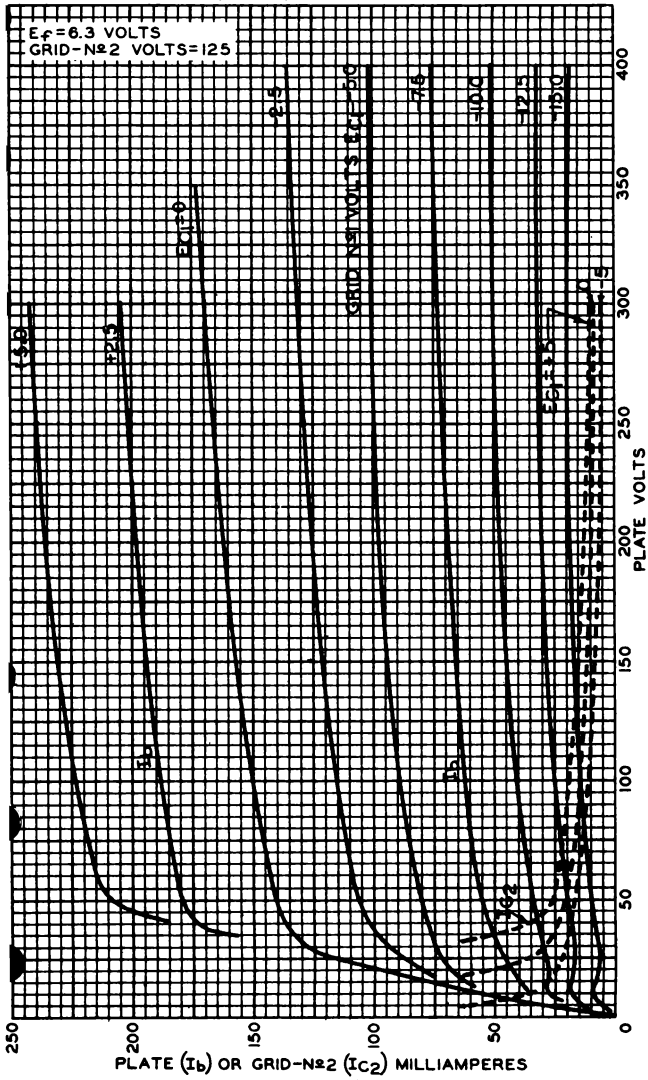
○ The duration of the voltage pulse must not exceed 15 per cent of one scanning cycle. In a 525-line, 30-frame system, 15 per cent of one scanning cycle is 2.5 milliseconds.

♦ Under no circumstances should this absolute value be exceeded.

6W6-GT

AVERAGE PLATE CHARACTERISTICS

PENTODE CONNECTION

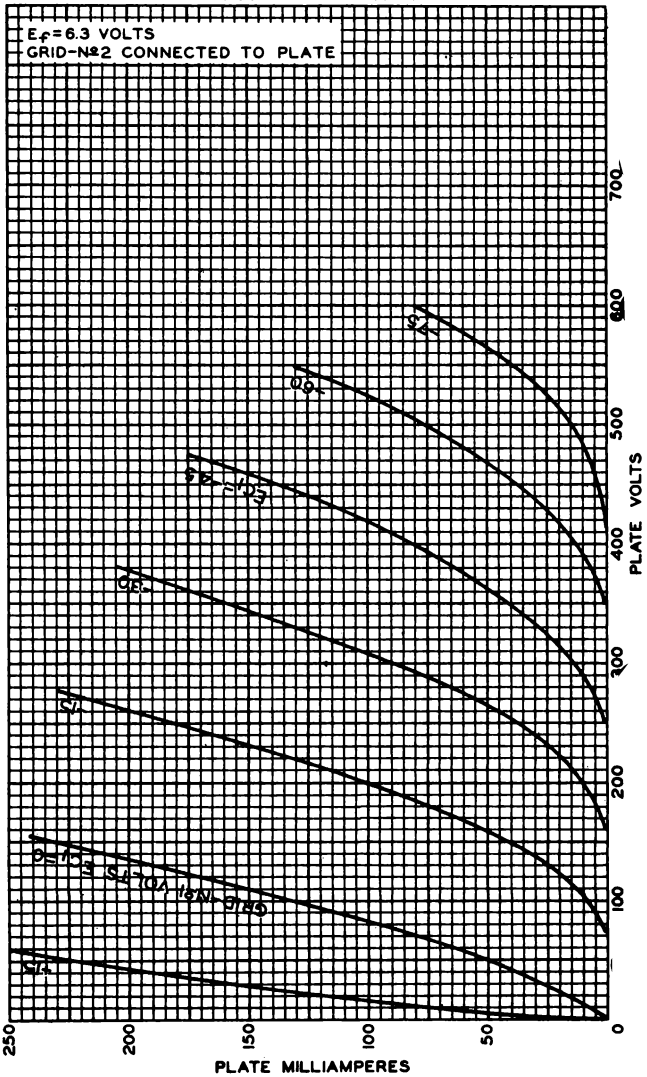


6W6-GT

6W6-GT

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION



MAR. 11, 1953

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7943

6W7-G

TRIPLE-GRID DETECTOR AMPLIFIER

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.15	amp.
Direct Interelectrode Capacitances:[o]		
Grid to Plate	0.007 max.	μμf
Input	5	μμf
Output	8.5	μμf
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
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		Any

BOTTOM VIEW (G-7R)

AMPLIFIER

Plate Voltage	300 max.	volts
Screen Voltage	100 max.	volts
Screen Supply Voltage	300 max.	volts
Grid Voltage	0 min.	volts
Plate Dissipation	0.5 max.	watt
Screen Dissipation	0.1 max.	watt
Typical Operation and Characteristics - Class A_1 Amplifier:		
Plate	250	volts
Screen	100	volts
Grid	-3	volts
Suppressor	Connected to cathode at socket	
Plate Res. (approx.)	1.5	megohms
Transcond.	1225	μmhos
Grid Bias (approx.) for cathode-current cut-off	-7	volts
Plate Cur.	2	ma.
Screen Cur.	0.5	ma.

Typical Operation as Resistance-Coupled Amplifier:

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.

[o] With close-fitting shield connected to cathode.

Curves under Types 6J7 and 57 apply to the 6W7-G within the limitations of the maximum ratings. ←

← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6X4
FULL-WAVE VACUUM RECTIFIER

MINIATURE TYPE

GENERAL DATA

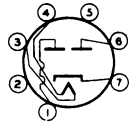
Electrical:

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 (JETEC 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). [redacted] 650 volts
Filter Input Capacitor . . . . . [redacted] 10 μf
Effective Plate-Supply Impedance per Pla[redacted] 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

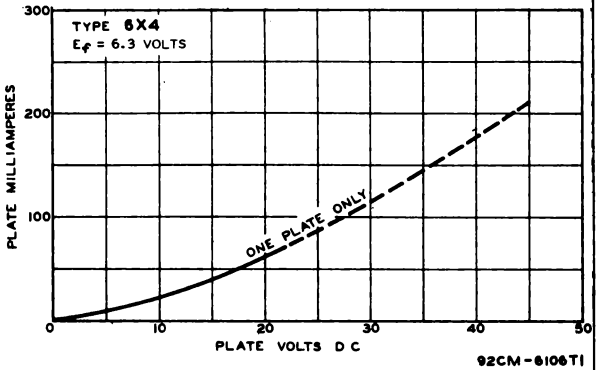
6X4

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-6106T1

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 [illegible] represents graphically the relationship between maxi[illegible] rectification efficiency and maximum dc output curre[illegible] per plate for conditions of capacitor input to filter.

→Indicates a change

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.

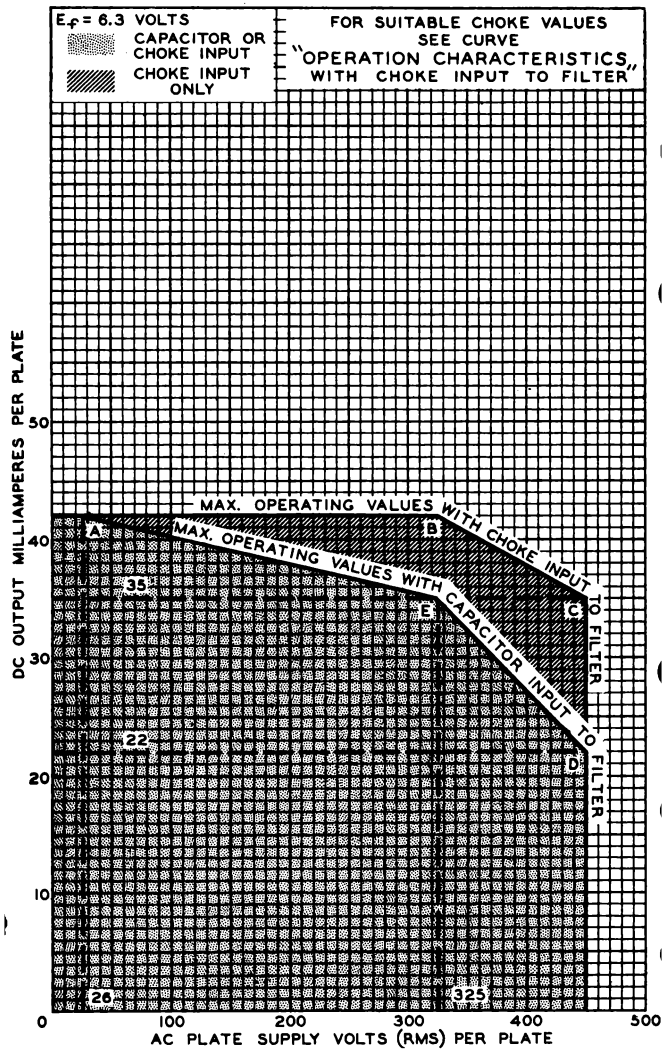
The *Operation Characteristics for Full-Wave Circuit with Capacitor-Input Filter* show not only the typical operating curves for such a circuit, but also show by means of boundary-lines "DEA" the limiting current and voltage relationships presented on *Rating Chart I*.

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

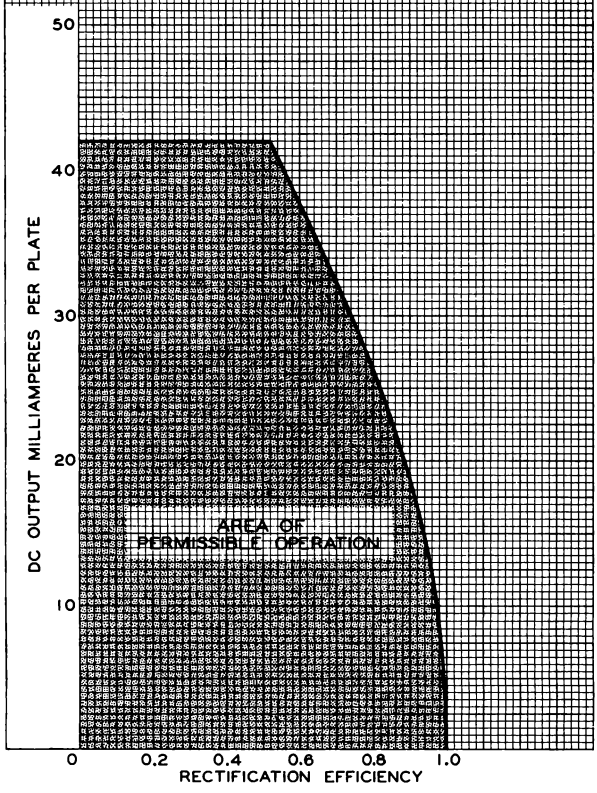
RATING CHART I



6X4

RATING CHART II
CAPACITOR INPUT TO FILTER

E_f = 6.3 VOLTS
MAX. PEAK PLATE CURRENT PER PLATE = 210 MA.
RECTIFICATION EFFICIENCY = $\frac{\bar{E}}{\sqrt{2}\,E_S}$
WHERE $\bar{E}$ = DC OUTPUT VOLTS AT INPUT TO FILTER
E_S = AC PLATE SUPPLY VOLTS (RMS) PER PLATE

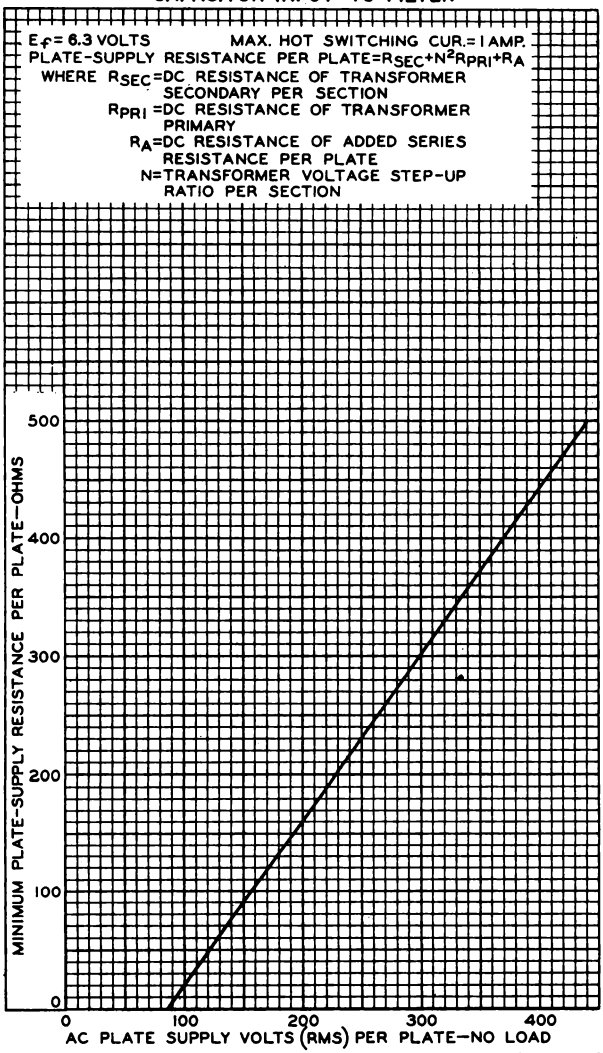


6X4

6X4

RATING CHART III

CAPACITOR INPUT TO FILTER



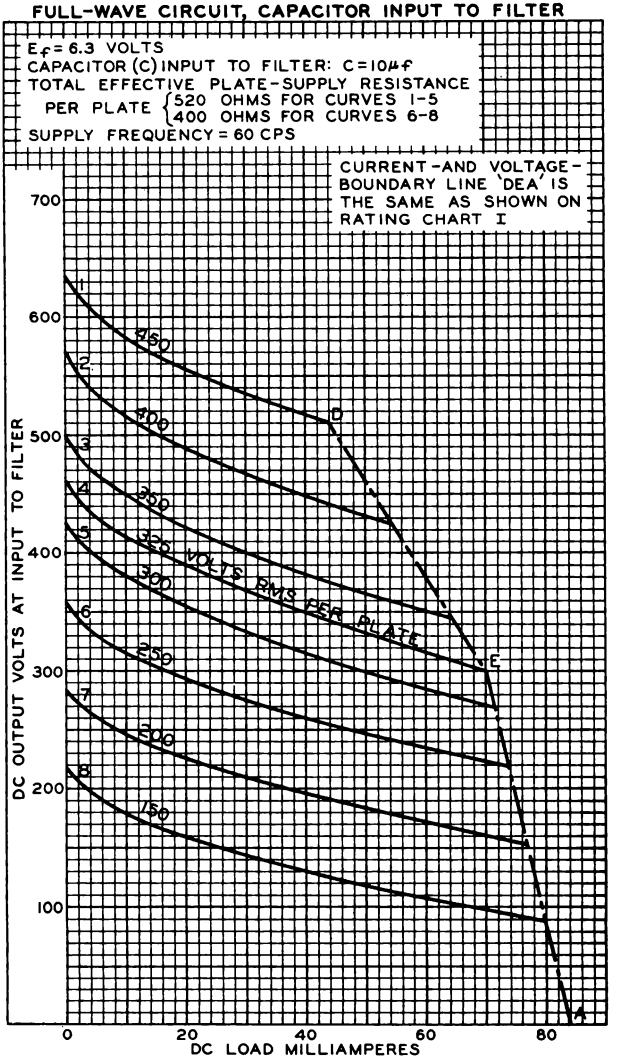
JUNE 29,1953 TUBE DEPARTMENT 92CM-8026

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6X4

OPERATION CHARACTERISTICS

FULL-WAVE CIRCUIT, CAPACITOR INPUT TO FILTER

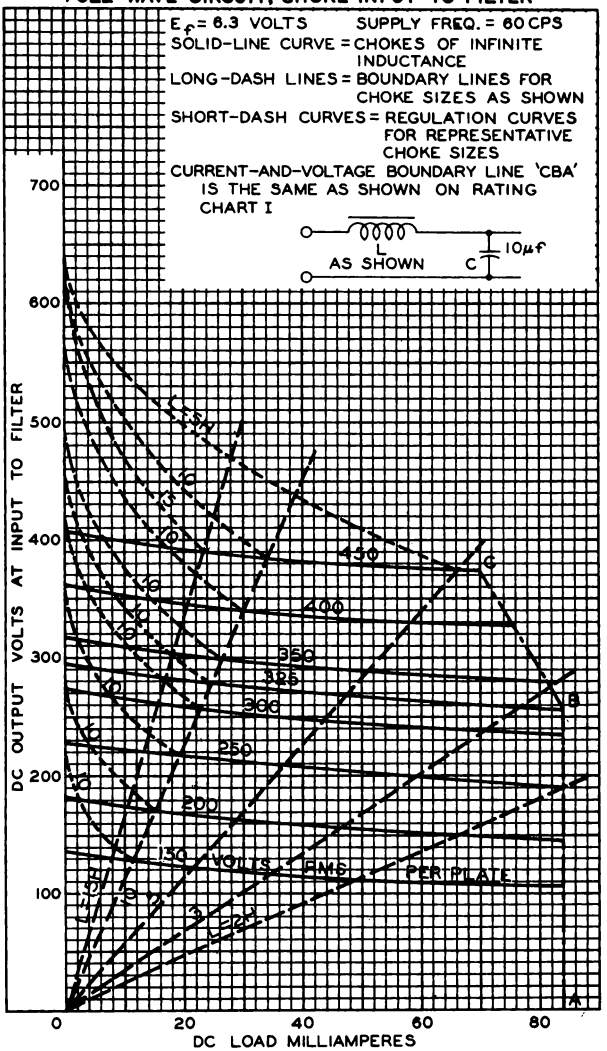


6X4

6X4

OPERATION CHARACTERISTICS

FULL-WAVE CIRCUIT, CHOKE INPUT TO FILTER



JUNE 30,1953

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8030

6X5, 6X5-GT/G

FULL-WAVE HIGH-VACUUM RECTIFIER

Heater	Coated Unipotential Cathode		
Voltage	6.3		a-c or d-c volts
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, MT-8	T-9	
Base	Small Wafer, Octal 6-Pin	Intermed. Sh., Octal 6-Pin	
Basing Designation	6S	G-6S	
Pin 1	6X5, Shell; 6X5-GT/G, No Con.	Pin 5 - Plate #1	
Pin 2 - Heater		Pin 7 - Heater	
Pin 3 - Plate #2		Pin 8 - Cathode	
Mounting Position		6X5: Vertical◇; 6X5-GT/G: Any	

BOTTOM VIEW

Maximum Ratings Are Design-Center Values

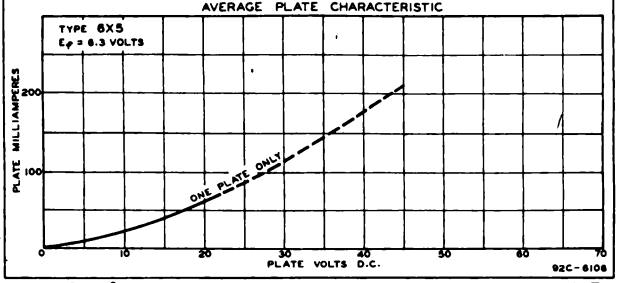
FULL-WAVE RECTIFIER

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	%

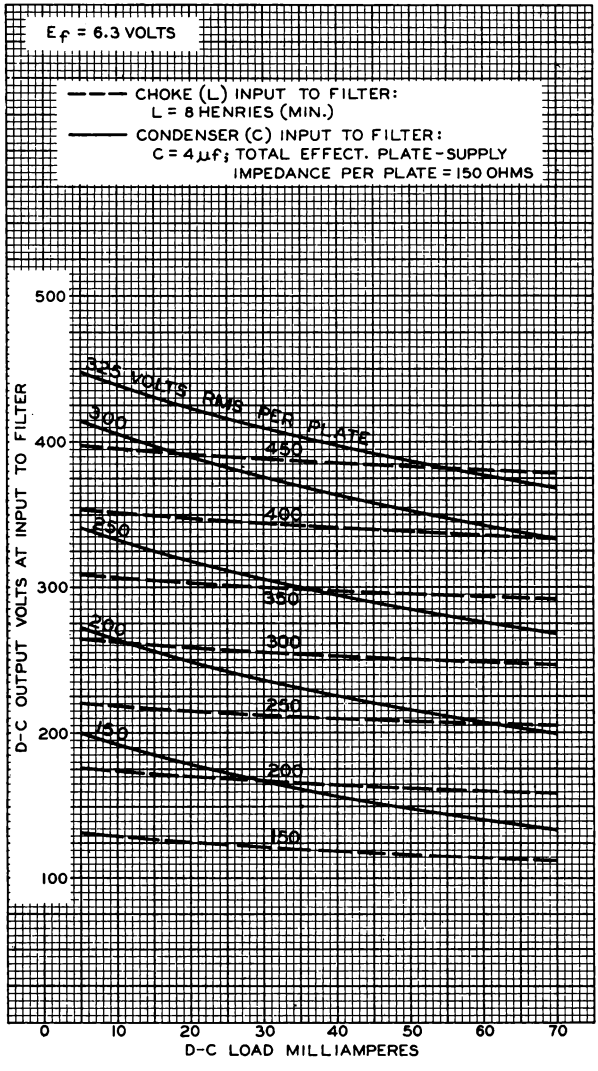
◇ Horizontal operation permitted if pins 3 & 5 are in a horizontal plane.
● For choke not less than 8 henries.
* Approximate values.

AVERAGE PLATE CHARACTERISTIC



6X5

OPERATION CHARACTERISTICS



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:	*Without External Shield*	*With External Shield No.315 Tied to Cathode*	
Triode Unit:			
Grid to Plate	1.4	1.4	μμf
Input	2.0	2.6	μμf
Output	0.5	1.0	μμf
Pentode Unit:			
Grid No.1 to Plate	0.09 max.	0.06 max.	μμf
Input	4.3	4.5	μμf
Output	0.7	1.4	μμf
Pentode Grid No.1 to Triode Plate	0.045 max.	0.035 max.	μμf
Pentode Plate to Triode Plate	0.040 max.	0.008 max.	μμf
Pentode Unit Connected as Triode:▲			
Grid No.1 to Plate	1.4	1.3	μμf
Input	3.0	3.2	μμf
Output	1.6	2.0	μμf
Heater to Cathode	6.0	6.0	μμf ←

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	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

Characteristics:

	Triode Unit	*Pentode Unit*	
Plate Voltage	100	250	volts
Grid No.3 (Suppressor)	-	Connected to cathode at socket	
Grid-No.2 Voltage	-	150	volts

▲: See next page. ← Indicates a change

6X8

6X8

TRIODE-PENTODE CONVERTER

	Triode Unit	*Pentode Unit*	
Cathode-Bias Resistor . . .	100	200	ohms
Amplification Factor . . .	40	–	
Plate Resistance (Approx.).	6900	750000	ohms
Transconductance	5800	4600	μmhos
Grid-No.1 Bias (Approx.) for Plate Cur. of 10 μamp . .	-10	-10	volts
Plate Current	8.5	7.7	ma
Grid-No.2 Current	–	1.6	ma

Pentode Unit Connected as Triode

Plate Voltage	150	volts
Grid No.3	Connected to cathode at socket	
Grid No.2	Tied to plate	
Cathode-Bias Resistor	250	ohms
Amplification Factor	42	
Plate Resistance (Approx.)	7900	ohms
Transconductance	4000	μmhos
Grid-No.1 Bias (Approx.) for Plate Current of 10 μamp	-10	volts
Plate Current	7.8	ma

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) VOLTAGE. . .	–	0 max.	volts
GRID-No.2 (SCREEN) VOLTAGE.	–	*See Rating Curve at front of this Section*	
GRID-No.2 SUPPLY VOLTAGE. .	–	250 max.	volts
GRID-No.1 (CONTROL-GRID) VOLT.:			
Negative bias value . . .	40 max.	40 max.	volts
Positive bias value . . .	0 max.	0 max.	volts
PLATE DISSIPATION	1.5 max.	2.0 max.	watts
GRID-No.2 INPUT	–	0.4 max.	watt
GRID-No.1 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

Pentode Unit as Triode-Connected Mixer▲

PLATE VOLTAGE	250 max.	volts

▲: See next page.

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6X8

TRIODE-PENTODE CONVERTER

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

Typical Operation:

	Triode Unit as 250-Mc Osc.●	*Pentode Unit as Mixer**	
Plate Voltage	150	150	volts
Grid No.3 (Suppressor)	-	Connected to cathode at socket	
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 Transconductance	-	2100	µmhos
Plate Current	13	6.2	ma
Grid-No.2 Current	-	1.8	ma
Grid-No.1 Current	3.6	-	ma
Grid-No.1 Current	-	2.0	µamp
Oscillator Power Output (Approx.)	0.5	-	watt

Pentode Unit as Triode-Connected Mixer ▲ ←

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	µmhos
Plate Current	7.8	ma
Grid-No.1 Current	2.0	µamp

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; grid No.2 connected to plate.

* With separate excitation and triode unit grounded.

● 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.

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.

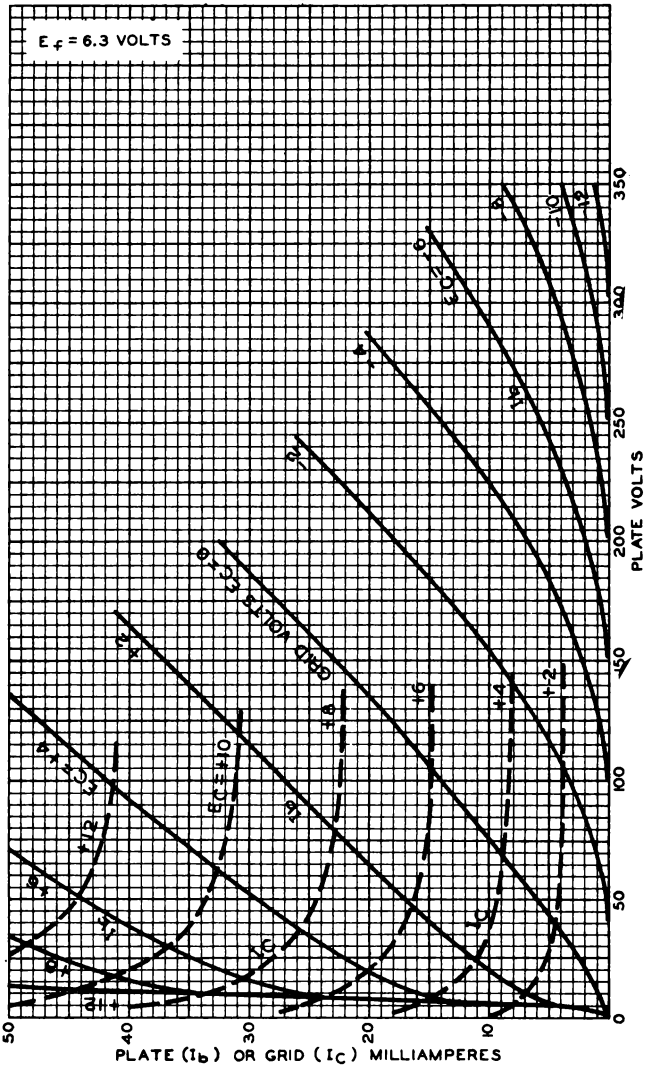
←indicates a change

6X8

6X8

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT

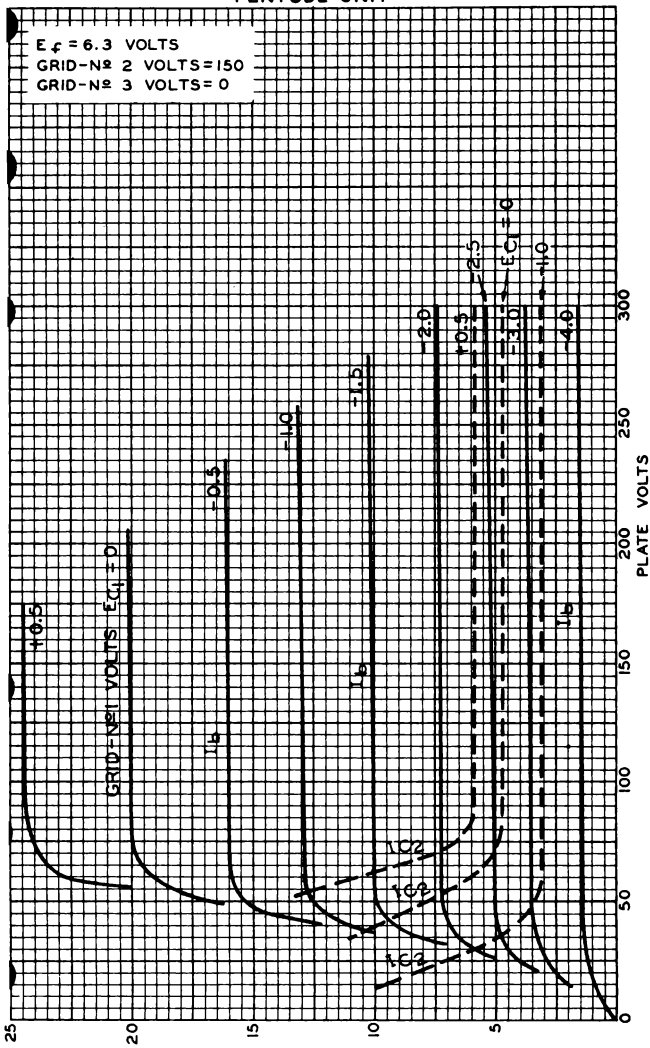


AUG. 28, 1950 TUBE DEPARTMENT 92CM-7531

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6X8

6X8
AVERAGE PLATE CHARACTERISTICS
PENTODE UNIT



AUG. 29, 1950 TUBE DEPARTMENT 92CM-7532

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

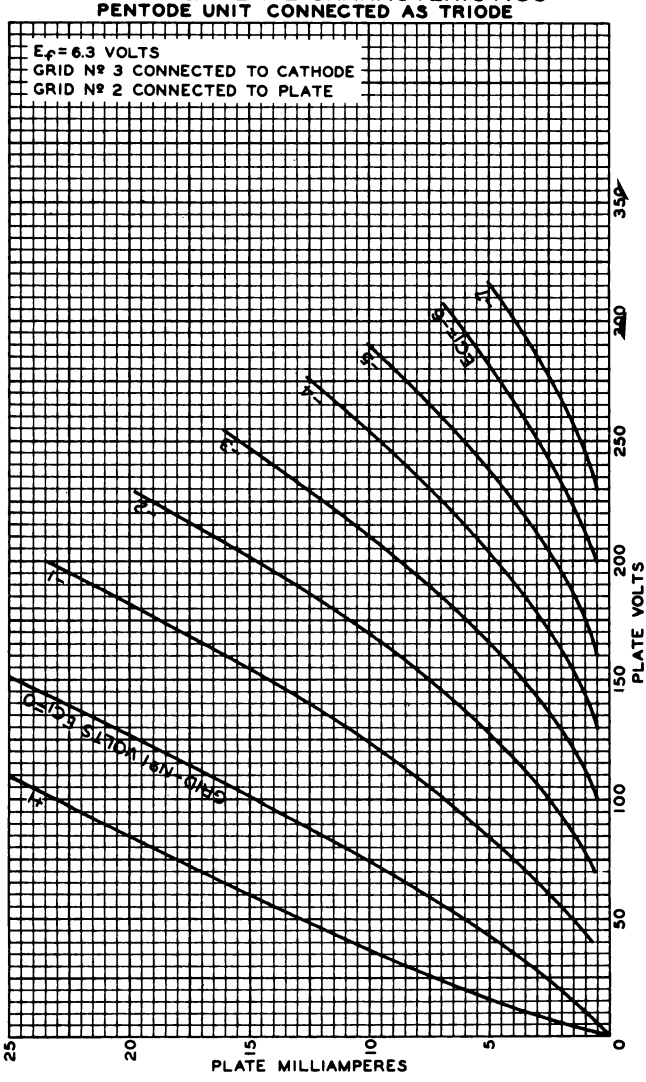
6X8

RCA

6X8

AVERAGE PLATE CHARACTERISTICS

PENTODE UNIT CONNECTED AS TRIODE



APRIL 29, 1952

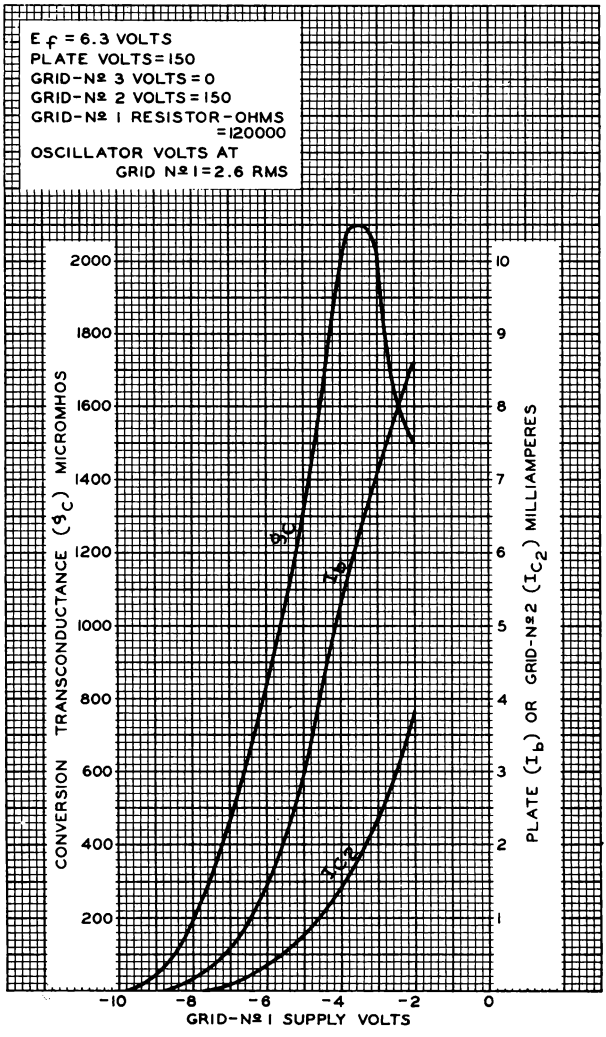
TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7599R1

6X8

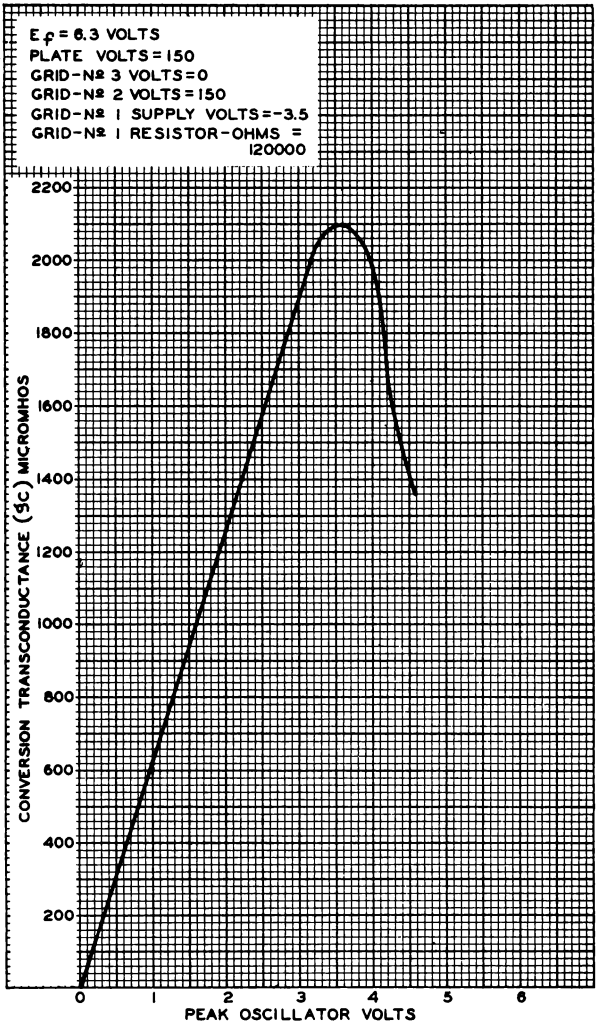
OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION
PENTODE UNIT



6X8

6X8

OPERATION CHARACTERISTIC
WITH SEPARATE OSCILLATOR EXCITATION
PENTODE UNIT



JUNE 18, 1951

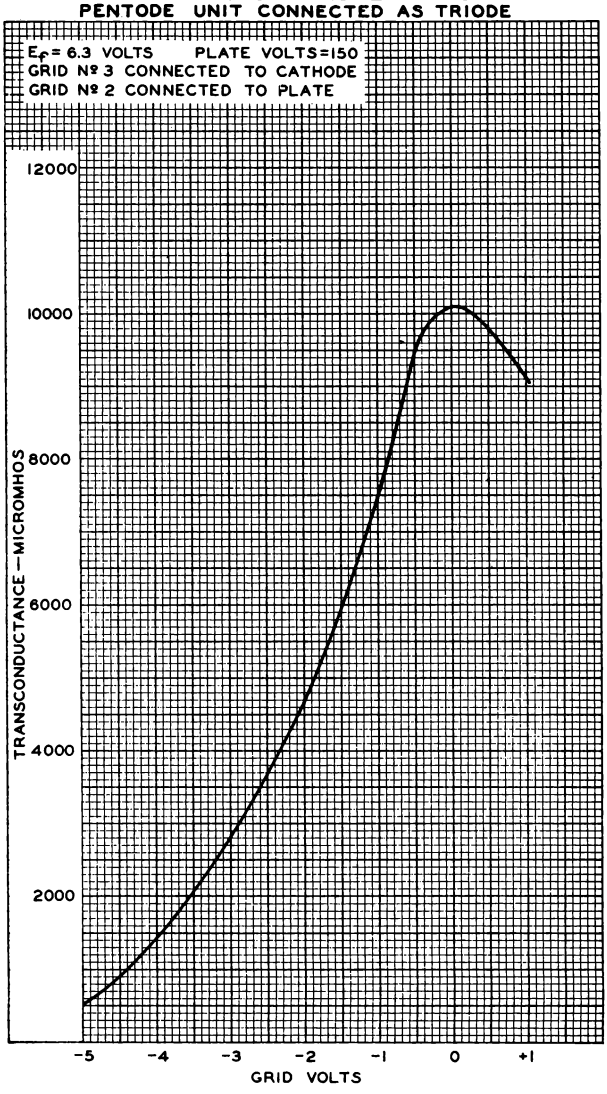
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7546R1

6X8

6X8

AVERAGE CHARACTERISTIC
PENTODE UNIT CONNECTED AS TRIODE



APRIL 29, 1952 TUBE DEPARTMENT 92CM-7844

6Y6-G

BEAM POWER AMPLIFIER

GENERAL DATA

Electrical:

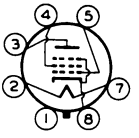
Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	1.25	amp
Direct Interelectrode Capacitances(Approx.):°		
Grid No.1 to Plate	0.7	μμf
Input	15	μμf
Output	11	μμf

° 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"
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_1

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	μmhos
Load Resistance	2000	2600	ohms

←Indicates a change.

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:

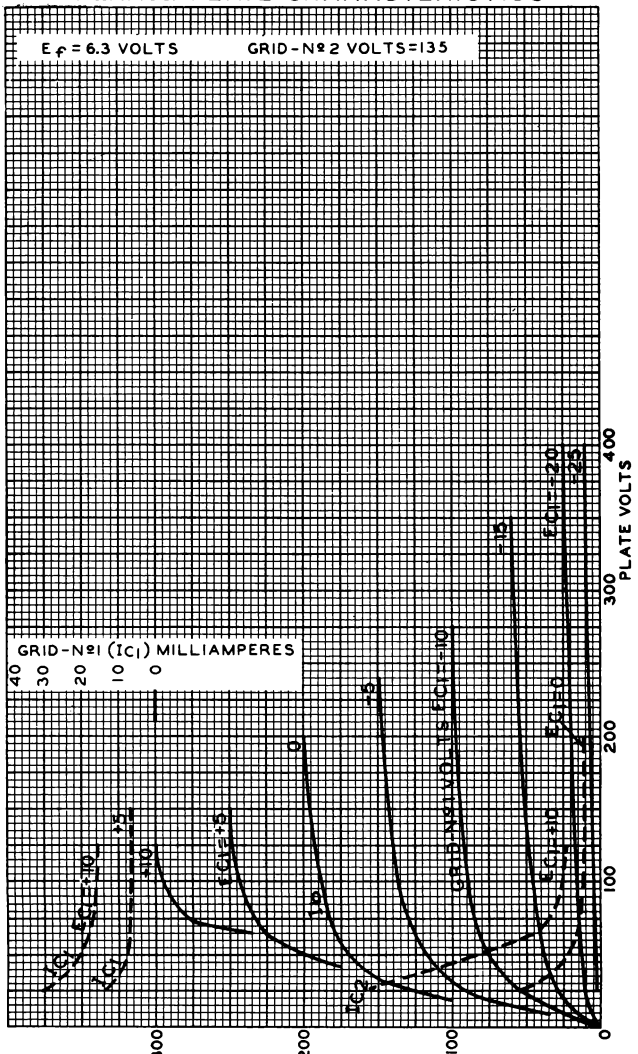
DC Plate Voltage	350	volts
DC Grid-No.2 Voltage□□	115	volts
	5000	ohms
DC Grid-No.1 Voltage†	-40	volts
	30000	ohms
	600	ohms
Peak RF Grid-No.1 Voltage.	48	volts
DC Plate Current	60	ma
DC Grid-No.2 Current	5.1	ma
DC Grid-No.1 Current (Approx.)	1.4	ma
Driving Power (Approx.).	0.1	watt
Power Output (Approx.)	14	watts

□□ 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.

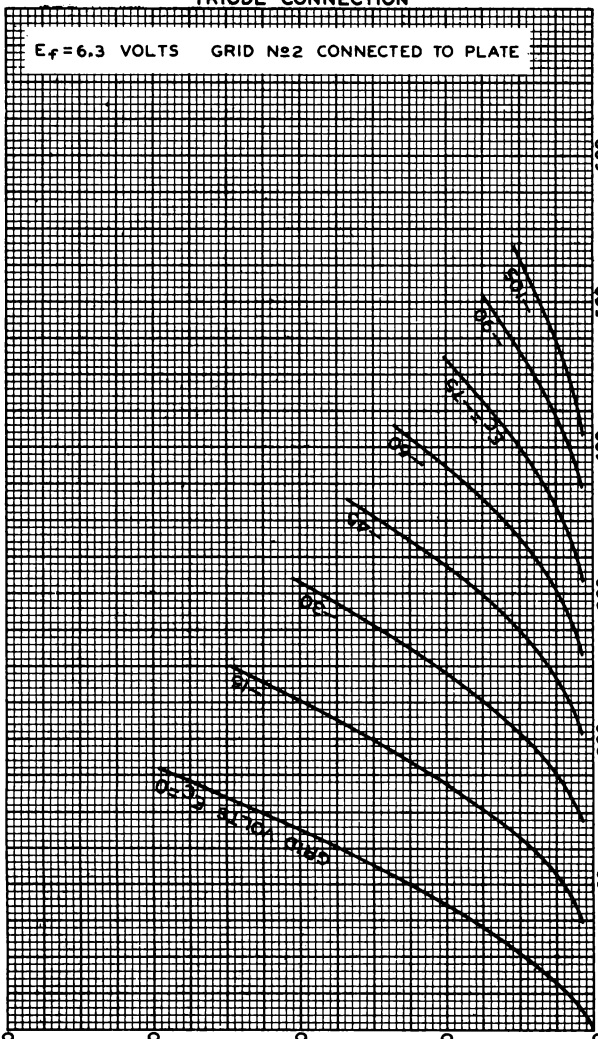
6Y6-G

AVERAGE PLATE CHARACTERISTICS



6Y6-G

6Y6-G
AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



FEB. 8, 1944

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6538

7A4

DETECTOR AMPLIFIER TRIODE

Heater ■	Coated Unipotential Cathode	
Voltage	6.3 □	a-c or d-c volts
Current	0.3 □□	amp.
Direct Interelectrode Capacitances: ○		
Grid to Plate		4.0 μμf
Grid to Cathode		3.4 μμf
Plate to Cathode		3.0 μμf
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		Any

BOTTOM VIEW ($5AC_2$)

Maximum Ratings, Typical Operating Conditions, and Curves for Type 7A4 are the same as for Type 6J5.

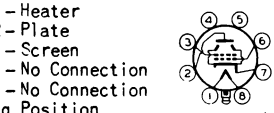
■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
□ Nominal voltage = 7.0 volts.
□□ Nominal current = 0.32 ampere.
○ With close-fitting shield connected to cathode. Values are approximate.

7A5

7A5

BEAM POWER AMPLIFIER

Heater ■	Coated Unipotential Cathode	
Voltage	6.3 □	a-c or d-c volts
Current	0.75 □□	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_1 Amplifier:			
Heater ■	6.3 □	6.3 □	volts
Plate	110	125	volts
Screen	110	125	volts
Grid ▲	-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

■ 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.

□ Nominal voltage = 7 volts.

□□ Nominal current = 0.80 ampere.

▲ 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.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

7A6
TWIN DIODE

GENERAL DATA

Electrical:

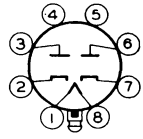
Heater, for Unipotential Cathodes:		
Voltage	6.3□	ac or dc volts
Current	0.15□□	amp
Direct Interelectrode Capacitances (Approx.):○		
Plate to Cathode (Diode No.1)	2.0	μμf
Plate to Cathode (Diode No.2)	2.6	μμf
Plate of Diode No.1 to Plate of Diode No.2	0.1 max.	μμf

○ 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	7AJ

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

□ Nominal voltage = 7.0 volts.
□□ Nominal current = 0.160 ampere.

7A7
REMOTE-CUTOFF PENTODE

GENERAL DATA

Electrical:

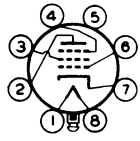
Heater, for Unipotential Cathode:		
Voltage	6.3□	ac or dc volts
Current	0.3□□	amp
Direct Interelectrode Capacitances:°		
Grid No.1 to Plate	0.005 max.	μμf
Input	5.5	μμf
Output	7.0	μμf

° 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
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

Maximum Ratings, Characteristics, and Typical Operating Conditions are the same as those for Type 6SK7

□ Nominal voltage = 7.0 volts.
□□ Nominal current = 0.32 ampere.

7A8

OCTODE CONVERTER

Heater ■	Coated Unipotential Cathode	
Voltage	6.3 □	a-c or d-c volts
Current	0.15 □□	amp.
Direct Interelectrode Capacitances: ○		
Grid No.4 to Plate	0.15 max.	μμf
Grid No.4 to Grid No.2	0.15	μμf
Grid No.4 to Grid No.1	0.15	μμf
Grid No.1 to Grid No.2	0.60	μμf
Grid No.4 to All Other Electrodes = R-F Input	7.5	μμf
Grid No.2 to All Other Electrodes Except Grid No.1 (Osc. Output)	3.4	μμf
Grid No.1 to All Other Electrodes Except Grid No.2 (Osc. Input)	3.8	μμf
Plate to All Other Electrodes	9	μμf
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		Any

BOTTOM VIEW (8U)

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.

Typical Operation and Characteristics:

Plate Voltage	100	250	volts
Screen Voltage	75	100	volts
Anode-Grid Voltage	100	-	volts
Anode-Grid Supply Voltage ▲	-	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	μmhos
Conversion Transconductance for Grid Bias of -30 volts	-	2	approx. μmhos
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 μmhos under the following conditions: plate volts, 250; screen volts, 100; anode-grid volts, 180; oscillator-grid volts, 0; and control-grid connected to cathode.

■ 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.

□ Nominal voltage = 7.0 volts.

□□ Nominal current = 0.16 ampere.

▲ Applied through a properly by-passed 20000-ohm voltage-dropping resistor.

← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

7AD7

POWER PENTODE

GENERAL DATA

Electrical:

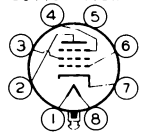
Heater, for Unipotential Cathode:		
Voltage	6.3□	ac or dc volts
Current	0.6□□	amp
Direct Interelectrode Capacitances:°		
Grid No.1 to Plate	0.030 max.	μμf
Input	11.5	μμf
Output	7.5	μμf

° 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_1

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

□ Nominal voltage = 7.0 volts. □□ Nominal current = 0.16 ampere.

7AF7
MEDIUM-MU TWIN TRIODE

Heater, for Unipotential Cathode:
Voltage. . . . . 6.3□ . . . . . ac or dc volts
Current. . . . . 0.3□□ . . . . . 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:

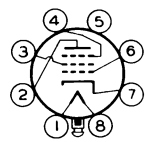
Heater, for Unipotential Cathode:
Voltage. . . . . 6.3□ . . . . . ac or dc volts
Current. . . . . 0.15□□ . . . . . amp
Direct Interelectrode Capacitances:°
Grid No.1 to Plate . . 0.005 max. . . . . μμf
Input. . . . . 7 . . . . . μμf
Output . . . . . 6 . . . . . μμf

° 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 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_1

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	μmhos
Grid-No.1 Bias (Approx.) for plate current of 10 μa	-10	volts
Plate Current	6	ma
Grid-No.2 Current	2	ma

* Fixed-bias operation is not recommended.

7AH7

REMOTE-CUTOFF PENTODE

GENERAL DATA

Electrical:

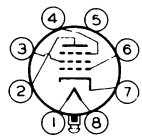
Heater, for Unipotential Cathode:		
Voltage	6.3□	ac or dc volts
Current	0.15□□	amp
Direct Interelectrode Capacitances:○		
Grid No.1 to Plate	0.005 max.	μμf
Input	7	μμf
Output	6.5	μμf

○ 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	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_1

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

REMOTE-CUTOFF PENTODE

Plate Current.	6.8	ma
Grid-No.2 Current.	1.9	ma

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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

GENERAL DATA

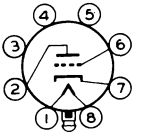
Electrical:

Heater, for Unipotential Cathode:
Voltage. . . . . 6.3□ . . . . . ac or dc volts
Current. . . . . 0.3□□ . . . . . amp

Mechanical:

Mounting Position. . . . . Any
Maximum Overall Length . . . . . 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
POWER PENTODE

GENERAL DATA

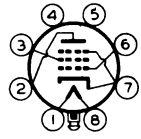
Electrical:

Heater, for Unipotential Cathode:
Voltage. . . . . 6.3□ . . . . . ac or dc volts
Current. . . . . 0.4□□ . . . . . 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 6K6-GT

□ Nominal voltage = 7.0 volts.
□□ Nominal current = 0.43 ampere.

7B6

TWIN DIODE—HIGH-MU TRIODE

GENERAL DATA

Electrical:

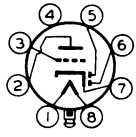
Heater, for Unipotential Cathode:		
Voltage	6.3□	ac or dc volts
Current	0.3□□	amp
Direct Interelectrode Capacitances—Triode Unit:°		
Grid to Plate	1.6	μμf
Grid to Cathode	3.0	μμf
Plate to Cathode	2.4	μμf

° 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	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_1

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	μmhos
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.

□ Nominal voltage = 7.0 volts.
□□ Nominal current = 0.32 ampere.

7B7
REMOTE-CUTOFF PENTODE

GENERAL DATA

Electrical:

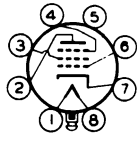
Heater, for Unipotential Cathode:		
Voltage	6.3□	ac or dc volts
Current	0.15□□	amp
Direct Interelectrode Capacitances:°		
Grid No.1 to Plate	0.007 max.	μμf
Input	5.0	μμf
Output	6.0	μμf

° 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	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_1

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	μmhos
Grid-No.1 Bias (Approx.) for transconductance of 10 μmhos	-40	-40	volts
Plate Current	8.2	8.5	ma.
Grid-No.2 Current	1.8	1.7	ma.

□ Nominal voltage = 7.0 volts. □□ Nominal current = 0.160 ampere.

7B8
PENTAGRID CONVERTER

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3□	ac or dc volts
Current	0.3□□	amp
Direct Interelectrode Capacitances:○		
Grid No.4 to All Other Electrodes (RF Input)	10.0	μμf
Plate to All Other Electrodes (Mixer Output)	9.0	μμf
Grid No.1 to All Other Electrodes except Grid No.2 (Osc. Input)	5.0	μμf
Grid No.2 to All Other Electrodes except Grid No.1 (Osc. Output)	3.4	μμf
Grid No.4 to Plate	0.2 max.	μμf
Grid No.4 to Grid No.2	0.2 max.	μμf
Grid No.4 to Grid No.1	0.2 max.	μμf
Grid No.1 to Grid No.2	0.9	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	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

□ Nominal voltage = 7.0 volts.
□□ Nominal current = 0.320 ampere.

7C5

7C5
BEAM POWER AMPLIFIER

GENERAL DATA

Electrical:

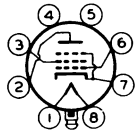
Heater, for Unipotential Cathode:		
Voltage	6.3□	ac or dc volts
Current	0.45□□	amp
Direct Interelectrode Capacitances (Approx.):○		
Grid No.1 to Plate	0.4	μμf
Input	9.5	μμf
Output	9.0	μμf

○ 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

□ Nominal voltage = 7.0 volts.
□□ Nominal current = 0.48 ampere.

7C6

DUPLEX-DIODE HIGH-MU TRIODE

Heater*	Coated Unipotential Cathode	
Voltage	6.3 □	a-c or d-c volts
Current	0.15 □□	amp.
Direct Interelectrode Capacitances - Triode Unit:°		
Grid to Plate	1.4	μμf
Grid to Cathode	2.4	μμf
Plate to Cathode	3.0	μμf
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 2 - Triode Plate
Pin 3 - Triode Grid
Pin 4 - Cathode
Pin 5 - Diode Plate #2

Pin 6 - Diode Plate #1
Pin 7 - Cathode
Pin 8 - Heater
Plug - Base Shell

Mounting Position BOTTOM VIEW (8W) Any

TRIODE UNIT

Plate Voltage	250 max.	volts
Characteristics - Class A_1 Amplifier:		
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.
Typical Operation—Resistance-Coupled Amplifier:		
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.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

7C7

7C7

TRIPLE-GRID DETECTOR AMPLIFIER

Heater■	Coated Unipotential Cathode	
Voltage	6.3□	a-c or d-c volts
Current	0.15□□	amp.
Direct Interelectrode Capacitances:○		
Grid to Plate	0.007 max.	μμf
Input	5.5	μμf
Output	6.5	μμf
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, 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.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

7E6
TWIN DIODE—MEDIUM-MU TRIODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

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

Direct Interelectrode Capacitances:* ←

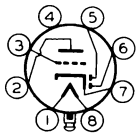
Triode Unit:		
Grid to Plate	1.5	μμf
Grid to Cathode	3.0	μμf
Plate to Cathode	2.4	μμf
Diode-No.1 Plate to Grid	0.01 max.	μμf
Diode-No.2 Plate to Grid	0.04 max.	μμf

* 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	8W

Pin 1 - Heater
Pin 2 - Triode Plate
Pin 3 - Triode Grid
Pin 4 - Internal Connection —Do Not Use
Pin 5 - Diode-No.2 Plate



Pin 6 - Diode-No.1 Plate
Pin 7 - Cathode
Pin 8 - Heater
Plug - Base Shell

TRIODE UNIT
AMPLIFIER-Class A1 ←

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

PLATE VOLTAGE	300 max.	volts
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	100	250	volts
Cathode-Bias Resistor	770	950	ohms
Amplification Factor	16.5	16	
Plate Resistance	11000	8500	ohms

(continued on next page)

□ Nominal Voltage = 7.0 volts. □□ Nominal Current = 0.32 ampere.

←Indicates a change.

7E6
TWIN DIODE—MEDIUM-MU TRIODE

Transconductance.	1500	1900	. . μmhos
Plate Current	3.9	9.5	. . ma

Maximum Circuit Values (for maximum circuit conditions):

Grid-No.1-Circuit Resistance. . . . . 1 max. megohm

DIODE UNITS - Two

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

PLATE CURRENT (Each Diode). . . . . 1 max. ma

7E7
TWIN DIODE—REMOTE-CUTOFF PENTODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:
- Voltage. . . . . 6.3□ . . . . . ac or dc volts
- Current. . . . . 0.3□□ . . . . . amp

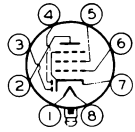
Direct Interelectrode Capacitances:°
- Pentode Unit:
  - Grid No.1 to Plate . . . . . 0.005 max. . . μμf
  - Input. . . . . 4.6 . . . . μμf
  - Output . . . . . 5.5 . . . . μμf
- Diode-No.1 Plate to Grid No.1 . . . 0.013 max. . . μμf
- Diode-No.2 Plate to Grid No.1 . . . 0.003 max. . . μμf

° 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 8AE

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



Pin 6 - Pentode Grid No.1
Pin 7 - Cathode, Pentode Grid No.3
Pin 8 - Heater
Plug - Base Shell

PENTODE • UNIT
AMPLIFIER - Class A_1

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)

□ Nominal voltage = 7.0 volts. □□ 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	1600	1300	μmhos
Grid-No.1 Bias (Approx.) for transconductance of 2 μmhos . . .	-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

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

7F7
HIGH-MU TWIN TRIODE

GENERAL DATA

Electrical:

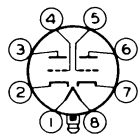
Heater, for Unipotential Cathodes:		
Voltage	6.3□	ac or dc volts
Current	0.3□□	amp
Direct Interelectrode Capacitances:*		
Each Unit:		
Grid to Plate	1.6	μμf
Grid to Cathode	2.4	μμf
Plate to Cathode	2.0	μμf
Grid to Grid	0.2 max.	μμf
Plate to Plate	1.0 max.	μμf

* 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	8AC

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



Pin 6 - Plate of Unit No.1
Pin 7 - Cathode of Unit No.1
Pin 8 - Heater

Plug - Base Shell

AMPLIFIER - Class A_1

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
MEDIUM-MU TWIN TRIODE

GENERAL DATA

Electrical:

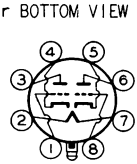
Heater, for Unipotential Cathodes:		
Voltage	6.3□	ac or dc volts
Current	0.3□□	amp
Direct Interelectrode Capacitances:		
Each Unit:		
Grid to Plate	1.2*	μμf
Grid to Cathode	2.8*	μμf
Plate to Cathode	1.4*	μμf
Heater to Cathode	2.8**	μμf
Grid to Grid	0.1 max.*	μμf
Plate to Plate	0.5 max.*	μμf

* 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.2
Pin 4 - Cathode of Unit No.2
Pin 5 - Cathode of Unit No.1



Pin 6 - Plate of Unit No.1
Pin 7 - Heater
Pin 8 - Grid of Unit No.1

Plug - Base Shell

AMPLIFIER - Class A_1

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.

7F8

7F8
MEDIUM-MU TWIN TRIODE

Plate Resistance (Approx.)	14500 . .	ohms
Transconductance	3300 . .	μmhos
Plate Current.	6 . .	ma
Grid Bias for plate current of 10 μa (Approx.). . . .	-11 . .	volts

Maximum Circuit Values (for maximum rated conditions):

Grid-Circuit Resistance:		
For cathode-bias operation	0.5 max.	megohm

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

7G7
SHARP-CUTOFF PENTODE

GENERAL DATA

Electrical:

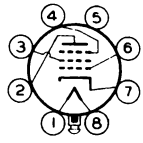
Heater, for Unipotential Cathode:		
Voltage	6.3□	ac or dc volts
Current	0.45□□	amp
Direct Interelectrode Capacitances:○		
Grid No.1 to Plate	0.007 max.	μμf
Input	9	μμf
Output	7	μμf

○ 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	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_1

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)

□ Nominal voltage = 7.0 volts. □□ 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.

7H7

REMOTE-CUTOFF PENTODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

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

Direct Interelectrode Capacitances:○

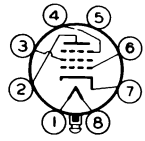
Grid No.1 to Plate	0.007 max.	μμf
Input	8	μμf
Output	7	μμf

○ 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	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_1

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)

□ Nominal voltage = 7.0 volts.
□□ Nominal current = 0.32 ampere.
← Indicates a change.

7H7
REMOTE-CUTOFF PENTODE

Plate Resistance (Approx.)	0.25	0.8	megohm
Transconductance	4800	4200	μmhos
Grid-No.1 Bias (Approx.) for transconductance of 35 μmhos . . .	-12	-19	volts
Plate Current.	8.2	10	ma
Grid-No.2 Current.	3.3	3.2	ma

7J7
TRIODE-HEPTODE CONVERTER

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:
- Voltage. . . . . 6.3□ . . . . . ac or dc volts
- Current. . . . . 0.3□□ . . . . . .amp

Direct Interelectrode Capacitances:○ ←

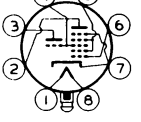
Heptode Grid No.1 to Heptode Plate . . .	0.03 max.	μμf
Heptode Grid No.1 to Triode Plate. . . .	0.1 max.	μμf
Heptode Grid No.1 to Triode Grid & Heptode Grid No.3. . .	0.3 max.	μμf
Triode Grid & Heptode Grid No.3 to Triode Plate	0.9 . .	μμf
Heptode Grid No.1 to All Other Electrodes (RF Input).	4.6 . .	μμf
Heptode Plate to All Other Electrodes (Mixer Output)	3.2 . .	μμf
Triode Grid & Heptode Grid No.3 to All Other Electrodes Except Triode Plate (Oscillator Input)	7.5 . .	μμf
Triode Plate to All Other Electrodes Except Triode Grid & Heptode Grid No.3 (Oscillator Output). . . .	7.5 . .	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	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
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

→ **Typical Operation:**

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†	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

† 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.

7K7

TWIN DIODE—HIGH-MU TRIODE

GENERAL DATA

Electrical:

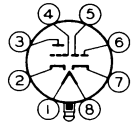
Heater, for Unipotential Cathodes:

Voltage	6.3□	ac or dc volts
Current	0.3□□	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_1

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.

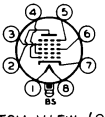
□Nominal voltage = 7.0 volts

□□Nominal current = 0.32 amperes.

7Q7

PENTAGRID CONVERTER

Heater ■	Coated Unipotential Cathode		
Voltage	6.3 □	a-c or d-c	volts
Current	0.3 □□		amp.
Direct Interelectrode Capacitances: ○			
Grid #3 to All Other Electrodes & Base Shell (R-F Input)		9.0	μμf
Plate to All Other Electrodes & Base Shell (Mixer Output)		9.0	μμf
Grid #1 to All Other Electrodes & Base Shell		7.0	μμf
Grid #3 to Plate		0.20 max.	μμf
Grid #1 to Grid #3		0.20 max.	μμf
Grid #1 to Plate		0.15 max.	μμf
Grid #1 to All Other Electrodes & Base Shell Except Cathode		5.0	μμf
Grid #1 to Cathode		2.2	μμf
Cathode to All Other Electrodes & Base Shell Except Grid #1		6.0	μμf
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 (8AL)		Any



CONVERTER SERVICE

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: *			
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.

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 μmhos 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 6SA7.

7V7
SHARP-CUTOFF PENTODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

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

Direct Interelectrode Capacitances:°

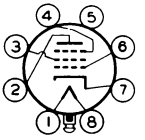
Grid No.1 to Plate	0.004 max.	μμf
Input	9.5	μμf
Output	6.5	μμf

° 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	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_1

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

□ Nominal voltage = 7.0 volts. □□ 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□	ac or dc volts
Current.	0.45□□	amp
Direct Interelectrode Capacitances:°		
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:

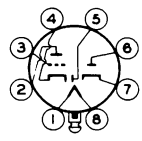
Heater, for Unipotential Cathodes:

Voltage	6.3□	ac or dc volts
Current	0.3□□	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	8BZ

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_1

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.

□ Nominal voltage = 7.0 volts.

□□ Nominal current = 0.32 ampere.

7Y4
FULL-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

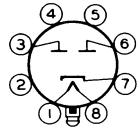
Heater, for Unipotential Cathode:

Voltage	6.3□	ac or dc volts
Current	0.5□□	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: ←

	Capacitor-Input to Filter	*Choke-Input to Filter*	
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	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.

7Z4

7Z4
FULL-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

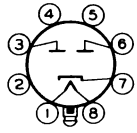
Heater, for Unipotential Cathode:

Voltage	6.3□	ac or dc volts
Current	0.9□□	amp

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-5/32"
Maximum Seated Length	2-5/8"
Maximum Diameter	1-3/16"
Bulb	T-9
Base	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW	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 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.

□ Nominal voltage = 7.0 volts.

□□ Nominal current = 0.96 ampere.

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

BEAM POWER TUBE

9-PIN MINIATURE TYPE

For use in automobile radio receivers operating from 12-volt storage batteries

GENERAL DATA

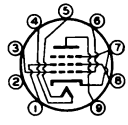
Electrical:

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. . . 0.2 . . . . . amp
Direct Interelectrode Capacitances:○
Grid No.1 to plate . . . . . 0.7 max. μμf
Grid No.1 to cathode & grid No.3,
grid No.2, and heater. . . . . 8 μμf
Plate to cathode & grid No.3,
grid No.2, and heater. . . . . 8.5 μμf

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
Base . . . . . Small-Button Noval 9-Pin (JETEC 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_1

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

●,○: see next page.

TUBE DIVISION
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	μmhos
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.	megohm
For cathode-bias operation	0.5 max.	megohm

PUSH-PULL AF POWER AMPLIFIER - Class AB_1

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.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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

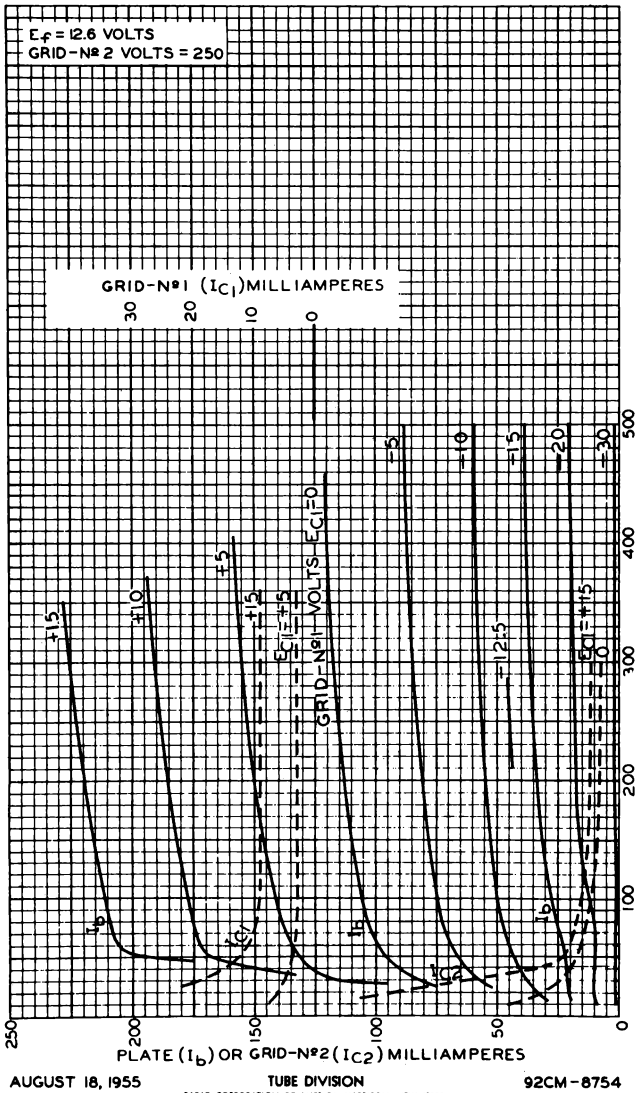
The *maximum ratings* in the tabulated data for the 12AB5 are working design-center maximums established according to the standard design-center system of rating electron tubes. Tubes so rated will give satisfactory performance in storage-battery-operated equipment provided the following stipulations 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.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

12AB5

AVERAGE CHARACTERISTICS



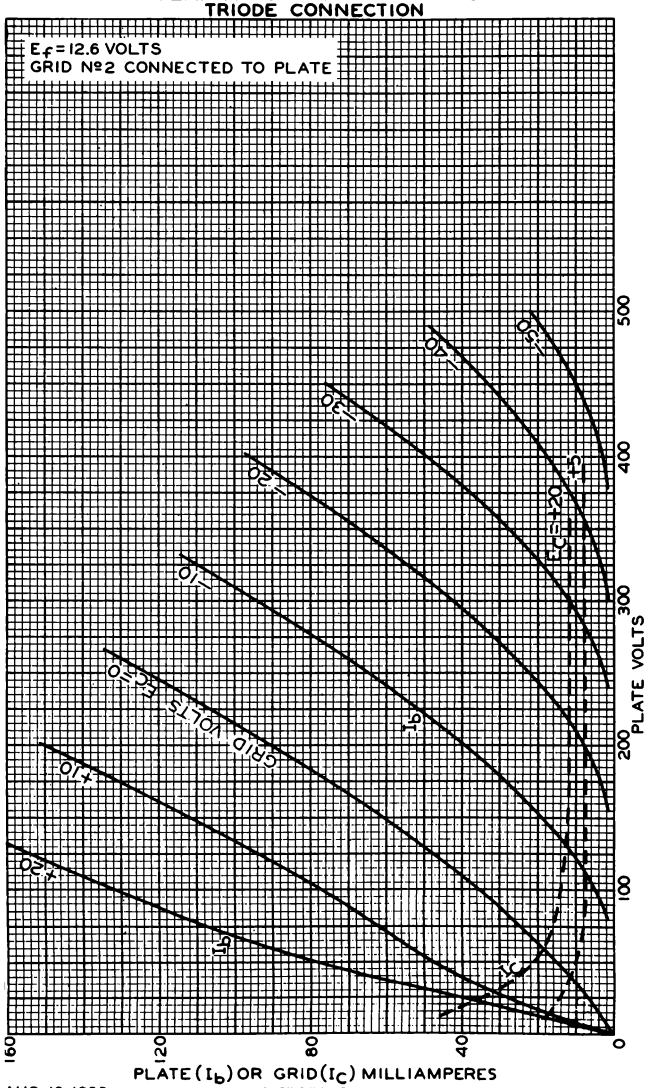
AUGUST 18, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8754

12AB5

AVERAGE CHARACTERISTICS
TRIODE CONNECTION



AUG. 19, 1955

TUBE DIVISION

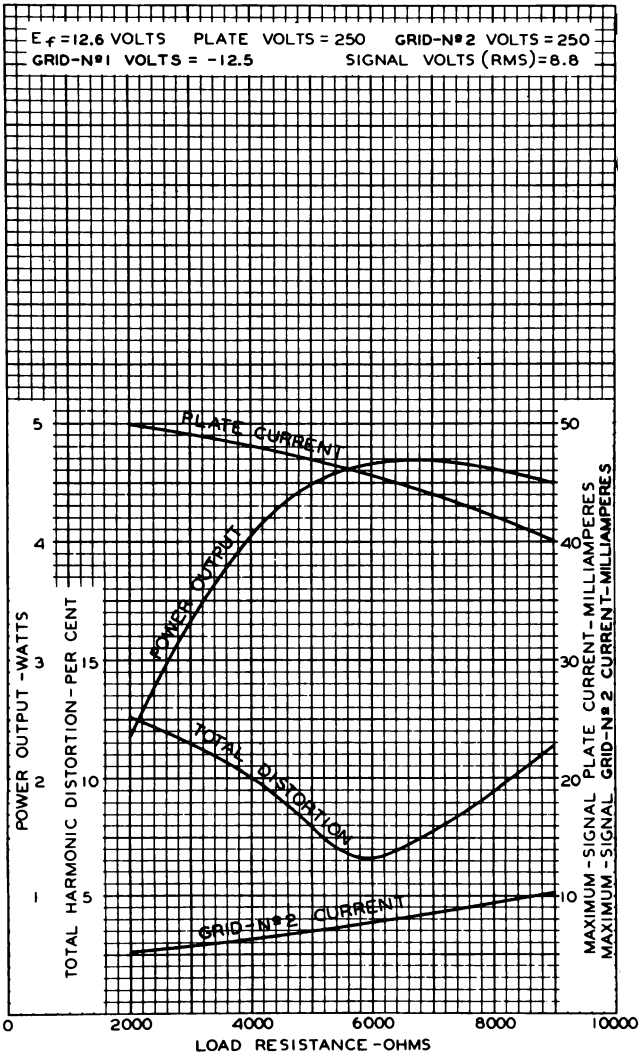
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8756

12AB5

12AB5

OPERATION CHARACTERISTICS



AUGUST 18, 1955 TUBE DIVISION 92CM-8755

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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.):[o]

	Unit No.1	*Unit No.2*	
Grid to plate	3	2.2	μμf
Grid to cathode and heater	2.8	3.2	μμf
Plate to cathode and heater	2.6	3	μμf
Plate of unit No.1 to plate of unit No.2	0.4		μμf
Grid of unit No.1 to grid of unit No.2	0.06		μμf

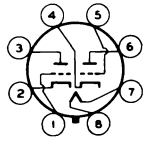
Characteristics, Class A_1 Amplifier (Each unit):

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	μmhos
Plate Current	3.7	7.6	ma
Grid Voltage (Approx.) for plate current of 10 μamp	-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.B8-6) ←
Basing Designation for BOTTOM VIEW	8BE

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



Pin 5 - Grid of Unit No.1
Pin 6 - Plate of Unit No.1
Pin 7 - Heater
Pin 8 - Heater

[o] With external shield JETEC No.308 connected to cathode of unit under test.

← Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

12AH7-GT

MEDIUM-MU TWIN TRIODE

AMPLIFIER - Class A_1

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▲max.	volts

▲ The dc component must not exceed 100 volts.

→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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:°

Triode Unit:		
Grid to plate.	5.7	μμf
Grid to cathode and heater	1.8	μμf
Plate to cathode and heater.	0.4	μμf
Tetrode Unit:		
Grid No.2 to plate	14	μμf
Grid No.2 to cathode, grid No.1, and heater	13	μμf
Plate to cathode, grid No.1, and heater	1.6	μμf
Tetrode grid No.2 to triode grid	0.01 max.	μμf

Characteristics, Class A_1 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	—	μmhos
Grid No.2 to plate	–	15000	μmhos
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"

°: See next page.

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

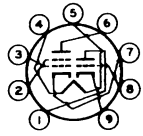
TENTATIVE DATA

12AL8

MEDIUM-MU TRIODE—POWER TETRODE

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 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_1

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

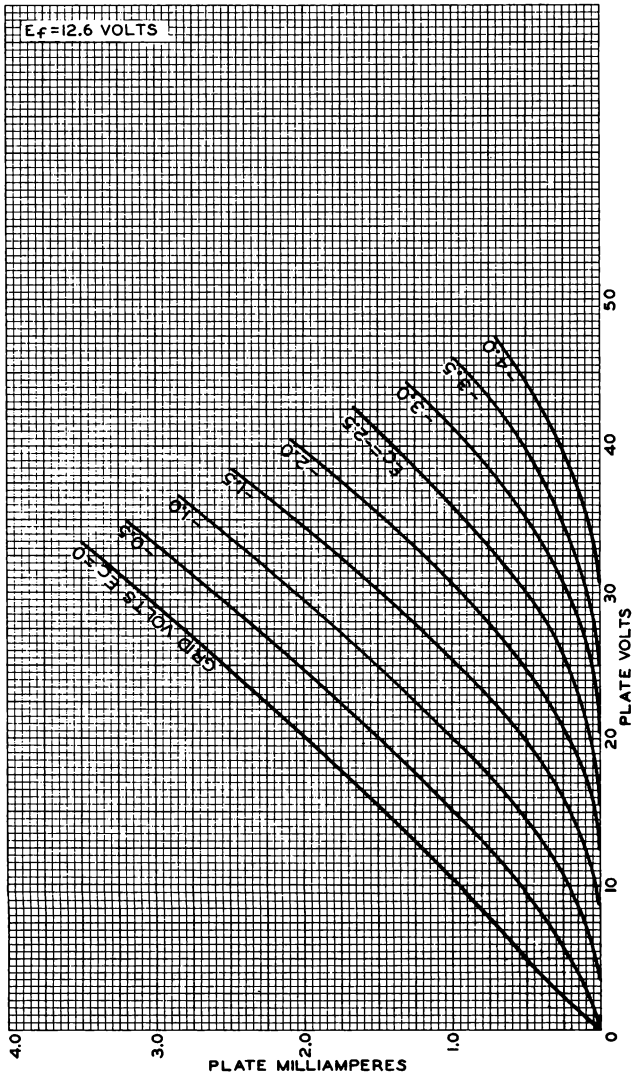
○ Without external shield.
● Under no circumstances should this absolute value be exceeded.

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

TENTATIVE DATA

12AL8

AVERAGE PLATE CHARACTERISTICS
TRIODE UNIT



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

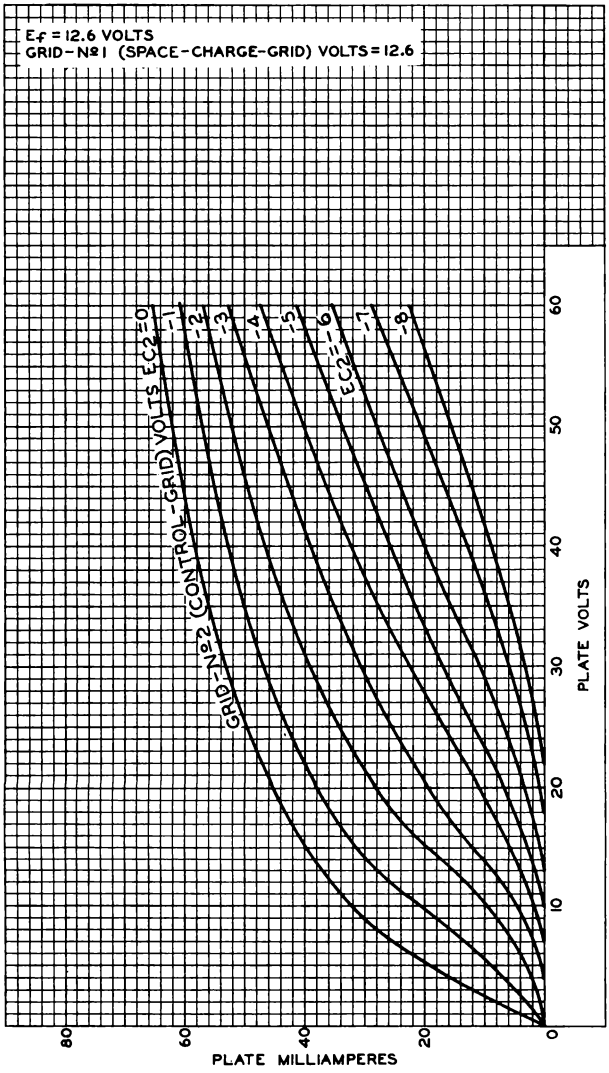
92CM-9432

12AL8

12AL8

AVERAGE PLATE CHARACTERISTICS

TETRODE UNIT



ELECTRON TUBE DIVISION

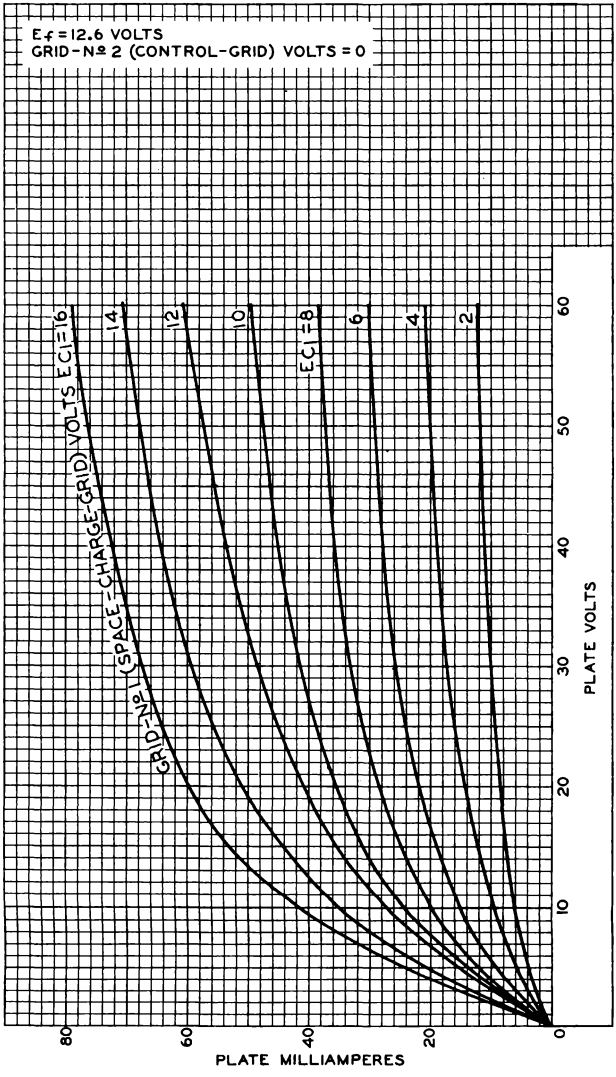
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9422

12AL8

AVERAGE PLATE CHARACTERISTICS

TETRODE UNIT



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.

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

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.)°: ←

	Unit No.1	*Unit No.2*	
Grid-Drive Operation:			
Grid to Plate	1.5	1.5	. . . . . μμf
Grid to Cathode . . .	2.2	2.2	. . . . . μμf
Plate to Cathode . .	0.5	0.4	. . . . . μμf
Heater to Cathode . .	2.4	2.4	. . . . . μμf
Cathode-Drive Operation:			
Plate to Cathode . .	0.2	0.2	. . . . . μμf
Grid & Heater to Cathode . . .	4.6	4.6	. . . . . μμf
Grid & Heater to Plate	1.8	1.8	. . . . . μμf
Grid to Grid	0.005 max.		. . . . . μμf
Plate to Plate	0.4 max.		. . . . . μμf

° 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 (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
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_1

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

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	μmhos
Grid Voltage (Approx.) for plate current of 10 μamp . .	-5	-12	volts
Plate Current	3.7	10	ma

→ Indicates a change

12AT7
AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT

AUG. 31, 1948 | TUBE DEPARTMENT | 92CM-7056

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

12AU6

12AU6

SHARP-CUTOFF PENTODE

MINIATURE TYPE

Heater, for Unipotential Cathode:		
Voltage.	12.6	. . . . . ac or dc volts
Current.	0.15	. . . . . amp

The 12AU6 is the same as the 6AU6 except for heater rating.

12AU7

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	0.15	0.3	. . . . . amp

Direct Interelectrode Capacitances (Approx.):

	Unit No.1	*Unit No.2*	
Without external shield:			
Grid to plate	1.5	1.5	μμf
Grid to cathode and heater. . . .	1.6	1.6	μμf
Plate to cathode and heater . . .	0.4	0.32	μμf ←
With external shield, JETEC No.315, connected to cathode: ←			
Grid to plate	1.5	1.5	μμf
Grid to cathode and heater. . . .	1.8	1.8	μμf
Plate to cathode and heater . . .	2	2	μμf

Characteristics, Class A_1 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

MEDIUM-MU TWIN TRIODE

AMPLIFIER - Class A_1

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 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□

DC PLATE VOLTAGE	300 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE♦	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 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□

DC PLATE VOLTAGE	300 max.	volts

♦ 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.

▲,□: See next page. → Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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▲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□

DC PLATE VOLTAGE	300 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE# (Absolute maximum)	1200■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▲max.	volts

Maximum Circuit Values:

Grid-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 per cent of one vertical scanning cycle is 2.5 milliseconds.

■ Under no circumstances should this absolute value be exceeded.

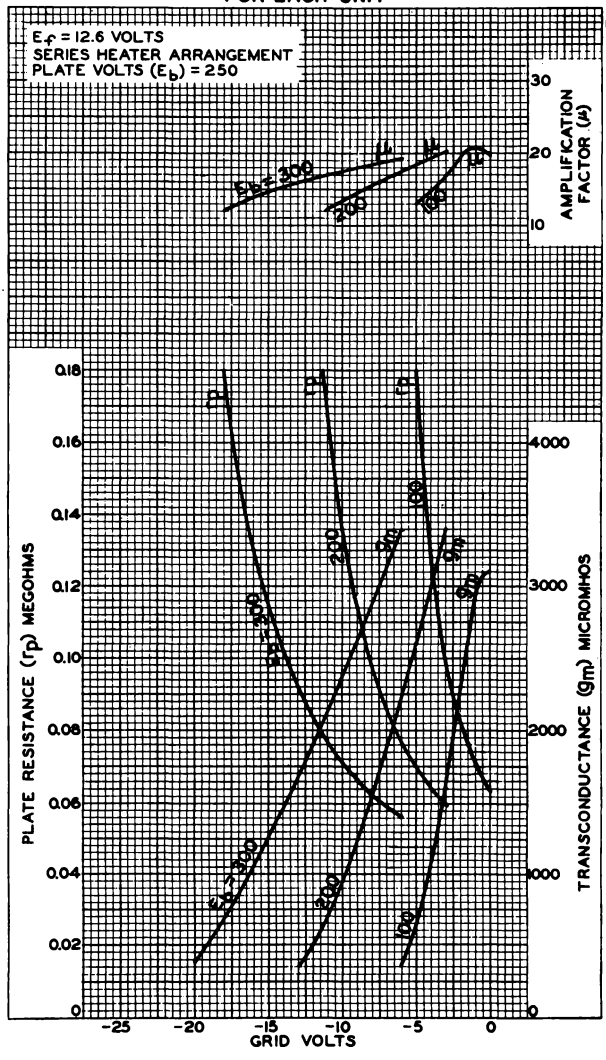
The curves under Type 6C4 also apply to each unit of the 12AU7

← Indicates a change.

12AU7

12AU7

AVERAGE CHARACTERISTICS
FOR EACH UNIT



MAR. 18, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8564

12AV6

12AV6
TWIN DIODE—HIGH-MU TRIODE

MINIATURE TYPE

Heater, for Unipotential Cathode:		
Voltage	12.6	. . . . . ac or dc volts
Current	0.15	. . . . . amp

The 12AV6 is the same as the 6AV6 except for heater rating.

12AV7

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

	Series	Parallel	
Heater Arrangement			
Voltage	12.6	6.3	ac or dc volts
Current	0.225	0.45	amp

Direct Interelectrode Capacitances:

	Unit No.1	Unit No.2	
Without external shield:			
Grid to plate	1.9	1.9	μμf
Grid to cathode and heater.	3.1	3.1	μμf
Plate to cathode.	0.24	0.24	μμf
Plate to cathode and heater	0.5	0.4	μμf
Plate to grid and heater. .	2	2	μμf
Cathode to grid and heater.	6.9	6.9	μμf
Cathode to heater	3.8	3.8	μμf
With external shield, JETEC No.315, connected to cathode, except as noted:			
Grid to plate	1.9	1.9	μμf
Grid to cathode and heater.	3.2	3.2	μμf
Plate to cathode.	0.24	0.23	μμf
Plate to cathode and heater	1.3	1.6	μμf
Plate to grid, heater, and external shield	2.8	3.2	μμf
Cathode to grid, heater, and external shield . .	7	7	μμf
Heater to cathode	4	4	μμf

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 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

12AV7

12AV7

MEDIUM-MU TWIN TRIODE

AMPLIFIER - Class A_1

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	μmhos
Plate Current	9	18	ma
Grid Voltage (Approx.) for plate current of 10 μamp	-9	-12	volts

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

12AW6

12AW6

SHARP-CUTOFF PENTODE

MINIATURE TYPE

GENERAL DATA

Electrical:

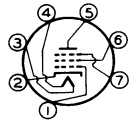
Heater, for Unipotential Cathode:		
Voltage	12.6	ac or dc volts
Current	0.15	amp
Direct Interelectrode Capacitances (Approx.)°:		
Grid to Plate	0.025 max.	μμf
Input	6.5	μμf
Output	1.5	μμf

° 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 Bulb Top (excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	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_1

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□	Connected to cathode at socket			
Grid-No.2 Voltage	100	125	150	volts
Cathode-Bias Resistor	100	100	200	ohms

□ See next page.

12AW6

12AW6

SHARP-CUTOFF PENTODE

Plate Resistance (Approx.)	0.3	0.5	0.8	. .	megohm
Transconductance	4750	5100	5000	. .	μmhos
Grid-No.1 Voltage for plate current of 10 μamp	-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_1

Triode Connection▲

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

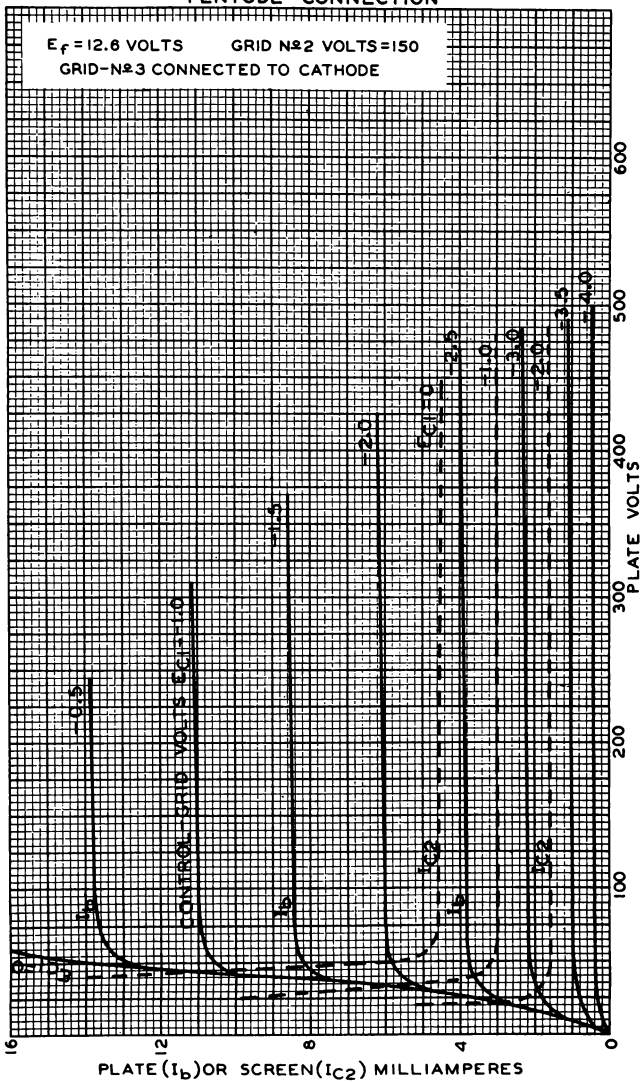
Typical Operation and Characteristics:

Plate Voltage.	180	250	. .	volts
Cathode-Bias Resistor	350	825	. .	ohms
Plate Resistance	7900	11000	. .	ohms
Amplification Factor	45	42		
Transconductance	5700	3800	. .	μmhos
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.

12AW6
AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



MARCH 26, 1947

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

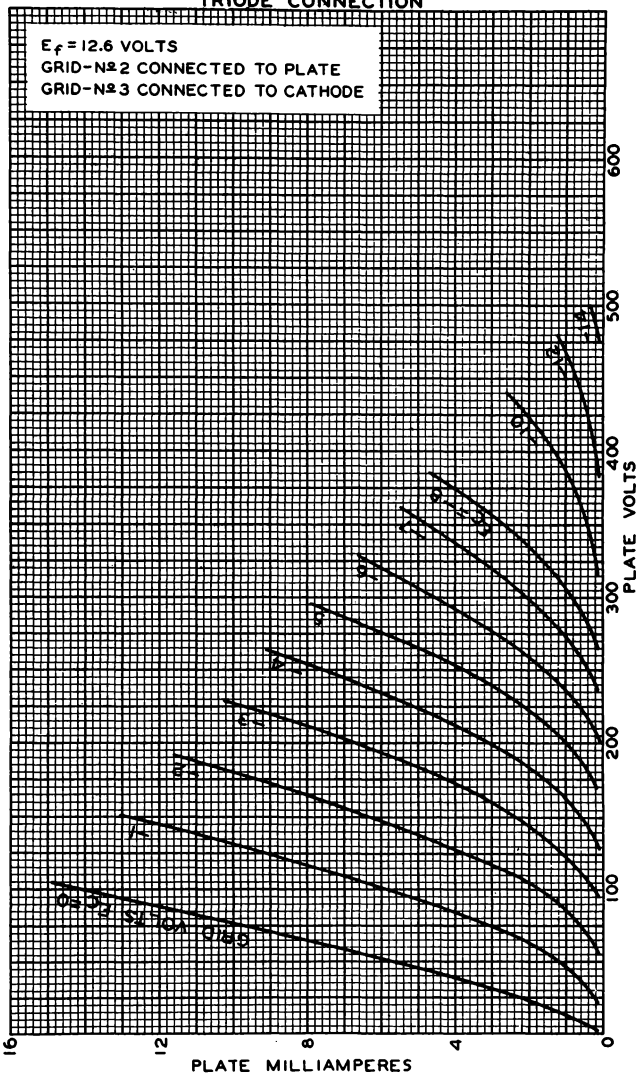
92CM-6855

12AW6

12AW6

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION



MARCH 26,1947

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6856

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

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:°

	Unit No.1	*Unit No.2*	
Grid to plate	1.7	1.7	μμf
Grid to cathode and heater	1.6	1.6	μμf ←
Plate to cathode and heater	0.46	0.34	μμf ←

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 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_1

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

° With no external shield.

← Indicates a change.

12AX7

HIGH-MU TWIN TRIODE

Grid Voltage	-1	-2	. . . .	volts
Amplification Factor . . .	100	100		
Plate Resistance	80000	62500	. . . .	ohms
Transconductance	1250	1600	. . . .	μmhos
Plate Current.	0.5	1.2	. . . .	ma

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

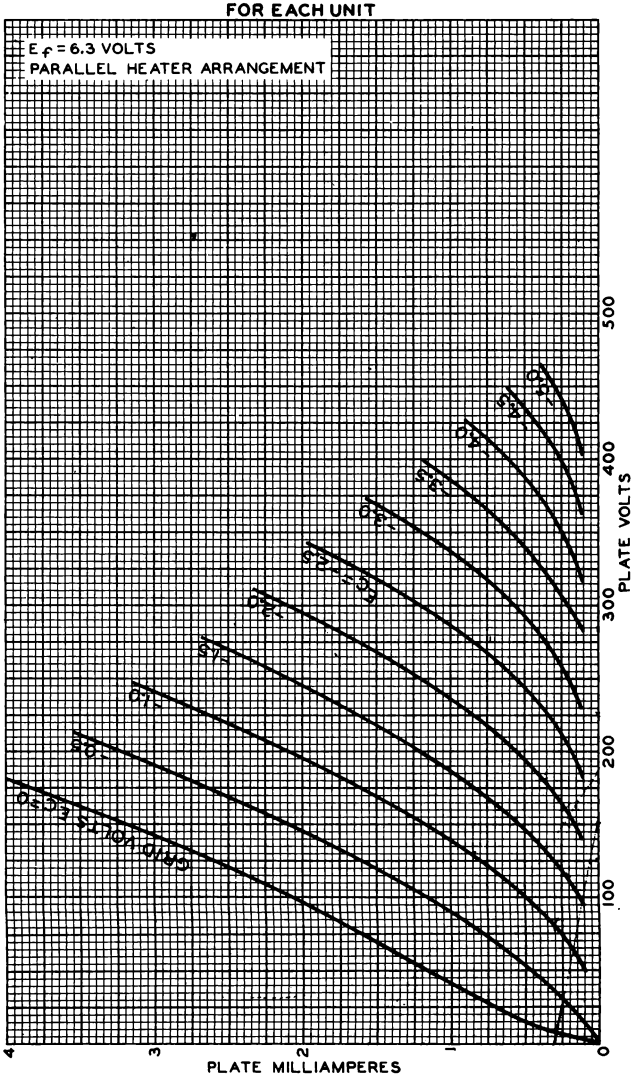
See RESISTANCE-COUPLED AMPLIFIER CHART No. 25 at front of this Section

→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

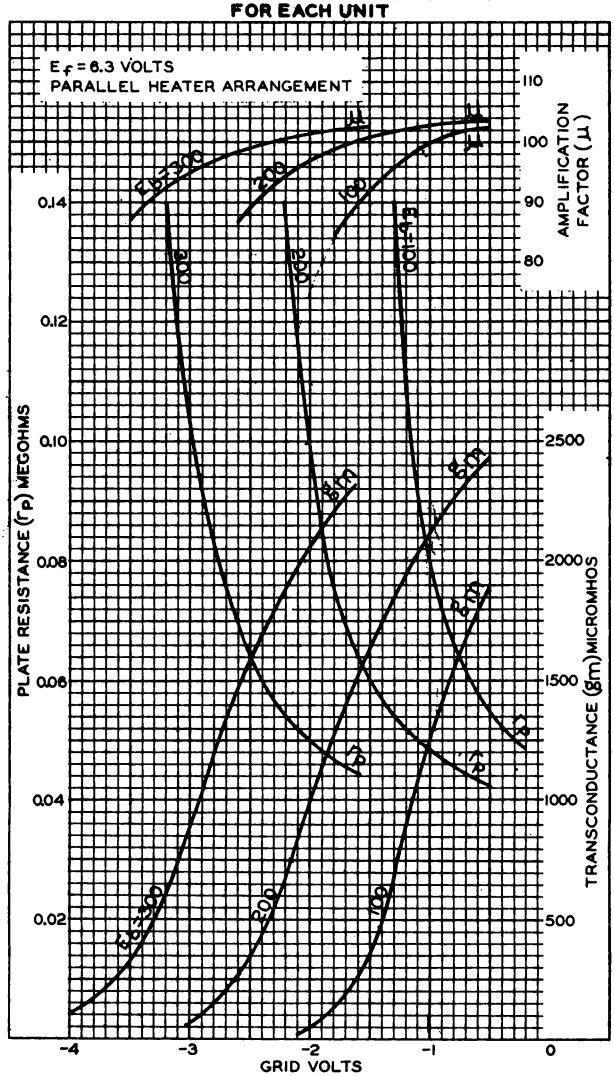
12AX7

AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT



12AX7

12AX7
AVERAGE CHARACTERISTICS
FOR EACH UNIT



JULY 30, 1947

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6880

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	0.450	. . . . . amp

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	*With External Shield°*	
Grid-Drive Operation:			
Grid to plate (Each unit) . .	1.9	1.9	μμf
Grid to heater and cathode (Each unit)	3.1	3.2	μμf
Plate to heater and cathode (Unit No.1)	0.5	1.3	μμf
Plate to heater and cathode (Unit No.2)	0.4	1.6	μμf
Heater to cathode (Each unit)	3.8	4	μμf
Cathode-Drive Operation:			
Plate to cathode (Each unit).	0.24	0.23	μμf
Cathode to grid and heater (Each unit).	6.9	7	μμf
Plate to grid and heater (Unit No.1).	2	2.8	μμf
Plate to grid and heater (Unit No.2).	2	3.2	μμf

Characteristics, Class A_1 Amplifier (Each Unit):

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	μmhos
Plate Current	3.7	10	ma
Grid Voltage (Approx.) for plate current of 10 μamp. . . .	-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" ± 3/32"
Maximum Diameter	7/8"
Bulb	T-6-1/2

° With external shield JETEC No.315 connected to cathode of unit under test.

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_1

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. .	90 max.	volts
Heater positive with respect to cathode. .	90 max.	volts

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.):°

Grid to plate	4.8	μμf
Grid to cathode and heater	5	μμf
Plate to cathode and heater	1.5	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	150	volts
Grid Voltage	-17.5	volts
Amplification Factor	6.5	
Plate Resistance (Approx.)	1030	ohms
Transconductance	6300	μmhos
Plate Current	34	ma
Grid Voltage (Approx.) for plate current of 200 μamp	-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" ± 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

° With external shield JETEC No.315 connected to cathode.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

12B4-A

12B4-A
LOW-MU TRIODE

AMPLIFIER - Class A_1

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▲	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□

DC PLATE VOLTAGE	550	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)#	1000■	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▲	max.	volts

Maximum Circuit Values:

Grid-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 per cent of one vertical scanning cycle is 2.5 milliseconds.

■ Under no circumstances should this absolute value be exceeded.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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.

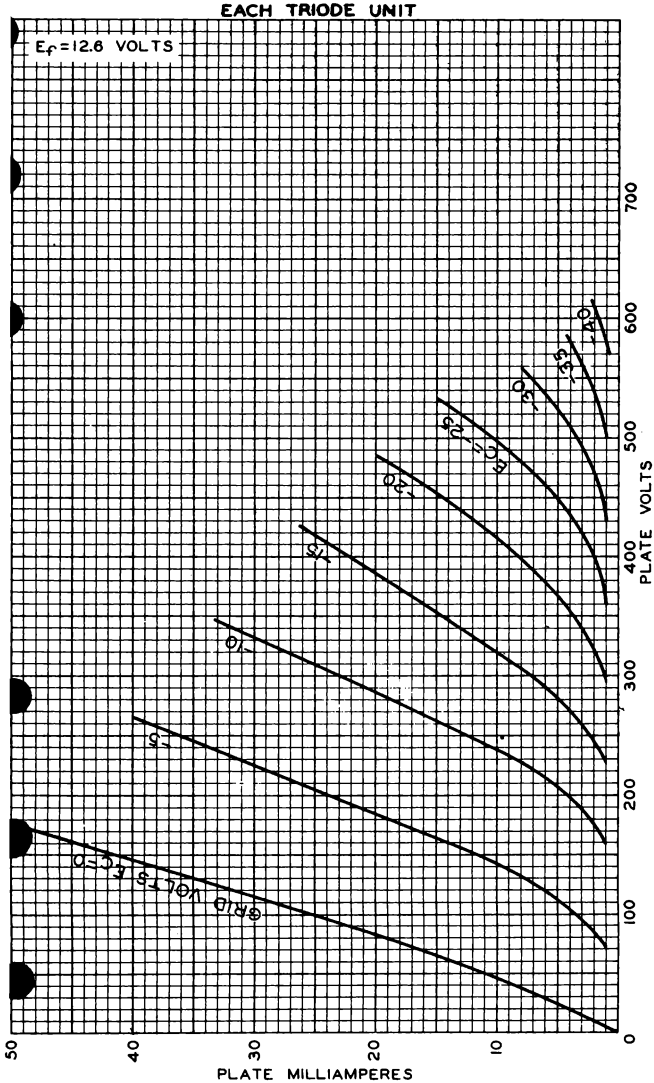
12BH7
MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

The 12BH7 is the same as the 12BH7-A except that the 12BH7 does not have a controlled Heater Warm-up Time, and is not intended for use in equipment having series heater-string arrangement.

12BH7

AVERAGE PLATE CHARACTERISTICS
EACH TRIODE UNIT



JAN. 25, 1952

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7742

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.):°

	Unit No.1	*Unit No.2*	
Grid to plate	2.6	2.6	μμf
Grid to cathode and heater.	3.2	3.2	μμf
Plate to cathode and heater.	0.5	0.4	μμf
Plate of unit No.1 to plate of unit No.2	0.8		μμf

Mechanical:

Mounting Position . . . . . Any
Maximum Overall Length. . . . . 2-5/8"
Maximum Seated Length . . . . . 2-3/8"
Length, Base Seat to Bulb Top (Excluding tip) . . . 2" ±3/32"
Maximum Diameter. . . . . 7/8"
Bulb. T-6-1/2
Base. . . . . .Small-Button Noval 9-Pin (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_1

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE . . . . . 300 max. volts

° Without external shield.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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▲max.	volts

Characteristics:

Plate Voltage	250	volts
Grid Voltage	-10.5	volts
Amplification Factor	16.5	
Plate Resistance (Approx.)	5300	ohms
Transconductance	3100	μmhos
Plate Current	11.5	ma
Plate Current for grid voltage of -14 volts	4	ma
Grid Voltage (Approx.) for plate current of 50 μamp	-23	volts

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation	0.25 max.	megohm
For cathode-bias operation	1.0 max.	megohm

HORIZONTAL DEFLECTION OSCILLATOR

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

For operation in a 525-line, 30-frame system□

DC PLATE VOLTAGE	450 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE♦	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▲max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias, grid-resistor bias, or cathode-bias operation	2.2 max.	megohms

♦ 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.

▲,□: See next page.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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□

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▲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□

DC PLATE VOLTAGE	450 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE# (Absolute Maximum)	1500■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▲max.	volts

Maximum Circuit Values:

Grid-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 per cent of one vertical scanning cycle is 2.5 milliseconds.

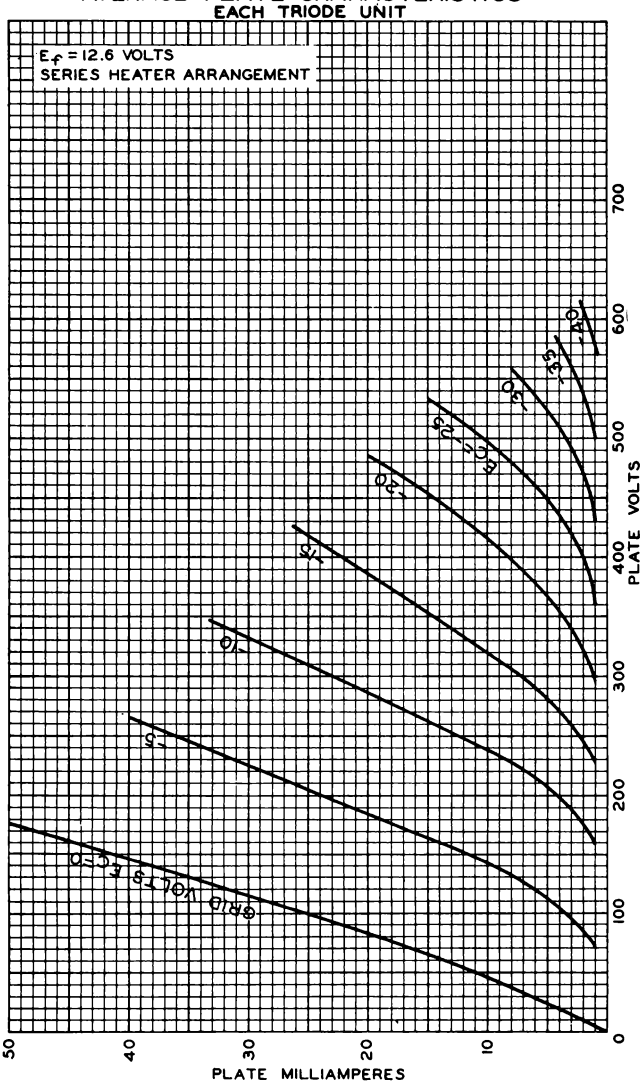
■ Under no circumstances should this absolute value be exceeded.

12BH7-A

12BH7-A

AVERAGE PLATE CHARACTERISTICS

EACH TRIODE UNIT



MAR. 1, 1955

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7742R1

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.

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	μμf
Grid No.1 to cathode, heater, grid No.2, and grid No.3 & internal shield	11.1	μμf
Plate to cathode, heater, grid No.2, and grid No.3 & internal shield	3	μμf

Characteristics, Class A_1 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	μmhos
Plate Current	25	ma
Grid-No.2 Current	6	ma
Grid Voltage (Approx.) for plate current of 20 μamp	-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" ± 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 2 - Grid No.1,
Pin 3 - Grid No.3, Int. 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, Int. Shield

AMPLIFIER - Class A_1

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

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

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▲max.	volts

▲ The dc component must not exceed 100 volts.

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

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.

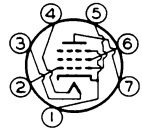
Direct Interelectrode Capacitances (Approx.):°

Grid No.1 to plate	0.5	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	15	μμf
Plate to cathode & grid No.3, grid No.2, and heater	9	μμf

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_1

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▲max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	180 max.	°C

° without external shield.
▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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	μmhos
Load Resistance	3500	4500	ohms
Total Harmonic Distortion	5	6	%
Max.-Signal Power Output	1.1	1.5	watts

Maximum Circuit Values:

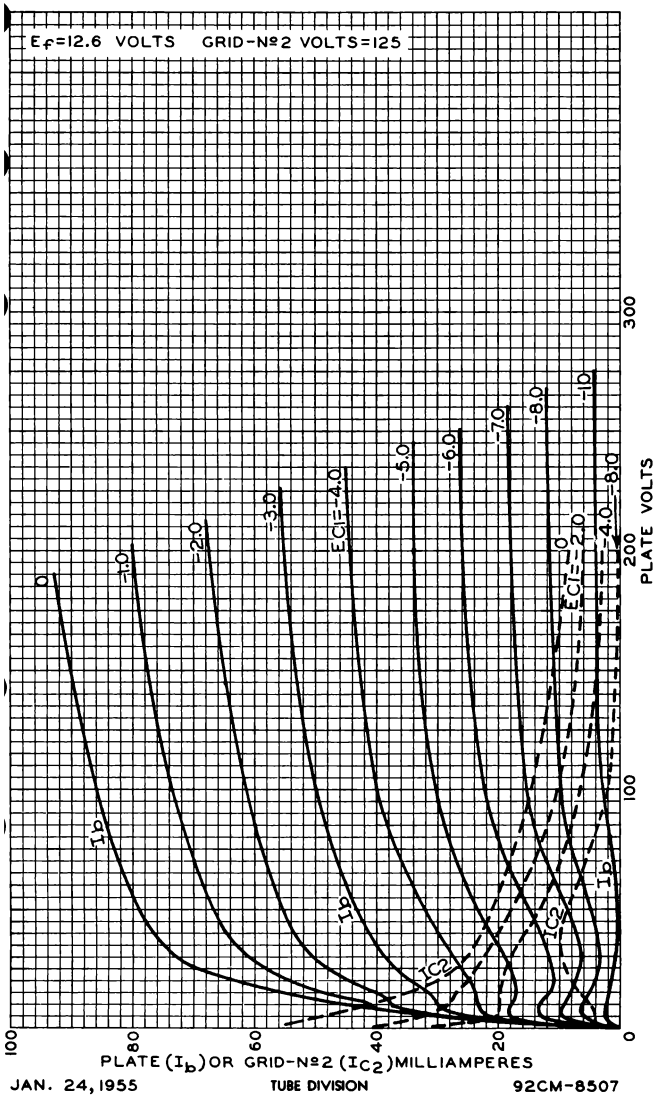
Grid-No.1-Circuit Resistance:

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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

12CA5

AVERAGE PLATE CHARACTERISTICS



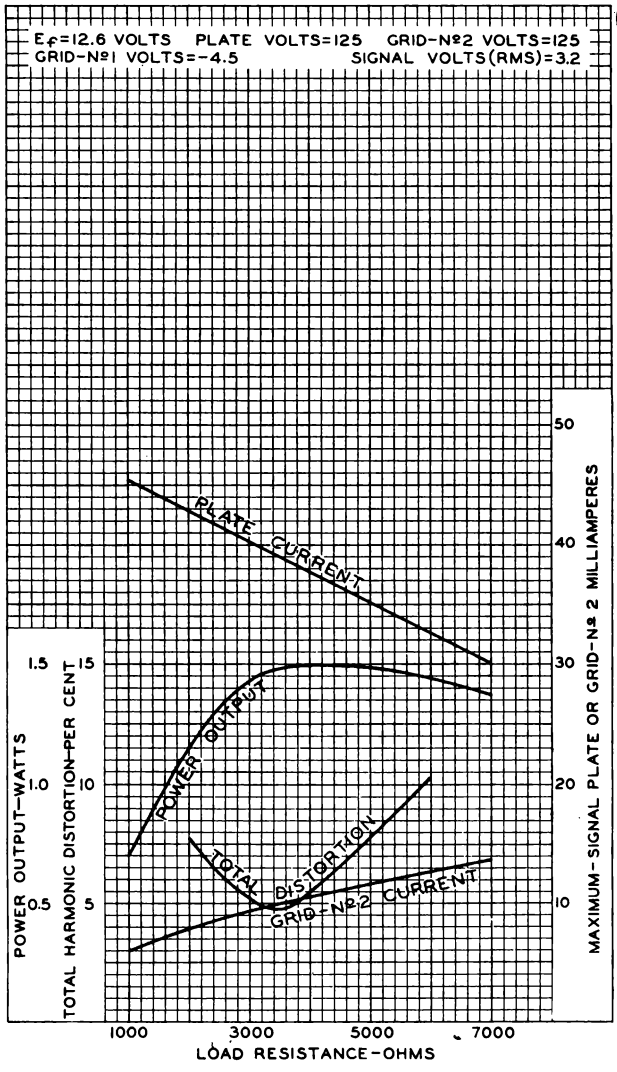
JAN. 24, 1955 TUBE DIVISION 92CM-8507

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

12CA5

12CA5

OPERATION CHARACTERISTICS



JAN. 20, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8506R1

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

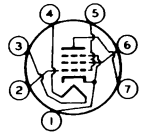
Direct Interelectrode Capacitance:

	Without External Shield	*With External Shield°*	
Grid No.1 to plate	0.25 max.	0.2 max.	μμf

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_1

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

° With external shield JEDEC No.316 connected to pin 1.

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

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	μmhos
Plate Current	4.5	ma
Grid-No.2 Current	3.5	ma

Maximum Circuit Values:

Grid-No.1-Circuit Resistance.	2.2 max.	megohms

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

TENTATIVE DATA

12CU5

BEAM POWER TUBE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 12CU5 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.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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:°
Grid No.1 to plate . . . . . 0.05 max. μμf
Grid No.1 to cathode, grid No.3, grid No.2, and heater. . . . . 7.6 μμf
Plate to cathode, grid No.3, grid No.2, and heater. . . . . 6.2 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 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_1

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

° Without external shield.

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

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	μmhos
Plate Current	3	ma
Grid-No.2 Current	1.4	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-4.5	volts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance.	10 max.	megohms

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

TENTATIVE DATA

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.

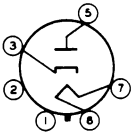
Direct Interelectrode Capacitances (Approx.):°

Plate to cathode and heater	6	μμf
Cathode to plate and heater	8	μμf
Heater to cathode	3	μμf

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□

PEAK INVERSE PLATE VOLTAGE*	4400	max.	volts
PEAK PLATE CURRENT	900	max.	ma
DC PLATE CURRENT	155	max.	ma

°,♦,●,□,*: See next page.

TENTATIVE DATA

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

12D4

HALF-WAVE VACUUM RECTIFIER

PLATE DISSIPATION.	5.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	4400▲	max.	volts
Heater positive with respect to cathode.	300#	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.

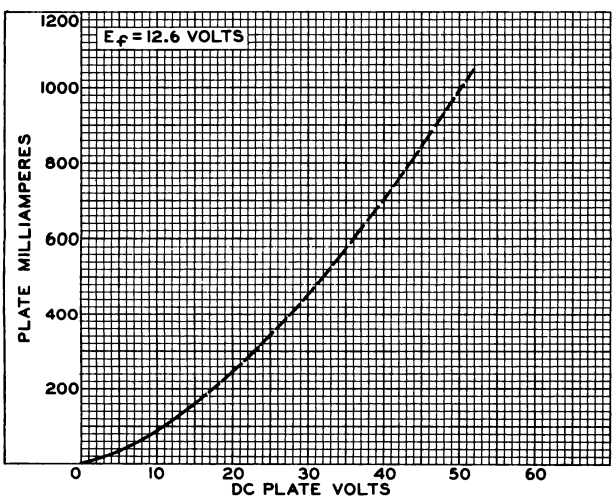
* This rating is applicable when the duty cycle of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

▲ The dc component must not exceed 900 volts.

\# The dc component must not exceed 100 volts.

4-59 TENTATIVE DATA

AVERAGE PLATE CHARACTERISTIC



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

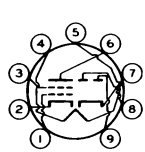
Direct Interelectrode Capacitances:°
Tetrode Unit:

Grid No.1 to plate	0.7	μμf
Grid No.1 to cathode, grid No.2, and heater	10.5	μμf
Plate to cathode, grid No.2, and heater	4.4	μμf
Tetrode grid No.1 to plate of diode unit No.1.	0.04 max.	μμf
Tetrode grid No.1 to plate of diode unit No.2.	0.015 max.	μμf

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 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 & 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

° Without external shield.

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

TENTATIVE DATA

RCA

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	μf
Zero-Signal Plate Current	12	ma
Zero-Signal Grid-No.2 Current	1.5	ma
Transconductance	5500	μmhos
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

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

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.

12K7-GT
REMOTE-CUTOFF PENTODE

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▲max. volts

▲ 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.

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

DIODE—REMOTE-CUTOFF PENTODE

Heater, for Unipotential Cathode:			
Voltage	12.6	. . . . .	ac or dc volts
Current	0.15	. . . . .	amp

The 12SF7 is the same as the 6SF7 except for heater rating.

12SG7

REMOTE-CUTOFF PENTODE

Heater, for Unipotential Cathode:			
Voltage	12.6	. . . . .	ac or dc volts
Current	0.15	. . . . .	amp

The 12SG7 is the same as the 6SG7 except for heater rating.

12SH7

SHARP-CUTOFF PENTODE

Heater, for Unipotential Cathode:			
Voltage	12.6	. . . . .	ac or dc volts
Current	0.15	. . . . .	amp

The 12SH7 is the same as the 6SH7 except for heater rating.

12SJ7, 12SJ7-GT

SHARP-CUTOFF PENTODE

Heater, for Unipotential Cathode:			
Voltage	12.6	. . . . .	ac or dc volts
Current	0.15	. . . . .	amp

The 12SJ7 and 12SJ7-GT are the same as the 6SJ7 and 6SJ7-GT, respectively, except for heater rating.

12SK7, 12SK7-GT

REMOTE-CUTOFF PENTODE

Heater, for Unipotential Cathode:		
Voltage	12.6	ac or dc volts
Current	0.15	amp

The 12SK7 and 12SK7-GT are the same as the 6SK7 and 6SK7-GT, respectively, except for heater rating.

12SL7-GT

HIGH-MU TWIN TRIODE

Heater, for Unipotential Cathode:		
Voltage	12.6	ac or dc volts
Current	0.15	amp

The 12SL7-GT is the same as the 6SL7-GT except for heater rating.

12SN7-GT

MEDIUM-MU TWIN TRIODE

Heater, for Unipotential Cathodes:		
Voltage	12.6	ac or dc volts
Current	0.30	amp

The 12SN7-GT is the same as the 6SN7-GT except for heater rating.

12SQ7, 12SQ7-GT

TWIN DIODE—HIGH-MU TRIODE

Heater, for Unipotential Cathode:		
Voltage	12.6	ac or dc volts
Current	0.15	amp

The 12SQ7 and 12SQ7-GT are the same as the 6SQ7 and 6SQ7-GT, respectively, except for heater rating.

12SR7

TWIN DIODE—MEDIUM-MU TRIODE

Heater, for Unipotential Cathode:		
Voltage	12.6	ac or dc volts
Current	0.15	amp

The 12SR7 is the same as the 6SR7 except for heater rating.

12V6-GT TO 12X4

12V6-GT
BEAM POWER TUBE

Heater, for Unipotential Cathode:
Voltage . . . . . 12.6 . . . . . .ac or dc volts
Current . . . . . 0.225 . . . . . amp

The 12V6-GT is the same as the 6V6-GT except for heater rating.

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 . . . . . 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

12X4
HALF-WAVE VACUUM RECTIFIER

Heater, for Unipotential Cathode:
Voltage . . . . . 12.6 . . . . . .ac or dc volts
Current . . . . . 0.3 . . . . . amp

The 12X4 is the same as the 6X4 except for heater rating.

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.):°

Grid No.1 to plate	0.55	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	13	μμf
Plate to cathode & grid No.3, grid No.2, and heater	9	μμf

Characteristics, Class A_1 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	μmhos
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" ± 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

°,*: See next page.

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

TENTATIVE DATA

12R5

BEAM POWER TUBE

VERTICAL-DEFLECTION AMPLIFIER

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

For operation in a 525-line, 30-frame system□

DC PLATE VOLTAGE	150	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)#	1500■	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▲	max.	volts

Maximum Circuit Values:

Grid-No.1-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 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.

▲ The dc component must not exceed 100 volts.

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

14A4
MEDIUM-MU TRIODE

Heater, for Unipotential Cathode:
Voltage. . . . . 12.6□ . . . . . ac or dc volts
Current. . . . . 0.15□□ . . . . . amp

The 14A4 is the same as the 7A4 except for heater rating.

□ Nominal voltage = 14.0 volts. □□ Nominal current = 0.16 ampere.

14A5
BEAM POWER AMPLIFIER

GENERAL DATA

Electrical:

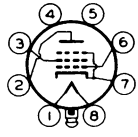
Heater, for Unipotential Cathode:
Voltage. . . . . 12.6□ . . . . . ac or dc volts
Current. . . . . 0.15□□ . . . . . amp
Direct Interelectrode Capacitances (Approx.):○
Grid No.1 to Plate . . . 0.4 . . . . . μμf
Input. . . . . 6.8 . . . . . μμf
Output . . . . . 7.0 . . . . . μμf

○ 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 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_1

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

□ Nominal voltage = 14.0 volts.
□□ Nominal current = 0.16 ampere.

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	μmhos
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□	ac or dc volts
Current	0.15□□	amp

The 14A7 is the same as the 7A7 except for heater rating.

□ Nominal voltage = 14.0 volts. □□ Nominal current = 0.16 ampere.

14B6
TWIN DIODE—HIGH-MU TRIODE

Heater, for Unipotential Cathode:		
Voltage	12.6□	ac or dc volts
Current	0.15□□	amp

The 14B6 is the same as the 7B6 except for heater rating.

□ Nominal voltage = 14.0 volts. □□ Nominal current = 0.16 ampere.

14AF7

MEDIUM-MU TWIN TRIODE

GENERAL DATA

Electrical:

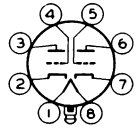
Heater, for Unipotential Cathodes:		
Voltage[□]	12.6	ac or dc volts
Current[□□]	0.15	amp
Direct Interelectrode Capacitances:[○]		
Each Unit:		
Grid to Plate	2.3	μμf
Grid to Cathode	2.2	μμf
Plate to Cathode	1.6	μμf
Grid of Unit No.1 to Grid of Unit No.2	0.20 max.	μμf
Plate of Unit No.1 to Plate of Unit No.2	0.60 max.	μμf
Grid of Unit No.1 to Plate of Unit No.2	0.06 max.	μμf
Grid of Unit No.2 to Plate of Unit No.1	0.10 max.	μμf

○ 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_1

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

□ Nominal voltage = 14.0 volts.
□□ Nominal current = 0.16 ampere.

14AF7
MEDIUM-MU TWIN TRIODE

Amplification Factor	17	16	16	
Plate Resistance	6500	8400	7600	ohms
Transconductance	2600	1900	2100	μmhos
Plate Current.	10.8	5	9	ma

14B6
TWIN DIODE—HIGH-MU TRIODE

Heater, for Unipotential Cathode:
Voltage. . . . . 12.6 □ . . . . . ac or dc volts
Current. . . . . 0.15 □□ . . . . . amp

The 14B6 is the same as the 7B6 except for heater rating.

□ Nominal voltage = 14.0 volts. □□ Nominal current = 0.16 ampere.

14C7
SHARP-CUTOFF PENTODE

GENERAL DATA

Electrical:

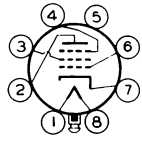
Heater, for Unipotential Cathode:		
Voltage	12.6□	ac or dc volts
Current	0.15□□	amp
Direct Interelectrode Capacitances:°		
Grid No.1 to Plate	0.007 max.	μμf
Input	6.0	μμf
Output	6.5	μμf

° 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	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_1

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

□ Nominal voltage = 14.0 volts.
□□ Nominal current = 0.16 ampere.

Greater than 1 megohm.

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□ . . . . . ac or dc volts
Current . . . . . 0.15□□ . . . . . 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□ . . . . . ac or dc volts
Current . . . . . 0.15□□ . . . . . 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□ . . . . . ac or dc volts
Current . . . . . 0.15□□ . . . . . 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□ . . . . . ac or dc volts
Current . . . . . 0.15□□ . . . . . 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□ . . . . . ac or dc volts
Current . . . . . 0.15□□ . . . . . 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

Heater, for Unipotential Cathode:		
Voltage.	12.6□	. . . . . ac or dc volts
Current.	0.15□□	. . . . . 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□	. . . . . ac or dc volts
Current.	0.3□□	. . . . . 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□	. . . . . ac or dc volts
Current.	0.15□□	. . . . . 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□	. . . . . ac or dc volts
Current.	0.15□□	. . . . . amp

The 14R7 is the same as the 7R7 except for heater rating.

□ Nominal voltage = 14.0 volts. □□ Nominal current = 0.16 ampere.

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	16.8	ac or dc 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	16.8	ac or dc volts
Current	0.45	amp
Warm-up time (Average)*	11	sec

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	17	ac or dc volts
Current	0.6 ± 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.*

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	16.8	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.

19BG6-G
BEAM POWER AMPLIFIER

GENERAL DATA

Electrical:

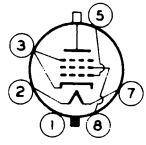
Heater, for Unipotential Cathode:		
Voltage	18.9	ac or dc volts
Current	0.3	amp
Transconductance (Approx.) with plate volts = 250, grid-No.2 volts = 250, grid-No.1 volts = -15	6000	μmhos
Mu-Factor, Grid No.2 to Grid No.1 with plate volts = 250, grid-No.2 volts = 250, grid-No.1 volts = -20	8	
Direct Interelectrode Capacitances:°		
Grid No.1 to Plate	0.65 max.	μμf
Input	11	μμf
Output	6.5	μμf

° With no external shield.

Mechanical:

Mounting Position	Vertical, Base Up or Down; Horizontal, with Plane of Pins 2 & 7 Vertical
Maximum Overall Length	5-11/16"
Seated Length	4-31/32" ± 5/32"
Maximum Diameter	2-1/16"
Bulb	ST-16
Cap	Small
Base	Medium-Shell Octal 6-Pin
Basing Designation for BOTTOM VIEW	5BT

Pin 1 - No Connection
Pin 2 - Heater
Pin 3 - Cathode, Grid No.3



Pin 5 - Grid No.1
Pin 7 - Heater
Pin 8 - Grid No.2
Cap - Plate

HORIZONTAL DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Center Values:*

For operation in a 525-line, 30-frame system□

DC PLATE VOLTAGE	700 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE*	6000 max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	-1500 max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE●	350 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-50 max.	volts

□ 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.

● Preferably obtained through a series-dropping resistor of sufficient magnitude to limit the grid-No.2 input to the rated maximum value.

19BG6-G
BEAM POWER AMPLIFIER

PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE. . .	-400 max.	volts
DC PLATE CURRENT	100 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.	250 max.	volts
Heater positive with respect to cathode.	250 max.	volts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	1.0 max.	megohm

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.):°		
Grid No.1 to plate	0.8	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	11	μμf
Plate to cathode & grid No.3, grid No.2, and heater	6	μμf

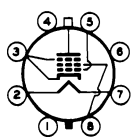
Characteristics, Class A_1 Amplifier:

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	μmhos
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" ± 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 Connection
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

° 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.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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□

DC PLATE VOLTAGE	700	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)●	6600■	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▲	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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

19J6
MEDIUM-MU TWIN TRIODE

MINIATURE TYPE

GENERAL DATA

Electrical:

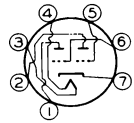
Heater, for Unipotential Cathode:		
Voltage	18.9	ac or dc volts
Current	0.15	amp
Direct Interelectrode Capacitances (Each unit, approx.):[o]		
Grid to Plate	1.5	μμf
Grid to Cathode	2.0	μμf
Plate to Cathode	0.4	μμf

[o] 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" ± 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_1

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▲	50♦	ohms
Amplification Factor	38	
Plate Resistance	7100	ohms
Transconductance	5300	μmhos
Plate Current	8.5	ma

Maximum Circuit Values (for maximum rated conditions):

Grid-Circuit Resistance:		
For cathode-bias operation	0.5 max.	megohm

▲,♦: See next page.

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▲	810†	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

▲ Operation with fixed bias is not recommended.

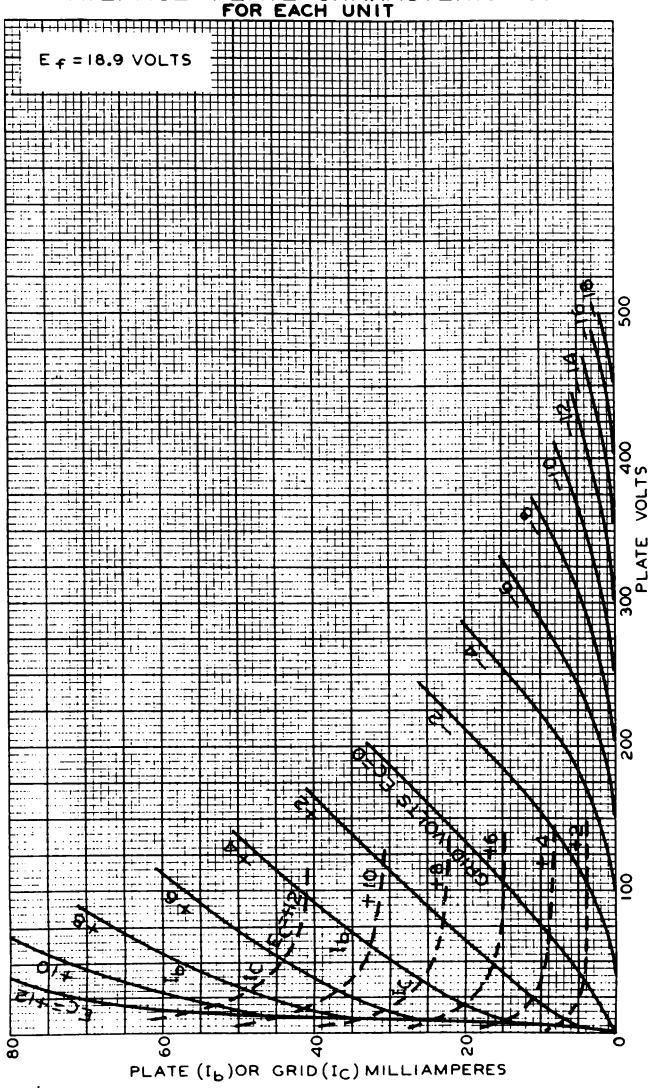
◆ Value is for both units operating at the specified conditions.

† 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.

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

19J6

AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT



AUG. 18, 1948

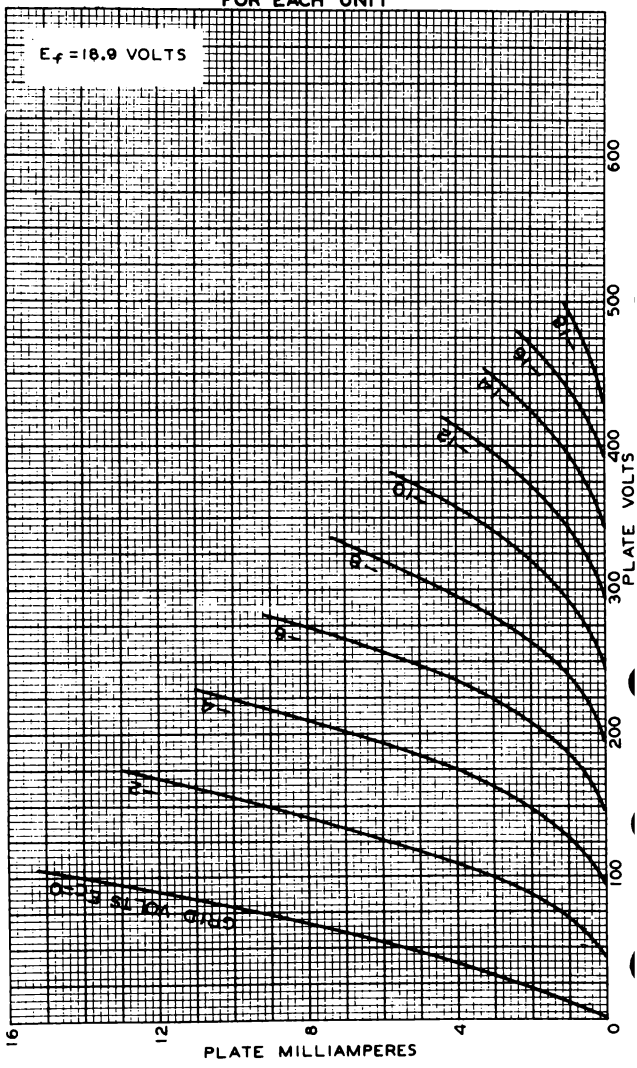
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7061

19J6

19J6

AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT



AUG. 18,1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7060

19T8

TRIPLE DIODE—HIGH-MU TRIODE

9-PIN MINIATURE TYPE

Heater, for Unipotential Cathode:

Voltage	18.9	ac or dc volts
Current	0.15	amp

The 19T8 is the same as the 6T8 except for heater rating.

19X8

TRIODE-PENTODE CONVERTER

9-PIN MINIATURE TYPE

Heater, for Unipotential Cathode:

Voltage	18.9	ac or dc volts
Current	0.15	amp

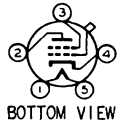
The 19X8 is the same as the 6X8 except for heater rating, but is intended primarily for use in "transformerless" AM/FM receivers whereas the 6X8 is intended for use in AM/FM receivers and in television receivers utilizing an intermediate frequency in the order of 40 Mc. Therefore, reference in the note (•) under the 6X8 to TV receivers does not apply to the 19X8.

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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.°	μμf
Input	5.3	μμf
Output	10.5	μμf
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	BOTTOM VIEW	Any ←



AMPLIFIER - Class A_1

Operating Conditions and Characteristics:

Heater*	2.5	2.5	volts
Plate	180	250□	volts
Screen	90	90	max. volts
Grid	-3	-3	volts
Amp. Fact.	400	630	
Plate Res.	400000	600000	ohms
Transcond.	1000	1050	μmhos
Plate Cur.	4	4	ma.
Screen Cur.	1.7	1.7	max. ma.

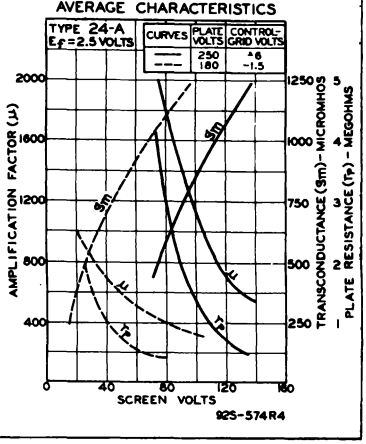
DETECTOR

Typical Operation:

	Biased	*Grid-Leak*	
Heater*	2.5	2.5	volts
Plate	250□	180 max.	volts
Screen	20 to 45	20 to 45	volts
Grid	-5 approx.	Return to Cathode▼	volts
Plate Load	0.25△	0.25△	megohm
Plate Cur.	Adjusted to 0.1 ma. with no input signal■	-	

□ Max. plate volts = 275.
▼ Conventional grid leak and condenser.
△ 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.
○ 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.

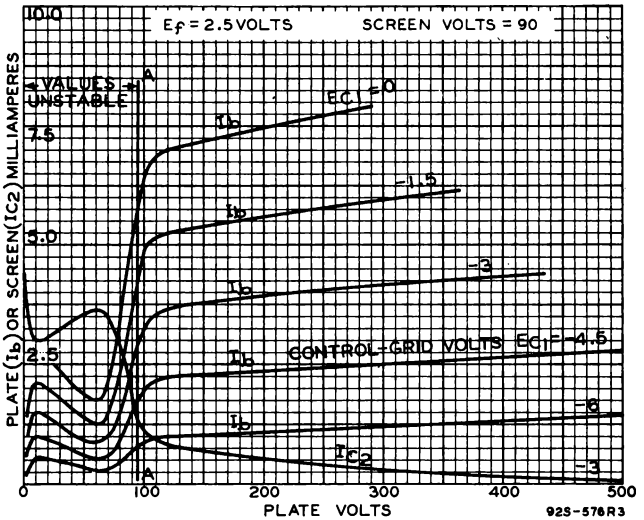
AVERAGE CHARACTERISTICS



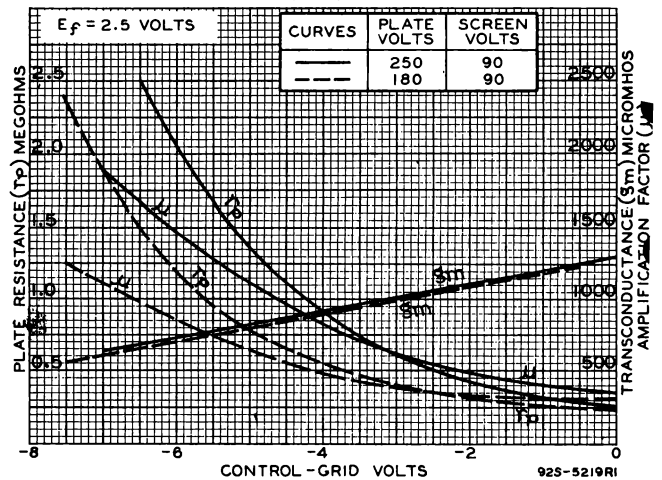
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

24-A

AVERAGE PLATE CHARACTERISTICS



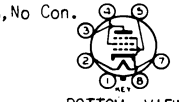
AVERAGE CHARACTERISTICS



25A6, 25A6-GT/G

POWER AMPLIFIER PENTODE

Heater■	Coated Unipotential Cathode		
Voltage	25		a-c or d-c volts
Current	0.3		amp.
	25A6	25A6-GT/G	
Direct Interelectrode Cap.	▲		
Grid to Plate	0.2	-	μμf
Input	8.5	-	μμf
Output	12.5	-	μμf
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	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 A₁ 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.

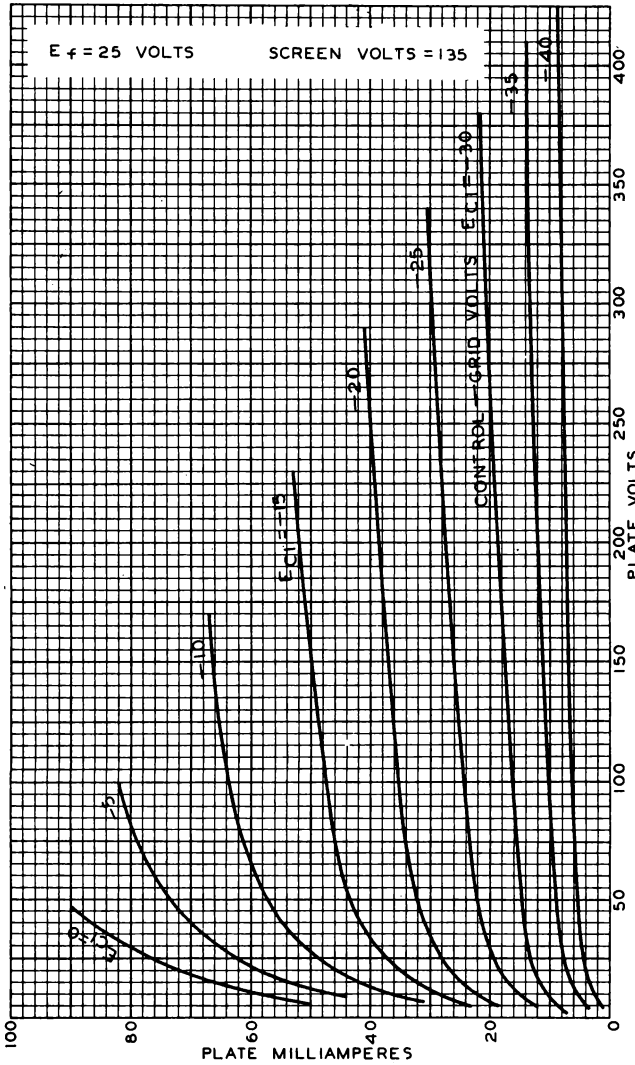
Curves under Type 43 also apply to the 25A6 and 25A6-GT/G.

→ Indicates a change.

25A6

25A6

AVERAGE PLATE CHARACTERISTICS



JAN. 8, 1940

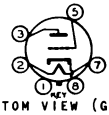
RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92C-4559R1

25AC5-GT/G

HIGH-MU POWER AMPLIFIER TRIODE

Heater ■	Coated Unipotential Cathode		
Voltage	25	a-c or d-c	volts
Current	0.3		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 - Grid	
Pin 2 - Heater		Pin 7 - Heater	
Pin 3 - Plate		Pin 8 - Cathode	
Mounting Position			Any



BOTTOM VIEW (G-6Q)

Maximum Ratings Are Design-Center Values

CHARACTERISTICS

Plate Voltage	110	volts
Grid Voltage	+15	volts
Amplification Factor	58	
Plate Resistance	15200	ohms
Transconductance	3800	µmhos
Plate Current	45	ma.
Grid Current	7	ma.

AMPLIFIER

Plate Voltage	180 max.	volts
Plate Dissipation	10 max.	watts

Typical Operation - Class B Power Amplifier:
Unless otherwise specified, values are for 2 tubes

Plate Voltage	180	volts
Grid Voltage	0	volts
Peak A-F Grid-to-Grid Voltage	60	volts
Zero-Signal D-C Plate Current	4	ma.
Effective Load Res. (plate-to-plate)	4800	ohms
Peak Power Input	810	mw.
Power Output	6	watts

Dynamic-Coupled Class A_1 Amplifier - With Driver as Indicated:

	6AE5-GT/G As Driver	*6P5-GT/G As Driver*	*37 As Driver*	
Plate-Supply Voltage	110	180	180	volts
Grid Voltage	▲	▲	▲	volts
Average Plate Current	45	27	37	ma.
Average Plate Current of Driver	7	4	5.3	ma.
Input Signal to Driver (RMS)*	22	12	17	volts
Driver Grid Resistor	1.0	1.0	1.0	max. megohm
Load Resistance	2000	8000	5000	ohms
Harmonic Distortion	10	10	10	%
Power Output	2.0	2.0	2.7	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.

▲ Bias voltage for both 25AC5-GT/G and the driver is developed by the Dynamic-Coupled connection. The Dynamic-Coupled connection is illustrated under Type 6AC5-GT/G; the 25AC5-GT/G does not require the use of the 25000-ohm resistor.

* Current does not flow in the driver grid circuit during any part of the input cycle. Under maximum rated conditions, the total d-c resistance in the grid circuit of the driver should not exceed 1.0 megohm.

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

25B5

DIRECT-COUPLED POWER AMPLIFIER

Heater ■	Coated Unipotential Cathode	
Voltage	25	a-c or d-c volts
Current	0.3	amp.
Maximum Overall Length		4-19/32"
Maximum Seated Height		3-31/32"
Maximum Diameter		1-9/16"
Bulb		ST-12
Base		Small 6-Pin

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

BOTTOM VIEW (6D)

Mounting Position: 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.

Maximum Ratings and Typical Operating Conditions for the 25B5 are the same as those for Type 25N6-G.

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

25BQ6-GT

BEAM POWER AMPLIFIER

Heater, for Unipotential Cathode:

Voltage.	25	. . . . . ac or dc volts
Current.	0.3	. . . . . amp

The 25BQ6-GT is the same as the 6BQ6-GT except for heater rating.

25BQ6-GTB

25BQ6-GTB/25CU6
BEAM POWER TUBE

The 25BQ6-GTB/25CU6 is the same as the 6BQ6-GTB/6CU6 except for the following items:

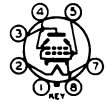
Heater, for Unipotential Cathode:

Voltage.	25	. . . . . .ac or dc volts
Current.	0.3	. . . . . amp

25C6-G

BEAM POWER AMPLIFIER

Heater■	Coated Unipotential Cathode	
Voltage	25	a-c or d-c volts
Current	0.3	amp.
Maximum Overall Length		4-5/8"
Maximum Seated Height		4-1/16"
Maximum Diameter		1-13/16"
Bulb		ST-14
Base		Medium 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	135 max.	volts
Plate Dissipation	12.5 max.	watts
Screen Dissipation	1.75 max.	watts

Typical Operation and Characteristics-Class A_1 Amplifier:

Heater■	25	25	volts
Plate	135	200	volts
Screen	135	135	volts
Grid▲	-13.5	14	volts
Peak A-F Grid Voltage	13.5	14	volts
Zero-Sig. Plate Cur.	58	61	ma.
Max.-Sig. Plate Cur.	60	66	ma.
Zero-Sig. Screen Cur.	3.5	2.2	ma.
Max.-Sig. Screen Cur.	11.5	9.0	ma.
Plate Res. (Approx.)	9300	18300	ohms
Transcond.	7000	7100	µmhos
Load Res.	2000	2600	ohms
Total Harmonic Dist.	10	10	%
Max.-Sig. Power Output	3.6	6.0	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.

▲ 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.

The curve under Type 6T6-G also applies to the 25C6-G.

25CD6-GA
BEAM POWER TUBE

Intended for use in equipment having series heater-string arrangement

The 25CD6-GA is the same as the 6CD6-G 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.

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲max.	volts

▲ The dc component must not exceed 100 volts.

25L6-GT
BEAM POWER TUBE

GENERAL DATA

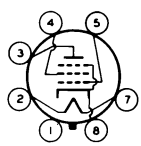
Electrical:

Heater, for Unipotential Cathode:		
Voltage	25	ac or dc volts
Current	0.3	amp ←
Direct Interelectrode Capacitances:°		
Grid No.1 to plate	0.6	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	15	μμf
Plate to cathode & grid No.3, grid No.2, and heater	10	μμf

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_1

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

° Without external shield.

← Indicates a change.

25L6-GT
BEAM POWER TUBE

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 (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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

25L6-GT

BEAM POWER AMPLIFIER

GENERAL DATA

Electrical:

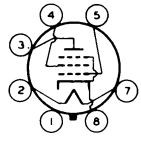
Heater, for Unipotential Cathode:		
Voltage	25	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances (Approx.):°		
Grid No.1 to Plate	0.8	μμf
Input	15	μμf
Output	10	μμf

° With no external shield.

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
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_1

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	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	-	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

← Indicates a change.

25L6-GT

BEAM POWER AMPLIFIER

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.	0.1	megohm
For cathode bias.	0.5	megohm

Curves shown under Type 50L6-GT also apply to the 25L6-GT.

25W4-GT

HALF-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

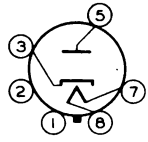
Heater, for Unipotential Cathode:

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 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	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

HALF-WAVE VACUUM RECTIFIER

Typical Operation:		*Half-Wave Rectifier (One Tube)*	*Full-Wave Rectifier (Two Tubes)*	
AC Plate-Supply Voltage (RMS)		350	–	volts
AC Plate-to-Plate Supply Voltage (RMS)		–	700	volts
Filter-Input Capacitor		20	20	μf
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	62.5 ma.	390	–	volts
	125 ma.	–	395	volts
At full-load cur. of	125 ma.	335	–	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

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

25Z5

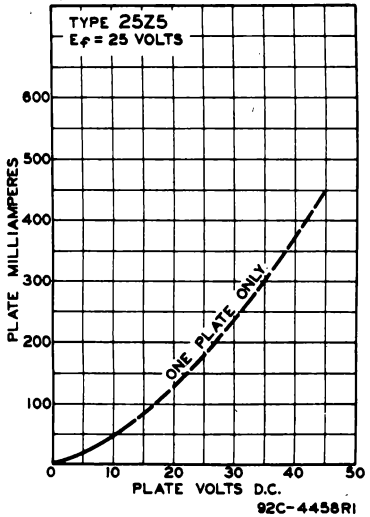
HIGH-VACUUM RECTIFIER-DOUBLER

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 25Z6.

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 μf, 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



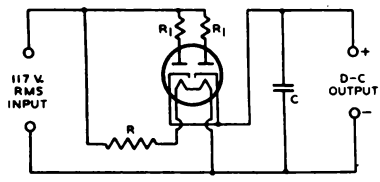
← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

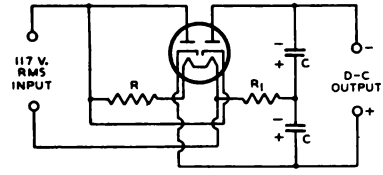
25Z5

TYPICAL RECTIFIER-DOUBLER CIRCUITS

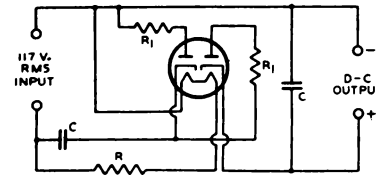
HALF-WAVE RECTIFIER



VOLTAGE-DOUBLER CIRCUIT
FULL-WAVE



VOLTAGE-DOUBLER CIRCUIT
HALF-WAVE



R = HEATERS OF OTHER TUBES IN SERIES WITH VOLTAGE-DROPPING RESISTOR

R_1 = PROTECTIVE RESISTOR

C = CONDENSERS

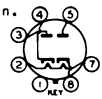
The license extended to the purchaser of tubes appears in the License Notice accompanying them. Information contained herein is furnished without assuming any obligations.

25Z6
25Z6-GT/G

25Z6, 25Z6-GT/G

HIGH-VACUUM RECTIFIER-DOUBLER

Heater	Coated Unipotential Cathodes	
Voltage	25	a-c or d-c volts
Current	0.3	amp.
	25Z6	25Z6-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	Intermed. Sh., Octal 7-Pin
Basing Designation	7Q	G-7Q
Pin 1	25Z6, Shell; 25Z6-GT/G, No Con.	
Pin 2	Heater	
Pin 3	Plate #2	
Pin 4		Cathode #2
Pin 5		Plate #1
Pin 7		Heater
Pin 8		Cathode #1
Mounting Position		Any



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.

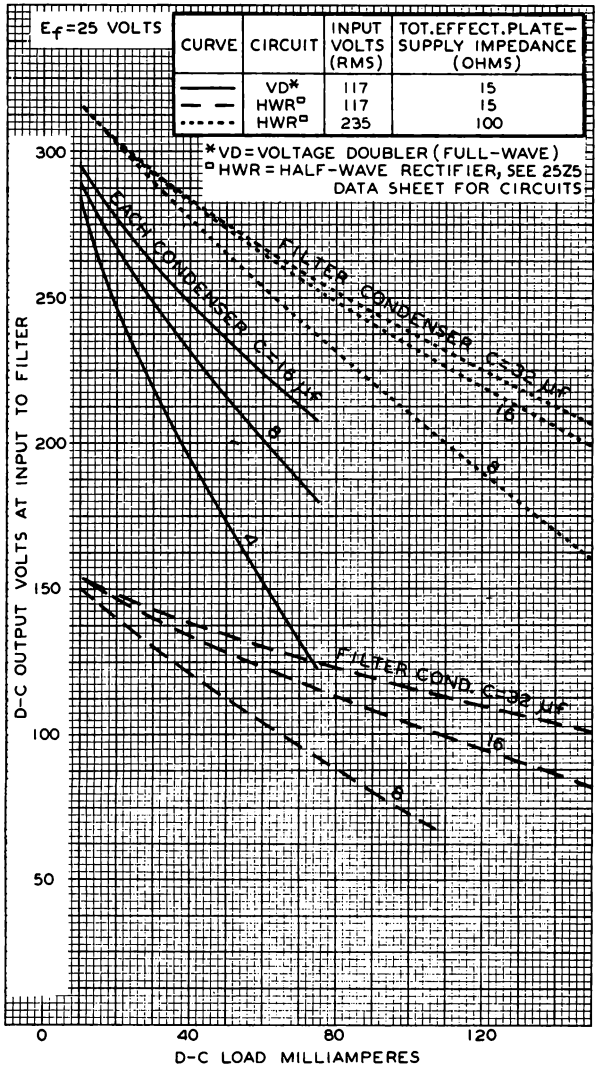
Circuits and Plate Characteristic Curve for the 25Z6 and 25Z6-GT/G are the same as for Type 25Z5.

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

2576

25Z6

OPERATION CHARACTERISTICS



Cunningham Radiotron

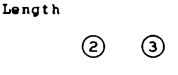
RCA-26

AMPLIFIER

A-C FILAMENT

Filament	Coated	
Voltage	1.5	a-c or d-c volts
Current	1.05	amp.
Direct Interelectrode Capacitances:		
Grid to Plate	8.1	μμf
Grid to Filament	2.8	μμf
Plate to Filament	2.5	μμf
Maximum Overall Length		4-11/16"
Maximum Diameter		1-13/16"
Bulb		ST-14
Base		Medium 4-Pin

Pin 1-Filament
Pin 2-Plate
Pin 3-Grid
Pin 4-Filament



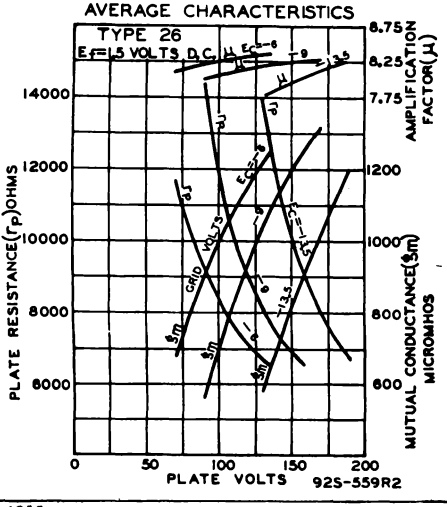
BOTTOM VIEW

AMPLIFIER (Class A)

Operating Conditions and Characteristics:

Filament	1.5	1.5	1.5	a-c volts
Plate	90	135	180 max.	volts
Grid*	-7	-10	-14.5	volts
Amp. Fact.	8.3	8.3	8.3	
Plate Res.	8900	7600	7300	ohms
Mut. Cond.	935	1100	1150	μmhos
Plate Cur.	2.9	5.5	6.2	ma.

* Grid volts measured from mid-point of a-c operated filament.

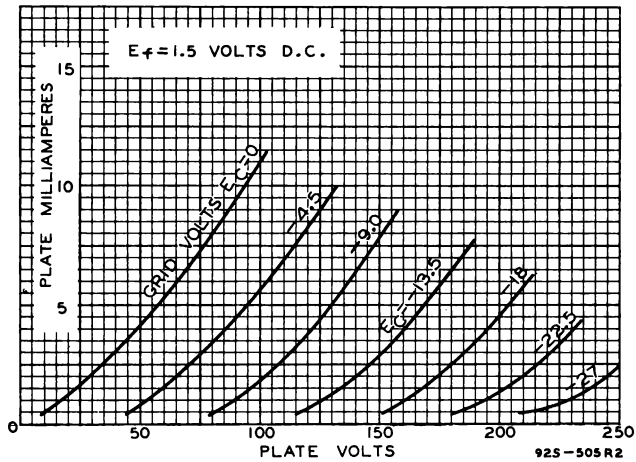


RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

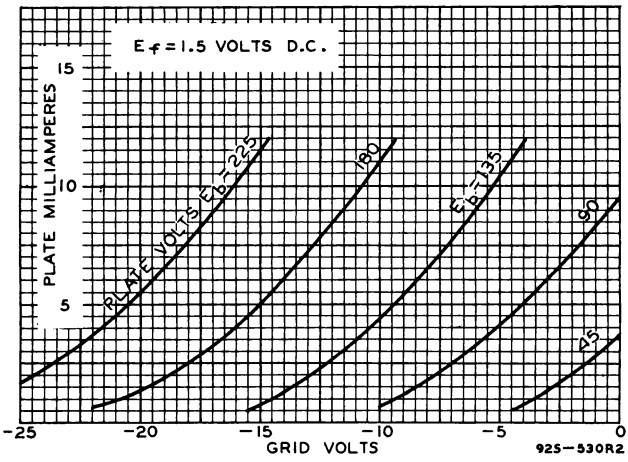
Cunningham Radiotron

RCA-26

AVERAGE PLATE CHARACTERISTICS



AVERAGE CHARACTERISTICS



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	μμf
Grid to Cathode	3.1	μμf
Plate to Cathode	2.3	μμf
Maximum Overall Length	(3)	4-1/4"
Maximum Diameter		1-9/16"
Bulb		ST-12
Base		Medium 5-Pin
Pin 1-Heater		Pin 4-Cathode
Pin 2-Plate		Pin 5-Heater
Pin 3-Grid		

(2) (4) (1) (5)

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

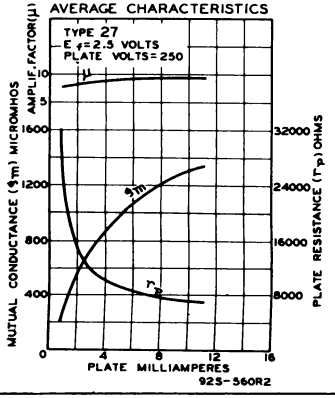
Typical Operation:	*Biased*		*Grid-Leak*	
Heater *	2.5	2.5	2.5	volts
Plate	250	275 max.	45	volts
Grid	-30#	-33#	Return to Cathode	volts
Plate Cur.°	Adjusted to 0.2 ma. with no input signal		-	
Grid Leak	-	-	1 to 5	megohms
Grid Condenser	-	-	0.00025	μf

° 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 CHARACTERISTICS



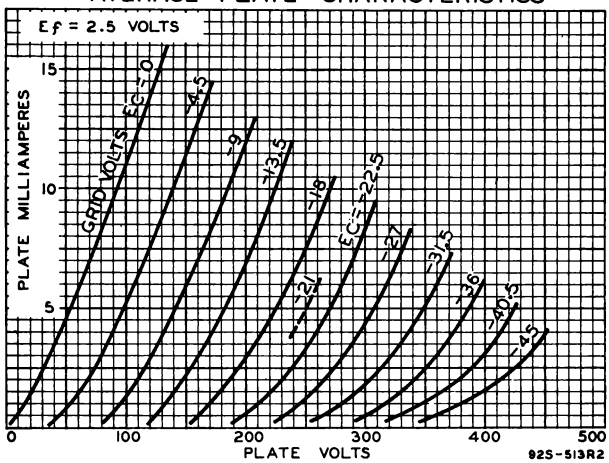
925-560R2

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

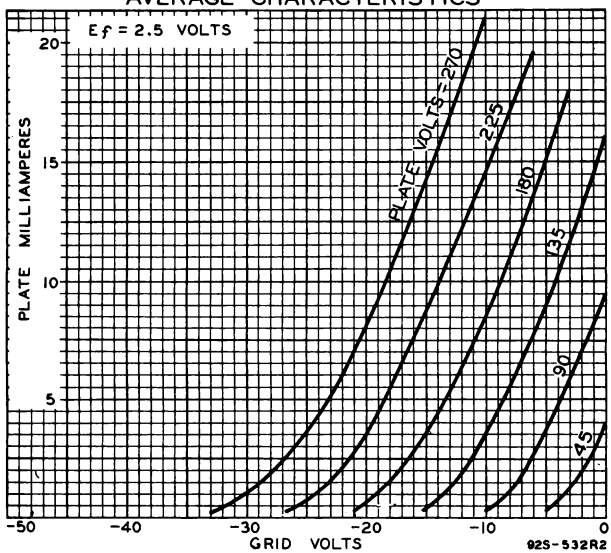
Cunningham Radiotron

RCA-27

AVERAGE PLATE CHARACTERISTICS



AVERAGE CHARACTERISTICS

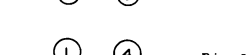


Cunningham Radiotron

RCA-31

POWER AMPLIFIER

Filament	Coated	
Voltage	2.0	d-c volts
Current	0.130	amp.
Direct Interelectrode Capacitances:		
Grid to Plate	5.7	μμf
Grid to Filament	3.5	μμf
Plate to Filament	2.7	μμf
Maximum Overall Length		4-1/4"
Maximum Diameter		1-9/16"
Bulb		ST-12
Base		Small 4-Pin
Pin 1-Filament+		Pin 3-Grid
Pin 2-Plate		Pin 4-Filament-



BOTTOM VIEW

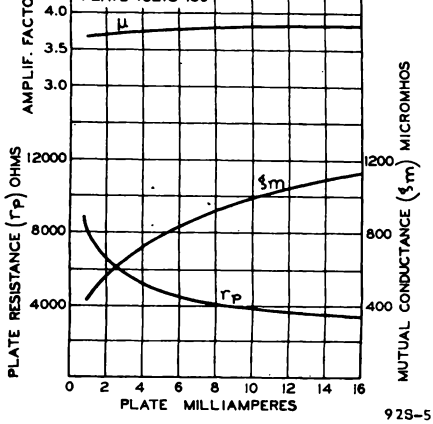
AMPLIFIER (Class A)

Operating Conditions and Characteristics:

Filament	2.0	2.0	d-c volts
Plate	135	180	volts
Grid	-22.5	-30	volts
Amp. Factor	3.8	3.8	
Plate Res.	4100	3600	ohms
Mut. Cond.	925	1050	μmhos
Plate Cur.	8.0	12.3	ma.
Load Res.	7000	5700	ohms
Self-Bias Res.	2815	2440	ohms
U.P.O.	185	375	mw.

Full or partial self-biasing is to be preferred; required if grid resistor (maximum value 1.0 megohm) is used.

AVERAGE CHARACTERISTICS

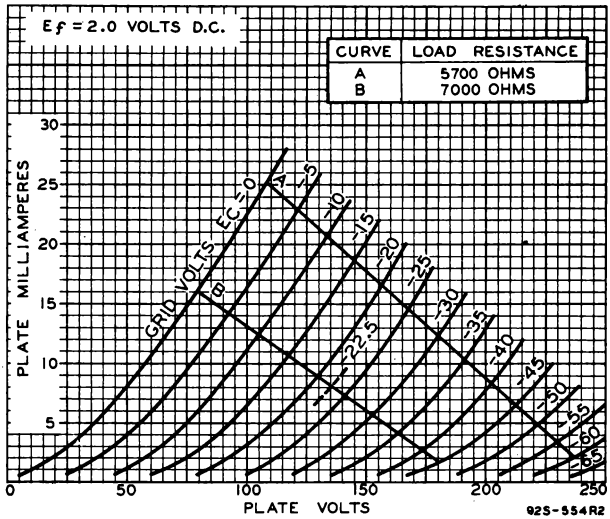


92S-562R2

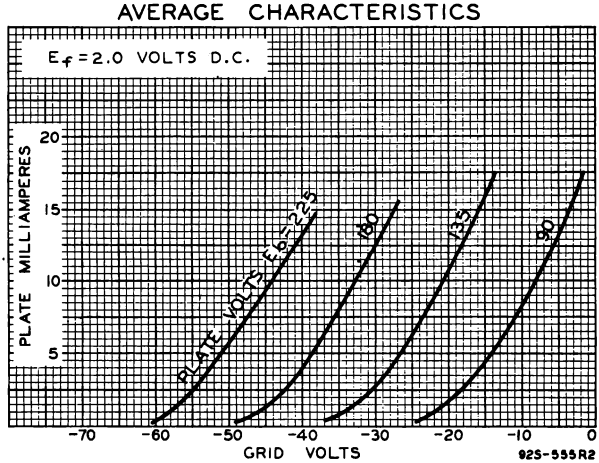
Cunningham Radiotron

RCA-31

AVERAGE PLATE CHARACTERISTICS



AVERAGE CHARACTERISTICS

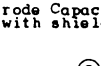


Cunningham Radiotron

RCA-32

SCREEN GRID R-F AMPLIFIER

Filament	Coated		
Voltage	2.0		d-c volts
Current	0.060		amp.
Direct Interelectrode Capacitances:			
Grid to Plate (with shield-can)		0.015 max.	µµf
Input		5.1	µµf
Output		10.5	µµf
Overall Length		4-25/32" to 5-1/32"	
Maximum Diameter		1-13/16"	
Bulb		ST-14	
Cap		Small Metal	
Base		Medium 4-Pin	
Pin 1-Filament +		Pin 4-Filament-	
Pin 2-Plate		Cap -Grid	
Pin 3-Screen			



BOTTOM VIEW

AMPLIFIER (Class A)

Operating Conditions and Characteristics:

Filament	2.0	2.0	volts
Plate	135	180 max.	volts
Screen	67.5	67.5	max.volts
Grid	-3	-3	volts
Amp. Fact.	610	780	
Plate Res.	0.95	1.2	megohms
Mut. Cond.	640	650	µmhos
Plate Cur.	1.7	1.7	ma.
Screen Cur.	0.4	0.4	max.ma.

Grid-coupling resistor, if used, should not exceed 2.0 megohms.

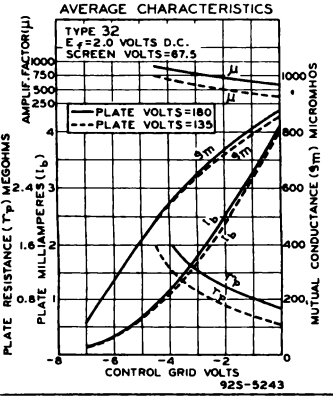
DETECTOR

Typical Operation:	*Biased*		*Grid-Leak*	
Filament	2.0	2.0	2.0	volts
Plate-Supply	135	180	135	volts
Screen	45	67.5 max.	Up to 45	volts
Grid	-4.5*	-6*	Return to (+)Fil.	volts
Plate Load	0.1 *	0.1 *	0.1 *	megohm
Plate Cur.	Adjusted to 0.2 ma. with no input signal.		-	
Grid Leak	-	-	1-5	megohms
Grid Condenser	-	-	0.00025	µf

* Or equivalent impedance. In designing circuits to use the 32 as a detector, it is desirable to work from the detector stage directly into the power output stage.

* Approximate.

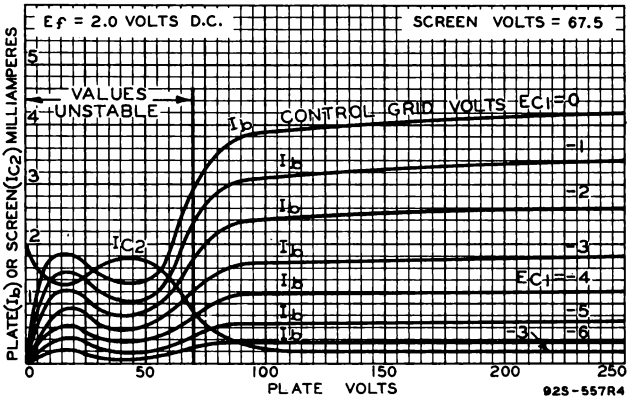
AVERAGE CHARACTERISTICS



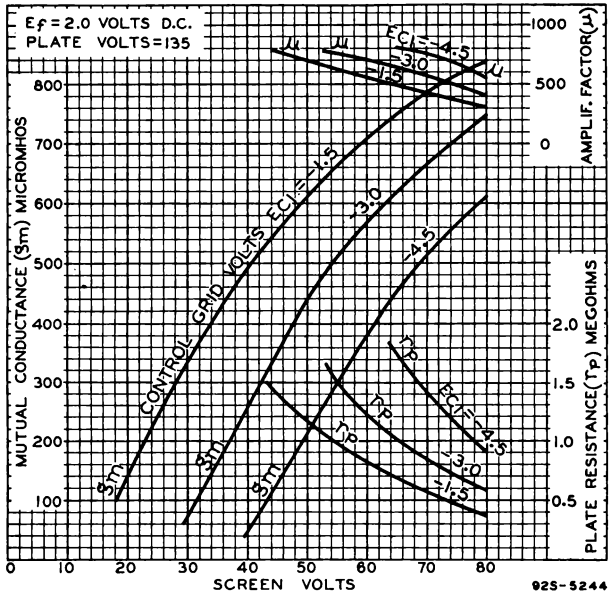
925-5243

Cunningham Radiotron
RCA-32

AVERAGE PLATE CHARACTERISTICS



AVERAGE CHARACTERISTICS



Cunningham Radiotron

RCA-33

POWER AMPLIFIER PENTODE

Filament	Coated	
Voltage	2.0	d-c volts
Current	0.260	amp.
Direct Interelectrode Capacitances:		
Grid to Plate	1.0	μμf
Input	8.0	μμf
Output	12.0	μμf
Maximum Overall Length		4-11/16"
Maximum Diameter		1-13/16"
Bulb	③	ST-14
Base		Medium 5-Pin
Pin 1-Filament +	② ④	Pin 4-Screen
Pin 2-Plate		Pin 5-Filament -
Pin 3-Grid	① ⑤	

BOTTOM VIEW

AMPLIFIER (Class A)

Operating Conditions and Characteristics:

Filament	2.0	2.0	d-c volts
Plate	135	180 max.	volts
Screen	135	180 max.	volts
Grid	-13.5	-18	volts
Amp. Fact.	70	90	approx.
Plate Res.	50000	55000	approx. ohms
Mut. Cond.	1450	1700	μmhos
Plate Cur.	14.5	22	ma.
Screen Cur.	3	5	ma.
Load Res.	7000	6000	ohms
P.O.°	0.7	1.4	watts

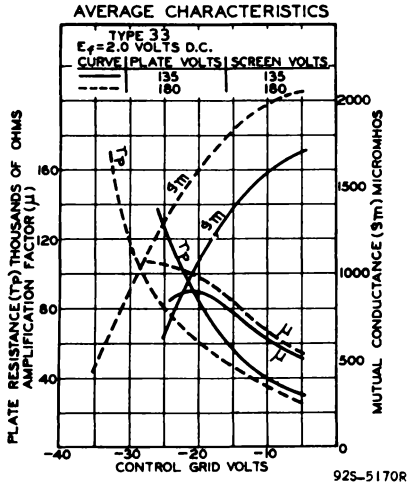
° 7% total harmonic distortion.

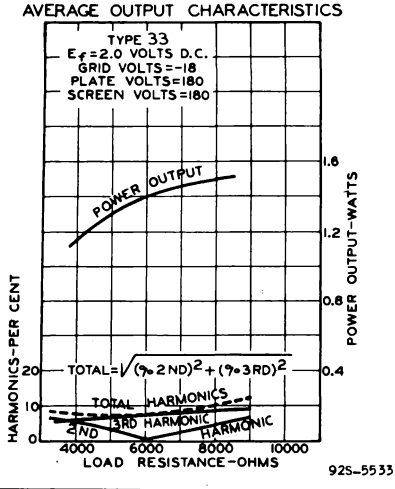
If a single 33 is self-biased, the self-biasing resistor (770 ohms for 135 volts, or 670 ohms for 180 volts) should be shunted by a suitable filter network to avoid degenerative effects at low audio frequencies. With two 33's in push-pull, the filter network may be omitted across the resistor (one-half of the values for a single tube).

Transformer or impedance input-coupling devices are recommended. If, however, resistance coupling is employed the grid resistor with self-bias should not exceed one megohm: without self-bias, it should be limited to 0.5 megohm.

Cunningham Radiotron
RCA-33

AVERAGE CHARACTERISTICS





SEPT. 30, 1936

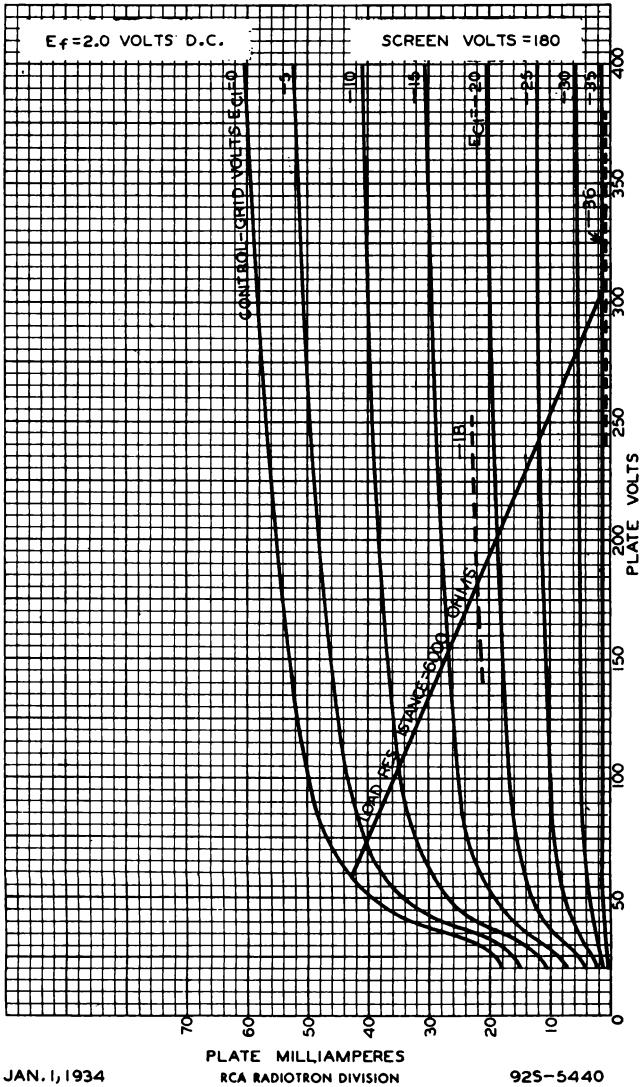
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92S-5170R1
92S-5533

Cunningham Radiotron

RCA-33

AVERAGE PLATE CHARACTERISTICS



JAN. 1, 1934

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

925-5440

Cunningham Radiotron

RCA-33

AVERAGE CHARACTERISTICS

Cunningham Radiotron

RCA-34

SUPER-CONTROL R-F AMPLIFIER PENTODE

Filament	Coated	
Voltage	2.0	d-c volts
Current	0.060	amp.
Direct Interelectrode Capacitances:		
Grid to Plate (with shield-can)	0.015 max.	µµf
Input	6.0	µµf
Output	11.5	µµf
Overall Length	4-25/32" to 5-1/32"	
Maximum Diameter	1-13/16"	
Bulb	ST-14	
Cap	Small Metal	
Base	Medium 4-Pin	
Pin 1-Filament+	Pin 4-Filament-	
Pin 2-Plate	Cap -Grid	
Pin 3-Screen		

BOTTOM VIEW

AMPLIFIER (Class A)

Operating Conditions and Characteristics:

Filament	2.0	2.0	2.0	d-c volts
Plate	67.5	135	180 max.	volts
Screen	67.5	67.5	67.5	max.volts
Grid	-3	-3	-3	min.volts
Amp. Fact.	224	360	620	
Plate Res.	400000	600000	1000000	ohms
Mut. Cond.	560	600	620	µmhos
Mut. Cond. *	15	15	15	µmhos
Plate Cur. *	2.7	2.8	2.8	ma.
Screen Cur.	1.1	1.0	1.0	ma.

* At -22.5 volts bias.

MIXER

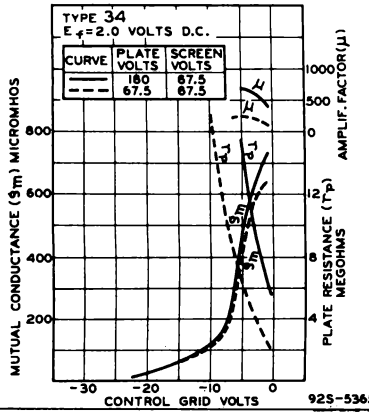
In Superheterodyne Circuits

Operating Conditions with Variable Bias:

Filament	2.0	2.0	2.0	d-c volts
Plate	67.5	135	180 max.	volts
Screen	67.5	67.5	67.5	max.volts
Grid	-5	-5	-5	approx.volts

The grid bias shown is minimum for an oscillator peak voltage of 4.0 volts. These values are optimum.

AVERAGE CHARACTERISTICS



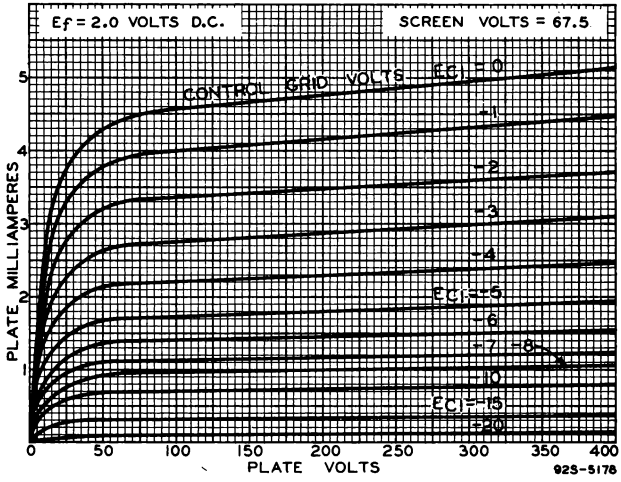
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

34

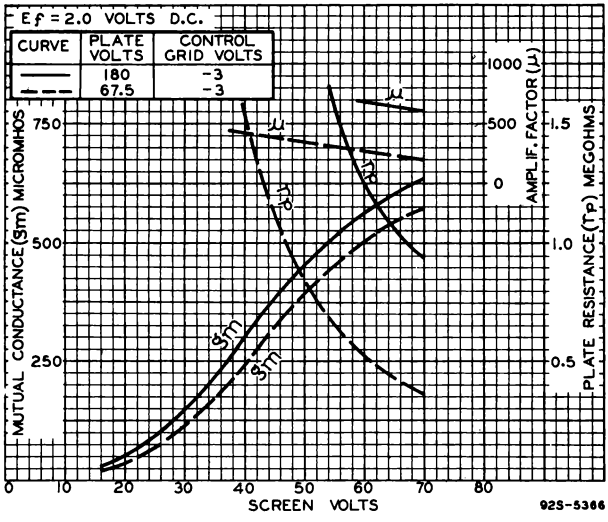
Cunningham Radiotron

RCA-34

AVERAGE PLATE CHARACTERISTICS



AVERAGE CHARACTERISTICS



35A5

BEAM POWER AMPLIFIER

GENERAL DATA

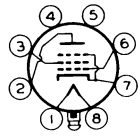
Electrical:

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 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_1

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

BEAM POWER AMPLIFIER

MINIATURE TYPE

GENERAL DATA

Electrical:

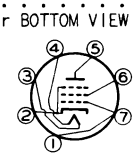
Heater, for Unipotential Cathode:		
Voltage	35	ac or dc volts
Current	0.15	amp
Direct Interelectrode Capacitances (Approx.): °		
Grid No.1 to Plate	0.4	μμf
Input	11	μμf
Output	6.5	μμf

° 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" ± 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_1

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
BEAM POWER AMPLIFIER

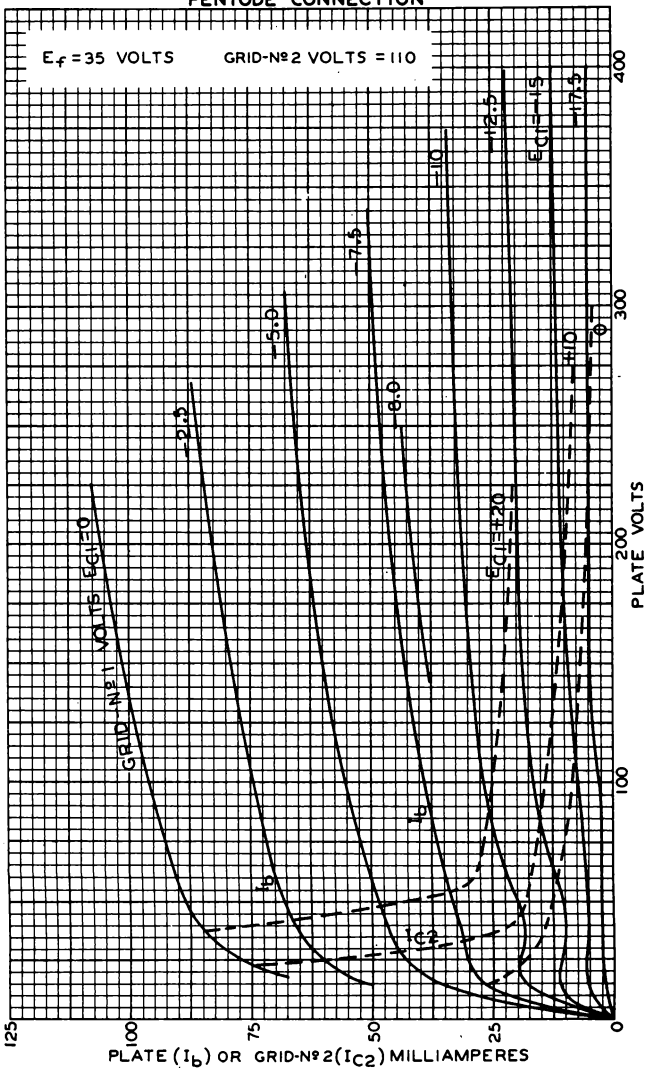
Transconductance	5800	μmhos
Load Resistance	2500	ohms
Total Harmonic Distortion	10	%
Max.-Signal Power Output	1.5	watts

Maximum Circuit Values *(for maximum rated conditions)*:

Grid-No.1-Circuit Res.	fixed bias	0.1	megohm
	cathode bias	0.5	megohm

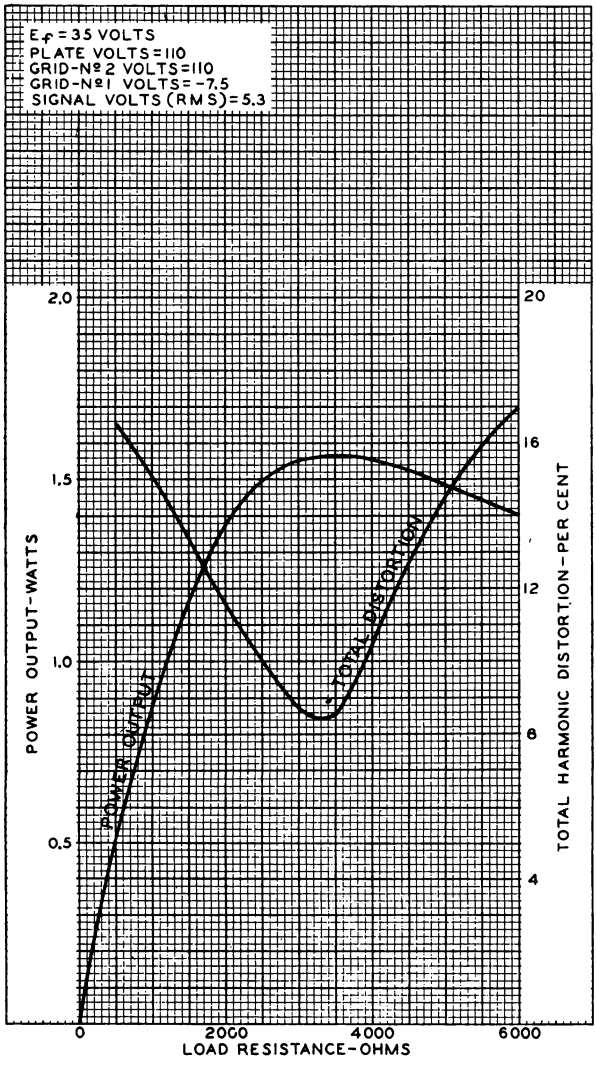
35B5

AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



35B5

OPERATION CHARACTERISTICS



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

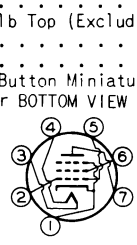
Electrical:

Heater, for Unipotential Cathode:		
Voltage	35	ac or dc volts
Current	0.15	amp
Direct Interelectrode Capacitances (Approx.):°		
Grid No.1 to plate	0.60	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	12	μμf
Plate to cathode & grid No.3, grid No.2, and heater	9	μμf

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_1

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)♦	250 max.	°C

° Without external shield.

♦ 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

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	μmhos
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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

35L6-GT
BEAM POWER AMPLIFIER

GENERAL DATA

Electrical:

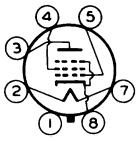
Heater, for Unipotential Cathode:		
Voltage	35	ac or dc volts
Current	0.15	amp
Direct Interelectrode Capacitances (Approx.):°		
Grid No.1 to Plate	0.8	μμf
Input	13	μμf
Output	9.5	μμf

° 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_1

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	μmhos
Load Resistance	2500	4500	ohms
Total Harmonic Distortion	10	10	%
Max.-Sig. Power Output	1.5	3.3	watts

35L6-GT
BEAM POWER AMPLIFIER

Maximum Circuit Values (for maximum rated conditions):

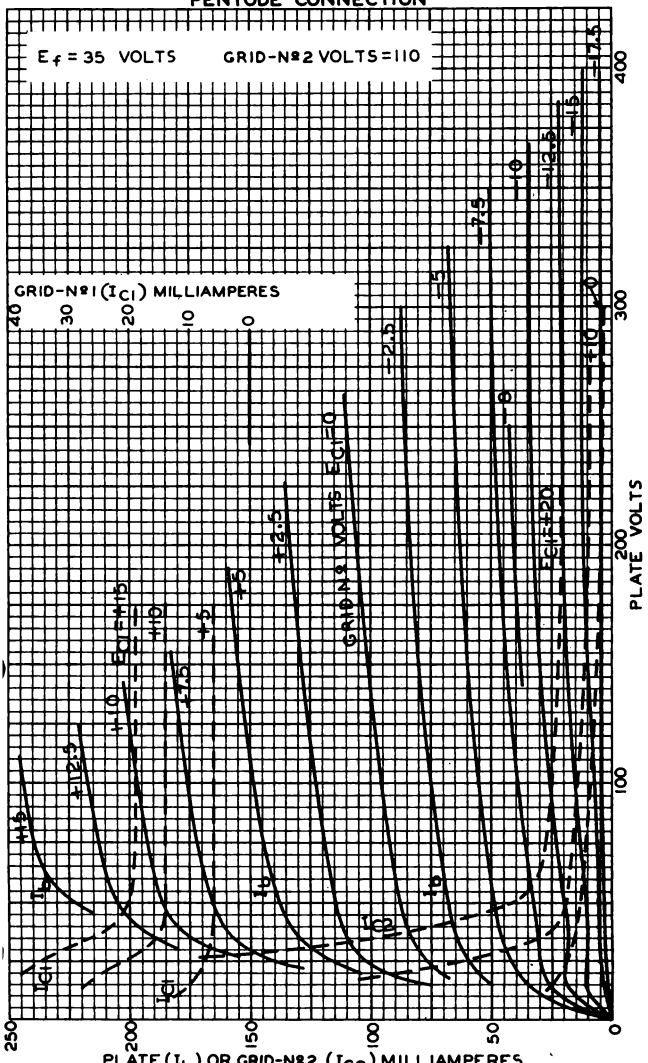
Grid-No.1-Circuit Resistance:

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

AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



AUG. 11, 1941

TUBE DEPARTMENT

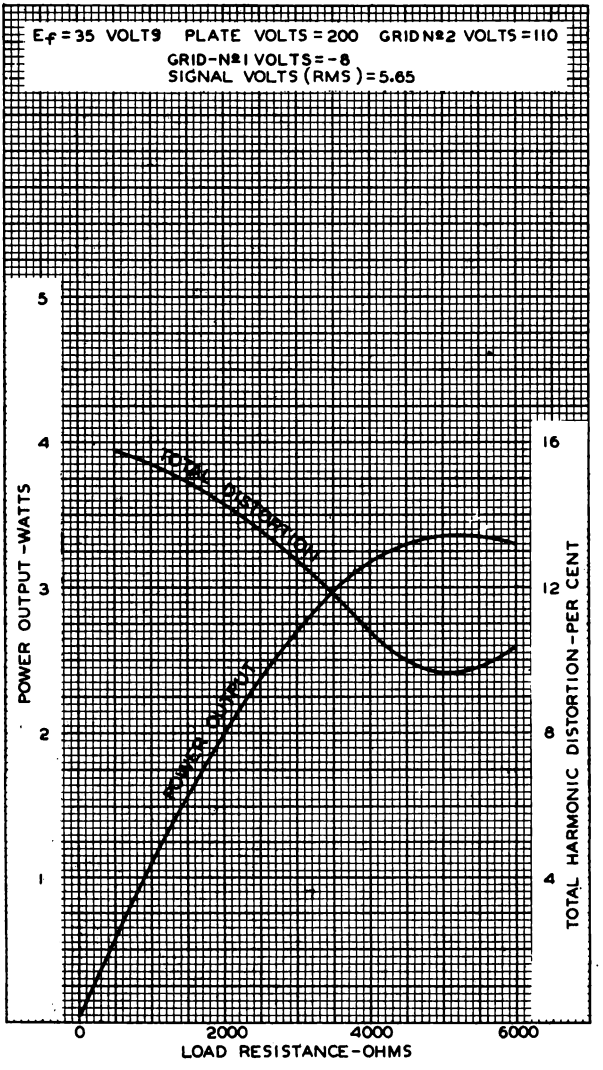
92CM-6309

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

35L6-GT

35L6-GT

OPERATION CHARACTERISTICS

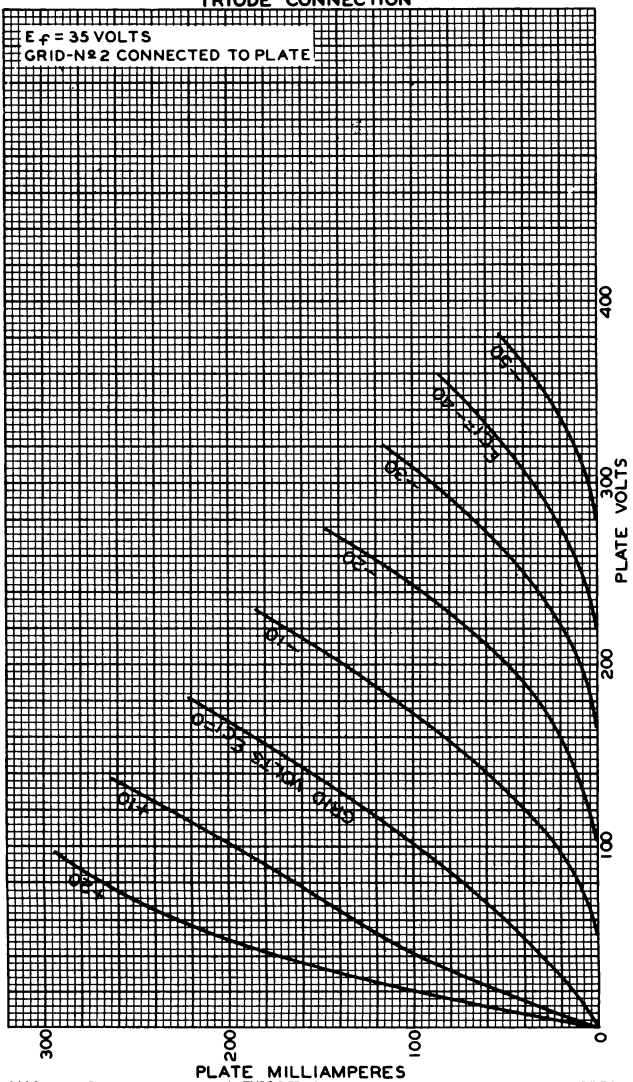


AUG. 21, 1941

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6315

35L6-GT
AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



AUG. 6, 1941

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6307R1

35W4
HALF-WAVE VACUUM RECTIFIER

MINIATURE TYPE

GENERAL DATA

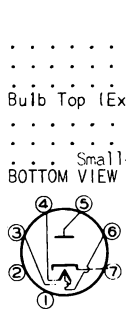
Electrical:

Heater, for Unipotential Cathode:	*Without Panel Lamp*	*With No. 40 or No. 47 Panel Lamp*	
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
Current 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
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
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
With Panel Lamp & 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	μf
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

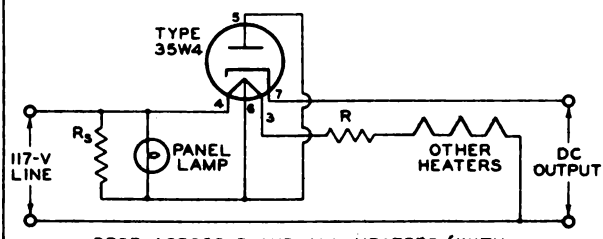
Maximum Circuit Values:

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.40 or No.47 Panel Lamp



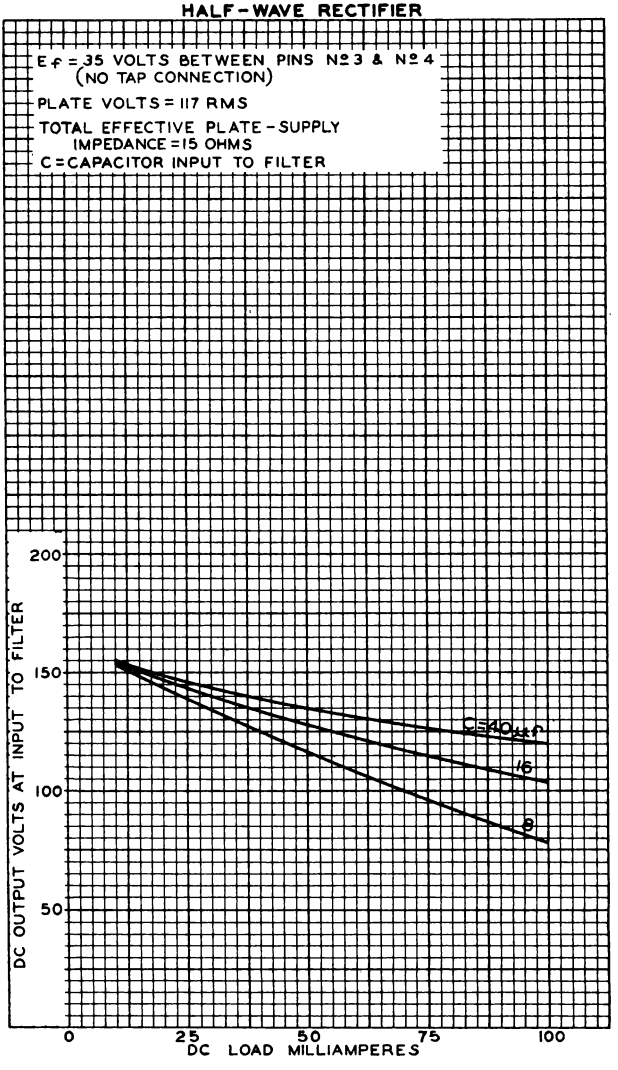
DROP ACROSS R AND ALL HEATERS (WITH PANEL LAMP) SHOULD EQUAL 117 VOLTS AT 0.15 AMPERE. R_S = SHUNTING RESISTOR REQUIRED WHEN DC OUTPUT CURRENT EXCEEDS 60 MILLIAMPERES

92CS-6626

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.

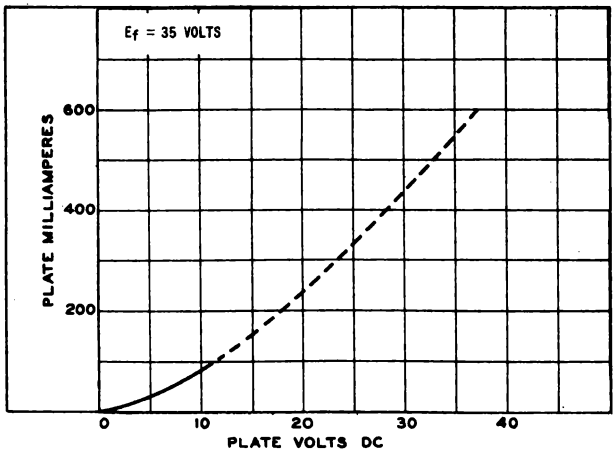
→ Indicates a change.

35W4
OPERATION CHARACTERISTICS
HALF-WAVE RECTIFIER



35W4

AVERAGE PLATE CHARACTERISTIC



92CM-6305TV

35Y4
HALF-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:	*Without Panel Lamp*	*With No.40 or No.47 Panel Lamp*▲	
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
Current { 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 Conrection
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
With Panel Lamp & { 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:

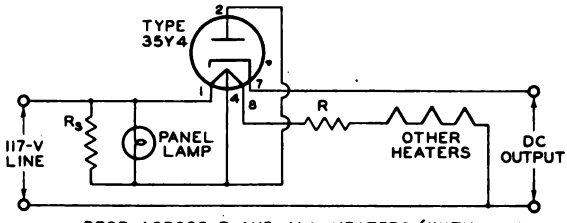
AC Plate-Supply Voltage (RMS)	117	235	volts
Filter-Input Capacitor	40	40	μf
Min. Total Effective Plate-Supply Imped.	15	100	ohms
DC Output Current	100	100	ma
DC Output Voltage at Input to Filter (Approx.):			
At half-load current (50 ma.)	140	280	volts
At full-load current (100 ma.)	120	235	volts
Voltage 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
For dc output current of 80 ma.	400 max.	ohms
For dc output current of 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
HALF-WAVE VACUUM RECTIFIER

GENERAL DATA

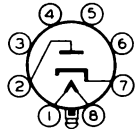
Electrical:

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

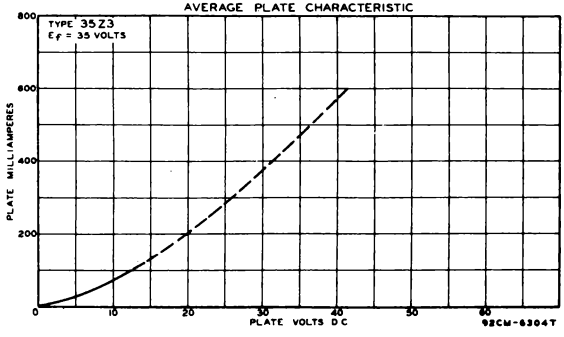
Pin 1 - Heater
Pin 2 - Plate
Pin 3 - No Connection
Pin 4 - No Connection
Pin 5 - No Connection



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.



35Z4-GT

35Z4-GT
HALF-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

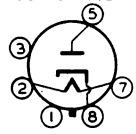
Heater, for Unipotential Cathode:

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	600 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

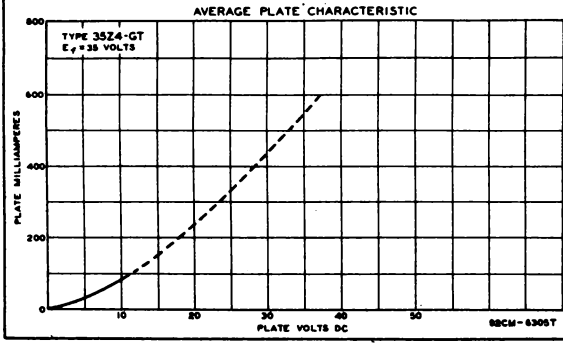
Typical Operation with Capacitor-Input Filter:

AC Plate-Supply Voltage (RMS)	117	235	volts
Min. Total Effective Plate-Supply Imped.▲	15	100	ohms
DC Output Current	100	100	ma.

▲ When a filter-input capacitor 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.

Curves under Type 35Z5-GT also apply to the 35Z4-GT

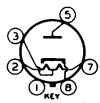
AVERAGE PLATE CHARACTERISTIC



35Z5-GT/G

HALF-WAVE HIGH-VACUUM RECTIFIER

Heater	Coated Unipotential Cathode	
Voltage	Entire Heater (pins 2 & 7)	35 a-c or d-c volts
	Panel Lamp Section (pins 2 & 3) with 0.15 amp. between pins 2 & 7	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 #40 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	%

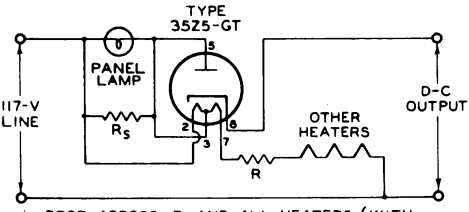
* A pilot lamp shunting resistor is required for a d-c output current greater than 60 ma. See Typical Operation for representative values. Maximum values are as follows: for 70 ma., 800 ohms; for 80 ma., 400 ohms; for 90 ma., 250 ohms.

** 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.

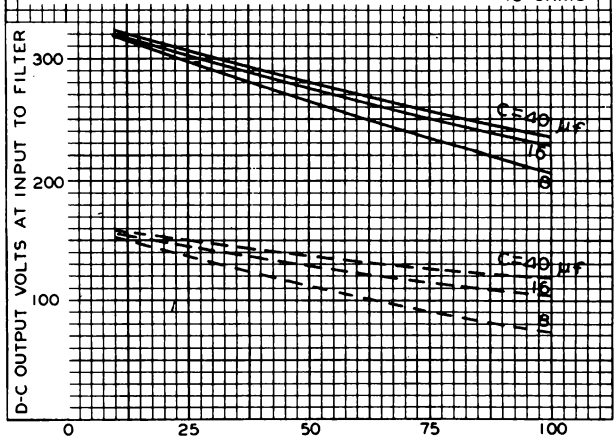
OPERATION CHARACTERISTICS
HALF-WAVE RECTIFIER

E_f = 35 VOLTS BETWEEN PINS №2 & №7 (NO TAP CONNECTON)

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



June 1, 1943

RCA VICTOR DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

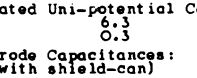
CE-6361

Cunningham Radiotron

RCA-36

SCREEN GRID R-F AMPLIFIER

Heater	Coated Uni-potential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances:		
Grid to Plate (with shield-can)		0.007 max. μμf
Input		3.7 μμf
Output		9.2 μμf
Overall Length		4-9/32" to 4-17/32"
Maximum Diameter		1-9/16"
Bulb		ST-12
Cap		Small Metal
Base		Small 5-Pin
Pin 1-Heater		Pin 4-Cathode
Pin 2-Plate		Pin 5-Heater
Pin 3-Screen		Cap -Grid



BOTTOM VIEW

AMPLIFIER (Class A)

Operating Conditions and Characteristics:

Heater *	6.3	6.3	6.3	6.3	volts
Plate	100	135	180	250 max.	volts
Screen	55	67.5	90 max.	90 max.	volts
Grid	-1.5	-1.5	-3	-3	volts
Amp. Fact.	470	475	525	695	
Plate Res.	0.55	0.475	0.50	0.55	megohm
Mut. Cond.	850	1000	1050	1080	μmhos
Plate Cur.	1.8	2.8	3.1	3.2	ma.
Screen Cur.	-	-	-	1.7	max.ma.

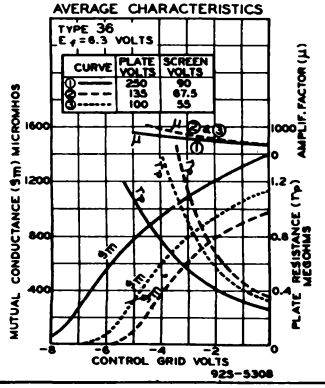
DETECTOR

Typical Operation:	*Biased*			*Grid-Leak*	
Heater *	6.3	6.3	6.3	6.3	volts
Plate-Supply	100	180	250 max.	135	volts
Screen	55	67.5	90 max.	Up to 45	volts
Grid	-5#	-6#	-8#	Return to Cathode	volts
Plate Load	0.25°	0.25°	0.25°	0.25°	megohm
Plate Cur.	Adjusted to 0.1 ma. with no input signal			-	
Grid Leak	-	-	-	2 to 5	megohms
Grid Condenser	-	-	-	0.00025	μf

° Or equivalent impedance. In designing circuits to use the 36 as a detector, it is desirable to work from the detector stage directly into the power output stage. # Approximate.

* 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.

AVERAGE CHARACTERISTICS

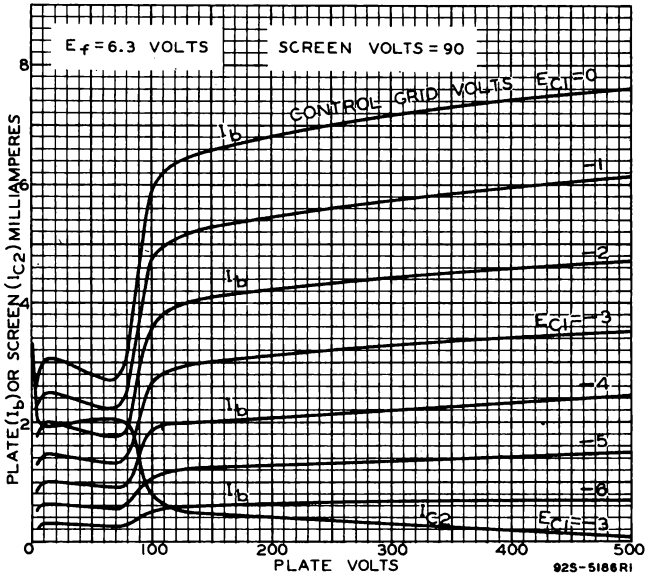


RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

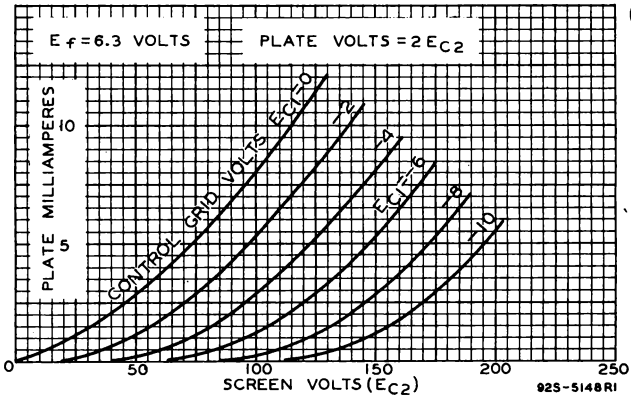
Cunningham Radiotron

RCA-36

AVERAGE PLATE CHARACTERISTICS



AVERAGE CHARACTERISTICS



41
POWER PENTODE

Heater■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.4	amp.
Direct Interelectrode Capacitances (Approx.):°		
Grid to Plate	0.6	μμf
Input	6.0	μμf
Output	7.5	μμf
Maximum Overall Length		4-3/16"
Maximum Seated Height		3-9/16"
Maximum Diameter		1-9/16"
Bulb		ST-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_1 Amplifier:

Plate	100	250	315	volts
Screen	100	250	250	volts
Grid*	-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_1 Amplifier:

Unless otherwise specified, values are for 2 tubes

	Fixed Bias	*Cathode Bias*	
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.

41

41
POWER PENTODE

	Fixed Bias	Cathode Bias	
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.

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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.

42

OPERATION CHARACTERISTICS
TRIODE CONNECTION-CLASS AB OPERATION

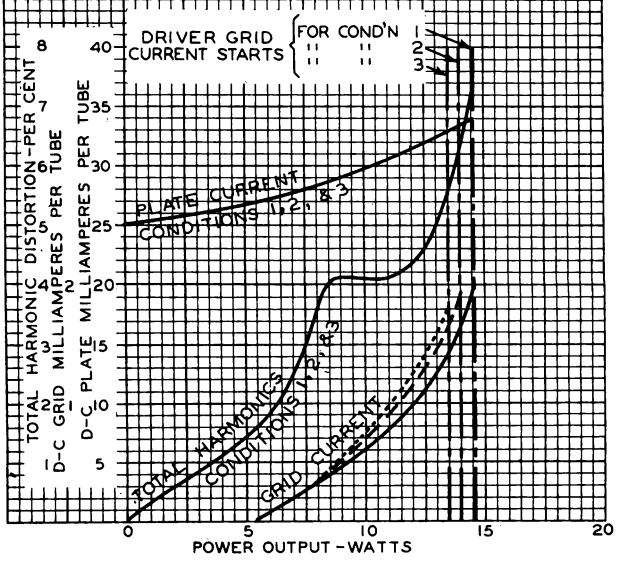
E_f = 6.3 VOLTS

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

CONDI-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



Cunningham Radiotron

RCA-43

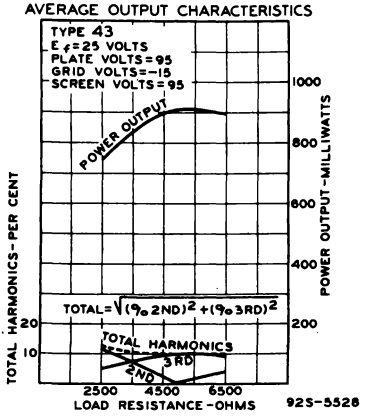
POWER AMPLIFIER PENTODE

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		Pin 4-Grid
Pin 2-Plate		Pin 5-Cathode
Pin 3-Screen		Pin 6-Heater

BOTTOM VIEW

For data and additional curve, refer to Type 25A6. The 43 and 25A6 are identical electrically.

AVERAGE OUTPUT CHARACTERISTICS

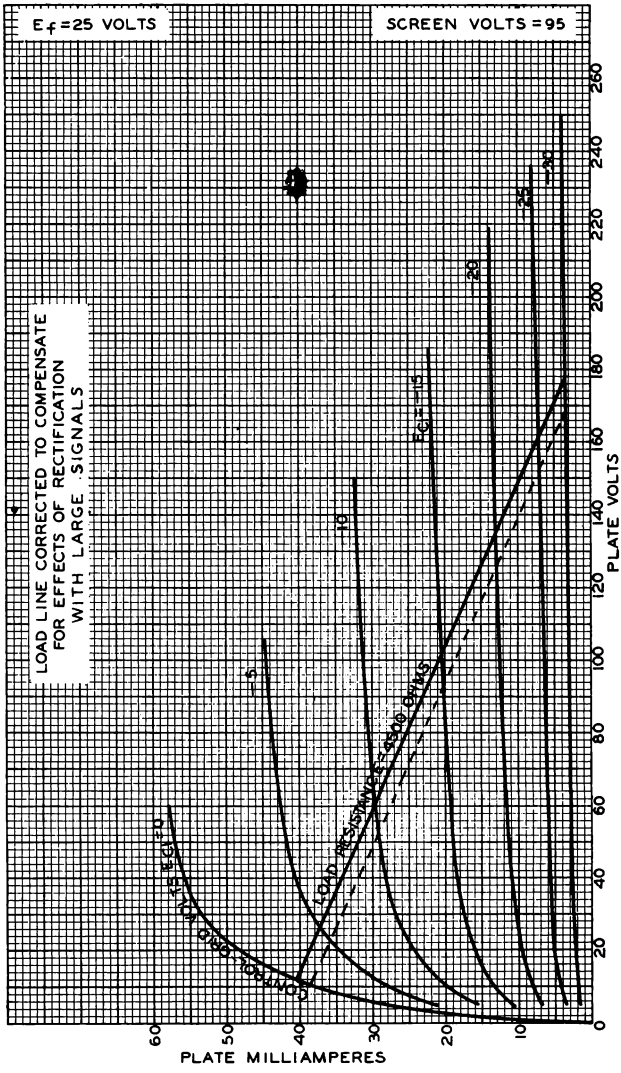


43

Cunningham Radiotron

RCA-43

AVERAGE PLATE CHARACTERISTICS



JULY 27, 1936

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

925-5231R1

45

POWER AMPLIFIER

Filament	Coated		
Voltage	2.5	a-c or d-c	volts
Current	1.5		amp.
Direct Interelectrode Capacitances:			
Grid to Plate		7	μμf
Grid to Filament		4	μμf
Plate to Filament		3	μμf
Maximum Overall Length			4-11/16"
Maximum Diameter			1-13/16"
Bulb			ST-14
Base			Medium 4-Pin
Pin 1 - Filament		Pin 3 - Grid	
Pin 2 - Plate		Pin 4 - Filament ◊	
Mounting Position	BOTTOM VIEW	vertical, Base Down	←

CLASS A AMPLIFIER

Operating Conditions and Characteristics:

Filament	2.5	2.5	2.5	a-c volts
Plate	180	250	275 max.	volts
Grid# °	-31.5	-50	-56	volts
Amp. Fact.	3.5	3.5	3.5	
Plate Res.	1650	1610	1700	ohms
Transcond.	2125	2175	2050	μmhos
Plate Cur.	31	34	36	ma.
Load Res.	2700	3900	4600	ohms
U.P.O.	825	1600	2000	mw.

° Cathode-bias is advisable in all cases; required if grid-coupling resistor (max. value 1.0 megohm) is used.

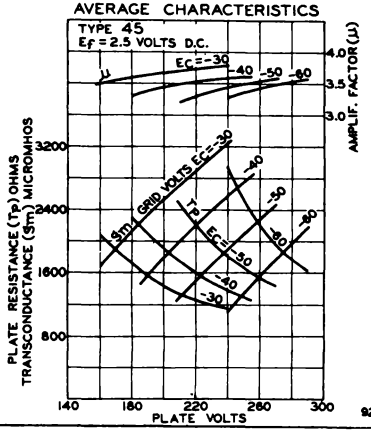
CLASS AB_2 AMPLIFIER

Values are for 2 tubes

Typical Operation:	*Fixed Bias*	*Cathode Bias*	
Filament	2.5	2.5	a-c volts
Plate	275	275	max. volts
Grid*	-68	-	volts
Cathode Resistor	-	775	ohms
Average Driving Power (grid to grid)	656	460	mw.
Zero-Sig. Plate Current	28	36	ma.
Max.-Sig. Plate Current	138	90	ma.
Load Resistance (per tube)	800	1265	ohms
Effective Load Res. (plate to plate)	3200	5060	ohms
Total Harmonic Distortion	5	5	%
Power Output	18	12	watts

* Grid volts measured from mid-point of a-c operated filament.
◊ Horizontal operation permitted if plane of filament is vertical.

AVERAGE CHARACTERISTICS



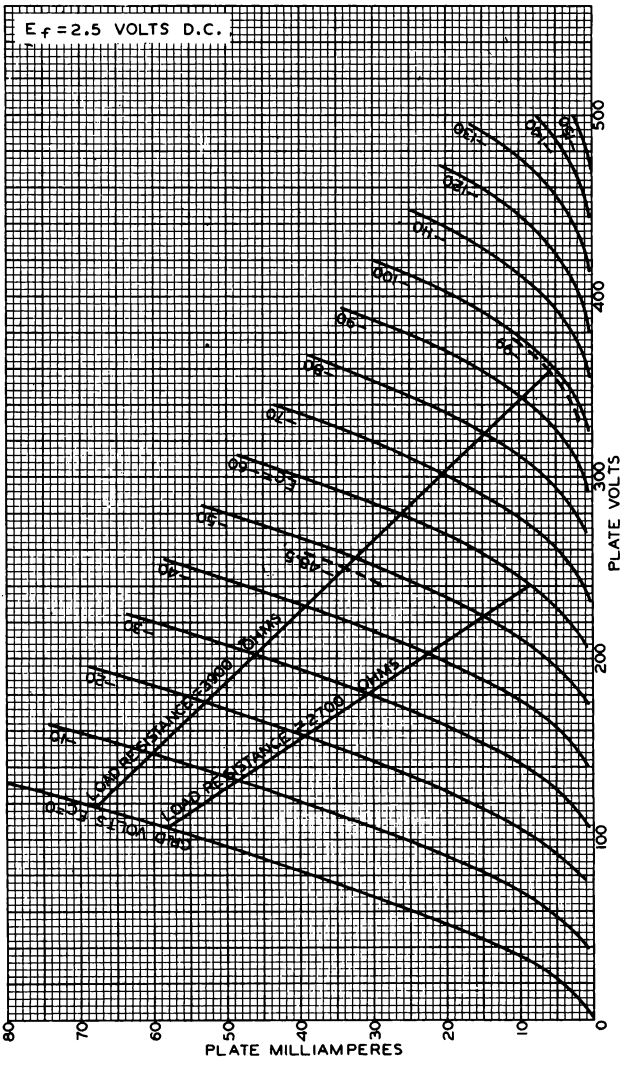
92C-565R2

← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

45

AVERAGE PLATE CHARACTERISTICS



45Z3

HALF-WAVE HIGH-VACUUM RECTIFIER

MINIATURE TYPE

Heater	Coated Unipotential Cathode	
Voltage	45	a-c or d-c volts
Current	0.075	amp.
Maximum Overall Length		2-1/8"
Maximum Seated Height		1-7/8"
Maximum Diameter		3/4"
Bulb		T-5-1/2
Base ▲		Miniature Button 7-Pin
Pin 1 - Heater		Pin 4 - Cathode
Pin 2 - Plate		Pin 5 - No Connection
Pin 3 - {Internal Con. Do Not Use		Pin 6 - Plate
		Pin 7 - Heater
Mounting Position		Any

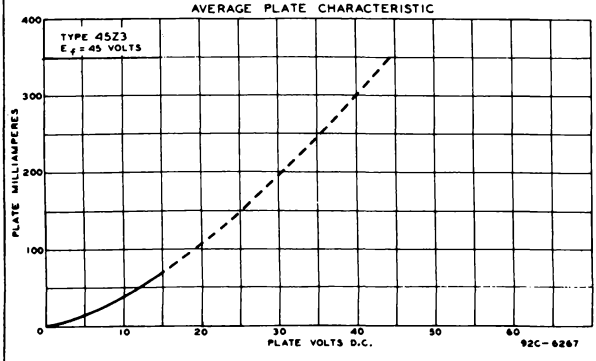
BOTTOM VIEW (5AM)

Half-Wave Rectifier

Peak Inverse Voltage	350 max. volts
Peak Plate Current	390 max. ma.
D-C Heater-Cathode Potential	175 max. volts
With Condenser-Input Filter:	
A-C Plate Voltage (RMS)	117 max. volts
Total Effec. Plate-Supply Impedance	15 min. ohms
D-C Output Current	65 max. ma.

▲ *The center hole in sockets designed for this base provides for the possibility that this tube type may be manufactured with the exhaust-tube tip at the base end. For this reason, it is recommended that in equipment employing this tube type, no material be permitted to obstruct the socket hole.*

AVERAGE PLATE CHARACTERISTIC



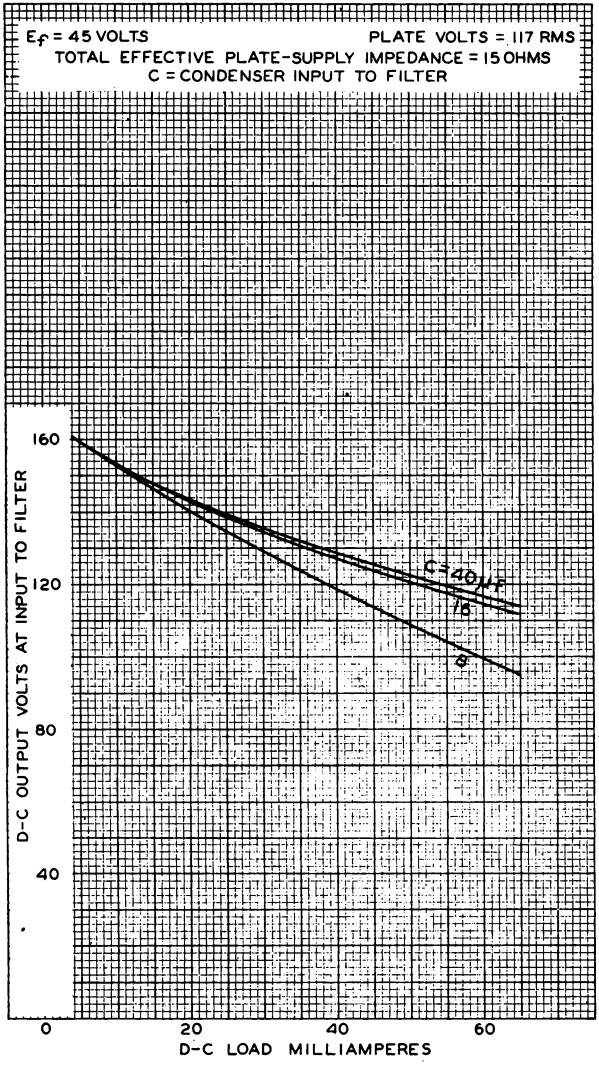
May 1, 1941

TENTATIVE DATA

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

45Z3

OPERATION CHARACTERISTICS



Cunningham Radiotron
RCA-47

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		ST-16
Base	② ④	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:

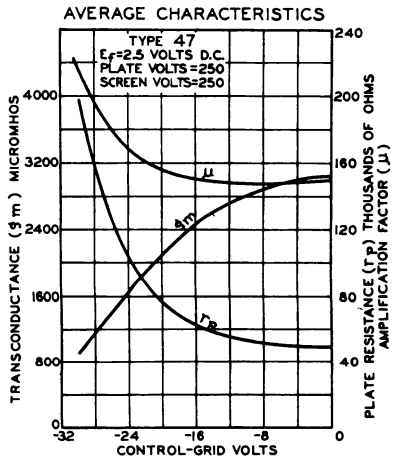
Filament	2.5	a-c volts
Plate	250 maximum	volts
Screen	250 maximum	volts
Grid *	-16.5	volts
Amp. Fact.	150	
Plate Res.	60000	ohms
Transcond.	2500	μmhos
Plate Cur.	31	ma.
Screen Cur.	6	ma.
Load Res.	7000	ohms
Power Output	2.7 °	watts

° 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

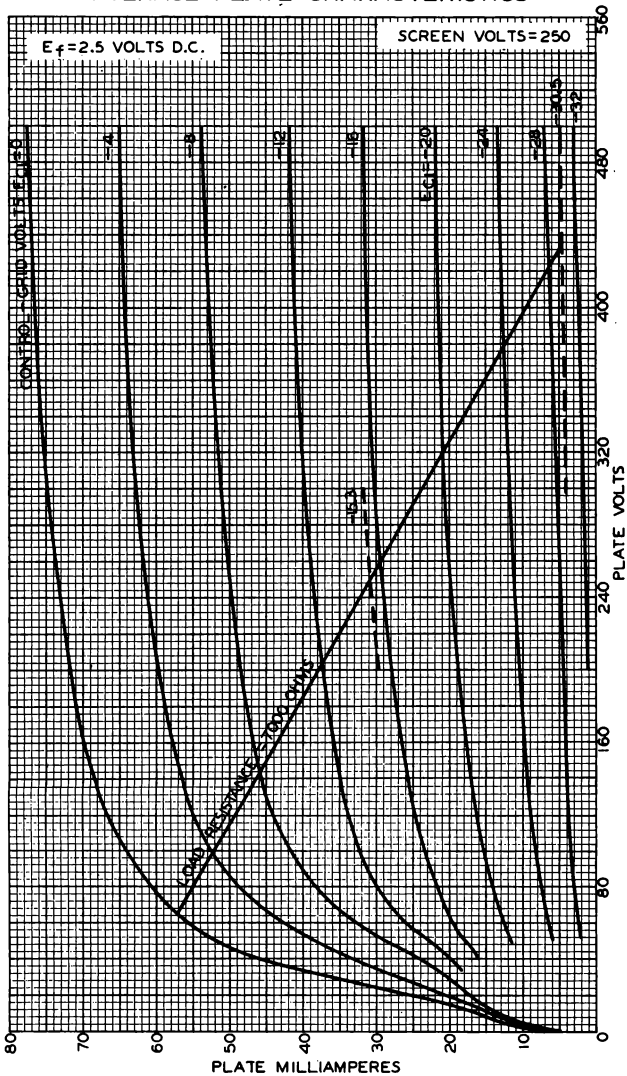
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

47

Cunningham Radiotron

RCA-47

AVERAGE PLATE CHARACTERISTICS



JAN. 29, 1934

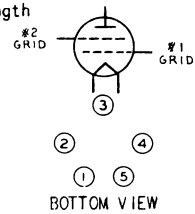
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

925—5137R2

RCA-49

DUAL-GRID POWER AMPLIFIER

Filament	Coated	
Voltage	2.0	d-c volts
Current	0.120	amp.
Maximum Overall Length		4-11/16"
Maximum Diameter		1-13/16"
Bulb		ST-14
Base		Medium 5-Pin



Pin 1-Filament+
Pin 2-Plate
Pin 3-Grid #1
Pin 4-Grid #2
Pin 5-Filament-

BOTTOM VIEW

CLASS B POWER AMPLIFIER

Grids #1 & #2 connected together at socket

Plate Voltage		180 max.	volts
Peak Plate Current		50 max.	ma.
Typical Operation (2 tubes):			
Filament	2.0	2.0	volts
Plate	135	180	volts
Grid (#1 & #2 tied together)	0	0	volts
Zero-Sig. Plate Cur. (per tube)	1.3	2	ma.
Load Resistance (per tube)	2000	3000	ohms
Effective Load Resistance (plate to plate)	8000	12000	ohms
Power Output (2 tubes)	2.3	3.5	approx. watts

CLASS A AMPLIFIER

Grid #2 connected to plate at socket

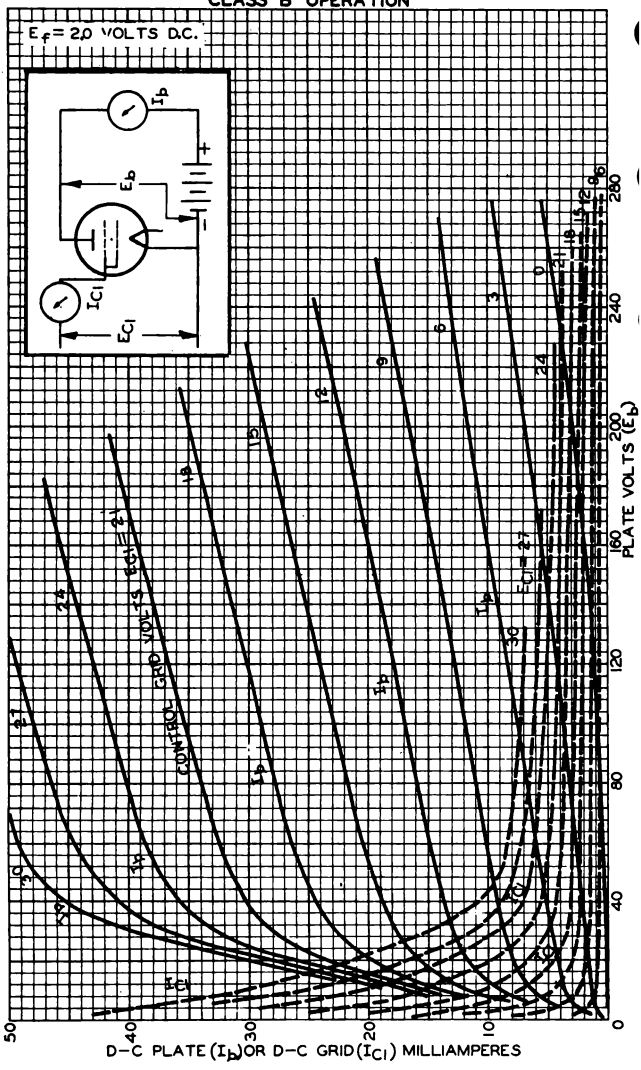
Operating Conditions and Characteristics:		
Filament	2.0	volts
Plate	135 max.	volts
Grid (#1 only)	-20	volts
Amp. Fact.	4.7	
Plate Res.	4175	ohms
Mut. Cond.	1125	µmhos
Plate Cur.	6.0	ma.
Load Res.	11000 *	ohms
Power Output	0.170	approx. watts

* Approximately twice this value is recommended for load of this tube when used as driver for Class B stage.

Cunningham Radiotron

RCA-49

AVERAGE PLATE CHARACTERISTICS
CLASS B OPERATION

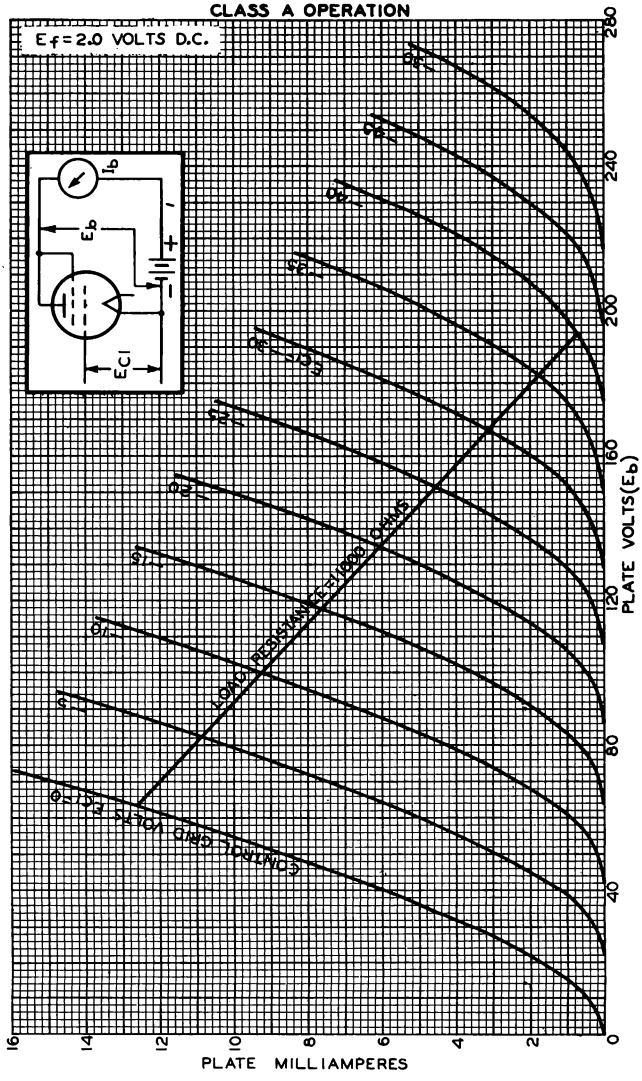


Cunningham Radiotron

RCA-49

AVERAGE PLATE CHARACTERISTICS

CLASS A OPERATION



Cunningham Radiotron

RCA-50

POWER AMPLIFIER

Filament	Coated	
Voltage	7.5	a-c or d-c volts
Current	1.25	amp.
Direct Interelectrode Capacitances:		
Grid to Plate	7.1	μμf
Grid to Filament	4.2	μμf
Plate to Filament	3.4	μμf
Maximum Overall Length		6-1/4"
Maximum Diameter		2-7/16"
Bulb		ST-19
Base		Med. 4-Pin Bay.
Pin 1-Filament		Pin 3-Grid
Pin 2-Plate		Pin 4-Filament

BOTTOM VIEW

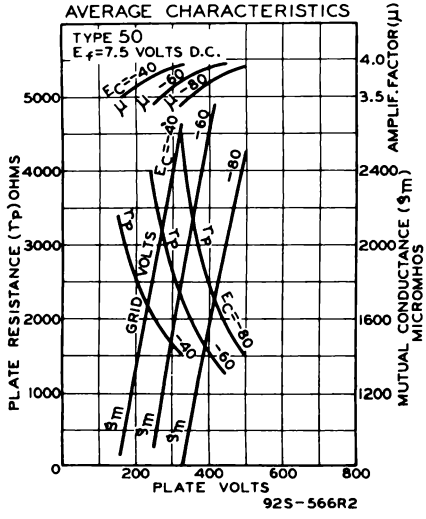
AMPLIFIER (Class A)

Operating Conditions and Characteristics:

Filament	7.5	7.5	7.5	7.5	a-c volts
Plate	300	350	400	450 max.	volts
Grid*	-54	-63	-70	-84	volts
Amp. Fact.	3.8	3.8	3.8	3.8	
Plate Res.	2000	1900	1800	1800	ohms
Mut. Cond.	1900	2000	2100	2100	μmhos
Plate Cur.	35	45	55	55	ma.
Load Res.	4600	4100	3670	4350	ohms
U.P.O.	1.6	2.4	3.4	4.6	watts

Self-bias is advisable in all cases. The resistance in the grid-coupling circuit should not exceed 10000 ohms.

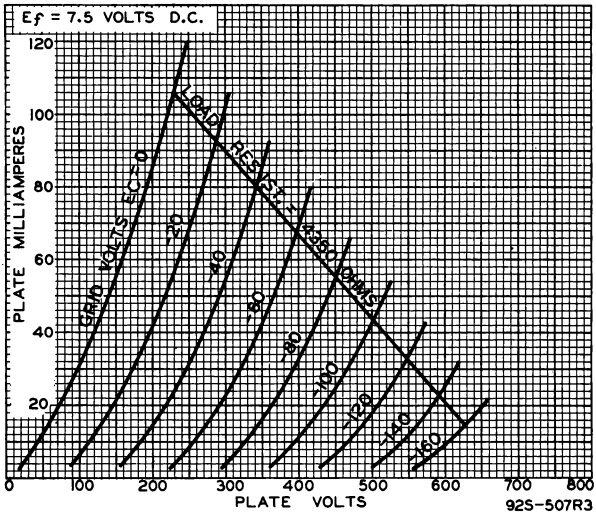
* Grid volts measured from mid-point of a-c operated filament.



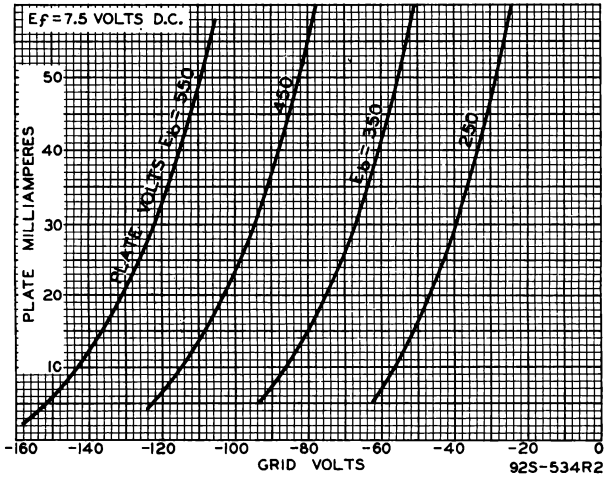
Cunningham Radiotron

RCA-50

AVERAGE PLATE CHARACTERISTICS



AVERAGE CHARACTERISTICS



50A5
BEAM POWER AMPLIFIER

GENERAL DATA

Electrical:

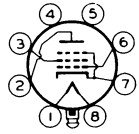
Heater, for Unipotential Cathode:

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 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

AMPLIFIER - Class A_1

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 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

50B5

BEAM POWER AMPLIFIER

MINIATURE TYPE

GENERAL DATA

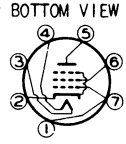
Electrical:

Heater, for Unipotential Cathode:		
Voltage	50	ac or dc volts
Current	0.15	amp.
Direct Interelectrode Capacitances (Approx.):[o]		
Grid-No.1 to Plate	0.5	μμf
Input	13	μμf
Output	6.5	μμf

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	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_1 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.

[o] With no external shield.

50B5

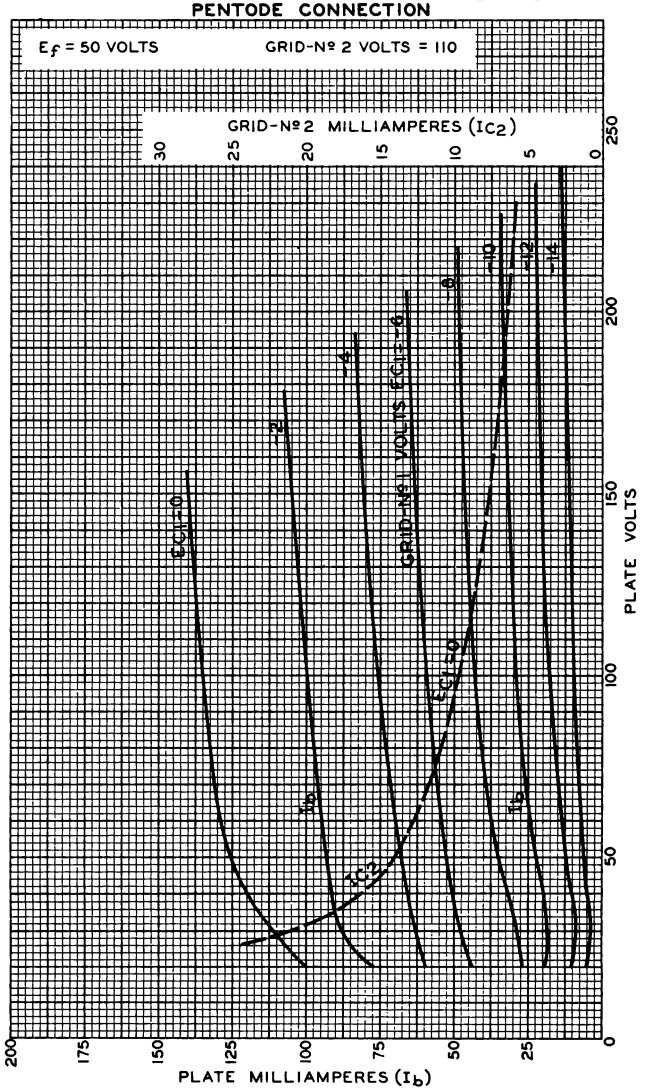
BEAM POWER AMPLIFIER

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

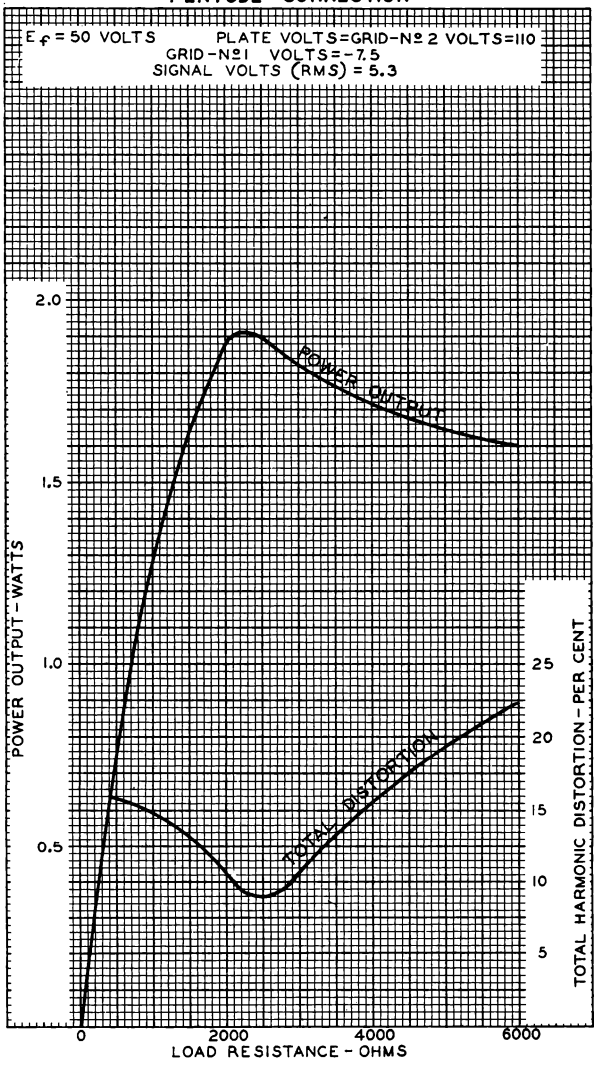
50B5
AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



50B5

50B5

OPERATION CHARACTERISTICS
PENTODE CONNECTION



50C5

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 50C5 is similar to the miniature type 50B5.

GENERAL DATA

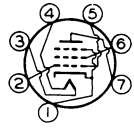
Electrical:

Heater, for Unipotential Cathode:		
Voltage	50	ac or dc volts
Current	0.15	amp
Direct Interelectrode Capacitances (Approx.):°		
Grid No.1 to plate	0.55	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	13	μμf
Plate to cathode & grid No.3, grid No.2, and heater	9	μμf

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_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	135 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	117 max.	volts
PLATE DISSIPATION	5.5 max.	watts
GRID-No.2 INPUT	1.25 max.	watts
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)♦	250 max.	°C

° Without external shield.

♦ 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.

50C5
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	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.)	1000	ohms
Transconductance	7500	μmhos
Load Resistance	2500	ohms
Total Harmonic Distortion	9	%
Max.-Signal Power Output	1.9	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 50B5 also apply to the 50C5

50C6-G

BEAM POWER AMPLIFIER

GENERAL DATA

Electrical:

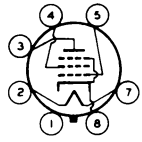
Heater, for Unipotential Cathode:

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_1

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:

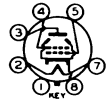
Plate Voltage	135	200	volts
Grid-No.2 Voltage	135	135	volts
Grid-No.1 (Control-Grid) Voltage	-13.5	-14	volts
Peak AF Grid-No.1 Voltage	13.5	14	volts
Zero-Signal Plate Current	58	61	ma
Max.-Signal Plate Current	60	66	ma
Zero-Signal Grid-No.2 Current	3.5	2.2	ma
Max.-Signal Grid-No.2 Current	11.5	9.0	ma
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.

50L6-GT

BEAM POWER AMPLIFIER

Heater ■	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_1 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.

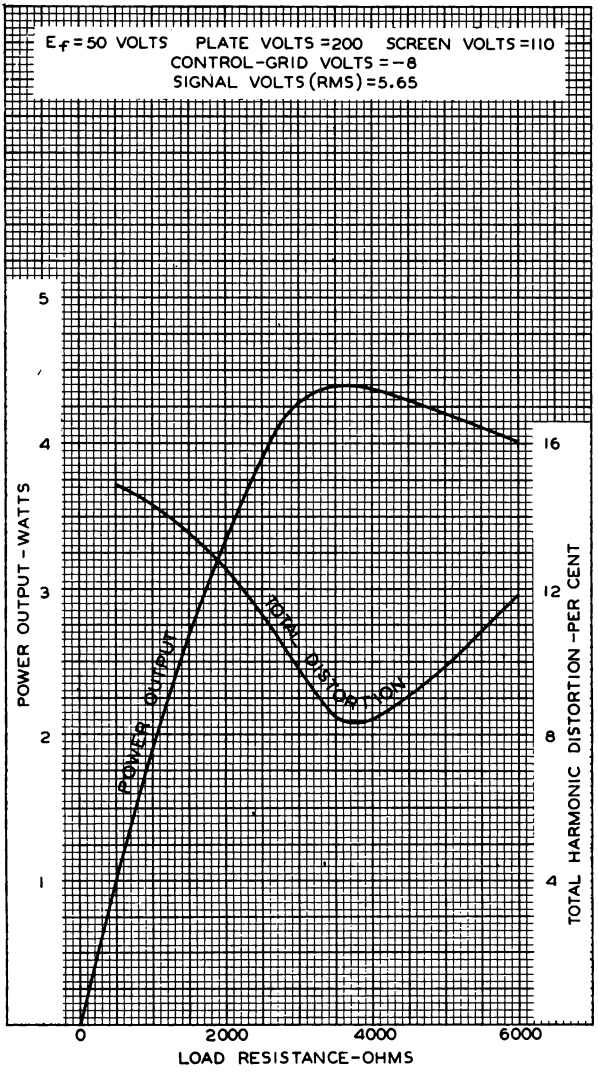
Curves under type 25L6-GT also apply to the 50L6-GT.

← Indicates a change.

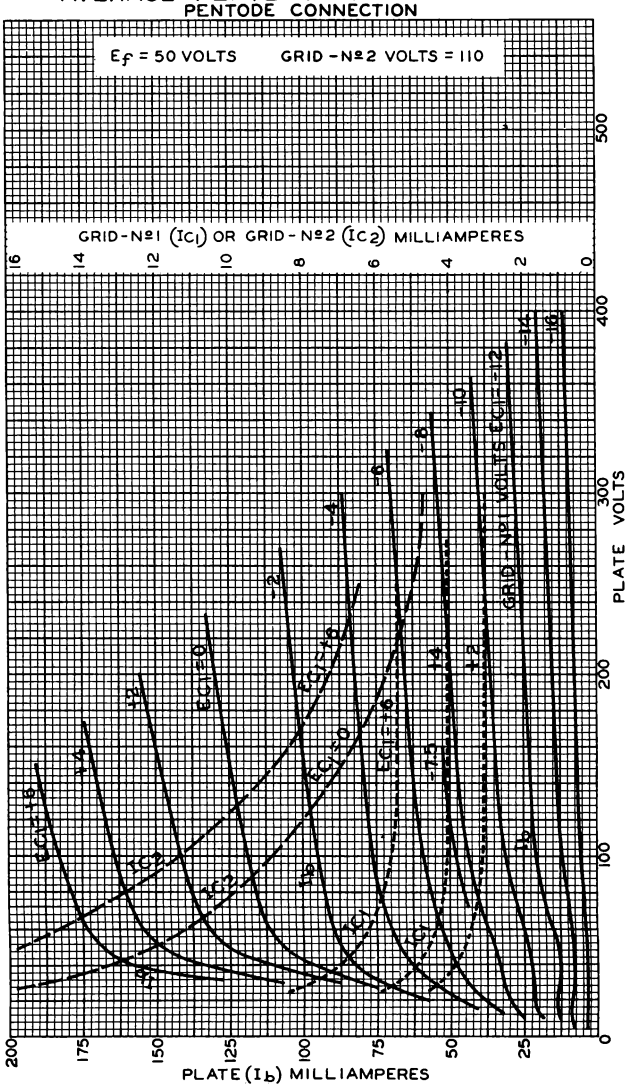
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

50L6-GT

OPERATION CHARACTERISTICS



50L6-GT
AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



JAN. 27, 1950

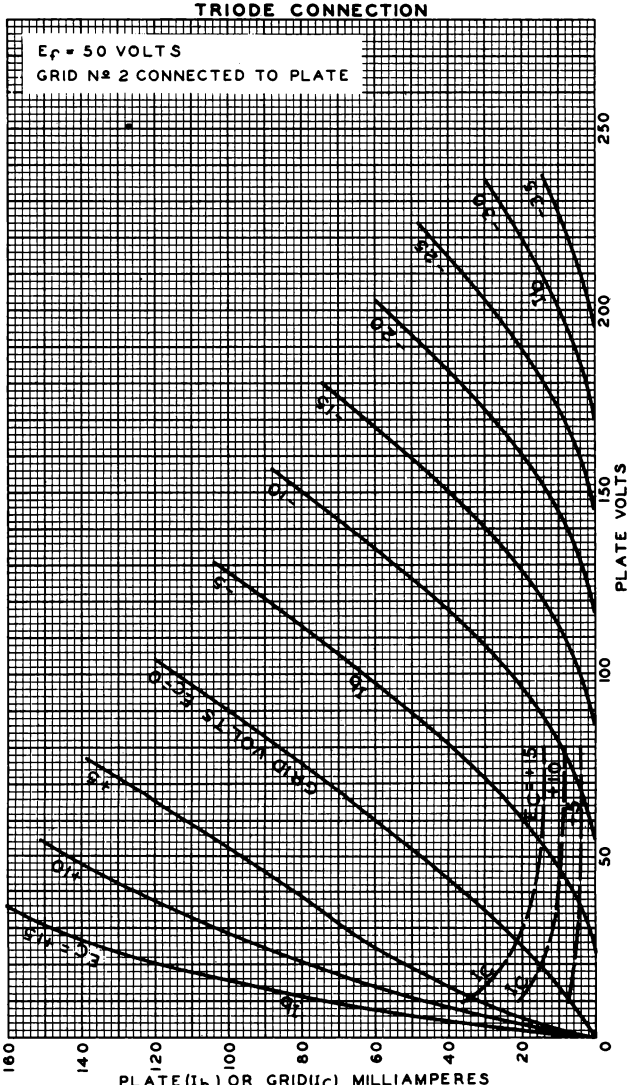
TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6314R1

50L6-GT

50L6-GT
AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



APRIL 6, 1948 TUBE DEPARTMENT 92CM-6316R1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

50X6
VACUUM RECTIFIER-DOUBLER

GENERAL DATA

Electrical:

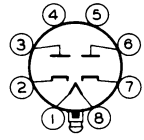
Heater, for Unipotential Cathodes:

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 2 - Cathode of Unit No.2
Pin 3 - Plate of Unit No.2
Pin 4 - No Connection



Pin 5 - No Connection
Pin 6 - Plate of Unit No.1
Pin 7 - Cathode of Unit No.1
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:°

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:

	Half-Wave	*Full-Wave*	
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

° 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.

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

50Y7-GT

VACUUM RECTIFIER-DOUBLER

GENERAL DATA

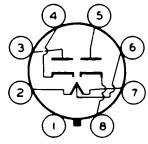
Electrical:

Heater, for Unipotential Cathode:	Without Panel Lamp	With No.40 or No.47 Panel Lamp	
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
Current { 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-8AN

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
With Panel Lamp & { 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

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:°

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

° Plate current must not flow through heater section between pins 6 and 7.

50Y6-GT/G

HIGH-VACUUM RECTIFIER-DOUBLER

Heater	Coated Unipotential Cathodes	
Voltage	50	a-c or d-c volts
Current	0.15	amp.

The 50Y6-GT/G is the same as the 25Z6-GT/G except for heater rating.

50Z7-G

HIGH-VACUUM RECTIFIER-DOUBLER

Heater	Coated Unipotential Cathodes	
Voltage: Entire Heater (pins #2 & #7)	50	a-c or d-c volts
Voltage: Panel Lamp Section (pins #6 & #7) with 0.15 amp. between pins #2 & #7	2.0	a-c or d-c volts
Current	0.15	amp.
Maximum Overall Length		4-1/8"
Maximum Seated Height		3-9/16"
Maximum Diameter		1-9/16"
Bulb		ST-12
Base		Small Shell Octal 8-Pin
Pin 1 - No Connection		Pin 5 - Plate #1
Pin 2 - Heater		Pin 6 - Heater Tap
Pin 3 - Plate #2		Pin 7 - Heater
Pin 4 - Cathode #2		Pin 8 - Cathode #1
Mounting Position		Any

BOTTOM VIEW (G-8AN)

Maximum Ratings Are Design-Center Values

RECTIFIER OR DOUBLER

Peak Inverse Plate Voltage	700 max.	volts
Peak Plate Current per Plate	400 max.	ma.
D-C Output Current per Plate with Panel Lamp	65 max.	ma.
D-C Heater-Cathode Potential	350 max.	volts
Panel-Lamp Sect. Volt. (between pins #6 & #7)	2.5 max.	volts

*Typical Operation as Half-Wave Rectifier-With #292 or #292A Panel Lamp:**

Heater Cur. (between pins #2 & #6)	0.15	0.15	amp.
Heater Volt. (between pins #2 & #7) approx.	50	50	volts
A-C Plate Supply Voltage per Plate (RMS)	117	235	volts
Min. Total Effect. Plate-Supply Imped. per Plate	15	100	ohms
D-C Output Current per Plate	65	65	ma.

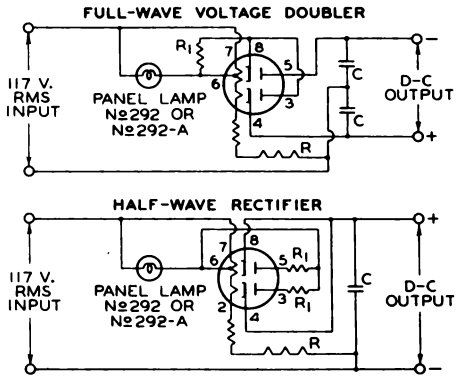
Typical Operation as Voltage Doubler-With #292 or #292A Panel Lamp:

Heater Cur. (between pins #2 & #6)	0.15	amp.
Heater Voltage (between pins #2 & #7) approx.	50	volts
A-C Plate Supply Voltage per Plate (RMS)	117	volts
Min. Total Effect. Plate-Supply Imped. per Plate	15	ohms
D-C Output Current	65	ma.

* In half-wave rectifier service, the two units may be used separately or in parallel.

50Z7-G

HIGH-VACUUM RECTIFIER-DOUBLER



C = Filter Condenser.
R = Heaters of Other Tubes in Series with Voltage-Dropping Resistor.
R_1 = Protective Resistor.

NOTE: Drop across R and all heaters (with panel lamp) should equal 117 volts at 0.15 amp.

The license extended to the purchaser of tubes appears in the License Notice accompanying them. Information contained herein is furnished without assuming any obligations.

CLASS B TWIN AMPLIFIER

Heater	Coated Unipotential Cathode	
Voltage	2.5	a-c or d-c volts
Current	2.0	amp.

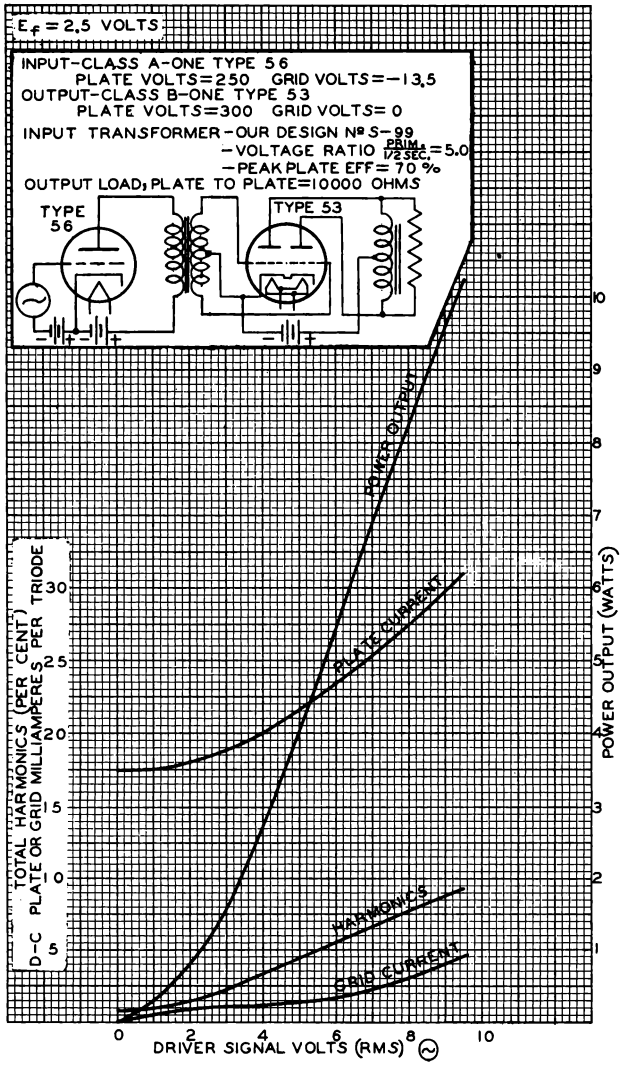
For additional data and curves, see Types 6N7 and 6A6, and the RESISTANCE-COUPLED AMPLIFIER CHART. The operating conditions and characteristics of the 53 are identical with those of the 6N7 and 6A6 except for heater voltage and current. The physical characteristics of the 53 are the same as those of the 6A6. ←

← Indicates a change

Cunningham Radiotron

RCA-53

OPERATION CHARACTERISTICS



55
TWIN DIODE—MEDIUM-MU TRIODE

Heater, for Unipotential Cathode:		
Voltage	2.5	ac or dc volts
Current	1.0	amp

Type 55 is the same as Type 85 except for heater rating.

56
MEDIUM-MU TRIODE

Heater, for Unipotential Cathode:		
Voltage	2.5	ac or dc volts
Current	1.0	amp
Direct Interelectrode Capacitances:[o]		
Grid to Plate	3.2	μμf
Grid to Cathode	3.2	μμf
Plate to Cathode	2.4	μμf

[o] Without external shield.

Type 56 is the same as Type 76 except for heater rating and direct interelectrode capacitances.

57
SHARP-CUTOFF PENTODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	2.5	ac or dc volts
Current	1.0	amp
Direct Interelectrode Capacitances:		
Pentode Connection:		
Grid No.1 to Plate[o]	0.007 max.	μμf
Input[oo]	5	μμf
Output[oo]	6.5	μμf
Triode Connection:[*oo]		
Grid No.1 to Plate	2	μμf
Grid No.1 to Cathode	3	μμf
Plate to Cathode	10.5	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	4-15/16"
Seated Length	4-3/16" ± 1/8"
Maximum Diameter	1-9/16"
Bulb	ST-12

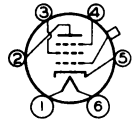
(continued on next page)

[o] With external shield connected to cathode.
[oo] Without external shield.
[*] With grid No.2 and grid No.3 connected to plate.

57
SHARP-CUTOFF PENTODE

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
Pin 6 - Heater

Cap - Grid No.1

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

58
REMOTE-CUTOFF PENTODE

GENERAL DATA

Electrical:

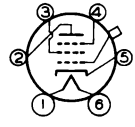
Heater, for Unipotential Cathode:
Voltage. . . . . 2.5 . . . . . ac or dc volts
Current. . . . . 1.0 . . . . . amp
Direct Interelectrode Capacitances:
Grid No.1 to Plate° . . 0.007 . . . . . μμf
Input. . . . . 4.7 . . . . . μμf
Output . . . . . 6.3 . . . . . μμf

° With external shield connected to cathode.

Mechanical:

Mounting Position. . . . . Any
Maximum Overall Length . . . . . 4-15/16"
Seated Length. . . . . 4-3/16" ± 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
Pin 6 - Heater

Cap - Grid No.1

Maximum Ratings, Characteristics, and Typical Operating Conditions are the same as for Type 6U7-G.

Curves for Type 58 are the same as those for Types 6U7-G and 6D6.

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

70L7-GT

70L7-GT

RECTIFIER–BEAM POWER AMPLIFIER

Heater ■	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		Any

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 ←
Typical Operation and Characteristics - Class A_1 Amplifier:			←
Plate	110		volts
Screen	110		volts
Grid *	-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 ←
With Condenser-Input Filter:			
A-C Plate Voltage (RMS)	117	max.	volts
Total Effective Plate-Supply Impedance ▲	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.

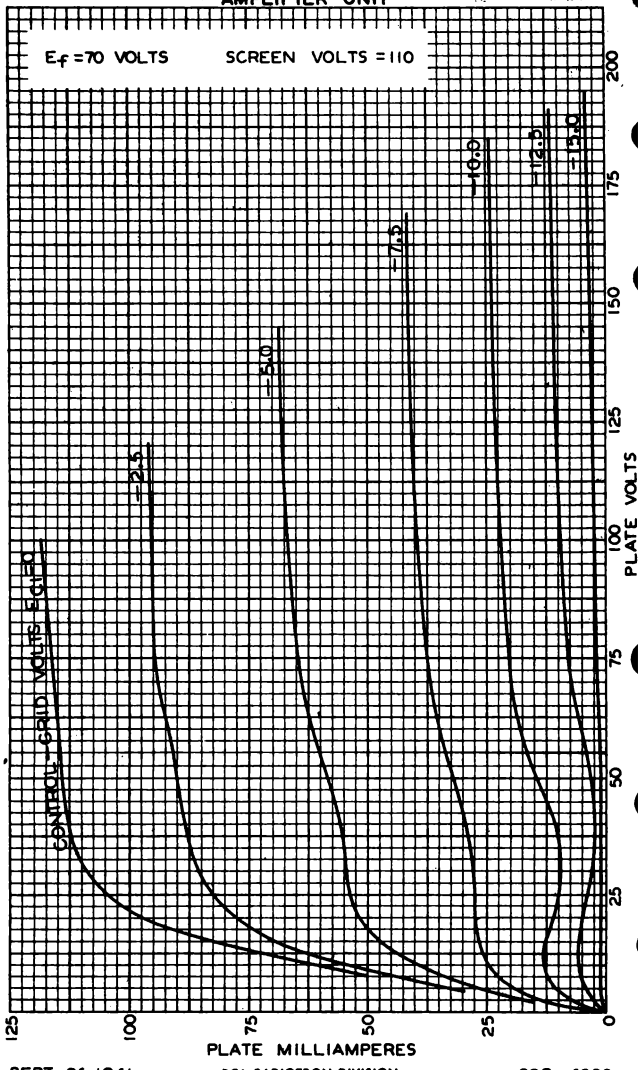
← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

70L7-GT

70L7-GT

AVERAGE PLATE CHARACTERISTICS
AMPLIFIER UNIT



SEPT. 26, 1941

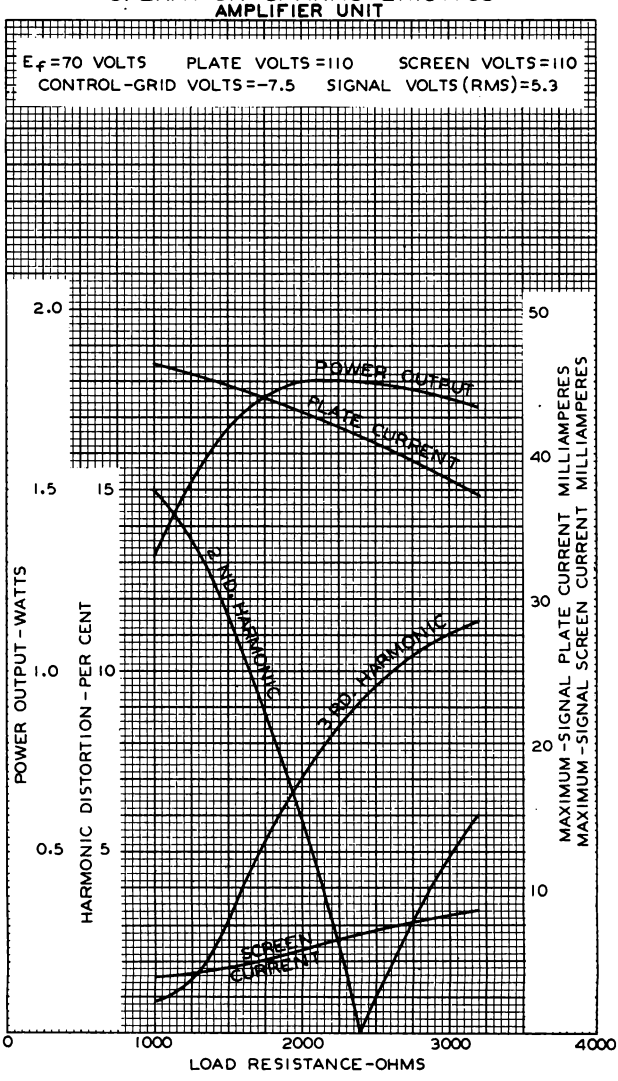
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6323

70L7-GT

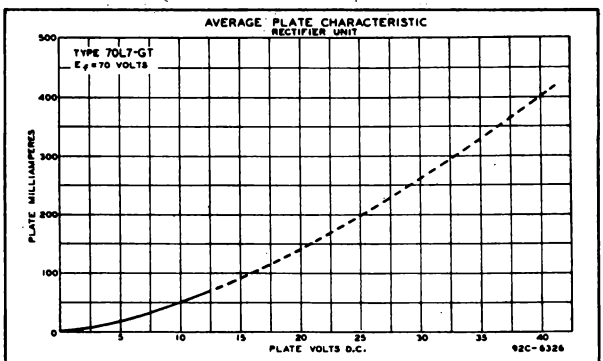
OPERATION CHARACTERISTICS

AMPLIFIER UNIT

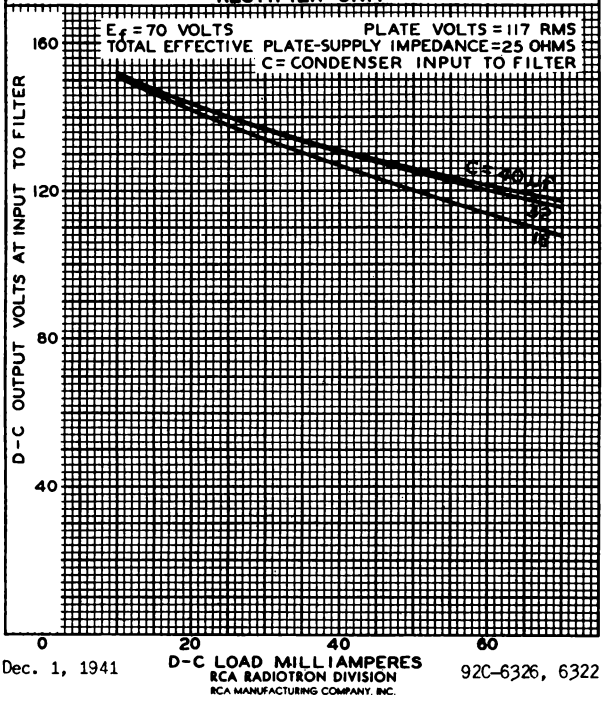


70L7-GT

RECTIFIER–BEAM POWER AMPLIFIER



OPERATION CHARACTERISTICS
RECTIFIER UNIT



Cunningham Radiotron

RCA-71-A

POWER AMPLIFIER

Filament	Coated	
Voltage	5.0	a-c or d-c volts
Current	0.25	amp.
Direct Interelectrode Capacitances:		
Grid to Plate	7.5	μμf
Grid to Filament	3.2	μμf
Plate to Filament	2.9	μμf
Maximum Overall Length		4-11/16"
Maximum Diameter		1-13/16"
Bulb		ST-14
Base		Medium 4-Pin Bay.
Pin 1-Filament+		Pin 3-Grid
Pin 2-Plate		Pin 4-Filament-

BOTTOM VIEW

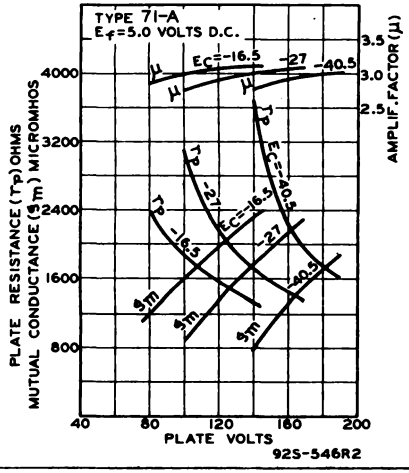
AMPLIFIER (Class A)

Operating Conditions and Characteristics:

Filament	5.0	5.0	5.0	d-c volts
Plate	90	135	180 max.	volts
Grid	-16.5	-27	-40.5	volts
Amp. Fact.	3	3	3	
Plate Res.	2170	1820	1750	ohms
Mut. Cond.	1400	1650	1700	μmhos
Plate Cur.	10	17.3	20	ma.
Load Res.	3000	3000	4800	ohms
U.P.O.	125	400	790	mw.

A grid coupling resistor, if used, should not exceed 0.5 megohm.

AVERAGE CHARACTERISTICS



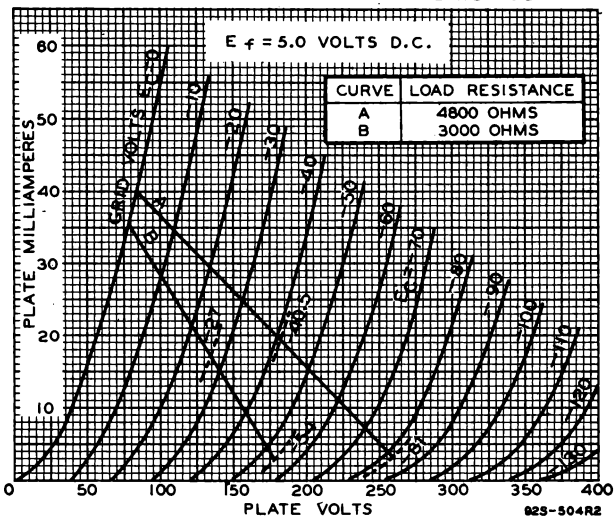
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

71-A

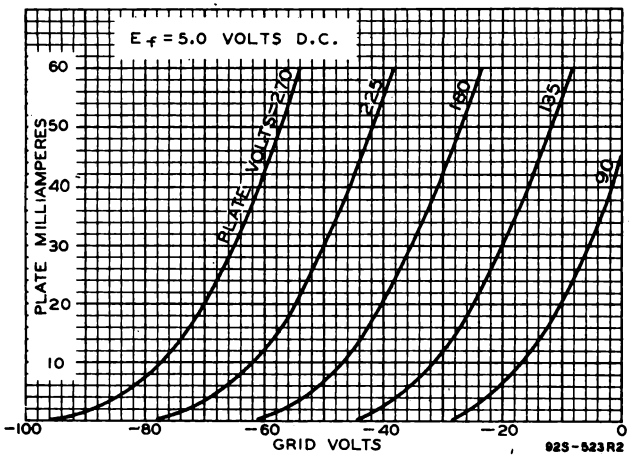
Cunningham Radiotron

RCA-71-A

AVERAGE PLATE CHARACTERISTICS



AVERAGE CHARACTERISTICS



SEPT. 13, 1935

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4477

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.):		
Triode Unit		
Grid to Plate		1.7 μμf
Grid to Cathode		1.7 μμf
Plate to Cathode		3.8 μμf
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.

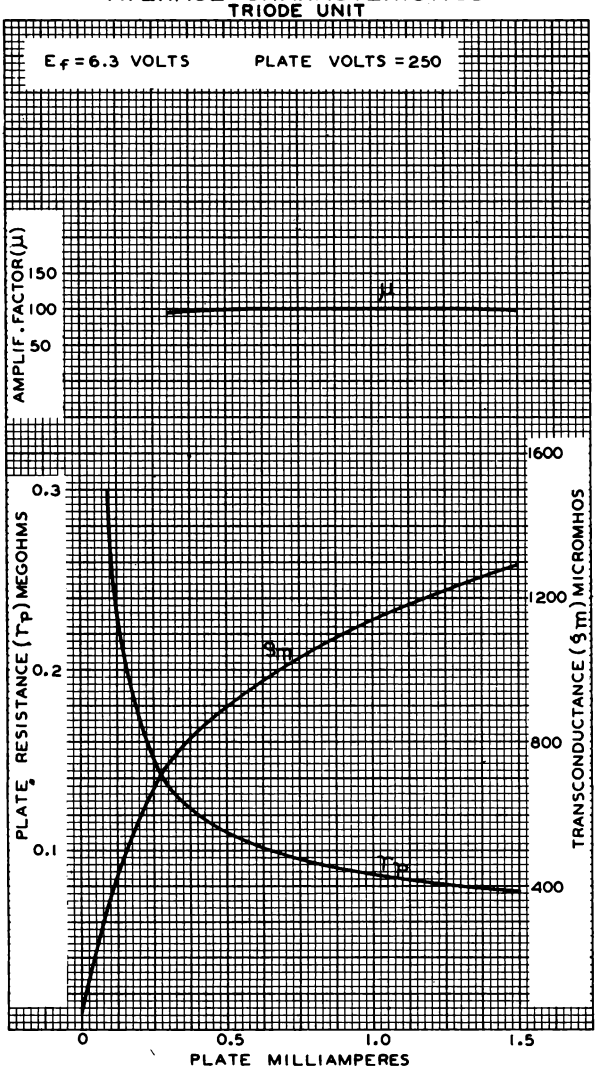
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

75

75

AVERAGE CHARACTERISTICS

TRIODE UNIT



JULY 31, 1941

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-5284R1

76
MEDIUM-MU TRIODE

GENERAL DATA

Electrical:

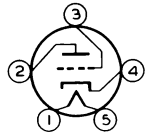
Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances:°		
Grid to Plate	2.8	μμf
Grid to Cathode	3.5	μμf
Plate to Cathode	2.5	μμf

° With no external shield.

Mechanical:

Mounting Position	Any
Maximum Overall Length	4-3/16"
Seated Length	3-3/8" ± 3/16"
Maximum Diameter	1-9/16"
Bulb	ST-12
Base	Small-Shell Small 5-Pin
Basing Designation for BOTTOM VIEW	5A

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



Pin 4 - Cathode
Pin 5 - Heater

AMPLIFIER - Class A_1

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

PLATE VOLTAGE	250 max.	volts
PLATE DISSIPATION	1.4 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	100	250	volts
Grid Voltage	-5	-13.5	volts
Amplification Factor	13.8	13.8	
Plate Resistance	12000	9500	ohms
Transconductance	1150	1450	μmhos
Plate Current	2.5	5	ma

Maximum Circuit Values:

Grid-Circuit Resistance	1 max. megohm

← Indicates a change.

76
MEDIUM-MU TRIODE

DETECTOR

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

Typical Operation as Biased Detector:

Plate Voltage	100	250	volts
Grid Voltage (Approx.)	-8	-20	volts
Plate Current	Adjust to 0.2 ma. with no input signal		
Cathode-Bias Resistor▲	30000 to 150000	30000 to 150000	ohms

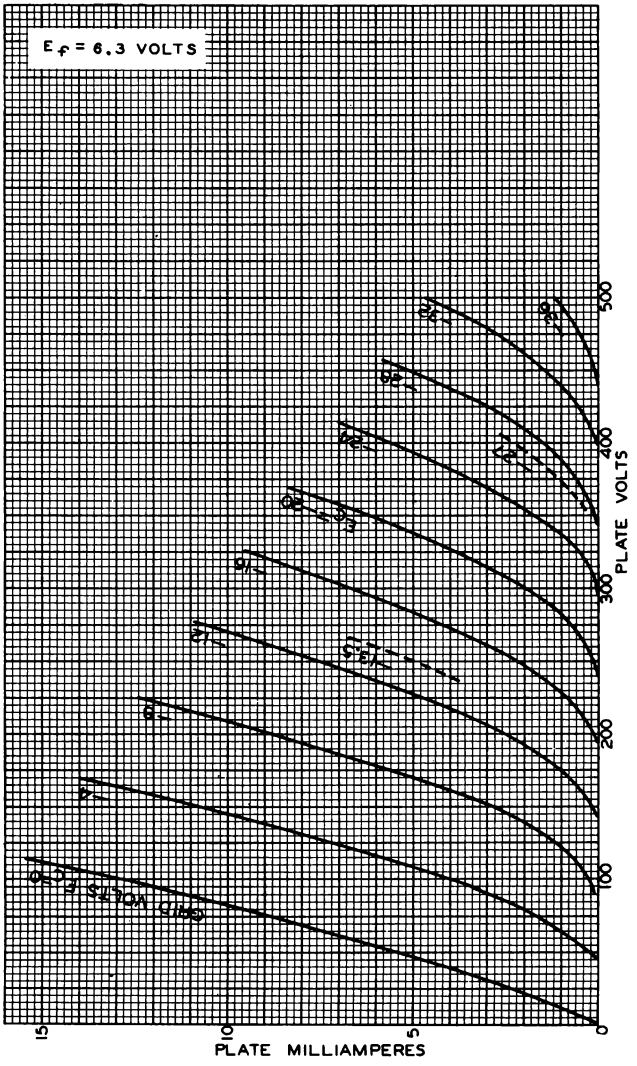
Typical Operation as Grid-Resistor Detector:

Plate Voltage	45	volts
Grid	Return to cathode	
Grid Resistor	1 to 5	megohms
Grid Capacitor	250	μμf

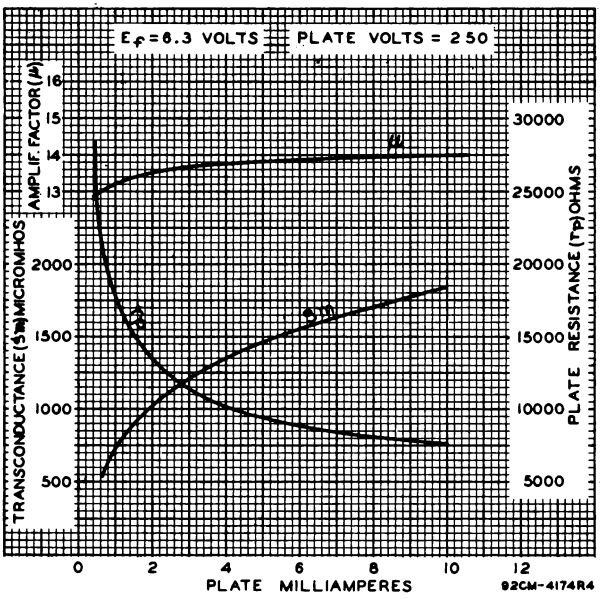
▲ Not critical.

76

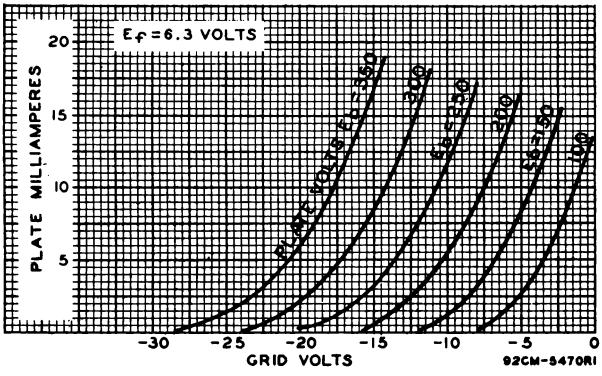
AVERAGE PLATE CHARACTERISTICS



AVERAGE CHARACTERISTICS



AVERAGE CHARACTERISTICS



77

TRIPLE-GRID DETECTOR 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.°		μμf
Input	4.7		μμf
Output	11		μμf
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 - Plate		Pin 6 - Heater	
Pin 3 - Screen		Cap - Grid	
Pin 4 - Suppressor			
Mounting Position	BOTTOM VIEW (6F)		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		0.75 max.	watt
Screen Dissipation		0.1 max.	watt
Typical Operation and Characteristics - Class A_1 Amplifier:			
Plate	100	250	volts
Screen	60	100	volts
Grid*	-1.5	-3	volts
Suppressor	Connected to cathode at socket		
Plate Res. (approx.)	0.6	#	megohm
Transcond.	1100	1250	μmhos
Grid Bias for cathode-current cut-off	-5.5	-7.5	volts
Plate Cur.	1.7	2.3	ma.
Screen Cur.	0.4	0.5	ma.

DETECTOR

Typical Operation as Biased Detector:				
Plate Supply▲	100	250	250	volts
Screen	36	50	100 max.	volts
Grid	-1.95	-1.95	-4.3	volts
Cathode Resistor	12500	3000	10000	ohms
Suppressor	Connected to cathode at socket			
Cathode Cur. (no signal)	0.155	0.650	0.43	ma.
Plate Resistor	0.25	0.25	0.5	megohm
Blocking Condenser	0.01	0.03	0.03	μf
Grid Resistor for following amplifier tube	0.25	0.25	0.25	megohm
R-F Signal (RMS)°°	1.88	1.18	1.37	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.

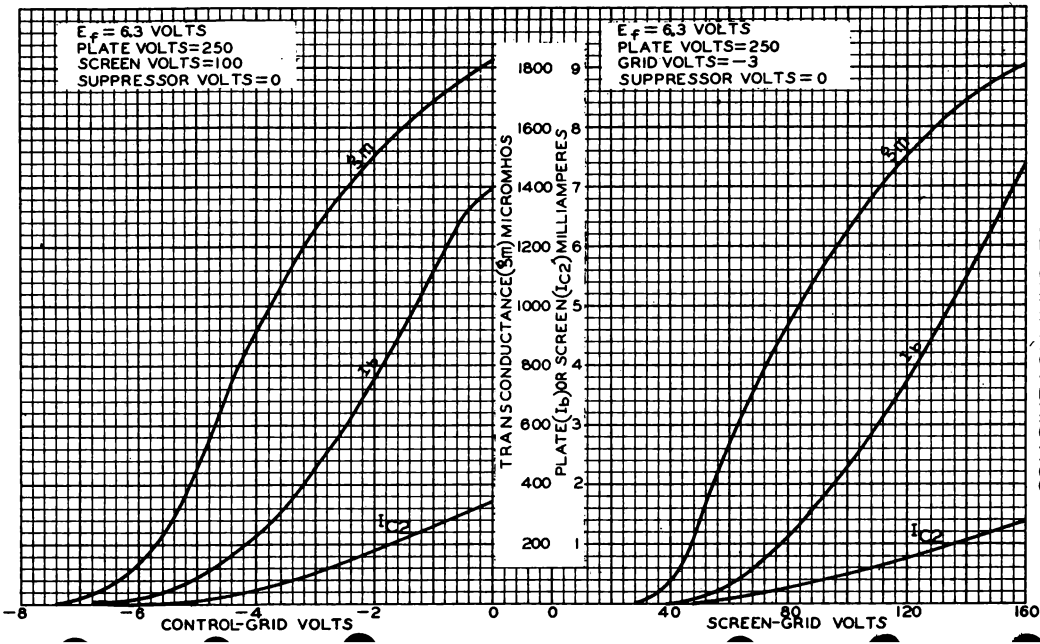
° With shield-can connected to cathode. The internal shield within the dome of the 77 is connected to the screen within the tube.

* The d-c resistance in the grid circuit should not exceed 1.0 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 for the 100-volt plate supply is 14 peak volts at the grid of the following amplifier; likewise, for the 250-volt conditions, 17 peak volts.

\# Greater than 1.0 megohm. ← Indicates a change.



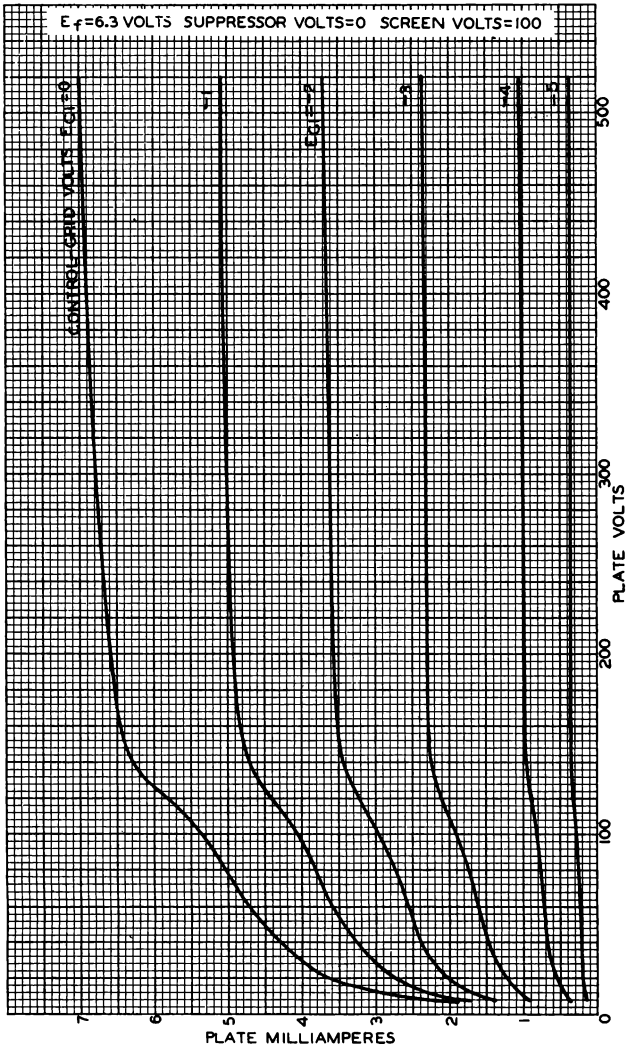
AVERAGE CHARACTERISTICS

77

Cunningham Radiotron

RCA-77

AVERAGE PLATE CHARACTERISTICS

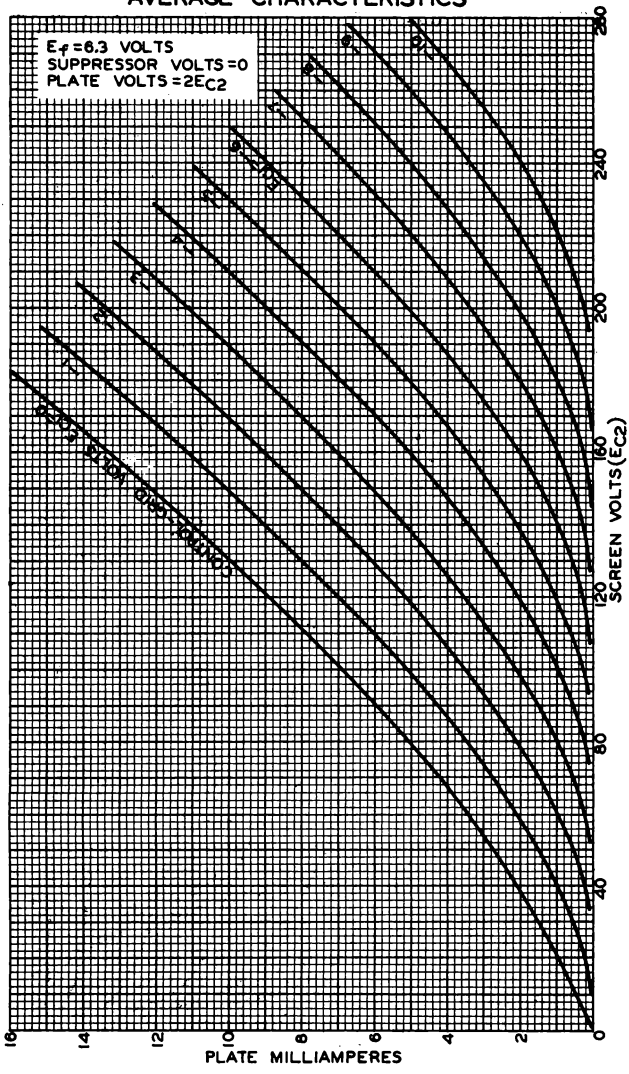


77

Cunningham Radiotron

RCA-77

AVERAGE CHARACTERISTICS



JUNE 12, 1933

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92S-5329

Cunningham Radiotron

RCA-78

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. ←

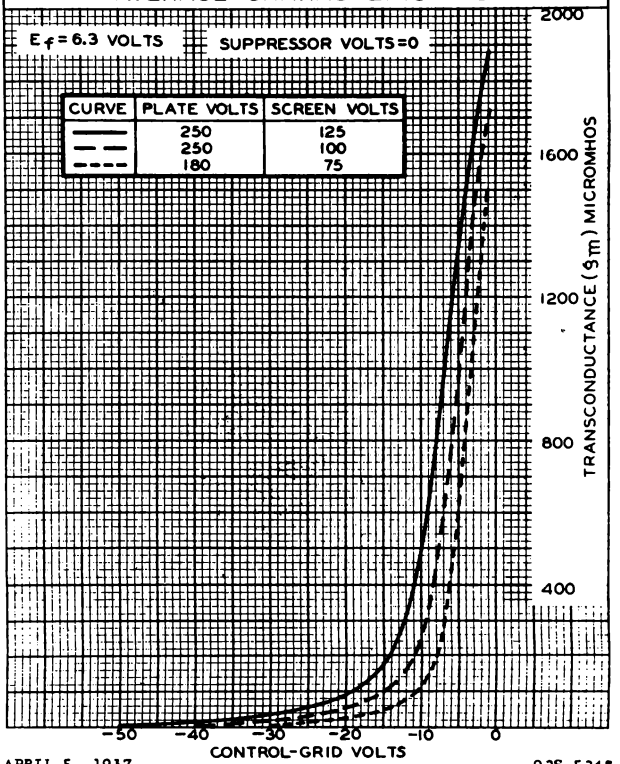
Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances:⊙		
Grid to Plate	0.007 max.	μμf
Input	4.5	μμf
Output	11.0	μμf
Overall Length		4-9/32" to 4-17/32"
Maximum Diameter		1-9/16"
Bulb		ST-12
Cap		Small Metal
Base		Small 6-Pin
Pin 1-Heater		Pin 5-Cathode
Pin 2-Plate		Pin 6-Heater
Pin 3-Screen		Cap -Grid
Pin 4-Suppressor		

BOTTOM VIEW

⊙With shield can.

←Indicates a change

AVERAGE CHARACTERISTICS



APRIL 5, 1937

92S-5248

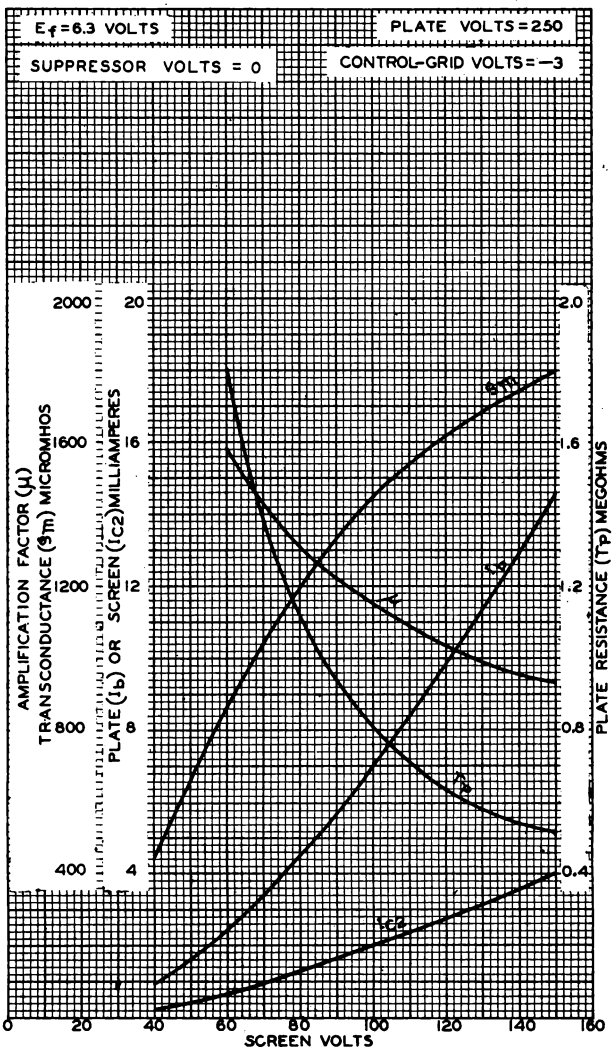
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

78

Cunningham Radiotron

RCA-78

AVERAGE CHARACTERISTICS



SEPT. 11, 1933

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

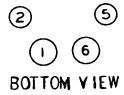
92S—5247R1

RCA-79

CLASS B TWIN AMPLIFIER

Heater	Coated Uni-potential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.6	amp.
Overall Length		4-9/32" to 4-17/32"
Maximum Diameter		1-9/16"
Bulb		ST-12
Cap		Small Metal
Base		Small 6-Pin

Pin 1-Heater
Pin 2-Plate (Triode T_2)
Pin 3-Grid (Triode T_2)
Pin 4-Cathode



BOTTOM VIEW

Pin 5-Plate (Triode T_1)
Pin 6-Heater
Cap -Grid (Triode T_1)

For convenience, one triode unit is identified as T_1, the other as T_2.

CLASS "B" POWER AMPLIFIER

Plate Voltage		250 max.	volts
Peak Plate Current (per plate)		90 max.	ma.
Average Plate Dissipation		11.5 max.	watts
Typical Operation:			
Heater *	6.3	6.3	volts
Plate	180	250	volts
Grid	0	0	volts
Zero-Sig. Plate Current (per plate)	3.8	5.3	ma.
Load Res. (per plate)	1750	3500	ohms
Effective Load Res. (plate to plate)	7000	14000	ohms
Power Output°	5.5	8.0	approx. watts

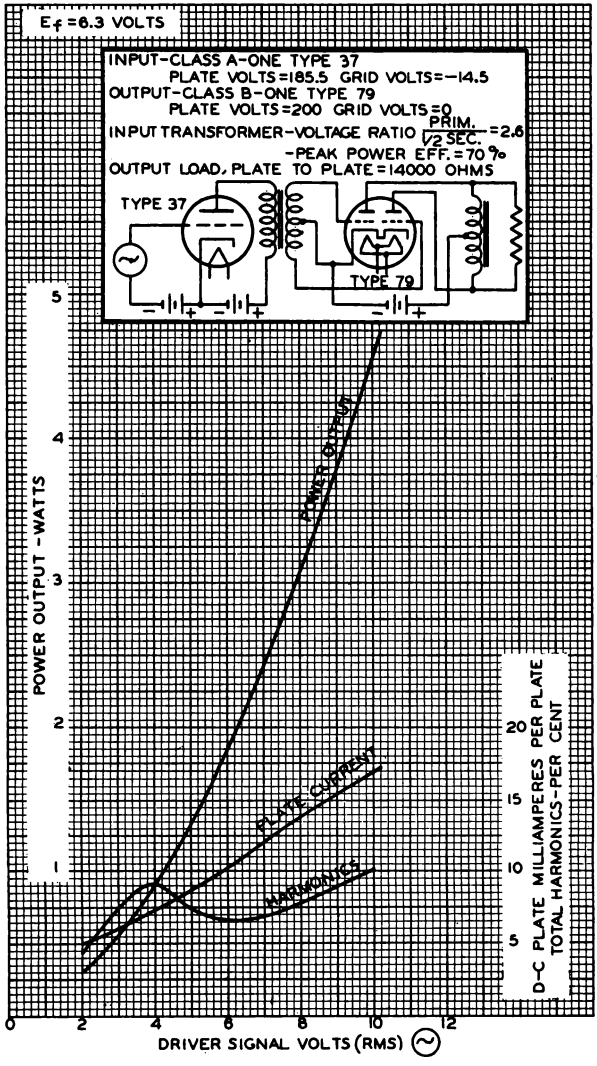
* In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

° With average power input of 380 milliwatts applied between grids.

Cunningham Radiotron

RCA-79

OPERATION CHARACTERISTICS

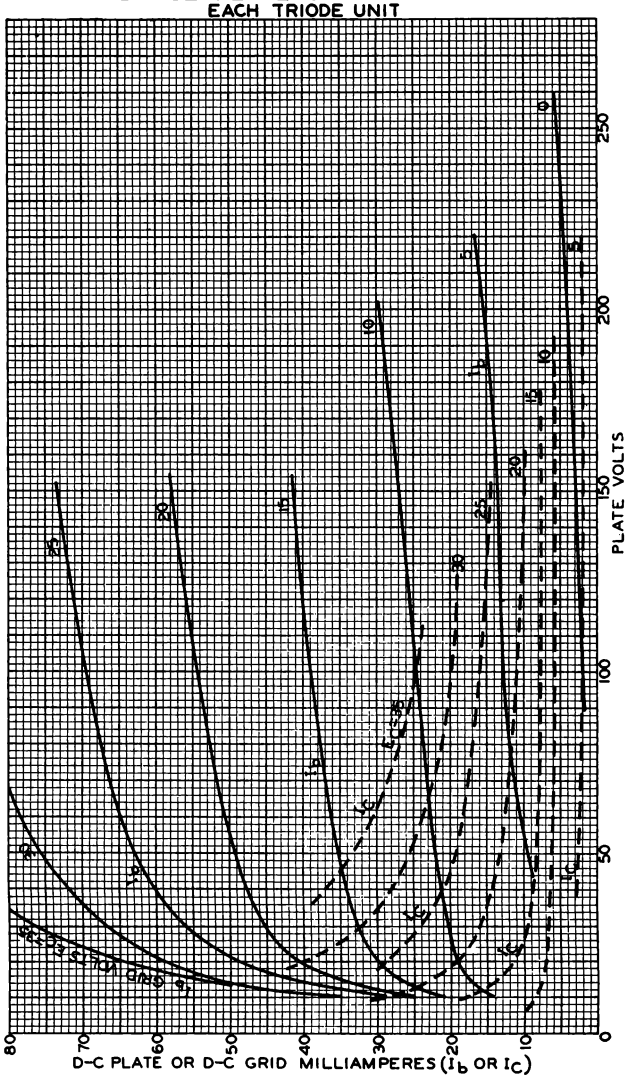


RCA Radiotron — Cunningham RADIO TUBES

RCA-79 — C-79

AVERAGE PLATE CHARACTERISTICS

EACH TRIODE UNIT



DEC. 6, 1932

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92S-5226

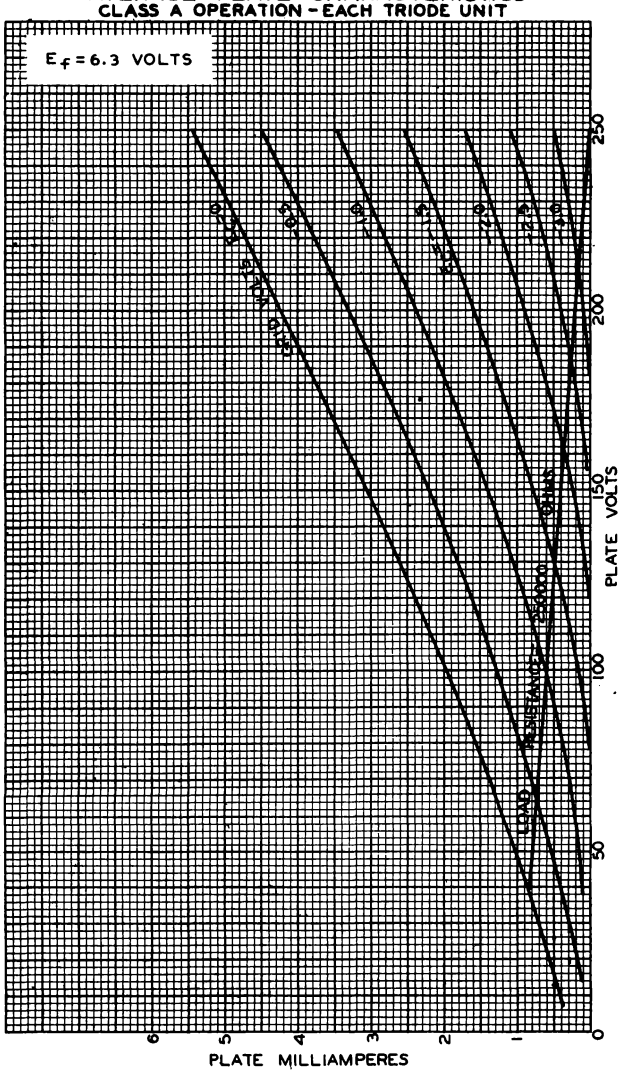
79

Radiotron — RCA-79

Cunningham RADIO TUBES — C-79

AVERAGE PLATE CHARACTERISTICS

CLASS A OPERATION - EACH TRIODE UNIT



NOV. 1, 1933

925-5413

80

FULL-WAVE HIGH-VACUUM RECTIFIER

Filament	Coated	
Voltage	5.0	a-c volts
Current	2.0	amp.
Maximum Overall Length		4-11/16"
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
Mounting Position	BOTTOM VIEW (4C)	Vertical◊

◊ 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

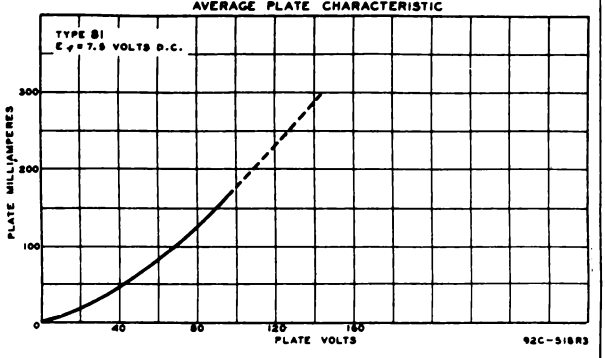
Filament	Coated	
Voltage	7.5	a-c volts
Current	1.25	amp.
Maximum Overall Length		6-1/4"
Maximum Diameter		2-7/16"
Bulb		ST-19
Base		Medium 4-Pin, Bay.
Pin 1 - Filament		Pin 3 - No Connection
Pin 2 - Plate		Pin 4 - Filament
Mounting Position	BOTTOM VIEW (4B)	Vertical◊

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.

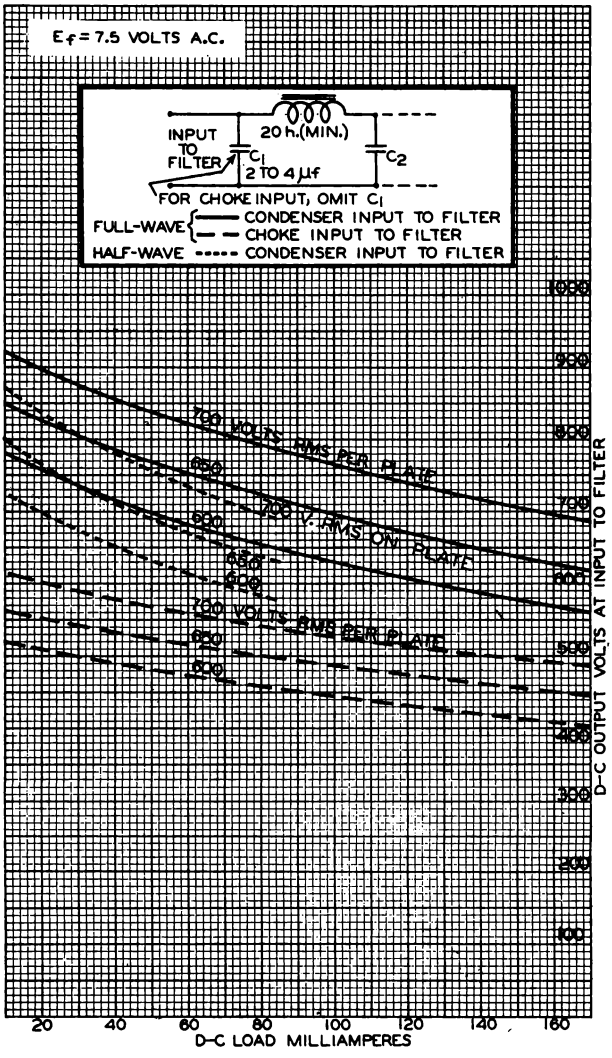
AVERAGE PLATE CHARACTERISTIC



RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

81

OPERATION CHARACTERISTICS



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
Mounting 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
With Condenser-Input Filter:	
A-C Plate Voltage per Plate (RMS)	450 max. volts
Total Effective Plate-Supply Impedance per Plate▲	50 min. ohms
D-C Output Current	115 max. ma.
With Choke-Input Filter:	
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.

▲ 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.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

83
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	BOTTOM VIEW (4C)	Vertical, base down

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	
With Condenser-Input Filter:		
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.
With Choke-Input Filter:		
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 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.

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	BOTTOM VIEW (4AD)	Any

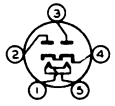
For Curves and additional data, see Type 5T4-G.

* The cathode of the 83-V is connected to the heater within the tube.
→ Indicates a change.

84/6Z4

FULL-WAVE HIGH-VACUUM RECTIFIER

Heater ■	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

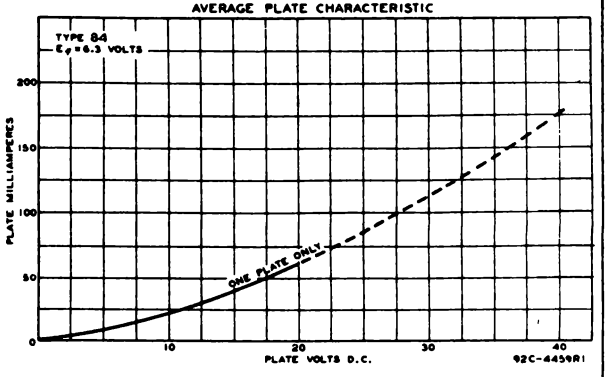


FULL-WAVE RECTIFIER

Peak Inverse Voltage	1250 max. volts
Peak Plate Current per Plate	180 max. ma.
D-C Heater-Cathode Potential	450 max. volts
Typical Operation with Condenser-Input Filter:	
A-C Plate Voltage per Plate (RMS)	325 max. volts
Total Effective Plate-Supply Impedance per Plate ▲	65 min. ohms
D-C Output Current	60 max. ma.
Typical Operation with Choke-Input Filter:	
A-C Plate Voltage per Plate (RMS)	450 max. volts
Input-Choke Inductance	10 min. henries
D-C Output Current	60 max. ma.

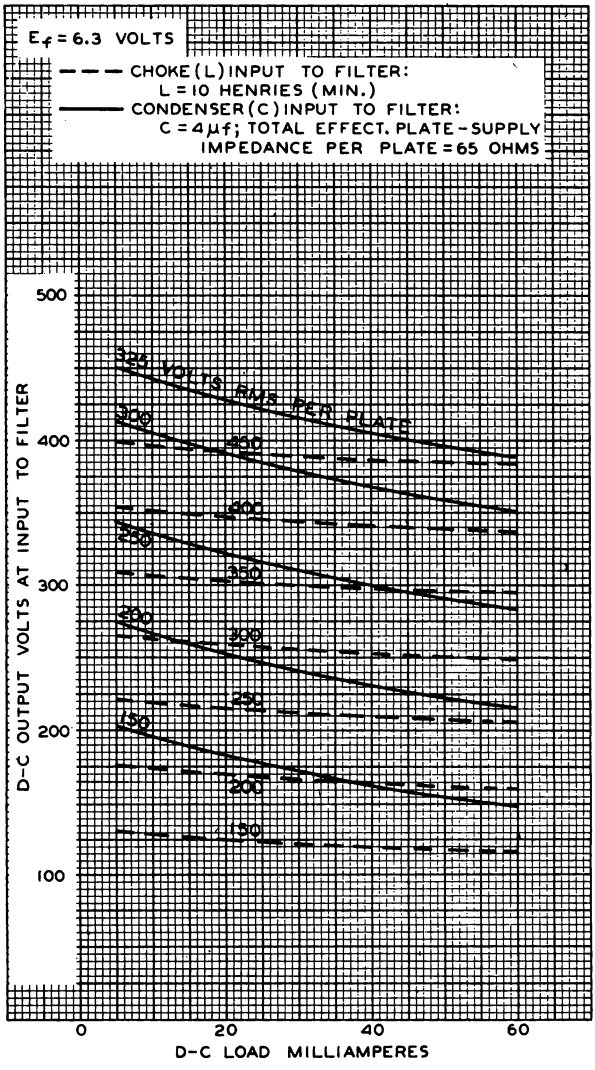
■ The heater voltage should never fluctuate to exceed 7.5 volts.
▲ When a filter-input condenser larger than 40 μf is used, it may be necessary to use more plate-supply impedance than the minimum value shown to limit the peak plate current to the rated value.

AVERAGE PLATE CHARACTERISTIC



84

OPERATION CHARACTERISTICS



85

TWIN DIODE—MEDIUM-MU TRIODE

GENERAL DATA

Electrical:

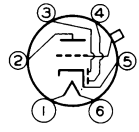
Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances - Triode Unit:*		
Grid to Plate	1.5	μμf
Grid to Cathode	1.5	μμf
Plate to Cathode	4.3	μμf

* With no external shield.

Mechanical:

Mounting Position	Any
Maximum Overall Length	4-17/32"
Seated Length	3-25/32" ± 1/8"
Maximum Diameter	1-9/16"
Bulb	ST-12
Cap	Small
Base	Small-Shell Small 6-Pin
Basing Designation for BOTTOM VIEW	6G

Pin 1 - Heater
Pin 2 - Triode Plate
Pin 3 - Diode No.2 Plate



Pin 4 - Diode No.1 Plate
Pin 5 - Cathode
Pin 6 - Heater
Cap - Triode Grid

TRIODE UNIT
AMPLIFIER - Class A_1

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

Typical Operation and Characteristics:

Plate Voltage	135	180	250	volts
Grid Voltage	-10.5	-13.5	-20	volts
Amplification Factor	8.3	8.3	8.3	
Plate Resistance	11000	8500	7500	ohms
Transconductance	750	975	1100	μmhos
Plate Current	3.7	6.0	8.0	ma
Load Resistance	25000	20000	20000	ohms
Power Output	75	160	350	mw

← Indicates a change.

(continued on next page)

85
TWIN DIODE—MEDIUM-MU TRIODE

DIODE UNITS - Two

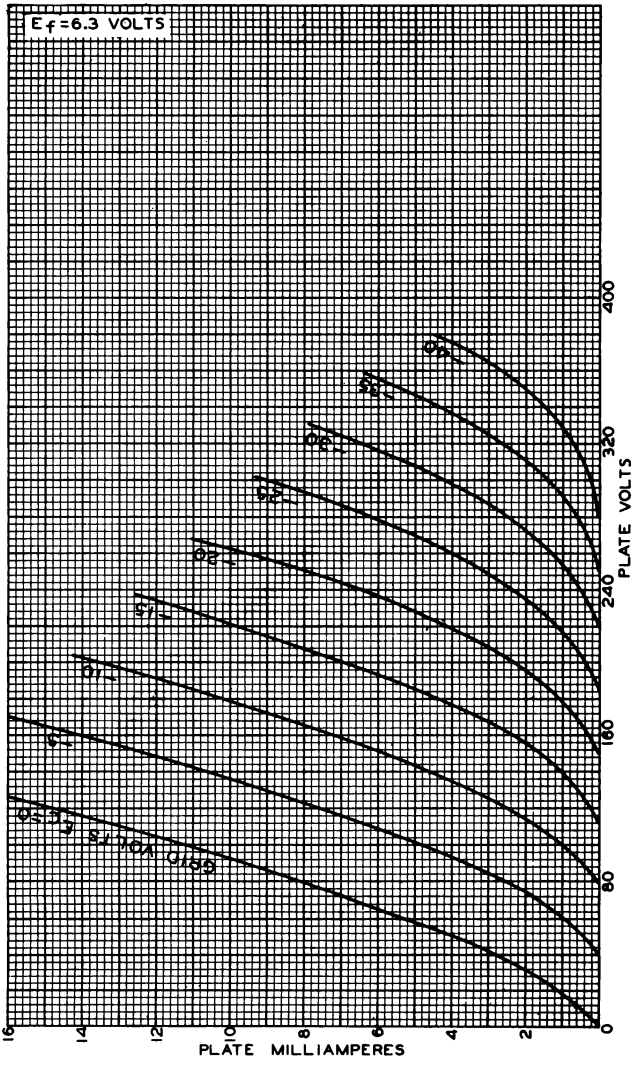
Consideration of these units, including typical circuits and diode curves, is given at the front of this Section. Diode biasing of the triode unit of the 85 may be used only when at least 20000 ohms resistance is in the triode plate circuit.

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

85

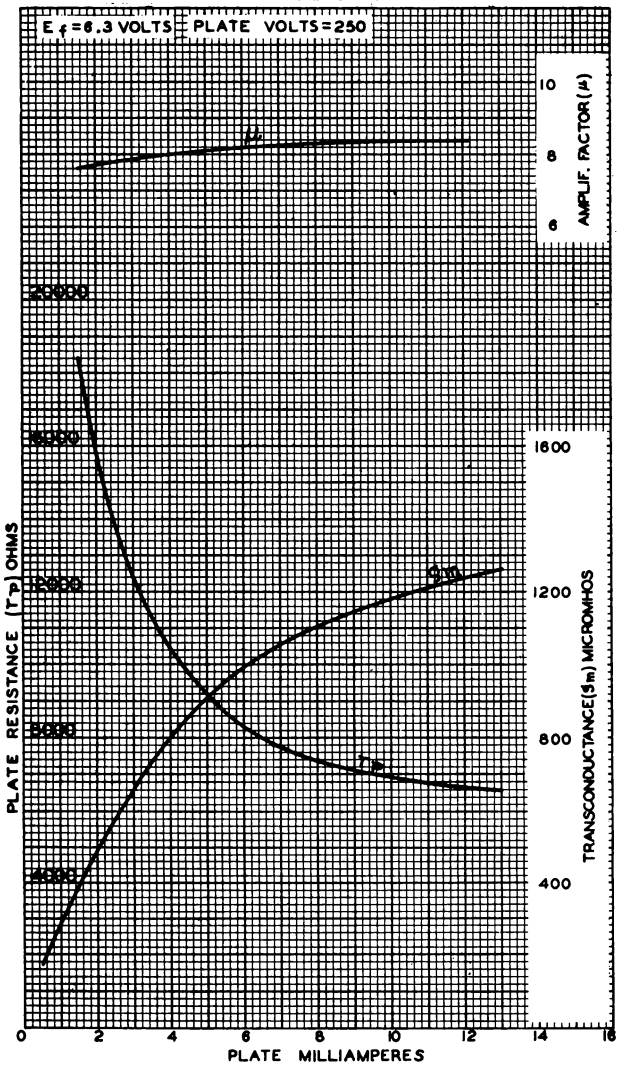
AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



85

85
AVERAGE CHARACTERISTICS
TRIODE UNIT



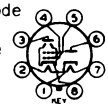
MAY 14, 1948 TUBE DEPARTMENT 92CM-4746R1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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 (8AO)

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
With Condenser-Input Filter:		
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
Typical Operation and Characteristics - Class A_1 Amplifier:		
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.

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
Mounting Position		Any

Pin 1 - No Connection
Pin 2 - Heater
Pin 3 - Amplifier Plate
Pin 4 - Amplifier Grid
Pin 5 - Amplifier Screen
Pin 6 - Amplifier Cathode
Pin 7 - Rectifier Plate, Heater
Pin 8 - Rectifier Cathode

BOTTOM VIEW (8AV)

RECTIFIER UNIT (Half-Wave)

Peak Inverse Voltage	350 max.	volts
Peak Plate Current	450 max.	ma.
D-C Heater-Cathode Potential	175 max.	volts
With Condenser-Input Filter:		
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	5.5 max.	watts
Screen Dissipation	1 max.	watt
Typical Operation and Characteristics - Class A_1 Amplifier:		
Plate Voltage	100	volts
Screen Voltage	100	volts
Grid Voltage □	-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

▲ 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.

□ 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.

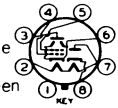
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

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 2 - Heater
Pin 3 - Amplifier Plate
Pin 4 - Amplifier Grid
Pin 5 - Amplifier Screen
Pin 6 - Amplifier Cathode
Pin 7 - Rectifier Plate, Heater
Pin 8 - Rectifier Cathode



BOTTOM VIEW (8AV)

Mounting Position: Any

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
With Condenser-Input Filter:		
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

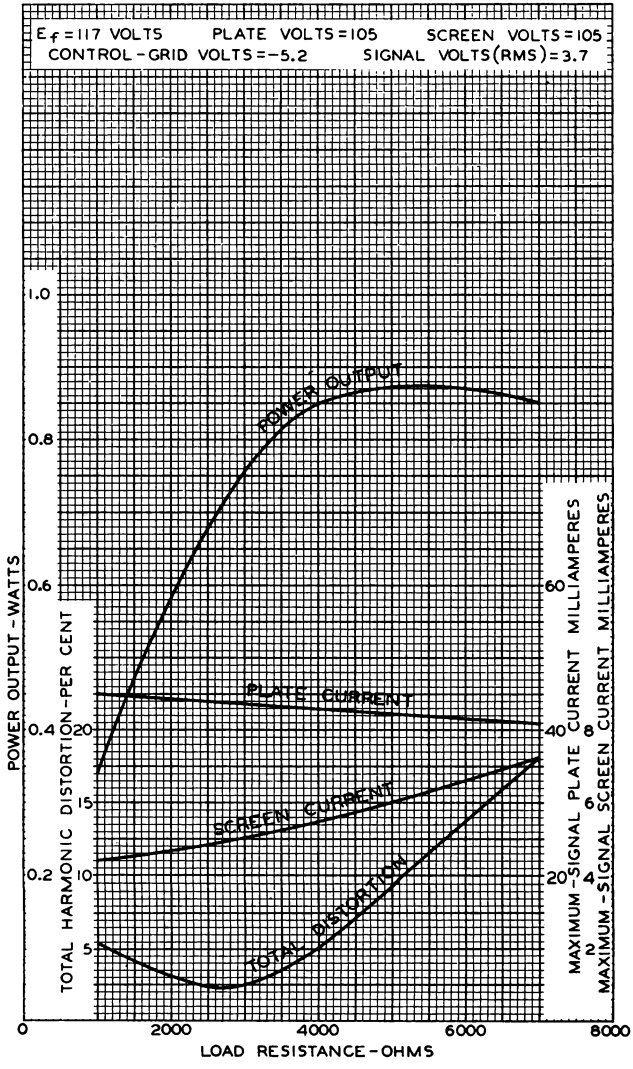
Plate Voltage	117 max.	volts
Screen Voltage	117 max.	volts
Plate Dissipation	6.0 max.	watts
Screen Dissipation	1.0 max.	watt
Typical Operation and Characteristics - Class A_1 Amplifier:		
Plate Voltage	105	volts
Screen Voltage	105	volts
Grid Voltage #	-5.2	volts
Peak A-F Grid Voltage	5.2	volts
Zero-Sig. 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.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

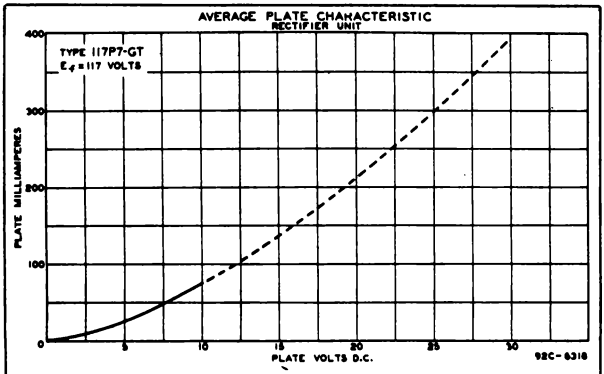
117P7-GT

OPERATION CHARACTERISTICS

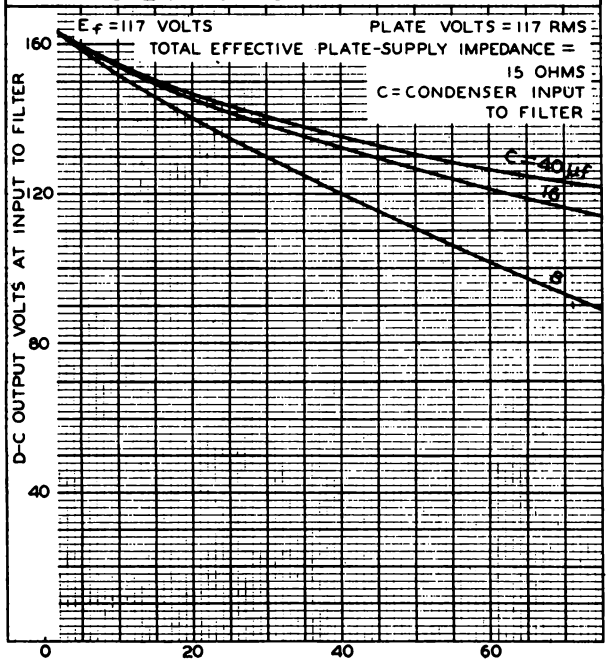


117P7-GT

RECTIFIER–BEAM POWER AMPLIFIER



OPERATION CHARACTERISTICS



117Z3

HALF-WAVE VACUUM RECTIFIER

MINIATURE TYPE

GENERAL DATA

Electrical:

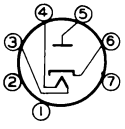
Heater, for Unipotential Cathode:

Voltage	117	ac or dc volts
Current	0.04	amp

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated 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:

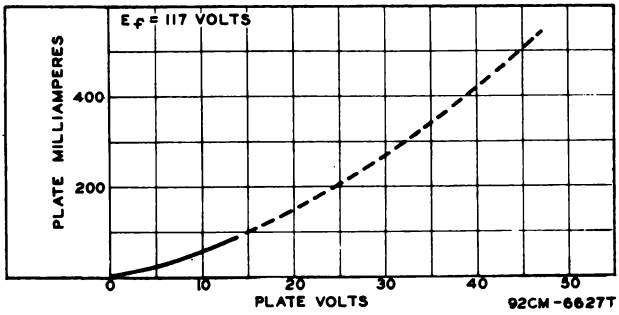
AC Plate-Supply Voltage (RMS)	117	volts
Filter-Input Capacitor	30	μf
Min. Total Effective Plate-Supply Impedance	20	ohms
DC Output Current	90	ma
DC Output Voltage at Input to Filter (Approx.):		
At half-load current (45 ma.)	130	volts
At full-load current (90 ma.)	110	volts
Voltage Regulation (Approx.):		
Half-load to full-load current	20	volts

← Indicates a change.

117Z3

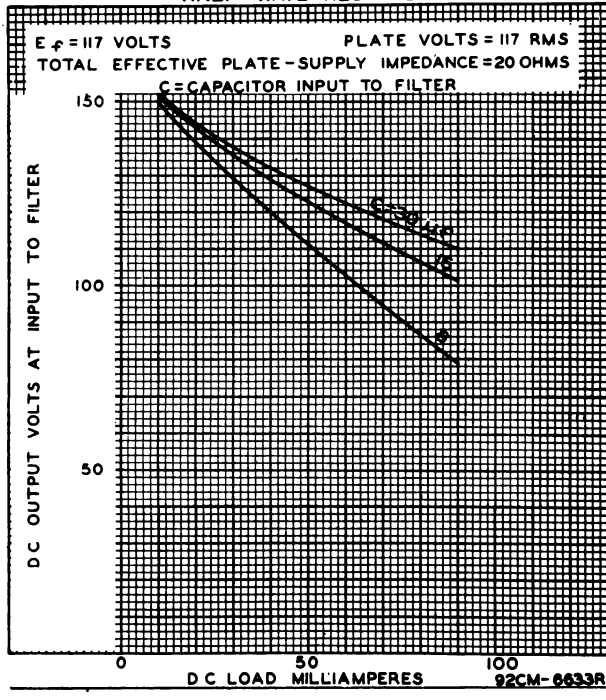
117Z3

AVERAGE PLATE CHARACTERISTIC



OPERATION CHARACTERISTICS

HALF-WAVE RECTIFIER



117Z4-GT

HALF-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

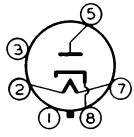
Heater, for Unipotential Cathode:

Voltage	117	ac or dc volts
Current	0.04	amp

Mechanical:

Mounting Position	Any
Maximum Overall Length	3"
Maximum Seated Length	2-7/16"
Maximum Diameter	1-9/32"
Bulb	T-9
Base	Intermediate-Shell Octal 6-Pin
Basing Designation for BOTTOM VIEW	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	350 max.	volts
PEAK PLATE CURRENT	540 max.	ma
DC OUTPUT CURRENT	90 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	175 max.	volts
Heater positive with respect to cathode	175 max.	volts

Typical Operation with Capacitor-Input to Filter:

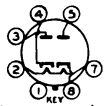
AC Plate-Supply Voltage (RMS)	117	volts
Filter-Input Capacitor	40	µf
Min. Total Effective Plate-Supply Impedance*	30	ohms
DC Output Current	90	ma

* When a filter-input capacitor larger than 40µf 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.

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:[o]

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.

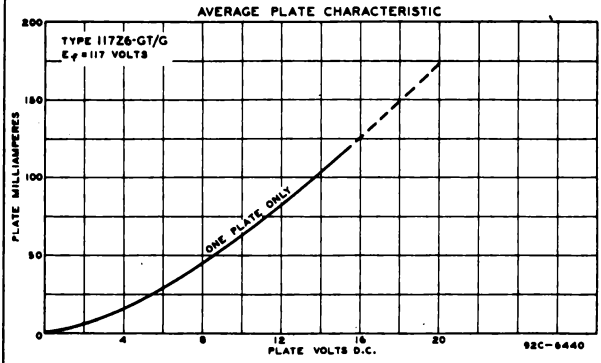
[o] In half-wave rectifier service, the two units may be used separately or in parallel.

For Typical Rectifier-Doubler Circuits, see Type 25Z5.

← Indicates a change.

117Z6-GT/G

HIGH-VACUUM RECTIFIER-DOUBLER



876
886

Cunningham Radiotron

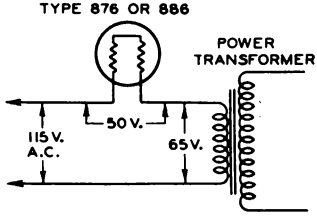
RCA-876, RCA-886

CURRENT REGULATOR

(BALLAST TUBE)

Filament	Iron	
	Type 876	*Type 886*
Maximum Overall Length	8"	8"
Maximum Diameter	2-1/16"	2- 1/16"
Bulb	T-16	T-16
Base	Mogul Screw	Mogul Screw
Operating Conditions:		
Voltage Range	40 to 60	40 to 60 volts
Operating Current	1.7	2.05 amp.
Ambient Temperature	150	150 °F

TYPICAL CIRCUIT CONNECTION FOR TYPE 876 OR 886



NOTE: THESE TUBES OPERATE AT A HIGH BULB TEMPERATURE AND MUST BE SURROUNDED BY A METAL VENTILATING STACK

The 876 and 886 are, within their range of operation, constant current regulating devices. Either type may be used in series with the primary of a suitably designed transformer (or in series with a resistive load) to maintain essentially constant input voltage to the primary (or load) over a range of 20 volts variation in line voltage. In other words, these tubes absorb line-voltage variation and maintain the wattage input to the primary of the transformer under load essentially constant. Therefore, the voltage output from the secondary is also essentially constant.

The primary of the transformer should be designed for a voltage input equal to the average line voltage minus 50 volts. The diagram above shows values for a line voltage of 115 volts a.c.

The primary current of the transformer under load should be 1.7 amperes for Type 876 and 2.05 amperes for Type 886. If less than this specified current is drawn, adjustment to the rated value for average line voltage must be made either by means of a shunt resistor across the primary or by an increase in the load on the secondary. If more than the specified current is drawn, two or more of these tubes connected in parallel will be required.

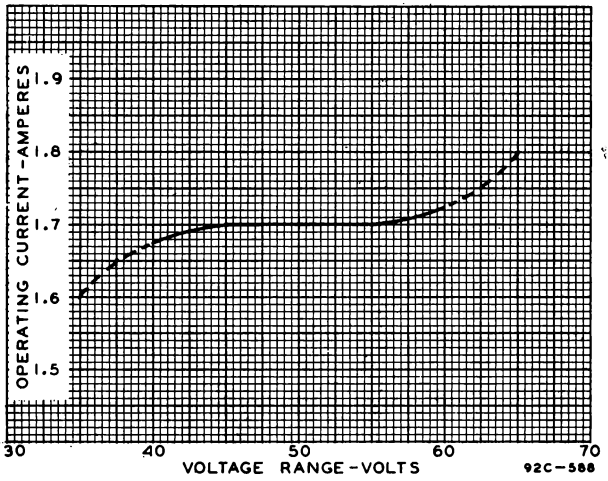
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

876
886

Cunningham Radiotron

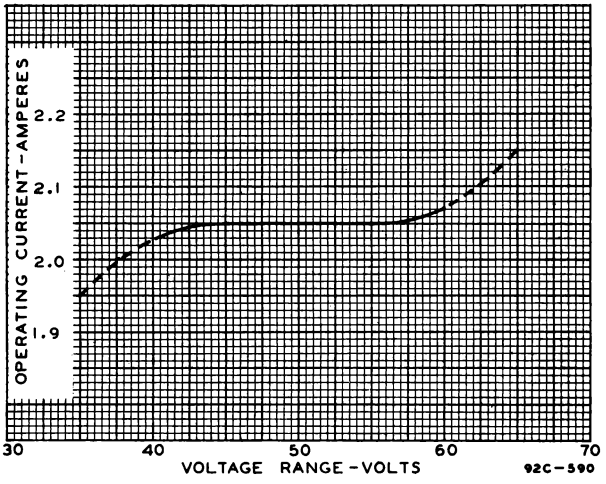
RCA-876

REGULATION CHARACTERISTIC



RCA-886

REGULATION CHARACTERISTIC



AUG. 28, 1936

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4668

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.):°

	Unit No. 1	*Unit No. 2*	
Grid to plate. . .	1.7	1.7	. . . . . .μμf
Grid to cathode and heater . . .	1.6	1.6	. . . . . .μμf
Plate to cathode and heater . . .	0.46	0.34	. . . . . .μμf

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 (μf) = 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_1 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	μmhos
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" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline.	*See General Section*
Bulb	T6-1/2

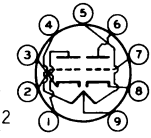
°: See next page.

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_1

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▲	max.	volts

Typical Operation as Resistance-Coupled Amplifier (Each Unit):

See RESISTANCE-COUPLED AMPLIFIER CHART No.25 at front of Receiving Tube Section

○ Without external shield.
▲ The dc component must not exceed 100 volts.

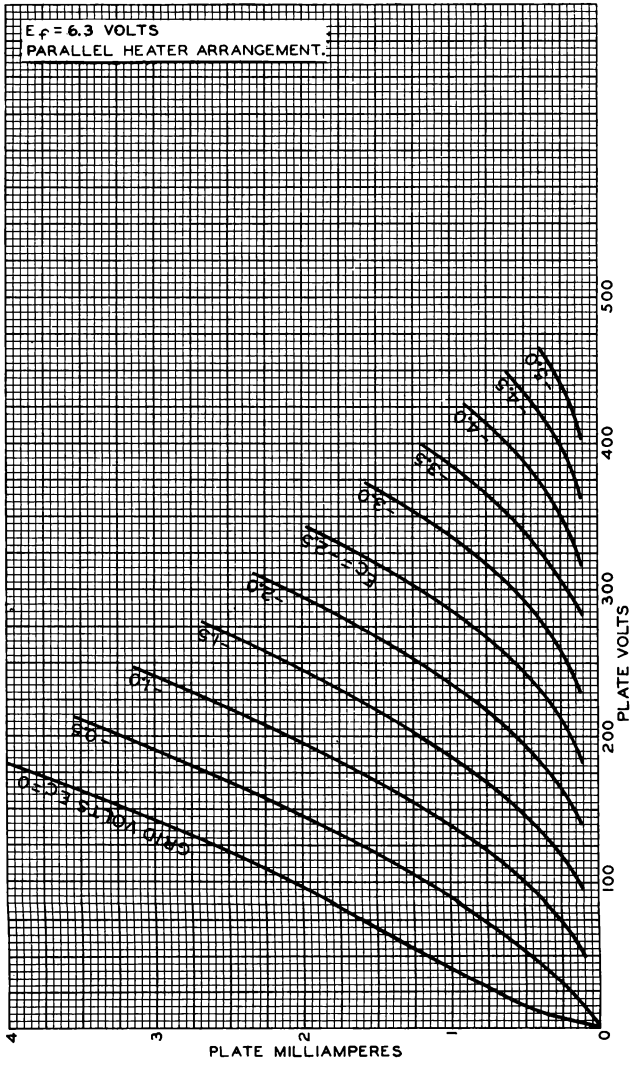
OPERATING CONSIDERATIONS

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

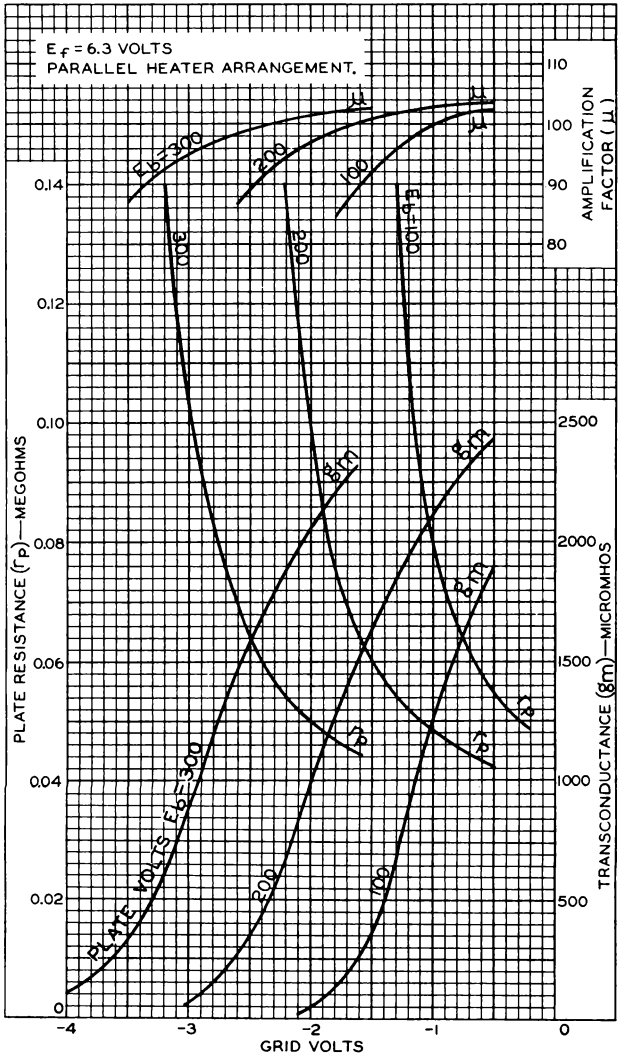


ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSE

92CM-6879

7025

7025
AVERAGE CHARACTERISTICS
EACH UNIT



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

92CM-6880

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:°

Triode Unit:		
Grid to plate	2	μμf
Grid to cathode and heater	2.3	μμf
Plate to cathode and heater	0.3	μμf
Pentode Unit:		
Grid No.1 to plate	0.06 max.	μμf
Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater	5	μμf
Plate to cathode & internal shield & grid No.3, grid No.2, and heater	2	μμf

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_1 Amplifier:

	Triode Unit	*Pentode Unit*		
Plate-Supply Voltage	215	100	220	volts

°: See next page.

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	μmhos
Plate Current.	9	1.1	12.5	ma
Grid-No.2 Current.	–	0.35	3.5	ma
Grid-No.1 Voltage (Approx.) for plate μa = 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" ± 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_1

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

°: See next page.

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▲ max.	200▲ 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.

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

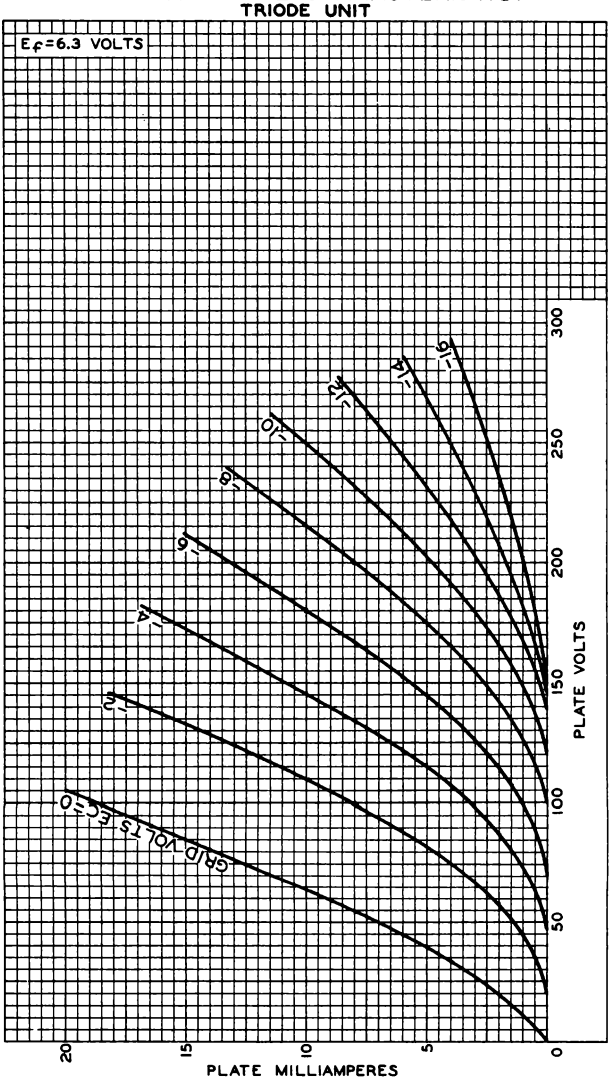
DEFINITIONS

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

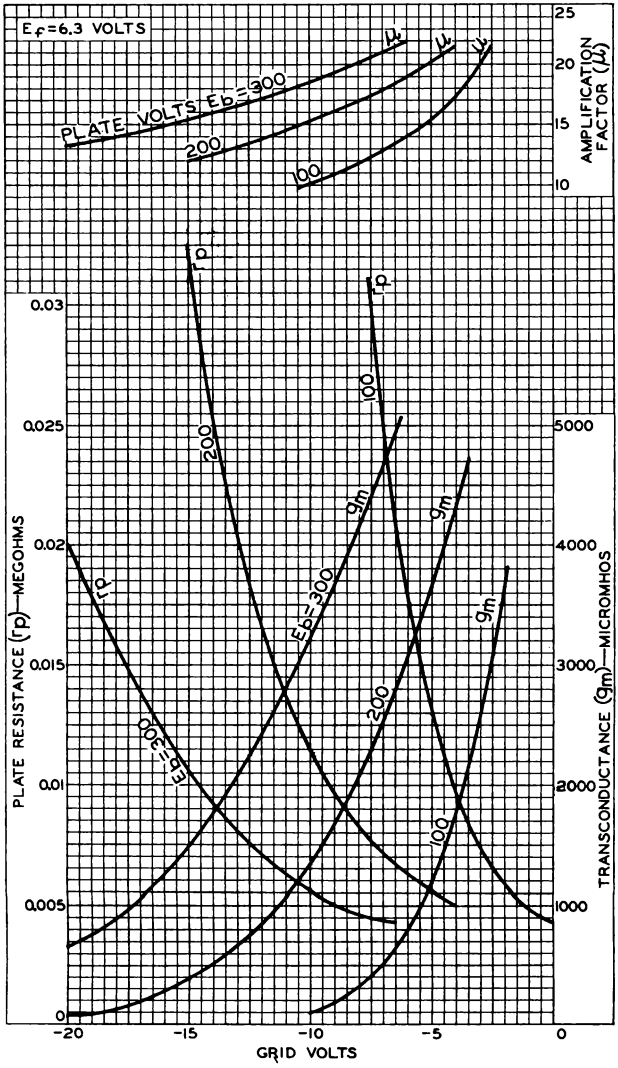


ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9693

7199

AVERAGE CHARACTERISTICS
TRIODE UNIT



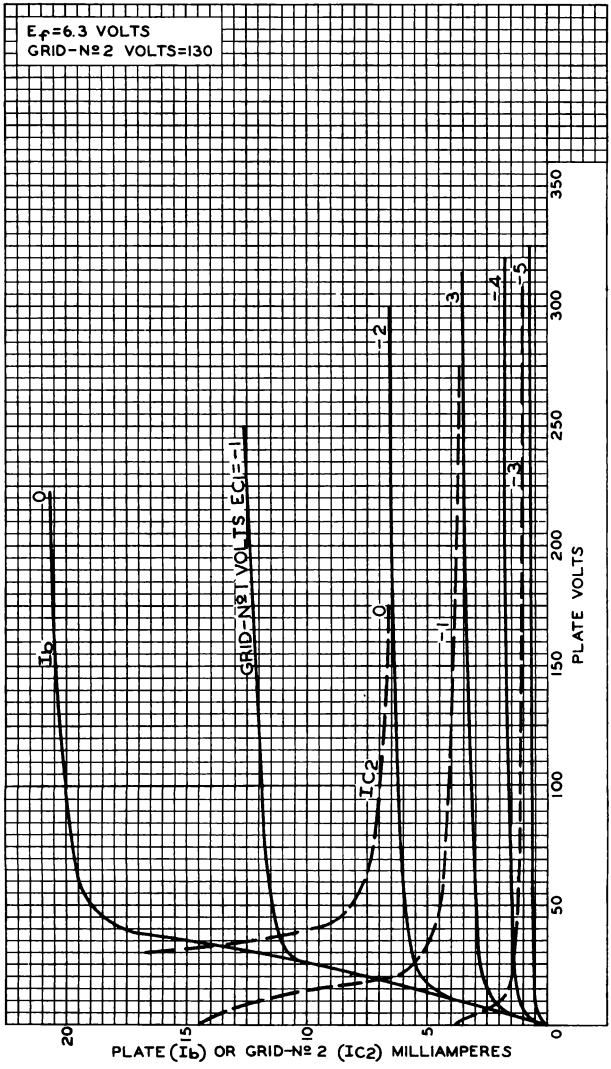
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9704

7199

7199

AVERAGE CHARACTERISTICS
PENTODE UNIT

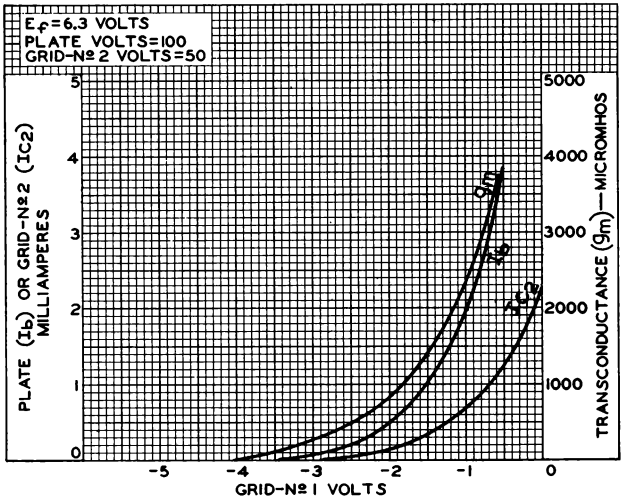


ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

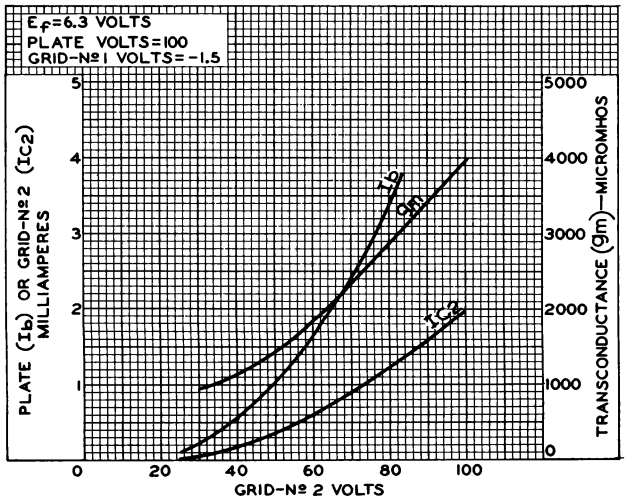
92CM-9701

7199

AVERAGE CHARACTERISTICS
PENTODE UNIT



92CS-9702



92CS-9703

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

SEMICONDUCTOR DEVICES

RCA TUBE
HANDBOOK
HB-3

SEMICONDUCTOR DEVICE SECTION

In this section data are given for semiconductor devices such as crystal diodes and transistors. These electron devices depend for their functioning on the flow of electrons in a solid—a semiconductor.

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

6-53

TRANSISTORS

Transistors are a new form of electron device. They can perform many of the functions of an electron tube and, in addition, can do some things better and more efficiently than electron tubes. Unlike electron tubes which depend for their functioning on the flow of electrons through a vacuum, a gas, or a vapor, transistors make use of the flow of electrons in a solid — a semiconductor.

A semiconductor is a material having a conductivity lower than that of metals but higher than that of insulators. There are many varieties of semiconductors, but the one employed for the transistors described in this section is germanium. Germanium in its very purest state behaves like an insulator, but its conductivity can be increased by the addition of exact but almost infinitesimal amounts of certain impurities. Peculiarly, the manner in which a germanium crystal conducts can be changed by the choice of the impurity. Thus, by the addition of the proper amount of certain impurities to pure germanium, its conductivity is increased because a surplus of electrons which can migrate freely through the crystal is provided. A conducting germanium crystal so made is identified as *n*-type because it depends on negative particles of electricity, electrons, for conduction.

On the other hand, the addition of other impurities provides a deficiency of electrons which effectively behave like positive particles of electricity. This deficiency of electrons leaves vacancies or holes in the crystal structure. These holes which are free to migrate can carry current but in a direction opposite to that of the *n*-type crystal. Because these carriers of the conduction current are positive in nature, a germanium crystal of this type is identified as *p*-type.

It should be noted that whereas electron tubes depend ordinarily on electrons for conduction, transistors not only make use of electrons but also of holes for obtaining conduction.

The transistors described in this section make use of both kinds of conduction and employ two different types of structures. These two types of structures are identified as "point-contact" and "junction".

Fig.1 shows the structure of a point-contact transistor. It consists of a crystal of *n*-type germanium having three electrical contacts. Two of these are point contacts and are known as the emitter and collector. A third, the

base, makes area contact with the germanium crystal. The complete assembly is encased in plastic to provide ruggedness and freedom from atmospheric contaminants.

Fig. 1 also shows the point-contact transistor connected in a simple circuit in which the base connection serves as the common return for the input circuit and the output circuit. The input circuit on the left is completed through the battery, the emitter, and the germanium crystal to the base connection. When a positive voltage is applied to the emitter, electrons will be drawn from the crystal into the emitter and thus leave holes in the crystal structure. Under the influence of the negative field of the collector, these holes flow to the collector and thereby increase the collector current appreciably. Or as is sometimes stated, the emitter electrode injects holes into the germanium crystal. Holes near the collector allow electrons to pass into the crystal. Some of these electrons neutralize the holes; others flow to the base connection and thus complete the circuit.

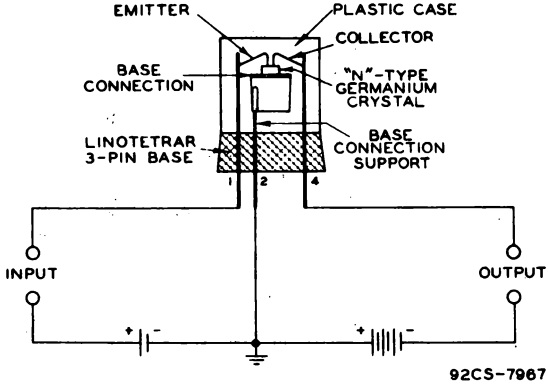


Fig. 1 - Diagrammatic Sketch Showing Structural Arrangement of Type 2N32 or Type 2N33 with Associated Simple Circuit.

If the assumption is made that every unit of hole current which leaves the emitter reaches the collector, it follows that a small change in emitter current will result in an equivalent change in collector current, and consequently produce a current amplification factor of one. The current

amplification factor or "alpha" of a transistor is defined as the ratio of change in collector current to a change in emitter current when collector voltage is maintained constant. In point-contact transistors "alpha" is greater than unity; in junction-type transistors, it is less than but approaches unity.

If the germanium crystal employed in Fig.1 is of the *p*-type, a negative voltage is applied to the emitter and holes will be drawn from the crystal into the emitter and thus leave an excess of electrons in the crystal structure. Under the influence of the positive field of the collector, these electrons flow through the crystal to the collector. In general, the *p*-type germanium crystal has characteristics similar to the *n*-type except that in operation all battery polarities are reversed.

Fig.2 shows the structure of a junction transistor of the *n-p-n* type. It is composed of a wafer of *p*-type germanium between two smaller layers of *n*-type germanium. Low-resistance connections are made to the *n*-layers, one of which serves as the emitter and the other as the collector. A third low-resistance connection to the *p*-layer is the base connection. The complete assembly is encased in plastic to provide ruggedness and freedom from atmospheric contaminants.

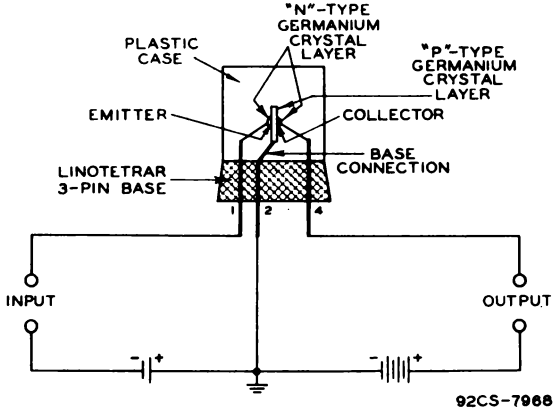


Fig.2 - Diagrammatic Sketch Showing Structural Arrangement of Type 2N35 with Associated Simple Circuit. For Illustration Purposes, the Crystal Assembly is Rotated 90° Within the Plastic Case.

TRANSISTORS

The principle of operation of the junction transistor is somewhat different from that of the point-contact transistor. In the *n-p-n* junction transistor, electrons from the *n*-layer diffuse through the *p*-layer and are attracted to the collector. The *p*-layer has a surplus of holes. Because the *p*-layer is very thin, most of the electrons entering the base region from the emitter will reach the collector region without recombining (neutralizing) the holes. Practically all of the electrons leaving the emitter reach the collector, thus resulting in a current amplification factor approaching unity.

The action of the *p-n-p* type of junction transistor is similar to that of the *n-p-n* type except that the polarities of the battery voltages are reversed and conduction is caused by holes instead of electrons.

Transistors are essentially low-impedance devices, that is, they deal with current changes rather than voltage changes. They are small in size and the power requirements for their operation are extremely small. In addition, they operate instantaneously on application of voltages to the electrodes.

The point-contact transistor has a current amplification factor greater than unity. This feature contributes to its usefulness in oscillator and triggering applications. In addition, the point-contact transistor can be operated at relatively high frequencies. Because of this feature, it has considerable application in switching circuits and in radio circuits such as intermediate-frequency amplifiers, radio-frequency amplifiers, and radio-frequency oscillators.

The junction transistor has a current amplification factor approaching unity. This characteristic contributes to the stability of the junction transistor even under short-circuit conditions. It has a high operating power gain and can operate with extremely low values of input power — features which are of primary importance in oscillator and amplifier applications in the audio-frequency and low-frequency ranges.

TENTATIVE DEFINITIONS

of Semiconductor-Device Terms

Small-Signal Current Gain (Current Transfer Ratio). The quotient of the change of output current with ac output circuit shorted divided by the change in input current producing the change in output current. The current components are understood to be small enough so that linear relations hold between them.

Large-Signal DC Current Gain. The quotient of the dc output current with the dc output circuit shorted divided by the dc input current producing the dc output current.

Circuit-Stability Factor. The quotient of the change of dc collector current divided by the change in collector saturation current producing the change in dc collector current.

Collector Saturation Current. The temperature-sensitive dc collector current that flows when a dc collector-to-base voltage greater than -0.2 volt is applied with emitter circuit open.

Class A Amplifier. An amplifier in which the bias of the input electrode and the alternating input signal are such that output current flows at all times.

Class B Amplifier. An amplifier in which the bias of the input electrode is such that the output current is approximately zero when no alternating input signal is applied, and such that when an alternating input signal is applied, the output current flows approximately one-half cycle.

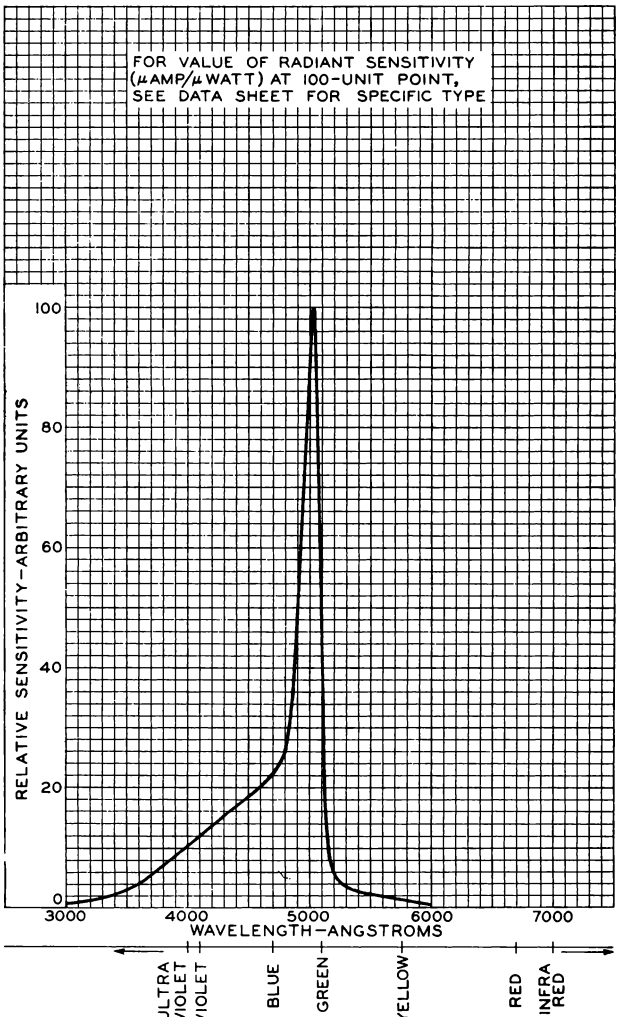
Collector Transition Capacitance. The capacitance across the collector-to-base transition region. (A transition region is a region between two homogeneous semiconductor regions, in which the impurity concentration changes).

Unilateralization. Unilateralization is a special case of neutralization in that the feedback parameters are completely balanced out. In the case of transistors, these feedback parameters include a resistive component in addition to a capacitive component. Unilateralization changes a bilateral network into a unilateral network.

Alpha-Cutoff Frequency. Frequency at which the forward current gain drops to 0.707 times its low-frequency (1-kc) value.

SPECTRAL SENSITIVITY CHARACTERISTIC OF PHOTOCONDUCTIVE CELL HAVING S-12 RESPONSE

FOR EQUAL VALUES OF RADIANT FLUX AT ALL WAVELENGTHS



MAR. 31, 1955

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8569

PRICES□

OF SEMICONDUCTOR DEVICES

Type	*Schedule D●*	*Schedule U▲*
1N34-A	$ 2.00	-
1N38-A	-	$ 2.55
1N54-A	-	1.45
1N55-A	-	4.70
1N56-A	-	1.45
1N58-A	-	1.80
2N32	-	15.40
2N33	-	23.00
2N34	-	13.40
2N35	-	18.40

□ This price list applies only in the United States of America and is subject to change without notice. All prices are exclusive of all Federal, State and local excise, sales, and similar taxes.

▲ Schedule U shows user prices for types priced for distribution through other than dealer and service channels.

● Schedule D shows list prices for types priced for distribution through dealer and service channels.

INFORMATION ON PURCHASING ABOVE TYPES

Information as to where *RCA Semiconductor Devices* can be purchased may be obtained from our *regional office* nearest you or from *Tube Department, Radio Corporation of America, Harrison, N.J.*

IN34-A

IN34-A
CRYSTAL DIODE

GERMANIUM POINT-CONTACT TYPE

A general-purpose type intended for low-power rectification in applications such as isolating, clipping, and switching circuits, as well as in certain meter circuits.

DATA

General:

Maximum Envelope Length (including studs)	15/16"
Maximum Envelope Diameter	1/4"
Maximum Overall Length (including flexible leads)	4-3/16"
Leads, Flexible	2
Length	1-3/8" to 1-5/8"
Diameter	0.025"
Envelope, Glass	T-1-1/2
Operating Position	Any

RECTIFIER SERVICE

For frequencies of 25 cps and above

Maximum Ratings, *Absolute Values:*

PEAK INVERSE VOLTAGE	60 max.	volts
FORWARD CURRENT:		
Peak	150 max.	ma
Average*	50 max.	ma
FAULT CURRENT▲ (For duration of 1 sec. max.)	500 max.	ma
AMBIENT TEMPERATURE RANGE	-50 to +75	°C

Characteristics at Ambient Temperature of 25°C:

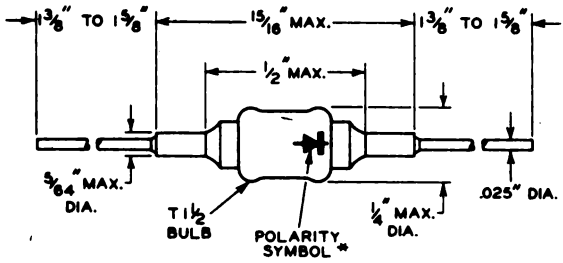
Minimum Forward Current at dc volts = 1	5	ma
Maximum Average Inverse Current:		
At dc volts = -10	30	μamp
At dc volts = -50	500	μamp
Minimum Peak Inverse Voltage for zero-dynamic resistance	75	volts
Shunt Capacitance (Approx.) - Measured Between Studs	1	μμf

* Averaged over one conduction cycle.

▲ Maximum fault current is the highest value of current that should be permitted to flow through the diode under a fault condition such as load short circuit.

IN34-A

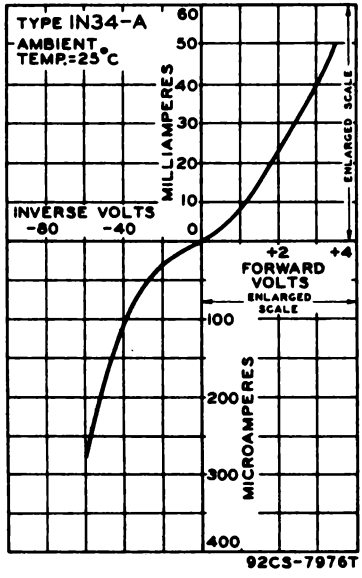
IN34-A
CRYSTAL DIODE



*ARROW INDICATES DIRECTION OF FORWARD (EASY) CURRENT AS INDICATED BY DC AMMETER.

92CS-7980

STATIC CHARACTERISTIC



92CS-7976T

AUG. 1, 1953

CE-7980-7976T

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

1N38-A

CRYSTAL DIODE

GERMANIUM POINT-CONTACT TYPE

A large-signal type having a high peak inverse voltage rating and intended for use in electronic computers and clamping circuits.

DATA

General:

Maximum Envelope Length (Including studs)	15/16"
Maximum Envelope Diameter	1/4"
Maximum Overall Length (Including flexible leads)	4-3/16"
Leads, Flexible	2
Length	1-3/8" to 1-5/8"
Diameter	0.025"
Envelope, Glass	T-1-1/2
Operating Position	Any

RECTIFIER SERVICE

For frequencies of 25 cps and above

Maximum Ratings, *Absolute Values:*

PEAK INVERSE VOLTAGE	100 max.	volts
FORWARD CURRENT:		
Peak	150 max.	ma
Average*	50 max.	ma
FAULT CURRENT▲ (For duration of 1 sec. max.)	500 max.	ma
AMBIENT TEMPERATURE RANGE	-50 to +75	°C

Characteristics at Ambient Temperature of 25°C:

Minimum Forward Current at dc volts = 1	4	ma
Maximum Average Inverse Current:		
At dc volts = -3	5	μamp
At dc volts = -100	500	μamp
Minimum Peak Inverse Voltage for zero dynamic resistance	120	volts
Shunt Capacitance (Approx.) - Measured Between Studs	1	μμf

* Averaged over one conduction cycle.

▲ Maximum fault current is the highest value of current that should be permitted to flow through the diode under a fault condition such as load short circuit.

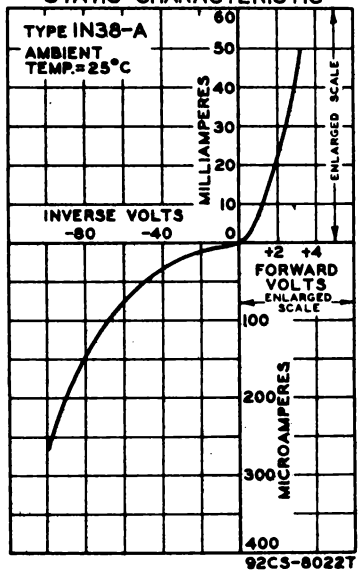
DIMENSIONAL OUTLINE

for Type 1N38-A is the same as that shown for Type 1N34-A

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

IN38-A
CRYSTAL DIODE

STATIC CHARACTERISTIC



92CS-8022T

1N54-A

CRYSTAL DIODE

GERMANIUM POINT-CONTACT TYPE

A high-back-resistance type intended for use in clipping circuits, high-impedance high-voltage probes, dc restorer circuits, and high-impedance detector circuits.

DATA

General:

Maximum Envelope Length (Including studs)	15/16"
Maximum Envelope Diameter	1/4"
Maximum Overall Length (Including flexible leads)	4-3/16"
Leads, Flexible	2
Length	1-3/8" to 1-5/8"
Diameter	0.025"
Envelope, Glass	T-1-1/2
Operating Position	Any

RECTIFIER SERVICE

For frequencies of 25 cps and above

Maximum Ratings, *Absolute Values:*

PEAK INVERSE VOLTAGE	50 max.	volts
FORWARD CURRENT:		
Peak	150 max.	ma
Average*	50 max.	ma
FAULT CURRENT▲ (For duration of 1 sec. max.)	500 max.	ma
AMBIENT TEMPERATURE RANGE	-50 to +75	°C

Characteristics at Ambient Temperature of 25°C:

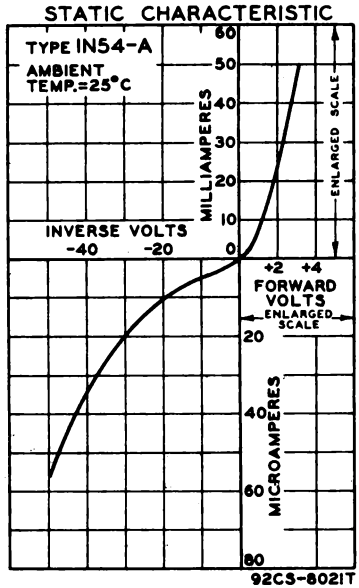
Minimum Forward Current at dc volts = 1	5	ma
Maximum Average Inverse Current:		
At dc volts = -10	7	μamp
At dc volts = -50	100	μamp
Minimum Peak Inverse Voltage for zero dynamic resistance	75	volts
Shunt Capacitance (Approx.) Measured Between Studs	1	μμf

* Averaged over one conduction cycle.

▲ Maximum fault current is the highest value of current that should be permitted to flow through the diode under a fault condition such as load short circuit.

DIMENSIONAL OUTLINE
for Type 1N54-A is the same as that shown for Type 1N34-A

IN54-A
CRYSTAL DIODE



1N55-A

CRYSTAL DIODE

GERMANIUM POINT-CONTACT TYPE

A large-signal type having a high peak inverse voltage rating and intended for use in electronic computers, clamping circuits, dc restorer circuits, and in high-voltage probes.

DATA

General:

Maximum Envelope Length (Including studs)	15/16"
Maximum Envelope Diameter	1/4"
Maximum Overall Length (Including flexible leads)	4-3/16"
Leads, Flexible	2
Length	1-3/8" to 1-5/8"
Diameter	0.025"
Envelope, Glass	T-1-1/2
Operating Position	Any

RECTIFIER SERVICE

For frequencies of 25 cps and above

Maximum Ratings, *Absolute Values:*

PEAK INVERSE VOLTAGE	150 max.	volts
FORWARD CURRENT:		
Peak	150 max.	ma
Average*	50 max.	ma
FAULT CURRENT▲ (For duration of 1 sec. max.)	500 max.	ma
AMBIENT TEMPERATURE RANGE	-50 to +75	°C

Characteristics at Ambient Temperature of 25°C:

Minimum Forward Current at dc volts = 1	4	ma
Maximum Average Inverse Current:		
At dc volts = -150	500	μamp
Minimum Peak Inverse Voltage for zero dynamic resistance	170	volts
Shunt Capacitance (Approx.)- Measured Between Studs	1	μμf

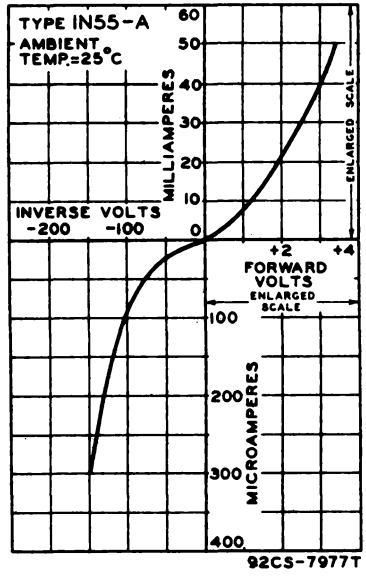
* Averaged over one conduction cycle.

▲ Maximum fault current is the highest value of current that should be permitted to flow through the diode under a fault condition such as load short circuit.

DIMENSIONAL OUTLINE
for Type 1N55-A is the same as that shown for Type 1N34-A

IN55-A
CRYSTAL DIODE

STATIC CHARACTERISTIC



1N56-A

CRYSTAL DIODE

GERMANIUM POINT-CONTACT TYPE

A high-conduction type featuring exceptionally low dynamic impedance and intended for limiter service in FM receivers.

DATA

General:

Maximum Envelope Length (Including studs)	15/16"
Maximum Envelope Diameter	1/4"
Maximum Overall Length (Including flexible leads)	4-3/16"
Leads, Flexible	2
Length	1-3/8" to 1-5/8"
Diameter	0.025"
Envelope, Glass	T-1-1/2
Operating Position	Any

RECTIFIER SERVICE

For frequencies of 25 cps and above

Maximum Ratings, *Absolute Values:*

PEAK INVERSE VOLTAGE	40 max.	volts
FORWARD CURRENT:		
Peak	200 max.	ma
Average*	60 max.	ma
FAULT CURRENT▲ (For duration of 1 sec. max.)	1000 max.	ma
AMBIENT TEMPERATURE RANGE	-50 to +75	°C

Characteristics at Ambient Temperature of 25°C:

Minimum Forward Current at dc volts = 1	15	ma
Maximum Average Inverse Current:		
At dc volts = -30	300	μamp
Minimum Peak Inverse Voltage for zero dynamic resistance	50	volts
Shunt Capacitance (Approx.) - Measured Between Studs)	1	μμf

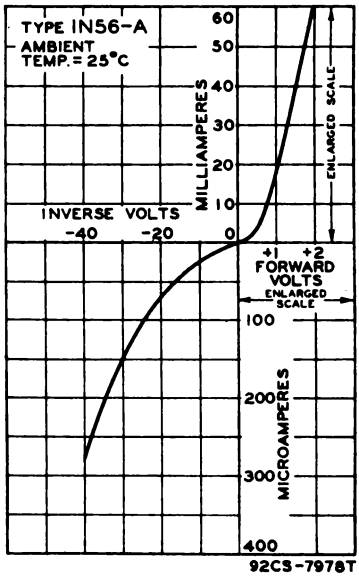
* Averaged over one conduction cycle.

▲ Maximum fault current is the highest value of current that should be permitted to flow through the diode under a fault condition such as load short circuit.

DIMENSIONAL OUTLINE
for Type 1N56-A is the same as that shown for Type 1N34-A

IN56-A
CRYSTAL DIODE

STATIC CHARACTERISTIC



92CS-7978T

1N58-A

CRYSTAL DIODE

GERMANIUM POINT-CONTACT TYPE

A large-signal type having a high peak inverse voltage rating and intended for use in electronic computers, clamping circuits, dc restorer circuits, and in high-voltage probes.

DATA

General:

Maximum Envelope Length (Including studs)	15/16"
Maximum Envelope Diameter	1/4"
Maximum Overall Length (Including flexible leads)	4-3/16"
Leads, Flexible	2
Length	1-3/8" to 1-5/8"
Diameter	0.025"
Envelope, Glass	T-1-1/2
Operating Position	Any

RECTIFIER SERVICE

For frequencies of 25 cps and above

Maximum Ratings, *Absolute Values*:

PEAK INVERSE VOLTAGE	100 max.	volts
FORWARD CURRENT:		
Peak	150 max.	ma
Average*	50 max.	ma
FAULT CURRENT▲ (For duration of 1 sec. max.)	500 max.	ma
AMBIENT TEMPERATURE RANGE	-50 to +75	°C

Characteristics at Ambient Temperature of 25°C:

Minimum Forward Current at dc volts = 1	4	ma
Maximum Average Inverse Current:		
At dc volts = -100	600	μamp
Minimum Peak Inverse Voltage for zero dynamic resistance	120	volts
Shunt Capacitance (Approx.)- Measured Between Studs	1	μμf

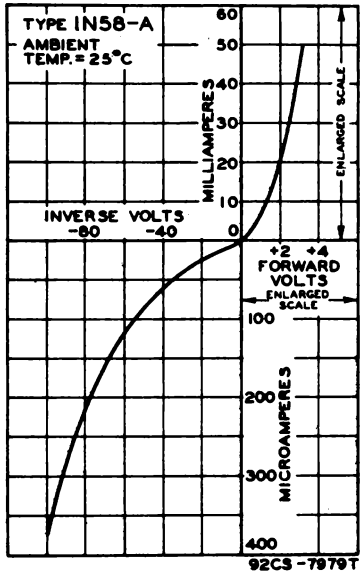
* Averaged over one conduction cycle.

▲ Maximum fault current is the highest value of current that should be permitted to flow through the diode under a fault condition such as load short circuit.

DIMENSIONAL OUTLINE
for Type 1N58-A is the same as that shown for Type 1N34-A

IN58-A
CRYSTAL DIODE

STATIC CHARACTERISTIC



1N1763

SILICON RECTIFIER

DIFFUSED-JUNCTION TYPE

For use in power supplies of color and black-and-white television receivers, radio receivers, phonographs, and other electronic equipment

GENERAL DATA

Mechanical:

Operating Position	Any
Maximum Length (Excluding flexible leads)	0.725"
Maximum Diameter	0.400"
Case	Metal
Envelope Seals	Hermetic
Leads, Flexible	2
Minimum length	1.250"
Diameter	0.027" to 0.035"

RECTIFIER SERVICE

Maximum Ratings, *Absolute-Maximum Values:*

For power-supply frequency of 60 cps and with capacitor input to filter

PEAK INVERSE VOLTAGE	400 max.	volts
RMS SUPPLY VOLTAGE	140 max.	volts
FORWARD CURRENT:		
At ambient temperatures	*Up to 75° C*	*Above 75° C*
DC	0.5 max.	amp
Peak, recurrent	5 max.	amp
Surge, for a "turn-on" transient of 2-milliseconds duration	35 max.	amp
	See Rating Chart	
AMBIENT TEMPERATURE (During operation)	100 max.	°C
STORAGE-TEMPERATURE RANGE	-65 to +150	°C

Characteristics:

At ambient temperature of 25° C

Maximum Instantaneous Forward Voltage at instantaneous forward amperes = 15	3	volts
Maximum Reverse Current at peak inverse volts = 400	100	μa

At ambient temperature of 100° C

Maximum Reverse Current at peak inverse volts = 400	1	ma

Typical Operation:

As half-wave rectifier

RMS Supply Voltage	117	117	117	volts
Filter-Input Capacitor (C)	50	100	250	μf
Surge-Limiting Resistance▲	5.6	5.6	5.6	ohms

▲: See next page.

SEMICONDUCTOR and MATERIALS DIVISION
RADIO CORPORATION OF AMERICA, SOMERVILLE, NEW JERSEY

IN1763
SILICON RECTIFIER

DC Output Voltage at input to filter (Approx.):				
At half-load ma. = 250. . . .	126	146	150	volts
At full-load ma. = 500. . . .	100	132	139	volts
Voltage Regulation (Approx.):				
Half-load to full-load current	26	14	11	volts
As half-wave voltage doubler				
RMS Supply Voltage.	117		117	volts
Filter-Input Capacitor (C). . .	100		250	μf
Surge-Limiting Resistance▲. . .	5.6		5.6	ohms
DC Output Voltage at input to filter (Approx.):				
At half-load ma. = 250. . . .	273		288	volts
At full-load ma. = 500. . . .	235		262	volts
Voltage Regulation (Approx.):				
Half-load to full-load current	38		26	volts
As full-wave voltage doubler				
RMS Supply Voltage.	117	117	117	volts
Filter-Input Capacitor (C). . .	50	100	250	μf
Surge-Limiting Resistance▲. . .	5.6	5.6	5.6	ohms
DC Output Voltage at input to filter (Approx.):				
At half-load ma. = 250. . . .	260	280	290	volts
At full-load ma. = 500. . . .	220	260	275	volts
Voltage Regulation (Approx.):				
Half-load to full-load current	40	20	15	volts

▲ The transformer series resistance or other resistance in the line may be deducted from the value shown.

OPERATING CONSIDERATIONS

A *surge-limiting resistor* should always be connected in series with the rectifier. The resistance value must be sufficient to limit the peak and surge currents to the value specified under the maximum ratings.

The *flexible leads* of the IN1763 are usually soldered to the circuit elements. The rectifier, however, may be mounted in a holder of the fuse-clip type. It is desirable in all soldering operations to provide some slack or an expansion elbow in the leads to prevent excessive tension on the leads. It is important during the soldering operation to avoid excessive heat in order to prevent possible damage to the rectifier. To absorb some of the heat, grip the flexible lead of the rectifier between the case and the soldering point with a pair of pliers.

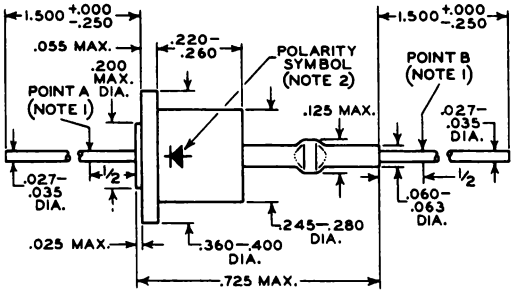
When dip soldering is employed in the assembly of printed circuitry using the IN1763, the temperature of the solder should

IN1763

SILICON RECTIFIER

not exceed 255° C for a maximum immersion period of 10 seconds. Furthermore, the leads should not be dip soldered beyond points A and B indicated on the *Dimensional Outline*.

Because the metal case of the IN1763 is operated at voltages which are dangerous, care should be taken in the design of equipment to prevent the operator from coming in contact with the metal case. It is recommended that the rectifier be mounted on the underside of the chassis.



DIMENSIONS IN INCHES

92CS-9728R1

NOTE 1: DO NOT DIP SOLDER BEYOND POINTS A AND B.

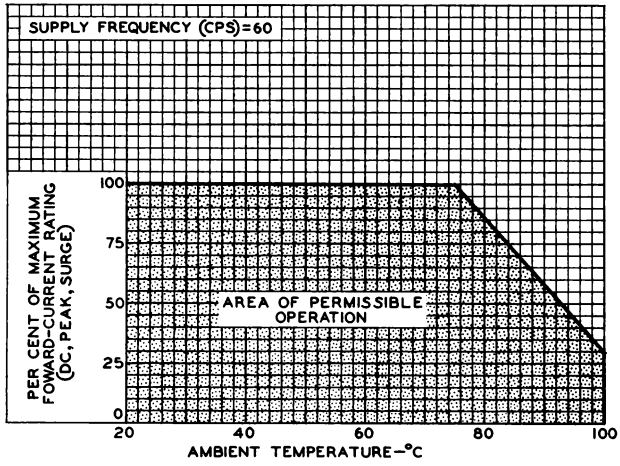
NOTE 2: ARROW INDICATES DIRECTION OF FORWARD (EASY) CURRENT FLOW AS INDICATED BY DC AMMETER.

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.

1N1763

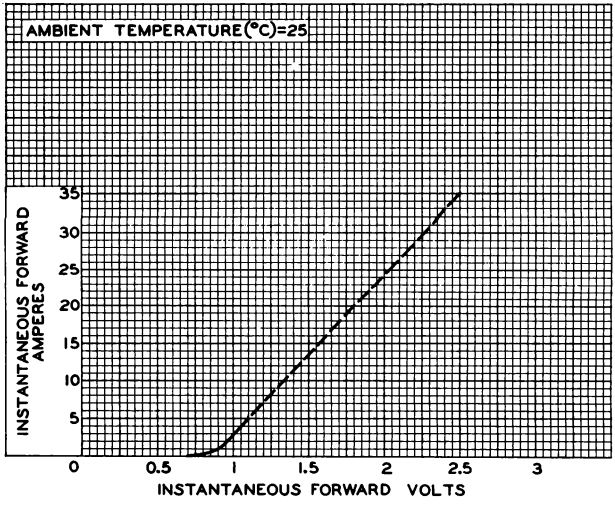
1N1763

RATING CHART



92CS-9727

TYPICAL CHARACTERISTIC



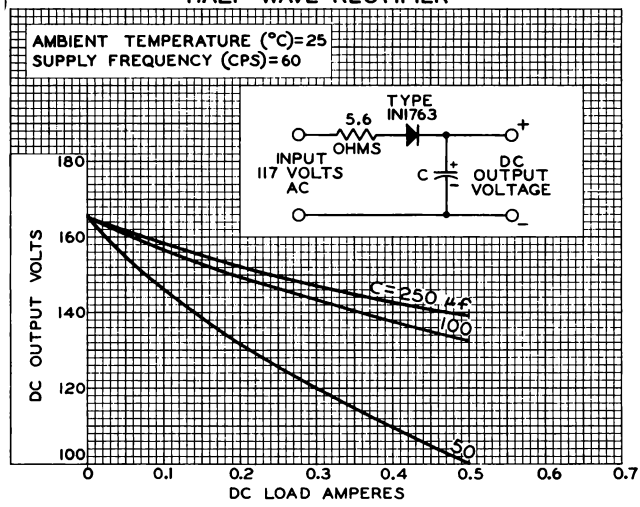
SEMICONDUCTOR and MATERIALS DIVISION
RADIO CORPORATION OF AMERICA, SOMERVILLE, NEW JERSEY

92CS-9730

1N1763

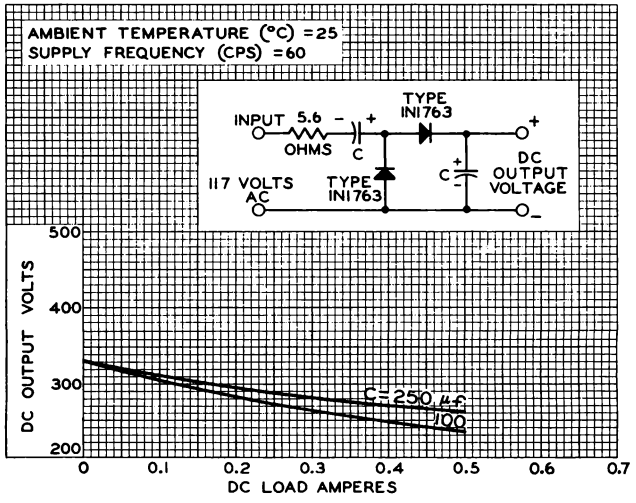
TYPICAL CHARACTERISTICS

HALF-WAVE RECTIFIER



92CS-9723

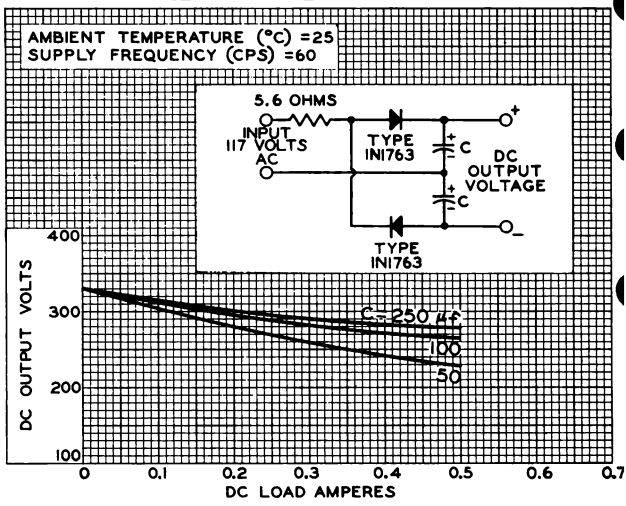
HALF-WAVE VOLTAGE DOUBLER



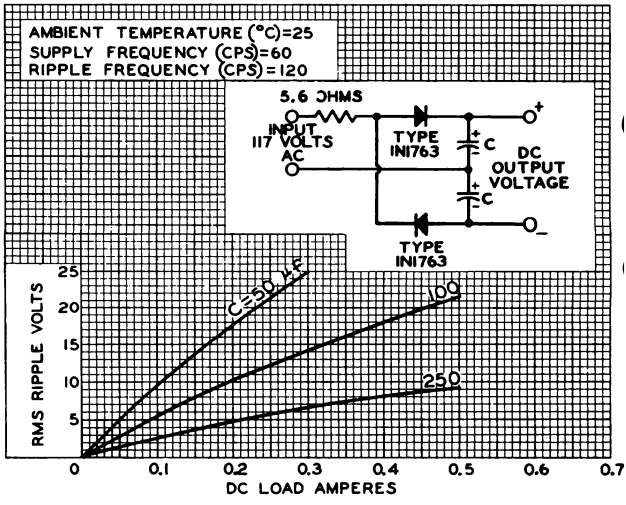
1N1763

TYPICAL CHARACTERISTICS

FULL-WAVE VOLTAGE DOUBLER



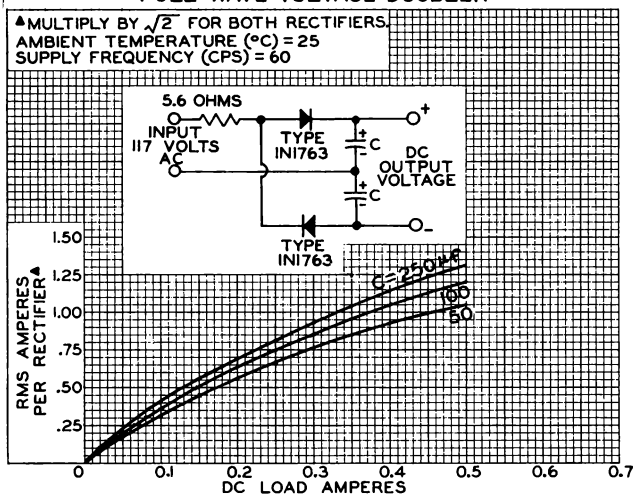
92CS-9716



1N1763

TYPICAL CHARACTERISTICS

FULL-WAVE VOLTAGE DOUBLER



92CS-9982

1N1764

SILICON RECTIFIER

DIFFUSED-JUNCTION TYPE

For use in power supplies of color and black-and-white television receivers, radio receivers, phonographs, and other electronic equipment

GENERAL DATA

Mechanical:

Operating Position	Any
Maximum Length (Excluding flexible leads)	0.725"
Maximum Diameter	0.400"
Case	Metal
Envelope Seals	Hermetic
Leads, Flexible	2
Minimum length	1.250"
Diameter	0.027" to 0.035"

RECTIFIER SERVICE

Maximum Ratings, *Absolute-Maximum Values:*

For power-supply frequency of 60 cps and with capacitor input to filter

PEAK INVERSE VOLTAGE	500 max.	volts
RMS SUPPLY VOLTAGE	175 max.	volts
FORWARD CURRENT:		
At ambient temperatures	*Up to 75° C*	*Above 75° C*
DC	0.5 max.	See Rating Chart — amp
Peak, recurrent	5 max.	See Rating Chart — amp
Surge, for a "turn-on" transient of 2-milliseconds duration	35 max.	See Rating Chart — amp
AMBIENT TEMPERATURE (During operation)	100 max.	°C
STORAGE-TEMPERATURE RANGE	-65 to +150	°C

Characteristics:

At ambient temperature of 25° C

Maximum Instantaneous Forward Voltage at instantaneous forward amperes = 15	3	volts
Maximum Reverse Current at peak inverse volts = 500	100	μa

At ambient temperature of 100° C

Maximum Reverse Current at peak inverse volts = 500	1	ma

Typical Operation:

As half-wave rectifier

RMS Supply Voltage	150	150	150	volts
Filter-Input Capacitor (C)	50	100	250	μf
Surge-Limiting Resistance▲	6.8	6.8	6.8	ohms

▲: See next page.

SEMICONDUCTOR and MATERIALS DIVISION
RADIO CORPORATION OF AMERICA, SOMERVILLE, NEW JERSEY

1N1764
SILICON RECTIFIER

DC Output Voltage at input to filter (Approx.):				
At half-load ma. = 250. . . .	158	184	190	volts
At full-load ma. = 500. . . .	128	170	178	volts
Voltage Regulation (Approx.):				
Half-load to full-load current	30	14	12	volts
As half-wave voltage doubler				
RMS Supply Voltage.	150		150	volts
Filter-Input Capacitor (C). . .	100		250	μf
Surge-Limiting Resistance▲. . .	6.8		6.8	ohms
DC Output Voltage at input to filter (Approx.):				
At half-load ma. = 250. . . .	345		367	volts
At full-load ma. = 500. . . .	301		336	volts
Voltage Regulation (Approx.):				
Half-load to full-load current	44		31	volts
As full-wave voltage doubler				
RMS Supply Voltage.	150	150	150	volts
Filter-Input Capacitor (C). . .	50	100	250	μf
Surge-Limiting Resistance▲. . .	6.8	6.8	6.8	ohms
DC Output Voltage at input to filter (Approx.):				
At half-load ma. = 250. . . .	340	370	380	volts
At full-load ma. = 500. . . .	290	340	360	volts
Voltage Regulation (Approx.):				
Half-load to full-load current	50	30	20	volts

▲ The transformer series resistance or other resistance in the line may be deducted from the value shown.

OPERATING CONSIDERATIONS

A *surge-limiting resistor* should always be connected in series with the rectifier. The resistance value must be sufficient to limit the peak and surge currents to the value specified under the maximum ratings.

The *flexible leads* of the 1N1764 are usually soldered to the circuit elements. The rectifier, however, may be mounted in a holder of the fuse-clip type. It is desirable in all soldering operations to provide some slack or an expansion elbow in the leads to prevent excessive tension on the leads. It is important during the soldering operation to avoid excessive heat in order to prevent possible damage to the rectifier. To absorb some of the heat, grip the flexible lead of the rectifier between the case and the soldering point with a pair of pliers.

When dip soldering is employed in the assembly of printed circuitry using the 1N1764, the temperature of the solder should

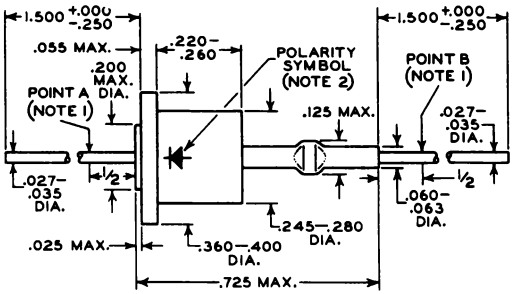
SEMICONDUCTOR and MATERIALS DIVISION
RADIO CORPORATION OF AMERICA, SOMERVILLE, NEW JERSEY

1N1764

SILICON RECTIFIER

not exceed 255° C for a maximum immersion period of 10 seconds. Furthermore, the leads should not be dip soldered beyond points A and B indicated on the *Dimensional Outline*.

Because the metal case of the 1N1764 is operated at voltages which are dangerous, care should be taken in the design of equipment to prevent the operator from coming in contact with the metal case. It is recommended that the rectifier be mounted on the underside of the chassis.



DIMENSIONS IN INCHES

92CS-9728R1

NOTE 1: DO NOT DIP SOLDER BEYOND POINTS A AND B.

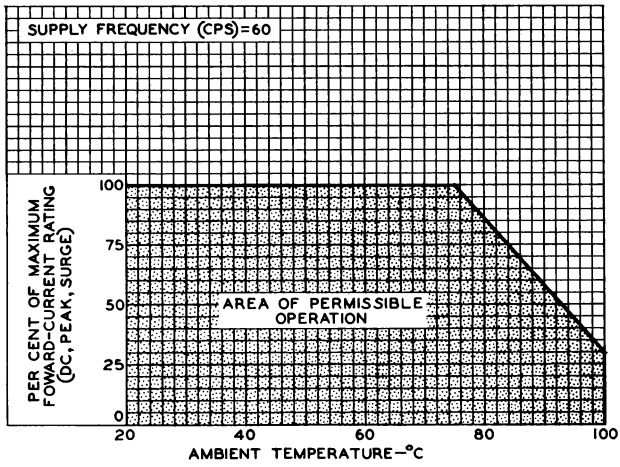
NOTE 2: ARROW INDICATES DIRECTION OF FORWARD (EASY) CURRENT FLOW AS INDICATED BY DC AMMETER.

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.

SEMICONDUCTOR and MATERIALS DIVISION
RADIO CORPORATION OF AMERICA, SOMERVILLE, NEW JERSEY

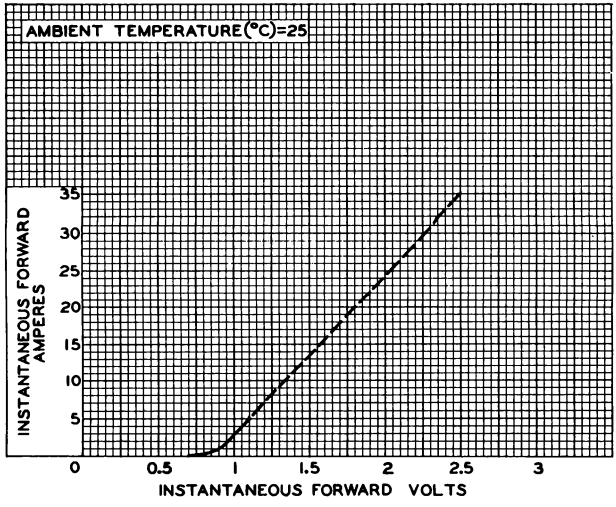
1N1764

RATING CHART



92CS-9727

TYPICAL CHARACTERISTIC



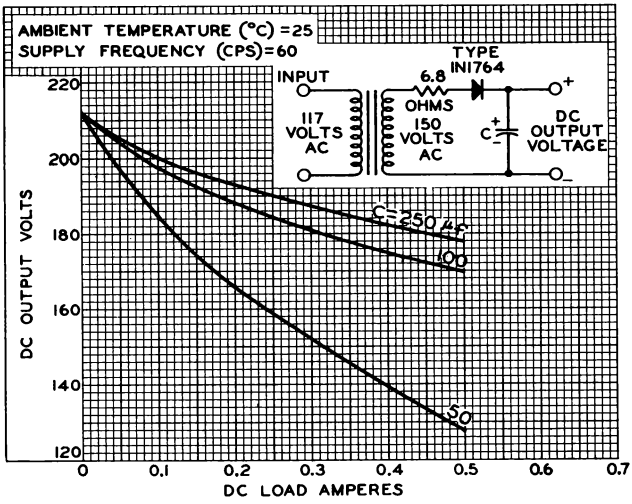
SEMICONDUCTOR and MATERIALS DIVISION
RADIO CORPORATION OF AMERICA, SOMERVILLE, NEW JERSEY

92CS-9730

1N1764

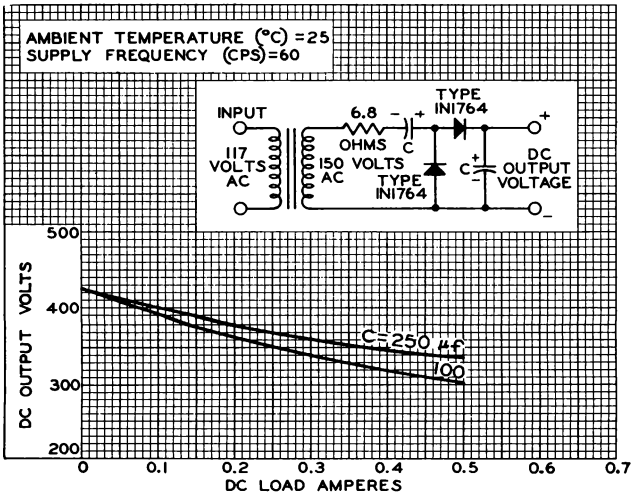
TYPICAL CHARACTERISTICS

HALF-WAVE RECTIFIER



92CS-9722

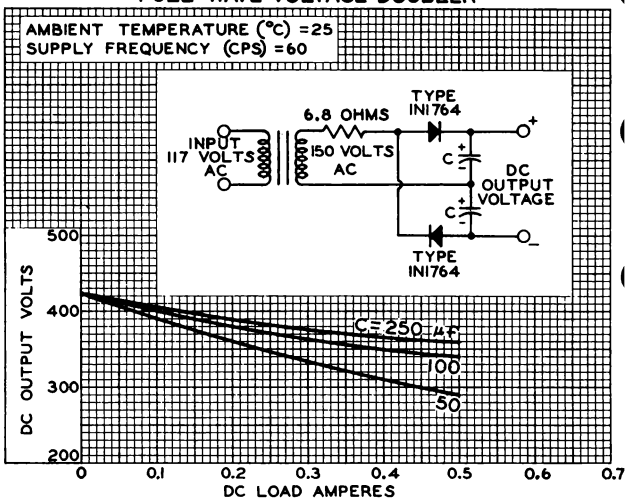
HALF-WAVE VOLTAGE DOUBLER



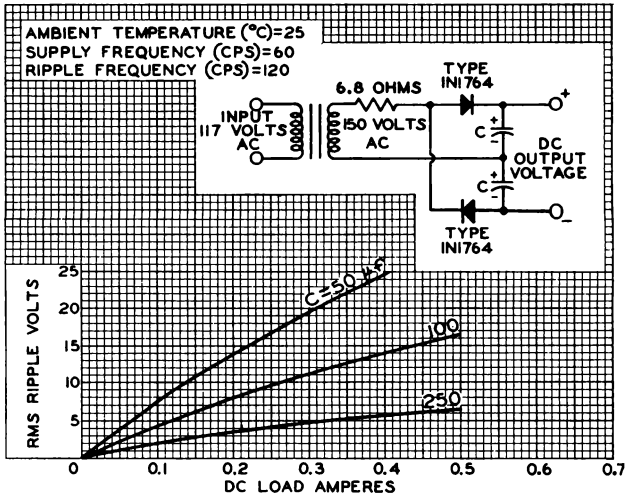
IN1764

TYPICAL CHARACTERISTICS

FULL-WAVE VOLTAGE DOUBLER

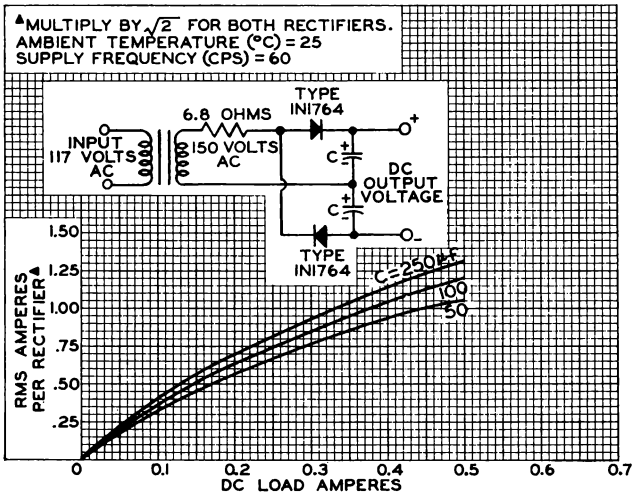


92CS-9717



1N1764

TYPICAL CHARACTERISTICS
FULL-WAVE VOLTAGE DOUBLER



92CS-9988

2N32

2N32

POINT-CONTACT TRANSISTOR

GERMANIUM TYPE FOR PULSE OR SWITCHING APPLICATIONS

DATA

General:

Maximum Overall Length	0.660"
Maximum Seated Length	0.445"
Width	0.320" ± .020"
Maximum Depth	0.240"
Case	Plastic
Base	Small-Oblong Linotetrar 3-Pin
Mounting Position	Any

PULSE or SWITCHING SERVICE

Voltage values are given with respect to base connection

Maximum Ratings, *Absolute Values:*

COLLECTOR:		
DC Voltage	-40 max.	volts
DC Current	-8 max.	ma
Dissipation	50 max.	mw
EMITTER:		
DC Voltage	-40 max.	volts
DC Current	3 max.	ma
AMBIENT TEMPERATURE	40 max.	°C

Characteristics at Ambient Temperature of 25°C:

With input circuit between emitter and base connection, and output circuit between collector and base connection

DC Collector Voltage	-25	volts
DC Emitter Current°	0.5	ma
Current Amplification Factor	2.2	
Resistance:		
Open-Circuit Input	400	ohms
Open-Circuit Output	31000	ohms
Feedback	140	ohms
Power Gain#	21	db
Frequency:		
For Voltage-gain cutoff†	0.9	Mc
For alpha cutoff††	2.7	Mc

Minimum Circuit Values:

Emitter-Circuit Resistance	1000 min.	ohms

° obtained by adjusting a variable resistor in series with power supply to give the desired current.

with collector load resistance of 10000 ohms, signal-source impedance of 500 ohms, and signal frequency of 5000 cycles per second.

† Measured at a point 3 decibels down from the low-frequency value (100 kc) and with collector load resistance of 20000 ohms, signal-source impedance of 300 ohms, and signal voltage of 25 millivolts rms. The cutoff frequency is defined as the frequency at which the output voltage has dropped to 0.7 of its low-frequency value.

††, see next page.

2N32

POINT-CONTACT TRANSISTOR

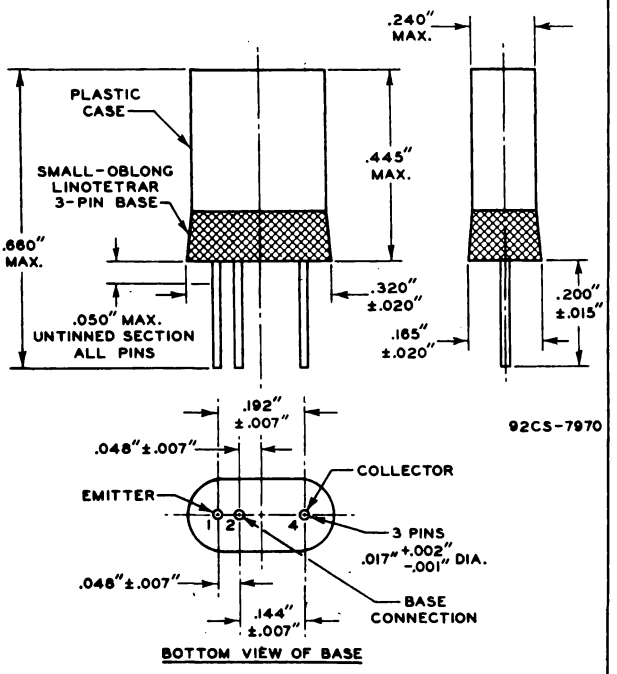
†† Measured at a point 3 decibels down from its low-frequency value (100 KC). The cutoff frequency is defined as the frequency at which the current amplification factor has dropped to 0.7 of its low-frequency value.

The 2N32 should not be inserted into or withdrawn from its socket with the power "on" because high transient currents may cause permanent damage to the transistor.

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

2N32

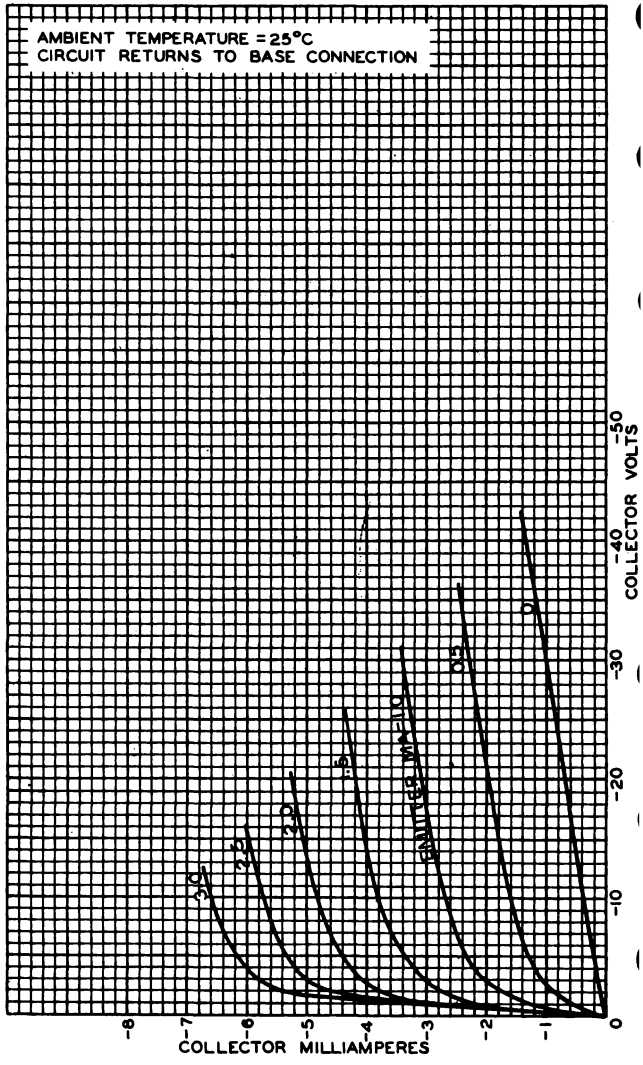
POINT-CONTACT TRANSISTOR



PIN-SPACING TOLERANCES ARE NOT CUMULATIVE

2N32

AVERAGE COLLECTOR CHARACTERISTICS



2N33

2N33

POINT-CONTACT TRANSISTOR

GERMANIUM TYPE FOR OSCILLATOR APPLICATIONS UP TO 50 Mc

DATA

General:

Maximum Overall Length	0.660"
Maximum Seated Length	0.445"
Width	0.320" ± .020"
Maximum Depth	0.240"
Case	Plastic
Base	Small-Oblong Linotetrar 3-Pin
Mounting Position	Any

VHF OSCILLATOR SERVICE

Voltage values are given with respect to base connection

Maximum Ratings, *Absolute Values:*

COLLECTOR:		
DC Voltage	-8.5 max.	volts
DC Current	-7 max.	ma
Dissipation	30 max.	mw
EMITTER:		
DC Current	0.8 max.	ma
AMBIENT TEMPERATURE	40 max.	°C

Typical Operation in Accompanying 50-Mc Oscillator Test Circuit:

COLLECTOR:		
DC Supply Voltage	-8	volts
DC Current	-3.3	ma
DC Emitter Current	0.3	ma
Useful Power Output (Approx.)	1.0	mw

The 2N33 should not be inserted into or withdrawn from its socket with the power "on" because high transient currents may cause permanent damage to the transistor.

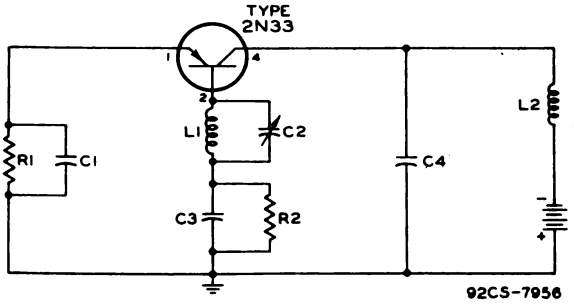
OUTLINE DIMENSIONS and TERMINAL CONNECTIONS for Type 2N33 are the same as those shown for Type 2N32

2N33

2N33

POINT-CONTACT TRANSISTOR

50-Mc Oscillator Test Circuit



C1: 1 μμf, ceramic, 25 volts
C2: 4 to 30 μμf, ceramic adjustable, 25 volts
C3: 270 μμf, mica, 25 volts
C4: 470 μμf, mica, 25 volts
L1: 0.46 μh tank inductance
L2: 1 mh rf choke
R1: 5100 ohms, 0.5 watt
R2: 1000 ohms, 0.5 watt

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.

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

2N34

2N34
JUNCTION TRANSISTOR

P-N-P GERMANIUM TYPE
FOR LOW-POWER, LOW-FREQUENCY APPLICATIONS

DATA

General:

Maximum Overall Length	0.885"
Maximum Seated Length	0.670"
Width	0.320" ± 0.020"
Depth	0.165" ± 0.020"
Case	Plastic
Base	Small-Oblong Linotetrar 3-Pin
Mounting Position	Any

AUDIO-FREQUENCY AMPLIFIER SERVICE

Voltages are given with respect to base connection

Maximum Ratings, *Absolute Values*:

COLLECTOR:		
DC Voltage	-25 max.	volts
DC Current	-8 max.	ma
Dissipation	50 max.	mw
EMITTER:		
DC Current	8 max.	ma
AMBIENT TEMPERATURE	50 max.	°C

Characteristics at Ambient Temperature of 25°C:

With input circuit between base connection and emitter, and output circuit between collector and emitter

Collector:		
DC Voltage	-6	volts
DC Current	-10▲	μamp
DC Emitter Current●	1	ma
DC Base-Connection Current	-25	μamp
Current Amplification Factor (Approx.):		
Between Emitter and Collector	0.98	
Between Base Connection and Collector	40	
Power Gain#	40	db

▲ With collector voltage of -12 volts and emitter current of 0 milliamperes.

● Obtained by adjusting a variable resistor in series with the power supply to give the desired current.

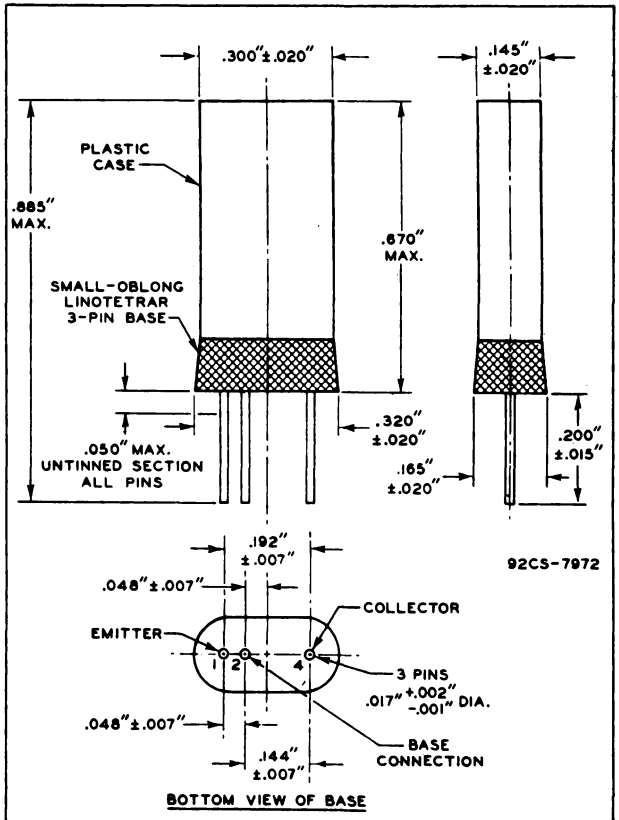
With collector load resistance of 30000 ohms, signal-source impedance of 500 ohms, and signal frequency of 5000 cycles per second.

The 2N34 should not be inserted into or withdrawn from its socket with the power "on" because high transient currents may cause permanent damage to the transistor.

2N34

2N34

JUNCTION TRANSISTOR

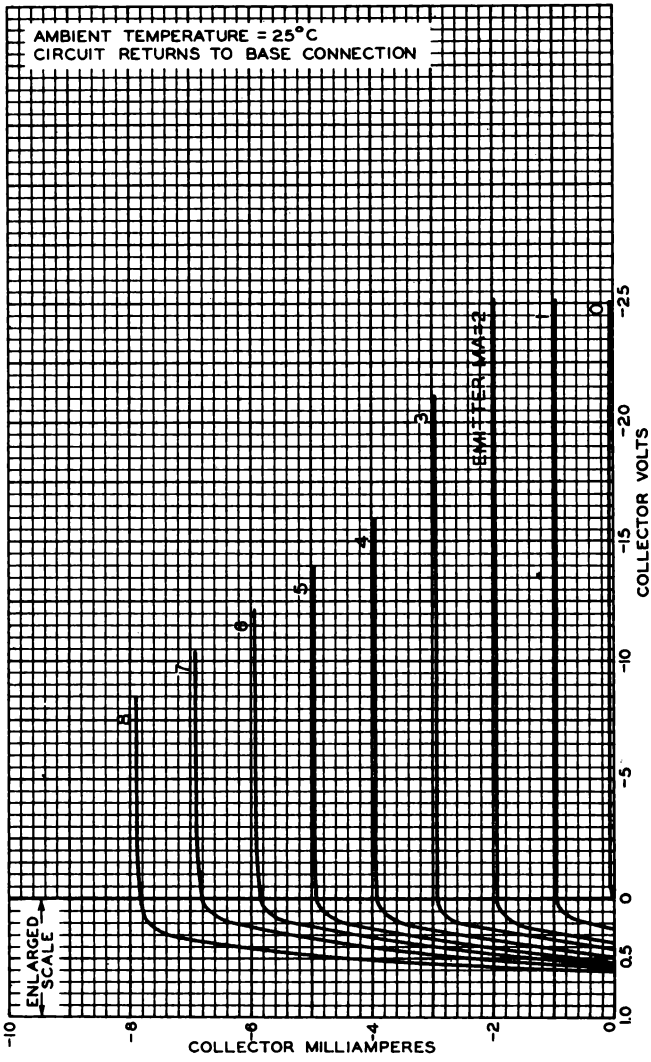


PIN-SPACING TOLERANCES ARE NOT CUMULATIVE

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

2N34

AVERAGE COLLECTOR CHARACTERISTICS



APR. 8, 1953

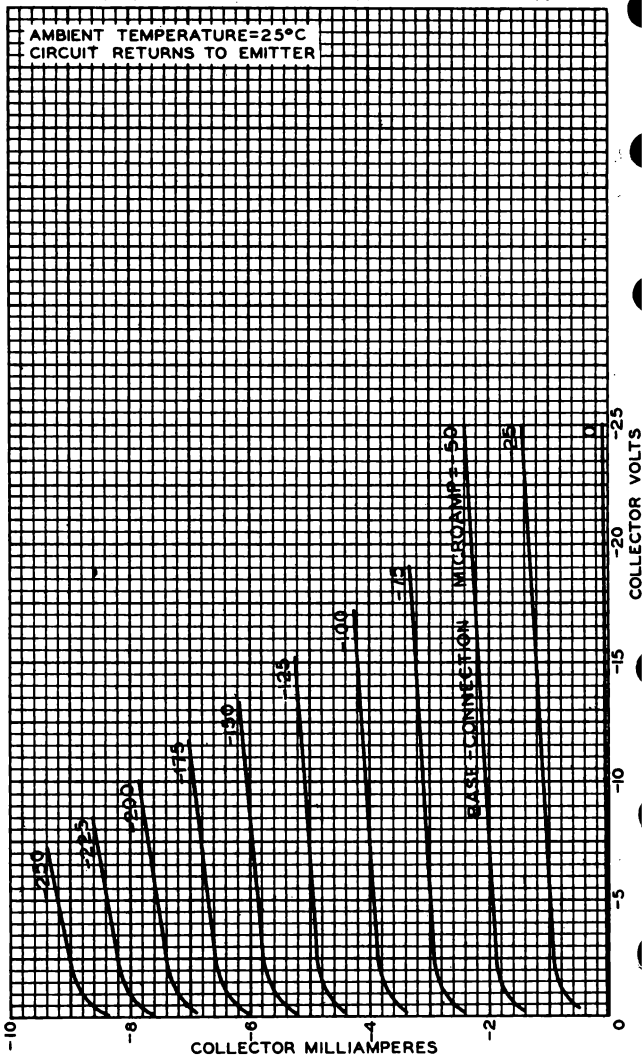
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7962

2N34

2N34

AVERAGE COLLECTOR CHARACTERISTICS



APR. 8, 1953

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7961

2N35

2N35

JUNCTION TRANSISTOR

N-P-N GERMANIUM TYPE
FOR LOW-POWER, LOW-FREQUENCY APPLICATIONS

DATA

General:

Maximum Overall Length	0.885"
Maximum Seated Length	0.670"
Width	0.320" ± 0.020"
Depth	0.165" ± 0.020"
Case	Plastic
Base	Small-Oblong Linotetrar 3-Pin
Mounting Position	Any

AUDIO-FREQUENCY AMPLIFIER SERVICE

Voltages are given with respect to base connection

Maximum Ratings, *Absolute Values:*

COLLECTOR:		
DC Voltage	25 max.	volts
DC Current	8 max.	ma
Dissipation	50 max.	mw
EMITTER:		
DC Current	-8 max.	ma
AMBIENT TEMPERATURE	50 max.	°C

Characteristics at Ambient Temperature of 25°C:

With input circuit between base connection and emitter, and output circuit between collector and emitter

Collector:		
DC Voltage	6	volts
DC Current	10 ▲▲	μamp
DC Emitter Current●	-1	ma
DC Base-Connection Current	25	μamp
Current Amplification Factor (Approx.):		
Between Emitter and Collector	0.98	
Between Base Connection and Collector	40	
Power Gain#	40	db

▲▲ With collector voltage of 12 volts and emitter current of 0 milliamperes.

● Obtained by adjusting a variable resistor in series with the power supply to give the desired current.

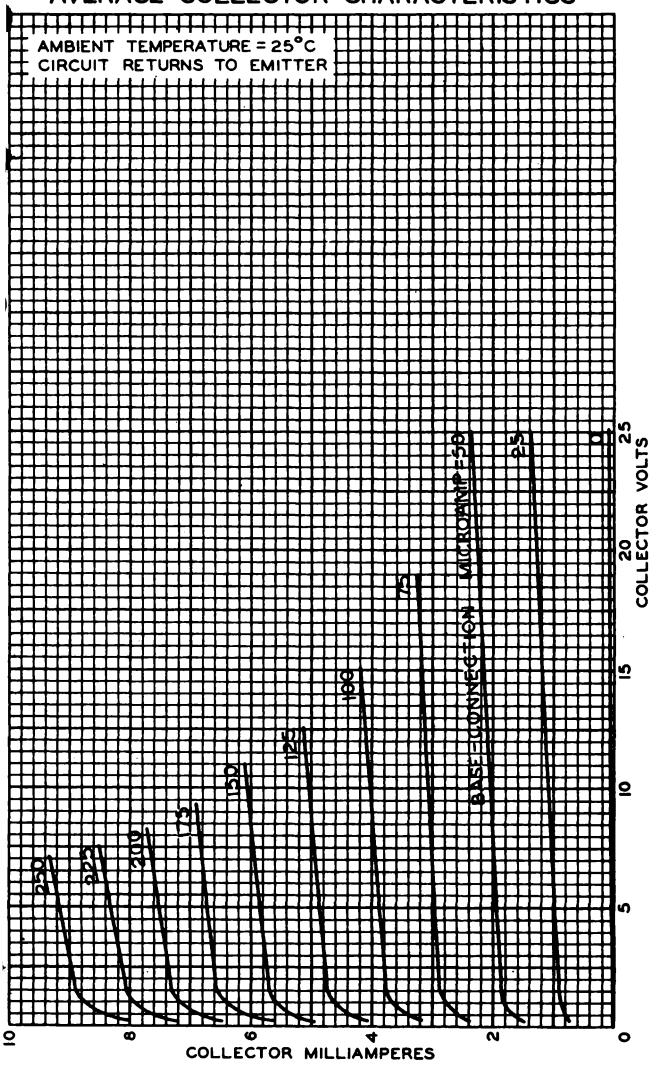
\# With collector load resistance of 30000 ohms, signal-source impedance of 500 ohms, and signal frequency of 5000 cycles per second.

The 2N35 should not be inserted into or withdrawn from its socket with the power "on" because high transient currents may cause permanent damage to the transistor.

OUTLINE DIMENSIONS and TERMINAL CONNECTIONS
for Type 2N35 are the same as those shown for Type 2N34

2N35

AVERAGE COLLECTOR CHARACTERISTICS



APR. 7, 1953

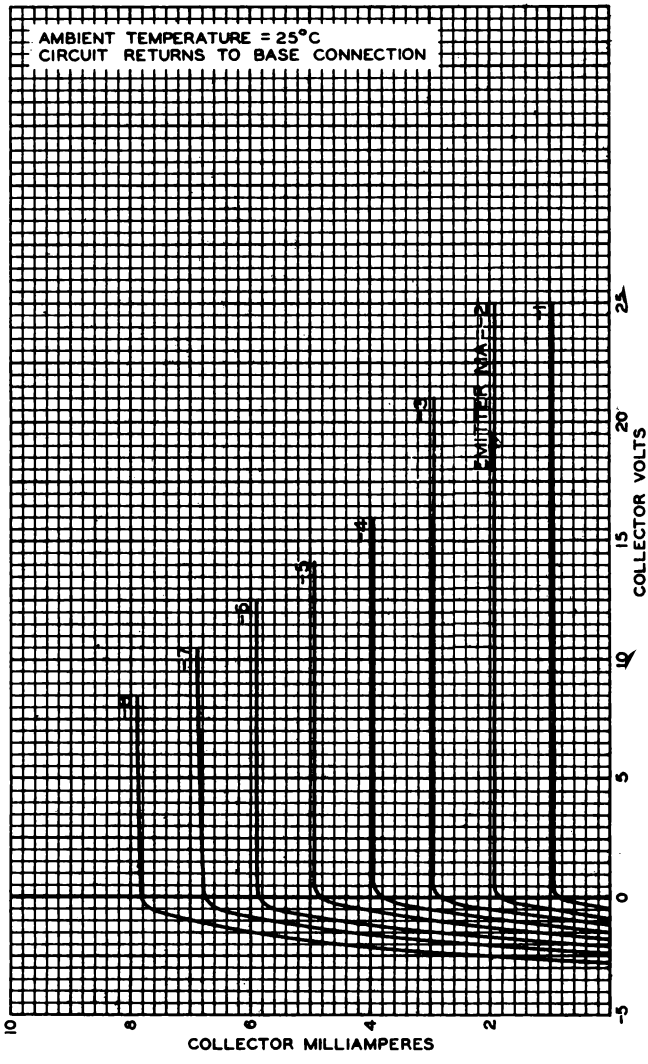
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7959

2N35

2N35

AVERAGE COLLECTOR CHARACTERISTICS



APR. 7, 1953

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7960

2N218
JUNCTION TRANSISTOR

GERMANIUM P-N-P ALLOY TYPE

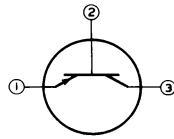
For 455-kc intermediate-frequency applications

The 2N218 is the same as the 2N139 except for the following items:

Mechanical:

Maximum Length (Excluding flexible leads) . . . . . 0.405"
Leads, Flexible 3
  Length. . . . . 1.5" ± 0.015"
  Orientation and diameter. . . . . *See Dimensional Outline*

BOTTOM VIEW



OPERATING CONSIDERATIONS

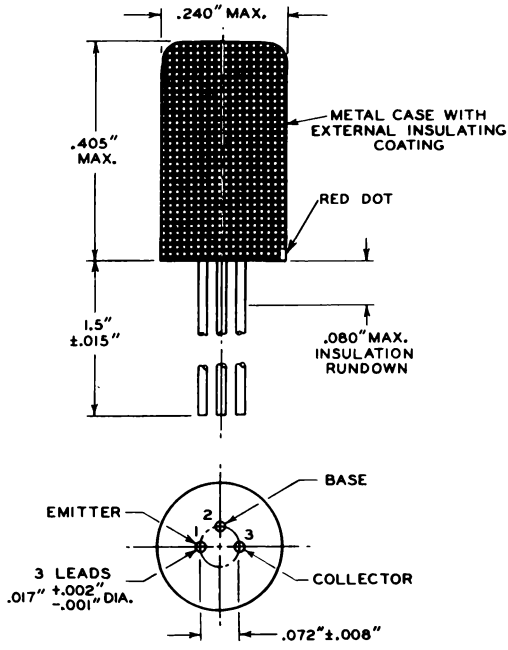
The 2N218 should not be connected into or disconnected from circuits with the power on because high transient currents may cause permanent damage to the transistor.

The *flexible leads* of the 2N218 are usually soldered to the circuit elements. Soldering of the leads may be made close to the glass stem provided care is taken to conduct excessive heat away from the lead seal. Otherwise, the heat of the soldering operation will crack the seals of the leads and damage the transistor.

When dip soldering is employed in the assembly of printed circuitry using the 2N218, the temperature of the solder should not exceed 230°C for a maximum immersion period of 10 seconds.

SEMICONDUCTOR DIVISION
RADIO CORPORATION OF AMERICA, SOMERVILLE, NEW JERSEY

2N218
JUNCTION TRANSISTOR



92CS-9025

2N219

JUNCTION TRANSISTOR

GERMANIUM P-N-P ALLOY TYPE

For 540 to 1600 kc converter applications

The 2N219 is the same as the 2N140 except for the following items:

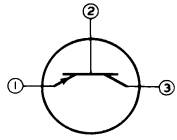
Mechanical:

Maximum Length (Excluding flexible leads) . . . . . 0.405"
Leads, Flexible 3
Length. . . . . 1.5" ± 0.015"
Orientation and diameter. . . . . *See Dimensional Outline*

BOTTOM VIEW

Lead 1 - Emitter

Lead 2 - Base



Lead 3 - Collector (Adjacent to red dot on side of envelope)

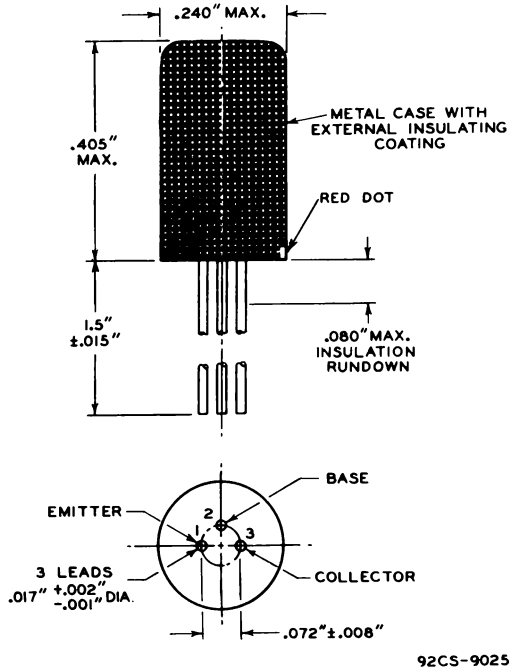
OPERATING CONSIDERATIONS

The 2N219 should not be connected into or disconnected from circuits with the power on because high transient currents may cause permanent damage to the transistor.

The *flexible leads* of the 2N219 are usually soldered to the circuit elements. Soldering of the leads may be made close to the glass stem provided care is taken to conduct excessive heat away from the lead seal. Otherwise, the heat of the soldering operation will crack the seals of the leads and damage the transistor.

When dip soldering is employed in the assembly of printed circuitry using the 2N219, the temperature of the solder should not exceed 230°C for a maximum immersion period of 10 seconds.

2N219
JUNCTION TRANSISTOR



SEMICONDUCTOR DIVISION
RADIO CORPORATION OF AMERICA, SOMERVILLE, NEW JERSEY

2N220

JUNCTION TRANSISTOR

GERMANIUM P-N-P ALLOY TYPE

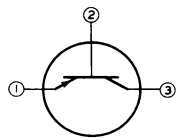
For low-noise audio-frequency applications

The 2N220 is the same as the 2N175 except for the following items:

Mechanical:

Maximum Length (Excluding flexible leads). . . . . 0.405"
Leads, Flexible. 3
Length . . . . . 1.5" ± 0.015"
Orientation and diameter . . . . . *See Dimensional Outline*

BOTTOM VIEW



OPERATING CONSIDERATIONS

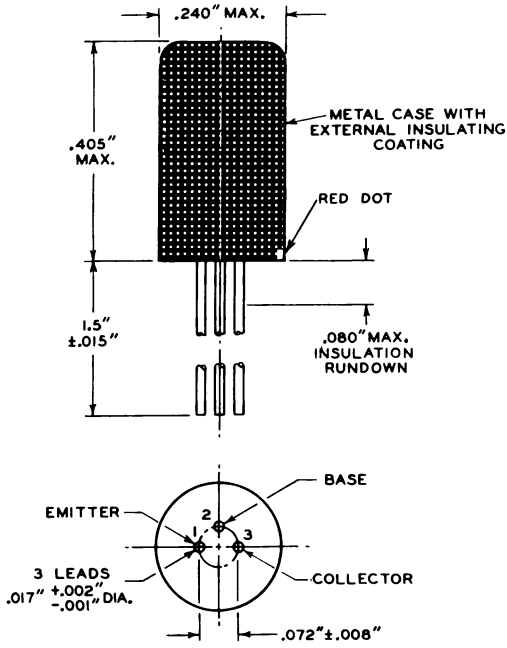
The 2N220 should not be connected into or disconnected from circuits with the power on because high transient currents may cause permanent damage to the transistor.

The flexible leads of the 2N220 are usually soldered to the circuit elements. Soldering of the leads may be made close to the glass stem provided care is taken to conduct excessive heat away from the lead seal. Otherwise, the heat of the soldering operation will crack the seals of the leads and damage the transistor.

When dip soldering is employed in the assembly of printed circuitry using the 2N220, the temperature of the solder should not exceed 230°C for a maximum immersion period of 10 seconds.

SEMICONDUCTOR DIVISION
RADIO CORPORATION OF AMERICA, SOMERVILLE, NEW JERSEY

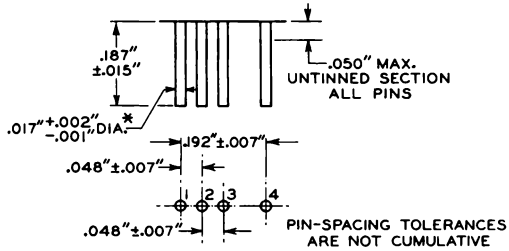
2N220
JUNCTION TRANSISTOR



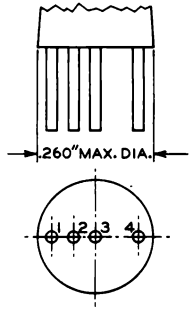
SEMICONDUCTOR DIVISION
RADIO CORPORATION OF AMERICA, SOMERVILLE, NEW JERSEY

"LINOTETRAR"

PIN DIMENSIONS AND ORIENTATION



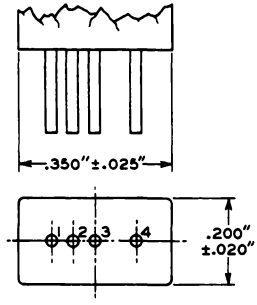
SMALL-ROUND LINOTETRAR



No. of Pins	*Pins*	*JETEC No.*	*RCA No.*
4-Pin	1,2,3,4	E4-24	-
3-Pin	1,2, 4	E3-25	-

* The specified pin diameter applies only in the zone between 0.050" from the base seat and the end of the pin.

SMALL-RECTANGLE LINOTETRAR



No. of Pins	*Pins*	*JETEC No.*	*RCA No.*
4-Pin	1, 2, 3, 4	E4-31	-
3-Pin	1, 2, 4	E3-32	-
2-Pin	1, 4	E2-33	FS6151

For other dimensions, see first page of the "Linotetrar" series

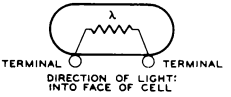
6694-A
PHOTOCONDUCTIVE CELL

CADMIUM-SULFIDE TYPE

DATA

General:

Spectral Response. S-12
Wavelength of Maximum Response . . . . . 5000 ± 500 angstroms
Sensitive Area:
  Shape. . . . . .Rectangular
  Dimensions (Minimum) . . . . . 0.020" x 0.018"
Direct Interelectrode Capacitance . . . . . 0.6 μμf
Maximum Overall Length . . . . . 0.500"
Maximum Seated Length . . . . . 0.300"
Width. . . . . 0.350" ± 0.025"
Depth. . . . . 0.200" ± 0.020"
Mounting Position. . . . . .Any
Weight (Approx.) . . . . . 0.02 oz
Base . . . .Small-Rectangle Linotetrar 2-Pin (JETEC No.E2-33)
Socket . . . . . Cinch Part No.46AZ20248, or equivalent



λ indicates that the primary characteristic of the element within the envelope symbol is designed to vary under the influence of light.

Maximum Ratings, *Absolute Values:*

POLARIZING VOLTAGE	150 max.	volts
POWER DISSIPATION.	30 max.	mw
AMBIENT-TEMPERATURE RANGE.	0 to +70	°C

Characteristics:

Under conditions with polarizing voltage of 90 volts and at ambient temperature of 25°C

	Min.	*Median*	*Max.*	
Sensitivity:				
Radiant♦, at 5000 angstroms	-	415	-	μamp/μwatt
Luminous*, at 0 cps.	-	1	-	amp/lumen
Luminous intensity▲, at 0 cps	1.9	4	-	μamp/ft-c
Dynamic.				*See Curves*
Dark Current	-	-	0.1	μamp
Dark Noise	Essentially lower than that of associated circuit			
Photocurrent:				
Rise				*See Curves*
Decay.				*See Curves*

♦ For conditions where the incident power is 0.2 μwatt.

* For conditions where the light source is a tungsten-filament lamp operated at a color temperature of 2870°K. A light flux of about 100 microlumens is used.

▲: See next page.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6694-A
PHOTOCONDUCTIVE CELL

▲ For light conditions the same as shown under (*) except that an incident light intensity of 30 foot-candles is used.

DEFINITIONS

Radiant Sensitivity. The quotient of output current by incident radiant power of a given wavelength, at constant electrode voltages.

Luminous Sensitivity. The quotient of output current by incident luminous flux, at constant electrode voltages.

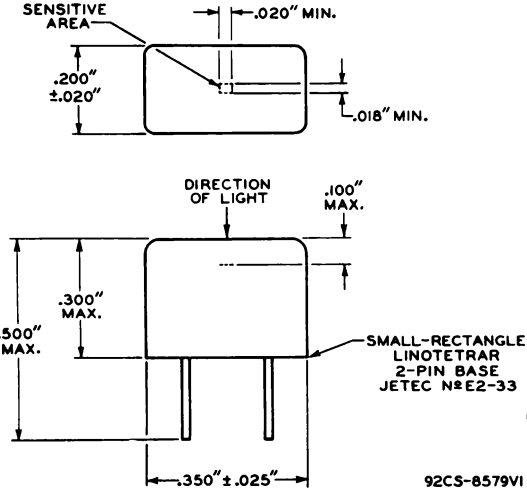
Luminous Intensity Sensitivity. The quotient of output current by the incident luminous intensity, at constant electrode voltages.

Dynamic Sensitivity. The quotient of the modulated component of the electrical output by the modulated component of the incident radiation.

OPERATING CONSIDERATIONS

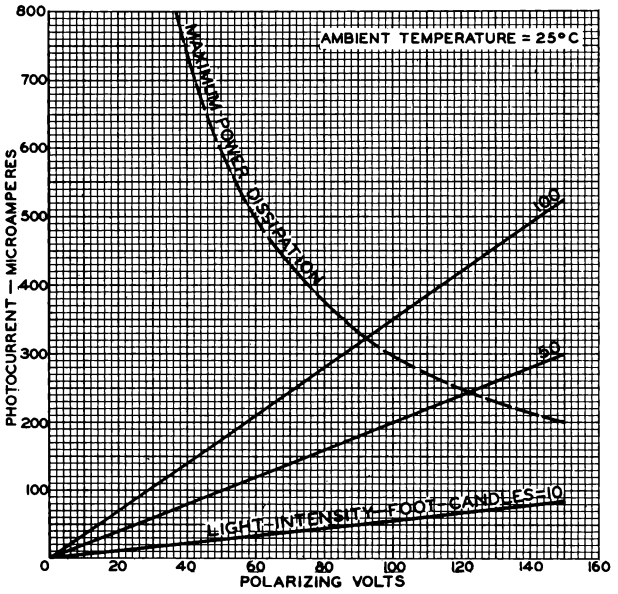
The *polarizing voltage* for the 6694-A may be applied without regard to polarity. To obtain the full sensitivity of the cell, it is essential that its entire photosensitive area be illuminated. Otherwise, a blocking action produced by the unilluminated area of the cell will occur and cause unsatisfactory operation.

SPECTRAL-SENSITIVITY CHARACTERISTIC
of Photoconductive Cell having S-12 Response
is shown at the front of this Section



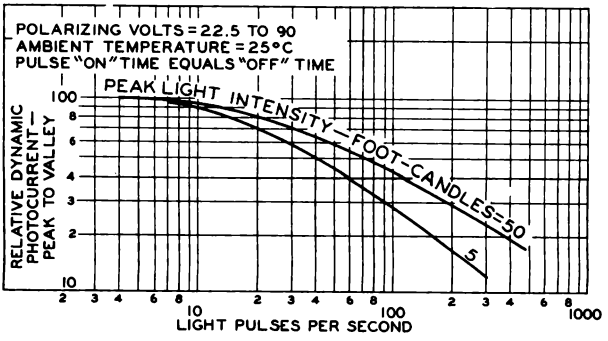
6694-A

AVERAGE CHARACTERISTICS



92CM-8583V1

DYNAMIC SENSITIVITY CHARACTERISTICS

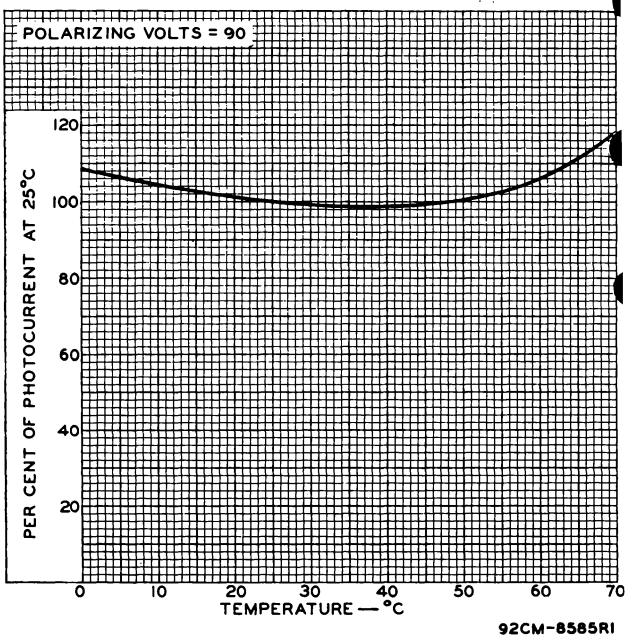


TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

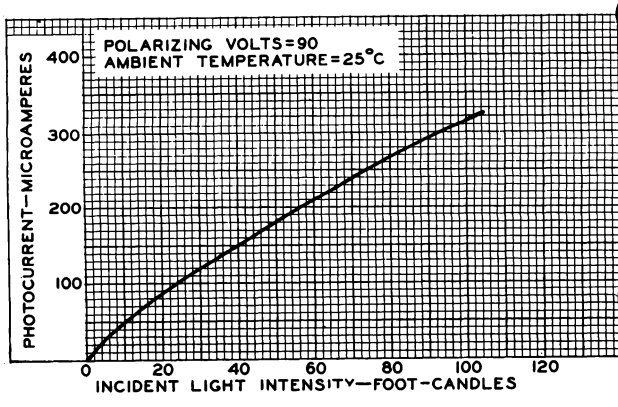
92CM-8872V

6694-A

TYPICAL CHARACTERISTICS



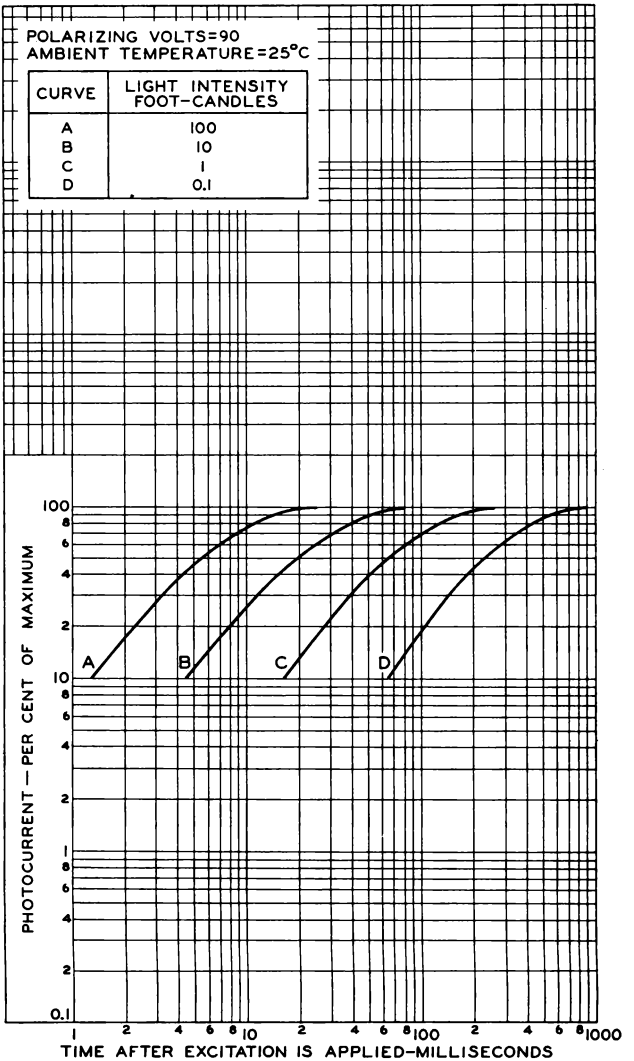
92CM-8585R1



92CM-8584R1

6694-A

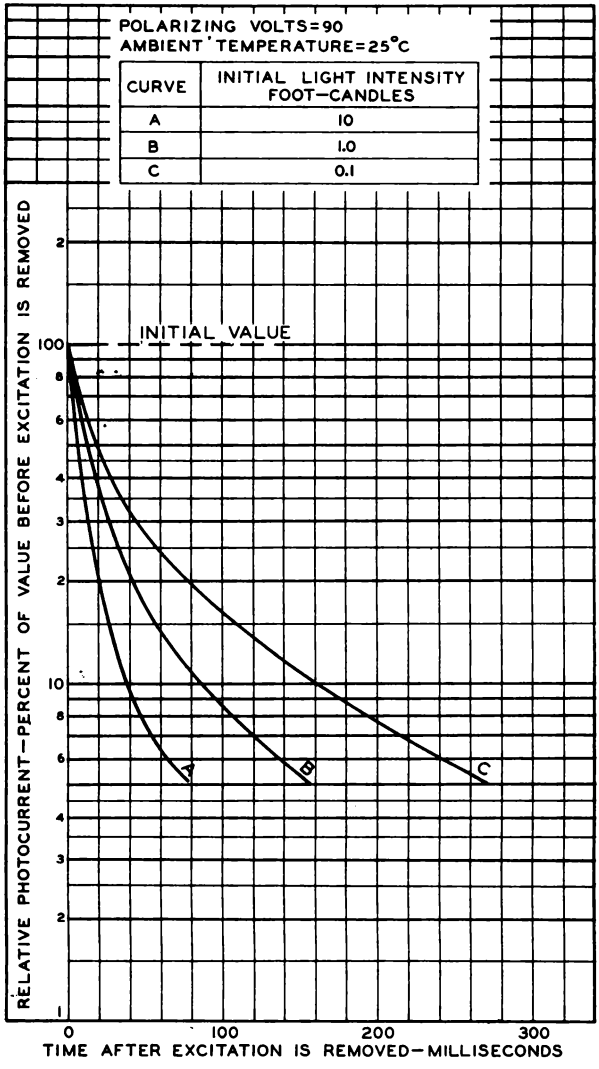
TYPICAL RISE CHARACTERISTICS



6694-A

6694-A

TYPICAL DECAY CHARACTERISTICS



CURVE	INITIAL LIGHT INTENSITY FOOT-CANDLES
A	10
B	1.0
C	0.1

ADV Plans, LLC

Copyright Notice:

The entire contents of this CD/DVD are copyright 2014 by ADV Plans, LLC. All Rights Reserved.

Reproduction or distribution of this disk, either free or for a fee is strictly prohibited. We actively monitor and remove listings on eBay thru Vero.

You are free to copy or use individual images in your own projects, magazines, brochures or other school projects.

Only the sellers listed here
are authorized distributors of this collection:
www.theclassicarchives.com/authorizedsuppliers

Please view our other products at
www.theclassicarchives.com,
or our ebay stores:

TheClassicArchives
ADVPlans
SuperShedPlans