

New

RCA MINIATURE TUBES

for
Broadcast and Television Receivers

TYPES



- ← 6AT6
- ← 6AU6
- ← 6BA6
- ← 6BE6
- ← 12AT6
- ← 12BA6
- ← 12BE6
- 35W4 →
- 50B5 →



Scans by Larry Daniel
Prepared by Dale H. Cook

Commercial Engineering Department
TUBE DIVISION

RADIO CORPORATION OF AMERICA
HARRISON, N. J.

Foreword

The group of nine new RCA Miniature Tubes described in this booklet are intended to meet peacetime needs for the compact design of broadcast receivers (frequency modulated or amplitude modulated) and television receivers.

Included in the group are five miniature types especially recommended as a combination for kit use in AC/DC receivers. These five—12AT6, 12BA6, 12BE6, 35W4, and 50B5—give performance equivalent to that of the larger types 12SQ7, 12SG7 (or 12SK7), 12SA7, 35Z5-GT/G, and 50L6-GT, respectively, which were so popular as a kit for AC/DC receivers in pre-war days.

The other four new types are equivalent to the metal types 6SA7, 6SG7, 6SH7, and 6SQ7, so widely used in automobile and home receivers.

For your convenience, the new types covered in the following pages are summarized here with their names and performance equivalents.

<i>Miniature Type</i>	<i>Name</i>	<i>Performance Equivalent</i>
6AT6	Duplex-Diode High-Mu Triode.....	6SQ7
6AU6	RF Amplifier Pentode with Sharp Cutoff.....	6SH7
6BA6	RF Amplifier Pentode with Remote Cutoff.....	6SG7
6BE6	Pentagrid Converter	6SA7
12AT6	Duplex-Diode High-Mu Triode.....	12SQ7
12BA6	RF Amplifier Pentode with Remote Cutoff.....	12SG7
12BE6	Pentagrid Converter	12SA7
35W4	Half-Wave High-Vacuum Rectifier.....	35Z5-GT/G
50B5	Beam Power Amplifier.....	50L6-GT

As the originator of miniature tubes back in 1939, and as their largest producer ever since, RCA takes pride in its family of miniature tubes now consisting of 35 types.



6AT6

DUPLEX-DIODE HIGH-MU TRIODE

Miniature Type

TENTATIVE DATA

RCA-6AT6 is a miniature multi-unit tube containing two diodes and a high-mu triode in one envelope. It is intended for use as a combined detector, amplifier, and avc tube.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC).....	6.3	Volts
Current.....	0.3	Ampere

Direct Interelectrode Capacitances:*

Triode Unit—Grid to Plate.....	2.1	$\mu\mu\text{f}$
Grid to Cathode and Heater.....	2.3	$\mu\mu\text{f}$
Plate to Cathode and Heater.....	1.1	$\mu\mu\text{f}$
Diode Plate No. 2 to Triode Grid.....	0.025 max.	$\mu\mu\text{f}$

Mechanical:

Mounting Position.....	Any
Maximum Overall Length.....	$2\frac{1}{8}"$
Maximum Seated Length.....	$1\frac{7}{8}"$
Length from Base Seat to Bulb Top (excluding tip).....	$1\frac{1}{2}" \pm \frac{3}{32}"$
Maximum Diameter.....	$\frac{3}{4}"$
Bulb.....	T-5 $\frac{1}{2}$
Base.....	Miniature Button 7-Pin

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 A₁ Amplifier:

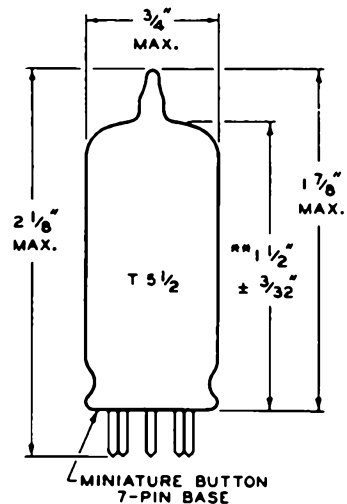
Plate Voltage.....	100	250	Volts
Grid Voltage.....	-1	-3	Volts
Amplification Factor.....	70	70	
Plate Resistance.....	54000	58000	Ohms
Transconductance.....	1300	1200	Micromhos
Plate Current.....	0.8	1.0	Milliamper

DIODE UNITS—Two

The two diode plates are placed around a cathode, the sleeve of which is common to the triode unit. Each diode has its own base pin.

* With no external shield.

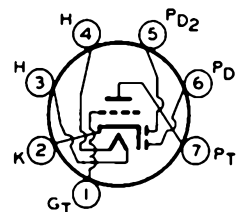
DIMENSIONAL OUTLINE



** Measured from base seat to bulb-top line as determined by ring gauge of $\frac{1}{16}"$ I.D.

SOCKET CONNECTIONS

Bottom View

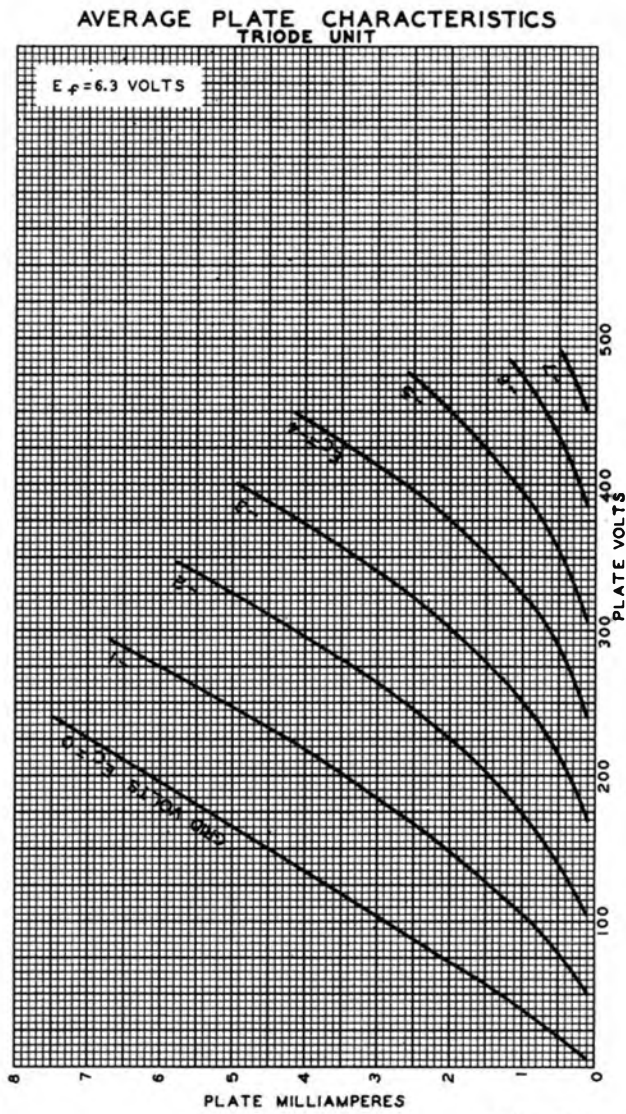


7BT

- 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



[6AT6 cont'd]





6AU6

RF AMPLIFIER PENTODE Miniature Sharp-Cutoff Type

TENTATIVE DATA

RCA-6AU6 is a miniature rf triple-grid tube with a sharp cutoff characteristic, low grid-plate capacitance, and high transconductance. The low value of grid-plate capacitance minimizes regenerative effects, while the high transconductance makes possible a high signal-to-noise ratio. Because of its high transconductance and sharp cutoff, the 6AU6 is particularly useful as a limiter tube in FM receivers.

Grid-No. 1 Voltage	.....	-1	-1	-1	....	Volt
Plate Resistance (Approx.)	...	0.6	2.5	2.0	..	Megohms
Transconductance	.....	3900	4450	5200	..	Micromhos
Grid-No. 1 Bias for plate current of 10 microamp	....	-4.2	-5.2	-6.2	....	Volts
Plate Current	.....	5.2	7.6	10.8	Milliampers	
Grid-No. 2 Current	.....	2.0	3.0	4.3	Milliampers	

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:				
Voltage (AC or DC)	.....	6.3	....	Volts
Current	.....	0.3	....	Ampere
Direct Interelectrode Capacitances:*				
Grid No. 1 to Plate [C _{g1p}]	.....	0.0035	max.	μf
Input [C _{g1} (k + h + g ₂ + g ₃ + internal shield)]	.....	5.5	..	μf
Output [C _p (k + h + g ₂ + g ₃ + internal shield)]	.....	5.0	..	μf

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	.....	Miniature Button 7-Pin

AMPLIFIER

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	.....	3	max.	Watt
GRID-NO. 2 DISSIPATION	.....	0.65	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

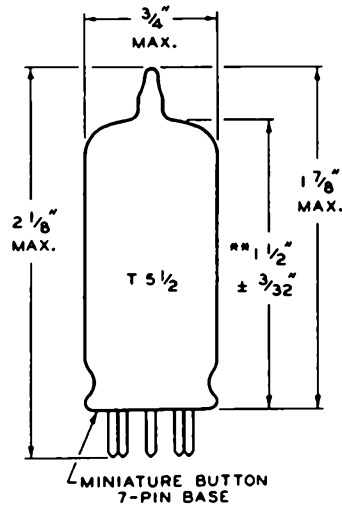
Typical Operation and Characteristics—

Class A₁ Amplifier:

Plate Voltage	.....	100	250	250	....	Volts
Grid No. 3 (Suppressor)	.....	Connected to cathode at socket				
Grid-No. 2 Voltage	.....	100	125	150	....	Volts

* With no external shield.

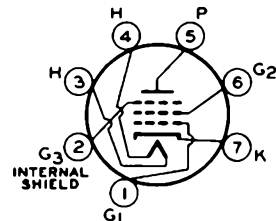
DIMENSIONAL OUTLINE



** Measured from base seat to bulb-top line as determined by ring gauge of 1/16" I.D.

SOCKET CONNECTIONS

Bottom View



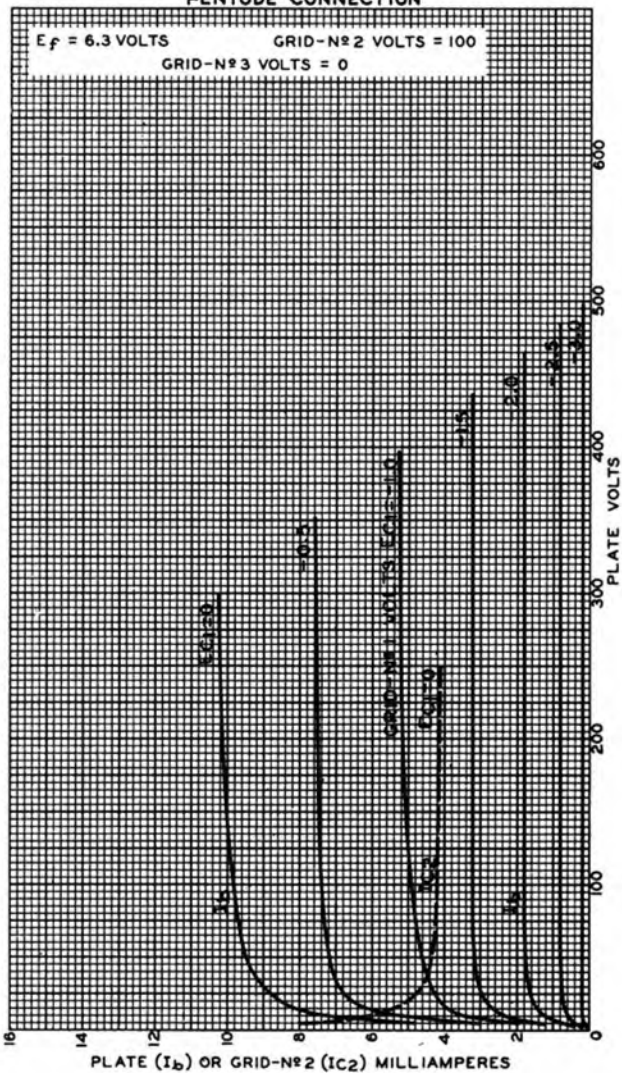
7BK1

Pin 1 : Grid No. 1	Pin 4 : Heater
Pin 2 : Grid No. 3,	Pin 5 : Plate
Pin 3 : Heater	Pin 6 : Grid No. 2
	Pin 7 : Cathode

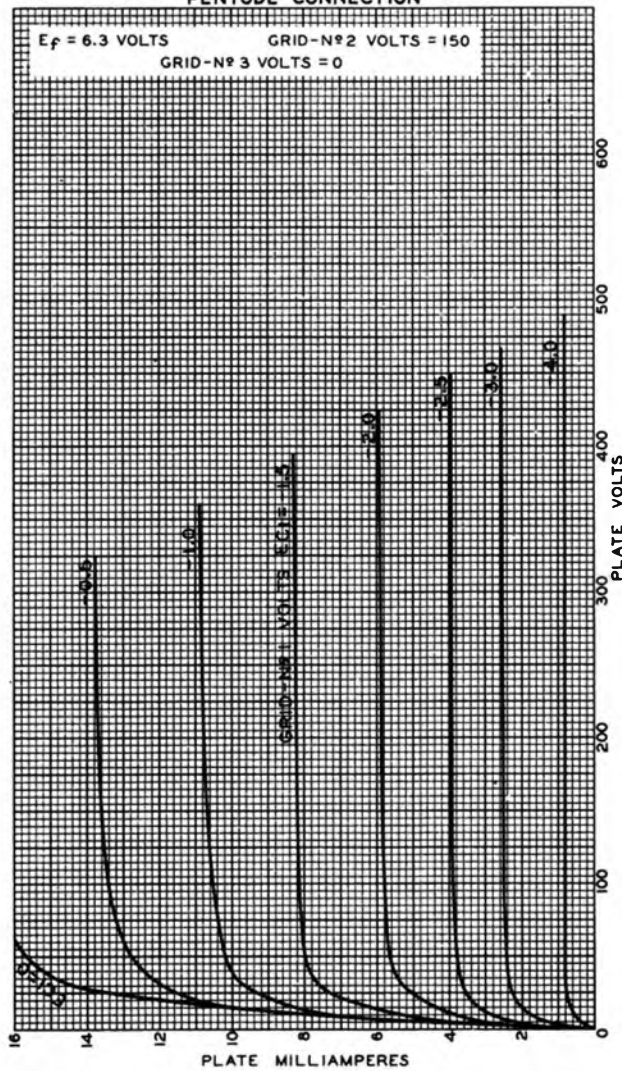


[6AU6 cont'd]

AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



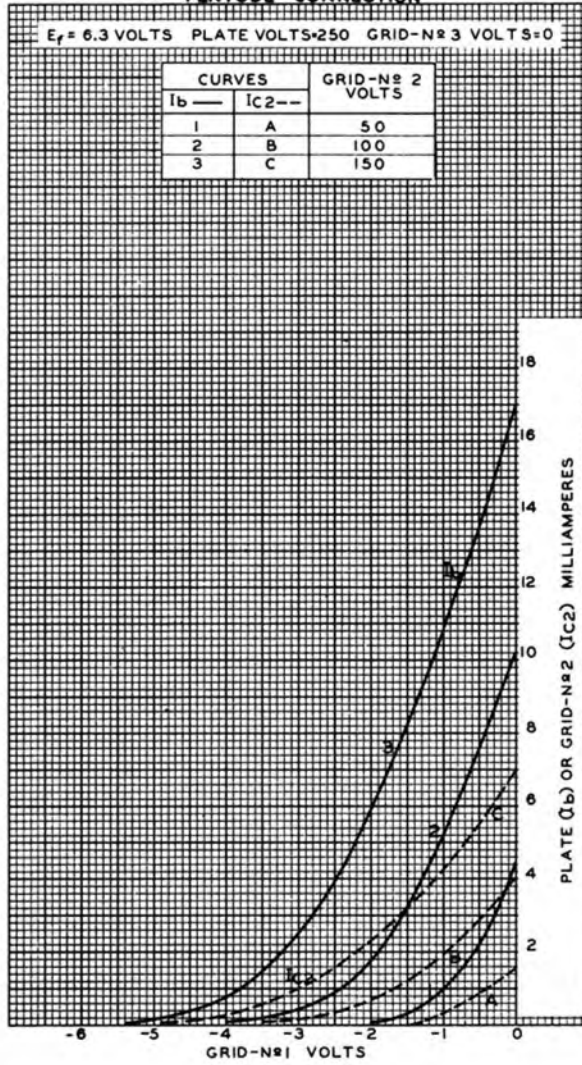
AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION





[6AU6 cont'd]

AVERAGE CHARACTERISTICS PENTODE CONNECTION

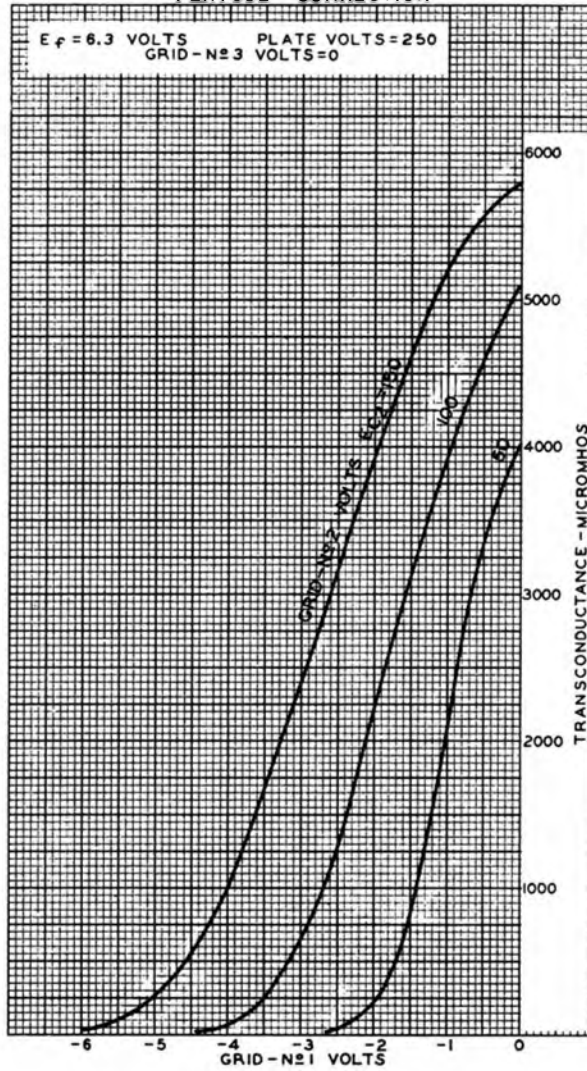


92CM-6623



[6AU6 cont'd]

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



92CM - 6614



6BA6

RF AMPLIFIER PENTODE Miniature Remote-Cutoff Type

TENTATIVE DATA

RCA-6BA6 is a miniature rf triple-grid tube with a remote cutoff characteristic. Its high transconductance and low grid-plate capacitance are desirable features for the design of hf receivers. The low value of grid-plate capacitance minimizes regenerative effects, while the high transconductance makes possible a high signal-to-noise ratio.

Plate Resistance (Approx.)	0.25	1.5	Megohms
Transconductance	4300	4400	Micromhos
Grid-No. 1 Bias (Approx.) for transconductance of 40 micromhos	-20	-20	Volts
Plate Current	10.8	11	Milliamperes
Grid-No. 2 Current	4.4	4.2	Milliamperes

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3	Volts
Current	0.3	Ampere

Direct Interelectrode Capacitances*:

Grid No. 1 to Plate [C _{G1P}]	0.0035 max.	μμf
Input [C _{G1(k+h+g2+g3+internal shield)}]	5.5	μμf
Output [C _{P(k+h+g2+g3+internal shield)}]	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	Miniature Button 7-pin

AMPLIFIER

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	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

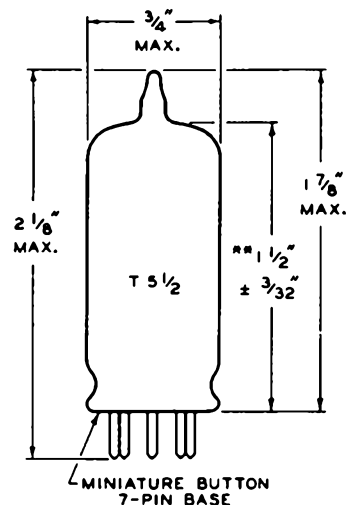
Typical Operation and Characteristics—

Class A₁ Amplifier:

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.

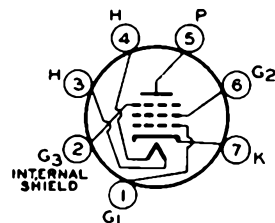
DIMENSIONAL OUTLINE



** Measured from base seat to bulb-top line as determined by ring gauge of 1/16" I.D.

SOCKET CONNECTIONS

Bottom View



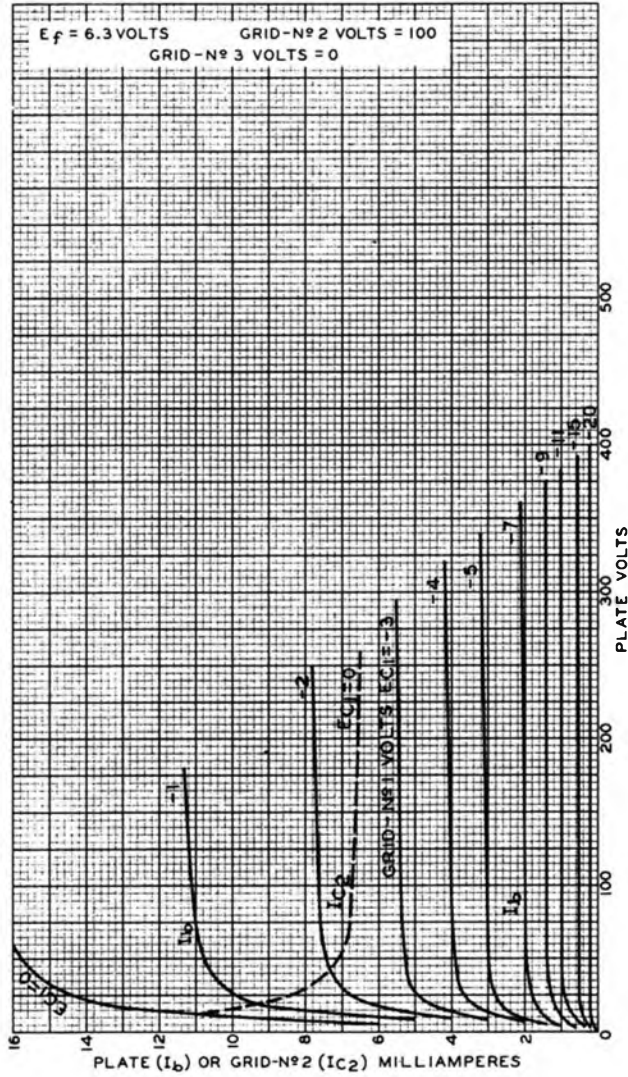
7BK1

Pin 1 : Grid No. 1	Pin 4 : Heater
Pin 2 : Grid No. 3, Internal Shield	Pin 5 : Plate
Pin 3 : Heater	Pin 6 : Grid No. 2
	Pin 7 : Cathode



[6BA6 cont'd]

AVERAGE PLATE CHARACTERISTICS

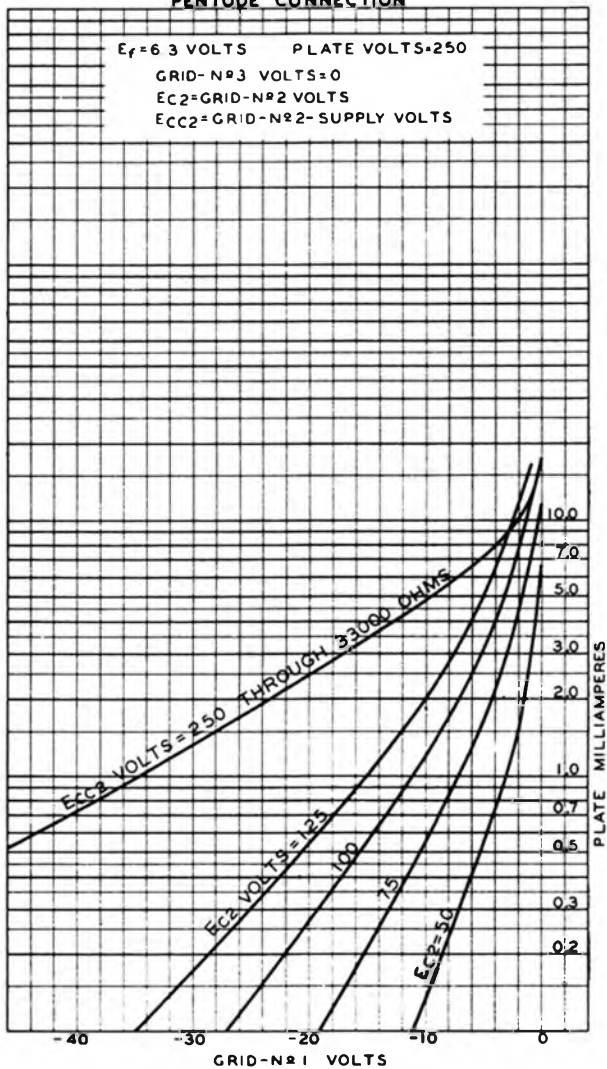


92CM-6609



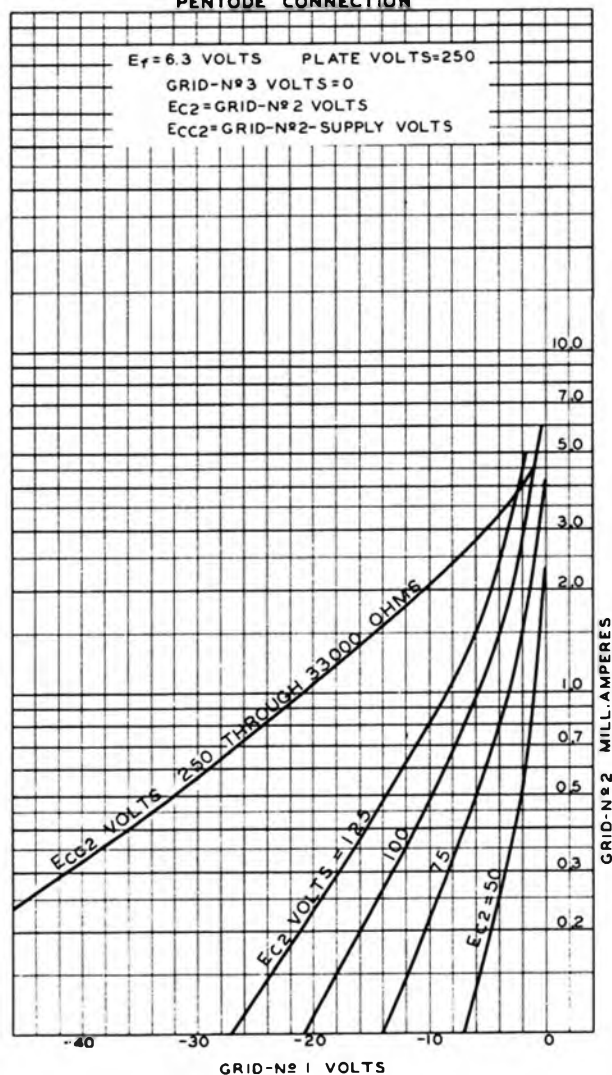
[6BA6 cont'd]

AVERAGE CHARACTERISTICS PENTODE CONNECTION



92CM-6622

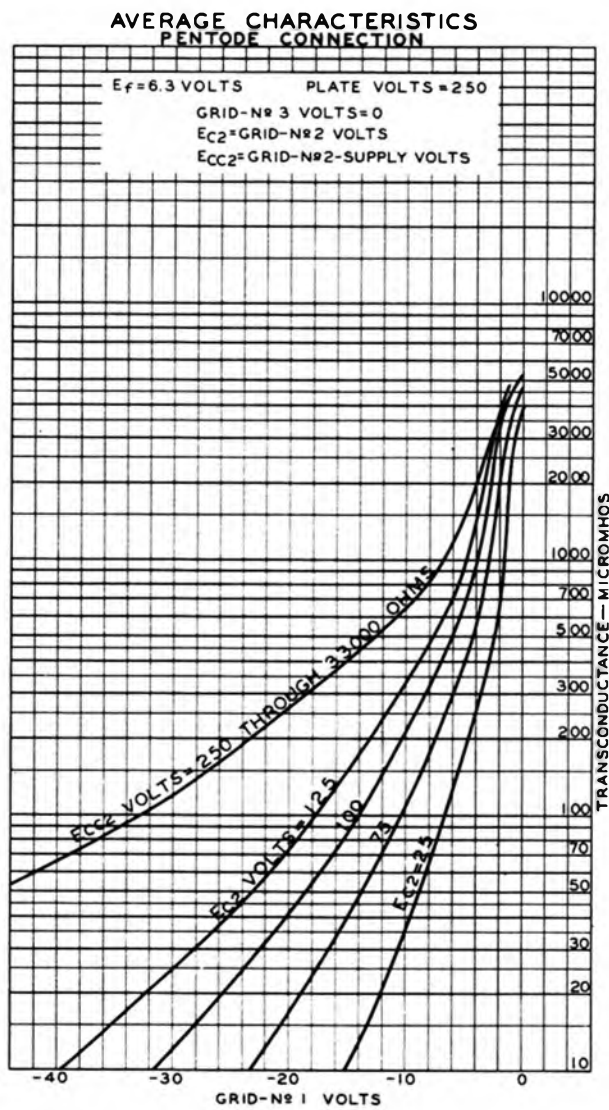
AVERAGE CHARACTERISTICS PENTODE CONNECTION



92CM-6620



[6BA6 cont'd]



92CM-6621



6BE6

PENTAGRID CONVERTER

Miniature Type

TENTATIVE DATA

RCA-6BE6 is a miniature multi-electrode vacuum tube of the single-ended type designed to perform simultaneously the functions of a mixer (first detector) tube and of an oscillator tube in superheterodyne circuits.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC).....	6.3	Volts
Current.....	0.3	Ampere

Direct Interelectrode Capacitances:*

Grid No. 3 to All Other Electrodes (RF Input) [C _{g3(h+k+g1+g2+g4+g5)}].....	7.2	μf
Plate to All Other Electrodes (Mixer Output) [C _{p(h+k+g1+g2+g4+g5)}].....	8.6	μf
Grid No. 1 to All Other Electrodes (Oscillator Input) [C _{g1(h+k+g2+g3+g4+g5+p)}].....	5.5	μf
Grid No. 3 to Plate [C _{g3p}].....	0.30 max.	μf
Grid No. 1 to Grid No. 3 [C _{g1g3}].....	0.15 max.	μf
Grid No. 1 to Plate [C _{g1p}].....	0.05 max.	μf
Grid No. 1 to All Other Electrodes Except Cathode [C _{g1(h+g2+g3+g4+g5+p)}].....	2.7	μf
Grid No. 1 to Cathode [C _{g1k}].....	2.8	μf
Cathode to All Other Electrodes Except Grid No. 1 [C _{k(h+g2+g3+g4+g5+p)}].....	15	μf

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.....	Miniature Button 7-Pin

CONVERTER

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.....	1.0 max.	Watt
GRIDS-NO. 2 & NO. 4 DISSIPATION.....	1.0 max.	Watt
TOTAL CATHODE CURRENT.....	14 max.	Ma.
GRID-NO. 3 VOLTAGE:		
Negative Bias Value.....	50 max.	Volts
Positive Bias Value.....	0 max.	Volts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode..	90 max.	Volts
Heater positive with respect to cathode..	90 max.	Volts

Characteristics—Separate Excitation:†

Plate Voltage.....	100	250	Volts
Grids-No. 2 & No. 4 (Screen) Voltage.....	100	100	Volts
Grid-No. 3 (Control Grid) Voltage.....	-1.5	-1.5	Volts
Grid-No. 1 (Oscillator Grid) Resistor.....	20000	20000	Ohms
Plate Resistance (Approx.).....	0.5	1.0	Megohm
Conversion Transconductance.....	455	475	Micromhos
Conversion Transconductance (Approx.)‡.....	4	4	Micromhos
Plate Current.....	2.8	3.0	Milliamperes
Grids-No. 2 & No. 4 Current.....	7.3	7.1	Milliamperes
Grid-No. 1 Current.....	0.5	0.5	Milliamperes
Total Cathode Current.....	10.6	10.6	Milliamperes

NOTE: The transconductance between grid No. 1 and grids No. 2 & No. 4 connected to plate (not oscillating) is approximately 7250 micromhos under the following conditions: grids No. 1 & No. 3 at 0 volts; grids No. 2 & No. 4 and plate at 100 volts. Under the same conditions, the plate current is 25 milliamperes, and the amplification factor is 20.

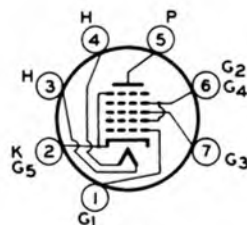
* With no external shield.

† 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 -30 volts.

SOCKET CONNECTIONS

Bottom View



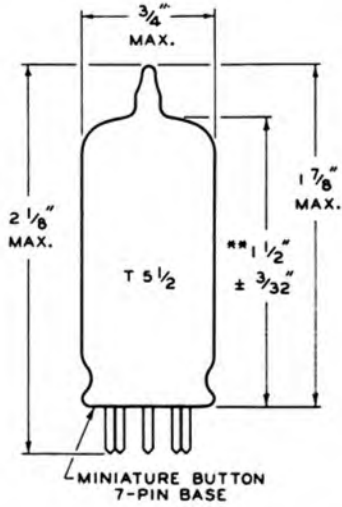
7CH

Pin 1 : Grid No. 1	Pin 5 : Plate
Pin 2 : Cathode, Grid No. 5	Pin 6 : Grid No. 2, Grid No. 4
Pin 3 : Heater	Pin 7 : Grid No. 3
Pin 4 : Heater	



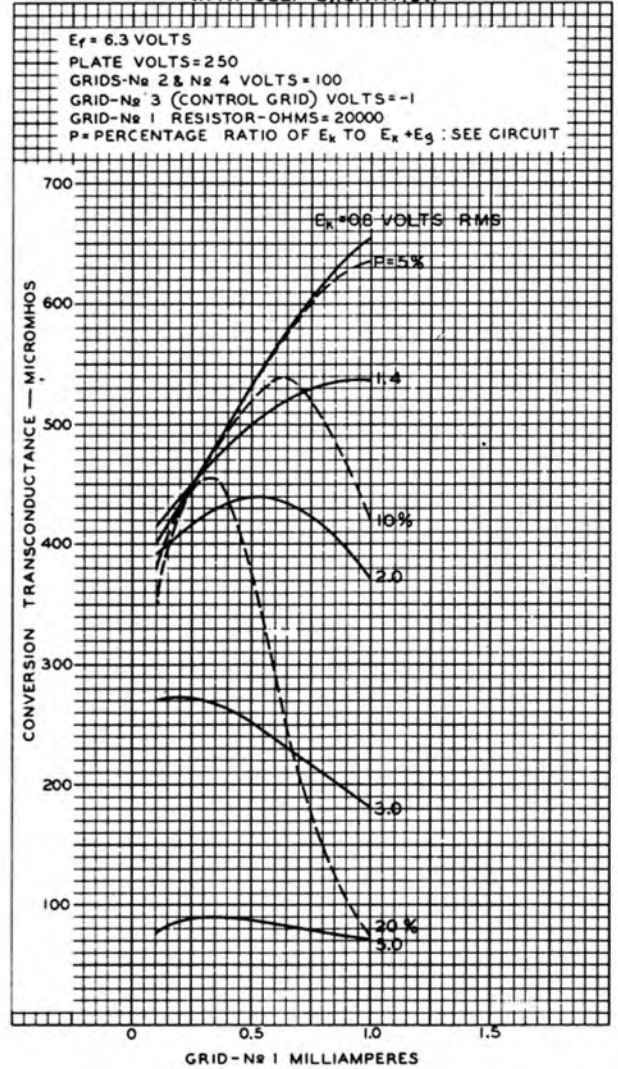
[6BE6 cont'd]

DIMENSIONAL OUTLINE



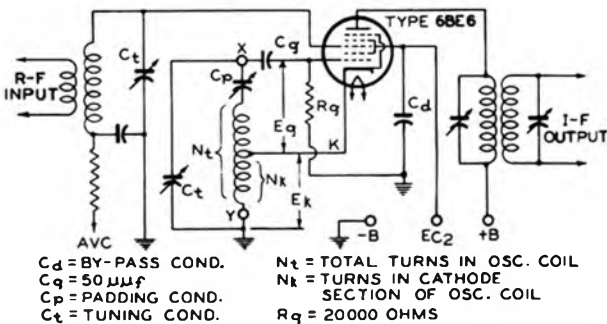
** Measured from base seat to bulb-top line as determined by ring gauge of 1/16" I.D.

OPERATION CHARACTERISTICS WITH SELF-EXCITATION



92CM-6625

TYPICAL SELF-EXCITED CONVERTER CIRCUIT FOR TYPE 6BE6



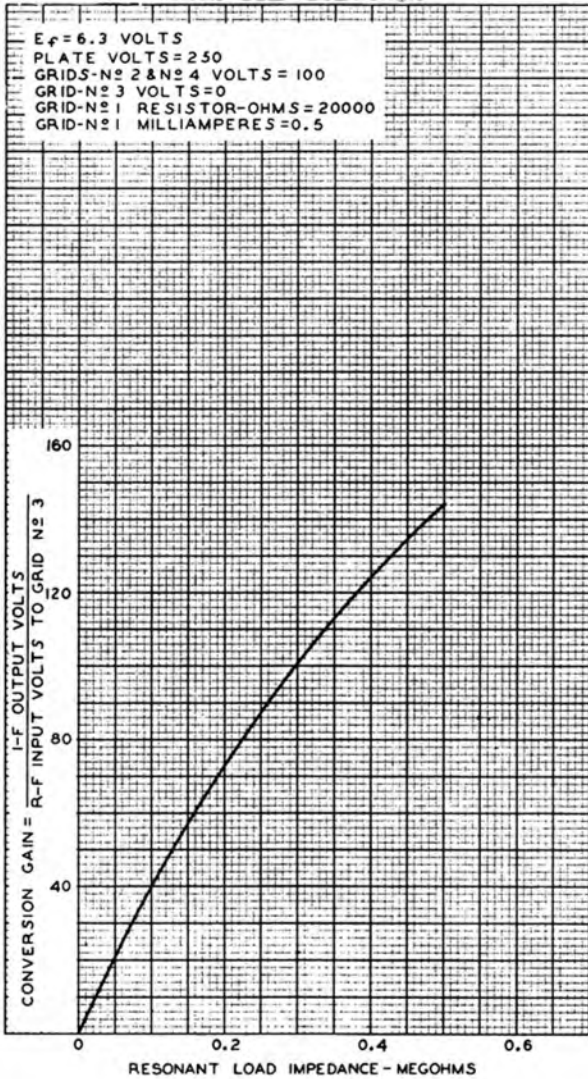
92CS-6616

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



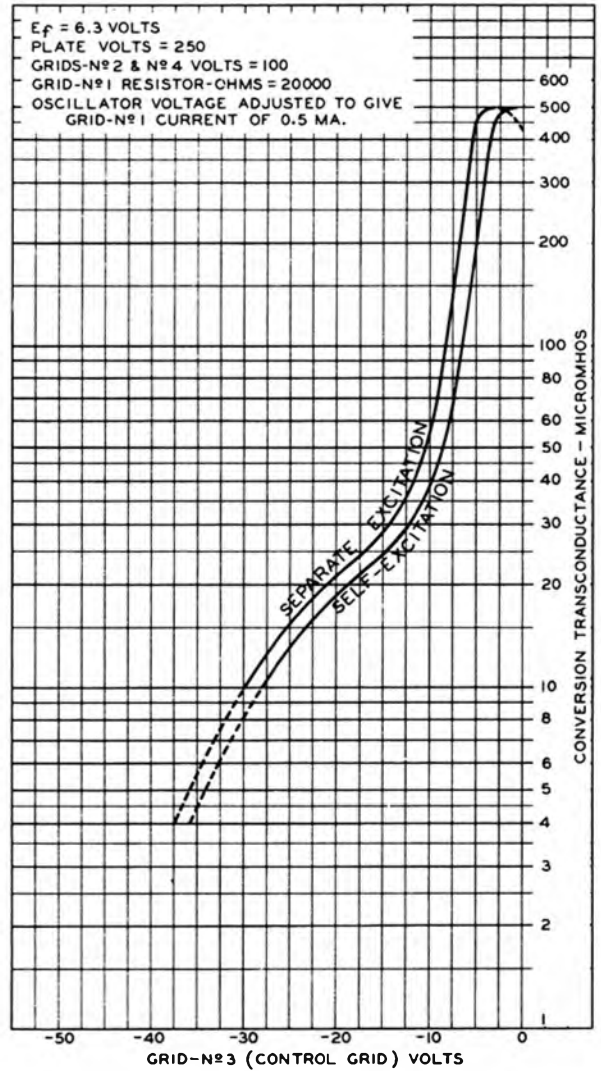
[6BE6 cont'd]

OPERATION CHARACTERISTIC WITH SELF-EXCITATION



92CM - 6805

OPERATION CHARACTERISTICS

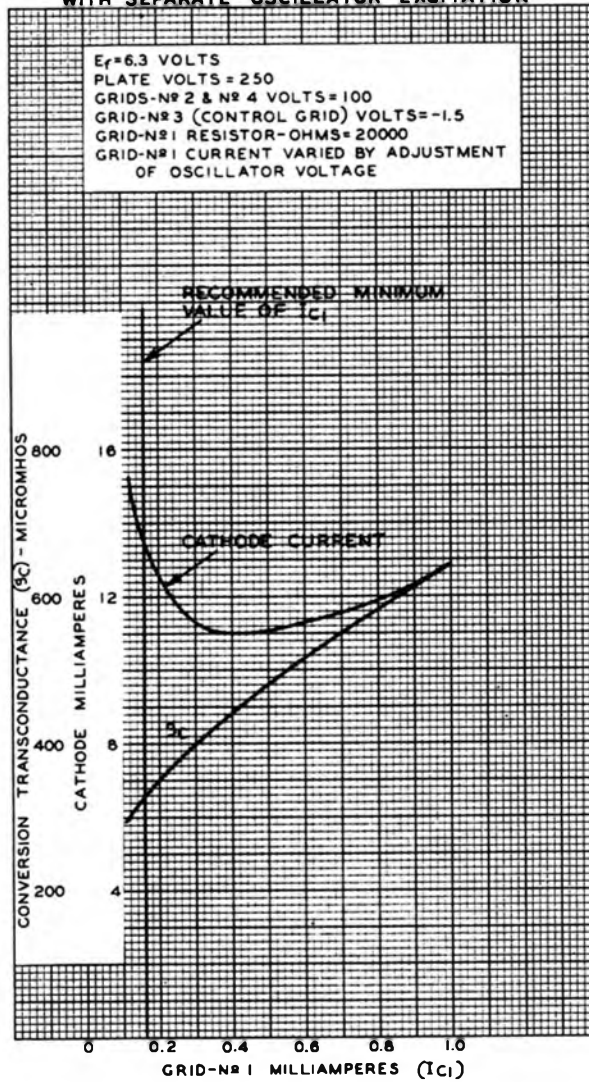


92CM - 6801



[6BE6 cont'd]

OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION



92CM-6624



12AT6

DUPLEX-DIODE HIGH-MU TRIODE

Miniature Type

TENTATIVE DATA

RCA-12AT6 is a miniature multi-unit tube containing two diodes and a high-mu triode in one envelope. It is intended for use as a combined detector, amplifier, and avc tube.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage (AC or DC)	12.6	Volts	
Current	0.15	Ampere	
Direct Interelectrode Capacitances:*			
Triode Unit—Grid to Plate	2.1	$\mu\mu\text{f}$	
Grid to Cathode and Heater	2.3	$\mu\mu\text{f}$	
Plate to Cathode and Heater	1.1	$\mu\mu\text{f}$	
Diode Plate No. 2 to Triode Grid	0.025 max.	$\mu\mu\text{f}$	

Mechanical:

Mounting Position	Any
Maximum Overall Length	$2\frac{1}{8}"$
Maximum Seated Length	$1\frac{1}{8}"$
Length from Base Seat to Bulb Top (excluding tip)	$1\frac{1}{2}" \pm \frac{3}{32}"$
Maximum Diameter	$\frac{3}{4}"$
Bulb	T-5 $\frac{1}{2}$
Base	Miniature Button 7-Pin

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 A₁ Amplifier:

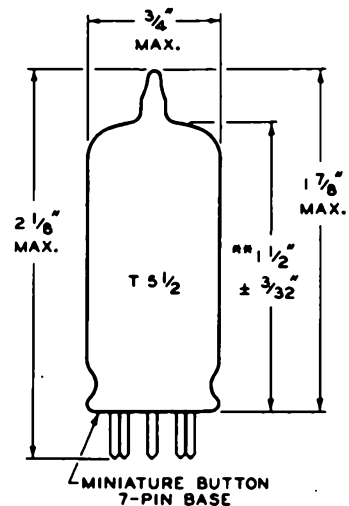
Plate Voltage	100	250	Volts
Grid Voltage	-1	-3	Volts
Amplification Factor	70	70	
Plate Resistance	54000	58000	Ohms
Transconductance	1300	1200	Micromhos
Plate Current	0.8	1.0	Milliamperes

DIODE UNITS—Two

The two diode plates are placed around a cathode, the sleeve of which is common to the triode unit. Each diode has its own base pin.

* With no external shield.

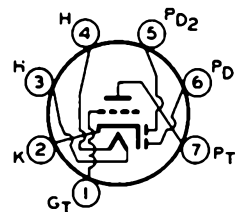
DIMENSIONAL OUTLINE



** Measured from base seat to bulb-top line as determined by ring gauge of $\frac{1}{16}"$ I.D.

SOCKET CONNECTIONS

Bottom View



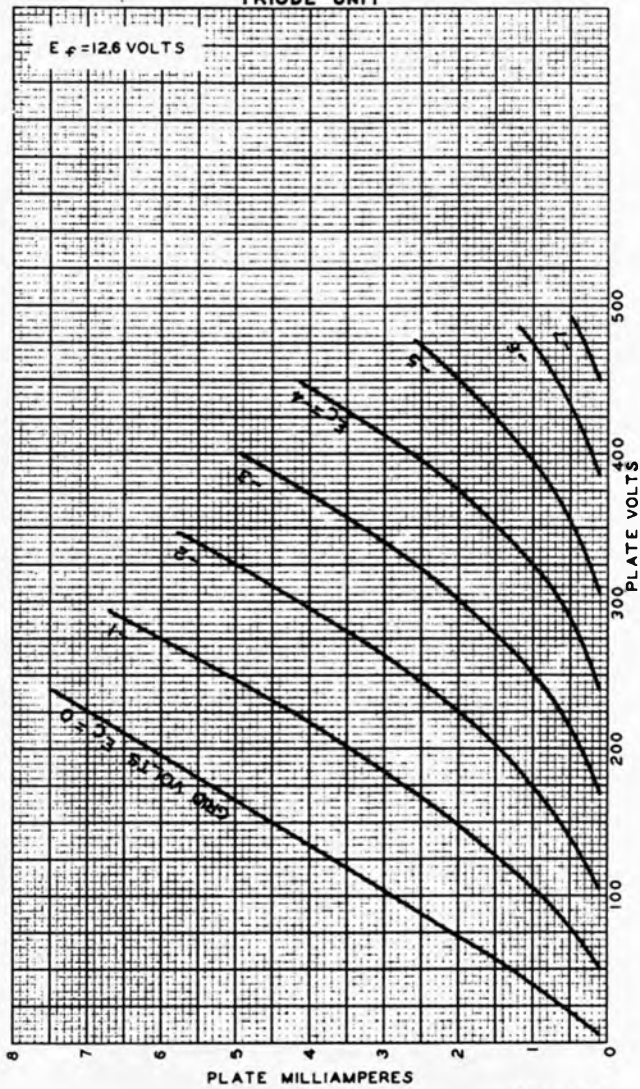
7BT

- 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



[12AT6 cont'd]

AVERAGE PLATE CHARACTERISTICS
TRIODE UNIT



92CM-6644



12BA6

RF AMPLIFIER PENTODE Miniature Remote-Cutoff Type

TENTATIVE DATA

RCA-12BA6 is a miniature rf triple-grid tube with a remote cutoff characteristic. Its high transconductance and low grid-plate capacitance are desirable features for the design of hf receivers. The low value of grid-plate capacitance minimizes regenerative effects, while the high transconductance makes possible a high signal-to-noise ratio.

Plate Resistance (Approx.)...	0.25	1.5	.. Megohms
Transconductance.....	4300	4400	Micromhos
Grid-No. 1 Bias (Approx.) for transconductance of 40 micromhos.....	-20	-20	.... Volts
Plate Current.....	10.8	11	Milliamperes
Grid-No. 2 Current.....	4.4	4.2	Milliamperes

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC).....	12.6	....	Volts
Current.....	0.15	....	Ampere

Direct Interelectrode Capacitances:*

Grid No. 1 to Plate [C_{g1p}].....	0.0035	max..	$\mu\mu f$
Input [$C_{g1(k+h+g_2+g_3+internal\ shield)}$].....	5.5	....	$\mu\mu f$
Output [$C_{p(k+h+g_2+g_3+internal\ shield)}$].....	5.0	....	$\mu\mu f$

Mechanical:

Mounting Position.....	Any
Maximum Overall Length.....	2 1/8"
Maximum Seated Length.....	1 7/8"
Length from Base Seat to Bulb Top (excluding tip).....	1 1/2" \pm 3/32"
Maximum Diameter.....	3/4"
Bulb.....	T-5 1/2
Base.....	Miniature Button 7-pin

AMPLIFIER

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.....	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

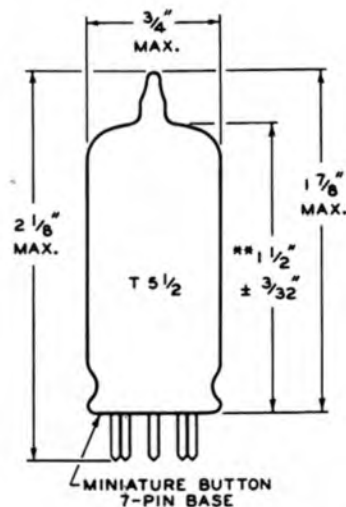
Typical Operation and Characteristics—

Class A₁ Amplifier:

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.

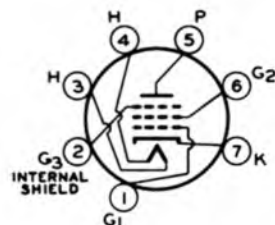
DIMENSIONAL OUTLINE



** Measured from base seat to bulb-top line as determined by ring gauge of 1/16" I.D.

SOCKET CONNECTIONS

Bottom View



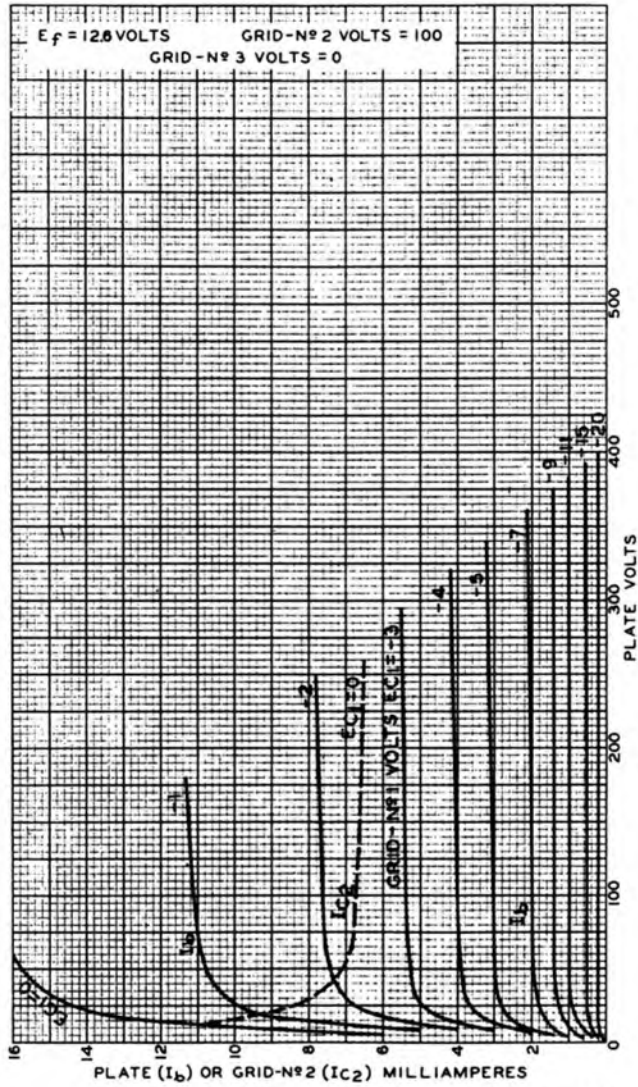
7BK1

Pin 1 : Grid No. 1	Pin 4 : Heater
Pin 2 : Grid No. 3, Internal Shield	Pin 5 : Plate
Pin 3 : Heater	Pin 6 : Grid No. 2
	Pin 7 : Cathode



[12BA6 cont'd]

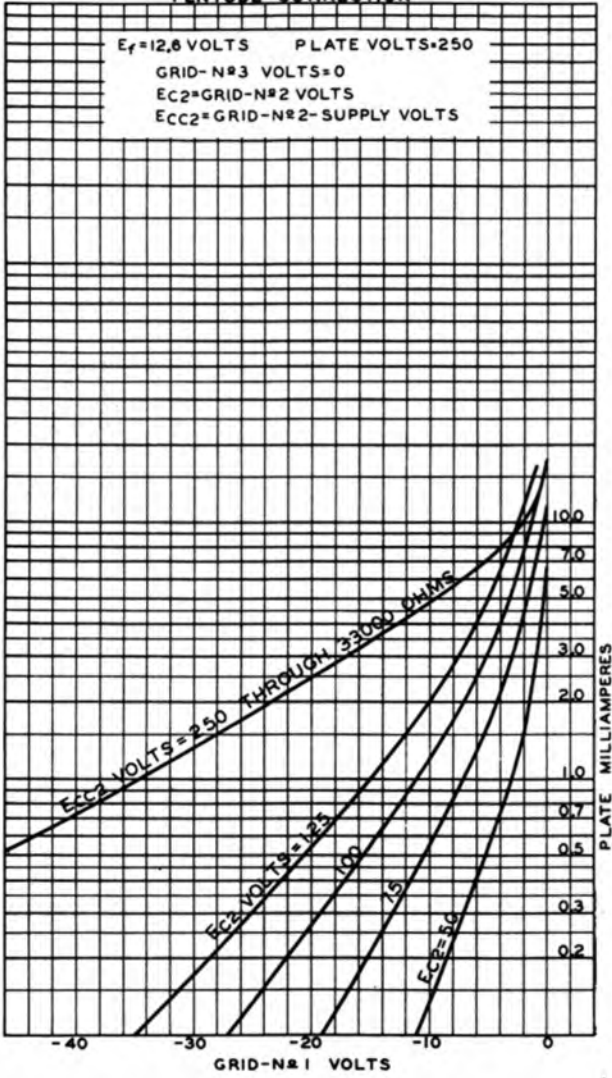
AVERAGE PLATE CHARACTERISTICS





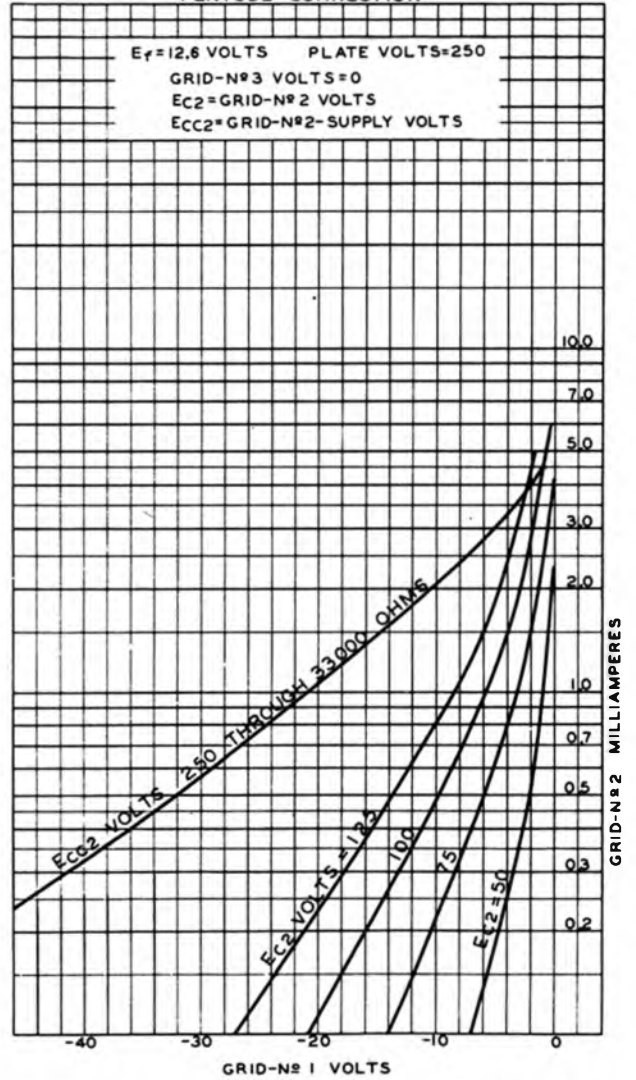
[12BA6 cont'd]

AVERAGE CHARACTERISTICS PENTODE CONNECTION



92CM-8640

AVERAGE CHARACTERISTICS PENTODE CONNECTION

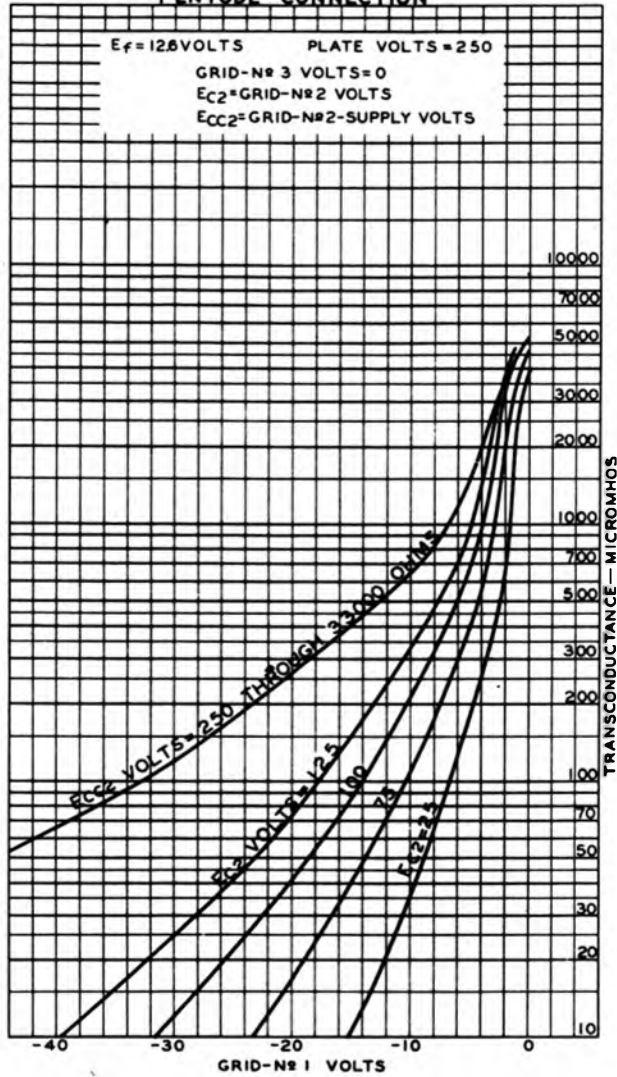


92CM-8643



[12BA6 cont'd]

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



92CM-6641



12BE6

PENTAGRID CONVERTER

Miniature Type

TENTATIVE DATA

RCA-12BE6 is a miniature multi-electrode vacuum tube of the single-ended type designed to perform simultaneously the functions of a mixer (first detector) tube and of an oscillator tube in superheterodyne circuits.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC).....	12.6	....	Volts
Current.....	0.15	....	Ampere

Direct Interelectrode Capacitances:*

Grid No. 3 to All Other Electrodes (RF Input) [C _{g3(h+k+g1+g2+g4+g5)}].....	7.2	μμf
--	-----	------	-----

Plate to All Other Electrodes (Mixer Output) [C _{p(h+k+g1+g2+g4+g5)}].....	8.6	μμf
--	-----	------	-----

Grid No. 1 to All Other Electrodes (Oscillator Input) [C _{g1(h+k+g2+g3+g4+g5+p)}].....	5.5	μμf
--	-----	------	-----

Grid No. 3 to Plate [C _{g3p}].....	0.30 max.	μμf
--	-----------	------	-----

Grid No. 1 to Grid No. 3 [C _{g1g3}].....	0.15 max.	μμf
--	-----------	------	-----

Grid No. 1 to Plate [C _{g1p}].....	0.05 max.	μμf
--	-----------	------	-----

Grid No. 1 to All Other Electrodes Except Cathode [C _{g1(h+g2+g3+g4+g5+p)}].....	2.7	μμf
--	-----	------	-----

Grid No. 1 to Cathode [C _{g1k}].....	2.8	μμf
--	-----	------	-----

Cathode to All Other Electrodes Except Grid No. 1 [C _{k(h+g2+g3+g4+g5+p)}].....	15	μμf
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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" ± 1/32"
Maximum Diameter.....	3/4"
Bulb.....	T-5 1/2
Base.....	Miniature Button 7-Pin

CONVERTER

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.....	1.0 max.	Watt
GRIDS-NO. 2 & NO. 4 DISSIPATION.....	1.0 max.	Watt
TOTAL CATHODE CURRENT.....	14 max.	Ma.
GRID-NO. 3 VOLTAGE:		
Negative Bias Value.....	50 max.	Volts
Positive Bias Value.....	0 max.	Volts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode..	90 max.	Volts
Heater positive with respect to cathode..	90 max.	Volts

Characteristics—Separate Excitation:†

Plate Voltage.....	100	250	....	Volts
Grids-No. 2 & No. 4 (Screen) Voltage.....	100	100	....	Volts
Grid-No. 3 (Control Grid) Voltage.....	-1.5	-1.5	....	Volts
Grid-No. 1 (Oscillator Grid) Resistor.....	20000	20000	....	Ohms
Plate Resistance (Approx.).....	0.5	1.0	..	Megohm
Conversion Transconductance.....	455	475		Micromhos
Conversion Transconductance (Approx.)‡.....	4	4		Micromhos
Plate Current.....	2.8	3.0		Milliamperes
Grids-No. 2 & No. 4 Current.....	7.3	7.1		Milliamperes
Grid-No. 1 Current.....	0.5	0.5		Milliamperes
Total Cathode Current.....	10.6	10.6		Milliamperes

NOTE: The transconductance between grid No. 1 and grids No. 2 & No. 4 connected to plate (not oscillating) is approximately 7250 micromhos under the following conditions: grids No. 1 & No. 3 at 0 volts; grids No. 2 & No. 4 and plate at 100 volts. Under the same conditions, the plate current is 25 milliamperes, and the amplification factor is 20.

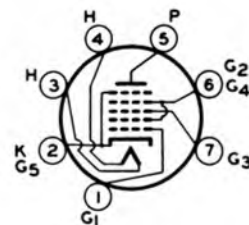
* With no external shield.

† 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 -30 volts.

SOCKET CONNECTIONS

Bottom View



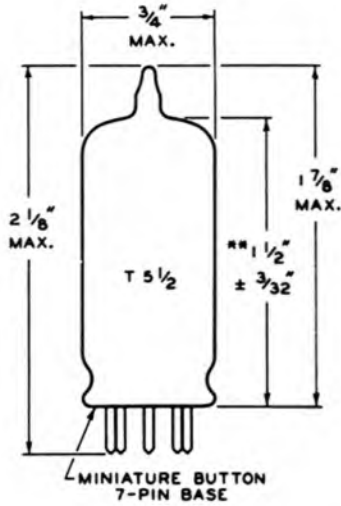
7CH

Pin 1 : Grid No. 1	Pin 5 : Plate
Pin 2 : Cathode, Grid No. 5	Pin 6 : Grid No. 2, Grid No. 4
Pin 3 : Heater	Pin 7 : Grid No. 3
Pin 4 : Heater	



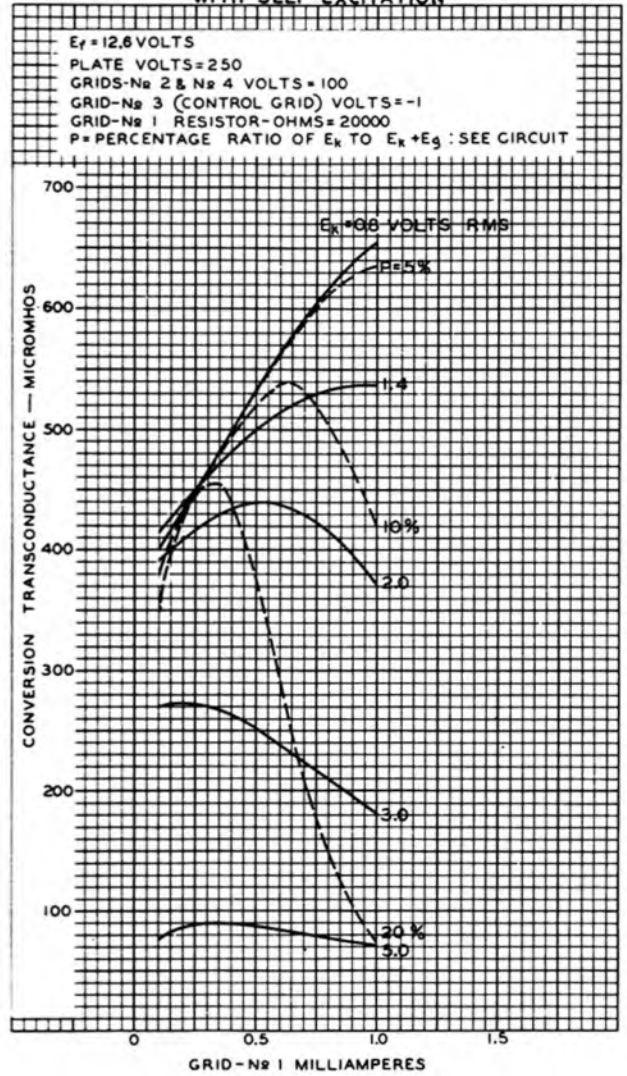
[12BE6 cont'd]

DIMENSIONAL OUTLINE

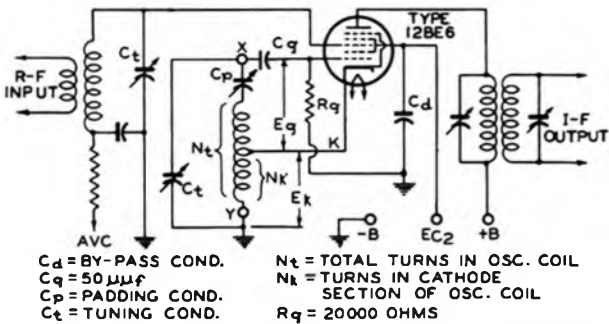


** Measured from base seat to bulb-top line as determined by ring gauge of 1/16" I.D.

OPERATION CHARACTERISTICS WITH SELF-EXCITATION



TYPICAL SELF-EXCITED CONVERTER CIRCUIT FOR TYPE 12BE6



92CS-6617

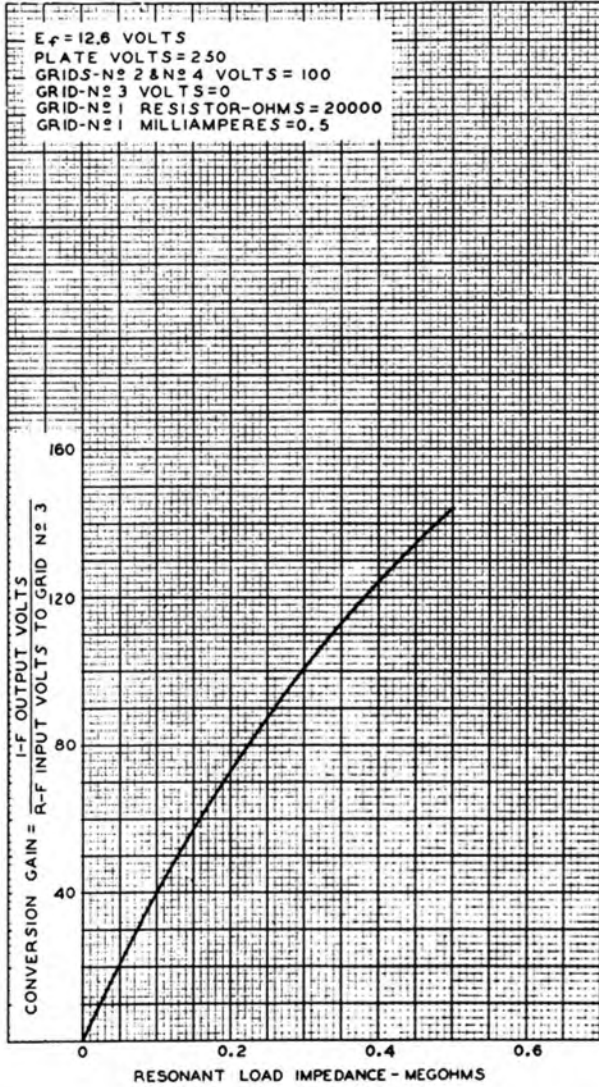
92CM-6637

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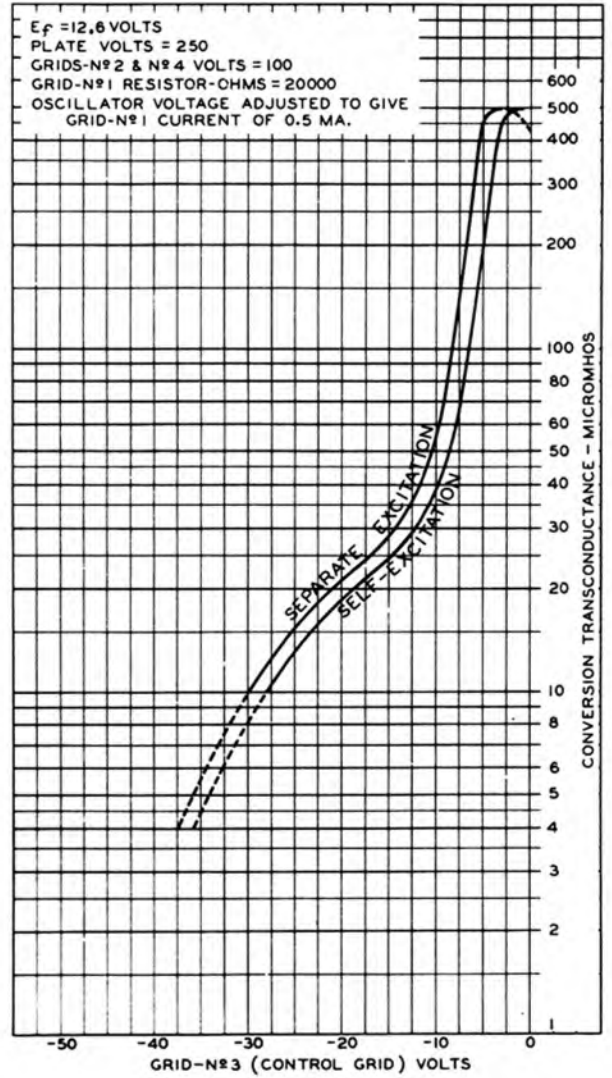
[12BE6 cont'd]

OPERATION CHARACTERISTIC WITH SELF-EXCITATION



92CM-6636

OPERATION CHARACTERISTICS

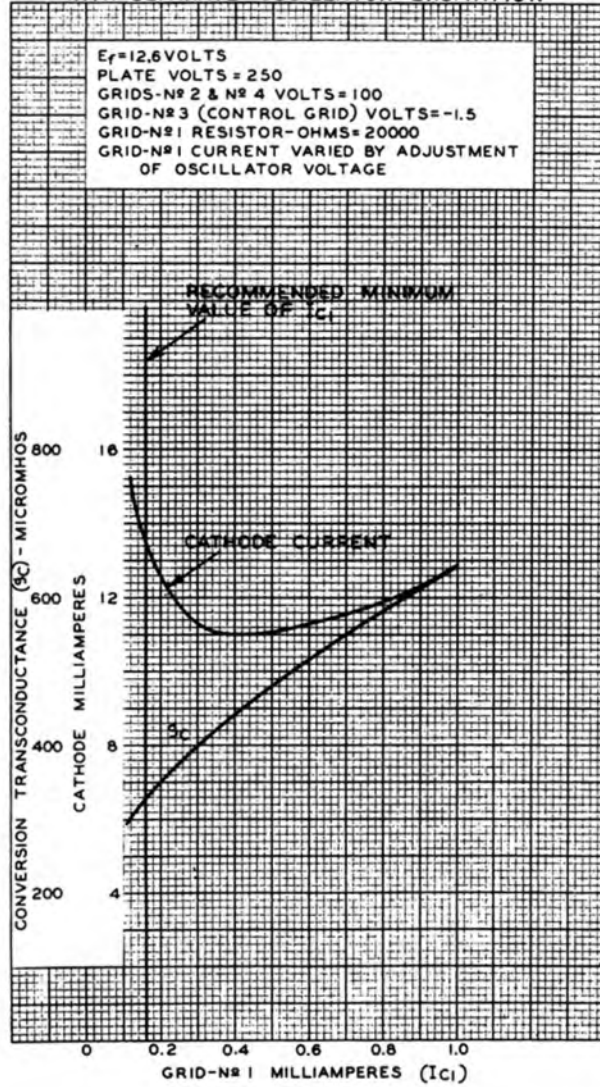


92CM-6639



[12BE6 cont'd]

OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION



92CM-6638



35W4

HALF-WAVE HIGH-VACUUM RECTIFIER

Miniature Type

TENTATIVE DATA

RCA-35W4 is a miniature, half-wave, high-vacuum rectifier of the heater-cathode type for use in ac/dc receivers. The heater is provided with a tap for operation of a panel lamp.

GENERAL DATA

Electrical:

	Without Panel Lamp	With No. 40 or No. 47 Panel Lamp	
Heater, for Unipotential Cathode:			
Voltage (AC or DC):			
Entire Heater (pins 3 & 4) . . .	35	32	Volts
Panel-Lamp Section (pins 4 & 6)	7.5	5.5	Volts
Current { between pins 3 & 4 . . .	0.15	...	Ampere
{ between pins 3 & 6 . . .	...	0.15	Ampere

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

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 and { No Shunting Resistor	60 max.	Ma.
{ Shunting Resistor†	90 max.	Ma.
Without Panel Lamp	100 max.	Ma.
PANEL-LAMP-SECTION VOLTAGE (RMS):		
When panel lamp fails	15 max.	Volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	330 max.	Volts
Heater positive with respect to cathode	330 max.	Volts

Typical Operation With No. 40 or No. 47 Panel Lamp in Circuit on Next Page with Condenser-Input Filter:

AC Plate-Supply Voltage (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 Resistor	—	300	150	100	Ohms
DC Output Current	60	70	80	80	Ma.

Typical Operation Without Panel Lamp in Conventional Half-Wave Circuit with Condenser-Input Filter:

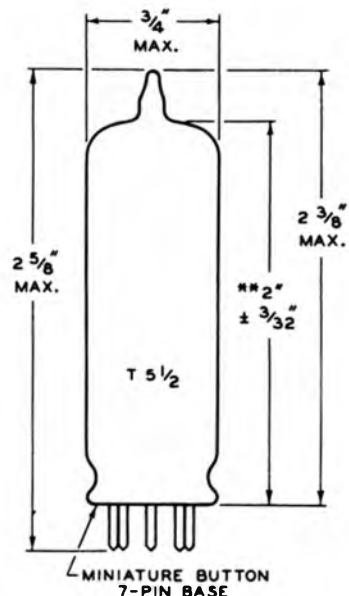
AC Plate-Supply Voltage (RMS)	117	Volts
Filter-Input Capacitor	40	μf
Min. Total Effective Plate-Supply Impedance	15	Ohms
DC Output Current	100	Ma.
DC Output Voltage at Input to Filter (Approx.):		
At half-load current (50 ma.)	140	Volts
At full-load current (100 ma.)	120	Volts
Voltage Regulation (Approx.):		
Half-load to full-load current	20	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.

DIMENSIONAL OUTLINE

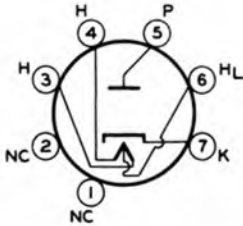


** Measured from base seat to bulb-top line as determined by ring gauge of 1/16" I.D.



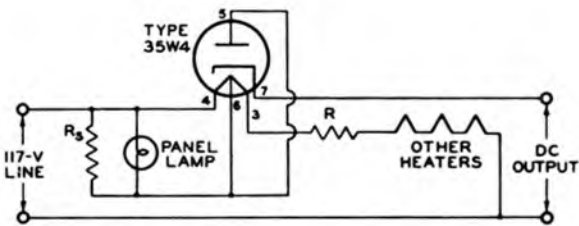
[35W4 cont'd]

SOCKET CONNECTIONS Bottom View



5BQ

- | | |
|-----------------------|----------------------------|
| Pin 1 : No Connection | Pin 6 : Heater Tap |
| Pin 2 : No Connection | Pin 7 : Cathode |
| Pin 3 : Heater | Panel-Lamp Heater |
| Pin 4 : Heater | Section between pins 4 & 6 |
| Pin 5 : Plate | |

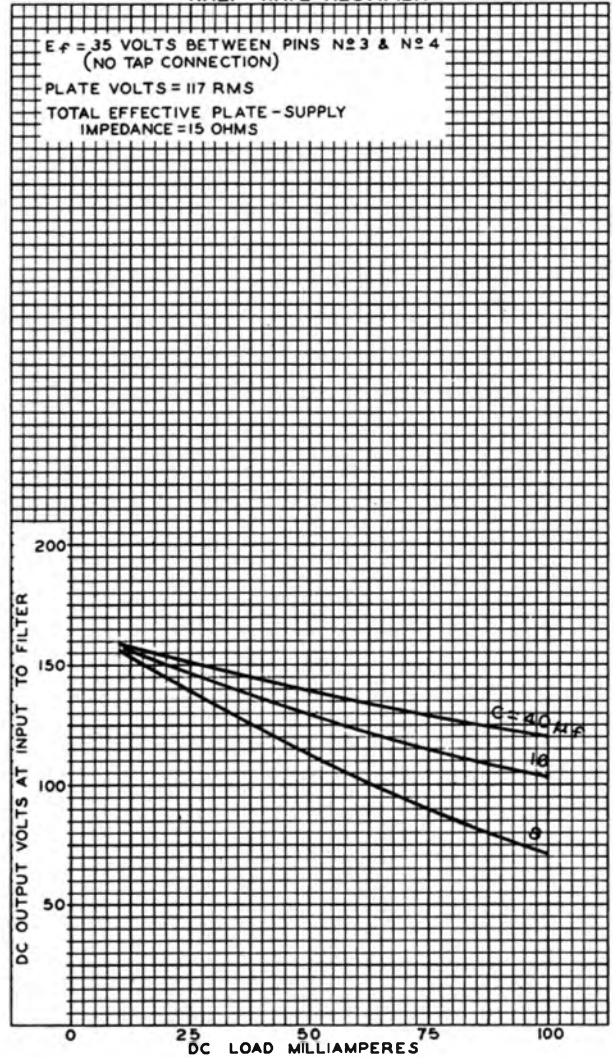


DROP ACROSS R AND ALL HEATERS (WITH PANEL LAMP) SHOULD EQUAL 117 VOLTS AT 0.15 AMPERE. R_s = SHUNTING RESISTOR REQUIRED WHEN DC OUTPUT CURRENT EXCEEDS 60 MILLIAMPERES

92CS-8826

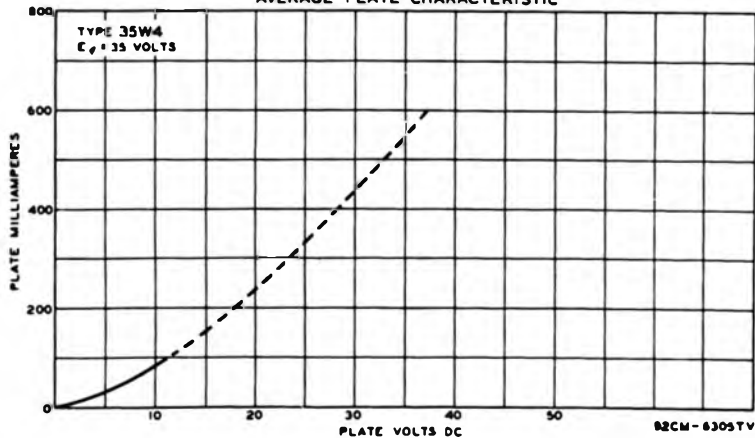
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OPERATION CHARACTERISTICS HALF-WAVE RECTIFIER



92CM-8615

AVERAGE PLATE CHARACTERISTIC



92CM-6305TV



50B5

BEAM POWER AMPLIFIER

Miniature Type

TENTATIVE DATA

RCA-50B5 is a miniature beam power amplifier of the heater-cathode type for use in the output stage of ac/dc receivers. At the relatively low plate and screen voltages available in such receivers, the 50B5 is capable of providing high power output because of its high power sensitivity and high efficiency.

Transconductance.....	7500	Micromhos
Load Resistance.....	2500	Ohms
Total Harmonic Distortion.....	9	Per cent
Max-Signal Power Output.....	1.9	Watts

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage (AC or DC).....	50	Volts	
Current.....	0.15	Ampere	
Direct Interelectrode Capacitances (Approx.):*			
Grid No. 1 to Plate [C_{g1p}].....	0.5	$\mu\mu\text{f}$	
Input [$C_{g1(k+h+g_2+g_3)}$].....	13	$\mu\mu\text{f}$	
Output [$C_{p(k+h+g_2+g_3)}$].....	6.5	$\mu\mu\text{f}$	

Mechanical:

Mounting Position.....	Any	
Maximum Overall Length.....	$2\frac{5}{8}$ "	
Maximum Seated Length.....	$2\frac{3}{8}$ "	
Length from Base Seat to Bulb Top (excluding tip)	$2" \pm \frac{3}{32}"$	
Maximum Diameter.....	$\frac{3}{4}"$	
Bulb.....	T-5 $\frac{1}{2}$	
Base.....	Miniature Button 7-Pin	

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—

Class A₁ Amplifier:

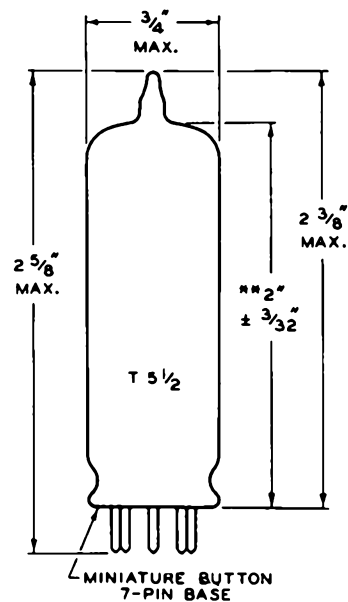
Plate Voltage.....	110	Volts
Grid-No. 2 Voltage.....	110	Volts
Grid-No. 1 (Control Grid) Voltage.....	-7.5	Volts
Peak AF Grid-No. 1 Voltage.....	7.5	Volts
Zero-Signal Plate Current.....	49	Milliamperes
Max-Signal Plate Current.....	50	Milliamperes
Zero-Signal Grid-No. 2 Current (Approx.)..	4	Milliamperes
Max-Signal Grid-No. 2 Current (Approx.)..	8.5	Milliamperes
Plate Resistance (Approx.).....	14000	Ohms

* With no external shield.

Maximum Circuit Values (for maximum rated conditions):

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

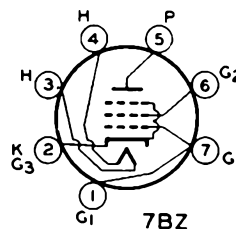
DIMENSIONAL OUTLINE



** Measured from base seat to bulb-top line as determined by ring gauge of $\frac{1}{16}$ " I.D.

SOCKET CONNECTIONS

Bottom View

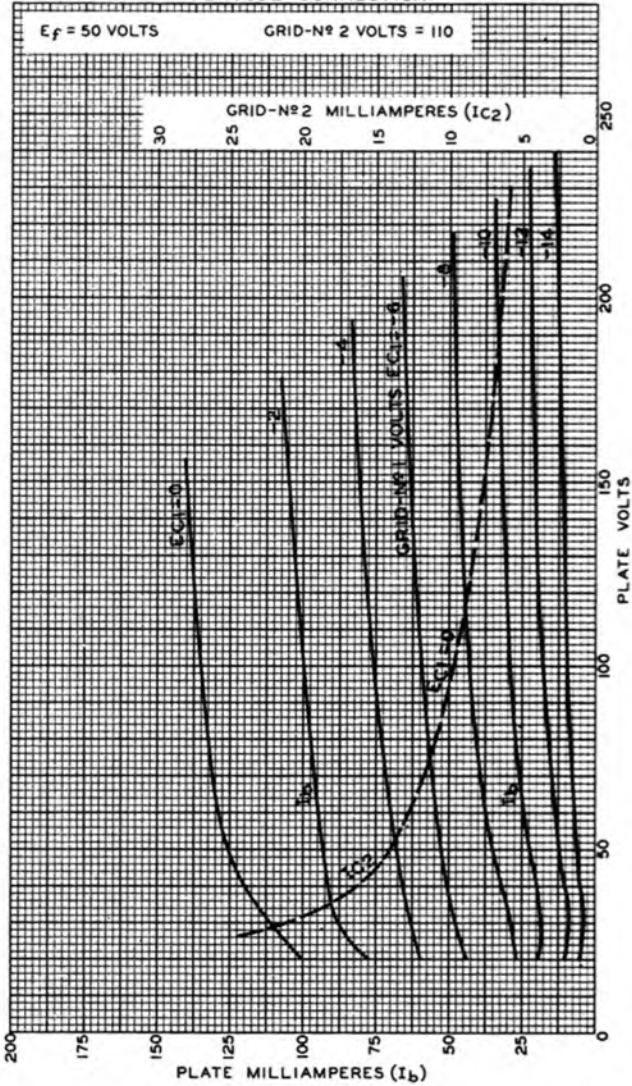


- Pin 1 : Grid No. 1
- Pin 2 : Cathode, Grid No. 3
- Pin 3 : Heater
- Pin 4 : Heater
- Pin 5 : Plate
- Pin 6 : Grid No. 2
- Pin 7 : Grid No. 1



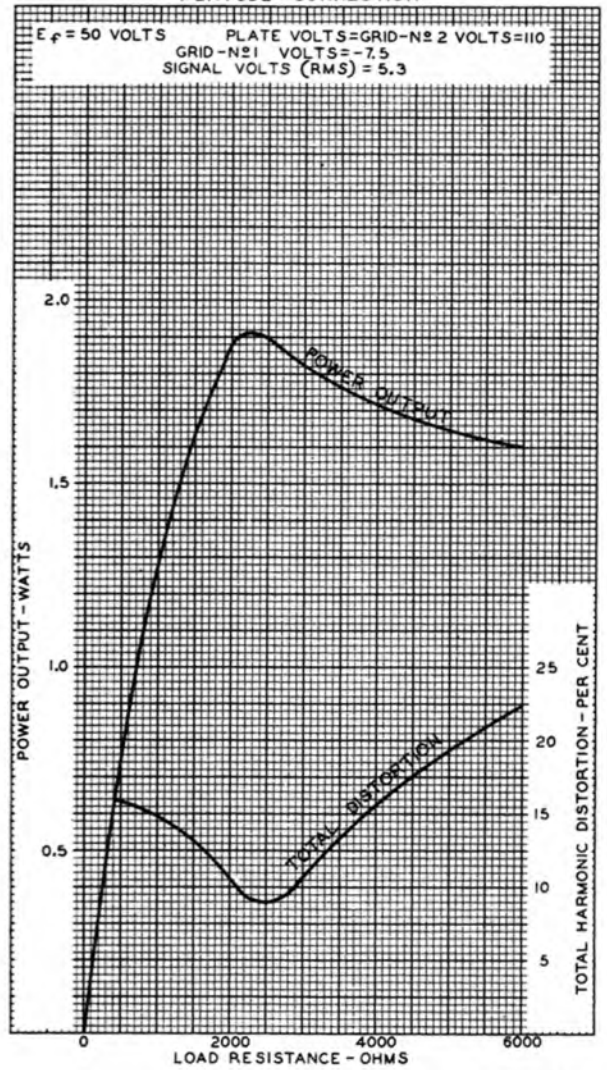
[50B5 cont'd]

AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



92CM-6603

OPERATION CHARACTERISTICS
PENTODE CONNECTION



92CM-6612