RCA TUBE HANDBOOK

HB-3

VOL. 7-8

COMMERCIAL ENGINEERING
ELECTRON TUBE DIVISION
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.

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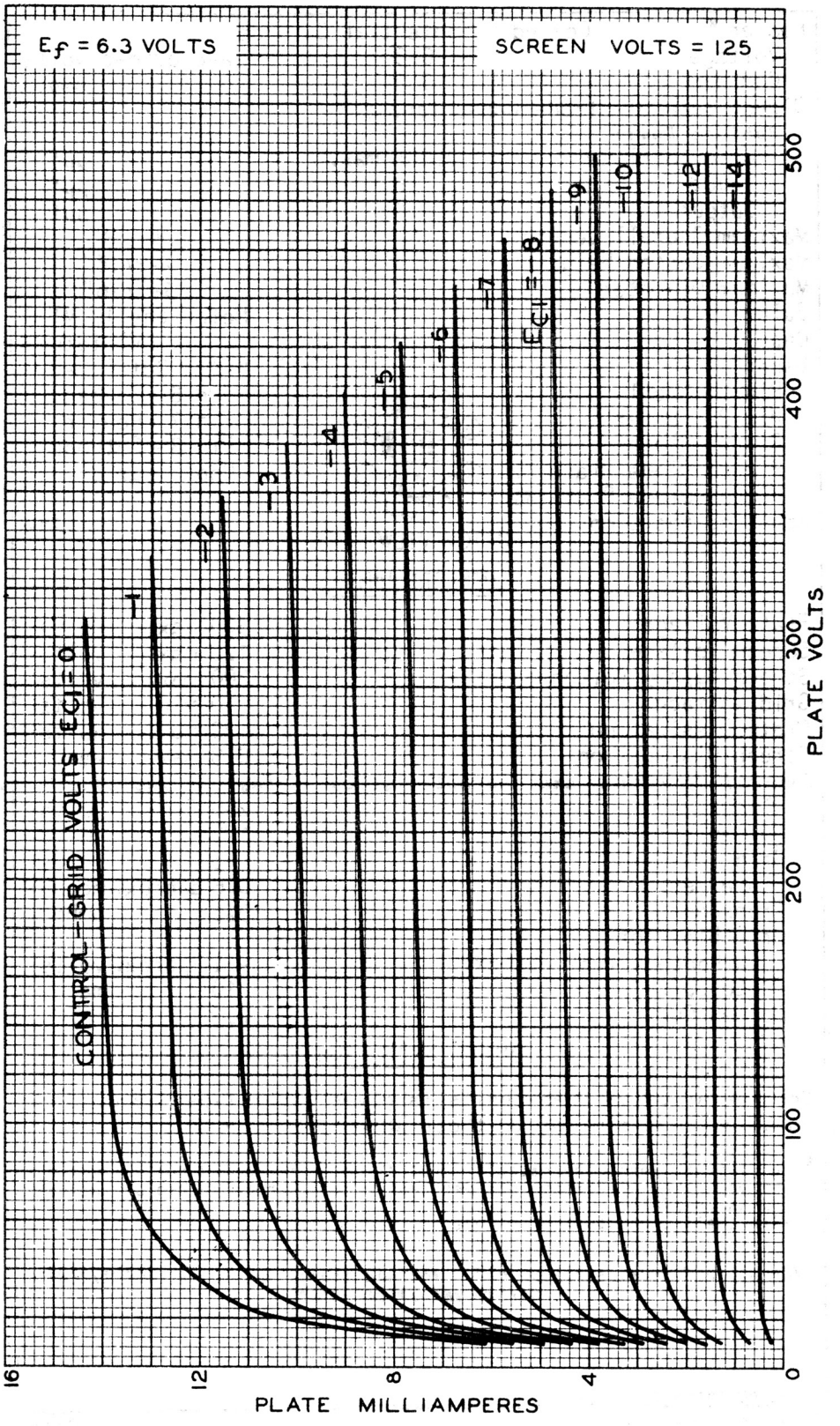
VT-93
6B8

6B8

AVERAGE PLATE CHARACTERISTICS



AUG. 14, 1936

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

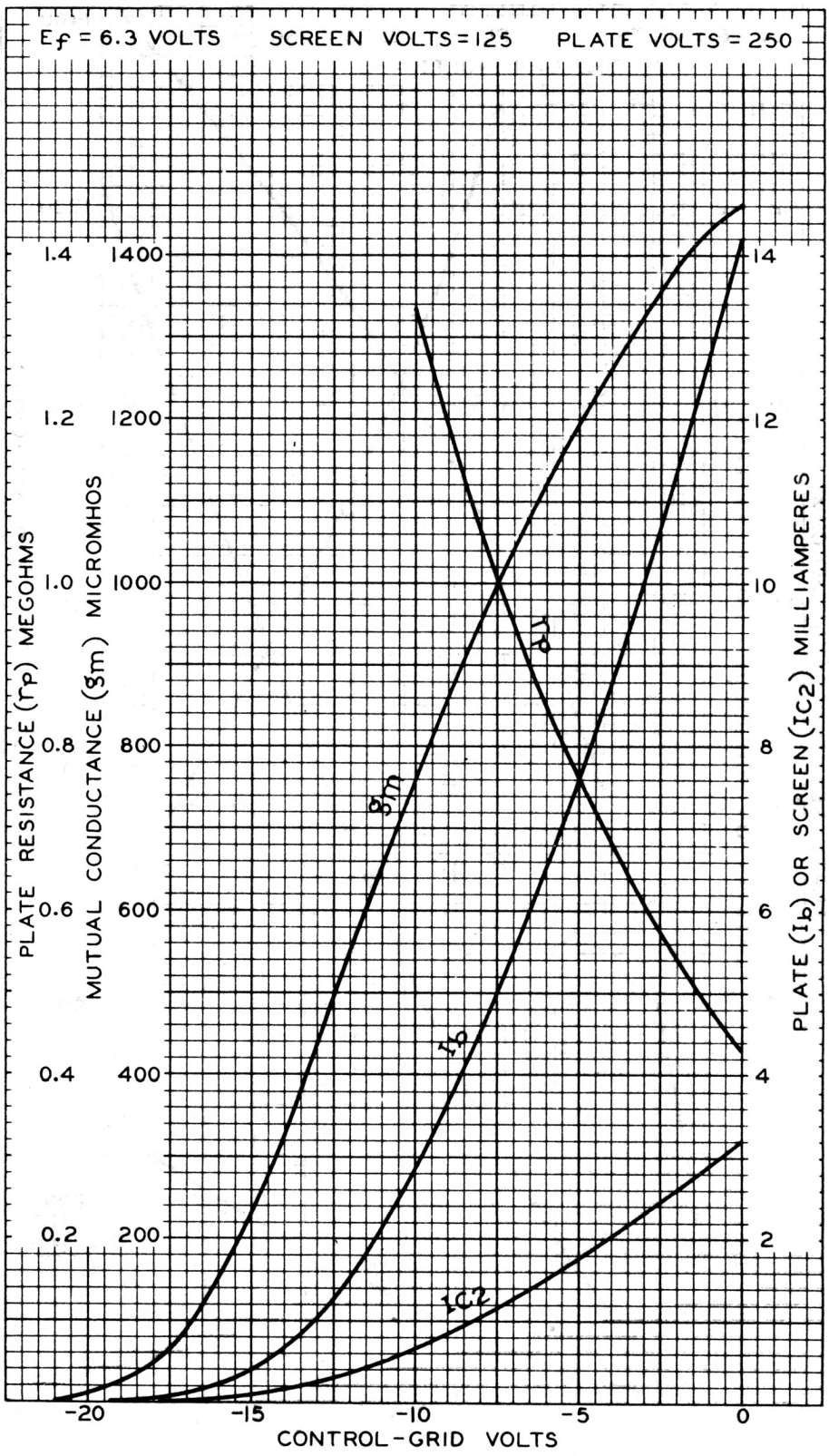
92C-4657

RCA Cunningham Radiotron RADIO TUBES

RCA-6B8

VT-93
6B8

AVERAGE CHARACTERISTICS



AUG. 18, 1936

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

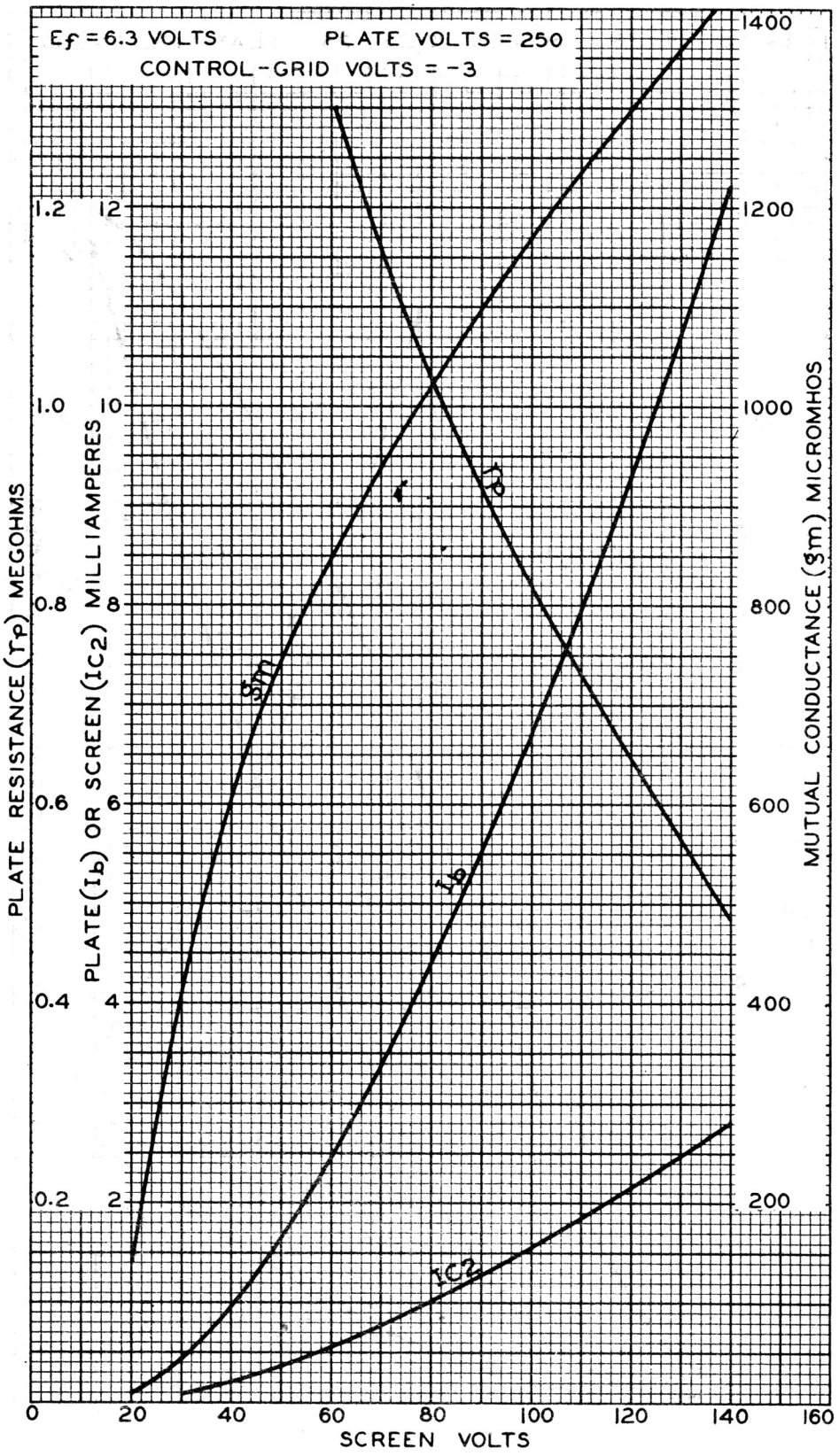
92C-4660

VT-93
6B8

RCA Cunningham Radiotron RADIO TUBES

RCA-6B8

AVERAGE CHARACTERISTICS



AUG. 18, 1936

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4661

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

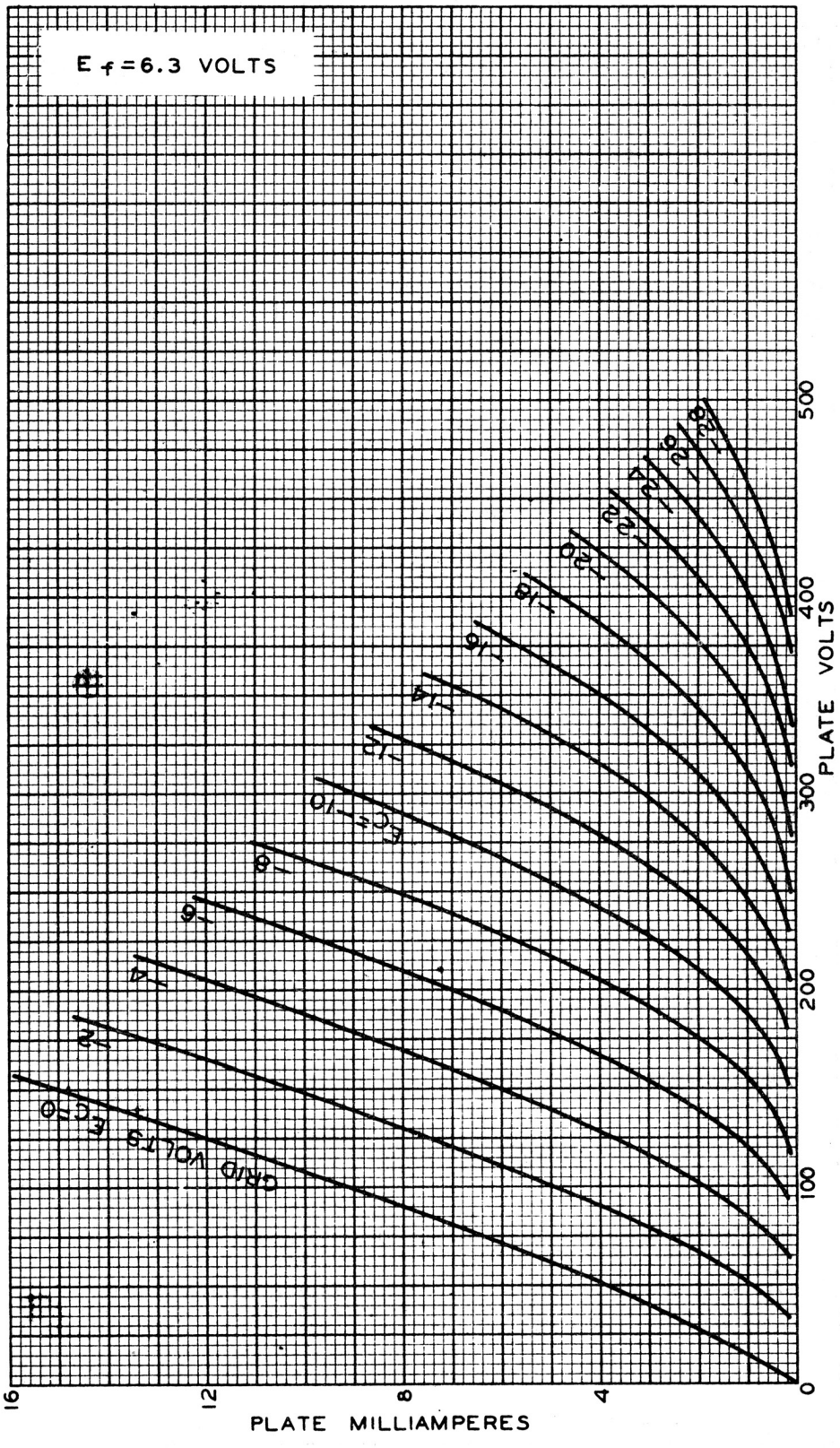
■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
▲ With shell of 6C5 connected to cathode. Values are approximate.
▲▲ With external shield connected to cathode. Values are approximate.
* Under maximum rated conditions, the resistance in the grid circuit should not exceed 1.0 megohm.

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

VT-65
6C5

6C5

AVERAGE PLATE CHARACTERISTICS



JULY 23, 1935

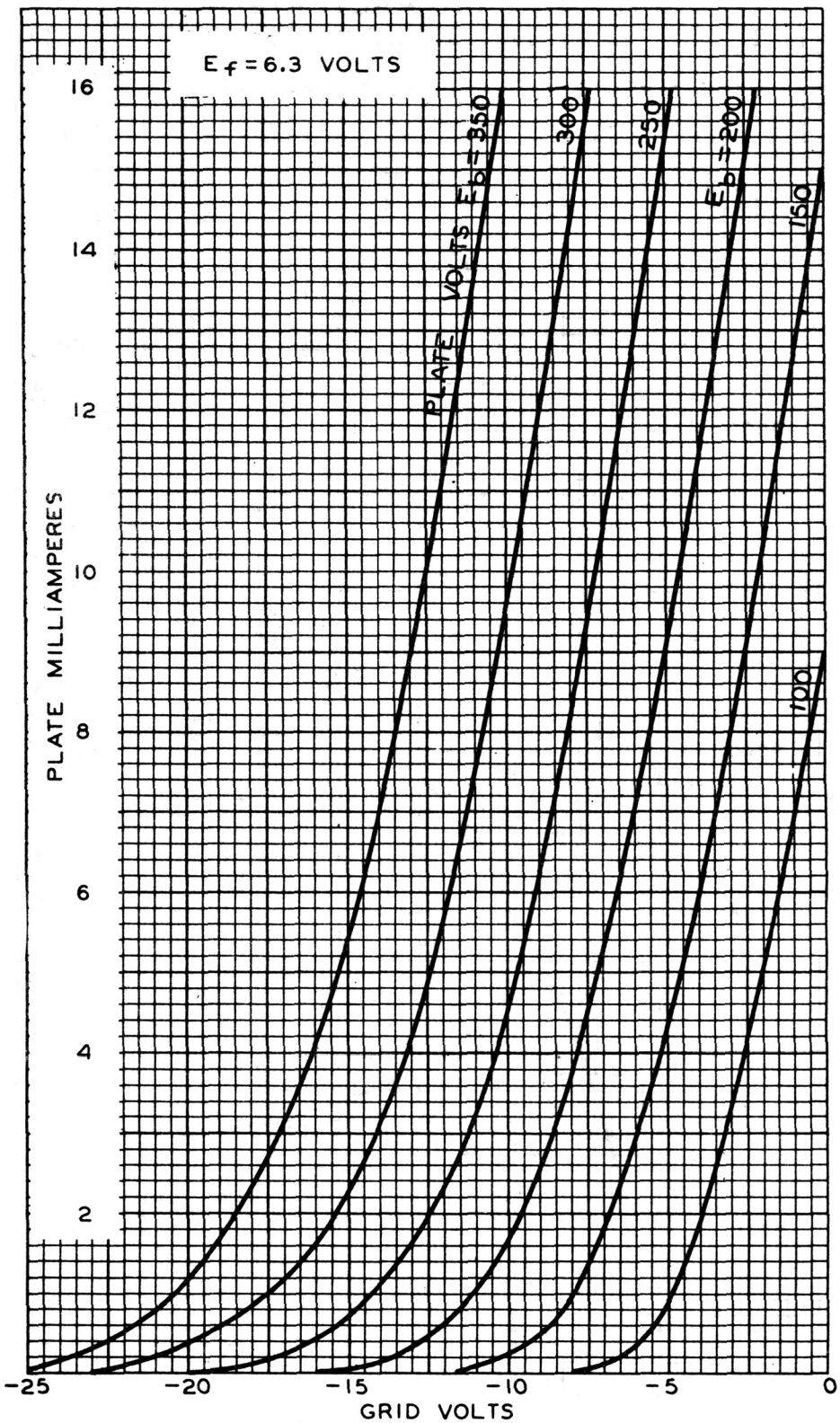
RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92C-4441

RCA Cunningham Radiotron RADIO TUBES

RCA-6C5

AVERAGE CHARACTERISTICS



NOV. 12, 1935

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

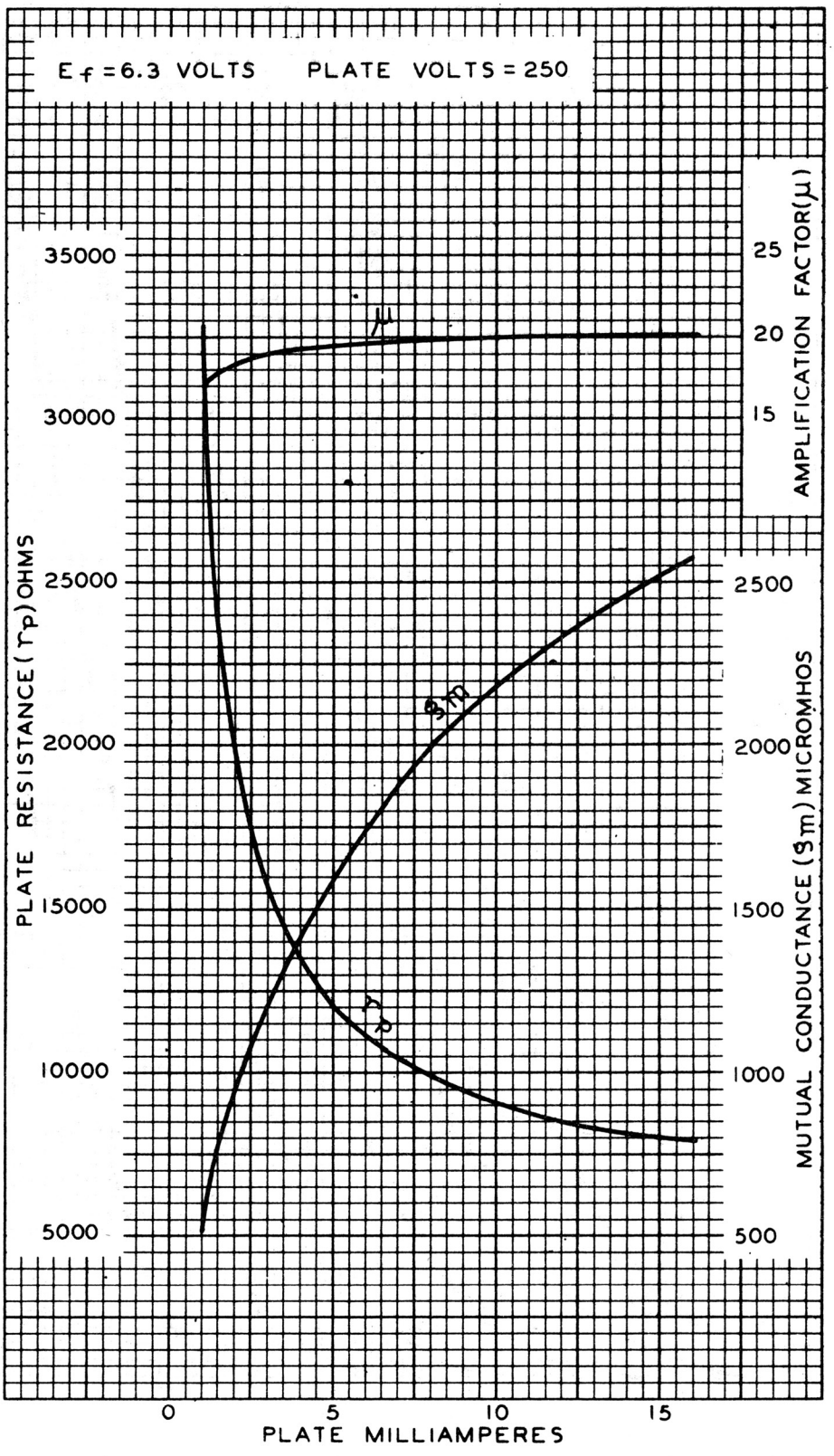
92C-4511

VT-65
6C5

RCA Cunningham Radiotron RADIO TUBES

RCA-6C5

AVERAGE CHARACTERISTICS



AUG. 23, 1935

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4462

RCA Cunningham Radiotron RADIO TUBES

RCA-6F7

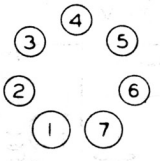
TRIODE-PENTODE

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 2-Pentode Plate
Pin 3-Pentode Screen
Pin 4-Triode Plate
Pin 5-Triode Grid
Pin 6-Cathode
Pin 7-Heater
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	290000	850000	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.

VT-70
6F7

RCA Cunningham Radiotron RADIO TUBES

RCA-6F7

TYPICAL CIRCUITS

FREQUENCY CONVERTER

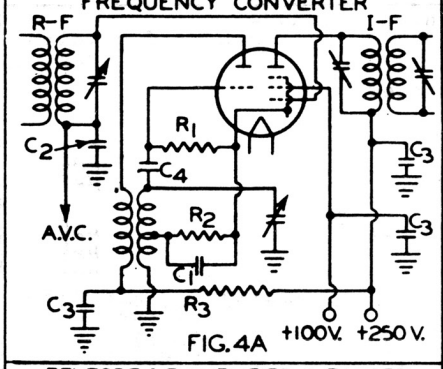


FIG.4A

FREQUENCY CONVERTER

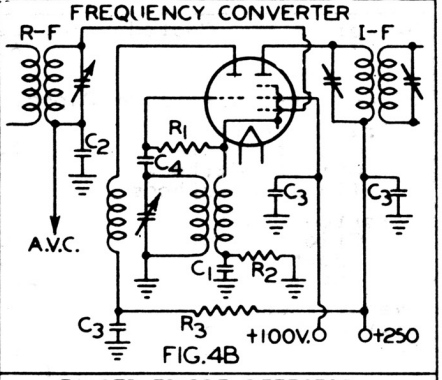


FIG.4B

PENTODE I-F AMPLIFIER & BIASED TRIODE 2ND DETECTOR

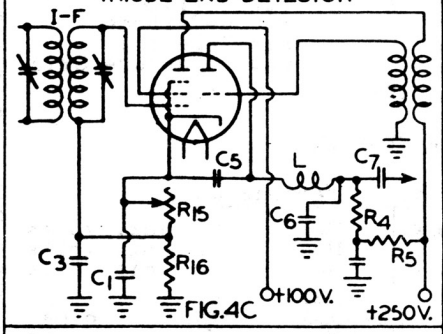


FIG.4C

BIASED TRIODE DETECTOR & PENTODE AUDIO AMPLIFIER

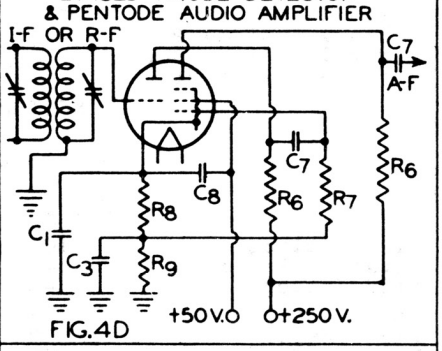


FIG.4D

GRID-LEAK TRIODE DETECTOR & PENTODE AUDIO AMPLIFIER

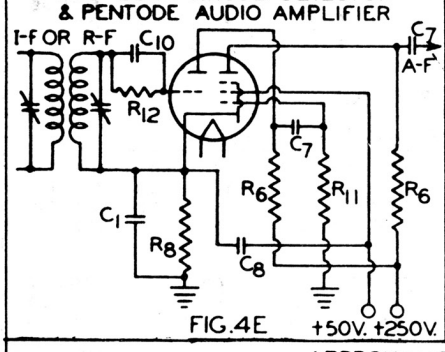


FIG.4E

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

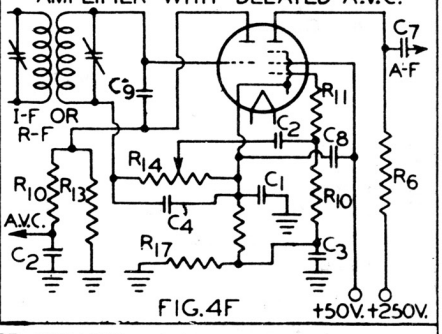


FIG.4F

	APPROXIMATE VALUES
C_1 = 5 μf	R_2 = PENTODE SELF-BIASING RESISTOR-1500 OHMS
C_2 = 0.05 μf	R_3 = VOLTAGE DROPPING RESISTOR-50000 OHMS
C_3 = 0.1 μf	R_4 = PLATE COUPLING RESISTOR-170000 OHMS
C_4 = 0.0002 μf	R_5 = FILTER RESISTOR-30000 OHMS
C_5 = 0.0024 μf	R_6 = PLATE COUPLING RESISTOR-300000 OHMS
C_6 = 0.00016 μf	R_7 = PENTODE GRID LEAK-0.5 MEGOHM
C_7 = 0.01 μf	R_8 = PENTODE SELF-BIASING RESISTOR-5000 OHMS
C_8 = 0.5 μf	R_9 = 10000 OHMS. R_9 + R_8 = TRIODE BIASING RESISTOR
C_9 = 0.0005 TO 0.001 μf	R_{10} = FILTER RESISTOR-1.0 MEGOHM
C_{10} = 0.00025 μf	R_{11} = GRID RESISTOR-500000 OHMS
L = I-F CHOKE COIL	R_{12} = TRIODE GRID LEAK-1.0 MEGOHM
R_1 = OSCILLATOR GRID LEAK-0.1 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

SEPT. 1, 1935 CE-4302

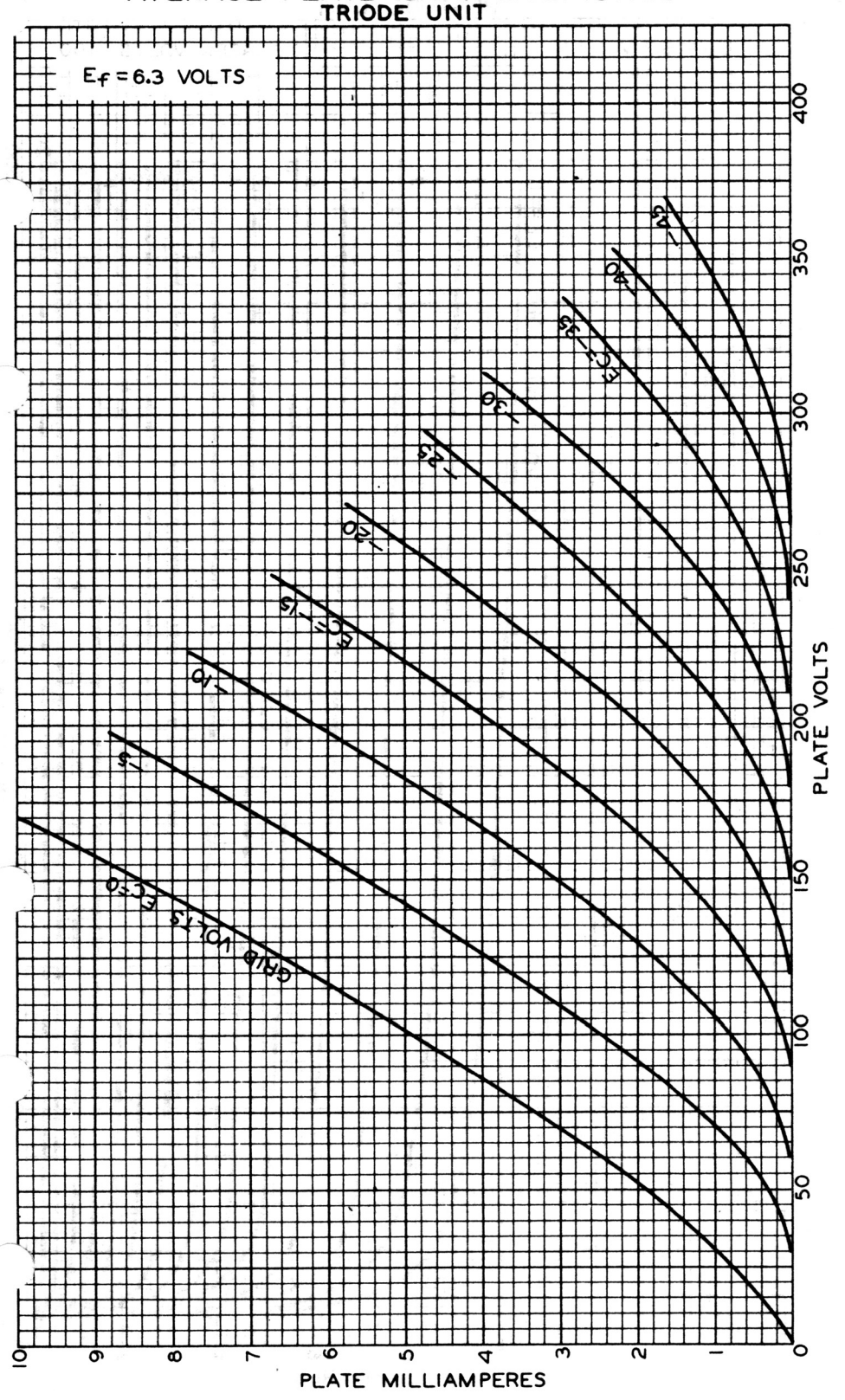
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

VT-70
6F7

RCA Radiotron
RCA-6F7

Cunningham RADIO TUBES
C-6F7

AVERAGE PLATE CHARACTERISTICS
TRIODE UNIT



DEC. 5, 1933

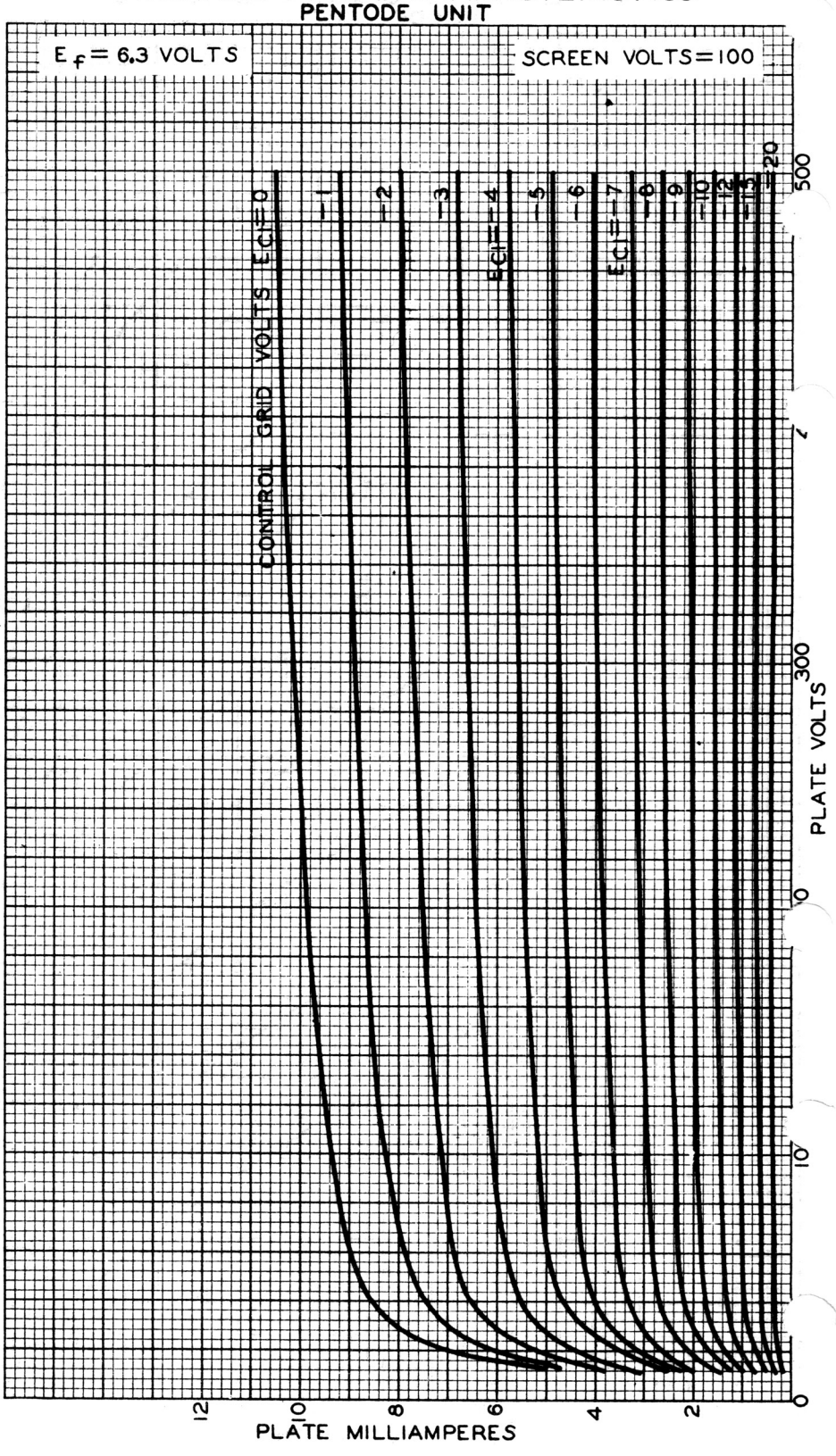
925-5426

VT-70
6F7

RCA Radiotron
RCA—6F7

Cunningham RADIO TUBES
C—6F7

AVERAGE PLATE CHARACTERISTICS



AUG. 18, 1933

92S—5360

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

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.3	amp

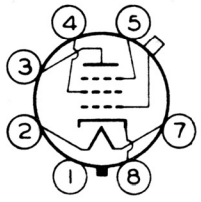
Direct Interelectrode Capacitances:

Pentode Connection:	6J7▲	6J7-G	6J7-GT	
Grid No. 1 to Plate	0.005 max.	0.007 max.●	0.005 max.●	μμf
Input	7	4.6●	4.6●	μμf
Output	12	12●	12●	μμf
*Triode Connection:**				
Grid No. 1 to Plate	2	1.8□	1.8□	μμf
Grid No. 1 to Cath.	5	2.6□	2.6□	μμf
Plate to Cathode	14	17□	17□	μμf

Mechanical:

	6J7▲	6J7-G	6J7-GT
Mounting Position	Any	Any	Any
Max. Overall Length	3-1/8"	4-15/32"	3-5/16"
Seated Length	2-7/16" ± 1/8"	3-3/4" ± 5/32"	2-5/16" to 2-3/4"
Maximum Diameter	1-5/16"	1-9/16"	1-5/16"
Bulb	Metal Shell MT8A	ST-12	T-9
Cap	Miniature	Skirted Miniature	Skirted Miniature
Base	Small-Wafer Octal 7-Pin	Small-Shell Octal 7-Pin	Small-Wafer Octal 7-Pin, Sleeve
Basing Designation	7R	G-7R	GT-7R

BOTTOM VIEW



Pin 1 { 6J7 - Shell; 6J7-G - Internal Shield; 6J7-GT - Base Sleeve }
Pin 2 - Heater
Pin 3 - Plate
Pin 4 - Grid No. 2
Pin 5 - Grid No. 3
Pin 7 - Heater
Pin 8 - Cathode
Cap - Grid No. 1

AMPLIFIER - Class A_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
PLATE DISSIPATION	0.75 max.	watt
GRID-No.2 DISSIPATION	0.1 max.	watt

(continued on next page)

▲ With shell connected to cathode. □ Without external shield.
● With external shield connected to cathode.
* With grid No.2 and grid No.3 connected to plate.

VT-91

6J7
6J7-G
6J7-GT

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

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.)	1	#	megohm
Transconductance	1185	1225	μmhos
Grid-No.1 Bias (Approx.) for cathode-current cutoff	-7	-7	volts
Plate Current	2	2	ma
Grid-No.2 Current	0.5	0.5	ma

Maximum Circuit Values:

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

AMPLIFIER - Class A_1

Triode Connection - Grids No.2 & No.3 Connected to Plate

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	250	max.	volts
PLATE DISSIPATION (Total)	1.75	max.	watts
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	-5.3	-8	volts
Amplification Factor	20	20	
Plate Resistance (Approx.)	11000	10500	ohms
Transconductance	1800	1900	μmhos
Plate Current	5.3	6.5	ma

Maximum Circuit Values:

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

BIASED DETECTOR

Typical Operation:

Plate-Supply Voltage♦	100	100	250	250	volts
Grid No.3	Connected to cathode at socket				
Grid-No.2 Voltage	12	30	50	100	volts
RF Grid-No.1 Volts (RMS)*	1.05	1.6	1.18	1.37	volts

#, ♦, *: See next page.

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

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.

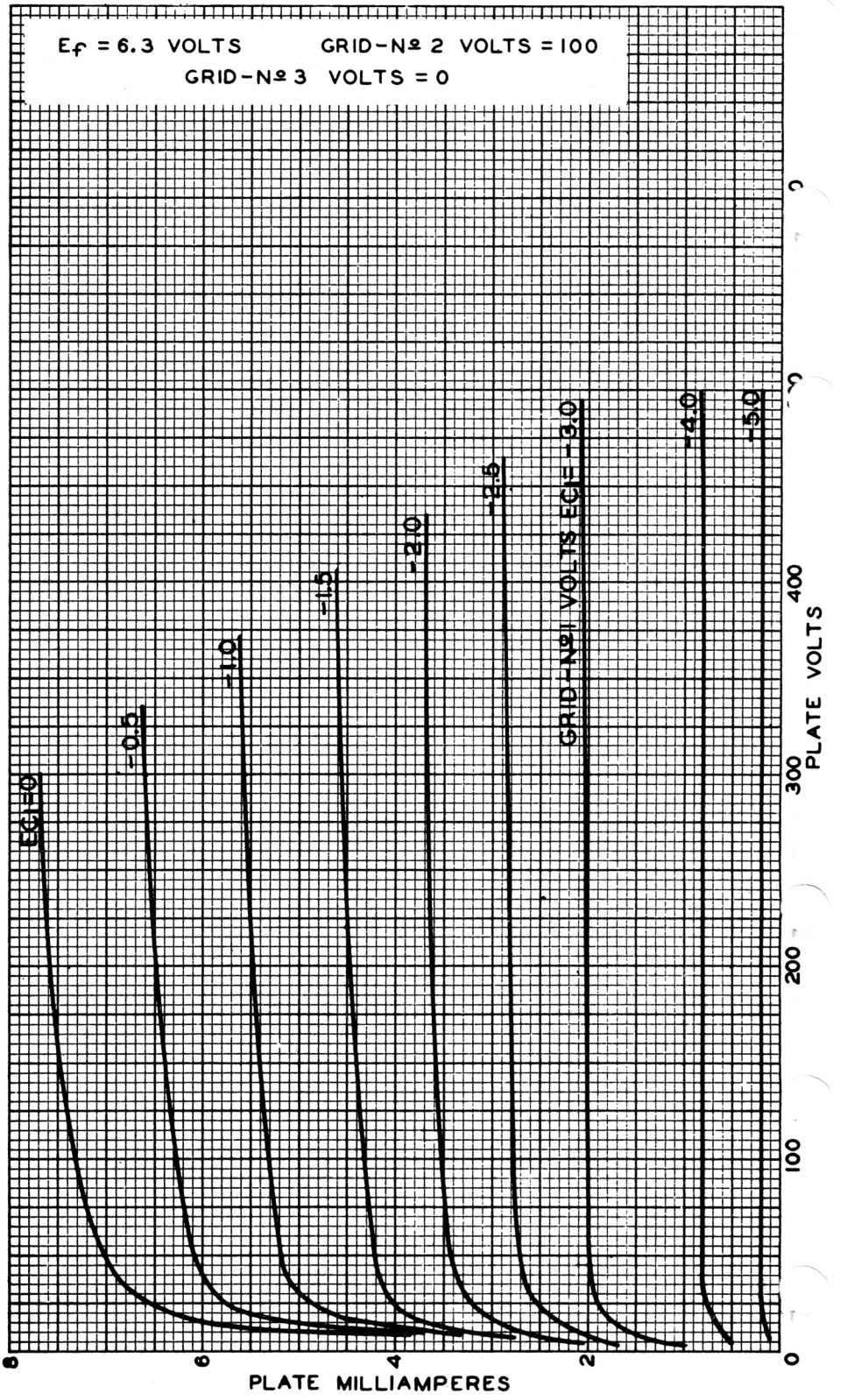
⊕ For the following amplifier tube.

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

VT-91
6J7

6J7

AVERAGE PLATE CHARACTERISTICS



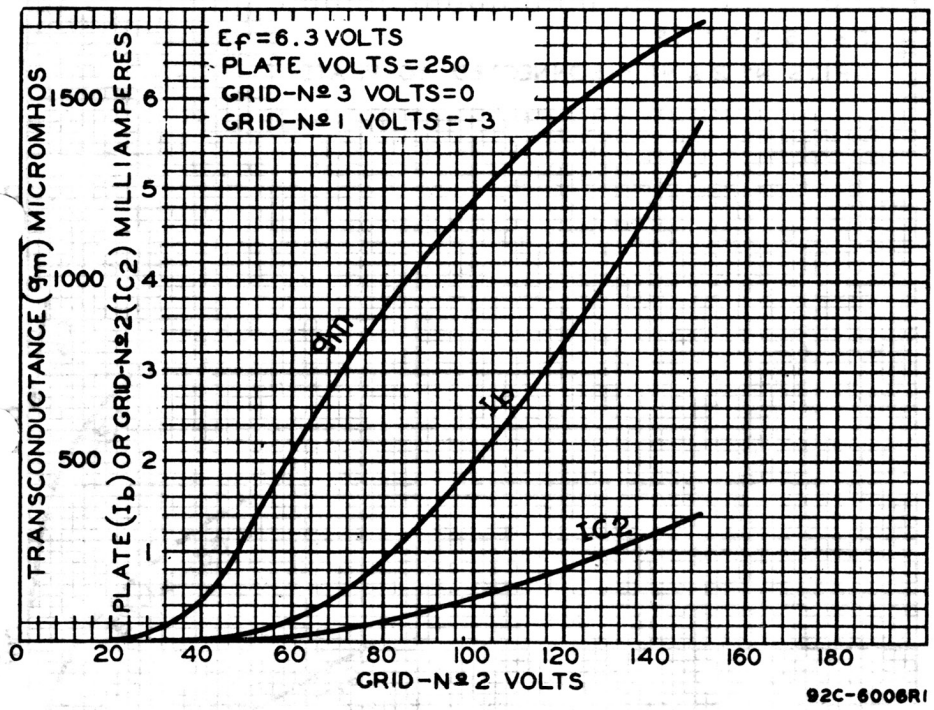
MAY 12, 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-4741R2

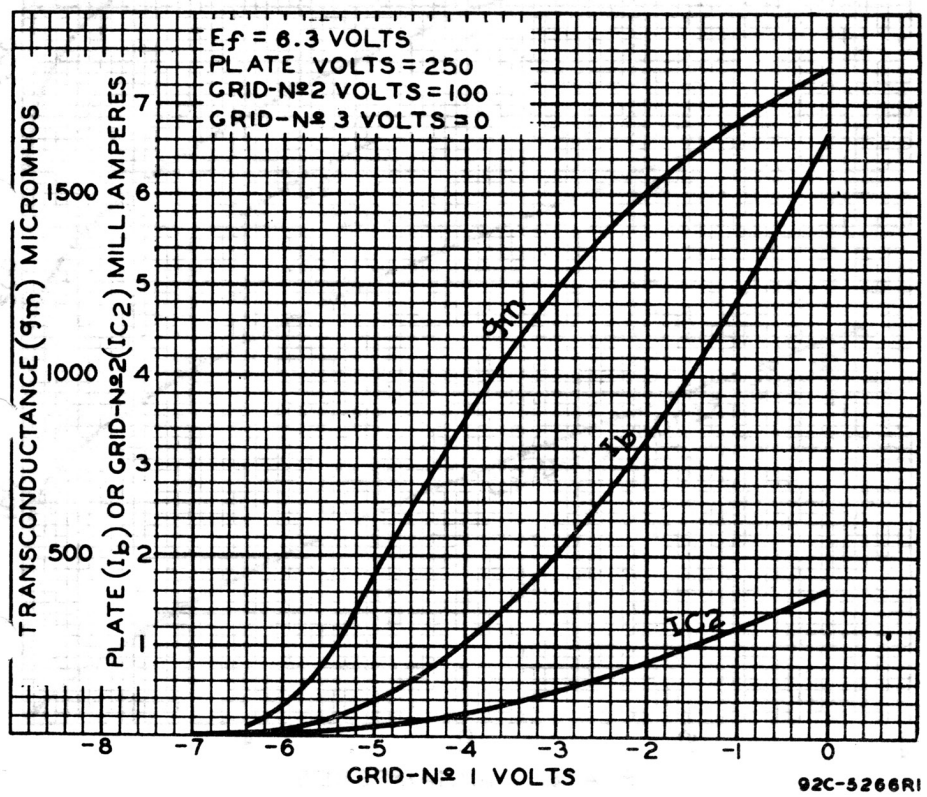
6J7

AVERAGE CHARACTERISTICS



92C-6006RI

AVERAGE CHARACTERISTICS



92C-5266RI

MAY 18, 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

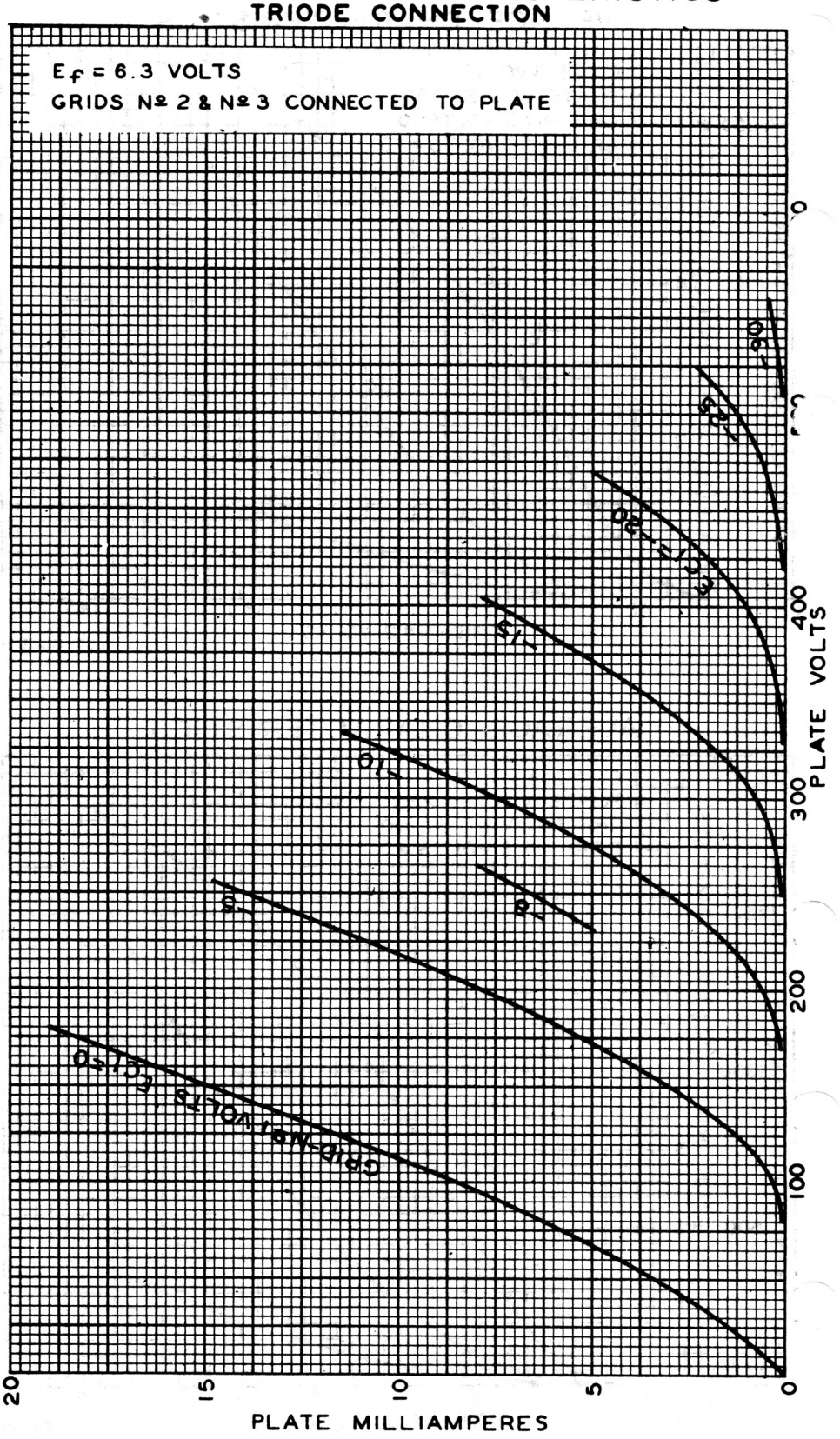
92CM-6007RI

VT-91
6J7

RCA

6J7

AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



MAY 11, 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-4842RI

6K6-GT

POWER PENTODE

GENERAL DATA

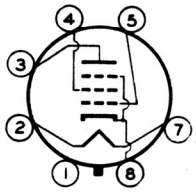
Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.4	amp
Direct Interelectrode Capacitances (Approx.):[o]		
Grid No.1 to plate	0.5	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	5.5	μμf
Plate to cathode & grid No.3, grid No.2, and heater	6	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-5/16"
Maximum Seated Length	2-3/4"
Maximum Diameter	1-9/32"
Dimensional Outline	*See General Section*
Bulb	T-9
Base	Intermediate-Shell Octal 7-Pin (JETEC No.B7-7), Short Intermediate-Shell Octal 7-Pin with External Barriers (JETEC No.B7-59), Intermediate-Shell Octal 6-Pin (JETEC No.B6-81), or Short Intermediate-Shell Octal 6-Pin with External Barriers (JETEC No.B6-84)
Basing Designation for BOTTOM VIEW	7S

Pin 1♦ - 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	315 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	285 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
GRID-No.2 INPUT	2.8 max.	watts
PLATE DISSIPATION	8.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲max.	volts

[o] Without external shield.

♦ Pin 1 as well as pin 6 is omitted on the 6-Pin bases.

▲: See next page.

← Indicates a change.

VT-152
6K6-GT

6K6-GT
POWER PENTODE

Typical Operation and Characteristics:

Plate Voltage	100	250	315	volts
Grid-No.2 Voltage	100	250	250	volts
Grid-No.1 Voltage	-7	-18	-21	volts
Peak AF Grid-No.1 Voltage	7	18	21	volts
Zero-Signal Plate Current	9	32	25.5	ma
Max.-Signal Plate Current	9.5	33	28	ma
Zero-Signal Grid-No.2 Current	1.6	5.5	4	ma
Max.-Signal Grid-No.2 Current	3	10	9	ma
Plate Resistance (Approx.)	104000	90000	110000	ohms
Transconductance	1500	2300	2100	μmhos
Load Resistance	12000	7600	9000	ohms
Total Harmonic Distortion	11	11	15	%
Max.-Signal Power Output	0.35	3.4	4.5	watts

Maximum Circuit Values:

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

PUSH-PULL AF POWER AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	315 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	285 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
GRID-No.2 INPUT	2.8 max.	watts
PLATE DISSIPATION	8.5 max.	watts
→ PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲max.	volts

Typical Operation:

Values are for 2 tubes

	Fixed Bias	*Cathode Bias*	
Plate Voltage	285	285	volts
Grid-No.2 Voltage	285	285	volts
Grid-No.1 Voltage	-25.5	-	volts
Cathode Resistor	-	400	ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage	51	51	volts
Zero-Signal Plate Current	55	55	ma
Max.-Signal Plate Current	72	61	ma
Zero-Signal Grid-No.2 Current	9	9	ma
Max.-Signal Grid-No.2 Current	17	13	ma

▲: See next page.

→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6K6-GT

POWER PENTODE

	Fixed Bias	*Cathode Bias*	
Effective Load Resistance (Plate to plate)	12000	12000	ohms
Total Harmonic Distortion	6	4	%
Max.-Signal Power Output	10.5	9.8	watts

Maximum Circuit Values:

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

AF POWER AMPLIFIER - Class A_1 ←

Triode Connection - Grid No.2 Connected to Plate

Characteristics:

Plate Voltage	250	volts
Grid-No.1 Voltage	-18	volts
Amplification Factor	6.8	
Plate Resistance (Approx.)	2500	ohms
Transconductance	2700	μmhos
Plate Current	37.5	ma
Grid-No.1 Voltage (Approx.) for plate current of 0.5 ma	-48	volts

VERTICAL DEFLECTION AMPLIFIER ←

Triode Connection - Grid No.2 Connected to Plate

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

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

DC PLATE VOLTAGE	315 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)#	1200■max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE	-250 max.	volts
CATHODE CURRENT:		
Peak	75 max.	ma
Average	25 max.	ma
PLATE DISSIPATION	7 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲max.	volts

Maximum Circuit Values:

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

▲ The dc component must not exceed 100 volts.

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

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

■ Under no circumstances should this absolute value be exceeded.

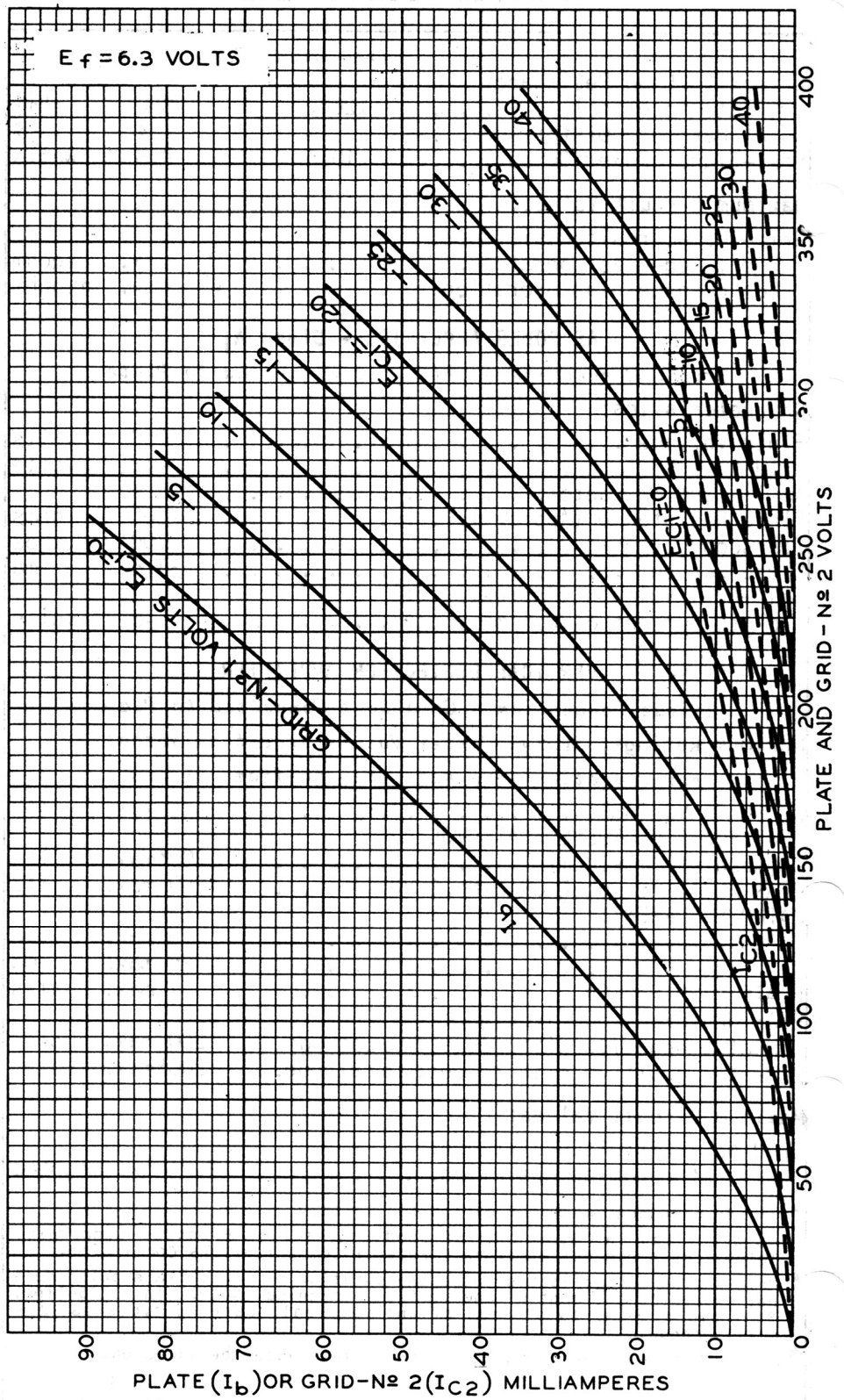
← Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

VT-152
6K6-GT

6K6-GT

AVERAGE CHARACTERISTICS



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

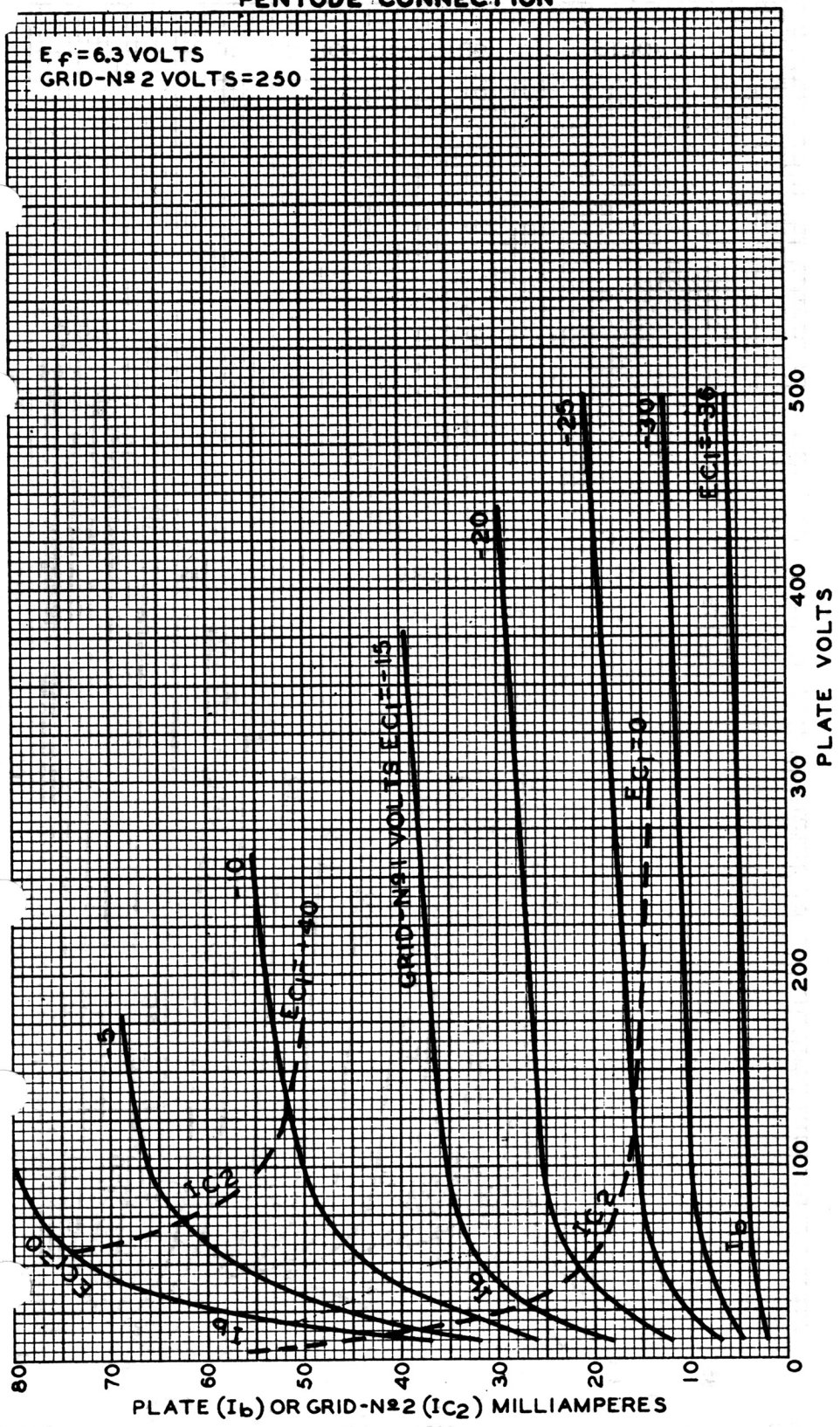
92CM-5209R2

RCA

6K6-GT

AVERAGE PLATE CHARACTERISTICS

PENTODE CONNECTION



FEB. 13, 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

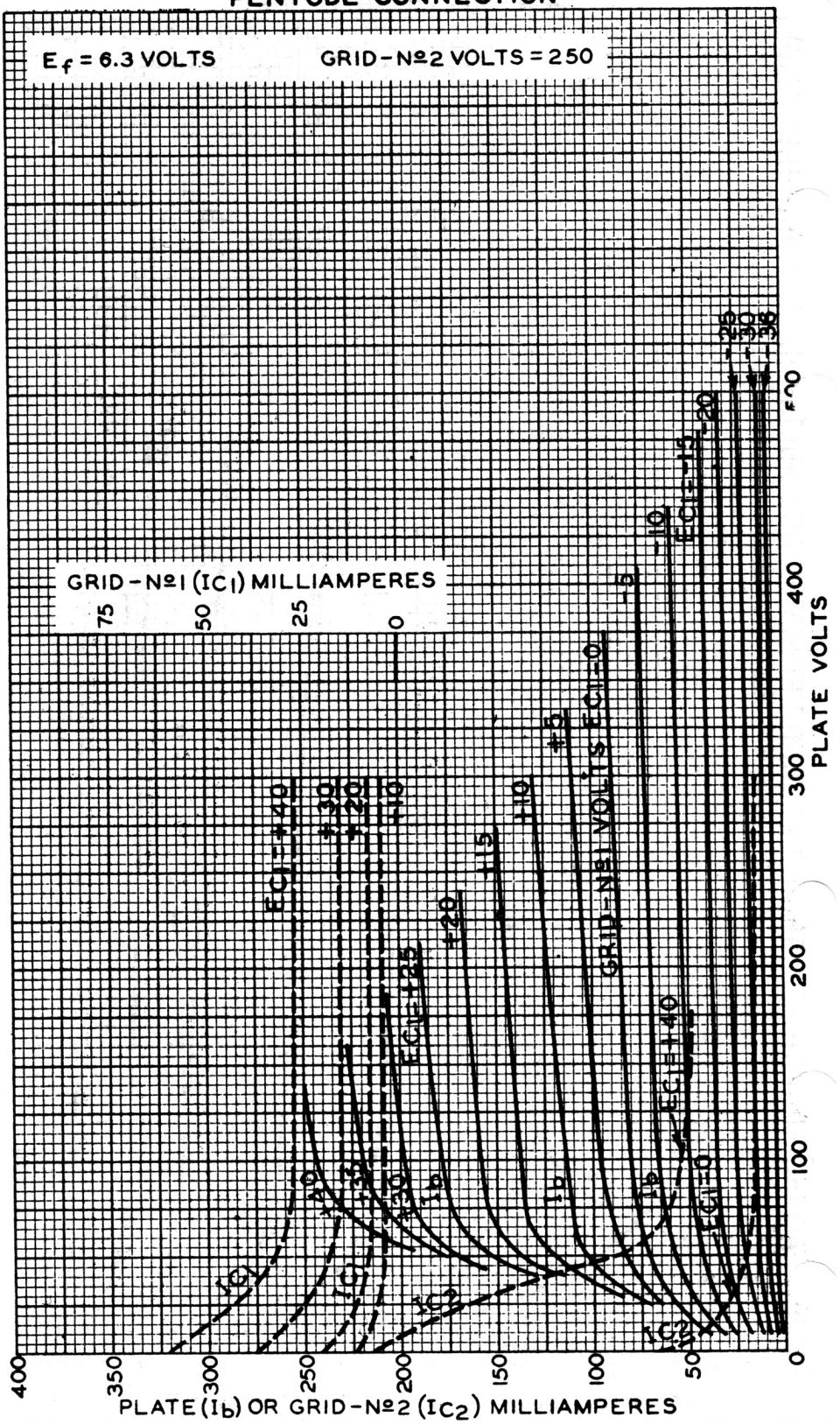
92CM-4881R2

VT-152
6K6-GT

RCA

6K6-GT

AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



FEB. 13, 1948

TUBE DEPARTMENT

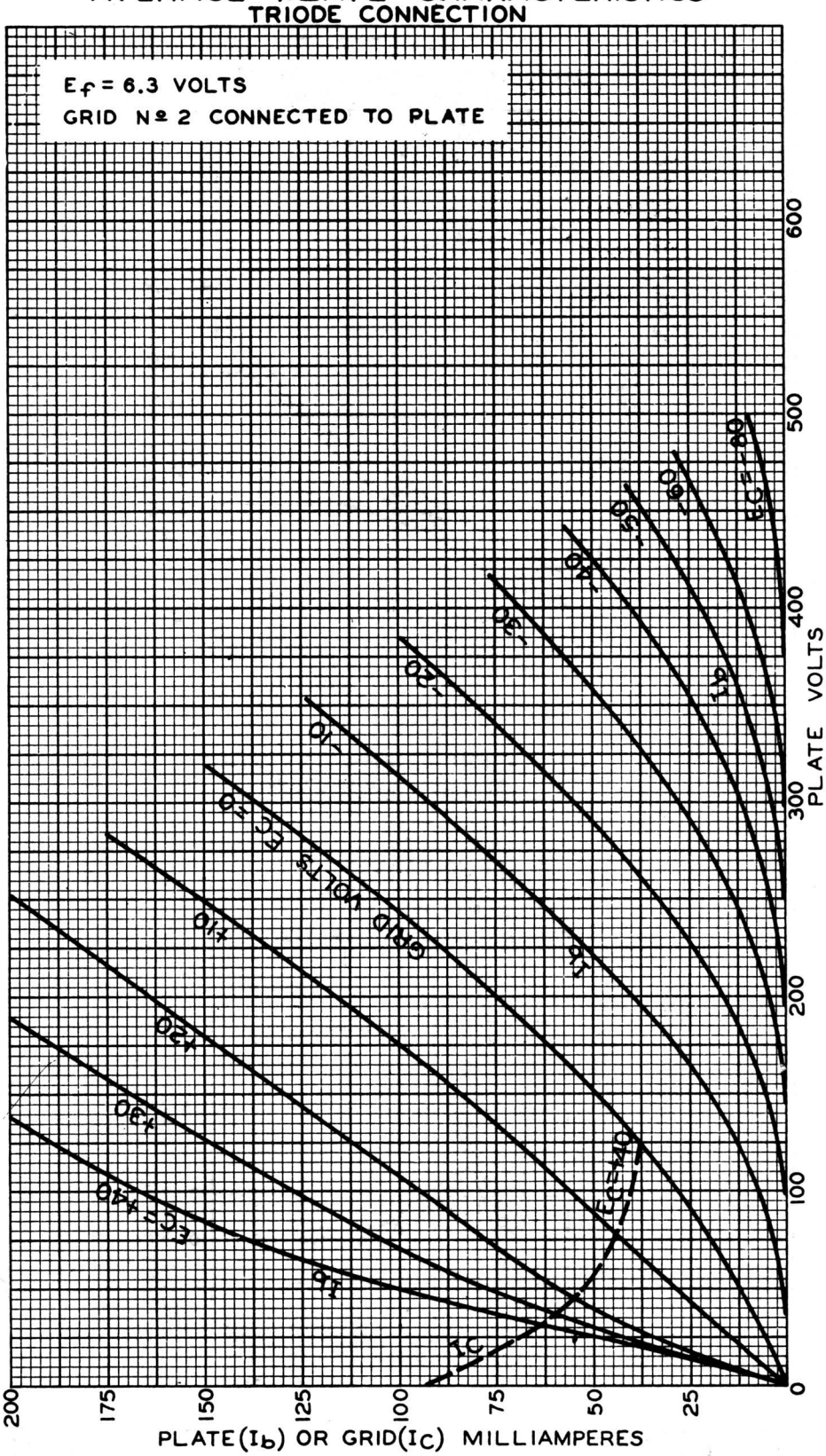
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6311R1

6K6-GT

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION



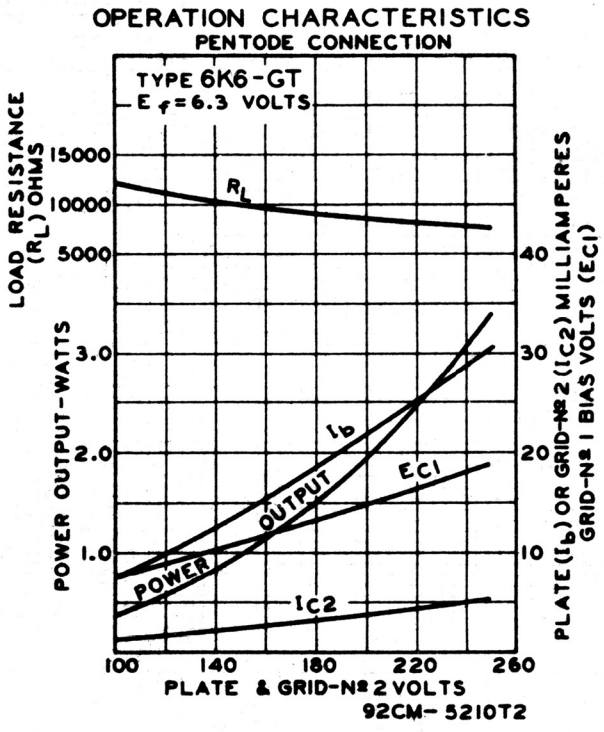
AUG. 18, 1941

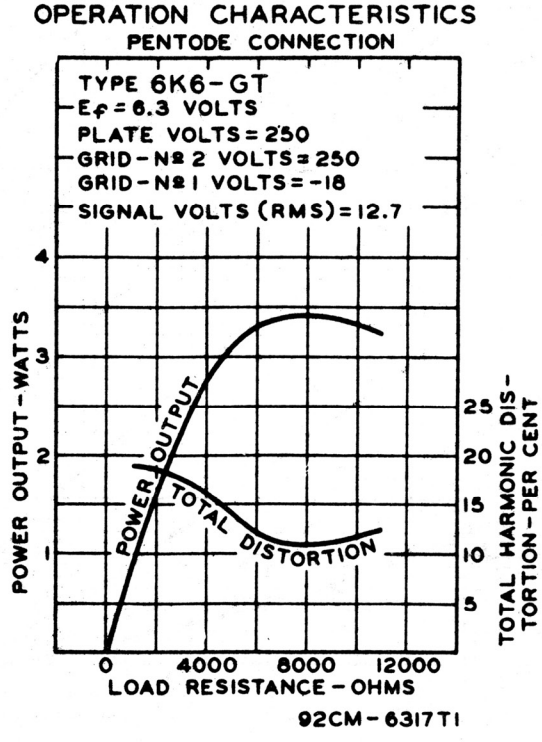
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6313

VT-152
6K6-GT

6K6-GT
POWER PENTODE





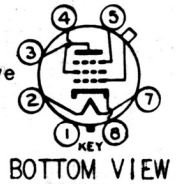
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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.

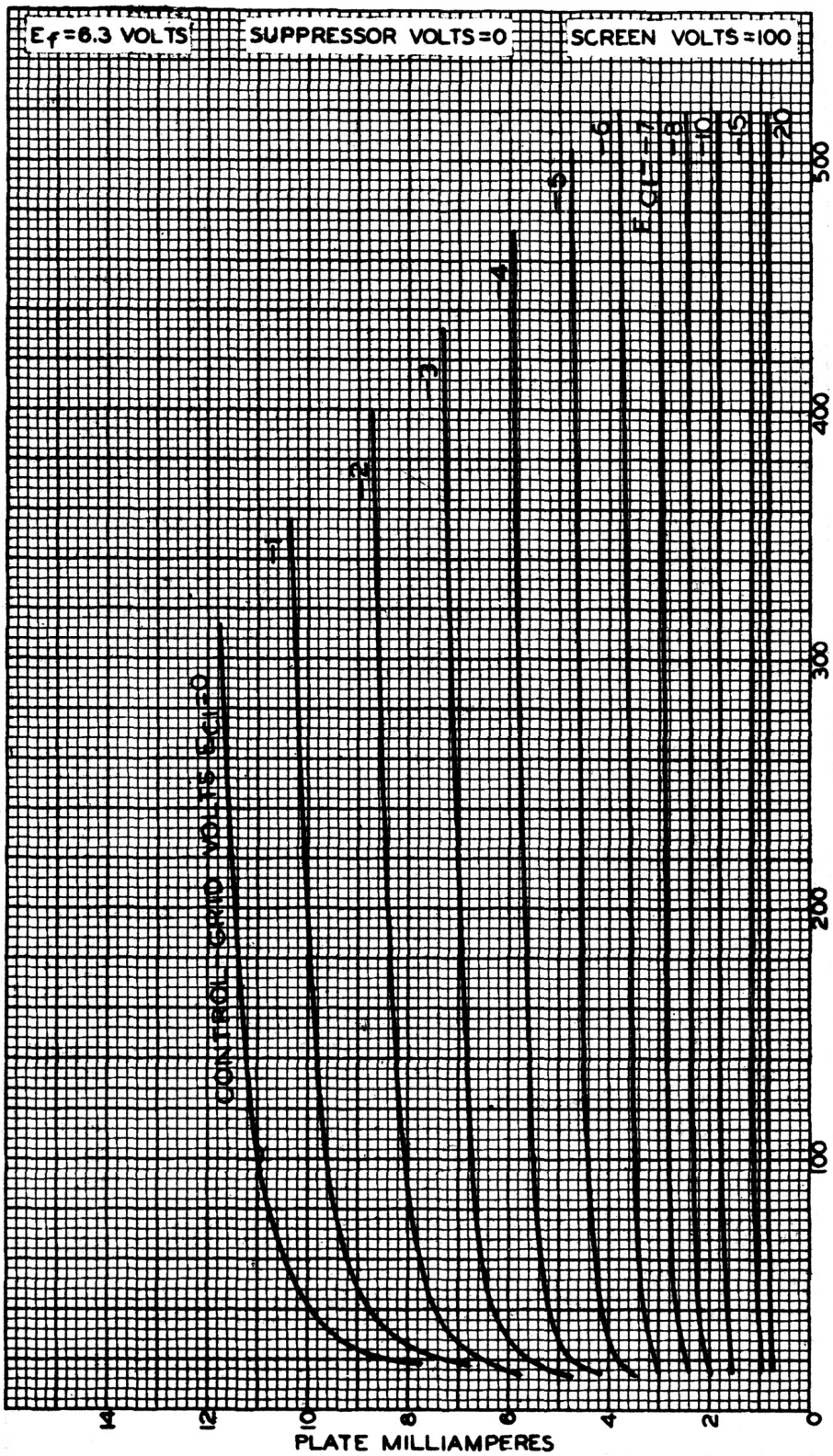
← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

VT-86
6K7

6K7

AVERAGE PLATE CHARACTERISTICS



FEB. 24, 1937

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4742

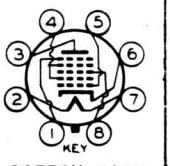
6SA7, 6SA7-GT/G

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)

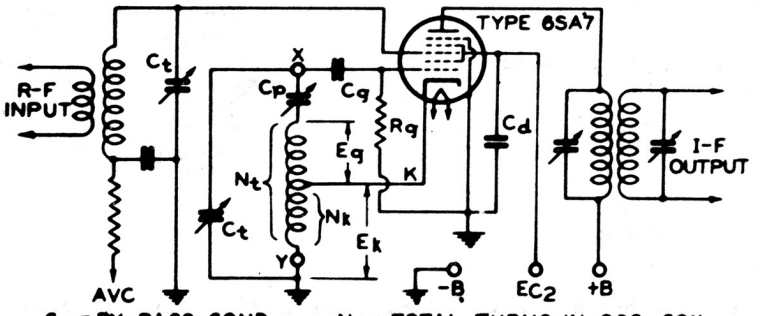
Characteristics:	*Self-excitation**		*Separate Excitation*		
Plate Voltage	100	250	100	250	volts
Grids #2 & #4 Volt.	100	100	100	100	volts
Grid #3 (Control) Volt.	0	0	−2	−2	volts
Grid #1 Resistor	20000	20000	20000	20000	ohms
Plate Res. (Approx.)	0.5	1.0	0.5	1.0	megohm
Conversion Transcond.	425	450	425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



C_d = BY-PASS COND.
C_g = 50 μμf
C_p = PADDING COND.
C_t = TUNING COND.

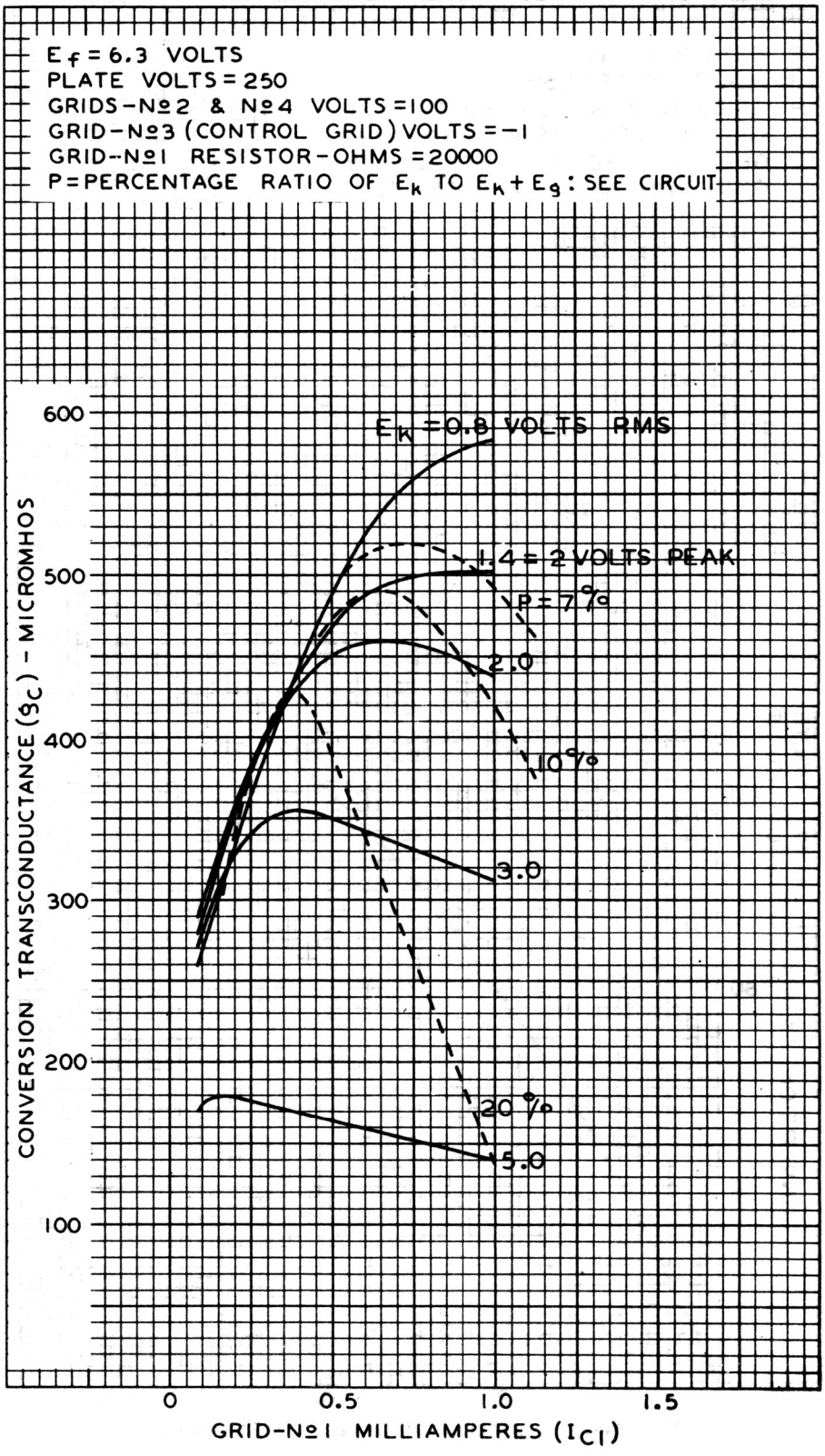
N_t = TOTAL TURNS IN OSC. COIL
N_k = TURNS IN CATHODE SECTION OF OSC. COIL
R_g = 20000 OHMS

CE-4992

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

6SA7

OPERATION CHARACTERISTICS
WITH SELF-EXCITATION

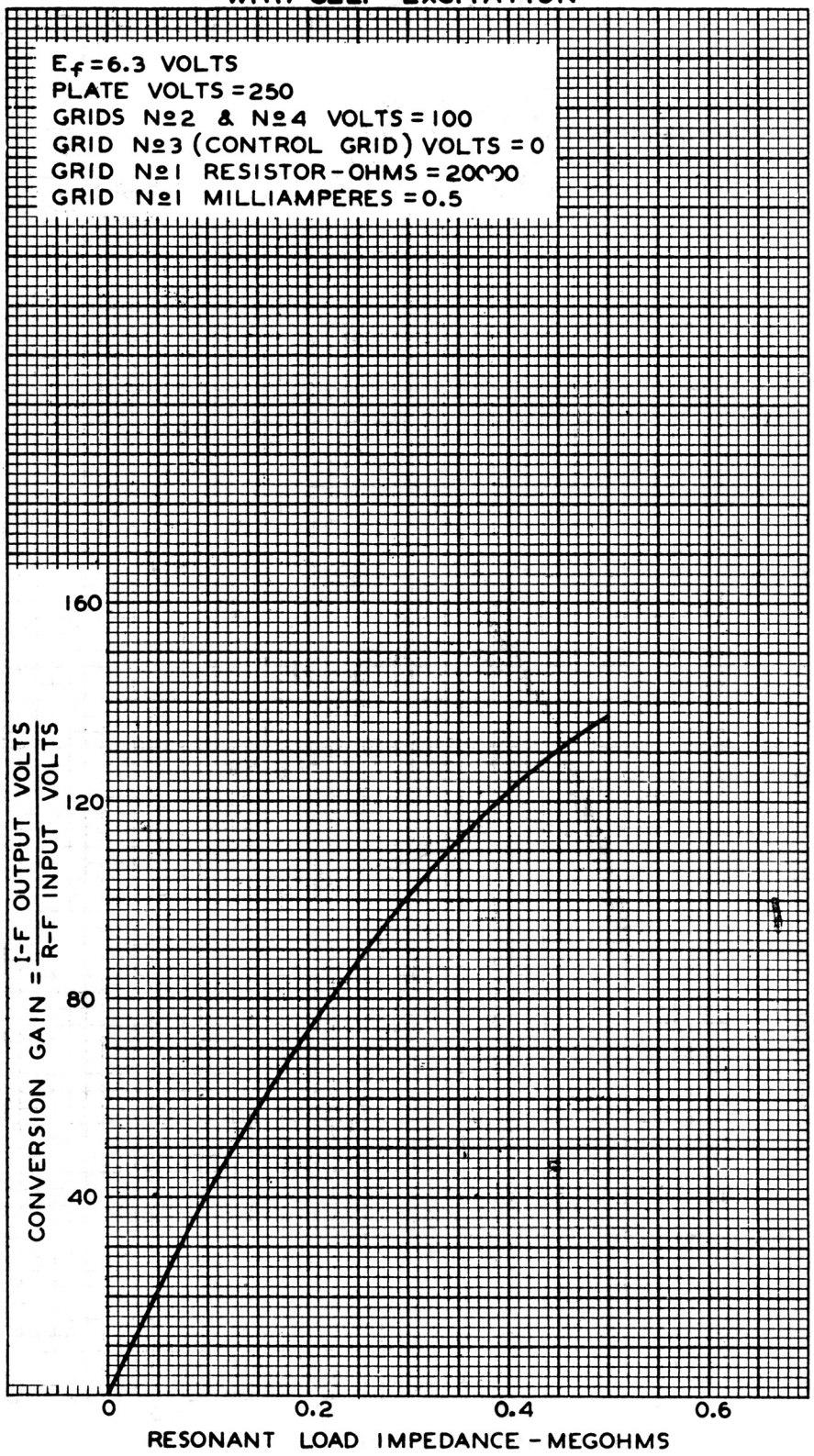


RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

VT-150
6SA7

6SA7

OPERATION CHARACTERISTIC
WITH SELF-EXCITATION



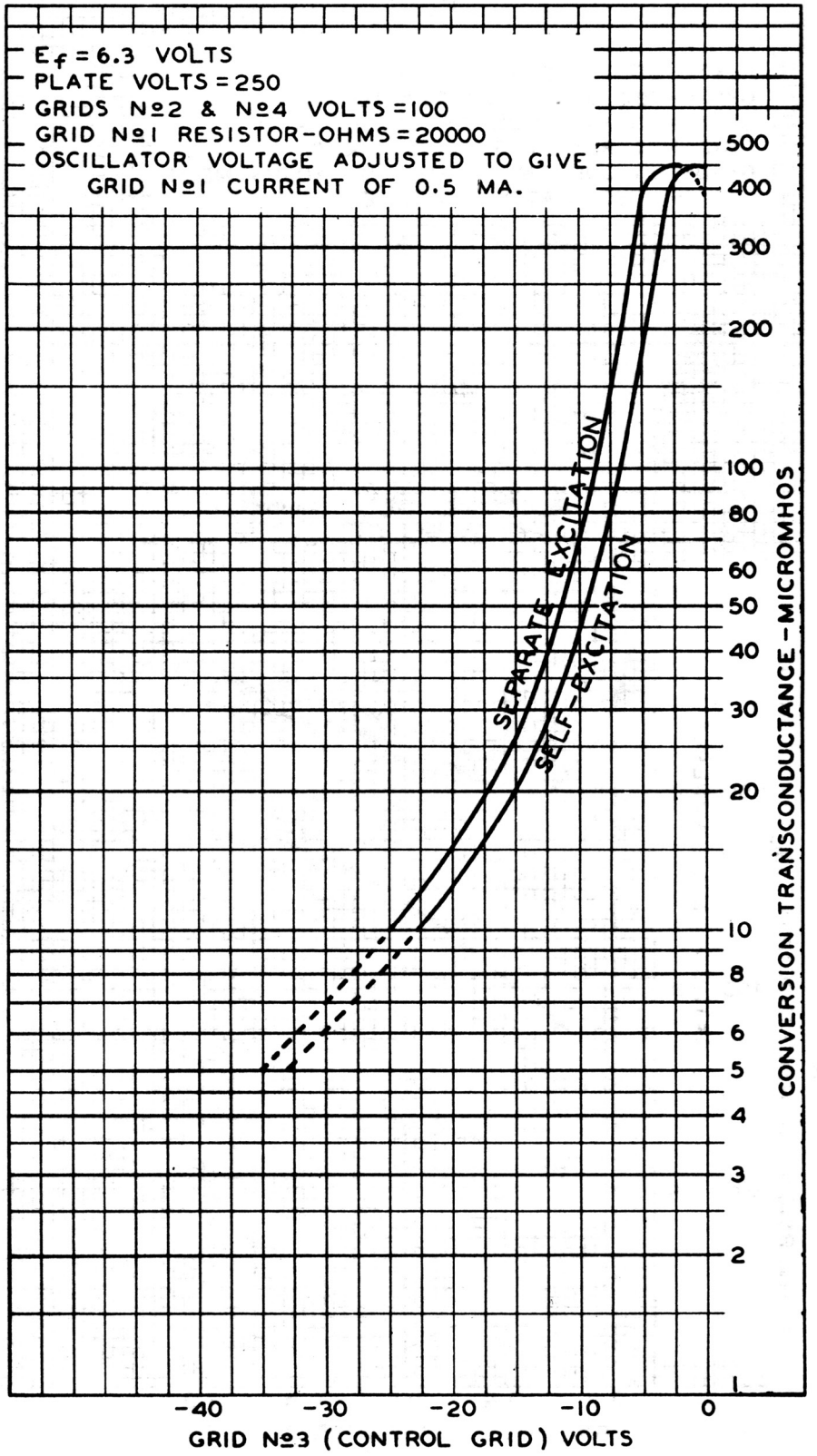
APR. 25, 1941

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

CE-4994

6SA7

OPERATION CHARACTERISTICS



OCT. 25, 1938

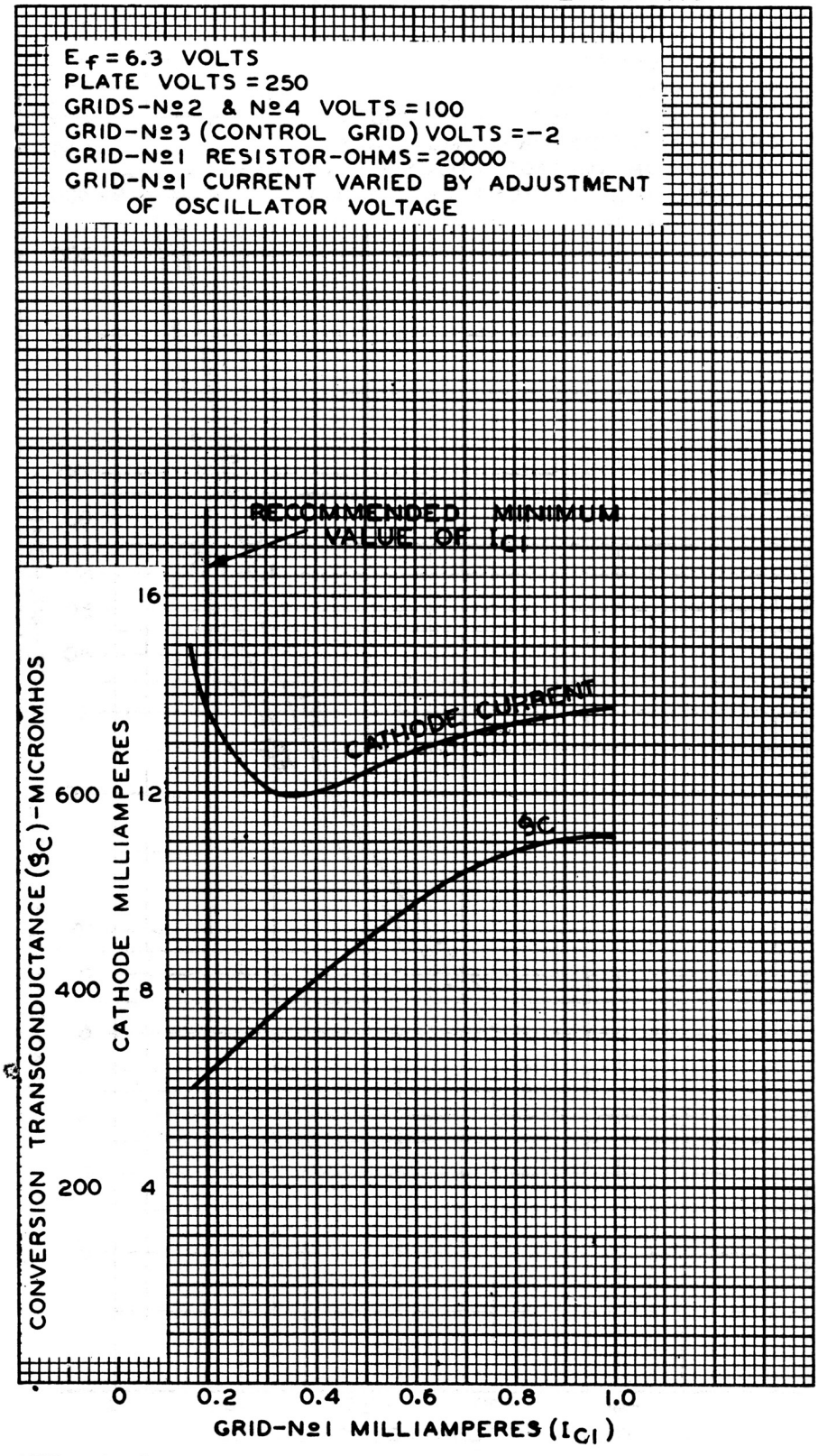
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4989

VT-150
6SA7

6SA7

OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION



APR. 24, 1941

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4990RI

6SJ7, 6SJ7-GT
SHARP-CUTOFF PENTODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.3	amp

Direct Interelectrode Capacitances:

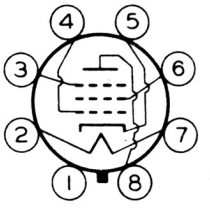
Pentode Connection:	6SJ7°	6SJ7-GT°°	
Grid No.1 to Plate	0.005 max.	0.005 max.	μμf
Input	6	7	μμf ←
Output	7	7	μμf ←
Triode Connection:*			
Grid No.1 to Plate	2.8	2.8	μμf
Grid No.1 to Cathode	3.4	3.4	μμf
Plate to Cathode	11	11	μμf

° 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.

VT-116
6SJ7
6SJ7-GT

6SJ7, 6SJ7-GT
SHARP-CUTOFF PENTODE

Typical Operation and Characteristics:

Plate voltage	100	250	volts
Grid No.3 (Suppressor)	Connected to cathode at socket		
Grid-No.2 Voltage	100	100	volts
Grid-No.1 Voltage	-3	-3	volts
Plate Resistance (Approx.)	0.7	#	megohm
Transconductance	1575	1650	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

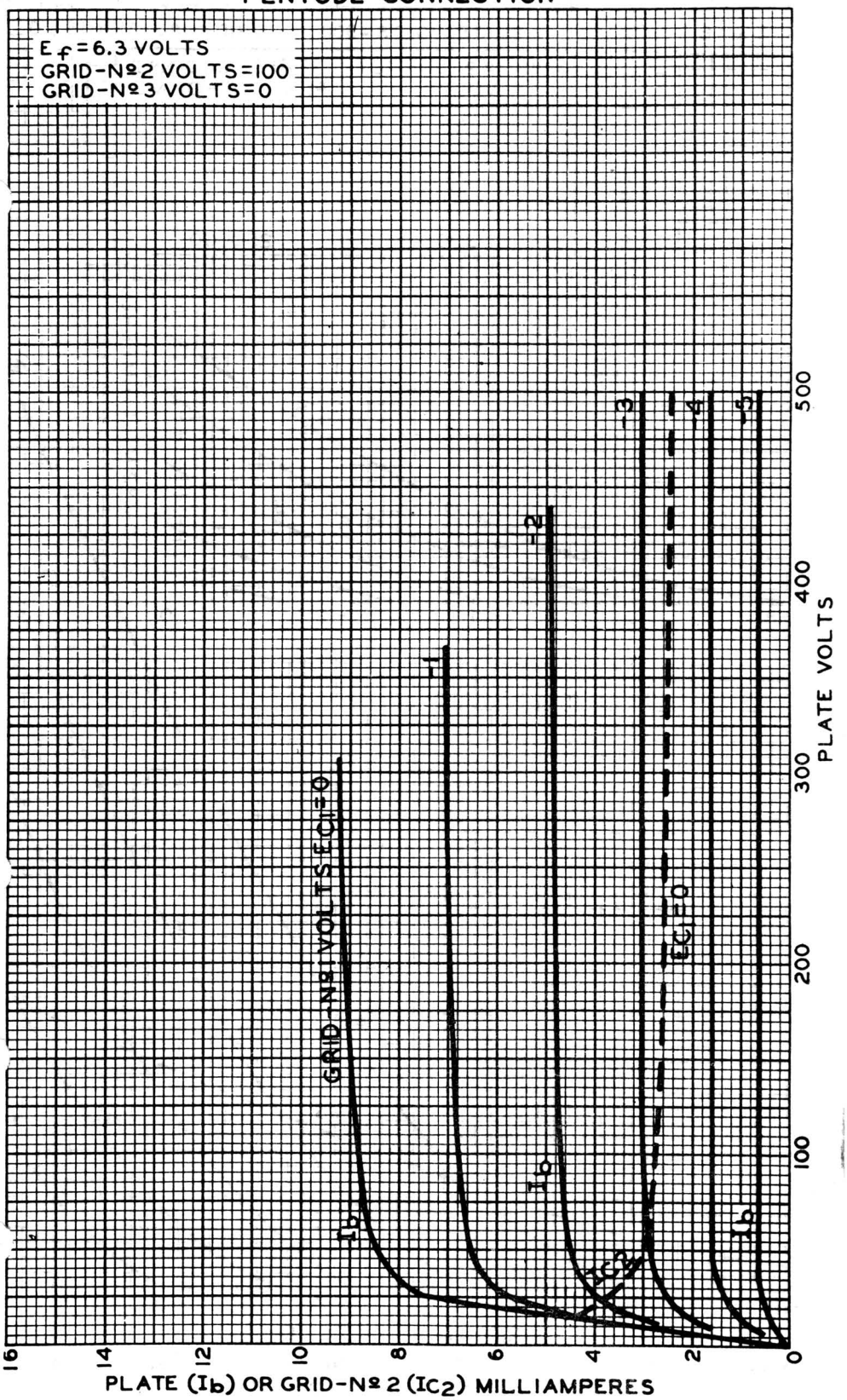
→Indicates a change.

RCA

6SJ7

AVERAGE PLATE CHARACTERISTICS

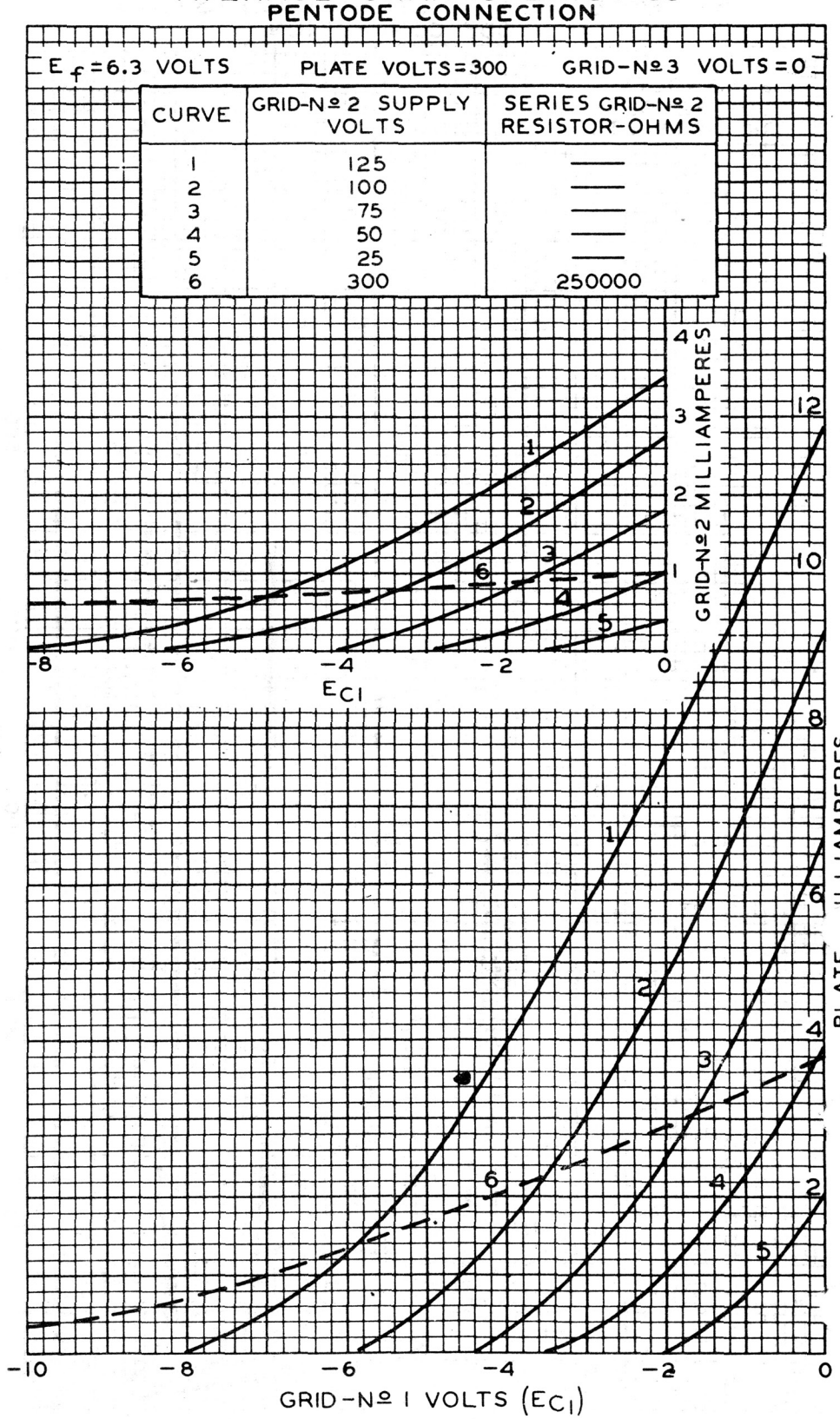
PENTODE CONNECTION



VT-116
6SJ7

6SJ7

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



MARCH 5, 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6443R1

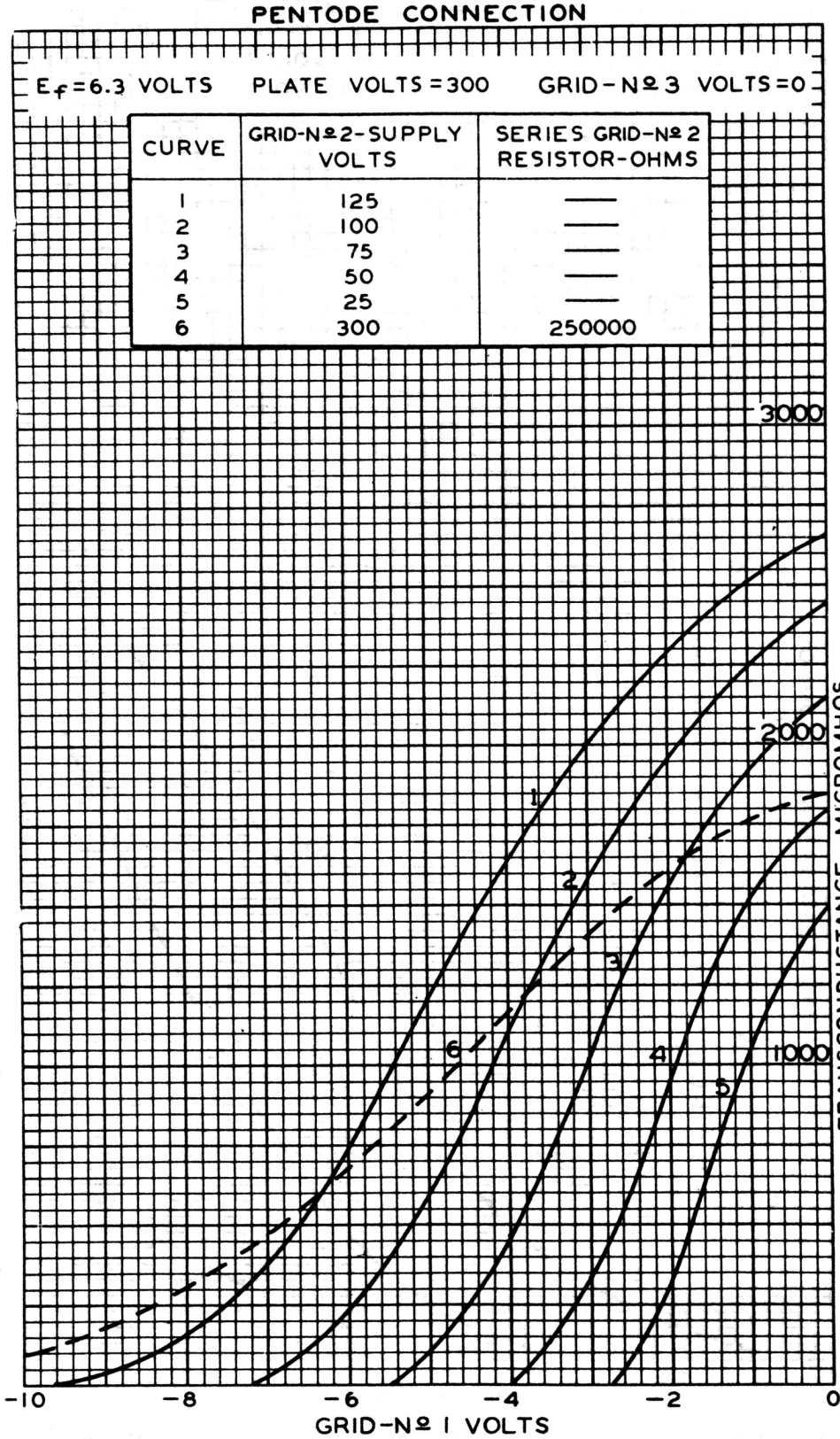
6SJ7

AVERAGE CHARACTERISTICS

PENTODE CONNECTION

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

CURVE	GRID-№2-SUPPLY VOLTS	SERIES GRID-№2 RESISTOR-OHMS
1	125	—
2	100	—
3	75	—
4	50	—
5	25	—
6	300	250000

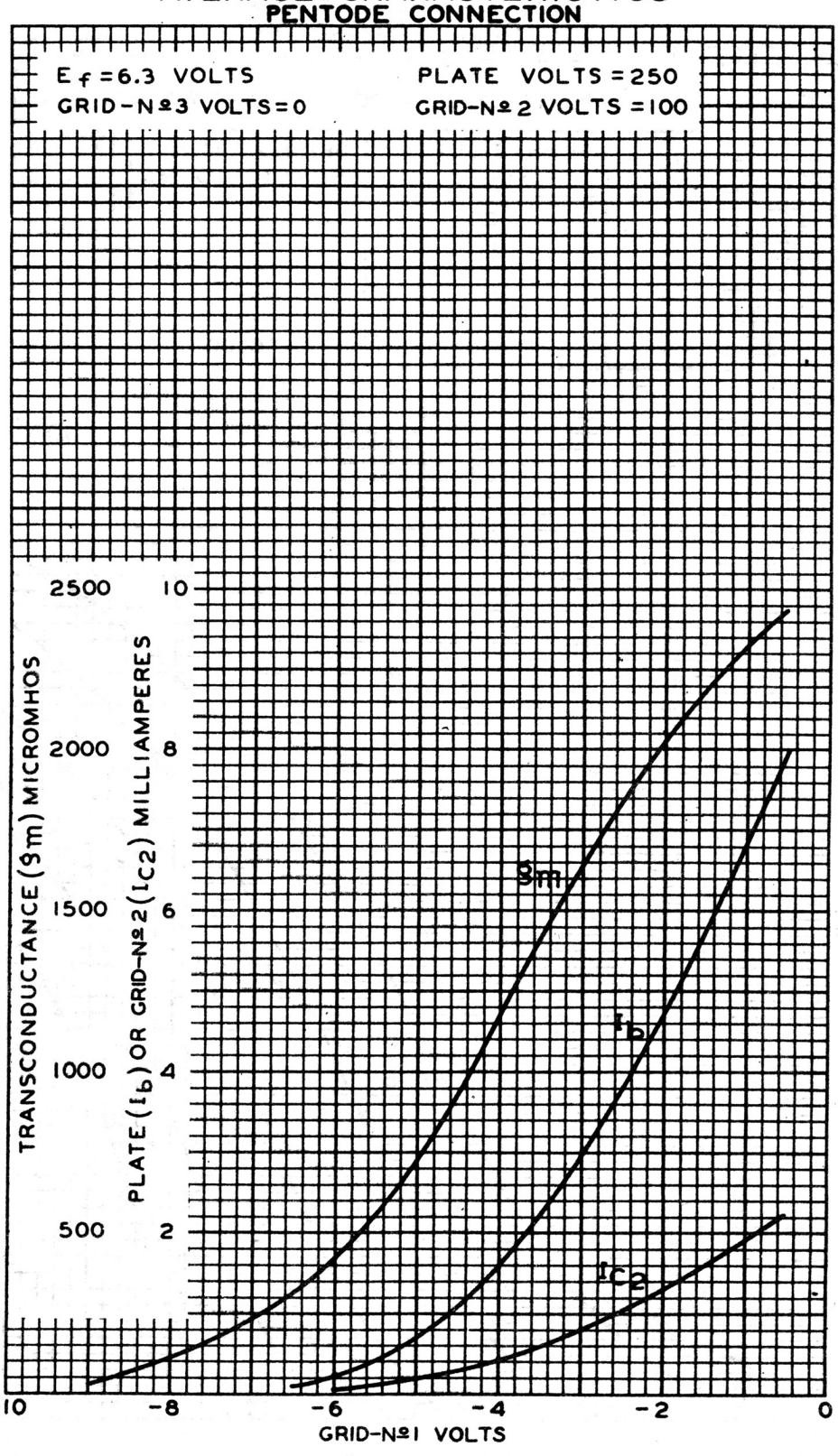


TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

VT-116
6SJ7

6SJ7

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



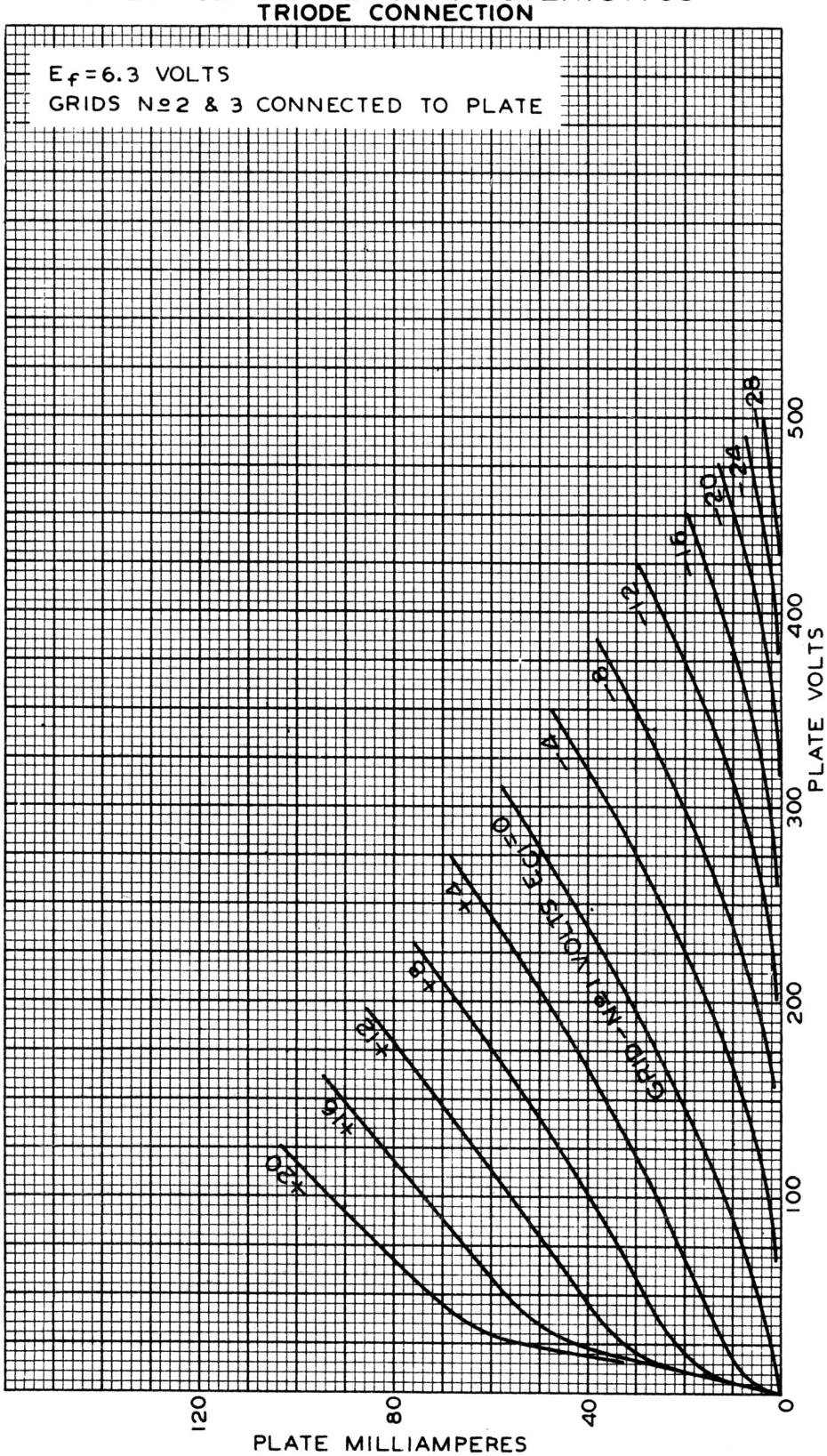
MARCH 5, 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-4937RI

VT-116
6SJ7

6SJ7
AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



MAY 12, 1948

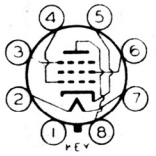
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6409RI

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

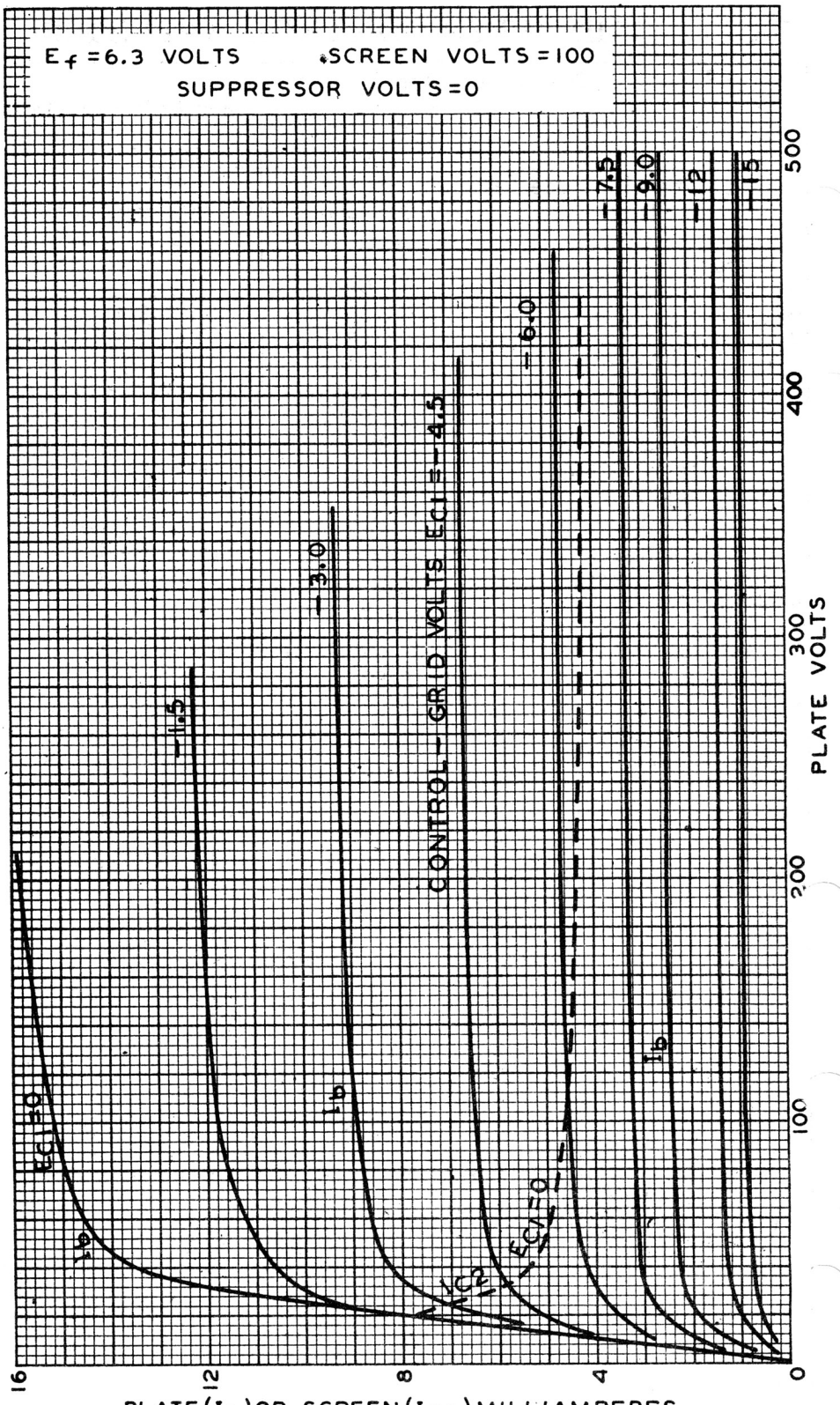
Plate Voltage		300 max.	volts
Screen Voltage		125 max.	volts
Screen Supply Voltage		300 max.	volts
Grid Voltage		0 min.	volts
Plate Dissipation		4.0 max.	watts
Screen Dissipation		0.4 max.	watt
Typical Operation and Characteristics - Class A_1 Amplifier:			
Plate	100	250	volts
Screen	100	100	volts
Grid	-1	-3	volts
Suppressor	Connected to cathode at socket		
Plate Res.	0.12	0.8	approx. megohm
Transcond.	2350	2000	μmhos
Grid Bias for transcond. of 10 umhos	-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.

VT-117
6SK7

6SK7

AVERAGE PLATE CHARACTERISTICS



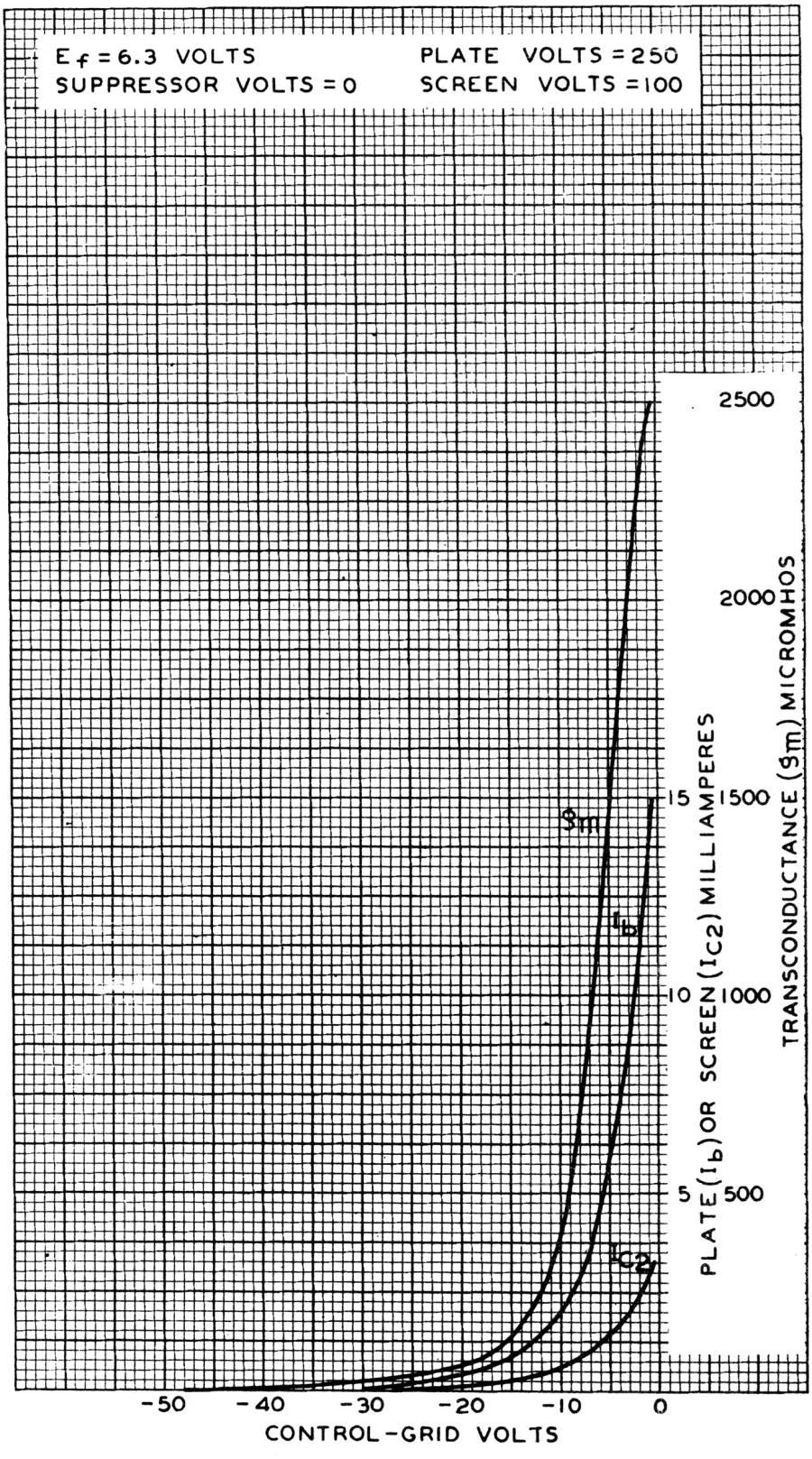
JUNE 24, 1938

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4940

6SK7

AVERAGE CHARACTERISTICS

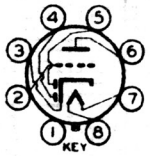


6SR7

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.

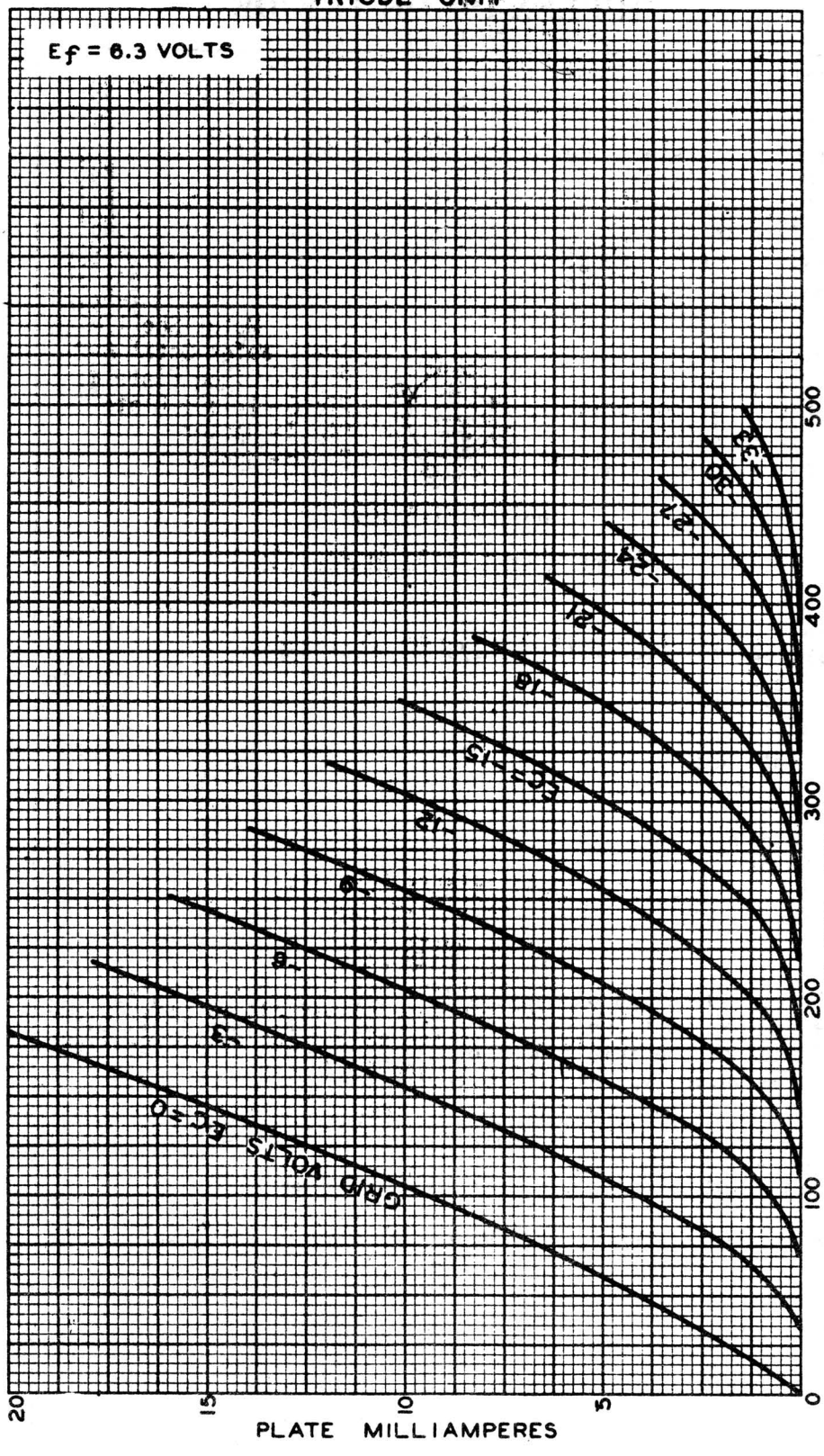
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6SR7

6SR7

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



JAN. 14, 1936

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6141

41
POWER PENTODE

Heater■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.4	amp.
Direct Interelectrode Capacitances (Approx.):o		
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.

o With no external shield.

* See next page.

← Indicates a change.

VT-48
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.