5AM8
DIODE–SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 5AN8 is the same as the 6AN8 except for the following items:

Heater, for Unipotential Cathodes:		
Voltage	4.7	ac or dc volts
Current	0.6	amp
Warm-up time (Average)*	11	sec

5AN8
MEDIUM-MU TRIODE–SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 5AN8 is the same as the 6AN8 except for the following items:

Heater, for Unipotential Cathodes:		
Voltage	4.7	ac or dc volts
Current	0.6	amp
Warm-up time (Average)*	11	sec

5AQ5
BEAM POWER TUBE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 5AQ5 is the same as the 6AQ5 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	4.7	ac or dc volts
Current	0.6	amp
Warm-up time (Average)*	11	sec
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲max.	volts

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

▲ The dc component must not exceed 100 volts.

5AS4-A

FULL-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

Filament, Coated:

Voltage	5	ac volts
Current	3	amp

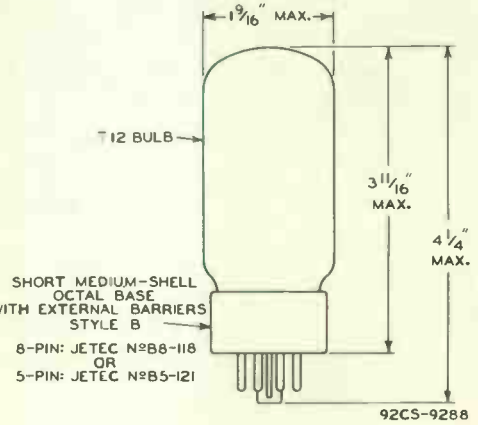
Mechanical:

Mounting Position	Vertical, base up or down, or Horizontal with pins 1 and 4 in vertical plane
Maximum Overall Length	4-1/4"
Maximum Seated Length	3-11/16"
Maximum Diameter	1-9/16"
Bulb	T12
Base	Short Medium-Shell Octal 8-Pin with External Barriers, Style B (JETEC No.38-118), or Short Medium-Shell Octal 5-Pin with External Barriers, Style B (JETEC No.B5-121)
Basing Designation for BOTTOM VIEW	5T

Pin 1 – No Connection
Pin 2 – Filament
Pin 3♦ – Same as Pin 1
Pin 4 – Plate No.2

Pin 5♦ – Same as Pin 1
Pin 6 – Plate No.1
Pin 7♦ – Same as Pin 1
Pin 8 – Filament

MAXIMUM RATINGS, TYPICAL OPERATION, and CURVES for Type 5AS4-A are the same as those shown for Type 5U4-GB



♦ On the 5-pin base, pins 3, 5, and 7 are omitted.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

5AS8

Diode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5AS8 is the same as the 6AS8 except for the following items:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

5AT8

Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5AT8 is the same as the 6AT8A except for the following items:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

Full-Wave Vacuum Rectifier

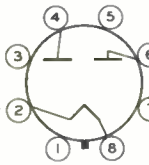
GENERAL DATA

Electrical:

Filament, Coated:
Voltage (AC or DC). . . . . 5 volts
Current . . . . . 3.75 amp

Mechanical:

Operating Position. . . . . Vertical, base down or up, or Horizontal with pins 2 and 4 in vertical plane
Maximum Overall Length. . . . . 4-3/4"
Maximum Seated Length . . . . . 4-3/16"
Maximum Diameter. . . . . 1-11/16"
Bulb. T12
Base. . . . . Jumbo-Shell Octal 8-Pin with External Barriers (JEDEC Group 1, No.B8-114)
Basing Designation for BOTTOM VIEW. 5T



Pin 1 – No Connection
Pin 2 – Filament
Pin 3 – Same as Pin 1
Pin 4 – Plate No.2
Pin 5 – Same as Pin 1
Pin 6 – Plate No.1
Pin 7 – Same as Pin 1
Pin 8 – Filament

FULL-WAVE RECTIFIER

Maximum Ratings, *Design-Center Values:*

For power-supply frequencies of 25 to 1000 cps

PEAK INVERSE PLATE VOLTAGE.	1400 max.	volts
AC PLATE SUPPLY VOLTAGE PER PLATE (RMS, without load)	See *Rating Chart*	
STEADY-STATE PEAK PLATE CURRENT PER PLATE	1.075 max.	amp
TRANSIENT PEAK PLATE CURRENT PER PLATE for duration of 0.2 second maximum. . .	5.25 max.	amp
DC OUTPUT CURRENT	See *Rating Chart*	

Typical Operation:

	With capacitor-input filter		*With choke-input filter*	
AC Plate-to-Plate Supply Voltage (RMS, without load)	600	800	1000	volts
Filter-Input Capacitor[a].	40	40	–	μf
Filter Input Choke. . .	–	–	10	henrys
Total Effective Plate Supply Impedance Per Plate	30	50	–	ohms

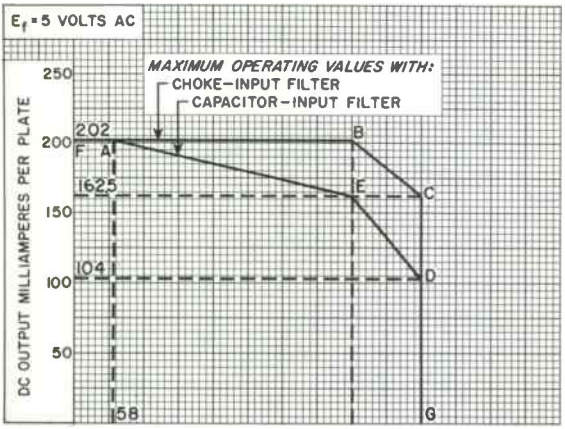
DC Output Voltage at input to filter . . .	275	395	395	volts
DC Output Current . . .	350	325	325	ma

Characteristics:

Tube-Voltage Drop for plate ma. = 350
(Per plate) . . . . . 50 volts

[a] When capacitance values higher than 40 μf are used, the effective plate supply impedance should be increased so that the maximum peak-plate-current rating is not exceeded.

RATING CHART



92CS-11206

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 (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec
Direct Interelectrode Capacitances:[a]		
Triode Unit:		
Grid to plate	1.5	μμf
Grid to cathode and heater	2	μμf
Plate to cathode and heater	0.34	μμf
Pentode Unit:		
Grid No.1 to plate	0.04 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	7	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	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

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 Resistor	–	180	ohms
Amplification Factor	19	–	
Plate Resistance (Approx.)	5750	300000	ohms
Transconductance	3300	6200	μmhos
Plate Current	13	9.5	ma
Grid-No.2 Current	–	2.8	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-19	-8	volts

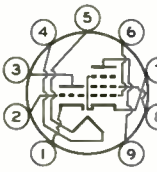
Mechanical:

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

5AV8

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

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



Pin 7 – Pentode Cathode, Pentode Grid No.3, Internal Shield
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-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	2.5 max.	2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200 max.	200 max.	volts
Heater positive with respect to cathode.	200[b] max.	200[b] max.	volts

Maximum Circuit Values:

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

[a] Without external shield.

[b] The dc component must not exceed 100 volts.

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

5B8
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	4.7	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:[o]

Triode Unit:		
Grid to plate	1.7	μμf
Grid to cathode & pentode grid No.3 & internal shield, and heater	1.9	μμf
Plate to cathode & pentode grid No.3 & internal shield, and heater	1.4	μμf
Pentode Unit:		
Grid No.1 to plate	0.05 max.	μμf
Grid No.1 to cathode, grid No.2, and heater	6	μμf
Plate to cathode, grid No.3 & triode cathode & internal shield, grid No.2, and heater	2.6	μμf
Plate to cathode, grid No.2, and heater	0.15	μμf
Triode grid to pentode plate	0.0078	μμf
Pentode grid No.1 to triode plate	0.0033	μμf
Pentode plate to triode plate	0.06	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Plate-Supply Voltage	200	200	volts
Grid-No.2 Supply Voltage	–	150	volts
Grid Voltage	-6	–	volts
Cathode Resistor	–	180	ohms
Amplification Factor	19	–	
Plate Resistance (Approx.)	5750	300000	ohms
Transconductance	3300	6200	μmhos
Plate Current	13	9.5	ma
Grid-No.2 Current	–	2.8	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-19	-8	volts

[o]: See next page.

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

5B8

MEDIUM-MU TRIODE — SHARP-CUTOFF PENTODE

Mechanical:

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

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

Pin 5 – Heater
Pin 6 – Pentode Grid No.1
Pin 7 – Pentode Cathode
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-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.	2.5 max.	2 max.	watts
PEAK HEATER-CATHODE VOLTAGE: Heater negative with respect to cathode . . .	200 max.	200 max.	volts
Heater positive with respect to cathode . . .	200▲ max.	200▲ max.	volts

°,▲: See next page.

5B8

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 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.

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

Full-Wave Vacuum Rectifier

NOVAR TYPE

For Power Supplies of Equipment Having High DC Power Output Requirements

GENERAL DATA

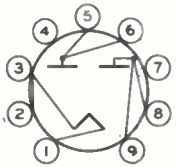
Electrical:

Filament Characteristics and Ratings:

Voltage (AC)	5.0 ± 0.5	volts
Current at filament volts = 5.0. . . .	3.000	amp

Mechanical:

Operating Position	Vertical, base down or up, or Horizontal with pins 2 and 7 in vertical plane
Maximum Overall Length	4.160"
Maximum Seated Length.	3.780"
Length, Base Seat to Bulb Top (Excluding tip) .	3.260" to 3.440"
Diameter	1.438" to 1.562"
Bulb	T12
Socket	Cinch Mfg. Corp. No. 149 19 00 033, Industrial Electronic Hardware Co. No. SO-0968-SL1, or equivalent
Base	Large-Button Novar 9-Pin (JEDEC No.E9-76)
Basing Designation for BOTTOM VIEW	9QJ



Pin 1 – Filament End B
Pin 2 – Filament End A
Pin 3 – Filament End A
Pin 4 – See *NOTE*
Pin 5 – Plate No.2
Pin 6 – Plate No.2
Pin 7 – See *NOTE*
Pin 8 – Plate No.1
Pin 9 – Plate No.1

Note: May be used as tie point for ac line providing the peak value of the ac voltage does not exceed 200 volts.

FULL-WAVE RECTIFIER

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

PEAK INVERSE PLATE VOLTAGE	1700 max.	volts
AC PLATE SUPPLY VOLTAGE PER PLATE (RMS, without load).	See *Rating Chart I*	
PEAK PLATE CURRENT PER PLATE	1 max.	amp
HOT-SWITCHING TRANSIENT PLATE CURRENT PER PLATE[a]	5 max.	amp
DC OUTPUT CURRENT.	See *Rating Chart I*	

◄ Indicates a change.

Typical Operation:

With capacitor-input filter				
AC Plate-to-Plate Supply Voltage (RMS, without load)	600	900	1100	volts
Filter-Input Capacitor[b]	40	40	40	μf
Total Effective Plate Supply Impedance Per Plate	21	67	97	ohms
DC Output Voltage (Approx.) at input to filter at load ma. =				
300	290	–	–	volts
275	–	460	–	volts
162	–	–	630	volts
150	335	–	–	volts
137.5	–	520	–	volts
81	–	–	680	volts
With choke-input filter				
AC Plate-to-Plate Supply Voltage (RMS, without load)	900	1100		volts
Filter-Input Choke	10	10		henrys
DC Output Voltage at input to filter (Approx.) at load ma. =				
348	340	–		volts
275	–	440		volts
174	355	–		volts
137.5	–	455		volts

[a] Even occasional hot-switching with capacitor-input circuits permits the flow of plate current having magnitudes which can adversely affect the life and reliability of rectifier tubes. If capacitor-input circuits are to be used, protect the circuits against the adverse effects of possible hot-switching, and do not exceed a hot-switching transient plate current per plate of 5 amperes during the initial cycles of the hot-switching transient. If hot-switching is 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.

[b] Values of capacitance higher than those indicated may be used, provided the effective plate supply impedance is increased to prevent exceeding the maximum peak-plate-current rating.

RATING CHARTS and OPERATION CHARACTERISTICS

Rating Chart I represents graphically the relationships between maximum ac voltage input and maximum dc output current derived from the fundamental ratings for conditions of capacitor-input and choke-input filters. This graphical presentation gives the equipment designer considerable latitude in choice of operating conditions.

Rating Chart II represents graphically the relationship between maximum rectification efficiency and maximum dc output current per plate for conditions of capacitor-input filter.

A choice of operating values of dc output current per plate and rectification efficiency should be made such that they fall within the area of permissible operation to insure that the maximum peak-plate-current rating will not be exceeded. If the operating values chosen fall outside the

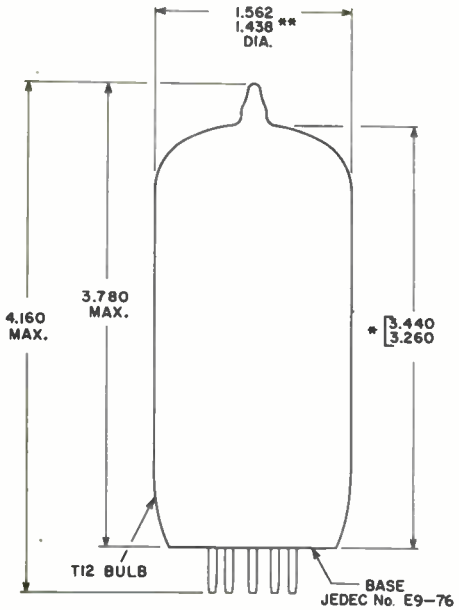
permissible operating area, a different choice of parameters should be made. For a given value of ac voltage input and dc output current, it is possible to reduce the rectification efficiency either by increasing the plate supply resistance per plate or by using a smaller value of input filter capacitor.

Rating Chart III represents graphically the relationships between minimum effective plate supply resistance per plate and maximum ac plate supply voltage per plate under no-load conditions of capacitor-input filter when occasional hot-switching is employed.

If occasional hot-switching is required with capacitor-input circuits, it is important to protect the tube and the circuits against the flow of plate currents having magnitudes in excess of the maximum hot-switching-current rating of 5 amperes. To limit the hot-switching current, adequate series plate supply resistance per plate is necessary. This resistance value may be determined with the formula shown in legend of *Rating Chart III*. To insure that the maximum hot-switching current is not exceeded, the value of series plate supply resistance per plate should be equal to or greater than the minimum value indicated by the curve.

If appreciable series inductance is present in the plate supply, a value of series plate supply resistance smaller than that indicated by the curve may be employed provided it is experimentally determined that the combined effect of inductance and plate supply resistance used are adequate to limit the hot-switching current to the indicated maximum-rated value.

5BC3



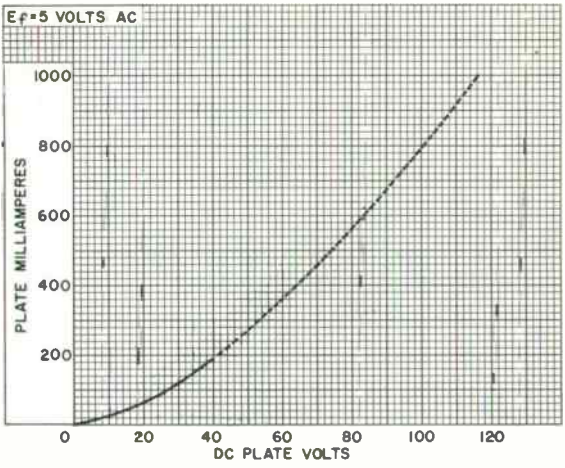
92CS-11130RI

ALL DIMENSIONS IN INCHES

** APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.

* MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY A RING GAUGE OF 0.600" INSIDE DIAMETER.

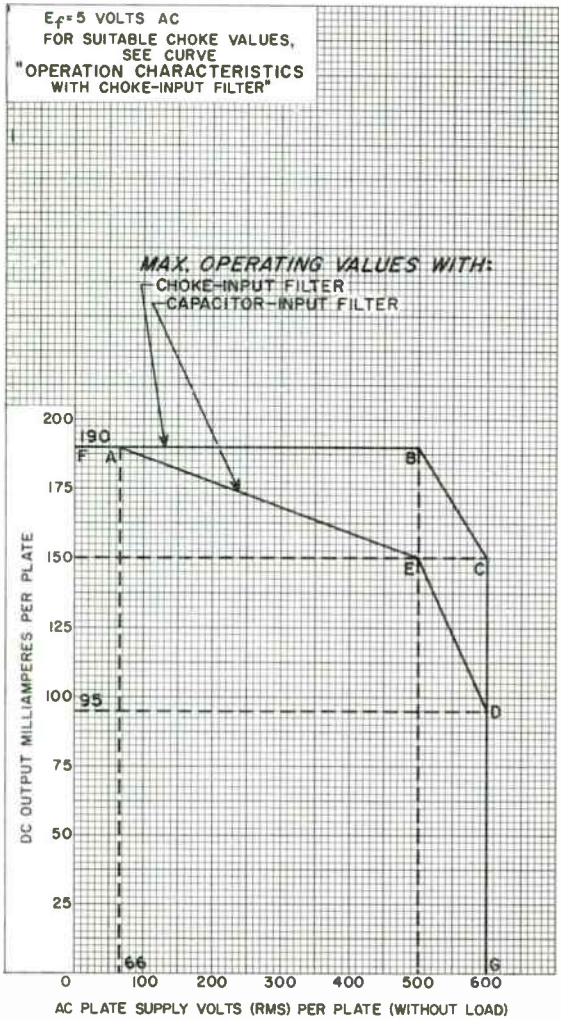
AVERAGE PLATE CHARACTERISTIC
Each Plate



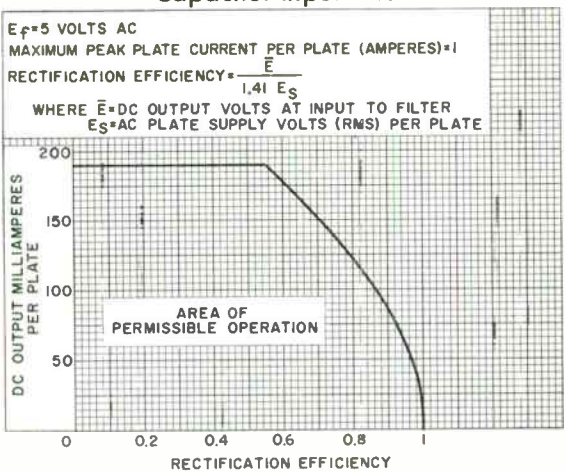
92CS-8440RI

5BC3

RATING CHART I

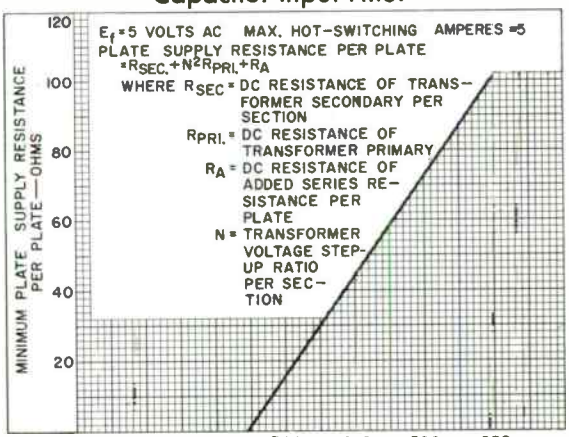


RATING CHART II
Capacitor-Input Filter



92CS-11201

RATING CHART III
Capacitor-Input Filter



92CS-11194

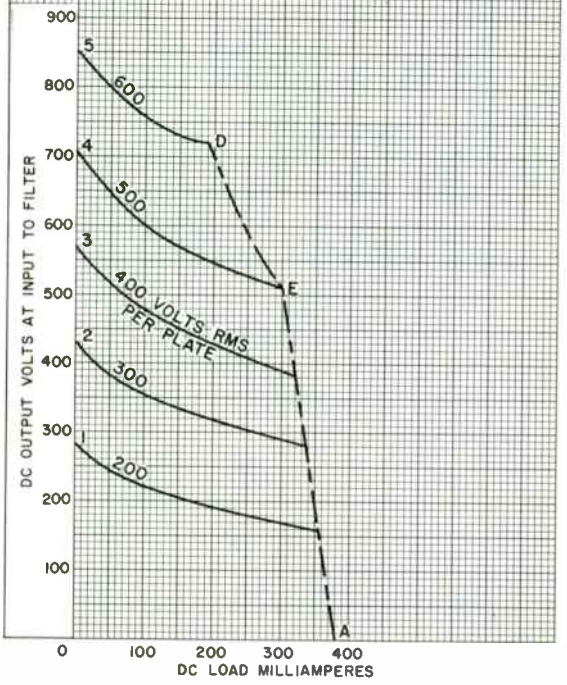
5BC3

OPERATION CHARACTERISTICS
Full-Wave Circuit, Capacitor-Input Filter

E_f = 5 VOLTS AC
SUPPLY FREQUENCY (CPS) = 60
CAPACITOR (C) INPUT TO FILTER = 40 μf
TOTAL EFFECTIVE PLATE SUPPLY IMPEDANCE PER PLATE

CURVE	1	2	3	4	5
OHMS	11	20	52	82	112

CURRENT- AND VOLTAGE-BOUNDARY LINE 'DEA' IS THE SAME SHOWN ON RATING CHART I

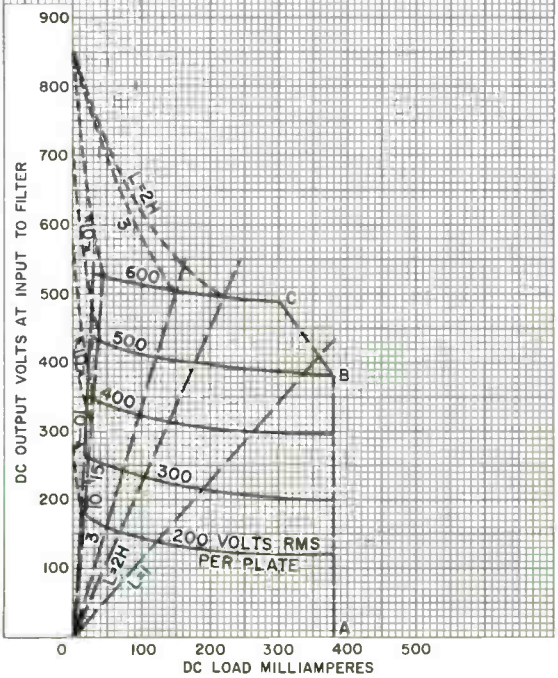


92CM-11197

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

OPERATION CHARACTERISTICS
Full-Wave Circuit, Choke-Input Filter

E_f=5 VOLTS AC SUPPLY FREQUENCY (CPS)=60
SOLID-LINE CURVES = CHOKES OF INFINITE INDUCTANCE
LONG-DASH LINES = BOUNDARY LINES FOR CHOKE SIZES AS SHOWN
SHORT-DASH CURVES = REGULATION CURVES FOR REPRESENTATIVE CHOKE SIZES
CURRENT- AND VOLTAGE-BOUNDARY LINE 'CBA' IS THE SAME AS SHOWN ON RATING CHART I



92CM-11199

Full-Wave Vacuum Rectifier

NOVAR TYPE

For Power Supplies of Equipment Having High DC Power Output Requirements

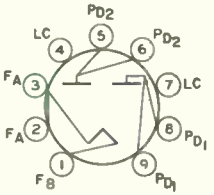
Electrical:

Filament Characteristics and Ratings:		
Voltage (AC)	5.0 ± 0.5	volts
Current at filament volts = 5.0	3.000	amp

Mechanical:

Operating Position	Vertical, base down or up, or Horizontal with pins 2 and 7 in vertical plane
Maximum Overall Length	3.880"
Seated Length	3.250" to 3.500"
Diameter	1.438" to 1.562"
Dimensional Outline (JEDEC No.12-99)	See *General Section*
Bulb	T12
Base	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC No.E9-88)
Basing Designation for BOTTOM VIEW	9QJ

Pin 1 – Filament End B
Pin 2 – Filament End A
Pin 3 – Filament End A
Pin 4 – See Note
Pin 5 – Plate No.2
Pin 6 – Plate No.2
Pin 7 – See Note
Pin 8 – Plate No.1
Pin 9 – Plate No.1



Note: May be used as tie point for ac line providing the peak value of the ac voltage does not exceed 200 volts.

FULL-WAVE RECTIFIER

Maximum Ratings, *Design-Maximum Values:*

Peak Inverse Plate Voltage	1500	volts
AC Plate Supply Voltage Per Plate (RMS, without load)	See accompanying *Rating Chart I*	
Peak Plate Current Per Plate	1	amp
Hot-Switching Transient Plate Current per plate[a]	5	amp
DC Output Current	See accompanying *Rating Chart I*	

Typical Operation:

With capacitor-input filter

AC Plate-to-Plate Supply Voltage (RMS, without load)	600	900	1100	volts
Filter-Input Capacitor[b]	40	40	40	μf
Total Effective Plate Supply Impedance Per Plate	21	67	97	ohms

DC Output Voltage (Approx.) at input to filter at load ma =				
300	290	–	–	volts
275	–	460	–	volts
162	–	–	630	volts
150	335	–	–	volts
137.5	–	520	–	volts
81	–	–	680	volts
With choke-input filter				
AC Plate-to-Plate Supply Voltage (RMS, without load)	900	1100		volts
Filter-Input Choke	10	10		henrys
DC Output Voltage at input to filter (Approx.) at load ma =				
348	340	–		volts
275	–	440		volts
174	355	–		volts
137.5	–	455		volts

[a] Even occasional hot-switching with capacitor-input circuits permits the flow of plate current having magnitudes which can adversely affect the life and reliability of rectifier tubes. If capacitor-input circuits are to be used, protect the circuits against the adverse effects of possible hot-switching, and do not exceed a hot-switching transient plate current per plate of 5 amperes during the initial cycles of the hot-switching transient. If hot-switching is 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.

[b] Values of capacitance higher than those indicated may be used, provided the effective plate supply impedance is increased to prevent exceeding the maximum peak-plate-current rating.

RATING CHARTS and OPERATION CHARACTERISTICS

Rating Chart I represents graphically the relationships between maximum ac voltage input and maximum dc output current derived from the fundamental ratings for conditions of capacitor-input and choke-input filters. This graphical presentation gives the equipment designer considerable latitude in choice of operating conditions.

Rating Chart II represents graphically the relationship between maximum rectification efficiency and maximum dc output current per plate for conditions of capacitor-input filter.

A choice of operating values of dc output current per plate and rectification efficiency should be made such that they fall within the area of permissible operation to insure that the maximum peak-plate-current rating will not be exceeded. If the operating values chosen fall outside the permissible operating area, a different choice of parameters should be made. For a given value of ac voltage input and dc output current, it is possible to reduce the rectification efficiency either by increasing the plate supply resistance per plate or by using a smaller value of input filter capacitor.

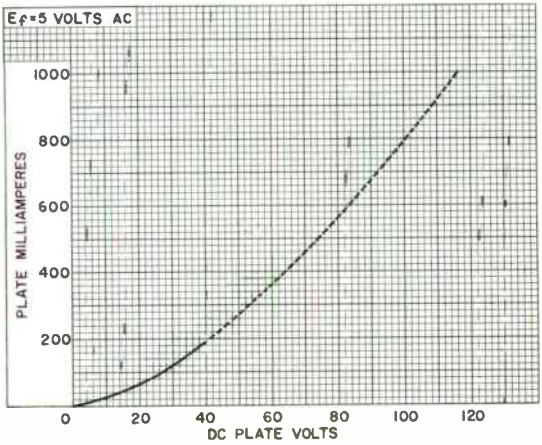
RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

Rating Chart III represents graphically the relationships between minimum effective plate supply resistance per plate and maximum ac plate supply voltage per plate under no-load conditions of capacitor-input filter when occasional hot-switching is employed.

If occasional hot-switching is required with capacitor-input circuits, it is important to protect the tube and the circuits against the flow of plate currents having magnitudes in excess of the maximum hot-switching-current rating of 5 amperes. To limit the hot-switching current, adequate series plate supply resistance per plate is necessary. This resistance value may be determined with the formula shown in legend of *Rating Chart III*. To insure that the maximum hot-switching current is not exceeded, the value of series plate supply resistance per plate should be equal to or greater than the minimum value indicated by the curve.

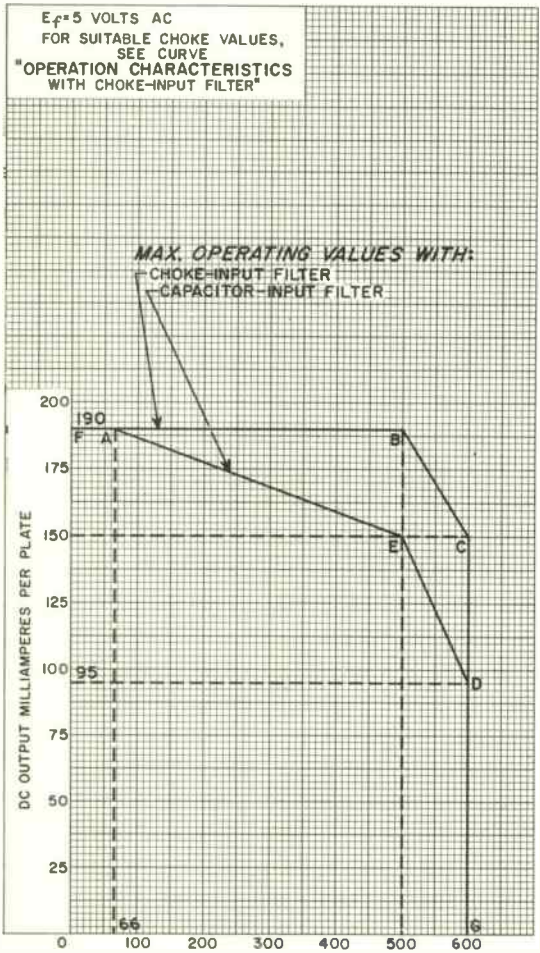
If appreciable series inductance is present in the plate supply, a value of series plate supply resistance smaller than that indicated by the curve may be employed provided it is experimentally determined that the combined effect of inductance and plate supply resistance used are adequate to limit the hot-switching current to the indicated maximum-rated value.

AVERAGE PLATE CHARACTERISTIC
Each Plate



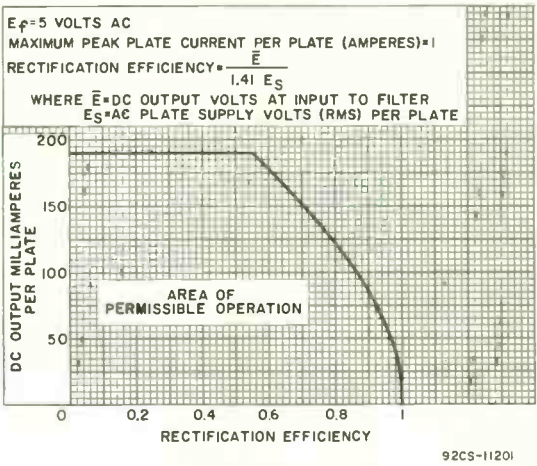
92CS-8440RI

RATING CHART I



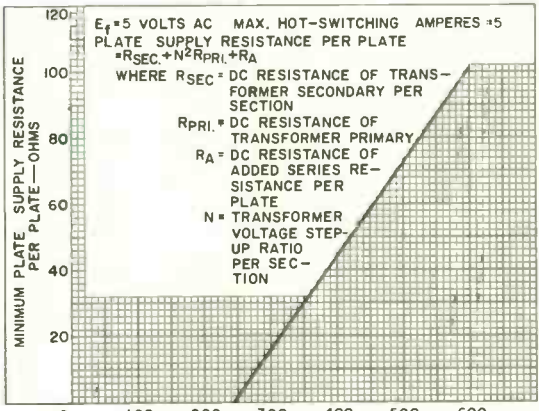
RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

RATING CHART II
Capacitor-Input Filter



92CS-11201

RATING CHART III
Capacitor-Input Filter



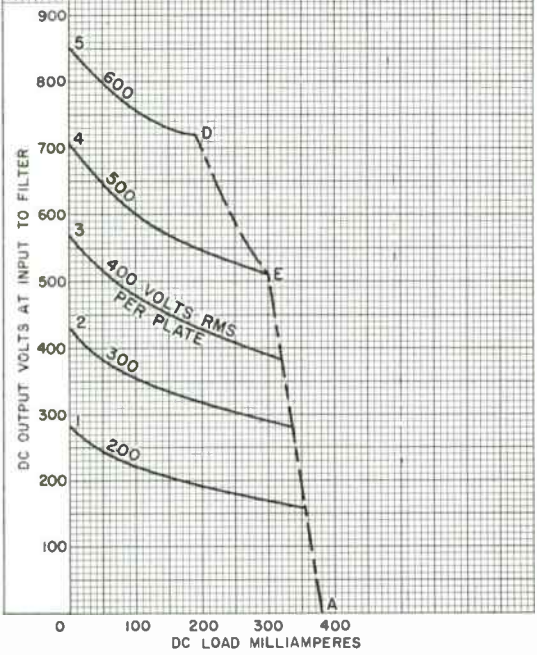
92CS-11194

OPERATION CHARACTERISTICS
Full-Wave Circuit, Capacitor-Input Filter

E_f = 5 VOLTS AC
SUPPLY FREQUENCY (CPS) = 60
CAPACITOR (C) INPUT TO FILTER: 40 μf
TOTAL EFFECTIVE PLATE SUPPLY IMPEDANCE PER PLATE

CURVE	1	2	3	4	5
OHMS	11	20	52	82	112

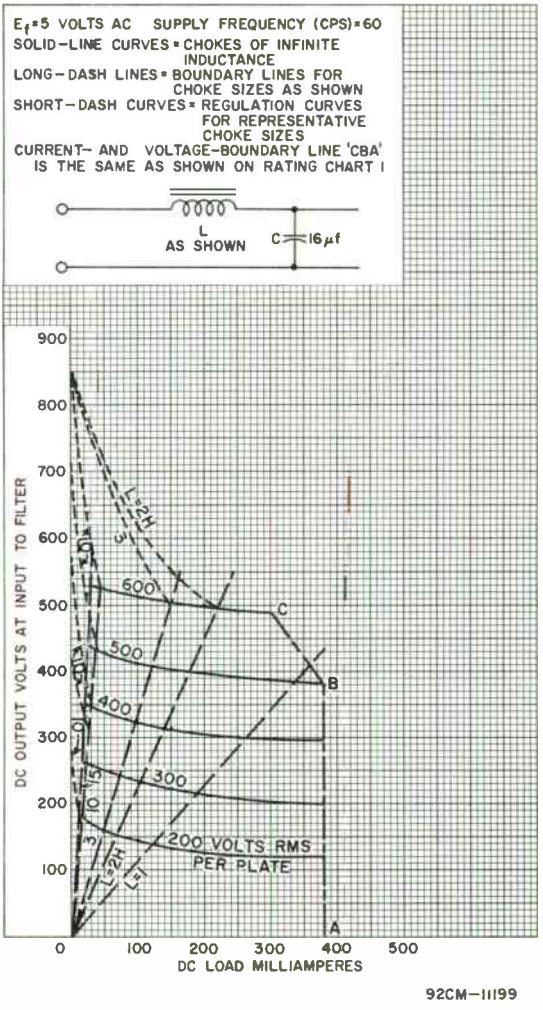
CURRENT- AND VOLTAGE-BOUNDARY LINE 'DEA' IS THE SAME SHOWN ON RATING CHART I



92CM-11197

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

OPERATION CHARACTERISTICS
Full-Wave Circuit, Choke-Input Filter



92CM-11199

RCA

5BK7-A

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

For use in direct-coupled cathode-drive circuits of TV tuners in equipment having series heater-string arrangement

The 5BK7-A is the same as the 6BK7-B except for the following items:

Heater, for Unipotential Cathodes:		
Voltage	4.7	ac or dc volts
Current	0.6	amp

5BQ7-A

MEDIUM-MU TWIN TRIODE

LOW-NOISE 9-PIN MINIATURE TYPE

For use in direct-coupled cathode-drive circuits of TV tuners in equipment having series heater-string arrangement

The 5BQ7-A is the same as the 6BQ7-A except for the following items:

Heater, for Unipotential Cathodes:		
Voltage	5.6	ac or dc volts
Current	0.45	amp
Warm-up time (Average)*	11	sec

5BR8

MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 5BR8 is the same as the 6BR8 except for the following items:

Heater, for Unipotential Cathodes:		
Voltage	4.7	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.*

Twin Diode—
Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5BW8 is the same as the 6BW8 except for the following items:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

5CG8

Medium-Mu Triode—
Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE
With Heater Having Controlled Warm-Up Time

The 5CG8 is the same as the 6CG8A except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp

5CL8A

Medium-Mu Triode—
Sharp-Cutoff Tetrode

9-PIN MINIATURE TYPE
With Heater Having Controlled Warm-Up Time

The 5CL8A is the same as the 6CL8A except for the following items:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp

5CM8

High-Mu Triode—
Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE
With Heater Having Controlled Warm-Up Time

The 5CM8 is the same as the 6CM8 except for the following items:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp

5CQ8

Medium-Mu Triode—
Sharp-Cutoff Tetrode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5CQ8 is the same as the 6CQ8 except for the following items:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp

5CZ5

Beam Power Tube

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5CZ5 is the same as the 6CZ5 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp

5EA8

Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5EA8 is the same as the 6EA8 except for the following items:

Heater Characteristics and Ratings *(Design-Maximum Values)*:		
Current	0.600 ± 0.040	amp
Voltage (AC or DC) at heater amperes = 0.600	4.7	volts

5EU8

Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5EU8 is the same as the 6EU8 except for the following items:

Heater Characteristics and Ratings *(Design-Center Values)*:		
Current	0.600 ± 0.040	amp
Voltage (AC or DC) at heater amperes = 0.600	4.7	volts
Cathode Warm-Up Time[a]	35	sec

5EW6

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5EW6 is the same as the 6EW6 except for the following items:

Heater Characteristics and Ratings *(Design-Maximum Values)*:		
Current	0.450 ± 0.030	amp
Voltage (AC or DC) at heater amperes = 0.450	5.6	volts
Warm-up time (Average)	11	sec

[a] The time required for the transconductance to reach 6500 μmhos when the tube is operated from a cold start with dc plate volts = 100, grid volts = 0, and heater amperes = 0.560.

5FG7

Medium-Mu Triode—
Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5FG7 is the same as the 6FG7 except for the following items:

Heater Characteristics and Ratings *(Design-Maximum Values)*:

Current	0.600 ± 0.040	amp
Voltage (AC or DC) at heater amperes = 0.600	4.7	volts

5FV8

Medium-Mu Triode—
Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 5FV8 is the same as the 6FV8 except for the following items:

Heater Characteristics and Ratings *(Design-Maximum Values)*:

Current	0.600 ± 0.040	amp
Voltage (AC or DC) at heater amperes = 0.600	4.7	volts

5GH8

Medium-Mu Triode—Sharp-Cutoff Pentode

CONTROLLED HEATER WARM-UP TIME

The 5GH8 is the same as the 6GH8A except for the following items:

Heater Characteristics and Ratings

Current	I_h	0.600 ± 0.040	A
Voltage (AC or DC) at 0.600 A. .	E_h	4.7	V

5GM6

Semiremote-Cutoff Pentode

The 5GM6 is the same as the 6GM6 except for the following items:

Heater Characteristics and Ratings

Current	I_h	0.450 ± 0.030	A
Voltage (AC or DC) at 0.450 A. .	E_h	5.6	V
Warm-up time (Average)		11	s

5GX6

Sharp-Cutoff Pentode

With Two Independent Control Grids

CONTROLLED HEATER WARM-UP TIME

The 5GX6 is the same as the 6GX6 except for the following items:

Heater Characteristics and Ratings

Current	I_h	0.600 ± 0.040	A
Voltage (AC or DC) at 0.600 A. .	E_h	4.7	V

5HZ6

Sharp-Cutoff Pentode
With Two Independent Control Grids

CONTROLLED HEATER WARM-UP TIME

The 5HZ6 is the same as the 6HZ6 except for the following items:

Heater Characteristics and Ratings

Current	I_h	0.600 ± 0.040	A
Voltage (AC or DC) at 0.600 A.	E_h	4.75	V

5J6

Medium-Mu Twin Triode

CONTROLLED HEATER WARM-UP TIME

The 5J6 is the same as the 6J6A except for the following items:

Heater Characteristics and Ratings

Current	I_h	0.600 ± 0.040	A
Voltage (AC or DC) at 0.600 A.	E_h	4.7	V

5KE8

Medium-Mu Triode—
Sharp-Cutoff Pentode

The 5KE8 is the same as the 6KE8 except for the following items:

Heater Characteristics and Ratings

Current	I_h	0.450 ± 0.030	A
Voltage (AC or DC) at 0.450 A.	E_h	5.6	V
Warm-up time (Average)		11	s

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

5T8

TRIPLE DIODE—HIGH-MU TRIODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 5T8 is the same as the 6T8 except for the following items:

Heater, for Unipotential Cathodes:

Voltage	4.7	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.

5U4GB

Full-Wave Vacuum Rectifier

GENERAL DATA

Electrical:

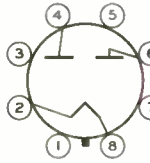
Filament, Coated:

Voltage (AC or DC)	5	volts
Current	3	amp

Mechanical:

Operating Position	Vertical, base down or up, or Horizontal with pins 1 and 4 in vertical plane
Maximum Overall Length	4-5/8"
Maximum Seated Length	4-1/16"
Diameter	1.438" to 1.562"
Bulb	T12
Base	Short Medium-Shell Octal 5-Pin with External Barriers, Style B, Arrangement 1 (JEDEC Group 1, No.B5-121), or Short Medium-Shell Octal 8-Pin with External Barriers, Style B (JEDEC Group 1, No.B8-118)
Basing Designation for BOTTOM VIEW	5T

Pin 1 – No Connection
Pin 2 – Filament
Pin 3[a] – No Connection



Pin 4 – Plate No.2
Pin 5 – Same as Pin 3
Pin 6 – Plate No.1
Pin 7 – Same as Pin 3
Pin 8 – Filament

FULL-WAVE RECTIFIER

Maximum Ratings, *Design-Center Values:*

For power-supply frequencies of 25 to 1000 cps

PEAK INVERSE PLATE VOLTAGE	1550 max.	volts
AC PLATE SUPPLY VOLTAGE PER PLATE (RMS, without load)	See *Rating Chart I*	
STEADY-STATE PEAK PLATE CURRENT PER PLATE (See *Rating Chart II*)	1 max.	amp
TRANSIENT PEAK PLATE CURRENT PER PLATE (See *Rating Chart III*)	4.6 max.	amp
DC OUTPUT CURRENT	See *Rating Chart I*	

Typical Operation:

	With capacitor-input filter		*With choke-input filter*	
AC Plate-to-Plate Supply Voltage (RMS, without load)	600	900	1100	volts
Filter-Input Capacitor[b]	40	40	–	μf
Filter-Input Choke	–	–	10	henrys

←Indicates a change.

5U4GB

Total Effective Plate Supply Impedance Per Plate	21	67	–	ohms
DC Output Voltage at input to filter	290	460	420	volts
DC Output Current	300	275	275	ma

Characteristics:

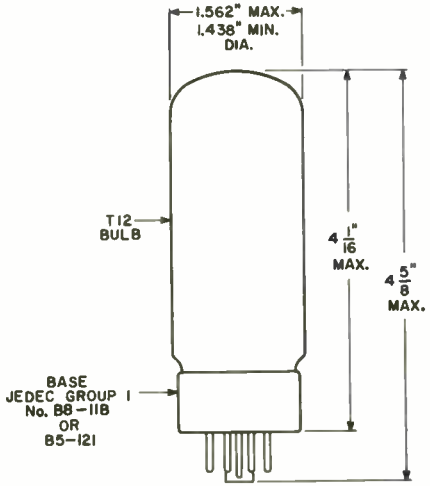
Tube Voltage Drop for plate ma. (Per plate) =

225	44 volts
275	50 volts
300	54 volts

[a] On the 5-pin base, pins 3, 5, and 7 are omitted.

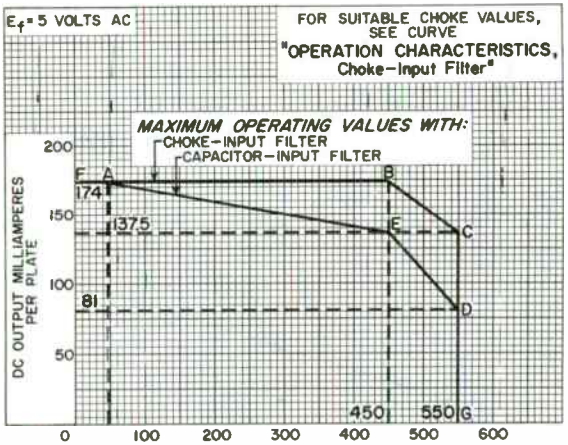
[b] Values of capacitance greater than 40 μf may be used, provided the plate supply impedance is increased to prevent exceeding the maximum peak-plate-current rating.

→ Indicates a change.



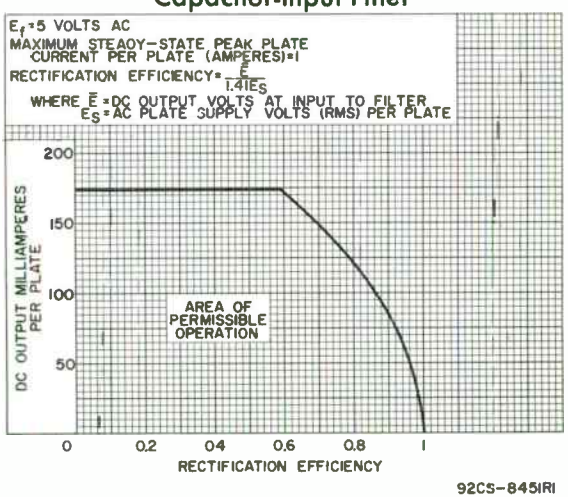
92CS-8444R2

RATING CHART I



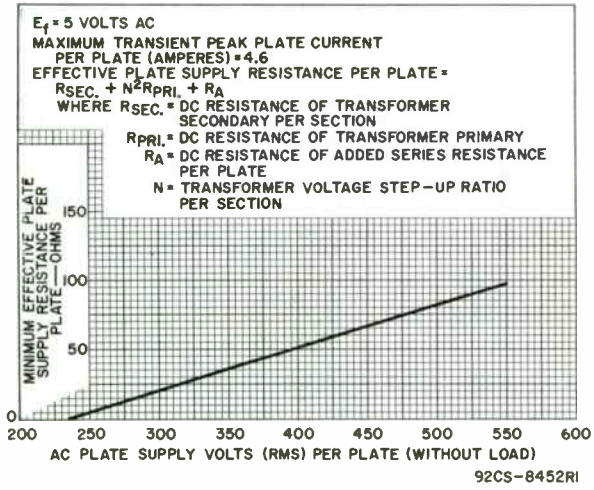
92CS-8450RI

RATING CHART II
Capacitor-Input Filter



92CS-8451RI

RATING CHART III
Capacitor-Input Filter

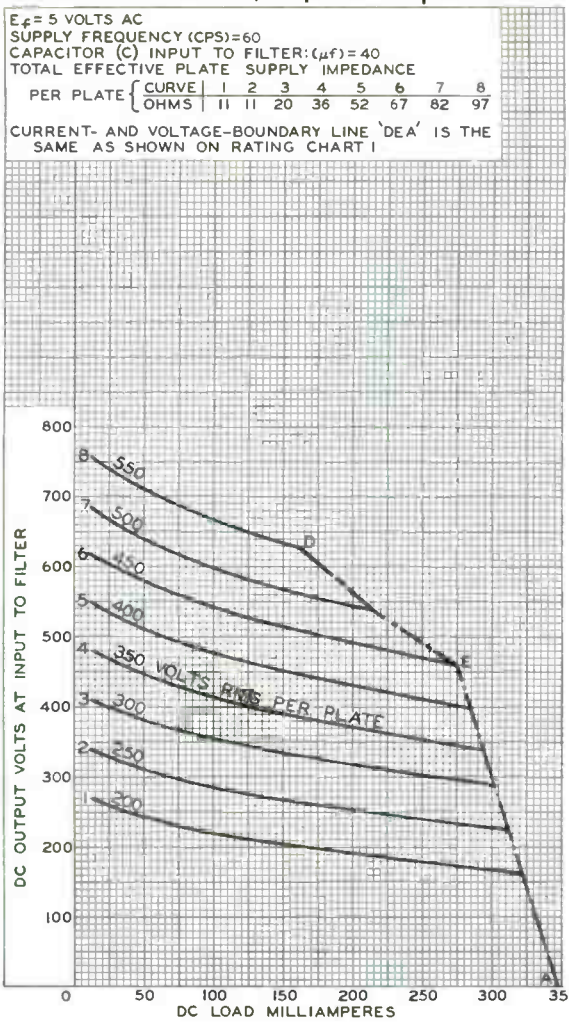


OPERATION CHARACTERISTICS
Full-Wave Circuit, Capacitor-Input Filter

E_f = 5 VOLTS AC
SUPPLY FREQUENCY (CPS) = 60
CAPACITOR (C) INPUT TO FILTER: (μf) = 40
TOTAL EFFECTIVE PLATE SUPPLY IMPEDANCE

PER PLATE	CURVE	1	2	3	4	5	6	7	8
	OHMS	11	11	20	36	52	67	82	97

CURRENT- AND VOLTAGE-BOUNDARY LINE 'DEA' IS THE SAME AS SHOWN ON RATING CHART I

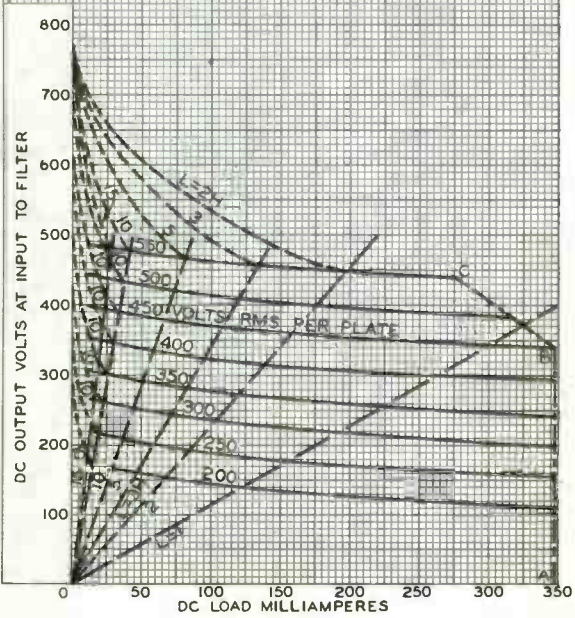


92CM-8446RI

5U4GB

OPERATION CHARACTERISTICS
Full-Wave Circuit, Choke-Input Filter

E_f=5 VOLTS AC
SUPPLY FREQUENCY (CPS)=60
SOLID LINE CURVES=CHOKES OF INFINITE INDUCTANCE
LONG-DASH LINES=BOUNDRY LINES FOR CHOKE SIZES AS SHOWN
SHORT-DASH CURVES=REGULATION CURVES FOR REPRESENTATIVE CHOKE SIZES
CURRENT- AND VOLTAGE-BOUNDARY LINE 'CBA' IS THE SAME AS SHOWN ON RATING CHART I



92CM-8447RI

RCA

5U8

MEDIUM-MU TRIODE–SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 5U8 is the same as the 6U8 except for the following items:

Heater, for Unipotential Cathodes:

Voltage	4.7	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.

Full-Wave Vacuum Rectifier

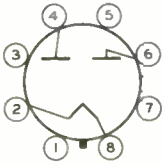
GENERAL DATA

Electrical:

Filament, Coated:		
Voltage (AC or DC)	5 ± 10%	volts
Current at 5 volts	3	amp

Mechanical:

Operating Position	Vertical, base down or up, or Horizontal with pins 2 and 4 in vertical plane
Maximum Overall Length	4-5/8"
Maximum Seated Length	4-1/16"
Diameter	1.438" to 1.562"
Bulb	T12
Base	Short Medium-Shell Octal 8-Pin with External Barriers Style B (JEDEC Group 1, No.B8-118) or Style A (JEDEC Group 1, No.B8-110), or Short Medium-Shell Octal 5-Pin with External Barriers, Style B, Arrangement 1 (JEDEC Group 1, No.B5-121)
Basing Designation for BOTTOM VIEW	5T



Pin 1 – No Connection
Pin 2 – Filament
Pin 3[a] – Same as Pin 1
Pin 4 – Plate No.2
Pin 5 – Same as Pin 1
Pin 6 – Plate No.1
Pin 7 – Same as Pin 1
Pin 8 – Filament

FULL-WAVE RECTIFIER

Maximum Ratings, *Design-Maximum Values:*

For power-supply frequencies of 25 to 1000 cps

PEAK INVERSE PLATE VOLTAGE	1550 max.	volts
AC PLATE SUPPLY VOLTAGE PER PLATE (RMS, without load)	550 max.	volts
STEADY-STATE PEAK PLATE CURRENT PER PLATE	1.4 max.	amp
TRANSIENT PEAK PLATE CURRENT PER PLATE	6.6 max.	amp
DC OUTPUT CURRENT with capacitor-input filter for ac plate supply volts (RMS, per plate, without load) = 470	415 max.	ma

Typical Operation:

	With capacitor-input filter		*With choke-input filter*	
AC Plate-to-Plate Supply Voltage (RMS, without load)	600	850	1000	volts
Filter-Input Capacitor[b]	40	40	–	μf
Filter-Input Choke	–	–	10	henrys

Total Effective Plate Supply Impedance Per Plate	20	50	–	ohms
DC Output Voltage at input to filter . . .	300	440	390	volts
DC Output Current . . .	380	350	350	ma

Characteristics:

Tube-Voltage Drop for plate ma. = 350 (Per plate)	42	volts

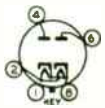
[a] On the 5-pin base, pin 3 as well as pins 5 and 7 is omitted.

[b] When capacitance values higher than 40 μf are used, the effective plate supply impedance should be increased so that the maximum peak-plate-current rating is not exceeded.

5V4-G

FULL-WAVE HIGH-VACUUM RECTIFIER

Heater	Coated Unipotential Cathode	
Voltage	5.0	a-c volts
Current	2.0	amp.
Maximum Overall Length		4-5/8"
Maximum Seated Height		4-1/16" ←
Maximum Diameter		1-13/16"
Bulb		S-14
Base		Medium Shell Octal 5-Pin
Pin 1 - No Connection		Pin 6 - Plate #1
Pin 2 - Heater		Pin 8 - Heater & Cathode
Pin 4 - Plate #2		
Mounting Position		Any



BOTTOM VIEW (G-5L)

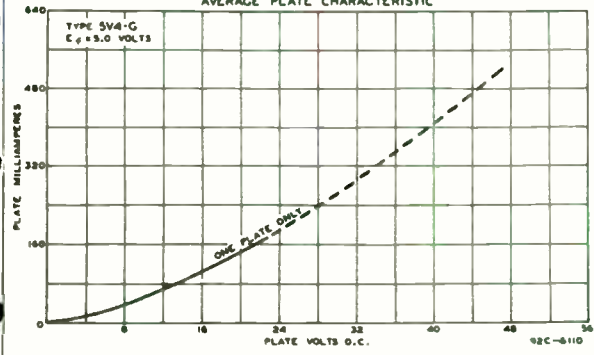
FULL-WAVE RECTIFIER

Peak Inverse Voltage	1400 max. volts
Peak Plate Current per Plate	525 max. ma.
With Condenser-Input Filter:	
A-C Plate Voltage per Plate (RMS)	375 max. volts
Total Effective Plate-Supply Impedance per Plate ▲	100 min. ohms ←
D-C Output Current	175 max. ma.
With Choke-Input Filter:	
A-C Plate Voltage per Plate (RMS)	500 max. volts
Input-Choke Inductance	4 min. henries
D-C Output Current	175 max. ma.

▲ 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.

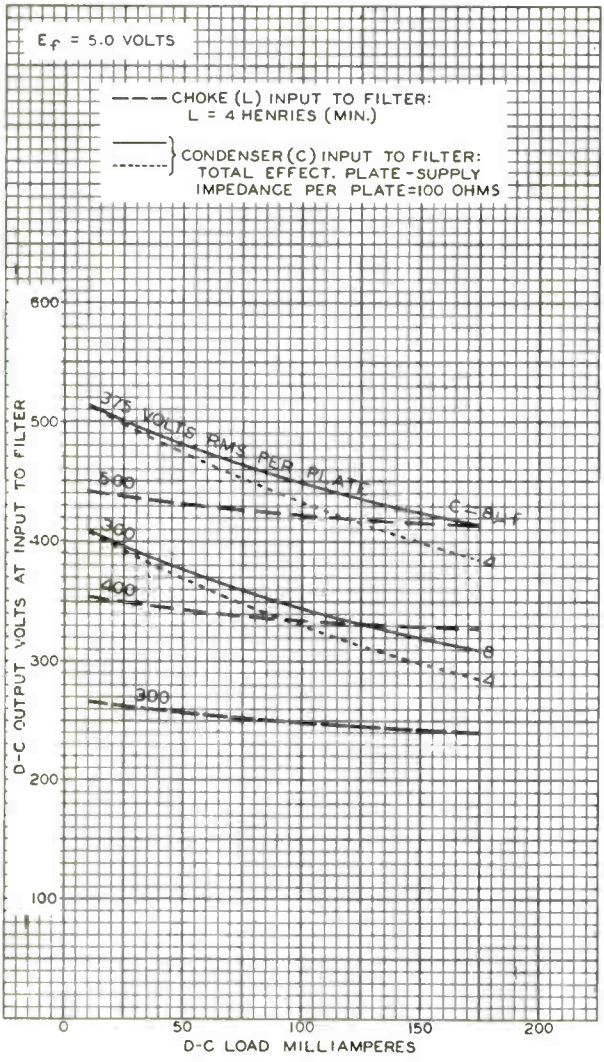
AVERAGE PLATE CHARACTERISTIC



RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY INC

5V4-G

OPERATION CHARACTERISTICS



5V4-GA

FULL-WAVE VACUUM RECTIFIER

For use in full-wave power supplies having high dc requirements

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:
- Voltage . . . . . 5 . . . . . ac or dc volts
- Current . . . . . 2 . . . . . amp

Mechanical:

Operating Position	Any
Maximum Overall Length	3-7/8"
Maximum Seated Length	3-5/16"
Maximum Diameter	1-9/16"
Bulb	T12
Base	Medium-Shell Octal 5-Pin (JETEC No.B5-15), or Short Medium-Shell Octal 5-Pin with External Barriers, Style B, Arrangement 1 (JETEC No.B5-121)
Basing Designation for BOTTOM VIEW	5L

Pin 1 – No Connection
Pin 2 – Heater
Pin 4 – Plate of Unit No.2

Pin 6 – Plate of Unit No.1
Pin 8 – Heater, Cathode

FULL-WAVE RECTIFIER

Maximum Ratings, *Design-Center Values:*

PEAK INVERSE PLATE VOLTAGE	1400 max.	volts
AC PLATE-SUPPLY VOLTAGE PER PLATE (RMS):		
With capacitor-input filter	375 max.	volts
With choke-input filter	500 max.	volts
PEAK PLATE CURRENT PER PLATE	525 max.	ma
DC OUTPUT CURRENT	175 max.	ma

HOT-SWITCHING TRANSIENT PLATE CURRENT PER PLATE:

Even occasional hot-switching with capacitor-input circuits permits the flow of plate current having magnitudes which can adversely affect the life and reliability of tubes. If capacitor-input circuits are to be used, protect the circuits against the possibility of hot-switching and do not exceed a maximum peak current value per plate of 3.5 amperes during the initial cycles of the hot-switching transient. If hot-switching is 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.

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

5V4-GA

FULL-WAVE VACUUM RECTIFIER

Typical Operation:

With capacitor input to filter		
AC Plate-to-Plate Supply Voltage (RMS). .	750	volts
Filter-Input Capacitor*	10	μf
Total Effective Plate-Supply Impedance Per Plate	100	ohms
DC Output Voltage at Input to Filter (Approx.) for dc output current of 175 ma.	410	volts
With choke input to filter		
AC Plate-to-Plate Supply Voltage (RMS). .	1000	volts
Filter-Input Choke.	4	henries
DC Output Voltage at Input to Filter (Approx.) for dc output current of 175 ma.	410	volts

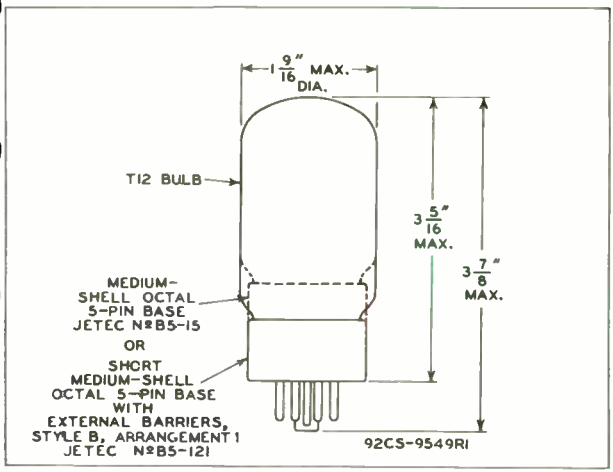
* Higher values of capacitance than indicated may be used, but the effective plate-supply impedance should be increased to prevent exceeding the maximum rating for peak plate current.

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

TENTATIVE DATA

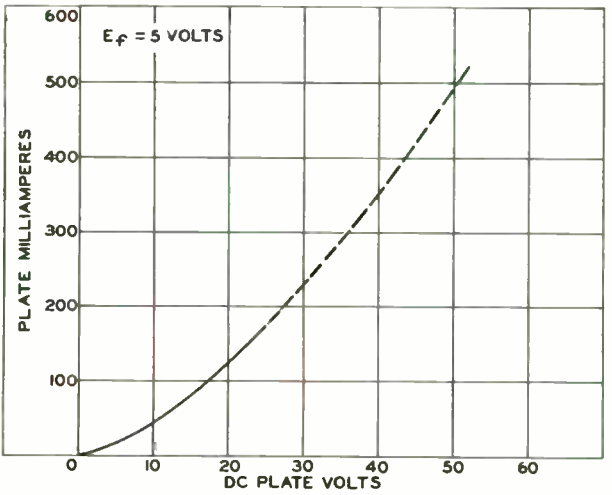
5V4-GA

FULL-WAVE VACUUM RECTIFIER



CE-9549R1

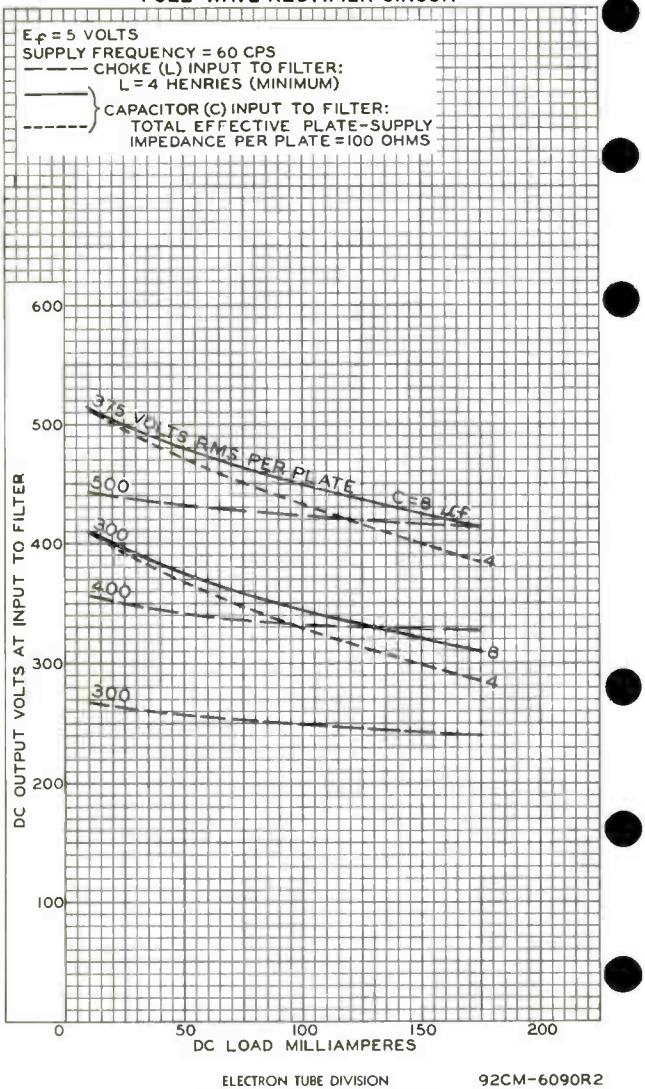
AVERAGE PLATE CHARACTERISTIC
EACH UNIT



5V4-GA

OPERATION CHARACTERISTICS

FULL-WAVE RECTIFIER CIRCUIT



5V6-GT

BEAM POWER TUBE

Intended for use in equipment having series heater-string arrangement

The 5V6-GT is the same as the 6V6-GT except for the following items:

Heater, for Unipotential Cathode:		
Voltage	4.7	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.

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

5X8
TRIODE-PENTODE CONVERTER

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 5X8 is the same as the 6X8 except for the following items:

Heater, for Unipotential Cathode:

Voltage	4.7	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.

Full-Wave Vacuum Rectifier

GENERAL DATA

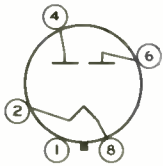
Electrical:

Filament, Coated:
Voltage (AC or DC). . . . . 5 volts
Current . . . . . 2 amp

Mechanical:

Operating Position. . . . . Vertical, base down or up, or Horizontal with pins 2 and 4 in vertical plane
Maximum Overall Length. . . . . 3-3/8"
Maximum Seated Length . . . . . 2-13/16"
Maximum Diameter. . . . . 1-9/32"
Dimensional Outline . . . . . See *General Section*
Bulb. T9
Base. . . . . Intermediate-Shell Octal 5-Pin, Arrangement 1 (JEDEC Group 1, No.B5-10), or Short Intermediate-Shell Octal 5-Pin with External Barriers, Arrangement 1 (JEDEC Group 1, No.B5-62)
Basing Designation for BOTTOM VIEW. 5T

Pin 1 - No Connection
Pin 2 - Filament



Pin 4 - Plate No.2
Pin 6 - Plate No.1
Pin 8 - Filament

FULL-WAVE RECTIFIER

Maximum Ratings, *Design-Center Values:*

For power-supply frequencies of 25 to 1000 cps

PEAK INVERSE PLATE VOLTAGE. . . . . 1400 max. volts
AC PLATE SUPPLY VOLTAGE PER PLATE (RMS, without load) . . . . . .See *Rating Chart I*
STEADY-STATE PEAK PLATE CURRENT PER PLATE (See *Rating Chart II*) . . . . . 440 max. ma
TRANSIENT PEAK PLATE CURRENT PER PLATE (See *Rating Chart III*). . . . . 2.5 max. amp
DC OUTPUT CURRENT . . . . . .See *Rating Chart I*

Typical Operation:

	With capacitor-input filter	*With choke-input filter*	
AC Plate-to-Plate Supply Voltage (RMS, without load)	700	1000	volts
Filter-Input Capacitor[a] .	20	-	μf

← Indicates a change.

5Y3GT

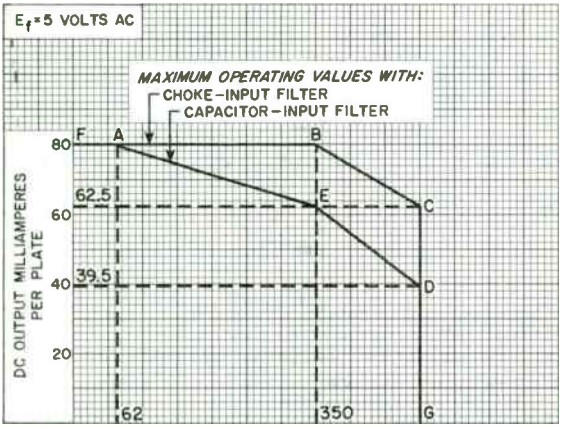
Filter-Input Choke. . . .	–	10	henrys
Total Effective Plate Supply Impedance Per Plate	50	–	ohms
DC Output Voltage at input to filter	360	380	volts
DC Output Current	125	125	ma

→Characteristics, Instantaneous Test Condition:

Tube-Voltage Drop for plate ma. = 125 (Per plate)	50 volts

[a] Values of capacitance greater than 20 μf may be used, provided the plate supply impedance is increased to prevent exceeding the maximum peak-plate-current rating.

RATING CHART I



92CS-7396RI

→Indicates a change.

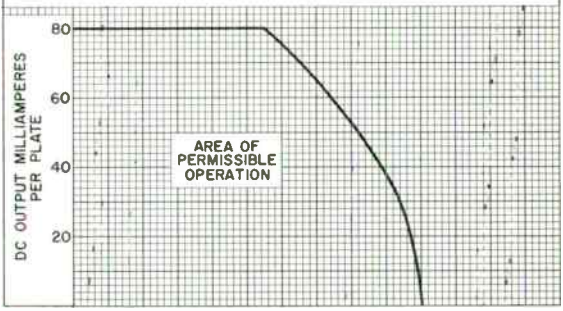
RADIO CORPORATION OF AMERICA
Electron Tube Division Harrison, N. J.

RATING CHART II
Capacitor-Input Filter

E_f=5 VOLTS AC MAXIMUM STEADY-STATE PEAK PLATE CURRENT PER PLATE (MILLIAMPERES)=440

RECTIFICATION EFFICIENCY = $\frac{\bar{E}}{1.41\,E_S}$

WHERE $\bar{E}$ = DC OUTPUT VOLTS AT INPUT TO FILTER
E_S = AC PLATE SUPPLY VOLTS (RMS) PER PLATE



92CS-11212

RATING CHART III
Capacitor-Input Filter

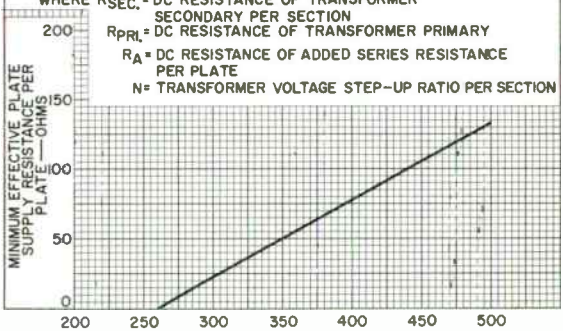
E_f=5 VOLTS AC

MAXIMUM TRANSIENT PEAK PLATE CURRENT PER PLATE (AMPERES)=2.5

EFFECTIVE PLATE SUPPLY RESISTANCE PER PLATE=

$R_{SEC.} + N^2 R_{PRI.} + R_A$

WHERE $R_{SEC.}$ = DC RESISTANCE OF TRANSFORMER SECONDARY PER SECTION
$R_{PRI.}$ = DC RESISTANCE OF TRANSFORMER PRIMARY
R_A = DC RESISTANCE OF ADDED SERIES RESISTANCE PER PLATE
N= TRANSFORMER VOLTAGE STEP-UP RATIO PER SECTION



92CS-11213

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 Catnode	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

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

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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

6AF3
HALF-WAVE VACUUM RECTIFIER

9-PIN MINIATURE TYPE

For television damper service

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current	1.2	amp
Direct Interelectrode Capacitances (Approx.):○		
Plate to cathode and heater	6	μμf
Cathode to plate and heater	9	μμf
Heater to cathode	2.8	μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	3-9/32"
Maximum Seated Length	2-7/8" ± 1/8"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2
Cap	Skirted Miniature (JEDEC No.C1-2)
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9CB

Pin 1 – Internal Connection—Do Not Use♦
Pin 2 – Same as Pin 1
Pin 3 – Same as Pin 1
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Same as Pin 1
Pin 7 – Same as Pin 1
Pin 8 – Same as Pin 1
Pin 9 – Plate
Cap – Cathode

DAMPER SERVICE

Maximum Ratings, *Design-Maximum Values:*

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

PEAK INVERSE PLATE VOLTAGE	4500■	max.	volts
PEAK PLATE CURRENT	750	max.	ma
DC PLATE CURRENT	185	max.	ma
PLATE DISSIPATION	6	max.	watts
PEAK HEATER CATHODE VOLTAGE:			
Heater negative with respect to cathode	4500*	max.	volts
Heater positive with respect to cathode	300▲	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	210	max.	°C

Characteristics:

Tube-Voltage Drop for plate ma. = 340	30	volts

○ Without external shield.

♦ Socket terminals 1,2,3,6,7, and 8 should not be used as tie points.

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

6AF3

HALF-WAVE VACUUM RECTIFIER

■ 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 1000 volts.

▲ The dc component must not exceed 100 volts.

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

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"

Medium-Mu Triode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

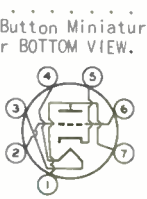
Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.225	amp
Direct Interelectrode Capacitance (Approx.):[a]		
Grid to plate	1.9	μμf
Grid to cathode and heater	2.2	μμf
Plate to cathode and heater	1.4	μμf
Heater to cathode	2.2[b]	μμf

Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	80	volts
Cathode Resistor	150	ohms
Amplification Factor	13.5	
Plate Resistance (Approx.)	2100	ohms
Transconductance	6500	μmhos
Plate Current	17.5	ma

Mechanical:

Operating 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"
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	7DK



Pin 1 – Plate
Pin 2 – Grid
Pin 3 – Heater
Pin 4 – Heater
Pin 5 – Cathode
Pin 6 – Grid
Pin 7 – Plate

UHF OSCILLATOR

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	150	max.	volts
GRID VOLTAGE:			
Negative-bias value	50	max.	volts
GRID CURRENT	2	max.	ma
CATHODE CURRENT	24	max.	ma
PLATE DISSIPATION	2.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	50	max.	volts
Heater positive with respect to cathode	50[c]	max.	volts

← Indicates a change.

Typical Operation:

At frequency of 1000 Mc

Plate Supply Voltage	100	volts
Plate Resistor	220	ohms
Grid Resistor	10000	ohms
Plate Current	17	ma
Grid Current (Approx.)	750	μa

Maximum Circuit Values:

Grid-Circuit Resistance:

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

[a] With external shield JEDEC No.316 connected to cathode except as noted.

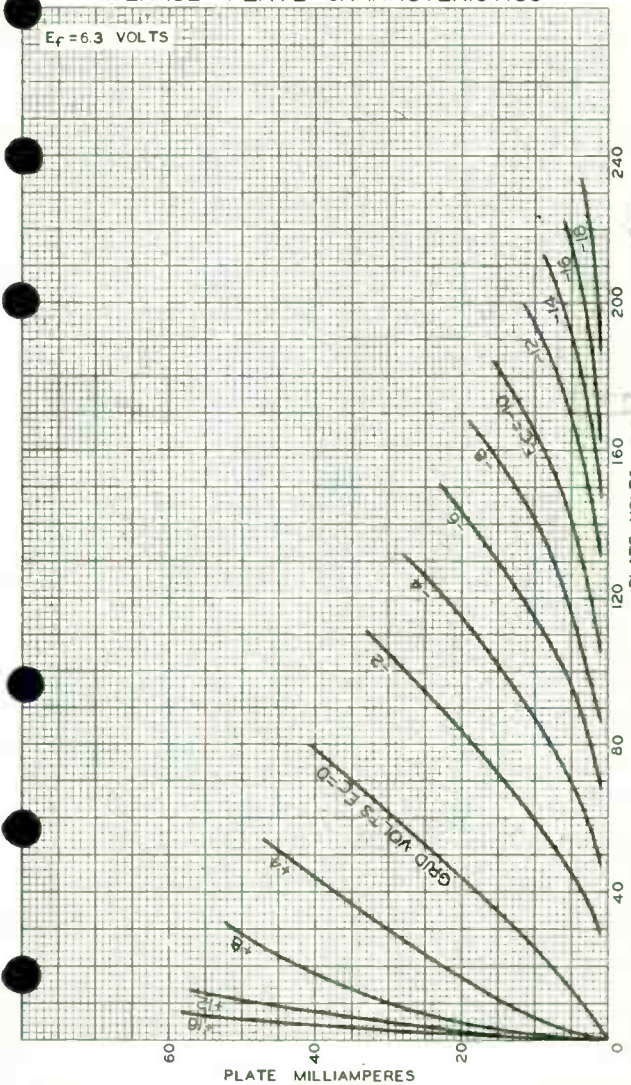
[b] With external shield JEDEC No.316 connected to plate.

[c] The dc component must not exceed 25 volts.

RCA

6AF4-A

AVERAGE PLATE CHARACTERISTICS



FEB. 20, 1952

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

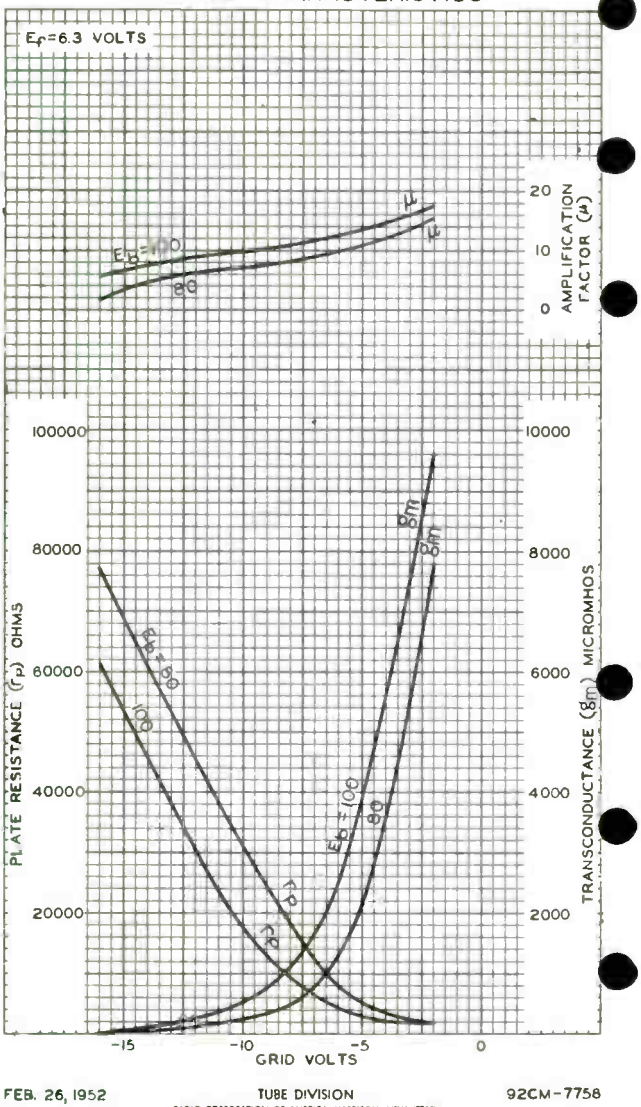
92CM-7756

6AF4-A

RCA

6AF4-A

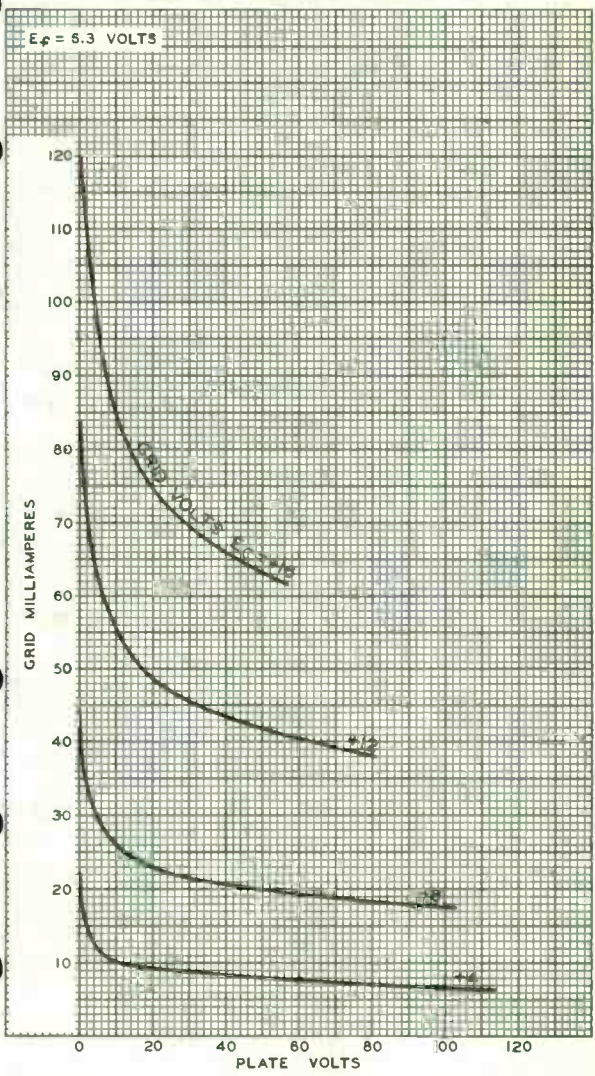
AVERAGE CHARACTERISTICS



RCA

6AF4-A

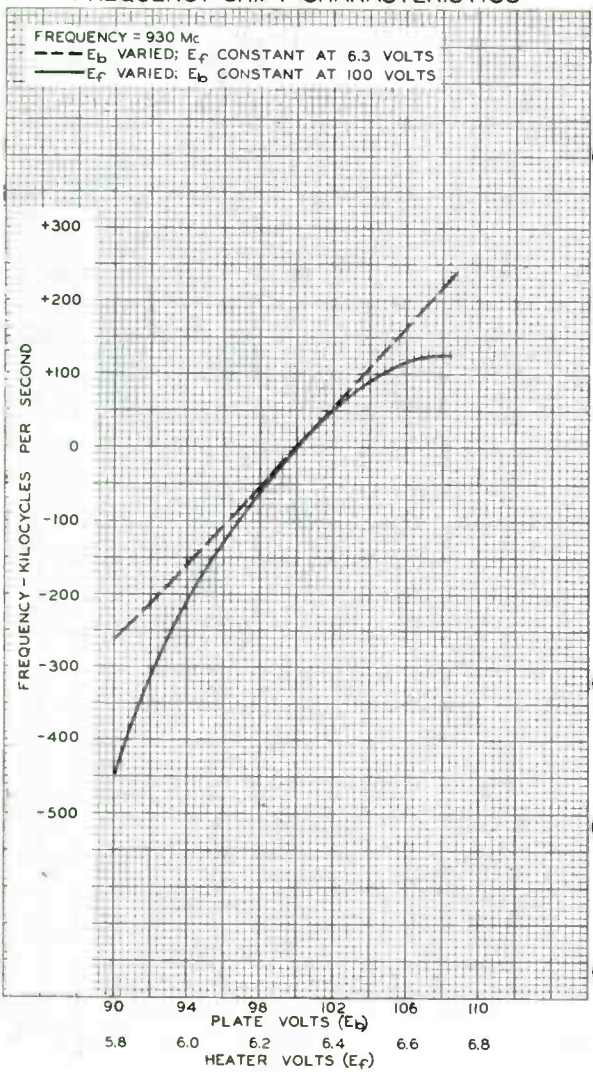
AVERAGE CHARACTERISTICS



RCA

6AF4-A

FREQUENCY SHIFT CHARACTERISTICS



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. {125 min.	volts ← 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.

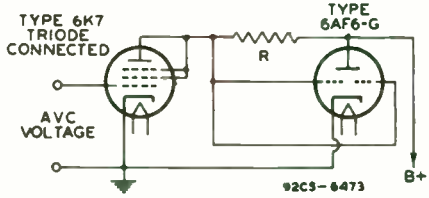
□ Designated R in circuit diagram below.

* 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

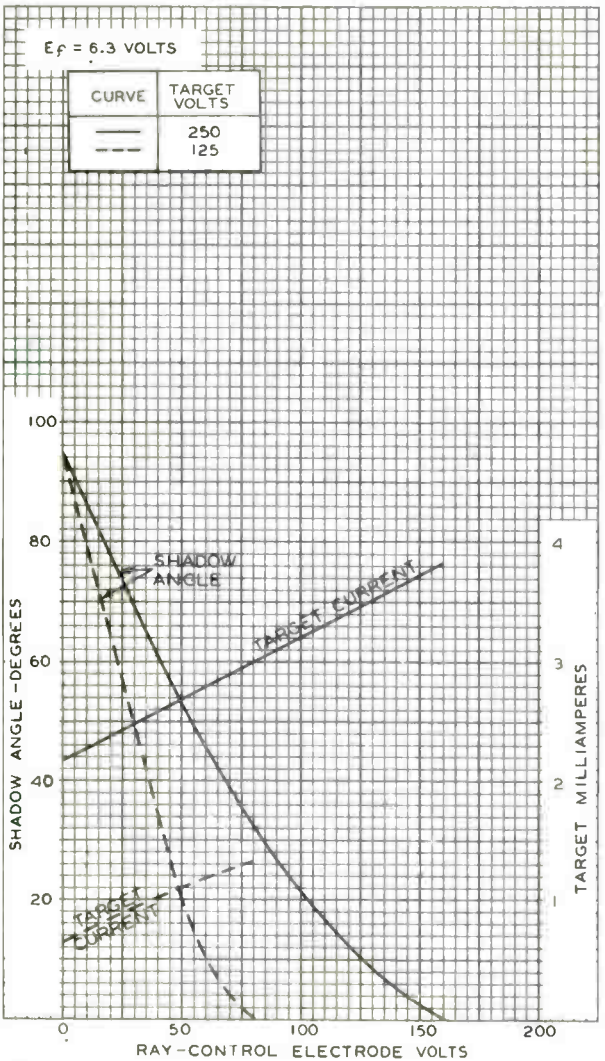


 ← Indicates a change.

6AF6-G

6AF6-G

AVERAGE CHARACTERISTICS



Dual Triode—Sharp-Cutoff Pentode

Dual Triode Has High-Mu Unit & Medium-Mu Unit

DUODECAR TYPE

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at 6.3 volts	1.050	amp
Maximum Heater Cathode Voltage:		
Heater negative with respect to cathode:		
Peak	200	volts
Heater positive with respect to cathode:		
Peak	200	volts
DC component	100	volts

Direct Interelectrode Capacitances: (Without external shield)

Triode Unit No.1		
Grid to plate	1.9	pf
Input: G_{T1} to (K_{T1}, K_{T2} + IS, Kp + G3p + IS, H)	3.6	pf
Output: P_{T1} to (K_{T1}, K_{T2} + IS, Kp + G3p + IS, H)	2.2	pf
Triode Unit No.2		
Grid to plate	3.8	pf
Input: G_{T2} to (K_{T2} + IS, Kp + G3p + IS, H)	2.4	pf
Output: P_{T2} to (K_{T2} + IS, Kp + G3p + IS, H)	3.8	pf
Pentode Unit		
Grid No.1 to plate	0.12	pf
Input: $G1_P$ to (K_{T2} + IS, Kp + G3p + IS, C2p, H)	10.0	pf
Output: P_P to (K_{T2} + IS, Kp + G3p + IS, C2p, H)	4.5	pf
Pentode plate to plate of triode No.2	0.045 max.	pf
Plate of triode No.1 to plate of triode No.2	0.06 max.	pf

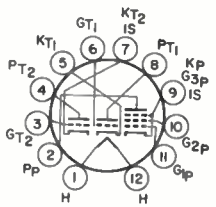
Characteristics, Class A_1 Amplifier:

	Triode Units No.1	No.2	
Plate Supply Voltage	200	200	volts
Grid Voltage	-2	–	volts
Cathode Resistor	–	220	ohms
Amplification Factor	68	41	
Plate Resistance (Approx.)	12400	9400	ohms
Transconductance	5500	4400	μmhos
Plate Current	7	9.2	ma
Grid Voltage for I_b = 10 μa	-5.5	–	volts
Grid Voltage for I_b = 100 μa	–	-6.5	volts
Pentode Unit			
Plate Supply Voltage	50	200	volts
Grid-No.2 Supply Voltage	150	150	volts
Grid-No.1 Voltage	0	–	volts
Cathode Resistor	–	100	ohms
Plate Resistance (Approx.)	–	68000	ohms
Transconductance	–	11000	μmhos
Plate Current	55[a]	24	ma
Grid-No.2 Current	18[a]	4.8	ma
Grid No.1 Voltage for I_b = 100 μa	–	-10	volts

Mechanical:

Operating Position	Any
Types of Cathodes	Coated Unipotential
Maximum Overall Length	2.375"
Seated Length	1.750" to 2.000"
Diameter	1.062" to 1.188"
Dimensional Outline (JEDEC 9-58)	See *General Section*
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC No.E12-70)
Basing Designation for BOTTOM VIEW	12DP

Pin 1 – Heater
Pin 2 – Pentode Plate
Pin 3 – Grid of Triode Unit No.2
Pin 4 – Plate of Triode Unit No.2
Pin 5 – Cathode of Triode Unit No.1
Pin 6 – Grid of Triode Unit No.1
Pin 7 – Cathode of Triode Unit No.2, Internal Shield
Pin 8 – Plate of Triode Unit No.1
Pin 9 – Pentode Cathode, Pentode Grid No.3, Internal Shield
Pin 10 – Pentode Grid No.2
Pin 11 – Pentode Grid No.1
Pin 12 – Heater



AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

	Triode Units No.1	*No.2*	
Plate Voltage	330	330	volts
Grid (Control-Grid) Voltage:			
Positive-bias value	0	0	volts
Plate Dissipation	1.1	2	watts

Pentode Unit		
Plate Voltage	330	volts
Grid-No.2 (Screen-Grid) Supply Voltage	330	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	volts
Grid-No.2 Input:		
For grid-No.2 voltages up to 165 volts	1.25	watts
For grid-No.2 voltages between 165 and 330 volts	See *Grid-No.2 Input Rating Chart*	
Plate Dissipation	5	watts

Maximum Circuit Values: *(Values are for Each Unit)*

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

[a] Value measured by recurrent waveform such that maximum ratings of tube are not exceeded.

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

RCA

6AG5

SHARP-CUTOFF PENTODE

MINIATURE TYPE

Useful at Frequencies up to 400 Mc

GENERAL DATA

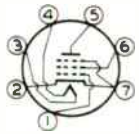
Electrical:

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:*

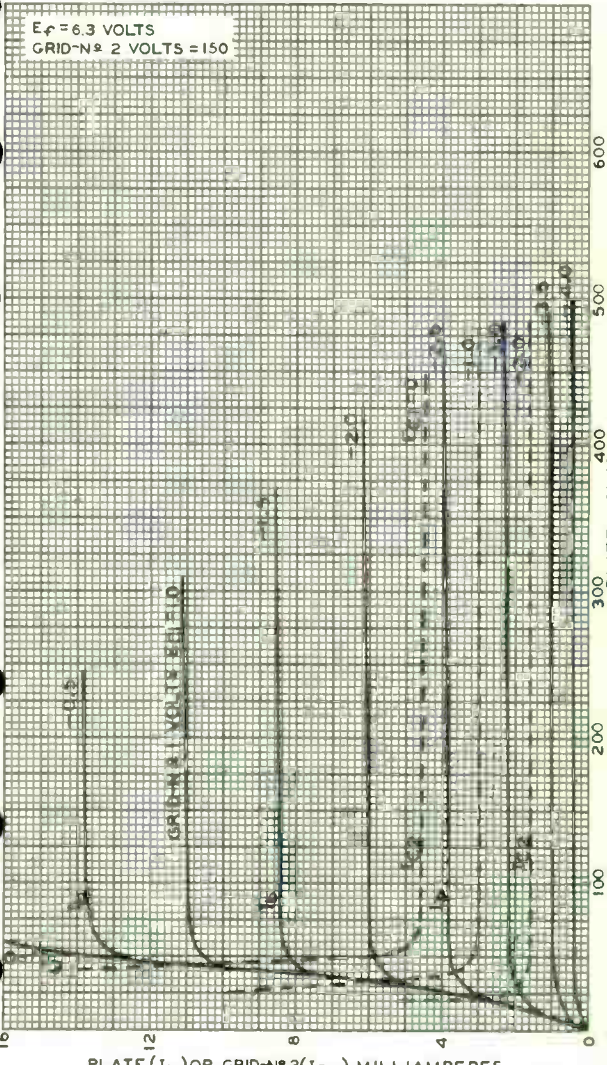
PLATE VOLTAGE	300 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
PLATE AND GRID-No.2 DISSIPATION (TOTAL)	2.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

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



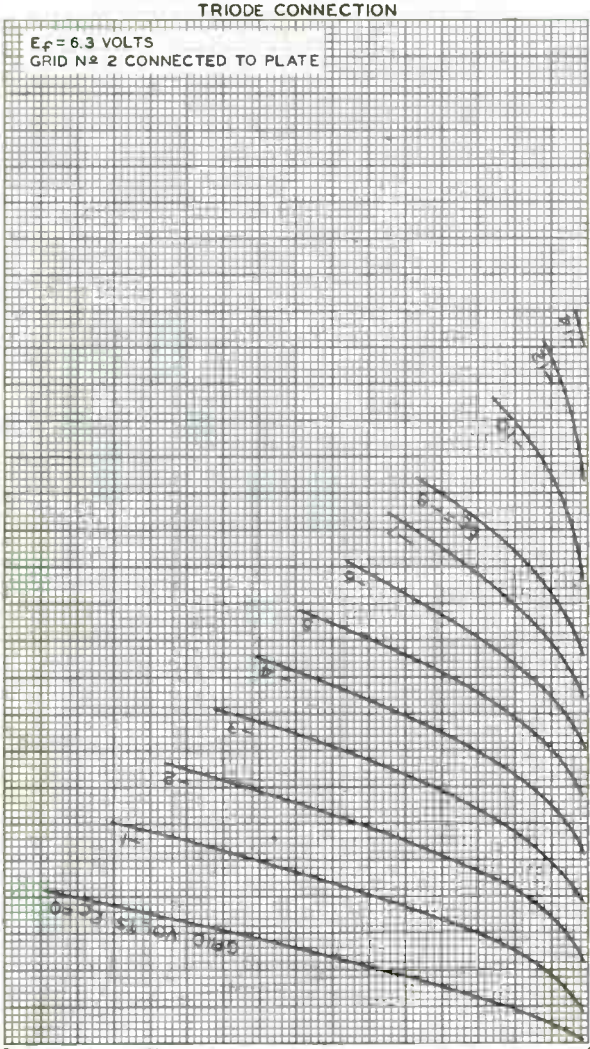
DEC. 27, 1954

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6399R2

6AG5

6AG5
AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



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

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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	ohm
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.

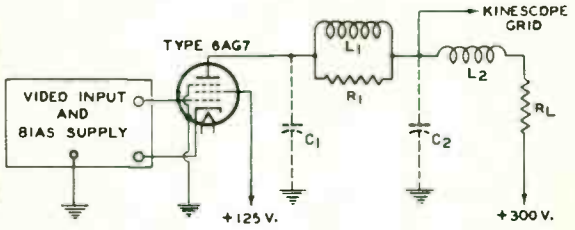
→ indicates a change

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 μμf = Tube Output Capacitance + Socket Capacitance + Wiring Capacitance + Coil Capacitance

C_2 = 19 μμf = Kinescope Capacitance + Socket Capacitance + Wiring Capacitance + Coil Capacitance

L_1 = 250 μh Filter Inductor

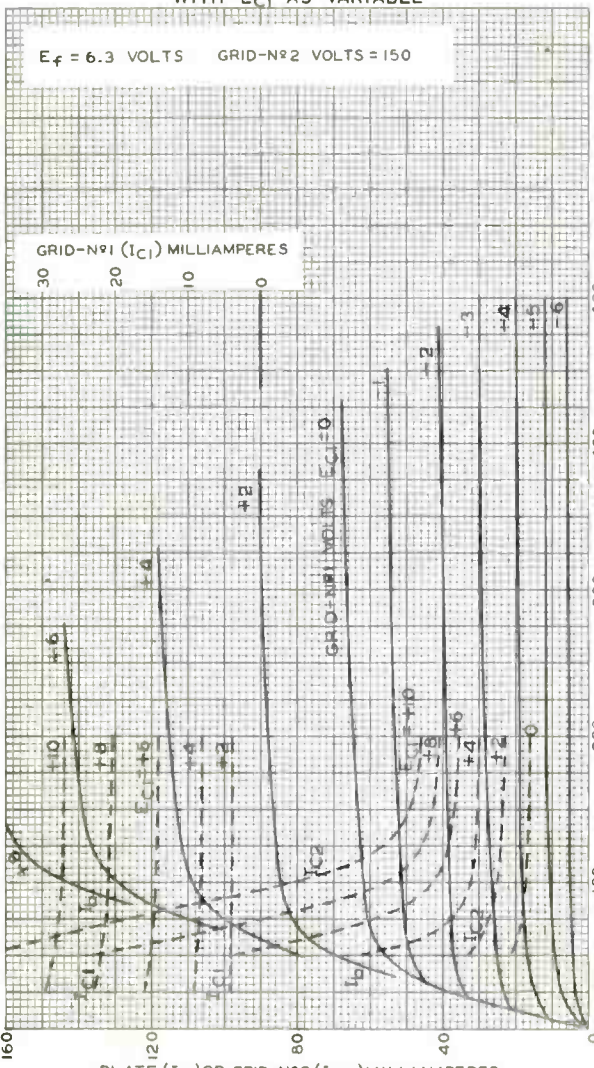
L_2 = 125 μh Filter Inductor

R_1 = 20000-Ohm, Non-Reactive Resistor

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

6AG7

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



RCA

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*[0]	
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

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

←Indicates a change.

6AK5

SHARP-CUTOFF PENTODE

AMPLIFIER - Class A_1

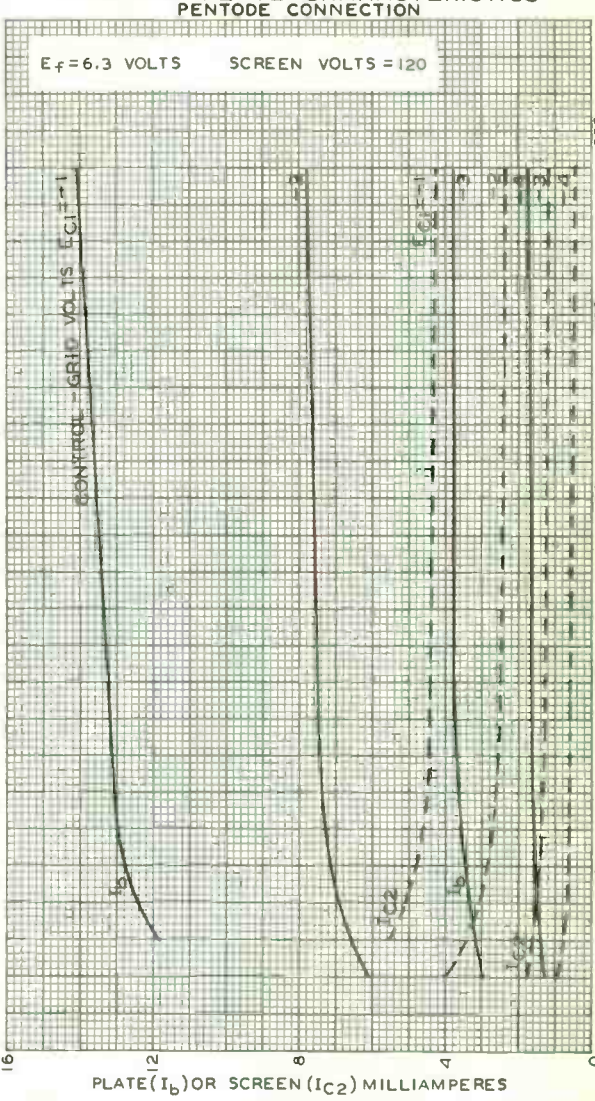
→ **Maximum Ratings,** *Design-Center Values:*

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 Sect*		
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 Cha at front of Receiving Tube Sectio*		
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

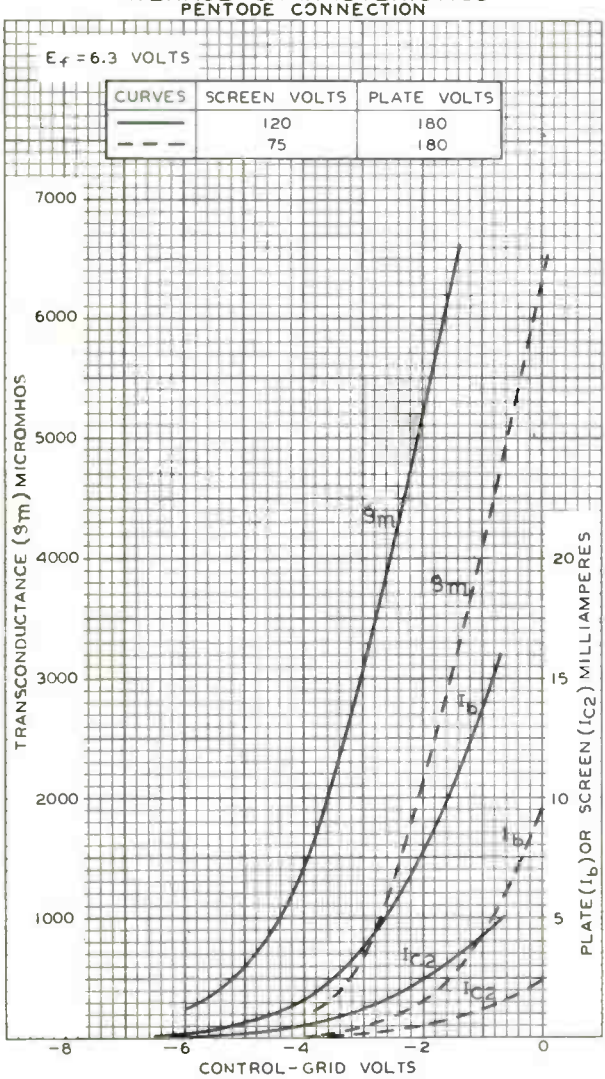
6AK5
AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AK5

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



Half-Wave Vacuum Rectifier

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Center Values):*		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.550	amp
Peak heater-cathode voltage	6600 max.	volts
Direct Interelectrode Capacitances (Approx.):[a]		
Plate to cathode and heater	8.6	μμf
Heater to cathode	2	μμf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3-1/2"
Maximum Seated Length	3-1/4"
Diameter	0.750" to 0.875"
Bulb	T6-1/2
Cap	Skirted Miniature (JEDEC No.C1-2)
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9CB

Pin 1 – Do Not Use[b]
Pin 2 – Same as Pin 1
Pin 3 – Same as Pin 1
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Same as Pin 1
Pin 7 – Same as Pin 1
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[c]

PEAK INVERSE PLATE VOLTAGE (Absolute-maximum value)[d]	7500[e]	max.	volts
PEAK PLATE CURRENT	550	max.	ma
DC PLATE CURRENT	220	max.	ma
PLATE DISSIPATION	5	max.	watts

[a] Without external shield.

[b] Socket terminals 1,2,3,6,7, and 8 should not be used as tie points.

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

[d] 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 m crosseconds.

[e] Under no circumstances should this absolute-maximum value be exceeded.

6AL5

AVERAGE CHARACTERISTICS
HALF-WAVE RECTIFICATION - SINGLE DIODE

JUNE 7, 1944 TUBE DEPARTMENT 92CM-6561
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AL11

Beam Power Tube—
Sharp-Cutoff Pentode

For Combined FM Detector and Audio-Frequency Output Amplifier Applications in TV Receivers

DUODECAR TYPE

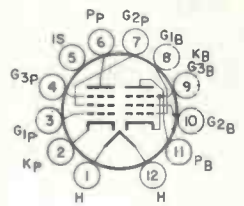
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.5	volts
Current at heater volts = 6.3	0.9	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances (Approx.):[b]		
Beam Power Unit:		
Grid No.1 to plate	0.2	pf
Input: $G1_B$ to (K_B+$G3_B$,$G2_B$,IS,H)	1	pf
Output: P_B to (K_B+$G3_B$,$G2_B$,IS,H)	12	pf
Pentode Unit:		
$G1_P$ to P_P	0.034	pf
$G3_P$ to P_P	3.3	pf
$G1_P$ to (K_P,$G2_P$,$G3_P$,IS,H)	6.5	pf
$G3_P$ to (K_P,$G1_P$,$G2_P$,P_P,IS,H)	7.5	pf
$G1_P$ to $G3_P$	0.24	pf
P_B to P_P	0.12	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2.375"
Seated Length	1.750" to 2.000"
Diameter	1.062" to 1.188"
Dimensional Outline	See *General Section*
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC No.E12-70)
Basing Designation for BOTTOM VIEW	12BU

Pin 1 – Heater
Pin 2 – Pentode Cathode
Pin 3 – Pentode Grid No.1
Pin 4 – Pentode Grid No.3
Pin 5 – Internal Shield
Pin 6 – Pentode Plate
Pin 7 – Pentode Grid No.2
Pin 8 – Beam Power Grid No.1
Pin 9 – Beam Power Cathode, Beam Power Grid No.3
Pin 10 – Beam Power Grid No.2
Pin 11 – Beam Power Plate
Pin 12 – Heater



[a] The dc component must not exceed 100 volts.
[b] Without external shield.

6AL11

Characteristics, Class A_1 Amplifier (Pentode Unit):

Plate Supply Voltage	150	volts
Grid-No.3	*Connected to cathode at socket*	
Grid-No.2 Supply Voltage	100	volts
Grid-No.1	*Connected to negative end of cathode resistor*	
Cathode Resistor	560	ohms
Plate Resistance (Approx.)	0.15	megohm
Transconductance, Grid No.1 to Plate	1000	μmhos
Transconductance, Grid No.2 to Plate	400	μmhos
Plate Current	1.3	ma
Grid-No.2 Current	2.1	ma
Grid-No.1 Voltage (Approx.) for plate μ = 30	−4.5	volts
Grid-No.3 Voltage (Approx.) for plate μ = 50	−4.5	volts

PENTODE UNIT — FM SOUND DETECTOR

Maximum Ratings, *Design-Maximum Values:*

Plate Voltage	330 max.	volts
Grid-No.3 (Suppressor-Grid) Voltage	28 max.	volts
Grid-No.2 (Screen-Grid) Supply Voltage	330 max.	volts
Grid-No.2 Voltage	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
Grid-No.1 (Control-Grid) Voltage:		
Positive-bias value	0 max.	volt
Plate Dissipation	1.7 max.	watts
Grid-No.2 Input:		
For grid-No.2 voltages up to 165 volts	1.1 max.	watts
For grid-No.2 voltages between 125 and 330 volts	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	

BEAM POWER UNIT — AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

Plate Voltage	275 max.	volts
Grid-No.2 (Screen-Grid) Voltage	275 max.	volts
Plate Dissipation	10 max.	watts
Grid-No.2 Input	2 max.	watts

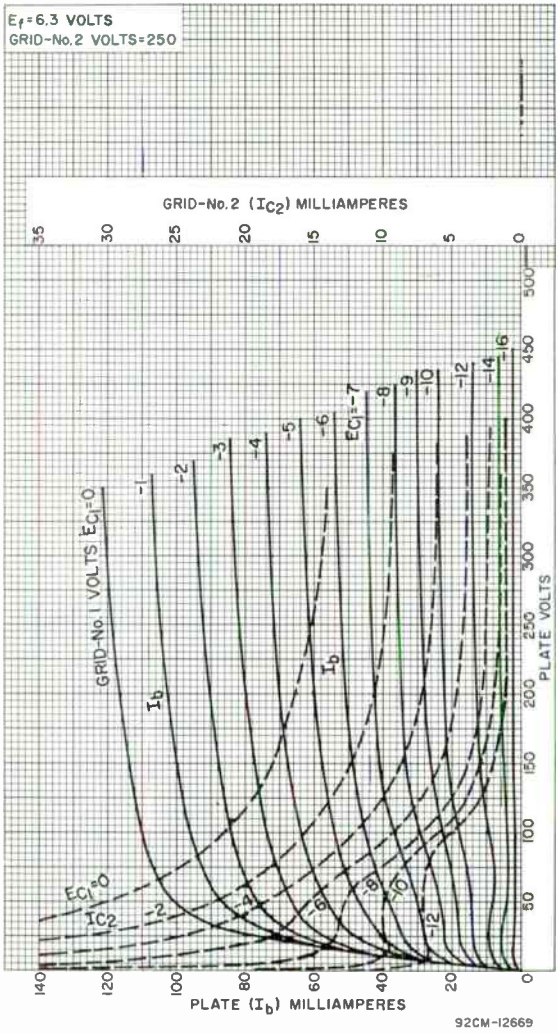
Typical Operation and Characteristics:

Plate Voltage	250	volts
Grid-No.2 Voltage	250	volts
Grid-No.1 (Control-Grid) Voltage	−8	volts
Peak AF Grid-No.1 Voltage	8	volts
Zero-Signal Plate Current	35	ma
Max.-Signal Plate Current	39	ma
Zero-Signal Grid-No.2 Current	2.5	ma
Max.-Signal Grid-No.2 Current	7	ma
Plate Resistance (Approx.)	0.1	megohm
Transconductance	6500	μmhos
Load Resistance	5000	ohms
Total Harmonic Distortion	10	per cent
Max.-Signal Power Output	4.2	watts

Maximum Circuit Values:

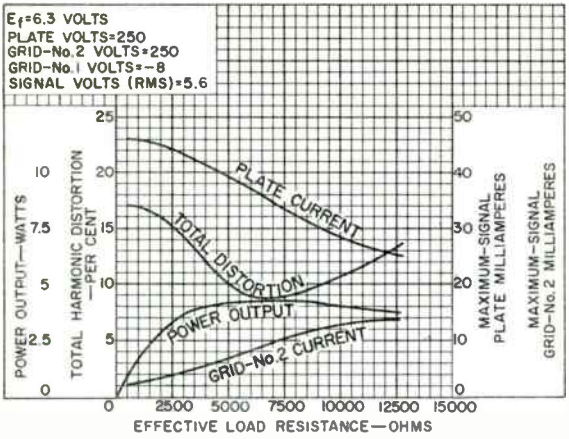
Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.25 max.	megohm
For cathode-bias operation	0.5 max.	megohm

AVERAGE CHARACTERISTICS
Beam Power Unit



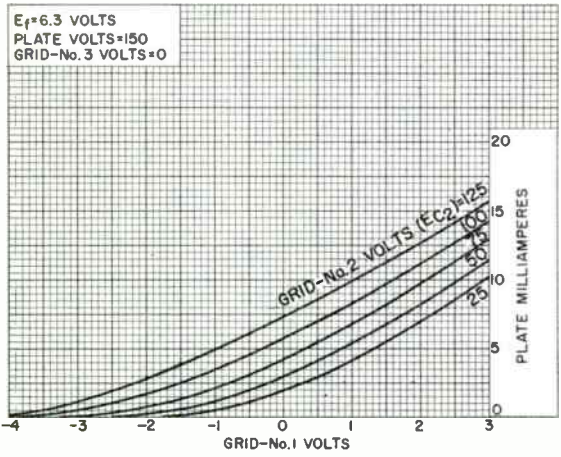
92CM-12669

OPERATION CHARACTERISTICS
Beam Power Unit



92CS-12663

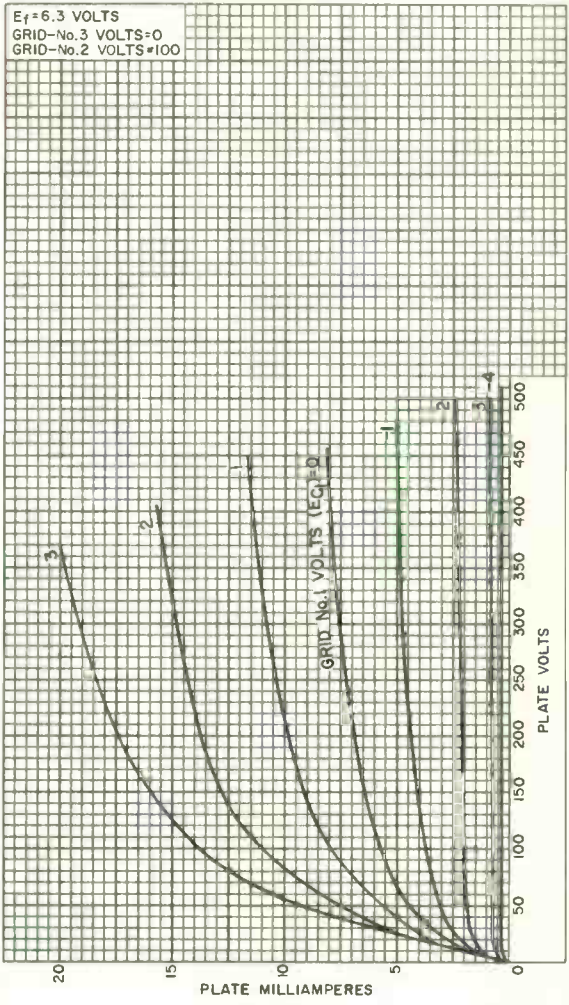
AVERAGE CHARACTERISTICS
Pentode Unit



92CS-12670

AVERAGE PLATE CHARACTERISTICS

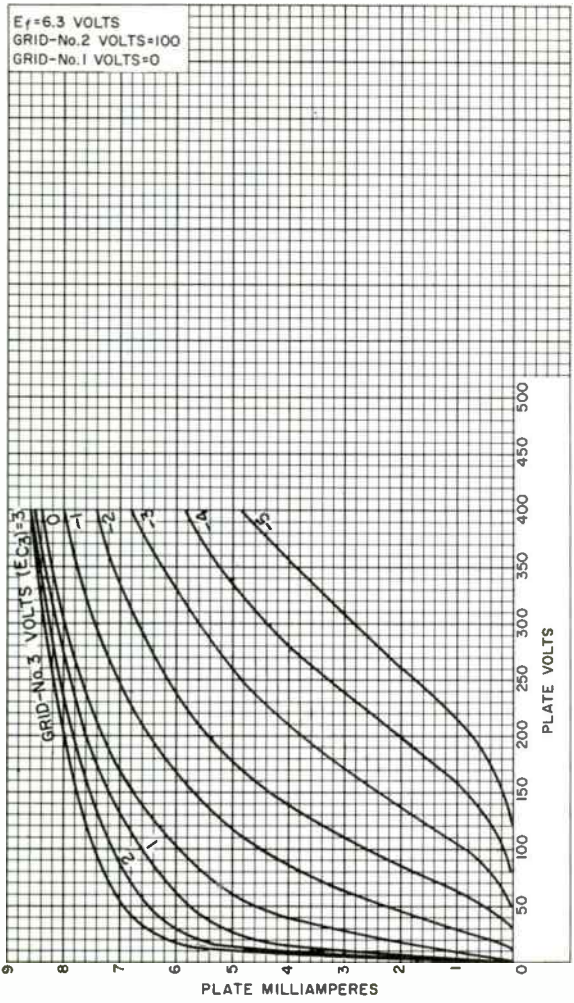
Pentode Unit



92CM-12671

6AL11

AVERAGE PLATE CHARACTERISTICS
Pentode Unit



92CM-12672

6AM8-A
DIODE—SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	6.3	volts
Current	0.45 ± 6%	amp
Warm-up time (Average.)	11	sec
Direct Interelectrode Capacitances:[o]		
Diode Unit:		
Plate to cathode and heater	1.8	μμf
Cathode to plate and heater	3	μμf
Pentode Unit:		
Grid No.1 to plate	0.015 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	6.5	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	2.6	μμf
Pentode grid No.1 to diode plate	0.006 max.	μμf
Pentode plate to diode cathode	0.15 max.	μμf
Pentode plate to diode plate	1 max.	μμf

Characteristics, Class A_1 Amplifier (Pentode Unit):

Plate Supply Voltage	125	volts
Grid No.3	*Connected to cathode at socket*	
Grid-No.2 Supply Voltage	125	volts
Cathode Resistor	56	ohms
Plate Resistance (Approx.)	0.3	megohm
Transconductance	7800	μmhos
Plate Current	12.5	ma
Grid-No.2 Current	3.2	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-6	volts
Grid-No.1 Voltage (Approx.) for plate ma. = 2, and cathode resistor (ohms) = 0	-3	volts

Mechanical:

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

← Indicates a change.

6AM8-A

DIODE—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	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

PENTODE UNIT — Class A_1 Amplifier

→ **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	3.2	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts

→ **Maximum Circuit Values:**

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

DIODE UNIT

Maximum Ratings, *Design-Maximum Values:*

DC PLATE CURRENT	5	max.	ma

→ Indicates a change.

6AM8-A

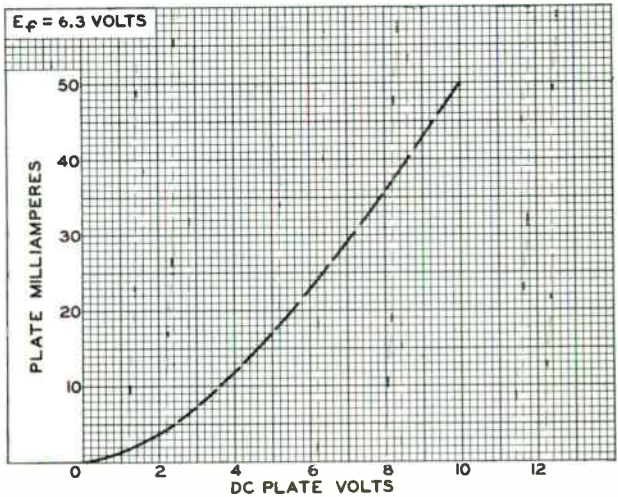
DIODE—SHARP-CUTOFF PENTODE

PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200▲ max.	volts
Heater positive with respect to cathode.	200▲ max.	volts

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

10-59 DATA 2

AVERAGE PLATE CHARACTERISTIC
DIODE UNIT



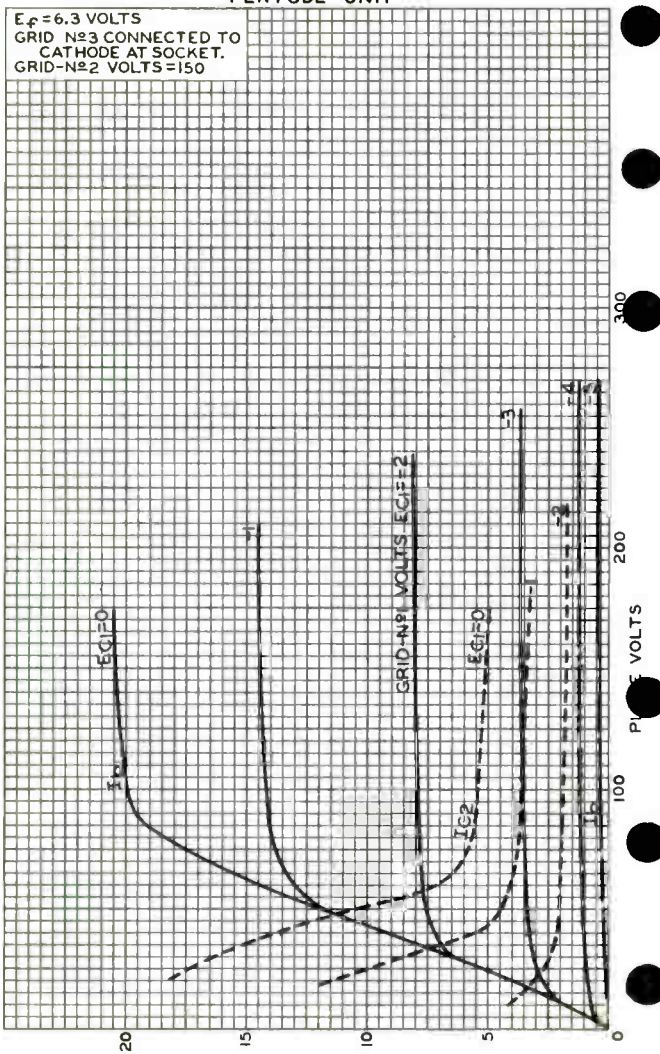
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CS-8504RI

RCA

6AM8-A

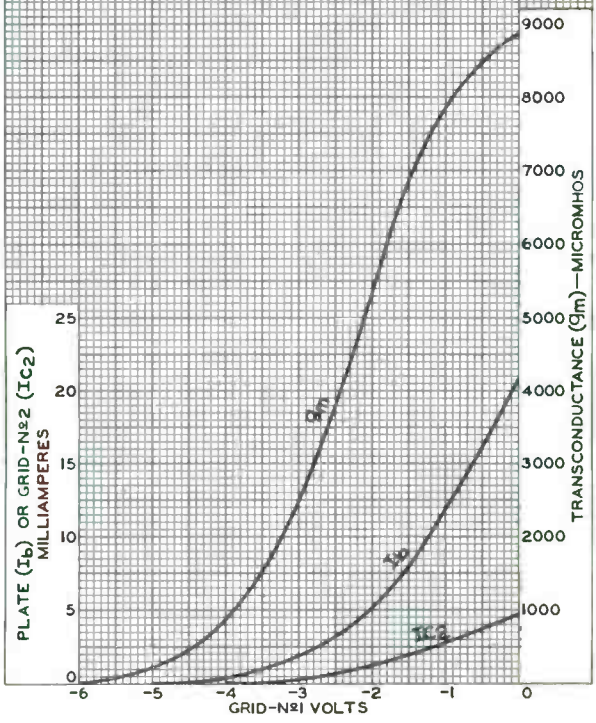
AVERAGE CHARACTERISTICS

PENTODE UNIT



6AM8-A
AVERAGE CHARACTERISTICS
PENTODE UNIT

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



6AN4

HIGH-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*[a]	
Grid to plate	1.7	1.7	μμf
Grid to cathode and heater	2.9	3.3	μμf
Plate to cathode and heater	0.25	1.8	μμf
Heater to cathode	3	2.9●	μμf
Grid to cathode	2.6	2.6●	μμf
Plate to cathode	0.2	0.18●	μμf
Cathode to grid and heater	5.5	5.7◆	μμf
Plate to grid and heater	1.8	3.4◆	μμf

Characteristics, Class A_1 Amplifier:

Plate-Supply Voltage	200	volts
Cathode Resistor	100	ohms
Amplification Factor	70	
Transconductance	10000	μmhos
Plate Current	13	ma
Grid Voltage (Approx.) for plate current of 20 μa	-7	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	T5-1/2
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

○ With external shield JETEC No.316 connected to cathode except as noted.
● With external shield JETEC No.316 connected to ground.
◆ With external shield JETEC No.316 connected to grid.

TENTATIVE DATA

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

6AN4

HIGH-MU TRIODE

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300	max.	volts
CATHODE CURRENT	30	max.	ma
PLATE DISSIPATION	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

Maximum Circuit Values:

Grid-Circuit Resistance:			
For fixed-bias operation.	0.1	max.	megohm
For cathode-bias operation.	0.5	max.	megohm

▲ The dc component must not exceed 100 volts.

TENTATIVE DATA

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

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 (AC or DC)	6.3	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec
Direct Interelectrode Capacitances:▲		
Triode Unit:		
Grid to plate	1.5	μμf
Grid to cathode and heater	2	μμf
Plate to cathode and heater	0.26	μμf
Pentode Unit:		
Grid No.1 to plate	0.04 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	7	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.4	μμf
Triode grid to pentode plate	0.02 max.	μμf
Pentode grid No.1 to triode plate	0.02 max.	μμf
Pentode plate to triode plate	0.15 max.	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Plate Supply Voltage	150	125	volts
Grid-No.2 Supply Voltage	–	125	volts
Grid-No.1 Supply Voltage	-3	0	volts
Cathode Resistor	0	56	ohms
Amplification Factor	21	–	
Plate Resistance (Approx.)	4700	170000	ohms
Transconductance	4500	7800	μmhos
Plate Current	15	12	ma
Grid-No.2 Current	–	3.8	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-17	-6	volts
Grid-No.1 Voltage (Approx.) for plate ma. = 1.6, and cathode resistor (ohms) = 0	–	-3	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"

6AN8-A

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

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

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

AMPLIFIER — Class A_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
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	2.8	max.	2.3	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:

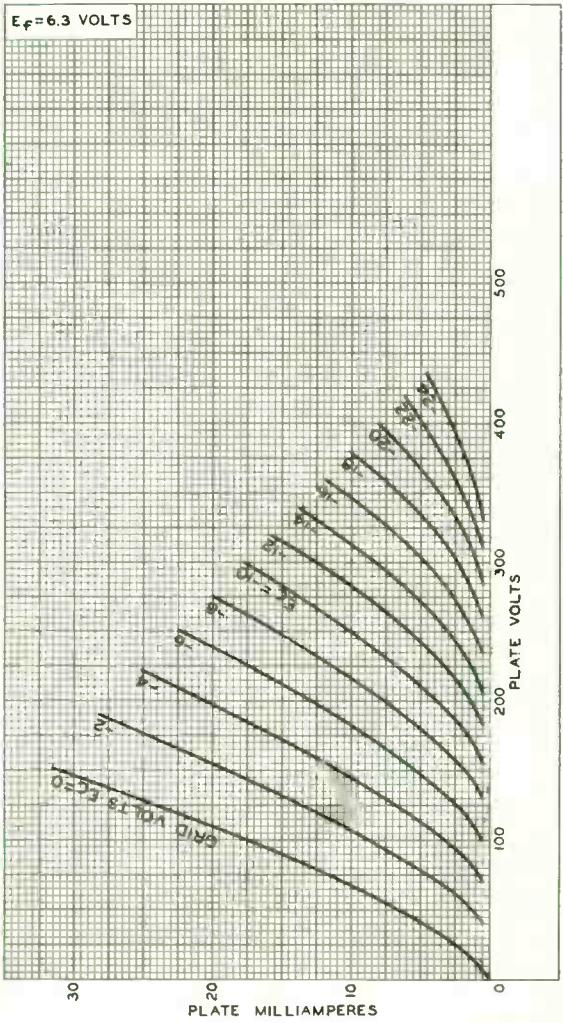
	Triode Unit		*Pentode Unit*		
Grid-No.1-Circuit Resistance:★					
For fixed-bias operation	0.5	max.	0.25	max.	megohm
For cathode-bias operation	1	max.	1	max.	megohm

▲ 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.

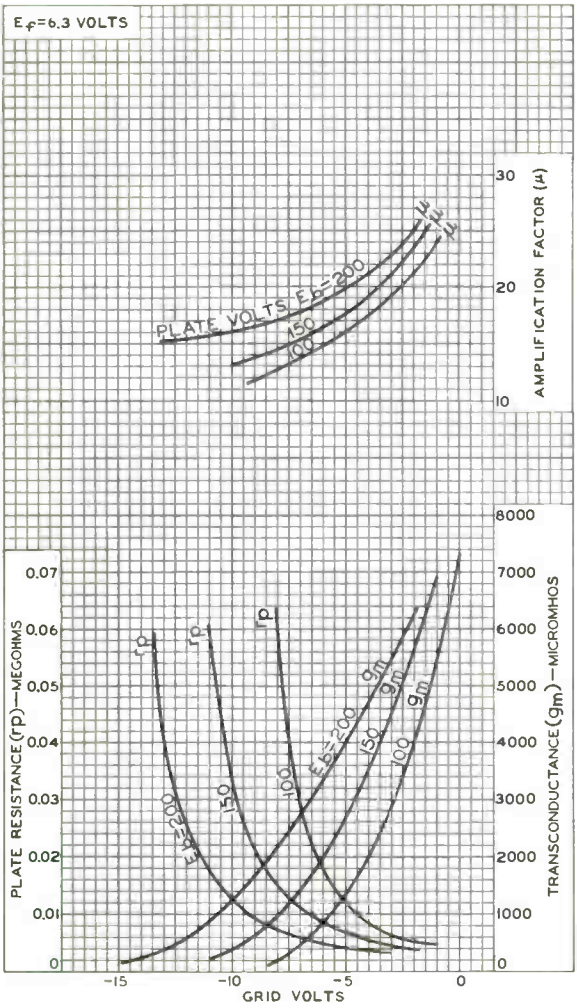
AVERAGE PLATE CHARACTERISTICS
Triode Unit



92CM-8209

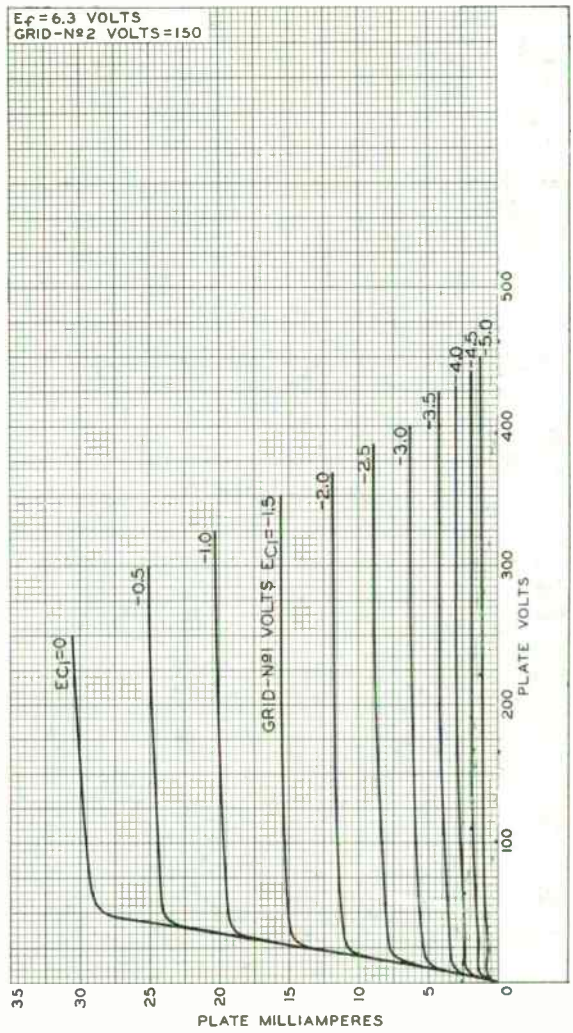
6AN8-A

AVERAGE CHARACTERISTICS
Triode Unit



92CM-8207RI

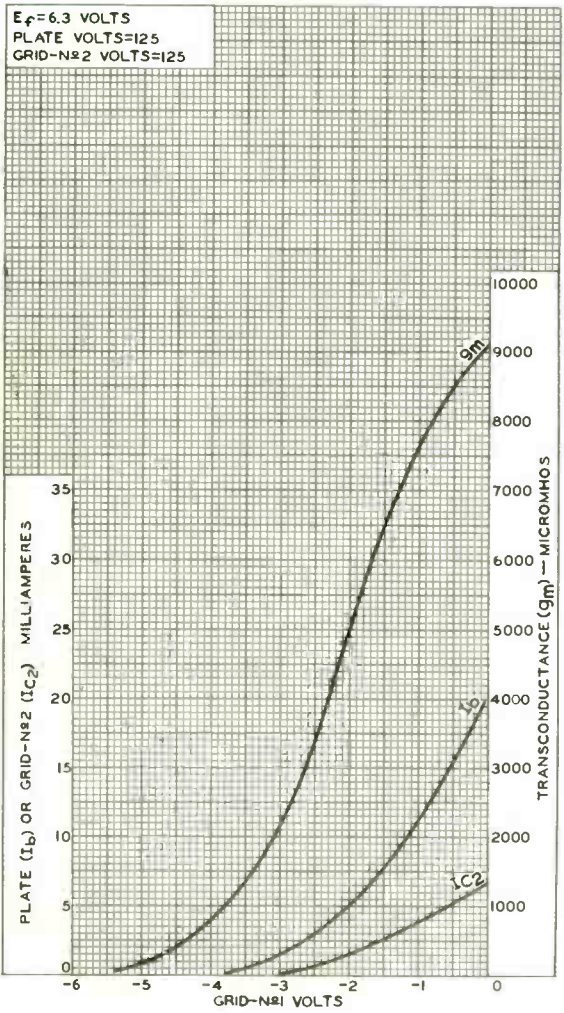
AVERAGE PLATE CHARACTERISTICS
Pentode Unit



92CM-8206

6AN8-A

AVERAGE CHARACTERISTICS
Pentode Unit



92CM-8208RI

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

6AQ5-A
BEAM POWER TUBE

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	0.45	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 (Approx.):[o]		
Grid No.1 to plate	0.4	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:

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 (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-GRID) VOLTAGE	250	max.	volts
GRID-No.2 INPUT	2	max.	watts
PLATE DISSIPATION	12	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[▲]	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	250	max.	°C

o, ▲: See next page.

← Indicates a change.

6AQ5-A

BEAM POWER TUBE

Typical Operation and Characteristics:

Plate Voltage	180	250	volts
Grid-No.2 Voltage	180	250	volts
Grid-No.1 (Control-Grid) Voltage	-8.5	-12.5	volts
Peak AF Grid-No.1 Voltage	8.5	12.5	volts
Zero-Signal Plate Current	29	45	ma
Max.-Signal Plate Current	30	47	ma
Zero-Signal Grid-No.2 Current	3	4.5	ma
Max.-Signal Grid-No.2 Current	4	7	ma
Plate Resistance (Approx.)	58000	52000	ohms
Transconductance	3700	4100	μmhos
Load Resistance	5500	5000	ohms
Total Harmonic Distortion	8	8	%
Max.-Signal Power Output	2	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

AMPLIFIER — Class AB_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	250	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	250	max.	volts
GRID-No.2 INPUT	2	max.	watts
PLATE DISSIPATION	12	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	250	max.	°C

Typical Push-Pull Operation:

Unless otherwise specified, values are for 2 tubes

Plate Voltage	250	volts
Grid-No.2 Voltage	250	volts
Grid-No.1 (Control-Grid) Voltage●	-15	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage	30	volts
Zero-Signal Plate Current	70	ma
Max.-Signal Plate Current	79	ma
Zero-Signal Grid-No.2 Current	5	ma
Max.-Signal Grid-No.2 Current	13	ma
Effective Load Resistance (Plate to plate)	10000	ohms
Total Harmonic Distortion	5	%
Max.-Signal Power Output	10	watts

o,▲,●: See next page.

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AQ5-A

BEAM POWER TUBE

Maximum Circuit Values:

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

VERTICAL-DEFLECTION AMPLIFIER

Triode Connection†

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# (Absolute maximum)	1100■ max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE	250 max.	volts
PEAK CATHODE CURRENT	105 max.	ma
DC CATHODE CURRENT	35 max.	ma
PLATE DISSIPATION	9 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲ max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	250 max.	°C

Characteristics:

Plate Voltage	250	volts
Grid-No.1 Voltage	-12.5	volts
Amplification Factor	9.5	
Plate Resistance (Approx.)	1970	ohms
Transconductance	4800	μmhos
Plate Current	49.5	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 0.5	-37	volts

Maximum Circuit Values:

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

○ Without external shield.

▲ The dc component must not exceed 100 volts.

● The type of input coupling used should not introduce too much resistance in the grid-No.1 circuit. Transformer- or impedance-coupling devices are recommended.

† Grid-No.2 (Screen-grid) connected to plate.

□ 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.

← Indicates a change.

6AQ5-A

BEAM POWER TUBE

CURVES
For the 6AQ5-A, within its ratings, are the same as those shown for Type 6V6

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

RCA

6AS8

AVERAGE PLATE CHARACTERISTICS
PENTODE UNIT

DEC. 23, 1953 TUBE DIVISION 92CM-8206

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

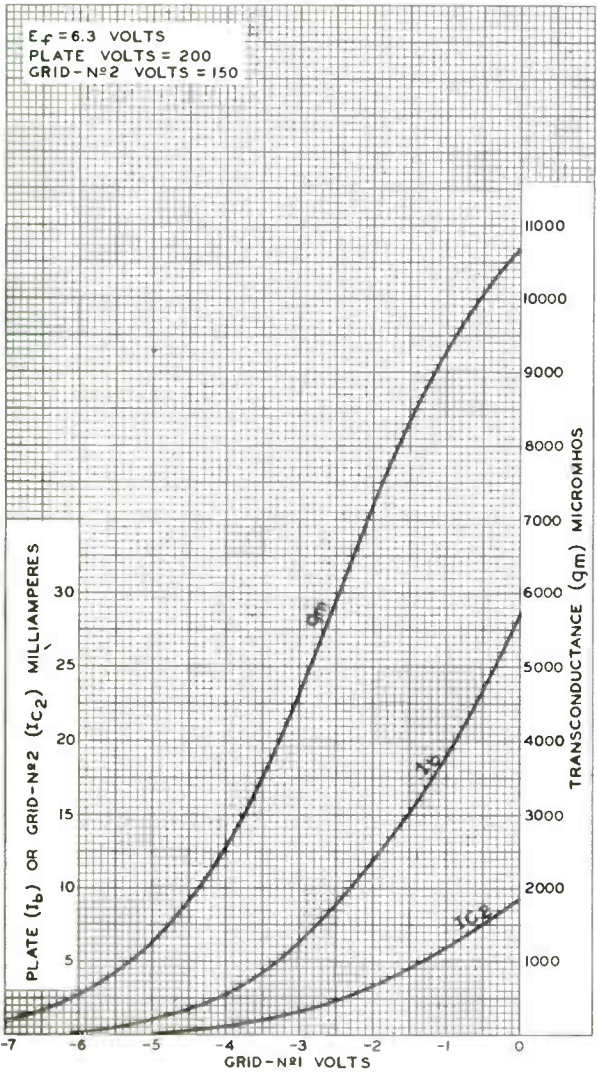
6AS8

RCA

6AS8

AVERAGE CHARACTERISTICS

PENTODE UNIT



DEC. 23, 1953

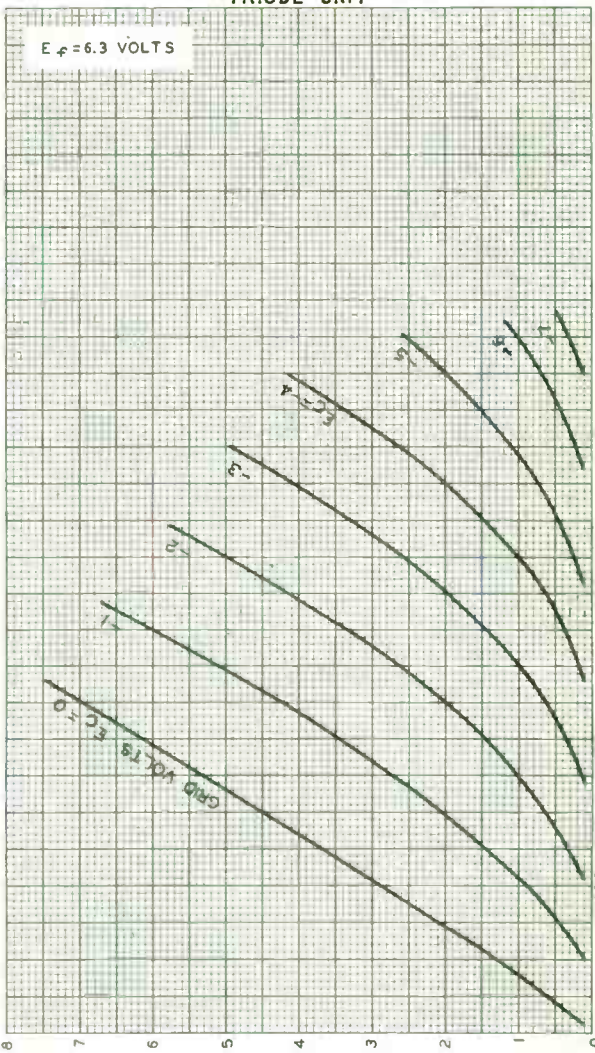
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8208

6AT6

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



OCT. 19, 1945

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-6610

Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

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

Electrical:

Heater, for Unipotential Cathode:			
Voltage (AC or DC)		6.3	volts
Current		0.45 ± 6%	amp
Warm-up time (Average)		11	sec
Direct Interelectrode Capacitances:	*Without External Shield*	*With External Shield*▲	
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	0.06 max.	0.03 max.	μμf
Grid No.1 to cathode, grid No.3, grid No.2, and heater	4.6	4.8	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.	0.008 max.	μμf
Heater to cathode	6	6●	μμf

Mechanical:

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 JEDEC No.315 connected to cathode except as noted.
● With external shield JEDEC No.315 connected to pentode plate.

→ Indicates a change.

6AU4-GTA

HALF-WAVE VACUUM RECTIFIER

For television damper service

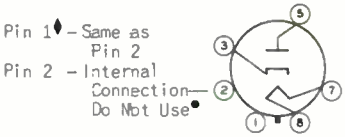
GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current	1.8	amp
Direct Interelectrode Capacitances (Approx.):[○]		
Plate to catnode and heater	8.5	μμf
Cathode to heater and plate	11.5	μμf
Heater to cathode	4	μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	3-13/16"
Maximum Seated Length	3-1/4"
Maximum Diameter	1-9/32"
Bulb	T9
Base	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



DAMPER SERVICE

Maximum Ratings, *Design-Maximum Values:*

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

PEAK INVERSE PLATE VOLTAGE	4500 max.	volts
PEAK PLATE CURRENT	1300 max.	ma
DC PLATE CURRENT	210 max.	ma
PLATE DISSIPATION	6.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	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.

[▲] The dc component must not exceed 900 volts.

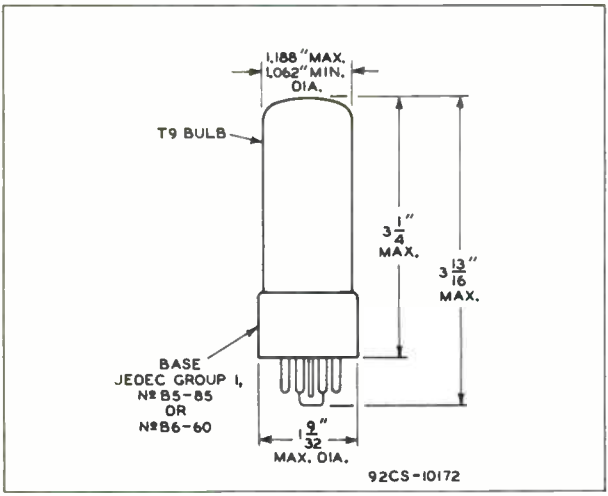
[#] The dc component must not exceed 100 volts.

← Indicates a change.

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

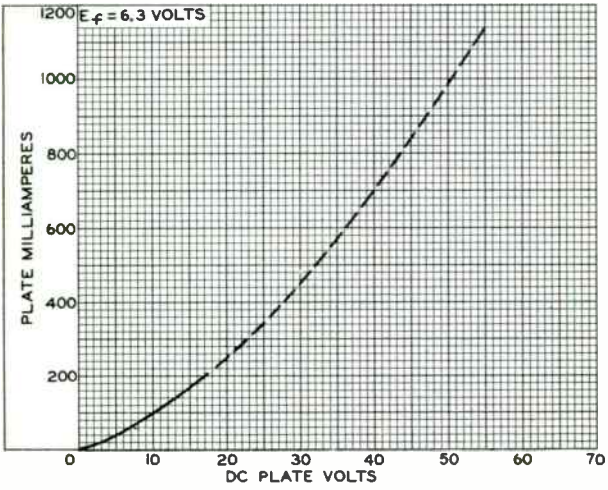
6AU4-GTA

HALF-WAVE VACUUM RECTIFIER



8-59 CE-10172

AVERAGE PLATE CHARACTERISTIC



92CS-8651R1

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

RCA

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.):[o]		
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

[o] 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 = -8.5.

[□] 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.

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

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

RCA

6AU5-GT

AVERAGE PLATE CHARACTERISTICS

E_f=6.3 VOLTS
GRID-No.1 VOLTS=0

PLATE VOLTS
0 100 200 300 400 500

PLATE MILLIAMPERES
400 300 200 100 0

SEPT. 8, 1949

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

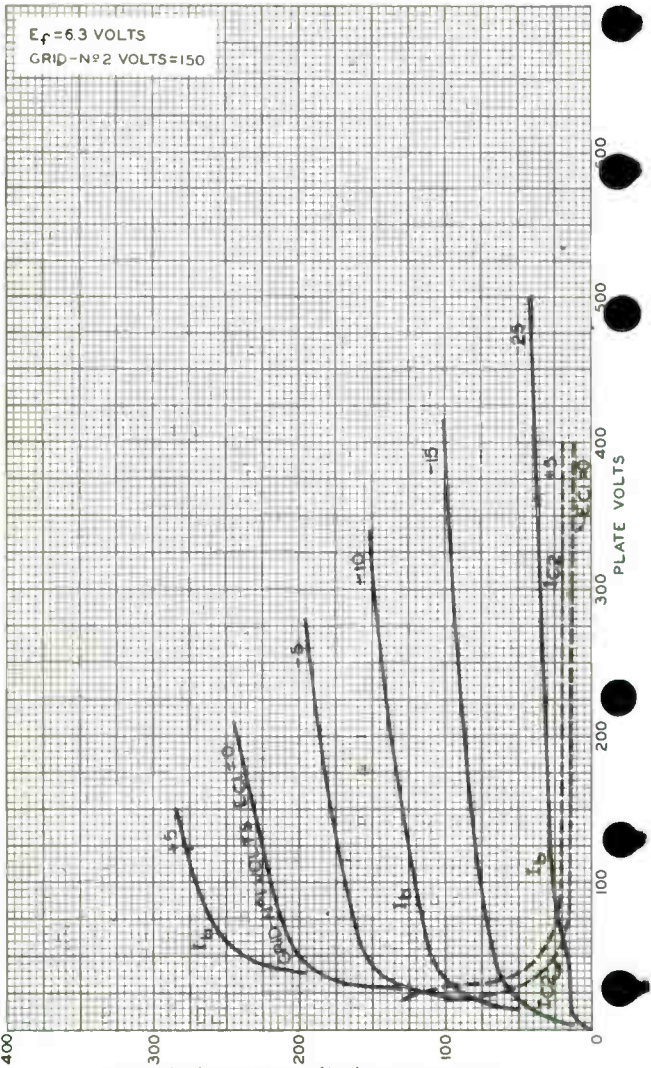
92CM-7355

6AU5-GT

RCA

6AU5-GT

AVERAGE PLATE CHARACTERISTICS



AUG. 29, 1949 TUBE DEPARTMENT 92CM-7349

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AU6-A

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE
With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current at 6.3 volts	0.3 ± 6%	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield▲*	
Pentode Connection:			
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	5.5	5.5	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	5	5	μμf
Triode Connection:●			
Grid No.1 to plate, grid No.3 & internal shield, and grid No.2	2.6	2.6	μμf
Grid No.1 to cathode and heater	3.2	3.2	μμf
Plate, grid No.3 & internal shield, and grid No.2 to cathode and heater	1.2	8.5	μμf

Characteristics, Class A_1 Amplifier:

Pentode Connection

Plate Supply Voltage	100	250	250	volts
Grid No.3	*Connected to cathode at socket*			
Grid-No.2 Supply Voltage	100	125	150	volts
Cathode Resistor	150	100	68	ohms
Plate Resistance (Approx.)	0.5	1.5	1	megohms
Transconductance	3900	4500	5200	μmhos
Plate Current	5	7.6	10.6	ma
Grid-No.2 Current	2.1	3	4.3	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-4.2	-5.5	-6.5	volts

Triode Connection●

Plate Supply Voltage	250	volts
Cathode Resistor	330	ohms
Amplification Factor	36	

6AU6-A

Plate Resistance (Approx.)	7500	ohms
Transconductance	4800	μmhos
Plate Current	12.2	ma

Mechanical:

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

Pin 1 – Grid No.1
Pin 2 – Grid No.3, Internal Shield
Pin 3 – Heater

Pin 4 – Heater
Pin 5 – Plate
Pin 6 – Grid No.2
Pin 7 – Cathode

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

	Triode Connection•	*Pentode Connection*	
PLATE VOLTAGE	275 max.	330 max.	volts
GRID No.3 (SUPPRESSOR GRID)	–	*Connect to cathode at socket*	
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	–	0.75 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	3.5 max.	3.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE: Heater negative with respect to cathode	200 max.	200 max.	volts
Heater positive with respect to cathode	200★ max.	200★ max.	volts

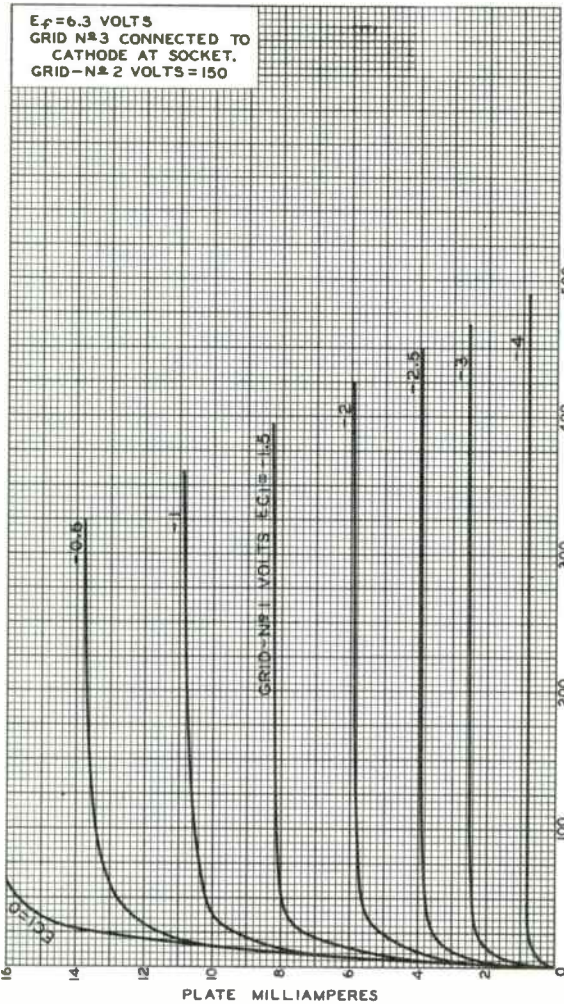
Typical Operation as Resistance-Coupled Amplifier:

See *RESISTANCE-COUPLED-AMPLIFIER CHART No.8* at front of this Section

▲ With external shield JEDEC No.316 connected to cathode.
● Grid No.3 and grid No.2 connected to plate.
★ The dc component must not exceed 100 volts.

6AU6-A

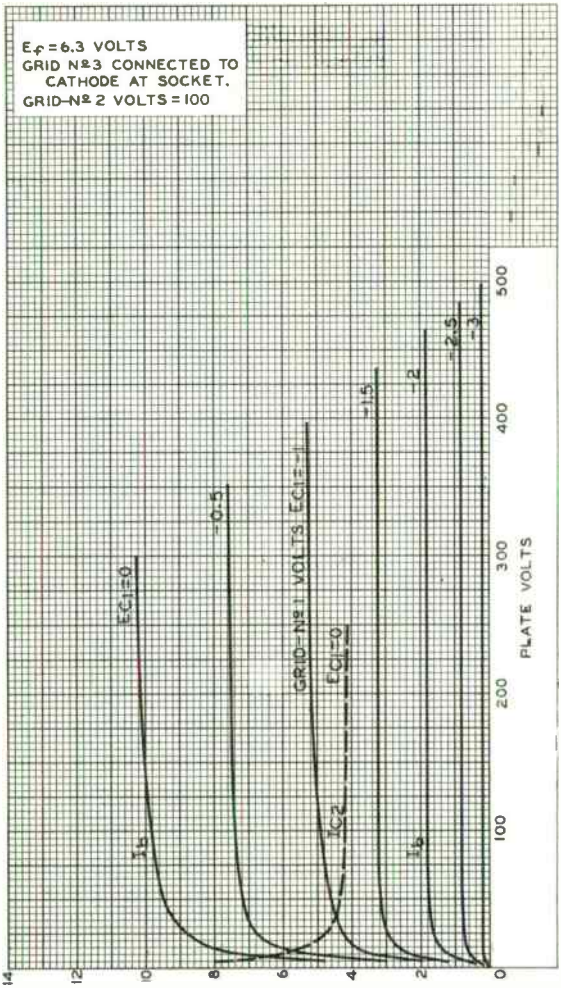
AVERAGE PLATE CHARACTERISTICS
Pentode Connection



92CM-6613R3

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

AVERAGE CHARACTERISTICS
Pentode Connection

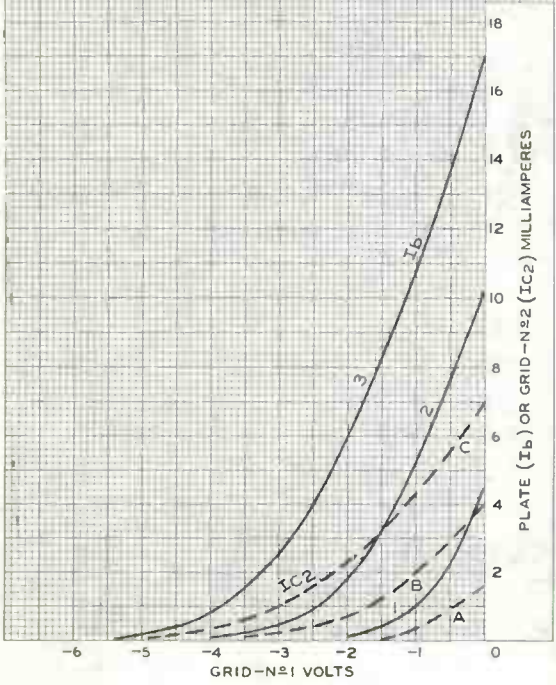


92CM-6611R3

AVERAGE CHARACTERISTICS
Pentode Connection

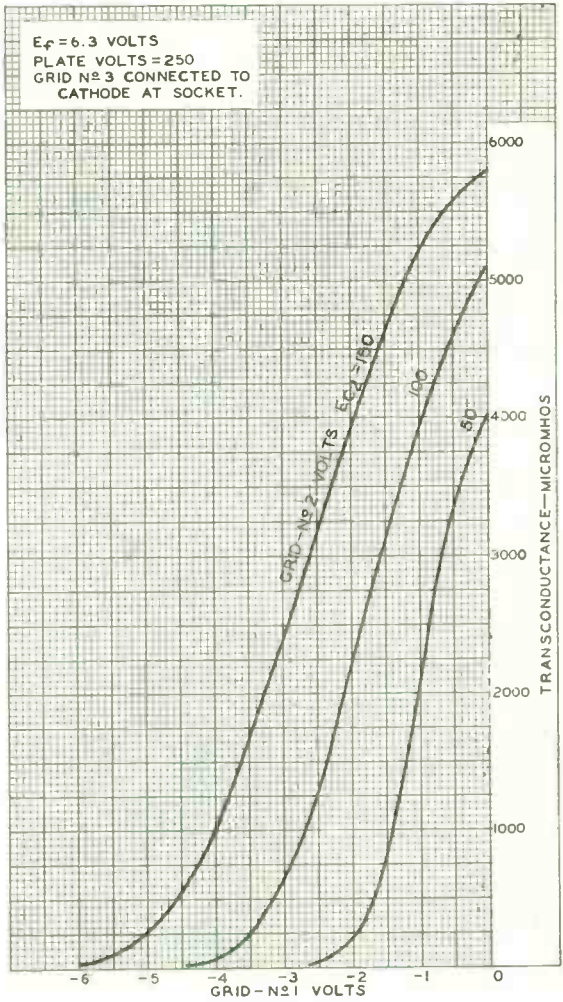
E_f=6.3 VOLTS
PLATE VOLTS=250
GRID №3 CONNECTED TO CATHODE AT SOCKET.

CURVES		GRID—№2 VOLTS
I_b—	I_{C2}--	
1	A	50
2	B	100
3	C	150



92CM—6623R3

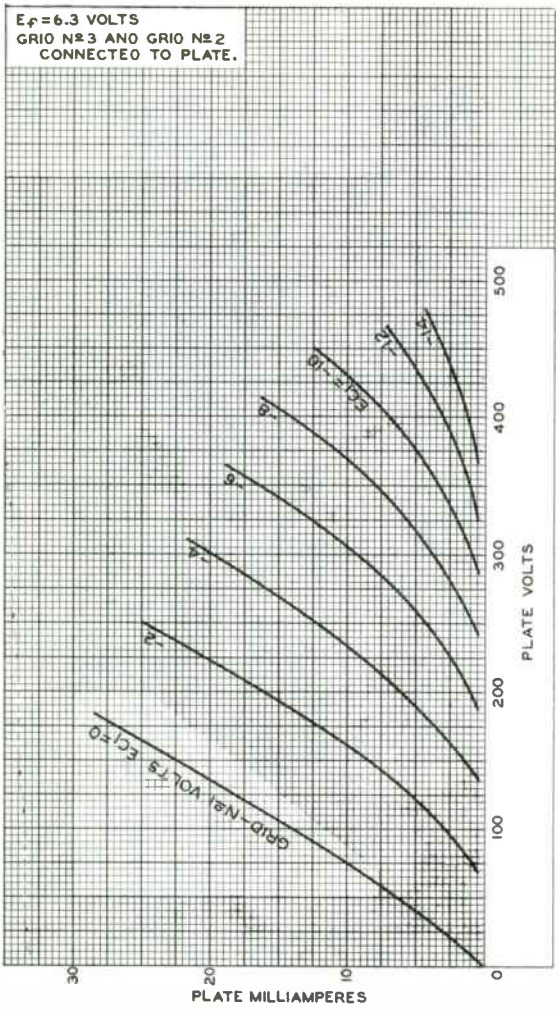
AVERAGE CHARACTERISTICS
Pentode Connection



92CM-6614R3

6AU6-A

AVERAGE PLATE CHARACTERISTICS
Triode Connection



92CM-6854RI

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

6AU8A

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 (AC or DC)	6.3	volts
Current	0.6 ± 5%	amp
Warm-up time (Average)	11	sec
Direct Interelectrode Capacitances:[a]		
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	0.06	μμf
Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater	7.5	μμf
Plate to cathode & internal shield & grid No.3, grid No.2, and heater	3.4	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	40	200	volts
Grid-No.2 Supply Voltage	–	125	125	volts
Cathode Resistor	150	–	82	ohms
Amplification Factor	43	–	–	
Plate Resistance (Approx.)	8100	–	100000	ohms
Transconductance	5300	–	8000	μmhos
Plate Current	9.5	28[b]	17	ma
Grid-No.2 Current	–	10[b]	3.4	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100	-6.5	–	-7.5	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)

6AU8A

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-Maximum Values:*

	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE.	–	330 max.	volts
GRID-No.2 VOLTAGE	–	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE: Positive-bias value	0 max.	0 max.	volts
GRID-No.2 INPUT: For grid-No.2 voltages up to 165 volts	–	1 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	2.8 max.	3.3 max.	watts
PEAK HEATER-CATHODE VOLTAGE: Heater negative with respect to cathode.	200 max.	200 max.	volts
Heater positive with respect to cathode.	200[c] max.	200[c] 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

OPERATING CONSIDERATIONS

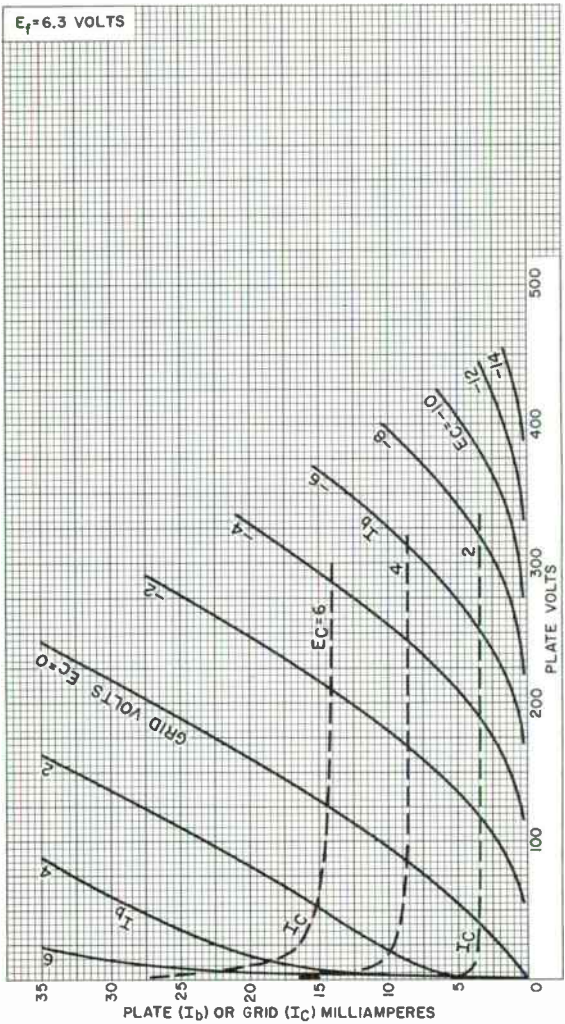
Because the *internal shield* is connected to the cathode and grid No.3, the impedance in the cathode circuit should be kept as low as possible to minimize cross-coupling effects.

[a] Without external shield.

[b] 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.

[c] The dc component must not exceed 100 volts.

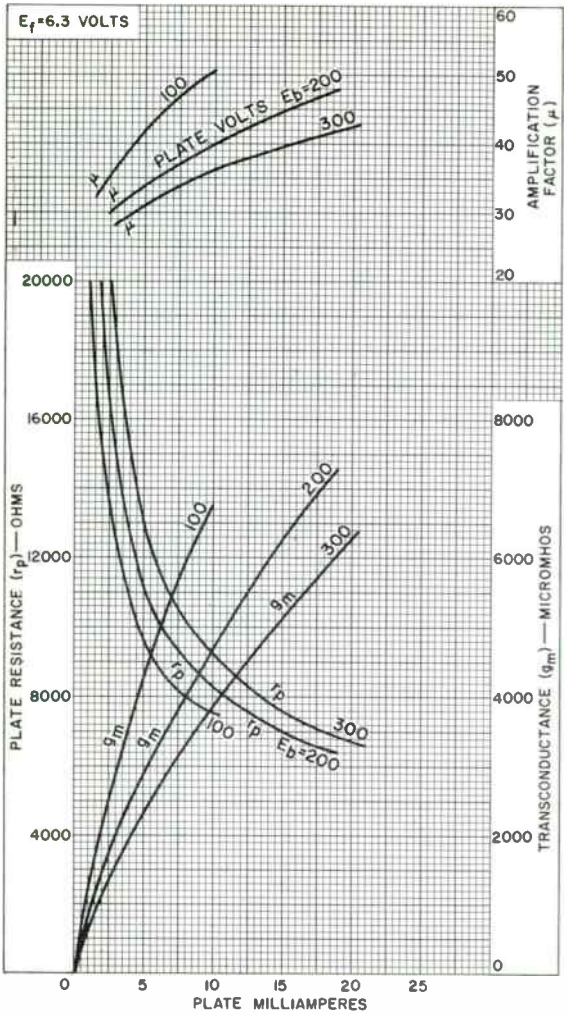
AVERAGE CHARACTERISTICS
Triode Unit



92CM-11140

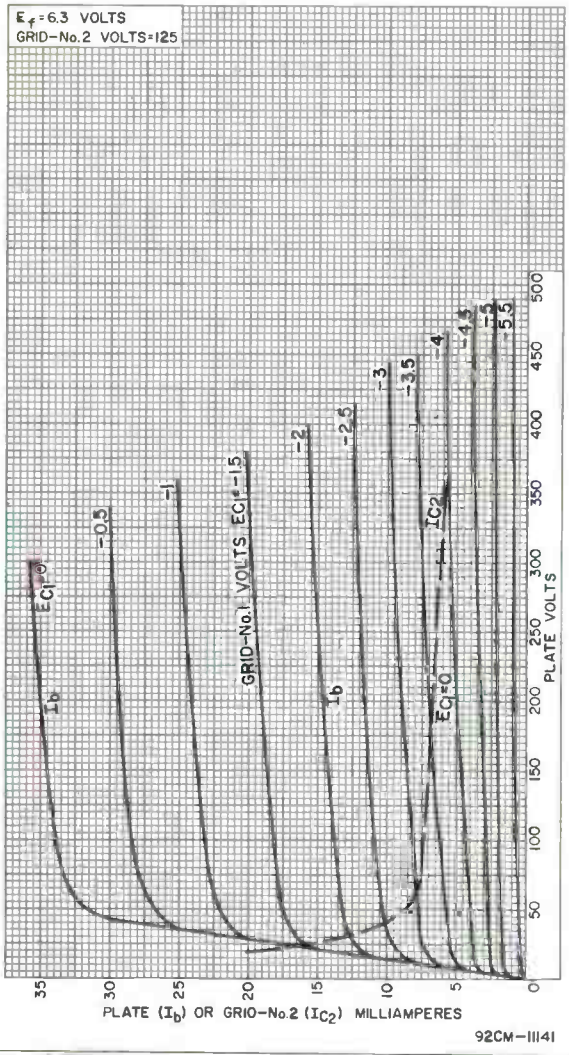
6AU8A

AVERAGE CHARACTERISTICS
Triode Unit



92CM-11144RI

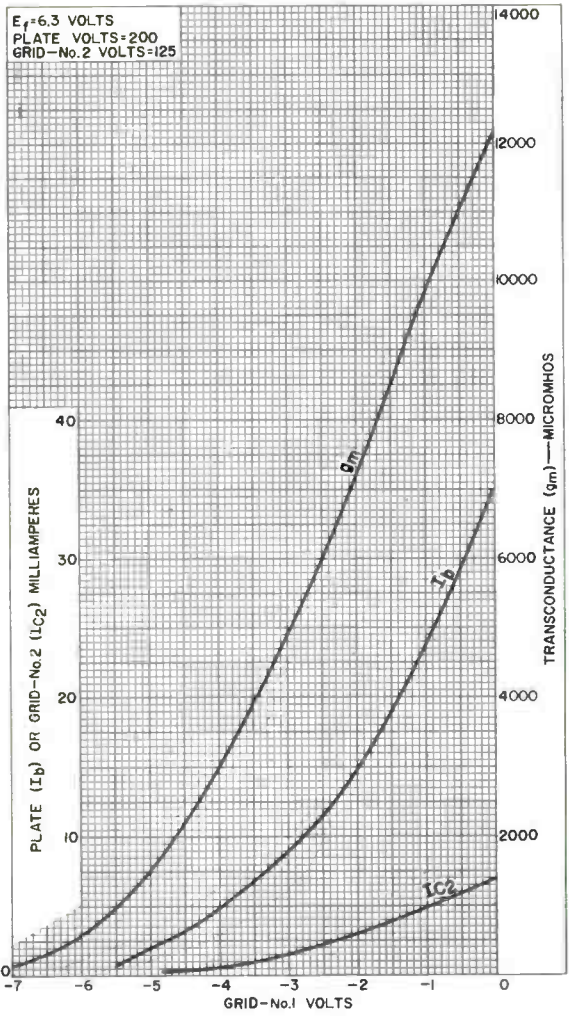
AVERAGE CHARACTERISTICS
Pentode Unit



92CM-11141

6AU8A

AVERAGE CHARACTERISTICS
Pentode Unit



92CM-11142

6AV6

TWIN DIODE—HIGH-MU TRIODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

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

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield[a]*	
Triode Unit:			
Grid to plate	2	2	μμf
Grid to cathode and heater	2.2	2.2	μμf
Plate to cathode and heater	0.8	1.2	μμf
Diode-No. 2 plate to triode grid	0.04 max.	0.04 max.	μμf

Characteristics, Class A_1 Amplifier (Triode Unit):

Plate Voltage	100	250	volts
Grid Voltage	−1	−2	volts
Amplification Factor	100	100	
Plate Resistance (Approx.)	0.08	0.0625	megohm
Transconductance	1250	1600	μmhos
Plate Current	0.5	1.2	ma

Mechanical:

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

Pin 1 – 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-Maximum Values:*

PLATE VOLTAGE	330	max.	volts
GRID VOLTAGE:			
Positive-bias value	0	max.	volts
PLATE DISSIPATION	0.55	max.	watt

←Indicates a change.

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

6AV6

TWIN DIODE—HIGH-MU TRIODE

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:

See RESISTANCE-COUPLED AMPLIFIER CHART No. 25 at front of this Section

DIODE UNITS — Two

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

PLATE CURRENT (For each diode)	1 max.	ma

→ **Characteristics:**

Values are for Each Unit

Plate Current for plate volts = 10	2	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.

[o] With external shield JEDEC NO.316 connected to cathode.

[▲] The dc component must not exceed 100 volts.

Curves for the triode unit of the 6AV6 are the same as those shown for Type 12AX7

→ Indicates a change.

High-Mu Triode—
Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at 6.3 volts	0.6[a]	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield*[b]	
Triode Unit:			
Grid to plate	2.2	2.2	μμf
Grid to cathode, pentode cathode & grid No.3 & internal shield, and heater	3.2	3.4	μμf
Plate to cathode, pentode cathode & grid No.3 & internal shield, and heater	1.8	3	μμf
Pentode Unit:			
Grid No.1 to plate	0.05 max.	0.04 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	10	10	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	3.6	4.5	μμf
Pentode grid No.1 to triode plate	0.008 max.	0.005 max.	μμf
Pentode plate to triode plate	0.150 max.	0.025 max.	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*		
Plate Supply Voltage	200	65	150	volts
Grid-No.2 Supply Voltage	–	150	150	volts
Grid-No.1 Voltage	-2	0	–	volts
Cathode Resistor	–	–	150	ohms
Amplification Factor	70	–	–	
Plate Resistance (Approx.)	0.0175	–	0.2	megohm

Indicates a change.

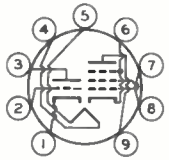
6AW8A

	Triode Unit	*Pentode Unit*	
Transconductance	4000	9500	μmhos
Plate Current	4	46[c] 15	ma
Grid-No.2 Current	–	15[c] 3.5	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-5	-8	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb-Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9DX

Pin 1 – Triode Cathode
Pin 2 – Triode Grid
Pin 3 – Triode Plate
Pin 4 – Heater
Pin 5 – Heater



Pin 6 – Pentode Cathode, Grid No.3, Internal Shield
Pin 7 – Pentode Grid No.1
Pin 8 – Pentode Grid No.2
Pin 9 – Pentode Plate

AMPLIFIER — Class A_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
PLATE DISSIPATION	1.1 max.	3.75 max.	watts
GRID-No.2 INPUT: For grid-No.2 voltages up to 165 volts	–	1.1 max.	watts
For grid-No.2 voltages between 165 and 330 volts	–	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	

→Indicates a change.

PEAK HEATER-CATHODE VOLTAGE:				
Heater negative with respect to cathode. . .	200	max.	200	max. volts
Heater positive with respect to cathode. . .	200[d]	max.	200[d]	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

[a] In series-heater-string operation, the heater current rating is 0.600 ± 0.040 ampere at 6.3 volts.

[b] With external shield JEDEC No.315 connected to pins 4 and 5.

[c] 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.

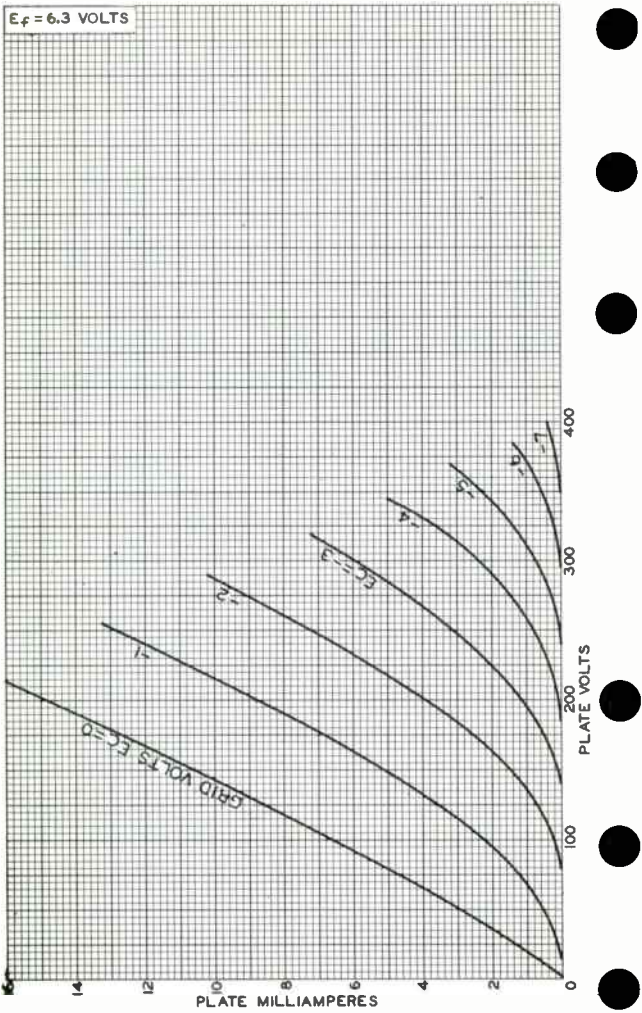
[d] The dc component must not exceed 100 volts.

OPERATING CONSIDERATIONS

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

6AW8A

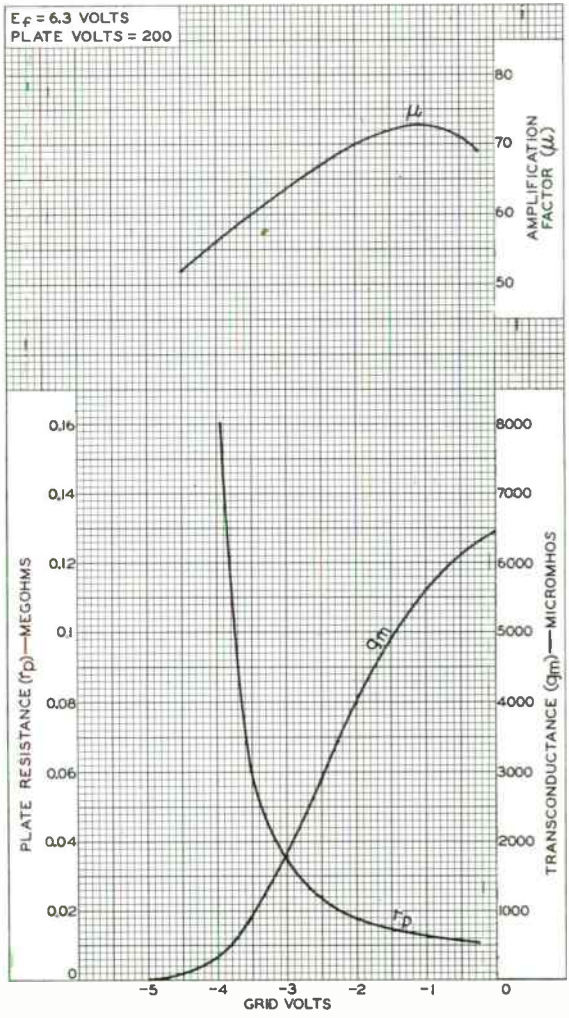
AVERAGE PLATE CHARACTERISTICS
Triode Unit



92CM-8644

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

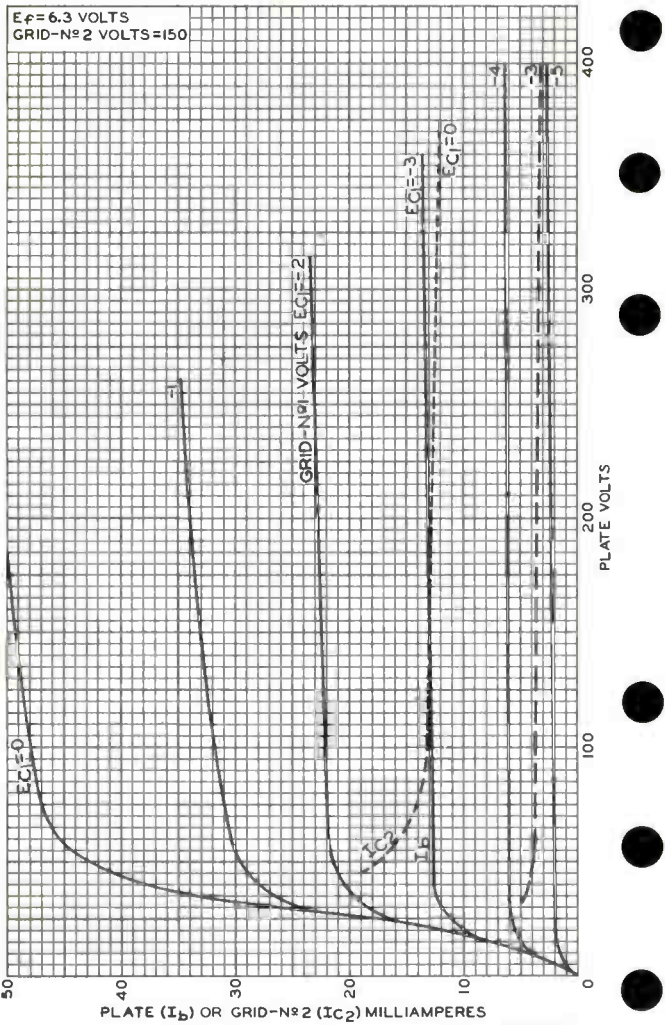
AVERAGE CHARACTERISTICS
Triode Unit



92CM-8647

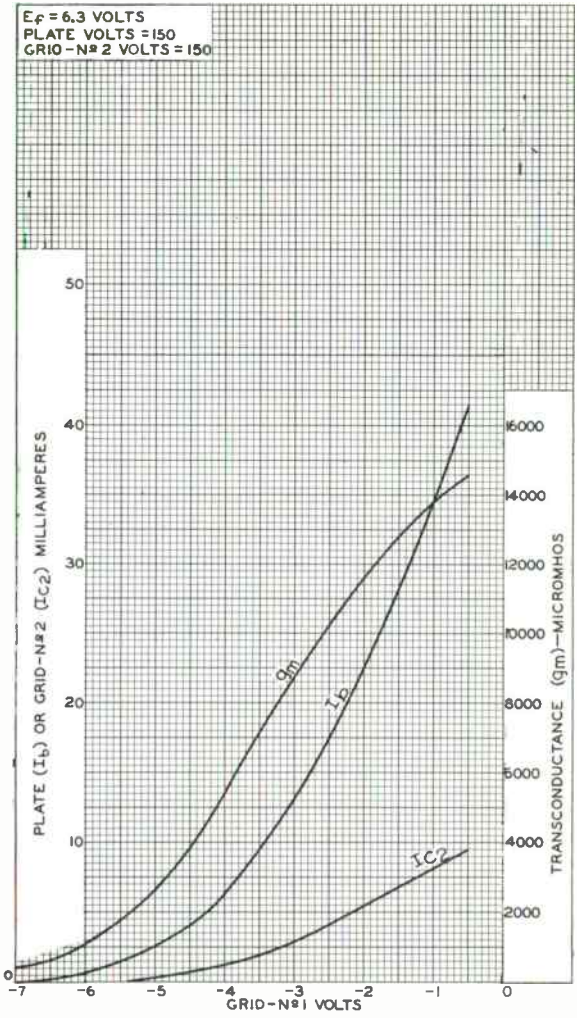
6AW8A

AVERAGE CHARACTERISTICS
Pentode Unit



92CM-9173RI

AVERAGE CHARACTERISTICS
Pentode Unit



92CS-8646RI

Half-Wave Vacuum Rectifier

DUODECAR TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Maximum Values):*		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode[a]	5000[b] max.	volts
Heater positive with respect to cathode	300[c] max.	volts
Direct Interelectrode Capacitances (Approx.):[d]		
Plate to cathode and heater	5.5	μμf
Cathode to plate and heater	7.5	μμf
Heater to cathode	2.8	μμf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2.625"
Seated Length	2.000" to 2.250"
Diameter	1.062" to 1.188"
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC No.E12-70)
Basing Designation for BOTTOM VIEW	12BL

Pin 1 – Heater
Pin 2 – No Internal Connection
Pin 3 – Same as Pin 2
Pin 4 – Plate
Pin 5 – Do Not Use[e]
Pin 6 – Do Not Use[e]
Pin 7 – Cathode
Pin 8 – Do Not Use[e]
Pin 9 – Do Not Use[e]
Pin 10 – Plate
Pin 11 – Same as Pin 2
Pin 12 – Heater

DAMPER SERVICE

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[f]

PEAK INVERSE PLATE VOLTAGE[a]	5000 max.	volts
PEAK PLATE CURRENT	1000 max.	ma
DC PLATE CURRENT	165 max.	ma
PLATE DISSIPATION	5.3 max.	watts

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma. = 250	32	volts

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

[b] The dc component must not exceed 900 volts.

[c] The dc component must not exceed 100 volts.

[d] Without external shield.

[e] Socket terminals 5,6,8, and 9 should not be used as tie points.

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

6AX5-GT

FULL-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

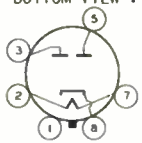
Heater, for Unipotential Cathode:

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.

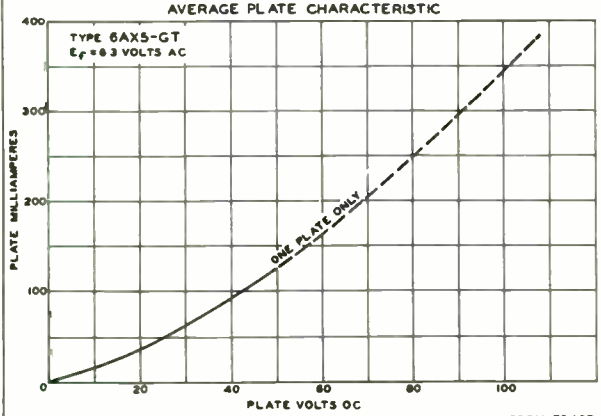
6AX5-GT

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
	62.5 ma. –	365	volts
At full-load cur. of	150 ma. 250	–	volts
	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.

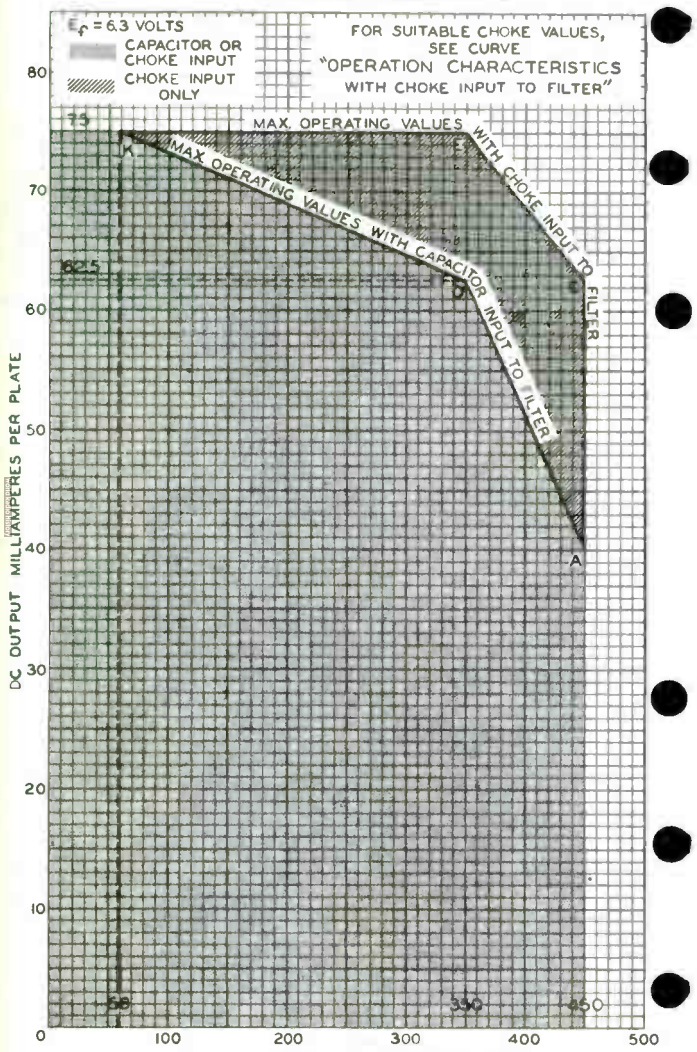
6AX5-GT

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.

6AX5-GT

RATING CHART

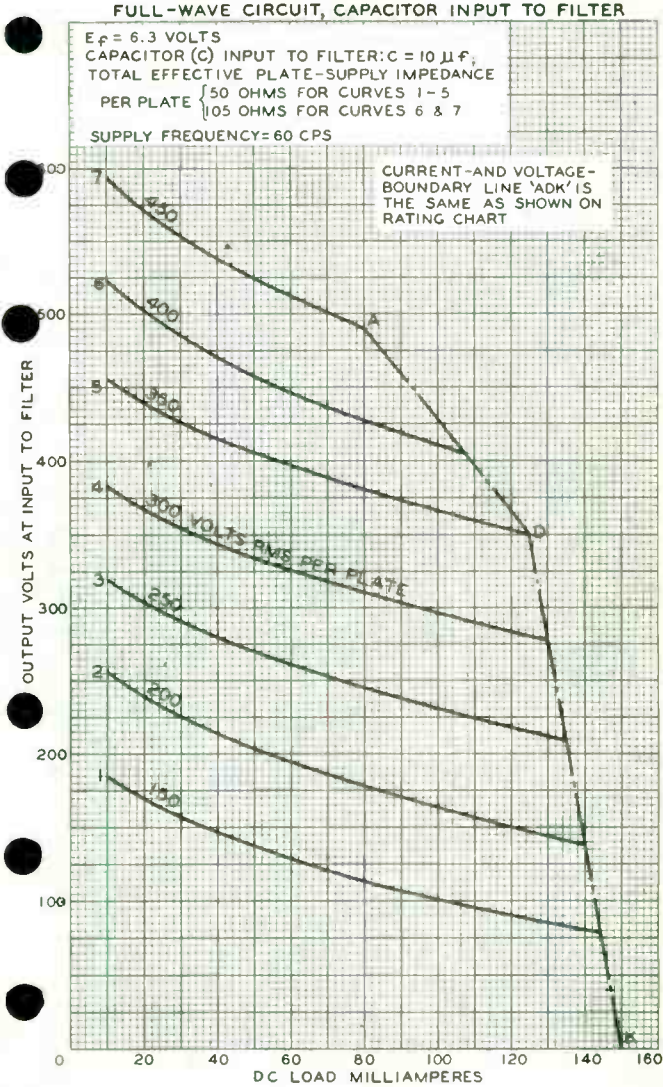


RCA

6AX5-GT

OPERATION CHARACTERISTICS

FULL-WAVE CIRCUIT, CAPACITOR INPUT TO FILTER



6AX5-GT

RCA

6AX5-GT

OPERATION CHARACTERISTICS

FULL-WAVE CIRCUIT, CHOKE INPUT TO FILTER

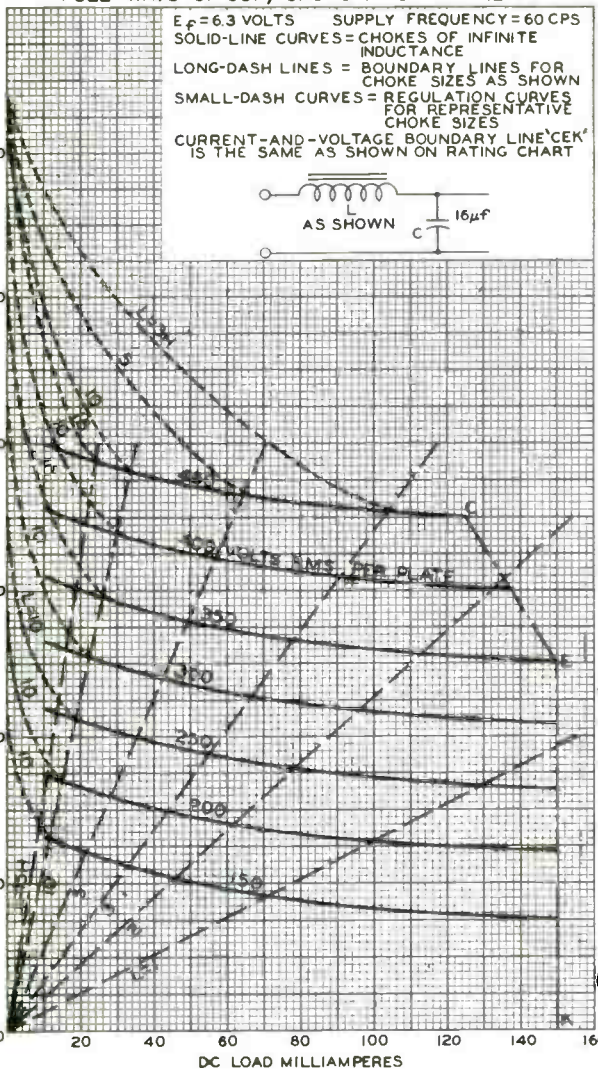
E_f = 6.3 VOLTS SUPPLY FREQUENCY = 60 CPS

SOLID-LINE CURVES = CHOKES OF INFINITE INDUCTANCE

LONG-DASH LINES = BOUNDARY LINES FOR CHOKE SIZES AS SHOWN

SMALL-DASH CURVES = REGULATION CURVES FOR REPRESENTATIVE CHOKE SIZES

CURRENT-AND-VOLTAGE BOUNDARY LINE 'CEK' IS THE SAME AS SHOWN ON RATING CHART



Half-Wave Vacuum Rectifier

NOVAR TYPE

For Television Damper Service

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode[a]	5000[b] max.	volts
Heater positive with respect to cathode	300[c] max.	volts
Direct Interelectrode Capacitances (Approx.):[d]		
Plate to cathode and heater	6.5	pf
Cathode to plate and heater	9.0	pf
Heater to cathode	2.8	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.410"
Maximum Seated Length	3.030"
Length, Base Seat to Bulb Top (Excluding tip)	2.510" to 2.690"
Diameter	1.062" to 1.188"
Bulb	T9
Socket	Cinch Mfg. Co. No. 149 19 00 033, Industrial Electronic Hardware Corp. No. SO-0968-SLI, or equivalent
Base	Small-Button Novar 9-Pin (JEDEC No. E9-75)
Basing Designation for BOTTOM VIEW	9HP

Pin 1 – Do Not Use[e]
Pin 2 – Plate
Pin 3 – Do Not Use[e]
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Do Not Use[e]
Pin 7 – Plate
Pin 8 – Do Not Use[e]
Pin 9 – Cathode

DAMPER SERVICE

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[f]

PEAK INVERSE PLATE VOLTAGE[a]	5000 max.	volts
PEAK PLATE CURRENT	1100 max.	ma
DC PLATE CURRENT	175 max.	ma
PLATE DISSIPATION	6.5 max.	watts

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

← Indicates a change.

6AY3

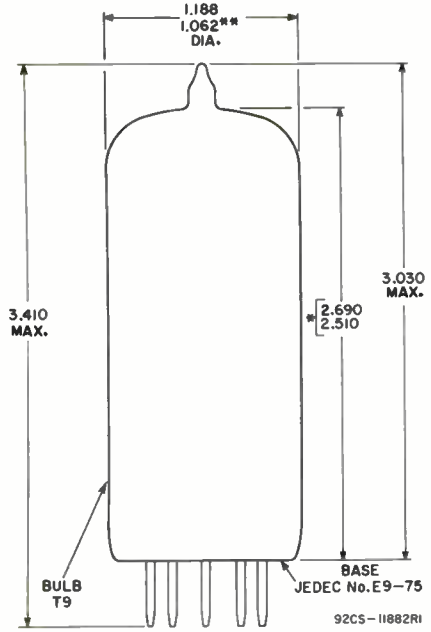
b The dc component must not exceed 900 volts.

c The dc component must not exceed 100 volts.

d Without external shield.

e Socket terminals 1, 3, 6, and 8 should not be used as tie points. It is recommended that the socket clips for these pins be removed to reduce the possibility of arc-over and to minimize leakage.

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

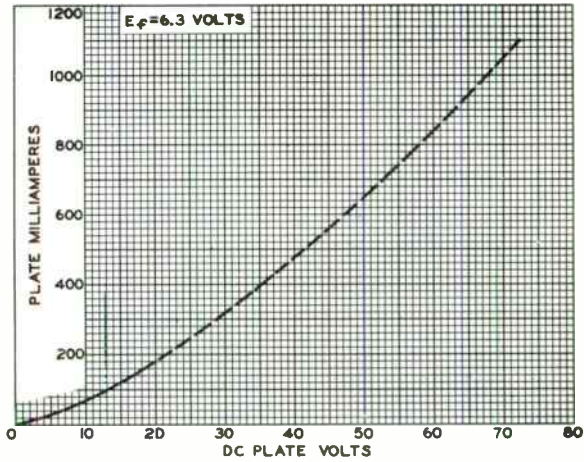


ALL DIMENSIONS IN INCHES

** APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.

* MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY A RING GAUGE OF 0.600" INSIDE DIAMETER.

AVERAGE PLATE CHARACTERISTIC



92CS-9884

Half-Wave Vacuum Rectifier

NOVAR TYPE

For Television Damper Service

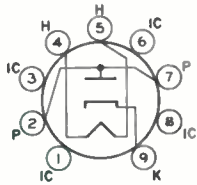
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode[a]	5000[b] max.	volts
Heater positive with respect to cathode	300[c] max.	volts
Direct Interelectrode Capacitances (Approx.):[d]		
P to (K,H)	6.5	pf
K to (P,H)	9.0	pf
Heater to cathode	2.8	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.005"
Seated Length	2.375" to 2.625"
Dimensional Outline	See *General Section*
Diameter	1.062" to 1.188"
Bulb	T9
Base	Small-Button Novar 9-Pin with Exhaust Tip (JEDEC No. E9-89)
Basing Designation for BOTTOM VIEW	9HP

Pin 1 – Do Not Use[e]
Pin 2 – Plate
Pin 3 – Do Not Use[e]
Pin 4 – Heater



Pin 5 – Heater
Pin 6 – Do Not Use[e]
Pin 7 – Plate
Pin 8 – Do Not Use[e]
Pin 9 – Cathode

DAMPER SERVICE

For operation in a 525-line, 30-frame system[f]

Maximum Ratings, *Design-Maximum Values:*

Peak Inverse Plate Voltage[a]	5000	max.	volts
Peak Plate Current	1100	max.	ma
Average Plate Current	175	max.	ma
Plate Dissipation	6.5	max.	watts

Characteristic, Instantaneous Value:

Tube Voltage Drop for plate ma = 350	32	volts

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

[b] The dc component must not exceed 900 volts.

[c] The dc component must not exceed 100 volts.

[d] Without external shield.

[e] Socket terminals 1, 3, 6, and 8 should not be used as tie points. It is recommended that the socket clips for these pins be removed to reduce the possibility of arc-over and to minimize leakage.

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

Twin Diode—High-Mu-Twin Triode

DUODECAR TYPE

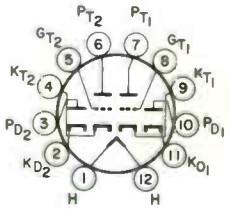
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.69	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200[a] max.	volts
Direct Interelectrode Capacitances:[b]		
Each Diode Unit:		
P_D to (K_D,H)	2.0	pf
K_D to (P_D,H)	5.5	pf
Each Triode Unit:		
Grid to plate	2.2	pf
Input: G_T to (K_T,H)	2.0	pf
Output: P_T to (K_T,H)	0.22	pf
G_T to P_D	0.08 max.	pf
G_{T1} to G_{T2}	0.01 max.	pf
P_{T1} to P_{T2}	0.48	pf

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	1.875"
Seated Length	1.250" to 1.500"
Diameter	1.062" to 1.188"
Dimensional Outline	See *General Section*
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC No. E12-70)
Basing Designation for BOTTOM VIEW	12DA

Pin 1 – Heater
Pin 2 – Cathode of Diode Unit No.2
Pin 3 – Plate of Diode Unit No.2
Pin 4 – Cathode of Triode Unit No.2
Pin 5 – Grid of Triode Unit No.2
Pin 6 – Plate of Triode Unit No.2
Pin 7 – Plate of Triode Unit No.1
Pin 8 – Grid of Triode Unit No.1
Pin 9 – Cathode of Triode Unit No.1
Pin 10 – Plate of Diode Unit No.1
Pin 11 – Cathode of Diode Unit No.1
Pin 12 – Heater



Characteristics, Class A_1 Amplifier (Each Triode Unit):

Plate Voltage	250	volts
Grid Voltage	-2.0	volts
Amplification Factor	100	
Plate Resistance (Approx.)	52700	ohms
Transconductance	1900	μmhos
Plate Current	1.2	ma

TRIODE UNITS — AMPLIFIER — Class A_1

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

Plate Voltage	330	volts
DC Grid Voltage:		
Negative	50	volts
Positive	0	volts
Plate Dissipation	1	watt

DIODE UNITS — Two

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

Plate Current	5 max.	ma

Characteristics, Instantaneous Value:

Plate Current for plate volts = 5	18	ma

[a] The dc component must not exceed 100 volts.
[b] Without external shield.

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:[o]		
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"

o Without external shield.

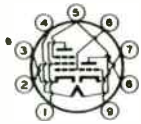
●: See next page.

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.

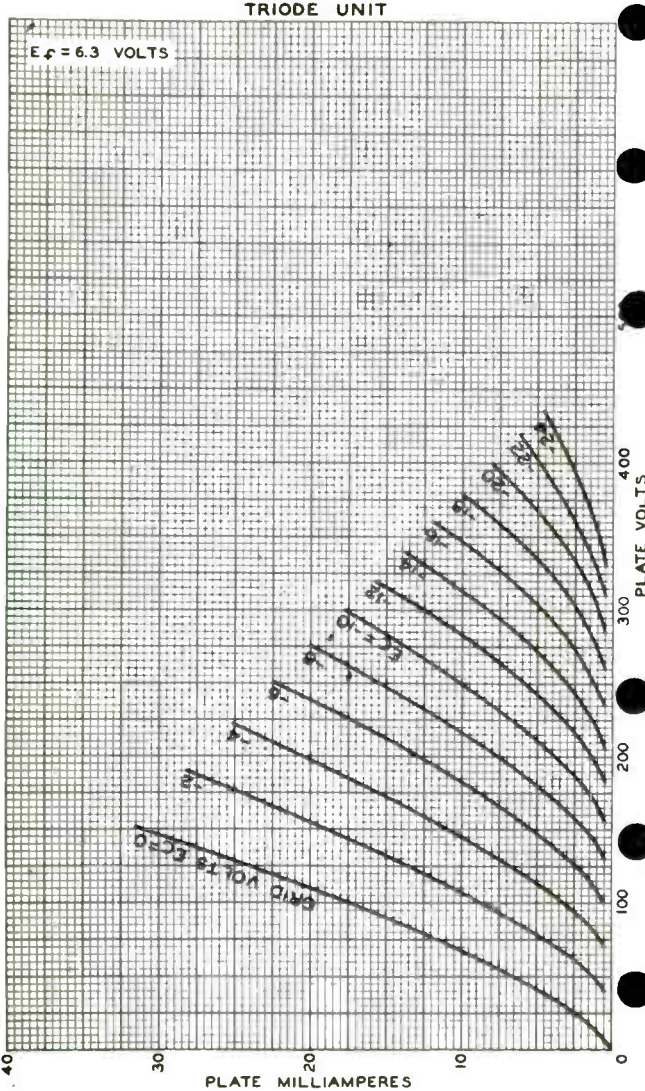
6AZ8

RCA

6AZ8

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



FEB. 2, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

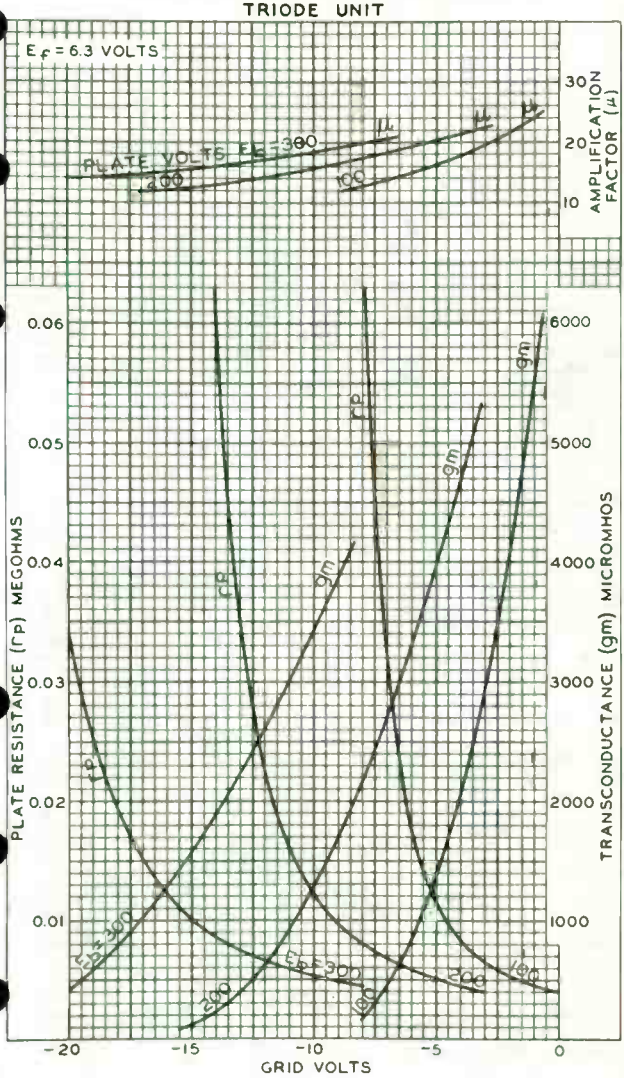
92CM-8520

RCA

6AZ8

AVERAGE CHARACTERISTICS

TRIODE UNIT



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AZ8

AVERAGE PLATE CHARACTERISTICS

PENTODE UNIT

6AZ8

E_f = 6.3 VOLTS
GRID-No. 3 VOLTS = 0
GRID-No. 2 VOLTS = 150

GRID-No. 1 VOLTS, E_{c1} = -2
-3
-4
-6
-10
E_{c1} = 0

PLATE MILLIAMPERES
0
5
10
15
20
25
30

PLATE VOLTS
100
200
300
400

FEB. 3, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

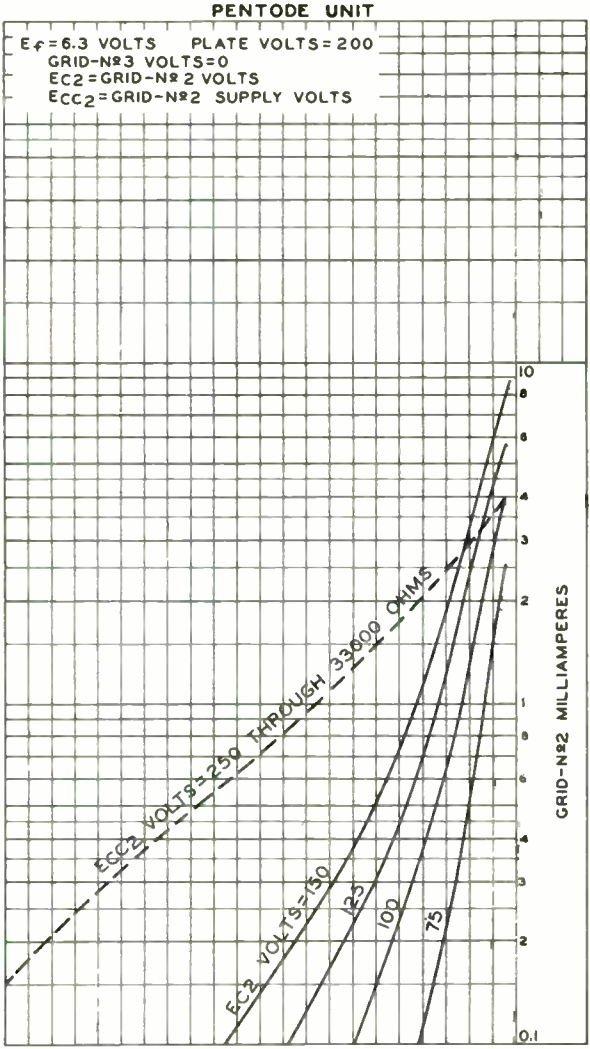
92CM-8525

RCA

6AZ8

AVERAGE CHARACTERISTICS

PENTODE UNIT



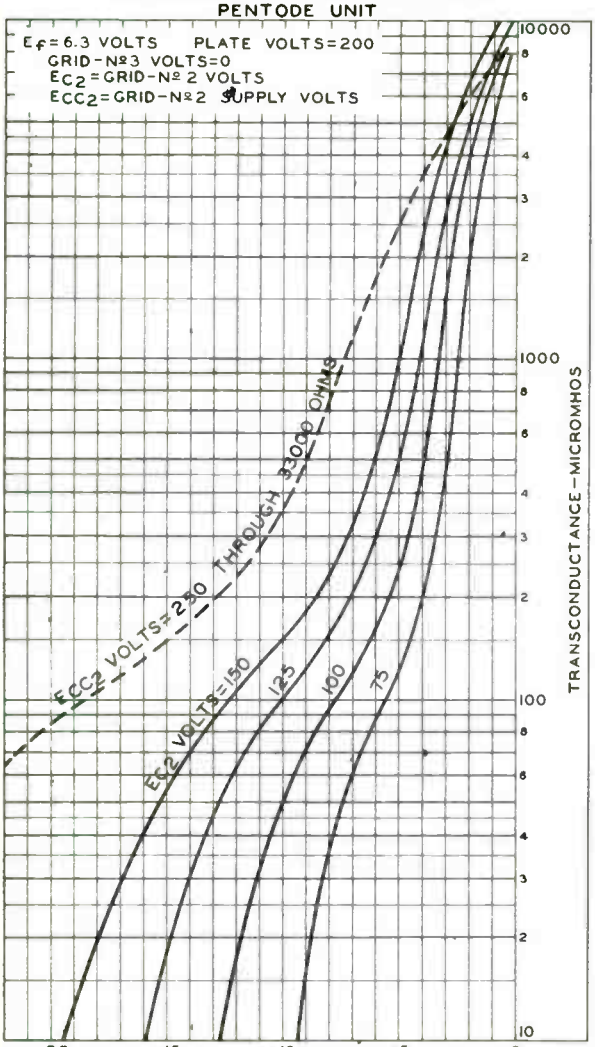
6AZ8

RCA

6AZ8

AVERAGE CHARACTERISTICS

PENTODE UNIT



FEB. 2, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

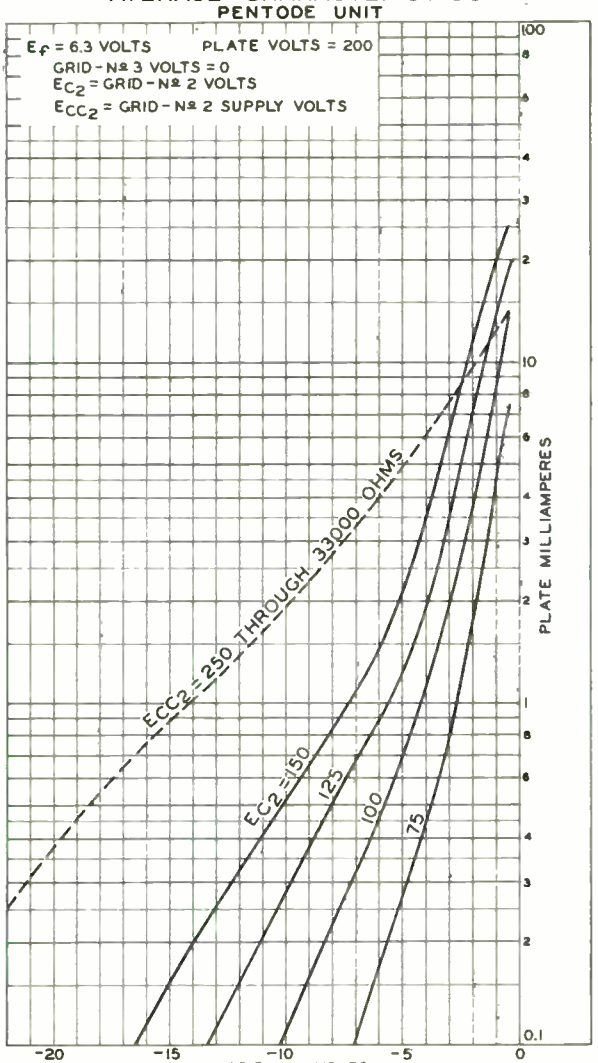
92CM-8522

RCA

6AZ8

AVERAGE CHARACTERISTICS

PENTODE UNIT



Half-Wave Vacuum Rectifier

NOVAR TYPE

For Television Damper Service

Electrical:

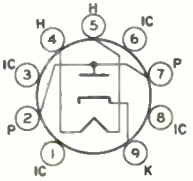
Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Maximum Heater-Cathode Voltage:		
Heater negative with respect to cathode:[a]		
Peak	5500	volts
DC component	900	volts
Heater positive with respect to cathode:		
Peak	300	volts
DC component	100	volts
Direct Interelectrode Capacitances (Approx.):[b]		
Plate to cathode and heater	4.4	pf
Cathode to plate and heater	6.0	pf
Heater to cathode	1.8	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.080"
Maximum Seated Length	2.700"
Diameter	1.062" to 1.188"
Dimensional Outline	See *General Section*
Bulb	T9

Bases (Alternates):
Small-Button Novar 9-Pin (JEDEC No. E9-75)
Small-Button Novar 9-Pin with Exhaust Tip (JEDEC No. E9-89)
Basing Designation for BOTTOM VIEW 9HP

Pin 1 – Do Not Use[c]
Pin 2 – Plate
Pin 3 – Do Not Use[c]
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Do Not Use[c]
Pin 7 – Plate
Pin 8 – Do Not Use[c]
Pin 9 – Cathode



DAMPER SERVICE

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[d]

Peak Inverse Plate Voltage[a]	5000	volts
Peak Plate Current	1000	ma
DC Plate Current	165	ma
Plate Dissipation	5.3	watts

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma = 250	32	volts

[a] 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.

[b] Without external shield.

[c] Socket terminals 1, 3, 6, and 8 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.

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

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

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:[o]		
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

[o] With no external shield.

← Indicates a change

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BA6

REMOTE-CUTOFF PENTODE

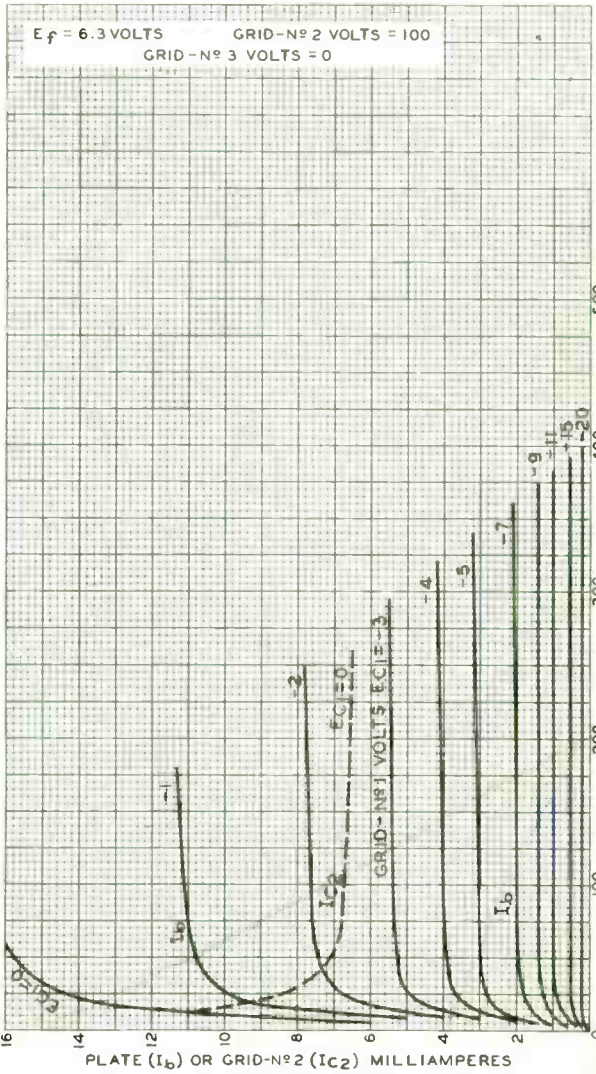
→ Plate Resistance (Approx.) . . .	0.25	1	. .	megohm
Transconductance	4300	4400	. . .	μmhos
Grid-No.1 Bias (Approx.) for transconductance of 40 μmhos .	−20	−20	. . .	volts
Plate Current.	10.8	11	. . .	ma.
Grid-No.2 Current.	4.4	4.2	. . .	ma.

→ Indicates a change

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BA6

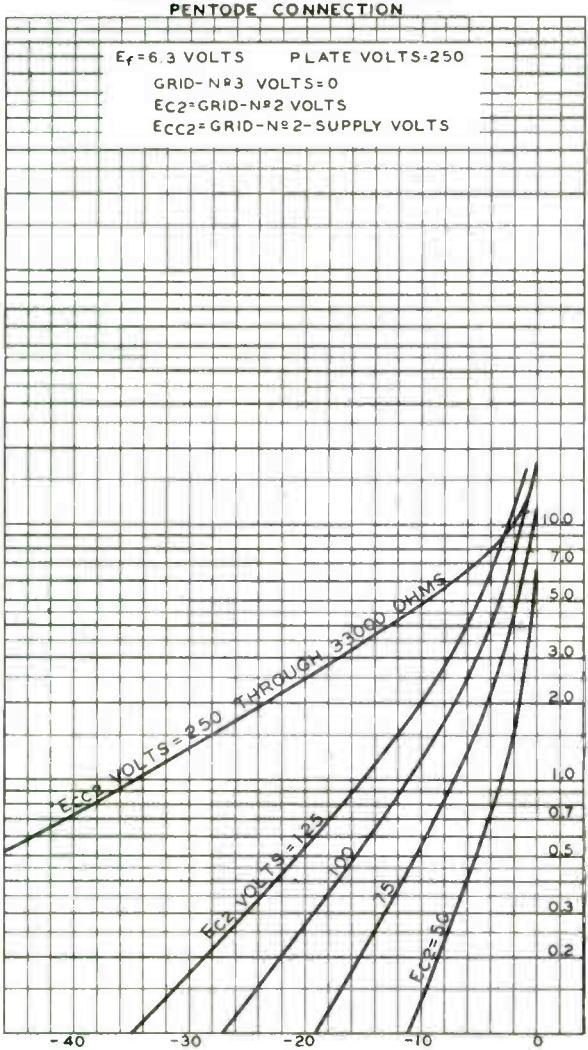
AVERAGE PLATE CHARACTERISTICS



RCA

6BA6

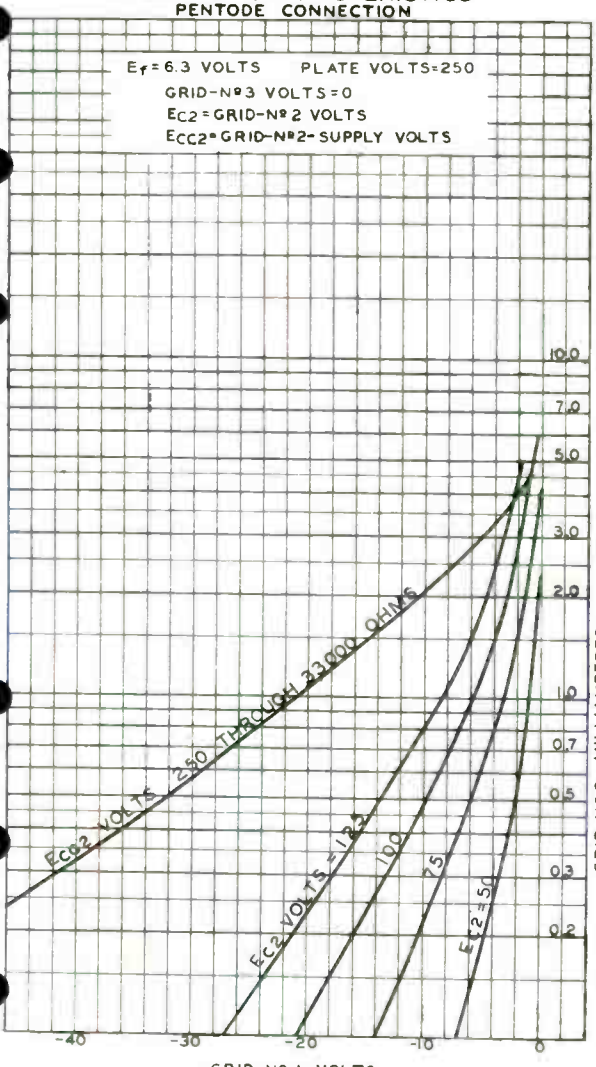
AVERAGE CHARACTERISTICS
PENTODE CONNECTION



RCA

6BA6

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



NOV. 12, 1945

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

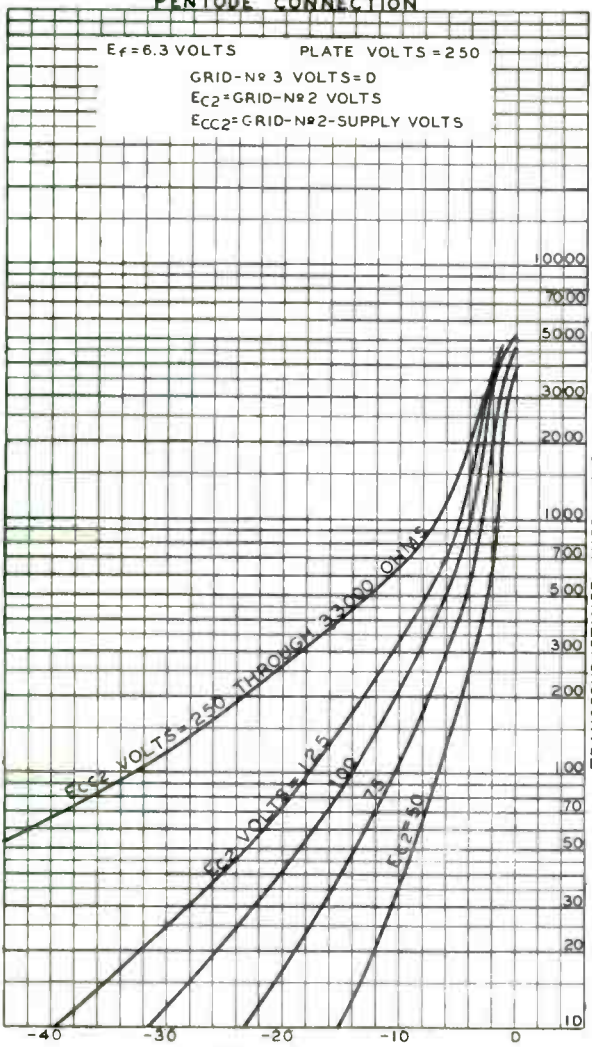
92CM-6620

6BA6

RCA

6BA6

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



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.

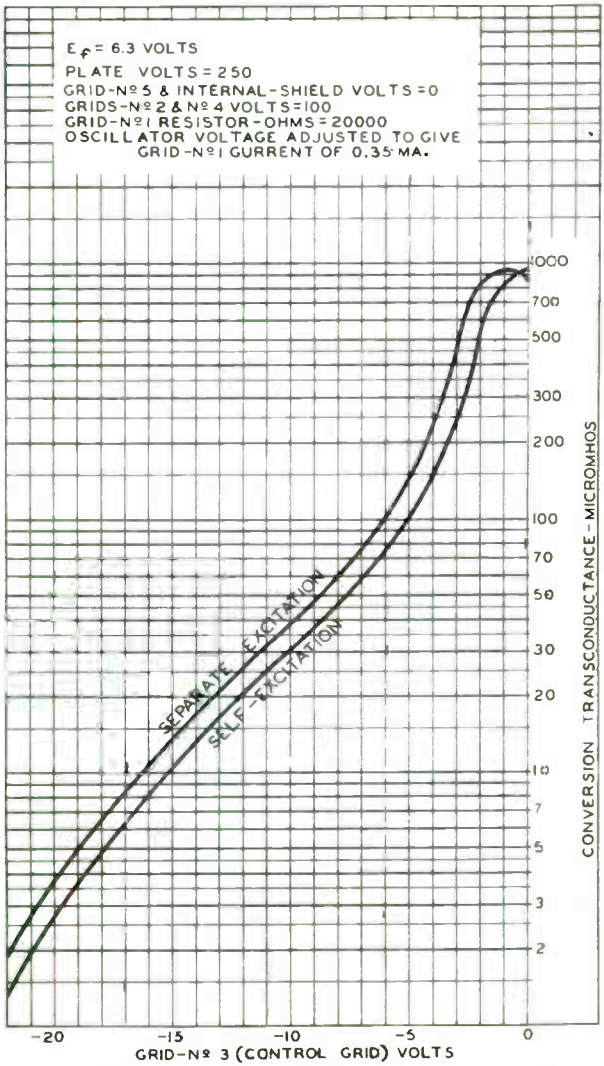
▲ Internal shield (Pins No.6 and No.8) connected directly to ground.

* 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

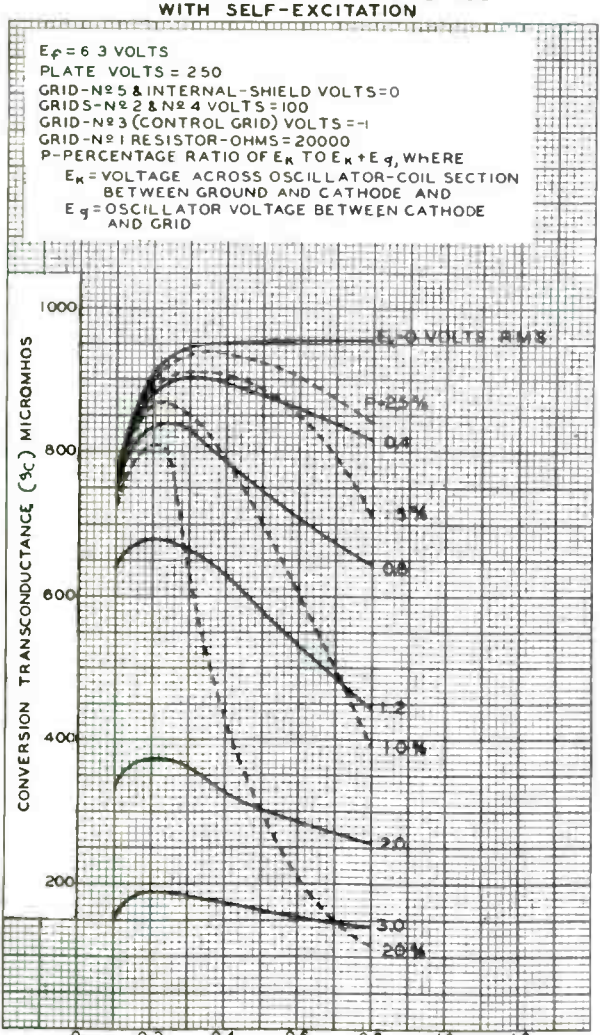
OPERATION CHARACTERISTICS



RCA

6BA7

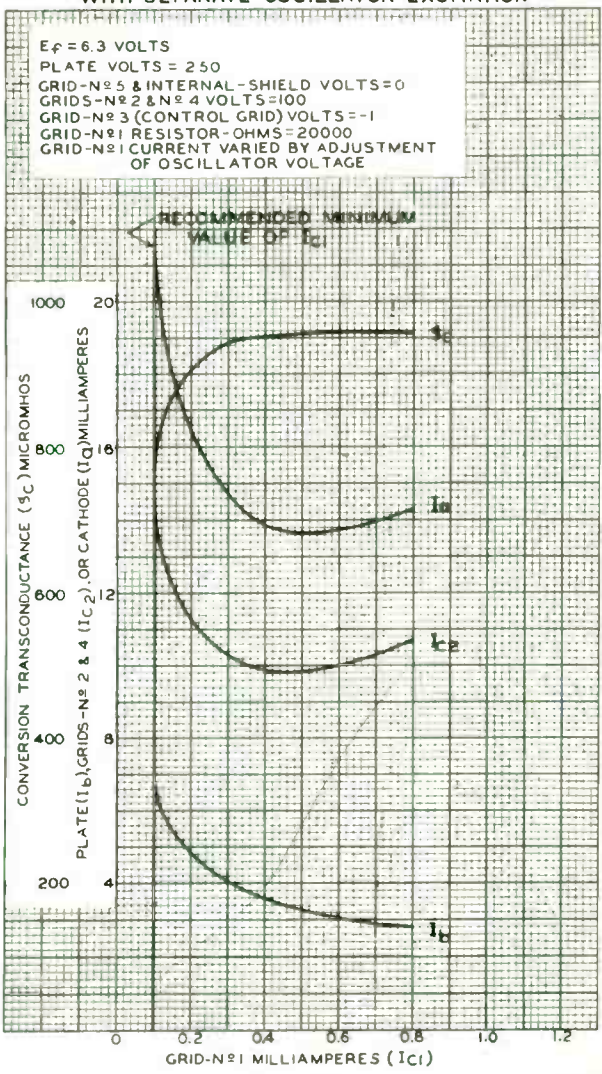
OPERATION CHARACTERISTICS
WITH SELF-EXCITATION



RCA

6BA7

OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION



RCA

6BA8-A

MEDIUM-MU TRIODE — SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage	6.3	ac or dc volts
Current	0.6	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.):

	Without External Shield	*With External Shield°*	
Triode Unit:			
Grid to plate	2.2	2.2	μμf
Grid to cathode and heater	2.5	2.7	μμf
Plate to cathode and heater	0.4	1.9	μμf
Pentode Unit:			
Grid No.1 to plate	0.04	0.03	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	10	10	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	3.6	4.5	μμf
Triode grid to pentode plate	0.016	0.006	μμf
Pentode grid No.1 to triode plate	0.006	0.003	μμf
Pentode plate to triode plate	0.15	0.023	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*		
Plate-Supply Voltage	200	65	200	volts
Grid-No.2 Supply Voltage	–	150	150	volts
Grid-No.1 Voltage	-8	0	-3	volts
Cathode Resistor	–	–	180	ohms
Amplification Factor	18	–	–	
Plate Resistance (Approx.)	6700	–	400000	ohms

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

6BA8-A

MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

	Triode Unit	*Pentode Unit*		
Transconductance	2700	–	9000	μmhos
Plate Current	8	42*	13	ma
Grid-No.2 Current	–	12.5*	3.5	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 μa	-16	–	-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"
Dimensional Outline	*See General Section*
Bulb	T6-1/2
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-GRID) SUPPLY VOLTAGE	–	300 max.	volts
GRID-No.2 VOLTAGE	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Negative bias value	–	50 max.	volts
Positive bias value	–	0 max.	volts
PLATE DISSIPATION	2 max.	3.25 max.	watts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts	–	1 max.	watt

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

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

6BA8-A

MEDIUM-MU TRIODE—SHARP-CUTOFF PENTODE

	Triode Unit	*Pentode Unit*	
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

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

▲ The dc component must not exceed 100 volts.

OPERATING CONSIDERATIONS

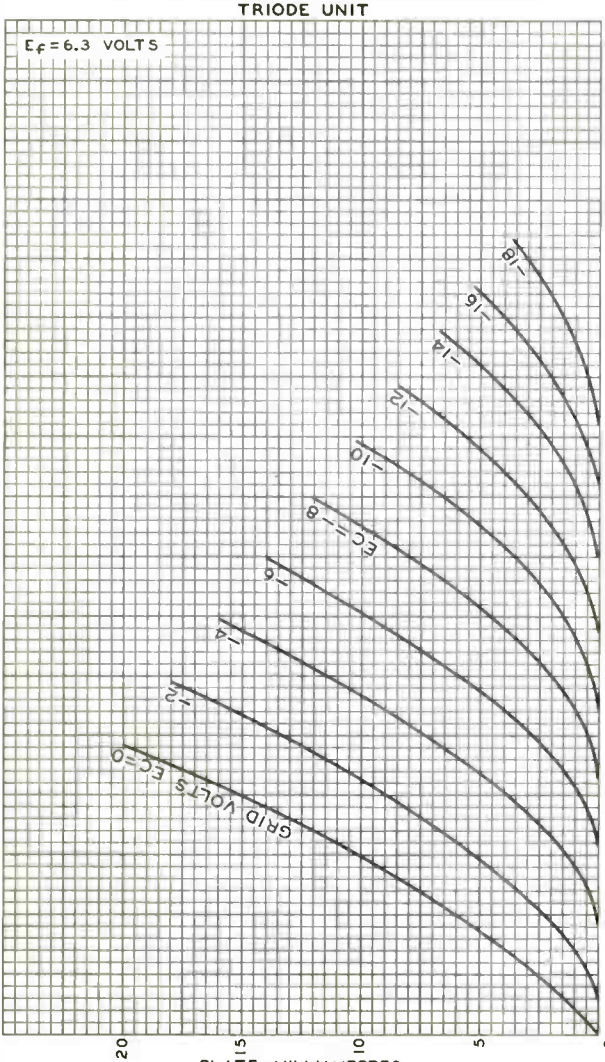
Because the internal shield is connected to the cathode and grid No.3, the impedance in the cathode circuit should be kept as low as possible to minimize cross-coupling effects.

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

6BA8-A

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT

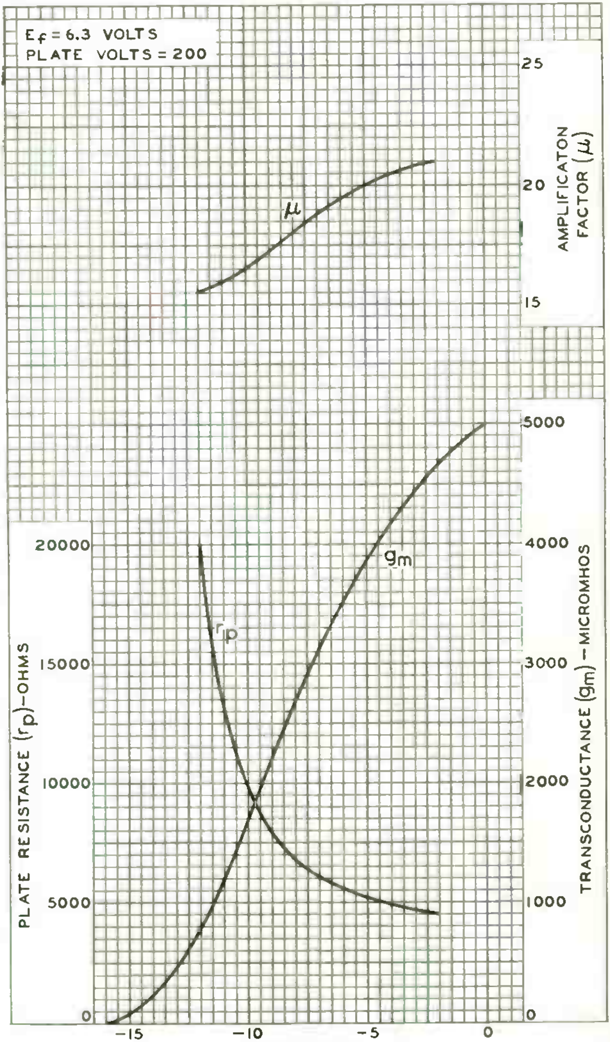


ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-9338

RCA

6BA8-A

AVERAGE CHARACTERISTICS
TRIODE UNIT



ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM—9339

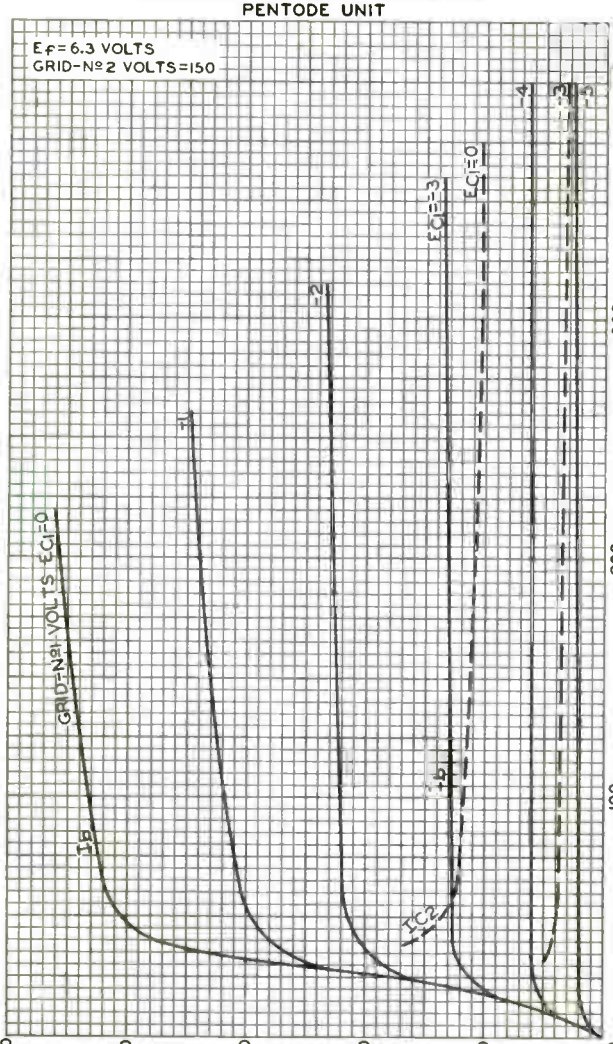
6BA8-A

RCA

6BA8-A

AVERAGE CHARACTERISTICS

PENTODE UNIT



ELECTRON TUBE DIVISION

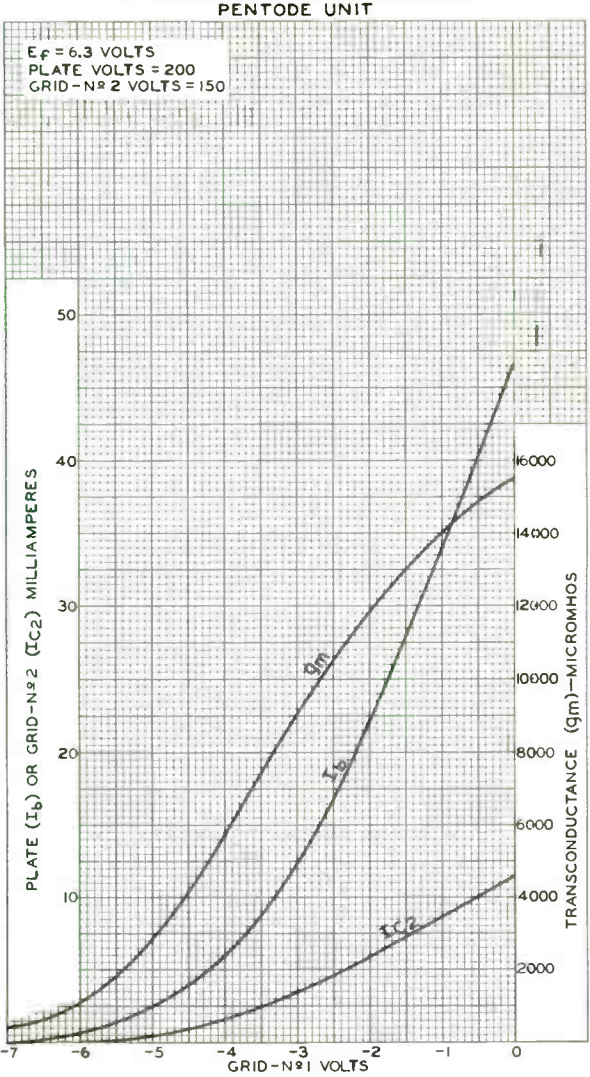
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9173

RCA

6BA8-A

AVERAGE CHARACTERISTICS
PENTODE UNIT



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

92CM-8646

Medium-Mu Triode—
Sharp-Cutoff Twin Pentode

DUODECAR TYPE

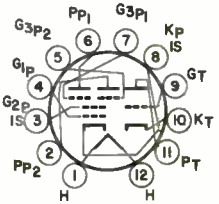
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6[a]	volts
Current at heater volts = 6.3	0.600[b]	amp
Warm-up time (Average)	11	sec
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[c] max.	volts
Direct Interelectrode Capacitances:[d]		
Triode Unit:		
Grid to plate	2.0	pf
Input: G_T to (K_T,H)	2.0	pf
Output: P_T to (K_T,IS,H)	1.9	pf
Each Pentode Unit:		
$G3_P$ to P_P	2.0	pf
$G3_P$ to all other electrodes	3.6	pf
$G1_P$ to all other electrodes	6.0	pf
P_P to all other electrodes	3.0	pf
$G3_{P1}$ to $G3_{P2}$	0.026 max.	pf

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2.375"
Seated Length	1.750" to 2.000"
Diameter	1.062" to 1.188"
Dimensional Outline	See *General Section*
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC E12-70)
Basing Designation for BOTTOM VIEW	12ER

Pin 1 – Heater
Pin 2 – Plate of Pentode Unit No.2
Pin 3 – Pentodes Grid No.2, Internal Shield
Pin 4 – Pentodes Grid No.1
Pin 5 – Grid No.3 of Pentode Unit No.2
Pin 6 – Plate of Pentode Unit No.1
Pin 7 – Grid No.3 of Pentode Unit No.1
Pin 8 – Pentodes Cathode, Internal Shield
Pin 9 – Triode Grid
Pin 10 – Triode Cathode
Pin 11 – Triode Plate
Pin 12 – Heater



Characteristics, Class A_1 Amplifier:

	Triode Unit	Pentode Units: Each Separately[e]		Pentode Units: Both Operating[f]		
Plate Voltage	250	100	100	100	100	volts
Grid-No.3 Voltage	–	0	0	-10	0	volts
Grid-No.2 Voltage	–	67.5	67.5	67.5	67.5	volts
Grid-No.1 Voltage	-11	0	g	g	g	volts
Amplification Factor	18	–	–	–	–	
Grid No.3 Transconductance	–	–	450	–	–	μmhos
Grid No.1 Transconductance	1800	1700	–	–	–	μmhos
Plate Current	5	–	2.5	0	2.5	ma
Grid No.2 Current	–	–	–	7	4.4	ma
Grid-No.3 Voltage (Approx.) for plate μa = 100	–	–	-3.2	–	–	volts
Grid-No.1 Voltage (Approx.) for plate μa = 100	-18	2.3	–	–	–	volts

AMPLIFIER — Class A_1

	Triode Unit	Pentode Unit	
Maximum Ratings, *Design-Maximum Values:*			
Plate Voltage	300 max.	300 max.	volts
Grid-No.3 (Suppressor-Grid) Voltage:			
Peak positive value	–	50 max.	volts
DC negative value	–	50 max.	volts
DC positive value	–	3 max.	volts
Grid-No.2 (Screen-Grid) Voltage	–	150 max.	volts
Grid-No.1 (Control-Grid) Voltage:			
Negative-bias value	–	50 max.	volts
Cathode Current	20	12 max.	ma
Grid-No.2 Input	–	0.75 max.	watts
Plate Dissipation (Each Plate)	1.5	1.1 max.	watts
Maximum Circuit Values:			
Grid-No.3-Circuit Resistance (Each Grid)	–	0.5 max.	megohm
Grid-No.1-Circuit Resistance:			
For fixed-bias operation	0.25 max.	0.5 max.	megohm
For cathode-bias operation	1 max.	0.5 max.	megohm

[a] For parallel heater operation.
[b] For series heater operation current must be limited to 0.600 ± 0.040 amperes.
[c] The dc component must not exceed 100 volts.
[d] Without external shield.
[e] Plate and grid 3 of opposite unit grounded.
[f] Voltages and plate current apply to each section.
[g] Adjusted to give a dc grid-No.1 current of 100 microamperes.

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.

RCA

6BC4

MEDIUM-MU TRIODE

Maximum Circuit Values (For maximum rated conditions):

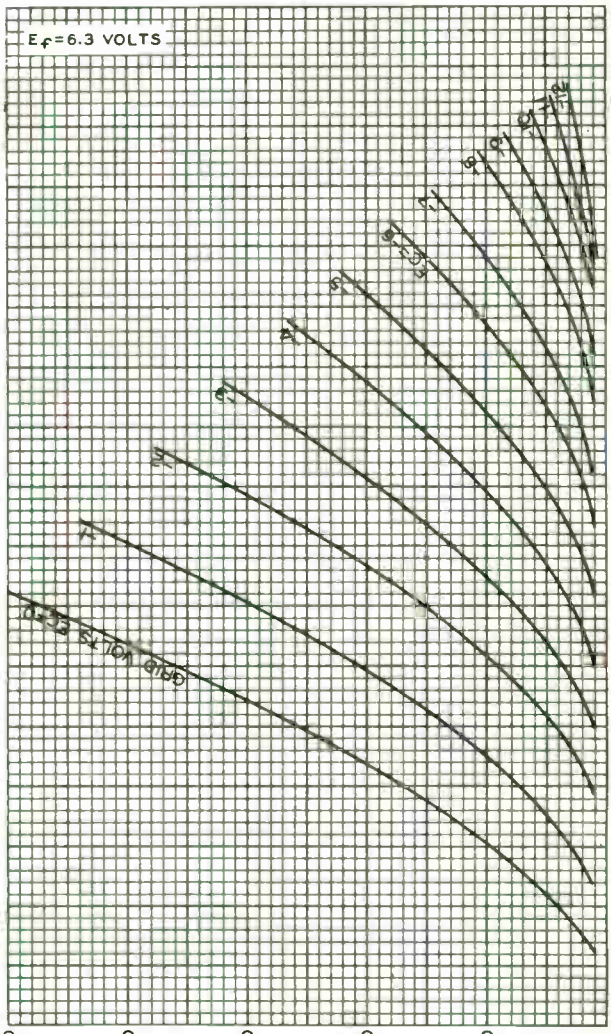
Grid-Circuit Resistance:

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

RCA

6BC4

AVERAGE PLATE CHARACTERISTICS



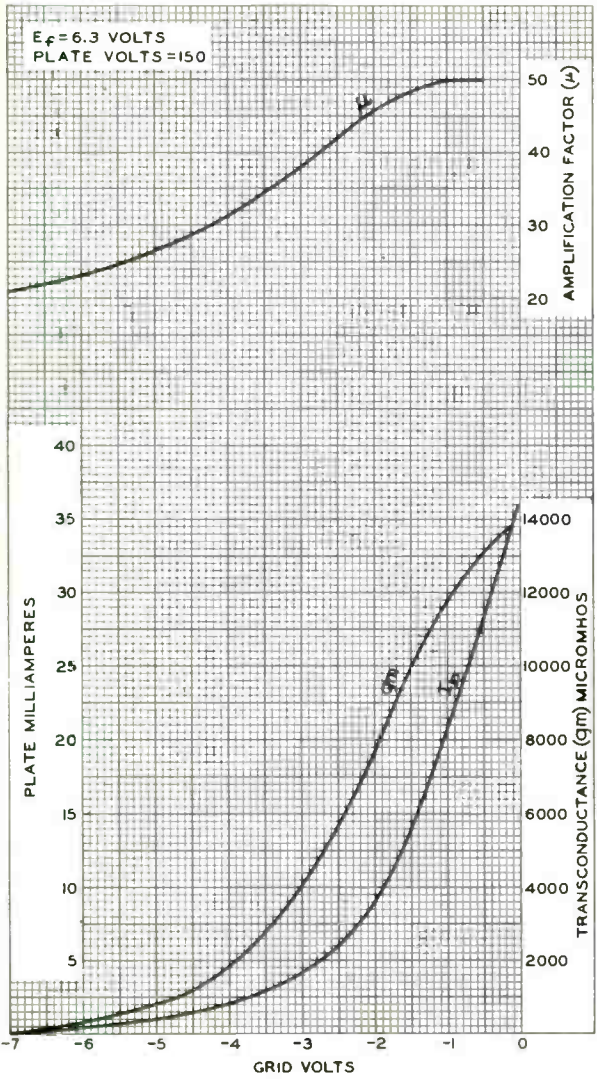
FEB. 12, 1954

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8241

6BC4

AVERAGE CHARACTERISTICS



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

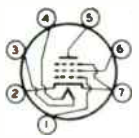
Direct Interelectrode Capacitances:

	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
Gr'd-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

RCA

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.):[o]		
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

[o] 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

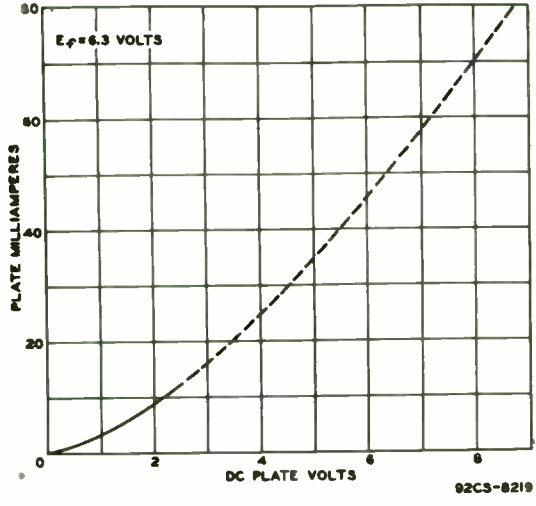
	Note	Min.	Av.	Max.	
Plate Current (2) (Each Unit)	1,3	18	35	65	ma
Ratio of Plate Current of Unit No.3 to Plate Current of Unit No.1 .	1,3	0.77	1	1.3	

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

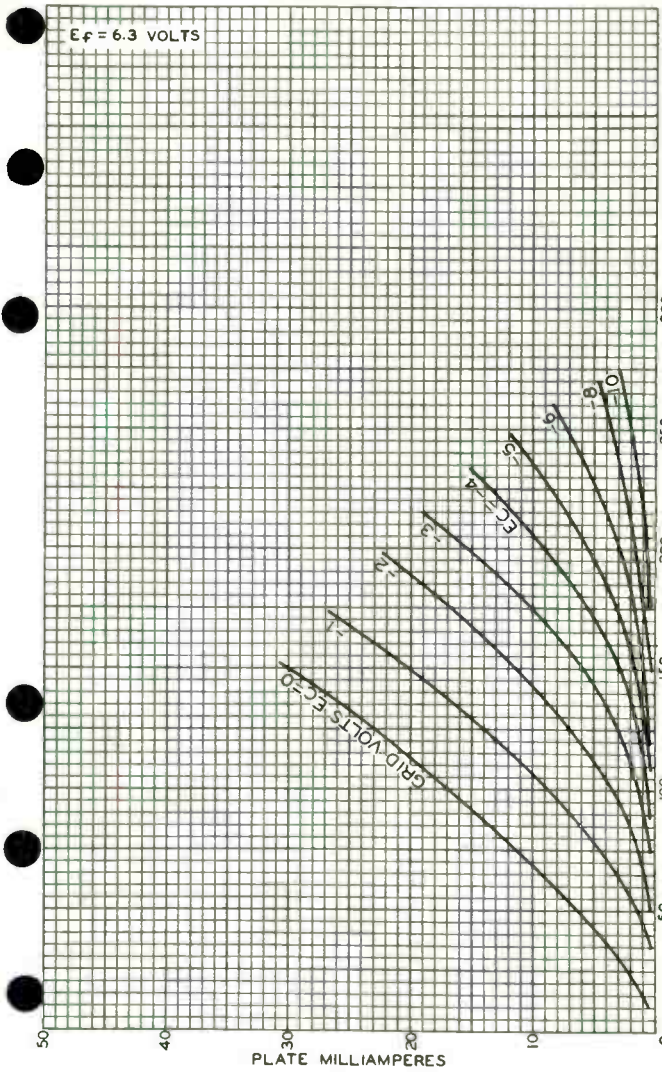
▲ The dc component must not exceed 100 volts.

TENTATIVE DATA

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BC8

AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT



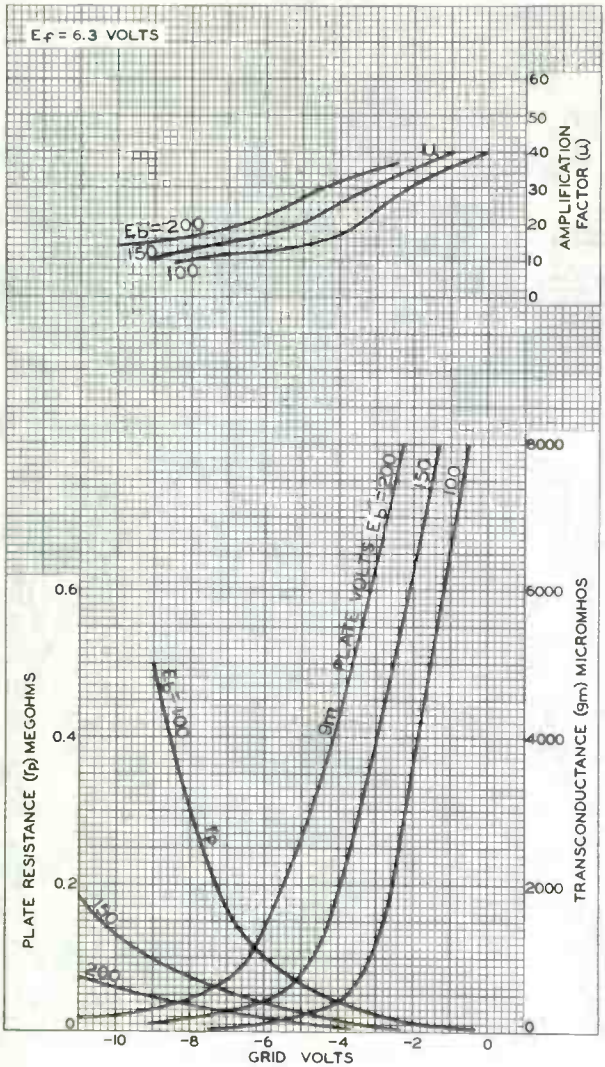
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8789

RCA

6BC8

AVERAGE CHARACTERISTICS
FOR EACH UNIT

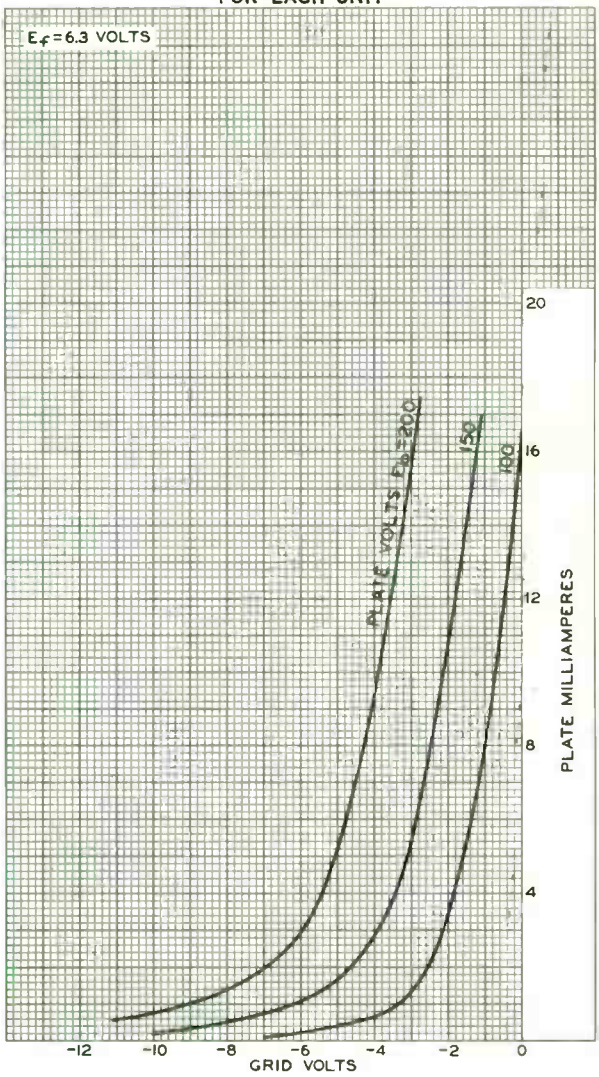


TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8790R1

6BC8

AVERAGE CHARACTERISTICS
FOR EACH UNIT



6BD11

Dual Triode—Sharp-Cutoff Pentode

Dual Triode Has High-Mu & Medium-Mu Units

DUODECAR TYPE

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at 6.3 volts	1.050	amp
Maximum Heater Cathode Voltage:		
Heater negative with respect to cathode:		
Peak	200	volts
Heater positive with respect to cathode:		
Peak	200	volts
DC component	100	volts
Direct Interelectrode Capacitances: (Without external shield)		
Triode Unit No.1		
Grid to plate	1.9	pf
Input: G_{T1} to (K_{T1}, K_{T2} + IS, Kp + G3p + IS, H)	3.0	pf
Output: P_{T1} to (K_{T1}, K_{T2} + IS, Kp + G3p + IS, H)	2.2	pf
Triode Unit No.2		
Grid to plate	3.6	pf
Input: G_{T2} to (K_{T2} + IS, Kp + G3p + IS, H)	2.4	pf
Output: P_{T2} to (K_{T2} + IS, Kp + G3p + IS, H)	3.8	pf
Pentode Unit		
Grid No.1 to plate	0.13	pf
Input: G1p to (K_{T2} + IS, Kp + G3p + IS, G2p, H)	11.0	pf
Output: Pp to (K_{T2} + IS, Kp + G3p + IS, G2p, H)	4.6	pf
Pentode plate to plate of triode No.2	0.045 max.	pf
Plate of triode No.1 to plate of triode No.2	0.075 max.	pf

Characteristics, Class A_1 Amplifier:

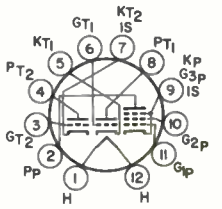
	Triode Units No.1	No.2	
Plate Supply Voltage	200	200	volts
Grid Voltage	−2	−	volts
Cathode Resistor	−	220	ohms
Amplification Factor	68	41	
Plate Resistance (Approx.)	12400	9400	ohms
Transconductance	5500	4400	μmhos
Plate Current	7	9.2	ma
Grid Voltage for plate μa = 100	−5.5	−6.5	volts

	Pentode Unit		
Plate Supply Voltage	35	135	volts
Grid-No.2 Supply Voltage	135	135	volts
Grid-No.1 Voltage	0[a]	−	volts
Cathode Resistor	−	100	ohms
Plate Resistance (Approx.)	−	45000	ohms
Transconductance	−	10400	μmhos
Plate Current	34[b]	17	ma
Grid-No.2 Current	13[b]	4	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100	−	−6	volts

Mechanical:

Operating Position	Any
Types of Cathodes	Coated Unipotential
Maximum Overall Length	2.375"
Seated Length	1.750" to 2.000"
Diameter	1.062" to 1.188"
Dimensional Outline (JEDEC 9-58)	See *General Section*
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC No.E12-70)
Basing Designation for BOTTOM VIEW	12DP

Pin 1 – Heater
Pin 2 – Pentode Plate
Pin 3 – Grid of Triode Unit No.2
Pin 4 – Plate of Triode Unit No.2
Pin 5 – Cathode of Triode Unit No.1
Pin 6 – Grid of Triode Unit No.1
Pin 7 – Cathode of Triode Unit No.2, Internal Shield
Pin 8 – Plate of Triode Unit No.1
Pin 9 – Pentode Cathode, Pentode Grid No.3, Internal Shield
Pin 10 – Pentode Grid No.2
Pin 11 – Pentode Grid No.1
Pin 12 – Heater



AMPLIFIER — Class A[1]

Maximum Ratings, *Design-Maximum Values:*

	Triode Units No.1	No.2	
Plate Voltage	330	330	volts
Grid (Control-Grid) Voltage:			
Positive-bias value	0	0	volts
Plate Dissipation	1.5	2	watts
Pentode Unit			
Plate Voltage	330		volts
Grid-No.2 (Screen-Grid) Supply Voltage	330		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		volts
Grid-No.2 Input:			
For grid-No.2 voltages up to 165 volts	1.1		watts
For grid-No.2 voltages between 165 and 330 volts	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section		
Plate Dissipation	4		watts

Maximum Circuit Values: *(Values are for Each Unit)*

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

[a] Applied for short interval (2 sec. max.) so as not to damage tube.
[b] Value measured by recurrent waveform such that maximum ratings of tube are not exceeded.

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

Half-Wave Vacuum Rectifier

DUODECAR TYPE

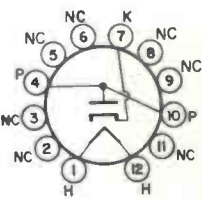
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode[a]	5000[b] max.	volts
Heater positive with respect to cathode	300[c] max.	volts
Direct Interelectrode Capacitances (Approx.):[d]		
P to (K,H)	10	pf
K to (P,H)	8.0	pf
H to K	3.4	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2.875"
Seated Length	2.250" to 2.500"
Diameter	1.062" to 1.188"
Dimensional Outline	See *General Section*
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC No. E12-70)
Basing Designation for BOTTOM VIEW	12BL

Pin 1 – Heater
Pin 2 – No Internal Connection
Pin 3 – Same as Pin 2
Pin 4 – Plate
Pin 5 – Same as Pin 2
Pin 6 – Same as Pin 2
Pin 7 – Cathode
Pin 8 – Same as Pin 2
Pin 9 – Same as Pin 2
Pin 10 – Plate
Pin 11 – Same as Pin 2
Pin 12 – Heater



DAMPER SERVICE

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[e]

Peak Inverse Plate Voltage[a]	5000 max.	volts
Peak Plate Current	1200 max.	ma
DC Plate Current	200 max.	ma
Plate Dissipation	6.5 max.	watts

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma. = 350	25	volts

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

[b] The dc component must not exceed 900 volts.

[c] The dc component must not exceed 600 volts.

[d] Without external shield.

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

Pentagrid Converter

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

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

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield*[a]	
Grid No.3 to all other electrodes (RF input)	7	7	μμf
Plate to all other electrodes (Mixer input)	8	13	μμf
Grid No.1 to all other electrodes (Oscillator input)	5.5	5.5	μμf
Grid No.3 to plate	0.3 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 & grid No.5	3	3	μμf
Cathode & grid No.5 to all other electrodes except grid No.1	15	20	μμf

Mechanical:

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

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

Pin 5 – Plate
Pin 6 – Grid No.2, Grid No.4
Pin 7 – Grid No.3

CONVERTER

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	330 max.	volts
GRID-No.3 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	55 max.	volts
Positive-bias value	0 max.	volts
GRIDS-No.2 & No.4 (SCREEN-GRID) SUPPLY VOLTAGE	330 max.	volts
GRIDS-No.2 & No.4 VOLTAGE	110 max.	volts

→ Indicates a change.

6BE6

CATHODE CURRENT	15.5	max.	ma
GRIDS-No.2 & No.4 INPUT	1.1	max.	watts
PLATE DISSIPATION	1.1	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[b]	max.	volts

Characteristics:

With separate excitation[c]

Plate Voltage	100	250	volts
Grid-No.3 Voltage	-1.5	-1.5	volts
Grids-No.2 & No.4 Voltage	100	100	volts
RMS Grid-No.1 (Oscillator Grid) Voltage	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 (μmhos) =			
10.	-30	-30	volts
100	-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
Cathode Current	10.1	10.2	ma

Oscillator Characteristics (Not Oscillating):

With grids No.2 & No.4 connected to plate

Plate and Grids-No.2 & No.4 Voltage	100	volts
Grid-No.3 Voltage	0	volts
Grid-No.1 Voltage	0	volts
Amplification Factor between grid No.1 and grids No.2 & No.4 connected to plate	20	
Transconductance between grid No.1 and grids No.2 & No.4 connected to plate	7250	μmhos
Catnode Current	25	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10.	-11	volts

[a] With external shield JEDEC No.316 connected to cathode.

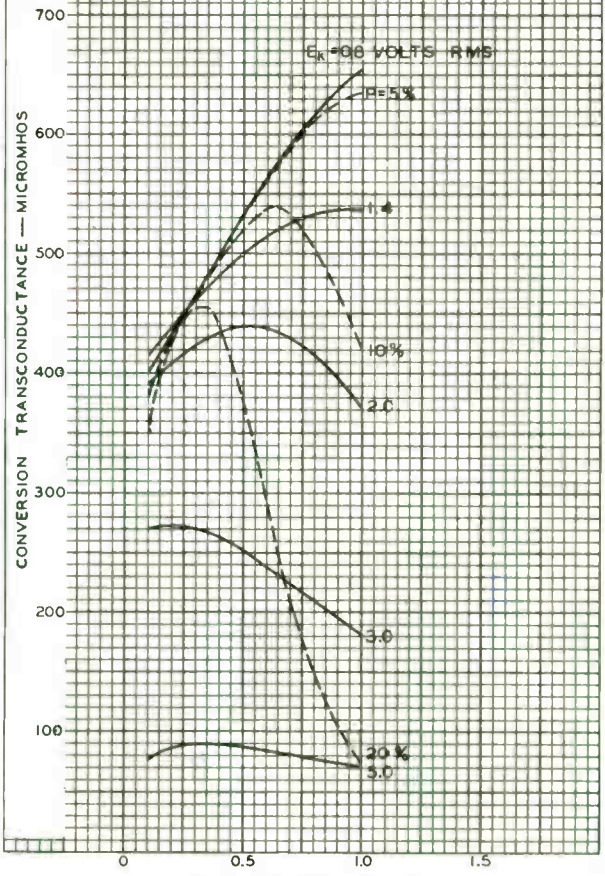
[b] The dc component must not exceed 100 volts.

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

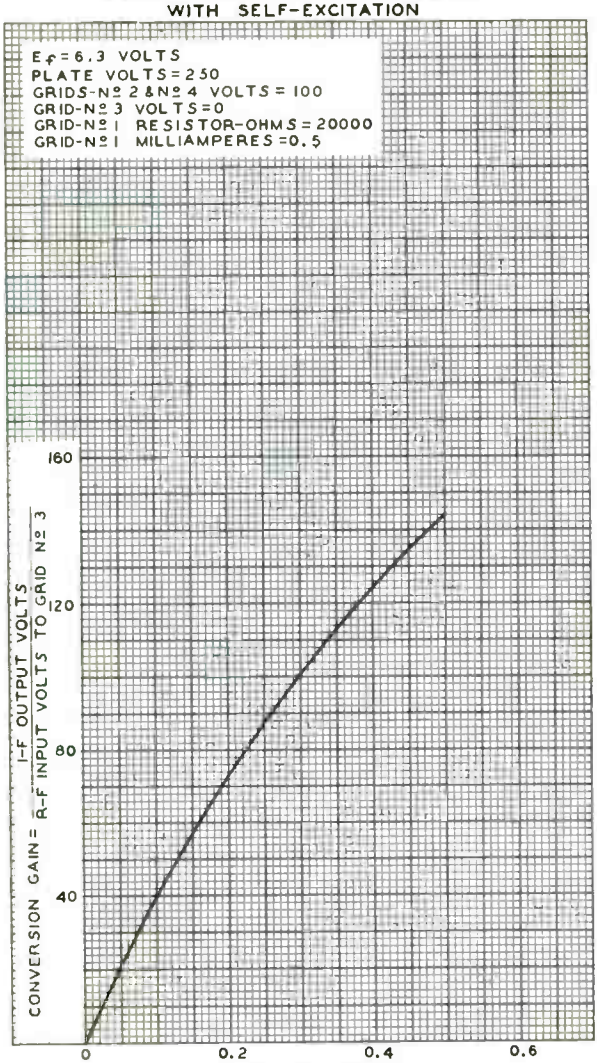
6BE6

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 & CATHODE
E_g = OSCILLATOR VOLTAGE BETWEEN CATHODE & GRID



6BE6
OPERATION CHARACTERISTIC
WITH SELF-EXCITATION



OCT. 16, 1945

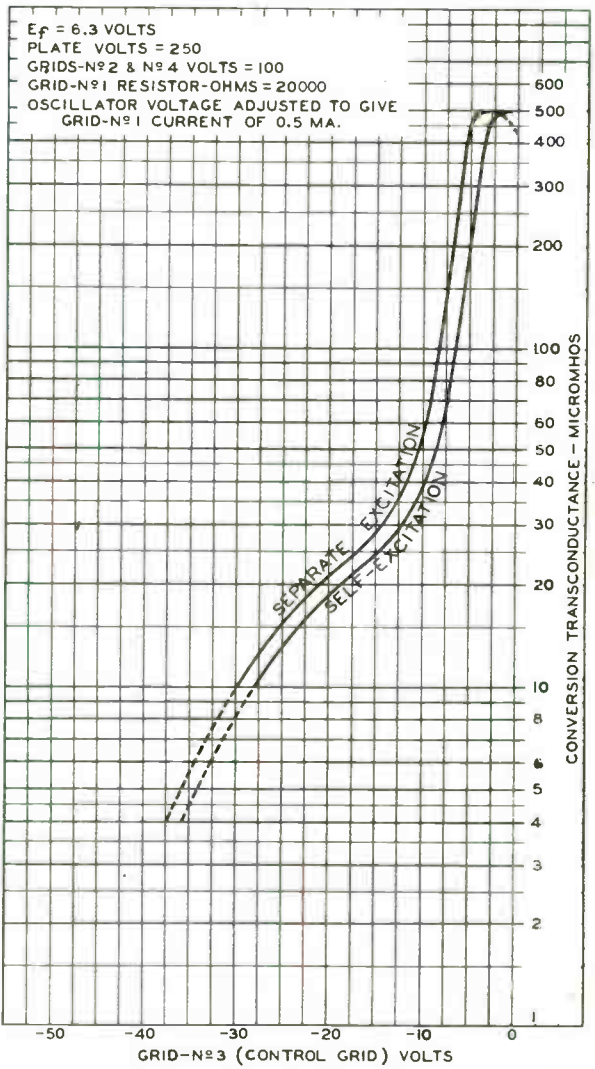
RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM - 6605

RCA

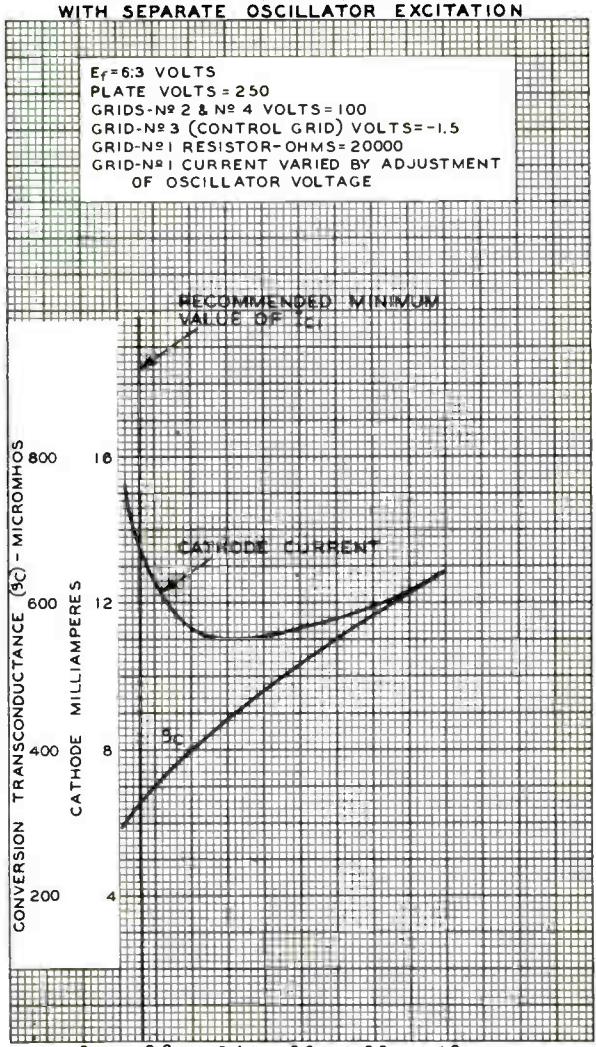
6BE6

OPERATION CHARACTERISTICS



6BE6

OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION



Beam Power Tube—
Sharp-Cutoff Pentode

DUODECAR TYPE

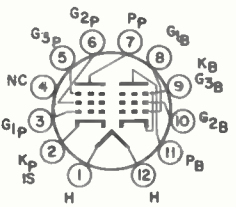
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ±0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances (Approx.):[b]		
Beam Power Unit:		
$G1_B$ to P_B	0.24	pf
Input: $G1_B$ to (K_B+$G3_B$,$G2_B$,IS,H)	13.0	pf
Output: P_B to (K_B+$G3_B$,$G2_B$,IS,H)	10.0	pf
Pentode Unit:		
$G1_P$ to P_P	0.036	pf
$G3_P$ to P_P	3.2	pf
$G1_P$ to (K_P+IS,G2p,$G3_P$,H)	6.5	pf
$G3_P$ to (K_P+IS,$G1_P$,G2p,P_P,H)	8.0	pf
$G1_P$ to $G3_P$	0.11	pf
P_B to P_P	0.13	pf

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2.375"
Seated Length	1.750" to 2.000"
Diameter	1.062" to 1.188"
Dimensional Outline	See *General Section*
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC No.E12-70)
Basing Designation for BOTTOM VIEW	12EZ

Pin 1 – Heater
Pin 2 – Pentode Cathode, Internal Shield
Pin 3 – Pentode Grid No.1
Pin 4 – No Internal Connection
Pin 5 – Pentode Grid No.3
Pin 6 – Pentode Grid No.2
Pin 7 – Pentode Plate
Pin 8 – Beam Power Grid No.1
Pin 9 – Beam Power Cathode, Beam Power Grid No.3
Pin 10 – Beam Power Grid No.2
Pin 11 – Beam Power Plate
Pin 12 – Heater



6BF11

Characteristics, Class A_1 Amplifier (Pentode Unit):

Plate Supply Voltage	150	volts
Grid-No.3 Supply Voltage	*Connected to cathode at socket*	
Grid-No.2 Supply Voltage	100	volts
Cathode Resistor	560	ohms
Plate Resistance (Approx.)	0.15	megohm
Transconductance, Grid No.1 to Plate	1000	μmhos
Transconductance, Grid No.3 to Plate	400	μmhos
Plate Current	1.3	ma
Grid-No.2 Current	2	ma
Grid-No.1 Voltage (Approx.) for plate μa=10	-4.5	volts
Grid-No.3 Voltage (Approx.) for plate μa=10	-4.5	volts

PENTODE UNIT — FM SOUND DETECTOR

Maximum Ratings, *Design-Maximum Values:*

Plate Voltage	330 max. volts
Grid-No.3 (Suppressor-Grid) Voltage	28 max. volts
Grid-No.2 (Screen-Grid) Supply Voltage	330 max. volts
Grid-No.2 Voltage	*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 165 volts	1.1 max. watts
For grid-No.2 voltages between 165 and 330 volts	*See Grid-No.2 Input Rating Chart* at front of Receiving Tube Section

BEAM POWER UNIT — AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

Plate Voltage	165 max. volts
Grid-No.2 (Screen-Grid) Voltage	150 max. volts
Average Cathode Current	65 max. ma
Plate Dissipation	6.5 max. watts
Grid-No.2 Input	1.8 max. watts

Typical Operation and Characteristics:

Plate Voltage	145	volts
Grid-No.2 Voltage	110	volts
Grid-No.1 (Control-Grid) Voltage	-6	volts
Peak AF Grid-No.1 Voltage	6	volts
Zero-Signal Plate Current	36	ma
Max.-Signal Plate Current	40	ma
Zero-Signal Grid-No.2 Current	3	ma
Max.-Signal Grid-No.2 Current	9	ma
Plate Resistance (Approx.)	30000	ohms
Transconductance	8600	μmhos
Load Resistance	3000	ohms
Total Harmonic Distortion	10	per cent
Max.-Signal Power Output	2.4	watts

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

Half-Wave Vacuum Rectifier

NOVAR TYPE
For Television Damper Service

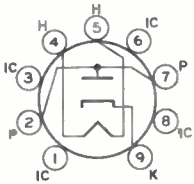
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.600	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode[a]	5500[b] max.	volts
Heater positive with respect to cathode	300[c] max.	volts
Direct Interelectrode Capacitances (Approx):[d]		
P to (H,K)	6.5	pf
K to (P,H)	9.0	pf
Heater to cathode	2.8	pf

Mechanical:

Mounting Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.005"
Seated Length	2.375" to 2.625"
Diameter	1.062" to 1.188"
Dimensional Outline	See *General Section*
Bulb	T9
Socket	Novar 9-Contact
Base	Small-Button Novar 9-Pin with Exhaust (JEDEC No.E9-89)
Basing Designation for BOTTOM VIEW	9HP

Pin 1 – Do Not Use[e]
Pin 2 – Plate
Pin 3 – Do Not Use[e]
Pin 4 – Heater



Pin 5 – Heater
Pin 6 – Do Not Use[e]
Pin 7 – Plate
Pin 8 – Do Not Use[e]
Pin 9 – Cathode

DAMPER SERVICE

For operation in a 525-line, 30-frame system[f]

Maximum Ratings, *Design-Maximum Values:*

Peak Inverse Plate Voltage[a]	5500	max.	volts
Peak Plate Current	1100	max.	ma
Average Plate Current	180	max.	ma
Plate Dissipation	6.8	max.	watts

Characteristic, Instantaneous Value:

Tube Voltage Drop for plate ma = 350	32	volts

[a] 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.

[b] The dc component must not exceed 900 volts.

[c] The dc component must not exceed 100 volts.

[d] Without external shield.

[e] Socket terminals 1, 3, 6, and 8 should not be used as tie points. It is recommended that the socket clips for these pins be removed to reduce the possibility of arc-over and to minimize leakage.

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

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

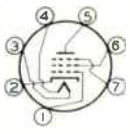
Characteristics, Class A_1 Amplifier:

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.

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

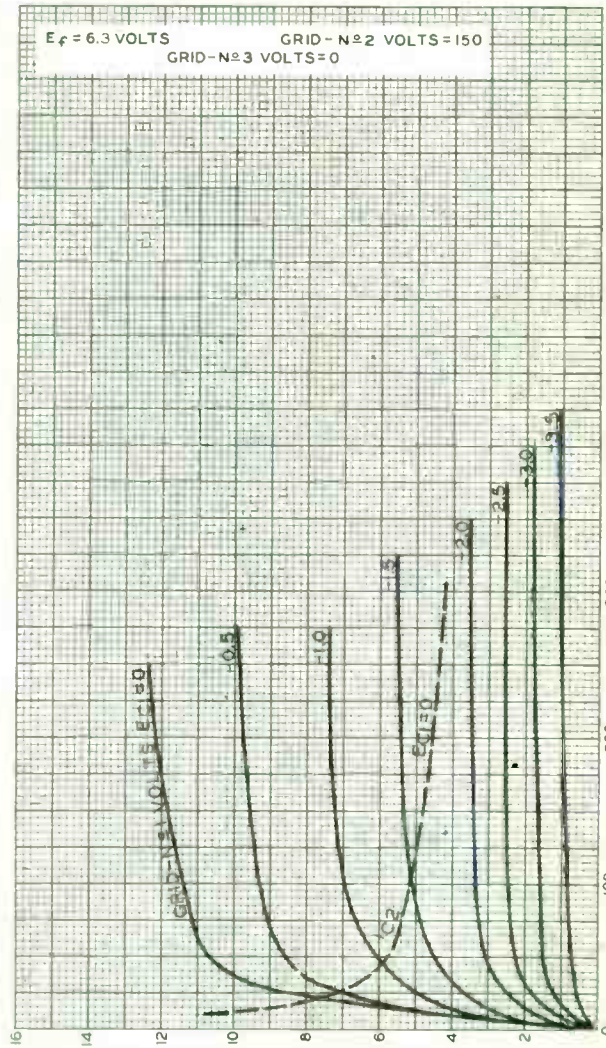
→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6BH6

AVERAGE PLATE CHARACTERISTICS



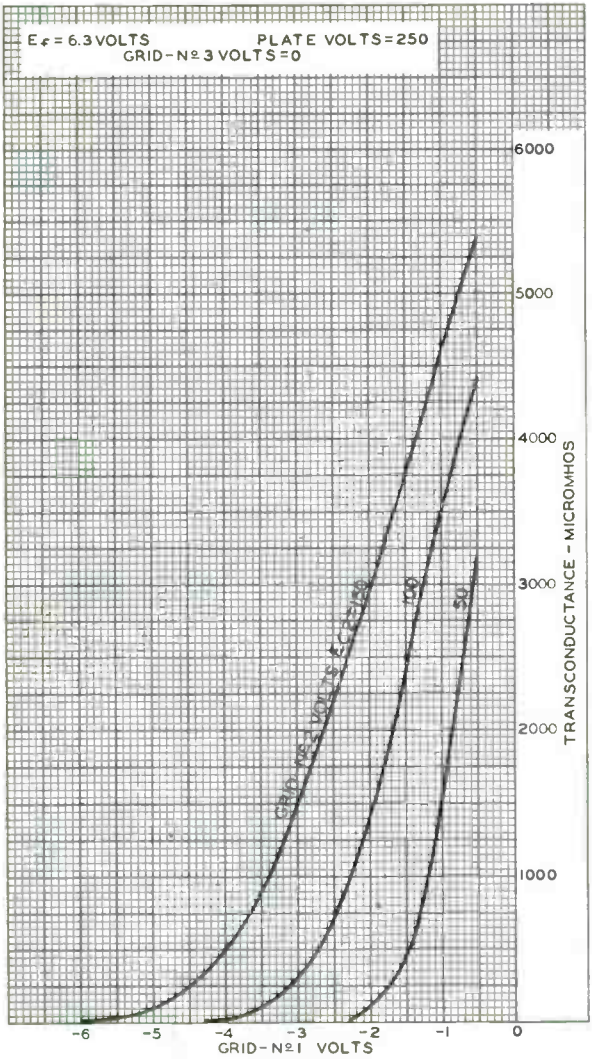
AUG. 23, 1947 TUBE DEPARTMENT 92CM-6892

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6BH6

AVERAGE CHARACTERISTICS



AUG. 21, 1947

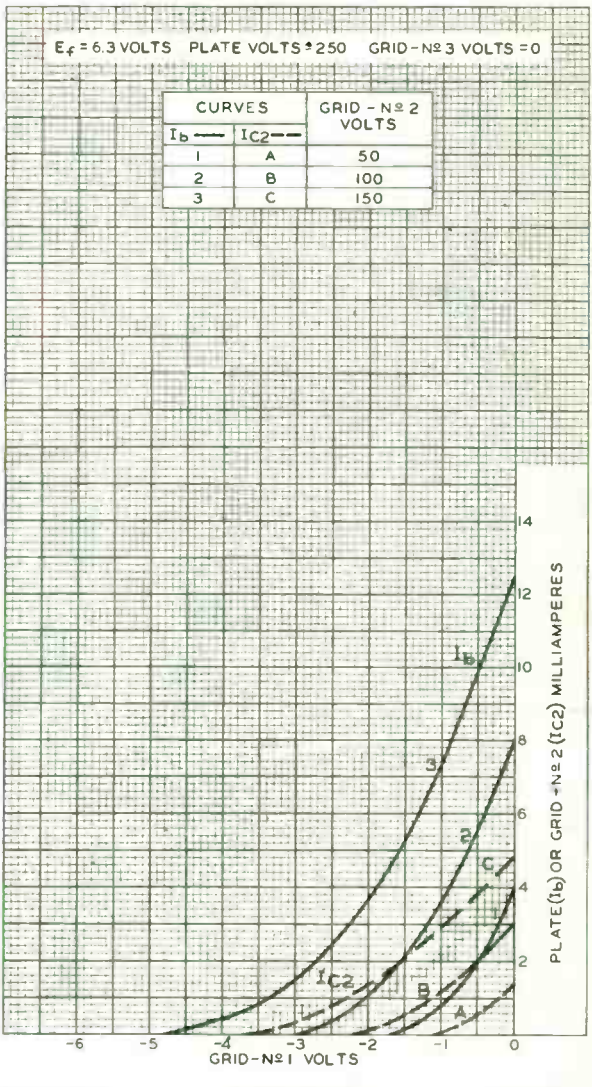
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6891

RCA

6BH6

AVERAGE CHARACTERISTICS



RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

6BH6

RCA

6BH6

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION

E_f=6.3 VOLTS
GRIDS-№2 & 3 CONNECTED TO PLATE

DEC.10,1947

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6896

Half-Wave Vacuum Rectifier

DUODECAR TYPE

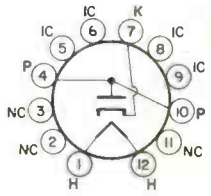
Electrical:

Heater Characteristics and Ratings *(Design-Maximum Values)*:		
Voltage (AC or DC)	6.3 ±0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode[a]	3300[b] max.	volts
Heater positive with respect to cathode	300[c] max.	volts
Direct Interelectrode Capacitances (Approx.):[d]		
K to (P,H)	8.0	pf
P to (K,H)	5.5	pf
H to K	2.7	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2.625"
Seated Length	2.000" to 2.250"
Diameter	1.062" to 1.188"
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC No.E12-70)
Basing Designation for BOTTOM VIEW	12BL

Pin 1 – Heater
Pin 2 – No Internal Connection
Pin 3 – Same as Pin 2
Pin 4 – Plate
Pin 5 – Do Not Use[e]
Pin 6 – Do Not Use[e]
Pin 7 – Cathode
Pin 8 – Do Not Use[e]
Pin 9 – Do Not Use[e]
Pin 10 – Plate
Pin 11 – Same as Pin 2
Pin 12 – Heater



DAMPER SERVICE

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[f]

Peak Inverse Plate Voltage[a]	3300 max.	volts
Peak Plate Current	840 max.	ma
DC Plate Current	140 max.	ma
Plate Dissipation	4 max.	watts

Characteristics, Instantaneous Value.

Tube Voltage Drop for plate ma. = 250	21	volts

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

[b] The dc component must not exceed 600 volts.

[c] The dc component must not exceed 100 volts.

[d] Without external shield.

[e] Socket terminals 5,6,8 and 9 should not be used at tie points.

[f] As described in "Standards of Good Engineering Practice Concerning Tevelision Broadcast Stations," Federal Communications Commission.

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:

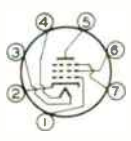
	Without External Shield	*With External Shield°*	
Grid No.1 to plate	0.0035 max.	0.0035 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	4.5	4.5	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	5.5	5.5	μμf

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

RCA

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

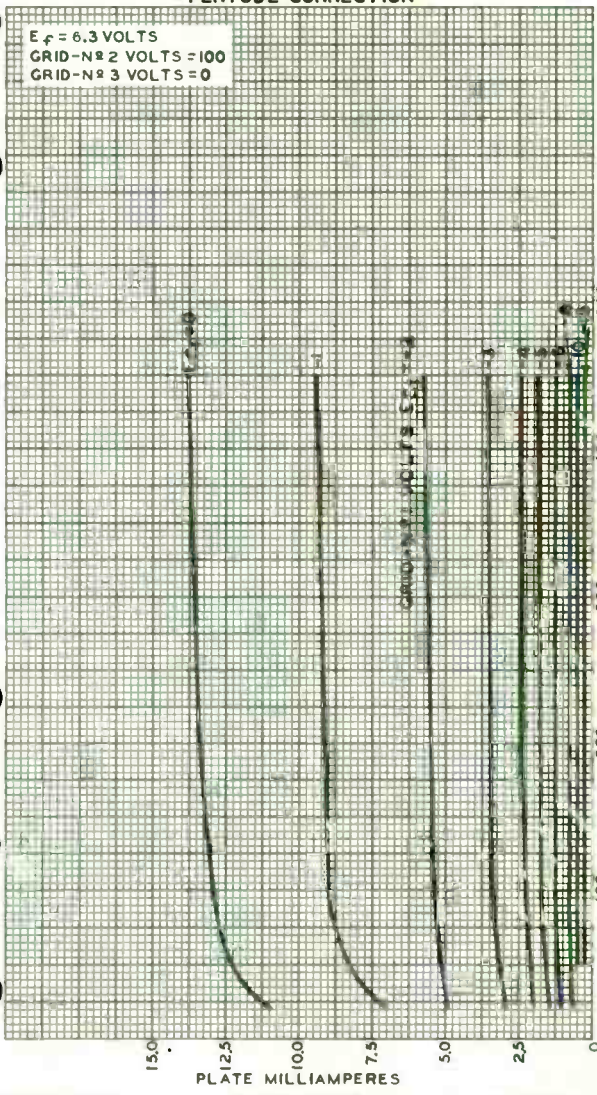
→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6BJ6

AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION



MAY 29, 1947

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

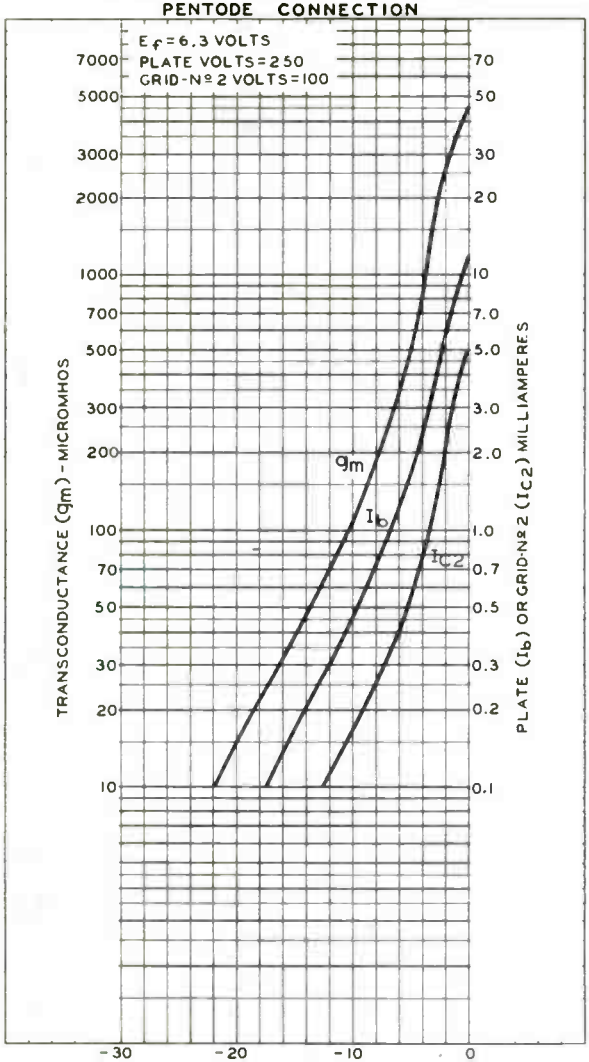
92CM-6867

RCA

6BJ6

AVERAGE CHARACTERISTICS

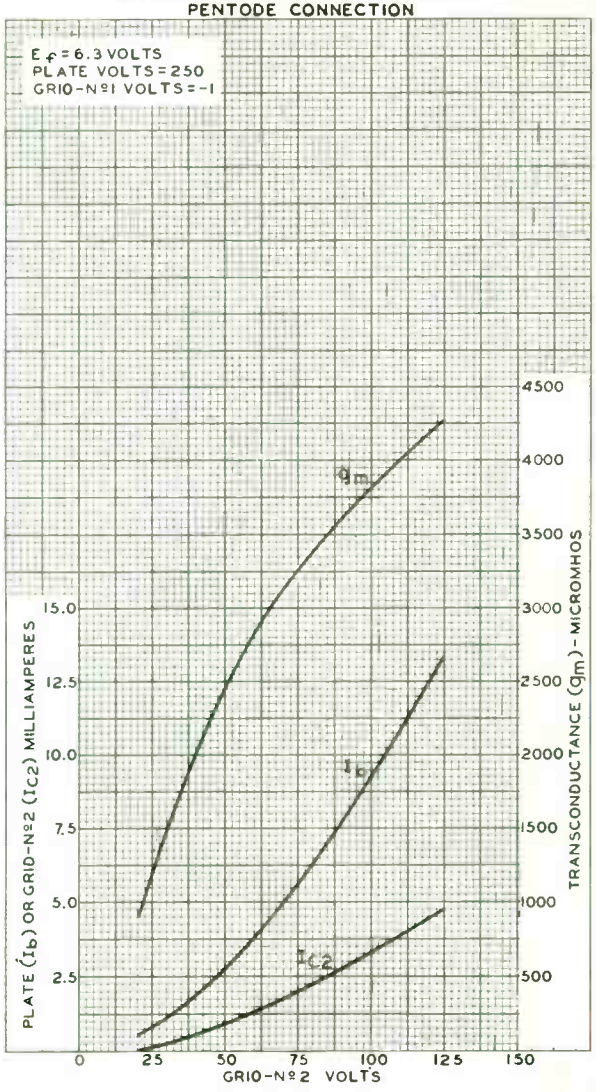
PENTODE CONNECTION



RCA

6BJ6

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BJ7
TRIPLE DIODE

9-PIN MINIATURE TYPE

For dc restorer service

GENERAL DATA

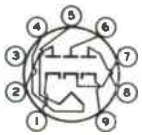
Electrical:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	6.3	volts
Current	0.45	amp
Direct Interelectrode Capacitances (Approx.):[o]		
Plate of unit No.1 to cathode of unit No.1, internal shield, and heater	3	μμf
Plate of unit No.2 to cathode of unit No.2, internal shield, and heater	2.6	μμf
Plate of unit No.3 to cathode of unit No.3, internal shield, and heater	2.6	μμf
Cathode of unit No.1 to plate of unit No.1, internal shield, and heater	4	μμf
Cathode of unit No.2 to plate of unit No.2, internal shield, and heater	3.8	μμf
Cathode of unit No.3 to plate of unit No.3, internal shield, and heater	4	μμf
Plate of unit No.1 to plate of unit No.2	0.055	μμf
Plate of unit No.2 to plate of unit No.3	0.036	μμf
Plate of unit No.3 to plate of unit No.1	0.036	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	9AX

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



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

DC RESTORER SERVICE

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

PEAK INVERSE PLATE VOLTAGE	330 max.	volts
PEAK PLATE CURRENT	10 max.	ma

[o] Without external shield.

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

6BJ7

TRIPLE DIODE

DC OUTPUT CURRENT.	1 max.	ma
PEAK HEATER–CATHODE VOLTAGE:		
Heater negative with respect to cathode . .	330 max.	volts
Heater positive with respect to cathode . .	100 max.	volts

Characteristics:

Plate Current for plate volts = 2.7.	10	ma

6BJ8

TWIN DIODE—MEDIUM-MU TRIODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

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

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

Direct Interelectrode Capacitances:[o]

Triode Unit:		
Grid to plate	2.6	μμf
Grid to heater and cathode	2.8	μμf
Plate to heater and cathode	0.31	μμf
Diode Units:		
Diode-No.1 plate to triode grid	0.07 max.	μμf
Diode-No.2 plate to triode grid	0.11 max.	μμf
Diode-No.1 cathode to all other electrodes	4.8	μμf
Diode-No.2 cathode to all other electrodes	4.8	μμf
Diode-No.1 plate to diode-No.2 plate	0.06 max.	μμf
Diode-No.1 plate to diode-No.1 cathode and heater	1.9	μμf
Diode-No.2 plate to diode-No.2 cathode and heater	1.9	μμf
Diode-No.1 cathode to diode-No.1 plate and heater	4.6	μμf
Diode-No.2 cathode to diode-No.2 plate and heater	4.6	μμf
Diode-No.1 plate to all other electrodes	3	μμf
Diode-No.2 plate to all other electrodes	3	μμf

Characteristics, Class A_1 Amplifier (Triode Unit):

Plate Voltage	90	250	volts
Grid Voltage	0	−9	volts
Amplification Factor	22	20	
Plate Resistance (Approx.)	4700	7150	ohms
Transconductance	4700	2800	μmhos
Plate Current	13.5	8	ma
Plate Current for grid volts = −12.5	−	1.7	ma
Grid Voltage (Approx.) for plate μa. = 10	−7	−18	volts

[o]: see next page.

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

RCA

6BJ8

TWIN DIODE—MEDIUM-MU TRIODE

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Maximum Diameter	7/8"
Dimensional Outline	*See General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JETEC No. E9-1)
Basing Designation for BOTTOM VIEW	9ER

Pin 1 – Diode–No.2 Plate
Pin 2 – Diode–No.2 Cathode
Pin 3 – Diode–No.1 Cathode
Pin 4 – Heater

Pin 5 – Heater
Pin 6 – Diode–No.1 Plate
Pin 7 – Triode Plate
Pin 8 – Triode Grid
Pin 9 – Triode Cathode

TRIODE UNIT — AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values:*

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

Maximum Circuit Values:

Grid-Circuit Resistance	1	max.	megohm

TRIODE UNIT — VERTICAL DEFLECTION AMPLIFIER

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

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

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	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

○,▲,□,#,■: See next page.

6BJ8

TWIN DIODE—MEDIUM-MU TRIODE

Maximum Circuit Values:

Grid-Circuit Resistance:

For cathode-bias operation.	2.2	max.	megohms

DIODE UNITS — Two

Maximum Ratings, *Design-Center Values:*

Values are for Each Unit

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

○ Without external shield.

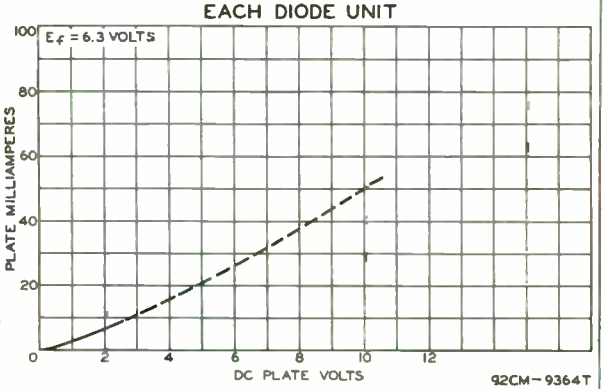
▲ The dc component must not exceed 100 volts.

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

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

■ Under no circumstances should this absolute value be exceeded.

AVERAGE PLATE CHARACTERISTIC
EACH DIODE UNIT

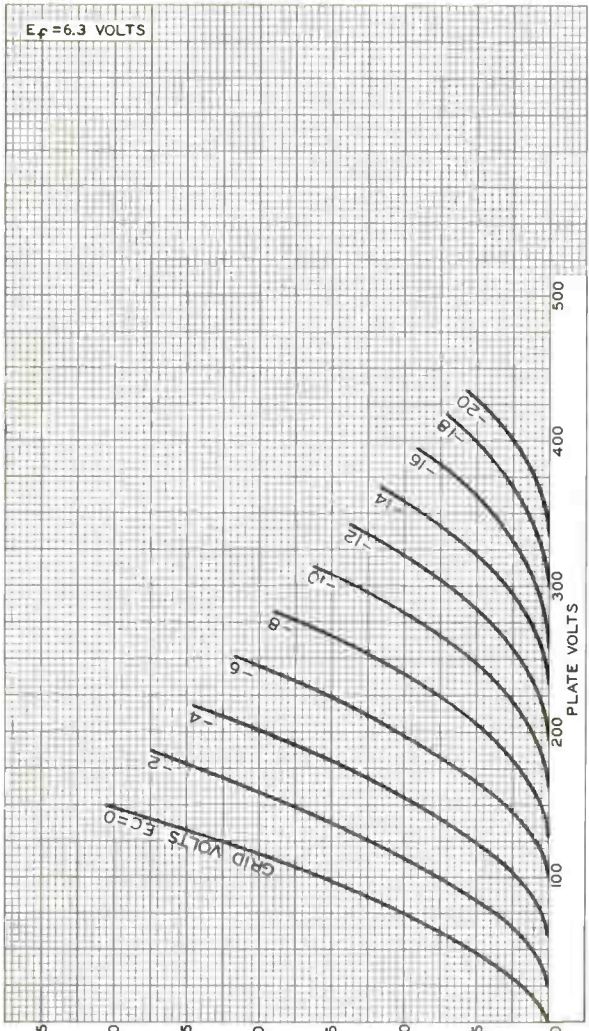


ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BJ8

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



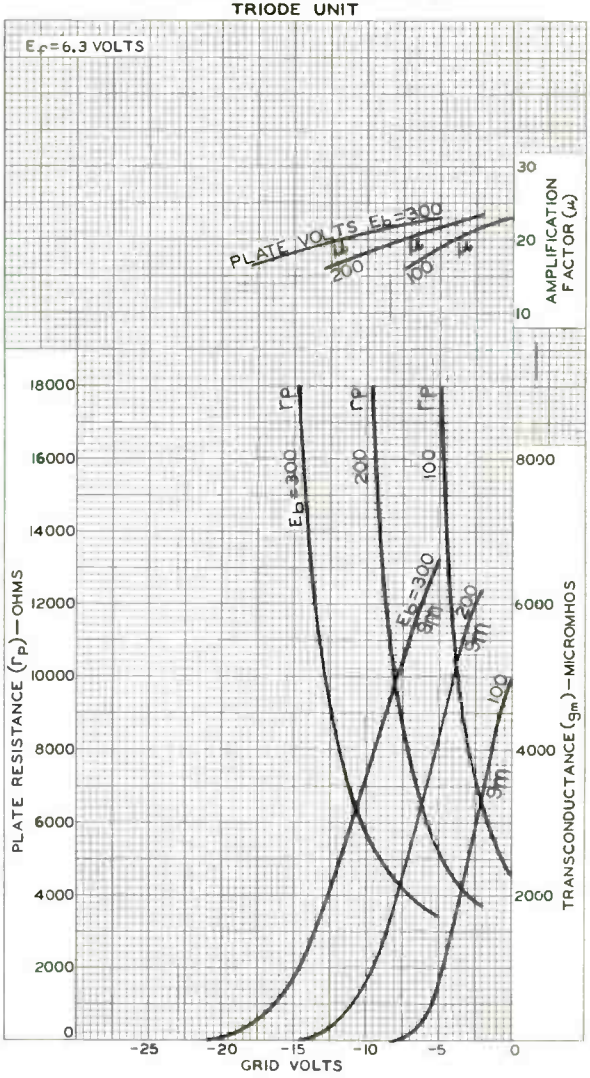
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9531

RCA

6BJ8

AVERAGE CHARACTERISTICS
TRIODE UNIT



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

92CM-9535

6BK4A

Beam Triode

High Voltage (Max. DC Plate Volts = 27000), Low Current Type. Especially Useful as a Shunt Voltage-Regulator Tube in High-Voltage Power Supply Circuits in Color TV Receivers.

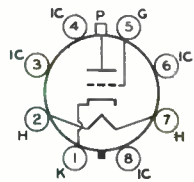
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ±0.6	volts
Current at heater volts = 6.3	0.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	Not Recommended	
Direct Interelectrode Capacitances (Approx.):[a]		
Grid to plate	0.03	pf
Grid to cathode and heater	2.6	pf
Plate to cathode and heater	1.0	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	5"
Seated Length	4-1/4" ± 3/16"
Maximum Diameter	1-23/32"
Bulb	T12
Cap	Small (JEDEC No.C1-1 or C1-34)
Bases (Alternates):	
Short Jumbo-Shell Octal with External Barriers: 8-Pin (JEDEC Group 1, No.B8-71)	
Short Medium-Shell Octal with External Barriers: 8-Pin, Style B (JEDEC Group 1, No.B8-118)	
Basing Designation for BOTTOM VIEW	8GC

Pin 1 – Cathode
Pin 2 – Heater
Pin 3 – Do Not Use
Pin 4 – Do Not Use
Pin 5 – Grid



Pin 6 – Do Not Use
Pin 7 – Heater
Pin 8 – Do Not Use
Cap – Plate

SHUNT VOLTAGE-REGULATOR SERVICE

Maximum Ratings, *Design-Maximum Values:*

DC Plate Voltage	27000 max.	volts
Unregulated DC Supply Voltage	60000 max.	volts
Grid Voltage:		
Peak[b]	-440 max.	volts
DC	-135 max.	volts

DC Plate Current	1.6 max.	ma
Plate Dissipation	30 max.	watts

Typical Operation:

As shunt voltage-regulator tube—See Accompanying Circuit

Unregulated Supply:		
DC voltage	36000	volts
Equivalent resistance	11	megohms
Voltage-Divider Values:		
R_1 (5 watts)	220	megohms
R_2 (2 watts)	1	megohm
R_3 (1/2 watt)	0.82	megohm
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	μa
For load current of 1 ma.	45	μa
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	3 max.	megohms

[a] Without external shield.
[b] For 20 seconds maximum duration during equipment warm-up period.

CHARACTERISTICS RANGE VALUES

	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

The *base pins* of the 6BK4A fit the standard octal socket. Socket terminals for pins 3,4,6, and 8 *should not be used for tie points.* If this precaution is not followed, tube performance may be adversely affected.

The high voltages at which the 6BK4A is operated may be extremely dangerous to the user. Great care should be taken during adjustment of circuits. The tube and its associated apparatus, especially those parts which may be at high potential with respect to ground, should be housed in a protective enclosure. The protective housing should contain interlocks so that personnel cannot possibly come in contact with any high

potential point in the electrical system. The interlocks should break the primary circuit of the high-voltage supply when any gate or door on the protective housing is opened, and should prevent the closing of this primary circuit until the door is locked again.

It should be noted that *high voltages* may appear at normally low-potential points in the circuit as a result of capacitor breakdown or incorrect circuit connections. Therefore, before any part of the circuit is touched, the power-supply switch should be turned off and both terminals of the circuit capacitors should be grounded.

The *bulb* of the 6BK4A becomes hot during operation. To insure adequate cooling, it is essential that free circulation of air be provided around the 6BK4A. The bulb will eventually darken during service. This darkening is normal and has no effect on tube performance.

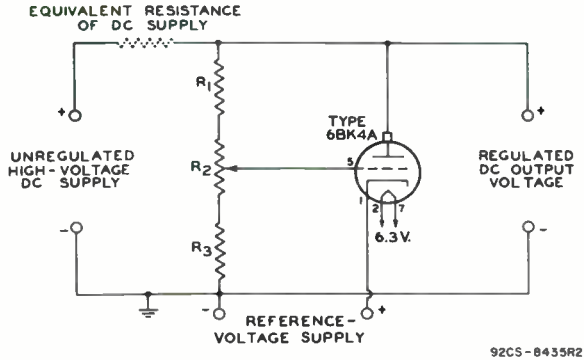
The *plate* of the 6BK4A shows a dull red color when the tube is operated at maximum plate dissipation. Connection to the plate cap should be made by a suitable connector with flexible lead to prevent any strain on the seal of the cap.

Operation of the 6BK4A 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.

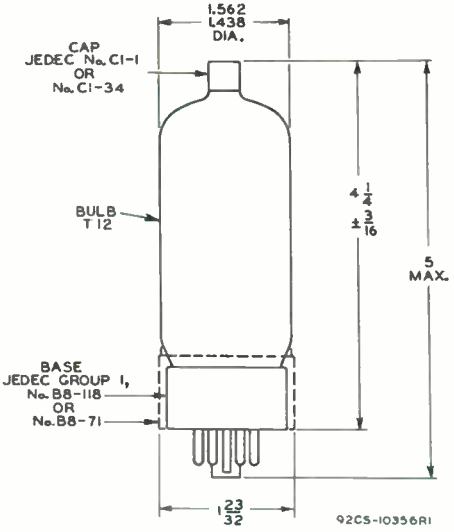
The 6BK4A may exhibit a blue glow on the upper half of the inner surface of the bulb wall under normal operating conditions. This effect is caused by fluorescence and is not to be mistaken for gas.

6BK4A

SHUNT VOLTAGE-REGULATOR CIRCUIT



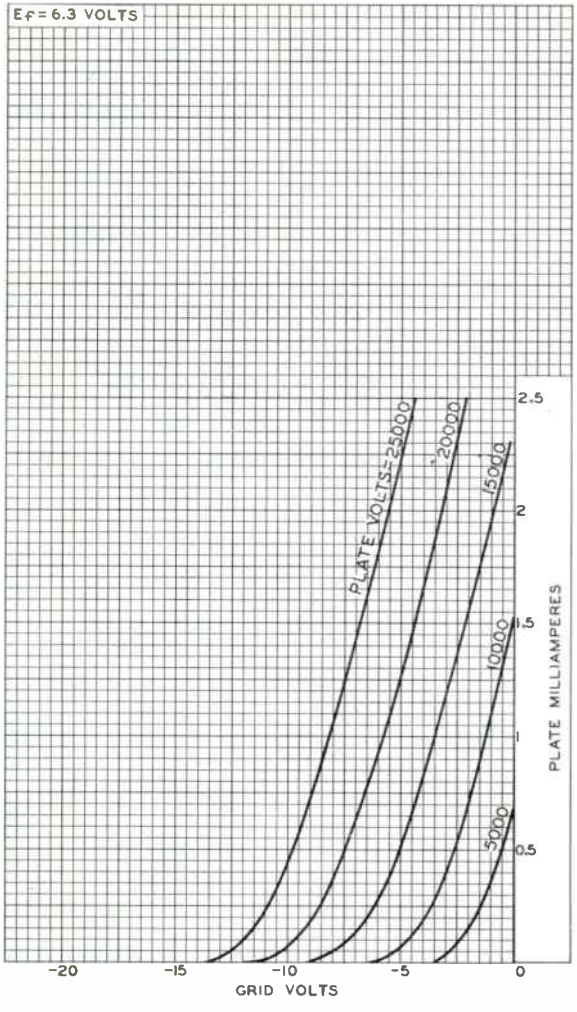
Typical performance data for this basic circuit with certain characteristics of the unregulated dc supply and related voltage-divider values are given in the tabulated data. Other combinations are feasible within the maximum ratings and the maximum circuit values for the 68K4A.



DIMENSIONS IN INCHES

6BK4A

AVERAGE TRANSFER CHARACTERISTICS



92CM-8432R1

6BK4B

Beam Triode

High-Voltage, Low-Current Type
For DC Power Supplies in Color-TV Receivers

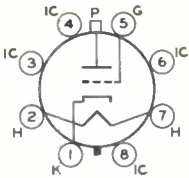
ELECTRICAL

Heater Characteristics and Ratings		
Voltage (AC or DC)	6.3 ± 0.6	V
Current at 6.3 V	0.200	A
Peak heater-cathode voltage:		
Heater negative with respect to cathode	450[a] max	V
Heater positive with respect to cathode	Not Recommended	
Direct Interelectrode Capacitances (Approx.)		
Without external shield		
Grid to plate	0.03	pF
Grid to cathode and heater	2.6	pF
Plate to cathode and heater	1.0	pF

MECHANICAL

Operating Position	Any
Maximum Overall Length	5 in
Seated Length	4-1/4 ± 3/16 in
Maximum Diameter	1-23/32 in
Bulb	T12
Cap.	Small (JEDEC No.C1-1 or C1-34)
Base (Alternates)	
Short Jumbo-Shell Octal with External Barriers: 8-Pin (JEDEC Group 1, No.B8-71)	
Short Medium-Shell Octal with External Barriers: 8-Pin, Style B (JEDEC Group 1, No.B8-118)	
Basing Designation for BOTTOM VIEW	8GC

Pin 1 – Cathode
Pin 2 – Heater
Pin 3 – Do Not Use
Pin 4 – Do Not Use
Pin 5 – Grid
Pin 6 – Do Not Use
Pin 7 – Heater
Pin 8 – Do Not Use
Cap – Plate



SHUNT VOLTAGE-REGULATOR SERVICE

Maximum Ratings, Design-Maximum Values

DC Plate Voltage	27000	V
Unregulated DC Supply Voltage	60000	V
Grid Voltage		
Peak[b]	-440	V
DC	-135	V
DC Plate Current	1.6	mA
Plate Dissipation	40	W

Typical Operation

As Shunt Voltage-Regulator Tube in Accompanying Circuit

Unregulated Supply		
DC Voltage	36000	V
Equivalent resistance	11	MΩ
Voltage Divider Values		
R_1 (5 W)	220	MΩ
R_2 (2 W)	1	MΩ
R_3 (1/2 W)	0.82	MΩ
Reference Voltage Supply		
DC Value	200	V
Equivalent resistance	1000	Ω
Effective Grid-Plate Transconductance	200	μmhos
DC Plate Current		
For load current of 0 mA	1000	μA
For load current of 1 mA	45	μA
Regulated DC Output Voltage		
For load current of 0 mA	25000	V
For load current of 1 mA	24500	V

MAXIMUM CIRCUIT VALUE

Grid-Circuit Resistance	3	MΩ

[a] Sufficient impedance should be used in series with the cathode to limit the cathode current under prolonged short-circuit conditions to 450 mA. This protective impedance will minimize the danger of heater burnout in case of a momentary internal arc within the tube.

[b] For 20 seconds maximum duration during equipment warm-up period.

CHARACTERISTICS RANGE VALUES

	Note	*Min*	*Max*	
Grid Voltage (1)	1	-7	-	V
Grid Voltage (2)	2	-	-40	V
Grid-Voltage Change	3	-	9	V

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

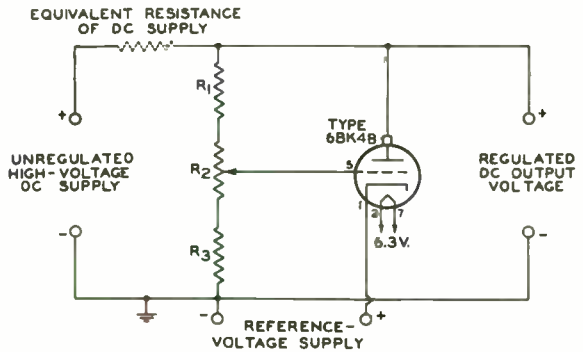
The 6BK4B *base pins* fit the standard octal socket. Socket terminals for pins 3, 4, 6, and 8 *should not be used for tie points.* Otherwise, tube performance may be adversely affected.

The high voltages at which the 6BK4B is operated may be extremely dangerous to the user. Great care should be taken during the adjustment of circuits. The tube and its associated apparatus, especially all parts which may be at high potential with respect to ground, should be housed in a protective enclosure.

At maximum plate dissipation the *plate* of the 6BK4B shows a dull red color. Connection to the plate cap should be made by a connector with flexible lead to prevent any strain on the seal of the cap.

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

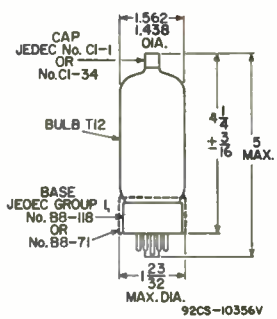
SHUNT VOLTAGE-REGULATOR CIRCUIT



Typical performance data for this basic circuit with certain characteristics of the unregulated dc supply and related voltage-divider values are given in the tabulated data. Other combinations are feasible within the maximum ratings and the maximum circuit values for the 6BK4B.

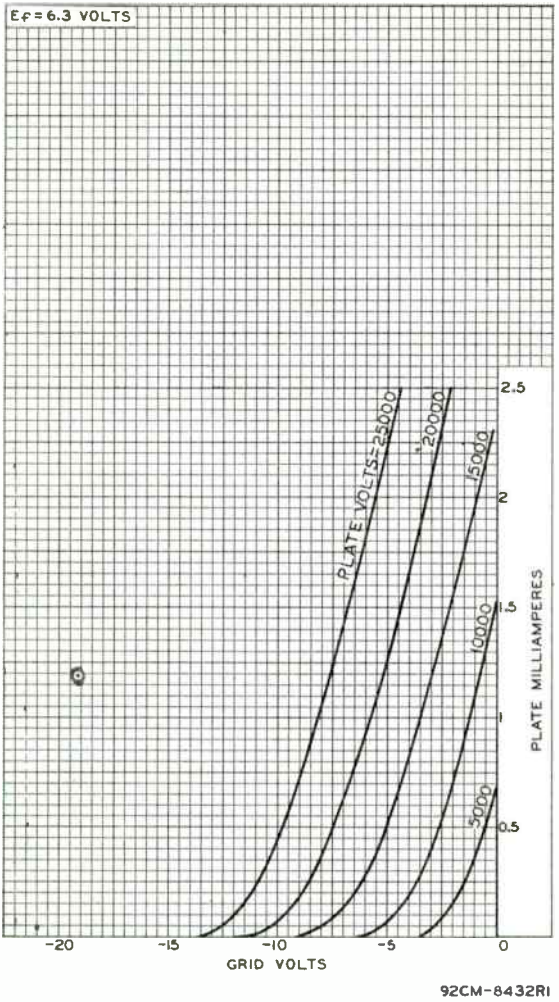
DIMENSIONAL OUTLINE

JEDEC No. 12-36



DIMENSIONS IN INCHES

Average Transfer Characteristics



92CM-8432RI

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

6BK7-B

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

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

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage	6.3	ac or dc volts
Current	0.45	amp
Warm-up time (Average)	11	sec

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

Direct Interelectrode Capacitances:[o]

	Unit No.1	Unit No.2	
Grid to plate	1.8	1.8	μμf
Grid to cathode, internal shield, and heater	3	3	μμf
Plate to cathode, internal shield, and heater	1	0.9	μμf
Heater to cathode	2.8	3	μμf
Plate to cathode	0.22	0.22	μμf
Cathode to grid, internal shield, and heater	6	6	μμf
Plate to grid, internal shield, and heater	2.4	2.4	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 Resistor	56	ohms
Amplification Factor	43	
Plate Resistance (Approx.)	4600	ohms
Transconductance	9300	μmhos
Plate Current	18	ma
Grid Volts (Approx.) for plate μa = 10.	-11	volts

Mechanical:

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

[o] Without external shield.

6BK7-B

MEDIUM-MU TWIN TRIODE

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

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

AMPLIFIER — Class A_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.	200■	max.	volts
Heater positive with respect to cathode.	200▲	max.	volts

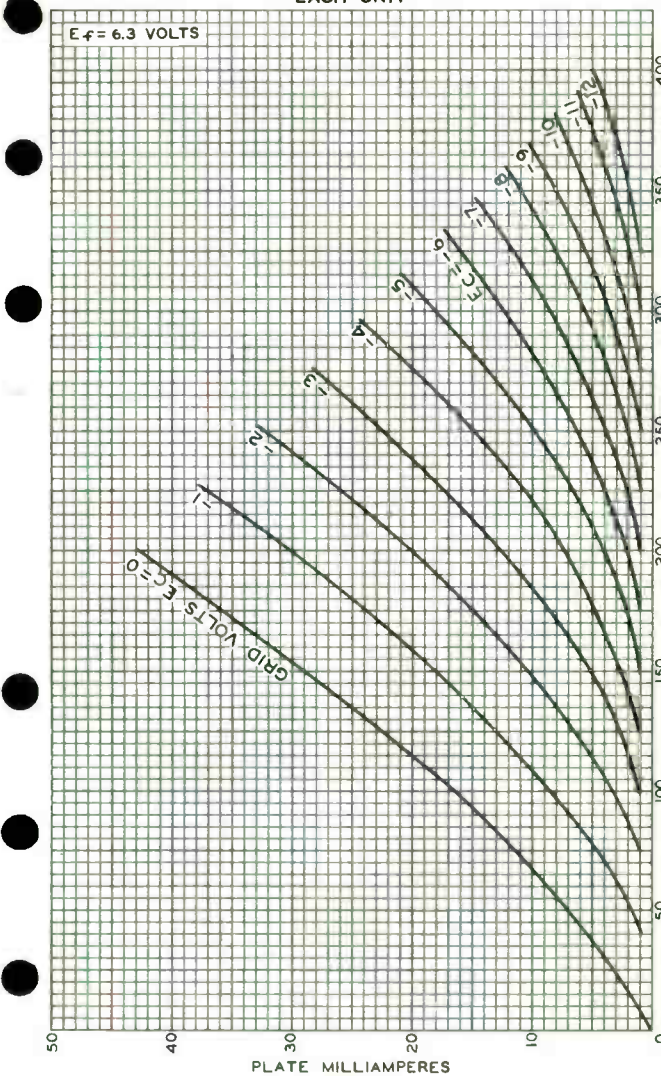
■ Under cutoff conditions in direct-coupled cathode-drive circuits, it is permissible for this voltage to be as high as 300 volts.

▲ The dc component must not exceed 100 volts.

6BK7-B

AVERAGE PLATE CHARACTERISTICS

EACH UNIT

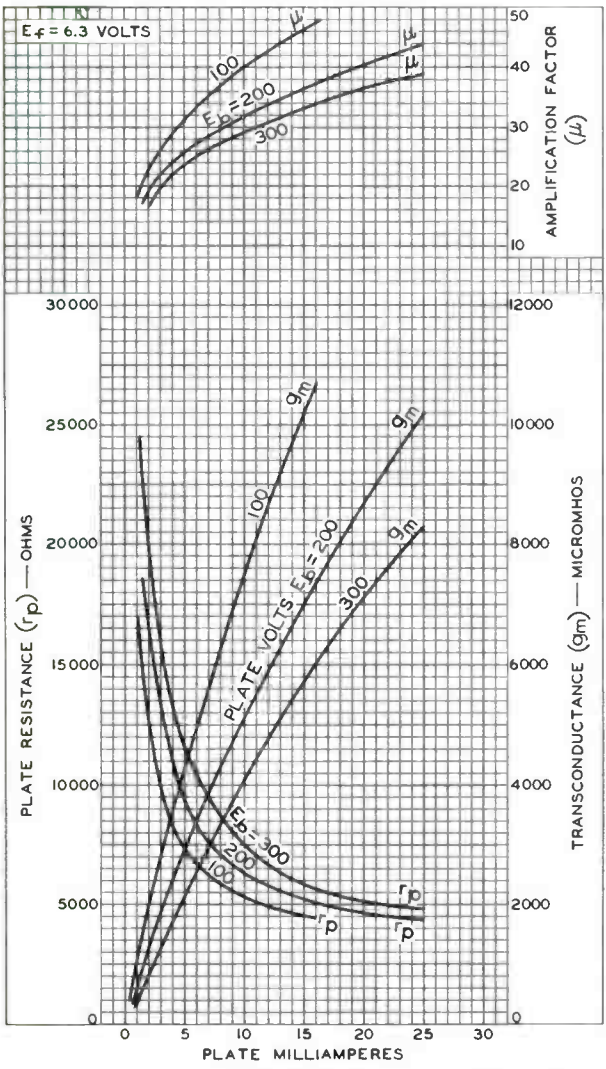


ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-9764

RCA

6BK7-B

AVERAGE CHARACTERISTICS
EACH UNIT



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

92CM-9768

6BL7-GTA

MEDIUM-MU TWIN TRIODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:
Voltage. . . . . 6.3 . . . . . ac or dc volts
Current. . . . . 1.5 . . . . . amp

Direct Interelectrode Capacitances (Approx.):○

	Unit No.1	Unit No.2	
Grid to plate.	6	6	μμf
Grid to cathode and heater . . .	4.2	4.6	μμf
Plate to cathode and heater. . .	0.9	0.9	μμf

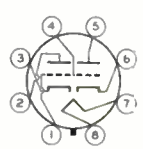
Characteristics, Class A_1 Amplifier (Each Unit):

Plate Voltage.	150	250	250	volts
Grid Voltage	0	−17	−9	volts
Amplification Factor	−	−	15	
Plate Resistance (Approx.)	−	−	2150	ohms
Transconductance	−	−	7000	μmhos
Plate Current.	65*	4	10	ma
Grid Voltage (Approx.) for plate current of 50 μa	−	−	−23	volts

Mechanical:

Operating Position . . . . . Any
Maximum Overall Length . . . . . 3-5/16"
Maximum Seated Length. . . . . 2-3/4"
Maximum Diameter . . . . . 1-9/32"
Dimensional Outline. . . . . *See General Section*
Bulb T9
Base . . . . . 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

VERTICAL DEFLECTION OSCILLATOR◆

Unless Otherwise Specified, Values are for Each Unit

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	400 max.	volts

○,*,◆,□: See next page.

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

TENTATIVE DATA

6BL7-GTA

MEDIUM-MU TWIN TRIODE

CATHODE CURRENT:			
Peak	210	max.	ma
DC	60	max.	ma
PLATE DISSIPATION:			
Either plate	10	max.	watts
Both plates (Both units operating)	12	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200▲	max.	volts
Maximum Circuit Values:			
Grid-Circuit Resistance	4.7	max.	megohms

VERTICAL DEFLECTION AMPLIFIER♦

Unless Otherwise Specified, Values are for Each Unit

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

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

DC PLATE VOLTAGE	500	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE# (Absolute maximum)	2000■	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	250	max.	volts
CATHODE CURRENT:			
Peak	210	max.	ma
DC	60	max.	ma
PLATE DISSIPATION:			
Either plate†	10	max.	watts
Both plates (Both units operating)	12	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200▲	max.	volts
Maximum Circuit Values:			
Grid-Circuit Resistance:			
For Cathode-bias operation†	4.7	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.

♦ When this tube type is operated as a combined vertical deflection oscillator and amplifier, it is recommended that unit No.1 (pins 4, 5, and 6) be used as the oscillator.

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

▲ The dc component must not exceed 100 volts.

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

■ Under no circumstances should this absolute value be exceeded.

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

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

TENTATIVE DATA

RCA

6BL7-GTA

AVERAGE PLATE CHARACTERISTICS

EACH UNIT

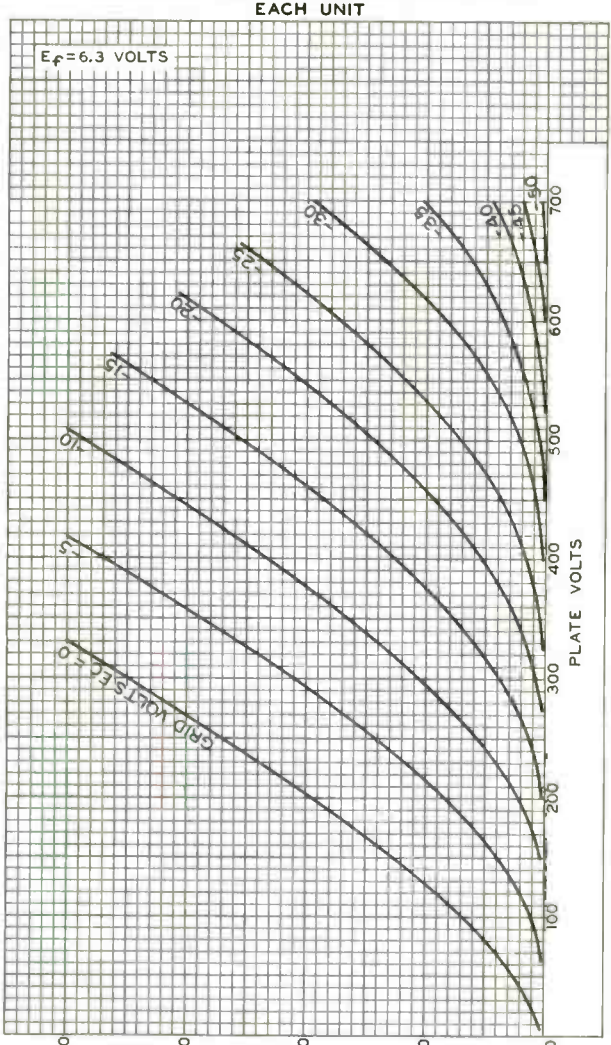


PLATE MILLIAMPERES

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9526

Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Center Values)*:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.450	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts
Direct Interelectrode Capacitances:[a]		
Triode Unit:		
Grid to plate	1.5	μμf
Grid to cathode and heater	2.5	μμf
Plate to cathode and heater	1.8	μμf
Pentode Unit:		
Grid No.1 to plate	0.025 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	3.8	μμf
Pentode plate to triode grid	0.02 max.	μμf
Pentode grid No.1 to triode plate	0.16 max.	μμf
Pentode plate to triode plate	0.07 max.	μμf

Characteristics, Class A$_1$ Amplifier:

	Triode Unit	*Pentode Unit*	
Plate Voltage	100	170	volts
Grid-No.2 Voltage	–	170	volts
Grid-No.1 Voltage	-2	-2	volts
Amplification Factor	20	–	
Amplification Factor, Grid No.2 to Grid No.1	–	47	
Plate Resistance (Approx.)	–	0.4	megohm
Transconductance	5000	6200	μmhos
Plate Current	14	10	ma
Grid-No.2 Current	–	2.8	ma
Input Resistance at frequency (Mc) = 50	–	0.01	megohm
Equivalent Noise Resistance	–	1500	ohms

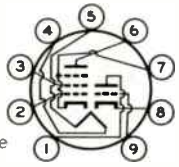
Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential

6BL8

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. 9DC

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 Grid No.3, Pentode Cathode, Internal Shield
Pin 8 – Triode Cathode
Pin 9 – Triode Grid

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values:*

	Triode Unit	*Pentode Unit*	
PLATE SUPPLY VOLTAGE.	550 max.	550 max.	volts
PLATE VOLTAGE	250 max.	250 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE.	–	550 max.	volts
GRID-No.2 VOLTAGE:			
With cathode ma. = 14	–	175 max.	volts
With cathode ma. < 10	–	200 max.	volts
CATHODE CURRENT	14 max.	14 max.	ma
GRID-No.2 INPUT:			
With plate dissipation (watts) > 1.2	–	0.5 max.	watt
With plate dissipation (watts) < 1.2	–	0.75 max.	watt
PLATE DISSIPATION	1.5 max.	1.7 max.	watts

Maximum Circuit Values:

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

[a] Without external shield.

6BM8/ECL82

High-Mu Triode—Power Pentode

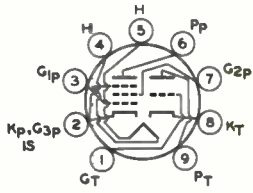
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.780	amp
Peak heater-cathode voltage	100	volts
Direct Interelectrode Capacitances:		
Triode Unit:		
Grid to plate	4.0	pf
Input: G_T to (K_T, H)	2.7	pf
Output: P_T to (K_T, H)	4.0	pf
Grid to heater	0.1 max.	pf
Pentode Unit:		
Grid No.1 to plate	0.3 max.	pf
Input: $G1_P$ to (K_P + $G3_P$ + IS, G2P, H)	9.3	pf
Output: P_P to (K_P + $G3_P$ + IS, G2P, H)	8.0	pf
Grid-No.1 to heater	0.3 max.	pf
Triode plate to pentode grid No.1	0.02 max.	pf
Triode grid to pentode plate	0.02 max.	pf
Triode grid to pentode grid No.1	0.025 max.	pf
Triode plate to pentode plate	0.25 max.	pf

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	3-1/16"
Maximum Seated Length	2-13/16"
Length, Base Seat to Bulb Top (Excluding tip)	2-7/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline (JEDEC No.6-4)	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9EX

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



CLASS A_1 AMPLIFIER

Characteristics:

	Triode Unit	*Pentode Unit*	
Plate Voltage	100	200	volts
Grid-No.2 Voltage	–	200	volts
Grid-No.1 Voltage	0	-16	volts
Grid-No.1 Voltage (RMS)	–	6.6	volts
Amplification Factor	70	9.5[a]	
Plate Resistance (Approx.)	–	20000	ohms
Transconductance	2500	6400	μmhos
Plate Current	3.5	35[b]	ma
Zero-Signal Grid-No.2 Current	–	7	ma
Load Resistance	–	5600	ohms
Total Harmonic Distortion	–	10	%
Max.-Signal Power Output	–	3.5	watts

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

Plate Supply Voltage	550	900	volts
Plate Voltage	300	600	volts
Grid-No.2 Supply Voltage	–	550	volts
Grid-No.2 Voltage	–	300	volts
Grid-No.2 Input	–	1.8	watts
Plate Dissipation	1	[c]	watts
Average Cathode Current	15	50	ma

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:			
For fixed-bias operation	1	1	megohm
For cathode-bias operation	2	.2	megohms
Between heater and cathode	0.02	0.02	megohm

[a] Grid No.2 to grid No.1.

[b] Zero-signal plate current.

[c] At plate voltage less than 250 volts, maximum plate dissipation is 7 watts; at plate voltage greater than 250 volts, maximum plate dissipation is 5 watts.

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

6BN4A

Medium-Mu Triode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	0.2	amp
Direct Interelectrode Capacitances (Approx.):[a]		
Grid to plate	1.2	μμf
Grid to cathode and heater	3.2	μμf
Plate to cathode and heater	1.4	μμf

Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	150	volts
Cathode Resistor	220	ohms
Amplification Factor	43	
Plate Resistance (Approx.)	5400	ohms
Transconductance	7700	μmhos ←
Plate Current	9	ma
Grid Volts (Approx.) for plate μa = 100	−6	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to 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	7EG

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

Pin 5 – Plate
Pin 6 – Cathode
Pin 7 – Grid

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values:*

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

← Indicates a change.

PEAK HEATER–CATHODE VOLTAGE:

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

Maximum Circuit Values:

Grid–Circuit Resistance	0.5 max.	megohm

[a] With external shield JEDEC No.316 connected to cathode.

6BN4-A
MEDIUM-MU TRIODE

7-PIN MINIATURE TYPE

Supersedes Type 6BN4

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	0.2	amp
Direct Interelectrode Capacitances (Approx.):[o]		
Grid to plate	1.2	μμf
Grid to cathode and heater	3.2	μμf
Plate to cathode and heater	1.4	μμf

Characteristics, Class A_1 Amplifier:

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

Mechanical:

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

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

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

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values:*

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

Maximum Circuit Values:

Grid-Circuit Resistance	0.5 max.	megohm

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

6BN4-A

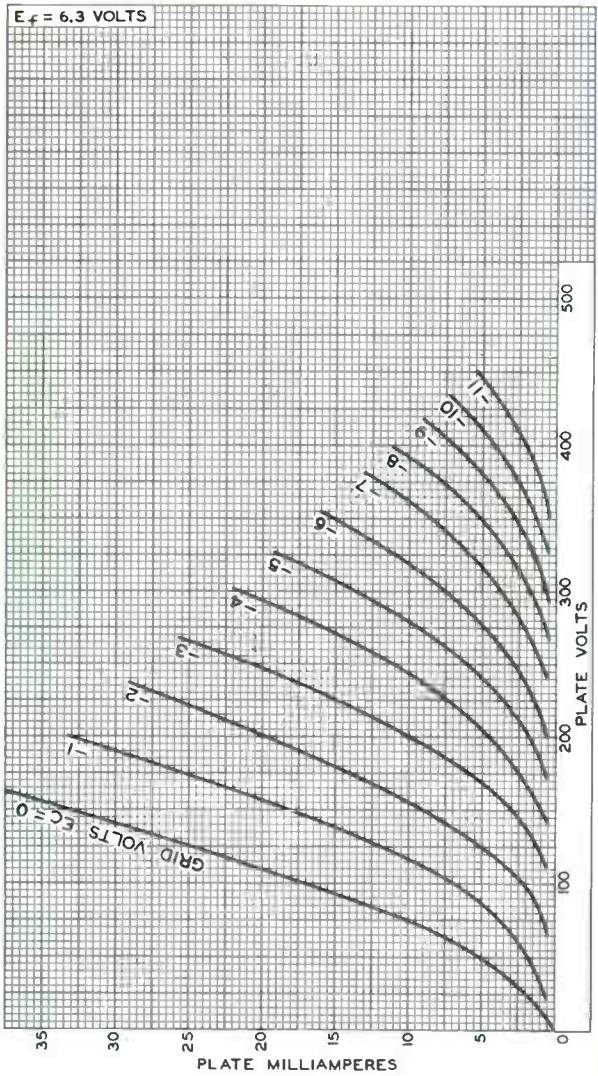
MEDIUM-MU TRIODE

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

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

6BN4-A

AVERAGE PLATE CHARACTERISTICS



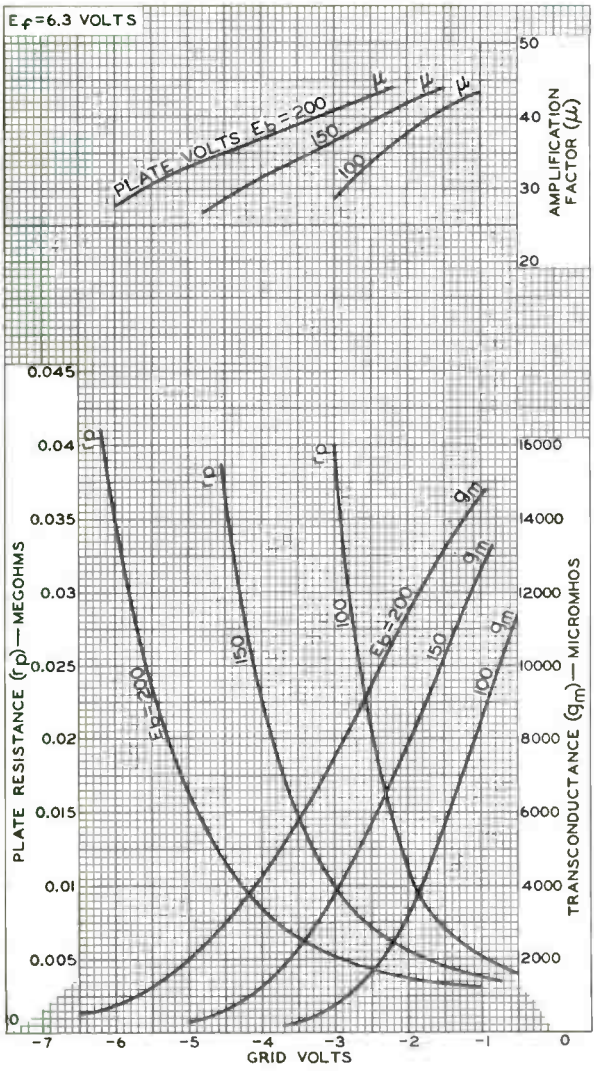
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-9941

6BN4-A

RCA

6BN4-A

AVERAGE CHARACTERISTICS



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

92CM-9897

Beam Tube

7-PIN MINIATURE TYPE

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

GENERAL DATA

Electrical:

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

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Maximum Diameter	0.650" to 0.750"
Dimensional Outline	See *General Section*
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No.E7-1)
Basing Designation for BOTTOM VIEW	7DF

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

LIMITER & DISCRIMINATOR SERVICE

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

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

→ Indicates a change.

Typical Operation:

In accompanying typical quadrature-grid-fm-detector circuit

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

▲ Without external shield.

● For proper operation of this electron tube in the accompanying Typical Quadrature-Grid-FM Detector Circuit, the Q of the quadrature-grid tuned circuit (L_1, C6) should be sufficiently high to assure that a 4-volt rms signal is developed at the quadrature grid when a 2-volt rms signal at the center frequency is applied to grid No.1.

It is recommended that L_1 be shunted by a capacitance of at least 10 μμf. This capacitance may be composed of tube capacitance, stray capacitance, the distributed capacitance of L_1, and a fixed capacitor.

■ The dc component must not exceed 100 volts.

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

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

OPERATING CONSIDERATIONS

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

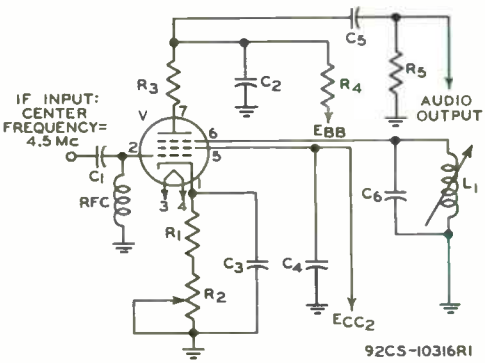
To obtain a symmetrical discriminator-response curve, the plate currents for no input signal and for unmodulated

→ Indicates a change.

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

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

TYPICAL QUADRATURE-GRID-FM-DETECTOR CIRCUIT



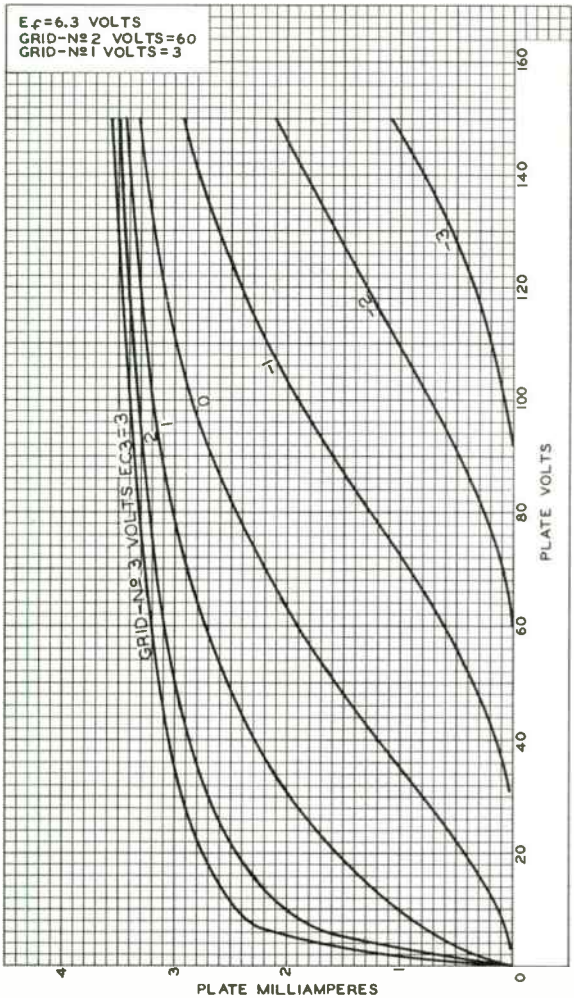
C_1: 100 $\mu\mu$f
C_2: Integrating capacitor, 0.001 μf
C_3, C_4: 0.01 μf
C_5: 0.25 μf
C_6: 10 $\mu\mu$f•
L_1: •
R_1: 200 ohms
R_2: Cathode-bias potentiometer, 200 ohms
R_3: Linearity resistor, 1000 ohms
R_4: Plate-load resistor, 0.33 megohm
R_5: 0.47 megohm
V: Electron-tube-type 6BN6

• For proper operation of this electron tube in the accompanying Typical Quadrature-Grid-FM Detector Circuit, the Q of the quadrature-grid tuned circuit (L_1, C_6) should be sufficiently high to assure that a 4-volt rms signal is developed at the quadrature grid when a 2-volt rms signal at the center frequency is applied to grid No.1.

It is recommended that L_1 be shunted by a capacitance of at least 10 $\mu\mu$f. This capacitance may be composed of tube capacitance, stray capacitance, the distributed capacitance of L_1, and a fixed capacitor.

6BN6

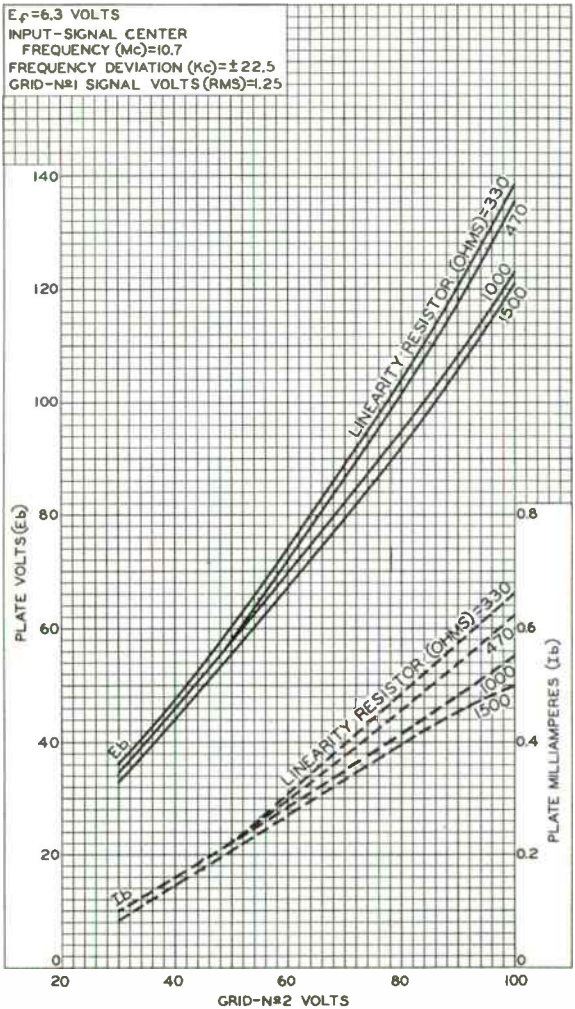
AVERAGE PLATE CHARACTERISTICS



92CM-10319

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

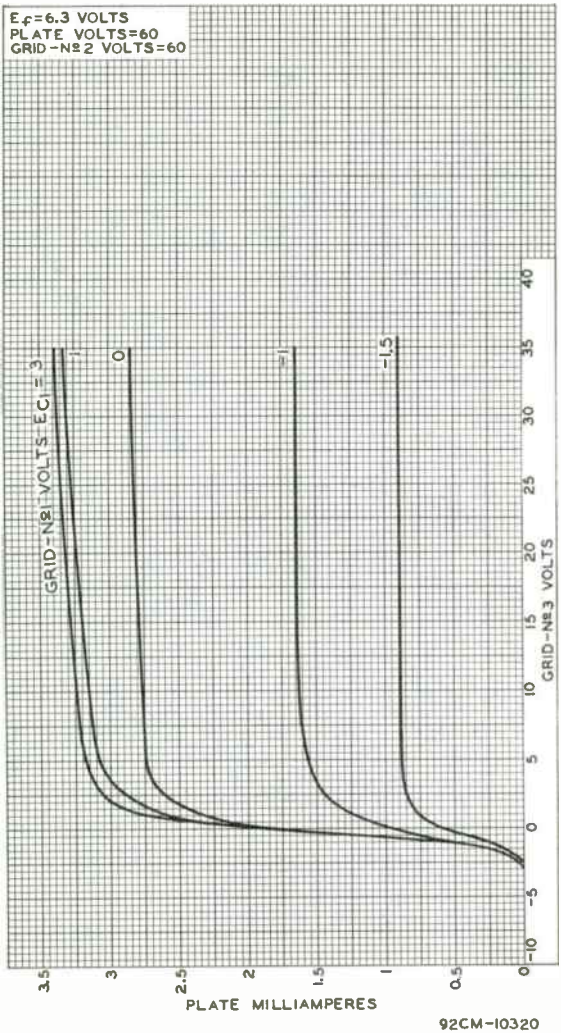
OPERATION CHARACTERISTICS



92CM-10321

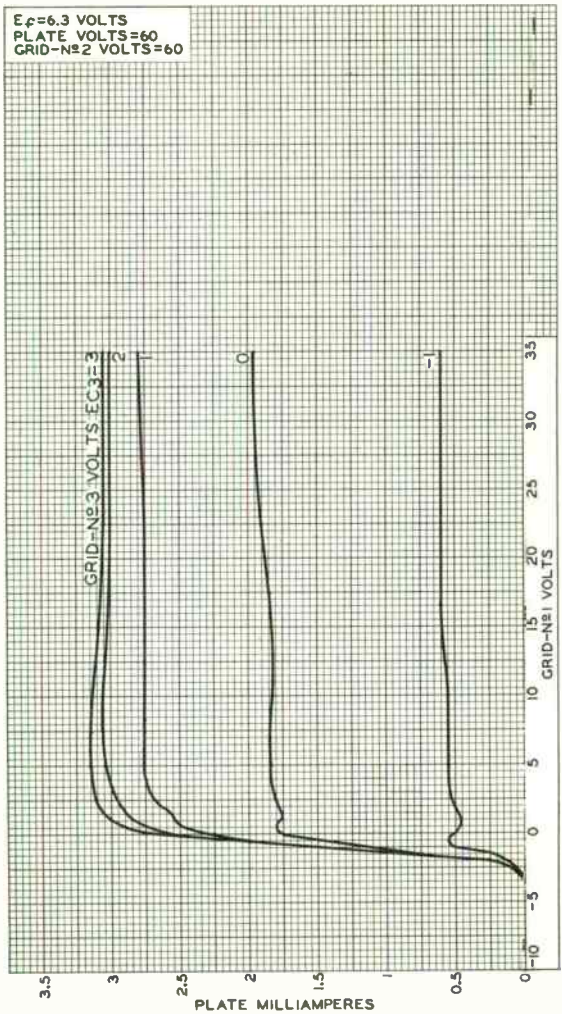
6BN6

AVERAGE CHARACTERISTICS



92CM-10320

AVERAGE CHARACTERISTICS



92CM-10322

6BN8

TWIN DIODE—HIGH-MU TRIODE

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	6.3	volts
Current	0.6 ± 6%	amp ←
Warm-up time (Average)	11	sec
Direct Interelectrode Capacitances:[o]		
Triode Unit:		
Grid to plate	2.5	μμf
Grid to heater and cathode	3.6	μμf
Plate to heater and cathode	0.25	μμf
Diode Units:		
Diode-No.1 plate to triode grid	0.06 max.	μμf
Diode-No.2 plate to triode grid	0.1 max.	μμf
Diode-No.1 cathode to all other electrodes	5	μμf
Diode-No.2 cathode to all other electrodes	5	μμf
Diode-No.1 plate to diode-No.2 plate	0.07 max.	μμf
Diode-No.1 plate to diode-No.1 cathode and heater	1.9	μμf
Diode-No.2 plate to diode-No.2 cathode and heater	1.9	μμf
Diode-No.1 cathode to diode-No.1 plate and heater	4.8	μμf
Diode-No.2 cathode to diode-No.2 plate and heater	4.8	μμf
Diode-No.1 plate to all other electrodes	3	μμf
Diode-No.2 plate to all other electrodes	3	μμf

Characteristics, Class A_1 Amplifier (Triode Unit):

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

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*

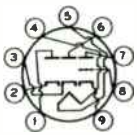
← Indicates a change.

6BN8

TWIN DIODE—HIGH-MU TRIODE

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

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



Pin 5 – Heater
Pin 6 – Diode-No. 1 Plate
Pin 7 – Triode Plate
Pin 8 – Triode Grid
Pin 9 – Triode Cathode

TRIODE UNIT — AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

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

Maximum Circuit Values:

Grid-Circuit Resistance	1	max.	megohm

DIODE UNITS — Two

Maximum Ratings, *Design-Maximum Values:*

Values are for Each Unit

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

○ without external shield.

▲ The dc component must not exceed 100 volts.

→ indicates a change.

6BQ5
POWER PENTODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.76	amp
Direct Interelectrode Capacitances:[o]		
Grid No.1 to plate	0.5 max.	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	10.8	μμf
Plate to cathode & grid No.3, grid No.2, and heater	6.5	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	250	volts
Grid-No.2 (Screen-grid) Voltage	250	volts
Grid-No.1 (Control-grid) Voltage	-7.3	volts
Plate Resistance (Approx.)	38000	ohms
Transconductance	11300	μmhos
Plate Current	48	ma
Grid-No.2 Current	5.5	ma

Mechanical:

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

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

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

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values:*

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

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

TENTATIVE DATA

6BQ5

POWER PENTODE

PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	100	max.	volts
Heater positive with respect to cathode.	100▲	max.	volts
Typical Operation:			
Plate Voltage.	250		volts
Grid-No.2 Voltage.	250		volts
Grid-No.1 Voltage.	-7.3		volts
Peak AF Grid-No.1 Voltage.	6.2		volts
Zero-Signal Plate Current.	48		ma
Max.-Signal Plate Current.	50.6		ma
Zero-Signal Grid-No.2 Current.	5.5		ma
Max.-Signal Grid-No.2 Current.	10		ma
Effective Load Resistance.	4500		ohms
Total Harmonic Distortion.	10		%
Max.-Signal Power Output	5.7		watts
Maximum Circuit Values:			
Grid-No.1-Circuit Resistance:			
For fixed-bias operation	0.3	max.	megohm
For cathode-bias operation	1	max.	megohm

○ Without external shield.

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

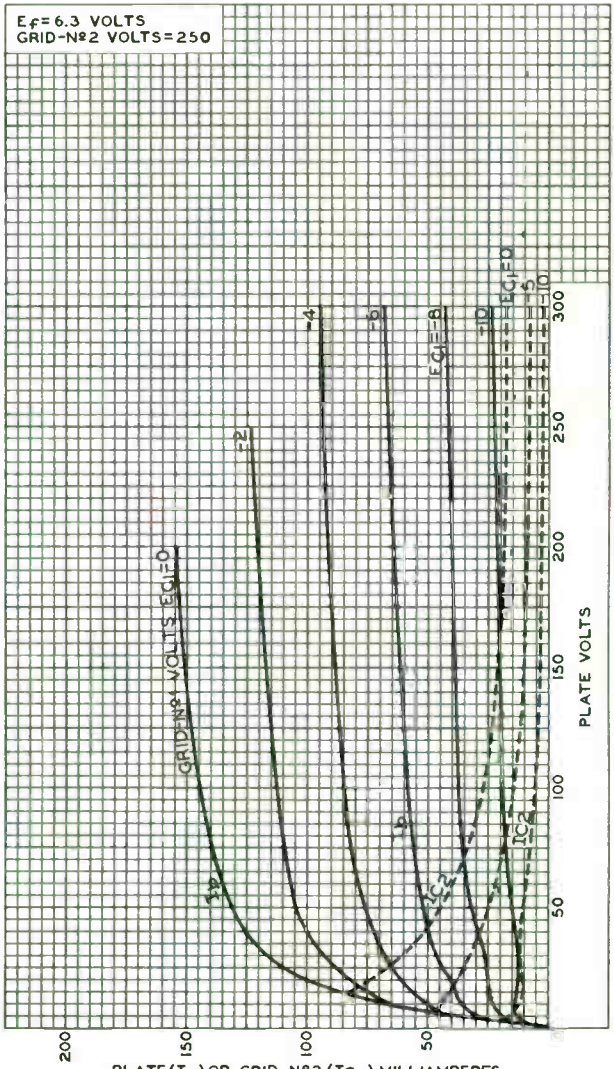
▲ The dc component must not exceed 100 volts.

OPERATING CONSIDERATIONS

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

6BQ5

AVERAGE CHARACTERISTICS



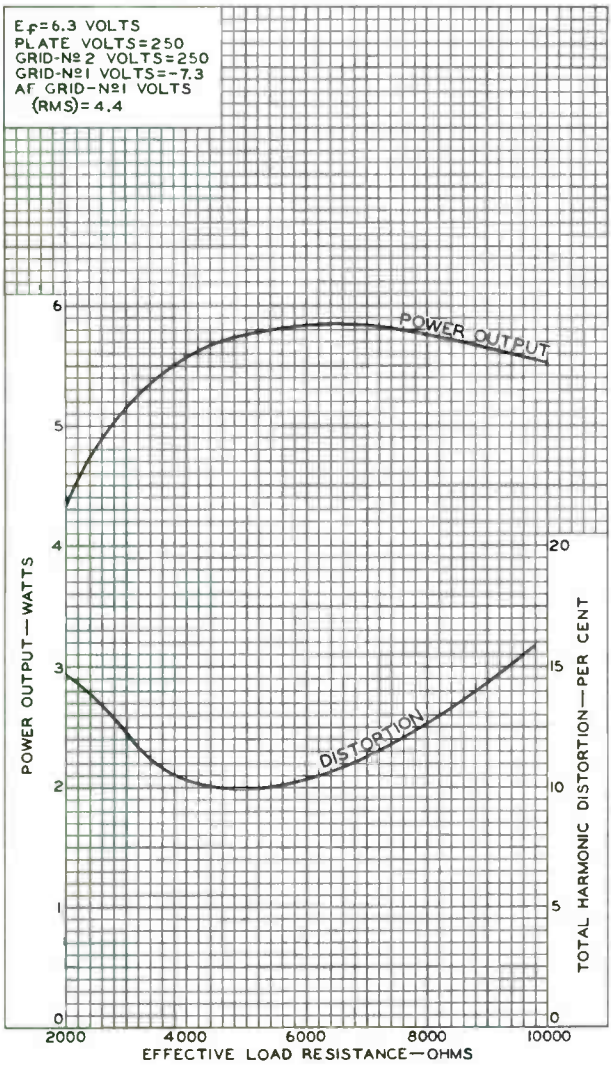
ELECTRON TUBE DIVISION 92CM-9903

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6BQ5

OPERATION CHARACTERISTICS



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

92CM-9902

Beam Power Tube

GENERAL DATA

Electrical:

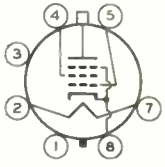
Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	1.2	amp
Direct Interelectrode Capacitances (Approx.):[a]		
Grid No.1 to plate	0.6	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	15	μμf
Plate to cathode & grid No.3, grid No.2, and heater	7	μμf

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.)	-	-	14500	ohms
Transconductance	-	-	5900	μmhos
Plate Current	260[b]	-	57	ma
Grid-No.2 Current	26[b]	-	2.1	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 1	-	-	-43	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	3-7/8"
Seated Length	2-7/8" to 3-5/16"
Maximum Diameter	1-9/32"
Bulb	T9
Cap	Skirted Miniature (JEDEC No.C1-2, C1-3, or C1-33)
Bases (Alternates):	
Intermediate-Shell Octal:	
7-Pin, Arrangement 1 (JEDEC Group 1, No.B7-7)	
6-Pin, Arrangement 2 (JEDEC Group 1, No.B6-81)	
Short Intermediate-Shell Octal with External Barriers:	
7-Pin (JEDEC Group 1, No.B7-59)	
6-Pin, Arrangement 2 (JEDEC Group 1, No.B6-84)	
5-Pin, Arrangement 3 (JEDEC Group 1, No.B5-187)	
Basing Designation for BOTTOM VIEW	6AM



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

→ Indicates a change.

HORIZONTAL-DEFLECTION AMPLIFIER

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

For operation in a 525-line, 30-frame system[d]

DC PLATE-SUPPLY VOLTAGE	600	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)[e]	6000[f]	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1250	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	200	max.	volts
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[g]	11	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[h]	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

[a] Without external shield.

[b] 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.

[c] On the 6-pin bases, pin 1 as well as pin 6 is omitted. On the 5-pin base, pins 1 and 3 as well as pin 6 are omitted.

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

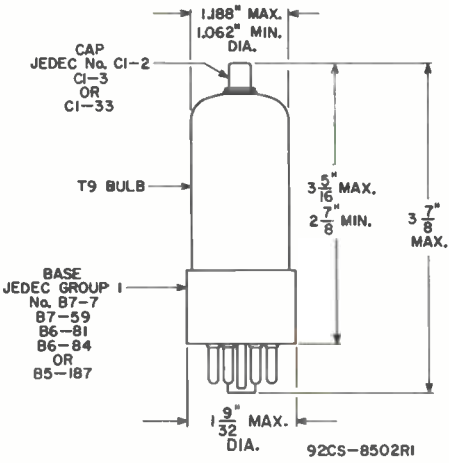
[e] This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

[f] Under no circumstances should this absolute value be exceeded.

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

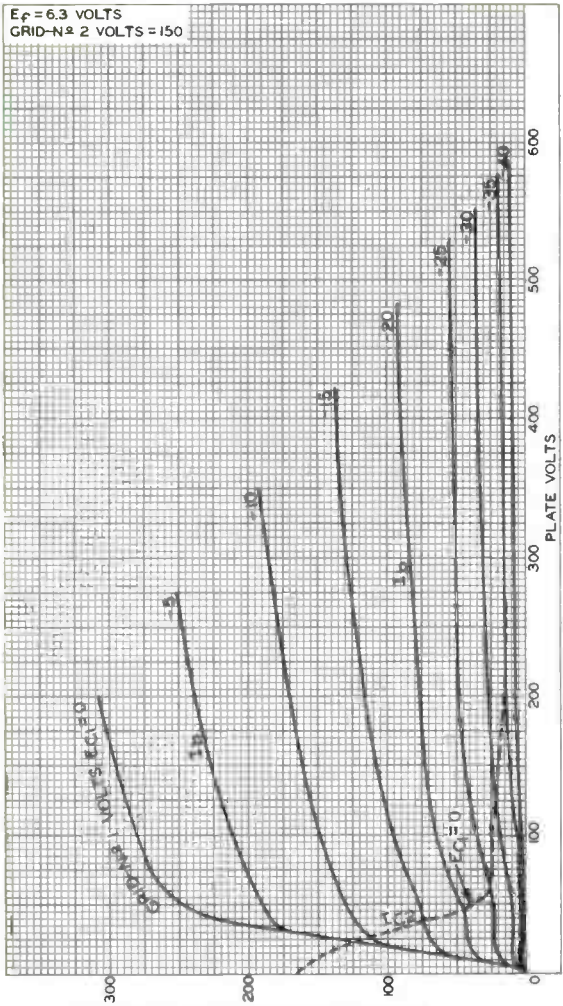
[h] The dc component must not exceed 100 volts.

→ Indicates a change.



6BQ6GTB/6CU6

AVERAGE CHARACTERISTICS



92CM-8501RI

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

Medium-Mu Twin Triode

9-PIN MINIATURE TYPE

For TV Tuners Using Direct-Coupled Cathode-Drive Circuits

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	6.3	volts
Current	0.4	amp

Direct Interelectrode Capacitances:[a] ←

	Unit No.1	Unit No.2	
Grid to plate	1.2	1.2	μμf
Grid to cathode, internal shield, and heater	2.6	–	μμf
Cathode to grid, internal shield, and heater	–	5	μμf
Plate to cathode, internal shield, and heater	1.2	–	μμf
Plate to grid, internal shield, and heater	–	2.2	μμf
Plate to cathode	0.12	0.12	μμf
Heater to cathode	2.6	2.6	μμf
Plate of unit No.1 to plate of unit No.2	0.010 max.		μμf
Plate to urit No.2 to plate and grid of unit No.1	0.024 max.		μμf

Characteristics, Class A_1 Amplifier (Each Unit): ←

Plate Supply Voltage	150	volts
Cathode Resistor	220	ohms
Amplification Factor	38	
Plate Resistance (Approx.)	5900	ohms
Transconductance	6400	μmhos
Plate Current	9	ma
Grid Voltage (Approx.) for plate μa = 100	-6.5	volts

Mechanical:

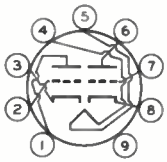
Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)

← Indicates a change.

6BQ7A

Basing Designation for BOTTOM VIEW. 9AJ

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



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

AMPLIFIER — Class A_1

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	250[b]	max.	volts
PLATE DISSIPATION	2	max.	watts
CATHODE CURRENT	20	max.	ma
→ PEAK HEATER–CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200[b]	max.	volts
Heater positive with respect to cathode.	200[c]	max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance	0.5	max.	megohm

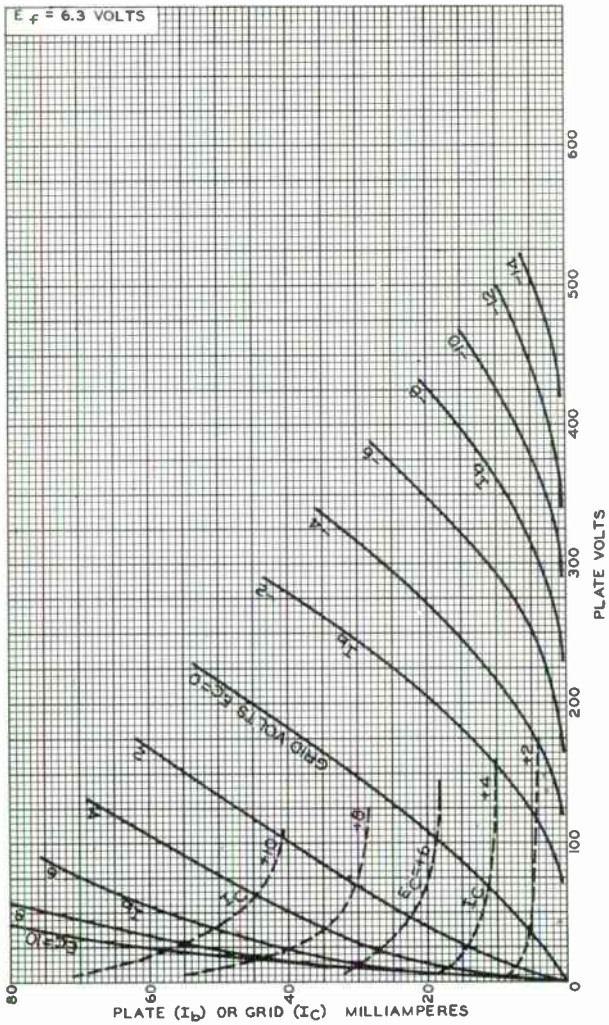
[a] With external shield JEDEC No.315 connected to internal shield.

[b] Under cutoff conditions in direct-coupled cathode-drive circuits, it is permissible for this voltage to be as high as 300 volts.

[c] The dc component must not exceed 100 volts.

→ Indicates a change.

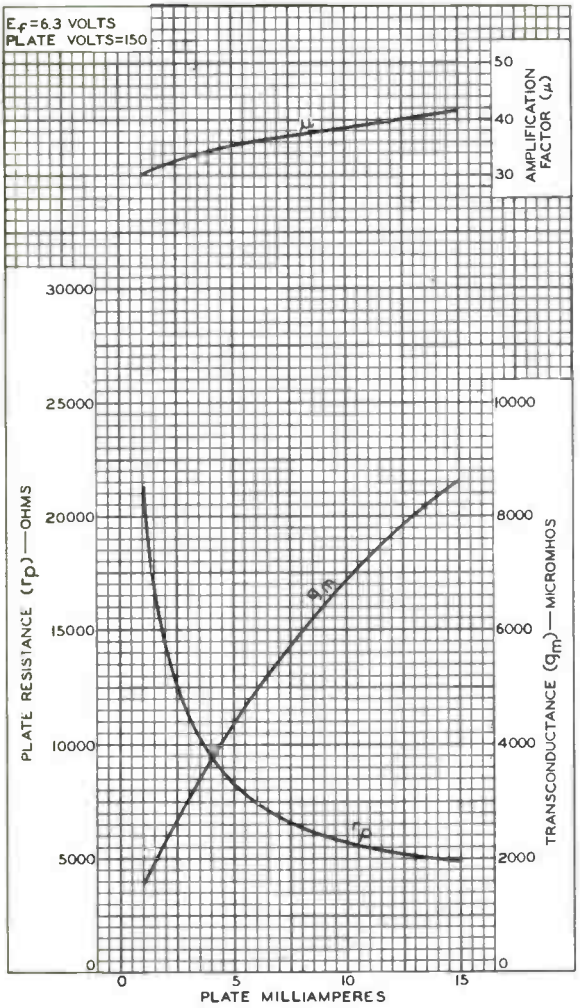
AVERAGE CHARACTERISTICS
Each Unit



92CM-7536R1

6BQ7A

AVERAGE CHARACTERISTICS
Each Unit



92CM-7538R2

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

RCA

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

RCA

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

Half-Wave Vacuum Rectifier

NOVAR TYPE

For Television Damper Service

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode[a]	5000[b] max.	volts
Heater positive with respect to cathode	300[c] max.	volts
Direct Interelectrode Capacitances (Approx.):[d]		
Plate to cathode and heater	6.5	pf
Cathode to plate and heater	9.0	pf
Heater to cathode	2.8	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.410"
Maximum Seated Length	3.030"
Length, Base Seat to Bulb Top (Excluding tip)	2.510" to 2.690"
Diameter	1.062" to 1.188"
Bulb	T9
Socket	Cinch Mfg. Co. No. 149 19 00 033, Industrial Electronic Hardware Corp. No. SO-0968-SL1, or equivalent
Base	Small-Button Novar 9-Pin (JEDEC No. E9-75)
Basing Designation for BOTTOM VIEW	9HP

Pin 1 – Do Not Use[e]
Pin 2 – Plate
Pin 3 – Do Not Use[e]
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Do Not Use[e]
Pin 7 – Plate
Pin 8 – Do Not Use[e]
Pin 9 – Cathode

DAMPER SERVICE

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[f]

PEAK INVERSE PLATE VOLTAGE[a]	5000	max.	volts
PEAK PLATE CURRENT	1100	max.	ma
DC PLATE CURRENT	200	max.	ma
PLATE DISSIPATION	6	max.	watts

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma. = 140 . . . . 12 volts

[a] 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.

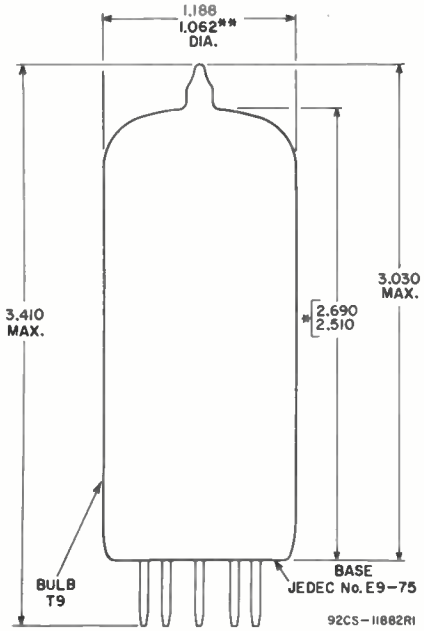
[b] The dc component must not exceed 900 volts.

[c] The dc component must not exceed 100 volts.

[d] Without external shield.

[e] Socket terminals 1, 3, 6, and 8 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.

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



ALL DIMENSIONS IN INCHES

** APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.

* MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY A RING GAUGE OF 0.600 INSIDE DIAMETER.

6BS3A

Half-Wave Vacuum Rectifier

NOVAR TYPE

For Television Damper Service

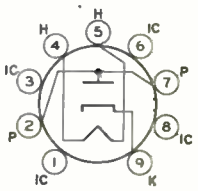
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ±0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode[a]	500[b] max.	volts
Heater positive with respect to cathode	300[c] max.	volts
Direct Interelectrode Capacitances (Approx):[d]		
P to (K,H)	6.5	pf
K to (P,H)	9.0	pf
Heater to cathode	2.8	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Ur potential
Maximum Overall Length	3.005"
Seated Length	2.375" to 2.625"
Diameter	1.062" to 1.188"
Dimensional Outline	See *General Section*
Bulb	T9
Base	Small-Button Novar 9-Pin with Exhaust Tip (JEDEC No.E9-89)
Basing Designation for BOTTOM VIEW	9HP

Pin 1 – Do Not Use[e]
Pin 2 – Plate
Pin 3 – Do Not Use[e]
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Do Not Use[e]
Pin 7 – Plate
Pin 8 – Do Not Use[e]
Pin 9 – Cathode



DAMPER SERVICE

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[f]

Peak Inverse Plate Voltage[a]	5000 max.	volts
Peak Plate Current	1100 max.	ma
Average Plate Current	200 max.	ma
Plate Dissipation	6 max.	watts

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma = 140	12	volts

[a] 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.

[b] The ac component must not exceed 900 volts.

[c] The dc component must not exceed 100 volts.

[d] Without external shield.

[e] Socket terminals 1, 3, 6, and 8 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.

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

Sharp-Cutoff Twin Pentode

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

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage (AC or DC)	6.3 ± 10%		volts
Current at 6.3 volts	0.3		amp
Direct Interelectrode Capacitances:[a]			
Grid No.3 to plate (Each unit)	1.9		μμf
Grid No.1 to all other electrodes	6		μμf
Grid No.3 to all other electrodes (Each unit)	3.6		μμf
Plate to all other electrodes (Each unit)	3		μμf
Grid No.3 (Unit No.1) to grid No.3 (Unit No.2)	0.015 max.		μμf

Characteristics, Class A_1 Amplifier:

With both units operating			
Plate Voltage (Each Unit)	100	100	volts
Grid-No.3 Voltage (Each Unit)	−10	0	volts
Grid-No.2 Voltage	67.5	67.5	volts
Grid-No.1 Voltage	[b]	[b]	volts
Plate Current (Each Unit)	–	2.2	ma
Grid-No.2 Current	6.5	3.3	ma
Cathode Current	6.6	7.8	ma
With one unit operating[c]			
Plate Voltage	100	100	volts
Grid-No.3 Voltage	0	0	volts
Grid-No.2 Voltage	67.5	67.5	volts
Grid-No.1 Voltage	0	[b]	volts
Grid-No.3-to-Plate Transconductance	–	180	μmhos
Grid-No.1-to-Plate Transconductance	1500	–	μmhos
Plate Current	–	2.2	ma
Grid-No.3 Voltage (Approx.) for plate μa = 100	–	-4.5	volts
Grid-No.1 Voltage (Approx.) for plate μa = 100	–	-2.3	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2

6BU8

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

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

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

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE (Each unit).	300	max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE (Each unit):			
Peak-positive value.	50	max.	volts
Negative-bias value.	0	max.	volts
Positive-bias value.	3	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE.	150	max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Negative-bias value.	50	max.	volts
CATHODE CURRENT.	12	max.	ma
GRID-No.2 INPUT.	0.75	max.	watt
PLATE DISSIPATION (Each unit).	1.1	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200[d]	max.	volts

Maximum Circuit Values:

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

[a] Without external shield.
[b] Adjusted to give a dc grid-No.1 current of 100 microamperes.
[c] With plate and grid No.3 of the other unit connected to ground.
[d] The dc component must not exceed 100 volts.

← Indicates a change.

Twin Diode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current	0.45	amp
Direct Interelectrode Capacitances:[a]		
Pentode Unit:		
Grid No.1 to plate	0.02 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	4.8	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.6	μμf
Diode Units:		
Diode-No.1 plate to cathode and heater	1.3	μμf
Diode-No.2 plate to cathode and heater	1.2	μμf
Pentode grid No.1 to either diode plate	0.006 max.	μμf

Characteristics, Class A_1 Amplifier (Pentode Unit):

Plate Supply Voltage	250	volts
Grid-No.2 Supply Voltage	110	volts
Cathode Resistor	68	ohms
Plate Resistance (Approx.)	0.25	megohm
Transconductance	5200	μmhos
Grid-No.2 Current	3.5	ma
Plate Current	10	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-10	volts

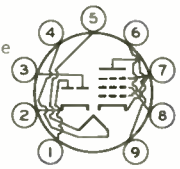
Mechanical:

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

6BW8

Basing Designation for BOTTOM VIEW. 9HK

Pin 1 – Diode Plate No.2
Pin 2 – Diode Cathode
Pin 3 – Diode Plate No.1
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Pentode Grid No.1



Pin 7 – Pentode Cathode, Grid No.3, Internal Shield
Pin 8 – Pentode Grid No.2
Pin 9 – Pentode Plate

PENTODE UNIT — AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE.	330	max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . .	330	max.	volts
GRID-No.2 VOLTAGE. . . . . See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section			
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Negative-bias value.	55	max.	volts
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.	3	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200[b]	max.	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

DIODE UNITS — Two

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

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

Characteristics, Instantaneous Test Condition:

Plate Current for plate volts = 50	20		ma

[a] Without external shield.
[b] The dc component must not exceed 100 volts.

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

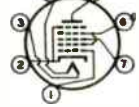
Characteristics, Class A_1 Amplifier:

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.

RCA

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:

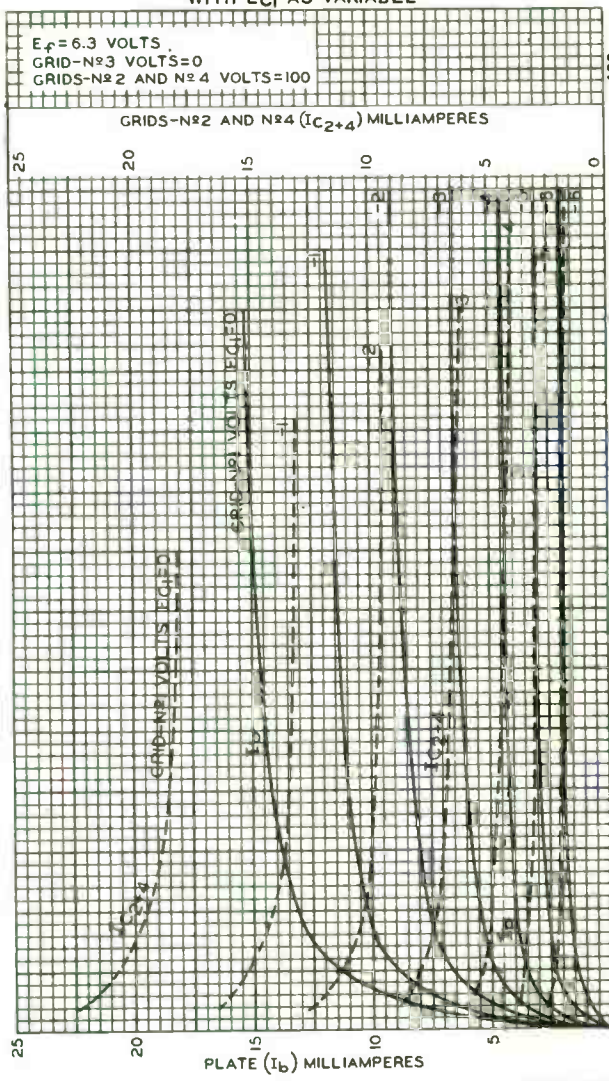
Grid-No.1 or Grid-No.3-Circuit Resistance:		
For fixed-bias operation	0.5 max.	megohm
For cathode-bias operation	1.0 max.	megohm

The dc component must not exceed 100 volts.

RCA

6BY6

AVERAGE OPERATION CHARACTERISTICS WITH E_{G1} AS VARIABLE



NOV.5,1953

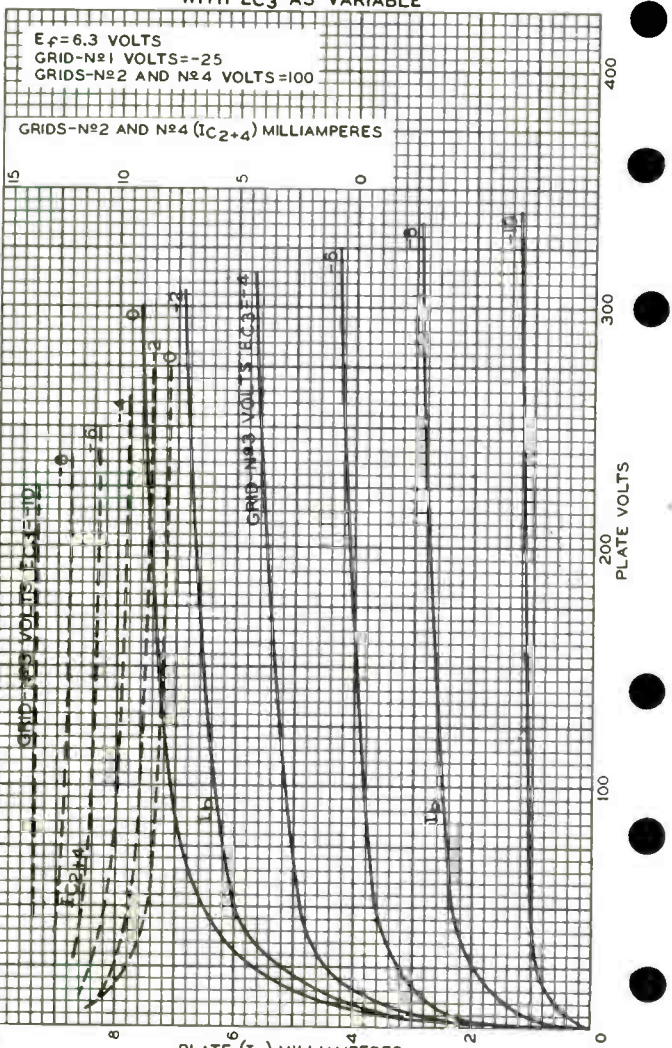
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8140

6BY6

6BY6

AVERAGE OPERATION CHARACTERISTICS
WITH E_{C3} AS VARIABLE



NOV. 5, 1953

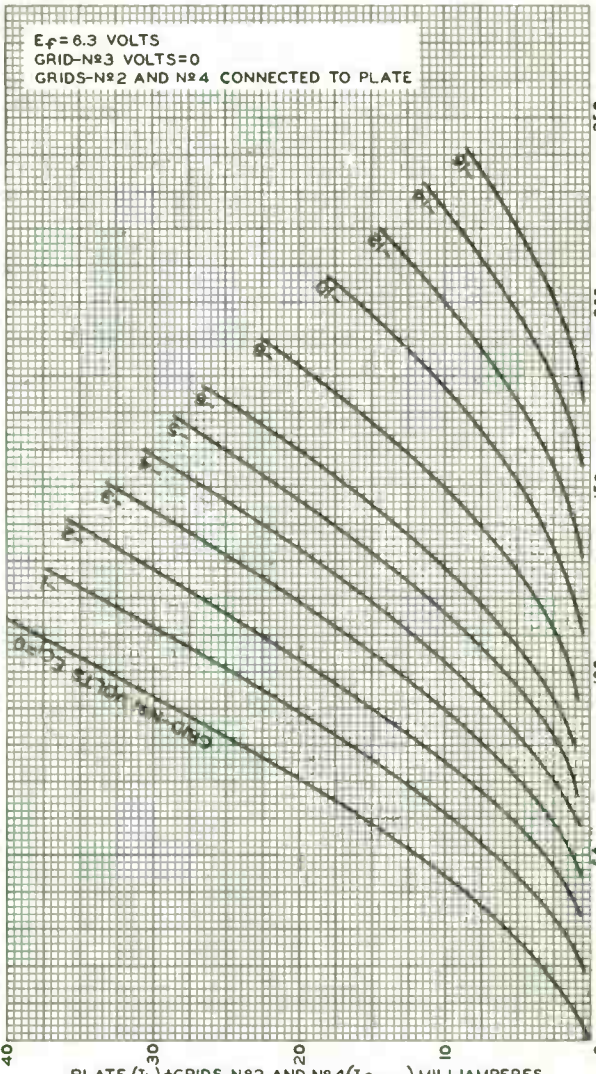
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8139

RCA

6BY6

AVERAGE PLATE CHARACTERISTICS



NOV. 5, 1953 TUBE DEPARTMENT 92CM-8138

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BY8

DIODE—SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage	6.3	ac or dc volts
Current	0.6	amp
Warm-up time (Average)	11	sec

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

Direct Interelectrode Capacitances:°

Diode Unit:			
Plate to cathode, pentode plate, pentode grid No.3 & internal shield, pentode grid No.2, pentode grid No.1, pentode cathode, and heater	4.8•		μμf
Pentode Unit:			
Grid No.1 to plate	0.0035	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	5		μμf

Characteristics, Class A_1 Amplifier (Pentode Unit):

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

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JETEC No.E9-1)

°,•: See next page.

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

6BY8

6BY8

DIODE—SHARP-CUTOFF PENTODE

Basing Designation for BOTTOM VIEW 9FN

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

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

PENTODE UNIT — AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300	max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE	0	max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	300	max.	volts
GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*		
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Negative-bias value	50	max.	volts
Positive-bias value	0	max.	volts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts	0.65	max.	watt
For grid-No.2 voltages between 150 and 300 volts	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*		
PLATE DISSIPATION	3	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts

Maximum Circuit Values:

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

DIODE UNIT

Maximum Ratings, *Design-Center Values:*

PEAK INVERSE PLATE VOLTAGE	430	max.	volts
PLATE CURRENT:			
Peak	180	max.	ma
DC	45	max.	ma
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts

° With external shield JETEC No.315 connected to pentode cathode (pin 9) except as noted.
● With external shield JETEC No.315 connected to ground.
▲ The dc component must not exceed 100 volts.

6BY8

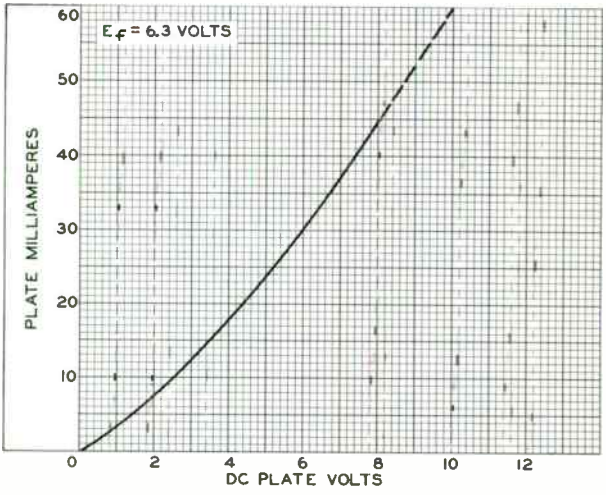
DIODE—SHARP-CUTOFF PENTODE

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

9-58

TENTATIVE DATA 2

AVERAGE PLATE CHARACTERISTIC
DIODE UNIT



92CS-9616

6BZ6

SEMIREMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage (AC or DC)		6.3 ± 10%	volts
Current		0.3	amp
Direct Interelectrode Capacitances:			
	Without External Shield	*With External Shield*[a]	
Grid No.1 to plate	0.025 max.	0.015 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	7	7	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	2	3	μμf

Characteristics, Class A1 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.)	0.26	megohm
Transconductance	8000	μmhos
Plate Current	14	ma
Grid-No.2 Current	3.6	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 50	-19	volts
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 700 and cathode resistor (ohms) = 0	-4.5	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	*See General Section*
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No.E7-11)
Basing Designation for BOTTOM VIEW	7CM

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

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

← Indicates a change.

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BZ6

SEMIREMOTE-CUTOFF PENTODE

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

o With external shield JEDEC No.316 connected to cathode.

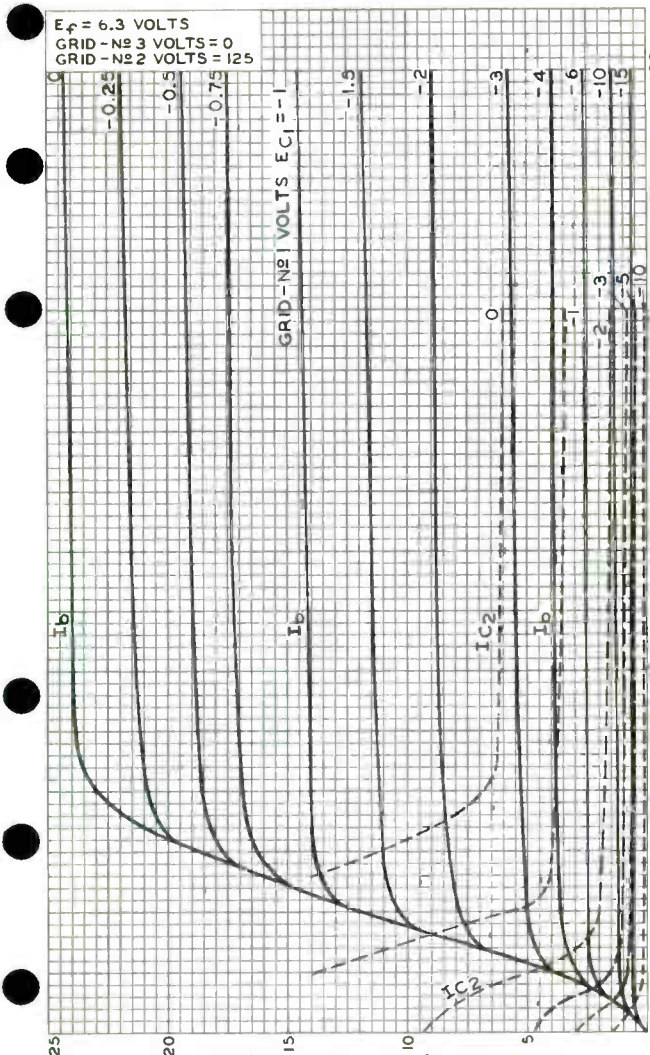
▲ The dc component must not exceed 100 volts.

→ indicates a change.

RCA

6BZ6

AVERAGE CHARACTERISTICS



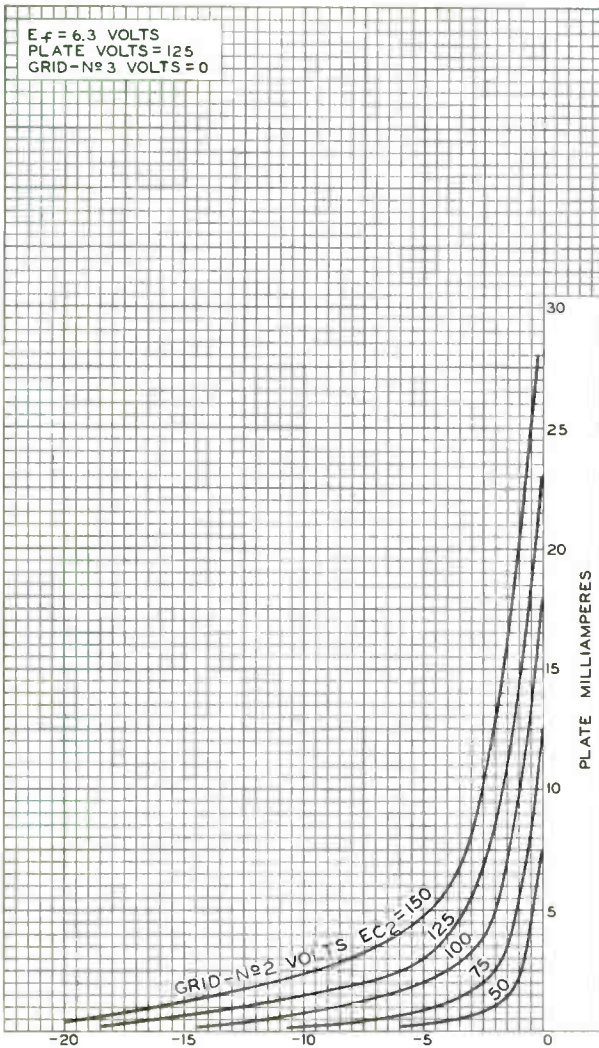
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8508R2

6BZ6

6BZ6

AVERAGE CHARACTERISTICS



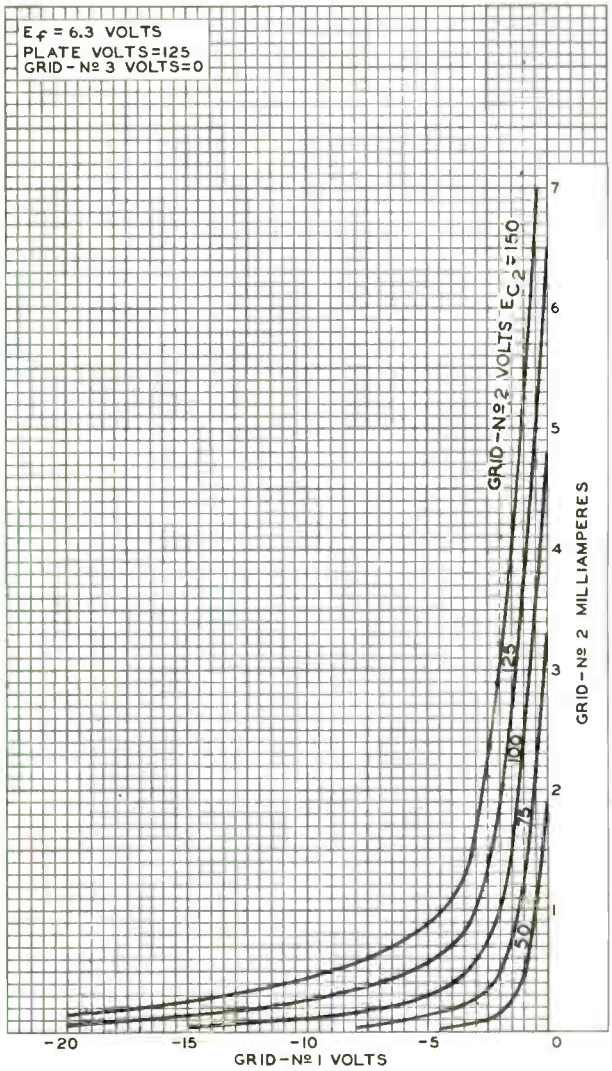
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9481R1

RCA

6BZ6

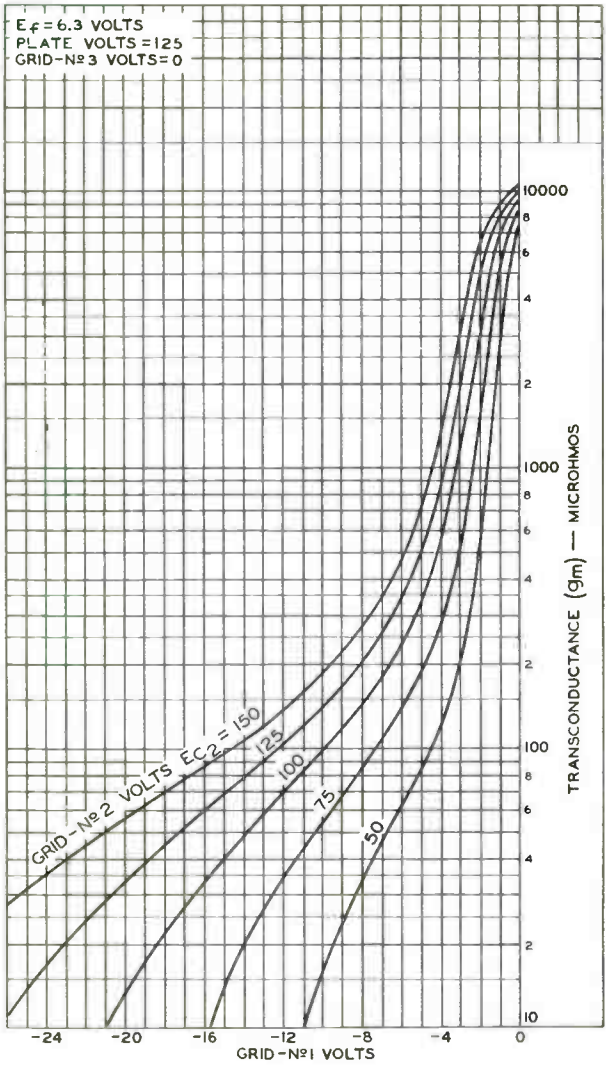
AVERAGE CHARACTERISTICS



6BZ6

6BZ6

AVERAGE CHARACTERISTICS



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

92CM-8509R1

Medium-Mu Twin Triode

9-PIN MINIATURE TYPE

For TV Tuners Using Direct-Coupled Cathode-Drive Circuits

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:			
Voltage (AC or DC)		6.3 ± 10%	volts
Current at 6.3 volts		0.4	amp
Direct Interelectrode Capacitances:[a]			
	Unit No.1	*Unit No.2*	
Grid to plate	1.2	1.2	μμf
Grid to cathode, internal shield, and heater	2.6	–	μμf
Plate to cathode, internal shield, and heater	1.2	–	μμf
Plate to cathode	0.12	0.12	μμf
Heater to cathode	2.6	2.6	μμf
Cathode to grid, internal shield, and heater	–	5	μμf
Plate to grid, internal shield, and heater	–	2.2	μμf
Plate of unit No.1 to plate of unit No.2	0.010 max.		μμf
Plate of unit No.2 to plate and grid of unit No.1	0.024 max.		μμf

Characteristics, Class A_1 Amplifier (Each Unit):

Plate Supply Voltage	150	volts
Cathode Resistor	220	ohms
Amplification Factor	36	
Plate Resistance (Approx.)	5300	ohms
Transconductance	6800	μmhos
Plate Current	10	ma
Grid Voltage (Approx.) for plate μa = 100	-7	volts

Mechanical:

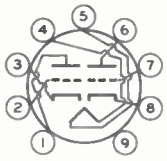
Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)

→ Indicates a change.

6BZ7

Basing Designation for BOTTOM VIEW. 9AJ

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



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

AMPLIFIER — Class A_1

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	250[b]	max.	volts
PLATE DISSIPATION	2	max.	watts
CATHODE CURRENT	20	max.	ma
PEAK HEATER–CATHODE VOLTAGE:			
Heater negative with respect to cathode	200[b]	max.	volts
Heater positive with respect to cathode	200[c]	max.	volts

→ **Maximum Circuit Values:**

Grid-Circuit Resistance	0.5	max.	megohm

[a] With external shield JEDEC No.315 connected to internal shield.

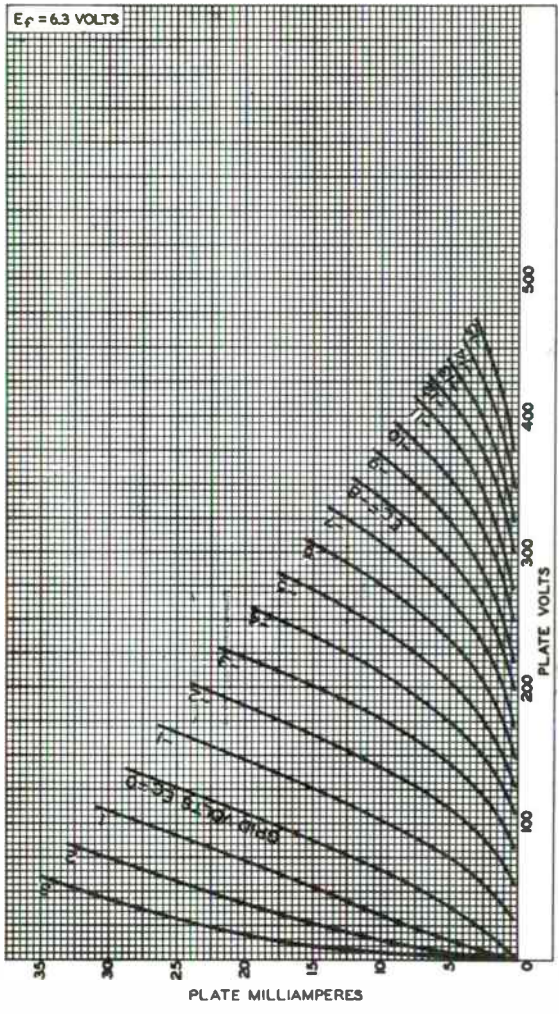
→ [b] Under cutoff conditions in direct-coupled cathode-drive circuits, it is permissible for this voltage to be as high as 300 volts.

[c] The dc component must not exceed 100 volts.

→ Indicates a change.

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

AVERAGE PLATE CHARACTERISTICS
Each Unit



92CM-9231

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:[o]		
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

[o] 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

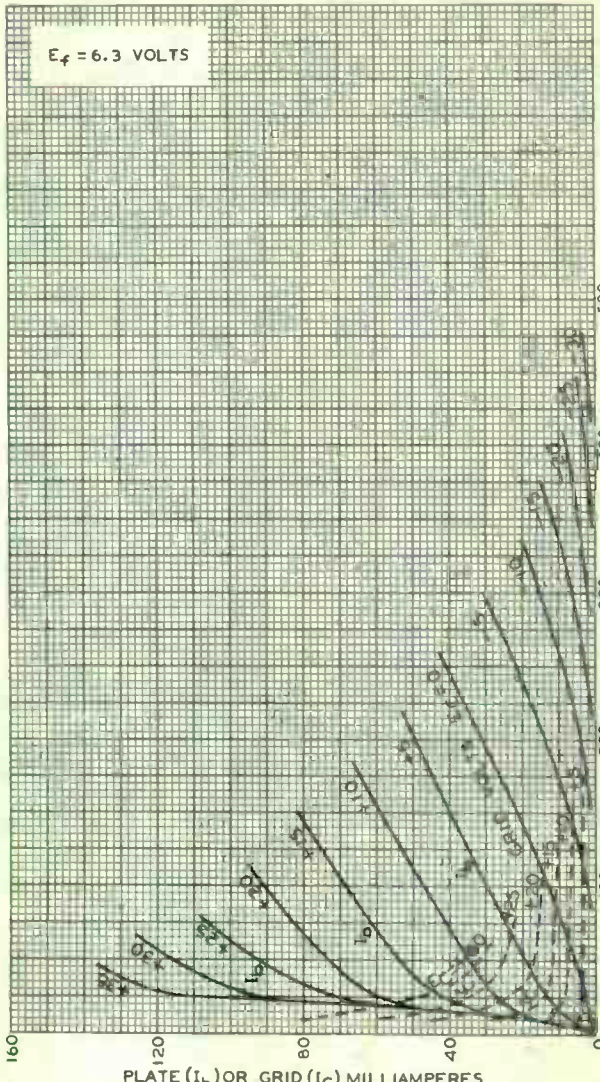
■ The dc component must not exceed 100 volts.

● 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

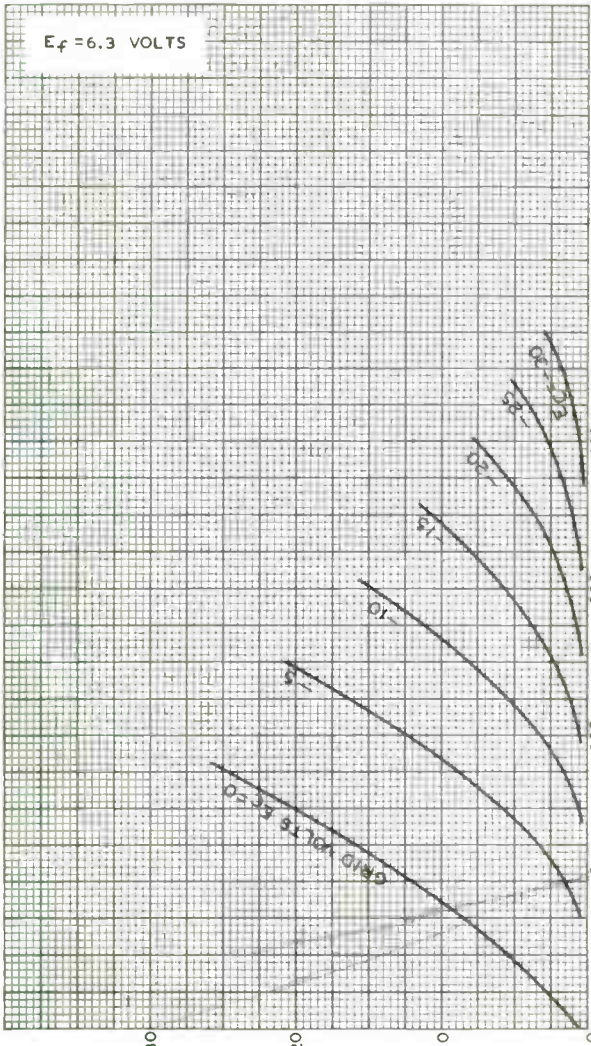


MARCH 16,1942 RCA RADIOTRON DIVISION 92C- 6378

6C4

6C4

AVERAGE PLATE CHARACTERISTICS



MARCH 14, 1942

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6377

Full-Wave Vacuum Rectifier

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	1	amp

Mechanical:

Operating Position	Any
Maximum Overall Length	3-1/16"
Maximum Seated Length	2-13/16"
Length, Base Seat to Bulb Top (Excluding tip)	2-7/16" ± 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	9M

Pin 1 – Plate No.1
Pin 2 – No Connection
Pin 3 – Cathode
Pin 4 – Heater
Pin 5 – Heater

Pin 6 – No Connection
Pin 7 – Plate No.2
Pin 8 – No.Connection
Pin 9 – No Connection

FULL-WAVE RECTIFIER

Maximum Ratings, *Design-Center Values:*

PEAK INVERSE PLATE VOLTAGE	1000 max.	volts
AC PLATE SUPPLY VOLTAGE PER PLATE (RMS):		
With capacitor-input to filter	350 max.	volts
PEAK PLATE CURRENT PER PLATE	450 max.	ma
DC OUTPUT CURRENT	150 max.	ma

HOT-SWITCHING TRANSIENT PLATE CURRENT PER PLATE:

Even occasional hot-switching with capacitor-input circuits permits the flow of plate current having magnitudes which can adversely affect the life and reliability of tubes. If capacitor-input circuits are to be used, protect the circuits against possible adverse effects of hot-switching by the use of a circuit arrangement which will limit the maximum peak current value per plate to a value of 1 ampere during the initial cycles of the hot-switching transient.

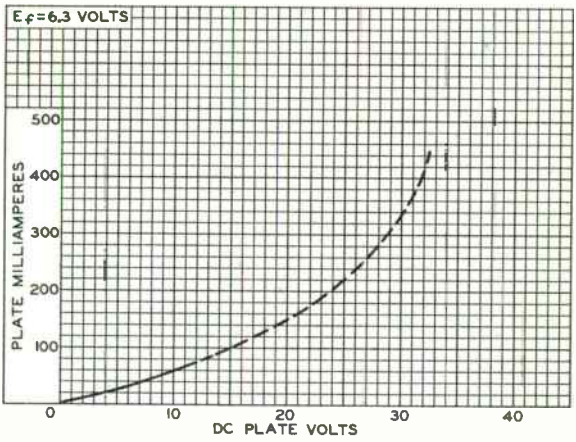
PEAK HEATER-CATHODE VOLTAGE:
Heater negative with respect to cathode . . 500 max. volts

Typical Operation:

With capacitor input to filter

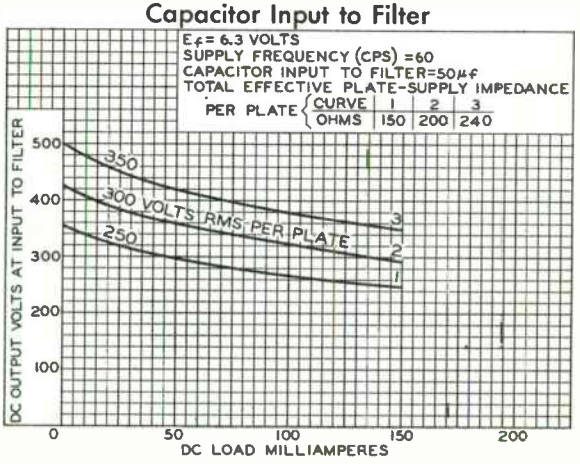
AC Plate-To-Plate Supply Voltage (RMS)	500	600	700	volts
Filter-Input Capacitor	50	50	50	μf
Total Effective Plate-Supply Impedance Per Plate	150	200	240	ohms
DC Output Voltage at Input to Filter (Approx.) for dc output ma. = 150	245	293	347	volts

AVERAGE PLATE CHARACTERISTIC
Each Unit



92CS-10378

OPERATION CHARACTERISTICS
Capacitor Input to Filter



92CS-10379

Beam Power Tube

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	1.2	amp
Direct Interelectrode Capacitances (Approx.):[a]		
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:

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	130	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	130	max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0	max.	volts
GRID-No.2 INPUT	1.4	max.	watts
PLATE DISSIPATION	5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[b]	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	180	max.	°C

Typical Operation and Characteristics:

Plate Voltage	110	125	volts
Grid-No.2 Voltage	110	125	volts

Grid-No.1 Voltage	-4	-4.5	volts
Peak AF Grid-No.1 Voltage	4	4.5	volts
Zero-Signal Plate Current	32	37	ma
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

[a] Without external shield.
[b] The dc component must not exceed 100 volts.

6CB5-A

BEAM POWER TUBE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage (AC or DC)		6.3 ± 10%	volts
Current		2.5	amp
Direct Interelectrode Capacitances (Approx.):[○]			
Grid No.1 to plate		0.4	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		10	μμf

Characteristics, Class A₁ Amplifier:

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

Mechanical:

Operating Position	Any
Maximum Overall Length	5"
Seated Length	4-1/4" ± 3/16"
Maximum Diameter	1-23/32"
Bulb	T12
Cap	Small (JEDEC No.C1-1)
Base	Short Jumbo-Shell Octal 8-Pin with External Barriers (JEDEC Group 1, No.B8-71), or Short Medium-Shell Octal 8-Pin with External Barriers, Style B (JEDEC Group 1, No.B8-118)
Basing Designation for BOTTOM VIEW	BGD

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

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

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

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

DC (Including boost) PLATE VOLTAGE	880 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[#]	6800 max.	volts

← Indicates a change.

6CB5-A

BEAM POWER TUBE

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

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:			
For grid-resistor-bias operation. . .	0.47	max.	megohm

° Without external shield.

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

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

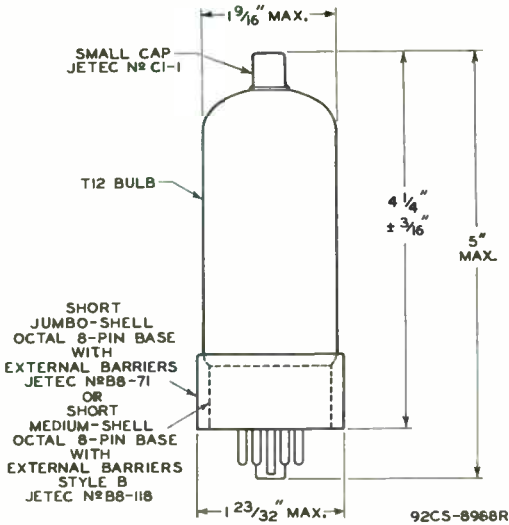
\# The duration of the voltage pulse must not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

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

▲ The dc component must not exceed 100 volts.

6CB5-A

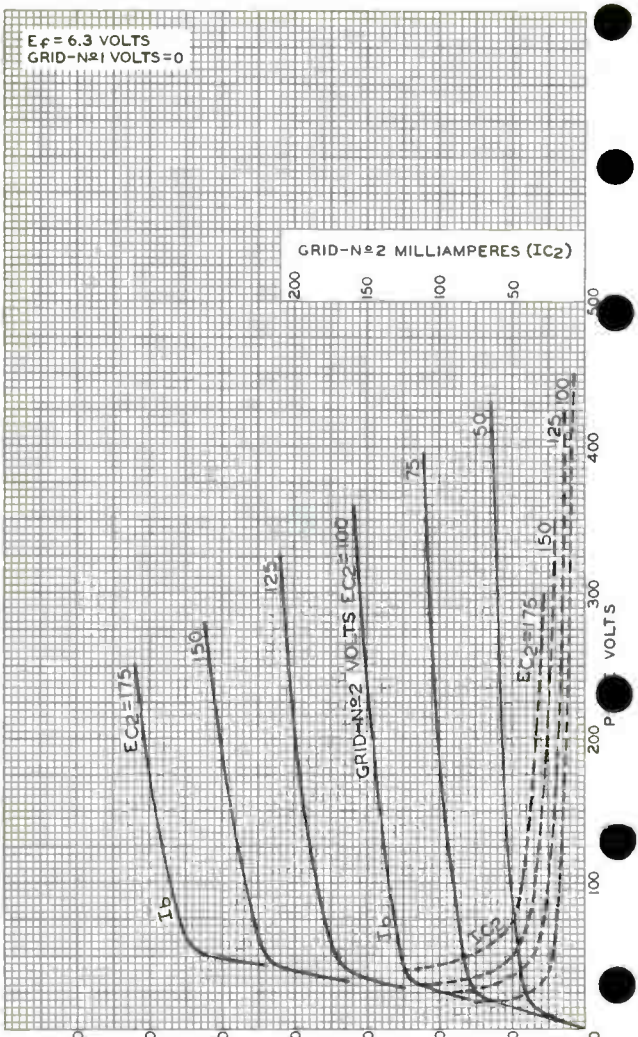
BEAM POWER TUBE



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CB5-A

AVERAGE CHARACTERISTICS

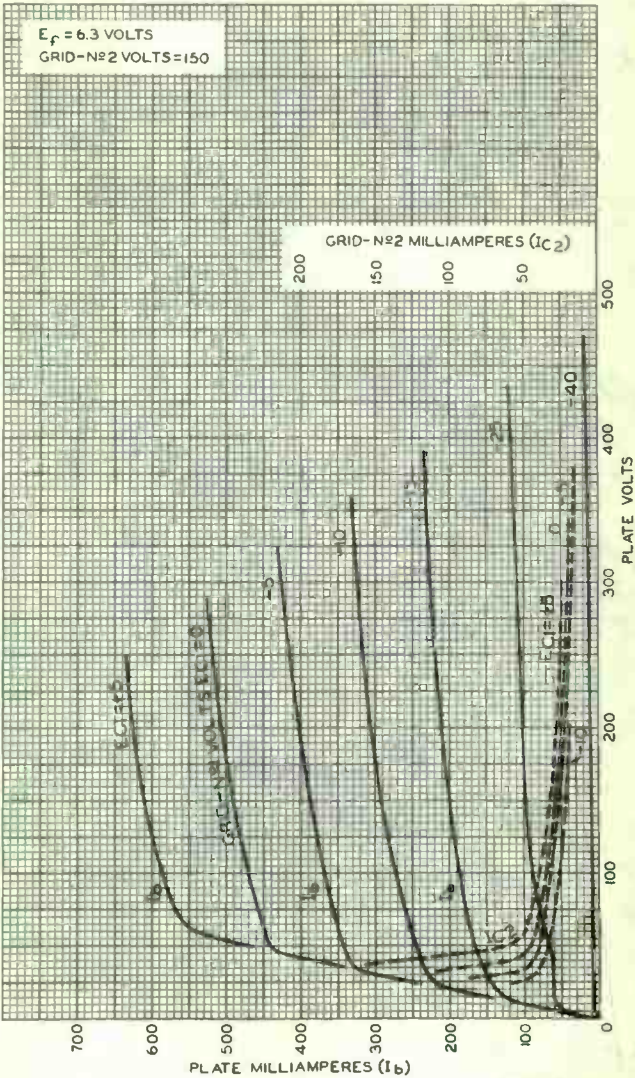


TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8437RI

6CB5-A

AVERAGE CHARACTERISTICS



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8436

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

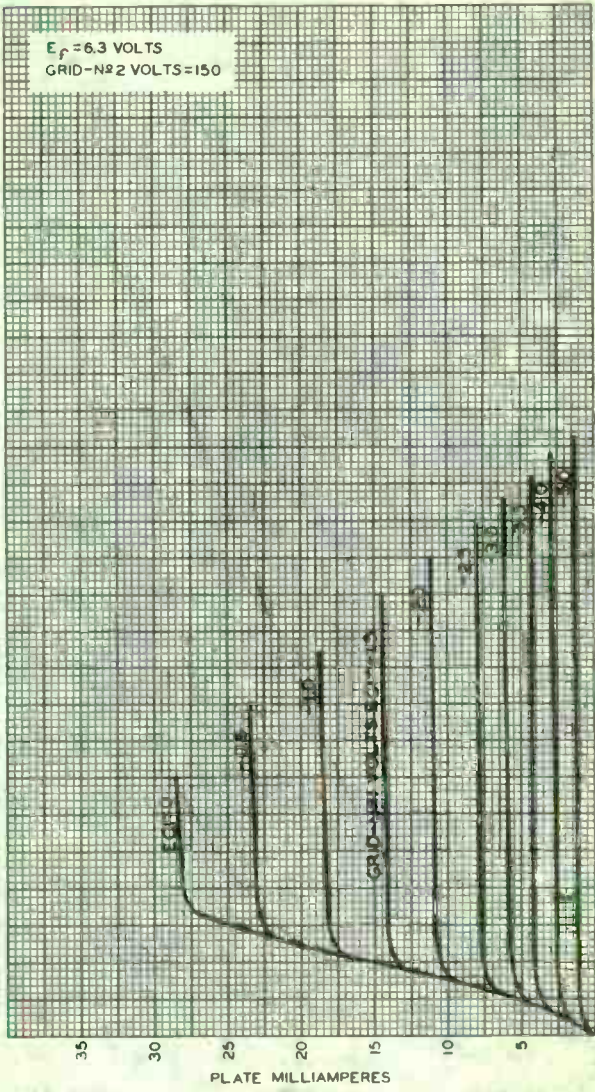
▲ The dc component must not exceed 100 volts.

→ indicates a change.

RCA

6CB6

AVERAGE PLATE CHARACTERISTICS



SEPT. 30, 1949

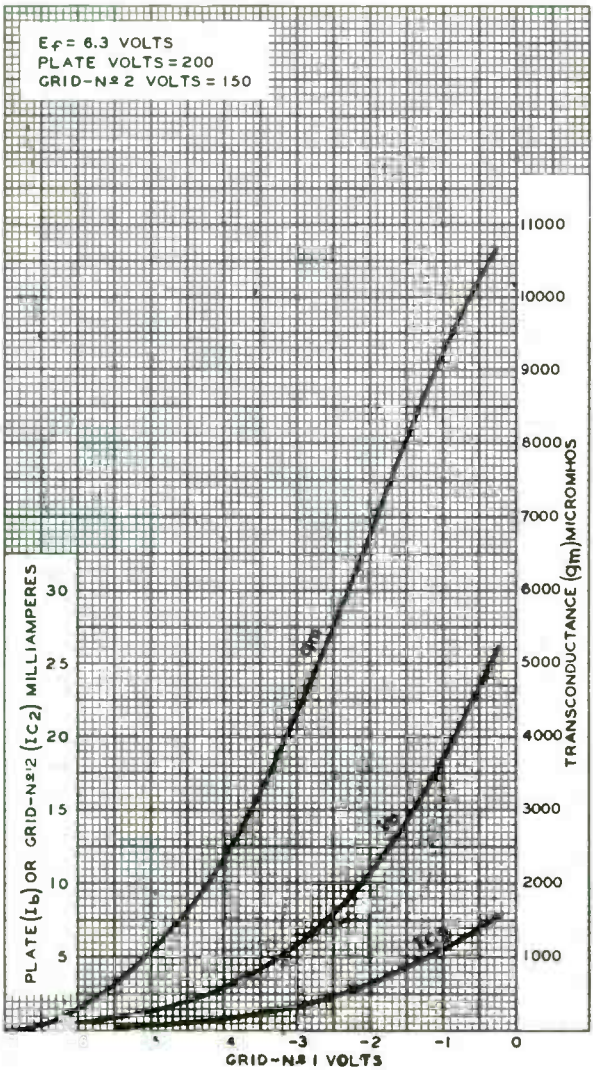
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7378

RCA

6CB6

AVERAGE CHARACTERISTICS



SEPT. 28, 1949

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7375

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

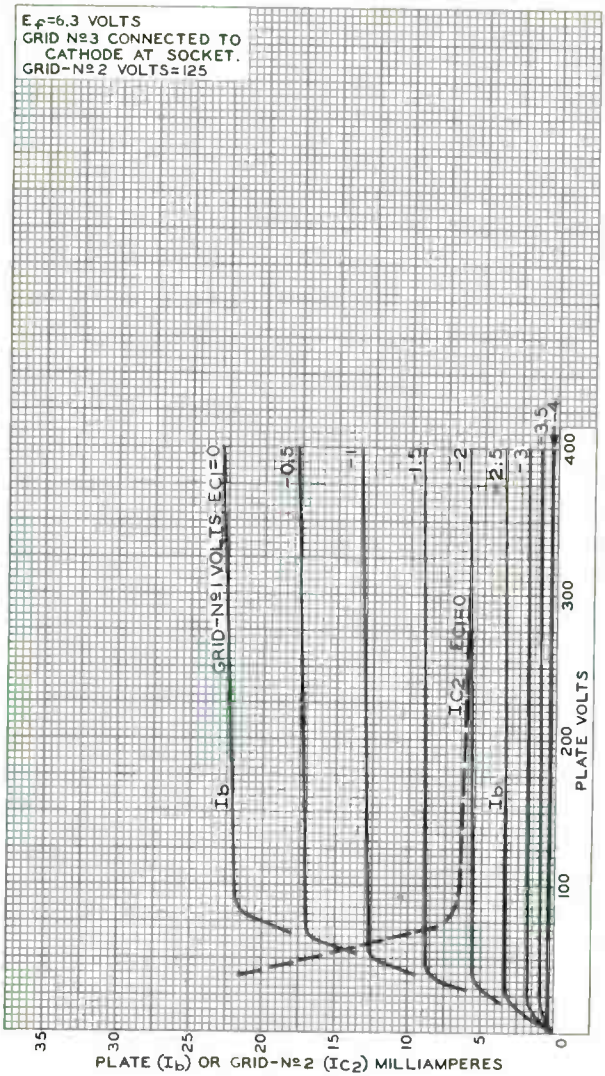
○ With external shield JEDEC No.316 connected to cathode.
◆ Connected to cathode at socket.
▲ The dc component must not exceed 100 volts.

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

TENTATIVE DATA

6CB6-A

AVERAGE CHARACTERISTICS

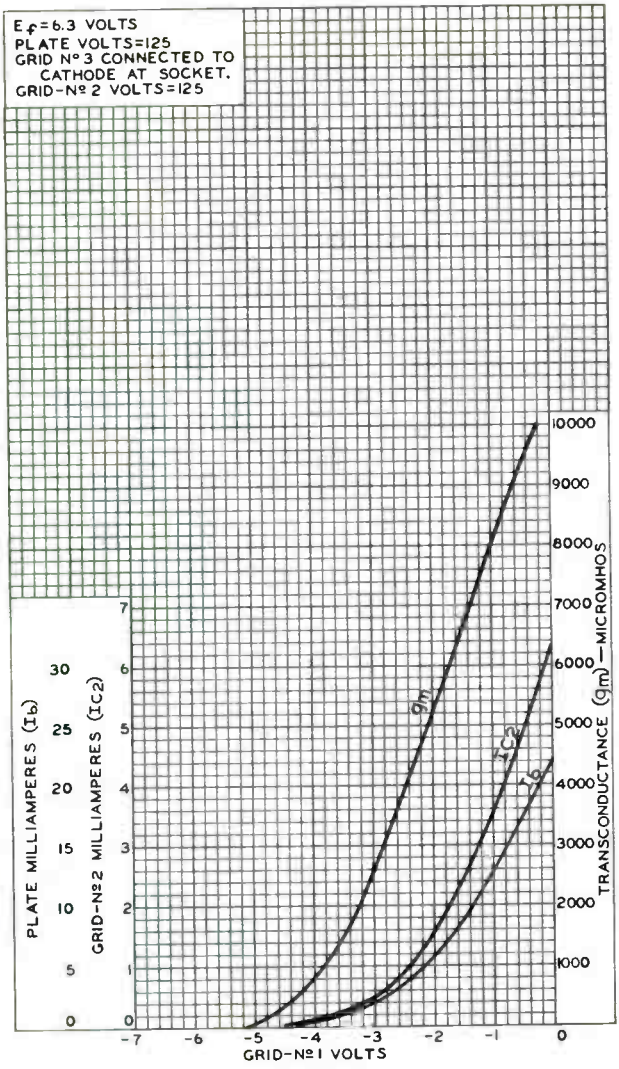


ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9854

6CB6-A

AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-9853

6CD6-GA
BEAM POWER TUBE

Supersedes Type 6CD5-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

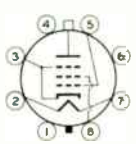
Characteristics, Class A_1 Amplifier:

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

TENTATIVE DATA

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 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†	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.

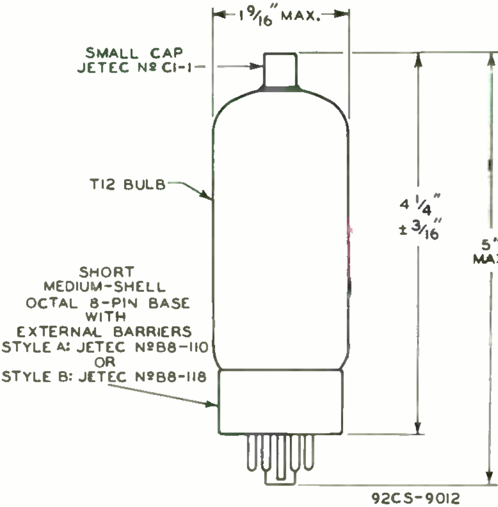
▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6CD6-GA

BEAM POWER TUBE



TUBE DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

6CD6-GA

RCA

6CD6-GA

AVERAGE CHARACTERISTICS

92CM-9017

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6CD6-GA

AVERAGE CHARACTERISTICS

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9016

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	0.3	amp
Warm-up time (Average)	11	sec
Direct Interelectrode Capacitances:[a]		
Grid No.1 to plate	0.03 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	6.5	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	1.9	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	125	volts
Grid-No.2 Voltage	125	volts
Grid-No.1 Supply Voltage	-1	volt
Grid-No.1 Resistor (Bypassed)	1	megohm
Plate Resistance (Approx.)	0.3	megohm
Transconductance	7600	μmhos
Plate Current	11	ma
Grid-No.2 Current	2.3	ma
Grid-No.1 Voltage (Approx.) for plate μa = 35	-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	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

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	150 max.	volts

6CE5

GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0	max.	volts
GRID-No.2 INPUT	0.5	max.	watt
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[b]	max.	volts

[a] Without external shield.

[b] The dc component must not exceed 100 volts.

6CF6
SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage (AC or DC)		6.3 ± 10%	volts
Current		0.3	amp
Direct Interelectrode Capacitances:			
	Without External Shield	*With External Shield[o]*	
Grid No.1 to plate	0.025 max.	0.015 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	6.5	6.5	μμf
Plate to cathode & grid No. 3 & internal shield, grid No.2, and heater	2	3	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.)	0.3	megohm
Transconductance	7800	μmhos
Plate Current	12.5	ma
Grid-No.2 Current	3.7	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	−6	volts
Grid-No.1 Voltage (Approx.) for plate ma. = 2.2, and cathode resistor (ohms) = 0	−3	volts

Mechanical:

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

← Indicates a change.

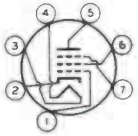
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CF6

SHARP-CUTOFF PENTODE

Basing Designation for BOTTOM VIEW. 7CM

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



AMPLIFIER — Class A_1

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

PLATE VOLTAGE	330	max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	330	max.	volts
GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*		
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0	max.	volts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 165 volts	0.55	max.	watt
For grid-No.2 voltages 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

° With external shield JEDEC No.316 connected to cathode.
▲ The dc component must not exceed 100 volts.

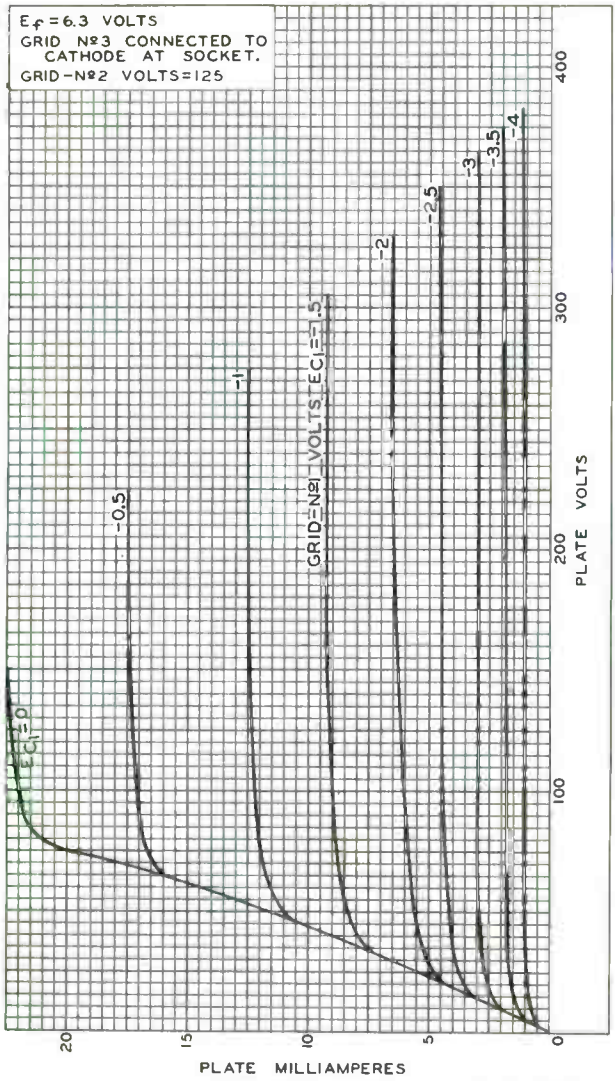
→ Indicates a change.

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

RCA

6CF6

AVERAGE PLATE CHARACTERISTICS



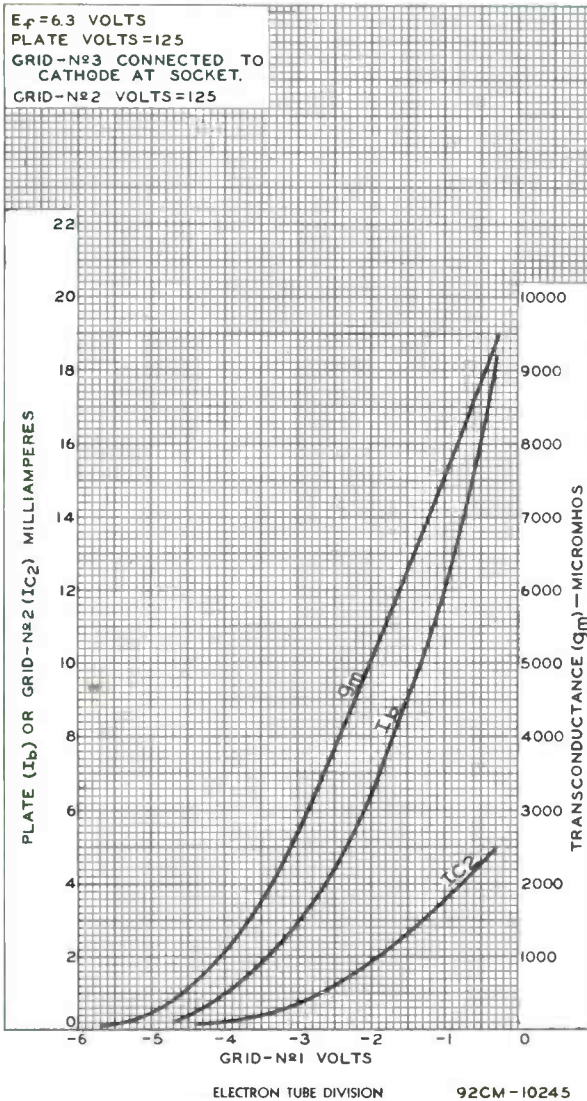
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-10243

6CF6

6CF6

AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION 92CM-10245
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CG7

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:			
Voltage (AC or DC)	6.3		volts
Current	0.6 ± 6%		amp
Warm-up time (Average)	11		sec
Direct Interelectrode Capacitances (Each unit, approx.):[o]			
Grid to plate	4		μμf
Grid to cathode, internal shield, and heater.	2.3		μμf
Plate to cathode, internal shield, and heater.	2.2		μμf

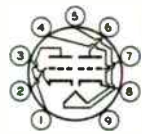
Characteristics, Class A_1 Amplifier (Each Unit):

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 volts = −12.5.	−	1.3	ma
Grid Voltage (Approx.) for plate μa = 10	−7	−18	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW	9AJ

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



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

AMPLIFIER — Class A_1

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

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

← Indicates a change.

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

6CG7

MEDIUM-MU TWIN TRIODE

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

Typical Operation as Resistance-Coupled Amplifier:

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

Maximum Circuit Values:

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

HORIZONTAL-DEFLECTION OSCILLATOR

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

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

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

Maximum Circuit Values:

Grid-Circuit Resistance	2.2	max.	megohms

VERTICAL-DEFLECTION OSCILLATOR

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

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

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

→ Indicates a change.

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

6CG7

MEDIUM-MU TWIN TRIODE

PLATE DISSIPATION:			
Either plate	4	max.	watts
Both plates (Both units operating)	5.7	max.	watts
PEAK HEATER–CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts
Maximum Circuit Values:			
Grid–Circuit Resistance	2.2	max.	megohms

○ Without external shield.

▲ The dc component must not exceed 100 volts.

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

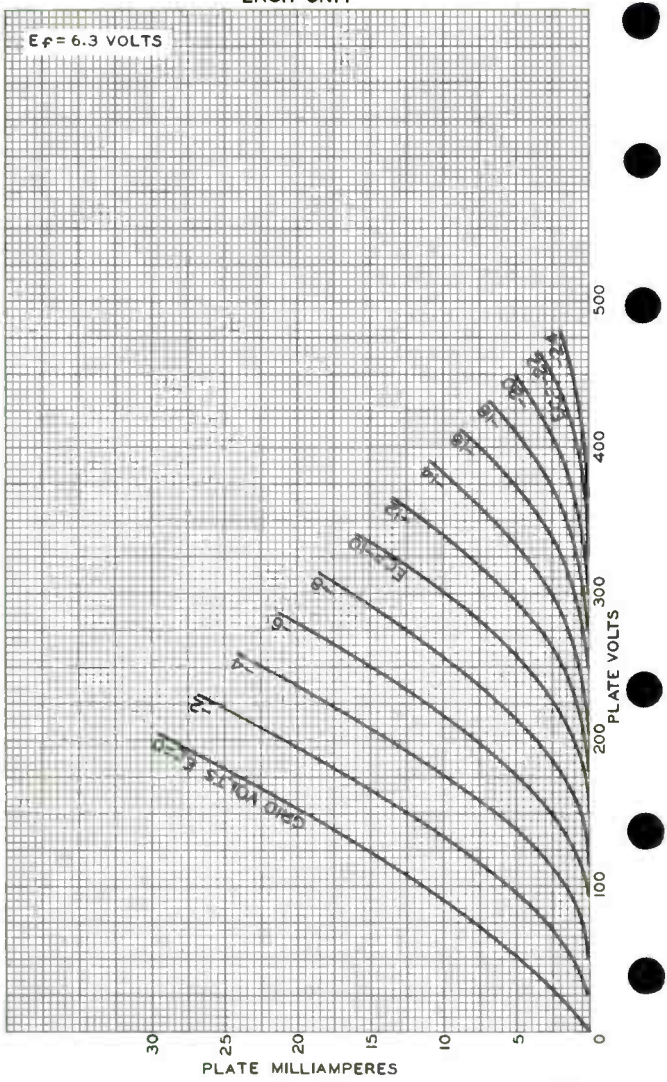
6CG7

RCA

6CG7

AVERAGE PLATE CHARACTERISTICS

EACH UNIT



ELECTRON TUBE DIVISION

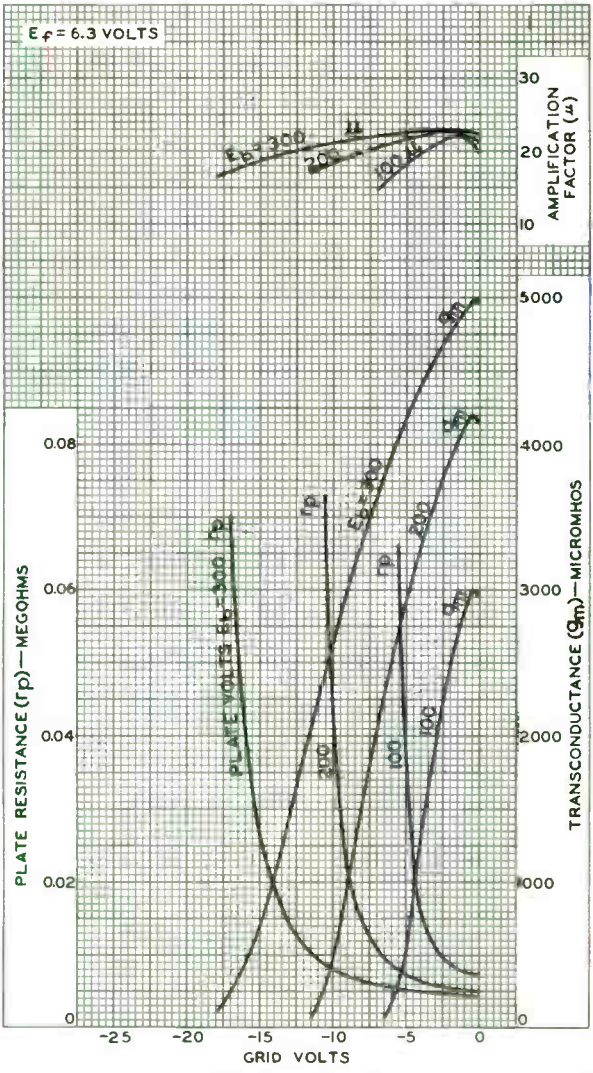
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8442

6CG7

AVERAGE CHARACTERISTICS

EACH UNIT



6CG8-A
TRIODE-PENTODE CONVERTER

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-strié arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

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

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

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield°	
Triode Unit:			
Grid to plate	1.5	1.5	μμf
Grid to cathode & pentode grid No.3, and heater	2.6	3	μμf
Plate to cathode & pentode grid No.3, and heater	0.05	1	μμf
Pentode Unit:			
Grid No.1 to plate	0.03 max.	0.016 max.	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	4.8	5	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	5.5	5.5•	μμf

Characteristics:

	Triode Unit	Pentode Unit	
Plate-Supply Voltage	100	250	volts
Grid-No.2 Supply Voltage	–	150	volts
Cathode Resistor	100	200	ohms
Amplification Factor	40	–	
Plate Resistance (Approx.)	6900	750000	ohms
Transconductance	5800	4600	μmhos
Plate Current	8.5	7.7	ma
Grid-No.2 Current	–	1.6	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp.	-10	-10	volts

° With external shield JETEC No.315 connected to cathode except as noted.

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

TENTATIVE DATA 1

TUBE DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

RCA

6CG8-A

TRIODE-PENTODE CONVERTER

Mechanical:

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

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

CONVERTER SERVICE

Maximum Ratings, *Design-Center Values:*

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

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

6CG8-A

TRIODE-PENTODE CONVERTER

Typical Operation:

	Triode Unit as 250-Mc Osc.[•]	*Pentode Unit as Mixer*[*]	
Plate Voltage	150	150	volts
Grid-No.2 Voltage	–	150	volts
Mixer Grid-No.1 Supply Voltage	–	-3.5	volts
Oscillator Voltage (rms) at mixer grid No.1	–	2.6	volts
Mixer Grid-No.1-Circuit Resistance	–	120000	ohms
Oscillator Grid Resistor	2700	–	ohms
Conversion Transconductance	–	2100	μmhos
Plate Current	13	6.2	ma
Grid-No.2 Current	–	1.8	ma
Grid Current	3.6	–	ma
Grid-No.1 Current	–	2	μamp
Oscillator Power Output (Approx.)	0.5	–	watt

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

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

[•] In TV or FM receivers, it is generally desirable to operate the oscillator with less power input than shown in the tabulated data in order to avoid over-excitation and excessive oscillator radiation.

[*] With separate excitation and triode unit connected to ground.

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

TENTATIVE DATA 2

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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

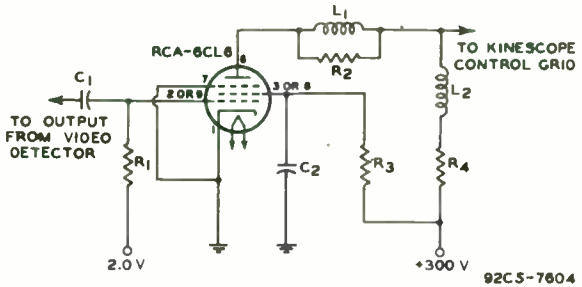
Maximum Circuit Values:

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

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

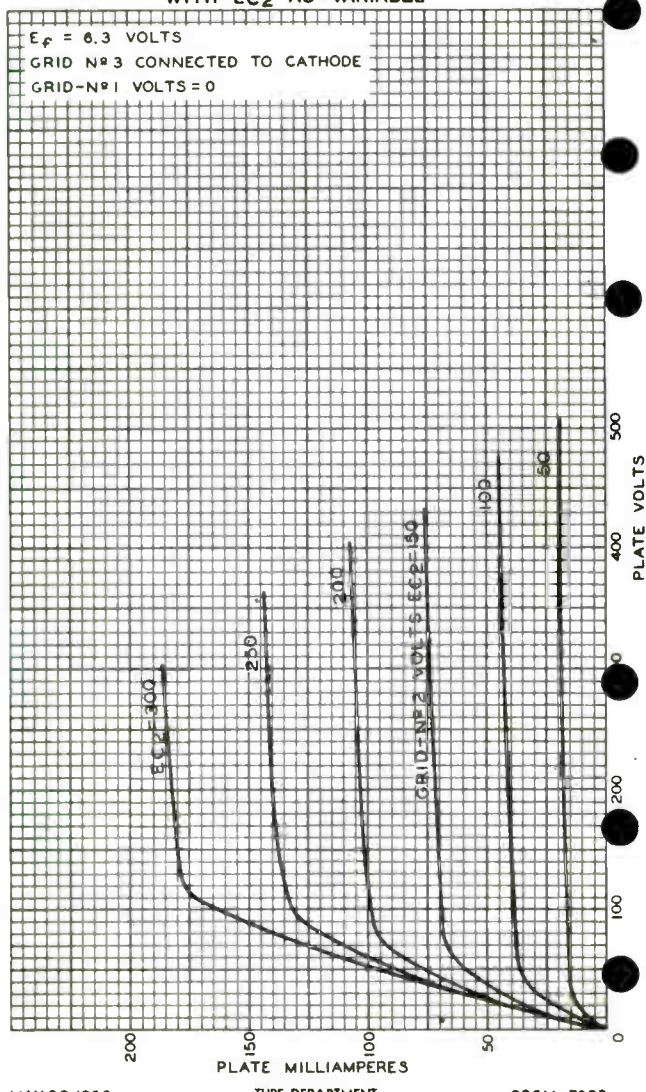
R1: 100000 ohms, 0.5 watt
R2: 47000 ohms, 0.5 watt
R3: 24000 ohms, 2 watts
R4: 3930 ohms, 5 watts non-inductive type

6CL6

RCA

6CL6

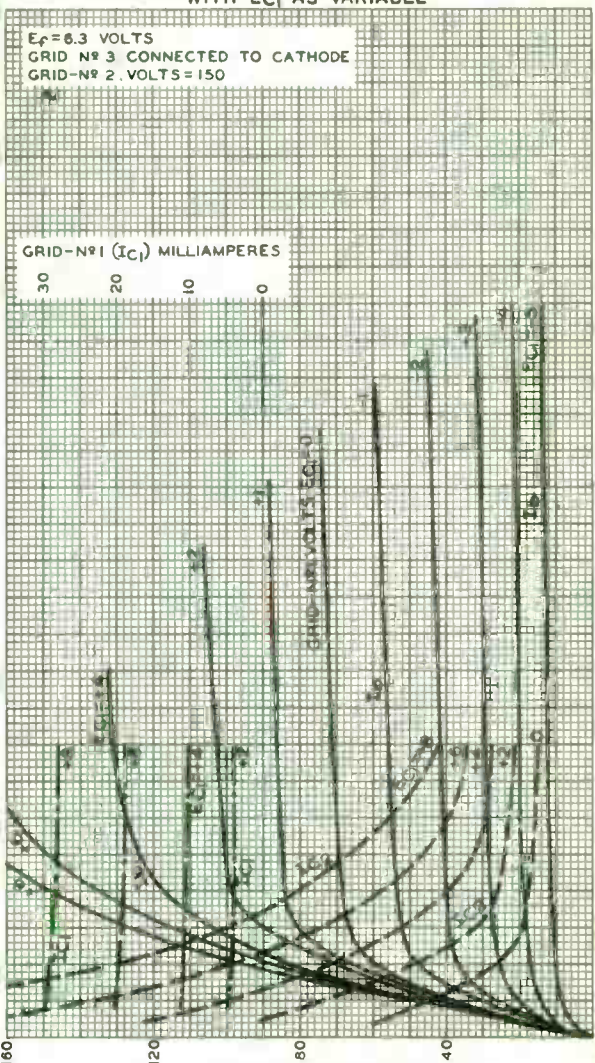
AVERAGE PLATE CHARACTERISTICS
WITH E_{C2} AS VARIABLE



RCA

6CL6

AVERAGE PLATE CHARACTERISTICS
WITH E_{C1} AS VARIABLE



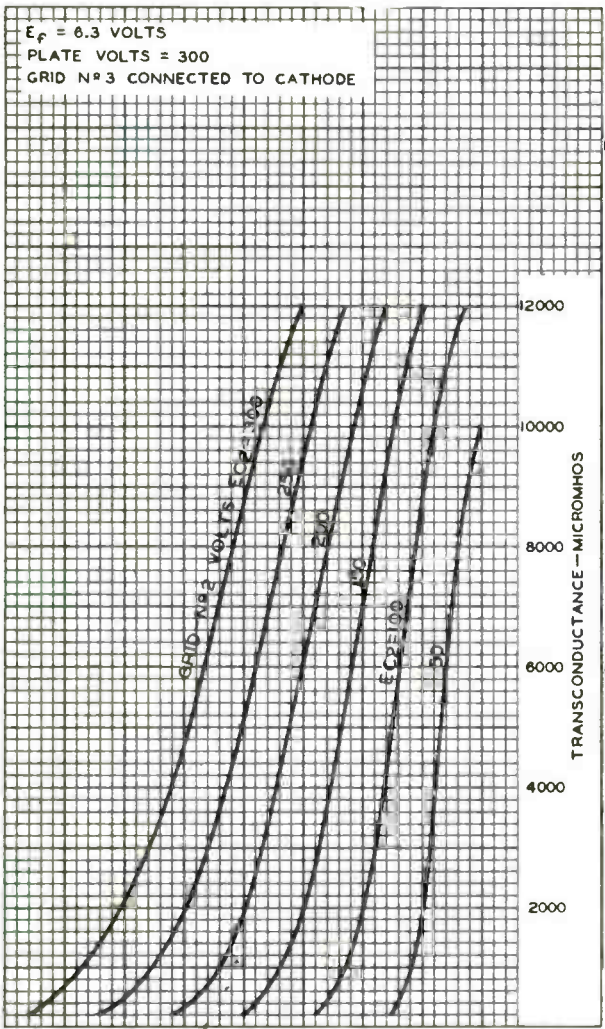
MAY 22, 1952 TUBE DEPARTMENT 92CM-7802

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6CL6

AVERAGE CHARACTERISTICS



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

9-PIN MINIATURE TYPE

With heater having controlled warm-up time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:			
Voltage (AC or DC)	6.3		volts
Current	0.45 ± 6%		amp
Warm-up time (Average)	11		sec
Direct Interelectrode Capacitances:	*Without External Shield*	*With External Shield°*	
Triode Unit:			
Grid to plate	1.8	1.8	μμf
Grid to cathode, tetrode cathode & internal shield, and heater	2.8	2.8	μμf
Plate to cathode, tetrode cathode & internal shield, and heater	1.5	2	μμf
Tetrode Unit:			
Grid No.1 to plate	0.02 max.	0.01 max.	μμf
Grid No.1 to cathode & internal shield, grid No.2, and heater	5	5	μμf
Plate to cathode & internal shield, grid No.2, and heater	2	3	μμf
Tetrode grid No.1 to triode plate	0.015 max.	0.01 max.	μμf
Tetrode plate to triode plate	0.15 max.	0.03 max.	μμf
Heater to cathode (Each Unit)	3	3•	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Tetrode Unit*		
Plate Voltage	125	100	125	volts
Grid-No.2 Voltage	–	70	125	volts
Grid-No.1 Voltage	-1	–	-1	volt
Amplification Factor	40	–	–	
Plate Resistance (Approx.)	5000	–	200000	ohms
Transconductance	8000	7000	6500	μmhos
Plate Current	14	–	12	ma
Grid-No.2 Current	–	–	4	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-9	–	-9	volts

← Indicates a change.

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

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, Internal Shield
Pin 9 – Tetrode Grid No.1

CONVERTER

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

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

→ Indicates a change.

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

6CM6

BEAM POWER TUBE

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 (Approx.):°		
Grid No.1 to plate	0.7	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:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JETEC No. E9-1)
Basing Designation for BOTTOM VIEW	9CK

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

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

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values:*

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

Typical Operation and Characteristics:

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

°,▲: See next page.

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

6CM6

BEAM POWER TUBE

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

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

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

VERTICAL-DEFLECTION AMPLIFIER

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

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

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

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For cathode-bias operation	2.2	max.	megohms

VERTICAL-DEFLECTION AMPLIFIER

Triode Connection†

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

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

o,▲,□,#,■,†: see next page.

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

6CM6

BEAM POWER TUBE

Characteristics:

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

Maximum Circuit Values:

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

c Without external shield.

▲ The dc component must not exceed 100 volts.

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

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

■ Under no circumstances should this absolute value be exceeded.

† Grid-No.2 connected to plate.

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

Medium-Mu Dual Triode

With Dissimilar Units

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:			
Voltage (AC or DC)	6.3		volts
Current	0.6 ± 6%		amp ←
Warm-up time (Average)	11		sec
Direct Interelectrode Capacitances (Approx.):[a]	*Unit No.1*	*Unit No.2*	
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	*Unit No.2*	
Plate Voltage	200	250	volts
Grid Voltage	−7	−8	volts
Amplification Factor	21	18	
Plate Resistance (Approx.)	10500	4100	ohms
Transconductance	2000	4400	μmhos
Plate Current	5	20	ma
Plate Current for grid volts = −10.	−1	−	ma
Grid Voltage (Approx.) for plate μa = 10	−14	−	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	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

← Indicates a change.

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No. 1

→Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[b]

DC PLATE VOLTAGE	550	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	220	max.	volts
CATHODE CURRENT:			
Peak	77	max.	ma
Average	17	max.	ma
PLATE DISSIPATION	1.45	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[c]	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-Maximum Values:*

For operation in a 525-line, 30-frame system[b]

DC PLATE VOLTAGE	550	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[d]	2200	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	220	max.	volts
CATHODE CURRENT:			
Peak	77	max.	ma
Average	22	max.	ma
PLATE DISSIPATION	6	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[c]	max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance:			
For fixed-bias operation	1	max.	megohm
For cathode-bias operation	2.5	max.	megohms

[a] Without external shield.

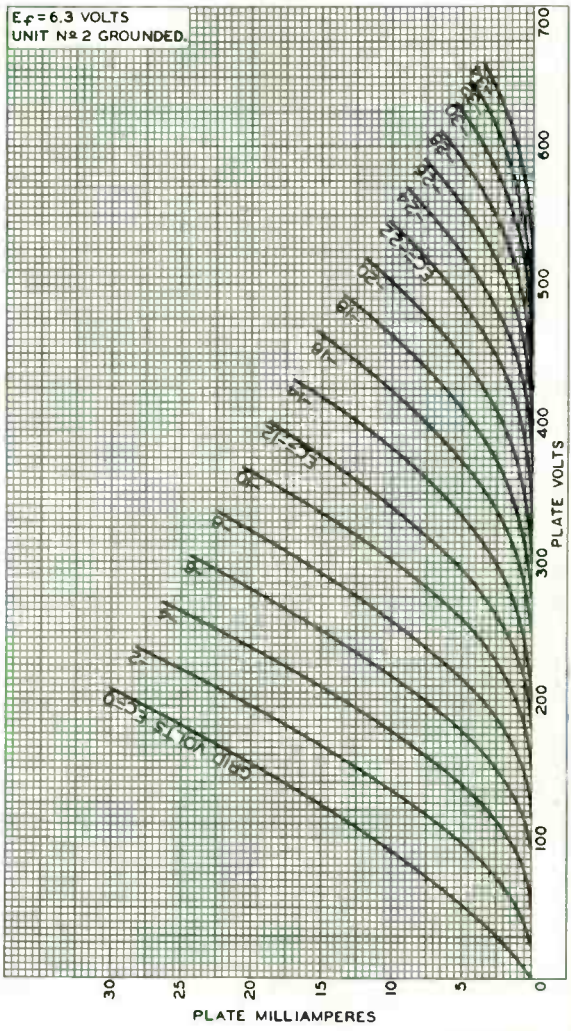
[b] As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

[c] The dc component must not exceed 100 volts.

[d] 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.

→Indicates a change.

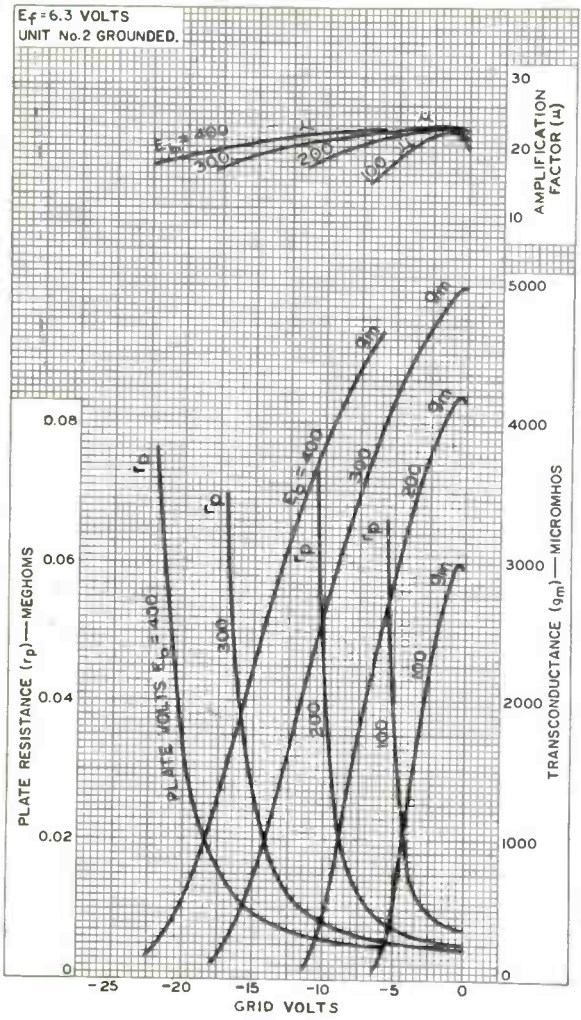
AVERAGE PLATE CHARACTERISTICS
Unit No.1



92CM-8617

6CM7

AVERAGE CHARACTERISTICS
Unit No.1



92CM-8616RI

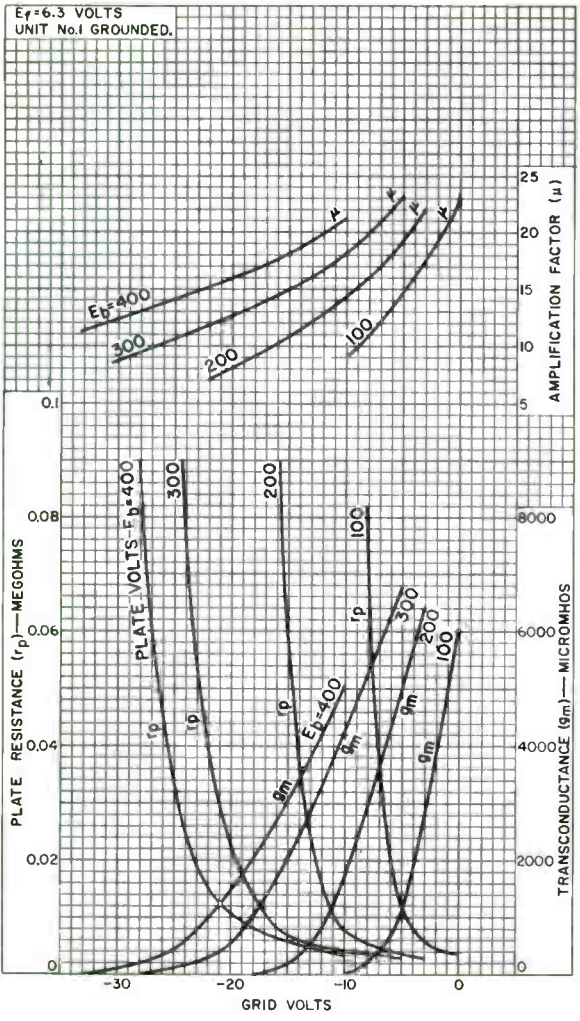
RADIO CORPORATION OF AMERICA
Electron Tube Division Harrison, N. J.

AVERAGE PLATE CHARACTERISTICS
Unit No.2

92CM-8615

6CM7

AVERAGE CHARACTERISTICS
Unit No.2



92CM-8613R1

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

Twin Diode—High-Mu Triode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Heater arrangement	*Series*	*Parallel*	
Voltage (AC or DC)	6.3 ± 10%	3.15	volts
Current	0.3	0.6 ± 6%	amp
Warm-up time (Average)	–	11	sec

Direct Interelectrode Capacitances (Approx.):[a]

Triode Unit:		
Grid to plate	1.8	μμf
Grid to cathode and heater	1.5	μμf
Plate to cathode and heater	0.5	μμf
Diode Units:		
Diode-No.1 plate to cathode of diodes No.1 and No.2 & internal shield, and heater	3.6	μμf
Diode-No.2 plate to cathode of diodes No.1 and No.2 & internal shield, and heater	3.6	μμf
Triode grid to either diode plate	0.006	μμf

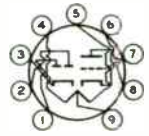
Characteristics, Class A_1 Amplifier (Triode Unit):

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"
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	9EN

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



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

→ Indicates a change.

6CN7

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	200	max.	volts
Heater positive with respect to cathode	200[b]	max.	volts

Typical Operation as Resistance-Coupled Amplifier:

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

DIODE UNITS — Two

Values are for Each Unit

→ Maximum Ratings, *Design-Maximum Values:*

PLATE CURRENT	5.5	max.	ma
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[b]	max.	volts

→ Characteristics, Instantaneous Test Condition:

Plate Current for plate volts = 5	20	ma

[a] Without external shield.
[b] The dc component must not exceed 100 volts.

Curves for Triode Unit shown under Type 6T8-A also apply to the 6CN7

→ Indicates a change.

Half-Wave Vacuum Rectifier

GENERAL DATA

Electrical:

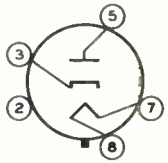
Heater Characteristics and Ratings *(Design-Maximum Values):*		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.600	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode[a]	5500[b] max.	volts
Heater positive with respect to cathode	300[c] max.	volts
Direct Interelectrode Capacitances (Approx.):[d]		
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
Type of Cathode	Coated Unipotential
Maximum Overall Length	3-13/16"
Maximum Seated Length	3-1/4"
Maximum Diameter	1-9/32"
Bulb	T9

Bases (Alternates):
- Intermediate-Shell Octal with External Barriers: 5-Pin, Arrangement 2 (JEDEC Group 1, No.B5-147)
- Short Intermediate-Shell Octal with External Barriers: 5-Pin, Arrangement 2 (JEDEC Group 1, No.B5-85)

Basing Designation for BOTTOM VIEW. 4CG



Pin 2 - Do Not Use[e]
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[f]

PEAK INVERSE PLATE VOLTAGE[a]	5500 max.	volts
PEAK PLATE CURRENT	1200 max.	ma
DC PLATE CURRENT	190 max.	ma
PLATE DISSIPATION	6.5 max.	watts

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma. = 250	25	volts

[a] 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.

[b] The dc component must not exceed 900 volts.

[c] The dc component must not exceed 100 volts.

[d] Without external shield.

[e] Socket terminals 1, 2, 4, and 6 should not be used as tie points.

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

6CQ8
MEDIUM-MU TRIODE — SHARP-CUTOFF TETRODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

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

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

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield[a]	
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	0.019 max.	0.015 max.	μμf
Grid No.1 to cathode & internal shield, grid No.2, and heater	5	5	μμf
Plate to cathode & internal shield, grid No.2, and heater	2.5	3.3	μμf
Tetrode plate to triode plate	0.07 max.	0.01 max.	μμf
Heater to cathode	3	3•	μμf

Characteristics:

	Triode Unit	Tetrode Unit	
Plate Voltage	125	125	volts
Grid-No.2 (Screen-Grid) Voltage	–	125	volts
Grid-No.1 (Control-Grid) Voltage	–	-1	volt
Cathode Resistor	56	–	ohms
Amplification Factor	40	–	
Plate Resistance (Approx.)	5000	140000	ohms
Transconductance	8000	5800	μmhos
Plate Current	15	12	ma
Grid-No.2 Current	–	4.2	ma
Grid-No.1 Voltage (Approx.) for plate current of 100 μamp	-7	-7	volts

[a] 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.

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

6CQ8

MEDIUM-MU TRIODE — SHARP-CUTOFF TETRODE

Mechanical:

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

Pin 1 – Triode Plate
Pin 2 – Tetrode Grid No.1
Pin 3 – Tetrode Grid No.2
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Tetrode Plate
Pin 7 – Tetrode Cathode, Internal Shield
Pin 8 – Triode Cathode
Pin 9 – Triode Grid

CONVERTER SERVICE

Maximum Ratings, *Design-Center Values:*

	Triode Unit as Osc.		*Tetrode Unit as Mixer*		
PLATE VOLTAGE	300	max.	300	max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	–		300	max.	volts
GRID-No.2 VOLTAGE	–		*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*		
GRID-No.1 (CONTROL-GRID) VOLTAGE: Positive bias value	0	max.	0	max.	volts
GRID-No.2 INPUT: For grid-No.2 voltages up to 150 volts	–		0.6	max.	watt
For grid-No.2 voltages between 150 and 300 volts	–		*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*		
GRID INPUT	0.5	max.	–		watt
PLATE DISSIPATION	2.7	max.	2.8	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

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA 1

6CQ8

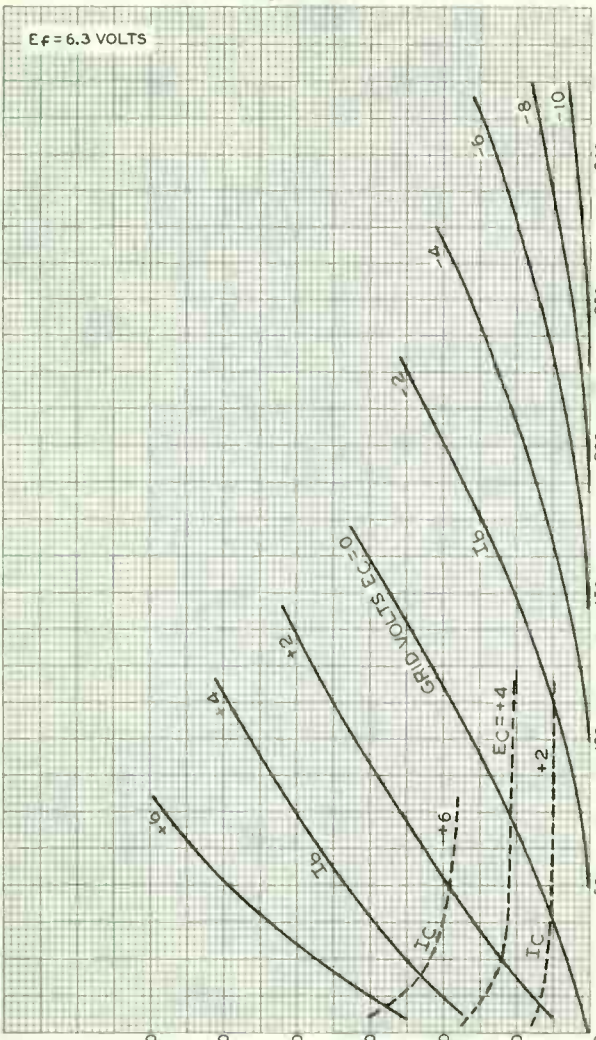
MEDIUM-MU TRIODE — SHARP-CUTOFF TETRODE

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. . .	1.0 max.	1.0 max.	megohm

RCA

6CQ8
AVERAGE CHARACTERISTICS
TRIODE UNIT

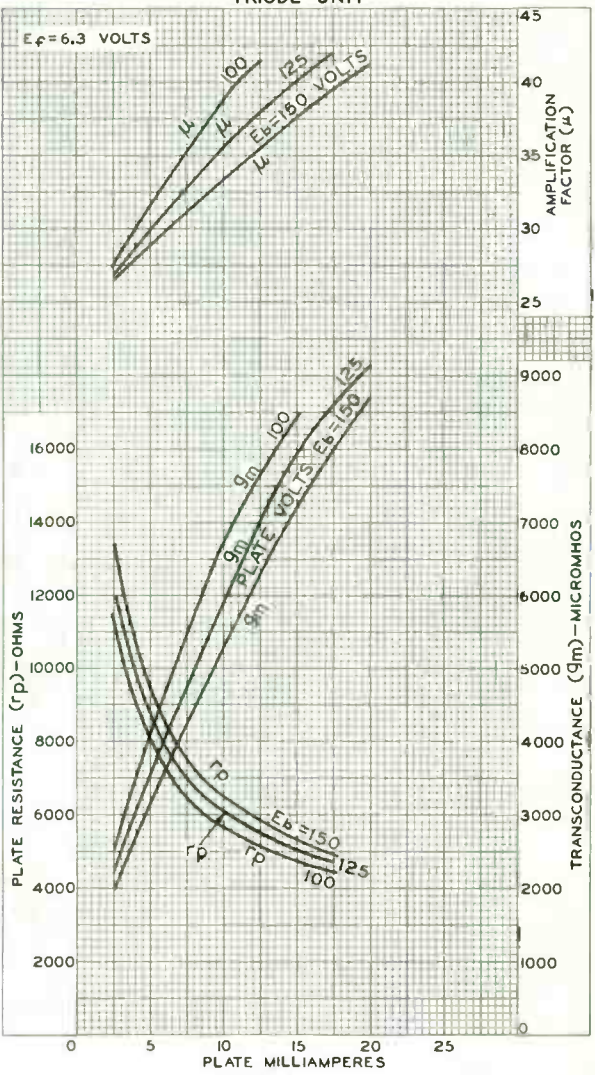


TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-9190RI

RCA

6CQ8

AVERAGE CHARACTERISTICS
TRIODE UNIT



6CQ8

RCA

6CQ8

AVERAGE CHARACTERISTICS
TETRODE UNIT

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

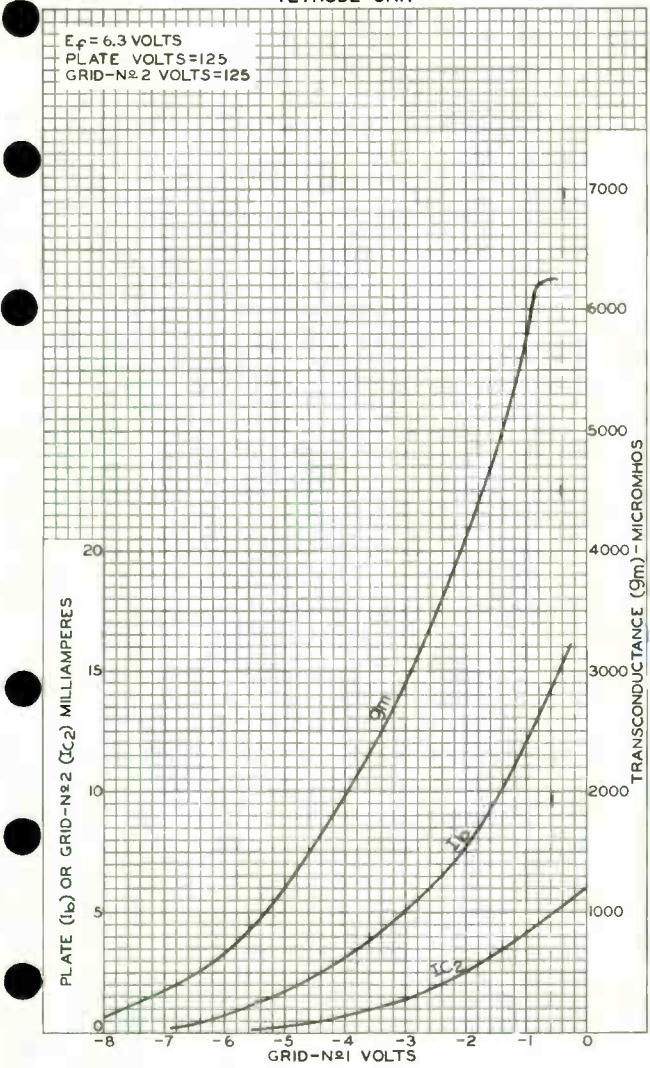
92CM-9197

RCA

6CQ8

AVERAGE CHARACTERISTICS

TETRODE UNIT



6CS6

PENTAGRID AMPLIFIER

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

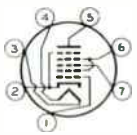
Heater, for Unipotential Cathode:			
Voltage	6.3		ac or dc volts
Current	0.3		amp
Direct Interelectrode Capacitances (Approx.):[a]			
Grid No.1 to plate		0.07 max.	μμf ←
Grid No.3 to plate		0.36 max.	μμf
Grid No.1 to grid No.3		0.22 max.	μμf ←
Grid No.1 to cathode & grid No.5, grid No.4 & grid No.2, 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	1500	-	μmhos ←
Grid-No.1-to-Plate Transconductance	-	1100	μmhos ←
Plate Current	0.8	1	ma ←
Grid-No.2 & Grid-No.4 Current	5.5	1.3	ma ←
Grid-No.3 Voltage (Approx.) for plate current of 50 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"
Dimensional Outline	*See General Section*
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	7CH



Pin 1 - Grid No.1
Pin 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

[a] Without external shield.

← Indicates a change.

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	2.0	ma
→ Grid-No.2 & Grid-No.4 Current	4.5	ma

Maximum Circuit Values:

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

▲ The dc component must not exceed 100 volts.

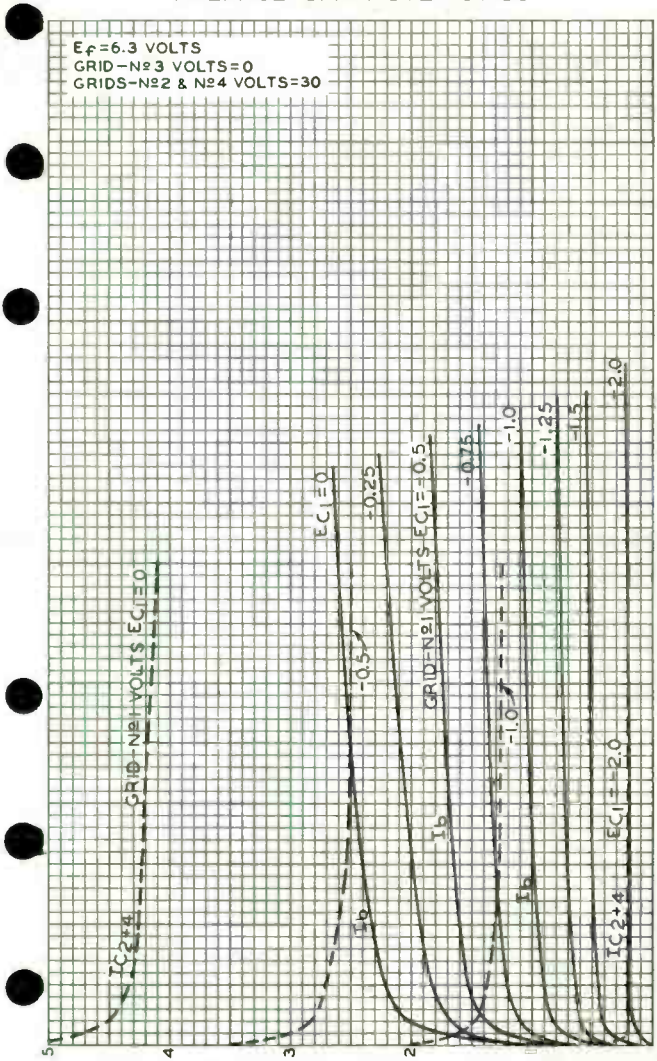
→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

RCA

6CS6

AVERAGE CHARACTERISTICS



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-8922

6CS6

AVERAGE CHARACTERISTICS

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8926

6CS7

MEDIUM-MU DUAL TRIODE
With Dissimilar Units

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

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

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

Direct Interelectrode Capacitances (Approx.):[C]

	Unit No.1 Oscillator	*Unit No.2 Amplifier*	
Grid to plate	2.6	2.6	μμf
Grid to cathode and heater	1.8	3	μμf
Plate to cathode and heater	0.5	0.5	μμf

Characteristics, Class A_1 Amplifier:

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

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2

[C]: See next page.

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

6CS7

MEDIUM-MU DUAL TRIODE
With Dissimilar Units

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

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

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

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No.1

Maximum Ratings, *Design-Center Values:*

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

DC PLATE VOLTAGE.	500	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	400	max.	volts
CATHODE CURRENT:			
Peak.	70	max.	ma
DC.	20	max.	ma
PLATE DISSIPATION	1.25	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200▲	max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance	2.2	max.	megohms

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No.2

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

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

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
DC.	30	max.	ma
PLATE DISSIPATION	6.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200▲	max.	volts

o,□,▲,#,■: See next page.

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

6CS7

MEDIUM-MU DUAL TRIODE

With Dissimilar Units

Maximum Circuit Values:

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

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

▲ The dc component must not exceed 100 volts.

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

■ Under no circumstances should this absolute value be exceeded.

○ Without external shield.

6CU5

Beam Power Tube

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	1.2	amp
Direct Interelectrode Capacitances (Approx.):[a]		
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	8.5	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-Maximum Values:*

PLATE VOLTAGE	150	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	130	max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0	max.	volts
PLATE DISSIPATION	7	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[b]	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	220	max.	°C

→ Indicates a change.

Typical Operation and Characteristics:

Plate Voltage	120	volts
Grid-No.2 Voltage	110	volts
Grid-No.1 Voltage	−8	volts
Peak AF Grid-No.1 Voltage	8	volts
Zero-Signal Plate Current	49	ma
Max.-Signal Plate Current	50	ma
Zero-Signal Grid-No.2 Current	4	ma
Max.-Signal Grid-No.2 Current	8.5	ma
Plate Resistance (Approx.)	10000	ohms
Transconductance	7500	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

[a] Without external shield.

[b] The dc component must not exceed 100 volts.

6CU5

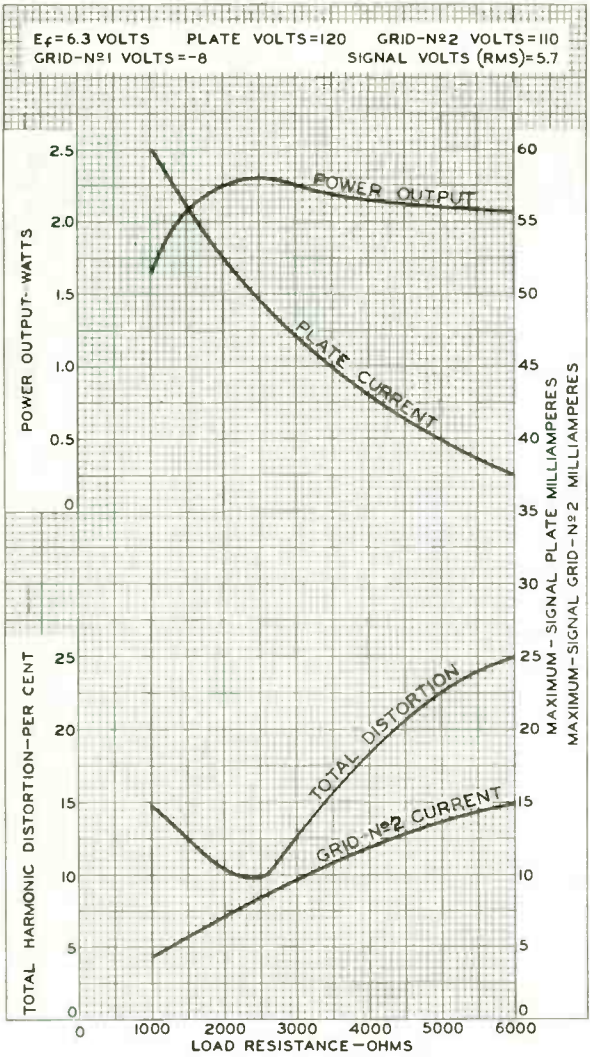
AVERAGE CHARACTERISTICS

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

RCA

6CU5

OPERATION CHARACTERISTICS



RCA

6CU8

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 (AC or DC)	6.3	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec
Direct Interelectrode Capacitances:[o]		
Triode Unit:		
Grid to plate	1.6	μμf
Grid to cathode & pentode grid No.3 & internal shield, and heater	1.9	μμf
Plate to cathode & pentode grid No.3 & internal shield, and heater	1.6	μμf
Pentode Unit:		
Grid No.1 to plate	0.025 max.	μμf
Grid No.1 cathode, grid No.3 & triode cathode & internal shield, grid No.2, and heater	7	μμf
Plate to cathode, grid No.3 & triode cathode & internal shield, grid No.2, and heater	2.4	μμf
Pentode grid No.1 to triode plate	0.03 max.	μμf
Pentode plate to triode plate	0.07 max.	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Plate Supply Voltage	125	125	volts
Grid-No.2 Supply Voltage	–	125	volts
Grid-No.1 Voltage	−1	0	volts
Cathode Resistor	0	56	ohms
Amplification Factor	24	–	
Plate Resistance (Approx.)	4100	170000	ohms
Transconductance	5800	7800	μmhos
Plate Current	17	12	ma
Grid-No.2 Current	–	3.8	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	−12	−6	volts
Grid-No.1 Voltage (Approx.) for plate ma. = 1.6, and cathode resistor (ohms) = 0	–	−3	volts

Mechanical:

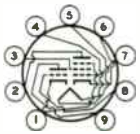
Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"

→ Indicates a change.

6CU8
MEDIUM-MU TRIODE—SHARP-CUTOFF PENTODE

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	9GM

Pin 1 – Triode Cathode, Pentode Grid No.3, Internal Shield
Pin 2 – Pentode Plate
Pin 3 – Pentode Grid No.2



Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Pentode Cathode
Pin 7 – Pentode Grid No.1
Pin 8 – Triode Grid
Pin 9 – Triode Plate

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
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	2.8 max.	2.3 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

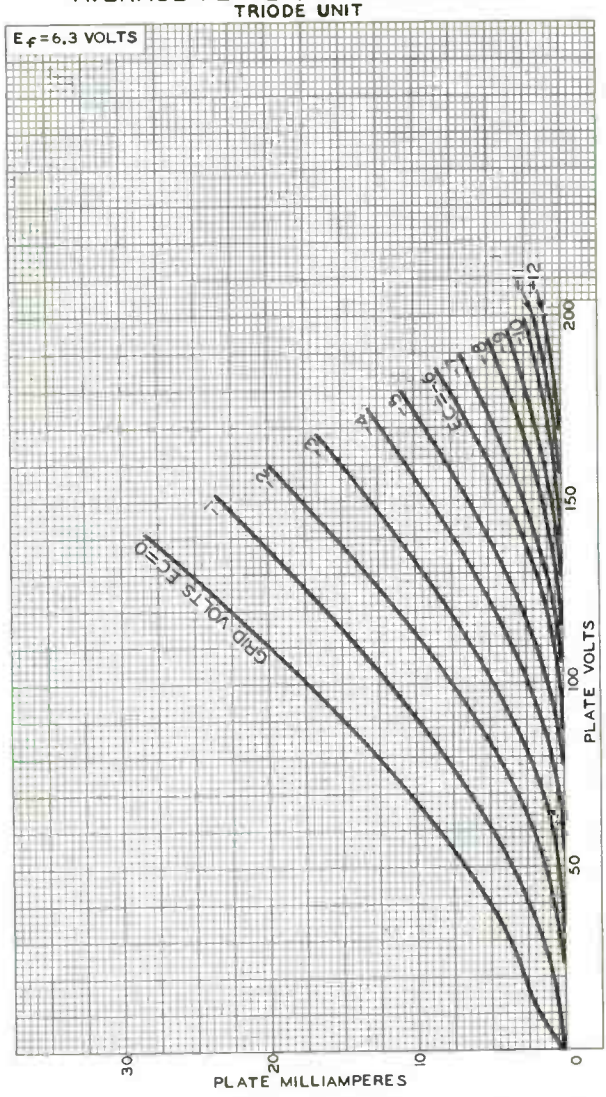
○ Without external shield.
▲ The dc component must not exceed 100 volts.

→ Indicates a change.

6CU8

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT

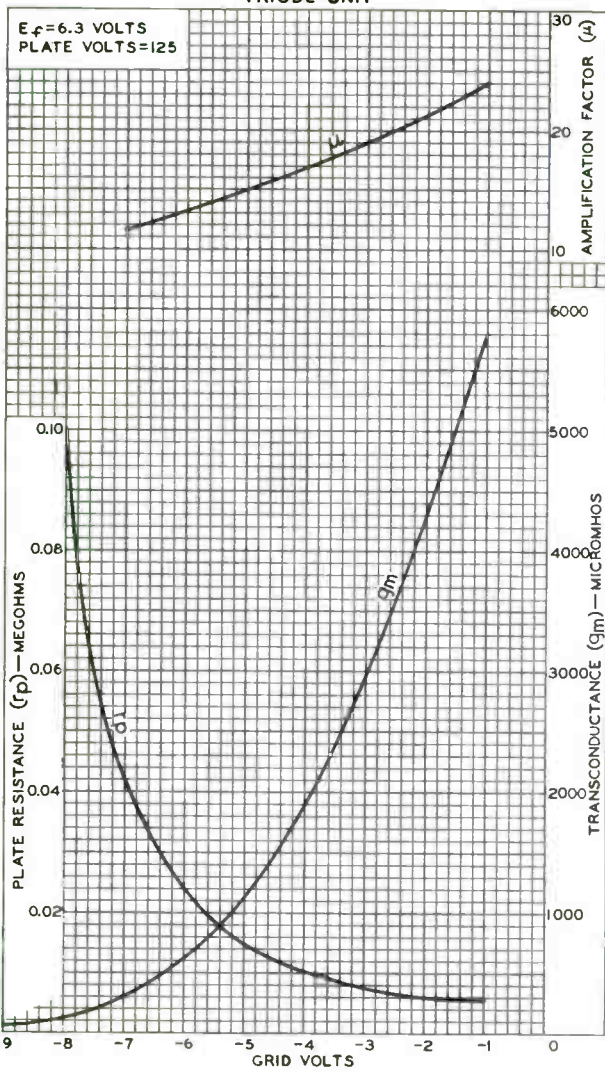


ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-10353

6CU8

6CU8

AVERAGE CHARACTERISTICS
TRIODE UNIT



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

92CM-10352

6CU8

AVERAGE PLATE CHARACTERISTICS

6CU8

PENTODE UNIT

RCA

E_f=6.3 VOLTS
GRID-№2 VOLTS=125

E_{c1}=0
-0.5
-1
GRID-№1 VOLTS E_{c1}=-1.5
-2
-2.5
-3
-3.5

PLATE MILLIAMPERES
0
5
10
15
20

PLATE VOLTS
100
200
300
400

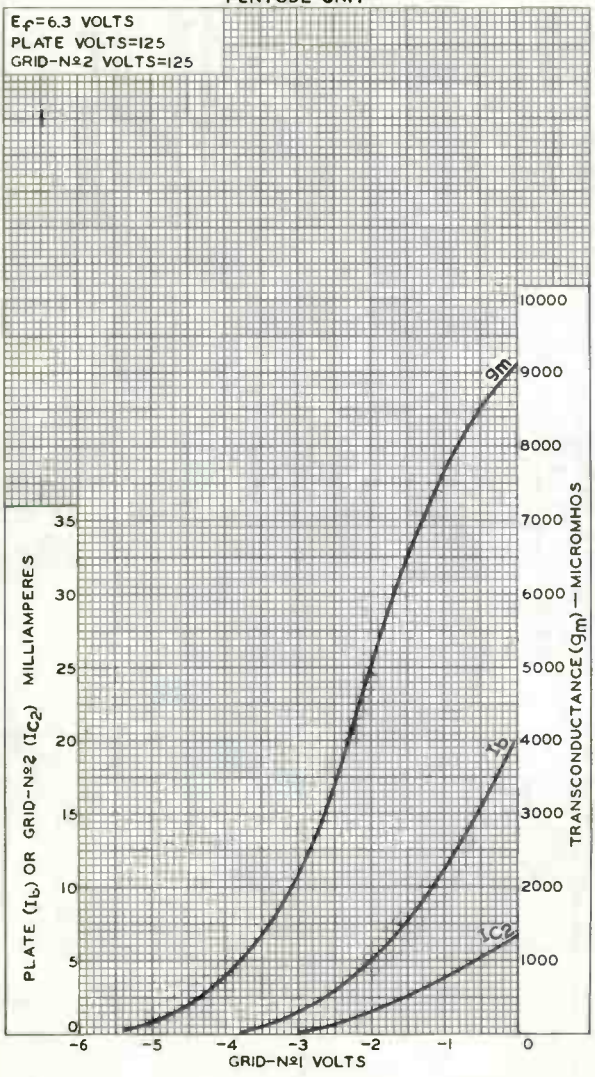
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-10646

RCA

6CU8

AVERAGE CHARACTERISTICS
PENTODE UNIT



High-Mu Triode

NUVISTOR TYPE

For Use in Tuners of VHF Television and FM Receivers as Grounded-Cathode, Neutralized RF-Amplifier Tube

GENERAL DATA

Electrical:

Heater, for Un potential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.13	amp
Direct Interelectrode Capacitances (Approx.):		
Grid to plate	0.92	μμf
Grid to cathode, shell, and heater	4.1	μμf
Plate to cathode, shell, and heater	1.7	μμf
Plate to cathode	0.18	μμf
Heater to cathode	1.3	μμf

Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	110	volts
Grid Supply Voltage	0	volts
Cathode Resistor	130	ohms
Amplification Factor	62	
Plate Resistance (Approx.)	6300	ohms
Transconductance	9800	μmhos
Plate Current	7.6	ma
Grid Voltage (Approx.) for plate μa = 10.	-4	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	0.8"
Maximum Seated Length	0.625"
Maximum Diameter	0.440"
Envelope	Metal Shell
Socket	.Cinch Mfg. Corp. No.133 65 10 001, or equivalent
Base	.Medium Ceramic-Wafer Twelvar 5-Pin (JEDEC No.E5-65)
Basing Designation for BOTTOM VIEW	.12AQ

Pin 1[▲] – Internal Connection—Do Not Use
Pin 2 – Plate
Pin 3 – Same as Pin 1
Pin 4 – Grid
Pin 5 – Same as Pin 1
Pin 6 – Same as Pin 1
Pin 7 – Same as Pin 1
Pin 8 – Cathode
Pin 9 – Same as Pin 1
Pin 10 – Heater
Pin 12 – Heater

INDEX = LARGE LUG
● = PIN CUT OFF

6CW4

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE SUPPLY VOLTAGE	300●	max.	volts
PLATE VOLTAGE	125	max.	volts
GRID VOLTAGE:			
Negative-bias value	55	max.	volts
Peak-positive value	0	max.	volts
CATHODE CURRENT	15	max.	ma
PLATE DISSIPATION	1	max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	100	max.	volts
Heater positive with respect to cathode	100	max.	volts

Typical Operation:

Plate Voltage	70	volts
Grid Supply Voltage	0	volts
Grid Resistor	47000	ohms
Amplification Factor	68	
Plate Resistance (Approx.)	5440	ohms
Transconductance	12500	μmhos
Plate Current	8	ma

Maximum Circuit Values:

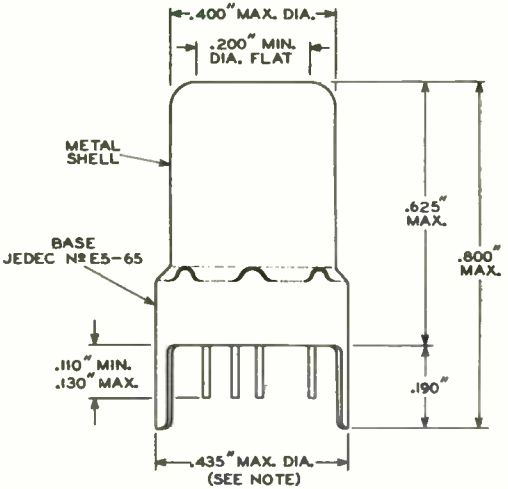
Grid-Circuit Resistance:*

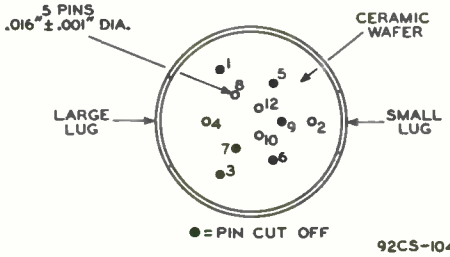
For fixed-bias operation	0.5	max.	megohm
For cathode-bias operation	2.2	max.	megohms

▲ Pin is cut off close to ceramic wafer.

● A plate supply voltage of 300 volts may be used provided that a sufficiently large resistor is used in the plate circuit to limit the plate dissipation to one watt under any condition of operation.

* For operation at metal-shell temperatures up to 125° C.

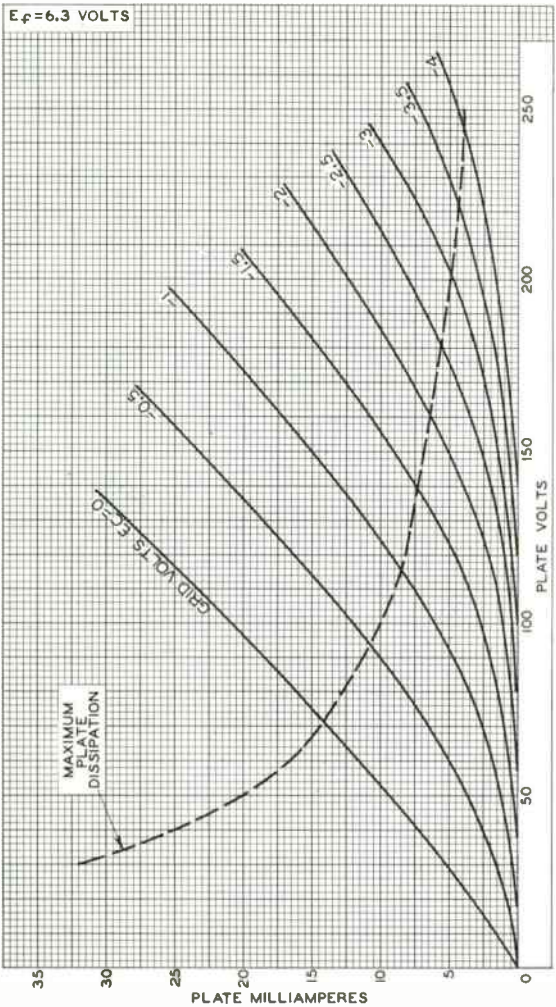




NOTE: MAXIMUM OUTSIDE DIAMETER OF 0.440" IS PERMITTED ALONG 0.190" LUG LENGTH.

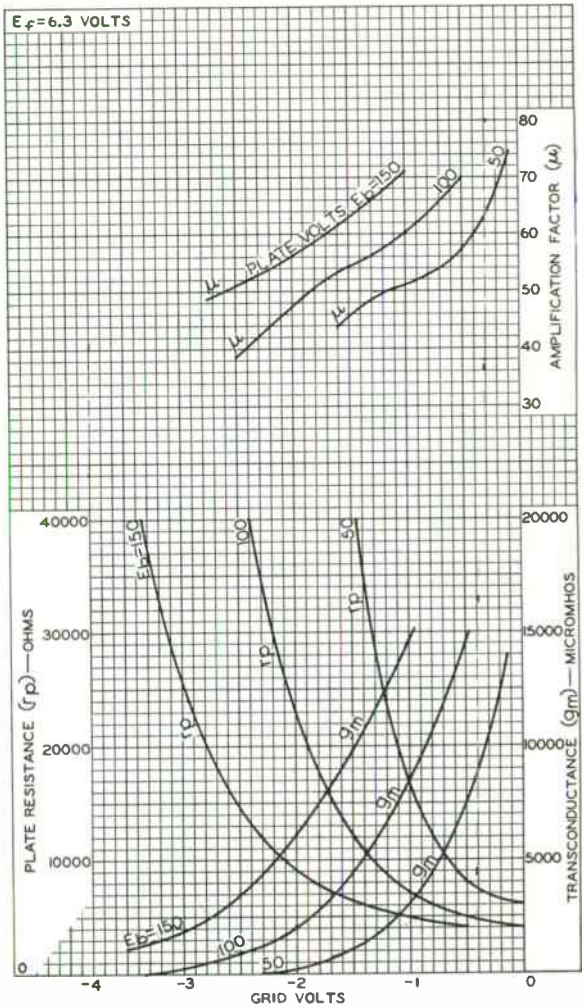
6CW4

AVERAGE PLATE CHARACTERISTICS



92CM-10524

AVERAGE CHARACTERISTICS



92CM-10520

Beam Power Tube

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at 6.3 volts	0.760	amp
Maximum Heater-Cathode Voltage:		
Heater negative with respect to cathode:		
Peak	330	volts
DC Component	220	volts
Heater positive with respect to cathode:		
Peak	330	volts
DC Component	220	volts
Direct Interelectrode Capacitances:		
Input: G1 to (K + G3, G2, H)	12.0	pf
Output: P to (K + G3, G2, H)	6.8	pf
Plate to grid No.1	0.6 max.	pf
Grid No.1 to heater	0.25 max.	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3-1/16"
Maximum Seated Length	2-13/16"
Length, Base Seat to Bulb Top (Excluding tip)	2-7/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline (JEDEC No.6-4)	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9CV

Pin 1 – Do Not Use
Pin 2 – Grid No.1
Pin 3 – Cathode, Grid No.3
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Do Not Use
Pin 7 – Plate
Pin 8 – Do Not Use
Pin 9 – Grid No.2

AMPLIFIER — Class A1

Characteristics:

Plate Voltage	170	volts
Grid-No.2 (Screen-Grid) Voltage	170	volts
Grid-No.1 (Control-Grid) Voltage	-12.5	volts
Mu-Factor, Grid No.2 to Grid No.1	8	
Plate Resistance (Approx.)	26000	ohms
Transconductance	11000	μmhos
Plate Current	7.0	ma
Grid-No.2 Current	3.5	ma

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

Plate Supply Voltage	600	volts
Plate Voltage	275	volts
Grid No.2 Supply Voltage	600	volts
Grid No.2 Voltage	220	volts
Average Cathode Current	110	ma
Grid No.2 Input:		
Peak	7	watts
Average	2.1	watts
Plate Dissipation	14	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	1	megohm

VERTICAL-DEFLECTION AMPLIFIER

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

For operation in a 525-line, 30-frame system[a]

DC Plate Voltage	275	volts
Peak Positive-Pulse Plate Voltage	2200[b]	volts
DC Grid-No.2 Voltage	275	volts
Peak Negative-Pulse Grid-No.1 Voltage	250	volts
Cathode Current:		
Peak	240	ma
Average	110	ma
Grid No.2 Input	2.1	watts
Plate Dissipation	12	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	2.2	megohms

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

[b] Maximum pulse duration 6 percent of a cycle with a maximum of 1.2 milliseconds.

6CX8

MEDIUM-MU TRIODE—SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current	0.75	amp
Direct Interelectrode Capacitances:[o]		
Triode Unit:		
Grid to plate	4.4	μμf
Grid to cathode and heater	2.2	μμf
Plate to cathode and heater	0.38	μμf
Pentode Unit:		
Grid No.1 to plate	0.06	μμf
Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater	9	μμf
Plate to cathode & internal shield & grid No.3, grid No.2, and heater	4.4	μμf
Triode grid to pentode plate	0.018 max.	μμf
Pentode grid No.1 to triode plate	0.005 max.	μμf
Pentode plate to triode plate	0.17 max.	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*		
Plate Supply Voltage	150	40	200	volts
Grid-No.2 Supply Voltage	–	125	125	volts
Grid-No.1 Voltage	–	0	–	volts
Cathode Resistor	150	–	68	ohms
Amplification Factor	40	–	–	
Plate Resistance (Approx.)	8700	–	70000	ohms
Transconductance	4600	–	10000	μmhos
Plate Current	9.2	40*	24	ma
Grid-No.2 Current	–	15.5*	5.2	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100	-5	–	-8.5	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)

6CX8

MEDIUM-MU TRIODE–SHARP-CUTOFF PENTODE

Basing Designation for BOTTOM VIEW. 9DX

Pin 1 – Triode Cathode
Pin 2 – Triode Grid
Pin 3 – Triode Plate
Pin 4 – Heater
Pin 5 – Heater

Pin 6 – Pentode Cathode, Grid No.3, Internal Shield
Pin 7 – Pentode Grid No.1
Pin 8 – Pentode Grid No.2
Pin 9 – Pentode Plate

AMPLIFIER — Class A_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
GRID-No.2 INPUT: For grid-No.2 voltages up to 165 volts.	–	1.1 max.	watts
For grid-No.2 voltages between 165 and 330 volts.	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PLATE DISSIPATION.	2 max.	5 max.	watts
PEAK HEATER-CATHODE VOLTAGE: Heater negative with respect to cathode	200 max.	200 max.	volts
Heater positive with respect to cathode	200▲ 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

[o] Without external shield.

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

▲ The dc component must not exceed 100 volts.

6CY5
SHARP-CUTOFF TETRODE

7-PIN MINIATURE TYPE

For use as rf amplifier in VHF tuners of television receivers

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts ←
Current	0.2	amp
Direct Interelectrode Capacitances (Approx.):[o]		
Grid No.1 to plate	0.03	μμf
Grid No.1 to cathode & internal shield, grid No.2, and heater	4.5	μμf
Plate to cathode & internal shield, grid No.2, and heater	3	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	125	volts
Grid-No.2 Voltage	80	volts
Grid-No.1 Voltage	-1	volt
Plate Resistance (Approx.)	0.1	megohm
Transconductance	8000	μmhos
Plate Current	10	ma
Grid-No.2 Current	1.5	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-6	volts

Mechanical:

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

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

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:* ←

PLATE VOLTAGE	180 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	180 max.	volts
GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	

← Indicates a change.

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CY5

SHARP-CUTOFF TETRODE

GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive-bias value.	0 max.	volts
CATHODE CURRENT.	20 max.	ma
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 90 volts. . .	0.5 max.	watt
For grid-No.2 voltages between 90 and 180 volts.	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PLATE DISSIPATION.	2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. .	100 max.	volts
Heater positive with respect to cathode. .	100 max.	volts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	0.5 max.	megohm

[o] with external shield JEDEC No.316 connected to cathode.

6CY7

DUAL TRIODE

With High-Mu Unit and Low-Mu Unit

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:			
Voltage (AC or DC)	6.3 ± 10%		volts
Current	0.75		amp
Direct Interelectrode Capacitances (Approx.):[o]	*Unit No.1*	*Unit No.2*	
Grid to plate	1.8	4.4	μμf
Grid to cathode and heater	1.5	5	μμf
Plate to cathode and heater	0.3	1	μμf

Characteristics, Class A_1 Amplifier:

	Unit No.1	*Unit No.2*		
Plate Supply Voltage	250	60	150	volts
Grid Voltage	-3	0	–	volts
Cathode Resistor	–	–	620	ohms
Amplification Factor	68	–	5	
Plate Resistance (Approx.)	52000	–	920	ohms
Transconductance	1300	–	5400	μmhos
Plate Current	1.2	80*	30	ma
Plate Current for grid volts = -30	–	–	3.5	ma
Grid Voltage (Approx.) for plate μa = 10	-5.5	–	–	volts
Grid Voltage (Approx.) for plate μa = 200	–	–	-40	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9LG

Pin 1 – Plate of Unit No.2
Pin 2 – Internal Connection—Do Not Use
Pin 3 – Grid of Unit No.2
Pin 4 – Heater
Pin 5 – Heater

Pin 6 – Plate of Unit No.1
Pin 7 – Grid of Unit No.1
Pin 8 – Cathode of Unit No.1
Pin 9 – Cathode of Unit No.2

6CY7
DUAL TRIODE
With High-Mu Unit and Low-Mu Unit

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No.1

Maximum Ratings, *Design-Maximum Values:*

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

DC PLATE VOLTAGE	350	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	400	max.	volts
PLATE DISSIPATION	1	max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200▲	max.	volts
Heater positive with respect to cathode	200	max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance	2.2	max.	megohms

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No.2

Maximum Ratings, *Design-Maximum Values:*

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

DC PLATE VOLTAGE	350	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE*	1800	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	250	max.	volts
CATHODE CURRENT:			
Peak	120	max.	ma
Average	35	max.	ma
PLATE DISSIPATION	5.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200▲	max.	volts
Heater positive with respect to cathode	200	max.	volts

Maximum Circuit Values:

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

○ 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.

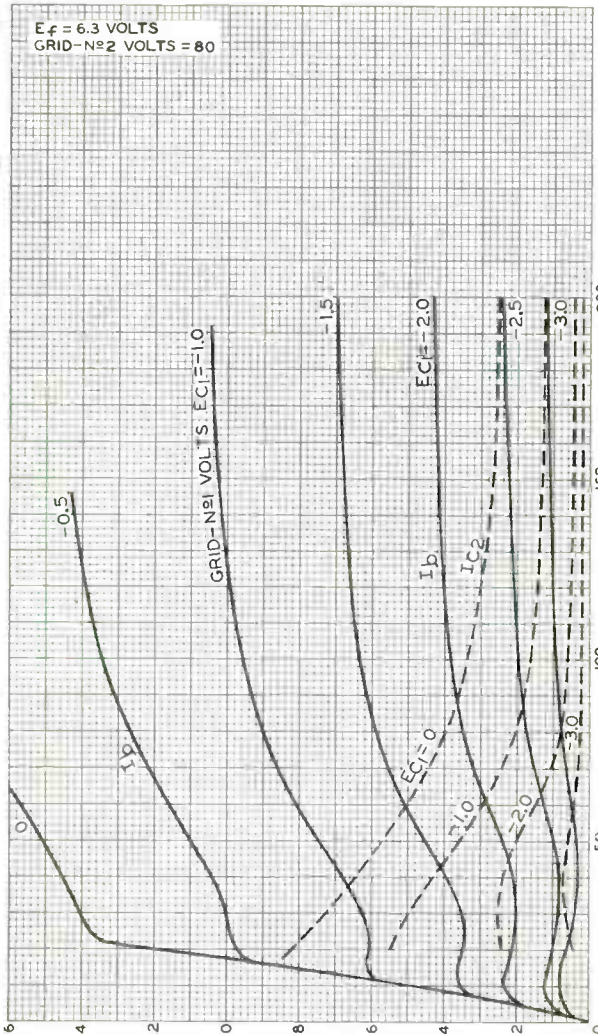
▲ The dc component must not exceed 100 volts.

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

RCA

6CY5

AVERAGE CHARACTERISTICS



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

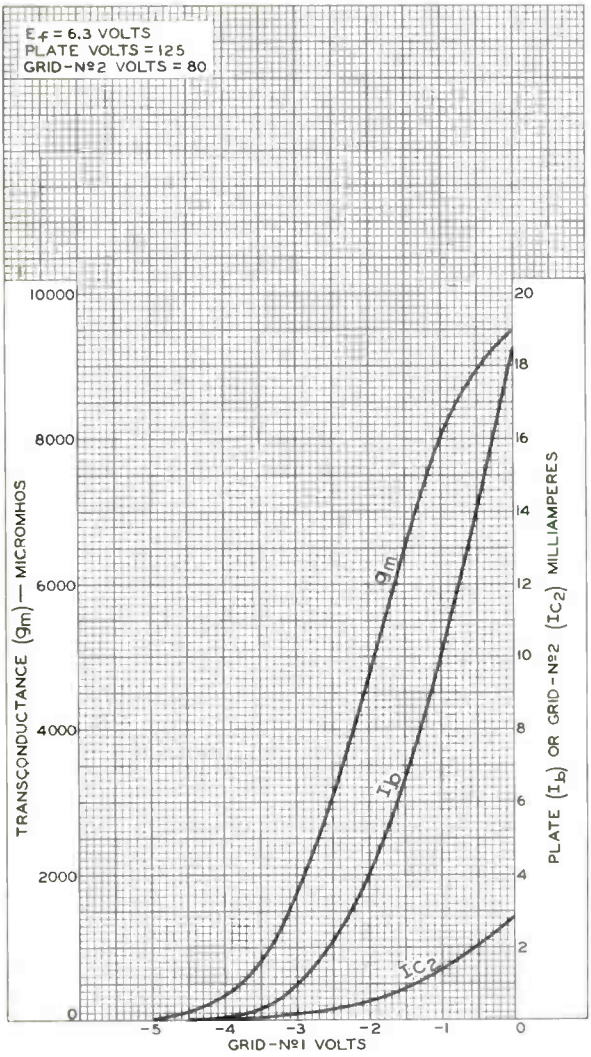
92CM-9518

6CY5

RCA

6CY5

AVERAGE CHARACTERISTICS



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

92CM-9519

6CZ5

Beam Power Tube

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec
Direct Interelectrode Capacitances:▲		
Grid No.1 to plate	0.4 max.	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	9	μμf
Plate to cathode & grid No.3, grid No.2, and heater	6	μμf

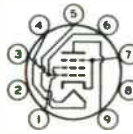
Characteristics, Class A_1 Amplifier:

Plate Voltage	75	250	volts
Grid-No.2 Voltage	250	250	volts
Grid-No.1 Voltage	0	-15	volts ←
Plate Resistance (Approx.)	–	73000	ohms
Transconductance	–	4800	μmhos
Plate Current	130●	46	ma
Grid-No.2 Current	16●	4.6	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100	–	-40	volts ←

Mechanical:

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

Pin 1 – Grid No.2
Pin 2 – No Connection
Pin 3 – Grid No.1
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Grid No.1



Pin 7 – Cathode, Grid No.3
Pin 8 – Internal Connection—Do Not Use
Pin 9 – Plate

← Indicates a change.

6CZ5

VERTICAL-DEFLECTION AMPLIFIER

→ Maximum Ratings, *Design-Maximum Values:*

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

DC PLATE VOLTAGE	350	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE♦	2200	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	315	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE	275	max.	volts
CATHODE CURRENT:			
Peak	155	max.	ma
Average	45	max.	ma
GRID-No.2 INPUT	2.2	max.	watts
PLATE DISSIPATION	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200♦	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	250	max.	°C

Maximum Circuit Values:

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

▲ Without external shield.

● This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

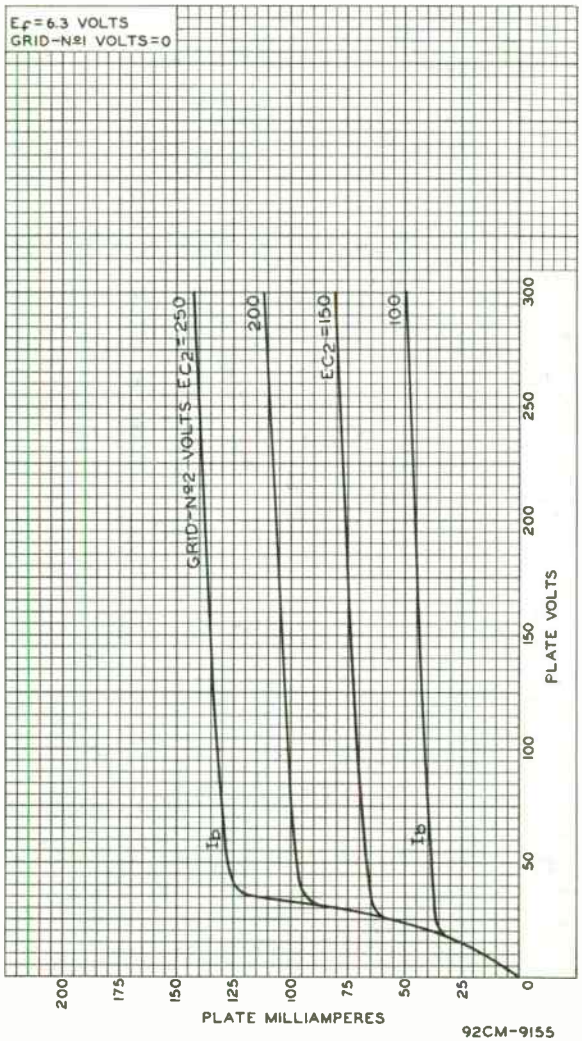
★ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

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

♦ The dc component must not exceed 100 volts.

→ Indicates a change.

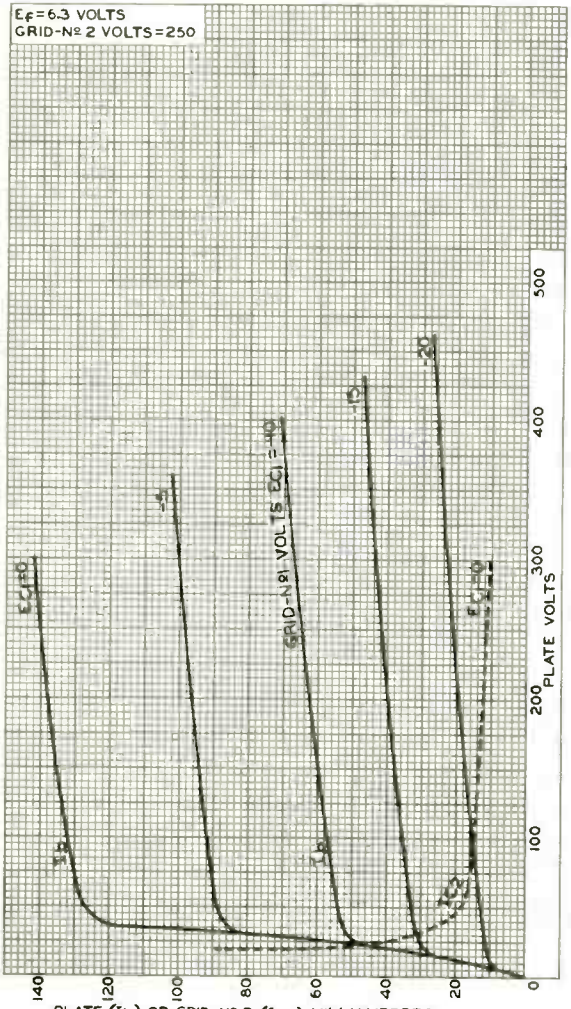
AVERAGE PLATE CHARACTERISTICS



92CM-9155

6CZ5

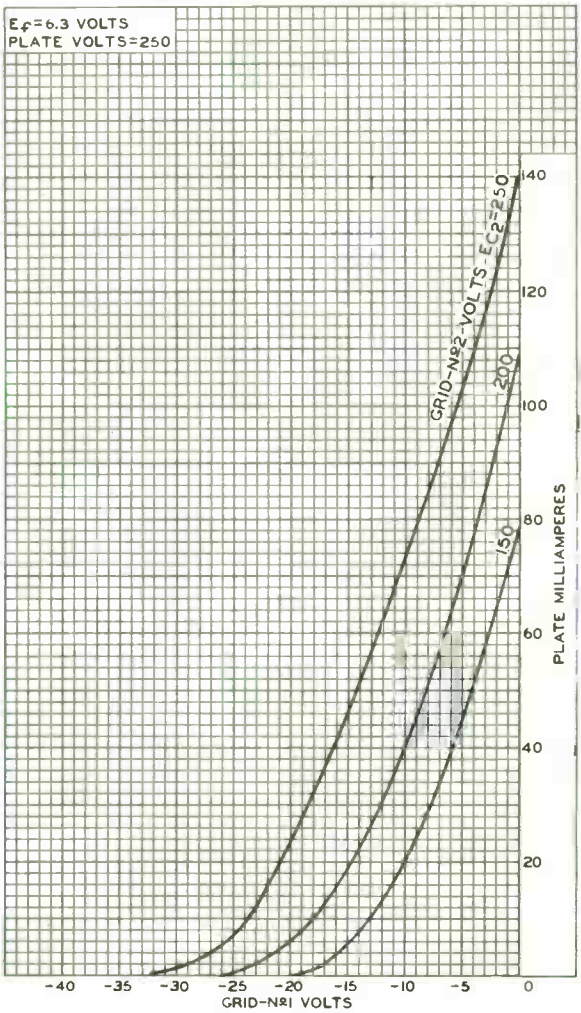
AVERAGE CHARACTERISTICS



92CM-9157

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

AVERAGE CHARACTERISTICS



92CM-9156R1

6DA4

HALF-WAVE VACUUM RECTIFIER

For television damper service

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current	1.2	amp
Direct Interelectrode Capacitances (Approx.):[o]		
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
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

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6DA4

HALF-WAVE VACUUM RECTIFIER

Characteristics:

Tube-Voltage Drop for plate
ma. = 250 . . . . . 22 volts

○ Without external shield.

◆ On the 5-pin bases, pin 1 as well as pins 4 and 6 is omitted.

● Socket terminals 1,2,4 and 6 should not be used as tie points.

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

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

▲ The dc component must not exceed 900 volts.

The dc component must not exceed 100 volts.

Beam Power Tube

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	1.2	amp
Direct Interelectrode Capacitances (Approx.):[a]		
Grid No.1 to plate	0.2	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	8	μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/4"
Maximum Seated Length	2-1/2"
Length, Base Seat to Bulb Top (Excluding tip)	2-1/8" ± 3/32"
Diameter	0.750" to 0.875"
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9GR

Pin 1 – Grid No.2
Pin 2 – Cathode, Grid No.3
Pin 3 – Grid No.1
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Grid No.1
Pin 7 – Cathode, Grid No.3
Pin 8 – Internal Connection—Do Not Use
Pin 9 – Plate

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	150	max.	volts
GRID-No.2 INPUT	1.25	max.	watts
PLATE DISSIPATION	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[b]	max.	volts

Typical Operation and Characteristics:

Plate Supply Voltage	110	200	volts
Grid-No.2 Supply Voltage	110	125	volts
Grid-No.1 (Control-grid) Voltage	-7.5	–	volts
Cathode Resistor	–	180	ohms

6DB5

Peak AF Grid-No.1 Voltage	7.5	8.5	volts
Zero-Signal Plate Current	49	46	ma
Max.-Signal Plate Current	50	47	ma
Zero-Signal Grid-No.2 Current	4	2.2	ma
Max.-Signal Grid-No.2 Current	10	8.5	ma
Plate Resistance (Approx.)	13000	28000	ohms
Transconductance	8000	8000	μmhos
Load Resistance	2000	4000	ohms
Total Harmonic Distortion	10	10	%
Max.-Signal Power Output	2.1	3.8	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.1 max.	megohm
For cathode-bias operation	2.2 max.	megohms

VERTICAL-DEFLECTION AMPLIFIER

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

For operation in a 525-line, 30-frame system[c]

DC PLATE VOLTAGE	300 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)[d]	2000[e] max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	150 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE	250 max.	volts
CATHODE CURRENT:		
Peak	200 max.	ma
Average	55 max.	ma
GRID-No.2 INPUT	1.25 max.	watts
PLATE DISSIPATION	10 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[b] max.	volts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.1 max.	megohm
For cathode-bias operation	2.2 max.	megohms

[a] Without external shield.

[b] The dc component must not exceed 100 volts.

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

[d] 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.

[e] Under no circumstances should this absolute value be exceeded.

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.

RCA

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

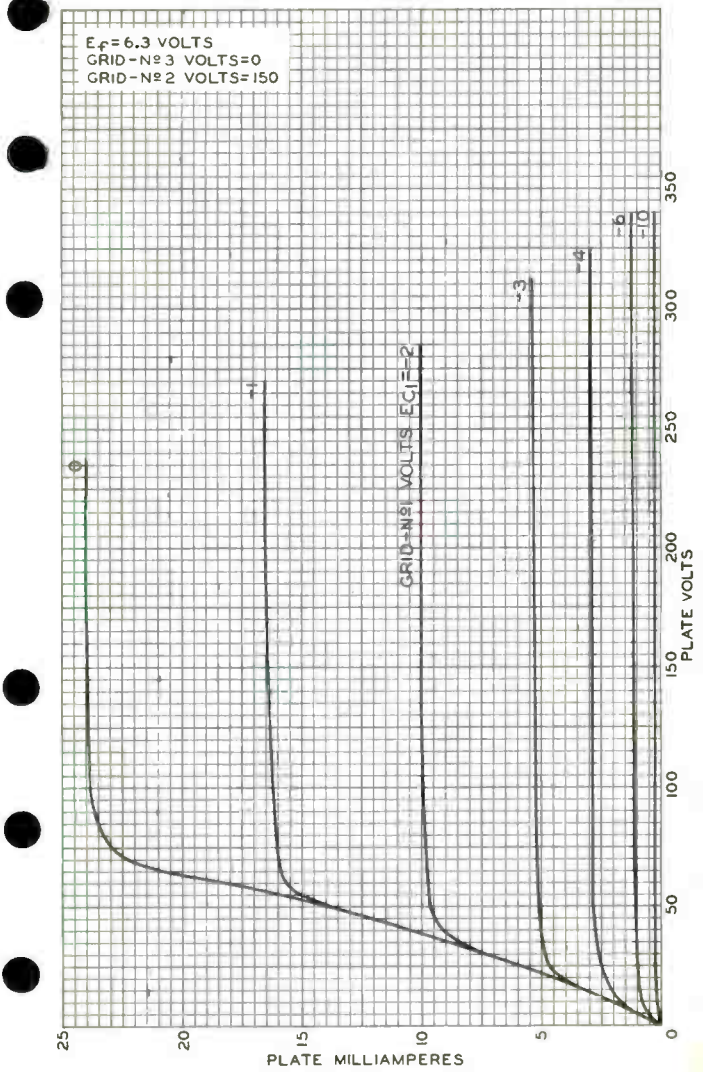
Maximum Circuit Values (For maximum rated conditions):

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

RCA

6DC6

AVERAGE PLATE CHARACTERISTICS



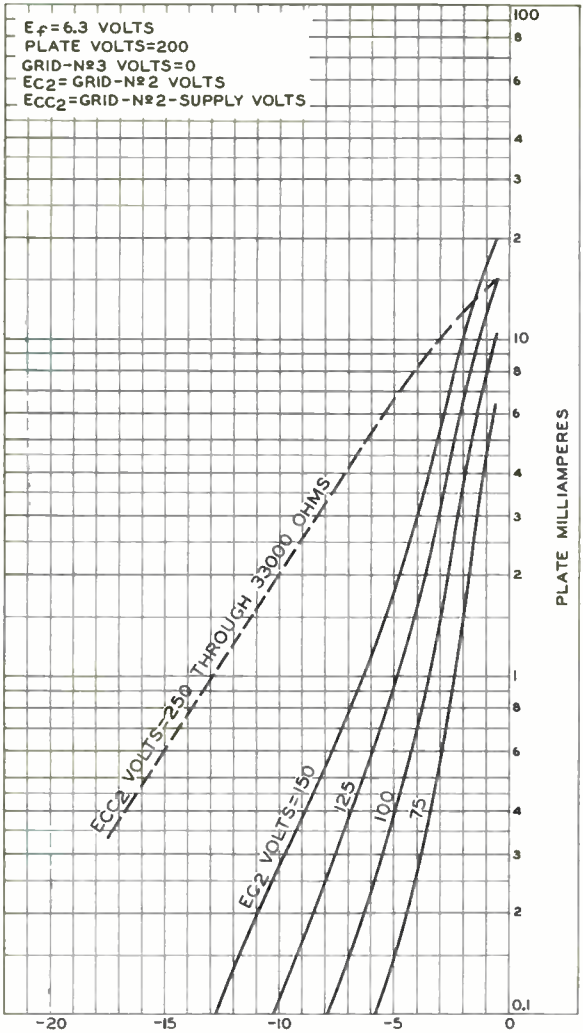
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8330RI

RCA

6DC6

AVERAGE CHARACTERISTICS



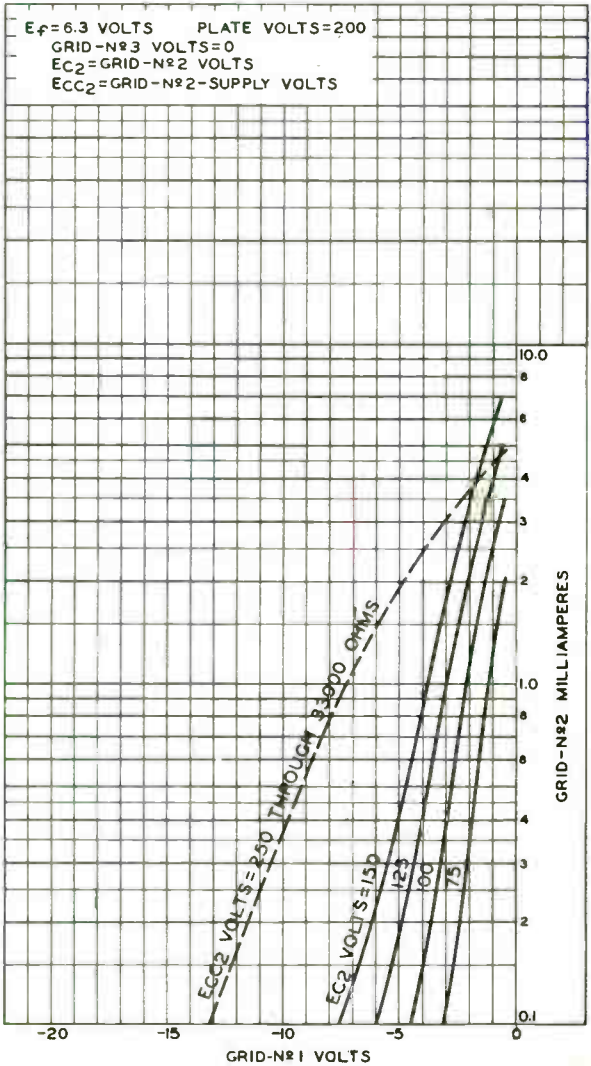
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8337

RCA

6DC6

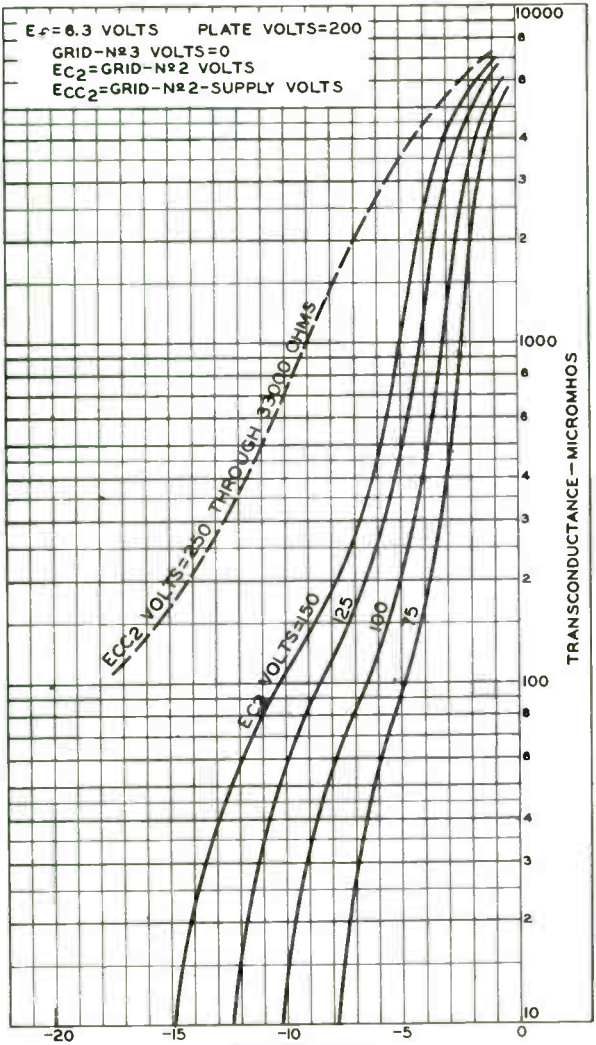
AVERAGE CHARACTERISTICS



RCA

6DC6

AVERAGE CHARACTERISTICS



Half-Wave Vacuum Rectifier

For Television Damper Service

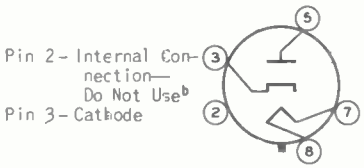
GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	1.6	amp
Direct Interelectrode Capacitances (Approx.):[a]		
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"
Maximum Diameter	1-9/32" ←
Bulb	T9
Base	Short Intermediate-Shell Octal 5-Pin with External Barriers, Arrangement 2 (JEDEC Group 1, No.B5-85)
Basing Designation for BOTTOM VIEW	4CG



Pin 2 - Internal Connection—Do Not Use[b]
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[c]

PEAK INVERSE PLATE VOLTAGE[d]	5500	max.	volts
PEAK PLATE CURRENT	1100	max.	ma
DC PLATE CURRENT	180	max.	ma
PLATE DISSIPATION	6.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode[d]	5500[e]	max.	volts
Heater positive with respect to cathode	300[f]	max.	volts

Characteristics, Instantaneous Value: ←

Tube Voltage Drop for plate ma. = 350	34	volts

[a] Without external shield.

[b] Socket terminals 1, 2, 4 and 6 should not be used as tie points.

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

← Indicates a change.

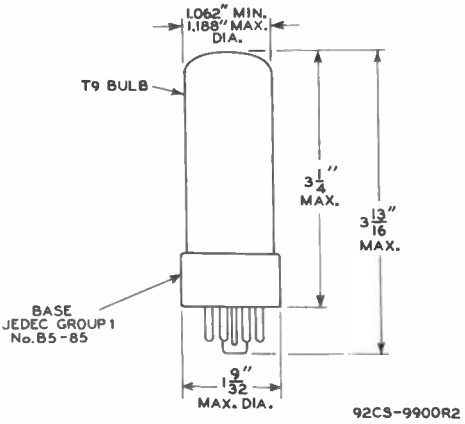
[d] This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

[e] The dc component must not exceed 900 volts.

[f] The dc component must not exceed 100 volts.

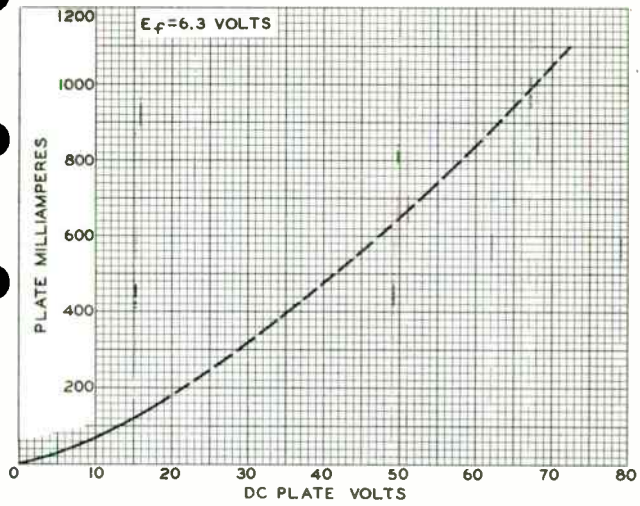
OPERATING CONSIDERATIONS

It is recommended that socket clips for pins 1, 2, 4, and 6 be removed to reduce the possibility of arc-over and to minimize leakage.



6DE4

AVERAGE PLATE CHARACTERISTIC



92CS-9884

6DE6

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage		6.3 ± 10%	volts
Current		0.3	amp
Direct Interelectrode Capacitances:			
	Without External Shield	*With External Shield*[c]	
Grid No.1 to plate	0.025 max.	0.015 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	6.5	6.5	μμf
Plate to cathode, grid No.3 & interal shield, grid No.2, ard heater	2	3	μμf

Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	125	volts
Grid No.3	♦	
Grid-No.2 Supply Voltage	125	volts
Cathode Resistor	56	ohms
Plate Resistance (Approx.)	0.25	megohm
Transconductance	8000	μmhos
Plate Current	15.5	ma
Grid-No.2 Current	4.2	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-9	volts
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 700 and cathode resistor (ohms) = 0	-5.5	volts

Mechanical:

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

◆ indicates a change.

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

6DE6

SHARP-CUTOFF PENTODE

Basing Designation for BOTTOM VIEW 7CM

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

AMPLIFIER — Class A_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.

→ indicates a change.

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

6DE6

RCA

6DE6

AVERAGE PLATE CHARACTERISTICS

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

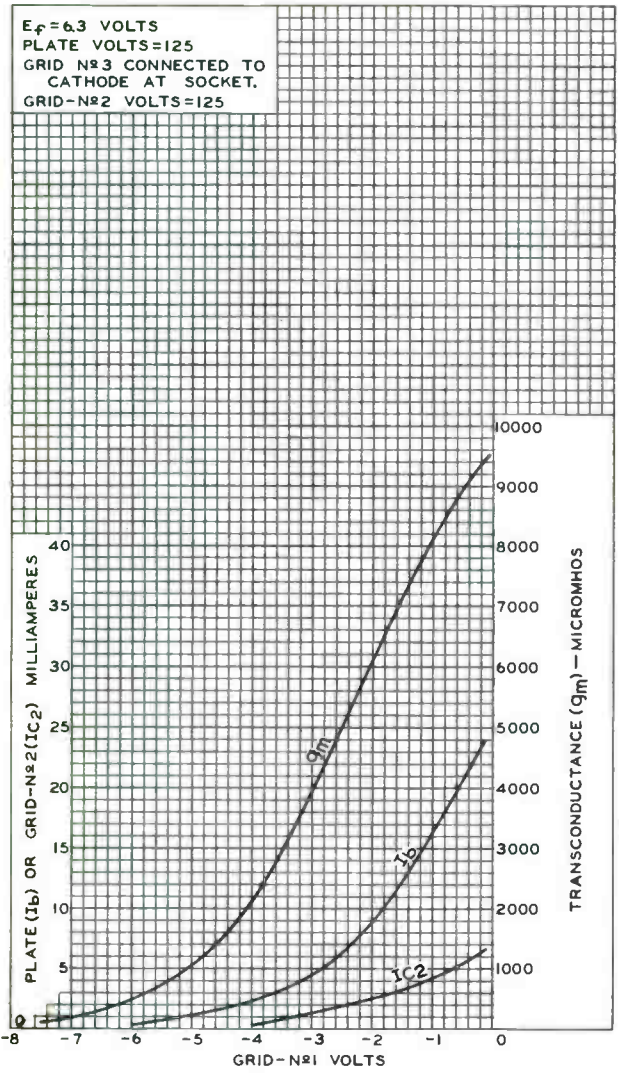
92CM-6578RI

6DE6

RCA

6DE6

AVERAGE CHARACTERISTICS



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

92CM-8575R1

6DE7

Dual Triode

With Medium-Mu Unit and Low-Mu Unit

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Maximum Values)*:			
Voltage (AC or DC)	6.3 ± 0.6		volts
Current at heater volts = 6.3	0.900		amp
Peak heater-cathode voltage (Each unit):			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[a]	max.	volts

Direct Interelectrode Capacitances (Approx.):[b]

	Unit No.1	*Unit No.2*	
Grid to plate	4.0	8.5	μμf
Grid to cathode and heater	2.2	5.5	μμf
Plate to cathode and heater	0.52	1.0	μμf

Characteristics, Class A$_1$ Amplifier:

	Unit No.1	*Unit No.2*		
Plate Voltage	250	60	150	volts
Grid Voltage	−11	0	−17.5	volts
Amplification Factor	17.5	–	6	
Plate Resistance (Approx.)	8750	–	925	ohms
Transconductance	2000	–	6500	μmhos
Plate Current	5.5	80[c]	35	ma
Plate Current for grid volts = −24	–	–	10	ma
Grid Voltage (Approx.) for plate μa = 10	−20	–	–	volts
Grid Voltage (Approx.) for plate μa = 50	–	–	−44	volts

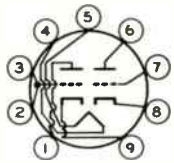
Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)

6DE7

Basing Designation for BOTTOM VIEW. 9HF

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



Pin 6 – Plate of Unit No.1
Pin 7 – Grid of Unit No.1
Pin 8 – Cathode of Unit No.1
Pin 9 – Cathode of Unit No.2

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No.1

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[d]

DC PLATE VOLTAGE.	330 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	400 max.	volts
CATHODE CURRENT:,		
Peak.	77 max.	ma
Average	22 max.	ma
→ PLATE DISSIPATION	1.5 max.	watts

Maximum Circuit Values:

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

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No.2

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[d]

DC PLATE VOLTAGE.	275 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[#]. . . .	1500 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	250 max.	volts
CATHODE CURRENT:		
Peak.	175 max.	ma
Average	50 max.	ma
PLATE DISSIPATION	7 max.	watts

Maximum Circuit Values:

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

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

[c] 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.

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

→ Indicates a change.

6DE7

DUAL TRIODE

With Medium-Mu Unit and Low-Mu Unit

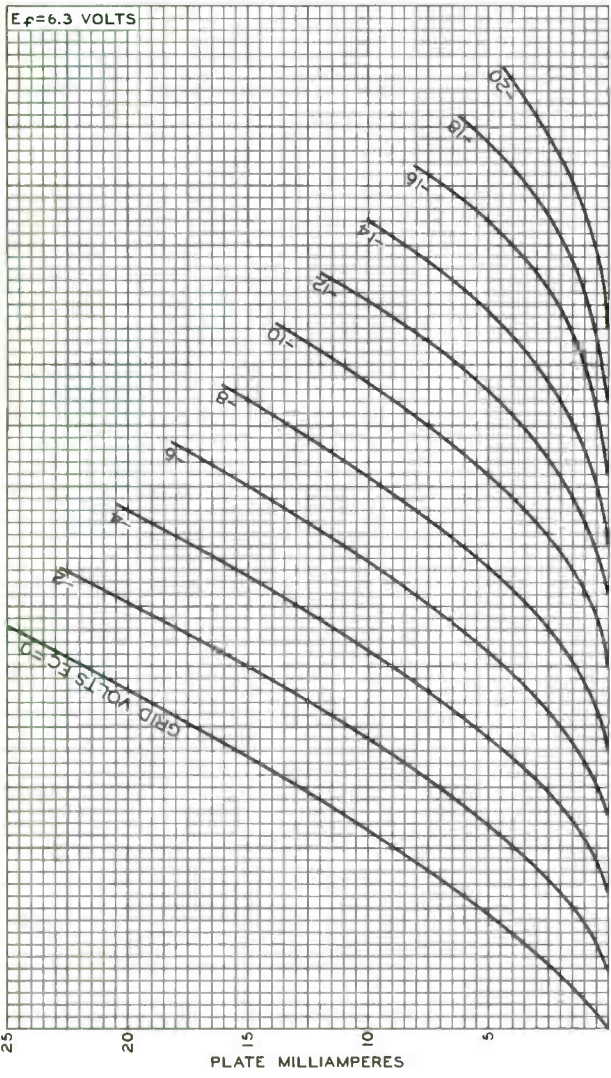
This rating is applicable when the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

6DE7

6DE7

AVERAGE PLATE CHARACTERISTICS

UNIT Nº1



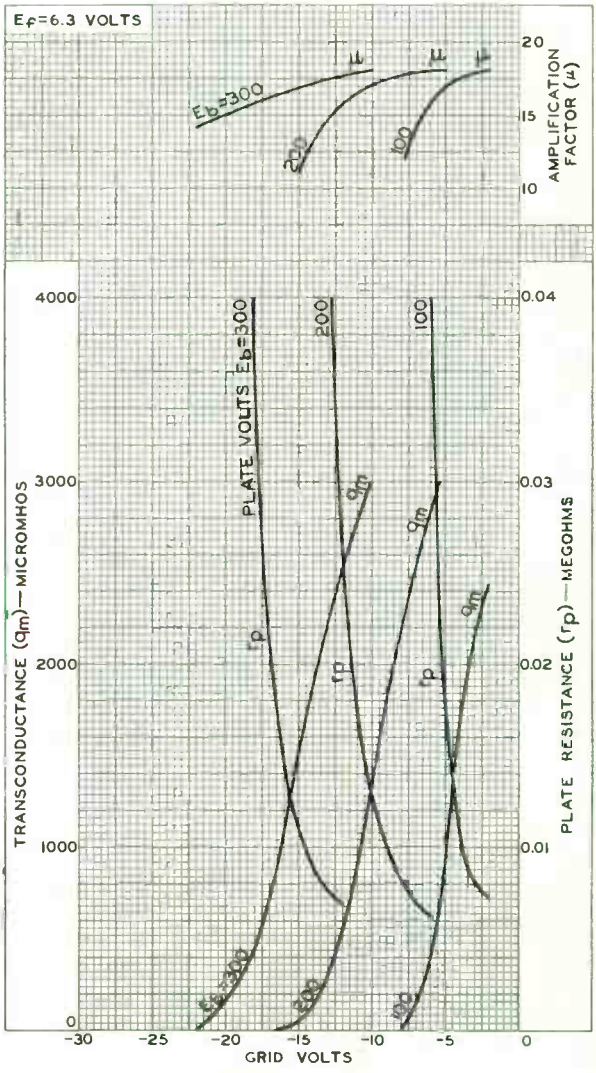
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9988

6DE7

AVERAGE CHARACTERISTICS

UNIT Nº 1



ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-9991

6DE7

RCA

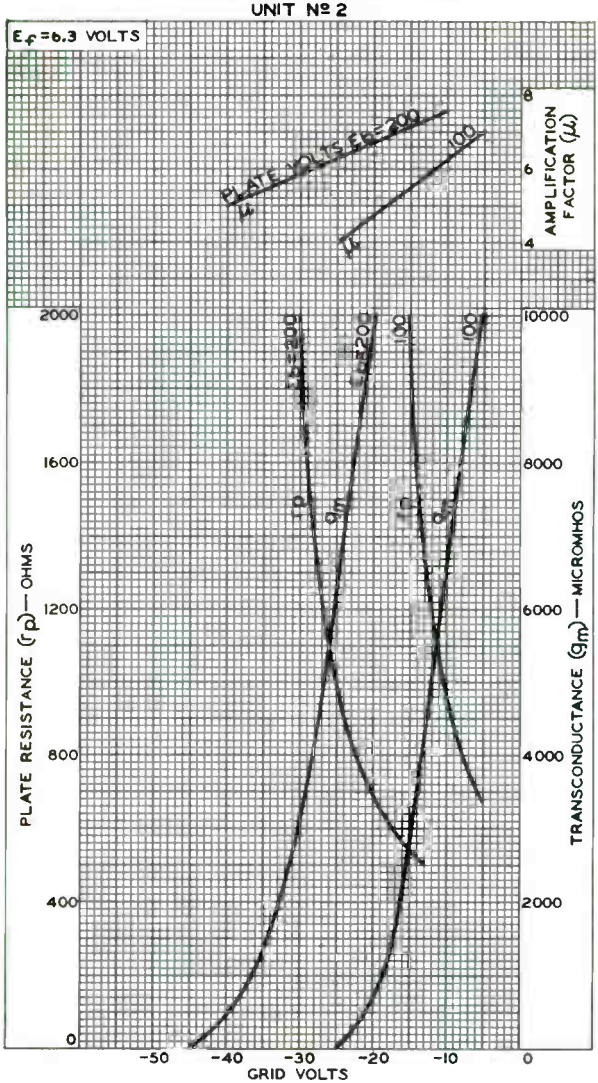
6DE7

AVERAGE PLATE CHARACTERISTICS
UNIT No 2

RCA

6DE7

AVERAGE CHARACTERISTICS
UNIT Nº 2



6DG6-GT

BEAM POWER TUBE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	1.2	amp
Direct Interelectrode Capacitances (Aporox.):[o]		
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"
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

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	200 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	125 max.	volts
PLATE DISSIPATION	10 max.	watts
GRID-No.2 INPUT	1.25 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Typical Operation and Characteristics:

Plate Voltage	110	200	volts
Grid-No.2 Voltage	110	125	volts
Grid-No.1 (Control-Grid) Voltage	-7.5	0	volts

[o] Without external shield.

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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6DG6-GT

BEAM POWER TUBE

Peak AF Grid-No.1 Voltage	7.5	8.5	volts
Cathode Resistor	0	180	ohms
Zero-Signal Plate Current	49	46	ma
Max.-Signal Plate Current	50	47	ma
Zero-Signal Grid-No.2 Current	4	2.2	ma
Max.-Signal Grid-No.2 Current	10	8.5	ma
Plate Resistance (Approx.)	13000	28000	ohms
Transconductance	8000	8000	μmhos
Load Resistance	2000	4000	ohms
Total Harmonic Distortion	10	10	%
Max.-Signal Power Output	2.1	3.8	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

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

Curves shown under Type 50L6-GT also apply to the 6DG6-GT

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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:[o]		
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

[o]: See next page.

TENTATIVE DATA

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.

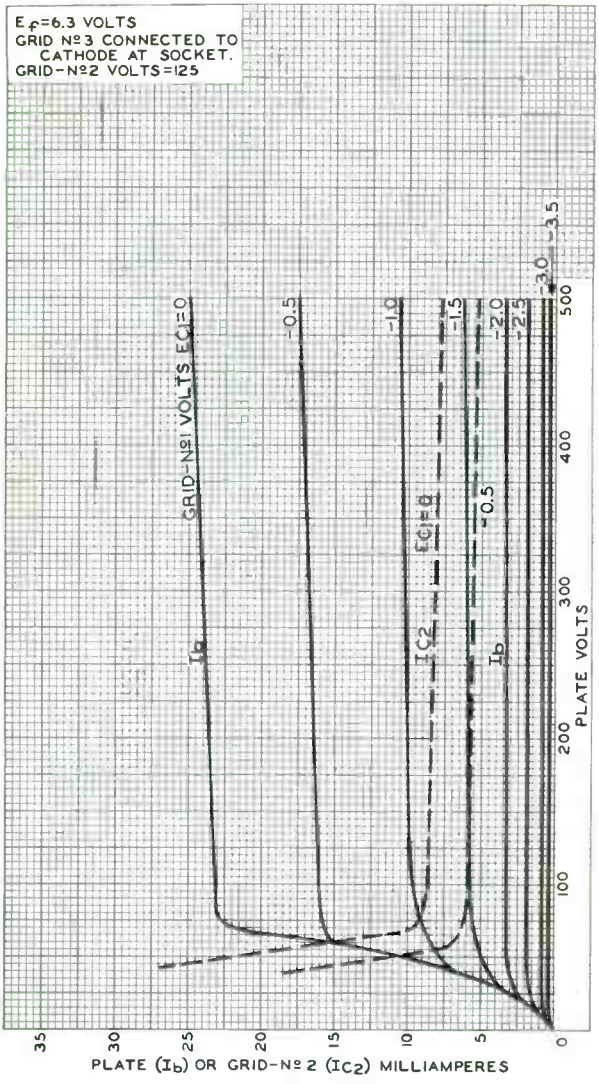
▲ The dc component must not exceed 100 volts.

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

TENTATIVE DATA

6DK6

AVERAGE CHARACTERISTICS

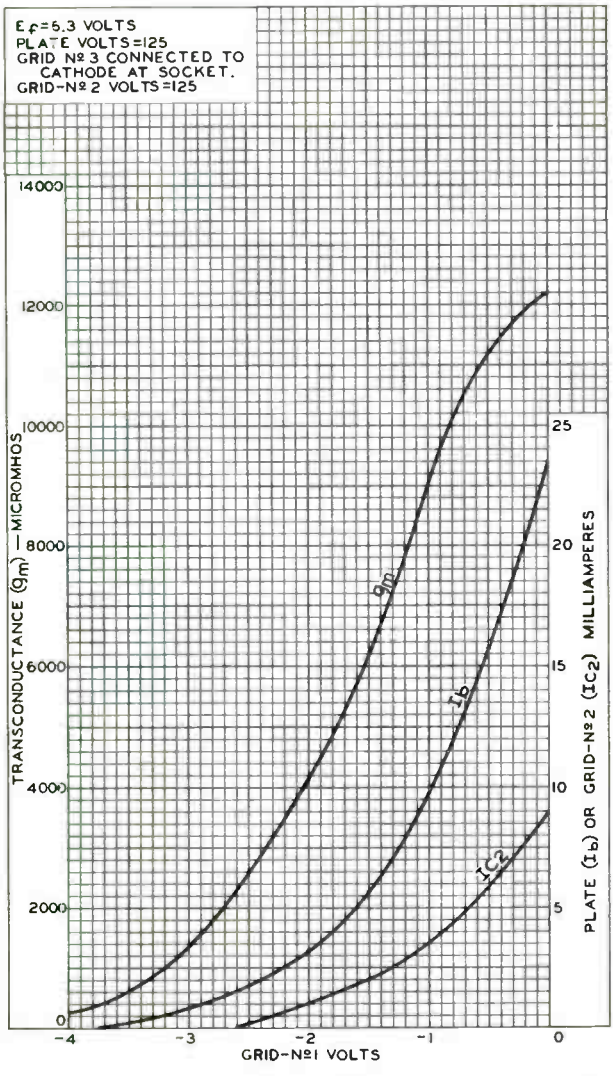


ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-9851RI

RCA

6DK6

AVERAGE CHARACTERISTICS



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

92CM-9852

6DN7

MEDIUM-MU DUAL TRIODE

With Dissimilar Units

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:			
Voltage (AC or DC)	6.3 ± 10%		volts
Current	0.9		amp
Direct Interelectrode Capacitances (Approx.):[C]			
	Unit No.1	*Unit No.2*	
Grid to plate	4	5.5	μμf
Grid to cathode and heater	2.2	4.6	μμf
Plate to cathode and heater	0.7	1	μμf

Characteristics, Class A_1 Amplifier:

	Unit No.1	*Unit No.2*		
Plate Voltage	250	150	250	volts
Grid Voltage	−8	0	−9.5	volts
Amplification Factor	22.5	—	15.4	
Plate Resistance (Approx.)	9000	—	2000	ohms
Transconductance	2500	—	7700	μmhos
Plate Current	8	68	41	ma
Grid Voltage (Approx.) for plate ma. = 10	−18	—	—	volts
Grid Voltage (Approx.) for plate ma. = 50	—	—	−23	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	3"
Maximum Seated Length	2-7/16"
Maximum Diameter	1-9/32"
Bulb	T9
Base	Intermediate-Shell Octal 8-Pin with External Barriers (JEDEC Group 1, 88-142)
Basing Designation for BOTTOM VIEW	8BD

Pin 1 – Grid of Unit No.2
Pin 2 – Plate of Unit No.2
Pin 3 – Cathode of Unit No.2
Pin 4 – Grid of Unit No.1

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

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No.1

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[D]

DC PLATE VOLTAGE	350 max.	volts

6DN7

MEDIUM-MU DUAL TRIODE
With Dissimilar Units

PEAK NEGATIVE-PULSE GRID VOLTAGE.	400	max.	volts
PLATE DISSIPATION	1	max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200▲	max.	volts
Heater positive with respect to cathode	200▲	max.	volts
Maximum Circuit Values:			
Grid-Circuit Resistance:			
For fixed-bias operation.	2.2	max.	megohms
For cathode-bias operation.	2.2	max.	megohms

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No.2

Maximum Ratings, *Design-Maximum Values:*

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

DC PLATE VOLTAGE.	550	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE#. . . .	2500	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE.	250	max.	volts
CATHODE CURRENT:			
Peak.	150	max.	ma
Average	50	max.	ma
PLATE DISSIPATION	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200▲	max.	volts
Heater positive with respect to cathode	200▲	max.	volts
Maximum Circuit Values:			
Grid-Circuit Resistance:			
For fixed-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.

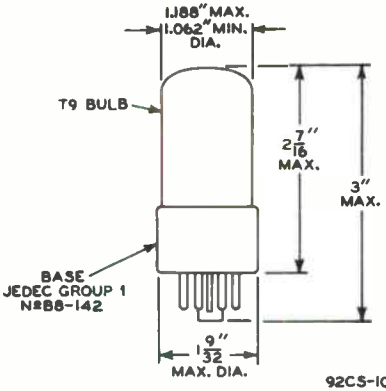
▲ The dc component must not exceed 100 volts.

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

6DN7

MEDIUM-MU DUAL TRIODE

With Dissimilar Units



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

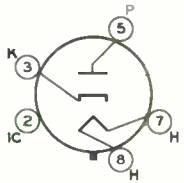
Half-Wave Vacuum Rectifier

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Maximum heater-cathode voltage:		
Heater negative with respect to cathode:		
Peak	5500	volts
DC component	900	volts
Heater positive with respect to cathode:		
Peak	300	volts
DC component	100	volts
Direct Interelectrode Capacitances (Approx.):		
P to (K,H)	5.0	pf
K to (P,H)	8.5	pf
Heater to cathode	4.0	pf

Mechanical:

Operating Position	Any
Maximum Overall Length	3-7/16"
Maximum Seated Length	2-7/8"
Maximum Diameter	1-9/32"
Dimensional Outline	See *General Section*
Bulb	T9
Base . . . Short Intermediate-Shell Octal 5-Pin (JEDEC B5-49)	
Basing Designation for BOTTOM VIEW	4CG



Pin 2 – Do Not Use[a]
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[b]	5500	volts
Peak Plate Current	1000	ma
DC Plate Current	175	ma
Plate Dissipation	6	watts

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma = 250	32	volts

[a] Socket terminals 1, 2, 4, and 6 should not be used as tie points.

[b] 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.

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

6DQ5

Beam Power Tube

For Use as a Horizontal-Deflection Amplifier Tube in Color and Black-and-White Television Receivers

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:			
Voltage (AC or DC)	6.3 ± 0.6		volts
Current at heater volts = 6.3	2.500		amp
Peak heater-cathode voltage:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[a]	max.	volts
Direct Interelectrode Capacitances:[b]			
Grid No.1 to plate	0.5		pf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	23.0		pf
Plate to cathode & grid No.3, grid No.2, and heater	11.0		pf

Characteristics, Class A_1 Amplifier:

			Triode Connection[c]	
Plate Voltage	70	175	125	volts
Grid No.2 (Screen-Grid) Voltage	125	125	–	volts
Grid No.1 (Control-Grid) Voltage	0	-25	-25	volts
Amplification Factor	–	–	3.3	
Plate Resistance (Approx.)	–	5500	–	ohms
Transconductance	–	10500	–	μmhos
Plate Current	550[d]	110	–	ma
Grid-No.2 Current	42[d]	5	–	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 1	–	-55	–	volts

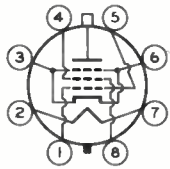
Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	5"
Seated Length	4-1/4" ± 3/16"
Maximum Diameter	1-9/16"
Bulb	T12
Cap	Small (JEDEC No.C1-1)
Base	Short Meduim-Shell Octal 8-Pin with External Barriers, Style B (JEDEC No.B8-118)

6DQ5

Basing Designation for BOTTOM VIEW. 8JC

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



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

HORIZONTAL-DEFLECTION AMPLIFIER

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

For operation in a 525-line, 30-frame system[e]

DC PLATE-SUPPLY VOLTAGE	990 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[f]	6500 max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1100 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE. . . .	190 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE . .	250 max.	volts
CATHODE CURRENT:		
Peak.	1100 max.	ma
Average	315 max.	ma
GRID-No.2 INPUT	3.2 max.	watts
PLATE DISSIPATION[g].	24 max.	watts
BULB TEMPERATURE (At hottest point on bulb surface).	220 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For grid-resistor-bias operation[g] . . .	0.47 max.	megohm

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

[c] With grid No.2 connected to plate.

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

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

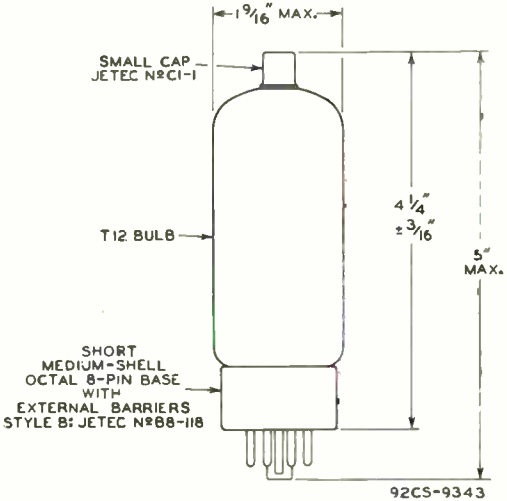
[f] This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

[g] 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.

→Indicates a change.

6DQ5

BEAM POWER TUBE



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

6DQ5

RCA

6DQ5

AVERAGE CHARACTERISTICS

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

92CM-9311

RCA

6DQ5

AVERAGE CHARACTERISTICS

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9309

6DQ5

RCA

6DQ5

AVERAGE CHARACTERISTICS

ELECTRON TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9310

RCA

6DR7

DUAL TRIODE

With High-Mu Unit and Low-Mu Unit

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:
Voltage . . . . . 6.3 ± 10% . . . ac or dc volts
Current . . . . . 0.9 . . . . . amp

Direct Interelectrode Capacitances (Aoprox.):[o]

	Unit No.1	Unit No.2	
Grid to plate	4.5	8.5	μμf
Grid to cathode and heater	2.2	5.5	μμf
Plate to cathode and heater	0.34	1	μμf

Characteristics, Class A_1 Amplifier:

	Unit No.1	Unit No.2	
Plate Voltage	250	150	volts
Grid Voltage	-3	-17.5	volts
Amplification Factor	68	6	
Plate Resistance (Approx.)	40000	925	ohms
Transconductance	1600	6500	μmhos
Plate Current	1.4	35	ma
Plate Current for plate volts = 60 and grid volts = 0	-	80	ma
Plate Current for grid volts = -24.	-	10	ma
Grid Voltage (Approx.) for plate μa = 10.	-5.5	-	volts
Grid Voltage (Approx.) for plate μa = 50.	-	-44	volts

Mechanical:

Operating Position . . . . . Any
Maximum Overall Length . . . . . 2-5/8"
Maximum Seated Length . . . . . 2-3/8"
Length, Base Seat to Bulb Top (Excluding tip) . . . 2" ± 3/32"
Diameter . . . . . 0.750" to 0.875"
Dimensional Outline . . . . . *See General Section*
Bulb T6-1/2
Base . . . . . Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW 9HF

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

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

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

TENTATIVE DATA

RCA

6DR7

DUAL TRIODE
With High-Mu Unit and Low-Mu Unit

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No.1

Maximum Ratings, *Design-Maximum Values:*

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

DC PLATE VOLTAGE	330	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	400	max.	volts
CATHODE CURRENT:			
Peak	70	max.	ma
Average	20	max.	ma
PLATE DISSIPATION	1	max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200■	max.	volts

Maximum Circuit Values:

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

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No.2

Maximum Ratings, *Design-Maximum Values:*

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

DC PLATE VOLTAGE	275	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE#	1500	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	250	max.	volts
CATHODE CURRENT:			
Peak	175	max.	ma
Average	50	max.	ma
PLATE DISSIPATION	7	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200■	max.	volts

Maximum Circuit Values:

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

○ Without external shield.

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

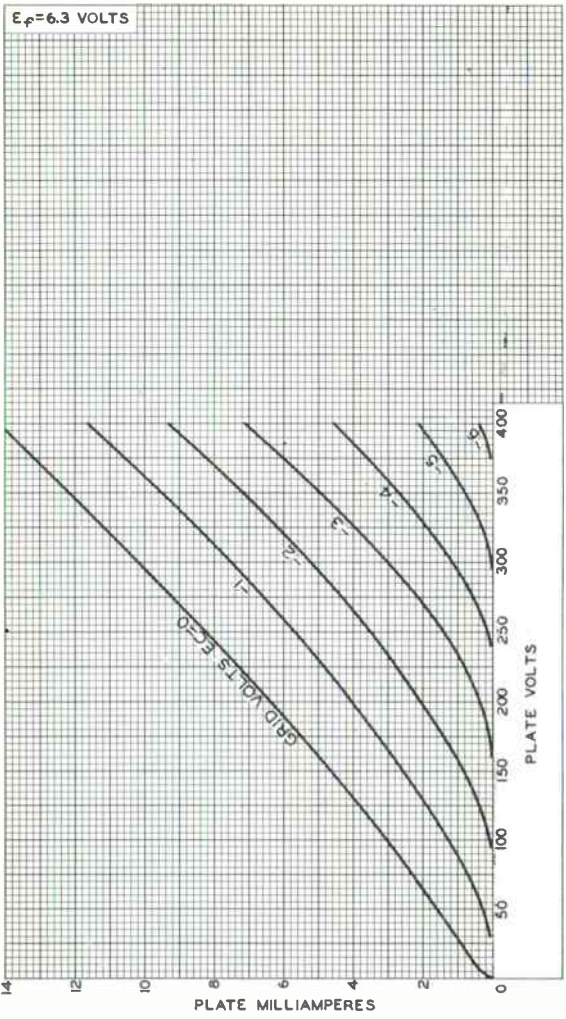
This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

■ The dc component must not exceed 100 volts.

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

TENTATIVE DATA

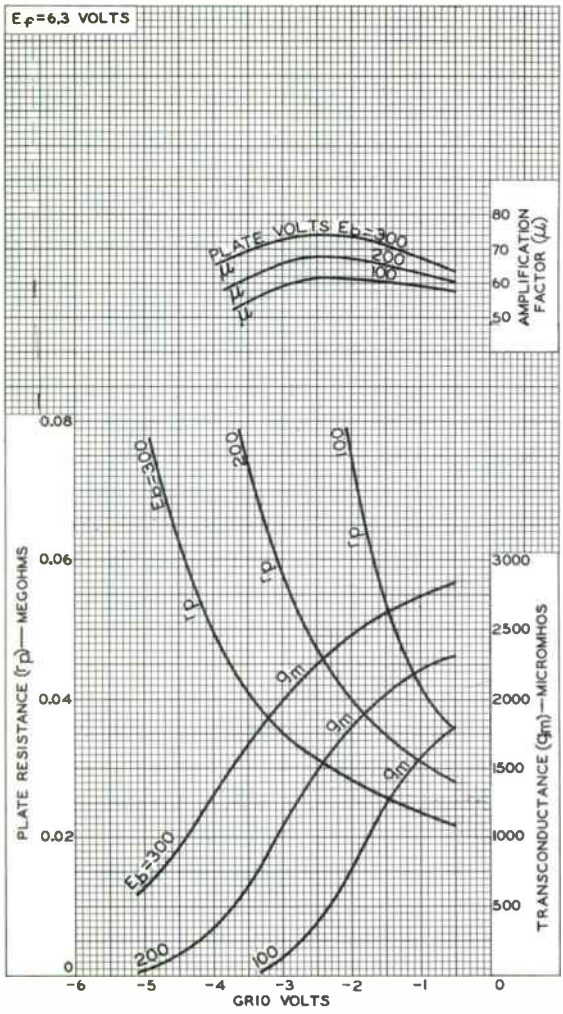
AVERAGE PLATE CHARACTERISTICS
Unit No.1



92CM-9912

6DR7

AVERAGE CHARACTERISTICS
Unit No.1

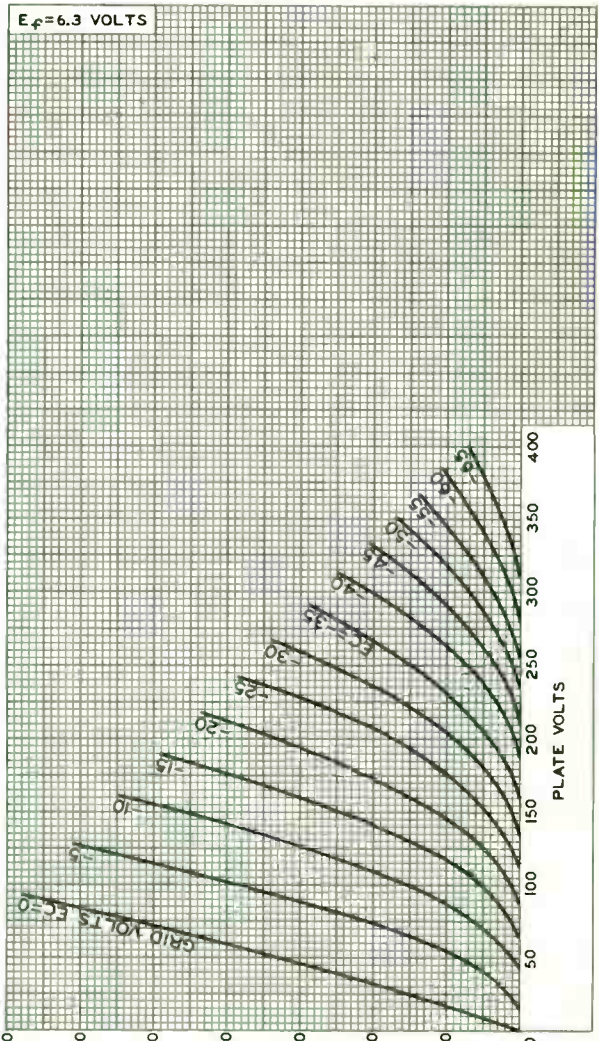


92CM-9915R1

RCA

6DR7

AVERAGE PLATE CHARACTERISTICS
UNIT Nº 2

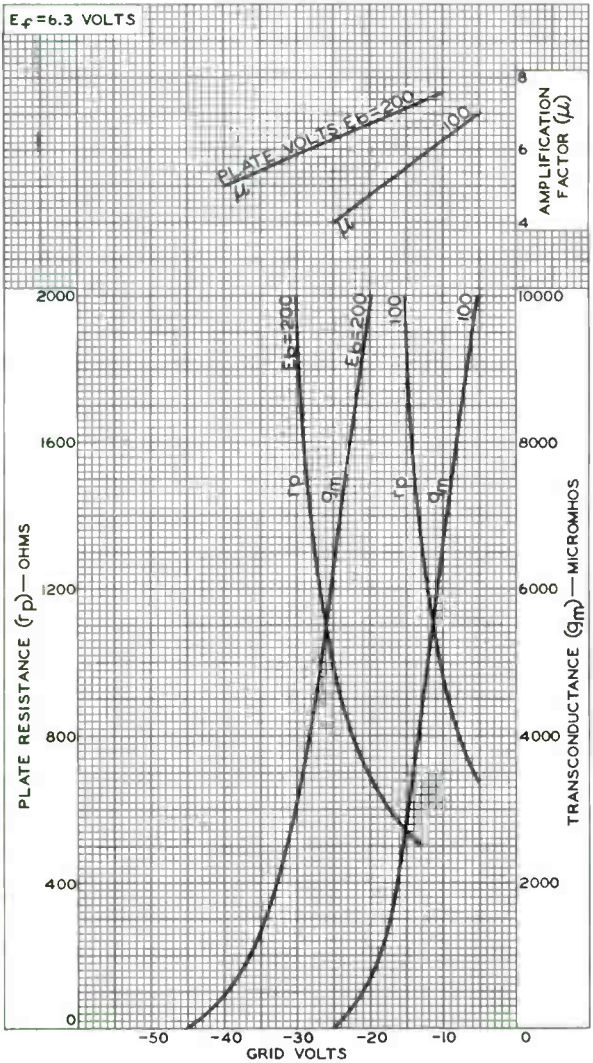


ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9913

6DR7

AVERAGE CHARACTERISTICS
UNIT Nº 2



ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-9914

6DS4

High-Mu Triode

NUVISTOR TYPE

HAVING EXTENDED CUTOFF CHARACTERISTIC

For Use as Grounded-Cathode Neutralized RF-Amplifier Tube in Tuners of VHF Television and FM Receivers Featuring Improved Weak-Signal-Area Reception

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.135	amp
Direct Interelectrode Capacitances (Approx.):		
Grid to plate	0.92	μμf
Grid to cathode, shell, and heater	4.1	μμf
Plate to cathode, shell, and heater	1.7	μμf
Plate to cathode	0.18	μμf
Heater to cathode	1.3	μμf

Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	110	volts
Grid Supply Voltage	0	volts
Cathode Resistor	130	ohms
Amplification Factor	62	
Plate Resistance (Approx.)	6900	ohms
Transconductance	9000	μmhos
Plate Current	6.5	ma
Grid Voltage (Approx.) for plate μa = 100	-5	volts
Grid Voltage (Approx.) for plate μa = 10	-6.8	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	0.800"
Maximum Seated Length	0.625"
Maximum Diameter	0.440"
Envelope	Metal Shell MT4
Socket	.Cinch Mfg. Corp. No.133 65 10 001, or equivalent
Base	Medium Ceramic-Wafer Twelvar 5-Pin (JEDEC No.E5-65)
Basing Designation for BOTTOM VIEW	12AQ

Pin 1[a] - Internal Connection—Do Not Use
Pin 2 - Plate
Pin 3 - Same as Pin 1
Pin 4 - Grid
Pin 5 - Same as Pin 1
Pin 6 - Same as Pin 1
Pin 7 - Same as Pin 1
Pin 8 - Cathode
Pin 9 - Same as Pin 1
Pin 10 - Heater
Pin 12 - Heater

INDEX = LARGE LUG
● = PIN CUT OFF

6DS4

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE SUPPLY VOLTAGE	300[b]	max.	volts
PLATE VOLTAGE	135	max.	volts
GRID VOLTAGE:			
Negative-bias value	55	max.	volts
Peak-positive value	0	max.	volts
CATHODE CURRENT	15	max.	ma
PLATE DISSIPATION	1	max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	100	max.	volts
Heater positive with respect to cathode.	100	max.	volts

Typical Operation:

Plate Voltage	70	volts
Grid Supply Voltage	0	volts
Grid Resistor	47000	ohms
Amplification Factor	68	
Plate Resistance (Approx.)	5440	ohms
Transconductance	12500	μmhos
Plate Current	8	ma

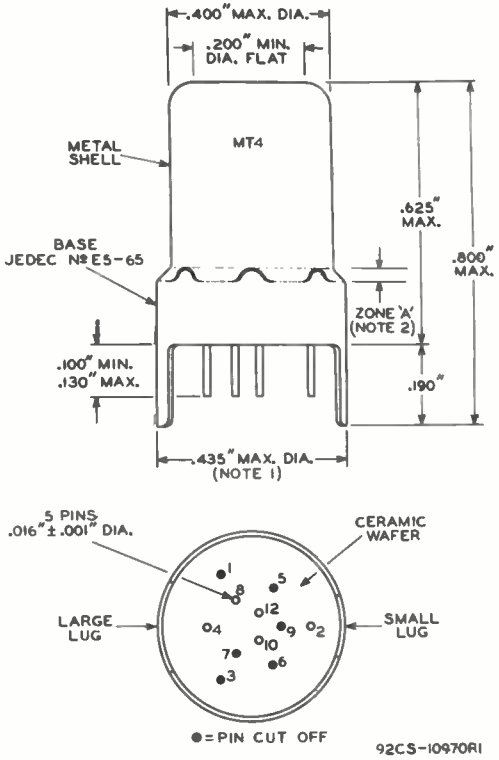
Maximum Circuit Values:

Grid-Circuit Resistance:[c]			
For fixed-bias operation.	0.5	max.	megohm
For cathode-bias operation.	2.2	max.	megohms

[a] Pin is cut off close to ceramic wafer.

[b] A plate supply voltage of 300 volts may be used provided that a sufficiently large resistor is used in the plate circuit to limit the plate dissipation to one watt under any condition of operation.

[c] For operation at metal-shell temperatures up to 125° C.

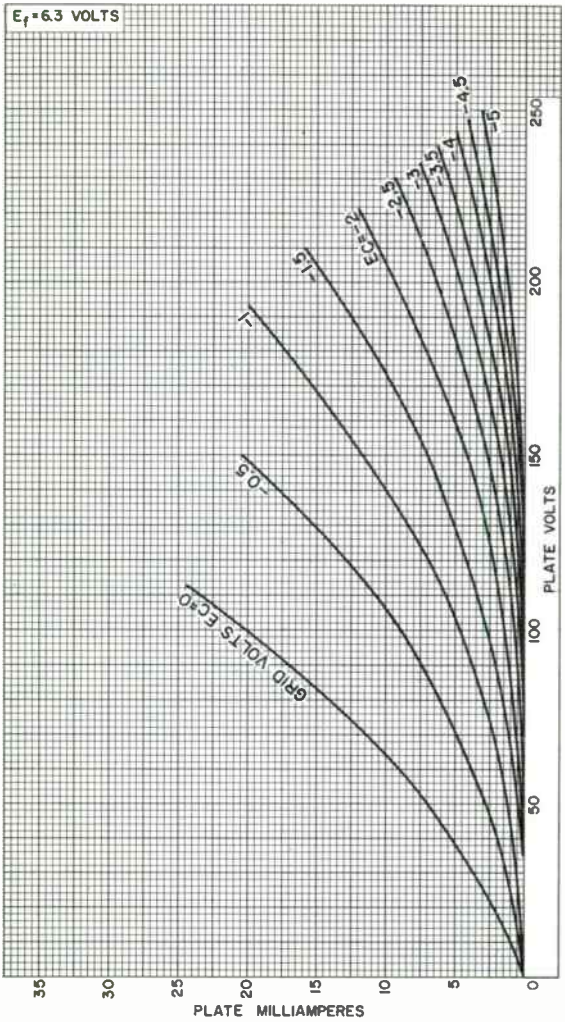


NOTE 1: MAXIMUM OUTSIDE DIAMETER OF 0.440" IS PERMITTED ALONG 0.190" LUG LENGTH.

NOTE 2: SHELL TEMPERATURE SHOULD BE MEASURED IN ZONE "A" BETWEEN BROKEN LINES.

6DS4

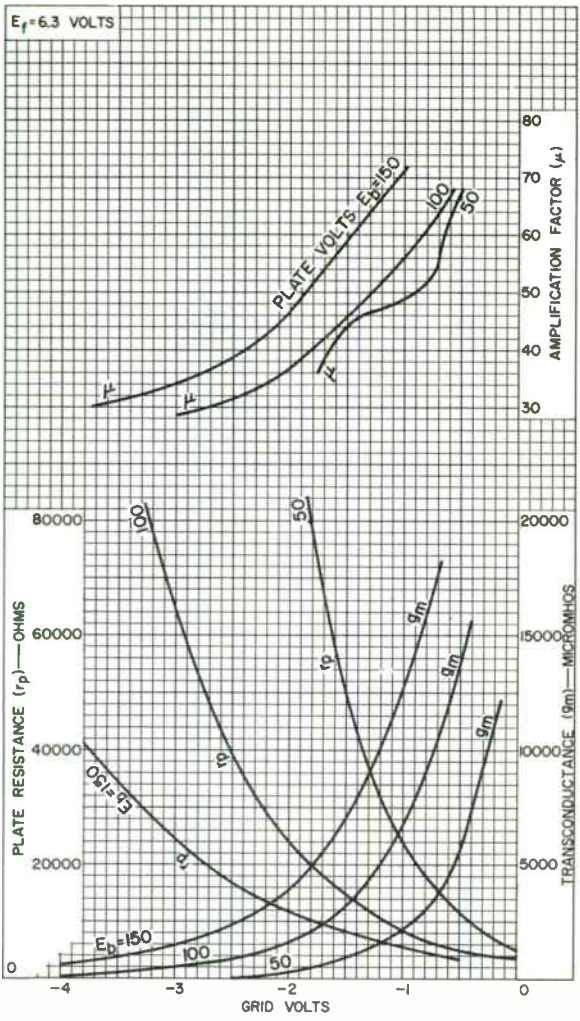
AVERAGE PLATE CHARACTERISTICS



92CM-11209

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

AVERAGE CHARACTERISTICS



92CM-11210

6DS5

BEAM POWER TUBE

7-PIN 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	0.19	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	9.5	μμf
Plate to cathode & grid No.3, grid No.2, and heater	6.3	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	T5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	7BZ

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

Pin 4 - Heater
Pin 5 - Plate
Pin 6 - Grid No.2
Pin 7 - Grid No.1

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	250 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	250 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
GRID-No.2 INPUT	2 max.	watts
PLATE DISSIPATION	8 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	250 max.	°C

Typical Operation and Characteristics:

Fixed-Bias Operation

Plate Voltage	200	250	volts
Grid-No.2 Voltage	200	200	volts
Grid-No.1 Voltage	-7.5	-8.5	volts
Peak AF Grid-No.1 Voltage	7.5	8.5	volts

[o] without external shield.

TENTATIVE DATA

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

RCA

6DS5

BEAM POWER TUBE

Zero-Signal Plate Current	35	29	ma
Max.-Signal Plate Current	36	32	ma
Zero-Signal Grid-No.2 Current	3	3	ma
Max.-Signal Grid-No.2 Current	9	10	ma
Plate Resistance (Approx.)	28000	28000	ohms
Trarsconductance	6000	5800	μmhos
Load Resistance	6000	8000	ohms
Total Harmonic Distortion	9	10	%
Max.-Signal Power Output	3	3.8	watts
Cathode-Bias Operation			
Plate-Supply Voltage	200	250	volts
Grid-No.2 Supply Voltage	200	200	volts
Cathode Resistor	180	270	ohms
Peak AF Grid-No.1 Voltage	7.5	9.2	volts
Zero-Signal Plate Current	34.5	27	ma
Max.-Signal Plate Current	32.5	25	ma
Zero-Signal Grid-No.2 Current	3.5	3	ma
Max.-Signal Grid-No.2 Current	9	9	ma
Plate Resistance (Approx.)	28000	28000	ohms
Trarsconductance	6000	5800	μmhos
Loac Resistance	6000	8000	ohms
Total Harmonic Distortion	10	10	%
Max.-Signal Power Output	2.8	3.6	watts

Maximum Circuit Values:

Gric-No.1-Circuit Resistance:		
Fcr fixed-bias operation	0.1 max.	megohm
Fcr cathode-bias operation	1.0 max.	megohm

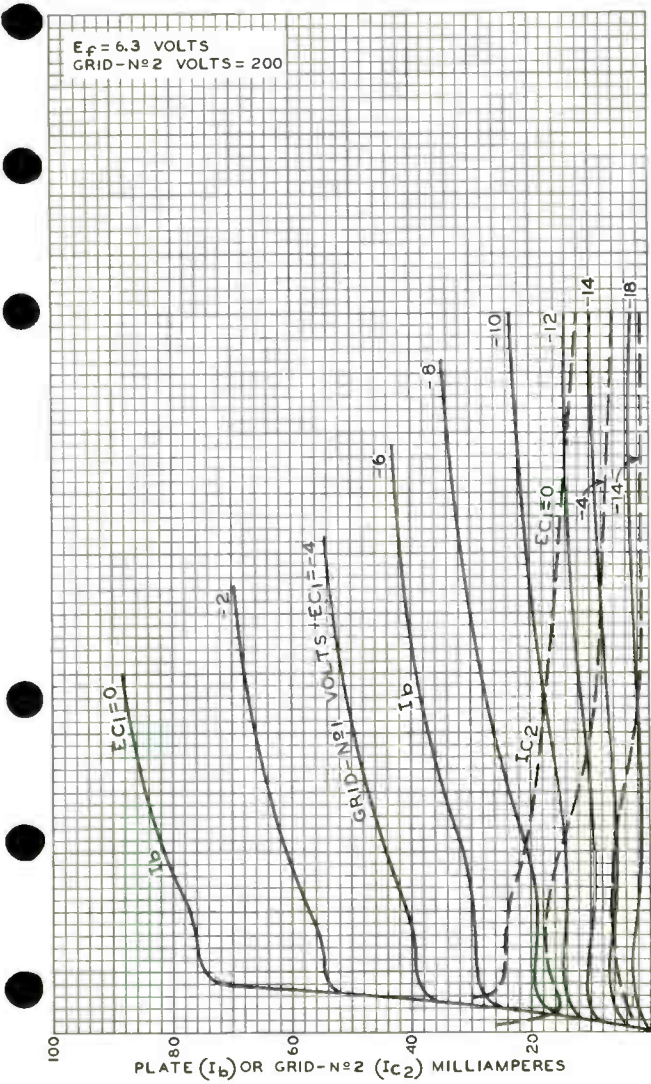
TENTATIVE DATA

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

RCA

6DS5

AVERAGE CHARACTERISTICS



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

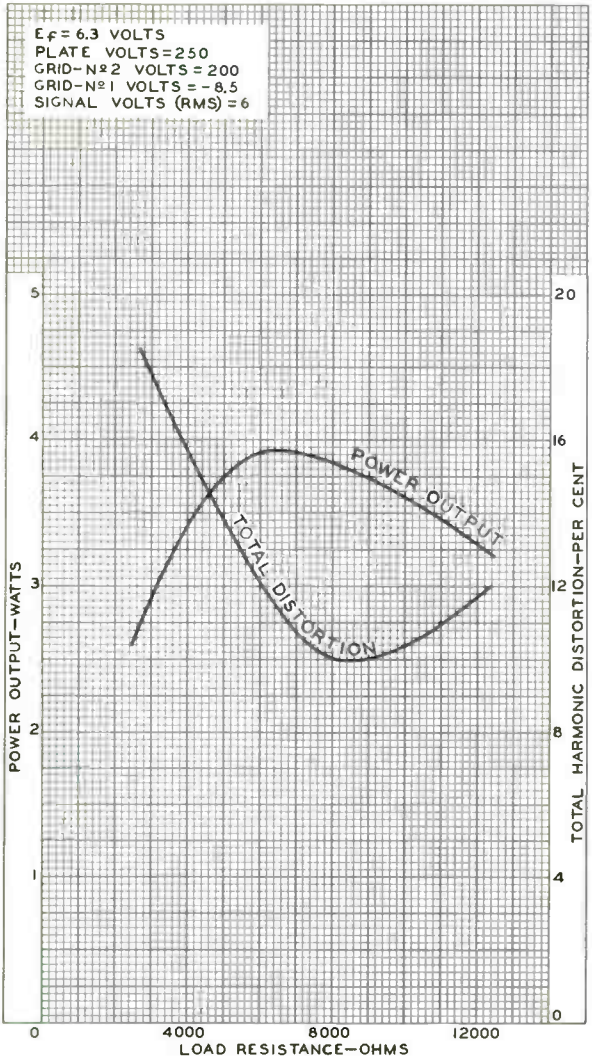
92CM-9292

6DS5

RCA

6DS5

OPERATION CHARACTERISTICS



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

92CM-9293

6DT5

BEAM POWER TUBE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current	1.2	amp
Direct Interelectrode Capacitances (Approx.):[○]		
Grid No.1 to plate	0.57	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	12.5	μμf
Plate to cathode & grid No.3, grid No.2, and heater	4.9	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	60	80	250	volts
Grid-No.2 Voltage	150	250	250	volts
Grid-No.1 Voltage	0	0	-16.5	volts
Transconductance	–	–	6200	μmhos
Plate Current	95	195	44	ma
Grid-No.2 Current	8.5	19	1.5	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 100	–	–	-35	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9HN

Pin 1 – Grid No.2
Pin 2 – No Connection
Pin 3 – Grid No.1
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Grid No.1

Pin 7 – Cathode, Grid No.3
Pin 8 – Internal Connection—Do Not Use
Pin 9 – Plate

VERTICAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

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

DC PLATE VOLTAGE	315 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[#]	2200 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	285 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE	250 max.	volts

6DT5

BEAM POWER TUBE

CATHODE CURRENT:			
Peak	190	max.	ma
Average	55	max.	ma
GRID-No.2 INPUT	2	max.	watts
PLATE DISSIPATION	9	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200▲	max.	volts
Heater positive with respect to cathode	200▲	max.	volts

Maximum Circuit Values:

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

○ Without external shield.

• This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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

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

▲ The dc component must not exceed 100 volts.

6DT6-A

Sharp-Cutoff Pentode

With Two Independent Control Grids

7-PIN MINIATURE TYPE

For FM Detector Service

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.3	amp
Direct Interelectrode Capacitances (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	1.7	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	*Connected to cathode at socket*	
Grid-No.2 Supply Voltage	100	volts
Cathode Resistor	560	ohms
Plate Resistance (Approx.)	0.15	megohm
Transconductance, Grid No.1 to Plate	1350	μmhos
Transconductance, Grid No.3 to Plate	515	μmhos
Plate Current	1.55	ma
Grid-No.2 Current	1.8	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-5.2	volts
Grid-No.3 Voltage (Approx.) for plate μa = 10	-4.2	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)

6DT6-A

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

FM DETECTOR

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

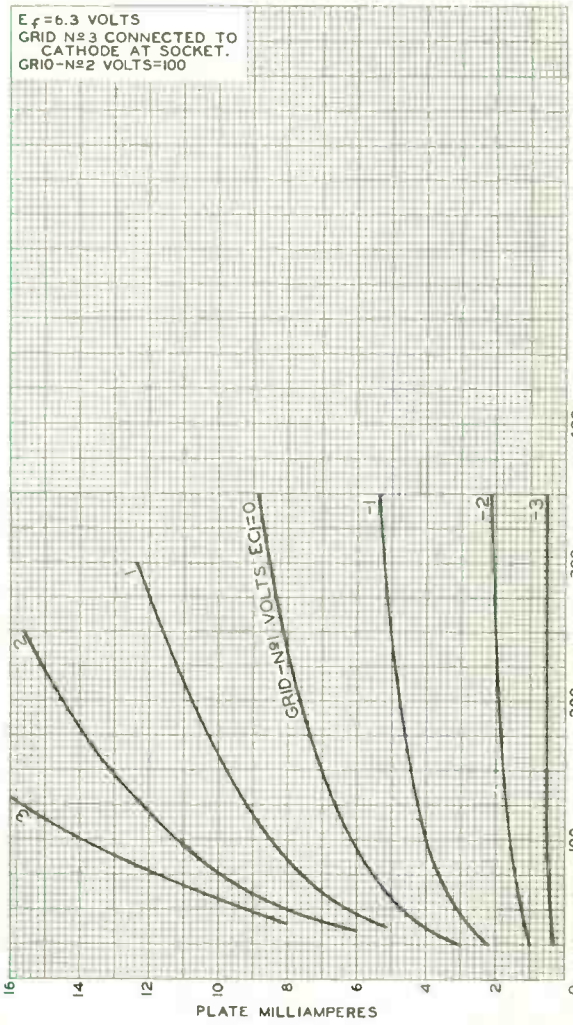
PLATE VOLTAGE.	330 max.	volts
GRID-No.3 (CONTROL-GRID) VOLTAGE	28 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE . .	330 max.	volts
GRID-No.2 VOLTAGE.	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive-bias value.	0 max.	volts
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 165 volts .	1.1 max.	watts
For grid-No.2 voltages between 165 and 330 volts.	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PLATE DISSIPATION.	1.7 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 fixed-bias operation	0.25 max.	megohm
For cathode-bias operation	0.5 max.	megohm

▲ With external shield JEDEC No.316 connected to cathode.
● The dc component must not exceed 100 volts.

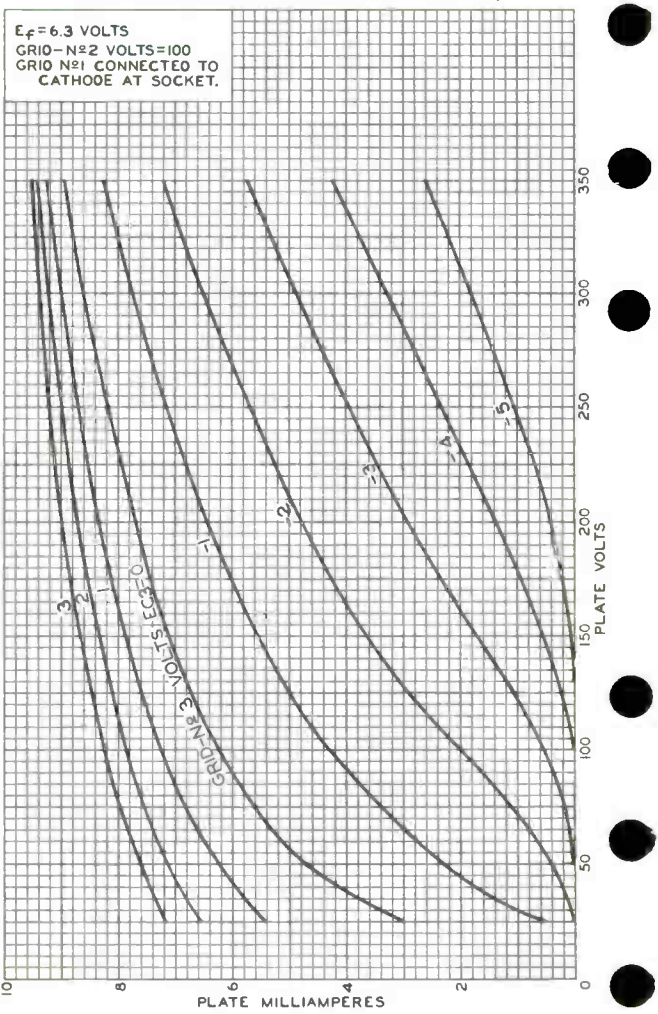
AVERAGE PLATE CHARACTERISTICS



92CM-8827R2

6DT6-A

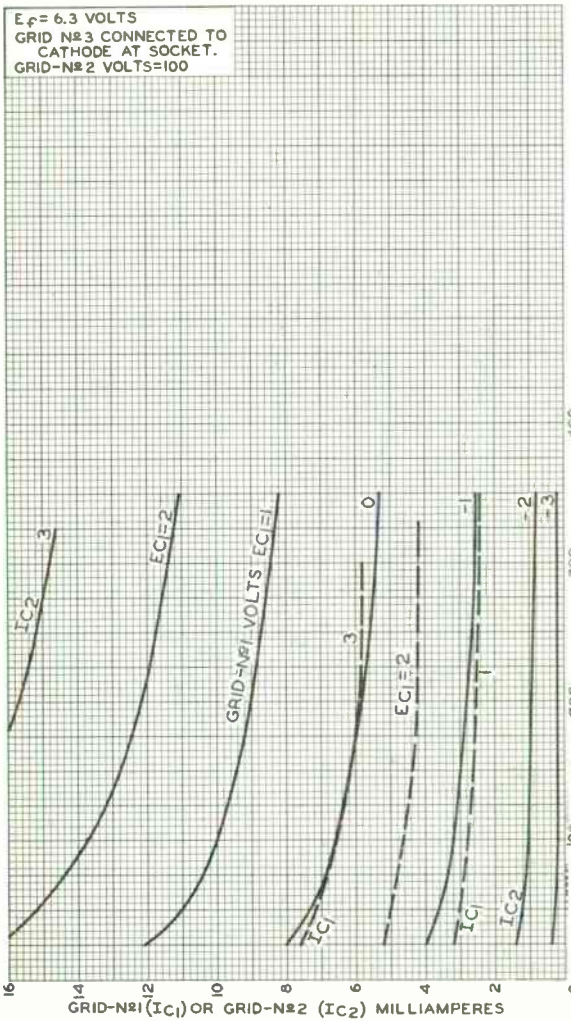
AVERAGE PLATE CHARACTERISTICS



92CM-8830R2

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

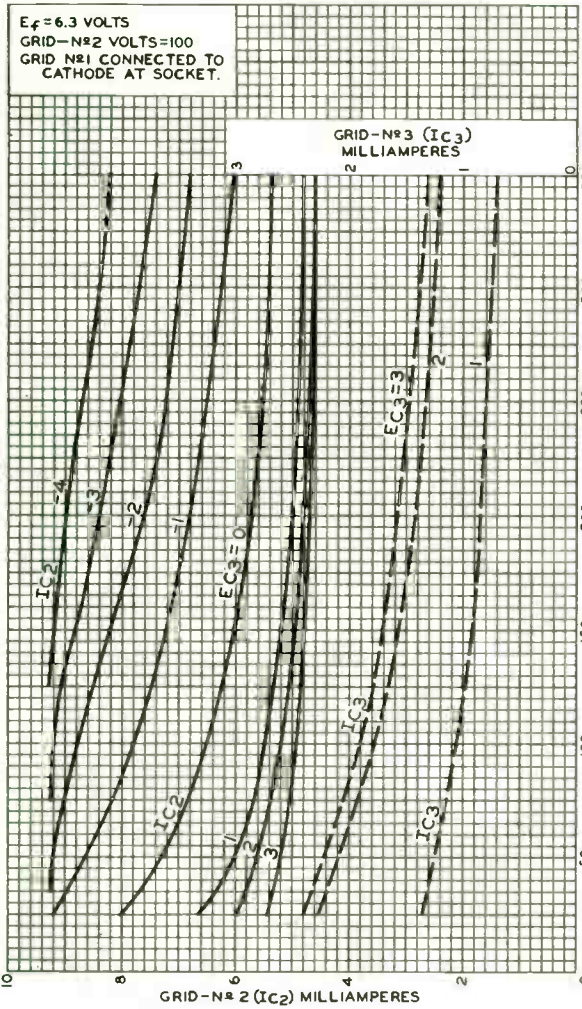
AVERAGE CHARACTERISTICS



92CM-8828R2

6DT6-A

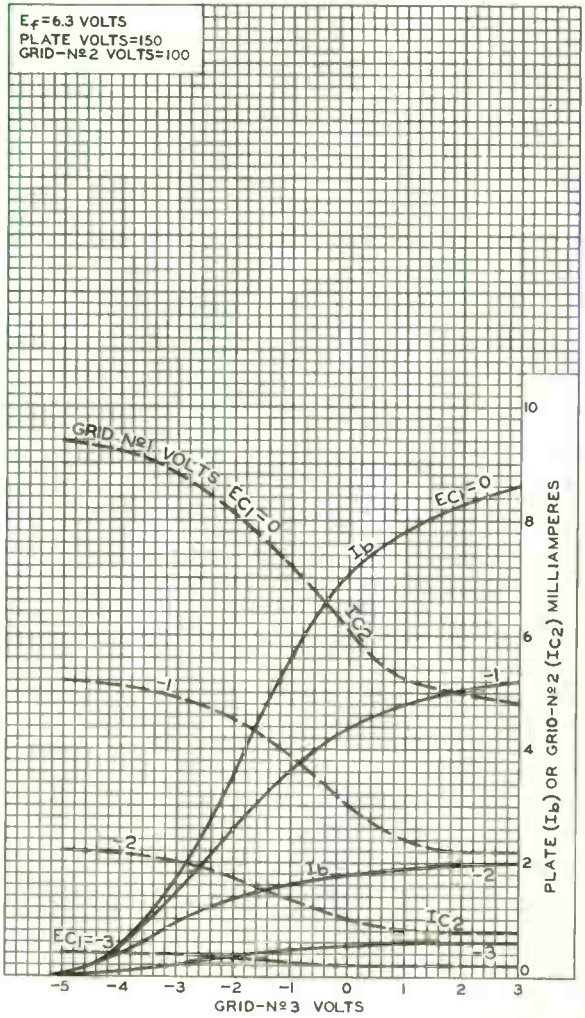
AVERAGE CHARACTERISTICS



92CM-8829R2

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

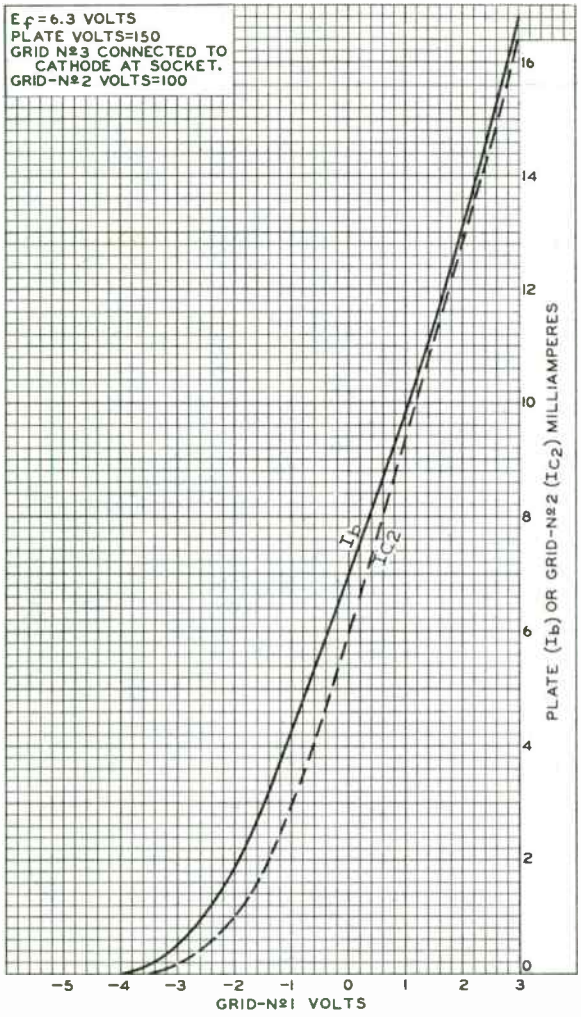
AVERAGE CHARACTERISTICS



92CM-8826RI

6DT6-A

AVERAGE CHARACTERISTICS



92CM-8825RI

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

Half-Wave Vacuum Rectifier

NOVAR TYPE

For Television Damper Service

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode[a]	5000[b] max.	volts
Heater positive with respect to cathode	300[c] max.	volts
Direct Interelectrode Capacitances (Approx.):[d]		
Plate to cathode and heater	6.5	pf
Cathode to plate and heater	9.0	pf
Heater to cathode	2.8	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.410"
Maximum Seated Length	3.030"
Length, Base Seat to Bulb Top (Excluding tip)	2.510" to 2.690"
Diameter	1.062" to 1.188"
Bulb	T9
Socket	Cinch Mfg. Co. 149 19 00 033, Industrial Electronic Hardware Corp. No. SO-0968-SL1, or equivalent
Base	Small-Button Novar 9-Pin (JEDEC No.E9-75)
Basing Designation for BOTTOM VIEW	9HP

Pin 1 – Do Not Use[e]
Pin 2 – Plate
Pin 3 – Do Not Use[e]
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Do Not Use[e]
Pin 7 – Plate
Pin 8 – Do Not Use[e]
Pin 9 – Cathode

DAMPER SERVICE

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[f]

PEAK INVERSE PLATE VOLTAGE[g]	5000 max.	volts
PEAK PLATE CURRENT	1300 max.	ma
DC PLATE CURRENT	250 max.	ma
PLATE DISSIPATION	8.5 max.	watts

←Indicates a change.

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma. = 350 . . . . . 25 volts

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

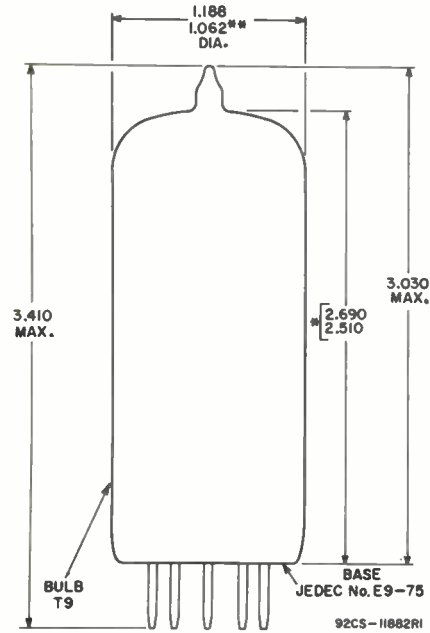
[b] The dc component must not exceed 900 volts.

[c] The dc component must not exceed 100 volts.

[d] Witnout external shield.

[e] Socket terminals 1, 3, 6, and 8 should not be used as tie points. It is recommended that the socket clips for these pins be removed to reduce the possibility of arc-over and to minimize leakage.

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



ALL DIMENSIONS IN INCHES

** APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.

* MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY A RING GAUGE OF 0.600" INSIDE DIAMETER.

Half-Wave Vacuum Rectifier

NOVAR TYPE

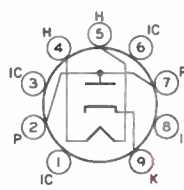
For Television Damper Service

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Maximum heater-cathode voltage:		
Heater negative with respect to cathode:[a]		
Peak	5500	volts
DC component	900	volts
Heater positive with respect to cathode:		
Peak	300	volts
DC component	100	volts
Direct Interelectrode Capacitances (Approx.):[b]		
Plate to cathode and heater	6.5	pf
Cathode to plate and heater	9.0	pf
Heater to cathode	2.8	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.005"
Seated Length	2.375" to 2.625"
Diameter	1.062" to 1.188"
Dimensional Outline (JEDEC 12-99)	See *General Section*
Bulb	T9
Base	Small-Button Novar 9-Pin with Exhaust Tip (JEDEC No.E9-89)
Basing Designation for BOTTOM VIEW	9HP



Pin 1 – Do Not Use[c]
Pin 2 – Plate
Pin 3 – Do Not Use[c]
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Do Not Use[c]
Pin 7 – Plate
Pin 8 – Do Not Use[c]
Pin 9 – Cathode

DAMPER SERVICE

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[d]

Peak Inverse Plate Voltage[a]	5500	volts
Peak Plate Current	1300	ma
DC Plate Current	250	ma
Plate Dissipation	8.5	watts

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma = 350	25	volts

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

[b] Without external shield.

[c] Socket terminals 1, 3, 6, and 8 should not be used as tie points. It is recommended that the socket clips for these pins be removed to reduce the possibility of arc-over and to minimize leakage.

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

High-Mu Triode—
Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Center Values):*		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.720	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 max.	volts
Direct Interelectrode Capacitances:[a]		
Triode Unit:		
Grid to plate	2.7	μμf
Grid to all other elements except plate	4.0	μμf
Plate to all other elements except grid	2.3	μμf
Grid to heater	0.1 max.	μμf
Pentode Unit:		
Grid No.1 to plate	0.1 max.	μμf
Grid No.1 to all other elements except plate	9.0	μμf
Plate to all other elements except grid No.1	4.5	μμf
Grid No.1 to heater	0.1 max.	μμf
Triode plate to pentode grid No.1	0.01 max.	μμf
Triode grid to pentode grid No.1	0.01 max.	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*			
Plate Voltage	200	170	200	220	volts
Grid-No.2 Voltage	–	170	200	220	volts
Grid-No.1 Voltage	-1.7	-2.1	-2.9	-3.4	volts
Amplification Factor	65	–	–	–	
Mu Factor, Grid No.2 to Grid No.1	–	36	36	36	
Plate Resistance (Approx.)	–	0.1	0.13	0.15	megohm
Transconductance	4000	11000	10400	10000	μmhos
Plate Current	3	18	18	18	ma
Grid-No.2 Current	–	3	3	3	ma

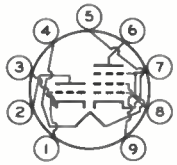
Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"

6DX8

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. 9HX

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.3, Pentode Cathode, Internal Shield
Pin 8 – Pentode Grid No.1
Pin 9 – Pentode Grid No.2

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values:*

	Triode Unit	*Pentode Unit*	
PLATE SUPPLY VOLTAGE.	550 max.	550 max.	volts
PEAK PLATE VOLTAGE with maximum plate ma. = 0.1[b] .	600 max.	–	volts
PLATE VOLTAGE	300 max.	300 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE.	–	550 max.	volts
GRID-No.2 VOLTAGE	–	300 max.	volts
CATHODE CURRENT	12 max.	40 max.	ma
GRID-No.2 INPUT	–	1.7 max.	watts
PLATE DISSIPATION	1 max.	4 max.	watts

Typical Operation (Pentode Unit):

As video-output tube

Plate Supply Voltage.	170	200	220	volts
Series Plate Resistor	3000	3000	3000	ohms
Grid-No.2 Voltage	170	200	220	volts
Grid-No.1 Voltage	-2	-2.8	-3.3	volts
Transconductance.	10400	10000	9700	μmhos
Plate Current	18	18	18	ma
Grid-No.2 Current	3.2	3.1	3.1	ma

Maximum Circuit Values:

	Triode Unit	*Pentode Unit*	
Grid-No.1-Circuit Resistance:			
For fixed-bias operation. . . .	1 max.	1 max.	megohm
For cathode-bias operation. . .	3 max.	2 max.	megohms

[a] Without external shield.
[b] With duty factor = 0.18 maximum and pulse duration = 18 microseconds maximum.

6DZ4

Medium-Mu Triode

7-PIN MINIATURE TYPE
For UHF-Oscillator Service in TV Receivers

GENERAL DATA

Electrical:

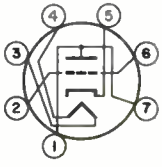
Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.225	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	50 max.	volts
Heater positive with respect to cathode	50[a] max.	volts
Direct Interelectrode Capacitances (Approx):[b]		
Grid to plate	1.8	pf
Grid to cathode and heater	2.2	pf
Plate to cathode and heater	1.3	pf

Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	80	volts
Plate Resistor	2700	ohms
Amplification Factor	14	
Plate Resistance (Approx)	2000	ohms
Transconductance	6700	μmhos
Plate Current	15	ma
Grid Voltage (Approx) for plate μa = 20	−11	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
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"
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	7DK



Pin 1 – Plate
Pin 2 – Grid
Pin 3 – Heater
Pin 4 – Heater
Pin 5 – Cathode
Pin 6 – Grid
Pin 7 – Plate

6DZ4

UHF OSCILLATOR

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	135 max.	volts
GRID VOLTAGE:		
Negative-bias value	50 max.	volts
GRID CURRENT	2 max.	ma
CATHODE CURRENT	20 max.	ma
PLATE DISSIPATION	2.3 max.	watts

Typical Operation:[c]

At frequency of 1000 Mc

Plate Supply Voltage	135	volts
Plate-Circuit Resistance	2700	ohms
Grid Resistor	10000	ohms
Plate Current	15.5	ma
Grid Current (Approx)	800	μa

Maximum Circuit Values:

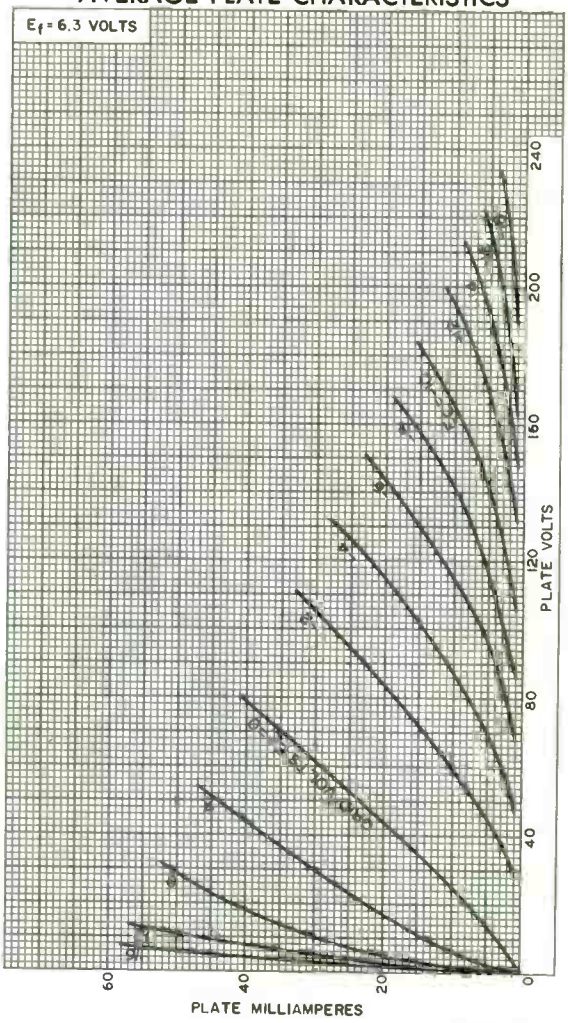
Grid-Circuit Resistance:	
For fixed-bias operation	Not recommended
For cathode-bias operation	0.5 max. megohm

[a] The dc component must not exceed 25 volts.

[b] With external shield JEDEC No.316 connected to cathode.

[c] Measured in JEDEC STANDARD OSCILLATION TEST SET No.400 with external, added resistance in plate circuit.

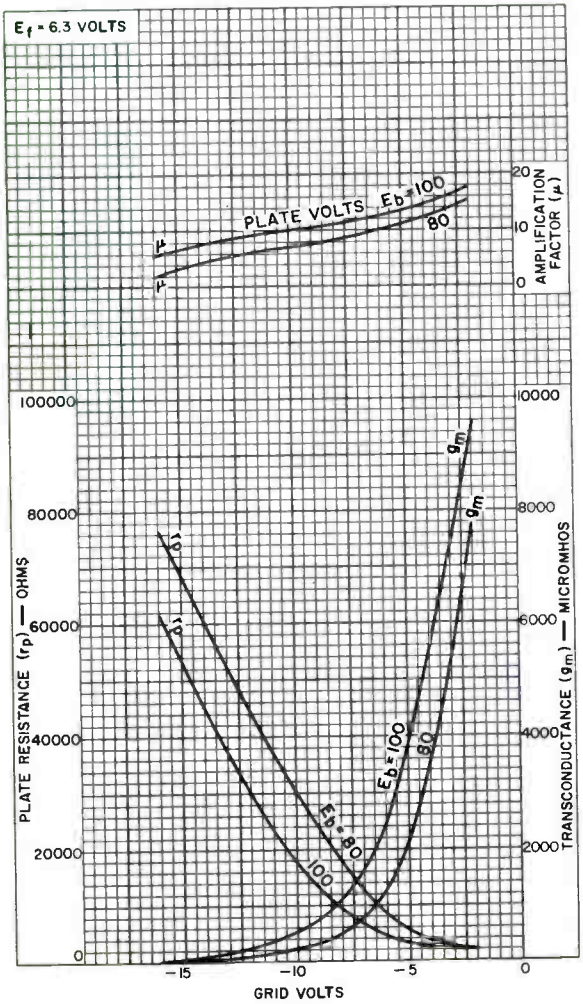
AVERAGE PLATE CHARACTERISTICS



92CM—7756

6DZ4

AVERAGE CHARACTERISTICS



92CM – 7758RI

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

RCA TUBE
HANDBOOK
HB-3

RECEIVING TUBE SECTION — Part 2

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

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

6E5

ELECTRON-RAY TUBE

INDICAIOR 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

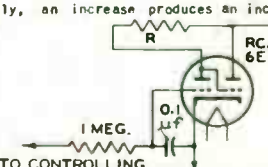
Plate-Supply Voltage		250 max.	volts
Target Voltage		250 max. 125 min.	volts ← volts
D-C Heater-Cathode Potential		90 max.	volts
Typical Operation:			
Plate and Target Supply	125	250	volts
Series Triode-Plate Resistor**	1	1	megohm
Target Current*** †	0.8	2	ma.
Triode-Plate Current***	0.1	0.2	ma.
Triode-Grid 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.

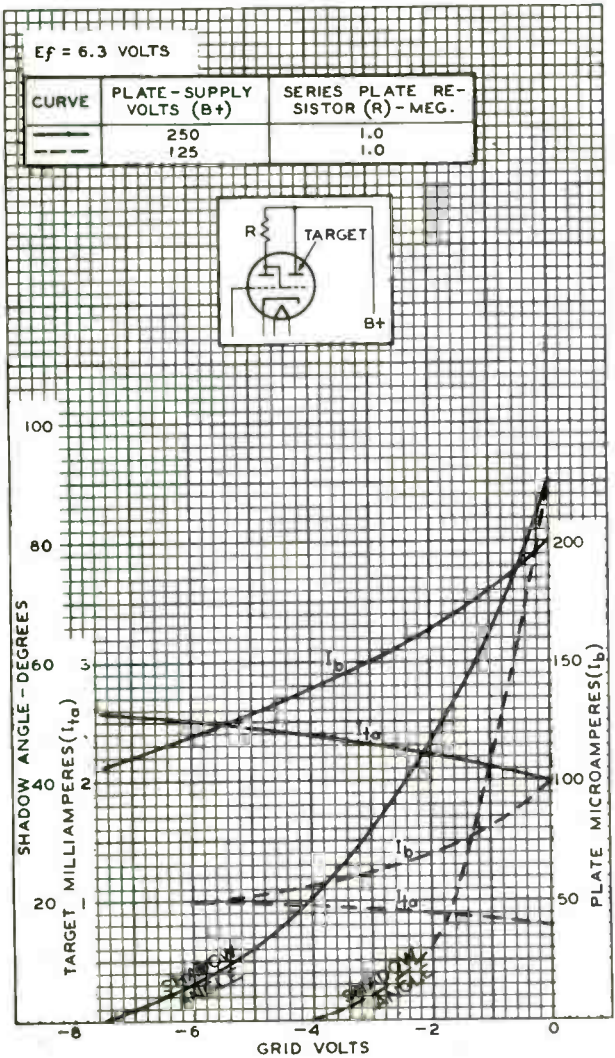


92C5-6476V

 ← Indicates a change.

6E5

AVERAGE CONTROL CHARACTERISTICS



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

Sharp-Cutoff Tetrode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage (AC or DC)		6.3 ± 10%	volts
Current at 6.3 volts		0.2	amp
Direct Interelectrode Capacitances:			
	Without External Shield	*With External Shield*[a]	
Grid No.1 to plate	0.06 max.	0.05 max.	μμf
Grid No.1 to cathode & internal shield, grid No.2, and heater	3.8	4.5	μμf
Plate to cathode & internal shield, grid No.2, and heater	2.3	3	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	250	volts
Grid-No.2 Voltage	140	volts
Grid-No.1 Voltage	−1	volt
Plate Resistance (Approx.)	0.15	megohm
Transconductance	8000	μmhos
Plate Current	10	ma
Grid-No.2 Current	0.95	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 100 or less	−6	volts

Mechanical:

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

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

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

6EA5

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	250	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	150	max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0	max.	volts
CATHODE CURRENT	20	max.	ma
GRID-No.2 INPUT	0.5	max.	watt
PLATE DISSIPATION	3.25	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[b]	max.	volts

[a] With external shield JEDEC No.316 connected to cathode.
[b] The dc component must not exceed 100 volts.

Dual Triode

With High-Mu Unit and Low-Mu Unit

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:			
Voltage (AC or DC)	6.3 ± 10%		volts
Current at 6.3 volts	1.05		amp
Direct Interelectrode Capacitances (Approx.):[a]	*Unit No.1*	*Unit No.2*	
Grid to plate	4	8	μμf
Grid to cathode and heater	2.2	6	μμf
Plate to cathode and heater	0.6	1.3	μμf

Characteristics, Class A_1 Amplifier:

	Unit No.1	*Unit No.2*		
Plate Voltage	250	60	175	volts
Grid Voltage	−3	0	−25	volts
Amplification Factor	66	–	5.5	
Plate Resistance (Approx.)	30000	–	920	ohms
Transconductance	2200	–	6000	μmhos
Plate Current	2	100[b]	40	ma
Grid Voltage (Approx.) for plate μa = 20	−5.3	–	–	volts
Grid Voltage (Approx.) for plate μa = 200	–	–	−45	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	3"
Maximum Seated Length	2-7/16"
Maximum Diameter	1-9/32"
Bulb	T9
Base	Intermediate-Shell Octal 8-Pin (JEDEC Group 1, B8-6)
Basing Designation for BOTTOM VIEW	8BD

Pin 1 – Grid of Unit No.2
Pin 2 – Plate of Unit No.2
Pin 3 – Cathode of Unit No.2
Pin 4 – Grid of Unit No.1

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

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No.1

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[c]

DC PLATE VOLTAGE	350	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	400	max.	volts
PLATE DISSIPATION	1	max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[d]	max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias operation	1	max.	megohm
For cathode-bias operation	2.2	max.	megohms

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No.2

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[c]

DC PLATE VOLTAGE	550	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[e]	1500	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	250	max.	volts
CATHODE CURRENT:			
Peak	175	max.	ma
Average	50	max.	ma
PLATE DISSIPATION	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[d]	max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance:

For fixed-bias operation	1	max.	megohm
For cathode-bias operation	2.2	max.	megohms

[a] Without external shield.

[b] 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.

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

[d] The dc component must not exceed 100 volts.

[e] 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.

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 (AC or DC)		6.3	volts
Current		0.45 ± 6%	amp
Warm-up time (Average)		11	sec
Direct Interelectrode Capacitances:	*Without External Shield*	*With External Shield*[a]	
Triode Unit:			
Grid to plate	1.7	1.7	μμf
Grid to cathode, pentode cathode & pentode grid No.3 & internal shield, and heater	3	3.2	μμf
Plate to cathode, pentode cathode & pentode grid No.3 & internal shield, and heater	1.4	1.9	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 (Each unit)	3	3[b]	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	200000	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

← Indicates a change.

6EA8

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. 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

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
GRID-No.2 INPUT: For grid-No.2 voltages up to 165 volts	–	0.55 max.	watt
For grid-No.2 voltages between 165 and 330 volts	–	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
→ PLATE DISSIPATION	2.5 max.	3.1 max.	watts
PEAK HEATER-CATHODE VOLTAGE: Heater negative with respect to cathode. . .	200 max.	200 max.	volts
Heater positive with respect to cathode. . .	200[c] max.	200[c] max.	volts

[a] With external shield JEDEC No.315 connected to cathode of unit under test except as noted.
[b] With external shield JEDEC No.315 connected to ground.
[c] The dc component must not exceed 100 volts.

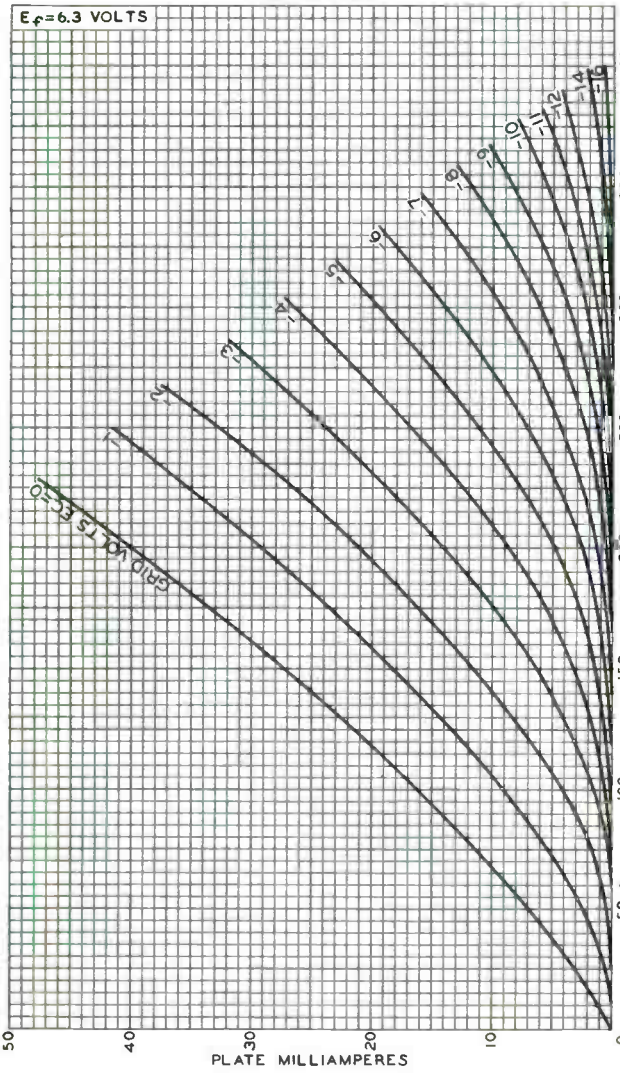
→ Indicates a change.

RCA

6EA8

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



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

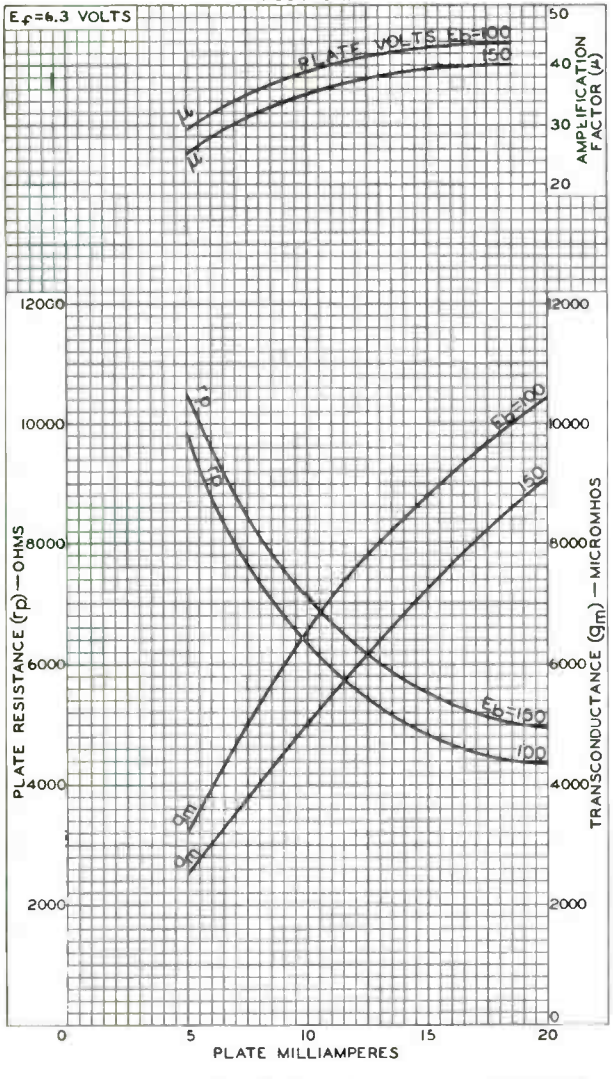
92CM-9866

6EA8

6EA8

AVERAGE CHARACTERISTICS

TRIODE UNIT



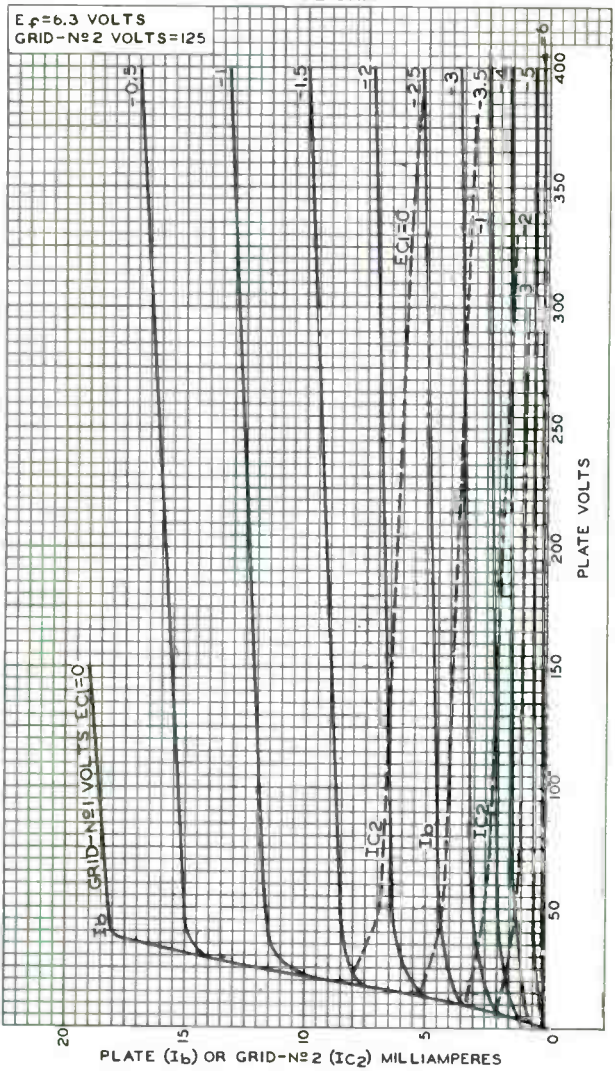
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9882

RCA

6EA8

AVERAGE CHARACTERISTICS
PENTODE UNIT



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

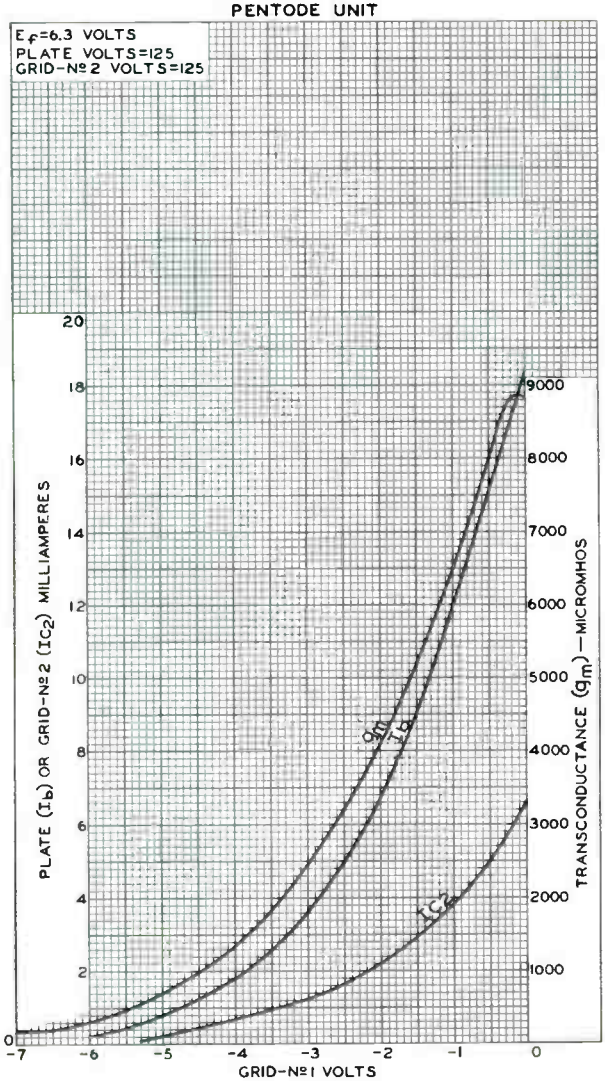
92CM-9867

6EA8

6EA8

AVERAGE CHARACTERISTICS

PENTODE UNIT



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

92CM-9868

6EB8

HIGH-MU TRIODE—SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:			
Voltage	6.3 ± 10%		ac or dc volts
Current	0.75		amp
Direct Interelectrode Capacitances:[o]			
Triode Unit:			
Grid to plate		4.4	μμf
Grid to cathode and heater		2.4	μμf
Plate to cathode and heater		0.36	μμf
Pentode Unit:			
Grid No.1 to plate		0.1 max.	μμf
Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater		11	μμf
Plate to cathode & internal shield & grid No.3, grid No.2, and heater		4.2	μμf
Triode grid to pentode plate		0.018 max.	μμf
Pentode grid No.1 to triode plate		0.005 max.	μμf
Pentode plate to triode plate		0.17 max.	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*		
Plate-Supply Voltage	250	45	200	volts
Grid-No.2 Supply Voltage	-	125	125	volts
Grid-No.1 Voltage	-2	0	-	volts
Cathode Resistor	-	-	68	ohms
Amplification Factor	100	-	-	
Plate Resistance (Approx.)	37000	-	75000	ohms
Transconductance	2700	-	12500	μmhos
Plate Current	2	40*	25	ma
Grid-No.2 Current	-	15*	7	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100	-	-	-9	volts
Grid Voltage (Approx.) for plate μa = 20	-5	-	-	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2

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

6EB8

HIGH-MU TRIODE—SHARP-CUTOFF PENTODE

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

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

Pin 6 - Pentode Cathode, Grid No.3, Internal Shield
Pin 7 - Pentode Grid No.1
Pin 8 - Pentode Grid No.2
Pin 9 - Pentode Plate

AMPLIFIER — Class A_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
PLATE DISSIPATION	1 max.	5 max.	watts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 165 volts	-	1.1 max.	watts
For grid-No.2 voltages between 165 and 330 volts	-	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode. . .	200 max.	200 max.	volts
Heater positive with respect to cathode. . .	200▲ 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

6EB8

HIGH-MU TRIODE—
SHARP-CUTOFF PENTODE

° Without external shield.

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

▲ The dc component must not exceed 100 volts.

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

6EB8

6EB8

AVERAGE PLATE CHARACTERISTICS

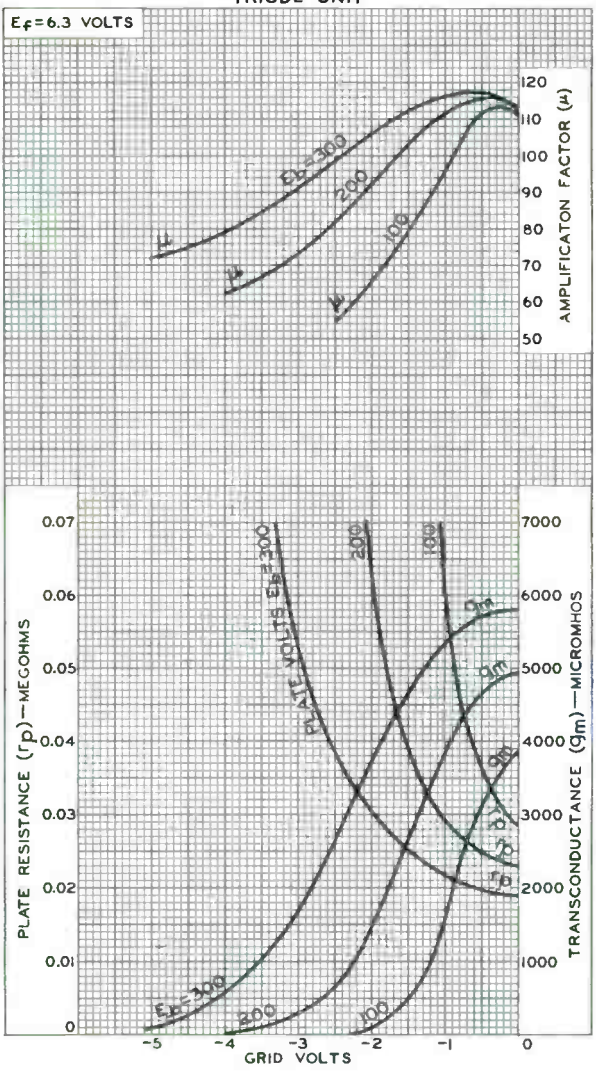
TRIODE UNIT

RCA

6EB8

AVERAGE CHARACTERISTICS

TRIODE UNIT



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

92CM-9908

6EB8

RCA

6EB8

AVERAGE CHARACTERISTICS

PENTODE UNIT

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

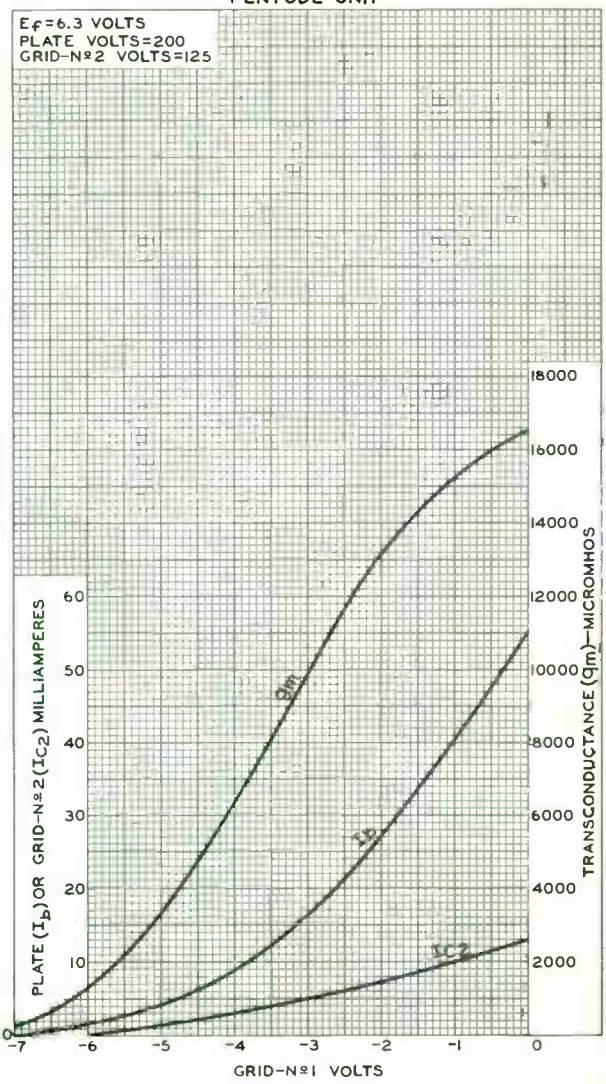
92CM-9906

RCA

6EB8

AVERAGE CHARACTERISTICS

PENTODE UNIT



ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-9905

Semiremote-Cutoff Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Center Values)*:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.300	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	150 max.	volts
Heater positive with respect to cathode	150 max.	volts
Direct Interelectrode Capacitances:[a]		
Grid No.1 to plate	0.005 max.	μμf
Grid No.1 to cathode, grid No.3, grid No.2, internal shield, and heater	9	μμf
Plate to cathode, grid No.3, grid No.2, internal shield, and heater	3	μμf

Characteristics, Class A1 Amplifier:

Plate Voltage	200	volts
Grid No.3	*Connected to cathode at socket*	
Grid-No.2 Voltage	90	volts
Grid-No.1 Voltage	−2	volts
Plate Resistance (Approx.)	0.5	megohm
Transconductance	12500	μmhos
Plate Current	12	ma
Grid-No.2 Current	4.5	ma

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-13/32"
Maximum Seated Length	2-5/32"
Length, Base Seat to Bulb Top (Excluding tip)	1-25/32" ± 3/32"
Diameter	0.750" to 0.875"
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9AQ

Pin 1 – Cathode
Pin 2 – Grid No.1
Pin 3 – Cathode
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Internal Shield
Pin 7 – Plate
Pin 8 – Grid No.2
Pin 9 – Grid No.3

6EH7

AMPLIFIER — Class A[1]

Maximum Ratings, *Design-Center Values:*

PLATE SUPPLY VOLTAGE	550 max.	volts
PLATE VOLTAGE	250 max.	volts
GRID No.3 (SUPPRESSOR GRID)	*Connect to cathode at socket*	
GRID No.2 (SCREEN-GRID) SUPPLY VOLTAGE	550 max.	volts
GRID-No.2 VOLTAGE	250 max.	volts
CATHODE CURRENT	20 max.	ma
GRID-No.2 INPUT	0.65 max.	watt
PLATE DISSIPATION	2.5 max.	watts

Typical Operation:

Plate Voltage	200	200	200	200	volts
Grid No.3	*Connected to cathode at socket*				
Grid-No.2 Supply Voltage	200	200	200	200	volts
Grid-No.2 Series Resistor	22000	22000	22000	22000	ohms
Grid-No.1 Voltage	-19.5	-9.5	-6.5	-2	volts
Trarsconductance	125	625	1250	12500	μmhos
RMS Grid-No.1 Voltage for cross-modulation factor = 0.01	450	160	100	-	mv

Maximum Circuit Values:

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

[a] Without external shield.

6EH8

TRIODE-PENTODE CONVERTER

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

○ with external shield JEDEC No.315 connected to cathode except as noted.
● with external shield JEDEC No.315 connected to ground.
▲ The dc component must not exceed 100 volts.

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

Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Center Values)*:			
Voltage (AC or DC)	6.3 ± 0.6		volts
Current at heater volts = 6.3	0.300		amp
Peak heater-cathode voltage:			
Heater negative with respect to cathode	150	max.	volts
Heater positive with respect to cathode	150	max.	volts
Direct Interelectrode Capacitances:[a]			
Grid No.1 to plate	0.005	max.	μμf
Grid No.1 to cathode, grid No.3, grid No.2, internal shield, and heater	10		μμf
Plate to cathode, grid No.3, grid No.2, internal shield, and heater	3		μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	190	200	volts
Grid No.3	*Connected to cathode at socket*		
Grid-No.2 Voltage	190	200	volts
Grid-No.1 Voltage	-2.35	-2.5	volts
Plate Resistance (Approx.)	0.35	0.35	megohm
Transconductance	15000	15000	μmhos
Plate Current	10	10	ma
Grid-No.2 Current	4.1	4.1	ma

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-13/32"
Maximum Seated Length	2-5/32"
Length, Base Seat to Bulb Top (Excluding tip)	1-25/32" ± 3/32"
Diameter	0.750" to 0.875"
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9AQ

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

AMPLIFIER — Class A[1]

Maximum Ratings, *Design-Center Values:*

PLATE SUPPLY VOLTAGE	550 max.	volts
PLATE VOLTAGE	250 max.	volts
GRID No.3 (SUPPRESSOR GRID)	*Connect to cathode at socket*	
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	550 max.	volts
GRID-No.2 VOLTAGE	250 max.	volts
CATHODE CURRENT	25 max.	ma
GRID-No.2 INPUT	0.9 max.	watt
PLATE DISSIPATION	2.5 max.	watts

Maximum Circuit Values:

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

[1] Without external shield.

Beam Power Tube

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage (AC or DC)	6.3		volts
Current	0.8		amp
Direct Interelectrode Capacitances:[a]			
Grid No.1 to plate	0.7	max.	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	10		μμf
Plate to cathode & grid No.3, grid No.2, and heater	5.1		μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	60	250	volts
Grid-No.2 Voltage	250	250	volts
Grid-No.1 Voltage	0	-18	volts
Mu Factor, Grid No.1 to Grid No.2	-	8.7	
Plate Resistance (Approx.)	-	0.05	megohm
Transconductance	-	5100	μmhos
Plate Current	180[b]	40	ma
Grid-No.2 Current	30[b]	3	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 0.2	-	-37	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	3-1/16"
Maximum Seated Length	2-13/16"
Length, Base Seat to Bulb Top (Excluding tip)	2-7/16" ± 3/32"
Diameter	0.750" to 0.850"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9HN

Pin 1 - Grid No.2
Pin 2 - No Connection
Pin 3 - Grid No.1
Pin 4 - Heater
Pin 5 - Heater
Pin 6 - Grid No.1
Pin 7 - Cathode, Grid No.3
Pin 8 - Internal Connection—Do Not Use
Pin 9 - Plate

VERTICAL-DEFLECTION AMPLIFIER

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

For operation in a 525-line, 30-frame system[c]

DC PLATE VOLTAGE	315	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)[d]	2200[e]	max.	volts

← Indicates a change.

DC GRID-No.2 (SCREEN-GRID) VOLTAGE. . . .	285	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE.	250	max.	volts
CATHODE CURRENT:			
Peak.	210	max.	ma
Average	60	max.	ma
GRID-No.2 INPUT	1.5	max.	watts
PLATE DISSIPATION	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200[f]	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface).	250	max.	°C

Maximum Circuit Values:

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

[a] Without external shield.

[b] 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.

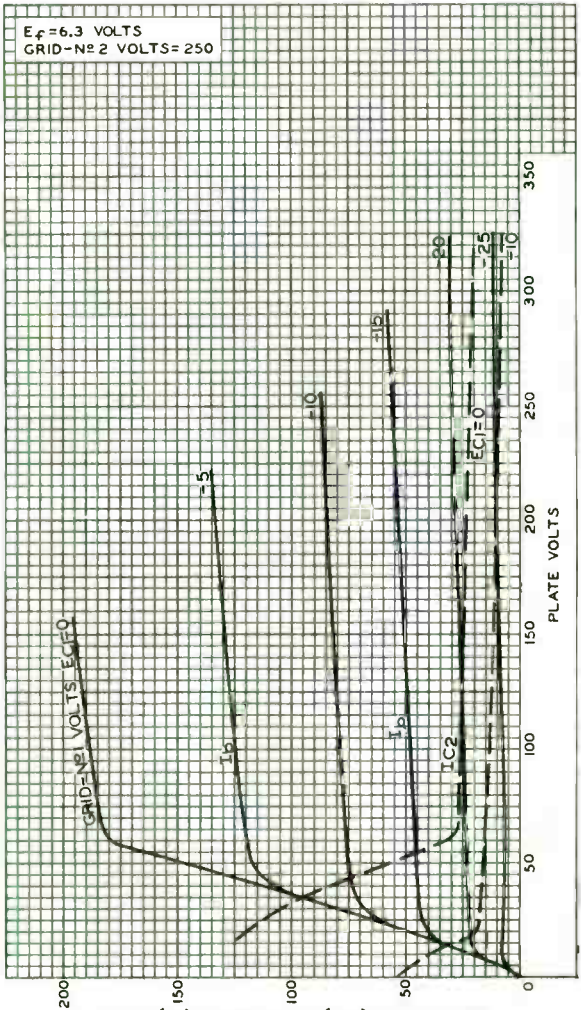
[c] As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

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

[e] Under no circumstances should this absolute-maximum value be exceeded.

[f] The dc component must not exceed 100 volts.

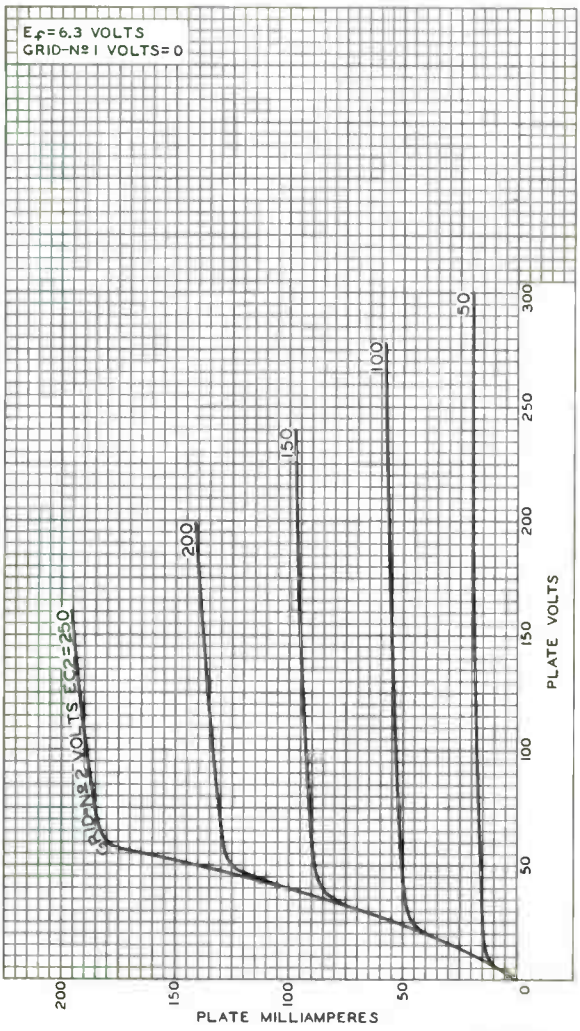
AVERAGE CHARACTERISTICS



92CM-9797RI

6EM5

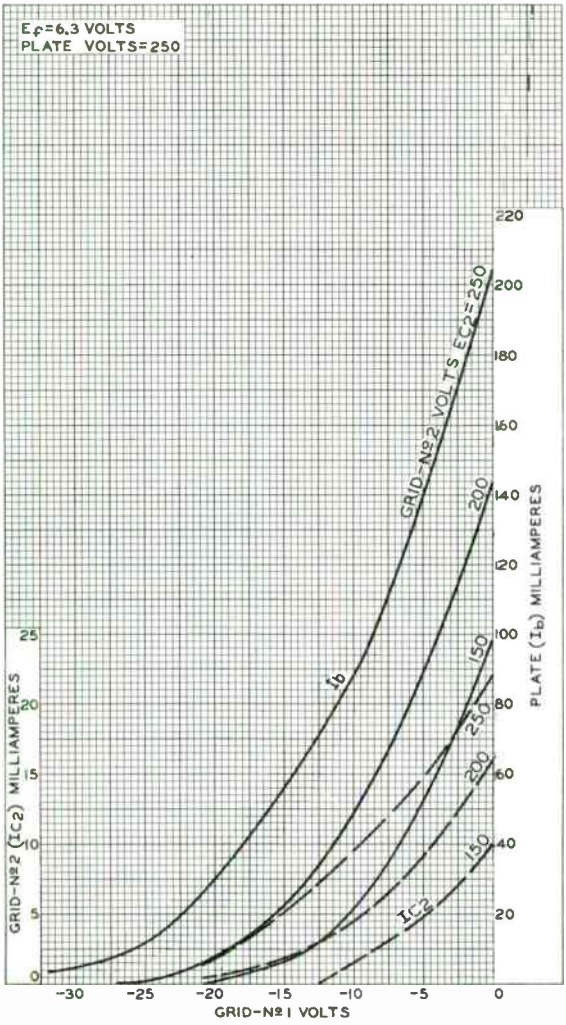
AVERAGE PLATE CHARACTERISTICS



92CM-9672

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

AVERAGE CHARACTERISTICS



92CM-9673R1

6EM7

Dual Triode

With High-Mu Unit and Low-Mu Unit

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:			
Voltage (AC or DC)	6.3 ± 10%		volts
Current at 6.3 volts	0.925		amp
Direct Interelectrode Capacitances (Approx.):[a]			
	Unit No.1	*Unit No.2*	
Grid to plate	4.8	10	μμf
Grid to cathode and heater	2.2	7	μμf
Plate to cathode and heater	0.6	1.8	μμf

Characteristics, Class A_1 Amplifier:

	Unit No.1	*Unit No.2*	
Plate Voltage	250	150	volts
Grid Voltage	-3	-20	volts
Amplification Factor	68	5.4	
Plate Resistance (Approx.)	40000	750	ohms
Transconductance	1600	7200	μmhos
Plate Current	1.4	50	ma
Plate Current for plate volts = 60 and grid volts = 0	–	95	ma
Plate Current for grid volts = -28	–	10	ma
Grid Voltage (Approx.) for plate μa = 10	-5.5	–	volts
Grid Voltage (Approx.) for plate μa = 100	–	-45	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-7/8" ←
Maximum Seated Length	2-5/16" ←
Maximum Diameter	1-9/32"
Bulb	T9
Base	Short Intermediate-Shell Octal 8-Pin with External Barriers (JEDEC Group 1, 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

← Indicates a change.

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No.1

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[b]

DC PLATE VOLTAGE	330	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	400	max.	volts
CATHODE CURRENT:			
Peak	77	max.	ma
Average	22	max.	ma
PLATE DISSIPATION	1.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[c]	max.	volts

Maximum Circuit Values:

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

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No.2

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[b]

DC PLATE VOLTAGE	330	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[d]	1500	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	250	max.	volts
CATHODE CURRENT:			
Peak	175	max.	ma
Average	50	max.	ma
PLATE DISSIPATION	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[c]	max.	volts

Maximum Circuit Values:

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

[a] Without external shield.

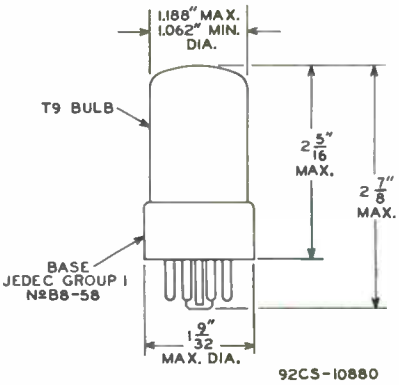
[b] As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

[c] The dc component must not exceed 100 volts.

[d] 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.

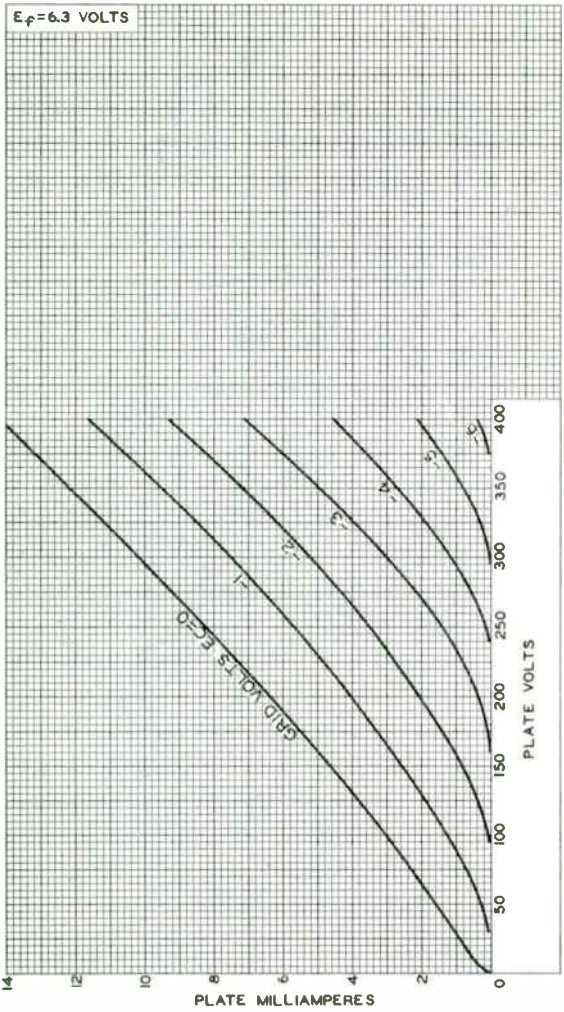
OPERATING CONSIDERATIONS

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



6EM7

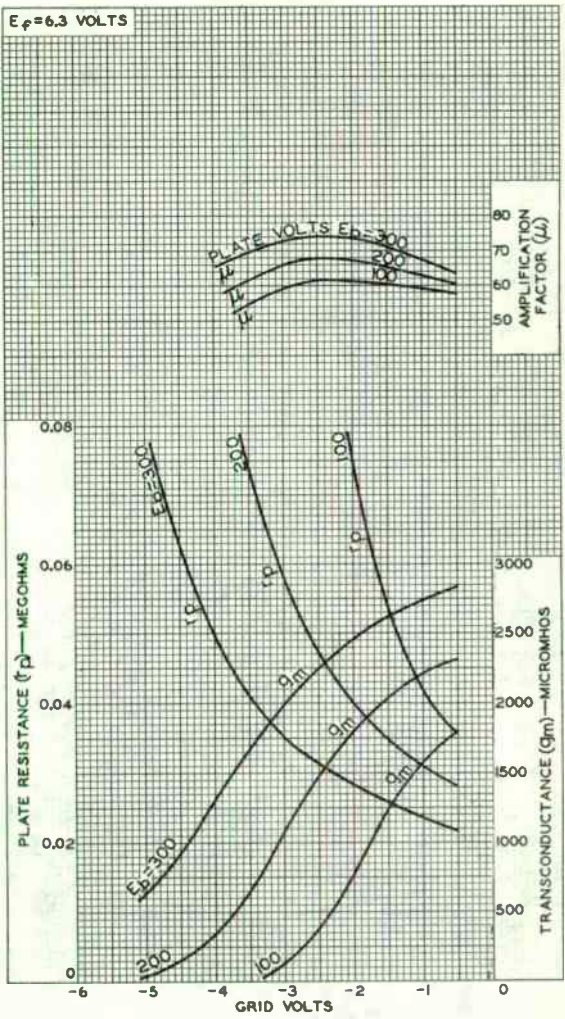
AVERAGE PLATE CHARACTERISTICS
Unit No.1



92CM-9912

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

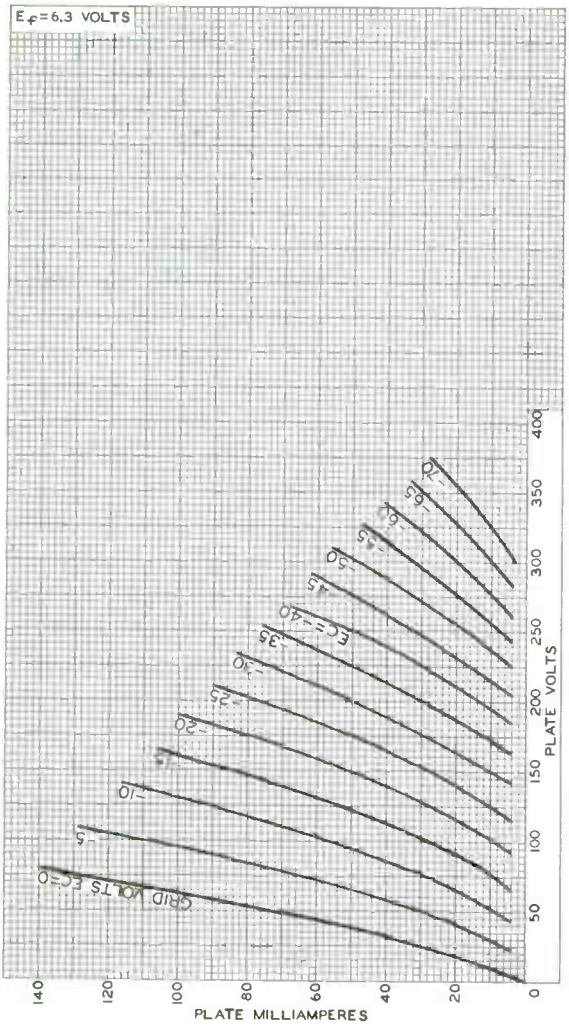
AVERAGE CHARACTERISTICS
Unit No.1



92CM-9915RI

6EM7

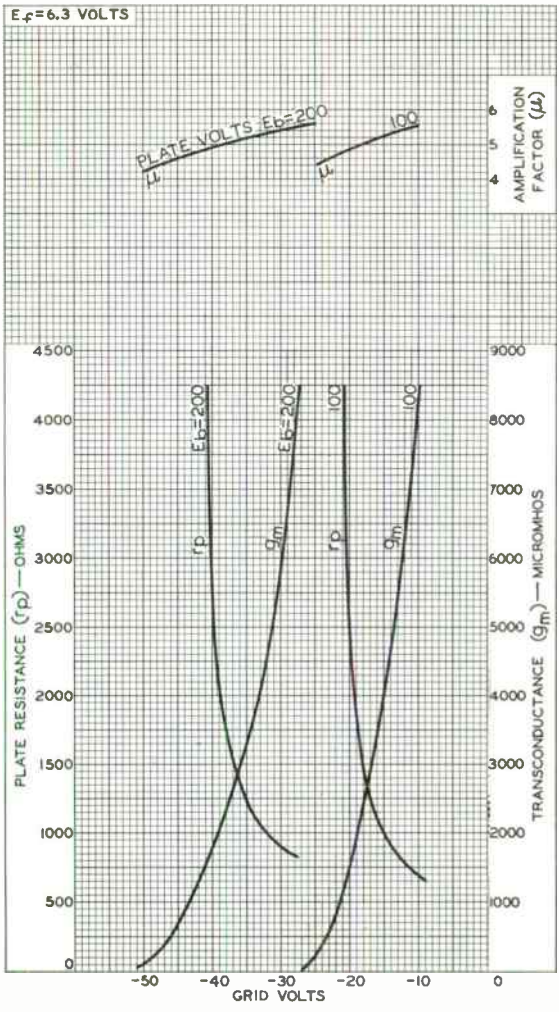
AVERAGE PLATE CHARACTERISTICS
Unit No.2



92CM-10466

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

AVERAGE CHARACTERISTICS
Unit No. 2



92CM-10467

Diode—Remote-Cutoff Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.3	amp
Direct Interelectrode Capacitances:▲		
Pentode Unit:		
Grid No.1 to plate	0.002 max.	μμf
Grid No.1 to cathode, grid No.3, grid No.2, internal shield, and heater	5.5	μμf
Plate to cathode, grid No.3, grid No.2, internal shield, and heater	5	μμf
Pentode grid No.1 to diode plate	0.0015 max.	μμf
Pentode plate to diode plate	0.095	μμf

Characteristics, Class A_1 Amplifier (Pentode Unit):

Plate Voltage	100	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 Supply Voltage	0	volts
Grid-No.1 Resistor (Bypassed)	2.2	megohms
Plate Resistance (Approx.)	0.25	megohm
Transconductance	3800	μmhos
Plate Current	9	ma
Grid-No.2 Current	3.5	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 40	−20	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Nova 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9LQ

Pin 1 – Pentode Grid No.3
Pin 2 – Pentode Grid No.1
Pin 3 – Cathode
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Pentode Grid No.2
Pin 7 – Pentode Plate
Pin 8 – Diode Plate
Pin 9 – Internal Shield

6EQ7

PENTODE UNIT — AMPLIFIER — CLASS A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	300	max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE:			
Positive value	300	max.	volts
Negative value	300	max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	300	max.	volts
GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*		
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0	max.	volts
Negative-bias value	50	max.	volts
GRID-No.3 INPUT	0.2	max.	watt
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*		
PLATE DISSIPATION	3	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200●	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	150	max.	°C

DIODE UNIT

Maximum Ratings, *Design-Maximum Values:*

PLATE CURRENT	1	max.	ma

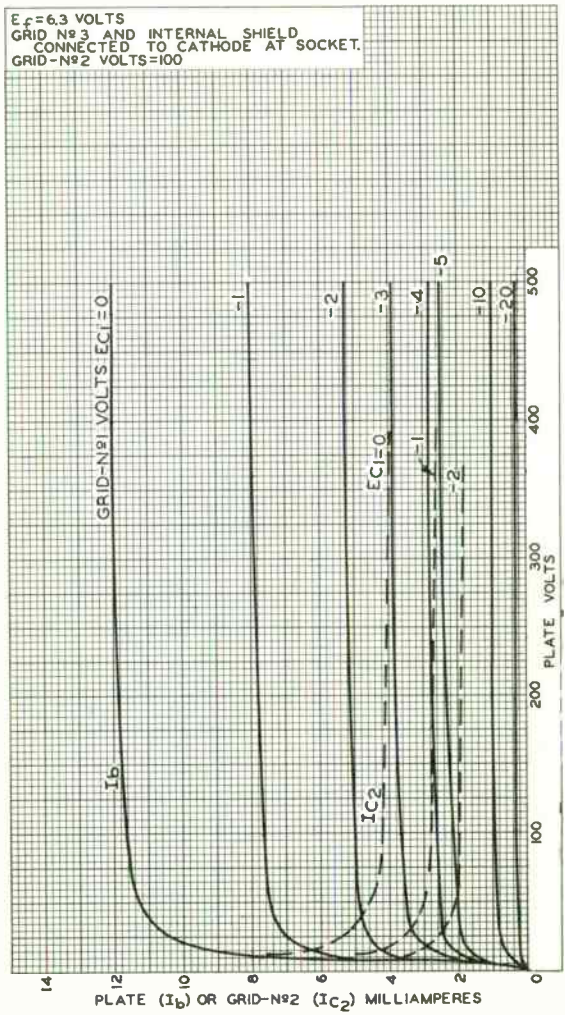
Characteristics, Instantaneous Test Condition:

Plate Current for plate volts = 10	2	ma

▲ Without external shield.

● The dc component must not exceed 100 volts.

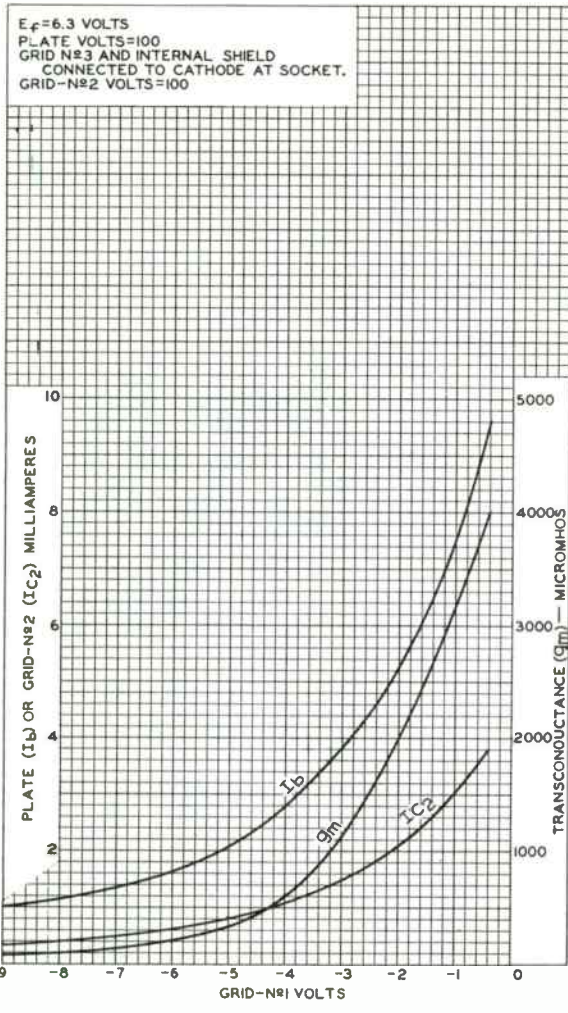
AVERAGE CHARACTERISTICS
Pentode Unit



92CM-10680

6EQ7

AVERAGE CHARACTERISTICS
Pentode Unit



92CM-10674

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

6ER5

High-Mu Triode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3	volts
Current	0.18	amp

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield*[a]	
Grid to plate	0.38	0.36	μμf
Grid to cathode, internal shield, and heater	4.4	4.4	μμf
Plate to cathode, internal shield, and heater	3	4	μμf
Grid to heater	0.28 max.	0.28 max.	μμf
Plate to cathode	0.24	0.2[●]	μμf
Cathode to grid	3.1	3.1[●]	μμf
Heater to cathode	2.5	2.5[●]	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	200	volts
Grid Voltage	-1.2	volts
Amplification Factor	80	
Plate Resistance (Approx.)	8000	ohms
Transconductance	10500	μmhos
Plate Current	10	ma
Grid Voltage (Approx.) for transconductance (μmhos) = 500	-3.3	volts
Grid Voltage (Approx.) for transconductance (μmhos) = 100	-5.6	volts

Mechanical:

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

Pin 1 – Cathode
Pin 2 – Grid
Pin 3 – Heater
Pin 4 – Heater
Pin 5 – Plate
Pin 6 – Internal Shield
Pin 7 – Cathode

← Indicates a change.

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	250 max.	volts
GRID VOLTAGE:		
Negative-bias value	50 max.	volts
CATHODE CURRENT	20 max.	ma
PLATE DISSIPATION	2.2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance	1 max.	megohm

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

→ Indicates a change.

High-Mu Triode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

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

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield*[a]	
Grid to plate	0.5 max.	0.5 max.	μμf
Grid to cathode, internal shield, and heater	3.2	3.2	μμf
Plate to cathode, internal shield, and heater	3.2	4	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	200	volts
Grid Voltage	−1	volt
Amplification Factor	75	
Plate Resistance (Approx.)	8000	ohms
Transconductance	9000	μmhos
Plate Current	10	ma
Grid Voltage (Approx.) for plate μa = 100	−6	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to 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	7FP

Pin 1 – Cathode
Pin 2 – Grid
Pin 3 – Heater
Pin 4 – Heater
Pin 5 – Plate
Pin 6 – Internal Shield
Pin 7 – Cathode

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	250 max.	volts
GRID VOLTAGE:		
Positive-bias value	0 max.	volts

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

Maximum Circuit Values:

Grid-Circuit Resistance	1 max.	megohm

[a] With external shield JEDEC No.316 connected to cathode.

Variable-Mu Twin Triode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	6.3	volts
Current	0.365	amp

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield*[a]	
Grid to plate (Each unit)	1.9	1.9	μμf
Plate to cathode (Each unit)	0.18	0.17	μμf
Heater to cathode (Each unit)	3	3[b]	μμf
Plate of unit No.2 to plate of unit No.1	0.04 max.	0.015 max.	μμf
Plate of unit No.2 to grid of unit No.1	0.003 max.	0.003 max.	μμf
Grid of unit No.1 to cathode of unit No.2	0.002 max.	0.002 max.	μμf

Characteristics, Class A_1 Amplifier (Each Unit):

Plate Voltage	90	90	90	volts
Grid Voltage	-1.2	-5	-9	volts
Plate Resistance (Approx.)	2500	–	–	ohms
Transconductance	12500	625	125	μmhos
Plate Current	15	–	–	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
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9AJ

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

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

6ES8

AMPLIFIER — Cascode Type

Maximum Ratings, *Design-Center Values:*

PLATE SUPPLY VOLTAGE with plate current = 0.	550 max.	volts
PLATE VOLTAGE (Each Unit)	130 max.	volts
GRID VOLTAGE:		
Negative-bias value (Each Unit)	50 max.	volts
CATHODE CURRENT (Each Unit)	22 max.	ma
PLATE DISSIPATION (Each Unit)	1.8 max.	watts
HEATER-CATHODE VOLTAGE:		
Unit No. 1:[c]		
RMS voltage between cathode and heater	50 max.	volts
Unit No. 2:[d]		
RMS voltage between cathode and heater[e]	50 max.	volts
DC voltage between cathode and heater[e]	130 max.	volts

Typical Operation:

In a cascode-type circuit with the grid of the output unit connected to a voltage divider[f]

Supply Voltage	180	volts
Plate Current	15	ma
Transconductance	12500	μmhos
Noise Figure[g]	6.5	db
Grid Voltage (Approx.) for transconductance (μmhos) = 125	−9	volts
Input Voltage for cross-modulation factor = 0.01 and transconductance (μmhos) = 125	500	millivolts

Maximum Circuit Values:

Grid-Circuit Resistance (Each Unit)	1 max.	megohm

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

[b] With external shield JEDEC No. 315 connected to ground.

[c] Grounded-cathode input unit—pins 6, 7, and 8.

[d] Grounded-grid output unit—pins 1, 2, and 3.

[e] Cathode positive with respect to heater.

[f] In order not to exceed the maximum-rated plate voltage when the cascode-type amplifier is controlled, it is necessary to use a voltage divider for the grid of the grounded-grid output unit.

[g] Measured with tube operating in a television tuner.

High-Mu Twin Triode

9-PIN MINIATURE TYPE

For High-Fidelity Audio-Amplifier Applications Critical as to Noise and Hum

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.3	amp
Direct Interelectrode Capacitances (Each Unit, Approx.):▲		
Grid to plate	1.5	μμf
Grid to cathode and heater	1.6	μμf
Plate to cathode and heater	0.2	μμf

Equivalent Noise and Hum Voltage (Referenced to Grid, Each Unit):

Average Value (RMS) . . . . . 1.8 μvolts

Measured in "true rms" units under the following conditions: Heater volts (AC)= 6.3; center-tap of heater transformer connected to ground; plate supply volts (DC)= 250; plate load resistor (megohms)= 0.1; cathode resistor (ohms)= 2700; cathode bypass capacitor (μf)= 100; grid resistor (ohms)= 0; amplifier frequency range 25 to 10000 cps.

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
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9L5

Pin 1 – Heater
Pin 2 – Heater
Pin 3 – No Connection
Pin 4 – Cathode of Unit No.2
Pin 5 – Grid of Unit No.2

Pin 6 – Plate of Unit No.2
Pin 7 – Plate of Unit No.1
Pin 8 – Grid of Unit No.1
Pin 9 – Cathode of Unit No.1

AMPLIFIER — Class A$_1$

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

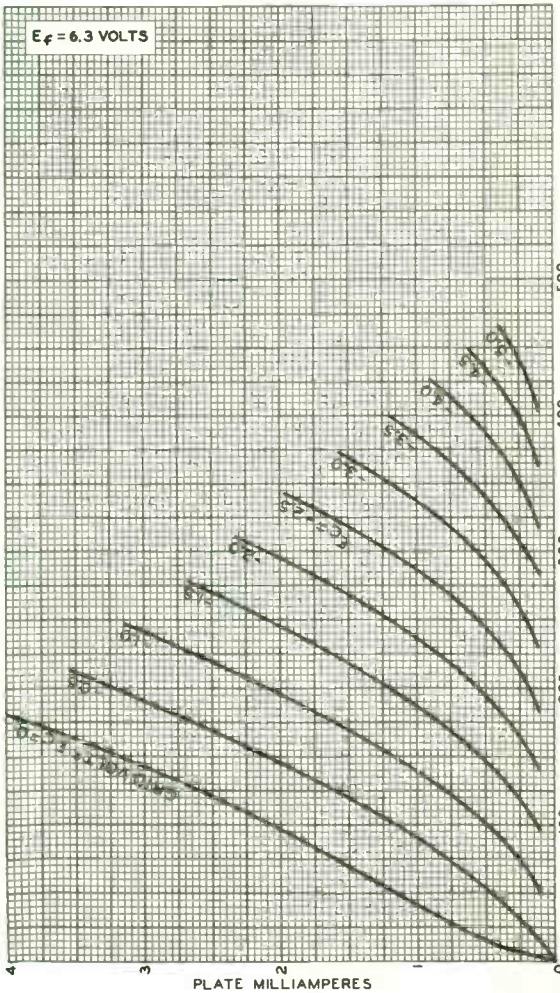
PLATE VOLTAGE	330 max.	volts
GRID VOLTAGE:		
Negative-bias value	55 max.	volts
Positive-bias value	0 max.	volts
PLATE DISSIPATION	1.2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲ max.	volts

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED-AMPLIFIER CHART No. 25 at front of this Section

▲ The dc component must not exceed 100 volts.

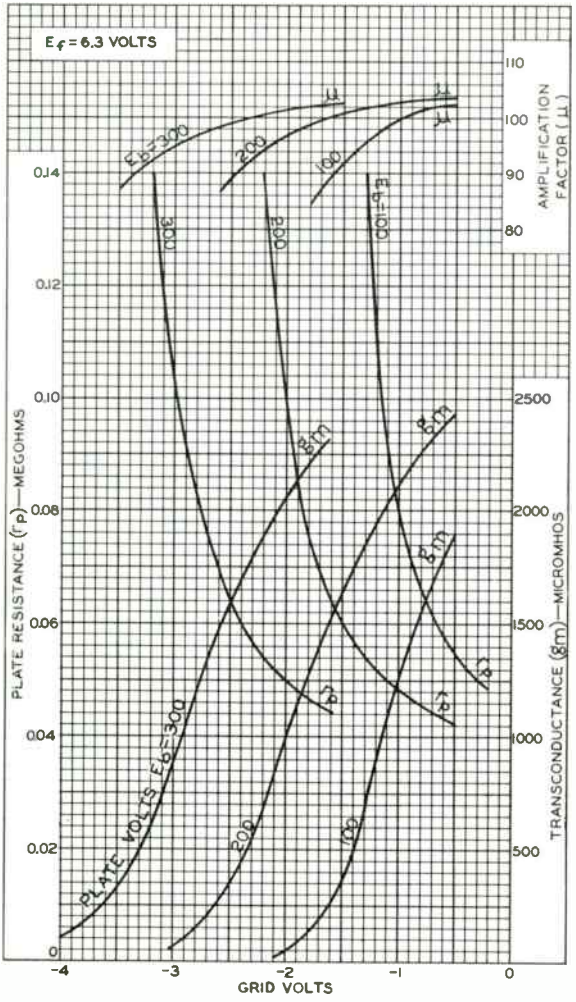
AVERAGE PLATE CHARACTERISTICS
Each Unit



92CM-10470

6EU7

AVERAGE CHARACTERISTICS
Each Unit



92CM-10471

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

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

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield*[a]	
Triode Unit:			
Grid to plate	1.7	1.7	μμf
Grid to cathode and heater	3	3.2	μμf
Plate to cathode and heater	1.6	1.1	μμf
Pentode Unit:			
Grid No.1 to plate	0.02 max.	0.1 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 (Each unit)	3.6	3.6[b]	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Plate Supply Voltage	150	125	volts
Grid-No.2 Supply 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
Cathode Warm-Up Time[c]	35	–	sec

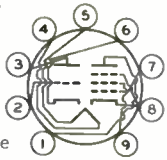
Mechanical:

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"

6EU8

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. 9JF

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



Pin 7 – Pentode Grid No.1
Pin 8 – Pentode Cathode, Grid No.3, Internal Shield
Pin 9 – Pentode Grid No.2

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values:*

	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE.	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	–	330 max.	volts
GRID-No.2 VOLTAGE.	–	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE: Positive-bias value.	0 max.	0 max.	volts
GRID-No.2 INPUT: For grid-No.2 voltages up to 165 volts.	–	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[d] max.	200[d] max.	volts

Maximum Circuit Values:

	Triode Unit	*Pentode Unit*	
Grid-No.1-Circuit Resistance . .	0.1 max.	0.1 max.	megohm

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

[b] With external shield JEDEC No.315 connected to ground.

[c] The time required for the transconductance to reach 6500 μmhos when the tube is operated from a cold start with dc plate volts = 100, grid volts = 0, and heater volts = 5.5.

[d] The dc component must not exceed 100 volts.

Sharp-Cutoff Tetrode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

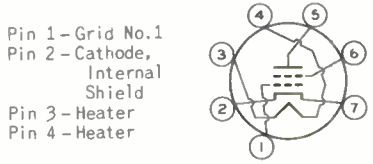
Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.2	amp
Direct Interelectrode Capacitances:[a]		
Grid No.1 to plate	0.035 max.	μμf
Grid No.1 to cathode & internal shield, grid No.2, and heater	4.50	μμf
Plate to cathode & internal shield, grid No.2, and heater	2.90	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	250	volts
Grid-No.2 Voltage	80	volts
Grid-No.1 Voltage	−1	volt
Plate Resistance (Approx.)	0.15	megohm
Transconductance	8800	μmhos
Plate Current	11.5	ma
Grid-No.2 Current	0.9	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 100	−4.5	volts

Mechanical:

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



AMPLIFIER — Class A_1

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

PLATE VOLTAGE	275 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	180 max.	volts
GRID-No.2 VOLTAGE	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	

GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0	max.	volts
CATHODE CURRENT	20	max.	ma
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 90 volts	0.2	max.	watt
For grid-No.2 voltages between 90 and 180 volts	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section		
PLATE DISSIPATION	3.25	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	100	max.	volts
Heater positive with respect to cathode	100[b]	max.	volts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	0.5	max.	megohm

[a] With external shield JEDEC No.316 connected to cathode.
[b] The dc component must not exceed 50 volts.

6EW6

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage (AC or DC)	6.3 ± 10%		volts
Current	0.4		amp
Direct Interelectrode Capacitances.	*Without External Shield*	*With External Shield[D]*	
Grid No.1 to plate	0.04 max.	0.03 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	10	10	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	2.4	3.4	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.)	0.2	megohm
Transconductance	14000	μmhos
Plate Current	11	ma
Grid-No.2 Current	3.2	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-3.5	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Diameter	0.650" to 0.750"
Dimensional Outline	*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

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6EW6

SHARP-CUTOFF PENTODE

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	0.65 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	3.1 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲max.	volts

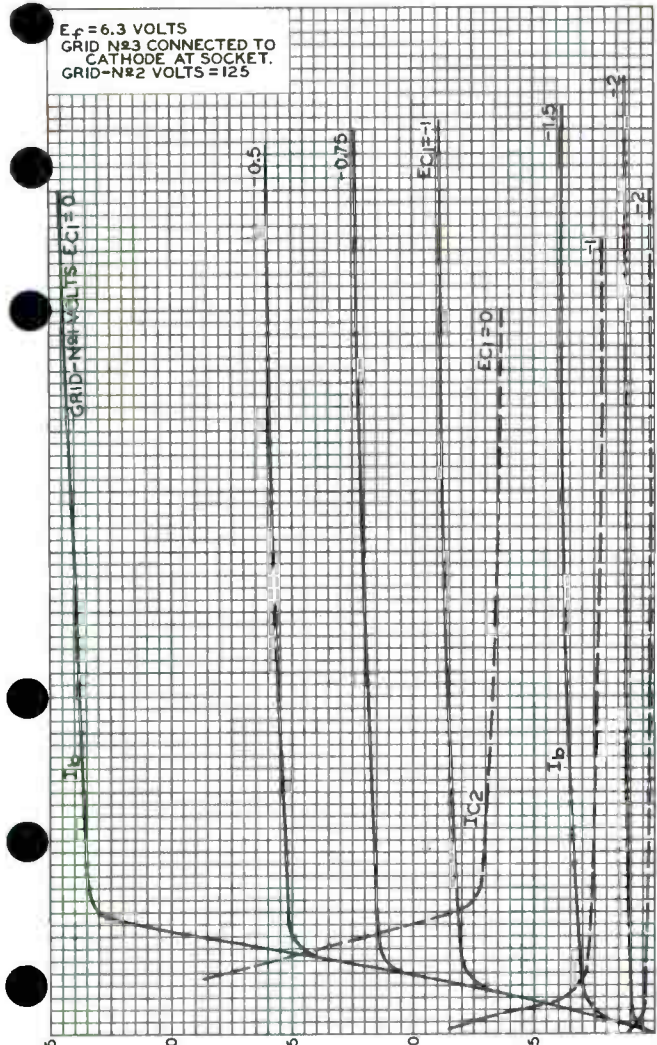
o with external shield JEDEC No.316 connected to cathode.

▲ The dc component must not exceed 100 volts.

RCA

6EW6

AVERAGE CHARACTERISTICS



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

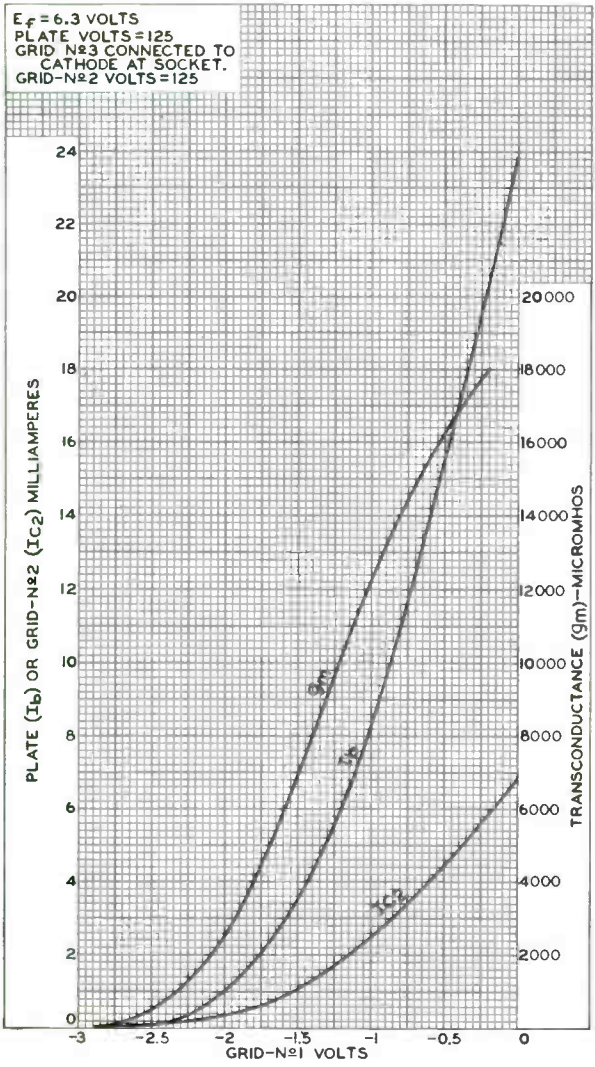
92CM-9965

6EW6

RCA

6EW6

AVERAGE CHARACTERISTICS



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

92CM-9962

Dual Triode

With Medium-Mu Unit and Low-Mu Unit

NEONOVAL TYPE

GENERAL DATA

Electrical:

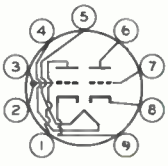
Heater, for Unipotential Cathodes:			
Voltage (AC or DC)		6.3 ± 10%	volts
Current at 6.3 volts		0.9	amp
Direct Interelectrode Capacitances (Approx.):[a]			
	Unit No.1	*Unit No.2*	
Grid to plate	4.2	9	μμf
Grid to cathode and heater	2.2	7	μμf
Plate to cathode and heater	0.4	1.2	μμf

Characteristics, Class A_1 Amplifier:

	Unit No.1	*Unit No.2*	
Plate Voltage	250	150	volts
Grid Voltage	-11	-17.5	volts
Amplification Factor	17.5	6	
Plate Resistance (Approx.)	8750	800	ohms
Transconductance	2000	7500	μmhos
Plate Current	5.5	45	ma
Plate Current for plate volts = 60 and grid volts = 0	-	95	ma
Plate Current for grid volts = -25	-	8	ma
Grid Voltage (Approx.) for plate μa = 10	-20	-	volts
Grid Voltage (Approx.) for plate μa = 100	-	-40	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2.93"
Maximum Seated Length	2.62"
Length, Base Seat to Bulb Top (Excluding tip)	2.07" to 2.31"
Diameter	1.062" to 1.188"
Bulb	T9
Base	Large-Button Neonoval 9-Pin (JEDEC No.E9-68)
Basing Designation for BOTTOM VIEW	9HF



Pin 1 – Plate of Unit No.2
Pin 2 – Grid of Unit No.2
Pin 3 – Grid of Unit No.2
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Plate of Unit No.1
Pin 7 – Grid of Unit No.1
Pin 8 – Cathode of Unit No.1
Pin 9 – Cathode of Unit No.2

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No.1

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[b]

DC PLATE VOLTAGE	330	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	400	maax.	volts
CATHODE CURRENT:			
Peak	77	max.	ma
Average	22	max.	ma
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[c]	max.	volts

Maximum Circuit Values:

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

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No.2

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[b]

DC PLATE VOLTAGE	330	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[d]	1500	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	250	max.	volts
CATHODE CURRENT:			
Peak	175	max.	ma
Average	50	max.	ma
PLATE DISSIPATION	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[c]	max.	volts

Maximum Circuit Values:

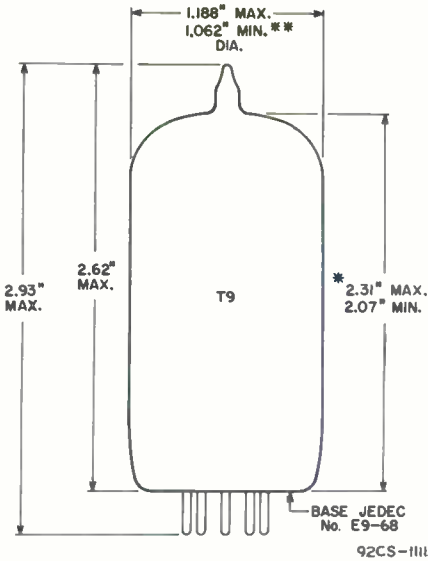
Grid-Circuit Resistance:			
For grid-resistor-bias or cathode-bias operation	2.2	max.	megohms

[a] Without external shield.

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

[c] The dc component must not exceed 100 volts.

[d] 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.

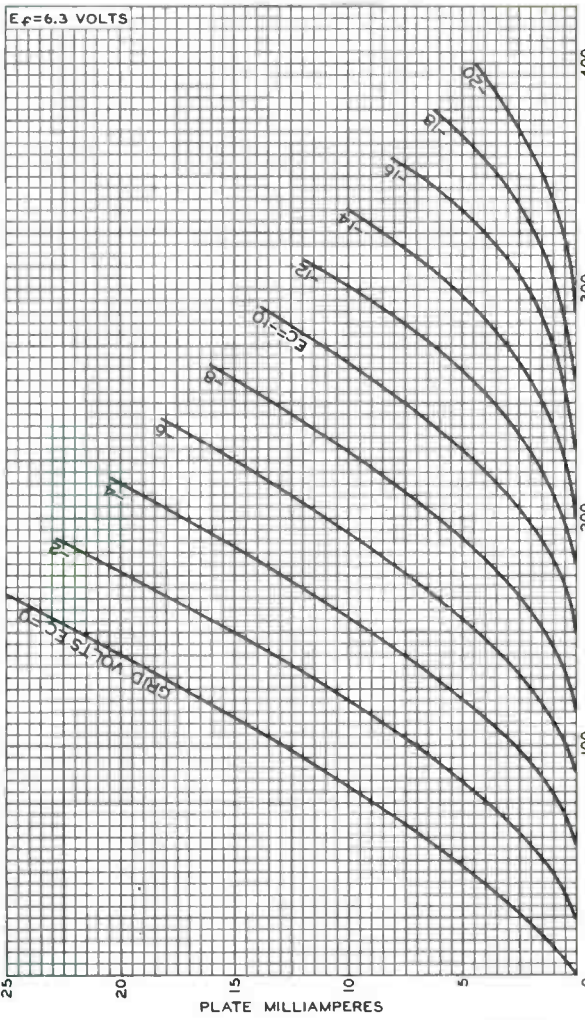


* MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY A RING GAUGE OF 0.600" INTERNAL DIAMETER.

** APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.

6EW7

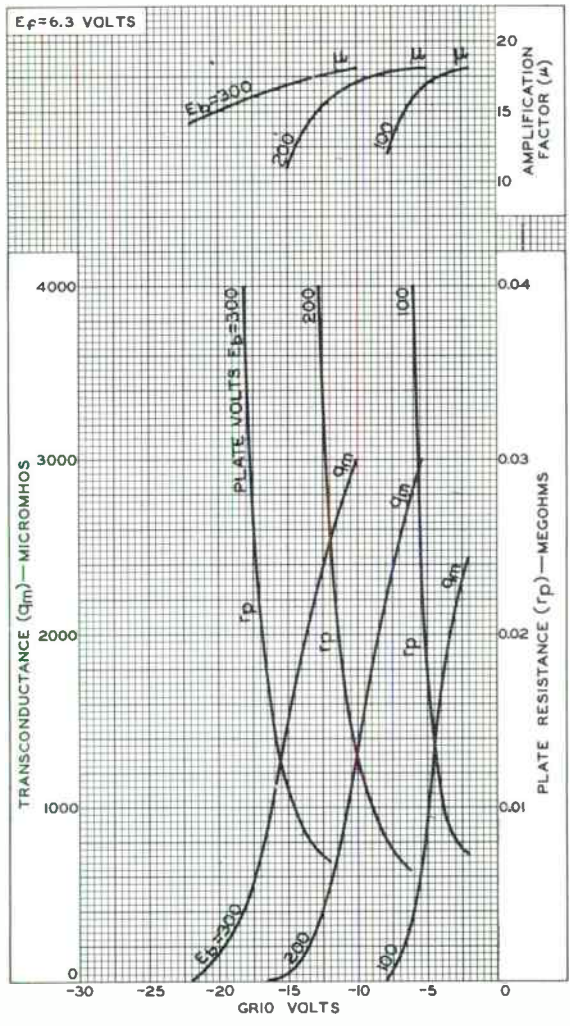
AVERAGE PLATE CHARACTERISTICS
Unit No.1



92CM-9988

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

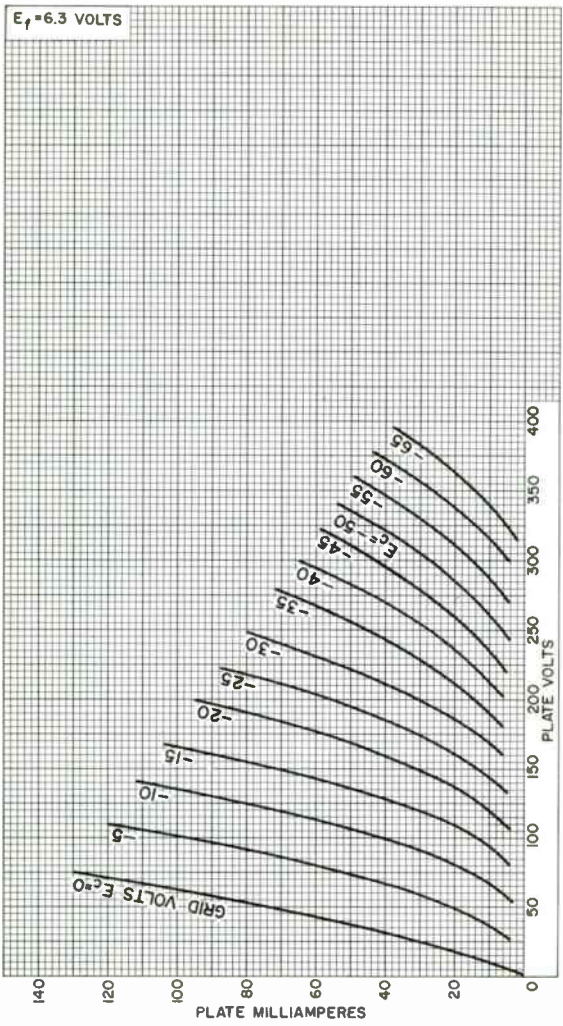
AVERAGE CHARACTERISTICS
Unit No.1



92CM-9991

6EW7

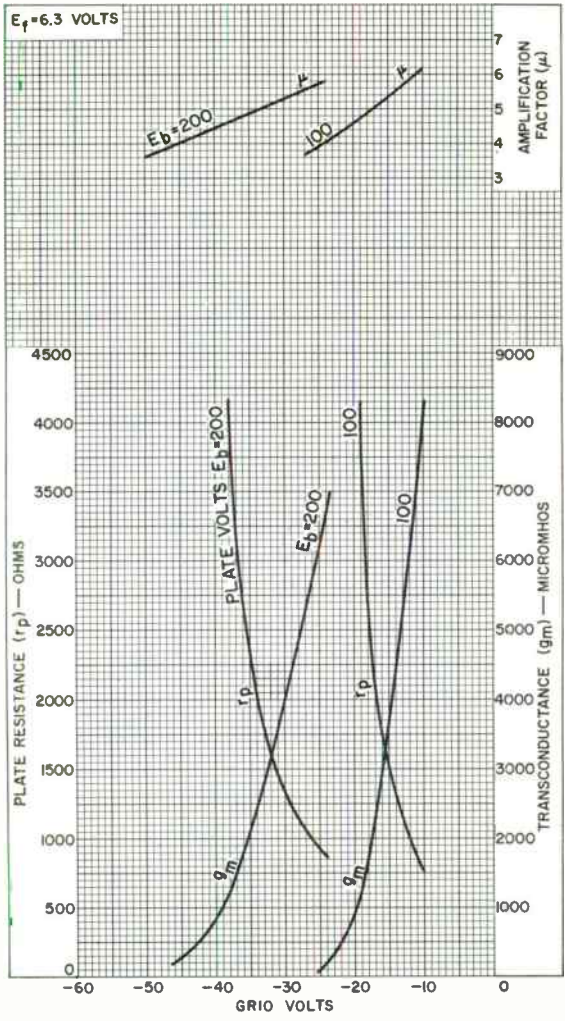
AVERAGE PLATE CHARACTERISTICS
Unit No.2



92CM—11111

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

AVERAGE CHARACTERISTICS
Unit No.2



92CM-11113

High-Mu Triple Triode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.45	amp

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	*With External Shield*[a]	
Grid to plate (Each Unit)	1.5	1.5	μμf
Grid of unit No.1 to cathode of unit No.1 & cathode of unit No.2, and heater	2.4	2.6	μμf
Grid of unit No.2 to cathode of unit No.2 & cathode of unit No.1, and heater	2.4	2.6	μμf
Grid of unit No.3 to cathode of unit No.3 and heater	2.4	2.6	μμf
Plate of unit No.1 to cathode of unit No.1 & cathode of unit No.2, and heater	0.21	1.4	μμf
Plate of unit No.2 to cathode of unit No.2 & cathode of unit No.1, and heater	0.4	1.2	μμf
Plate of unit No.3 to cathode of unit No.3 and heater	0.36	1.2	μμf
Heater of unit No.3 to cathode of unit No.3.	0.17	0.15[b]	μμf

Characteristics, Class A_1 Amplifier (Each Unit):

Plate Voltage	125	volts
Grid Voltage	−1	volt
Amplification Factor	57	
Plate Resistance (Approx.)	13600	ohms
Transconductance	4200	μmhos
Plate Current	4.2	ma
Grid Voltage (Approx.) for plate μa = 20	−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)

6EZ8

Basing Designation for BOTTOM VIEW. 9KA

Pin 1 – Cathode of Unit No.3
Pin 2 – Grid of Unit No.3
Pin 3 – Plate of Unit No.3
Pin 4 – Cathode of Unit No.2, Cathode of Unit No.1, Heater

Pin 5 – Heater
Pin 6 – Plate of Unit No.2
Pin 7 – Grid of Unit No.2
Pin 8 – Plate of Unit No.1
Pin 9 – Grid of Unit No.1

AMPLIFIER — Class A_1

Unless Otherwise Specified, Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	330 max.	volts
GRID VOLTAGE:		
Negative-bias value	50 max.	volts
Positive-bias value	0 max.	volts
PLATE DISSIPATION	2 max.	watts
TOTAL PLATE DISSIPATION (ALL PLATES)	5 max.	watts
HEATER-CATHODE VOLTAGE (Unit No.3):		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts

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

[b] With external shield JEDEC No.315 connected to ground.

Diode—Sharp-Cutoff Twin-Plate Tetrode

9-PIN MINIATURE TYPE

For Frequency-Divider and Complex-Wave-Generator Circuits of Electronic Musical Instruments

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.3	amp
Direct Interelectrode Capacitances:▲		
Tetrode Unit:		
Grid No.1 to plate A	0.04	μμf
Grid No.1 to plate B	0.03 max.	μμf
Grid No.1 to cathode & internal shield, grid No.2, and heater	5.5	μμf
Plate A to cathode & internal shield, grid No.2, and heater	1.8	μμf
Plate B to cathode & internal shield, grid No.2, and heater	1.8	μμf
Tetrode grid No.1 to diode plate	0.022	μμf
Tetrode plate A to diode plate	0.02 max.	μμf
Tetrode plate B to diode plate	0.055	μμf

Characteristics, Class A_1 Amplifier (Tetrode Unit):

Plates A and B connected together

Plate Voltage	100	volts
Grid-No.2 Voltage	100	volts
Grid-No.1 Supply Voltage	0	volts
Grid-No.1 Resistor (Bypassed)	2.2	megohms
Plate Resistance (Approx.)	90000	ohms
Transconductance	3200	μmhos
Plate Current	3.8	ma
Grid-No.2 Current	1.7	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	−4	volts

Using either Plate A or B, with plate not in use connected to ground

Plate Voltage	100	volts
Grid-No.2 Voltage	100	volts
Grid-No.1 Supply Voltage	0	volts
Grid-No.1 Resistor (Bypassed)	2.2	megohms
Plate Resistance (Approx.)	130000	ohms
Transconductance	1900	μmhos
Plate Current	2.2	ma
Grid-No.2 Current	3	ma

Mechanical:

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

6FA7

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. 9MR

Pin 1 – Tetrode Plate B
Pin 2 – No Connection
Pin 3 – Diode Plate
Pin 4 – Heater
Pin 5 – Heater

Pin 6 – Cathode, Internal Shield
Pin 7 – Tetrode Grid No.1
Pin 8 – Tetrode Grid No.2
Pin 9 – Tetrode Plate A

FREQUENCY-DIVIDER & COMPLEX-WAVE-GENERATOR SERVICE

TETRODE UNIT

Maximum Ratings, *Design-Maximum Values:*

PLATE A VOLTAGE	330	max.	volts
PLATE B VOLTAGE	330	max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	330	max.	volts
GRID-No.2 VOLTAGE . . . . . .See *Grid-No.2 Input Rating Chart at front of Receiving Tube Section*			
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Negative-bias value	50	max.	volts
Positive-bias value	0	max.	volts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 165 volts	0.65	max.	watt
For grid-No.2 voltages between 165 and 330 volts .See *Grid-No.2 Input Rating Chart at front of Receiving Tube Section*			
PLATE A DISSIPATION	1.5	max.	watts
PLATE B 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

Maximum Circuit Values:

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

DIODE UNIT

Maximum Ratings, *Design-Maximum Values:*

PLATE CURRENT	1	max.	ma

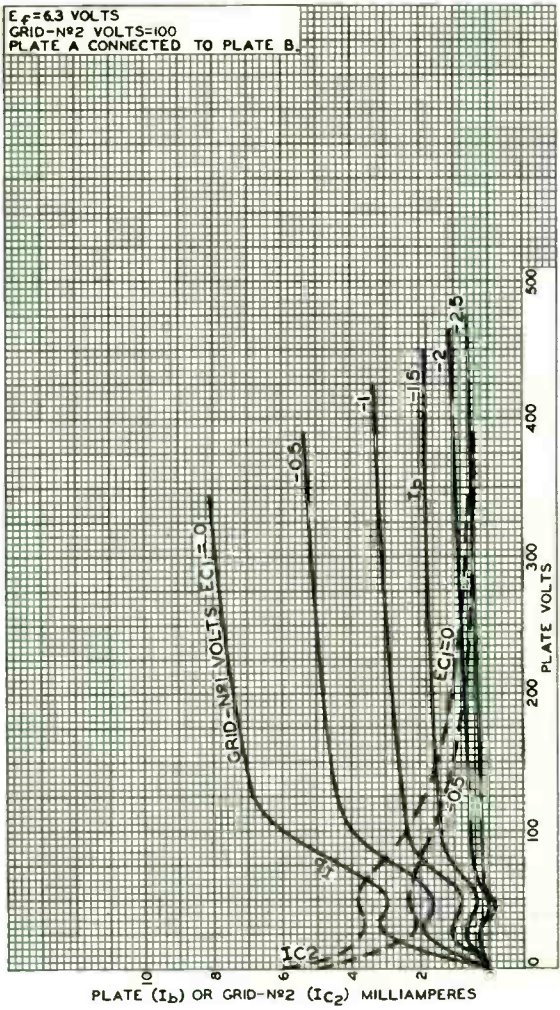
Characteristics, Instantaneous Test Condition:

Plate Current for plate volts = 10. . . .	2	ma

▲ Without external shield.

● The dc component must not exceed 100 volts.

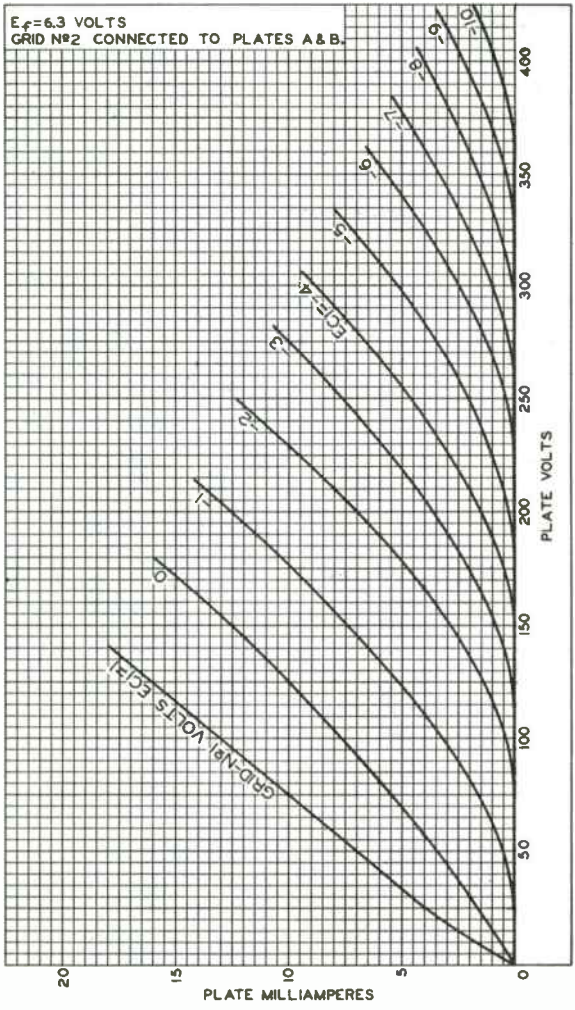
AVERAGE CHARACTERISTICS
Tetrode Unit



92CM-10693

6FA7

AVERAGE PLATE CHARACTERISTICS
Tetrode Unit—Triode Connection



92CM-10695

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

6FD7

Dual Triode

With High-Mu Unit and Low-Mu Unit

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Maximum Values)*:			
Voltage (AC or DC)	6.3 ± 0.6		volts
Current at heater volts = 6.3	0.925		amp
Peak heater-cathode voltage (Each unit):			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[a]	max.	volts

Direct Interelectrode Capacitances (Approx.):[b]

	Unit No.1	*Unit No.2*	
Grid to plate	4.5	10	μμf
Grid to cathode and heater	2.2	6.5	μμf
Plate to cathode and heater	0.4	1.2	μμf

Characteristics, Class A_1 Amplifier:

	Unit No.1	*Unit No.2*		
Plate Voltage	250	60	150	volts
Grid Voltage	−3	0	−17.5	volts
Amplification Factor	64	–	6	
Plate Resistance (Approx.)	40000	–	800	ohms
Transconductance	1600	–	7500	μmhos
Plate Current	1.4	95[c]	40	ma
Grid Voltage (Approx.) for plate μa =.				
10	−5.5	–	–	volts
100	–	–	−40	volts
Transconductance for plate ma. = 1	–	–	500	μmhos
Plate Current for grid volts = −25	–	–	6	ma

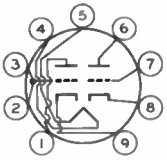
Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2.900"
Maximum Seated Length	2.620"
Length, Base Seat to Bulb Top (Excluding tip)	2.070" to 2.310"
Diameter	1.062" to 1.188"
Bulb	T9
Base	JEDEC No.E9-82

6FD7

Basing Designation for BOTTOM VIEW. 9HF

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



Pin 6 – Plate of Unit No.1
Pin 7 – Grid of Unit No.1
Pin 8 – Cathode of Unit No.1
Pin 9 – Cathode of Unit No.2

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No.1

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[d]

DC PLATE VOLTAGE	330 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	400 max.	volts
CATHODE CURRENT:		
Peak	70 max.	ma
Average	20 max.	ma
PLATE DISSIPATION	1.5 max.	watts

Maximum Circuit Values:

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

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No.2

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[d]

DC PLATE VOLTAGE	330 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[e]	1500 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	250 max.	volts
CATHODE CURRENT:		
Peak	175 max.	ma
Average	50 max.	ma
PLATE DISSIPATION	10 max.	watts

Maximum Circuit Values:

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

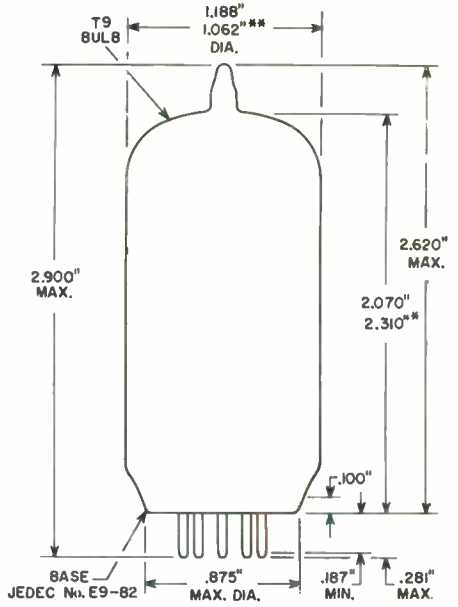
[a] The dc component must not exceed 100 volts.

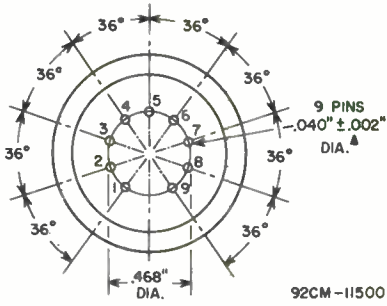
[b] Without external shield.

[c] 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

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

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





** APPLIES IN ZONE STARTING 0.625" FROM BASE SEAT.

* MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY A RING GAUGE OF 0.600" INSIDE DIAMETER.

▲ BASE-PIN CONTOUR AND GAUGE (JEDEC No. GE9-4) INFORMATION FOR THIS BASE IS THE SAME AS THAT SHOWN IN GENERAL SECTION FOR BASE JEDEC No. E9-68 (LARGE-BUTTON NEONOVAL 9-PIN).

Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Maximum Values):*

Voltage (AC or DC)	6.3[a]	6.3 ± 0.6	volts
Current	0.450 ± 0.030	0.450[b]	amp
Warm-up time (Average)	11	-	sec
Peak heater-cathode voltage (Each unit):			
Heater negative with respect to cathode	200 max.		volts
Heater positive with respect to cathode	200[c] max.		volts

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield*[d]	
Triode Unit:			
Grid to plate	1.8	1.8	μμf
Grid to cathode & pentode grid No.3, and heater	3	3	μμf
Plate to cathode & pentode grid No.3, and heater	1.3	1.9	μμf
Pentode Unit:			
Grid No.1 to plate	0.02 max.	0.01 max.	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	2.4	3.4	μμf
Heater to cathode & pentode grid No.3	6	6[e]	μμf

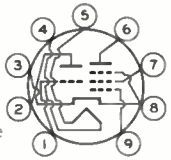
Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*		
Plate Voltage	125	100	125	volts
Grid-No.2 Voltage	-	100	125	volts
Grid-No.1 Voltage	-1	0	-1	volts
Amplification Factor	43	-	-	
Plate Resistance (Approx.)	5700	-	180000	ohms
Transconductance	7500	7400	6000	μmhos
Plate Current	13	-	11	ma
Grid-No.2 Current	-	-	4	ma
Grid-No.1 Voltage (Approx.) for plate μa = 30	-6.5	-	-7.5	volts

6FG7

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
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	9GF



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

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
GRID-No.2 INPUT: For grid-No.2 voltages up to 165 volts	–	0.55 max.	watt
For grid-No.2 voltages between 165 and 330 volts	–	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
PLATE DISSIPATION	2.5 max.	3 max.	watts

[a] At heater amperes = 0.450.
[b] At heater volts = 6.3.
[c] The dc component must not exceed 100 volts.
[d] With external shield JEDEC No.315 connected to cathode except as noted.
[e] With external shield JEDEC No.315 connected to ground.

High-Mu Triode

7-PIN MINIATURE TYPE
For VHF Tuner and Amplifier Applications

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.2	amp

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield*[o]	
Grid to plate	0.6 max.	0.6 max.	μμf
Grid to cathode, internal shield, and heater	3.2	3.2	μμf
Plate to cathode, internal shield, and heater	3.2	4	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	135	volts
Grid Voltage	−1	volt
Amplification Factor	50	
Plate Resistance (Approx.)	5600	ohms
Transconductance	9000	μmhos
Plate Current	11	ma
Grid Voltage (Approx.) for plate μa = 100	−5.5	volts

Mechanical:

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

Pin 1 – Cathode
Pin 2 – Grid
Pin 3 – Heater
Pin 4 – Heater
Pin 5 – Plate
Pin 6 – Internal Shield
Pin 7 – Cathode

AMPLIFIER — Class A1

Maximum Ratings, *Design-Maximum Values:*

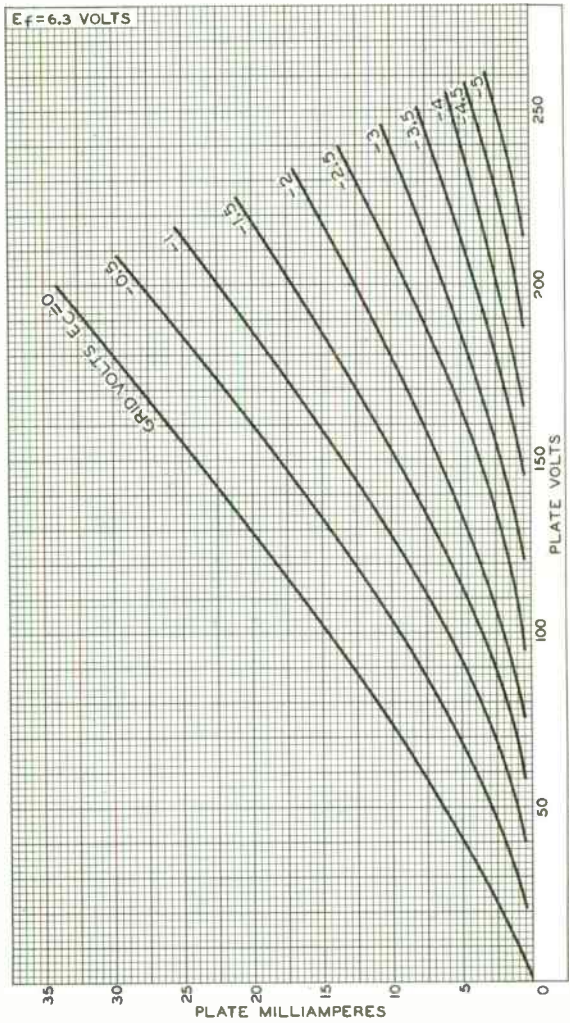
PLATE VOLTAGE	150 max.	volts
GRID VOLTAGE:		
Positive-bias value	0 max.	volts
CATHODE CURRENT	22 max.	ma
PLATE DISSIPATION	2.2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts

Maximum Circuit Values:

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

o With external shield JEDEC No.316 connected to cathode.

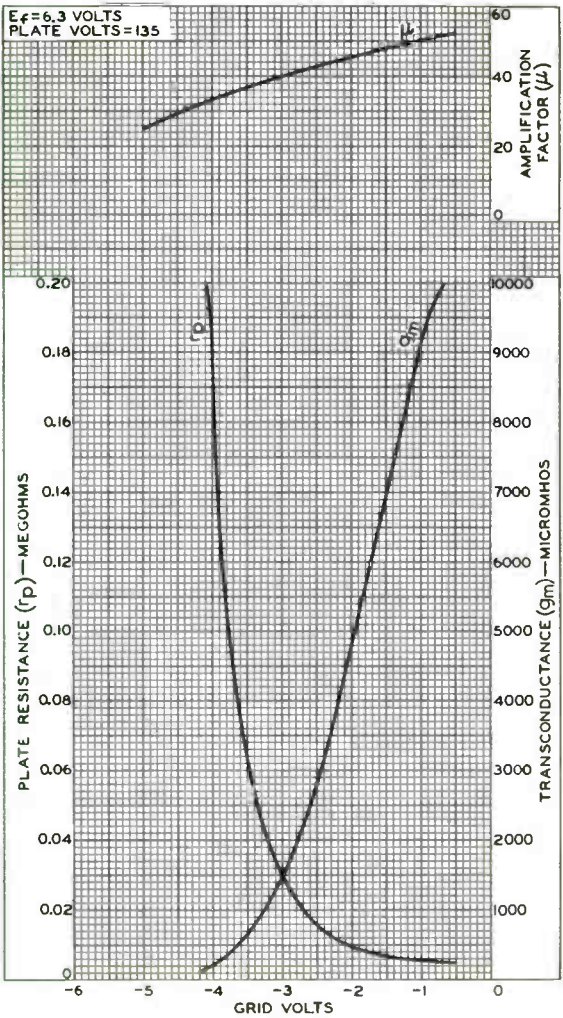
AVERAGE PLATE CHARACTERISTICS



92CM-10355R1

6FH5

AVERAGE CHARACTERISTICS



92CM-10354RI

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

RCA

6FH8

MEDIUM-MU TRIODE— THREE-PLATE TETRODE

9-PIN MINIATURE TYPE

For harmonic-generator applications

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current	0.45	amp
Direct Interelectrode Capacitances:[o]		
Triode Unit:		
Grid to plate	1.4	μμf
Grid to cathode & heater	2.6	μμf
Plate to cathode & heater	1	μμf
Tetrode Unit:		
Grid No.1 to plate No.1	0.06 max.	μμf
Grid No.1 to cathode & heater, plate No.3, plate No.2, and grid No.2	4.5	μμf
Plate No.1 to cathode & heater, plate No.3, plate No.2, and grid No.2	1.4	μμf
Tetrode grid No.1 to triode plate	0.35 max.	μμf
Tetrode plate No.1 to triode plate	0.008 max.	μμf

Characteristics, Class A_1 Amplifier:

Triode Unit		
Plate Voltage	100	volts
Grid Voltage	−1	volt
Amplification Factor	40	
Plate Resistance (Approx.)	7400	ohms
Transconductance	5400	μmhos
Plate Current	7.9	ma
Grid Voltage (Approx.) for plate μa = 100	−7	volts
Tetrode Unit with plates No.2 and No.3 connected to cathode		
Plate-No.1 Voltage	250	volts
Grid-No.2 Voltage	250	volts
Grid-No.1 Voltage	−2	volts
Plate-No.1 Resistance (Approx.)	0.75	megohm
Transconductance, Grid No.1 to Plate No.1	4400	μmhos
Plate-No.1 Current	7.3	ma
Grid-No.2 Current	1.4	ma
Grid-No.1 Voltage (Approx.) for plate-No.1 μa = 100	−7	volts

[o] with external shield JEDEC No.315 connected to cathode.

6FH8

MEDIUM-MU TRIODE—THREE-PLATE TETRODE

Mechanical:

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

Pin 1 – Tetrode Plate No.3
Pin 2 – Triode Grid
Pin 3 – Triode Plate
Pin 4 – Heater, Cathode
Pin 5 – Heater

Pin 6 – Tetrode Grid No.1
Pin 7 – Tetrode Grid No.2
Pin 8 – Tetrode Plate No.2
Pin 9 – Tetrode Plate No.1

HARMONIC-GENERATOR SERVICE

Maximum Ratings, *Design-Maximum Values:*

	Triode Unit	*Tetrode Unit*	
PLATE VOLTAGE	275 max.	–	volts
PLATE-No.1 VOLTAGE	–	275 max.	volts
PLATE-No.2 VOLTAGE	–	200 max.	volts
PLATE-No.3 VOLTAGE	–	200 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	–	275 max.	volts
GRID-No.2 VOLTAGE	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Negative-bias value	40 max.	40 max.	volts
Positive-bias value	0 max.	0 max.	volts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 137.5 volts	–	0.45 max.	watt
For grid-No.2 voltages between 137.5 and 275 volts	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PLATE DISSIPATION	1.7 max.	–	watts
PLATE-No.1 DISSIPATION	–	2.3 max.	watts
PLATE-No.2 DISSIPATION	–	0.3 max.	watt
PLATE-No.3 DISSIPATION	–	0.3 max.	watt

6FH8

MEDIUM-MU TRIODE—THREE-PLATE TETRODE

Typical Operation:

Tetrode Unit with separate plate operation

Plates–No.1, No.2, and No.3 Voltage	100	volts
Grid–No.2 Voltage	50	volts
Grid–No.1 Voltage	−1	volt
Plate–No.1 Current	1.6	ma
Plate–No.2 Current	0.04	ma
Plate–No.3 Current	0.04	ma
Grid–No.2 Current	0.3	ma
Transconductance (Approx.):		
Grid No.1 to plate No.1	2500	μmhos
Grid No.1 to plate No.2	70	μmhos
Grid No.1 to plate No.3	70	μmhos

Maximum Circuit Values:

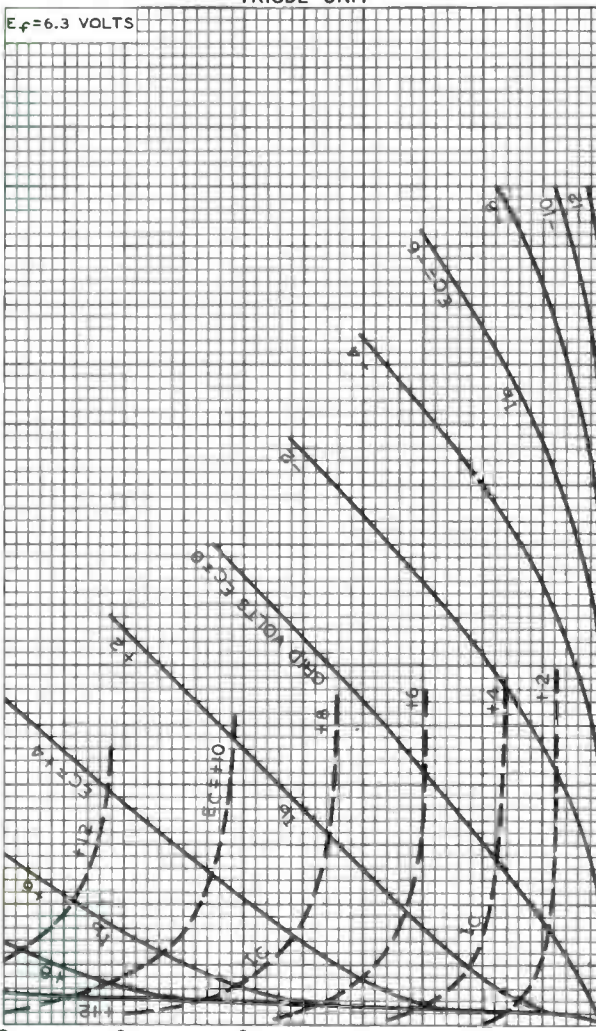
	Triode Unit	*Tetrode Unit*	
Grid–No.1–Circuit Resistance: For fixed–bias operation	0.5 max.	0.5 max.	megohm

RCA

6FH8

AVERAGE CHARACTERISTICS

TRIODE UNIT



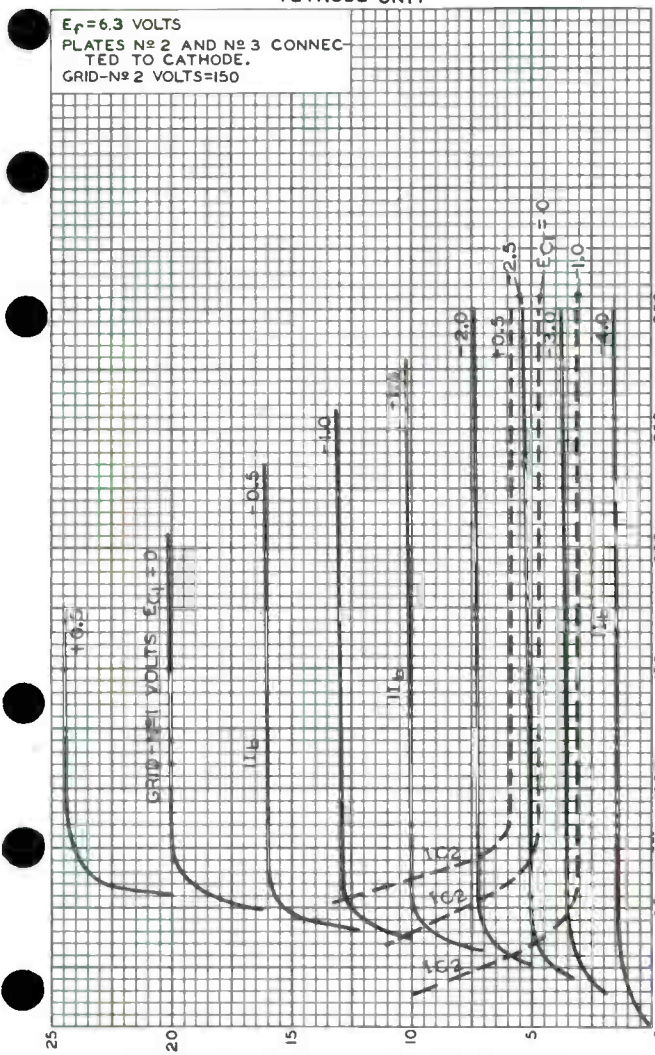
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-10220

RCA

6FH8

AVERAGE CHARACTERISTICS
TETRODE UNIT



ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-10221

6FM7

Dual Triode

With High-Mu Unit and Low-Mu Unit

DUODECAR TYPE

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at 6.3 volts	1.050	amp
Maximum heater-cathode voltage (Each unit):		
Heater negative with respect to cathode:		
Peak	200	volts
Heater positive with respect to cathode:		
Peak	200	volts
DC component	100	volts

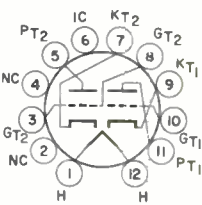
Direct Interelectrode Capacitances (Approx.):[a]

	Unit No.1	Unit No.2	
Grid to plate	4.0	7.0	pf
Input: G to (K, H)	2.4	7.0	pf
Output: P to (K, H)	0.4	1.1	pf

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2.375"
Seated Length	1.750" to 2.000"
Diameter	1.062" to 1.188"
Dimensional Outline (JEDEC 9-58)	See *General Section*
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC No.E12-70)
Basing Designation for BOTTOM VIEW	12EJ

Pin 1 – Heater
Pin 2 – No Internal Connection
Pin 3 – Grid of Unit No.2
Pin 4 – No Internal Connection
Pin 5 – Plate of Unit No.2
Pin 6 – Do Not Use
Pin 7 – Cathode of Unit No.2
Pin 8 – Grid of Unit No.2
Pin 9 – Cathode of Unit No.1
Pin 10 – Grid of Unit No.1
Pin 11 – Plate of Unit No.1
Pin 12 – Heater



Characteristics, Class A$_1$ Amplifier:

	Unit No.1	Unit No.2	
Plate Voltage	250	60	175 volts
Grid Voltage	−3	0[b]	−25 volts
Amplification Factor	66	–	5.5
Plate Resistance (Approx.)	30000	–	920 ohms
Transconductance	2200	–	6000 μmhos
Plate Current	2	95	40 ma
Grid-Voltage (Approx.) for plate:			
μa = 20	−5.3	–	– volts
μa = 200	–	–	−45 volts

VERTICAL DEFLECTION OSCILLATOR AND AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

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

	Unit No.1 (Oscillator)	*Unit No.2 (Amplifier)*	
DC Plate Voltage	350	550	volts
Peak Positive-Pulse Plate Voltage	–	1500[c]	volts
Peak Negative Pulse-Grid Voltage	400	250	volts
Cathode Current:			
Peak	–	175	ma
Average	–	50	ma
Plate Dissipation	1	10[d]	watts

Maximum Circuit Values:

Grid-Circuit Resistance:			
For fixed-bias operation	1	1	megohm
For cathode-bias operation	2.2	2.2	megohms

[a] Without external shield.

[b] Applied for short interval (2 seconds maximum) so as not to damage tube.

[c] 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.

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

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

Twin Diode—High-Mu Triode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.45	amp
Direct Interelectrode Capacitances (Approx.):[a]		
Triode Unit:		
Grid to plate	1.8	μμf
Grid to cathode and heater	1.5	μμf
Plate to cathode and heater	0.16	μμf
Diode Units:		
Diode-No.1 plate to triode grid	0.05	μμf
Diode-No.2 plate to triode grid	0.04	μμf
Diode-No.1 cathode to all other tube electrodes	4.6	μμf
Diode-No.2 cathode to all other tube electrodes	4.8	μμf
Diode-No.1 plate to cathode and heater	2.4	μμf
Diode-No.2 plate to cathode and heater	2.2	μμf

Characteristics, Class A_1 Amplifier (Triode Unit):

Plate Voltage	250	volts
Grid Voltage	-3	volts
Amplification Factor	70	
Plate Resistance (Approx.)	58000	ohms
Transconductance	1200	μmhos
Plate Current	1	ma

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 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	9KR

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

Pin 5 – Heater
Pin 6 – Diode-No.2 Plate
Pin 7 – Triode Cathode
Pin 8 – Triode Grid
Pin 9 – Triode Plate

6FM8

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	200	max.	volts
Heater positive with respect to cathode	200[b]	max.	volts

DIODE UNITS — Two

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

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

Characteristics, Instantaneous Test Condition:

Plate Current for plate volts = 5	20	ma

[a] Without external shield.

[b] The dc component must not exceed 100 volts.

6FQ5A

High-Mu Triode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

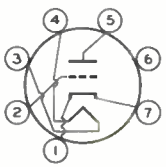
Heater Characteristics and Ratings *(Design-Maximum Values)*:		
Voltage (AC or DC)	6.3±0.6	volts
Current at heater volts = 6.3	0.180	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts
Direct Interelectroce Capacitances (Approx.):[a]		
Grid to plate	0.52	μμf
Grid to cathode, internal shield, and heater	5.0	μμf
Plate to cathode, internal shield, and heater	3.5	μμf
Heater to cathode	2.5[b]	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	135	volts
Grid Voltage	-1.2	volts
Amplification Factor	74	
Plate Resistance (Approx.)	6300	ohms
Transconductance	12000	μmhos
Plate Current	8.9	ma
Grid Voltage (Approx.) for plate μa = 100	-4.5	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
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	7FP



Pin 1 – Cathode
Pin 2 – Grid
Pin 3 – Heater
Pin 4 – Heater
Pin 5 – Plate
Pin 6 – Internal Shield
Pin 7 – Cathode

6FQ5A

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	200 max.	volts
GRID VOLTAGE:		
Negative-bias value	50 max.	volts
CATHODE CURRENT	22 max.	ma
PLATE DISSIPATION	2.5 max.	watts

Maximum Circuit Values:

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

[a] With external shield JEDEC No.316 connected to cathode except as noted.
[b] With external shield JEDEC No.316 connected to ground.

CURVES
shown under Type 6GK5 also apply to the 6FQ5A

Medium-Mu Twin Triode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	6.3	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec
Direct Interelectrode Capacitances (Approx.):[a]		

	Unit No.1	Unit No.2	
Grid to plate	3.6	3.8	μμf
Grid to cathode and heater	2.4	2.4	μμf
Plate to cathode and heater	0.34	0.26	μμf
Plate of unit No.1 to plate of unit No.2	1		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 volts = −12.5	−	1.3	ma
Grid Voltage (Approx.) for plate μa = 10	−7	−18	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9LP

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 – No Connection

AMPLIFIER — Class A_1

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	330 max.	volts
GRID VOLTAGE:		
Positive-bias value	0 max.	volts
CATHODE CURRENT	22 max.	ma
PLATE DISSIPATION:		
Either plate	4 max.	watts
Both plates (Both units operating)	5.7 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[b] max.	volts

Typical Operation as Resistance-Coupled Amplifier:

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

Maximum Circuit Values:

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

HORIZONTAL-DEFLECTION OSCILLATOR

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[c]

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

Maximum Circuit Values:

Grid-Circuit Resistance	2.2 max.	megohms

VERTICAL-DEFLECTION OSCILLATOR

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[c]

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

PLATE DISSIPATION:			
Either plate	4	max.	watts
Both plates (Both units operating)	5.7	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[b]	max.	volts
Maximum Circuit Values:			
Grid-Circuit Resistance	2.2	max.	megohms

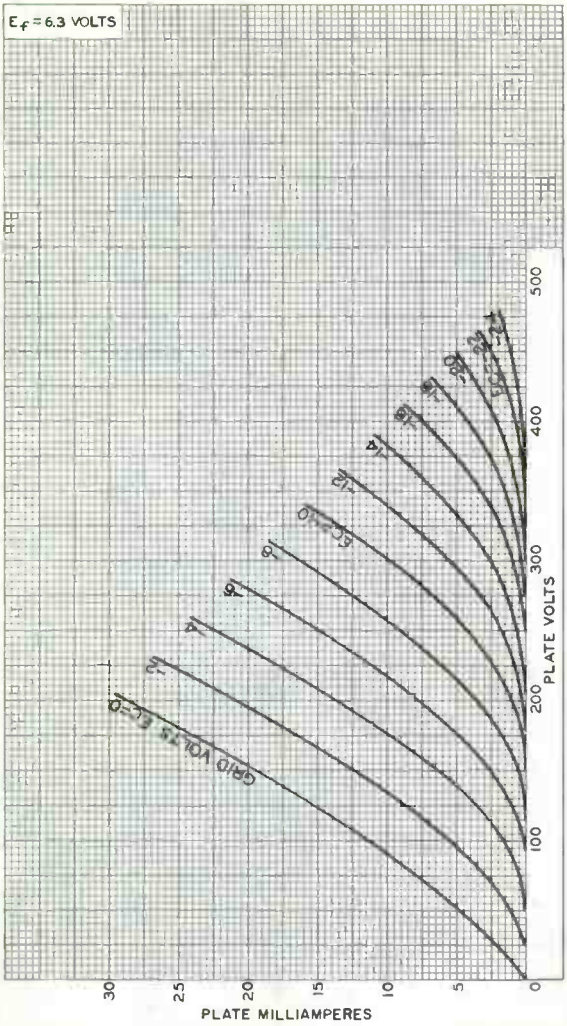
[a] Without external shield.

[b] The dc component must not exceed 100 volts.

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

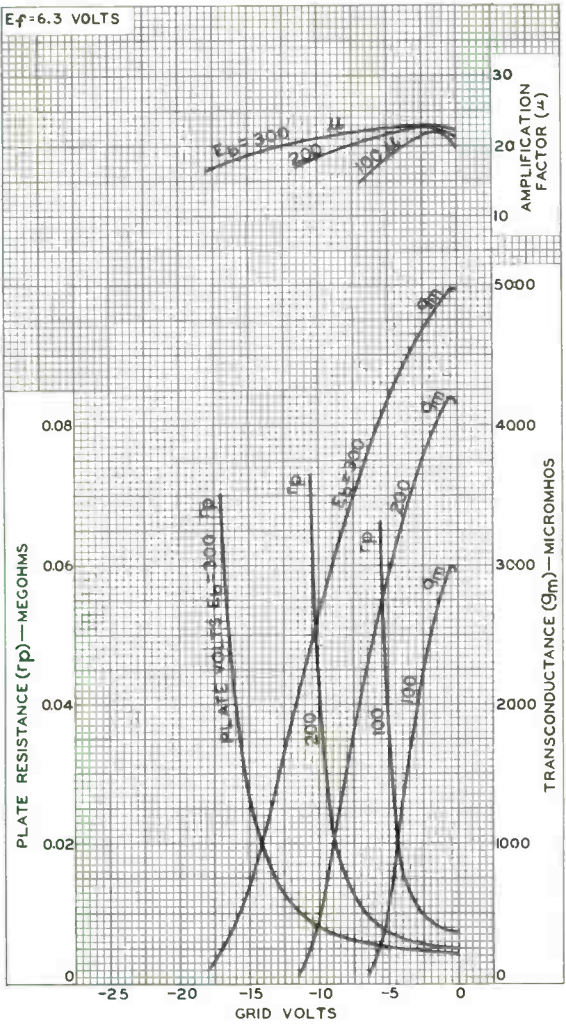
6FQ7

AVERAGE PLATE CHARACTERISTICS
Each Unit



92CM-8442

AVERAGE CHARACTERISTICS
Each Unit



92CM-8441RI

Beam Hexode

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Maximum Values)*:

Voltage (AC or DC)	6.3 ± 0.6		volts
Current at heater volts = 6.3	0.200		amp
Peak heater-cathode voltage:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[a]	max.	volts

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	*With External Shield*[b]	
Grid No.1 to plate	0.03	0.016	μμf
Grid No.1 to cathode & grid No.4 & grid No.2, grid No.3, and heater	4.8	4.8	μμf
Plate to cathode & grid No.4 & grid No.2, grid No.3, and heater	2	2.8	μμf

Characteristics, Class A$_1$ Amplifier:

Plate Voltage	275	volts
Grid-No.3 Voltage	135	volts
Grid-No.1 Voltage	-0.2	volt
Plate Resistance (Approx.)	0.24	megohm
Transconductance	10000	μmhos
Plate Current	9	ma
Grid-No.3 Current	0.17	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 100	-5	volts

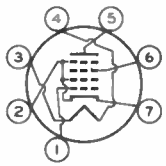
Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
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)

6FS5

Basing Designation for BOTTOM VIEW. 7GA

Pin 1 – Grid No.1
Pin 2 – Cathode, Grid No.2, Grid No.4
Pin 3 – Heater
Pin 4 – Heater



Pin 5 – Plate
Pin 6 – Grid No.3
Pin 7 – Cathode, Grid No.2, Grid No.4

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	300 max.	volts
GRID-No.3 (SCREEN-GRID) VOLTAGE	150 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	50 max.	volts
Positive-bias value	0 max.	volts
CATHODE CURRENT	20 max.	ma
GRID-No.3 INPUT	0.15 max.	watt
PLATE DISSIPATION	3.25 max.	watts

Maximum Circuit Values:

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

[a] The dc component must not exceed 100 volts.
[b] With external shield JEDEC No.316 connected to pin 7.

OPERATING CONSIDERATIONS

This type has four grids—grid No.1 (Control grid), grid No.2 (Focusing grid), grid No.3 (Screen grid), and grid No.4 (Suppressor grid). Grid No.2 is (1) internally connected to cathode and grid No.4, (2) aligned with grid No.3, and (3) located between grids No.1 and No.3. The addition of grid No.2 results in an increase in the plate-current-to-screen-current ratio with subsequent noise reduction.

6FV6

SHARP-CUTOFF TETRODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3 ± 10%	ac or dc volts
Current	0.2	amp
Direct Interelectrode Capacitances:[o]		
Grid No.1 to plate	0.03 max.	μμf
Grid No.1 to cathode, grid No.2, internal shield, and heater	4.5	μμf
Plate to cathode, grid No.2, internal shield, and heater	3	μμf
Cathode to heater	2.7[•]	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	125	volts
Grid-No.2 (Screen-grid) Voltage	80	volts
Grid-No.1 (Control-grid) Voltage	−1	volt
Plate Resistance (Approx.)	0.1	megohm
Transconductance	8000	μmhos
Plate Current	10	ma
Grid-No.2 Current	1.5	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	−6	volts

Mechanical:

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

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

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	275 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	180 max.	volts
GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	

RCA

6FV6

SHARP-CUTOFF TETRODE

GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value.	0	max.	volts
CATHODE CURRENT.	20	max.	ma
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 90 volts	0.5	max.	watt
For grid-No.2 voltages between 90 and 180 volts	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*		
PLATE DISSIPATION.	2	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200*	max.	volts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	0.5	max.	megohm

° With external shield JEDEC No.316 connected to cathode except as noted.
● With external shield JEDEC No.316 connected to ground.
* The dc component must not exceed 100 volts.

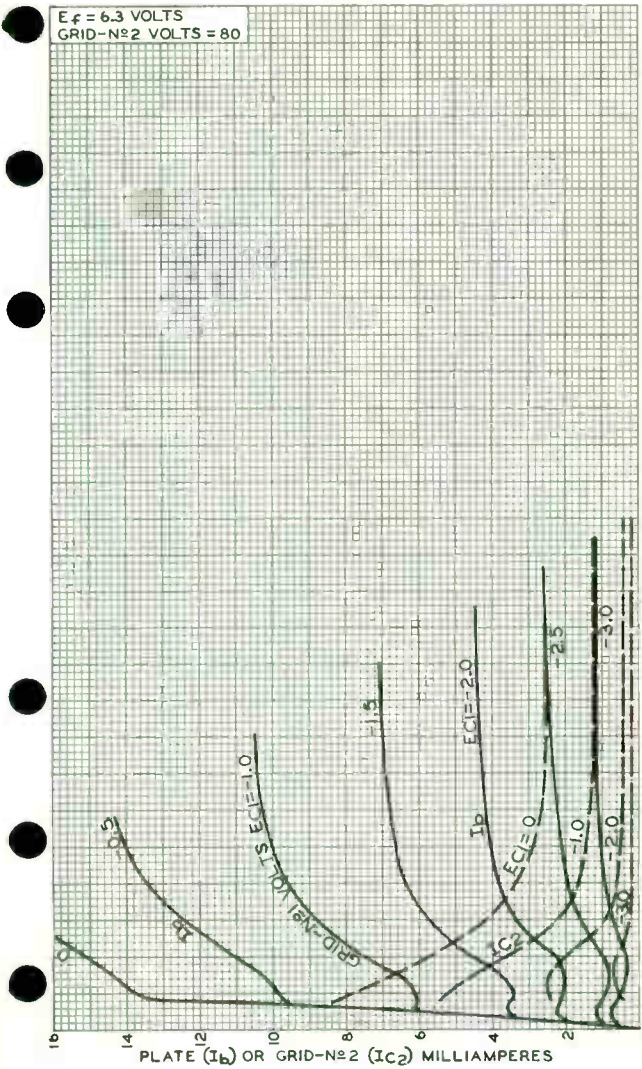
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

RCA

6FV6

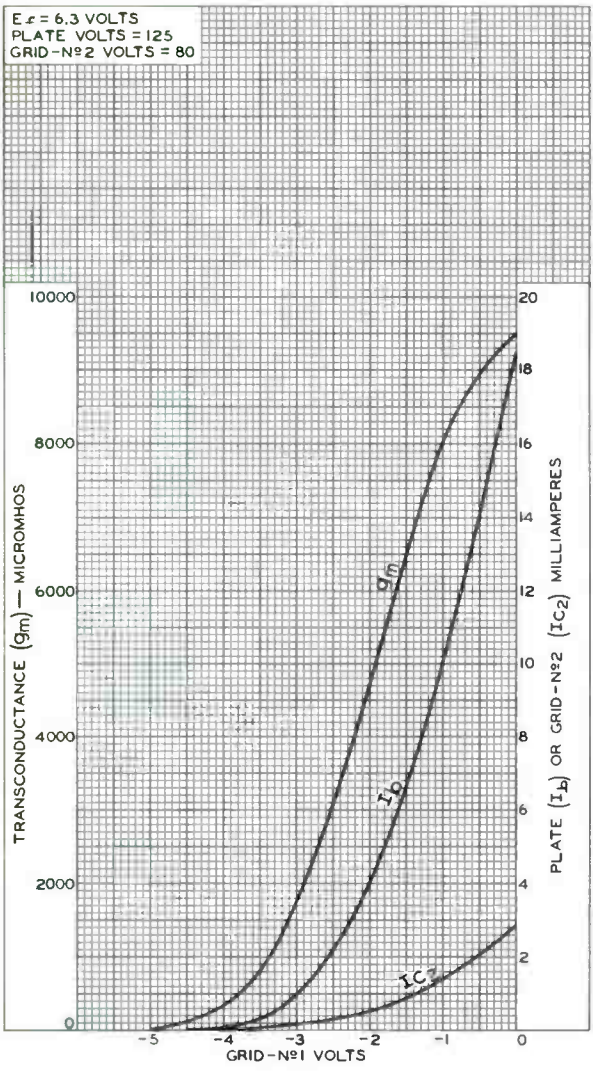
AVERAGE CHARACTERISTICS



RCA

6FV6

AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-9519

6FV8A

Medium-Mu Triode-Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3[a]	6.3 ± 0.6	volts
Current	0.450 ± 0.031	0.450[b]	amp
Warm-up time (Average)	11	–	sec
Peak heater-cathode voltage (Each unit):			
Heater negative with respect to cathode	200 max.		volts
Heater positive with respect to cathode	200[c] max.		volts

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield[d]	
Triode Unit:			
Grid to plate	1.8	1.8	pf
Grid to cathode, pentode cathode & pentode No. 3 & internal shield, and heater	2.8	2.8	pf
Plate to cathode, pentode cathode & pentode grid No. 3 & internal shield, and heater	1.5	2	pf
Pentode Unit:			
Grid No. 1 to plate	0.01 max.	0.01 max.	pf
Grid No. 1 to cathode & grid No. 3 & internal shield, grid No. 2, and heater	5	5	pf
Plate to cathode & grid No. 3 & internal shield, grid No. 2, and heater	2	2	pf
Pentode plate to triode plate	0.15 max.	0.02 max.	pf

Characteristics, Class A_1 Amplifier:

	Triode Unit	Pentode Unit	
Plate Voltage	125	125	volts
Grid-No. 2 Voltage	–	125	volts
Grid-No. 1 Voltage	−1	−1	volt
Amplification Factor	43	–	
Plate Resistance (Approx.)	5600	300000	ohms
Transconductance	8000	6500	μmhos
Plate Current	12	12	ma
Grid-No. 2 Current	–	4	ma
Grid-No. 1 Voltage (Approx.) for plate μa = 20	−7.5	−9	volts

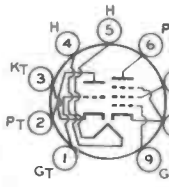
Mechanical:

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"

6FV8A

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, Grid No.3, Internal Shield
Pin 9 – Pentode Grid No.1



AMPLIFIER — Class A_1 *(Pentode Unit)*

Maximum Ratings, *Design-Maximum Values:*

Plate Voltage	330 max.	volts
Grid-No.2 (Screen-Grid) Supply Voltage	330 max.	volts
Grid-No.2 Voltage	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
Grid-No.1 (Control-Grid) Voltage:		
Positive-bias value	0 max.	volts
Grid-No.2 Input:		
For grid-No.2 voltages up to 165 volts	0.55 max.	watt
For grid-No.2 voltages between 165 and 330 volts	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
Plate Dissipation	2.3 max.	watts

Maximum Circuit Values:

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

VERTICAL-DEFLECTION OSCILLATOR *(Triode Unit)*

Maximum Ratings, *Design-Maximum Values:*
For operation in a 525-line, 30-frame system[e]

DC Plate Voltage	330 max.	volts
Peak Negative-Pulse Grid Voltage	250 max.	volts
Cathode Current:		
Peak	70 max.	ma
Average	20 max.	ma
Plate Dissipation	2 max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:		
For cathode-bias operation	3 max.	megohms

[a] At heater amperes = 0.450.
[b] At heater volts = 6.3.
[c] The dc component must not exceed 100 volts.
[d] With external shield JEDEC No.316 connected to pin 4.
[e] As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

Beam Power Tube

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Maximum Values)*:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances (Approx.):[b]		
Grid No.1 to plate	0.5	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	15.0	μμf
Plate to cathode & grid No.3, grid No.2, and heater	7.0	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
Amplification Factor	–	4.4	–	
Plate Resistance (Approx.)	–	–	18000	ohms
Transconductance	–	–	7300	μmhos
Plate Current	345[c]	–	65	ma
Grid-No.2 Current	27[c]	–	1.8	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 1	–	–	-42	volts
Grid-No.1 Voltage (Approx.) for peak positive-pulse plate volts = 5000, grid-No.2 volts = 150, and plate ma. = 1	–	–	-100	volts

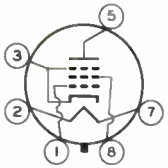
Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3-7/8"
Maximum Seated Length	3-5/16"
Diameter	1.438" to 1.562"
Bulb	T12
Base	Short Medium-Shell Octal 6-Pin with External Barriers, Arrangement 1, Style A, (JEDEC Group 1, No.B6-112)

6FW5

Basing Designation for BOTTOM VIEW. 6CK

Pin 1 – Grid No.1
Pin 2 – Heater
Pin 3 – Cathode, Grid No.3



Pin 5 – Plate
Pin 7 – Heater
Pin 8 – Grid No.2

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[d]

DC PLATE VOLTAGE.	770 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[e]. . .	6500 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE. . .	220 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE .	330 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE . .	-55 max.	volts
CATHODE CURRENT:		
Peak.	610 max.	ma
Average	175 max.	ma
GRID-No.2 INPUT	3.6 max.	watts
PLATE DISSIPATION[f].	18 max.	watts
BULB TEMPERATURE (At hottest point on bulb surface).	220 max.	°C

Maximum Circuit Values:

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

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

[c] 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.

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

[e] 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.

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

6FY7

Dual Triode

With High-Mu Unit and Low-Mu Unit

DUODECAR TYPE

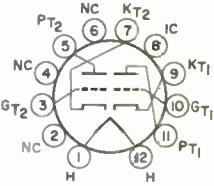
Electrical:

Heater Characteristics and Ratings:			
Voltage (AC or DC)	6.3 ± 0.6		volts
Current at 6.3 volts	1.050		amp
Maximum heater-cathode voltage (Each unit):			
Heater negative with respect to cathode:			
Peak	200		volts
Heater positive with respect to cathode:			
Peak	200		volts
DC component	100		volts
Direct Interelectrode Capacitances (Approx.):[a]	*Unit No.1*	*Unit No.2*	
Grid to plate	4.4	9.5	pf
Input: G to (K, H)	2.2	6.5	pf
Output: P to (K, H)	0.4	1.2	pf

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2.875"
Seated Length	2.250" to 2.500"
Diameter	1.062" to 1.188"
Dimensional Outline (JEDEC 9-60)	See *General Section*
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC No.E12-70)
Basing Designation for BOTTOM VIEW	12E0

Pin 1 – Heater
Pin 2 – No Internal Connection
Pin 3 – Grid of Unit No.2
Pin 4 – No Internal Connection
Pin 5 – Plate of Unit No.2
Pin 6 – No Internal Connection
Pin 7 – Cathode of Unit No.2
Pin 8 – Do Not Use
Pin 9 – Cathode of Unit No.1
Pin 10 – Gric of Unit No.1
Pin 11 – Plate of Unit No.1
Pin 12 – Heater



Characteristics, Class A1 Amplifier:

	Unit No.1	*Unit No.2*		
Plate Voltage	250	60	150	volts
Grid Voltage	−3	0[b]	−17.5	volts
Amplification Factor	65	–	6	
Plate Resistance (Approx.)	40500	–	920	ohms
Transconductance	1600	–	6500	μmhos
Plate Current	1.4	95	35	ma
Plate Current for grid volts = −25	–	–	6	ma
Grid-Voltage for plate μa = 30	−5.5	–	–	volts
Grid-Voltage for plate μa = 50	–	–	−36	volts

VERTICAL DEFLECTION OSCILLATOR AND AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[c]

	Unit No.1 (Oscillator)	*Unit No.2 (Amplifier)*	
DC Plate Voltage	330	275	volts
Peak Positive-Pulse Plate Voltage	–	2000	volts
Peak Negative Pulse-Grid Voltage	400	250	volts
Cathode Current:			
Peak	70	175	ma
Average	20	50	ma
Plate Dissipation	1	7[d]	watts
Maximum Circuit Values:			
Grid-Circuit Resistance	2.2	2.2	megohms

[a] Without external shield.

[b] Applied for short interval (2 seconds maximum) so as not to damage tube.

[c] 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.

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

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

Beam Power Tube—
Sharp-Cutoff Pentode

DUODECAR TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ±0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances (Approx.):[b]		
Beam Power Unit:		
Grid No.1 to plate	0.26	pf
Grid No.1 to cathode & grid No.3, grid No.2, internal shield, and heater	12.0	pf
Plate to cathode & grid No.3, grid No.2, internal shield, and heater	12.0	pf
Pentode Unit:		
Grid No.1 to plate	0.034	pf
Grid No.3 to plate	2.8	pf
Grid No.1 to cathode, grid No.2, grid No.3, internal shield, and heater	6.5	pf
Grid No.3 to cathode, grid No.1, grid No.2, plate, internal shield, and heater	7.5	pf
Grid No.1 to grid No.3	0.24	pf
Plate of beam power unit to plate of pentode unit	0.12	pf

Characteristics, Class A_1 Amplifier (Pentode Unit):

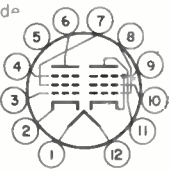
Plate Supply Voltage	150	volts
Grid-No.3 Supply Voltage	*Connected to cathode at socket*	
Grid-No.2 Supply Voltage	100	volts
Cathode Resistor	560	ohms
Plate Resistance (Approx.)	0.15	megohm
Transconductance, Grid No.1 to Plate	1000	μmhos
Transconductance, Grid No.3 to Plate	400	μmhos
Plate Current	1.3	ma
Grid-No.2 Current	2	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	−4.5	volts
Grid-No.3 Voltage (Approx.) for plate μa = 10	−4.5	volts

6G11

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2.375"
Seated Length	1.750" to 2.000"
Diameter	1.062" to 1.188"
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC No.E12-70)
Basing Designation for BOTTOM VIEW	12BU

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



Pin 8 – Beam Power Grid No.1
Pin 9 – Beam Power Cathode, Beam Power Plate
Pin 10 – Beam Power Grid No.2
Pin 11 – Beam Power Plate
Pin 12 – Heater

PENTODE UNIT — FM SOUND DETECTOR

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	330 max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE	28 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	330 max.	volts
GRID-No.2 VOLTAGE	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 165 volts	1.1 max.	watts
For grid-No.2 voltages between 165 and 330 volts	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	

BEAM POWER UNIT — AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

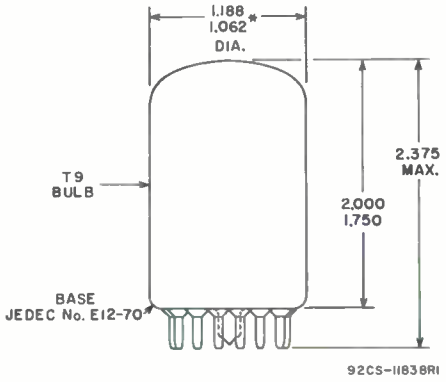
PLATE VOLTAGE	150 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	135 max.	volts
AVERAGE CATHODE CURRENT	65 max.	ma
PLATE DISSIPATION	6.5 max.	watts
GRID-No.2 INPUT	1.8 max.	watts

Typical Operation and Characteristics:

Plate Voltage	120	volts
Grid-No.2 Voltage	110	volts
Grid-No.1 (Control-Grid) Voltage	-8	volts
Peak AF Grid-No.1 Voltage	8	volts

Zero-Signal Plate Current	49	ma
Max.-Signal Plate Current	50	ma
Zero-Signal Grid-No.2 Current	4	ma
Max.-Signal Grid-No.2 Current	8.5	ma
Plate Resistance (Approx.)	10000	ohms
Transconductance	7500	μmhos
Load Resistance	2500	ohms
Total Harmonic Distortion	10	per cent
Max.-Signal Power Output	2.3	watts

[a] The dc component must not exceed 100 volts.
[b] Without external shield.



DIMENSIONS IN INCHES

* APPLIES TO MINIMUM DIAMETER EXCEPT IN AREA OF SEAL.

Beam Power Tube

MAGNOVAL TYPE

ELECTRICAL

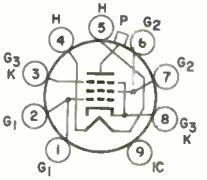
Heater Characteristics and Ratings		
Voltage (AC or DC)	6.3 ± 0.6	V
Current at 6.3 V	1.380	A
Maximum heater–cathode voltage		
Heater negative with respect to cathode:		
Peak	250	V
DC component	125	V
Heater positive with respect to cathode:		
Peak	250	V
DC component	125	V

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	4.125 in
Maximum Seated Length	3.750 in
Diameter	1.062 to 1.188 in
Envelope	JEDEC T9
Cap	Skirted Miniature (JEDEC No. C1-2)
Base	Small-Button Magnoval 9-Pin (JEDEC No. E9-23) ←

TERMINAL DIAGRAM (Bottom View)

Pin 1 – Grid-No.1
Pin 2 – Grid-No.1
Pin 3 – Cathode, Grid No.3
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Grid No.2
Pin 7 – Grid No.2
Pin 8 – Cathode, Grid No.3
Pin 9 – Do Not Use
Cap – Plate



9NH

CHARACTERISTICS, INSTANTANEOUS VALUES[a]

Plate Voltage	75	V
Grid-No.2 (Screen-Grid) Voltage	200	V
Grid-No.1 (Control-Grid) Voltage	-10	V
Plate Current	440	mA
Grid-No.2 Current	37	mA

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values

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

DC Plate-Supply Voltage	275	V
Peak Positive-Pulse Plate Voltage[b]	7700	V
DC Grid-No.2 Voltage	275	V

← Indicates a change.

Average Cathode Current	275	mA
Grid-No.2 Input[c]	5	W
Plate Dissipation[d]	17	W

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance

Without grid current	0.5	MΩ
With grid current (Horizontal output service only)	2.2	MΩ

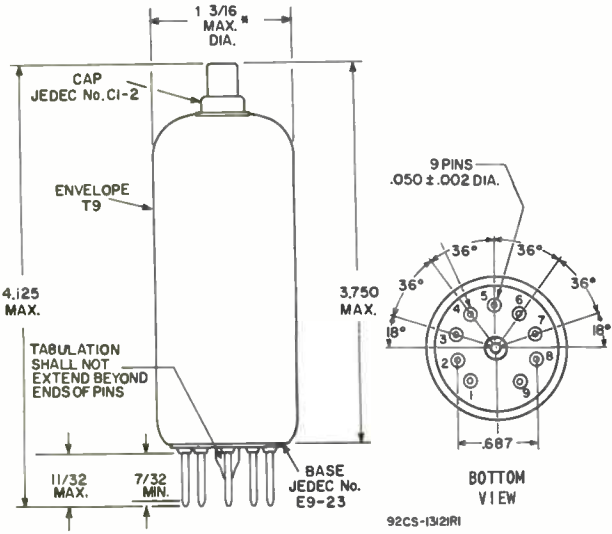
[a] Not to be tested under DC conditions.

[b] 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.

[c] Grid-No.2 input may reach 6 watts for plate-dissipation values below 11 watts.

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

DIMENSIONAL OUTLINE



DIMENSIONS IN INCHES

For pin alignment use gauge No.GE9-2.

* Applies in zone starting 0.375 inch from base seat.

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

Power Pentode

NEONOVAL TYPE

GENERAL DATA

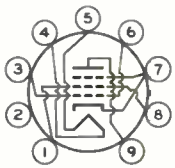
Electrical:

Heater Characteristics and Ratings *(Design-Maximum Values):*		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances (Approx.):[b]		
Grid No.1 to plate	0.9	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	18.0	μμf
Plate to cathode & grid No.3, grid No.2 and heater	7.0	μμf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.230"
Maximum Seated Length	2.920"
Length, Base Seat to Bulb Top (Excluding tip)	2.370" to 2.610"
Diameter	1.062" to 1.188"
Bulb	T9
Base	Large-Button Neonoval 9-Pin (JEDEC No.E9-68)
Basing Designation for BOTTOM VIEW	9EU

Pin 1 - Grid No.2
Pin 2 - No Internal 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-Maximum Values:*

PLATE VOLTAGE	220 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	140 max.	volts
GRID-No.2 INPUT	1.4 max.	watts
PLATE DISSIPATION	12 max.	watts

6GC5

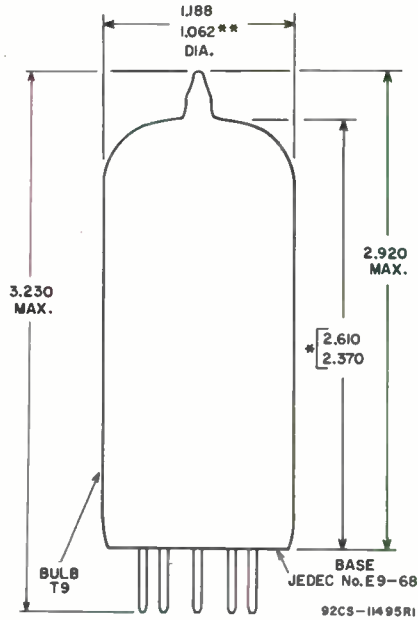
Typical Operation and Characteristics:

	Fixed Bias	*Cathode Bias*	
Plate Supply Voltage.	110	200	volts
Grid-No.2 Supply Voltage.	110	125	volts
Grid-No.1 (Control-Grid) Voltage. .	-7.5	–	volts
Cathode Resistor.	–	180	ohms
Peak AF Grid-No.1 Voltage	7.5	8.5	volts
Zero-Signal Plate Current	49	46	ma
Max.-Signal Plate Current	50	47	ma
Zero-Signal Grid-No.2 Current . . .	4	2.2	ma
Max.-Signal Grid-No.2 Current . . .	10	8.5	ma
Plate Resistance (Approx.).	13000	28000	ohms
Transconductance.	8000	8000	μmhos
Load Resistance	2000	4000	ohms
Total Harmonic Distortion	10	10	%
Max.-Signal Power Output.	2.1	3.8	watts

Maximum Circuit Values:

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

[a] The dc component must not exceed 100 volts.
[b] Without external shield.



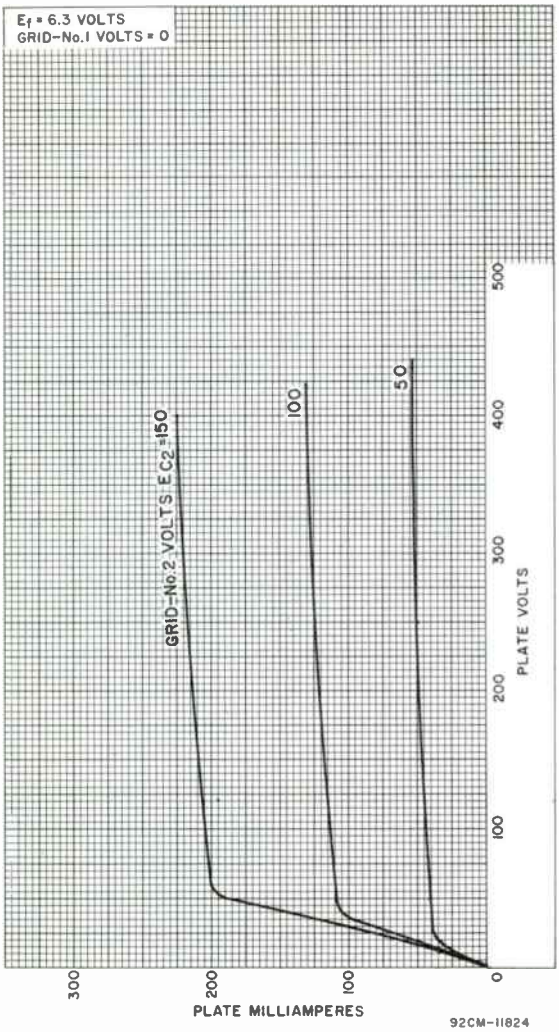
ALL DIMENSIONS IN INCHES

** APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.

* MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY A RING GAUGE OF 0.600" INSIDE DIAMETER.

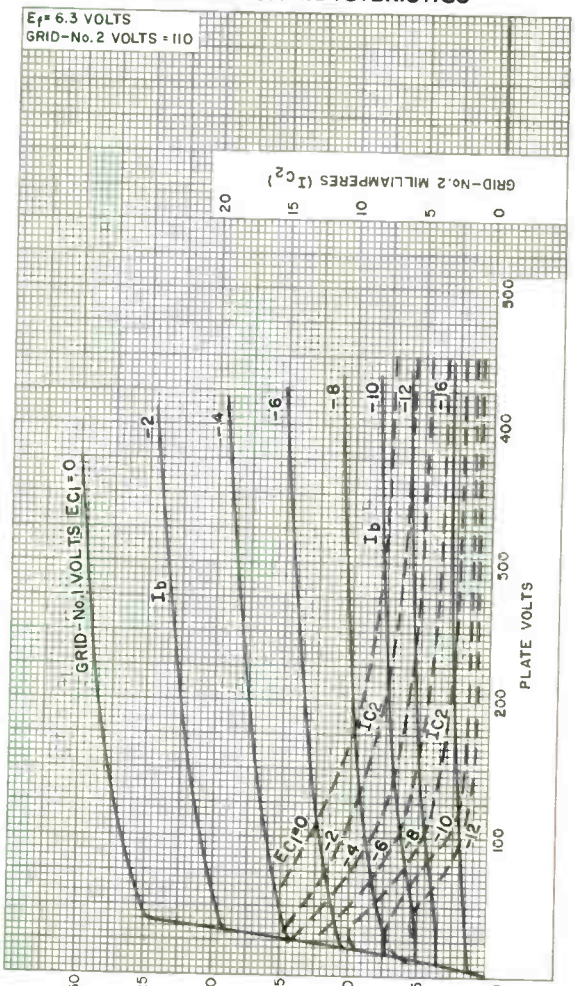
6GC5

AVERAGE PLATE CHARACTERISTICS



92CM-11824

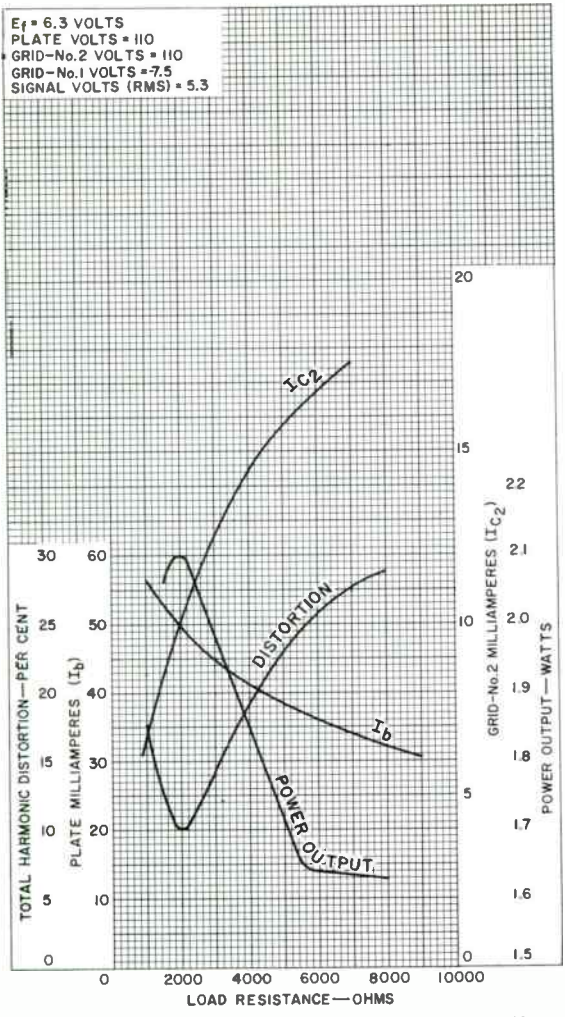
AVERAGE CHARACTERISTICS



92CM-11827

6GC5

OPERATION CHARACTERISTICS



6GE5

Beam Power Tube

DUODECAR TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:					
Voltage (AC or DC)			6.3 ± 0.6		volts
Current at heater volts = 6.3			1.200		amp
Peak heater-cathode voltage:					
Heater negative with respect to cathode			200	max.	volts
Heater positive with respect to cathode			200[a]	max.	volts
Direct Interelectrode Capacitances (Approx.):[b]					
Grid No. 1 to plate			0.34		pf
Grid No.1 to cathode & grid No.3, grid No.2, and heater			16.0		pf
Plate to cathode & grid No.3, grid No.2, and heater			7.0		pf

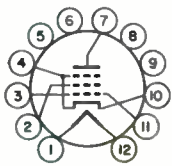
Characteristics, Class A_1 Amplifier:

Plate Voltage	60	150	250	5000	volts
Grid-No.2 Voltage	150	150	150	150	volts
Grid-No.1 Voltage	0	-22.5	-22.5	–	volts
Mu-Factor, Grid No.2 to Grid No.1	–	4.4	–	–	
Plate Resistance (Approx.)	–	–	18000	–	ohms
Transconductance	–	–	7300	–	μmhos
Plate Current	34.5[c]	–	65	–	ma
Grid-No.2 Current	27[c]	–	1.8	–	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 1	–	–	-42	-100	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotentia
Maximum Overall Length	2.875"
Seated Length	2.250" to 2.500"
Diameter	1.437" to 1.563"
Bulb	T12
Base	Large-Button Duodecar 12-Pin (JEDEC No.E12-74)
Basing Designation for BOTTOM VIEW	12BJ

Pin 1 – Heater
Pin 2 – Grid No.2
Pin 3 – Grid No.1
Pin 4 – Cathode, Grid No.3
Pin 5 – Do Not Use[d]
Pin 6 – Do Not Use[d]



Pin 7 – Plate
Pin 8 – Do Not Use[d]
Pin 9 – Do Not Use[d]
Pin 10 – Cathode, Grid No.3
Pin 11 – Grid No.1
Pin 12 – Heater

6GE5

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[e]

DC PLATE-SUPPLY VOLTAGE	770 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[f]	6500 max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	220 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-55 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE	330 max.	volts
CATHODE CURRENT:		
Peak	550 max.	ma
Average	175 max.	ma
GRID-No.2 INPUT	3.5 max.	watts
PLATE DISSIPATION[g]	17.5 max.	watts
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 max.	megohm

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

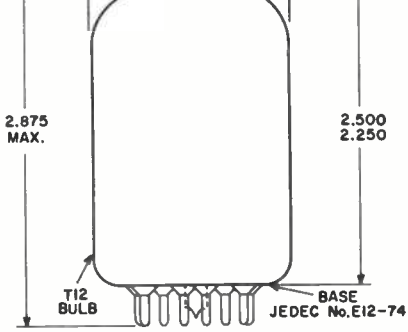
[c] This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

[d] Socket terminals 5,6,8, and 9 should not be used as tie points.

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

[f] 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.

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



ALL DIMENSIONS IN INCHES

*APPLIES TO MINIMUM DIAMETER EXCEPT IN THE AREA OF THE SEAL.

6GF7A

Dual Triode

With High-Mu Unit and Low-Mu Unit

NOVAR TYPE

For Combined Vertical-Deflection-Oscillator and-Amplifier Service in TV Receivers

Electrical:

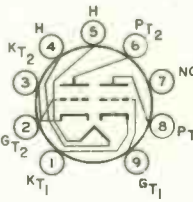
Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.985	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts

Direct Interelectrode Capacitances (Approx.):

	Unit No. 1	Unit No. 2	
Grid to plate	4.6	9.0	pf
G to (K,H)	2.4	6.5	pf
P to (K,H)	0.26	1.4	pf

Mechanical:

Operating Position	Any
Types of Cathodes	Coated Unipotential
Maximum Overall Length	2.360"
Seated Length	1.750" to 2.000"
Diameter	1.062" to 1.188"
Dimensional Outline	See *General Section*
Bulb	T9
Base	Small-Button Novar, 9-Pin with Exhaust Tip (JEDEC No. E9-89)
Basing Designation for BOTTOM VIEW	9QD



Pin 1 – Cathode of Unit No. 1
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. 2
Pin 7 – No internal Connection
Pin 8 – Plate of Unit No. 1
Pin 9 – Grid of Unit No. 1

Characteristics, Class A_1 Amplifier:

	Unit No. 1	Unit No. 2			
Plate Voltage	250	60	150	250	volts
Grid Voltage	-3	0	-20	-28	volts
Amplification Factor	64	–	5.4	–	
Plate Resistance (Approx.)	40000	–	750	–	ohms
Plate Current	1.4	95	50	10	ma
Grid-Voltage (Approx.) for plate μa = 10	-5.5	–	–	–	volts
100	–	–	-45	–	volts

6GF7A

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No. 1

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[b]

DC Plate Voltage	330	max.	volts
Peak Negative Pulse-Grid Voltage	400	max.	volts
Cathode Current:			
Peak	77	max.	ma
Average	22	max.	ma
Plate Dissipation	1.5	max.	watts

Maximum Circuit Values:

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

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No. 2

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

For operation in a 525-line, 30-frame system[b]

DC Plate Voltage	330	max.	volts
Peak Positive-Pulse Plate Voltage (Absolute-maximum value)[c]	1500[d]	max.	volts
Peak Negative-Pulse Grid Voltage	250	max.	volts
Cathode Current:			
Peak	175	max.	ma
Average	50	max.	ma
Plate Dissipation	11	max.	watts

Maximum Circuit Values:

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

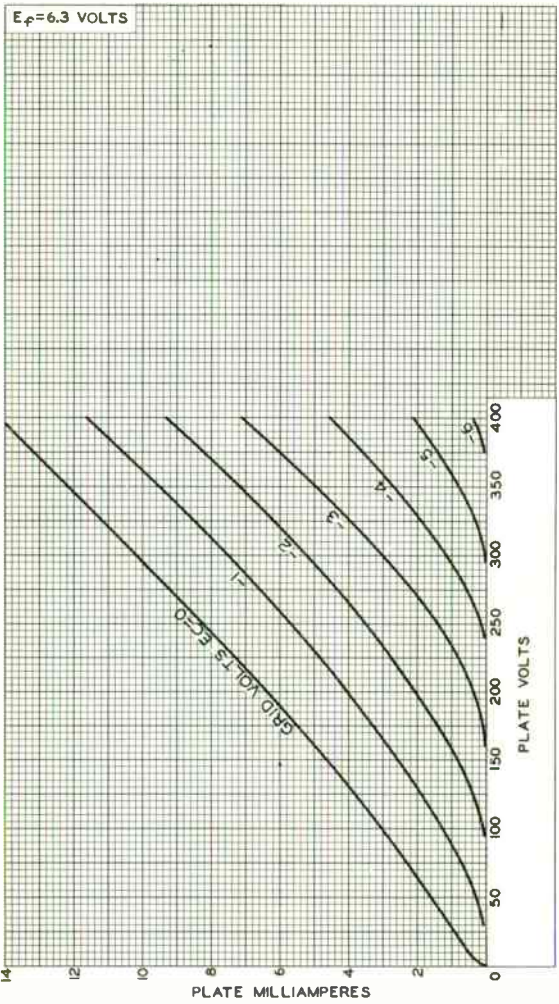
[a] The dc component must not exceed 100 volts.

[b] As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations" Federal Communications Commission.

[c] 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.

[d] Under no circumstances should this absolute-maximum value be exceeded.

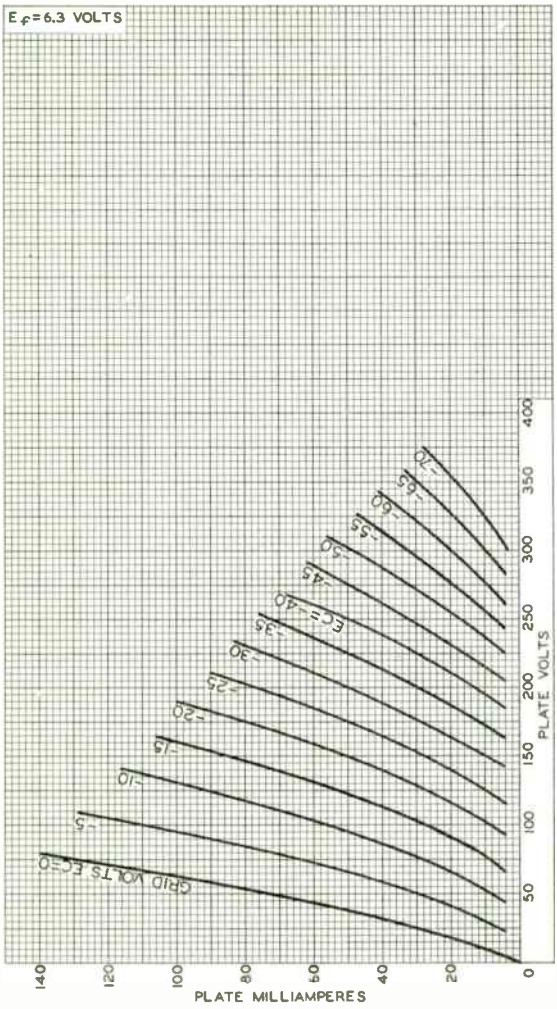
AVERAGE PLATE CHARACTERISTICS
Unit No.1



92CM-9912

6GF7A

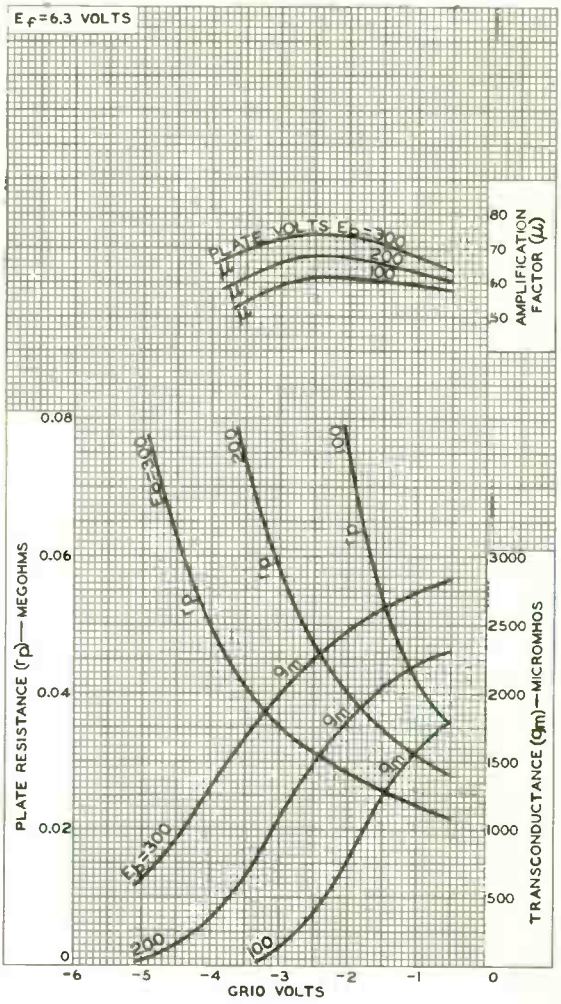
AVERAGE PLATE CHARACTERISTICS
Unit No.2



92CM-10466

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

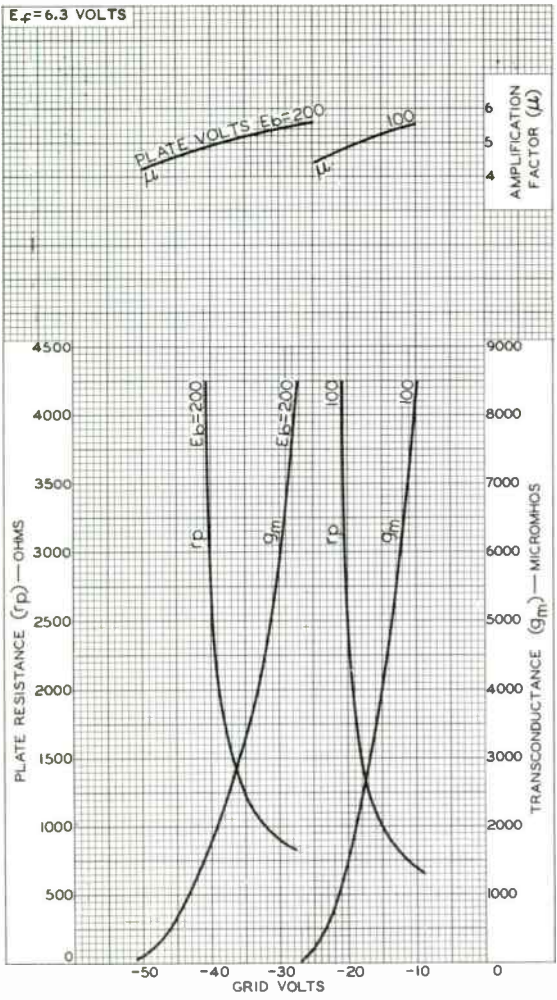
AVERAGE CHARACTERISTICS
Unit No.1



92CM-9915RI

6GF7A

AVERAGE CHARACTERISTICS
Unit No.2



92CM-10467

Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For Multivibrator-Type Horizontal-Deflection Oscillator, AGC Amplifier, and Sync-Separator Applications

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:			
Voltage (AC or DC)	6.3[a]	6.3 ± 0.6	volts
Current	0.450 ± 0.030	0.450[b]	amp
Warm-up time (Average)	11	–	sec
Peak heater-cathode voltage (Each unit):			
Heater negative with respect to cathode		200 max.	volts
Heater positive with respect to cathode		200[c] max.	volts

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield*[d]	
Triode Unit:			
Grid to plate	1.7	1.7	pf
Grid to cathode, pentode grid No.3 & pentode cathode & internal shield, and heater	3.0	3.2	pf
Plate to cathode, pentode grid No.3 & pentode cathode & internal shield, and heater	1.4	1.9	pf
Heater to cathode	3.0	3.0[e]	pf
Pentode Unit:			
Grid No.1 to plate	0.02 max.	0.01 max.	pf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	5.0	5.0	pf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.6	3.4	pf
Heater to cathode & grid No.3 & internal shield	3.0	3.0[e]	pf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Plate Voltage	125	125	volts
Grid-No.2 Voltage	–	125	volts
Grid-No.1 Voltage	-1	-1	volt
Amplification Factor	46	–	
Plate Resistance (Approx.)	5400	200000	ohms
Transconductance	8500	7500	μmhos

6GH8A

Plate Current	13.5	12	ma
Grid-No.2 Current	–	4	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-8	-8	volts

Mechanical:

Operating Position . . . . . Any
Type of Cathodes . . . . . Coated Unipotential
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

HORIZONTAL-DEFLECTION OSCILLATOR

For operation in a 525-line, 30-frame system[f]

Maximum Ratings, *Design-Maximum Values:*

	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE	330 max.	350 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	–	330 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0 max.	0 max.	volts
Peak-negative value	–	175 max.	volts
PLATE DISSIPATION	2.5 max.	2.5 max.	watts
GRID-No.2 INPUT	–	0.55 max.	watts
CATHODE CURRENT:			
Peak	–	300 max.	ma
Average	–	20 max.	ma

Maximum Circuit Values (Each Unit):

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

[a] At heater amperes = 0.450.
[b] At heater volts = 6.3.
[c] The dc component must not exceed 100 volts.
[d] With external shield JEDEC No.315 connected to cathode of unit under test except as noted.
[e] With external shield JEDEC No.315 connected to ground.
[f] As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

INTERELECTRODE LEAKAGE

Leakage Resistance between Plate of Each Unit and All Other Electrodes of both units tied together . . . . . 100 min. megohms

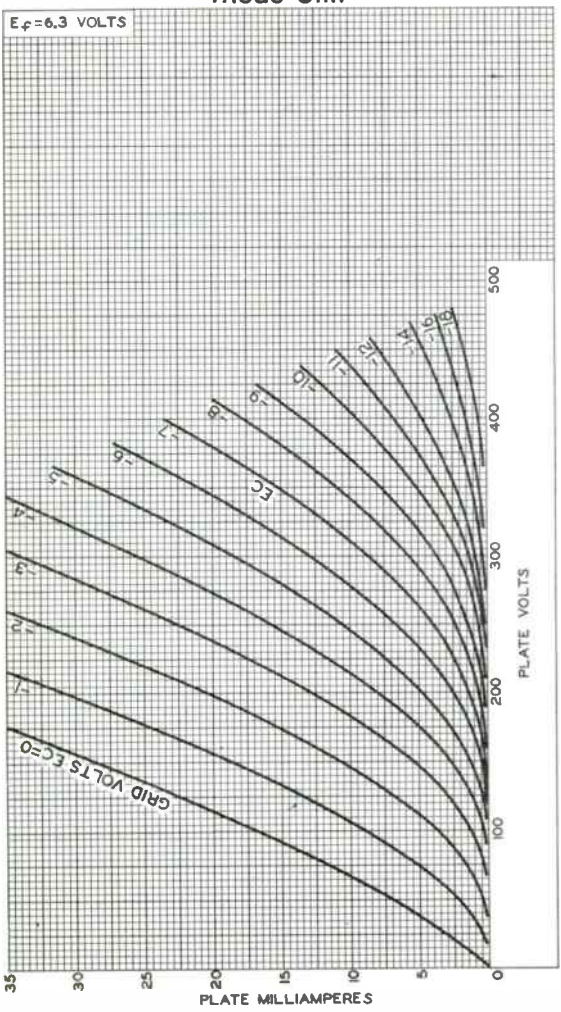
This test is performed under the following conditions: heater volts = 6.3; and plate 300 volts negative with respect to all other electrodes tied together.

Leakage Resistance between Grid No.1 of Each Unit and All Other Electrodes of both units tied together . . . . . 100 min. megohms

This test is performed under the following conditions: heater volts = 6.3; and grid 100 volts negative with respect to all other electrodes tied together.

6GH8A

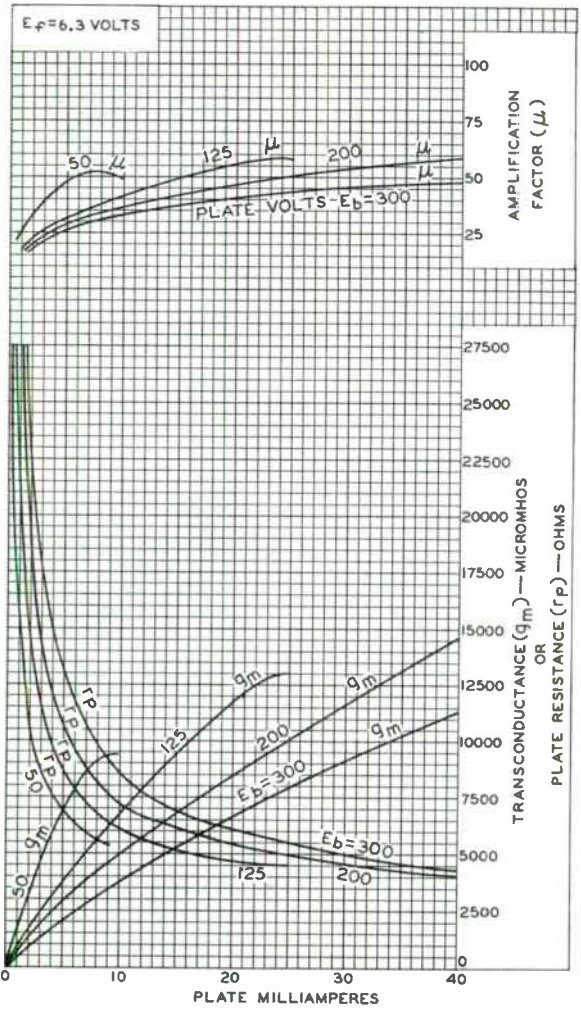
AVERAGE PLATE CHARACTERISTICS
Triode Unit



92CM-10421RI

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

AVERAGE CHARACTERISTICS
Triode Unit



92CM—10428

6GH8A

AVERAGE CHARACTERISTICS
Pentode Unit

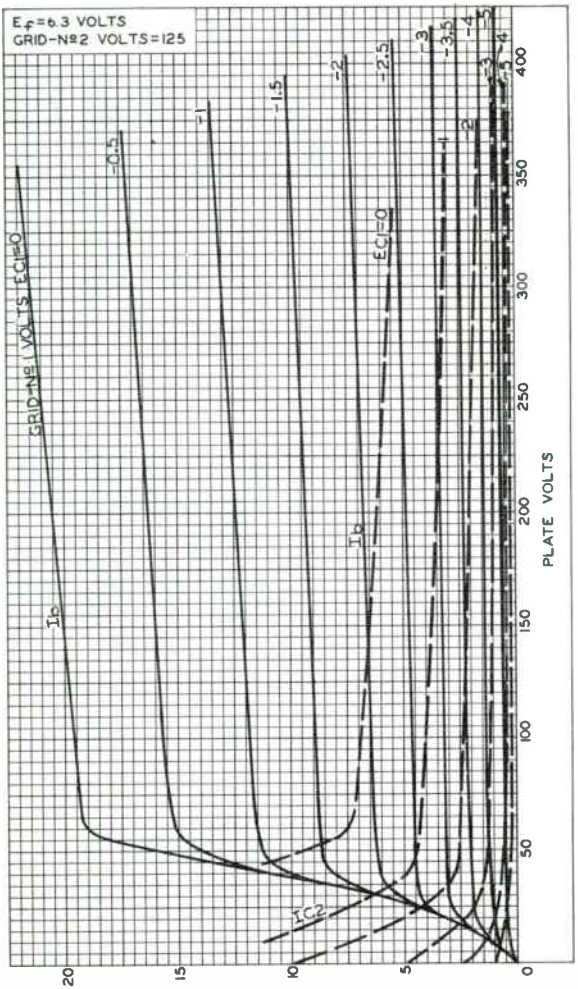
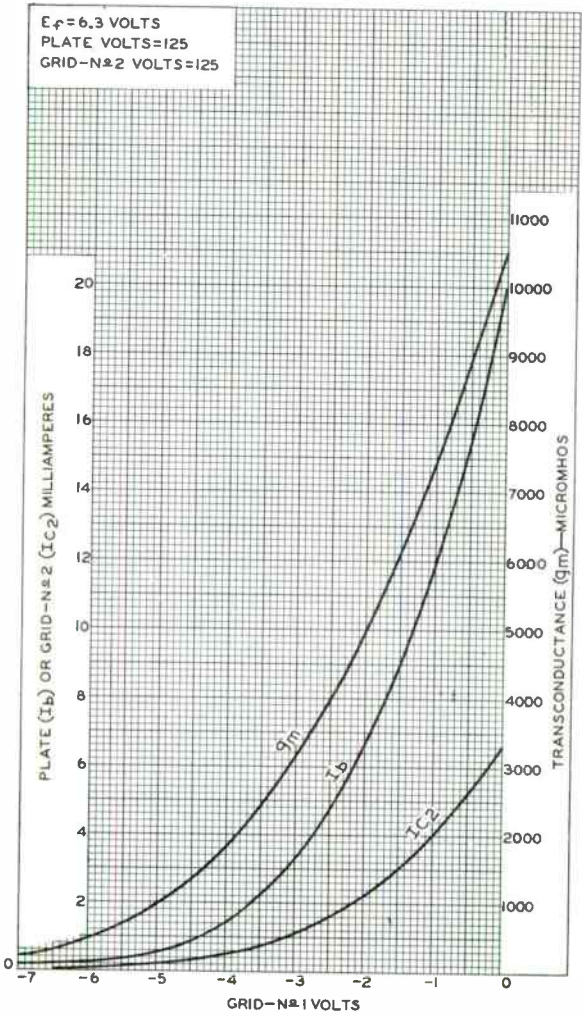


PLATE (I_b) OR GRID-№2 (I_{c2}) MILLIAMPERES

92CM-10436

AVERAGE CHARACTERISTICS
Pentode Unit



92CM-10417

Beam Power Tube

NOVAR TYPE

GENERAL DATA

Electrical:

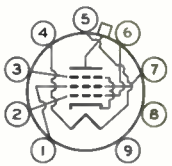
Heater, for Unipotential Cathode:			
Voltage (AC or DC)	6.3	± 10%	volts
Current at 6.3 volts	1.2		amp
Mu-Factor, Grid No.2 to Grid No.1 for plate volts = 150, grid-No.2 volts = 150, grid-No.1 volts = -22.5	4.4		
Direct Interelectrode Capacitances (Approx.):[a]			
Grid No.1 to plate	0.26		μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	15		μμf
Plate to cathode & grid No.3, grid No.2, and heater	6.5		μμf

Characteristics, Class A$_1$ Amplifier:

Plate Voltage	60	250	volts
Grid-No.2 Voltage	150	150	volts
Grid-No.1 Voltage	0	-22.5	volts
Plate Resistance (Approx.)	-	15000	ohms
Transconductance	-	7100	μmhos
Plate Current	390[b]	70	ma
Grid-No.2 Current	32[b]	2.1	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 1	-	-42	volts

Mechanical:

Operating Position . . . . . Any
Maximum Overall Length . . . . . 3.55"
Seated Length . . . . . 3.04" ± 0.13"
Diameter . . . . . 1.438" to 1.562"
Bulb T12
Cap . . . . . Skirted Miniature (JEDEC C1-2 or C1-3)
Socket . . . . . Cinch Mfg. Co. No.149 1900 24, Industrial Electronic Hardware Co. No.30-0968-M, or equivalent
Base . . . . . Large-Button Novar 9-Pin (JEDEC No.E9-76)
Basing Designation for BOTTOM VIEW 9NM



Pin 1 - Grid No.2
Pin 2 - Grid No.1
Pin 3 - Cathode, Grid No.3
Pin 4 - Heater
Pin 5 - Heater
Pin 6 - Grid No.1
Pin 7 - Grid No.2
Pin 8 - Do Not Use
Pin 9 - Do Not Use
Cap - Plate

6GJ5

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[c]

DC PLATE-SUPPLY VOLTAGE	770	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[d]	6500	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	220	max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-55	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE	330	max.	volts
CATHODE CURRENT:			
Peak	550	max.	ma
Average	175	max.	ma
GRID-No.2 INPUT	3.5	max.	watts
PLATE DISSIPATION[e]	17.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[f]	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	240	max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:			
For grid resistor-bias operation	1	max.	megohm

[a] Without external shield.

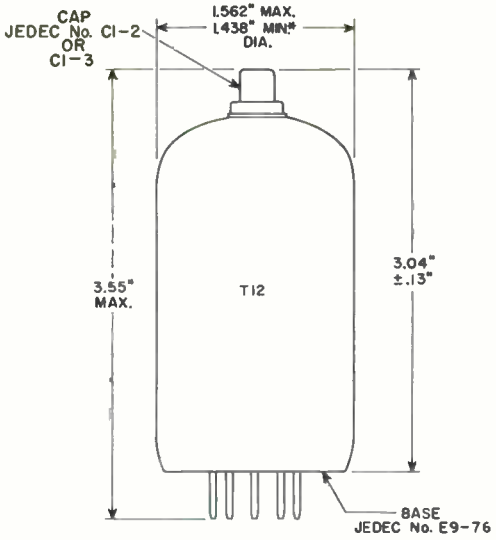
[b] This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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

[d] 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.

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

[f] The dc component must not exceed 100 volts.

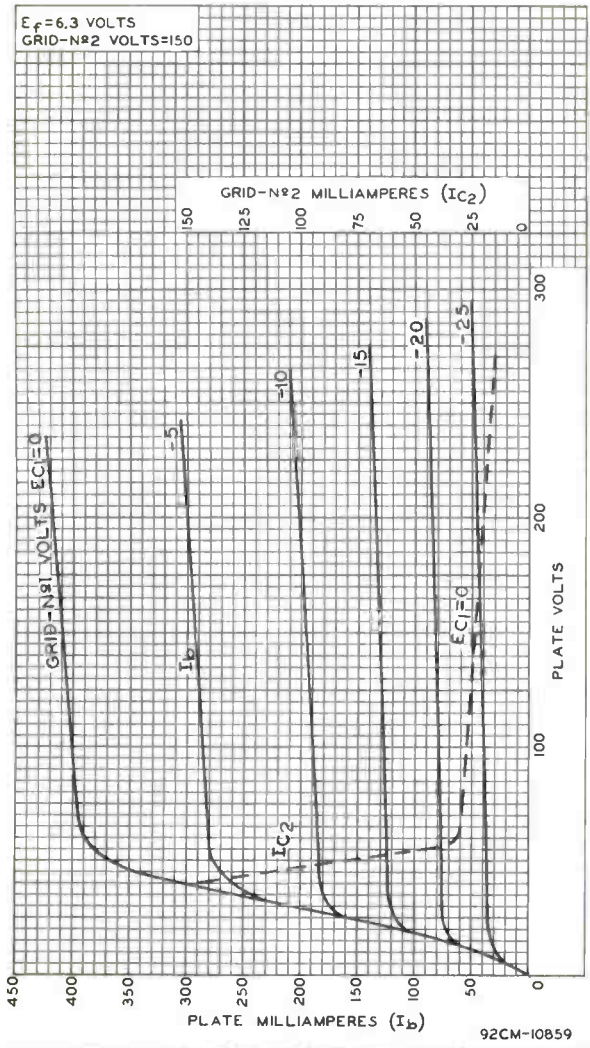


92CS-11127R1

* APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.

6GJ5

AVERAGE CHARACTERISTICS



92CM-10859

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

6GJ5A

Beam Power Tube

NOVAR TYPE

For Horizontal-Deflection-Amplifier Service in Black-and-White TV Receivers

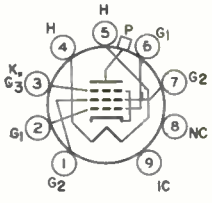
Electrical:

Heater Ratings and Characteristics:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 max.[a]	volts
Direct Interelectrode Capacitances (Approx.):[b]		
Grid No.1 to plate	0.26	pf
Input: G1 to (K,G3,G2,H)	15.0	pf
Output: P to (K,G3,G2,H)	6.5	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.505"
Seated Length	2.875" to 3.125"
Diameter	1.438" to 1.562"
Dimensional Outline	See *General Section*
Bulb	T12
Cap	Skirted Miniature (JEDEC C1-2 or C1-3)
Base	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC No.E9-88)
Basing Designation for BOTTOM VIEW	9QK

Pin 1 – Grid No.2
Pin 2 – Grid No.1
Pin 3 – Cathode, Grid No.3
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Grid No.1
Pin 7 – Grid No.2
Pin 8 – No Internal Connection
Pin 9 – Do Not Use
Cap – Plate



Characteristics, Class A_1 Amplifier:

	Triode Connection	*Pentode Connection*		
Plate Voltage	150	60	250	volts
Grid-No.2 Voltage	150	150	150	volts
Grid-No.1 Voltage	-22.5	0	-22.5	volts
Mu-factor, Grid No.2 to Grid No.1	4.4	–	–	
Plate Resistance (Approx.)	–	–	15000	ohms
Transconductance	–	–	7100	μmhos

	Triode Connection	Pentode Connection		
Plate Current	–	390[c]	70	ma
Grid-No.2 Current	–	32[c]	2.1	ma
Grid-No.1 Voltage (Approx.) for plate ma = 1.	–	–	-42	volts

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[d]

DC Plate-Supply Voltage	770	max.	volts
Peak Positive-Pulse Plate Voltage[e]	6500	max.	volts
Peak Negative-Pulse Plate Voltage	1500	max.	volts
DC Grid-No.2 (Screen-Grid) Voltage	220	max.	volts
DC Grid-No.1 (Control-Grid) Voltage	-55	max.	volts
Peak Negative-Pulse Grid-No.1 Voltage	330	max.	volts
Cathode Current:			
Peak	550	max.	ma
Average	175	max.	ma
Grid-No.2 Input	3.5	max.	watts
Plate Dissipation[f]	17.5	max.	watts
Bulb Temperature (At hottest point on bulb surface)	240	max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance: For grid resistor-bias operation	1	max.	megohm

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

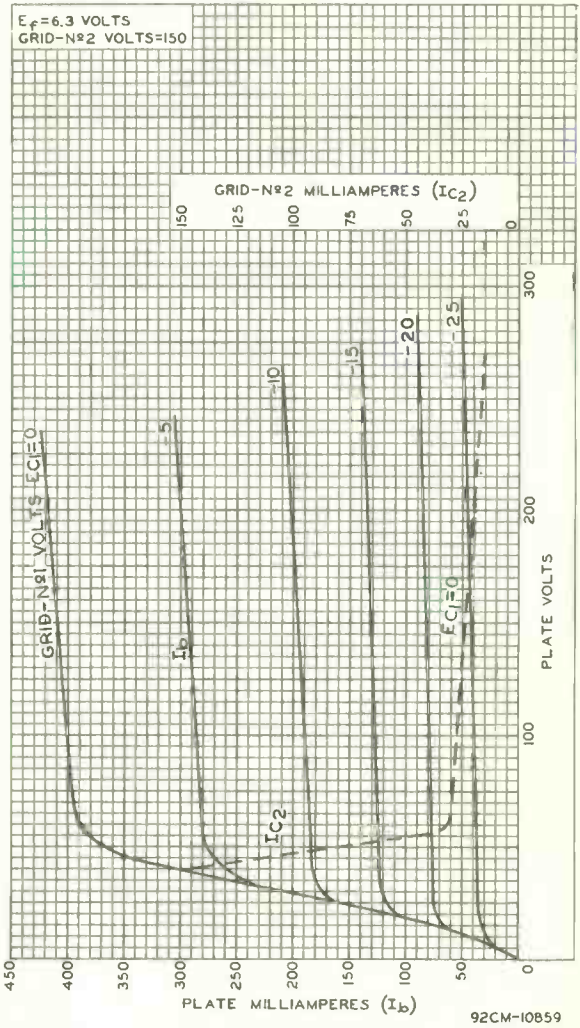
[c] This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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

[e] 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.

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

AVERAGE CHARACTERISTICS



Medium-Mu Triode—Sharp-Cutoff Pentode

ELECTRICAL

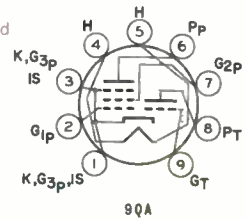
Heater Characteristics and Ratings		
Voltage (AC or DC)	6.3 ± 0.6	V
Current at 6.3 V	0.410	A
Heater-cathode voltage[a]	110 max	V
Direct Interelectrode Capacitances (Approx.)		
Triode Unit		
P_T to G_T	1.8	pF
G_T to K, H	3.3	pF
P_T to all except G1p	1.7	pF
Pentode Unit (With external shield)		
Input	6.2	pF
Output	3.5	pF
P_P to G1p	0.009	pF
G1p to G2p	1.5	pF
Between Triode and Pentode Units		
P_T to P_P	0.025 max	pF
P_P to G_T	0.01 max	pF
P_T to G1p	0.01 max	pF
G_T to G1p	0.01 max	pF

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2 in
Maximum Seated Length	1-3/4 in
Diameter	0.750 to 0.875 in
Envelope	JEDEC T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)

TERMINAL DIAGRAM (Bottom View)

Pin 1 – Cathode, Pentode Grid No.3, Internal Shield
Pin 2 – Pentode Grid No.1
Pin 3 – Same as Pin 1
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Pentode Plate
Pin 7 – Pentode Grid No.2
Pin 8 – Triode Plate
Pin 9 – Triode Grid



9QA

CHARACTERISTICS

	Triode Unit	*Pentode Unit*	
Plate Voltage	100	170	V
Grid-No.2 Voltage	-	120	V
Grid-No.1 Voltage	-3	-1.2	V
Amplification Factor	20	55[b]	

	Triode Unit	Pentode Unit	
Plate Resistance (Approx.)	-	0.35	MΩ
Transconductance	9000	11000	μmhos
Plate Current	15	10	mA
Grid No.2 Current	-	3	mA

DESIGN-MAXIMUM RATINGS

	Triode Unit	Pentode Unit	
Plate-Supply Voltage	600	600	V
DC Plate Voltage	140	275	V
Grid-No.2 Supply Voltage	-	600	V
DC Grid-No.2 (Screen-Grid) Voltage	-	275	V
DC Grid-No.1 (Control-Grid) Voltage	-	-50	V
Cathode Current	22	20	mA
Plate Dissipation	1.8	2.4	W
Grid-No.2 Input[c]	-	0.55	W

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance			
For fixed-bias operation	0.5	1	MΩ
For cathode-bias operation	0.5	2.2	MΩ

[a] The hum should be minimized in intercarrier receiver applications by limiting the heater-cathode voltage to 100 volts rms, and in AM receivers to 50 volts rms.

[b] Grid No.2 to grid No.1; approximate value.

[c] When control grid bias is between -1.5 and -2 volts, screen dissipation is limited to 0.50 watt. When this bias is greater than -2 volts, maximum screen dissipation is 0.36 watt.

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

6GK5

High-Mu Triode

7-PIN MINIATURE TYPE

For VHF-Amplifier Applications

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.18	amp
Direct Interelectrode Capacitances (Approx.):[a]		
Grid to plate	0.52	μμf
Grid to cathode, internal shield, and heater	5	μμf
Plate to cathode, internal shield, and heater	3.5	μμf
Heater to cathode	2.5[b]	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	135	volts
Grid Voltage	-1	volt
Amplification Factor	78	
Plate Resistance (Approx.)	5400	ohms
Transconductance	15000	μmhos
Plate Current	11.5	ma
Grid Voltage (Approx.) for transconductance (μmhos) =		
150	-4.2	volts
1500	-2.5	volts
Input Resistance[c]	275	ohms
Input Capacitance[c]	11.2	μμf
Noise Figure[d]	4.7	db

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	7FP

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

Pin 5 – Plate
Pin 6 – Internal Shield
Pin 7 – Cathode

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	200 max.	volts
GRID VOLTAGE:		
Negative-bias value	50 max.	volts
Positive-bias value	0 max.	volts
AVERAGE CATHODE CURRENT	22 max.	ma
PLATE DISSIPATION	2.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts

Maximum Circuit Values:

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

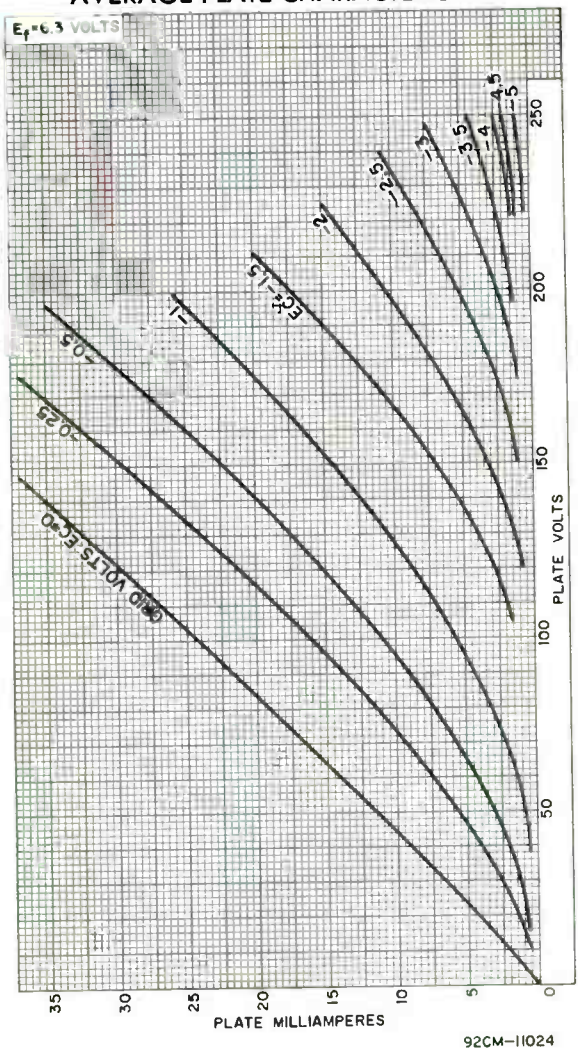
[a] With external shield JEDEC No.316 connected to cathode except as noted.

[b] With external shield JEDEC No.316 and internal shield connected to ground.

[c] Measured at 200 Mc with heater volts = 6.3 and plate effectively grounded for rf voltages.

[d] For a neutralized triode amplifier at a frequency of 200 Mc with signal-source impedance adjusted for minimum noise output.

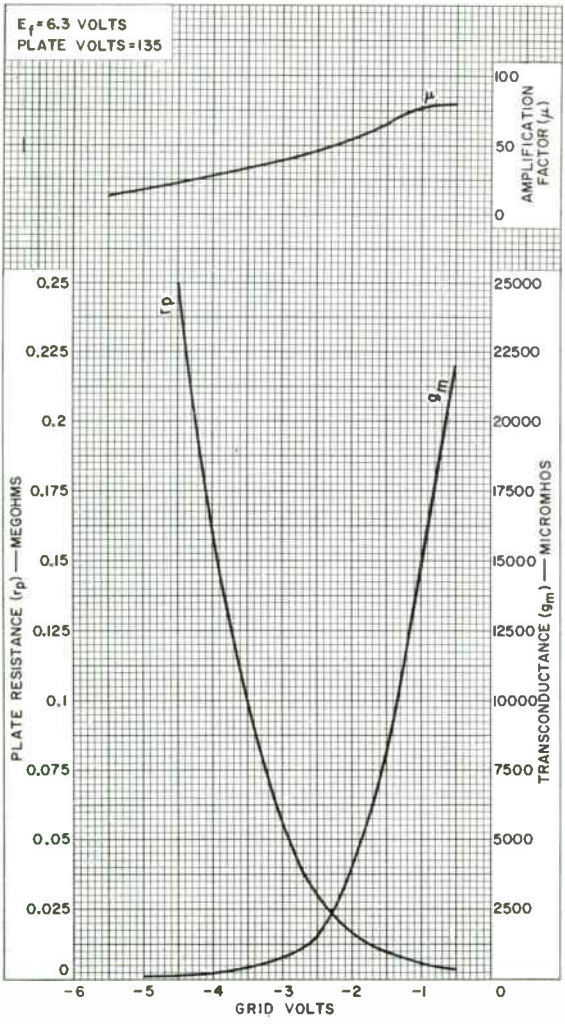
AVERAGE PLATE CHARACTERISTICS



92CM-11024

6GK5

AVERAGE CHARACTERISTICS



92CM-11023

6GK6

Power Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.76	amp
Direct Interelectrode Capacitances:[a]		
Grid No.1 to plate	0.14 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	10	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	7	μμf

Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	250	volts
Grid-No.2 Supply Voltage	250	volts
Cathode Resistor	135	ohms
Mu-Factor, Grid No.2 to Grid No.1	19	
Plate Resistance (Approx.)	38000	ohms
Transconductance	11300	μmhos
Plate Current	48	ma
Grid-No.2 Current	5.5	ma

Mechanical:

Operating Position	Any
Maximum Overall Length	3-1/16"
Maximum Seated Length	2-13/16"
Length, Base Seat to Bulb Top (Excluding tip)	2-7/16" ± 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	9GK

Pin 1 – Cathode
Pin 2 – Grid No.1
Pin 3 – Grid No.3, Internal Shield
Pin 4 – Heater
Pin 5 – Heater

Pin 6 – No Connection
Pin 7 – Plate
Pin 8 – Grid No.2
Pin 9 – Grid No.3, Internal Shield

AF POWER AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE SUPPLY VOLTAGE	600 max.	volts
PLATE VOLTAGE	330 max.	volts
GRID-No.2 SUPPLY VOLTAGE	600 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	330 max.	volts

GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	100 max.	volts
CATHODE CURRENT	65 max.	ma
GRID-No.2 INPUT:		
Peak	4 max.	watts
Average	2 max.	watts
PLATE DISSIPATION	13.2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts

Typical Operation:

Plate Supply Voltage	250	volts
Grid-No.2 Supply Voltage	250	volts
Cathode Resistor	135	ohms
Peak AF Grid-No.1 Voltage	7.3	volts
Zero-Signal Plate Current	48	ma
Max.-Signal Plate Current	50.6	ma
Zero-Signal Grid-No.2 Current	5.5	ma
Max.-Signal Grid-No.2 Current	10	ma
Effective Load Resistance	5200	ohms
Total Harmonic Distortion	10	%
Max.-Signal Power Output	5.7	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.3 max.	megohm
For cathode-bias operation	1 max.	megohm

PUSH-PULL AF POWER AMPLIFIER — Class AB_1

Maximum Ratings, *Design-Maximum Values:*

PLATE SUPPLY VOLTAGE	600 max.	volts
PLATE VOLTAGE	330 max.	volts
GRID-No.2 SUPPLY VOLTAGE	600 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	330 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	100 max.	volts
CATHODE CURRENT	65 max.	ma
GRID-No.2 INPUT:		
Peak	4 max.	watts
Average	2 max.	watts
PLATE DISSIPATION	13.2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts

Typical Operation:

Values are for 2 tubes

Plate Supply Voltage	250	300	volts
Grid-No.2 Supply Voltage	250	300	volts
Cathode Resistor	130	130	ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage	22.4	28	volts
Zero-Signal Plate Current	62	72	ma

Max.-Signal Plate Current	75	92	ma
Zero-Signal Grid-No.2 Current	7	8	ma
Max.-Signal Grid-No.2 Current	15	22	ma
Effective Load Resistance (Plate to plate)	8000	8000	ohms
Total Harmonic Distortion	3	4	%
Max.-Signal Power Output	11	17	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

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

PUSH-PULL AF POWER AMPLIFIER — Class B

Maximum Ratings, *Design-Maximum Values:*

PLATE SUPPLY VOLTAGE	600 max.	volts
PLATE VOLTAGE	330 max.	volts
GRID-No.2 SUPPLY VOLTAGE	600 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	330 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	100 max.	volts
CATHODE CURRENT	65 max.	ma
GRID-No.2 INPUT:		
Peak	4 max.	watts
Average	2 max.	watts
PLATE DISSIPATION	13.2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts

Typical Operation:

Values are for 2 tubes

Plate Voltage	250	300	volts
Grid-No.2 Voltage	250	300	volts
Grid-No.1 Voltage	-11.6	-14.7	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage	22.4	28	volts
Zero-Signal Plate Current	20	15	ma
Max.-Signal Plate Current	75	92	ma
Zero-Signal Grid-No.2 Current	2.2	1.6	ma
Max.-Signal Grid-No.2 Current	15	22	ma
Effective Load Resistance (Plate to plate)	8000	8000	ohms
Total Harmonic Distortion	3	4	%
Max.-Signal Power Output	11	17	watts

Maximum Circuit Values:

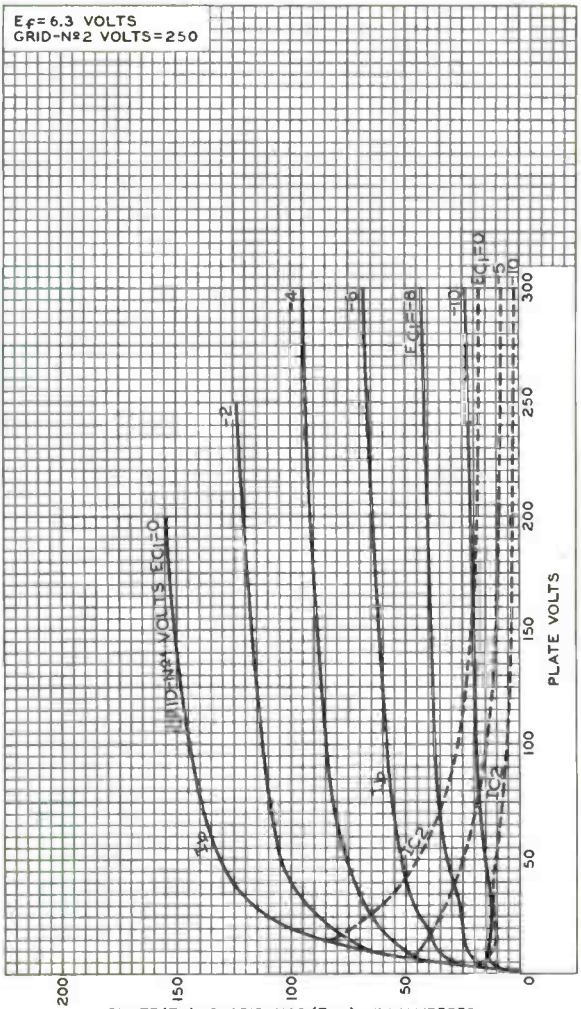
Grid-No.1-Circuit Resistance:

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

[a] Without external shield.

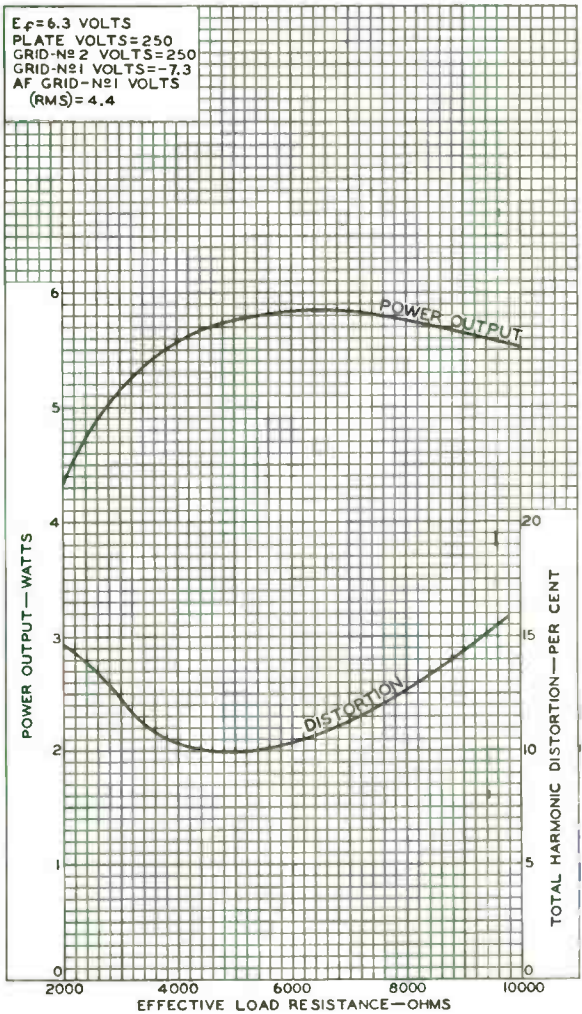
6GK6

AVERAGE CHARACTERISTICS



92CM-9903

OPERATION CHARACTERISTICS



92CM-9902

Dual Triode

With High-Mu Unit and Low-Mu Unit

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.05	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts

Direct Interelectrode Capacitances (Approx.):[b]

	Unit No.1	Unit No.2	
Grid to plate	4.0	8.0	pf
Grid to cathode and heater	2.2	6.0	pf
Plate to cathode and heater	0.6	1.3	pf

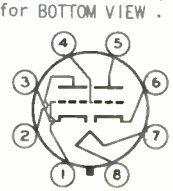
Characteristics, Class A_1 Amplifier:

	Unit No.1		Unit No.2		
Plate Voltage	250	275	60	175	volts
Grid Voltage	-3	[c]	0[d]	-25	volts
Amplification Factor	66	–	–	5	
Plate Resistance (Approx.)	30000	–	–	780	ohms
Transconductance	2200	1600	–	6400	μmhos
Plate Current	2	13	100	46	ma
Grid Voltage (Approx.) for plate μa =					
20	-5.3	–	–	–	volts
200	–	–	–	-60	volts

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	3"
Maximum Seated Length	2-7/16"
Maximum Diameter	1-9/32"
Bulb	T9
Base	Intermediate-Shell Octal 8-Pin, (JEDEC Group 1, No.B8-6)
Basing Designation for BOTTOM VIEW	8BD

Pin 1 – Grid of Unit No.2
Pin 2 – Plate of Unit No.2
Pin 3 – Cathode of Unit No.2
Pin 4 – Grid of Unit No.1



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

VERTICAL-DEFLECTION OSCILLATOR

Values are for Unit No.1

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[e]

DC PLATE VOLTAGE	350 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	400 max.	volts
PLATE DISSIPATION	1 max.	watt

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation	1 max.	megohm
For cathode-bias operation	2.2 max.	megohms

VERTICAL-DEFLECTION AMPLIFIER

Values are for Unit No.2

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[e]

DC PLATE VOLTAGE	550 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[f]	1500 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	250 max.	volts
CATHODE CURRENT:		
Peak	175 max.	ma
Average	50 max.	ma
PLATE DISSIPATION	10[g] max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation	1 max.	megohm
For cathode-bias operation	2.2 max.	megohms

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

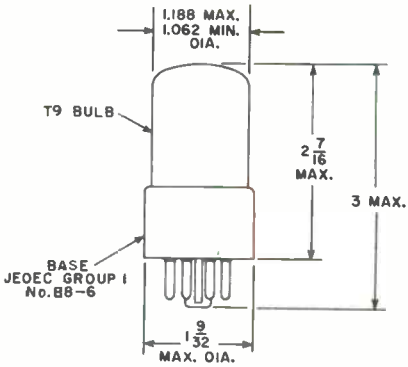
[c] Adjusted for plate ma.=13.

[d] Applied for short interval (two seconds maximum) so as not to damage tube.

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

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

[g] In stages operating with grid-leak bias, an adequate cathode-bias resistor or other suitable means is required to protect the tube in the absence of excitation.



ALL DIMENSIONS IN INCHES

Semiremote-Cutoff Pentode

7-PIN MINIATURE TYPE

For Gain-Controlled, 40-Mc, Picture-IF Stages of TV Receivers

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.4	amp

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield*▲	
Grid No.1 to plate	0.036 max.	0.026 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	10	10	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	2.4	3.4	μμf

Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	125	volts
Grid No.3 and Internal Shield	*Connected to cathode at socket*	
Grid-No.2 Supply Voltage	125	volts
Cathode Resistor	56	ohms
Plate Resistance (Approx.)	0.2	megohm
Transconductance	13000	μmhos
Plate Current	14	ma
Grid-No.2 Current	3.4	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos)= 60	-15	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

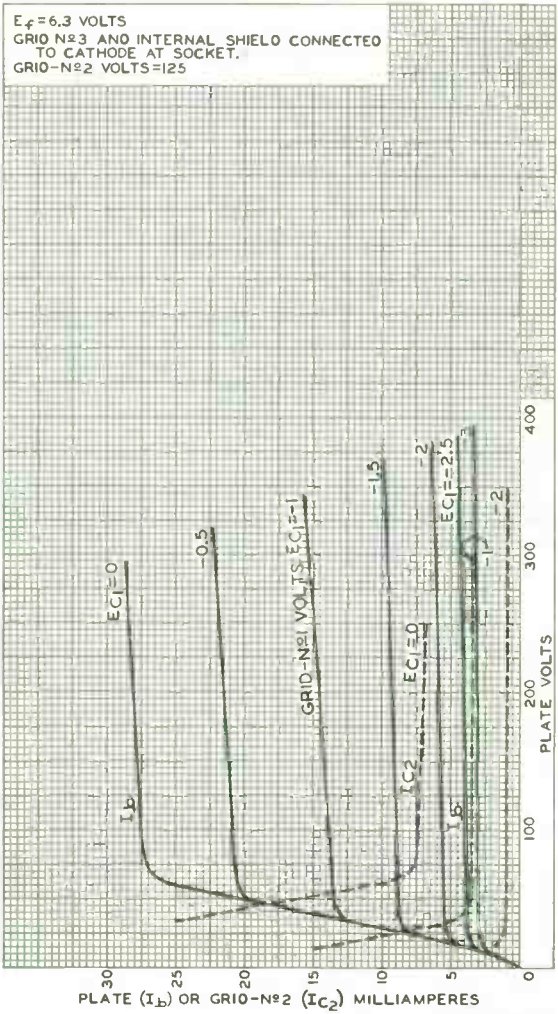
Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	330 max.	volts
GRID No.3 (SUPPRESSOR GRID)	*Connect to cathode at socket*	
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	0.65 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	3.1 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200● max.	volts

▲ With external shield JEDEC No.316 connected to cathode.

● The dc component must not exceed 100 volts.

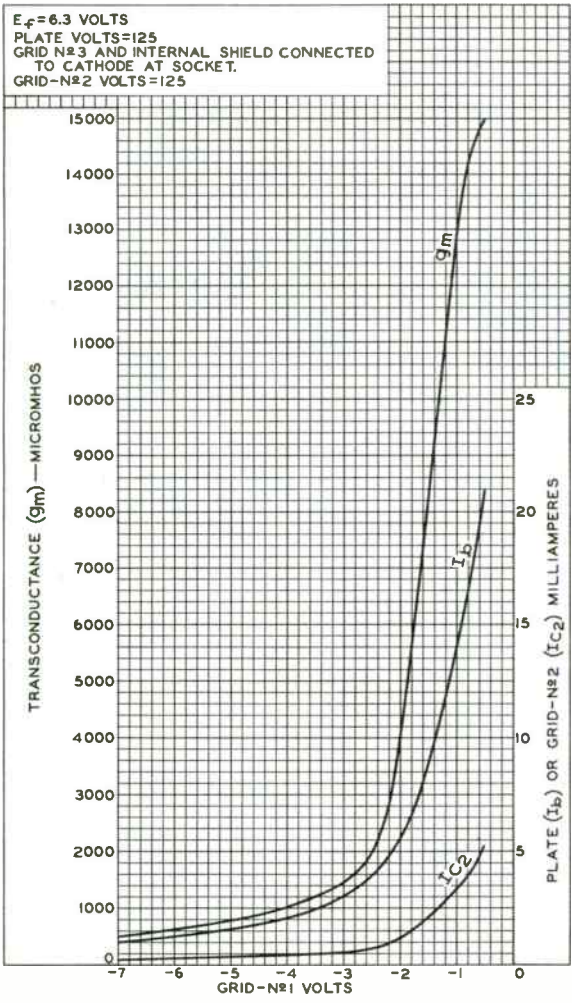
AVERAGE CHARACTERISTICS



92CM-10390RI

6GM6

AVERAGE CHARACTERISTICS



92CM-10391R1

High-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.75	amp
Direct Interelectrode Capacitances:[a]		
Triode Unit:		
Grid to plate	4.4	μμf
Grid to cathode and heater	2.4	μμf
Plate to cathode and heater	0.36	μμf
Pentode Unit:		
Grid No.1 to plate	0.1 max.	μμf
Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater	11	μμf
Plate to cathode & internal shield & grid No.3, grid No.2, and heater	4.2	μμf
Triode grid to pentode plate	0.018 max.	μμf
Pentode grid No.1 to triode plate	0.005 max.	μμf
Pentode plate to triode plate	0.17 max.	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*		
Plate Supply Voltage	250	60	200	volts
Grid-No.2 Supply Voltage	–	150	150	volts
Grid-No.1 Voltage	-2	0	–	volts
Cathode Resistor	–	–	100	ohms
Amplification Factor	100	–	–	
Plate Resistance (Approx.)	37000	–	60000	ohms
Transconductance	2700	–	11500	μmhos
Plate Current	2	55[b]	25	ma
Grid-No.2 Current	–	18[b]	5.5	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100	–	–	-10	volts
Grid Voltage (Approx.) for plate μa = 20	-5	–	–	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2

6GN8

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

Pin 1 – Triode Cathode
Pin 2 – Triode Grid
Pin 3 – Triode Plate
Pin 4 – Heater
Pin 5 – Heater

Pin 6 – Pentode Cathode, Grid No.3, Internal Shield
Pin 7 – Pentode Grid No.1
Pin 8 – Pentode Grid No.2
Pin 9 – Pentode Plate

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

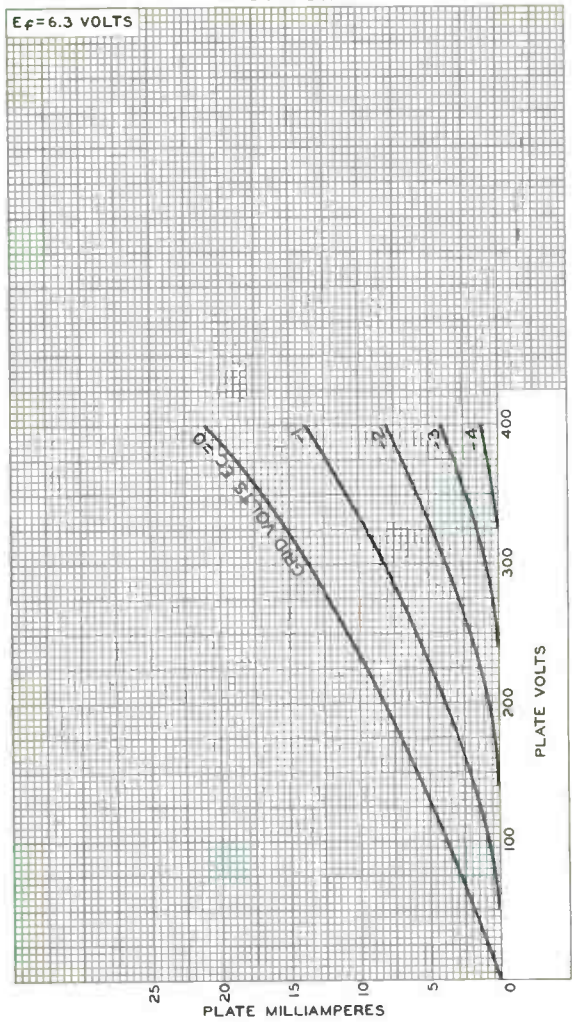
	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE.	–	330 max.	volts
GRID-No.2 VOLTAGE	–	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive-bias value	0 max.	0 max.	volts
PLATE DISSIPATION	1 max.	5 max.	watts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 165 volts	–	1.1 max.	watts
For grid-No.2 voltages between 165 and 330 volts .	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section		
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200 max.	200 max.	volts
Heater positive with respect to cathode.	200[c] max.	200[c] 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

[a] Without external shield.
[b] 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.
[c] The dc component must not exceed 100 volts.

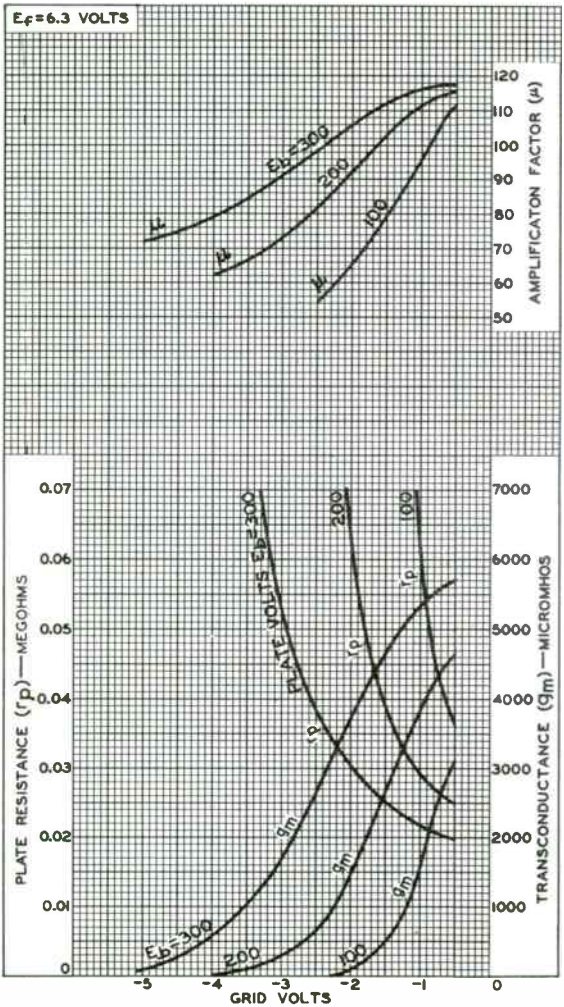
AVERAGE PLATE CHARACTERISTICS
Triode Unit



92CM-9907RI

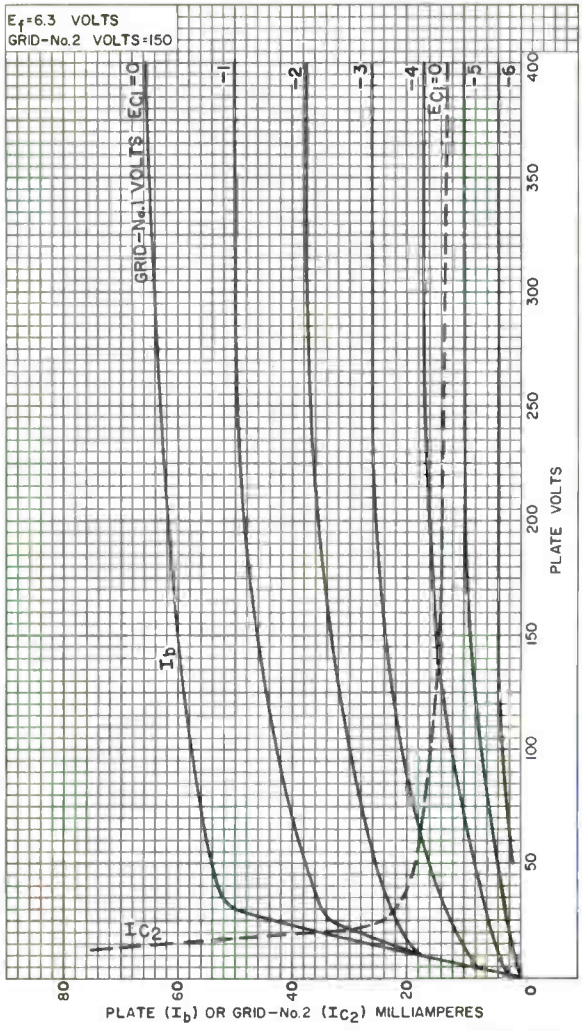
6GN8

AVERAGE CHARACTERISTICS
Triode Unit



92CM-11025

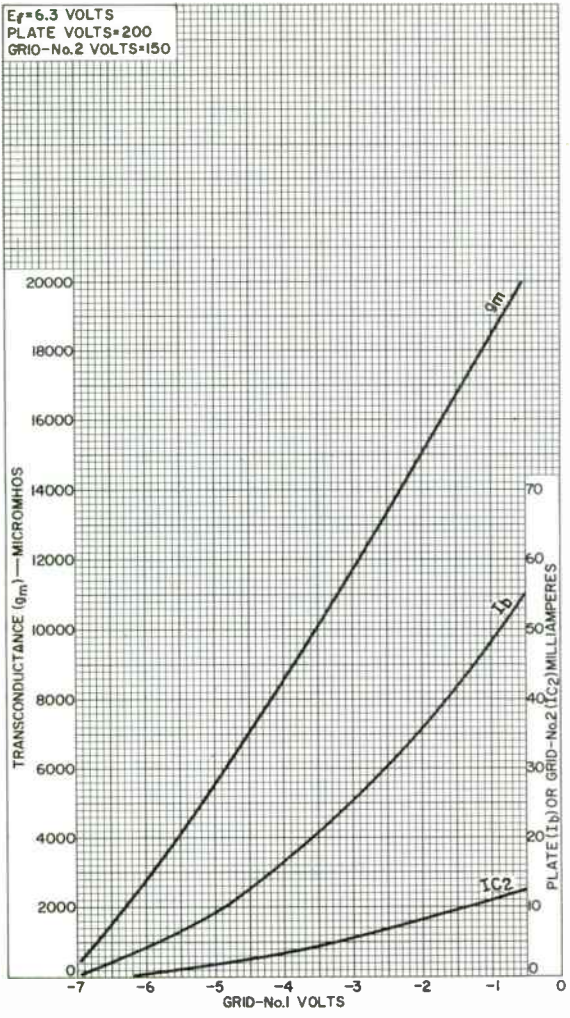
AVERAGE CHARACTERISTICS
Pentode Unit



92CM-11021

6GN8

AVERAGE CHARACTERISTICS
Pentode Unit



92CM-11022

Beam Power Tube

NOVAR TYPE

For TV Horizontal-Deflection-Amplifier Applications

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:			
Voltage (AC or DC)	6.3 ± 0.6		volts
Current at heater volts = 6.3	1.200		amp
Peak heater-cathode voltage:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[a]	max.	volts
Direct Interelectrode Capacitances (Approx.):[b]			
Grid No.1 to plate	0.26		pf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	15.0		pf
Plate to cathode & grid No.3, grid No.2, and heater	6.5		pf

Characteristics, Class A_1 Amplifier:

			Triode Connection[c]	
Plate Voltage	60	250	150	volts
Grid-No.2 Voltage	150	150	150	volts
Grid-No.1 Voltage	0	-22.5	-22.5	volts
Amplification Factor	–	–	4.4	
Plate Resistance (Approx.)	–	15000	–	ohms
Transconductance	–	7100	–	μmhos
Plate Current	39[d]	70	–	ma
Grid-No.2 Current	3.2[d]	2.1	–	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 0.1	–	-42	–	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.410"
Maximum Seated Length	3.030"
Length, Base Seat to Bulb Top (Excluding tip)	2.510" to 2.690"
Diameter	1.438" to 1.562"
Bulb	T12
Socket	Cinch Mfg. Co. No.149 19 00 033, Industrial Electronic Hardware Co. No.SO-0968-SL1, or equivalent
Base	Large-Button Novar 9-Pin (JEDEC No.E9-76)

← Indicates a change.

6GT5

Basing Designation for BOTTOM VIEW. 9NZ

Pin 1 – Grid No.2
Pin 2 – Grid No.1
Pin 3 – Cathode, Grid No.3
Pin 4 – Heater

Pin 5 – Heater
Pin 6 – Grid No.1
Pin 7 – Grid No.2
Pin 8 – Do Not Use
Pin 9 – Plate

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[e]

DC PLATE-SUPPLY VOLTAGE	770 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[f]	6500 max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	220 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-55 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE	330 max.	volts
CATHODE CURRENT:		
Peak	550 max.	ma
Average	175 max.	ma
GRID-No.2 INPUT	3.5 max.	watts
PLATE DISSIPATION[g]	17.5 max.	watts
BULB TEMPERATURE (At hottest point on bulb surface)	240 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For grid-resistor-bias operation	1 max.	megohm

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

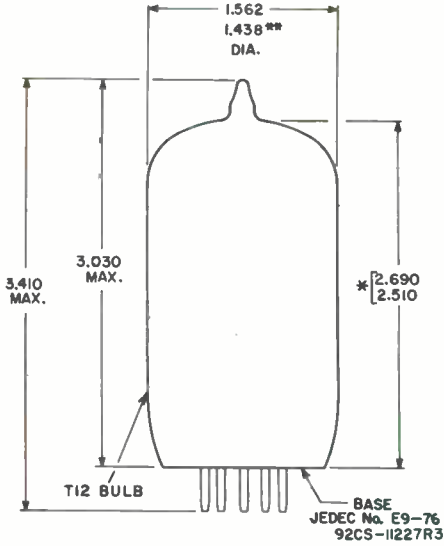
[c] With grid No.2 connected to plate.

[d] 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.

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

[f] 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.

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



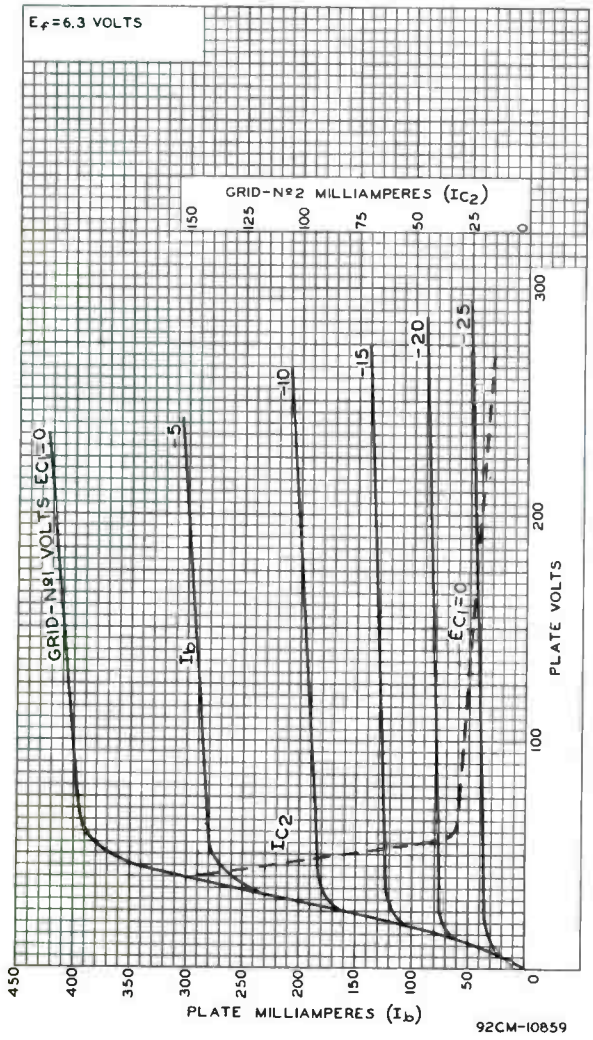
ALL DIMENSIONS IN INCHES

** APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.

* MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY A RING GAUGE OF 0.600" INSIDE DIAMETER.

6GT5

AVERAGE CHARACTERISTICS



Beam Power Tube

NOVAR TYPE

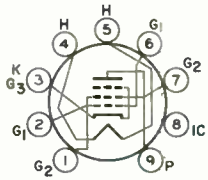
For Horizontal-Deflection-Amplifier Service in Black-and-White TV Receivers

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances (Approx):[b]		
Grid No.1 to Plate	0.26	pf
Input: G1 to (K+G3,G2,H)	15.0	pf
Output: P to (K+G3,G2,H)	6.5	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Uniootential
Maximum Overall Length	2.880"
Seated Length	2.250" to 2.500"
Diameter	1.438" to 1.562"
Dimensional Outline	See *General Section*
Bulb	T12
Base	Large-Button Novar 9-Pin with Exnaust Tip (JEDEC No. E9-88)
Basing Designation for BOTTOM VIEW	9NZ



Pin 1 – Grid No.2
Pin 2 – Grid No.1
Pin 3 – Cathode, Grid No.3
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Grid No.1
Pin 7 – Grid No.2
Pin 8 – Do Not Use
Pin 9 – Plate

Characteristics, Class A_1 Amplifier:

	Triode Connection[c]	*Pentode Connection*		
Plate Voltage	150	60	250	volts
Grid-No.2 Voltage	150	150	150	volts
Grid-No.1 Voltage	-22.5	0	-22.5	volts
Amplification Factor	4.4	–	–	
Plate Resistance (Approx.)	–	–	15000	ohms
Transconductance	–	–	7100	μmhos
Plate Current	–	390[d]	70	ma
Grid-No.2 Current	–	32[d]	2.1	ma
Grid-No.1 Voltage (Approx.) for plate ma = 0.1	–	–	-42	volts

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[e]

DC Plate-Supply Voltage	770 max.	volts
Peak Positive-Pulse Plate Voltage[f]	6500 max.	volts
Peak Negative-Pulse Plate Voltage	1500 max.	volts
DC Grid-No.2 (Screen-Grid) Voltage	220 max.	volts
DC Grid-No.1 (Control-Grid) Voltage	-55 max.	volts
Peak Negative-Pulse Grid-No.1 Voltage	330 max.	volts
Cathode Current:		
Peak	550 max.	ma
Average	175 max.	ma
Grid-No.2 Input	3.5 max.	watts
Plate Dissipation[g]	17.5 max.	watts
Bulb Temperature (At hottest point on bulb surface)	240 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For grid-resistor-bias operation	1 max.	megohm

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

[c] With grid No.2 connected to plate.

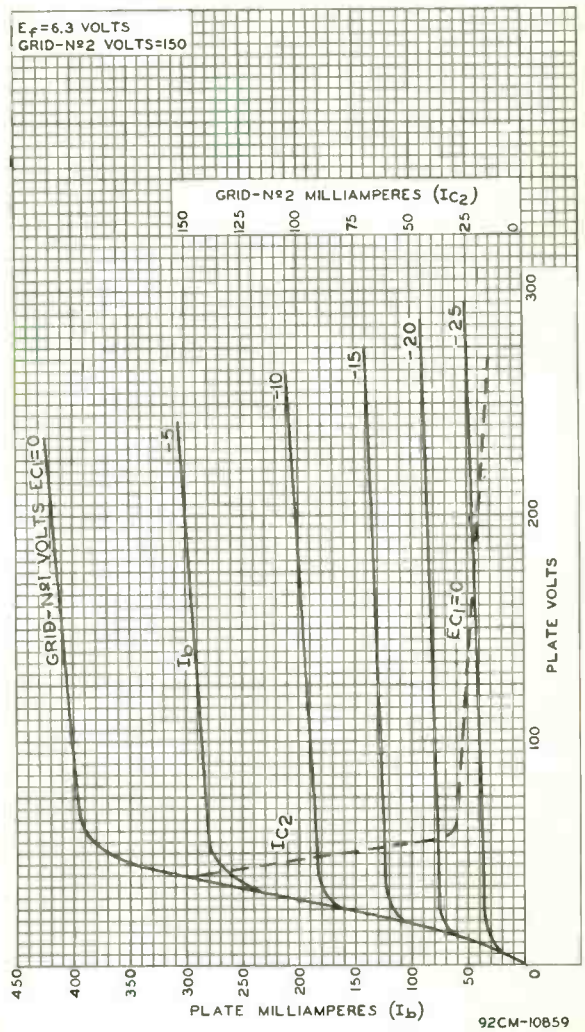
[d] This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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

[f] 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.

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

AVERAGE CHARACTERISTICS



6GU5

Beam Hexode

ELECTRICAL

Heater Characteristics and Ratings

Voltage (AC or DC)	6.3 ± 0.6	V
Current at 6.3 V	0.220	A
Maximum heater-cathode voltage		
Heater negative with respect to cathode		
Peak	200	V
Heater positive with respect to cathode		
Peak	200	V
DC component	100	V

Direct Interelectrode Capacitances (Approx.)
Without external shield

Grid No.1 to plate	0.018	pF
Input: G1 to (K + G4 + G2, G3, H)	7.0	pF
Output: P to (K + G4 + G2, G3, H)	3.2	pF

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-1/8 in
Maximum Seated Length	1-7/8 in
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2 ± 3/32 in
Diameter	0.650 to 0.750 in
Dimensional Outline (JEDEC No.5-2)	See *General Section*
Envelope	JEDEC T5-1/2
Base	Small-Button Miniature 7-Pin (JEDEC No.E7-1)

TERMINAL DIAGRAM (Bottom View)

Pin 1 – Grid No.1
Pin 2 – Cathode, Grid No.2, Grid No.4
Pin 3 – Heater
Pin 4 – Heater
Pin 5 – Plate
Pin 6 – Grid No.3
Pin 7 – Same as Pin 2

CHARACTERISTICS

Plate Voltage	135	275	V
Grid-No.3 Voltage	135	135	V
Grid-No.1 Voltage	-0.4	-0.4	V
Plate Resistance (Approx.)	0.67	0.165	MΩ
Transconductance	15000	15500	μmhos
Plate Current	9	10	mA
Grid-No.3 Current	0.25	0.17	mA
Grid-No.1 Voltage (Approx.) for transconductance = 100 μmhos	-6.2	-6.5	V
Noise Figure at 200 Mc/s	5.9	5.7	dB

DESIGN-MAXIMUM RATINGS

Plate Voltage	300	V
Grid-No.3 (Screen-Grid) Voltage	150	V
Grid-No.1 (Control-Grid) Voltage		
Negative-bias value	50	V
Positive-bias value	0	V
Cathode Current	20	mA
Grid-No.3 Input	0.15	W
Plate Dissipation	3	W

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance		
For fixed-bias operation	0.5	MΩ

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

Medium-Mu Twin Triode

9-PIN MINIATURE TYPE

For Use in the Matrixing Circuits of Color TV Receivers. Also Useful in Phase-Inverter and Multivibrator Circuits, and as a General-Purpose Amplifier Tube.

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:			
Voltage (AC or DC)	6.3[a]	6.3 ± 0.6	volts
Current	0.600 ± 0.040	0.600[b]	ma
Warm-up time (Average)	11	-	sec
Peak heater-cathode voltage (Each unit):			
Heater negative with respect to cathode	200 max.		volts
Heater positive with respect to cathode	200[c] max.		volts

Direct Interelectrode Capacitances (Approx.):[d]

	Unit No.1	Unit No.2	
Grid to plate	3.0	3.0	pf
Grid to cathode and heater	3.4	3.6	pf
Plate to cathode and heater	0.44	0.34	pf
Plate of unit No.1 to plate of unit No.2	1.0	1.0	pf

Characteristics, Class A_1 Amplifier (Each unit):

Plate Voltage	250	volts
Grid Voltage	-10.5	volts
Amplification Factor	17	
Plate Resistance (Approx.)	5500	ohms
Transconductance	3100	μmhos
Plate Current	11.5	ma
Plate Current for grid volts = -14	4	ma
Grid Voltage (Approx.) for plate μa = 50	-23	volts

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)

6GU7

Basing Designation for BOTTOM VIEW. 9LP

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 –No Internal Connection

AMPLIFIER — Class A_1

Values are for Each Unit

Maximum Ratings, *Design-Maximum Values:*

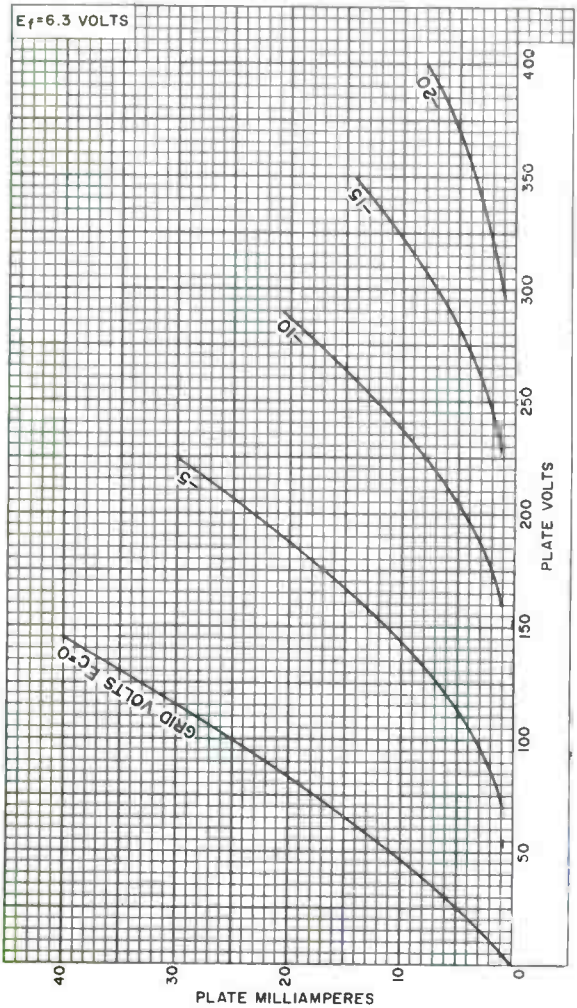
PLATE VOLTAGE.	330 max.	volts
GRID VOLTAGE:		
Positive-bias value.	0 max.	volts
PLATE DISSIPATION.	3 max.	watts

Maximum Circuit Values:

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

[a] At heater amperes = 0.600.
[b] At heater volts = 6.3.
[c] The dc component must not exceed 100 volts.
[d] Without external shield.

AVERAGE PLATE CHARACTERISTICS
Each Unit



92CM-11966

6GV5

Beam Power Tube

DUODECAR TYPE

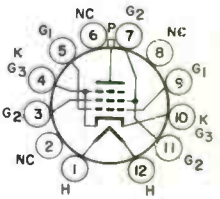
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ±0.6	volts
Current at heater volts = 6.3	1.2	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances (Approx):[b]		
G1 to P	0.6	pf
Input: G1 to (K+G3,G2,H)	16	pf
Output: P to (K+G3,G2,H)	7.0	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.625"
Seated Length	2.000" to 2.250"
Diameter	1.437" to 1.562"
Dimensional Outline	See *General Section*
Bulb	T12
Cap	Skirted Miniature (JEDEC No.C1-3)
Base	Large-Button Duodecar 12-Pin (JEDEC No.E12-74)
Basing Designation for BOTTOM VIEW	12DR

Pin 1 – Heater
Pin 2 – No Internal Connection
Pin 3 – Grid No.2
Pin 4 – Cathode, Grid No.3
Pin 5 – Grid No.1
Pin 6 – Same as Pin 2
Pin 7 – Grid No.2
Pin 8 – Same as Pin 2
Pin 9 – Grid No.1
Pin 10 – Same as Pin 4
Pin 11 – Grid No.2
Pin 12 – Heater
Cap – Plate



Characteristics, Class A_1 Amplifier:

				Triode Connection[c]	
Plate Voltage	5000	60	250	150	volts
Grid-No.2 Voltage	150	150	150	150	volts
Grid-No.1 Voltage	–	0	-22.5	-22.5	volts
Amplification Factor	–	–	–	4.4	
Plate Resistance (Approx.)	–	–	18000	–	ohms
Transconductance	–	–	7300	–	μmhos
Plate Current	–	34[d]	65	–	ma
Grid-No.2 Current	–	27[d]	1.8	–	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 1	-100	–	-42	–	volts

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[e]

DC Plate-Supply Voltage	770 max.	volts
Peak Positive-Pulse Plate Voltage[f]	6500 max.	volts
Peak Negative-Pulse Plate Voltage	1500 max.	volts
DC Grid-No.2 (Screen-Grid) Voltage	220 max.	volts
DC Grid-No.1 (Control-Grid) Voltage	-55 max.	volts
Peak Negative-Pulse Grid-No.1 Voltage	330 max.	volts
Cathode Current:		
Peak	550 max.	ma
Average	175 max.	ma
Grid-No.2 Input	3.5 max.	watts
Plate Dissipation[g]	17.5 max.	watts
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 max.	megohm

[a] The ic component must not exceed 100 volts.

[b] Without external shield.

[c] With grid No.2 connected to plate.

[d] 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.

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

[f] 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.

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

6GW8/ECL86

High-Mu Triode-Sharp-Cutoff Pentode

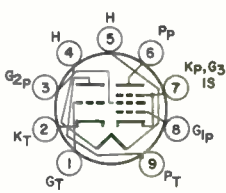
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3	volts
Current at heater volts = 6.3	0.660	amp
Peak heater-cathode voltage	100	volts
Direct Interelectrode Capacitances:		
Triode Unit:		
Grid to plate	1.4	pf
Input: G_T to (K_T, H)	2.3	pf
Output: P_T to (K_T, H)	2.5	pf
Grid to heater	0.006 max.	pf
Pentode Unit:		
Grid No.1 to plate	0.4 max.	pf
Input: G1p to (Kp+G3p+IS,G2p,H)	10.0	pf
Grid No.1 to heater	0.24 max.	pf
Triode plate to pentode grid No.1	0.2 max.	pf
Triode grid to pentode plate	0.006 max.	pf
Triode grid to pentode grid No.1	0.02 max.	pf
Triode plate to pentode plate	0.15 max.	pf

Mechanical:

Operating Position	Any
Maximum Overall Length	3-1/16"
Maximum Seated Length	2-13/16"
Length, Base Seat to Bulb Top (Excluding Tip)	2-7/16" ±3/32"
Diameter	0.750" to 0.875"
Dimensional Outline (JEDEC No.6-4)	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-11)
Basing Designation for BOTTOM VIEW	9LZ

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



CLASS A_1 AMPLIFIER

Characteristics:

	Triode Unit	*Pentode Unit*	
Plate Voltage	250	250	volts
Grid No.2 (Screen-Grid) Voltage	–	250	volts
Grid No.1 (Control-Grid) Voltage	-1.9	-7	volts
Amplification Factor	100	21[a]	
Plate Resistance (Approx.)	–	48000	ohms
Transconductance	1600	10000	μmhos
Plate Current	1.2	36	ma
Grid-No.2 Current	–	6	ma

Maximum Ratings, *Design-Center Values:*

Plate Supply Voltage	550	550	volts
Plate Voltage	300	300	volts
Grid-No.2 Supply Voltage	–	550	volts
Grid-No.2 Voltage	–	300	volts
Average Cathode Current	4	55	ma
Grid-No.2 Input	–	1.8	watts
Plate Dissipation	0.5	9	watts
Grid-No.1 Voltage at grid No.1 μa = 0.3	-1.3	-1.3	volts

Maximum Circuit Values:

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

[a] Grid No.1 to Grid No.2

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

Sharp-Cutoff Pentode

With Two Independent Control Grids

7-PIN MINIATURE TYPE

For FM Sound-Detector Service

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec
Direct Interelectrode Capacitances (Approx.):[a]		
Grid No.1 to plate	0.022	μμf
Grid No.1 to cathode & internal shield, grid No.3, grid No.2, and heater	8	μμf
Grid No.3 to plate	1.6	μμf
Grid No.1 to grid No.3	0.11	μμf
Grid No.3 to cathode & internal shield, plate, grid No.2, grid No.1, and heater	7.5	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
Grid-No.1 Supply Voltage	0	volts
Cathode Resistor	180	ohms
Plate Resistance (Approx.)	0.14	megohm
Transconductance, Grid No.1 to Plate	3700	μmhos
Transconductance, Grid No.3 to Plate	750	μmhos
Plate Current	3.7	ma
Grid-No.2 Current	3	ma
Grid-No.1 Supply Voltage (Approx.) for plate μa = 20	-4.5	volts
Grid-No.3 Supply Voltage (Approx.) for plate μa = 20	-7	volts

Mechanical:

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

6GX6

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

FM SOUND-DETECTOR SERVICE

Maximum Ratings, *Design-Maximum Values:*

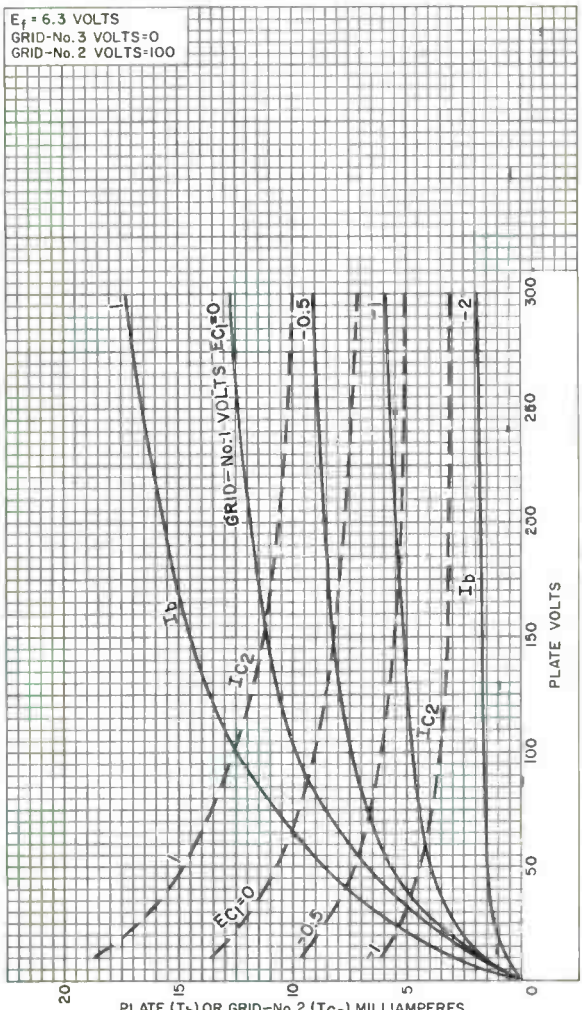
PLATE VOLTAGE	300	max.	volts
GRID-No.3 (CONTROL-GRID) VOLTAGE:			
Negative value (DC and Peak AC)	100	max.	volts
Positive value (DC and Peak AC)	25	max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	300	max.	volts
GRID-No.2 VOLTAGE . . . . . See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section			
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Negative-bias value	50	max.	volts
Positive-bias value	0	max.	volts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts.	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			
GRID-No.3 INPUT	0.1	max.	watt
PLATE DISSIPATION	1.7	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200[b]	max.	volts

Maximum Circuit Values:

Grid-No.3-Circuit Resistance.	0.68	max.	megohm
Grid-No.1-Circuit Resistance:			
For fixed-bias operation.	0.22	max.	megohm
For cathode-bias operation.	0.47	max.	megohm

[a] Without external shield.
[b] The dc component must not exceed 100 volts.

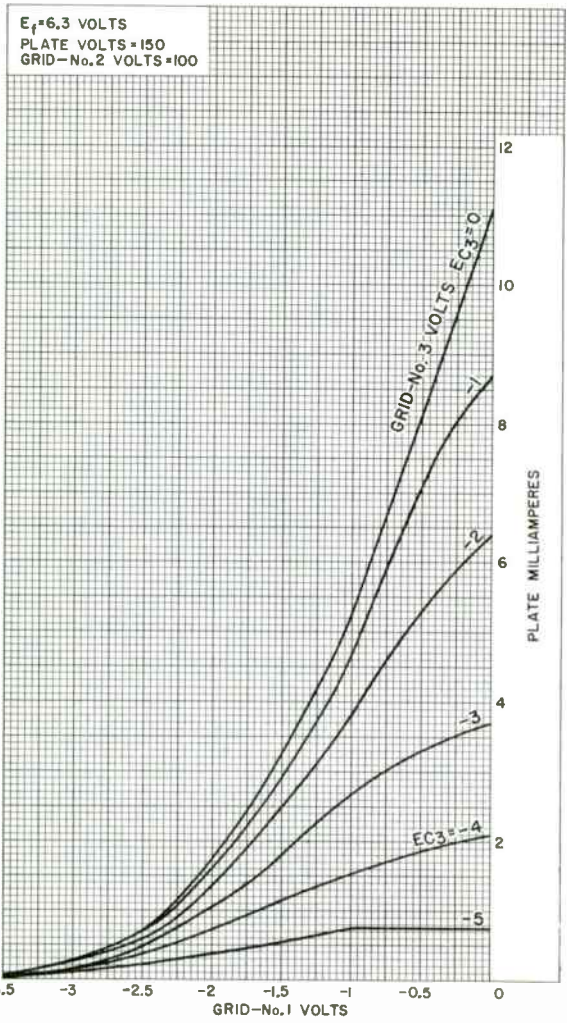
AVERAGE CHARACTERISTICS



92CM-11002

6GX6

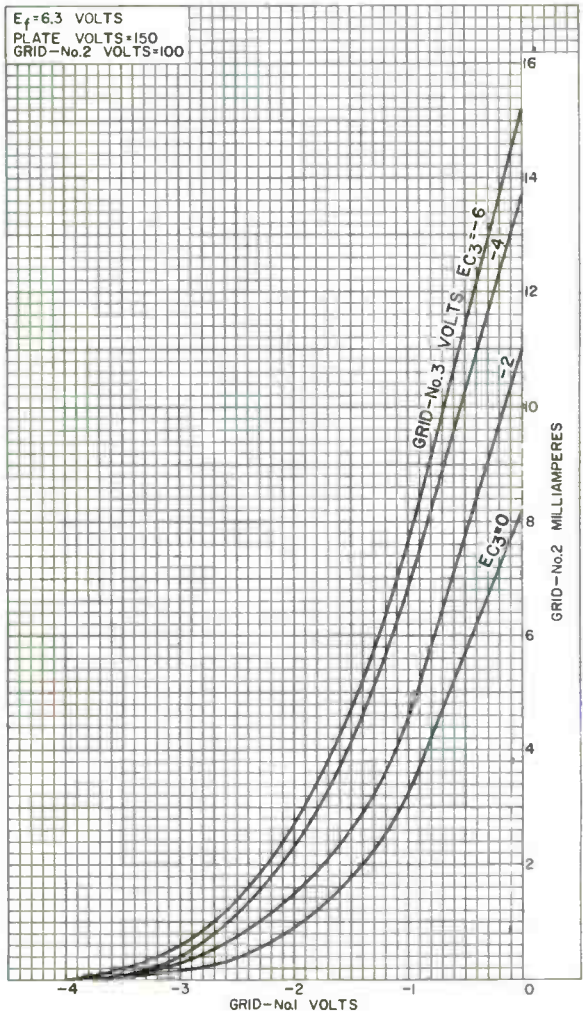
AVERAGE CHARACTERISTICS



92CM—11005

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

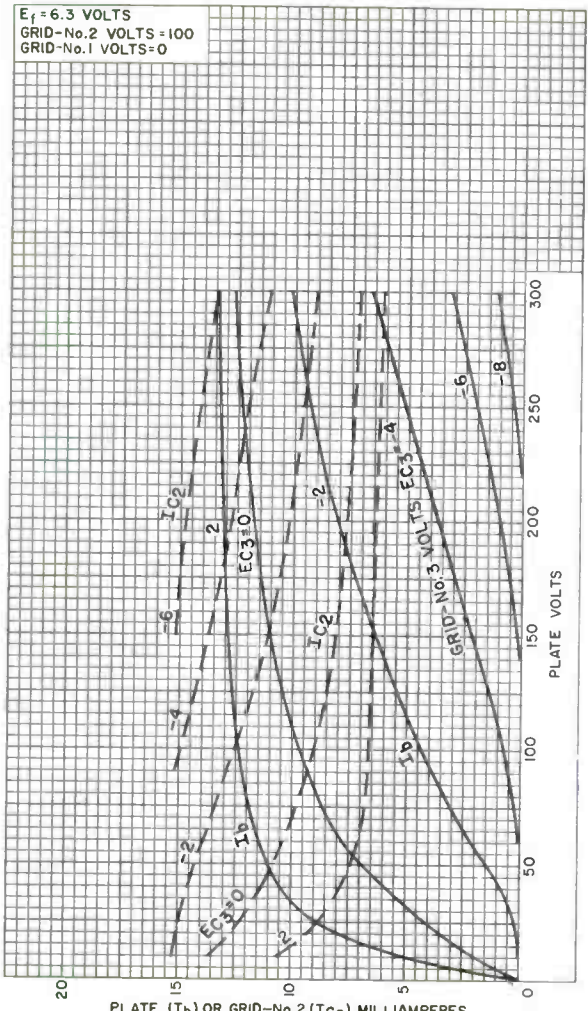
AVERAGE CHARACTERISTICS



92CM-11007

6GX6

AVERAGE CHARACTERISTICS



92CM-11003

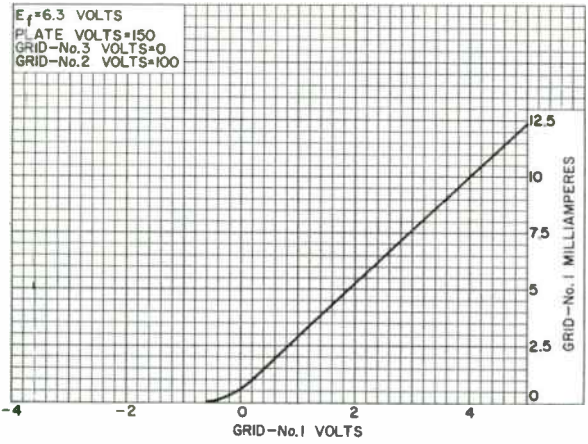
RADIO CORPORATION OF AMERICA
Electron Tube Division Harrison, N. J.

AVERAGE CHARACTERISTICS

92CM-11006

6GX6

AVERAGE GRID-No.1 OPERATION CHARACTERISTIC



92CS-11004

Sharp-Cutoff Pentode

With Two Independent Control Grids

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	0.45 ± 5%	amp
Warm-up time (Average)	11	sec
Direct Interelectrode Capacitances (Approx.):[a]		
Grid No.1 to plate	0.026	μμf
Grid No.1 to cathode & internal shield, grid No.3, grid No.2, and heater	8	μμf
Grid No.3 to plate	1.6	μμf
Grid No.1 to grid No.3	0.12	μμf
Grid No.3 to cathode & internal shield, plate, grid No.2, grid No.1, and heater	6.5	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
Grid-No.1 Supply Voltage	0	volts
Cathode Resistor	180	ohms
Plate Resistance (Approx.)	0.14	megohm
Transconductance, Grid No.1 to Plate	3700	μmhos
Transconductance, Grid No.3 to Plate	750	μmhos
Plate Current	3.7	ma
Grid-No.2 Current	3	ma
Grid-No.1 Supply Voltage (Approx.) for plate μa = 20	-4.5	volts
Grid-No.3 Supply Voltage (Approx.) for plate μa = 20	-7	volts

Mechanical:

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

6GY6

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

GATED AGC AMPLIFIER & NOISE INVERTER

For operation in a 525-line, 30-frame system[b]

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	300	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[c]	600	max.	volts
GRID-No.3 (CONTROL-GRID) VOLTAGE:			
Negative-bias value	100	max.	volts
Positive-bias value	0	max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	300	max.	volts
GRID-No.2 VOLTAGE	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section		
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Negative-bias value	50	max.	volts
Positive-bias value	0	max.	volts
GRID-NO.2 INPUT:			
For grid-No.2 voltages up to 150 volts	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		
PLATE DISSIPATION	1.7	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[d]	max.	volts

Maximum Circuit Values:

Grid-No.3-Circuit Resistance	0.68	max.	megohm
Grid-No.1-Circuit Resistance:			
For fixed-bias operation	0.22	max.	megohm
For cathode-bias operation	0.47	max.	megohm

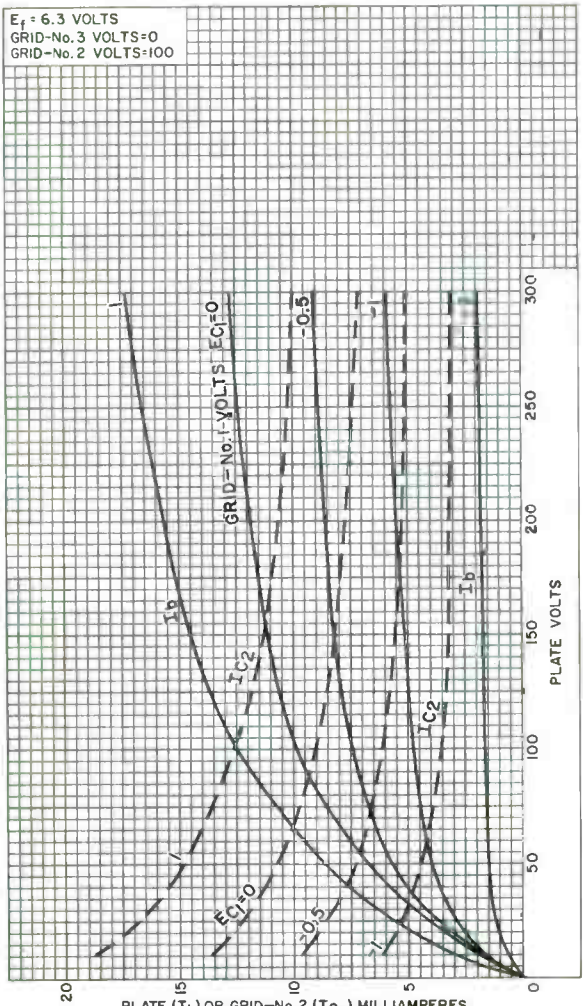
[a] Without external shield.

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

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

[d] The dc component must not exceed 100 volts.

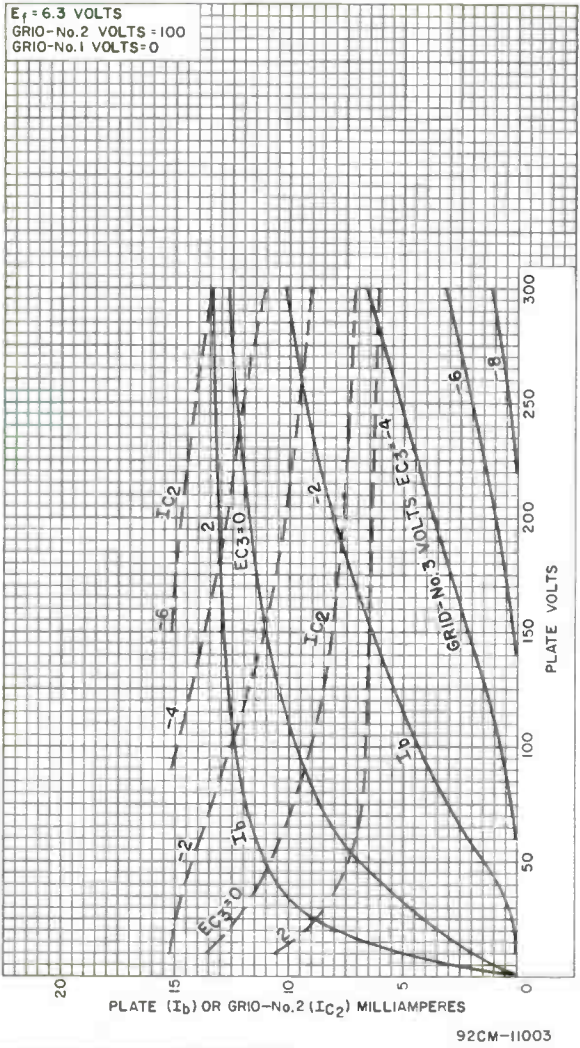
AVERAGE CHARACTERISTICS



92CM-11002

6GY6

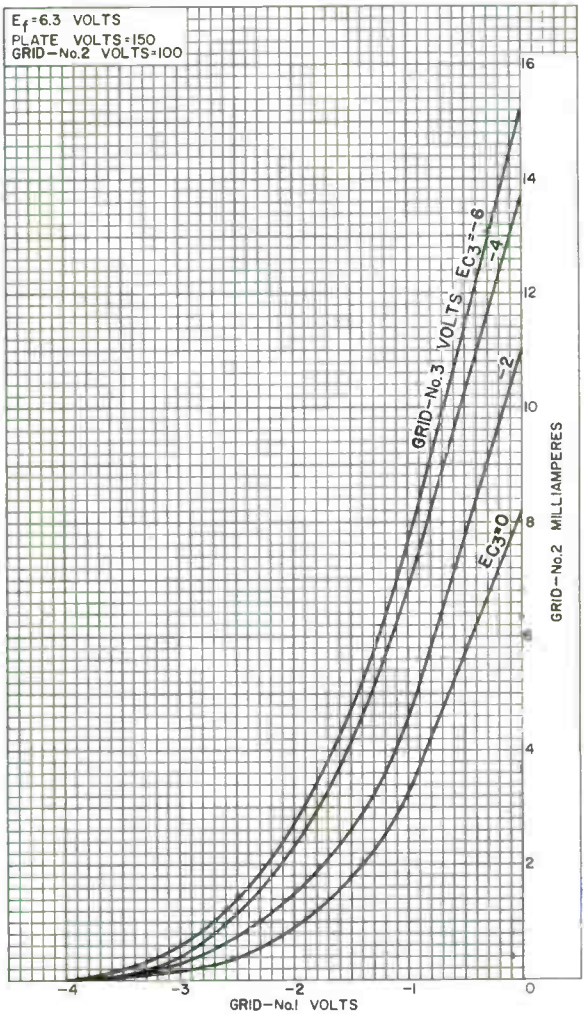
AVERAGE CHARACTERISTICS



92CM-11003

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

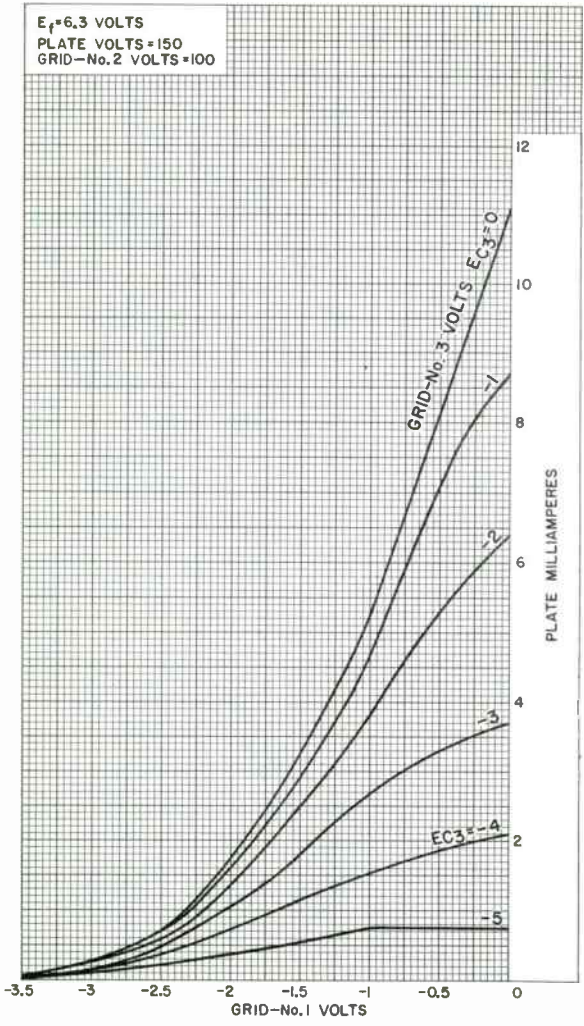
AVERAGE CHARACTERISTICS



92CM-11007

6GY6

AVERAGE CHARACTERISTICS



92CM—11005

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

6GZ5

Power Pentode

7-PIN MINIATURE

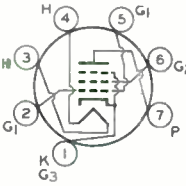
Electrical:

Heater Ratings and Characteristics:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.38C	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances:[b]		
Grid No.1 to plate	0.24	pf
Input: G1 to (K+G3,G2,H)	8.5	pf
Output: P to (K+G3,G2,H)	3.8	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
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	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



Bulb Temperature (At hottest point on bulb surface) . . 200° C

AMPLIFIER —Class A_1

Maximum Ratings, *Design-Maximum Values:*

Plate Voltage	300 max.	volts
Grid-No.2 (Screen-Grid) Voltage	300 max.	volts
Grid-No.1 (Control-Grid) Voltage:		
Positive-bias value	0 max.	volts
Average Cathode Current	30 max.	ma
Grid-No.2 Input	1.1 max.	watts
Plate Dissipation	4.8 max.	watts

Typical Operation and Characteristics:

	No Bypassing	*Bypass Capacitor*	
Plate Supply Voltage	250	250	volts
Grid-No.2 Supply Voltage	250	250	volts

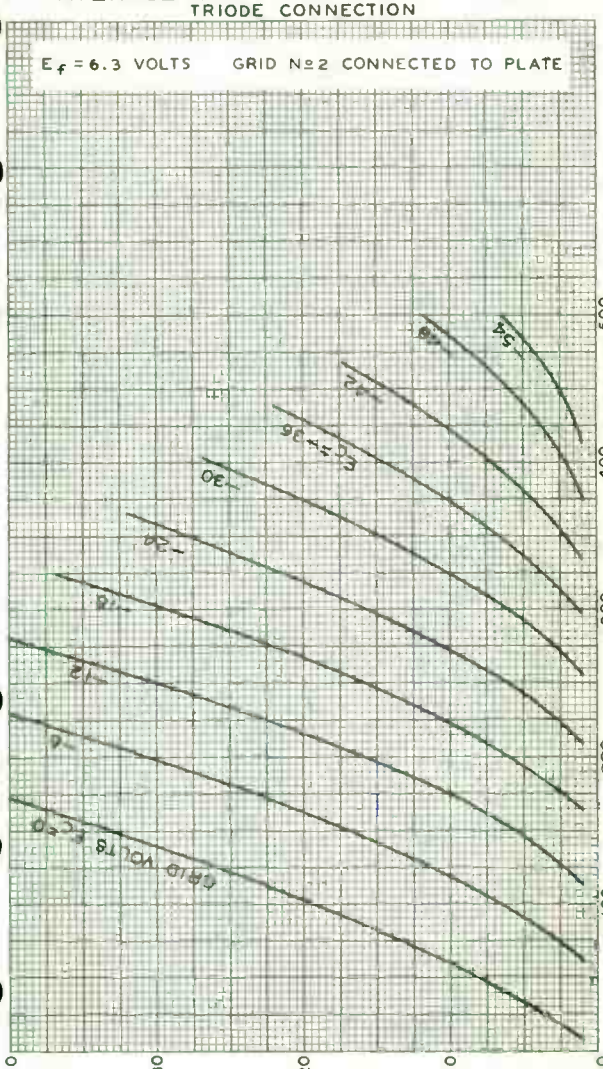
	No Bypassing	*Bypass Capacitor*	
Cathode Resistor	270	270	ohms
Peak AF Grid-No.1 Voltage	9.8	2	volts
Zero-Signal Plate Current	16	16	ma
Max.-Signal Plate Current	16	16	ma
Zero-Signal Grid-No.2 Current	2.7	2.7	ma
Max.-Signal Grid-No.2 Current	5	5	ma
Plate Resistance (Approx.)	–	0.15	megohm
Transconductance	–	8400	μmhos
Load Resistance	15000	15000	ohms
Total Harmonic Distortion	10	10	percent
Power Output	1.8	1.1	watts

Maximum Circuit Values:

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

[a] The DC component must not exceed 100 volts.
[b] Without external shield.

6G6-G
AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



AUG. 12, 1943

RCA VICTOR DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6122R1

6G6-G

AVERAGE PLATE CHARACTERISTICS

PENTODE CONNECTION

$E_f = 6.3$ VOLTS SCREEN VOLTS = 180

AUG. 19, 1943

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

92CM-4956R1

6G6-G

6H6, 6H6-GT/G

TWIN DIODE

Heater	Coated Unipotential Cathodes		
Voltage	6.3		a-c or d-c volts
Current	0.3		amp.
	6H6	6H6-GT/G	
Direct Interelectrode Cap.°			
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	70	G-7Q	
Pin 1	6H6, Shell / 6H6-GT/G, Internal Shield	Pin 4 - Cathode #2	
Pin 2	Heater	Pin 5 - Plate #1	
Pin 3	Plate #2	Pin 7 - Heater	
		Pin 8 - Cathode #1	
RCA Socket		Stock No.9924	←
Mounting Position		Any	

BOTTOM VIEW

Maximum Ratings Are Design-Center Values

RECTIFIER OR DOUBLER

Peak Inverse Voltage		420 max.	volts ←
Peak Plate Current per Plate		48 max.	ma. ←
D-C Heater-Cathode Potential		330 max.	volts ←
*As Half-Wave Rectifier:**			←
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.

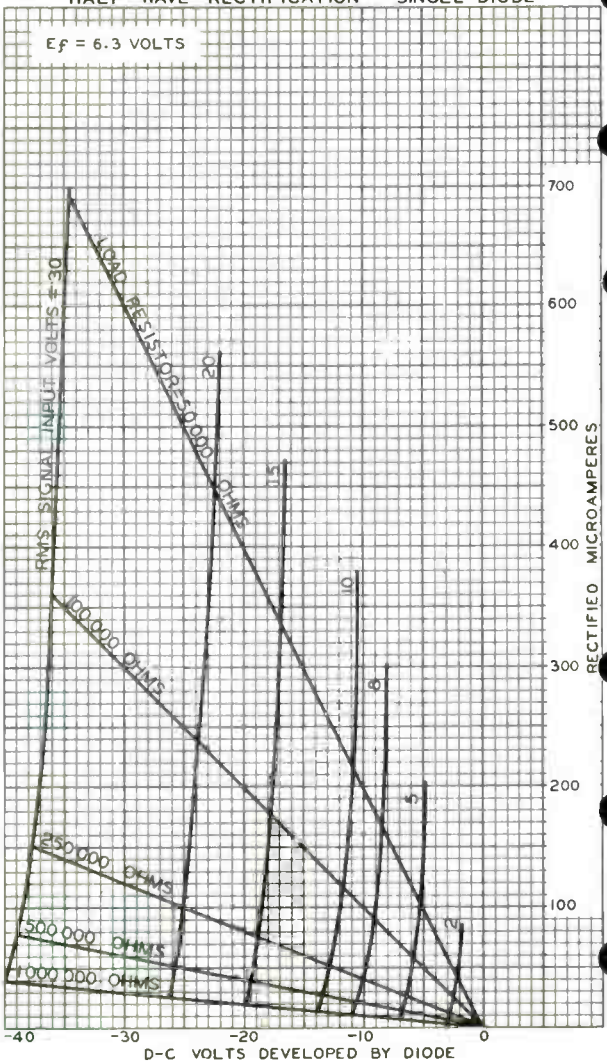
← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6H6

AVERAGE CHARACTERISTICS

HALF-WAVE RECTIFICATION - SINGLE DIODE



RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6HB6

Power Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Maximum Values)*:			
Voltage (AC or DC)	6.3 ± 0.6		volts
Current at heater volts = 6.3	0.760		amp
Peak heater-cathode voltage:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[a]	max.	volts
Direct Interelectrode Capacitances (Approx.):[b]			
Grid No.1 to plate	0.18		μμf
Grid No.1 to cathode, grid No.3, grid No.2, and heater	13.0		μμf
Plate to cathode, grid No.3, grid No.2, and heater	8.0		μμf

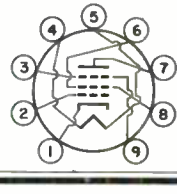
Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	60	250	250	volts
Grid No.3	*Connected to cathode at socket*			
Grid-No.2 Supply Voltage	250	125	250	volts
Grid-No.1 Voltage	0	–	–	volts
Cathode Resistor	–	33	100	ohms
Mu-Factor, Grid No.2 to Grid No.1	–	–	33	
Plate Resistance (Approx.)	–	28000	24000	ohms
Transconductance	–	24000	20000	μmhos
Plate Current	150[c]	40	40	ma
Grid-No.2 Current	37[c]	4.2	6.2	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100	–	-6.4	-13	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3-1/16"
Maximum Seated Length	2-13/16"
Length, Base Seat to Bulb Top (Excluding tip)	2-7/16" ± 3/32"
Diameter	0.750" to 0.850"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Basing Designation for BOTTOM VIEW	9PU

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



Pin 6 – Grid No.2
Pin 7 – Plate
Pin 8 – Grid No.2
Pin 9 – Grid No.3

VERTICAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[d]

DC PLATE VOLTAGE	350 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[e]	2500 max.	volts
GRID No.3 (SUPPRESSOR GRID)	*Connect to cathode at socket*	
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	300 max.	volts
GRID No.1 (CONTROL-GRID) VOLTAGE	-100 max.	volts
GRID-No.2 INPUT	2 max.	watts
PLATE DISSIPATION	10 max.	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation	1 max.	megohm
For cathode-bias operation	2.2 max.	megohms

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

[c] 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.

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

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

Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For VHF Oscillator-Mixer Service in TV Receivers

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6[a]	volts
Current at heater volts = 6.3	0.450[b]	amp
Warm-up time (Average)	11	sec
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[c] max.	volts
Direct Interelectrode Capacitances:[d]		
Triode Unit:		
G_T to P_T	1.9	pf
Input: G_T to (K+G3$_P$+IS,H)	3.0	pf
Output: P_T to (K+G3$_P$+IS,H)	1.9	pf
Pentode Unit:		
G1$_P$ to P_P	0.010 max.	pf
Input: G1$_P$ to (K+G3$_P$+IS,G2$_P$,H)	5.0	pf
Output: G1$_P$ to (K+G3$_P$+IS,G2$_P$,H)	3.4	pf
H to K[e]	3.8	pf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Plate Supply Voltage	150	125	volts
Grid-No.2 Supply Voltage	–	125	volts
Grid-No.1 Supply Voltage	0	−1	volts
Cathode Resistor	56	–	ohms
Amplification Factor	40	–	
Plate Resistance (Approx.)	5000	200000	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

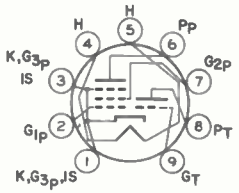
Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
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

6HB7

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

Pin 1 – Cathode, Pentode Grid No.3, Internal Shield
Pin 2 – Pentode Grid No.1
Pin 3 – Same as Pin 1
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Pentode Plate
Pin 7 – Pentode Grid No.2
Pin 8 – Triode Plate
Pin 9 – Triode Grid



AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

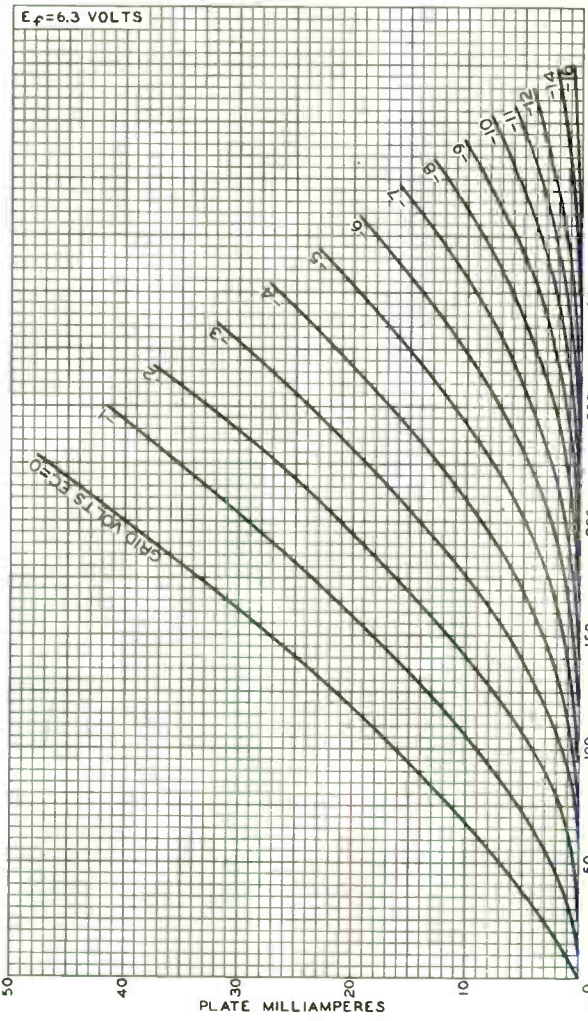
	Triode Unit	*Pentode Unit*	
Plate Voltage	330 max.	330 max.	volts
Grid-No.2 (Screen-Grid) Supply Voltage.	–	330 max.	volts
Grid-No.2 Voltage	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section		
Grid-No.1 (Control-Grid) Voltage:			
Positive-bias value	0 max.	0 max.	volts
Grid-No.2 Input:			
For grid-No.2 voltages up to 165 volts	–	0.55 max.	watt
For grid-No.2 voltages between 165 and 330 volts	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section		
Plate Dissipation	2.5 max.	3.1 max.	watts

Maximum Circuit Values:

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

[a] For parallel heater operation.
[b] For series heater operation current must be limited to 0.450 ± 0.030 amperes.
[c] The dc component must not exceed 100 volts.
[d] With external shield JEDEC No.315 connected to cathode except as noted.
[e] With external shield JEDEC No.315 connected to ground.

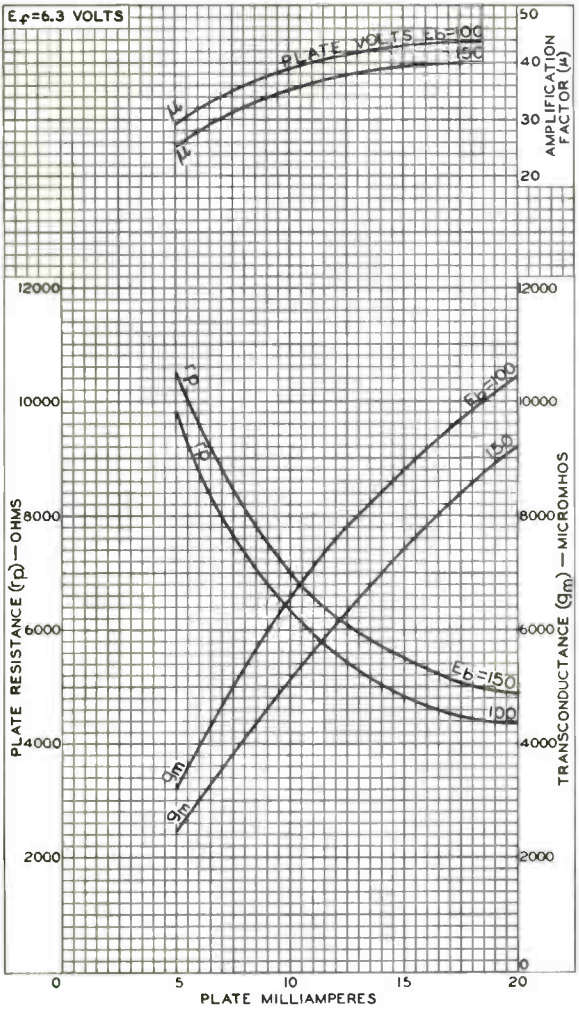
AVERAGE PLATE CHARACTERISTICS
Triode Unit



92CM-9866

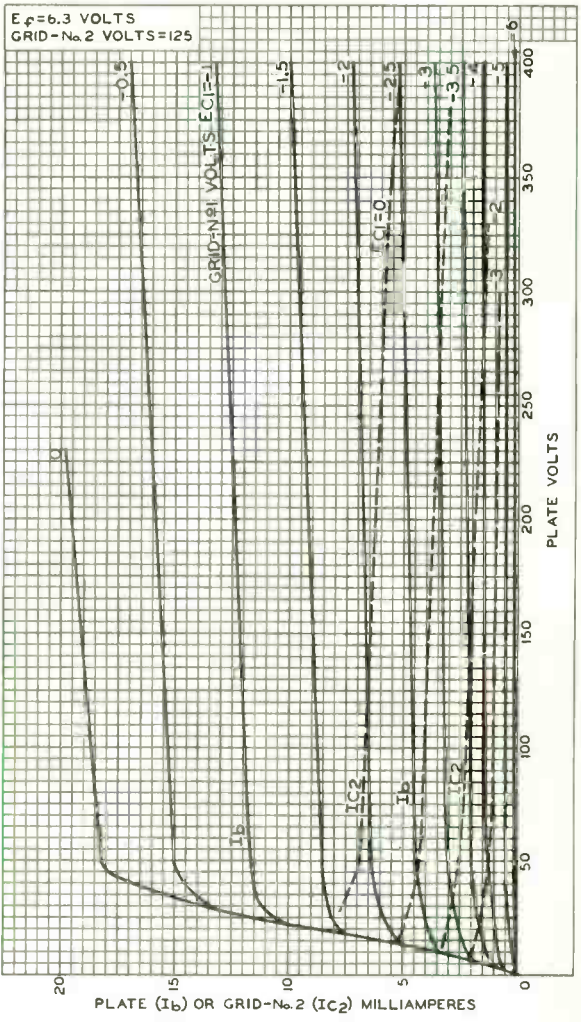
6HB7

AVERAGE CHARACTERISTICS
Triode Unit



92CM-9882RI

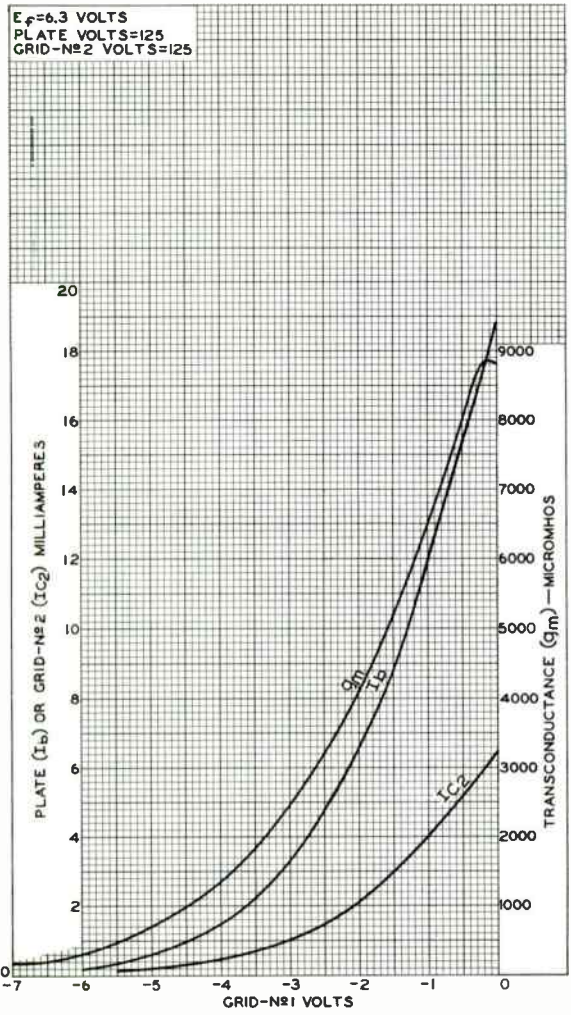
AVERAGE CHARACTERISTICS
Pentode Unit



92CM-9867RI

6HB7

AVERAGE CHARACTERISTICS
Pentode Unit



92CM-9868R1

Beam Power Tube

7-PIN MINIATURE TYPE
CONTROLLED CATHODE WARM-UP TIME MINIMIZES EXTRANEOUS SOUND DURING RECEIVER WARM UP.

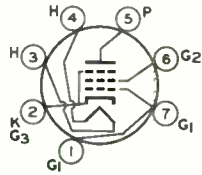
For Use in the Audio Output Stages of Television Receivers

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.450	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Minimum Cathode Warm-up Time:[b] Heater volts = 6.3, plate and grid-No.2 volts = 250, and cathode resistor (ohms) = 680	14	sec
Direct Interelectrode Capacitances (Approx.):		
G1 to P	0.4	pf
Input: G1 to (K+G3,G2,H)	8.0	pf
Output: P to (K+G3,G2,H)	8.5	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
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	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-Maximum Values:*

Plate Voltage	275 max.	volts
Grid-No.2 (Screen-Grid) Voltage	275 max.	volts
Grid-No.2 Input	2 max.	watts

6HG5

Plate Dissipation	12 max.		watts
Bulb Temperature (At hottest point on bulb surface)	250 max.		°C

Typical Operation and Characteristics:

Plate Voltage	180	250	volts
Grid-No.2 Voltage	180	250	volts
Grid-No.1 (Control-Grid) Voltage	-8.5	-12.5	volts
Peak AF Grid-No.1 Voltage	8.5	12.5	volts
Zero-Signal Plate Current	29	45	ma
Max.-Signal Plate Current	30	47	ma
Zero-Signal Grid-No.2 Current	3	4.5	ma
Max.-Signal Grid-No.2 Current	4	7	ma
Plate Resistance (Approx.)	58000	52000	ohms
Transconductance	3700	4100	μmhos
Load Resistance	5500	5000	ohms
Total Harmonic Distortion	8	8	%
Max.-Signal Power Output	2	4.5	watts

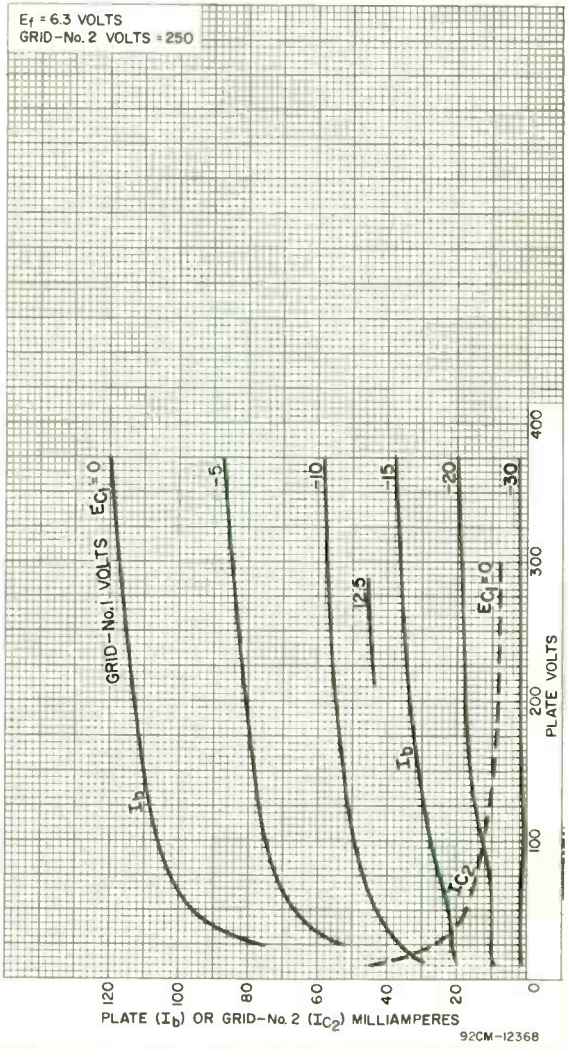
Maximum Circuit Values:

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

[a] The dc component must not exceed 100 volts.

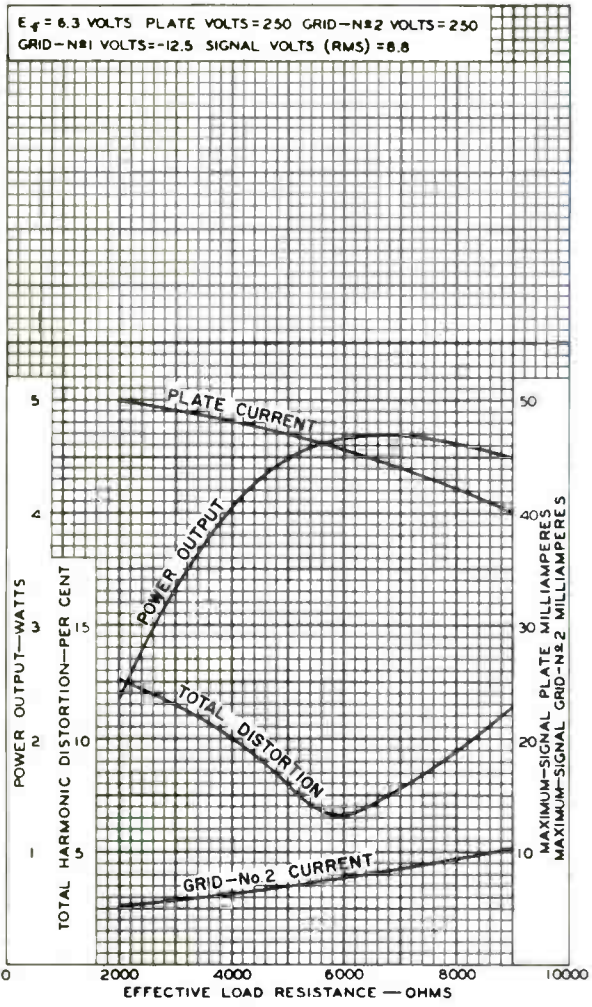
[b] The time interval between the instant all electrode voltages are applied and the instant a current of one milliampere flows in the plate circuit of the 6HG5.

AVERAGE CHARACTERISTICS



6HG5

OPERATION CHARACTERISTICS



92CM-6339R2

Beam Power Tube

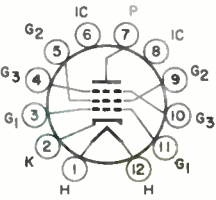
DUODECAR TYPE

Electrical:

Heater Ratings and Characteristics:		
Voltage (AC or DC)	6.3 ± 0.5	volts
Current at heater volts = 6.3	2.250	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.625"
Seated Length	3.000" to 3.250"
Diameter	1.437" to 1.563"
Dimensional Outline	See *General Section*
Bulb	T12
Base	Large-Button Duodecar 12-Pin (JEDEC No. E12-74)
Basing Designation for BOTTOM VIEW	12FL



Pin 1 – Heater
Pin 2 – Cathode
Pin 3 – Grid No.1
Pin 4 – Grid No.3
Pin 5 – Grid No.2
Pin 6 – Do Not Use
Pin 7 – Plate
Pin 8 – Do Not Use
Pin 9 – Grid No.2
Pin 10 – Grid No.3
Pin 11 – Grid No.1
Pin 12 – Heater

Characteristics, Class A_1 Amplifier:

				Triode Connection[b]	
Plate Voltage	40	60	135	135	volts
Grid-No.1 Voltage	*Connected to cathode at socket*		0	–	volts
Grid-No.2 Voltage	110	135	135	135	volts
Grid-No.1 Voltage	0	0	-22	-22	volts
Amplification Factor	–	–	–	4.2	
Plate Resistance (Approx.)	–	–	5000	–	ohms
Transconductance	–	–	10000	–	μmhos
Plate Current	400[c]	540[c]	80	–	ma
Grid-No.2 Current	42[c]	40[c]	5.5	–	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 1, grid-No.2 volts = 135, plate volts = 4500	–	–	-70	–	volts

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[d]

DC Plate Supply Voltage	770 max.	volts
Peak Positive-Pulse Plate Voltage[e]	7000 max.	volts
Peak Negative-Pulse Plate Voltage	1500 max.	volts
DC Grid-No.3 (Suppressor-Grid) Voltage[f]	70 max.	volts
DC Grid-No.2 (Screen-Grid) Voltage	220 max.	volts
Peak Negative-Pulse Grid-No.1 Voltage	330 max.	volts
Cathode Current:		
Peak	1000 max.	ma
Average	280 max.	ma
Grid-No.2 Input	6 max.	watts
Grid-No.2 Input (warm-up surge)[g]	12 max.	watts
Plate Dissipation[h]	24 max.	watts
Bulb Temperature (At hottest point on bulb surface)	240 max.	°C

Maximum Circuit Values:

Grid-No.1 Circuit Resistance:		
For grid-resistor-bias operation	1 max.	megohm

[a] The dc component must not exceed 100 volts.

[b] With grid No.2 connected to plate at socket.

[c] Instantaneous values.

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

[e] 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.

[f] A positive voltage may be applied to grid No.3 to reduce interference from "snivets" which may occur in television receivers. A typical value for this voltage is 30 volts.

[g] Surge not to exceed 15 second duration.

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

Diode—Sharp-Cutoff Pentode

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Maximum Values):*			
Voltage (AC or DC)	6.3[a]	6.3 ± 0.6	volts
Current	0.450 ± 0.030	0.450[b]	amp
Warm-up time (Average)	11	–	sec
Peak heater–cathode voltage (Each unit):			
Heater negative with respect to cathode	200 max.		volts
Heater positive with respect to cathode	200[c] max.		volts
Direct Interelectrode Capacitances:[d]			
Diode Unit:			
Plate to cathode and heater	2.4		μμf
Cathode to plate and heater	3.0		μμf
Pentode Unit:			
Grid No.1 to plate	0.015 max.		μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	7.0		μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	3.2		μμf
Diode plate to pentode grid No.1	0.005 max.		μμf
Diode cathode to pentode plate	0.15 max.		μμf
Diode plate to pentode plate	0.035 max.		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.)	0.2	megohm
Transconductance	9300	μmhos
Plate Current	11.5	ma
Grid-No.2 Current	3.6	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20.	–6	volts
Grid-No.1 Voltage (Approx.) for plate ma. = 2, and cathode resistor (ohms) = 0.	–3	volts

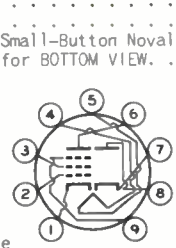
Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
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"

6HJ8

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. 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

PENTODE UNIT — Class A_1 Amplifier

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	330 max.	volts
GRID No.3 (SUPPRESSOR GRID)	*Connect to cathode at socket*	
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	3.2 max.	watts

Maximum Circuit Values:

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

DIODE UNIT

Maximum Ratings, *Design-Maximum Values:*

DC PLATE CURRENT.	5 max.	ma

Characteristics, Instantaneous Value:

Plate Current for plate volts = 10.	50	ma

[a] At heater amperes = 0.450.
[b] At heater volts = 6.3.
[c] The dc component must not exceed 100 volts.
[d] Without external shield.

Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For Video and Bandpass Amplifier Applications in TV Receivers

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6[a]	volts
Current at heater volts = 6.3	0.600[b]	amp
Warm-up time (Average)	11	sec
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[c] max.	volts

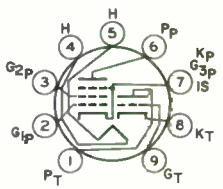
Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield*[d]	
Triode Unit:			
G_T to P_T	2.8	2.8	pf
Input: G_T to (K_T, K_P+$G3_P$+IS, H)	2.8	3.0	pf
Output: P_T to (K_T, K_P+$G3_P$+IS, H)	1.6	2.4	pf
Pentode Unit:			
$G1_P$ to P_P	0.030 max.	0.026 max.	pf
Input: $G1_P$ to (K_P+$G3_P$+IS, $G2_P$, H)	7.5	7.5	pf
Output: P_P to (K_P+$G3_P$+IS, $G2_P$, H)	2.4	3.0	pf

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
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, Grid No.3, Internal Shield
Pin 8 – Triode Cathode
Pin 9 – Triode Grid



Characteristics:

	Triode Unit	*Pentode Unit*	
Plate Voltage	125	125	volts
Grid-No.2 Voltage	–	125	volts
Grid-No.1 Voltage	-1	-1	volt
Amplification Factor	40	–	
Plate Resistance (Approx.)	5000	150000	ohms
Transconductance	7000	10000	μmhos
Plate Current	12.5	12	ma
Grid-No.2 Current	–	4.5	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	–	-7	volts

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
Grid-No.2 Input: For grid-No.2 voltages up to 165 volts	–	0.55 max.	watt
For grid-No.2 voltages between 165 and 330 volts	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section		
Plate Dissipation	2.5 max.	2.5 max.	watts

Maximum Circuit Values:

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

[a] For parallel heater operation.

[b] For series heater operation current must be limited to 0.600 ± 0.040 amperes.

[c] The dc component must not exceed 100 volts.

[d] With external shield, JEDEC No.315, connected to cathode of unit under test.

6HM5/6HA5

High-Mu Triode

7-PIN MINIATURE TYPE

Useful as Grounded-Cathode RF-Amplifier Tube in VHF Tuners

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.3	volts
Current at heater volts = 6.3	0.180	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	110 max.	volts
Heater positive with respect to cathode	110 max.	volts
Direct Interelectrode Capacitances:[a]		
Grid to plate	0.36	pf
Grid to cathode, internal shield, external shield, and heater	4.3	pf
Plate to cathode, internal shield, external shield, and heater	2.9	pf
Cathode to plate	0.080	pf
Cathode to grid, internal shield, external shield, and heater	3.1	pf
Heater to cathode	2.3	pf
Heater to grid	0.070 max.	pf

Characteristics, Class A_1 Amplifier:

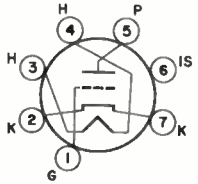
Plate Voltage	135	volts
Grid Voltage	-1	volt
Amplification Factor	72	
Plate Resistance (Approx.)	5000	ohms
Transconductance	14500	μmhos
Plate Current	11.5	ma
Grid Voltage (Approx.) for Transconductance (μmhos) = 150	-5.7	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
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)

6HM5/6HA5

Basing Designation for BOTTOM VIEW. 7GM



Pin 1 – Grid
Pin 2 – Cathode
Pin 3 – Heater
Pin 4 – Heater
Pin 5 – Plate
Pin 6 – Internal Shield
Pin 7 – Cathode

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

Plate Supply Voltage.	600 max.	volts
Plate Voltage	220 max.	volts
Grid Voltage:		
Negative-bias value	50 max.	volts
Positive-bias value	0 max.	volts
Cathode Current	22 max.	ma
Plate Dissipation	2.6 max.	watts

Typical Operation:

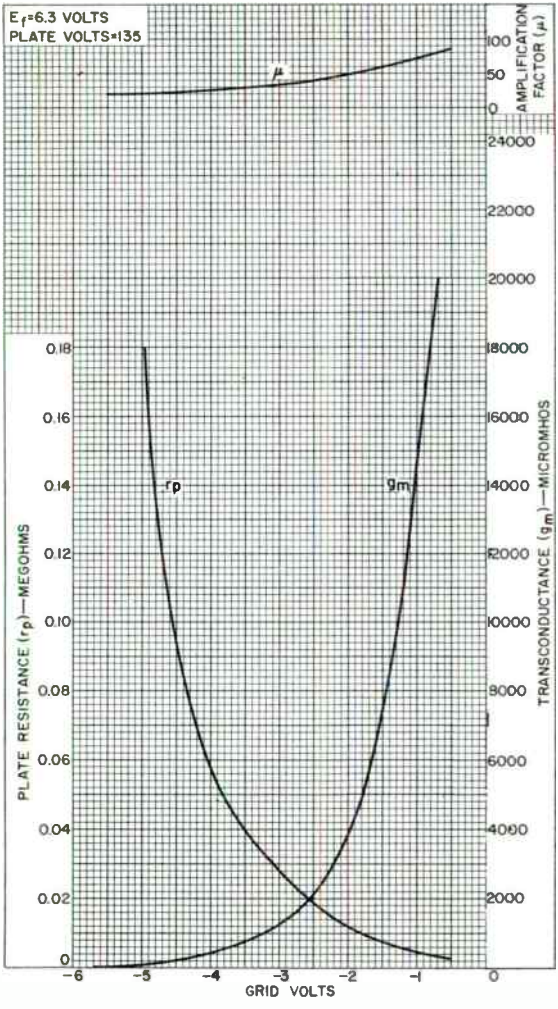
Plate Voltage	135	volts
Grid Voltage. . . . . Adjusted for grid μa =	10	
Plate Load Resistance	1000	ohms
Amplification Factor.	80	
Plate Resistance (Approx.).	4000	ohms
Transconductance.	20000	μmhos
Plate Current	19	ma

Maximum Circuit Values:

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

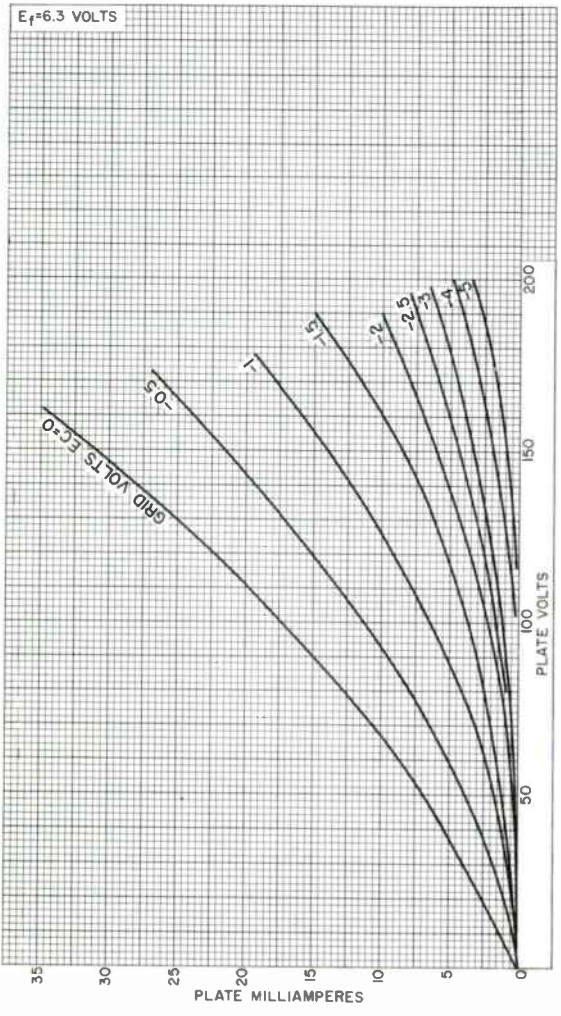
[a] With external shield JEDEC No.316 connected to cathode.

AVERAGE CHARACTERISTICS



92CM-12224

AVERAGE PLATE CHARACTERISTICS



92CM-12223

6HR6

Semiremote-Cutoff Pentode

7-PIN MINIATURE TYPE

For Intermediate-Frequency-Amplifier Applications in FM, AM, and AM/FM Receivers

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Maximum Values)*:			
Voltage (AC or DC)	6.3[a]	6.3 ± 0.6	volts
Current	0.450 ± 0.030	0.450[b]	amp
Warm-up time (Average)	11	–	sec
Peak heater-cathode voltage:			
Heater negative with respect to cathode	200 max.		volts
Heater positive with respect to cathode	200[c] max.		volts
Direct Interelectrode Capacitances:[d]			
Grid No.1 to plate	0.006 max.		μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	8.8		μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	5.2		μμf

Characteristics, Class A1 Amplifier:

Plate Supply Voltage	200	volts
Grid No.3	*Connected to cathode at socket*	
Grid-No.2 Supply Voltage	115	volts
Grid-No.1 Supply Voltage	0	volts
Cathode Resistor	68	ohms
Plate Resistance (Approx.)	0.5	megohm
Transconductance	8500	μmhos
Plate Current	13.2	ma
Grid-No.2 Current	4.3	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 60	-15	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
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)

6HR6

Basing Designation for BOTTOM VIEW. 7BK

Pin 1 – Grid No.1
Pin 2 – Grid No.3, Internal Shield
Pin 3 – Heater

Pin 4 – Heater
Pin 5 – Plate
Pin 6 – Grid No.2
Pin 7 – Cathode

AMPLIFIER — Class A[1]

Maximum Ratings, *Design-Maximum Values:*

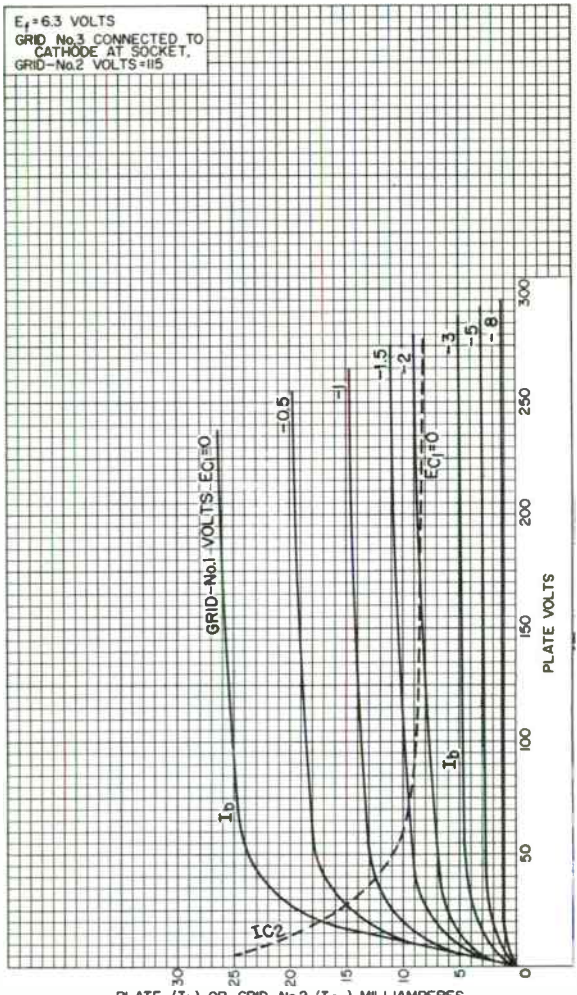
PLATE VOLTAGE	300 max.	volts
GRID No.3 (SUPPRESSOR GRID)	*Connect to cathode at socket*	
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	300 max.	volts
GRID-No.2 VOLTAGE	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	50 max.	volts
Positive-bias value	0 max.	volts
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 150 volts	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	
PLATE DISSIPATION	3 max.	watts

Maximum Circuit Values:

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

[a] At heater amperes = 0.450.
[b] At heater volts = 6.3.
[c] The dc component must not exceed 100 volts.
[d] Without external shield.

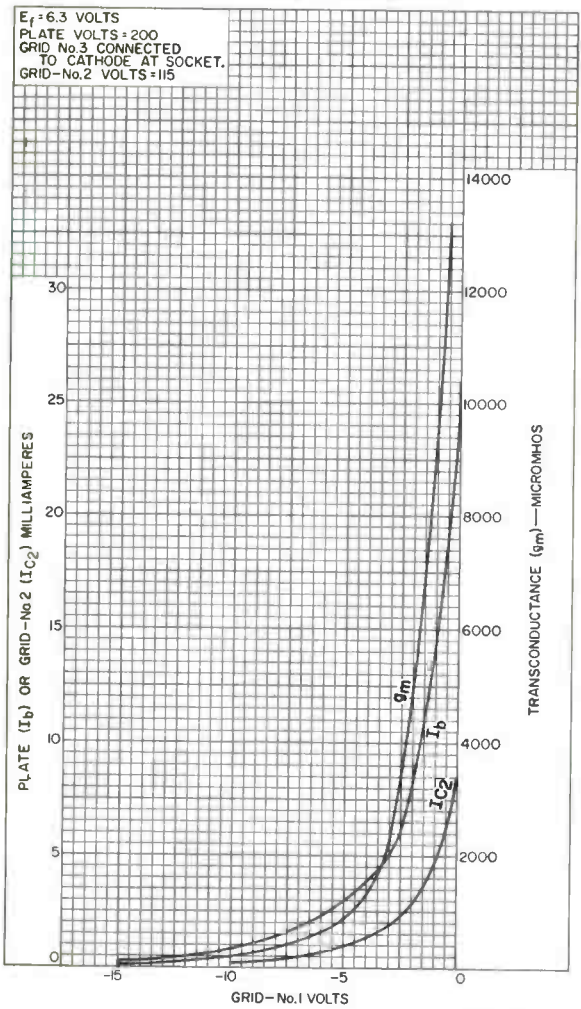
AVERAGE CHARACTERISTICS



92CM-11530

6HR6

AVERAGE CHARACTERISTICS



92CM-11533

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE
With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Maximum Values)*:			
Voltage (AC or DC)	6.3[a]	6.3 ± 0.6	volts
Current	0.450 ± 0.030	0.450[b]	amp
Warm-up time (Average)	11	–	sec
Peak heater-cathode voltage:			
Heater negative with respect to cathode	200 max.		volts
Heater positive with respect to cathode	200[c] max.		volts
Direct Interelectrode Capacitances:[d]			
Grid No.1 to plate	0.006 max.		μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	8.8		μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	5.2		μμf

Characteristics, Class A$_1$ Amplifier:

Plate Supply Voltage	75	150	volts
Grid No.3	*Connected to cathode at socket*		
Grid-No.2 Supply Voltage	75	75	volts
Grid-No.1 Supply Voltage	0	0	volts
Cathode Resistor	68	68	ohms
Amplification Factor[e]	50	–	
Plate Resistance (Approx.)	–	0.5	megohm
Transconductance	–	9500	μmhos
Plate Current	–	8.8	ma
Grid-No.2 Current	–	2.8	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	–	-4	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
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)

6HS6

Basing Designation for BOTTOM VIEW. 7BK

Pin 1 – Grid No.1
Pin 2 – Grid No.3, Internal Shield
Pin 3 – Heater

Pin 4 – Heater
Pin 5 – Plate
Pin 6 – Grid No.2
Pin 7 – Cathode

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

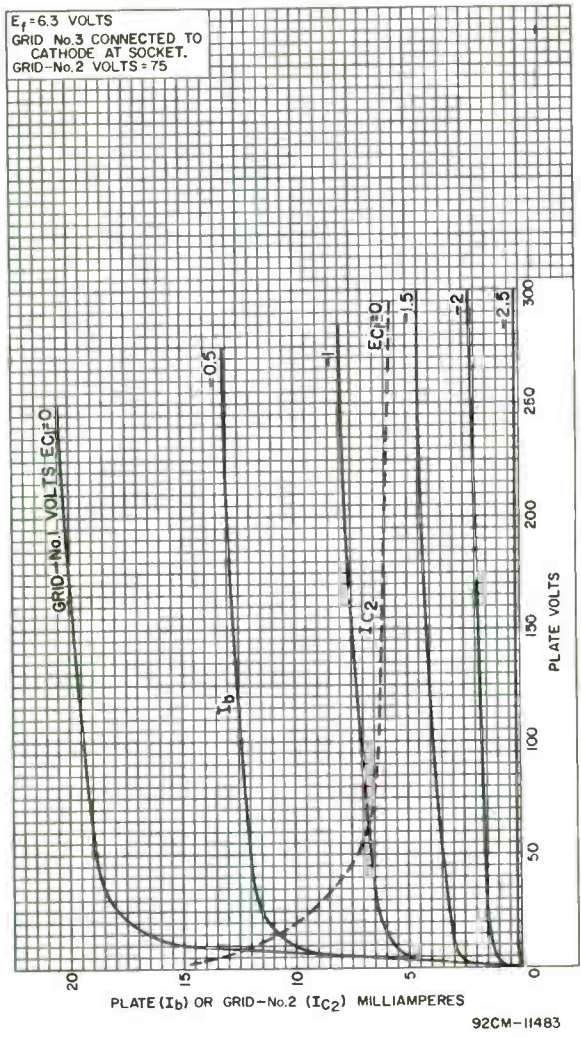
PLATE VOLTAGE.	300 max.	volts
GRID No.3 (SUPPRESSOR GRID). . .	*Connect to cathode at socket*	
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	300 max.	volts
GRID-No.2 VOLTAGE.	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value.	50 max.	volts
Positive-bias value.	0 max.	volts
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 150 volts .	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	
PLATE DISSIPATION.	3 max.	watts

Maximum Circuit Values:

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

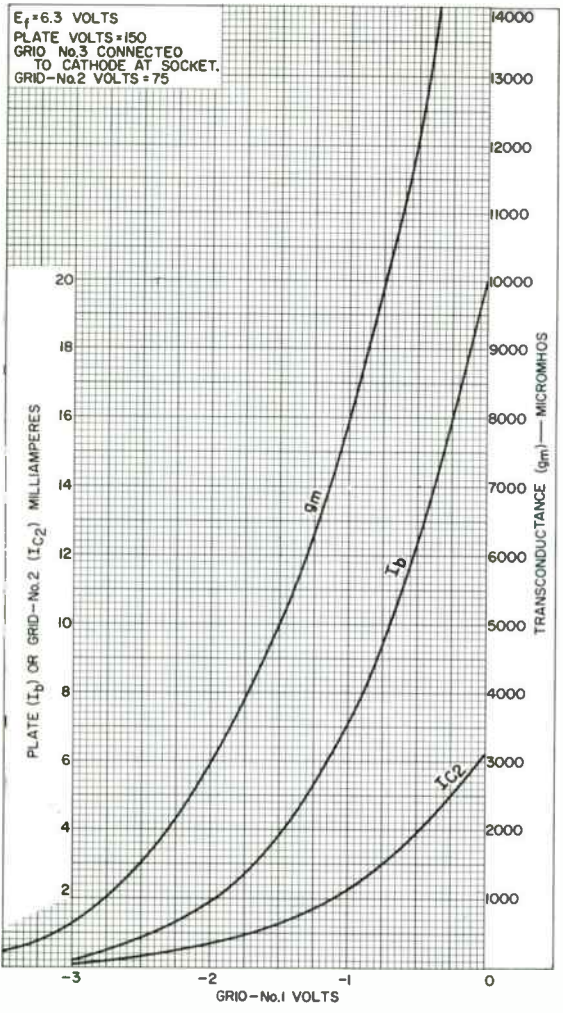
[a] At heater amperes = 0.450.
[b] At heater volts = 6.3.
[c] The dc component must not exceed 100 volts.
[d] Without external shield.
[e] Triode connection (Grid No.2 connected to plate).

AVERAGE CHARACTERISTICS



92CM-11483

AVERAGE CHARACTERISTICS



Sharp-Cutoff Twin Pentode

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

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.3	amp
Direct Interelectrode Capacitances:[a]		
Grid No.3 to plate (Each unit)	2	μμf
Grid No.1 to all other electrodes	6	μμf
Grid No.3 (Each unit) to all other electrodes	3.6	μμf
Plate (Each unit) to all other electrodes	3	μμf
Grid No.3 (Unit No.1) to grid No.3 (Unit No.2)	0.015 max.	μμf

Characteristics, Class A_1 Amplifier:

	With one unit operating and plate and grid No.3 of other unit connected to ground		
Plate Voltage	100	100	volts
Grid-No.3 Voltage	0	0	volts
Grid-No.2 Voltage	67.5	67.5	volts
Grid-No.1 Voltage	0	[b]	volts
Grid-No.3-to-Plate Transconductance	–	450	μmhos
Grid-No.1-to-Plate Transconductance	1100	–	μmhos
Plate Current	–	2	ma
Grid-No.3 Voltage (Approx.) for plate μa = 25	–	-3	volts
Grid-No.1 Voltage (Approx.) for plate μa = 100	–	-2.3	volts

	With both units operating		
Plate Voltage (Each unit)	100	100	volts
Grid-No.3 Voltage (Each unit)	-10	0	volts
Grid-No.2 Voltage	67.5	67.5	volts
Grid-No.1 Voltage	[b]	[b]	volts
Plate Current (Each unit)	–	2	ma
Grid-No.2 Current	7	4.4	ma
Cathode Current	7.1	8.5	ma

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2

6HS8

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

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

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

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE (Each unit)	300	max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE (Each unit):			
Peak positive value	50	max.	volts
DC negative value	50	max.	volts
DC positive value	3	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	150	max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Negative-bias value	50	max.	volts
CATHODE CURRENT	12	max.	ma
GRID-No.2 INPUT	0.75	max.	watt
PLATE DISSIPATION (Each unit)	1.1	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200[c]	max.	volts

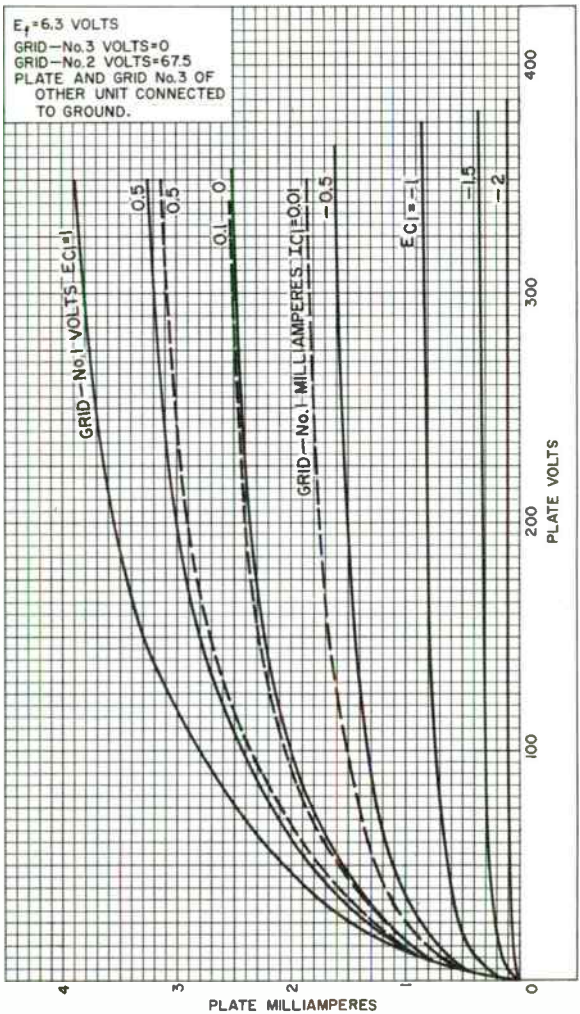
Maximum Circuit Values:

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

[a] Without external shield.
[b] Adjusted to give a dc grid-No.1 current of 100 microamperes.
[c] The dc component must not exceed 100 volts.

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

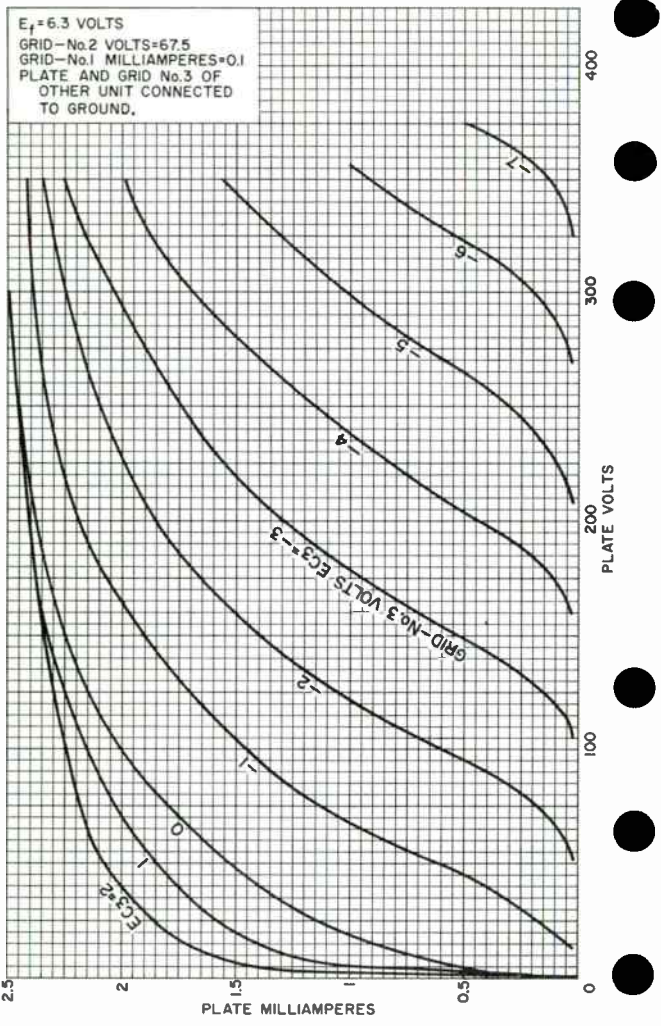
AVERAGE PLATE CHARACTERISTICS
Each Unit



92CM—11099

6HS8

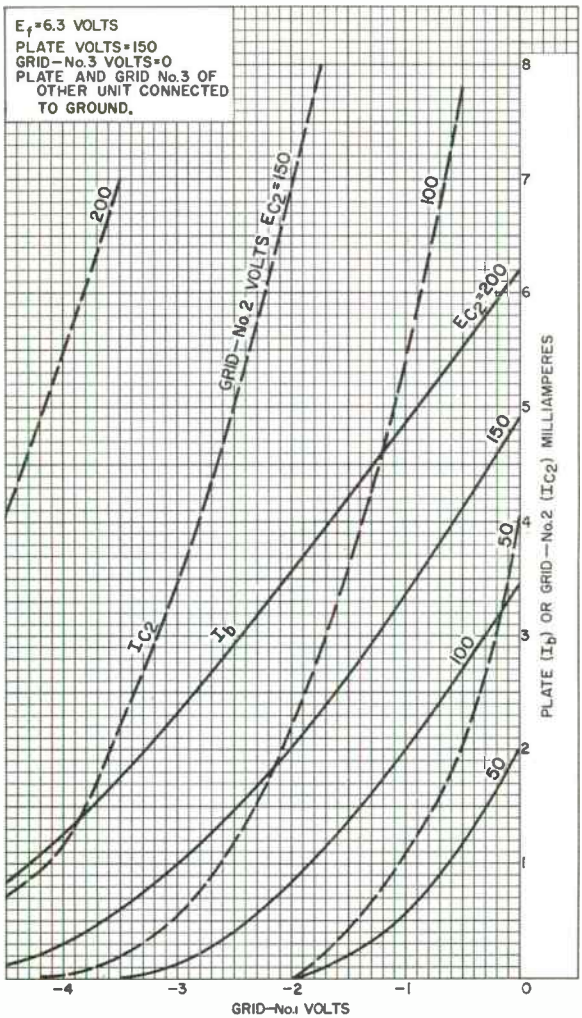
AVERAGE PLATE CHARACTERISTICS
Each Unit



92CM—11102

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

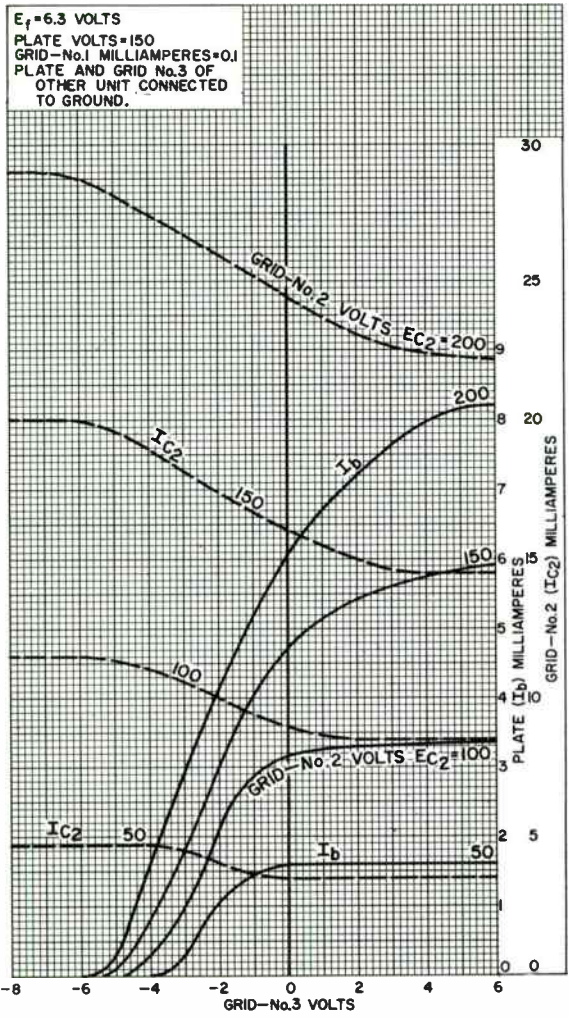
AVERAGE CHARACTERISTICS
Each Unit



92CM—11104

6HS8

AVERAGE CHARACTERISTICS
Each Unit



92CM—11105

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

Medium-Mu Twin Triode

7-PIN MINIATURE TYPE
With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	*With External Shield*[a]	
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	μμf

Characteristics, Class A_1 Amplifier (Each Unit):

Plate Supply Voltage	100	volts
Cathode Resistor[b]	50[c]	ohms
Amplification Factor	38	
Plate Resistance (Approx.)	7100	ohms
Transconductance	5300	μmhos
Plate Current	8.5	ma

Mechanical:

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

6J6A

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:

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:[d]

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.)[e]	16	ma
Driving Power (Approx.)[e]	0.35	watt
Useful Power Output (Approx.)	3.5	watts

[a] With external shield JEDEC No.316 connected to cathode.

[b] Fixed-bias operation is not recommended.

[c] Value is for both units operating at the specified conditions.

[d] Approximately 1 watt can be obtained when the 6J6A 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

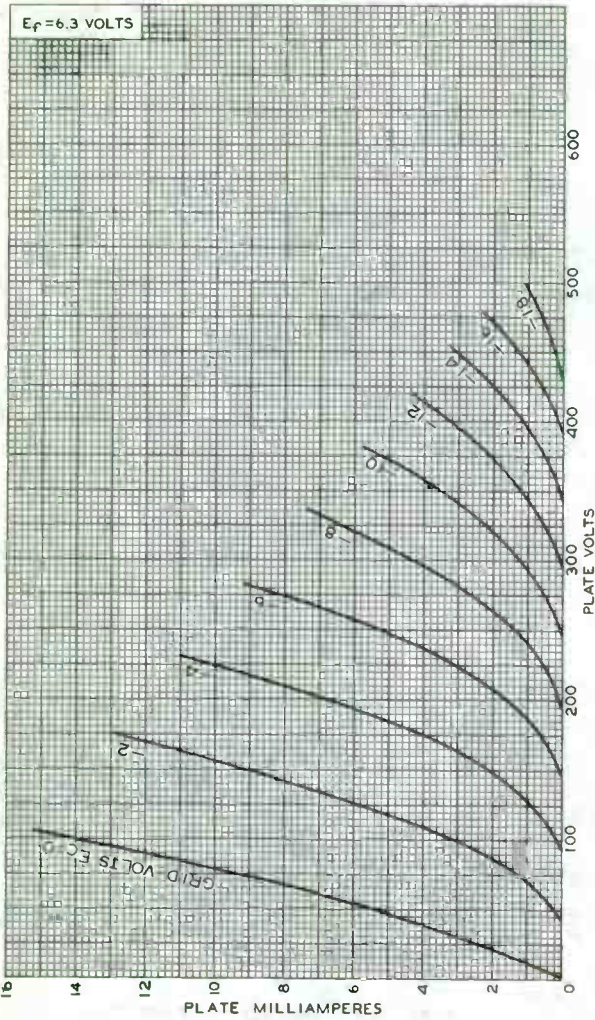
[e] For effect of load resistance on grid current and driving power, refer to *TUBE RATINGS—Grid Current and Driving Power* in the *General Section*.

AVERAGE CHARACTERISTICS
Each Unit

92CM-6403R1

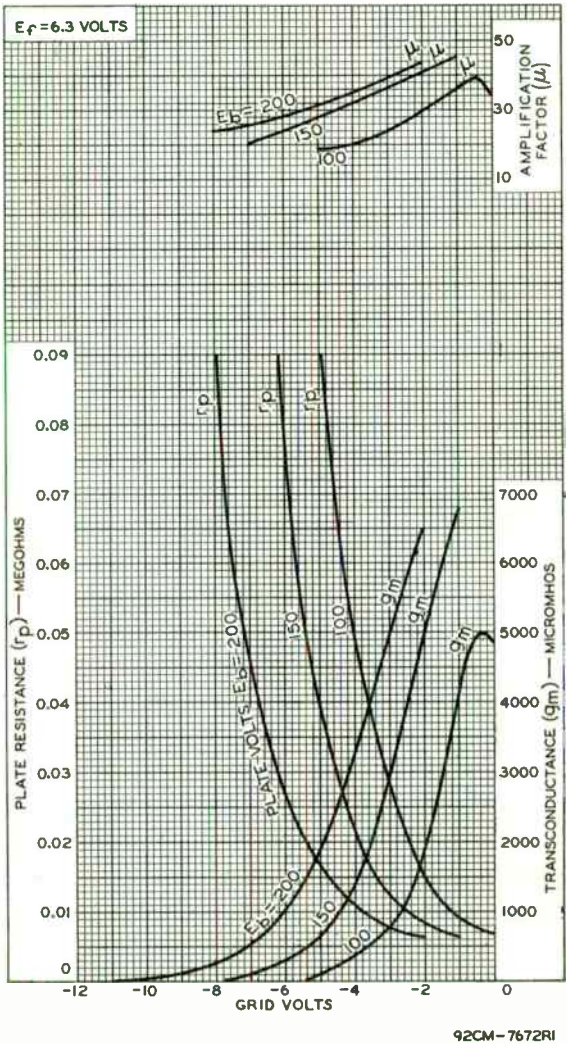
6J6A

AVERAGE PLATE CHARACTERISTICS
Each Unit



92CM-6402R1

AVERAGE CHARACTERISTICS
Each Unit



92CM-7672RI

Pentode—
Beam Power Tube

For Combined Limiter, Quadrature-Grid Discriminator, and Audio Power Output Applications in FM and TV Receivers

DUODECAR TYPE

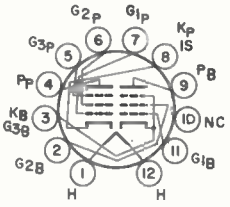
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ±0.6	volts
Current at heater volts = 6.3	0.950	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances:[b]		
Beam Power Unit:		
Grid No.1 to plate	0.2	pf
Input: $G1_B$ to $(K_B+G3_B,G2_B,H)$	11	pf
Output: P_B to $(K_B+G3_B,G2_B,H)$	7.0	pf
Pentode Unit:		
Grid No.1 to plate	0.01	pf
$G1_P$ to $(K_P+'S,P_P,G3_P,G2_P,H)$	4.0	pf
$G3_P$ to $(K_P+'S,P_P,G2_P,G1_P,H)$	3.2	pf

Mechanical:

Operating Position	Any
Types of Cathodes	Coated Unipotential
Maximum Overall Length	2.375"
Seated Length	1.750" to 2.000"
Diameter	1.062" to 1.188"
Dimensional Outline (JEDEC 9-58)	See *General Section*
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC E12-70)
Basing Designation for BOTTOM VIEW	12BT

Pin 1 – Heater
Pin 2 – Beam Power Grid No.2
Pin 3 – Beam Power Cathode, Beam Power Grid No.3
Pin 4 – Pentode Plate
Pin 5 – Pentode Grid No.3
Pin 6 – Pentode Grid No.2
Pin 7 – Pentode Grid No.1
Pin 8 – Pentode Cathode, Internal Shields
Pin 9 – Beam Power Plate
Pin 10 – No Internal Connection
Pin 11 – Beam Power Grid No.1
Pin 12 – Heater



PENTODE UNIT — LIMITER & DISCRIMINATOR SERVICE

Maximum Ratings, *Design-Maximum Values:*

Plate Supply Voltage	330	volts
Grid-No.3 (Quadrature-Grid) Voltage	[c]	
Grid-No.2 (Accelerator-Grid) Voltage	110	volts
Grid-No.1 (Limiter-Grid) Voltage:		
Positive-peak value	60	volts
Cathode Current	13	ma

Typical Operation:

Input-Signal Center Frequency	*4.5*	*10.7*	*10.7*	*Mc*
Plate Supply Voltage	270	85	285	volts
Plate Voltage	62	121	122	volts
Grid-No.3 Voltage	[c]	[c]	[c]	[c]
Grid-No.2 Voltage	100	55	100	volts
Cathode-Circuit Resistance[d]	200-400	200-400	200-400	ohms
Peak AF Output Voltage	16.8	6	16.6	volts
Minimum Grid-No.1 Signal Voltage (RMS) for AM rejection[d]	2	1.25	2	volts
Minimum Grid-No.1 Signal Voltage (RMS) for limiting action[e]	1.25	1.25	1.25	volts
Plate Current	0.44	0.25	0.49	ma
Grid-No.2 Current	10	4.1	9.8	ma
Plate Load Resistor	0.33	0.085	0.33	megohm
Linearity Resistor	1000	470	1500	ohms
Integrating Capacitor	0.001	0.002	0.001	μf
Coupling Capacitor	0.25	0.25	0.01	μf
Frequency Deviation	±25	±75	±75	kc
AM Rejection:				
For grid-No.1 signal volts (RMS) = 2	25	31	20	db
For grid-No.1 signal volts (RMS) = 3	30	30	29	db
Total Harmonic Distortion	1.8	2	1.6	%

BEAM POWER UNIT — AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

Plate Voltage	275	volts
Grid-No.2 (Screen-Grid) Voltage	275	volts
Plate Dissipation	10	watts
Grid-No.2 Input	2	watts

Typical Operation and Characteristics:

Plate Voltage	250	volts
Grid-No.2 Voltage	250	volts
Grid-No.1 (Control-Grid) Voltage	-8	volts
Peak AF Grid-No.1 Voltage	8	volts

Zero-Signal Plate Current.	35	ma
Max.-Signal Plate Current.	39	ma
Zero-Signal Grid No.2 Current.	2.5	ma
Max.-Signal Grid No.2 Current.	7	ma
Plate Resistance (Approx.)	0.1	megohm
Transconductance	6500	μmhos
Load Resistance.	5000	ohms
Total Harmonic Distortion.	10	%
Max.-Signal Power Output	4.2	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation	0.25	megohm
For cathode-bias operation	0.5	megohm

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

[c] For proper operation of the pentode unit of the type shown in the accompanying Typical Quadrature-Grid-FM Detector circuit, the Q of the tuned circuit (L_1, C_6) should be sufficiently high to develop a 4-volt rms signal at the quadrature grid when a 2-volt rms signal at the center frequency is applied to grid No.1.

It is recommended that L_1 be shunted by a capacitance of at least 10 μμf. This capacitance may be composed of tube capacitance, stray capacitance, the distributed capacitance of L_1, and a fixed capacitor.

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

[e] At signal levels above specified value, limiting is within ±3 decibels.

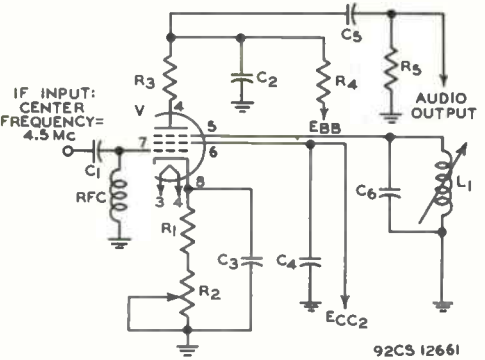
OPERATING CONSIDERATIONS FOR PENTODE UNIT

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

To obtain a symmetrical discriminator-response curve, the plate currents for no input signal and for unmodulated input signal should be equal. To assure this equality, it is necessary that the plate voltage and grid-No.2 voltage have the proper values.

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

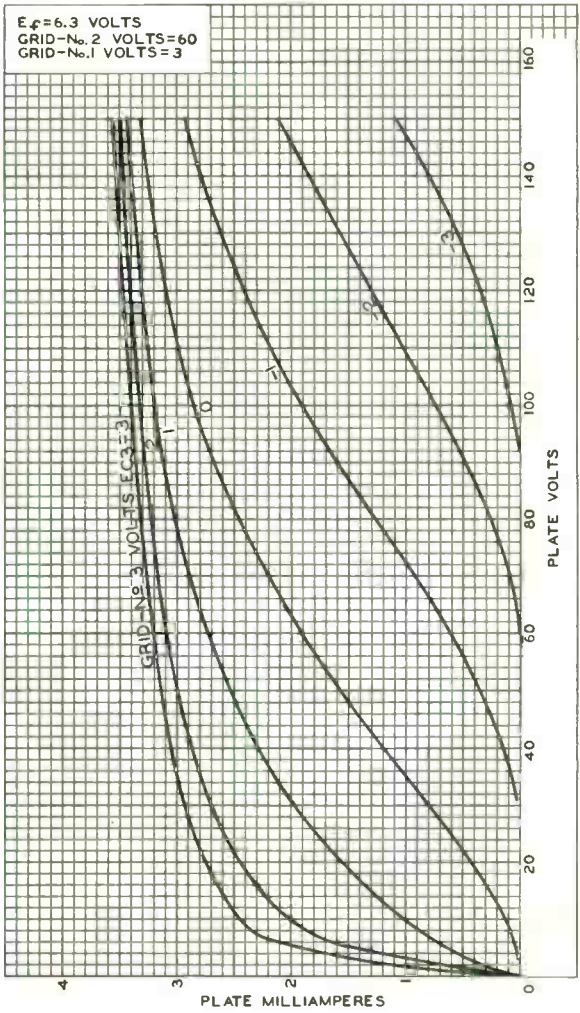
TYPICAL QUADRATURE-GRID-
FM-DETECTOR CIRCUIT



C_1: 100 $\mu\mu$f
C_2: Integrating capacitor, 0.001 μf
C_3, C_4: 0.01 μf
C_5: 0.25 μf
C_6: 10 $\mu\mu$f[c]
L_1: c
R_1: 200 ohms
R_2: Cathode-bias potentiometer, 200 ohms
R_3: Linearity resistor, 1000 ohms
R_4: Plate-load resistor, 0.33 megohm
R_5: 0.47 megohm
V: Pentode Unit of Electron-tube-type 6J10

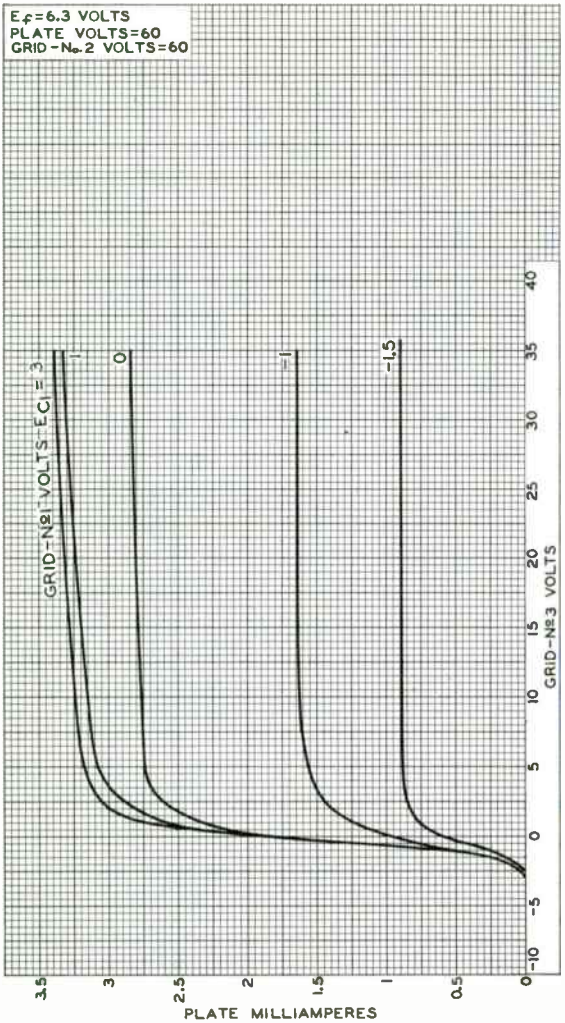
[c] For footnote see end of data.

AVERAGE PLATE CHARACTERISTICS
Pentode Unit



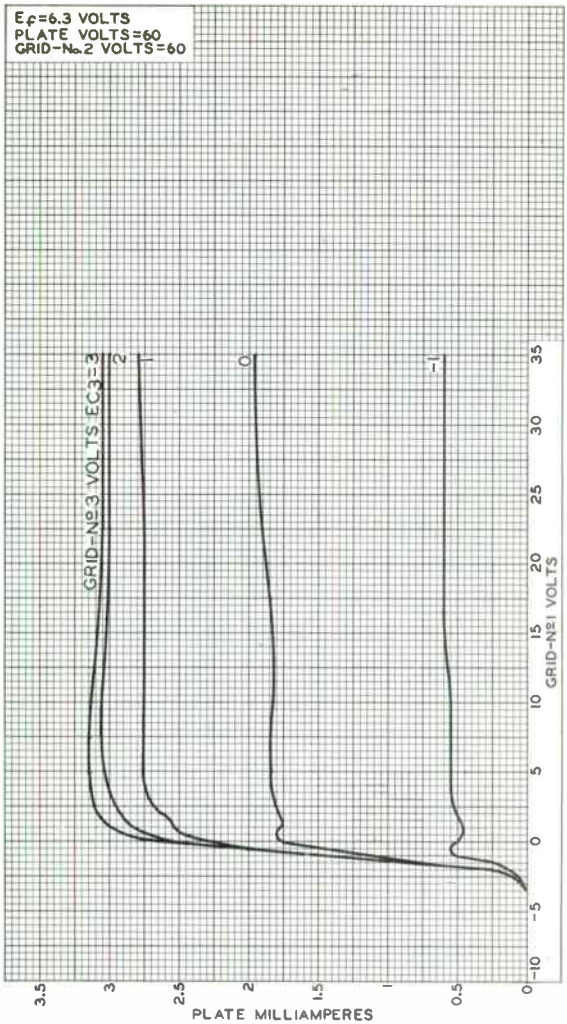
92CM-10319

AVERAGE CHARACTERISTICS
Pentode Unit



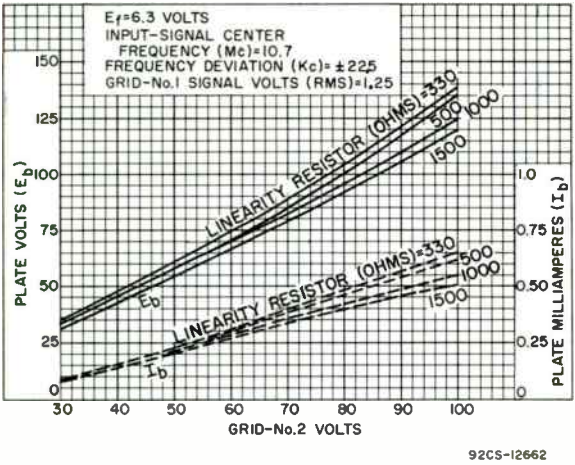
92CM-10320

AVERAGE CHARACTERISTICS
Pentode Unit



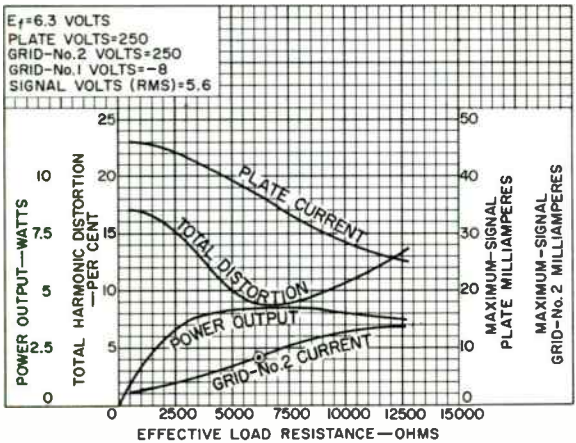
92CM-10322

OPERATION CHARACTERISTICS
Pentode Unit



92CS-12662

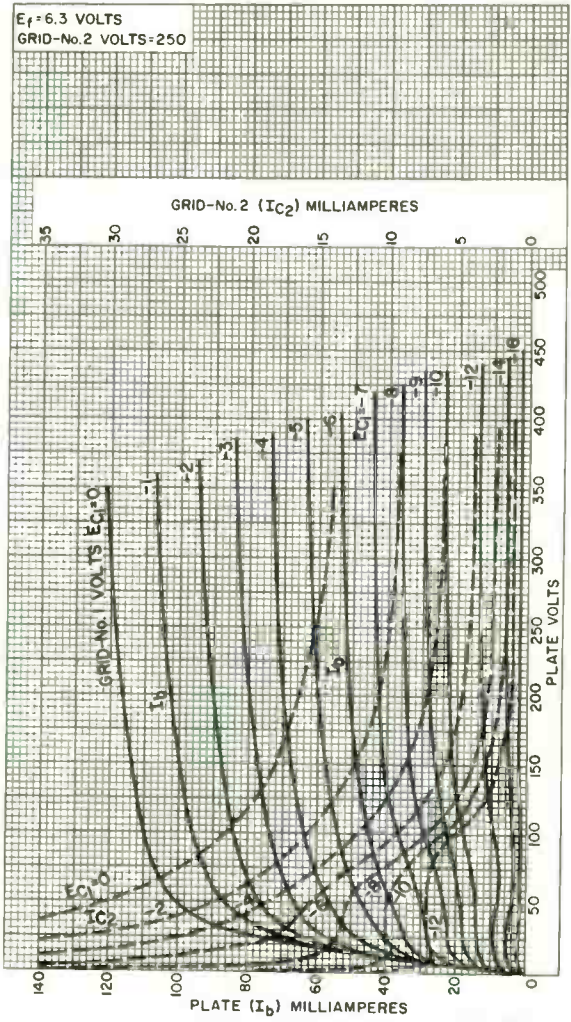
OPERATION CHARACTERISTICS
Beam Power Unit



92CS-12663

AVERAGE CHARACTERISTICS

Beam Power Unit



92CM-12669

6JB6

Beam Power Tube

NOVAR TYPE

For TV Horizontal-Deflection Amplifier Applications

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:			
Voltage (AC or DC)	6.3 ± 0.6		volts
Current at heater volts = 6.3	1.2		amp
Peak-heater-cathode voltage:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[a]	max.	volts
Direct Interelectrode Capacitances (Approx.):[b]			
Grid No.1 to plate	0.2		pf
Grid No.1 to cathode, grid No.3, grid No.2, and heater	15.0		pf
Plate to cathode, grid No.3, grid No.2, and heater	6.0		pf

Characteristics, Class A$_1$ Amplifier:

	Triode Connection	*Pentode Connection*		
Plate Voltage	150	60	250	volts
Grid No.3	–	*Connected to cathode at socket*		
Grid-No.2 Voltage	150	150	150	volts
Grid-No.1 Voltage	-22.5	0	-22.5	volts
Mu-factor, Grid No.2 to Grid No.1	4.4	–	–	
Plate Resistance (Approx.)	–	–	15000	ohms
Transconductance	–	–	7100	μmhos
Plate Current	–	39[c]	7[c]	ma
Grid-No.2 Current	–	32[c]	2.1	ma
Grid-No.2 Voltage (Approx.) for plate current = 1 ma	–	–	-42	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.550"
Seated Length	3.040" ± 0.130"
Diameter	1.438" to 1.562"
Bulb	T12
Cap	Skirted Miniature (JEDEC No.C1-2 or C1-3)
Socket	Cinch Mfg. Co. No.149 19 00 033, Industrial Electronic Hardware Corp. No.S0-0968-SL1, or equivalent

6JB6

Base. . . . . Large-Button Novar 9-Pin (JEDEC No.E9-76)
Basing Designation for BOTTOM VIEW. 9QL

Pin 1 – Grid No.2
Pin 2 – Grid No.1
Pin 3 – Cathode
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Grid No.1
Pin 7 – Grid No.2
Pin 8 – Grid No.3
Pin 9 – Do Not Use
Cap – Plate

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[d]

DC PLATE-SUPPLY VOLTAGE (Boost + DC Power Supply)	770 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[e]. . .	6500 max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE . . .	1500 max.	volts
DC GRID-No.3 VOLTAGE (See *Operating Considerations*). . . .	70 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE. . .	220 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE . .	-55 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE .	330 max.	volts
CATHODE CURRENT:		
Peak.	550 max.	ma
Average	175 max.	ma
GRID-No.2 INPUT	3.5 max.	watts
PLATE DISSIPATION[f].	17.5 max.	watts
BULB TEMPERATURE (At hottest point on bulb surface). .	240 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance: For grid-resistor bias operation[f] . .	1 max.	megohm

[a] The dc component must not exceed 100 volts.

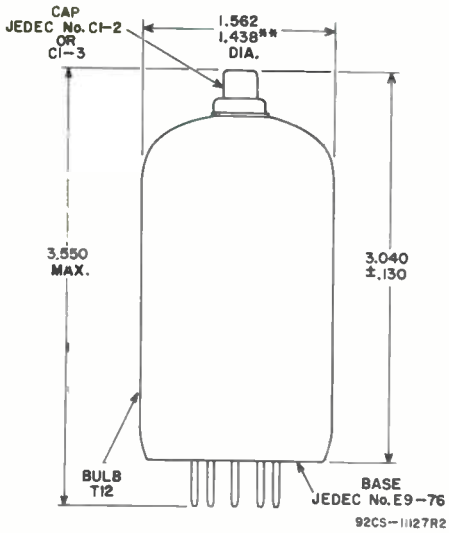
[b] Without external shield.

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

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

[e] 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.

[f] 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.



ALL DIMENSIONS IN INCHES

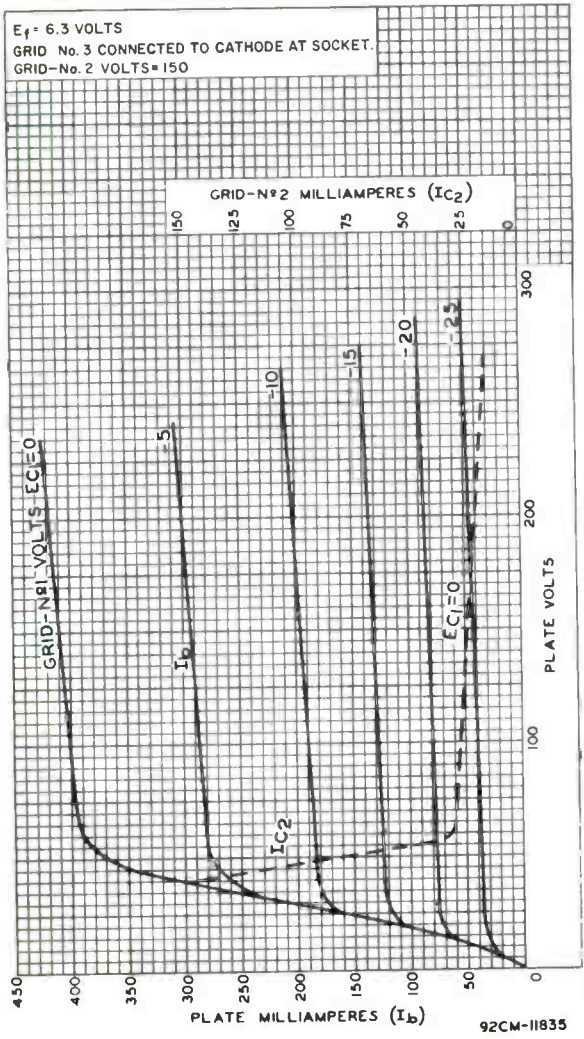
** APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.

OPERATING CONSIDERATIONS

In *horizontal-deflection amplifier service* a positive voltage may be applied to grid No.3 to minimize "srivets" interference in both vhf and uhf television receivers. A typical value for this voltage is 30 volts.

6JB6

AVERAGE CHARACTERISTICS



6JC6

Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE
FRAME-GRID CONSTRUCTION

For Use as an IF-Amplifier Tube in TV Receivers. No External Shield Required.

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:			
Voltage (AC or DC)	6.3 ± 0.6		volts
Current at heater volts = 6.3	0.300		amp
Peak heater-cathode voltage:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[a]	max.	volts
Direct Interelectrode Capacitances:[b]			
Grid No.1 to plate	0.019	max.	pf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	8.2		pf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	3.0		pf

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.)	0.18	megohm
Transconductance	15000	μmhos
Plate Current	13	ma
Grid-No.2 Current	3.2	ma
Grid-No.1 Voltage (Approx.) for plate μa = 100	-3	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
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)

6JC6

Basing Designation for BOTTOM VIEW. 9PM

Pin 1 – Cathode
Pin 2 – Grid No.1
Pin 3 – Cathode
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – No Internal Connection

Pin 7 – Plate
Pin 8 – Grid No.2
Pin 9 – Grid No.3, Internal Shield

AMPLIFIER — CLASS A_1

Maximum Ratings, *Design-Maximum Values:*

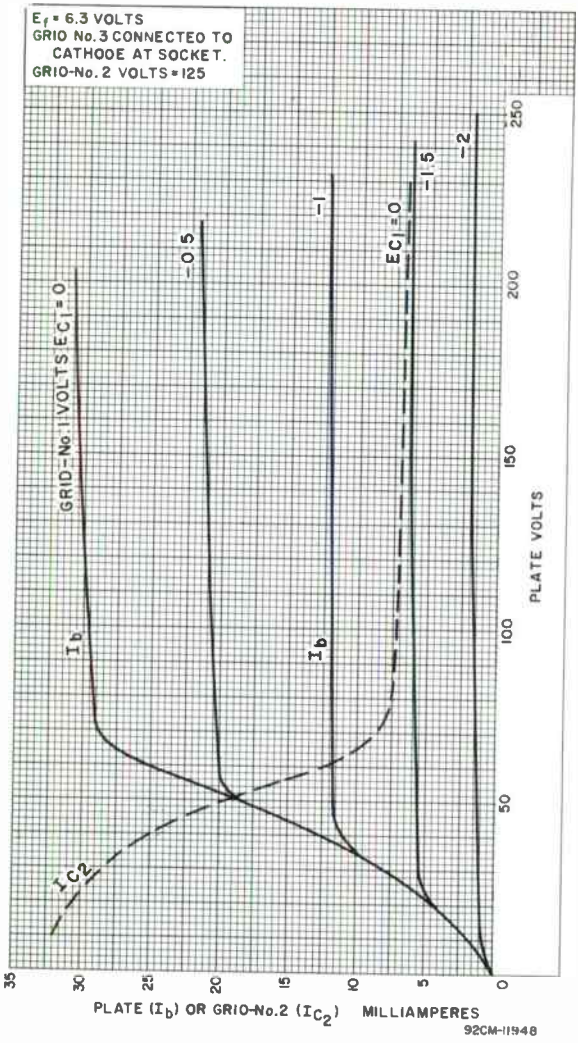
PLATE VOLTAGE	330 max. volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE:	
Positive value	0 max. volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	330 max. volts
GRID-No.2 VOLTAGE	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section
GRID-No.1 (CONTROL-GRID) VOLTAGE:	
Positive-bias value	0 max. volts
GRID-No.2 INPUT:	
For grid-No.2 voltages up to 165 volts	0.6 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	2.5 max. watts

Maximum Circuit Values:

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

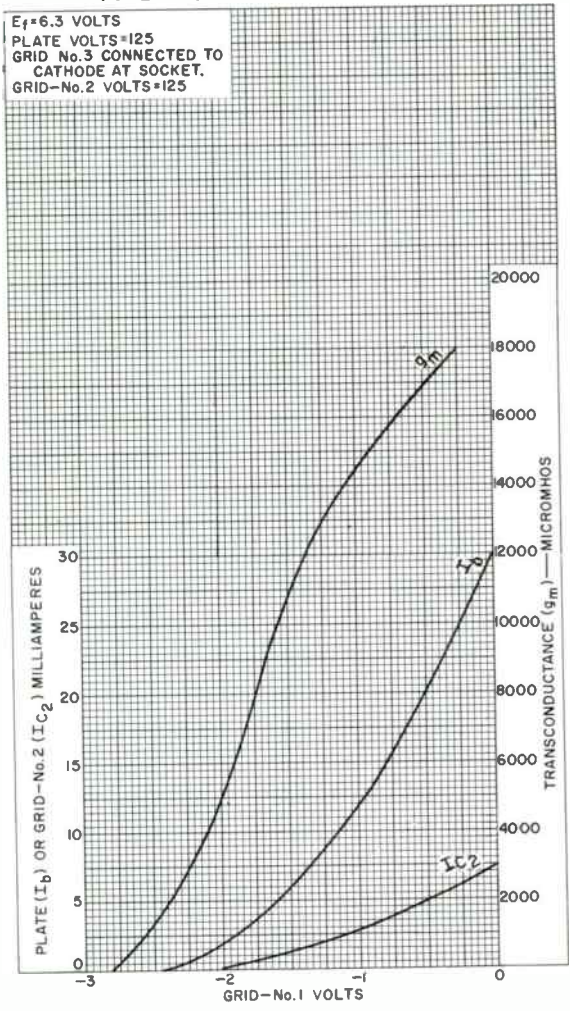
[a] The dc component must not exceed 100 volts.
[b] Without external shield.

AVERAGE CHARACTERISTICS



6JC6

AVERAGE CHARACTERISTICS



92CM-11949

6JB6A

Beam Power Tube

NOVAR TYPE
SEPARATE GRID-No.3 BASE-PIN TERMINAL FOR "SNIVETS" CONTROL[a]
For Horizontal-Deflection-Amplifier Service in Black-and-White TV Receivers

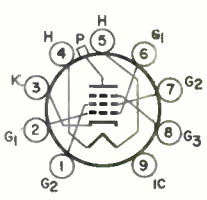
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[b] max.	volts
Direct Interelectrode Capacitances (Approx.):[c]		
Grid No.1 to plate	0.2	pf
Input: G1 to (K+G3,G2,H)	15.0	pf
Output: P to (K+G3,G2,H)	6.0	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.505"
Seated Length	2.875" ± 3.125"
Diameter	1.438" ± 1.562"
Dimensional Outline	See *General Section*
Bulb	T12
Cap	Skirted Miniature (JEDEC No.C1-2 or C1-3)
Base	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC No.E9-88)
Basing Designation for BOTTOM VIEW	9QL

Pin 1 – Grid No.2
Pin 2 – Grid No.1
Pin 3 – Cathode
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Grid No.1
Pin 7 – Grid No.2
Pin 8 – Grid No.3
Pin 9 – Do Not Use
Cap – Plate



Characteristics, Class A_1 Amplifier:

	Triode Connection	*Pentode Connection*		
Plate Voltage	150	60	250	volts
Grid No.3	–	*Connected to cathode at socket*		
	–	–		
Grid-No.2 Voltage	150	150	150	volts
Grid-No.1 Voltage	-22.5	0	-22.5	volts
Amplification Factor	4.4	–	–	
Plate Resistance (Approx.)	–	–	15000	ohms

6JB6A

	Triode Connection	*Pentode Connection*		
Transconductance	–	–	7100	μmhos
Plate Current	–	390[d]	70	ma
Grid-No.2 Current	–	32[d]	2.1	ma
Grid-No.1 Voltage (Approx.) for plate current = 1 ma.	–	–	-42	volts

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[e]

DC Plate-Supply Voltage	770 max.	volts
Peak Positive-Pulse Plate Voltage[f]	6500 max.	volts
Peak Negative-Pulse Plate Voltage	1500 max.	volts
DC Grid-No.3 Voltage[a]	70 max.	volts
DC Grid-No.2 (Screen-Grid) Voltage	220 max.	volts
DC Grid-No.1 (Control-Grid) Voltage	-55 max.	volts
Peak Negative-Pulse Grid-No.1 Voltage	330 max.	volts
Cathode Current:		
Peak	550 max.	ma
Average	175 max.	ma
Grid-No.2 Input	3.5 max.	watts
Plate Dissipation[g]	17.5 max.	watts
Bulb Temperature (At hottest point on bulb surface)	240 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance: For grid-resistor bias operation[f]	1 max.	megohm

[a] A positive voltage may be applied to grid No.3 to reduce interference from "snivets" which may occur in television receivers. A typical value for this voltage is 30 volts.

[b] The dc component must not exceed 100 volts.

[c] Without external shield.

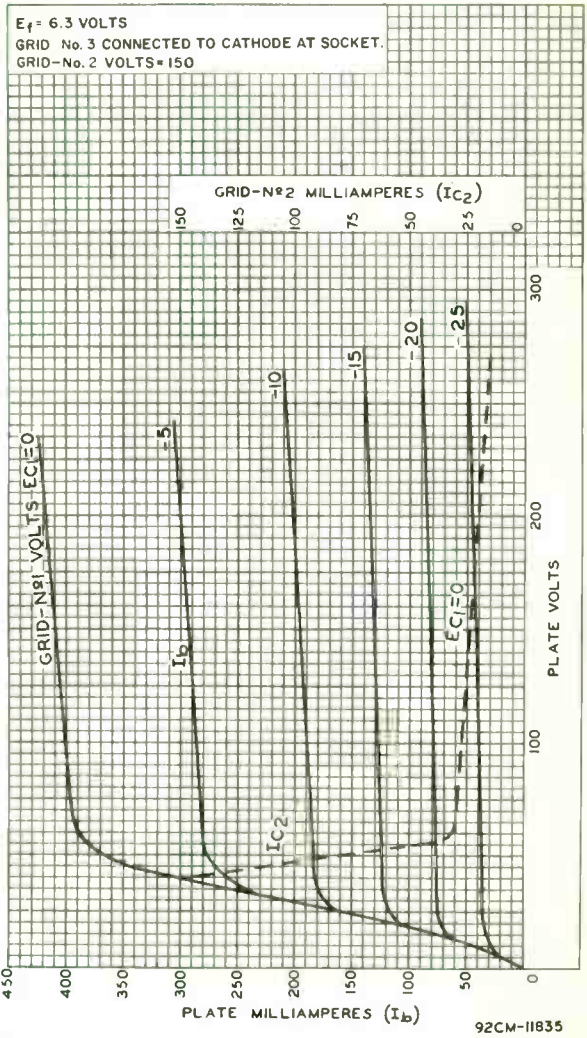
[d] This value can be measured by a method involving a recurrent wave form such that the plate dissipation, grid-No.2 input, and cathode current will be kept within ratings in order to prevent damage to the tube.

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

[f] 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 scanningcycle is 10 microseconds.

[g] 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.

AVERAGE CHARACTERISTICS



Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Maximum Values):*

Voltage (AC or DC)	6.3[a]	6.3 ± 0.6	volts
Current	0.450 ± 0.030	0.450[b]	amp
Warm-up time (Average)	11	–	sec
Peak heater-cathode voltage:			
Heater negative with respect to cathode	200 max.		volts
Heater positive with respect to cathode	200[c] max.		volts

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield*[d]	
Triode Unit:			
Grid to plate	1.3	1.2	μμf
Grid to cathode and heater	2.8	3.2	μμf
Plate to cathode and heater	0.44	0.9	μμf
Pentode Unit:			
Grid No.1 to plate	0.038 max.	0.018 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	4.8	5.0	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	0.9	1.6	μμf
Pentode grid No.1 to triode plate	0.05 max.	0.036 max.	μμf
Pentode plate to triode plate	0.075 max.	0.012 max.	μμf
Heater to cathode	6.5	6.5[e]	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*		
Plate Voltage	125	100	125	volts
Grid-No.2 Voltage	–	70	125	volts
Grid-No.1 Voltage	-1	0	-1	volt
Amplification Factor	40	–	–	
Plate Resistance (Approx.)	6000	–	300000	ohms
Transconductance	6500	5700	5500	μmhos

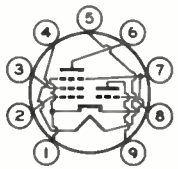
6JC8

	Triode Unit	*Pentode Unit*	
Plate Current	12	– 9	ma
Grid-No.2 Current	–	– 2.2	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-7	– 6.5	volts

Mechanical:

Operating Position . . . . . .Any
Type of Cathode. . . . . .Coated Unipotential
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 9PA

Pin 1 – Pentode Grid No.3, Cathode, Internal Shield
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 Grid No.3, Cathode, Internal Shield
Pin 8 – Triode Grid
Pin 9 – Triode Plate

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE	275 max.	275 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	–	275 max.	volts
GRID-No.2 VOLTAGE	–	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE: Positive-bias value	0 max.	0 max.	volts
PLATE DISSIPATION	1.7 max.	2.3 max.	watts
GRID-No.2 INPUT: For grid-No.2 voltages up to 137.5 volts	–	0.45 max.	watt
For grid-No.2 voltages between 137.5 and 275 volts	–	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	

Maximum Circuit Values:

	Triode Unit	*Pentode Unit*	
Grid-No.1-Circuit Resistance: For fixed-bias operation	–	0.1 max.	megohm
For cathode-bias operation	–	0.5 max.	megohm

[a] At heater amperes = 0.450.
[b] At heater volts = 6.3.
[c] The dc component must not exceed 100 volts.
[d] With external shield JEDEC No.315 connected to pin 3 except as noted.
[e] With external shield JEDEC No.315 connected to pin 6.

6JD6

Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE
FRAME-GRID CONSTRUCTION

For Use as High-Gain Intermediate-Frequency-Amplifier Tube in Television Receivers. No External Shield Required. Cutoff Characteristic Approaching Semiremote.

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:			
Voltage (AC or DC)	6.3 ± 0.6		volts
Current at heater volts = 6.3	0.300		amp
Peak heater-cathode voltage:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[a]	max.	volts
Direct Interelectrode Capacitances:[b]			
Grid No.1 to plate	0.019	max.	pf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	8.2		pf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	3.0		pf

Characteristics, Class A_1 Amplifier:

Plate Supply Voltage	125	volts
Grid-No.3 Voltage	0	volts
Grid-No.2 Supply Voltage	125	volts
Grid-No.1 Supply Voltage	0	volts
Cathode Resistor	56	ohms
Plate Resistance (Approx.)	160000	ohms
Transconductance	14000	μmhos
Plate Current	15	ma
Grid-No.2 Current	4	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 600	-4.5	volts

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
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)

6JD6

Basing Designation for BOTTOM VIEW. 9PM

Pin 1 –Cathode
Pin 2 –Grid No.1
Pin 3 –Cathode
Pin 4 –Heater
Pin 5 –Heater
Pin 6 –No Internal Connection

Pin 7 –Plate
Pin 8 –Grid No.2
Pin 9 –Grid No.3 Internal Shield

AMPLIFIER — Class A_1

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

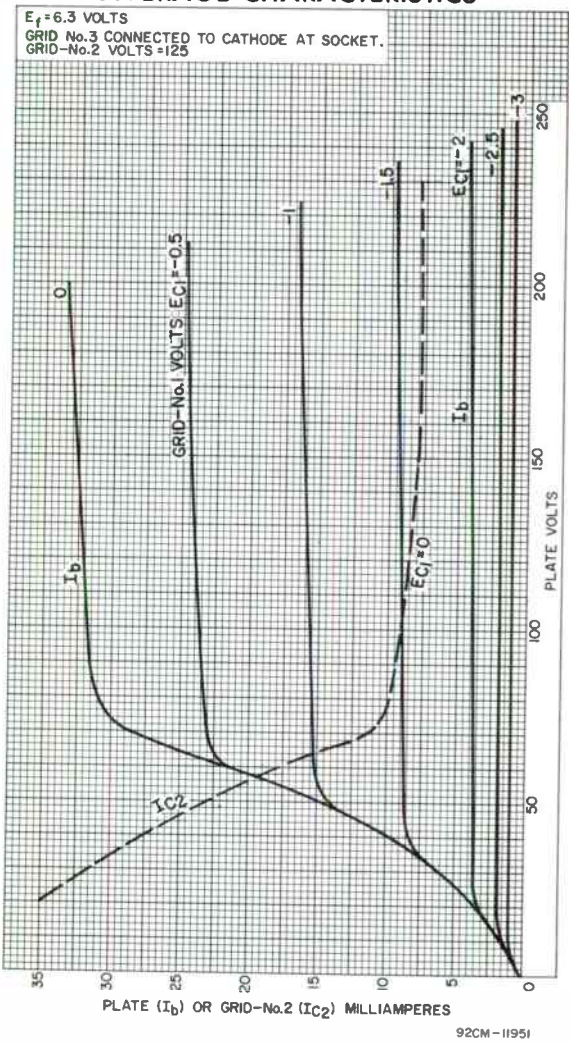
PLATE VOLTAGE	330 max.	volts
GRID-NO.3 (SUPPRESSOR-GRID) VOLTAGE:		
Positive value	0 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	330 max.	volts
GRID-NO.2 VOLTAGE	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
GRID-NO.1 (CONTROL-GRID) VOLTAGE:		
Positive-bias value	0 max.	volts
GRID-NO.2 INPUT:		
For grid-No.2 voltages up to 165 volts	0.6 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	2.5 max.	watts

Maximum Circuit Values:

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

[a] The dc component must not exceed 100 volts.
[b] Without external shield.

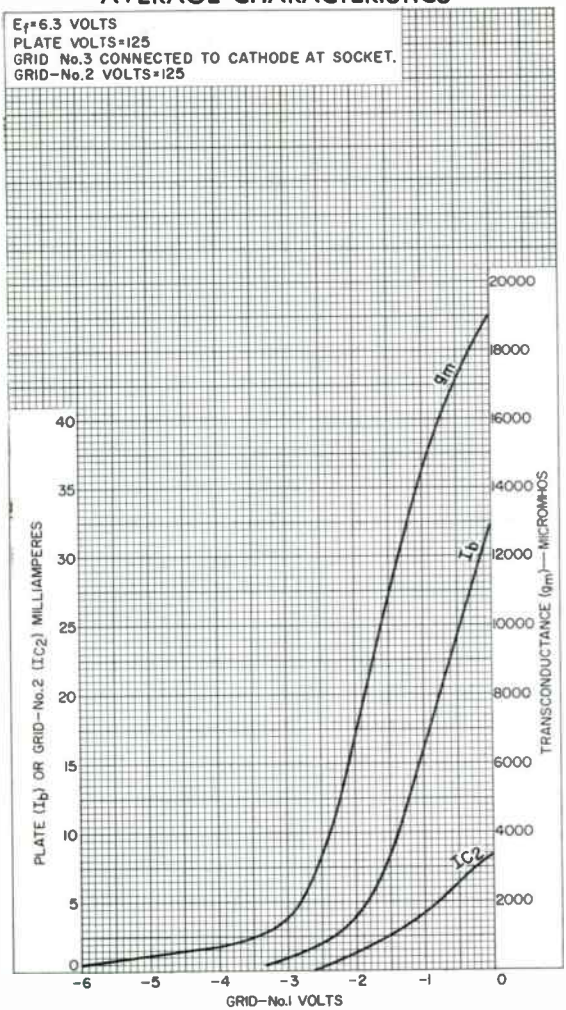
AVERAGE CHARACTERISTICS



92CM-11951

6JD6

AVERAGE CHARACTERISTICS



92CM-11952R1

Beam Power Tube

NOVAR TYPE

For Color-TV Horizontal-Deflection Amplifier Applications

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	2.500	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances (Approx.):[b]		
Grid No.1 to plate	0.44	pf
Grid No.1 to cathode, grid No.3, grid No.2, and heater	21.0	pf
Plate to cathode, grid No.3, grid No.2, and heater	11.0	pf

Characteristics, Class A1 Amplifier:

	Triode Connection	*Pentode Connection*		
Plate Voltage	125	70	175	volts
Grid No.3	*Connected to cathode at socket*			
Grid-No.2 Voltage	125	125	125	volts
Grid-No.1 Voltage	-25	0	-25	volts
Amplification Factor	3.3	-	-	
Plate Resistance (Approx.)	-	-	5500	ohms
Transconductance	-	-	10500	μmhos
Plate Current	-	580[c]	115	ma
Grid-No.2 Current	-	40[c]	5	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 1	-	-	-55	volts

Mechanical:

Operating Fosition	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	4.600"
Seated Length	4.090" ± 0.130"
Diameter	1.438" to 1.562"
Bulb	T12
Cap	Small (JEDEC No.C1-1)
Socket	Cinch Mfg. Co. No.149 19 00 033, Industrial Electronic Hardware Corp. No.S0-0968-SL1, or equivalent

6JE6

Base. . . . . .Large Button Novar 9-Pin (JEDEC No. E9-76)
Basing Designation for BOTTOM VIEW. 9QL

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

Pin 6 - Grid No.1
Pin 7 - Grid No.2
Pin 8 - Grid No.3
Pin 9 - Do Not Use
Cap - Plate

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[d]

DC PLATE-SUPPLY VOLTAGE	990 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[e]. . . .	7000 max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1100 max.	volts
DC GRID-No.3 VOLTAGE (See *Operating Considerations*).	75 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE. . . .	190 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE.	250 max.	volts
CATHODE CURRENT:		
Peak.	1100 max.	ma
Average	315 max.	ma
GRID-No.2 INPUT	3.2 max.	watts
PLATE DISSIPATION[f].	24 max.	watts
BULB TEMPERATURE (At hottest point on bulb surface). . .	240 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For grid-resistor bias operation[f] . . .	0.47 max.	megohm
For plate-pulsed operation (horizontal-deflection circuits only).	10 max.	megohms

[a] The dc component must not exceed 100 volts.

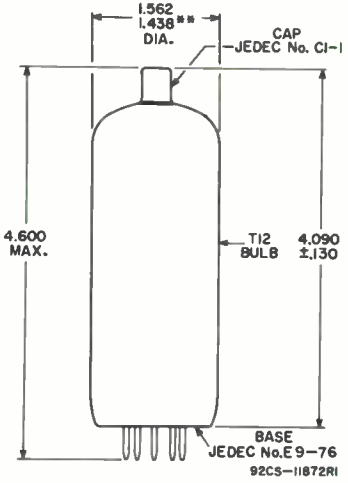
[b] Without external shield.

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

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

[e] 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.

[f] 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.



ALL DIMENSIONS IN INCHES

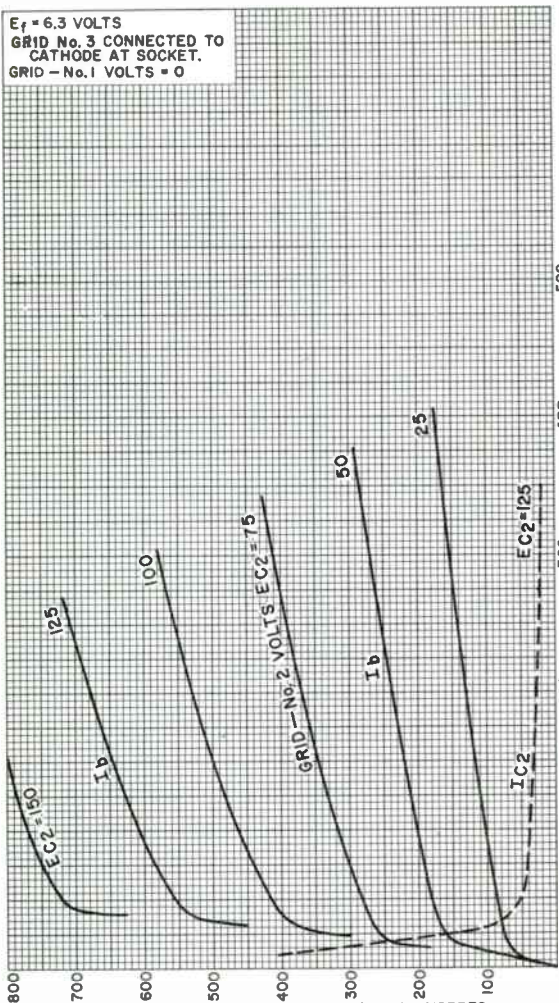
** APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.

OPERATING CONSIDERATIONS

In *horizontal-deflection amplifier service* a positive voltage may be applied to grid No.3 to minimize "snivets" interference which may occur in both uhf and vhf television receivers. A typical value for this voltage is 30 volts.

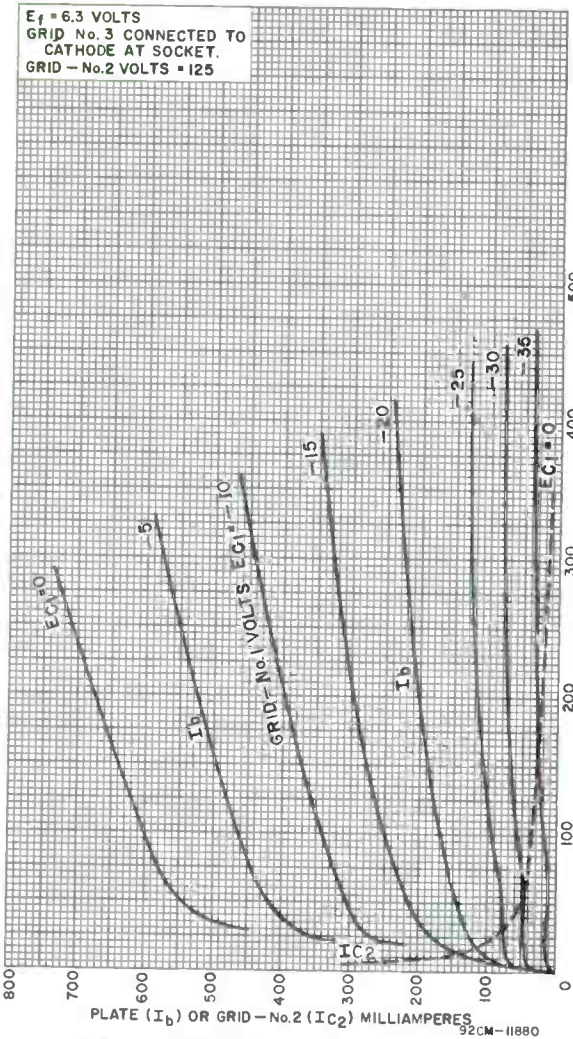
6JE6

AVERAGE CHARACTERISTICS



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

AVERAGE CHARACTERISTICS



Beam Power Tube

NOVAR TYPE

SPECIAL PLATE STRUCTURE[a]

For Color TV Horizontal-Deflection-Amplifier Applications

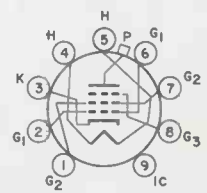
ELECTRICAL

Heater Characteristics and Ratings		
Voltage (AC or DC)	6.3 ± 0.6	V
Current at 6.3 V	2.500	A
Maximum heater-cathode voltage		
Heater negative with respect to cathode:		
Peak	200	V
Heater positive with respect to cathode:		
Peak	200	V
DC component	100	V
Direct Interelectrode Capacitances (Approx.)		
Without external shield		
Grid No.1 to plate	0.56	pF
Input: G1 to (K, G3, G2, H)	22	pF
Output: P to (K, G3, G2, H)	11	pF

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	4.130 in
Seated Length	3.500 to 3.750 in
Diameter	1.438 to 1.562 in
Dimensional Outline (JEDEC No.12-116)	See *General Section*
Bulb	T12
Cap	Small (JEDEC No.C1-1)
Base	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC No.E9-88)
Basing Designation for BOTTOM VIEW	9QL

Pin 1 – Grid No.2
Pin 2 – Grid No.1
Pin 3 – Cathode
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Grid No.1
Pin 7 – Grid No.2
Pin 8 – Grid No.3
Pin 9 – Do Not Use
Cap – Plate



CHARACTERISTICS

Plate Voltage	-	55	175	-	60	175	V
Peak Positive-Pulse Plate Voltage[b]	5000	-	-	5000	-	-	V
Grid-No.3 Voltage	+30	+30	+30	+30	+30	+30	V
Grid-No.2 Voltage	125	125	125	145	145	145	V
Grid-No.1 Voltage	-	0	-25	-	0	-35	V
Plate Resistance (Approx.)	-	-	5800	-	-	7000	Ω
Transconductance	-	-	9600	-	-	7500	μmhos

Plate Current	-	580[c]	130	-	710[c]	95	mA
Grid-No.2 Current	-	40[c]	2.8	-	55[c]	2.4	mA
Grid-No.1 Voltage (Approx.) for plate mA = 1	-120	-	-54	-125	-	-60	V
Triode Amplification Factor (Triode connection: grid No.2 connected to plate at socket)	-	-	3[d]	-	-	2.8[e]	

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, Design-Maximum Values

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

DC Plate Supply Voltage	990	V
Peak Positive-Pulse Plate Voltage[f]	7500	V
Peak Negative-Pulse Plate Voltage	1100	V
DC Grid-No.3 Voltage[g]	75	V
DC Grid-No.2 (Screen-Grid) Voltage	220	V
Peak Negative-Pulse Grid-No.1 (Control-Grid) Voltage	330	V
Cathode Current		
Peak	1200	mA
Average	350	mA
Grid-No.2 Input	5	W
Plate Dissipation[h]	30	W
Bulb Temperature (At hottest point on bulb surface)	250	°C

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance		
For grid-resistor bias operation[h]	0.47	MΩ
For plate-pulsed operation (Horizontal-deflection circuits only)	10	MΩ

[a] Designed to minimize secondary-electron emission from plate and eliminate "knee" discontinuites in zero-bias region.

[b] Under conditions shown in footnote[e].

[c] 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.

[d] Plate volts = grid-No.2 volts = 125; grid No.3 connected to cathode at socket; grid-No.1 volts = -25.

[e] Plate volts = grid-No.2 volts = 145; grid No.3 connected to cathode at socket; grid-No.1 volts = -35.

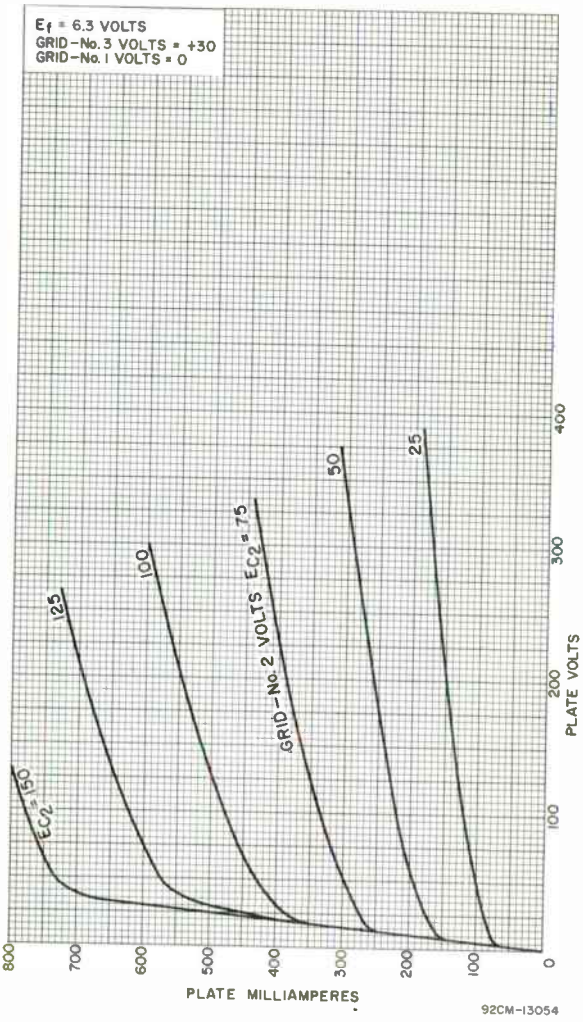
[f] This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

[g] In horizontal-deflection-amplifier service, a positive voltage should be applied to grid No.3 to reduce interference from "snivets", which may occur in both vhf and uhf television receivers, and to increase power output. A typical value for this voltage is 30 volts.

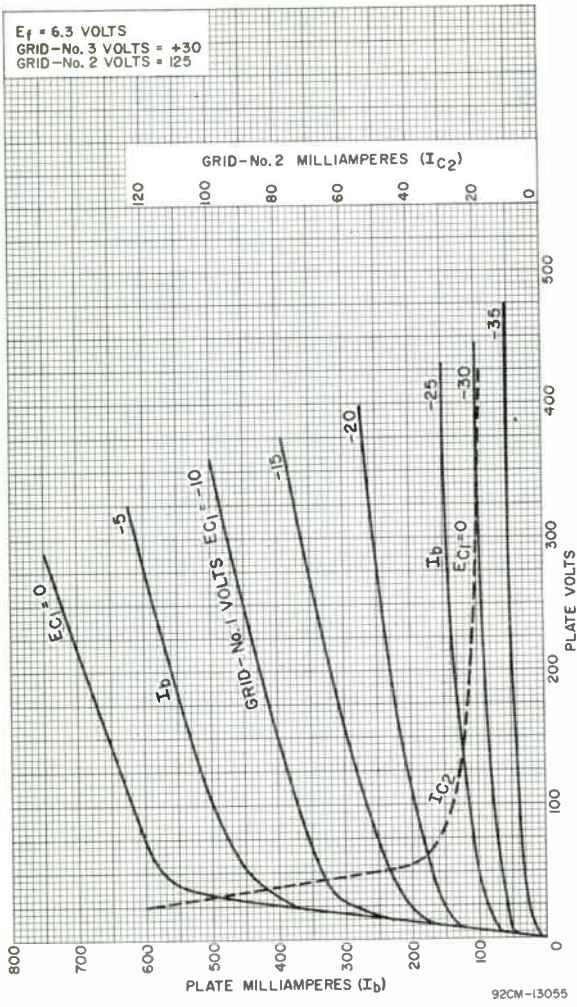
[h] An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

Average Characteristics



Average Characteristics



RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

Beam Power Tube

NOVAR TYPE

For Horizontal-Deflection-Amplifier Service
in Low-B+ Black-and-White TV Receivers

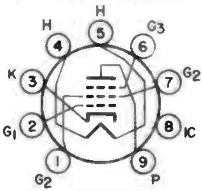
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.600	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances (Approx.)[b]		
G1 to P	0.7	pf
Input: G1 to (K,G3,G2,H)	22.0	pf
Output: P to (K,G3,G2,H)	4.0	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.410"
Maximum Seated Length	3.030"
Length, Base Seat to Bulb Top (Excluding Tip)	2.510" to 2.690"
Diameter	1.438" to 1.562"
Bulb	T12
Socket	Cinch Mfg. Co. No.133 19 00 033, Industrial Electronic Hardware Corp. No.SO-4968-SL1, or equivalent
Base	Large-Button Novar 9-Pin (JEDEC No.E9-76)
Basing Designation for BOTTOM VIEW	9QU

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



Pin 6 - Grid No.3
Pin 7 - Grid No.2
Pin 8 - Do Not Use
Pin 9 - Plate

Characteristics, Class A_1 Amplifier:

	Triode Connection[c]	*Pentode Connection*		
Plate Voltage	125	50	130	volts
Grid No.3	*Connected to cathode at socket*			
Grid-No.2 Voltage	–	125	125	volts
Grid-No.1 Voltage	–20	0	–20	volts
Amplification Factor . . .	4.1	–	–	
Plate Resistance (Approx.)	–	–	12000	ohms
Transconductance	–	–	10000	μmhos

	Triode Connection[c]	Pentode Connection	
Plate Current	–	525[d] 80	ma
Grid-No.2 Current	–	32[d] 2.5	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 1	–	– -40	volts

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[e]

DC Plate Supply Voltage	770 max.	volts
Peak Positive-Pulse Plate Voltage[f]	6500 max.	volts
Peak Negative-Pulse Plate Voltage	1500 max.	volts
DC Grid-No.3 (Suppressor-Grid) Voltage (See *Operating Considerations*)	75 max.	volts
DC Grid-No.2 (Screen-Grid) Voltage	220 max.	volts
DC Grid-No.1 (Control-Grid) Voltage: Negative-bias value	55 max.	volts
Peak Negative-Pulse Grid-No.1 Voltage	330 max.	volts
Cathode Current:		
Peak	950 max.	ma
Average	275 max.	ma
Grid-No.2 Input	3.5 max.	watts
Plate Dissipation[g]	17 max.	watts
Bulb Temperature (At hottest point on bulb surface)	220 max.	°C

Maximum Circuit Values:

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

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

[c] With grid No.2 connected to plate at socket.

[d] This value can be measured by a method involving a recurrent waveform such that the maximum ratings of the tube will not be exceeded.

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

[f] 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.

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

OPERATING CONSIDERATIONS

In *Horizontal-Deflection-Amplifier Service*, a positive voltage may be applied to grid No.3 to reduce interference from "snivets" which may occur in both vhf and uhf television receivers. A typical value for this voltage is 30 volts.

DIMENSIONAL OUTLINE AND CURVES

shown under Type 22JG6 also apply to the 6JG6

Beam Power Tube

NOVAR TYPE

SEPARATE GRID-No.3 BASE-PIN TERMINAL FOR "SNIVETS" CONTROL[a]

For Horizontal-Deflection-Amplifier Service in Low-B+ Black-and-White TV Receivers

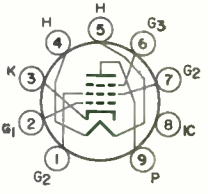
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.600	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[b] max.	volts
Direct Interelectrode Capacitances (Approx.)[c]		
Grid No.1 to plate	0.7	pf
Input: G1 to (K,G3,G2,H)	22.0	pf
Output: P to (K,G3,G2,H)	9.0	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.130"
Seated Length	2.500" to 2.750"
Diameter	1.438" to 1.562"
Dimensional Outline	See *General Section*
Bulb	T12
Base	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC No.E9-88)
Basing Designation for BOTTOM VIEW	90U

Pin 1 – Grid No.2
Pin 2 – Grid No.1
Pin 3 – Cathode
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Grid No.3
Pin 7 – Grid No.2
Pin 8 – Do Not Use
Pin 9 – Plate



Characteristics, Class A_1 Amplifier:

	Triode Connection[d]	*Pentode Connection*	
Plate Voltage	125	50 130	volts
Grid No.3	*Connected to cathode at socket*		
Grid-No.2 Voltage	–	125 125	volts
Grid-No.1 Voltage	-20	0 -20	volts
Amplification Factor	4.1	– –	
Plate Resistance (Approx.)	–	– 12000	ohms
Transconductance	–	– 10000	μmhos
Plate Current	–	525[e] 80	ma
Grid-No.2 Current	–	32[e] 2.5	ma
Grid-No.1 Voltage (Approx.) for plate ma = 1	–	– -40	volts

6JG6A

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[f]

DC Plate Supply Voltage	770 max.	volts
Peak-Positive-Pulse Plate Voltage[g]	6500 max.	volts
Peak Negative-Pulse Plate Voltage	1500 max.	volts
DC Grid-No.3 (Suppressor-Grid) Voltage[a]	75 max.	volts
DC Grid-No.2 (Screen-Grid) Voltage	220 max.	volts
DC Grid-No.1 (Control-Grid) Voltage:		
Negative-bias value	55 max.	volts
Peak Negative-Pulse Grid-No.1 Voltage	330 max.	volts
Cathode Current:		
Peak	950 max.	ma
Average	275 max.	ma
Grid-No.2 Input	3.5 max.	watts
Plate Dissipation[h]	17 max.	watts
Bulb Temperature (At hottest point on bulb surface)	220 max.	°C

Maximum Circuit Values:

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

[a] A positive voltage may be applied to grid No.3 to reduce interference from "snivets" which may occur in television receivers. A typical value for this voltage is 30 volts.

[b] The dc component must not exceed 100 volts.

[c] Without external shield.

[d] With grid No.2 connected to plate at socket.

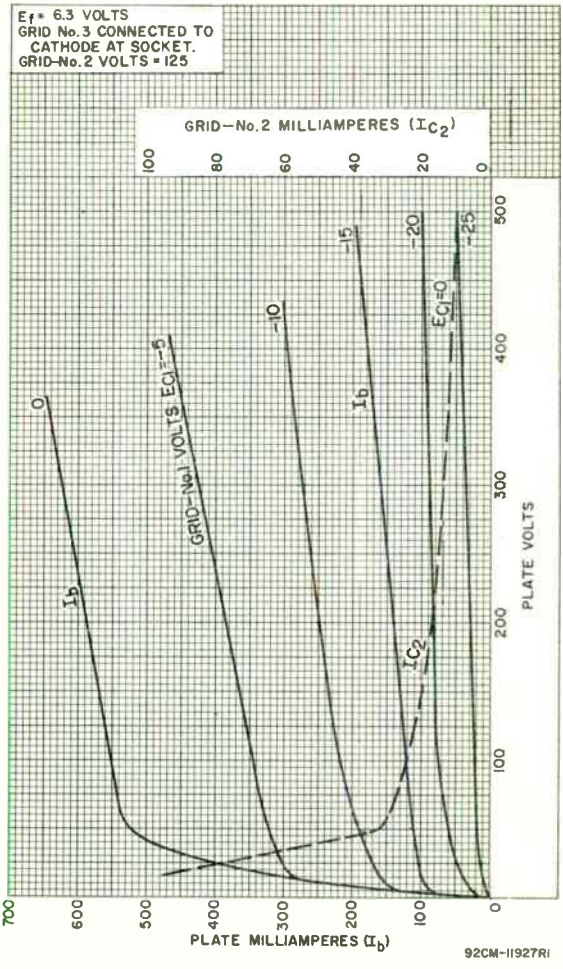
[e] This value can be measured by a method involving a recurrent waveform such that the maximum ratings of the tube will not be exceeded.

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

[g] 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.

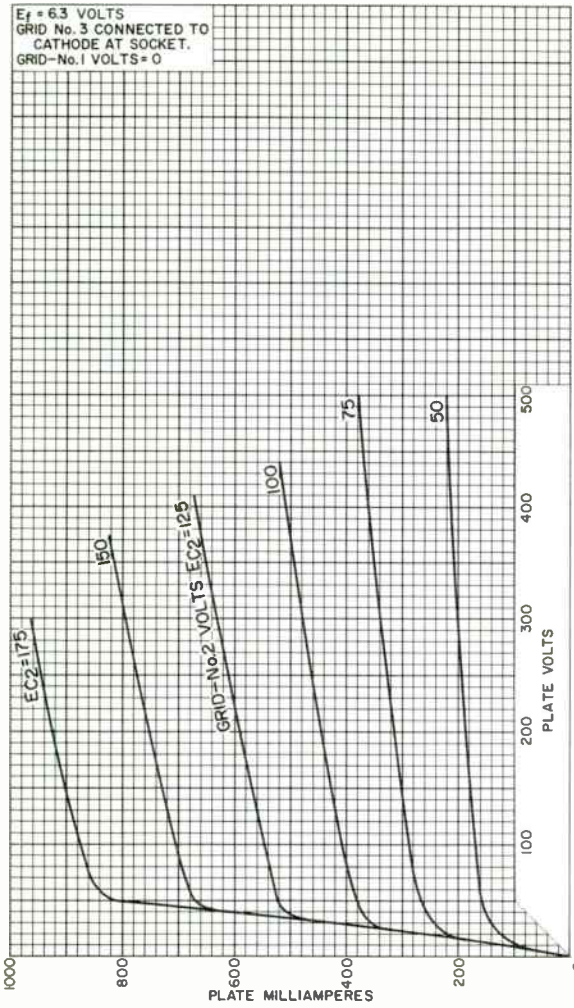
[h] An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

AVERAGE CHARACTERISTICS



6JG6A

AVERAGE PLATE CHARACTERISTICS



92CM-11923RI

6JH6

Semiremote-Cutoff Pentode

7-PIN MINIATURE TYPE

For Use in Gain-Controlled Picture-IF Amplifier Stages of Color TV Receivers

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.300	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200	volts
Heater positive with respect to cathode	200[a]	volts

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield*[b]	
Grid No.1 to plate	0.025 max.	0.015 max.	pf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	7	7	pf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	2	3	pf

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.)	0.26	megohm
Transconductance	8000	μmhos
Plate Current	14	ma
Grid-No.2 Current	3.6	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 50 and cathode resistor (ohms) = 0	-19	volts
Transconductance Range for grid-No.1 volts = -4.5 and cathode resistor of 56 ohms	400 - 900	μmhos

Mechanical:

Mounting Position	Any
Type of Cathode	Coated Unipotential
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"

6JH6

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:*

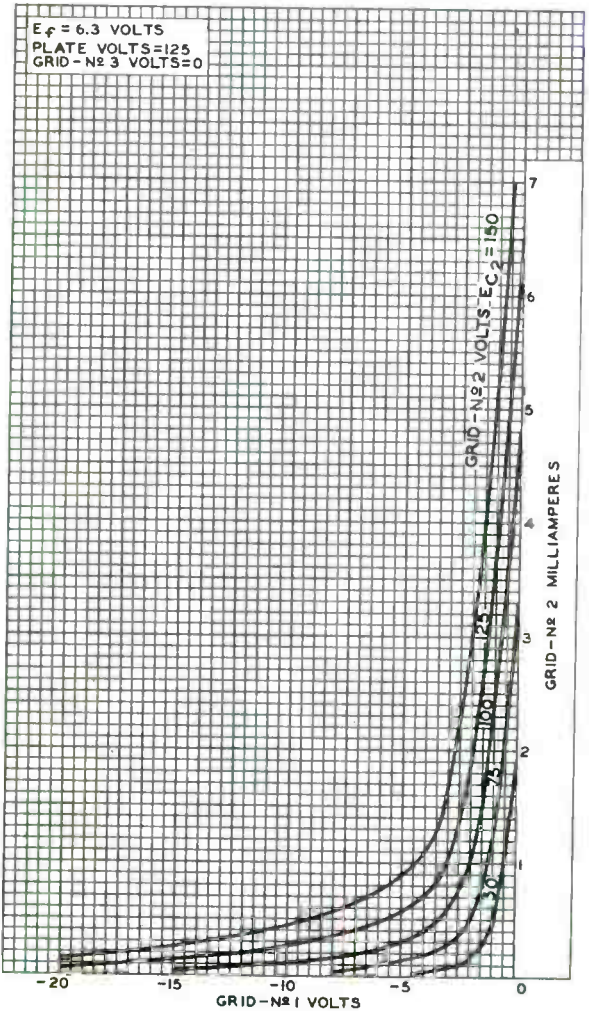
PLATE VOLTAGE	300 max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE	0 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	300 max.	volts
GRID-No.2 VOLTAGE . . . . . See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section		
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive-bias value	0 max.	volts
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 150 volts	0.55 max.	watt
For grid-No.2 voltages between 150 and 300 volts . See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section		
PLATE DISSIPATION	2.3 max.	watts

Maximum Circuit Values:

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

[a] The dc component must not exceed 100 volts.
[b] With external shield JEDEC No.316 connected to cathode.

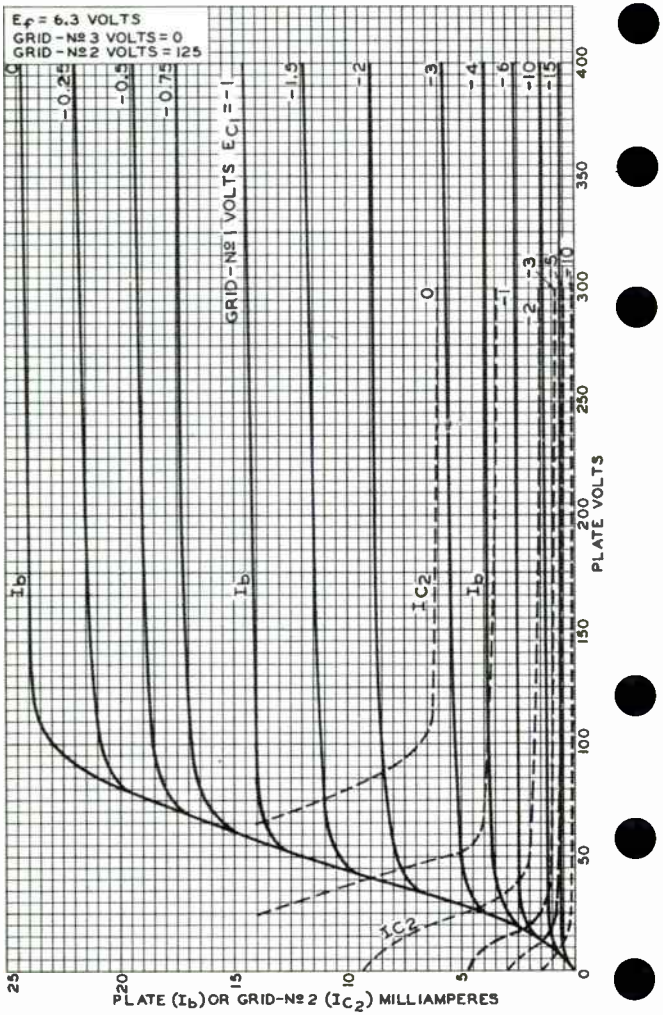
AVERAGE CHARACTERISTICS



92CM-9485RI

6JH6

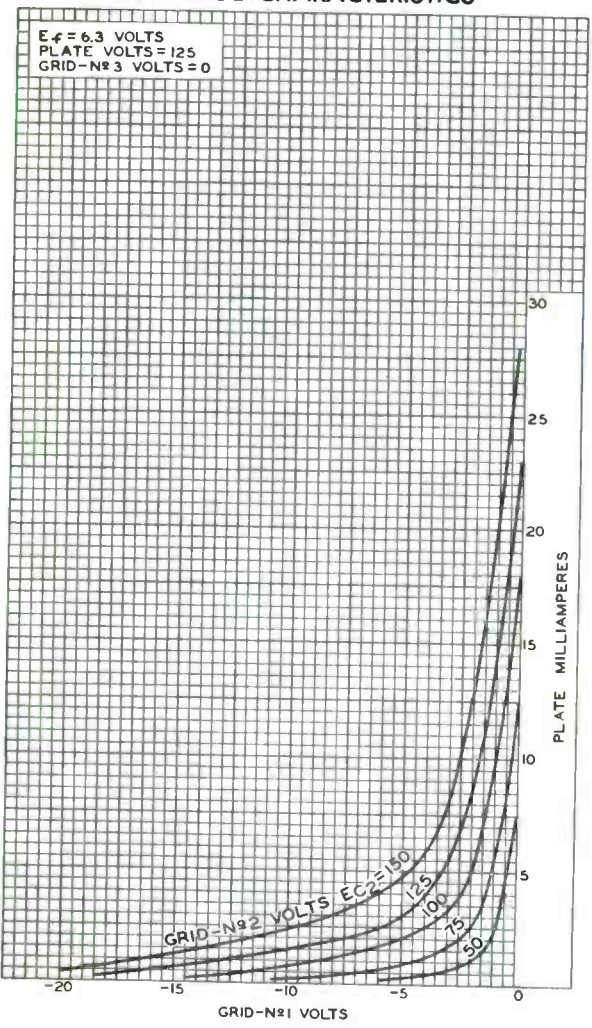
AVERAGE CHARACTERISTICS



92CM-8508R2

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

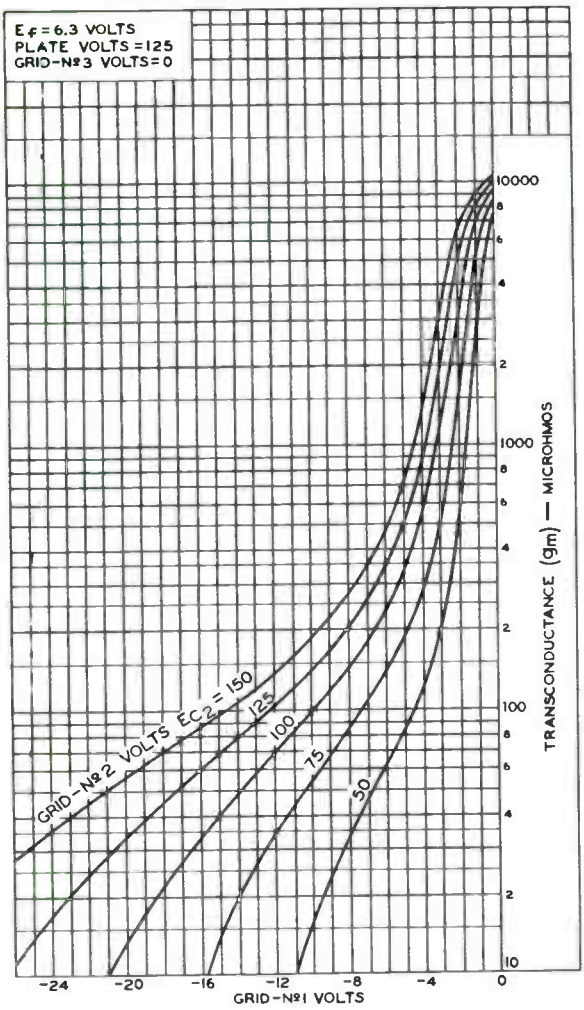
AVERAGE CHARACTERISTICS



92CM-9481RI

6JH6

AVERAGE CHARACTERISTICS



92CM-8509R1

Beam-Deflection Tube

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Maximum Values)*:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.300	amp
Direct Interelectrode Capacitances:[a]		
Grid No.1 to all other electrodes except both plates	7.5	μμf
Grid No.1 to deflecting electrode No.1	0.04 max.	μμf
Grid No.1 to deflecting electrode No.2	0.07 max.	μμf
Plate No.1 to all other electrodes	5.0	μμf
Plate No.2 to all other electrodes	5.0	μμf
Plate No.1 to plate No.2	0.4	μμf
Deflecting electrode No.1 to all other electrodes	4.8	μμf
Deflecting electrode No.2 to all other electrodes	4.8	μμf
Deflecting electrode No.1 to deflecting electrode No.2	0.38	μμf

Characteristics, Class A_1 Amplifier:

With both plates connected together and with both deflecting electrodes connected to cathode at socket

Plate-No.1 Supply Voltage	250	volts
Plate-No.2 Supply Voltage	250	volts
Grid-No.3 Voltage	250	volts
Cathode Resistor	220	ohms
Total Plate Current	14	ma
Grid-No.3 Current	1.5	ma
Transconductance	4400	μmhos
Grid-No.1 Voltage (Approx.) for total plate μa = 10	-13	volts

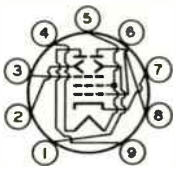
Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)

6JH8

Basing Designation for BOTTOM VIEW. 9DP

Pin 1 – Deflecting Electrode No.2
Pin 2 – Deflecting Electrode No.1
Pin 3 – Grid No.3
Pin 4 – Heater



Pin 5[b] – Heater, Internal Shield, Grid No.2
Pin 6 – Grid No.1
Pin 7 – Cathode
Pin 8 – Plate No.2
Pin 9 – Plate No.1

COLOR-TV DEMODULATOR

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

PLATE VOLTAGE (Each plate). . . .	330 max.	volts
PEAK DEFLECTING-ELECTRODE VOLTAGE (Each electrode):		
Negative value.	165 max.	volts
Positive value.	165 max.	volts
GRID-No.3 (ACCELERATING-GRID) VOLTAGE	330 max.	volts
GRID-No.2 (FOCUSING-GRID) VOLTAGE	*Connect to cathode at socket*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive-bias value	0 max.	volts
GRID-No.3 INPUT	1 max.	watt
CATHODE CURRENT	33 max.	ma
PLATE DISSIPATION (Each plate). .	3 max.	watts

Typical Operation:

Plate Supply Voltage (Each plate)	250	volts
Grid-No.3 Voltage	250	volts
Grid No.2	*Connected to cathode at socket*	
Cathode Resistor.	220	ohms
Maximum Deflecting-Electrode Switching Voltage[c].	20	volts
Deflecting-Electrode Voltage for minimum deflecting-electrode switching voltage[c]. .	-14	volts
Voltage Difference Between Deflecting Electrodes for plate-No.1 current and plate-No.2 current to be equal. . . .	0	volts
Maximum Plate-No.1 Current for deflecting-electrode-No.1 volts = -15, and deflecting-electrode-No.2 volts = +15. . .	0.7	ma
Maximum Plate-No.2 Current for deflecting-electrode-No.1 volts = +15, and deflecting-electrode-No.2 volts = -15. . .	0.7	ma

Maximum Deflecting-Electrode-No.1 Current for deflecting-electrode-No.1 volts = +25, and deflecting-electrode-No.2 volts = −25	0.1	ma
Maximum Deflecting-Electrode-No.2 Current for deflecting-electrode-No.1 volts = −25, and deflecting-electrode-No.2 volts = +25	0.1	ma

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation. . . .	0.1 max.	megohm
For cathode-bias operation. . .	0.25 max.	megohm

[a] Without external shield.

[b] Pin 5 should be connected directly to cathode at socket.

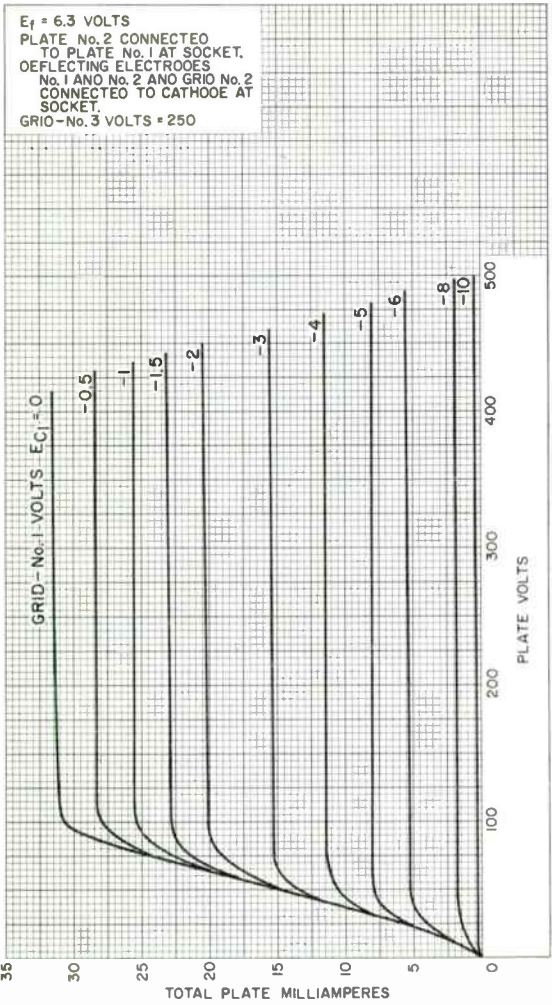
[c] The Deflecting-Electrode Switching Voltage is the total voltage change on either deflecting electrode with an equal and opposite voltage change on the other deflecting electrode required to switch the plate current from one plate to the other plate.

OPERATING CONSIDERATIONS

This type should be located in equipment so that it is not subjected to stray magnetic fields which may affect the intrinsic operating plate-current balance.

6JH8

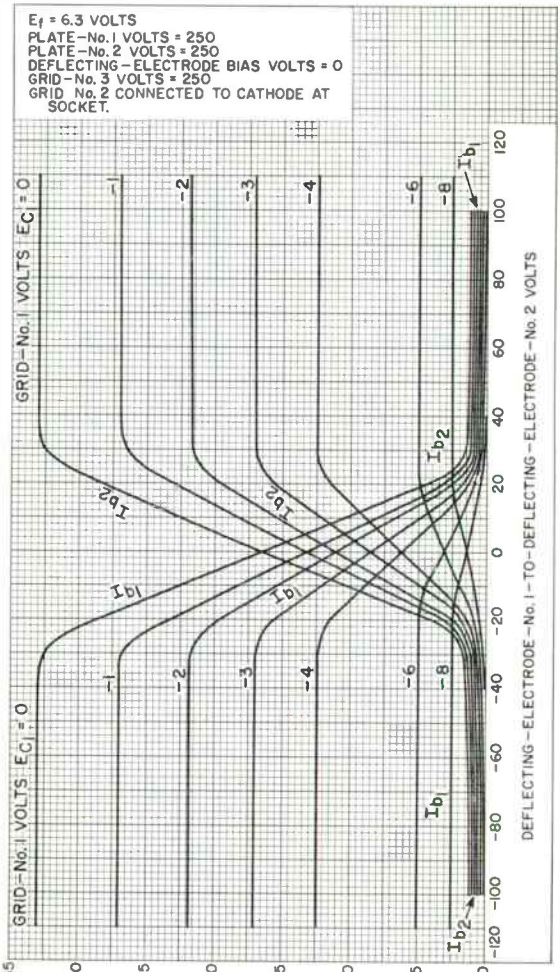
Average Plate Characteristics



92CM-12938

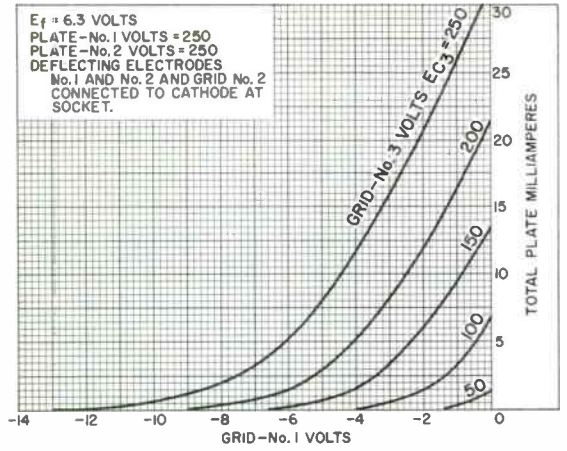
RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

Average Characteristics

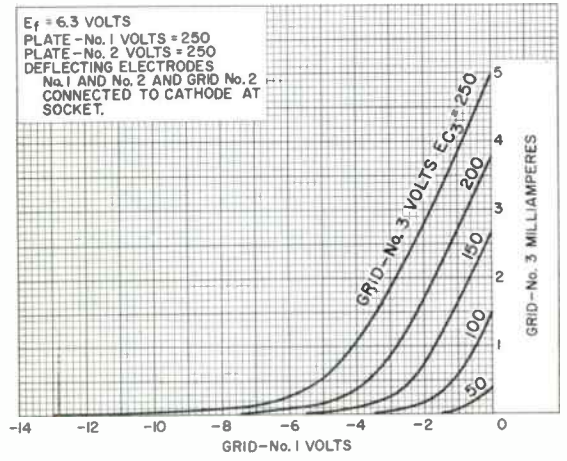


92CM–12939

Average Characteristics



92CS-12936



92CS-12937

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

6JT6

Beam Power Tube

NOVAR TYPE

For TV Horizontal-Deflection Amplifier Applications

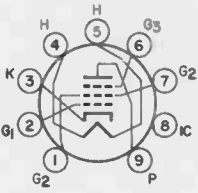
Electrical:

Heater Ratings and Characteristics:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances (Approx.):[b]		
Grid No.1 to plate	0.25	pf
Input: G1 to (K,G3,G2,H)	15.0	pf
Output: P to (K,G3,G2,H)	6.5	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.180"
Maximum Seated Length	2.800"
Diameter	1.438" to 1.562"
Bulb	T12
Base	Large-Button Novar 9-Pin (JEDEC No.E9-76)
Basing Designation for BOTTOM VIEW	9QU

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



Pin 6 – Grid No.3
Pin 7 – Grid No.2
Pin 8 – Do Not Use
Pin 9 – Plate

Characteristics, Class A_1 Amplifier:

	Triode Connection[c]			
Plate Voltage	150	60	250	volts
Grid No.3	–	Connected to Cathode at socket		
Grid-No.2 Voltage	150	150	150	volts
Grid-No.1 Voltage	-22.5	0	-22.5	volts
Amplification Factor	4.4	–	–	
Plate Resistance (Approx.)	–	–	15000	ohms
Transconductance	–	–	7100	μmhos
Plate Current	–	390[d]	70	ma
Grid-No.2 Current	–	32[d]	2.1	ma
Grid-No.1 Voltage (Approx.) for plate ma = 1	–	–	-42	volts

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[e]

DC Plate Supply Voltage	770 max.	volts
Peak Positive-Pulse Plate Voltage[f]	6500 max.	volts
Peak Negative-Pulse Plate Voltage	1500 max.	volts
DC Grid-No.3 (Suppressor-Grid) Voltage[g]	70 max.	volts
DC Grid-No.2 (Screen-Grid) Voltage	220 max.	volts
DC Grid-No.1 (Control-Grid) Voltage:		
Negative-bias value	55 max.	volts
Peak Negative-Pulse Grid-No.1 Voltage	330 max.	volts
Cathode Current:		
Peak	550 max.	ma
Average	175 max.	ma
Grid-No.2 Input	3.5 max.	watts
Plate Dissipation[h]	17.5 max.	watts
Bulb Temperature (At hottest point on bulb surface)	240 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For grid-resistor-bias operation	1 max.	megohm

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

[c] With grid No.2 connected to plate at socket.

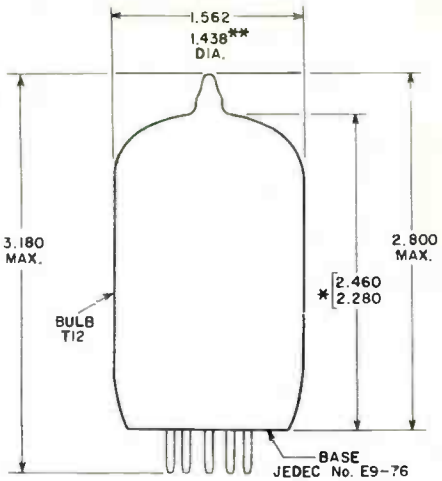
[d] This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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

[f] 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.

[g] A positive voltage may be applied to grid No.3 to reduce interference from "snivets" which may occur in television receivers. A typical value for this voltage is 30 volts.

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

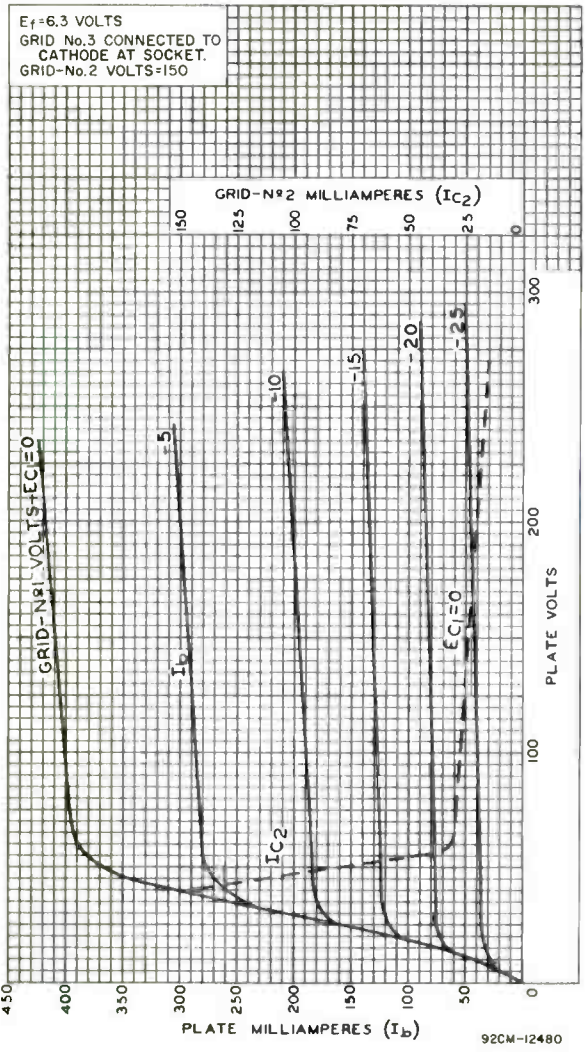


* Measured from base seat to bulb-top line as determined by a ring gauge of 0.600" inside diameter.

** The minimum applies in the zone starting 0.375" from the base seat.

6JT6

AVERAGE CHARACTERISTICS



Beam Power Tube

NOVAR TYPE

SEPARATE GRID-No 3 BASE-PIN TERMINAL FOR "SNIVETS" CONTROL[a]

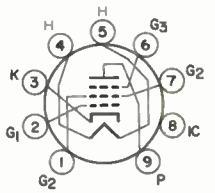
For Horizontal-Deflection-Amplifier Service in Black-and-White TV Receivers

Electrical:

Heater Ratings and Characteristics:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200[b] max.	volts
Direct Interelectrode Capacitances (Approx.):[c]		
Grid No.1 to plate	0.26	pf
Input: G1 to (K,G3,G2,H)	15.0	pf
Output: P to (K,G3,G2,H)	6.5	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2.880"
Seated Length	2.250' to 2.500"
Diameter	1.438' to 1.562"
Dimensional Outline	See *General Section*
Bulb	T12
Base	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC No.E9-88)
Basing Designation for BOTTOM VIEW	9QU



Pin 1 – Grid No.2
Pin 2 – Grid No.1
Pin 3 – Cathode
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Grid No.3
Pin 7 – Grid No.2
Pin 8 – Do Not Use
Pin 9 – Plate

Characteristics, Class A_1 Amplifier:

	Triode Connection[d]	*Pentode Connection*		
Plate Voltage	150	60	250	volts
Grid No.3	–	*Connected to Cathode at socket*		
Grid-No.2 Voltage	150	150	250	volts
Grid-No.1 Voltage	-22.5	0	-22.5	volts
Amplification Factor	4.4	–	–	
Plate Resistance (Approx.)	–	–	15000	ohms
Transconductance	–	–	7100	μmhos

6JT6A

	Triode Connection[d]	Pentode Connection		
Plate Current	–	390[e]	70	ma
Grid-No.2 Current	–	32[e]	2.1	ma
Grid-No.1 Voltage (Approx.) for plate ma = 1	–	–	-42	volts

HORIZONTAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[f]

DC Plate Supply Voltage	770 max.	volts
Peak Positive-Pulse Plate Voltage[g]	6500 max.	volts
Peak Negative-Pulse Plate Voltage	1500 max.	volts
DC Grid-No.3 (Suppressor-Grid) Voltage[a]	70 max.	volts
DC Grid-No.2 (Screen-Grid)-Voltage	220 max.	volts
DC Grid-No.1 (Control-Grid) Voltage:		
Negative-bias value	55 max.	volts
Peak Negative-Pulse Grid-No.1 Voltage	330 max.	volts
Cathode Current:		
Peak	550 max.	ma
Average	175 max.	ma
Grid-No.2 Input	3.5 max.	watts
Plate Dissipation[h]	17.5 max.	watts
Bulb Temperature (At hottest point on bulb surface)	240 max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For grid-resistor-bias operation	1 max.	megohm

[a] A positive voltage may be applied to grid No.3 to reduce interference from "snivets" which may occur in television receivers. A typical value for this voltage is 30 volts.

[b] The dc component must not exceed 100 volts.

[c] Without external shield.

[d] With grid No.2 connected to plate at socket.

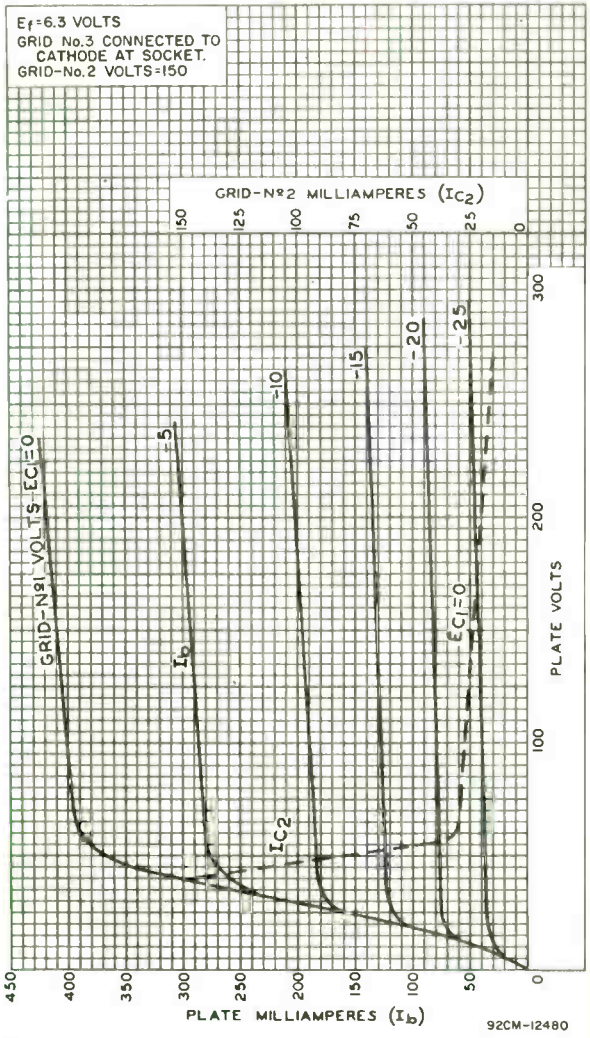
[e] This value can be measured by a method involving a recurrent wave form such that the maximum ratings of the tube will not be exceeded.

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

[g] 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.

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

AVERAGE CHARACTERISTICS



Quadruple Diode

9-PIN MINIATURE TYPE

For Phase-Detector and Noise-Immune Color-Killer Circuits in Color-Television Receivers, and for FM-Stereo-Multiplex Equipment

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Maximum Values):*		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.600	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	300 max.	volts
Heater positive with respect to cathode	300 max.	volts
Direct Interelectrode Capacitances (Approx.):[a]		
Plate of unit No.1 & cathode of unit No.2 to cathode of unit No.1	1.8	μμf
Plate of unit No.1 & cathode of unit No.2 to plate of unit No.2	2.2	μμf
Plate of unit No.2 to internal shield and heater	0.62	μμf
Plate of unit No.3 & cathode of unit No.4 to cathode of unit No.3	1.9	μμf
Plate of unit No.3 & cathode of unit No.4 to plate of unit No.4	2.2	μμf
Plate of unit No.4 to internal shield and heater	0.94	μμf
Cathode of unit No.1 to internal shield and heater	1.8	μμf
Cathode of unit No.3 to internal shield and heater	1.9	μμf

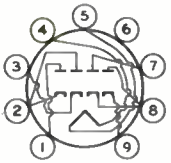
Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)

6JU8

Basing Designation for BOTTOM VIEW. 9PQ

Pin 1 – Plate of Unit No.4
Pin 2 – Plate of Unit No.3, Cathode of Unit No.4
Pin 3 – Cathode of Unit No.3
Pin 4 – Heater
Pin 5 – Heater



Pin 6 – Internal Shield
Pin 7 – Plate of Unit No.2
Pin 8 – Plate of Unit No.1, Cathode of Unit No.2
Pin 9 – Cathode of Unit No.1

Maximum Ratings, *Design-Maximum Values:*

Values are for Each Unit

PEAK INVERSE PLATE VOLTAGE.	300 max.	volts
PEAK PLATE CURRENT.	54 max.	ma
DC OUTPUT CURRENT	9 max.	ma

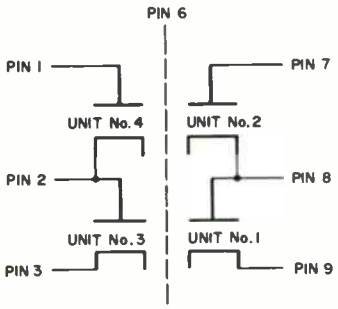
Characteristics, Instantaneous Value:

Values are for Each Unit

Plate Current for plate volts = 10.	60	ma

[a] Without external shield.

ARRANGEMENT OF DIODE UNITS



92CS-11532RI

6JU8A

Quadruple Diode

9-PIN MINIATURE TYPE

For Phase-Detector and Noise-Immune Color-Killer Circuits in Color-Television Receivers, and for FM-Stereo-Multiplex Equipment

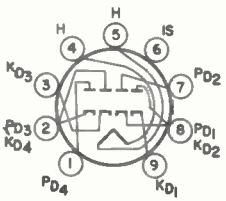
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3±0.6	volts
Current at heater volts = 6.3	0.600	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	300 max.	volts
Heater positive with respect to cathode	300 max.	volts
Direct Interelectrode Capacitances (Approx.):[a]		
$P_{D1}+K_{D2}$ to K_{D1}	1.8	pf
$P_{D1}+K_{D2}$ to F_{D2}	2.2	pf
P_{D2} to (IS,H)	0.62	pf
$P_{D3}+K_{D4}$ to K_{D3}	1.9	pf
$P_{D3}+K_{D4}$ to P_{D4}	2.2	pf
P_{D4} to (IS,H)	0.94	pf
K_{D1} to (IS,H)	1.8	pf
K_{D3} to (IS,H)	1.9	pf

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
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	9PQ

Pin 1 – Plate of Unit No.4
Pin 2 – Plate of Unit No.3, Cathode of Unit No.4
Pin 3 – Cathode of Unit No.3
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Internal Shield
Pin 7 – Plate of Unit No.2
Pin 8 – Plate of Unit No.1, Cathode of Unit No.2
Pin 9 – Cathode of Unit No.1



6JU8A

Maximum Ratings, *Design-Maximum Values:*

Values are for Each Unit

Peak Inverse Plate Voltage	300 max.	volts
Peak Plate Current	54 max.	ma
DC Output Current	9 max.	ma

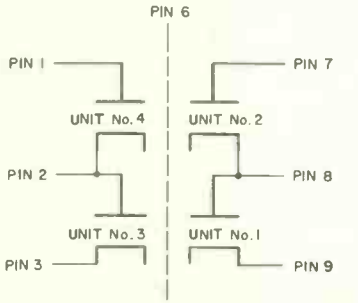
Characteristics, Instantaneous Value:

Values are for Each Unit

Plate Current for plate volts = 10	60	ma

[a] without external shield.

ARRANGEMENT OF DIODE UNITS



92CS-11532RI

High-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For Sound-IF, Keyed-AGC, Sync-Separator, Sync-Amplifier, Noise-Suppression Circuits, and Video Amplifier Service

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:			
Voltage (AC or DC)	6.3[a]	6.3 ±0.6	volts
Current	0.600 ±0.040	0.600[b]	amp
Warm-up time (Average)	11	–	sec
Peak heater-cathode voltage (Each unit):			
Heater negative with respect to cathode	200 max.		volts
Heater positive with respect to cathode	200[c] max.		volts
Direct Interelectrode Capacitances:[d]			
Triode Unit:			
Grid to plate	2.2		pf
Grid to cathode and heater	3.0		pf
Plate to cathode and heater	2.0		pf
Pentode Unit:			
Grid No.1 to plate	0.08 max.		pf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2 and heater	8.0		pf
Pentode plate to pentode cathode & grid No.3 & internal shield, grid No.2 and heater	3.2		pf
Pentode grid No.1 to triode plate	0.012 max.		pf
Pentode plate to triode plate	0.24 max.		pf

Characteristics, Class A_1 Amplifier:

	Triode Unit	
Plate Voltage	200	volts
Grid-No.1 Voltage	−2	volts
Amplification Factor	70	
Plate Resistance (Approx.)	17500	ohms
Transconductance	4000	μmhos
Plate Current	4	ma

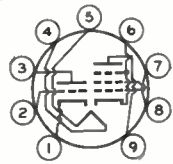
6JV8

	Triode Unit				
Grid-No.1 Voltage (Approx.) for plate μa =20.			-5		volts
	Pentode Unit				
Plate Voltage	40	60	125	200	volts
Grid-No.2 Voltage	125	200	125	200	volts
Grid-No.1 Voltage	0	0	-1	-2.9	volts
Plate Resistance (Approx.)	-	-	100000	150000	ohms
Transconductance.	-	-	11500	10700	μmhos
Plate Current	28[e]	51[e]	22	22	ma
Grid-No.2 Current	9[e]	14[e]	4	4	ma
Grid-No.1 Voltage (Approx.) for plate μa =20. . . .	-	-	-5.5	-9	volts

Mechanical:

Operating Position. . . . . Any
Type of Cathodes. . . . . Coated Unipotential
Maximum Overall Length. . . . . 2-5/8"
Maximum Seated Length . . . . . 2-3/8"
Length from 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. 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-Maximum Values:*

	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE	330 max.	330 max.	volts
GRID-NO.2 (SCREEN-GRID) VOLTAGE	-	330 max.	volts
GRID-NO.1 (CONTROL-GRID) VOLTAGE:			
Negative-bias value	50 max.	50 max.	volts
Positive-bias value	0 max.	0 max.	volts
PLATE DISSIPATION	1.1 max.	4 max.	watts
GRID-NO.2 INPUT	-	1.7 max.	watts

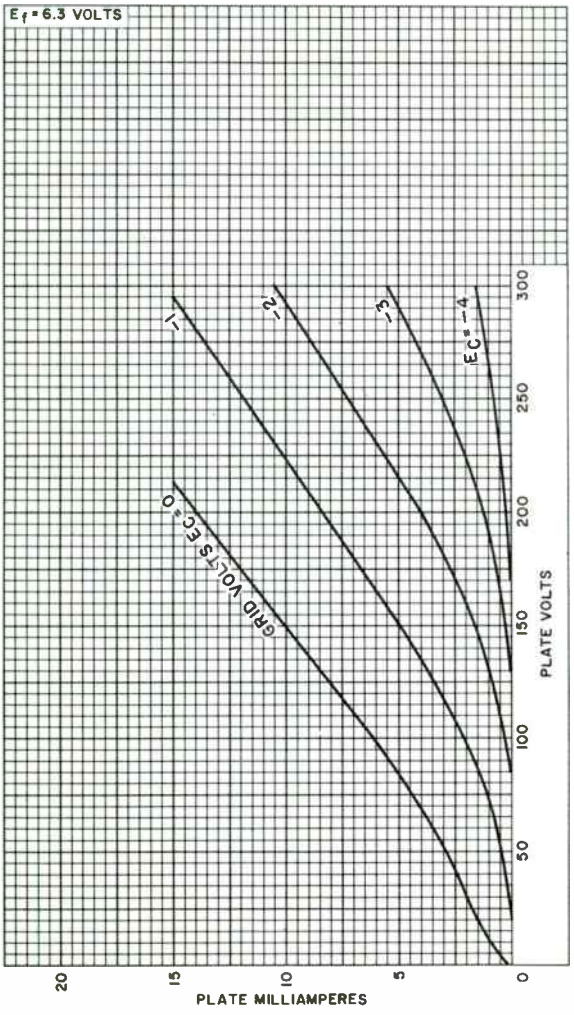
Maximum Circuit Values:

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

[a] At heater amperes = 0.600.
[b] At heater volts = 6.3.
[c] The dc component must not exceed 100 volts.
[d] Without external shield.
[e] This value can be measured by a method involving a recurrent waveform such that the maximum ratings of the tube will not be exceeded.

6JV8

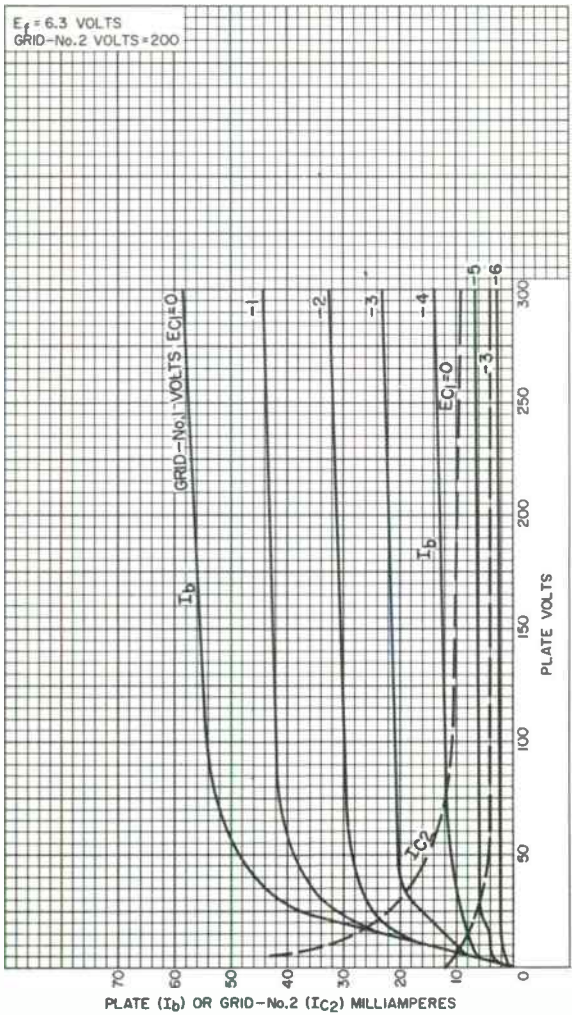
AVERAGE PLATE CHARACTERISTICS
Triode Unit



92CM-11960

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

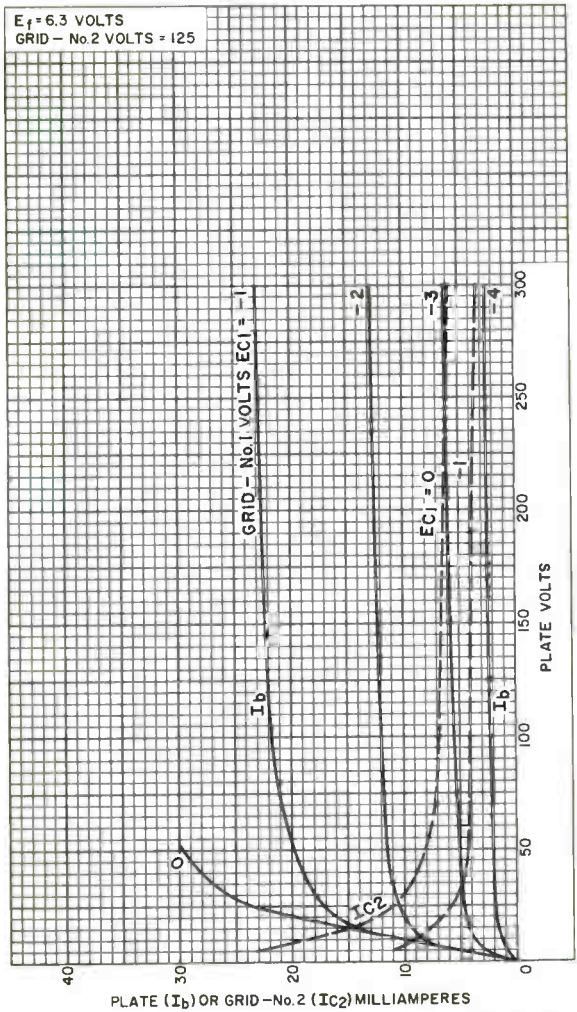
AVERAGE CHARACTERISTICS
Pentode Unit



92CM-11961

6JV8

AVERAGE CHARACTERISTICS
Pentode Unit



92CM – 11962

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

Medium-Mu Triode—Beam Power Tube

DUODECAR TYPE

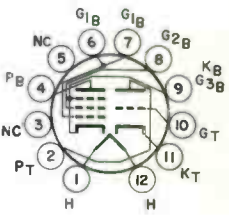
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ±0.6	volts
Current at heater volts = 6.3	1.200	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances (Approx.):[b]		
Triode Unit:		
G_T to P_T	3.6	pf
Input: G- to (K_T,H)	2.2	pf
Output: P_T to (K_T,H)	0.7	pf
Beam Power Unit:		
$G1_B$ to P_B	0.34	pf
Input: $G1_B$ to (K_B+$G3_B$,$G2_B$,H)	11.0	pf
Output: P_B to (K_B+$G3_B$,$G2_B$,H)	7.0	pf

Mechanical:

Operating Position	Any
Types of Cathodes	Coated Unipotential
Maximum Overall Length	2.375"
Seated Length	1.750" to 2.000"
Diameter	1.062" to 1.188"
Dimensional Outline	See *General Section*
Bulb	T9
Base	Small-Button Duodecar 12-Pin (JEDEC No.E12-70)
Basing Designation for BOTTOM VIEW	12DZ

Pin 1 – Heater
Pin 2 – Triode Plate
Pin 3 – No Internal Connection
Pin 4 – Beam Power Plate
Pin 5 – Same as Pin 3
Pin 6 – Beam Power Grid No.1
Pin 7 – Beam Power Grid No.1
Pin 8 – Beam Power Grid No.2
Pin 9 – Beam Power Cathode, Beam Power Grid No.3
Pin 10 – Triode Grid
Pin 11 – Triode Cathode
Pin 12 – Heater



Characteristics, Class A_1 Amplifier:

	Triode Unit	*Beam Power Tube*		
Plate Voltage	150	45	120	volts
Grid-No.2 Voltage	–	110	110	volts
Grid-No.1 Voltage	-5	0	-8	volts
Amplification Factor	20	–	–	

6JZ8

	Triode Unit	Beam Power Tube		
Plate Resistance (Approx.)	8900	-	1700	ohms
Transconductance	2350	-	5400	μmhos
Plate Current	5.5	123	46	ma
Grid-No.2 Current	-	16.5	3.5	ma
Grid-No.1 Voltage (Approx.)				
for plate μa=10	-11	-	-	volts
100.	-	-	-25	volts

VERTICAL-DEFLECTION OSCILLATOR

Triode Unit

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[c]

DC Plate Voltage	250 max.	volts
Peak Negative Pulse-Grid Voltage	400 max.	volts
Cathode Current:		
Peak	70 max.	ma
Average	20 max.	ma
Plate Dissipation	1 max.	watt

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation	1 max.	megohm
For cathode-bias operation	2.2 max.	megohms

VERTICAL-DEFLECTION AMPLIFIER

Beam Power Unit

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[c]

DC Plate Voltage	250 max.	volts
Peak Positive-Pulse Plate Voltage	2000 max.	volts
Grid No.2 Voltage	200 max.	volts
Cathode Current:		
Peak	245 max.	ma
Average	70 max.	ma
Plate Dissipation[d]	7 max.	watts
Grid-No.2 Input	1.8 max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation	1 max.	megohm
For cathode-bias operation	2.2 max.	megohms

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

[c] 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.

[d] In stages operating with grid-leak bias, an adequate cathode-bias resistor or other suitable means is required to protect the tube in the absence of excitation.

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)	4.8	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
Pin 5 - Triode Grid & Heptode Grid #3
Pin 6 - Triode Plate
Pin 7 - Heater
Pin 8 - Cathode

BOTTOM VIEW (G-8H)

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.

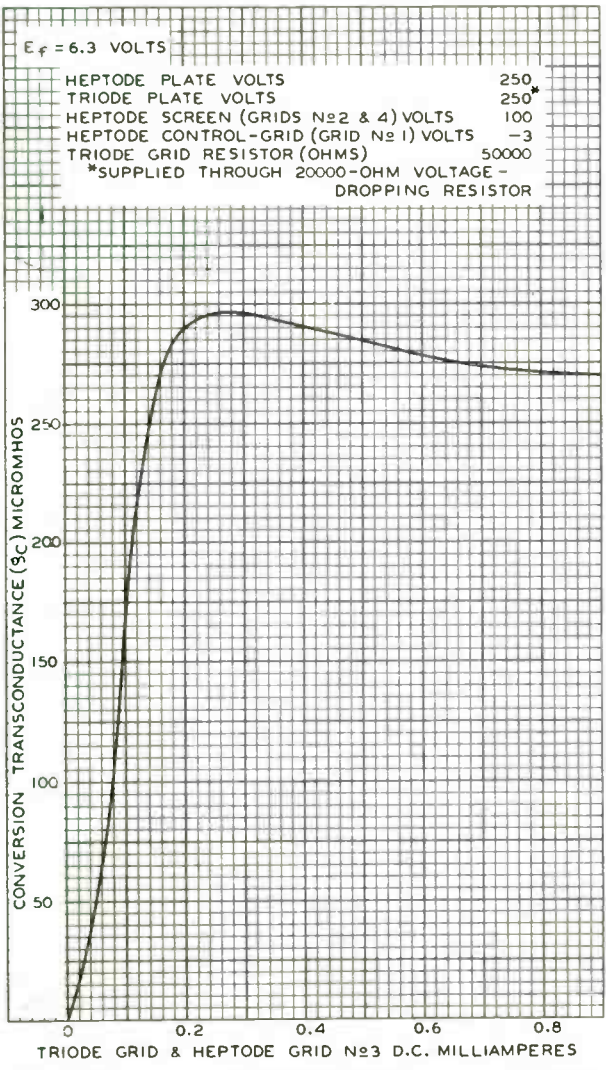
● With shield-can connected to cathode.

* 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:

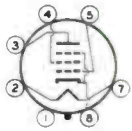
Heater, for Unipotential Cathode:
- Voltage . . . . . 6.3 . . . . . ac or dc volts
- Current . . . . . 0.4 . . . . . amp

Direct Interelectrode Capacitances (Approx.):[○] ←
- Grid No.1 to plate. . . . . 0.5 μμf
- 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.E7-59), 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

○ without external shield.
◆ Pin 1 as well as pin 6 is omitted on the 6-Pin bases.

▲: See next page. ← Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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.

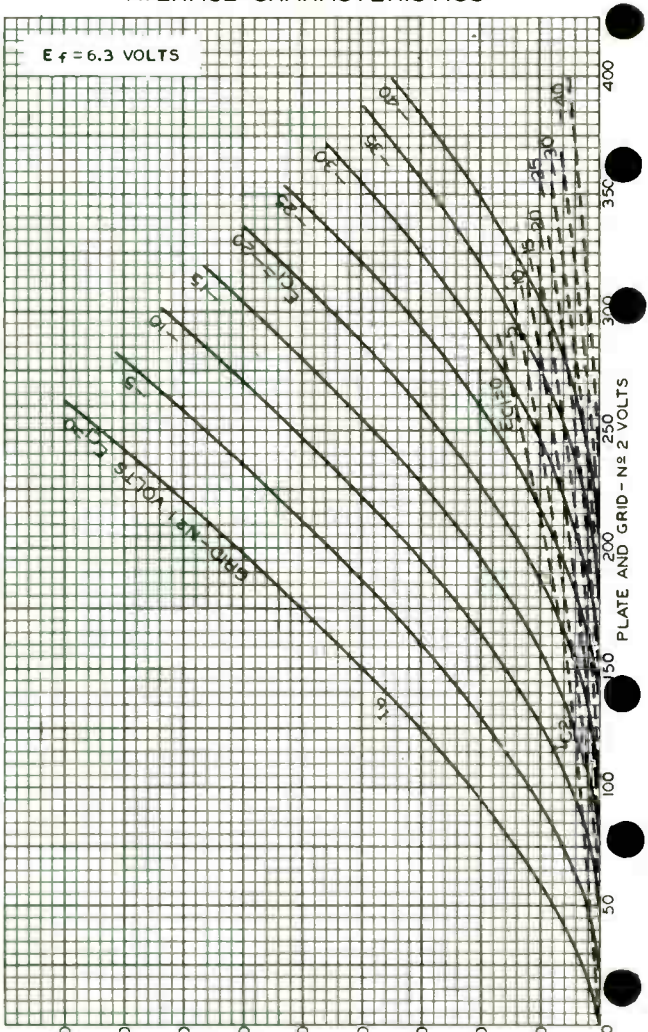
← Indicates a change.

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6K6-GT

AVERAGE CHARACTERISTICS



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

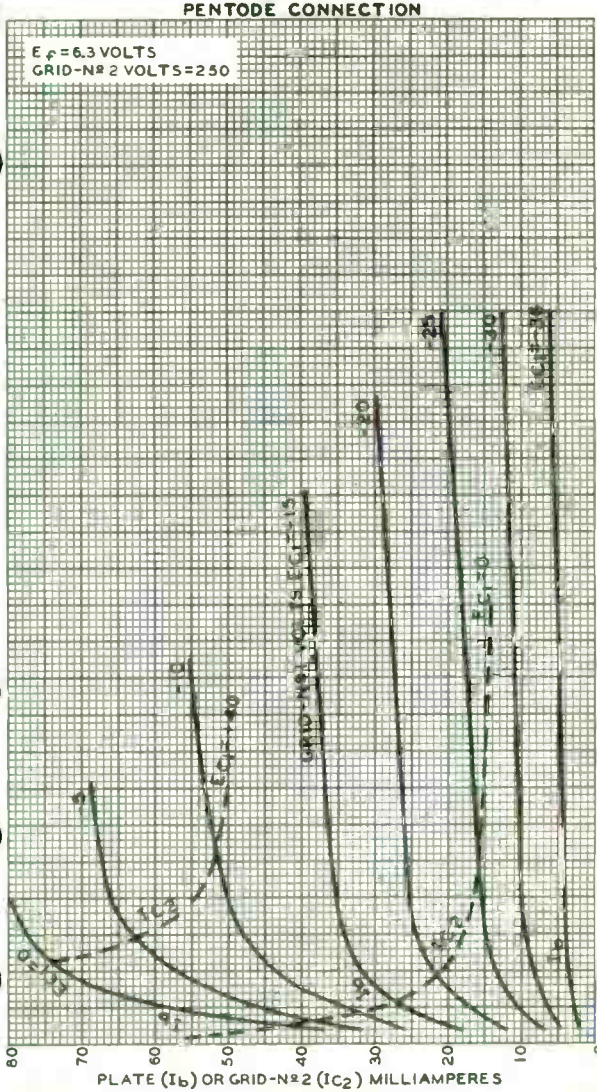
92CM-5209R2

RCA

6K6-GT

AVERAGE PLATE CHARACTERISTICS

PENTODE CONNECTION



FEB. 13, 1948 TUBE DEPARTMENT 92CM-488IR2
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6K6-GT

RCA

6K6-GT

AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION

E_f = 6.3 VOLTS

GRID-№2 VOLTS = 250

GRID-№1 (IC1) MILLIAMPERES

PLATE VOLTS

PLATE (I_b) OR GRID-№2 (I_{C2}) MILLIAMPERES

FEB. 13, 1948

TUBE DEPARTMENT

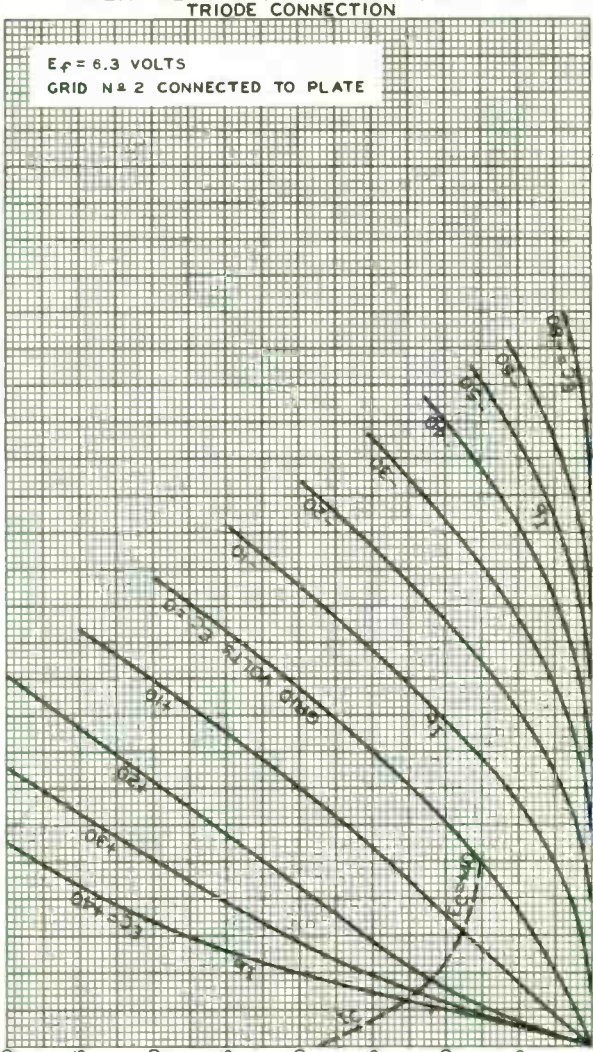
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6311RI

6K6-GT

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION

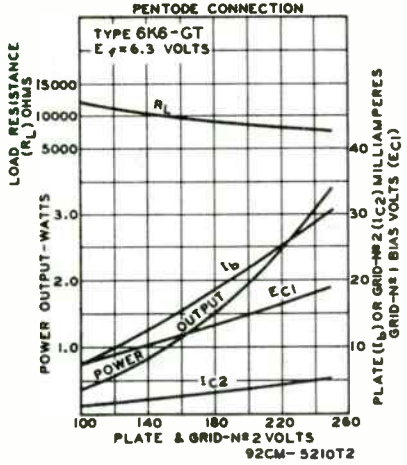


AUG. 18, 1941 TUBE DEPARTMENT 92CM-6313

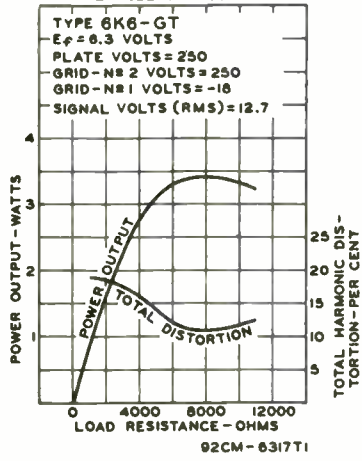
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6K6-GT
POWER PENTODE

OPERATION CHARACTERISTICS
PENTODE CONNECTION



OPERATION CHARACTERISTICS
PENTODE CONNECTION



TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6K11/6Q11

Three-Unit Triode

With Medium-Mu Unit and Two High-Mu Units

DUODECAR TYPE

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3[a]	6.3±0.6	volts
Current	0.600±0.040	0.600[b]	amp
Warm-up time (Average)	11	-	sec
Peak heater-cathode voltage (Each unit):			
Heater negative with respect to cathode	200 max.		volts
Heater positive with respect to cathode	200[c] max.		volts

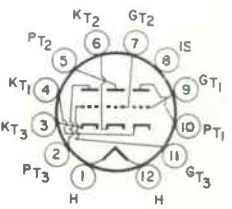
Direct Interelectrode Capacitances (Approx.):[d]

	Unit No. 1	Unit No. 2	Unit No. 3	
Grid to plate	1.3	1.3	1.3	pf
Input: G to (K,IS,H)	1.9	1.8	1.8	pf
Output: P to (K,IS,H)	1.8	0.7	1.8	pf

Mechanical:

Operating Position . . . . . Any
Type of Cathodes . . . . . Coated Unipotential
Maximum Overall Length . . . . . 1.875"
Seated Length . . . . . 1.250" to 1.500"
Diameter . . . . . 1.062" to 1.188"
Dimensional Outline (JEDEC 9-56) . . . . . See *General Section*
Bulb T9
Base . . . . . Small-Button Duodecar 12-Pin (JEDEC No.E12-70)
Basing Designation for BOTTOM VIEW 12BY

Pin 1 - Heater
Pin 2 - Plate of Unit No.3
Pin 3 - Cathode of Unit No.3
Pin 4 - Cathode of Unit No.1
Pin 5 - Plate of Unit No.2
Pin 6 - Cathode of Unit No.2
Pin 7 - Grid of Unit No.2
Pin 8 - Internal Shield
Pin 9 - Grid of Unit No.1
Pin 10 - Plate of Unit No.1
Pin 11 - Grid of Unit No.3
Pin 12 - Heater



AMPLIFIER — Class A_1

	Unit No. 1	Unit No. 2 or 3	
Characteristics:			
Plate Voltage	250	250	volts
Grid Voltage	-8.5	-2	volts

	Unit No.1	Unit No. 2 or 3	
Amplification Factor.	17	100	
Plate Resistance (Approx.). . .	7700	62500	ohms
Transconductance.	2200	1600	μmhos
Plate Current	10.5	1.2	ma
Grid Voltage (Approx.) for plate μa = 10	-24	-	volts
Maximum Ratings, *Design-Maximum Values:*			
Plate Voltage	330	330	volts
Grid Voltage:			
Negative-bias value	50	50	volts
Positive-bias value	0	0	volts
Cathode Current	20		ma
Plate Dissipation	2.75	0.3	watts

[a] At heater amperes = 0.600.
[b] At heater volts = 6.3.
[c] The dc component must not exceed 100 volts.
[d] Without external shield.

High-Mu Triode—Sharp-Cutoff Pentode

Pentode Unit Has Two Independent Control Grids

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater Characteristics and Ratings *(Design-Maximum Values)*:			
Voltage (AC or DC) . .	6.3[a]	6.3 ± 0.6	volts
Current.	0.600 ± 0.040	0.600[b]	amp
Warm-up time (Average).	11	–	sec
Peak heater-cathode voltage:			
Heater negative with respect to cathode . .	200 max.		volts
Heater positive with respect to cathode . .	200[c] max.		volts
Direct Interelectrode Capacitances:[d]			
Triode Unit:			
Grid to plate.		2.2	μμf
Grid to cathode & internal shield, and heater		2.8	μμf
Plate to cathode & internal shield, and heater		2.2	μμf
Pentode Unit:			
Grid No.1 to plate		0.1 max.	μμf
Grid No.1 to cathode & internal shield, grid No.3, grid No.2, and heater		9.5	μμf
Grid No.1 to grid No.3		0.5	μμf
Grid No.3 to plate		2.2	μμf
Grid No.3 to cathode & internal shield, plate, grid No.2, grid No.1, and heater		7.0.	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Plate Supply Voltage	200	150	volts
Grid-No.3 Supply Voltage	–	0	volts
Grid-No.2 Supply Voltage	–	100	volts
Grid-No.1 Supply Voltage	-2	0	volts
Cathode Resistor	–	180	ohms
Amplification Factor	70	–	
Plate Resistance (Approx.)	17500	100000	ohms
Transconductance, Grid No.1 to Plate	4000	4400	μmhos
Transconductance, Grid No.3 to Plate	–	600	μmhos

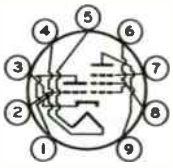
6KA8

Plate Current	4	4	ma
Grid-No.2 Current	–	2.8	ma
Grid-No.1 Supply Voltage (Approx.) for plate μa =			
10	–5	–	volts
20	–	–4	volts
Grid-No.3 Supply Voltage (Approx.) for plate μa = 20	–	–7	volts

Mechanical:

Operating Position . . . . . Any
Type of Cathode . . . . . Coated Unipotential
Maximum Overall Length . . . . . 2-5/8"
Maximum Seated Length . . . . . 2-3/8"
Length, Base Seat to Bulb Top (Excluding tip) . . . . 2" ± 3/32"
Diameter . . . . . 0.750" to 0.875"
Dimensional Outline . . . . . See *General Section*
Bulb T6-1/2
Base . . . . . Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW 9PV

Pin 1 – Triode Plate
Pin 2 – Triode Grid
Pin 3 – Cathode, Internal Shield
Pin 4 – Heater
Pin 5 – Heater



Pin 6 – Pentode Grid No.1
Pin 7 – Pentode Grid No.3
Pin 8 – Pentode Grid No.2
Pin 9 – Pentode Plate

GATED AGC AMPLIFIER & NOISE INVERTER

Pentode Unit

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

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

PLATE VOLTAGE	300 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[f]	600 max.	volts
GRID-No.3 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	100 max.	volts
Positive-bias value	0 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	300 max.	volts
GRID-No.2 VOLTAGE	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	50 max.	volts
Positive-bias value	0 max.	volts
GRID-No.2 INPUT: For grid-No.2 voltages up to 150 volts	1.1 max.	watts

For grid-No.2 voltages between 150 volts and 300 volts.	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
PLATE DISSIPATION.	2 max.	watts

Maximum Circuit Values:

Grid-No.3-Circuit Resistance	0.68 max.	megohm
Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.5 max.	megohm
For cathode-bias operation	1 max.	megohm

AMPLIFIER — Class A_1

Triode Unit

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE.	300 max.	volts
GRID VOLTAGE:		
Negative-bias value.	50 max.	volts
Positive-bias value.	0 max.	volts
PLATE DISSIPATION.	1.1 max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation	0.25 max.	megohm
For cathode-bias operation	1 max.	megohm

[a] At heater amperes = 0.600.

[b] At heater volts = 6.3.

[c] The dc component must not exceed 100 volts.

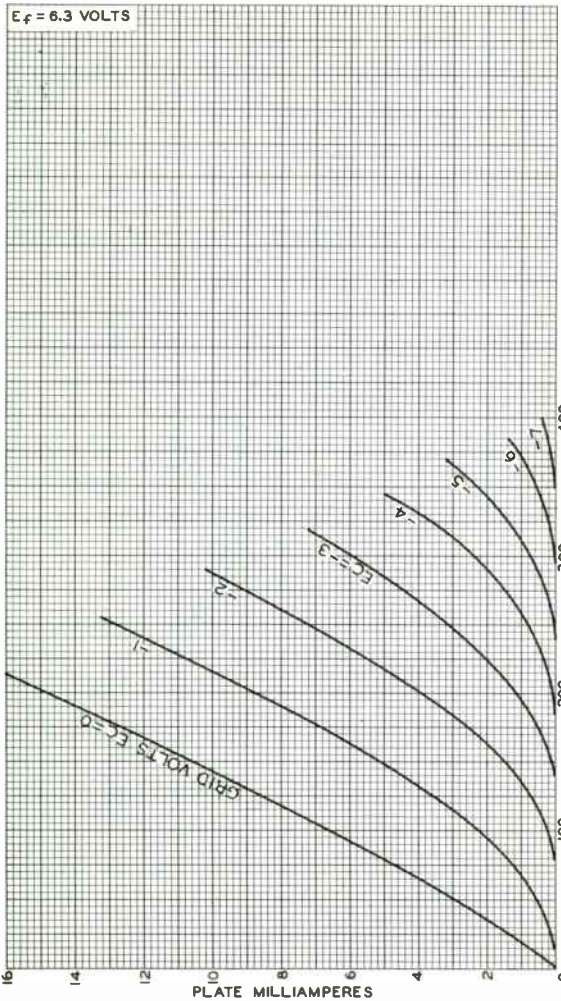
[d] Without external shield.

[e] As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commision.

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

6KA8

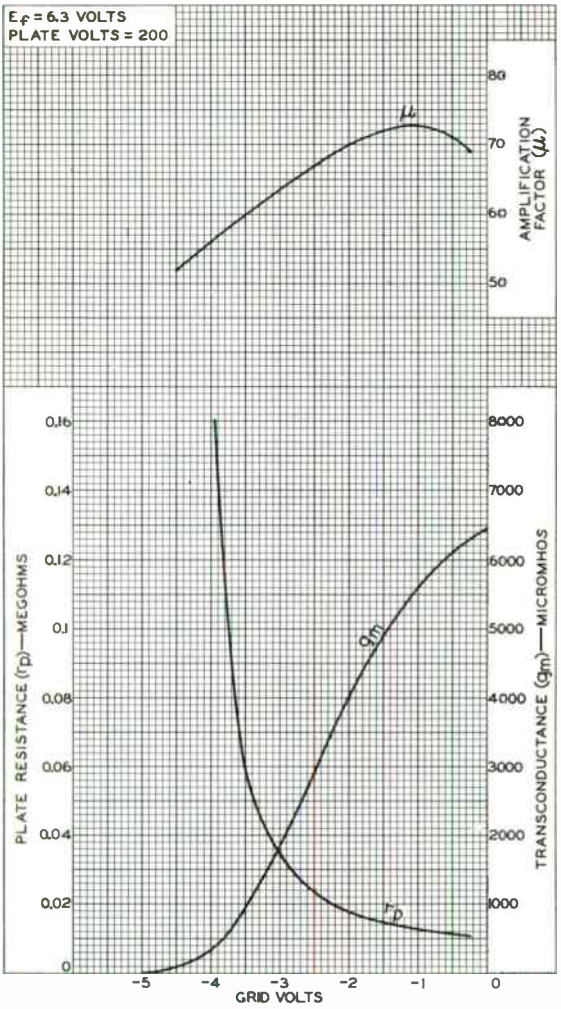
AVERAGE PLATE CHARACTERISTICS
Triode Unit



92CM-8644

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

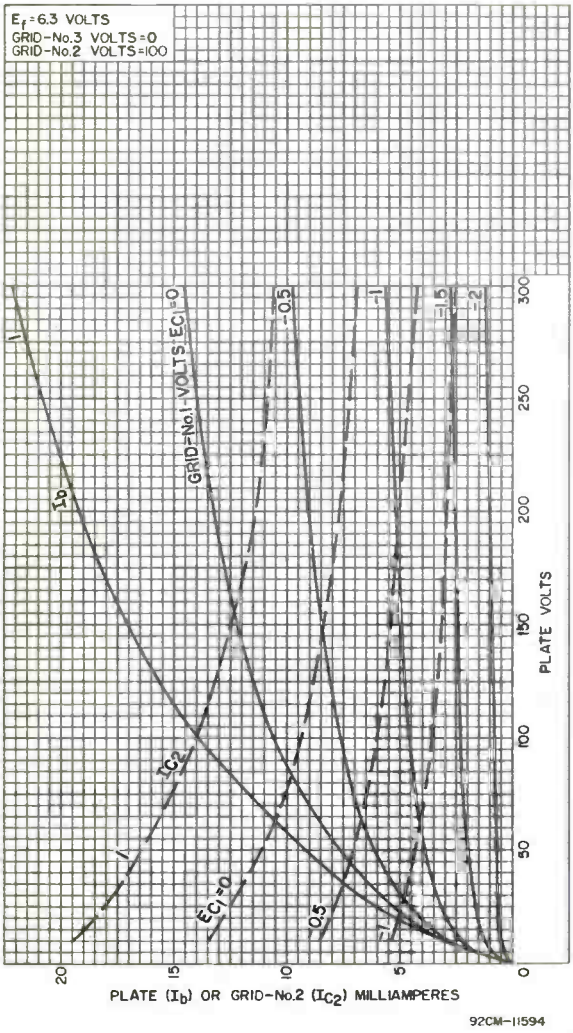
AVERAGE CHARACTERISTICS
Triode Unit



92CM-8647

6KA8

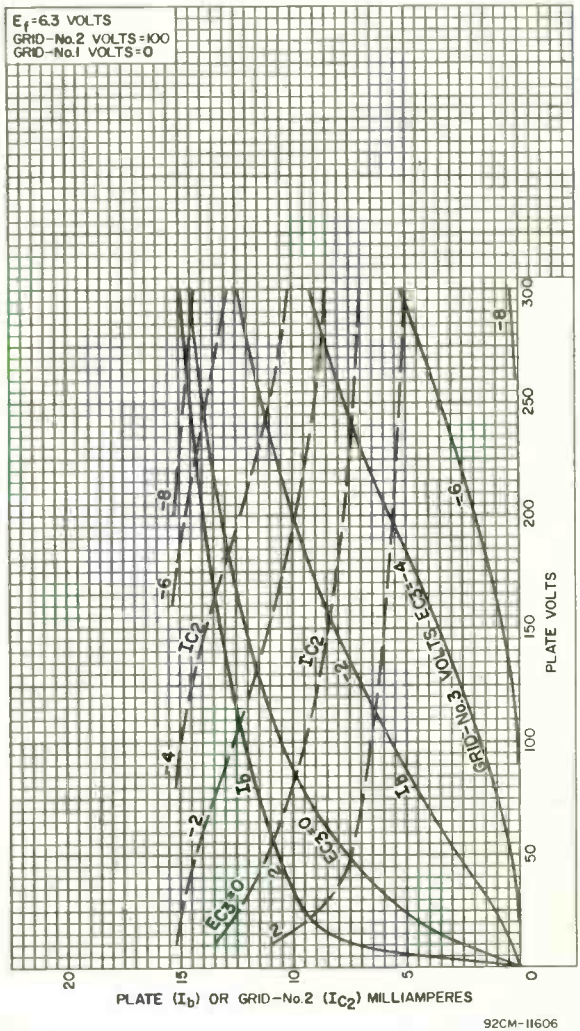
AVERAGE CHARACTERISTICS
Pentode Unit



92CM-11594

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

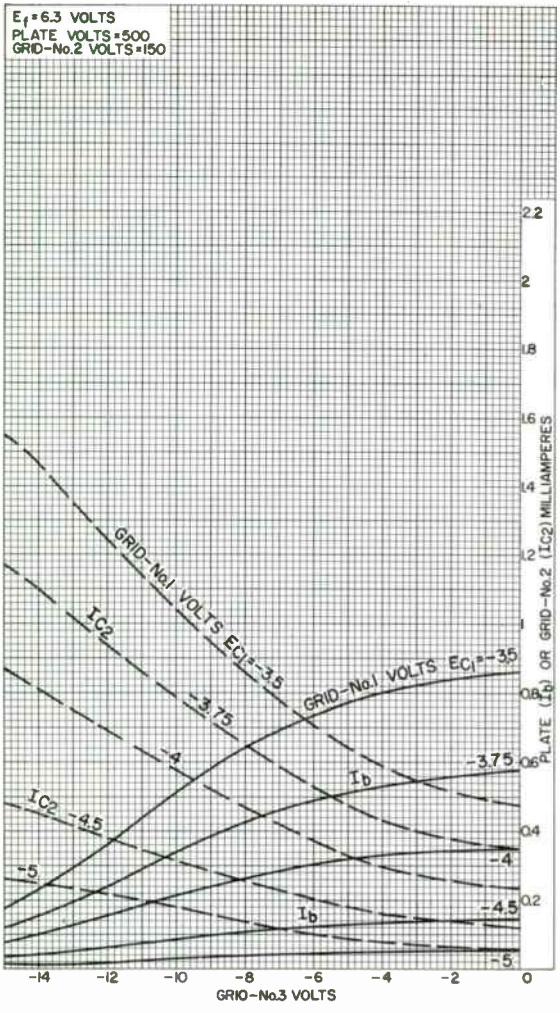
AVERAGE CHARACTERISTICS
Pentode Unit



92CM-11606

6KA8

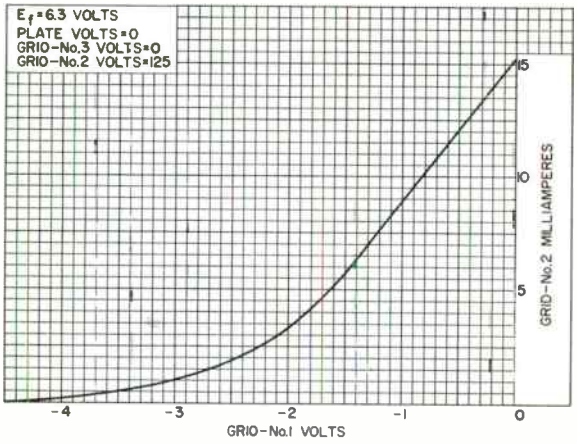
AVERAGE CHARACTERISTICS
Pentode Unit



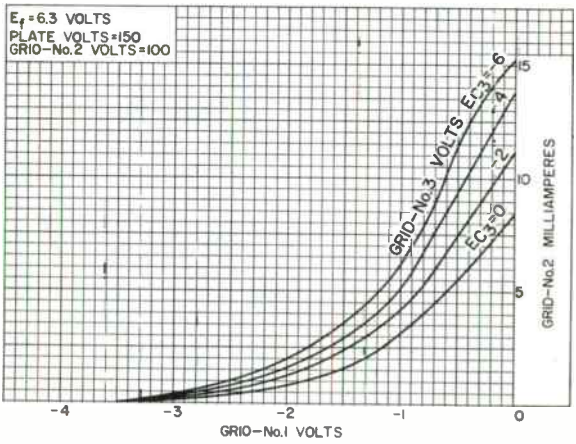
92CM-11600

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

AVERAGE CHARACTERISTICS
Pentode Unit



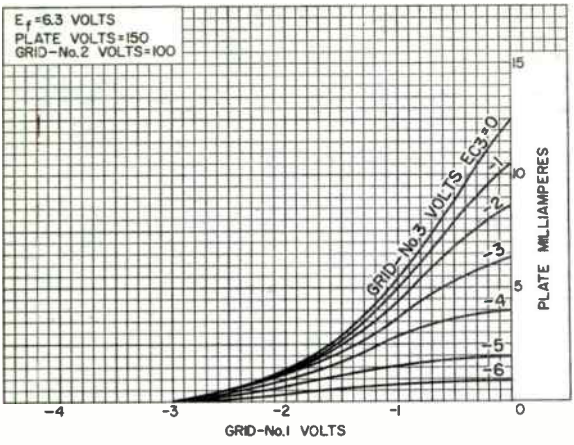
92CS-11603



92CS-11596

6KA8

AVERAGE CHARACTERISTICS
Pentode Unit



92CS-11614

Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE
FRAME-GRID PENTODE
For Combined Oscillator-Mixer Applications in TV Receivers Having an IF of 40 Mc

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.400	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances:[b]		
Triode Unit:		
Grid to plate	1.3	pf
Grid to cathode, pentode cathode & pentode grid No.3 & internal shield, and heater	2.4	pf
Plate to cathode, pentode cathode & pentode grid No.3 & internal shield, and heater	2.0	pf
Pentode Unit:		
Grid No.1 to plate	0.015 max.	pf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	5.0	pf
Plate to cathode & grid No.3, & internal shield, grid No.2, and heater	3.4	pf
Heater to triode cathode and pentode cathode	5.5[c]	pf

Characteristics, Class A$_1$ Amplifier:

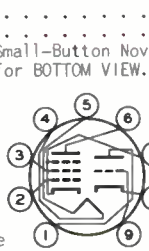
	Triode Unit	*Pentode Unit*	
Plate Supply Voltage	125	125	volts
Grid-No.2 Supply Voltage	–	125	volts
Cathode Resistor	68	33	ohms
Amplification Factor	40	–	
Plate Resistance (Approx.)	5000	125000	ohms
Transconductance	8000	12000	μmhos
Plate Current	13	10	ma
Grid-No.2 Current	–	2.8	ma

6KE8

Grid-No.1 Voltage (Approx.)
for plate μa =
100 . . . . . -5 - volts
50. . . . . - -3 volts

Mechanical:

Operating Position. . . . . Any
Type of Cathodes. . . . . Coated Unipotential
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. 9DC



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

AMPLIFIER — Class A1

Maximum Ratings, *Design-Maximum Values:*

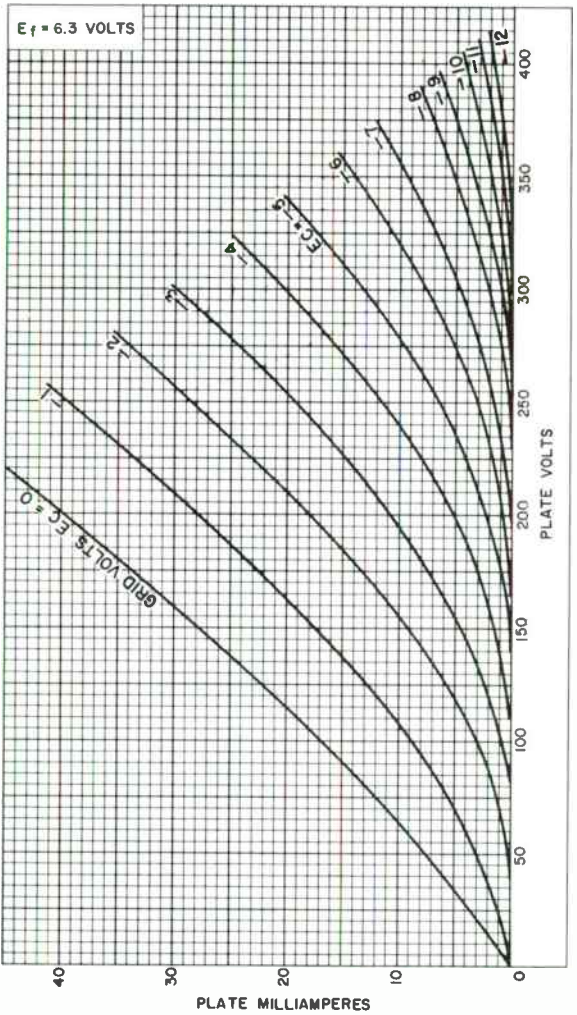
	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE	280 max.	280 max.	volts
GRID-No.2 SUPPLY VOLTAGE.	-	280 max.	volts
GRID-No.2 VOLTAGE	-	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
GRID-No.1 VOLTAGE:			
Positive-bias value	0 max.	0 max.	volts
CATHODE CURRENT	20 max.	20 max.	ma
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 140 volts	-	0.5 max.	watt
For grid-No.2 voltages between 140 and 280 volts . .	-	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
PLATE DISSIPATION	2 max.	2 max.	watts

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.	0.5 max.	megohm

[a] The dc component must not exceed 100 volts.
[b] With external shield JEDEC No.315 connected to cathode of unit under test except as noted.
[c] With external shield JEDEC No.315 connected to ground.

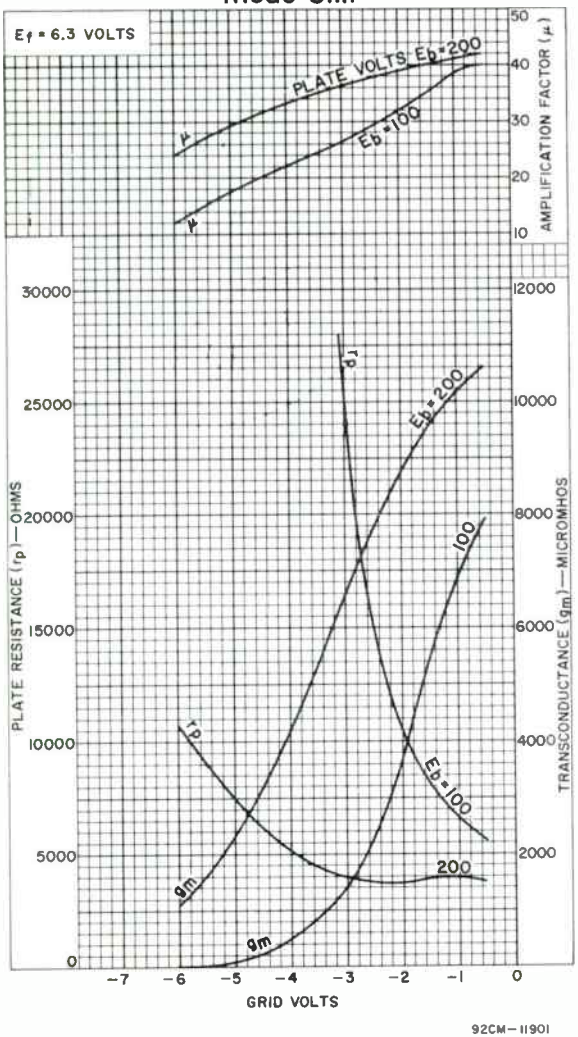
AVERAGE PLATE CHARACTERISTICS
Triode Unit



92CM-11897

6KE8

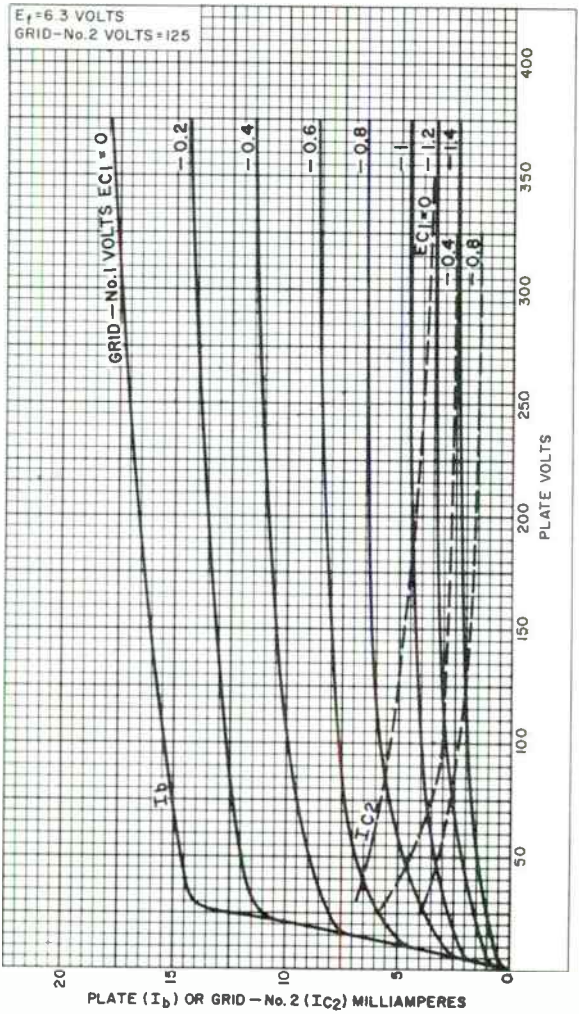
AVERAGE CHARACTERISTICS
Triode Unit



92CM-11901

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

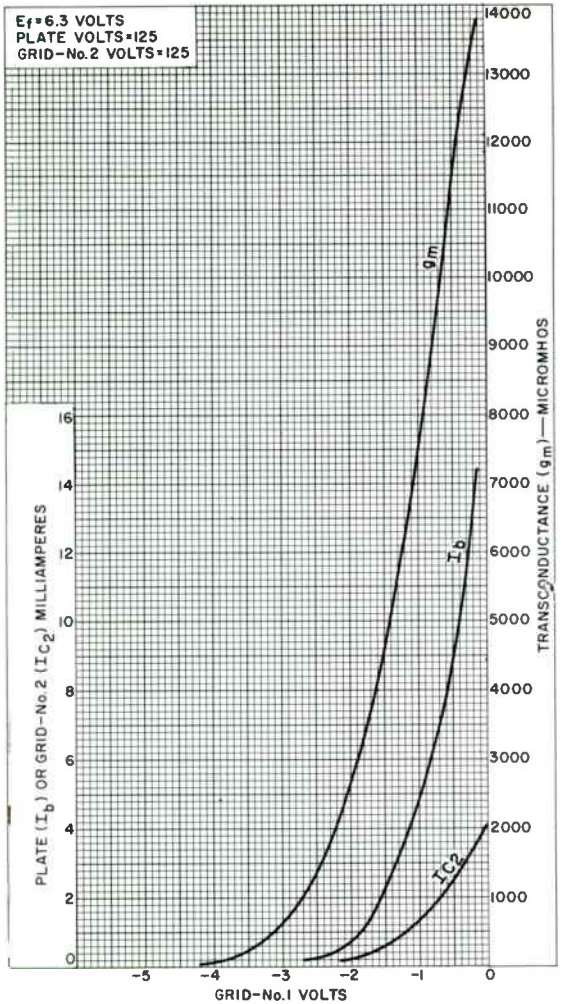
AVERAGE CHARACTERISTICS
Pentode Unit



92CM-11903

6KE8

AVERAGE CHARACTERISTICS
Pentode Unit



92CM-11902

6KM6

Beam Power Tube

NOVAR TYPE

SPECIAL MULTIPLE-FIN PLATE STRUCTURE[a]
SPECIALLY FORMULATED ENVELOPE GLASS[b]

For Color-TV Horizontal-Deflection-Amplifier Applications

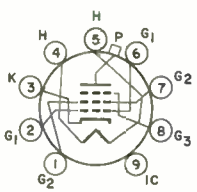
ELECTRICAL

Heater Characteristics and Ratings		
Voltage (AC or DC)	6.3 ± 0.6	V
Current at 6.3 V	1.600	A
Maximum heater-cathode voltage:		
Heater negative with respect to cathode:		
Peak	200	V
Heater positive with respect to cathode:		
Peak	200	V
DC component	100	V
Direct Interelectrode Capacitances (Approx.)		
Without external shield		
Grid No.1 to plate	1.2	pF
Input: GI to (K, G3, G2, H)	22	pF
Output: P to (K, G3, G2, H)	9.0	pF

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.550 in
Seated Length	2.910 to 3.170 in
Diameter	1.438 to 1.562 in
Dimensional Outline	See *General Section*
Bulb	T12
Cap	Skirted Miniature (JEDEC No.C1-2 or C1-3)
Base	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC E9-88)
Basing Designation for BOTTOM VIEW	9QL

Pin 1 – Grid No.2
Pin 2 – Grid No.1
Pin 3 – Cathode
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Grid No.1
Pin 7 – Grid No.2
Pin 8 – Grid No.3
Pin 9 – Do Not Use
Cap – Plate



CHARACTERISTICS

For the following characteristics, see Conditions

Amplification Factor Triode Connection[c]	-	-		4	-
Plate Resistance	-	-	-	6000	Ω
Transconductance	-	-	-	9500	μmho
DC Plate Current	-	560[d]	-	80	mA

DC Grid-No.2 Current	-	31[d]	-	2.4	mA
Cutoff DC Grid-No.1 Voltage (Plate mA = 1)	-110	-	-	-42	V
Conditions					
Heater Voltage	6.3	6.3	6.3	6.3	V
Peak Positive-Pulse Plate Voltage[e]	6500	-	-	-	V
DC Plate Voltage	-	60	140	140	V
DC Grid-No.3 Voltage	30	30	0	30	V
DC Grid-No.2 Voltage	140	140	140	140	V
DC Grid-No.1 Voltage	-	0	-24.5	-24.5	V

MAXIMUM RATINGS, DESIGN-MAXIMUM VALUES

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

DC Plate Supply Voltage	770	V
Peak Positive-Pulse Plate Voltage[e]	6500	V
Peak Negative-Pulse Plate Voltage	1500	V
DC Grid-No.3 Voltage[f]	75	V
DC Grid-No.2 (Screen-Grid) Voltage	220	V
Peak Negative-Pulse Grid-No.1 (Control-Grid) Voltage	330	V
Cathode Current		
Peak	950	mA
Average	275	mA
Grid-No.2 Input	3.5	W
Plate Dissipation[g]	20	W
Envelope Temperature (At hottest point on bulb surface)	240	°C

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance		
For grid-No.1-resistor-bias operation	0.47	MΩ
For plate-pulsed operation	10	MΩ

[a] Designed to minimize secondary-electron emission from plate and eliminate "knee" discontinuities in zero-bias region.

[b] Designed to reduce glass problems after long periods of high-voltage and elevated temperature operation.

[c] With grid No.3 and grid No.2 connected, respectively, to cathode and plate at socket.

[d] This value can be measured by a method involving a recurrent waveform such that the Maximum Ratings of the tube will not be exceeded.

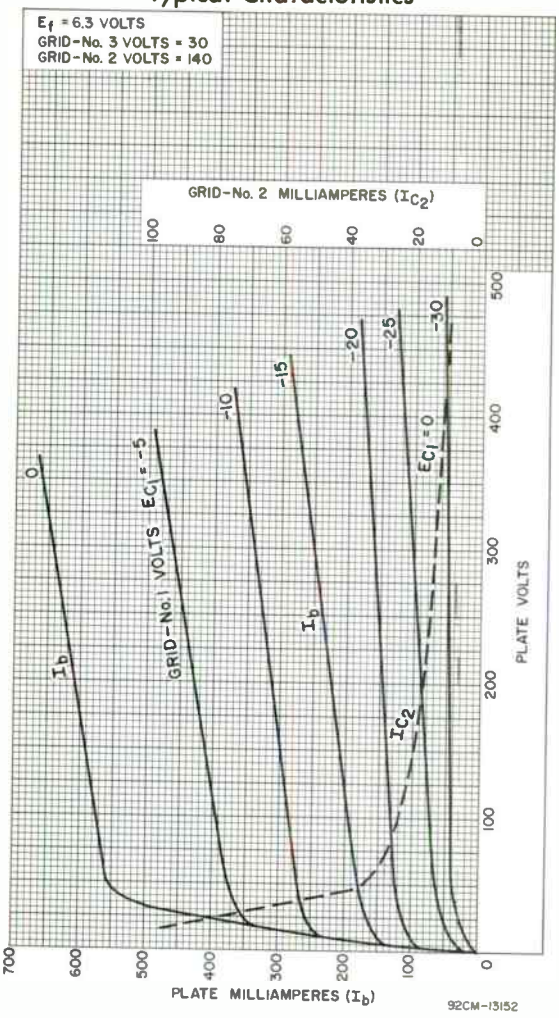
[e] This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

[f] In horizontal-deflection-amplifier service, a positive voltage may be applied to grid No.3 to reduce interference from "aniveta" which may occur in both vhf and uhf television receivers. A typical operating value for this voltage is 30 volts.

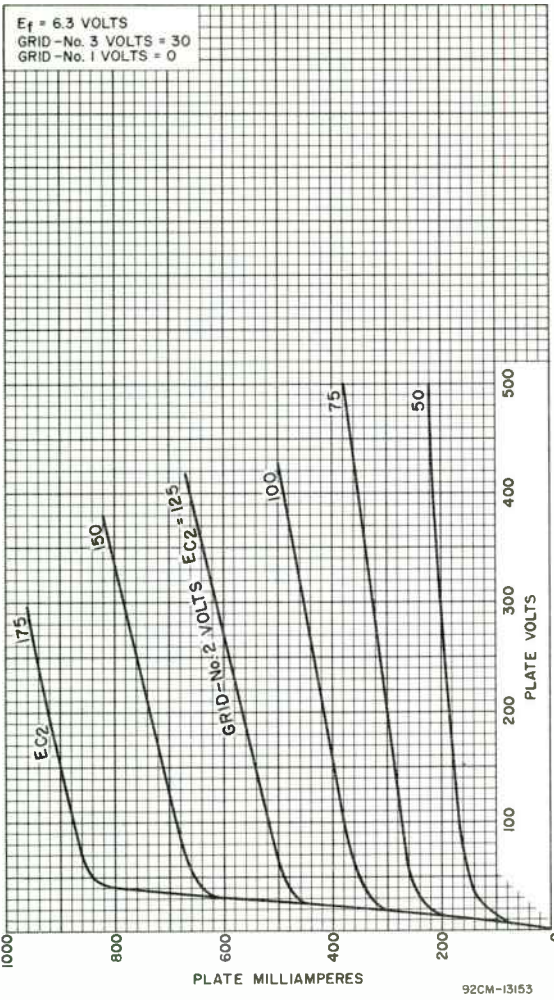
[g] An adequate bias resistor or other means is required to protect the tube in the absence of excitation.

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

Typical Characteristics



Typical Plate Characteristics



RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

High-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For Color-Killer, Sound IF Amplifier, and Band-pass-Amplifier Applications in TV Receivers

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3±0.6	volts
Current at heater volts = 6.3	0.600	amp

Peak heater-cathode voltage:

	Unit:	*Triode*	*Pentode*[a]	
Heater negative with respect to cathode		200 max.	20 max.	volts
Heater positive with respect to cathode		200[b] max.	20 max.	volts

Direct Interelectrode Capacitances:

Triode Unit:	*Without External Shield*	*With External Shield*[c]	
G_T to P_T	3.0	3.0	pf
Input: G_T to $(H+G3_P+IS, K_T)$	3.2	3.2	pf
Output: P_T to $(H+G3_P+IS, K_T)$	1.6	2.4	pf
Pentode Unit:			
$G1_P$ to P_P	0.046 max.	0.030 max.	pf
Input: $G1_P$ to $(H+G3_P+IS, G2_P, K_P)$	7.5	7.5	pf
Output: P_P to $(H+G3_P+IS, G2_P, K_P)$	2.2	2.8	pf
G_T to P_P	0.018 max.	0.003 max.	pf
$G1_P$ to P_T	0.006 max.	0.002 max.	pf

Characteristics, Class A_1 Amplifier:

Unit:	*Triode*	*Pentode*	
Plate Voltage	250	125	volts
Grid-No.2 Voltage	–	125	volts
Grid-No.1 Voltage	−2	−1	volts
Amplification Factor	100	–	
Plate Resistance (Approx.)	31500	150000	ohms
Transconductance	3200	10000	μmhos
Plate Current	1.8	12	ma
Grid-No.2 Current	–	4.5	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	−3.5	−7	volts

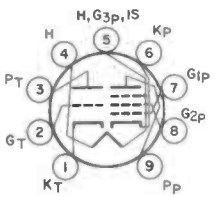
Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"

6KT8

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 90P

Pin 1 – Triode Cathode
Pin 2 – Triode Grid
Pin 3 – Triode Plate
Pin 4 – Heater
Pin 5 – See Footnote a (Heater, Pentode Grid No.3, Internal Shield)
Pin 6 – Pentode Cathode
Pin 7 – Pentode Grid No.1
Pin 8 – Pentode Grid No.2
Pin 9 – Pentode Plate



AMPLIFIER — Class A1

Maximum Ratings, *Design-Maximum Values:*

	Unit:	*Triode*	*Pentode*	
Plate Voltage		330 max.	330 max.	volts
Grid-No.2 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 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		1 max.	2.5 max.	watts

Maximum Circuit Values:

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

[a] Pin No.5 (Pentode Grid No.3, Internal Shield, and Heater) should be operated at or near ground potential. If the peak cathode-to-grid-No.3 voltage exceeds +20 volts, undesirable changes in the tube characteristics may result.

[b] The dc component must not exceed 100 volts.

[c] With external shield JEDEC No.315 connected to pins 4 and 5.

6KV8

High-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE **FRAME-GRID CONSTRUCTION**

For Use as a Combined Voltage Amplifier and Video Output Tube in TV Receivers

ELECTRICAL

Heater Characteristics and Ratings		
Voltage (AC or DC)	6.3 ± 0.6	V
Current at heater volts = 6.3	0.775	A
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200	V
Heater positive with respect to cathode	200[a]	V
Direct Interelectrode Capacitances[b]		
Triode Unit:		
Grid to plate	3.7	pF
Grid to cathode, pentode cathode, pentode grid No.3 & internal shield, and heater.	2.5	pF
Plate to cathode, pentode cathode, pentode grid No.3 & internal shield, and heater.	2.4	pF
Triode grid to pentode plate	0.015 max	pF
Pentode Unit:		
Grid No.1 to plate	0.12 max	pF ←
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater.	13.0	pF
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater.	4.8	pF
Pentode plate to triode plate	0.17 max	pF

Characteristics, Class A_1 Amplifier

	Triode Unit	*Pentode Unit*		
Plate Supply Voltage	-	125	200	V
Plate Voltage	200	-	-	V
Grid-No.2 Supply Voltage	-	125	125	V
Grid-No.1 Supply Voltage	-2	-	-	V
Cathode Resistor	-	82	68	Ω
Amplification Factor	70	-	-	
Plate Resistance (Approx.)	17500	55000	75000	Ω
Transconductance	4000	21000	23000	μmho
Plate Current	4	16.5	20	mA ←
Grid-No.2 Current	-	3.1	3.5	mA ←
Grid-No.1 Voltage (Approx.) for plate current = 100 μA	-4.5	-4.2	-4.2	V

← Indicates a change.

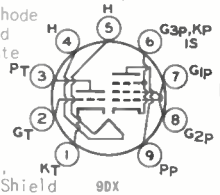
6KV8

MECHANICAL

Operating Position	Any
Maximum Overall Length	2-5/8 in
Maximum Seated Length	2-3/8 in
Length, Base Seat to Bulb Top (Excluding tip)	2 ± 3/32 in
Diameter	0.750 to 0.875 in
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)

BASING DIAGRAM (Bottom View)

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



9DX

AMPLIFIER — Class A_1

Design-Maximum Ratings

	Triode Unit	*Pentode Unit*	
Plate Voltage	300	300 max	V
Grid-No.2 (Screen-Grid) Supply Voltage	-	300 max	V
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	0 max	V
Grid-No.2 Input			
For grid-No.2 voltages up to 150 V.	-	1 max	W
For grid-No.2 voltages between 150 and 300 V.	-	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
Plate Dissipation	1	5 max	W

Maximum Circuit Values

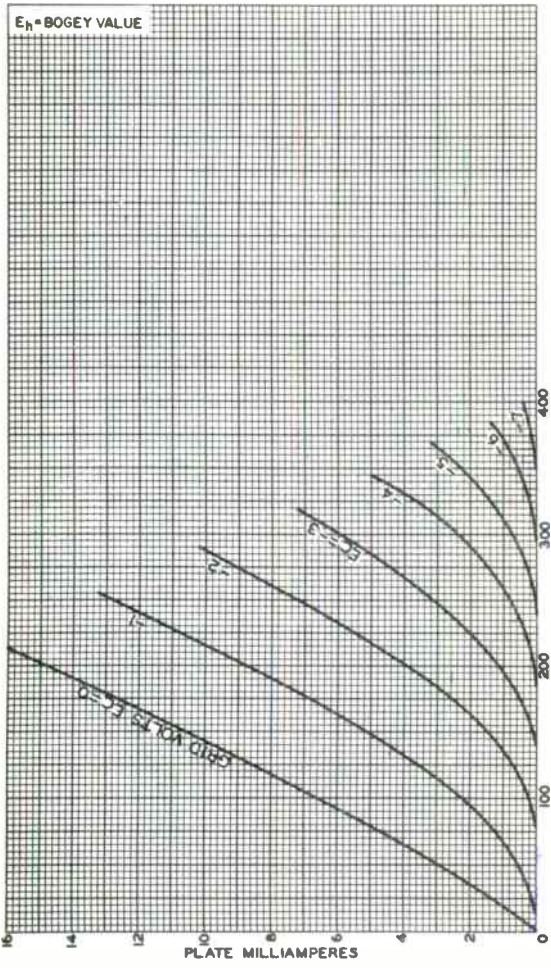
	Triode Unit	*Pentode Unit*	
Grid-No.1-Circuit Resistance			
For fixed-bias operation	0.5	0.1 max	MΩ
For cathode-bias operation	1	0.25 max	MΩ

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

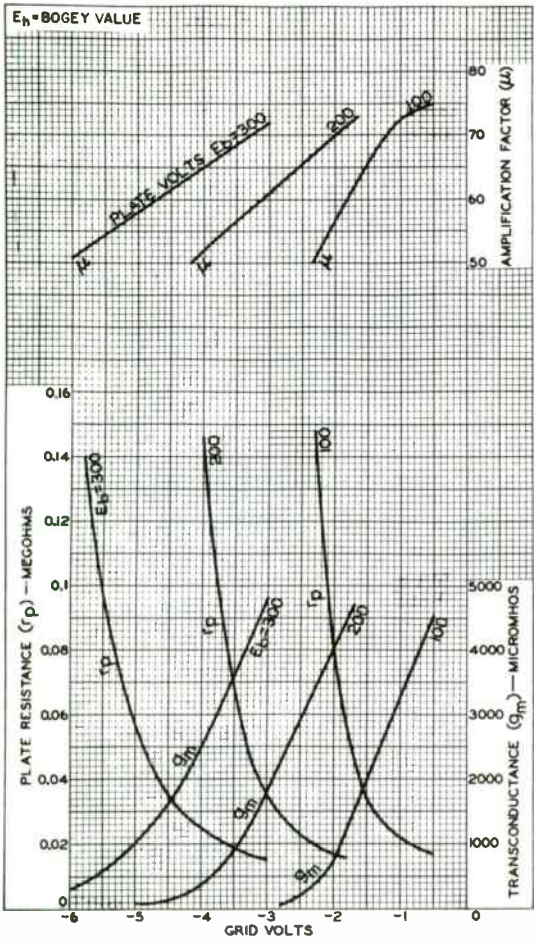
Average Plate Characteristics
Triode Unit



92CM-8644RI

6KV8

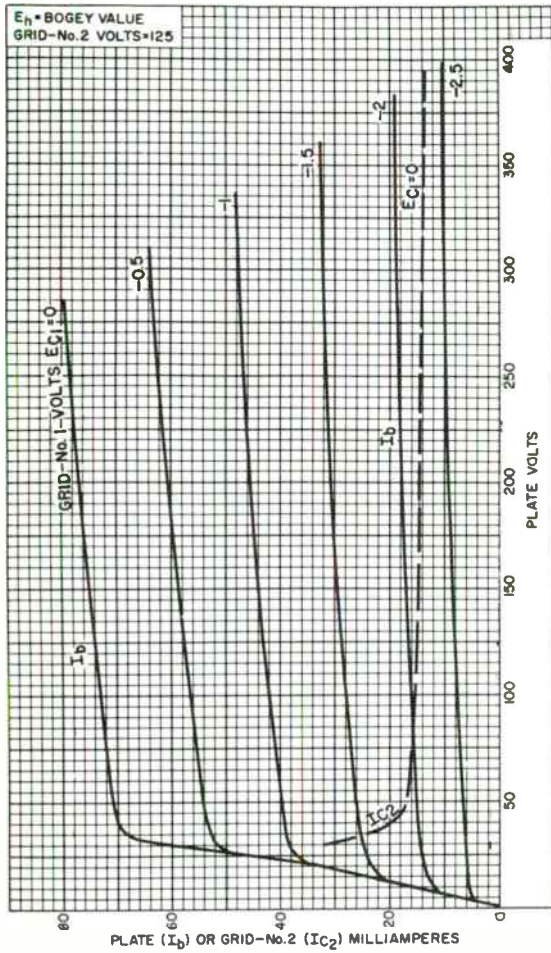
Average Characteristics
Triode Unit



92CM-10874R1

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

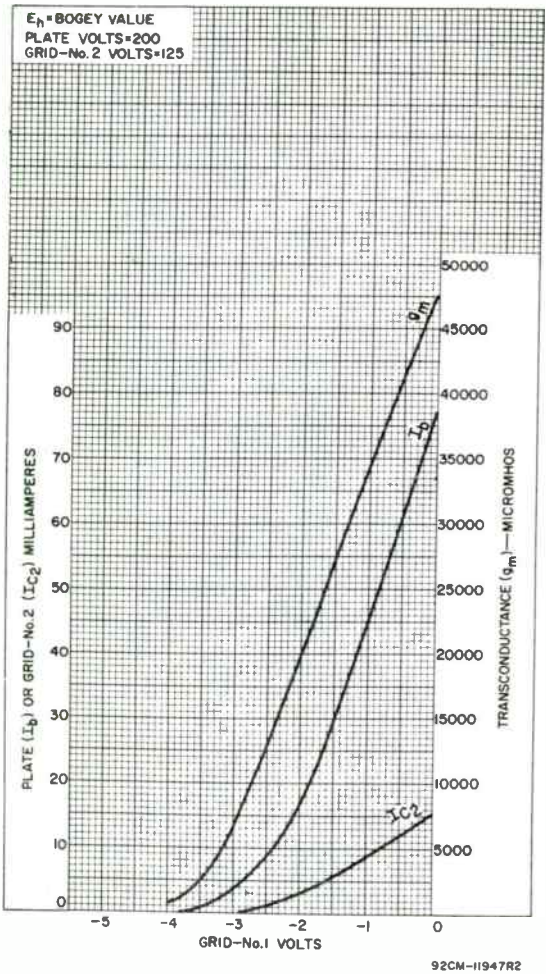
Average Characteristics
Pentode Unit



92CM-11946R2

6KV8

Average Characteristics
Pentode Unit



92CM-11947R2

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

High-Mu Triode—Beam Power Tube

NOVAR TYPE

For Combined Vertical-Deflection Oscillator and Amplifier Service in TV Receivers

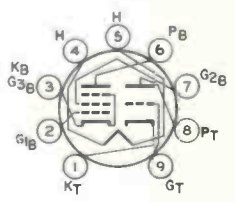
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ±0.6	volts
Current at heater volts = 6.3	1.100	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances (Approx.):[b]		
Triode Unit:		
Grid to plate	0.44	pf
G_T to (K_T,H)	15.0	pf
P_T to (K_T,H)	7.0	pf
Beam Power Unit:		
Grid No.1 to plate	0.048	pf
G1p to (K_B+$G3_B$,$G2_B$,H)	2.6	pf
P_P to (K_B+$G3_B$,$G2_B$,H)	0.28	pf

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	3.110"
Maximum Seated Length	2.730"
Length, Base Seat to Bulb Top (Excluding tip)	2.210" to 2.390"
Diameter	1.062" to 1.188"
Bulb	T9
Socket	Cinch Mfg. Co. No.149 19 00 033, Industrial Electronics Hardware Corp. No.SO-0968-SL1, or equivalent
Base	Small Button Novar 9-Pin (JEDEC No.E9-75)
Basing Designation for BOTTOM VIEW	9QT

Pin 1 – Triode Cathode
Pin 2 – Beam Power Grid No.1
Pin 3 – Beam Power Cathode & Grid No.3
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Beam Power Plate
Pin 7 – Beam Power Grid No.2
Pin 8 – Triode Plate
Pin 9 – Triode Grid



Characteristics, Class A_1 Amplifier:

	Triode Unit	*Beam Power Unit*			
Plate Voltage	250	50	135	120	volts
Grid-No.2 Voltage	–	120	120	*Connected to plate at socket*	volts
Grid-No.1 Voltage	-3	0	-10	-10	volts
Amplification Factor	64	–	–	7	

6KY8

	Triode Unit		Beam Power Unit		
Plate Resistance (Approx.)	40000	–	18000	–	ohms
Transconductance	1600	–	8400	–	μmhos
Plate Current	1.4	170[c]	39	–	ma
Grid-No.2 Current	–	20[c]	3	–	ma
Grid-No.1 Voltage (Approx.) for plate ma = 1.	–	–	– 24	–	volts

VERTICAL-DEFLECTION OSCILLATOR *(Triode Unit)*

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[d]

DC Plate Voltage	330 max.	volts
Peak Negative-Pulse Grid Voltage	400 max.	volts
Peak Cathode Current	77 max.	ma
Average Cathode Current	22 max.	ma
Plate Dissipation	1.5 max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:

For grid-resistor-bias operation	2.2 max.	megohms

VERTICAL-DEFLECTION AMPLIFIER *(Beam Power Unit)*

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[d]

DC Plate Voltage	300 max.	volts
Peak Positive-Pulse Plate Voltage[e]	2000 abs.max.	volts
DC Grid-No.2 (Screen-Grid) Voltage	150 max.	volts
Peak Negative-Pulse Grid-No.1 (Control-Grid) Voltage	250 max.	volts
Peak Cathode Current	200 max.	ma
Average Cathode Current	70 max.	ma
Plate Dissipation	12 max.	watts
Grid-No.2 Input	1.9 max.	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For grid-resistor-bias operation	2.2 max.	megohms

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

[c] This value 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.

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

[e] 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.

DIMENSIONAL OUTLINE & CURVES
shown under Type 15KY8 also apply to the 6KY8

High-Mu Triode—Beam Power Tube

NOVAR TYPE

For Combined Vertical-Deflection Oscillator and Amplifier Service in TV Receivers

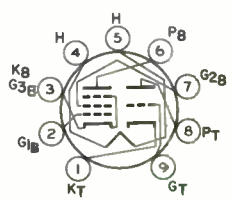
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ±0.6	volts
Current at heater volts = 6.3	1.1[00]	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances (Approx.):[b]		
Triode Unit:		
Grid to plate	0.44	pf
G_T to (K_T,H)	15.0	pf
P_T to (K_T,H)	7.0	pf
Beam Power Unit:		
Grid No.1 to plate	0.048	pf
$G1_B$ to (K_B+$G3_B$,$G2_B$,H)	2.6	pf
P_B to (K_B+$G3_B$,$G2_B$,H)	0.28	pf

Mechanical:

Operating Position	Any
Type of Catnodes	Coated Unipotential
Maximum Overall Length	2.380"
Seated Length	1.750" to 2.000"
Diameter	1.062" to 1.188"
Dimensional Outline	See *General Section*
Bulb	T9
Base	Small Button Novar 9-Pin with Exhaust Tip (JEDEC No.E9-89)
Basing Designation for BOTTOM VIEW	9QT

Pin 1 – Triode Cathode
Pin 2 – Beam Power Grid No.1
Pin 3 – Beam Power Cathode & Grid No.3
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Beam Power Plate
Pin 7 – Beam Power Grid No.2
Pin 8 – Triode Plate
Pin 9 – Triode Grio



Characteristics, Class A_1 Amplifier:

	Triode Unit	*Beam Power Unit*			
Plate Voltage	250	50	135	120	volts
Grid-No.2 Voltage	–	120	120	*Connected to plate at socket*	volts
Grid-No.1 Voltage	-3	0	-10	-10	volts
Amplification Factor	64	–	–	7	

	Triode Unit	*Beam Power Unit*		
Plate Resistance (Approx.)	40000	–	18000	– ohms
Transconductance	1600	–	8400	– μmhos
Plate Current	1.4	170[c]	39	– ma
Grid-No.2 Current	–	20[c]	3	– ma
Grid-No.1 Voltage (Approx.) for plate ma = 1	–	–	-24	– volts

VERTICAL-DEFLECTION OSCILLATOR *(Triode Unit)*

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[d]

DC Plate Voltage	330 max.	volts
Peak Negative-Pulse Grid Voltage	400 max.	volts
Peak Cathode Current	77 max.	ma
Average Cathode Current	22 max.	ma
Plate Dissipation	1.5 max.	watts

Maximum Circuit Values:

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

VERTICAL-DEFLECTION AMPLIFIER *(Beam Power Unit)*

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[d]

DC Plate Voltage	300 max.	volts
Peak Positive-Pulse Plate Voltage[e]	2000 abs.max.	volts
DC Grid-No.2 (Screen-Grid) Voltage	150 max.	volts
Peak Negative-Pulse Grid-No.1 (Control-Grid) Voltage	250 max.	volts
Peak Cathode Current	200 max.	ma
Average Cathode Current	70 max.	ma
Plate Dissipation	12 max.	watts
Grid-No.2 Input	1.9 max.	watts

Maximum Circuit Values:

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

[a] The dc component must not exceed 100 volts.

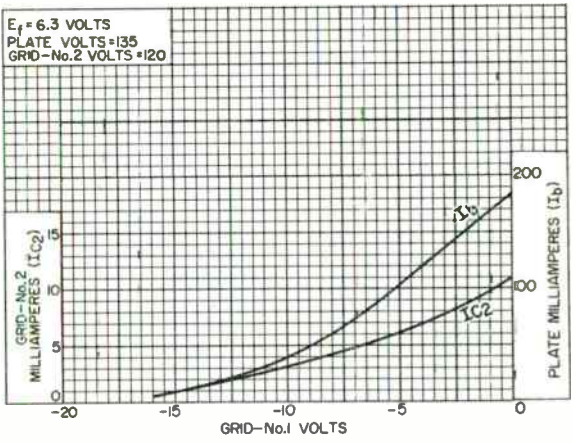
[b] Without external shield.

[c] This value 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.

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

[e] 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.

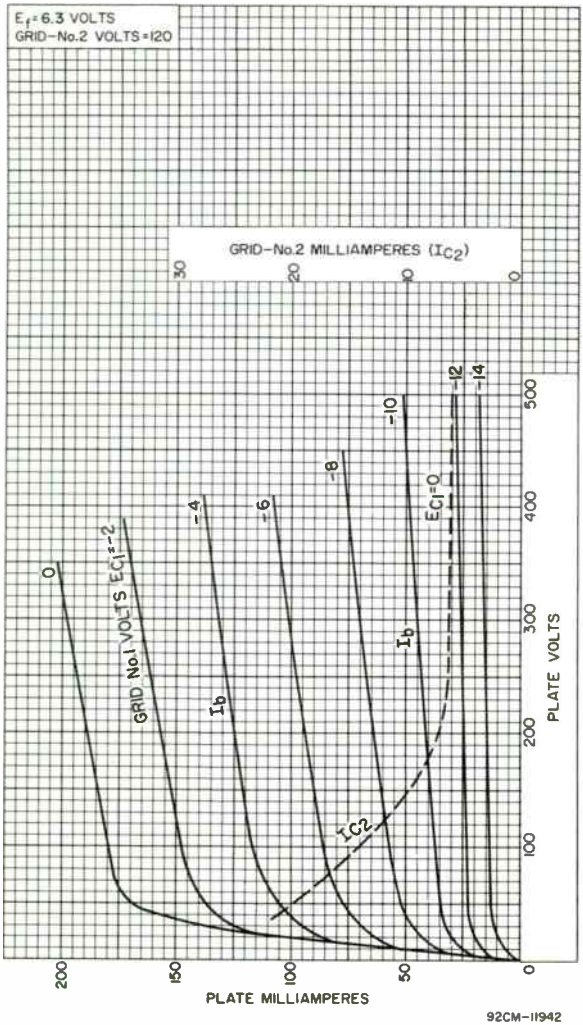
AVERAGE CHARACTERISTICS
Beam Power Unit



92CS-11929

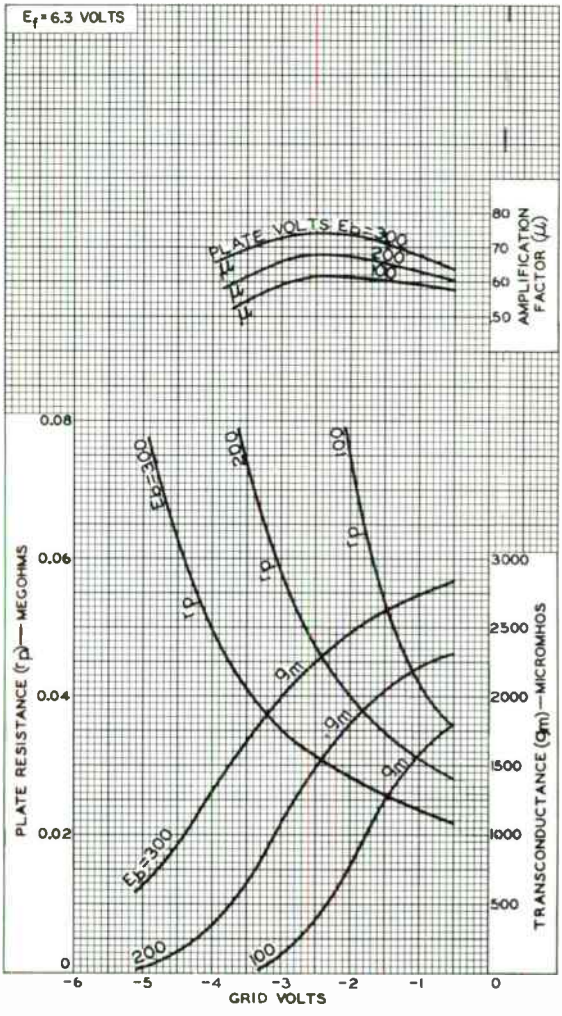
6KY8A

AVERAGE CHARACTERISTICS
Beam Power Unit



92CM-11942

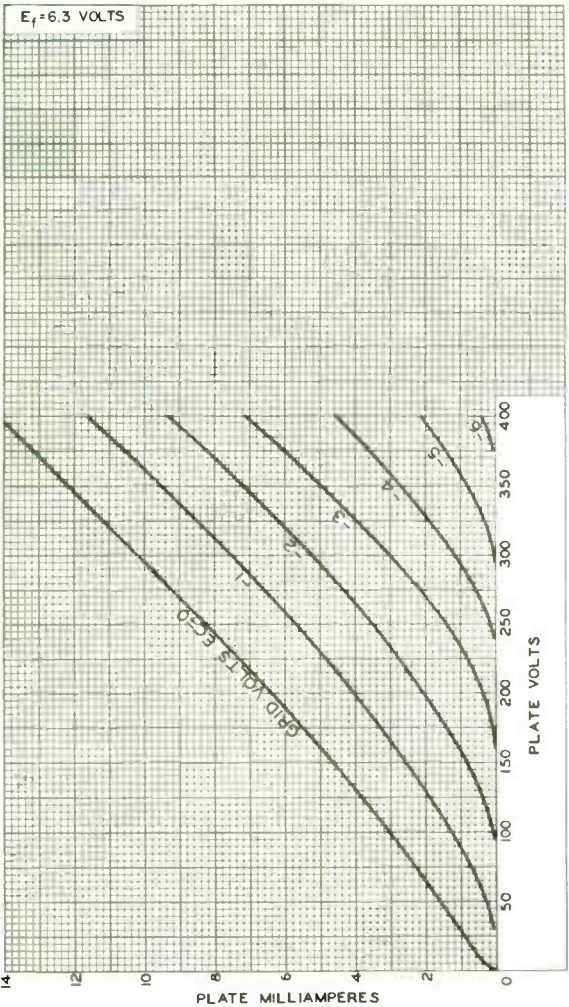
AVERAGE CHARACTERISTICS
Triode Unit



92CM-11945

6KY8A

AVERAGE CHARACTERISTICS
Triode Unit



92CM-11944

Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For Oscillator-Mixer Service in VHF TV-Tuner Applications

Electrical:

Heater Characteristics and Ratings:			
Voltage (AC or DC)	5.3[a]	6.3±0.6	volts
Current	0.450±0.030	0.450[b]	amp
Warm-up time (Average)	11	-	sec
Peak heater-cathode voltage (Each Unit):			
Heater negative with respect to cathode	200 max.		volts
Heater positive with respect to cathode	200[c] max.		volts
Direct Interelectrode Capacitances:[d]			
Triode Unit:			
G_T to P_T	1.6		pf
Input: G_T to (K_T,$G3_P$+K_P+IS,H)	3.2		pf
Output: P_T to (K_T,$G3_P$+K_P+IS,H)	1.8		pf
Pentode Unit:			
$G1_P$ to P_P	0.01 max.		pf
Input: $G1_P$ to (K_P+$G3_P$+IS,$G2_P$,H)	5.5		pf
Output: P_P to (K_P+$G3_P$+IS,$G2_P$,H)	3.4		pf
Heater to cathode (Each Unit)	3.2		pf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Plate Voltage	125	125	volts
Grid-No.2 Voltage	-	125	volts
Grid-No.1 Voltage	-1	-1	volt
Amplification Factor	46	-	
Plate Resistance (Approx.)	5400	200000	ohms
Transconductance	8500	7500	μmhos
Plate Current	13.5	12	ma
Grid-No.2 Current	-	4	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-8	-8	volts

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Exclucing 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)

6KZ8

Basing Designation for BOTTOM VIEW. 9FZ

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

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

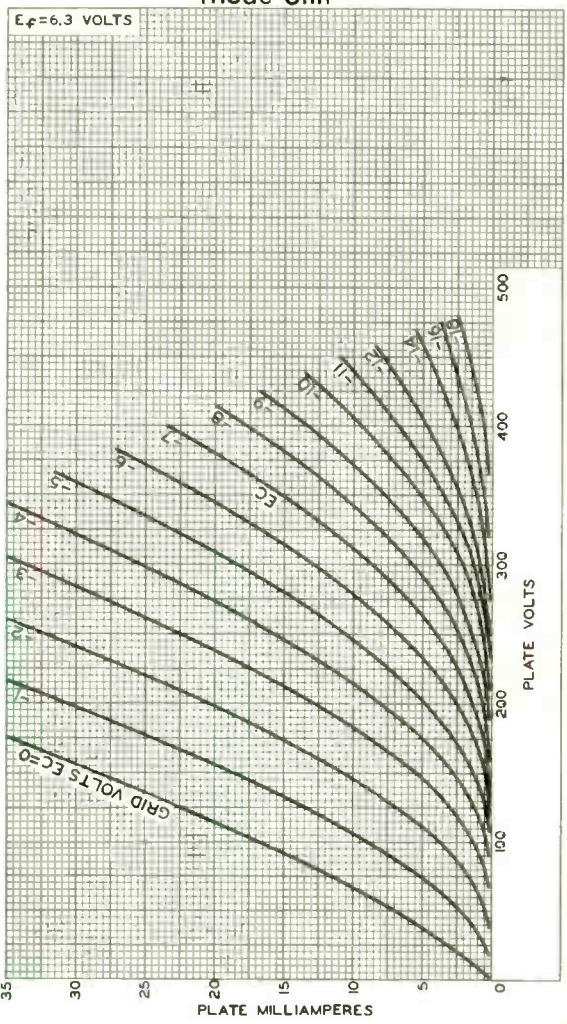
	Triode Unit	*Pentode Unit*	
Plate Voltage.	330 max.	330 max.	volts
Grid-No.2 (Screen-Grid) Supply Voltage	–	330 max.	volts
Grid-No.2 Voltage.	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section		
Grid-No.1 (Control-Grid) Voltage: Positive-bias value.	0 max.	0 max.	volts
Plate Dissipation.	2.5 max.	2.5 max.	watts
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		

Maximum Circuit Values:

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

[a] At heater amperes = 0.450.
[b] At heater volts = 6.3.
[c] The dc component must not exceed 100 volts.
[d] With external shield JEDEC No.315 connected to cathode of unit under test.

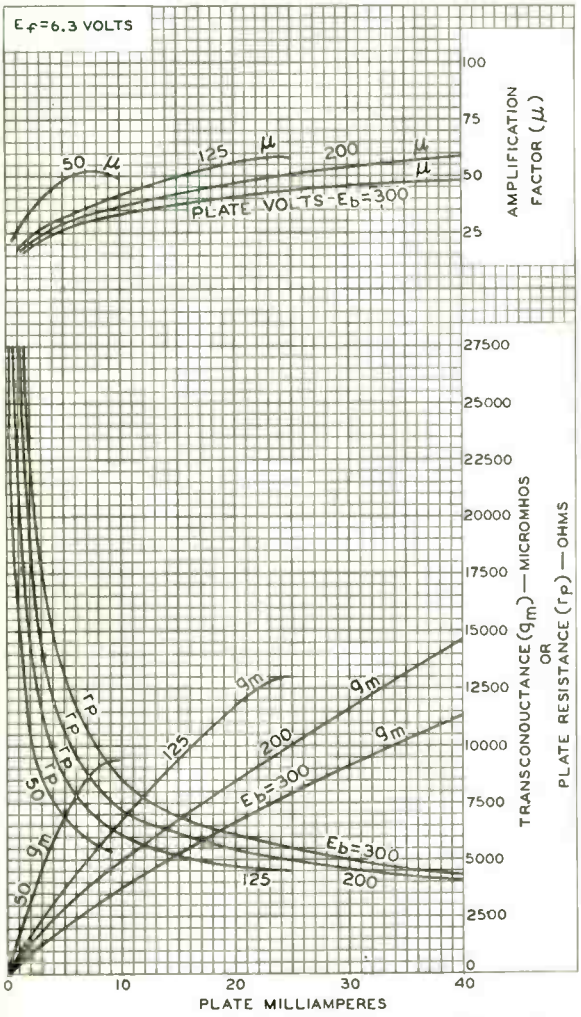
AVERAGE PLATE CHARACTERISTICS
Triode Unit



92CM-10421R1

6KZ8

AVERAGE CHARACTERISTICS
Triode Unit



ELECTRON TUBE DIVISION 92CM—10428
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

AVERAGE CHARACTERISTICS
Pentode Unit

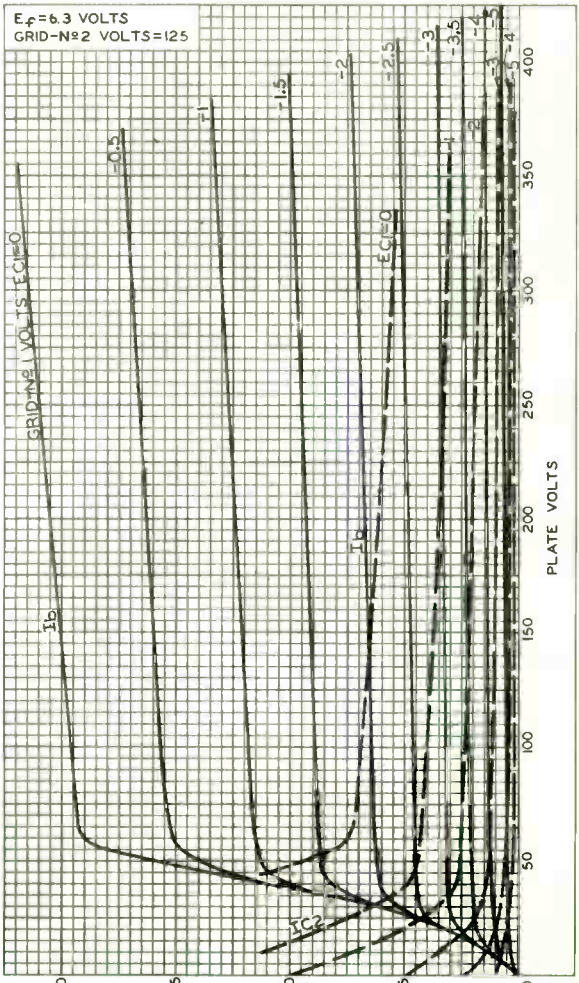
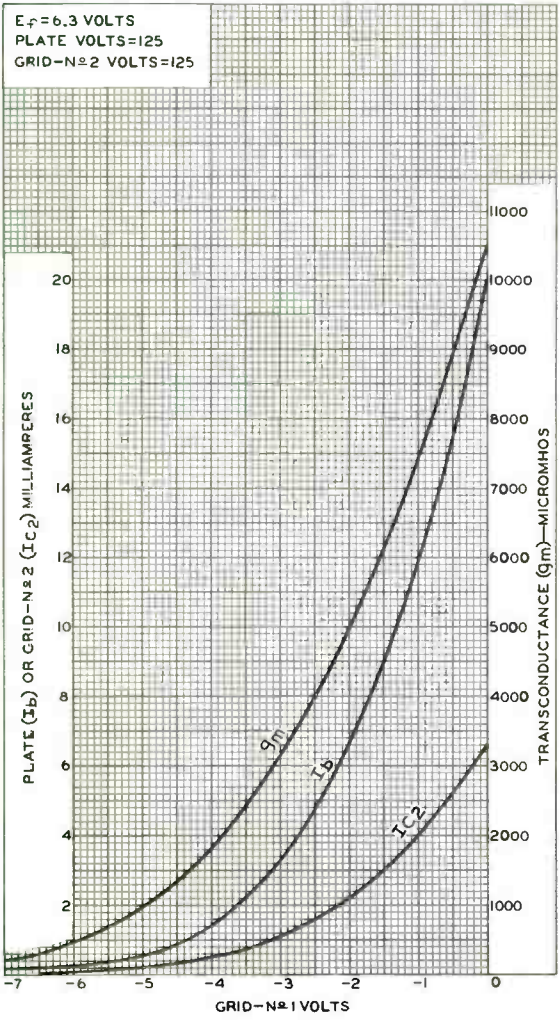


PLATE (I_b) OR GRID-№2 (I_{C2}) MILLIAMPERES

92CM-10436

6KZ8

AVERAGE CHARACTERISTICS
Pentode Unit



92CM-10417

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

o With shell connected to cathode.

oo 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

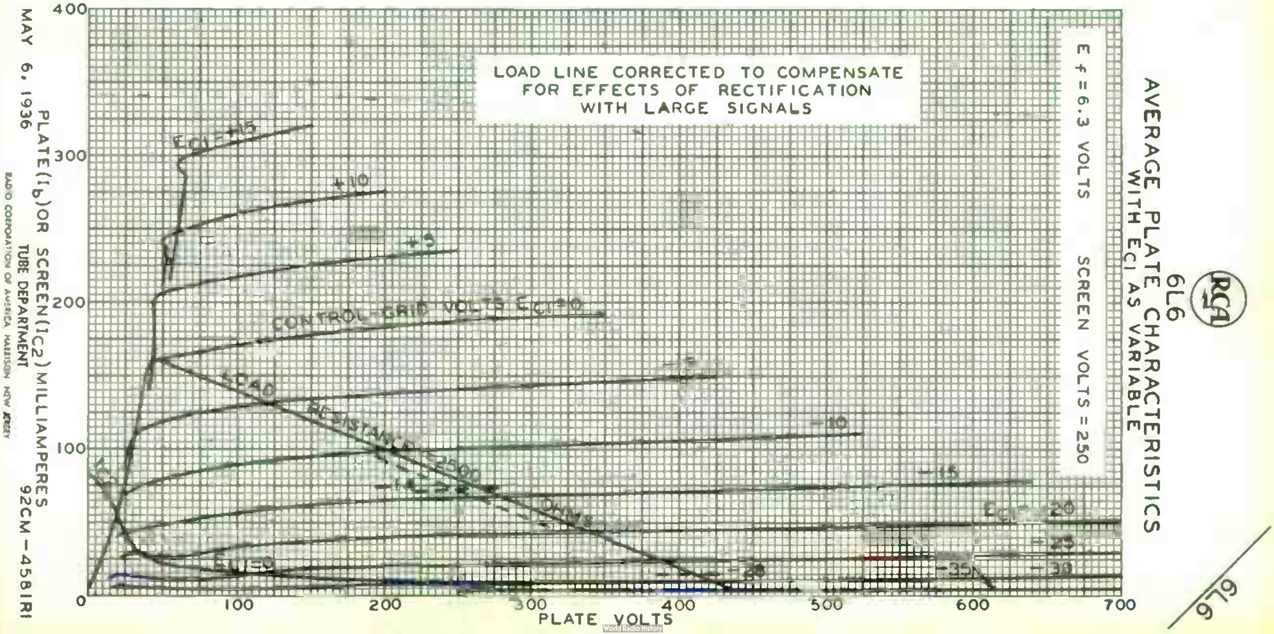
† Subscript 1 indicates that grid-No.1 current does not flow during any part of input cycle.

♦ 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.

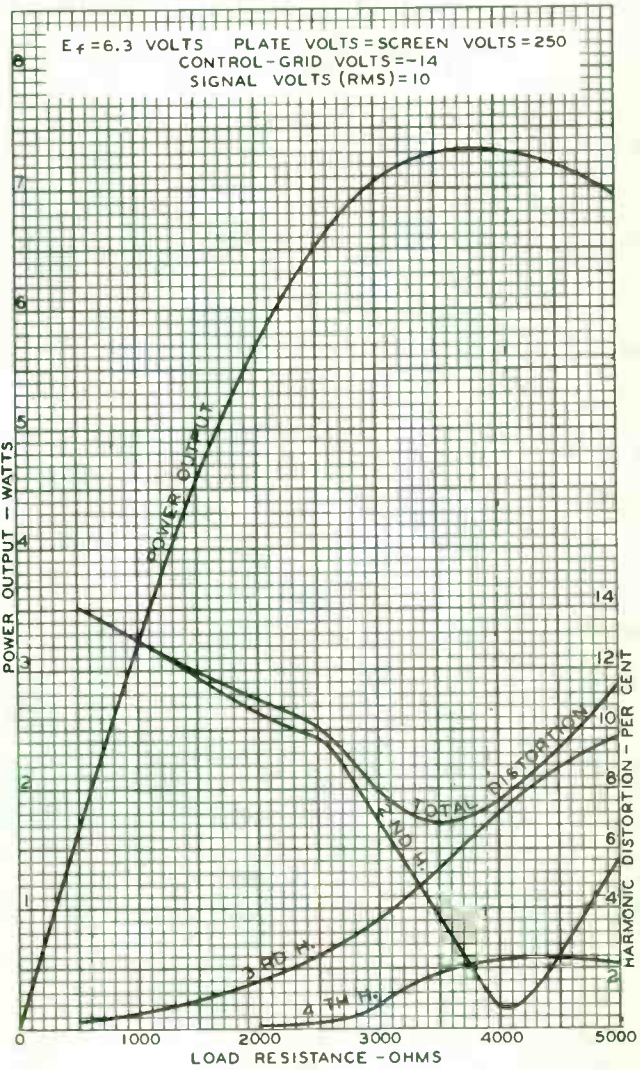
← Indicates a change.


RCA
6L6
AVERAGE PLATE CHARACTERISTICS
WITH Ec1 AS VARIABLE
E f = 6.3 VOLTS SCREEN VOLTS = 250
LOAD LINE CORRECTED TO COMPENSATE
FOR EFFECTS OF RECTIFICATION
WITH LARGE SIGNALS
Ec1=+15
+10
+5
CONTROL-GRID VOLTS Ec1=0
-5
-10
-15
Ec1=-20
-25
-30
-35
LOAD RESISTANCE=2500 OHMS
Ic2
Ec1=0
PLATE (Ib) OR SCREEN (Ic2) MILLIAMPERES
PLATE VOLTS
0
100
200
300
400
500
600
700
MAY 6, 1936
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-4581R1
979

RCA

6L6

OPERATION CHARACTERISTICS



MAY 7, 1936

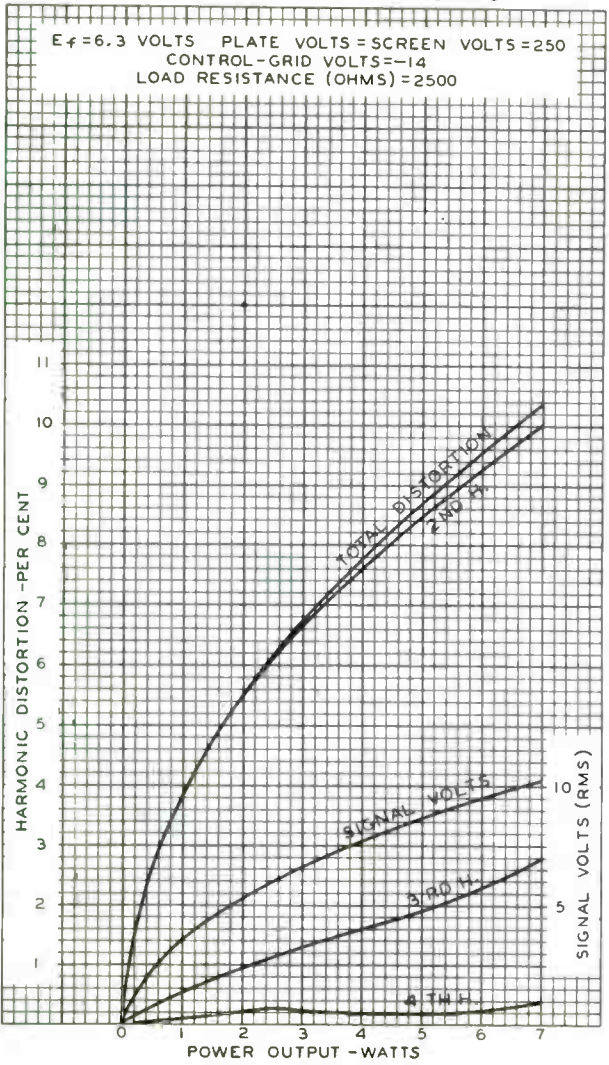
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY INC

92C-4608

RCA

6L6

OPERATION CHARACTERISTICS



Beam Power Tube

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.9	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	10	μμf
Plate to cathode & grid No.3, grid No.2, and heater	6.5	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	250	volts
Grid-No.2 Voltage	250	volts
Grid-No.1 Voltage	−14	volts
Plate Resistance (Approx.)	22500	ohms
Transconductance	6000	μmhos
Plate Current	72	ma
Grid-No.2 Current	5	ma

Mechanical:

Operating Position . . . . . Any
Maximum Overall Length . . . . . 4-1/4"
Maximum Seated Length . . . . . 3-11/16"
Diameter . . . . . 1.438" to 1.562"
Bulb T-12
Base . . Medium-Shell Octal 7-Pin (JEDEC Group 1, No.B7-12),
Short Medium-Shell Octal 7-Pin with External Barriers
Style A (JEDEC Group 1, No.B7-111) or
Style B (JEDEC Group 1, No.B7-119), or
Short Medium-Shell Octal 6-Pin with External Barriers
Style A (JEDEC Group 1, No.B6-148) or
Style B (JEDEC Group 1, No.B6-122)
Basing Designation for BOTTOM VIEW 7AC

Pin 1● – No Connection
Pin 2 – Heater
Pin 3 – Plate
Pin 4 – Grid No.2

Pin 5 – Grid No.1
Pin 7 – Heater
Pin 8 – Cathode, Grid No.3

AF POWER AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	500	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	450	max.	volts
GRID-No.2 INPUT	5	max.	watts
PLATE DISSIPATION	30	max.	watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. .	200 max.	volts
Heater positive with respect to cathode. .	200* max.	volts

Typical Operation and Characteristics:

Fixed-Bias Operation

Plate Voltage.	200	250	300	350	volts
Grid-No.2 Voltage.	200	250	200	250	volts
Grid-No.1 (Control-Grid) Voltage.	-11.5	-14	-12.5	-18	volts
Peak AF Grid-No.1 Voltage.	11.5	14	12.5	18	volts
Zero-Signal Plate Current.	52	72	48	54	ma
Max.-Signal Plate Current.	57	79	55	66	ma
Zero-Signal Grid-No.2 Current.	3.5	5	2.5	2.5	ma
Max.-Signal Grid-No.2 Current.	5.7	7.3	4.7	7	ma
Plate Resistance (Approx.).	35000	22500	35000	33000	ohms
Transconductance	5300	6000	5300	5200	μmhos
Load Resistance.	3000	2500	4500	4200	ohms
Total Harmonic Distortion.	9	10	11	15	%
Max.-Signal Power Output .	4	6.5	6.5	10.8	watts

Cathode-Bias Operation

Plate Supply Voltage	200	250	300	volts
Grid-No.2 Supply Voltage	200	250	200	volts
Cathode Resistor	186	167	218	ohms
Peak AF Grid-No.1 Voltage.	11.5	14	12.7	volts
Zero-Signal Plate Current.	55	75	51	ma
Max.-Signal Plate Current.	56	78	54.5	ma
Zero-Signal Grid-No.2 Current. . . .	4.2	5.4	3	ma
Max.-Signal Grid-No.2 Current. . . .	5.6	7.2	4.6	ma
Load Resistance.	3000	2500	4500	ohms
Total Harmonic Distortion.	9	10	11	%
Max.-Signal Power Output	4	6.5	6.5	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

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

AF POWER AMPLIFIER — Class A_1

Triode Connection — Grid No.2 Connected to Plate

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE.	450 max.	volts
PLATE DISSIPATION.	30 max.	watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode. .	200 max.	volts
Heater positive with respect to cathode. .	200* max.	volts

Typical Operation and Characteristics:

	Fixed Bias	*Cathode Bias*	
Plate Supply Voltage	250	250	volts
Grid-No.1 (Control-Grid) Voltage	−20	−	volts
Cathode Resistor	−	490	ohms
Peak AF Grid-No.1 Voltage	20	20	volts
Zero-Signal Plate Current	40	40	ma
Maximum-Signal Plate Current	44	42	ma
Plate Resistance (Approx.)	1700	−	ohms
Amplification Factor	8	−	
Transconductance	4700	−	μmhos
Load Resistance	5000	6000	ohms
Total Harmonic Distortion	5	6	%
Maximum-Signal Power Output	1.4	1.3	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

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

PUSH-PULL AF POWER AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	500 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	450♦ max.	volts
GRID-No.2 INPUT	5 max.	watts
PLATE DISSIPATION	30 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200* max.	volts

Typical Operation and Characteristics:

Unless otherwise specified, values are for 2 tubes

	Fixed Bias		*Cathode Bias*		
Plate Supply Voltage	250	270	250	270	volts
Grid-No.2 Supply Voltage	250	270	250	270	volts
Grid-No.1 Voltage	−16	−17.5	−	−	volts
Cathode Resistor	−	−	124	124	ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage	32	35	35.6	28.2	volts
Zero-Signal Plate Current	120	134	120	134	ma
Max.-Signal Plate Current	140	155	130	145	ma
Zero-Signal Grid-No.2 Current	10	11	10	11	ma
Max.-Signal Grid-No.2 Current	16	17	15	17	ma
Plate Resistance (Approx., per tube)	24500	23500	−	−	ohms
Transconductance (Per tube)	5500	5700	−	−	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

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-Maximum Values:*

PLATE VOLTAGE	500 max.	volts
GRID-No.2 VOLTAGE	450♦ max.	volts
GRID-No.2 INPUT	5 max.	watts
PLATE DISSIPATION	30 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 Supply Voltage	360	450	450	360	volts
Grid-No.2 Supply Voltage	270	350	400	270	volts
Grid-No.1 (Control-Grid) Voltage♦	-22.5	-30	-37	-	volts
Cathode Resistor	-	-	-	248	ohms
Peak Af Grid-No.1-to-Grid-No.1 Voltage	45	60	70	40.6	volts
Zero-Signal Plate Current	88	95	116	88	ma
Max.-Signal Plate Current	132	194	210	100	ma
Zero-Signal Grid-No.2 Current	5	3.4	5.6	5	ma
Max.-Signal Grid-No.2 Current	15	19.2	22	17	ma
Effective Load Resistance (Plate to plate)	6600	6000	5600	9000	ohms
Total Harmonic Distortion	2	1.5	1.8	4	%
Max.-Signal Power Output	26.5	50	55	24.5	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 AMPLIFIER — Class AB_2

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	500 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	450♦ max.	volts
GRID-No.2 INPUT	5 max.	watts
PLATE DISSIPATION	30 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		
Plate Voltage	360	360	volts
Grid-No.2 Voltage	225	270	volts
Grid-No.1 (Control-Grid) Voltage♦	-18	-22.5	volts
Peak AF Grid-No.1 to Grid-No.1 Voltage	52	72	volts
Zero-Signal Plate Current	78	88	ma
Max.-Signal Plate Current	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:

Grid-No.1-Circuit Resistance:♠

For fixed-bias operation	0.1 max. megohm
For cathode-bias operation	Not recommended

▲ Without external shield.

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

★ The dc component must not exceed 100 volts.

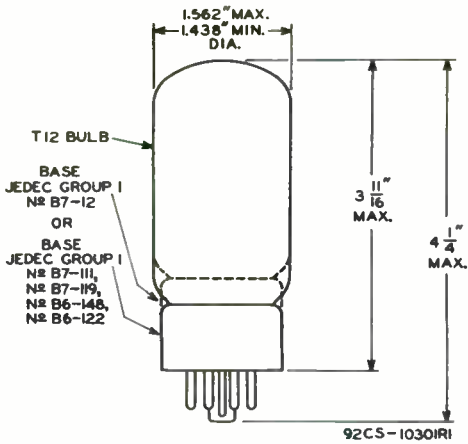
♦ In push-pull circuits where grid No.2 of each tube is connected to a tap on the plate winding of the output transformer, it is permissible for this voltage to be as high as 500 volts.

♦ The type of input coupling used should not introduce too much resistance in the grid-No.1 circuit. Transformer- or impedance-coupling devices are recommended.

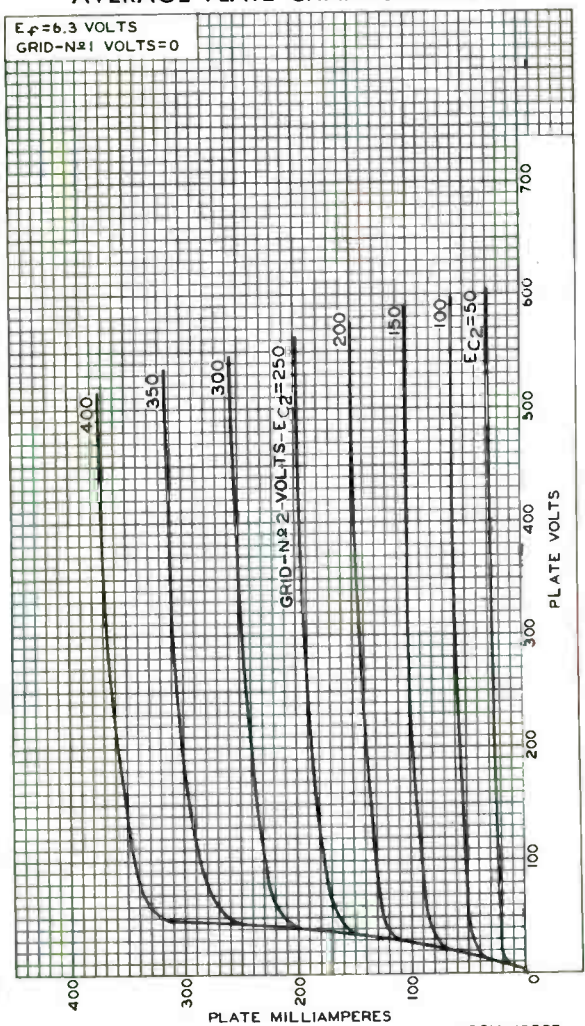
♠ Driver stage should be capable of supplying the specified driving power at low distortion to the No.1 grids of the AB_2 stage. To minimize distortion, the effective resistance per grid-No.1 circuit of the AB_2 stage should be held at a low value. For this purpose, the use of transformer coupling is recommended.

OPERATING CONSIDERATIONS

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

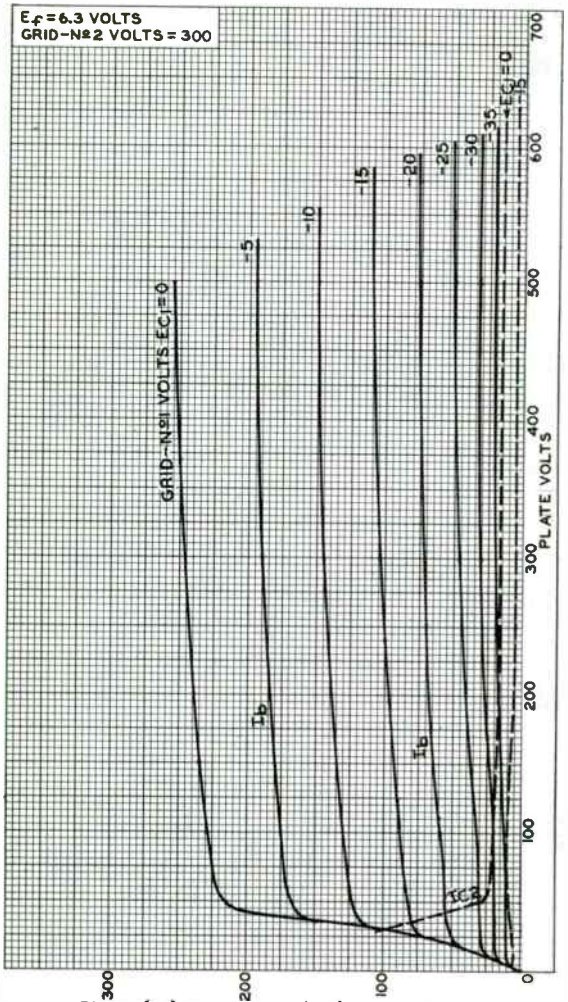


AVERAGE PLATE CHARACTERISTICS



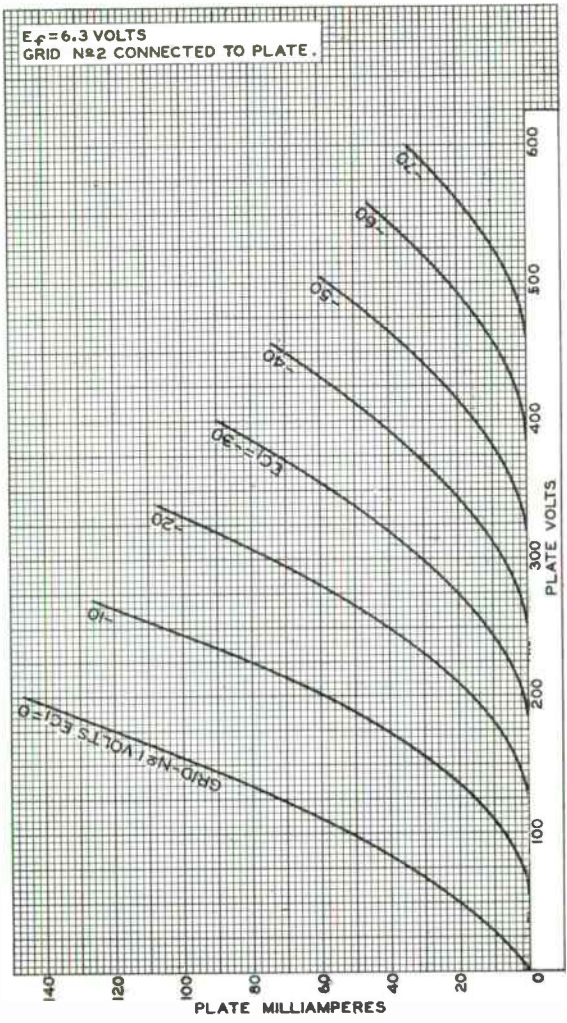
6L6-GC

AVERAGE CHARACTERISTICS



92CM-10133

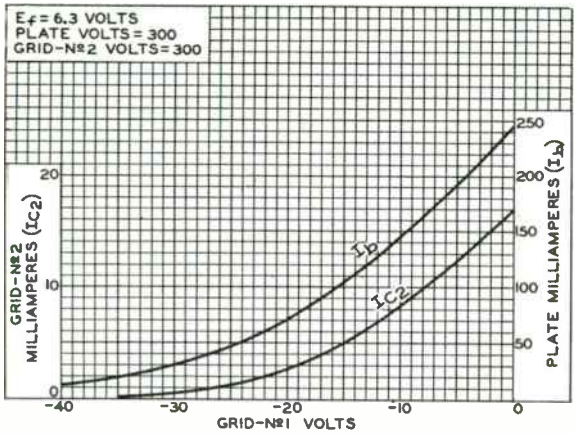
AVERAGE PLATE CHARACTERISTICS
Triode Connection



92CM-9568

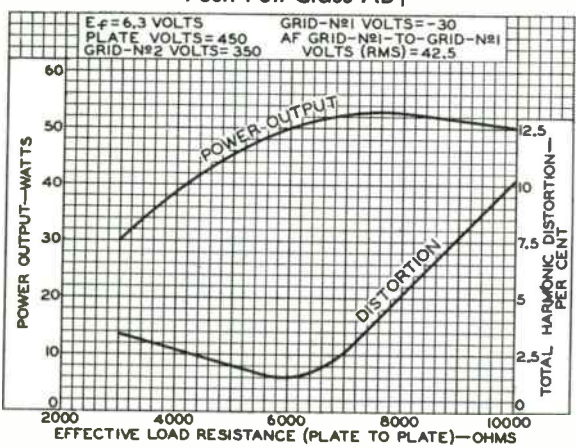
6L6-GC

AVERAGE CHARACTERISTICS



92CS-10126

OPERATION CHARACTERISTICS
Push-Pull Class AB1



92CS-9575

High-Mu Triode—
Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For Sync-Separator and Noise-Immune Gated-AGC-Amplifier Applications in Color and Black-and White TV Receivers

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:			
Voltage (AC or DC) . . .	6.3[a]	6.3 ± 0.6	volts
Current.	0.600 ± 0.040	0.600[b]	amp
Warm-up time (Average) .	11	–	sec
Peak heater-cathode voltage (Each unit):			
Heater negative with respect to cathode	200 max.		volts
Heater positive with respect to cathode	200[c] max.		volts
Direct Interelectrode Capacitances:[d]			
Triode Unit:			
Grid to plate.	2.2		pf
Grid to cathode & pentode grid No.3 & internal shield, and heater	2.8		pf
Plate to cathode & pentode grid No.3 & internal shield, and heater	2.2		pf
Pentode Unit:			
Grid No.1 to plate	0.1 max.		pf
Grid No.1 to cathode, triode cathode & grid No.3 & internal shield, grid No.2, and heater	10.0		pf
Grid No.3 & triode cathode & internal shield to plate . .	3.4		pf
Grid No.1 to grid No.3 & triode cathode & internal shield	0.36		pf
Grid No.3 & triode cathode & internal shield to plate, cathode, grid No.2, grid No.1, and heater.	12.5		pf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Plate Supply Voltage	200	150	volts
Grid No.3.	–	[e]	

	Triode Unit	*Pentode Unit*	
Grid-No.2 Supply Voltage	–	100	volts
Grid-No.1 Voltage	-2	–	volts
Grid No.1	–	e	
Cathode Resistor	–	180	ohms
Amplification Factor	70	–	
Plate Resistance (Approx.)	17500	100000	ohms
Transconductance, Grid No.1 to Plate	4000	4400	μmhos
Transconductance, Grid No.3 to Plate[f]	–	600	μmhos
Plate Current	4	4	ma
Grid-No.2 Current	–	2.8	ma
Grid-No.1 Supply Voltage (Approx.) for plate μa =			
10	-5	–	volts
20	–	-4	volts
Grid-No.3 Supply Voltage (Approx.) for plate μa = 20[f]	–	-7	volts

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9QY

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

GATED AGC AMPLIFIER & NOISE INVERTER

Pentode Unit

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[g]

DC PLATE VOLTAGE	300 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[h]	600 max.	volts

GRID-No.3 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	100 max.	volts
Positive-bias value	0 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	300 max.	volts
GRID-No.2 VOLTAGE	See *Grid-No.2-Input Rating Chart* at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative-bias value	50 max.	volts
Positive-bias value	0 max.	volts
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 150 volts	1.1 max.	watts
For grid-No.2 voltages between 150 and 300 volts	See *Grid-No.2-Input Rating Chart* at front of Receiving Tube Section	
PLATE DISSIPATION	2 max.	watts

Maximum Circuit Values:

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

AMPLIFIER — Class A_1

Triode Unit

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	300 max.	volts
GRID VOLTAGE:		
Negative-bias value	50 max.	volts
Positive-bias value	0 max.	volts
PLATE DISSIPATION	1.1 max.	watts

Maximum Circuit Values:

Grid-Circuit Resistance:		
For fixed-bias operation	0.25 max.	megohm
For cathode-bias operation	1 max.	megohm

[a] At heater amperes = 0.600.

[b] At heater volts = 6.3.

[c] The dc component must not exceed 100 volts.

[d] Without external shield.

[e] Connected to negative end of cathode resistor.

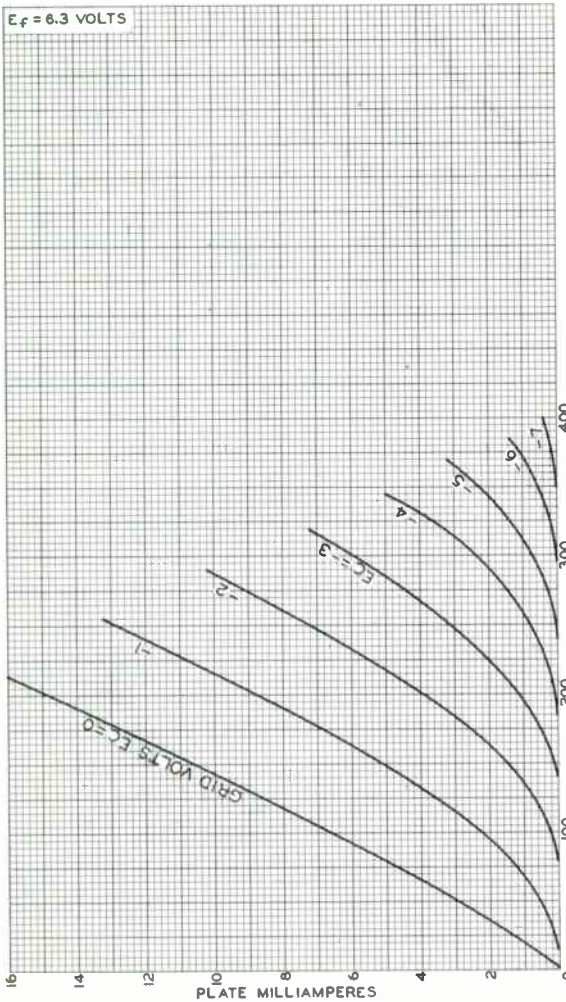
[f] With no external connection to triode plate and triode grid.

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

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

6LC8

AVERAGE PLATE CHARACTERISTICS
Triode Unit



92CM-8644

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

High-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For Video-Amplifier Service in Color-TV Receivers and Other Applications Using Positive Triode-Grid Operation

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.3[a]	volts
Current at heater volts = 6.3	0.600[b]	amp
Warm-up time (Average)	11	sec
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[c] max.	volts

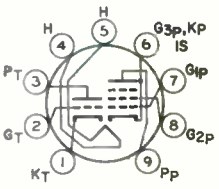
Direct Interelectrode Capacitances:[d]

Triode Unit:		
G_T to P_T	2.2	pf
Input: G_T to (K_T, Kp+G3p+IS, H)	3.2	pf
Output: P_T to (K_T, Kp+G3p+IS, H)	1.8	pf
Pentode Unit:		
G1p to Pp	0.060 max.	pf
Input: G1p to (Kp+G3p+IS, G2p, H)	10	pf
Output: Pp to (Kp+G3p+IS, G2p, H)	3.6	pf
G1p to F_T	0.008 max.	pf
Pp to P_T	0.15 max.	pf

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ±3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	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



Characteristics, Class A Amplifier:

	Triode Unit		Pentode Unit		
Plate Voltage	200	40	75	100	volts
Grid-No.2 Voltage	–	–	150	150	volts
Grid-No.1 Voltage	-2	+3	0	-2.5	volts
Amplification Factor	70	40	–	–	
Plate Resistance (Approx.)	17500	10000	–	200000	ohms
Transconductance	4000	4000	–	11000	μmhos
Plate Current	4	11	50[e]	20	ma
Grid-No.2 Current	–	–	12[e]	5	ma
Grid-No.1 Current	0	2.7	0	0	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-5	–	–	-8	volts

AMPLIFIER – Class A[f]

Maximum Ratings, *Design-Maximum Values:*

	Triode Unit as Class A_1 or A_2 Amplifier	Pentode Unit as Class A_1 Amplifier	
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:			
Negative-bias value	55 max.	55 max.	volts
Positive-bias value	4 max.	0 max.	volts
Grid-No.1 Current	8 max.	0 max.	ma
Grid-No.2 Input:			
For grid-No.2 voltages up to 165 volts	–	1.1 max.	watts
For grid-No.2 voltages between 165 and 330 volts	–	See *Grid-No.2-Input Rating Chart* at front of Receiving Tube Section	
Plate Dissipation	1.1 max.	3.75 max.	watts

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

[a] For parallel heater operation.

[b] For series heater operation current must be limited to 0.600 ± 0.040 amperes.

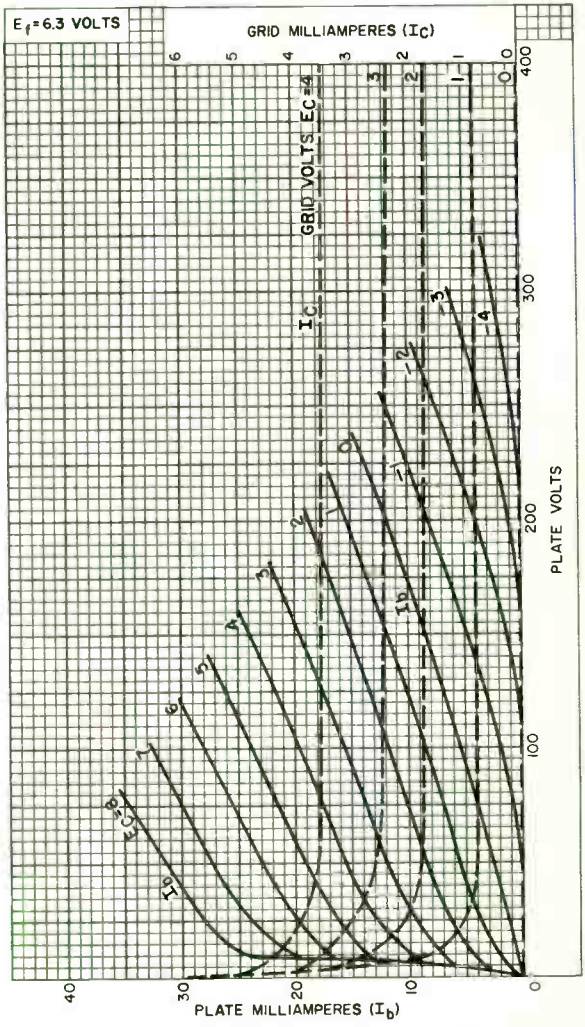
[c] The dc component must not exceed 100 volts.

[d] Without external shield.

[e] 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.

[f] A Class A Amplifier is an amplifier in which the grid bias and varying grid voltages are such that plate current flows at all times. The subscript 1 added to the class letter denotes that *grid current* does not flow during any part of the input cycle. The subscript 2 denotes that *grid current* flows during some part of the cycle.

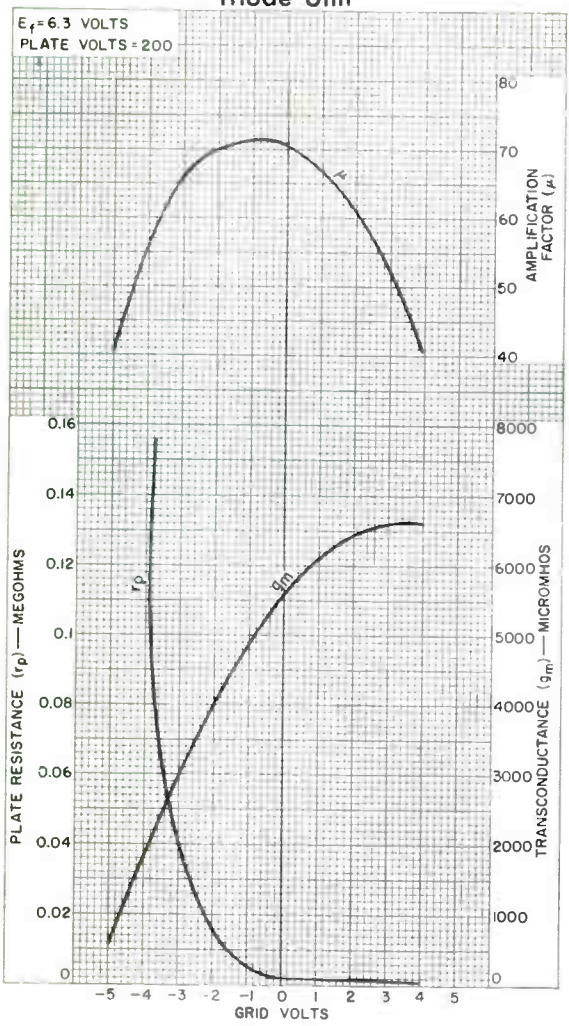
AVERAGE CHARACTERISTICS
Triode Unit



92CM-12384

6LF8

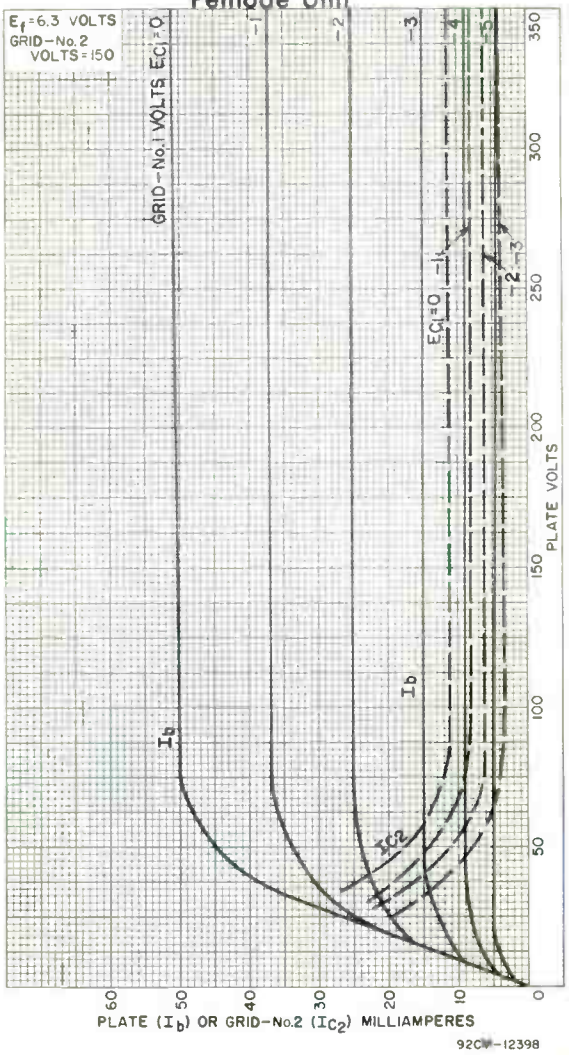
AVERAGE CHARACTERISTICS
Triode Unit



92CM-12388

AVERAGE CHARACTERISTICS

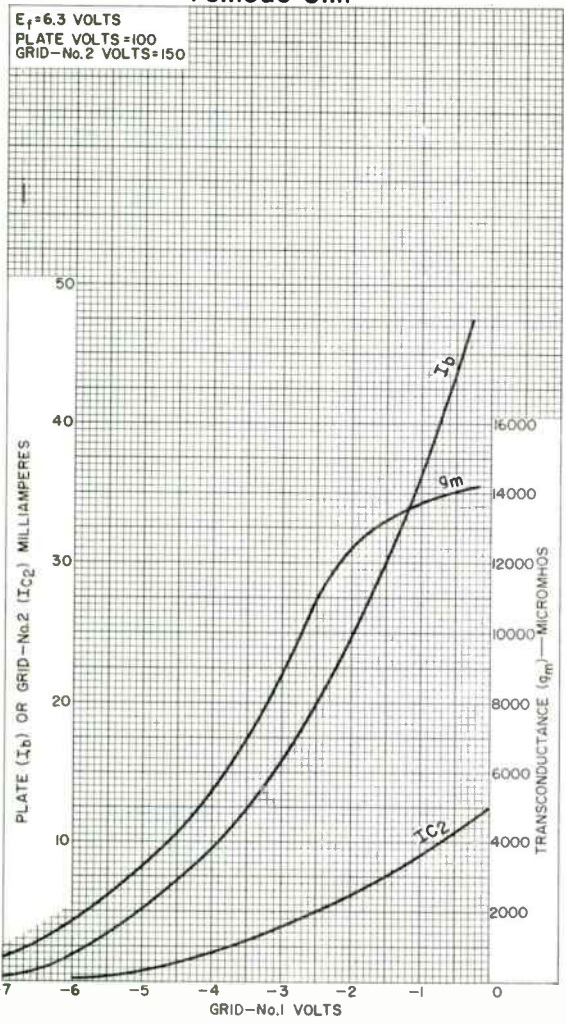
Pentode Unit



92CM-12398

6LF8

AVERAGE CHARACTERISTICS
Pentode Unit



92CM—12403

Medium-Mu Triode—
Semiremote-Cutoff Pentode

9-PIN MINIATURE TYPE

SEPARATE CATHODE BASE-PIN CONNECTIONS

For Color and Black-and-White TV Receivers. Pentode Unit is Particularly Suited for Burst-Amplifier Circuit in Color TV. Triode Unit is Useful as a General-Purpose Amplifier.

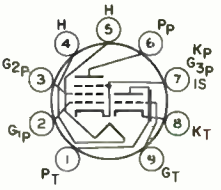
Electrical:

Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.450	amp
Peak heater-cathode voltage (Each unit):		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200[a] max.	volts
Direct Interelectrode Capacitances:[b]		
Triode Unit:		
Grid to plate	1.8	pf
Input: G_T to (K_T,K_P+$G3_P$+IS,H)	3.2	pf
Output: P_T to (K_T,K_P+$G3_P$+IS,H)	1.9	pf
Pentode Unit:		
Grid No.1 to plate	0.015 max.	pf
Input: $G1_P$ to (K_P+$G3_P$+IS,$G2_P$,H)	5.5	pf
Output: P_P to (K_P+$G3_P$+IS,$G2_P$,H)	3.8	pf
Heater to cathode (Each unit)	3.2	pf

Mechanical:

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length from 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, and Internal Shield
Pin 8 – Triode Cathode
Pin 9 – Triode Grid



6LM8

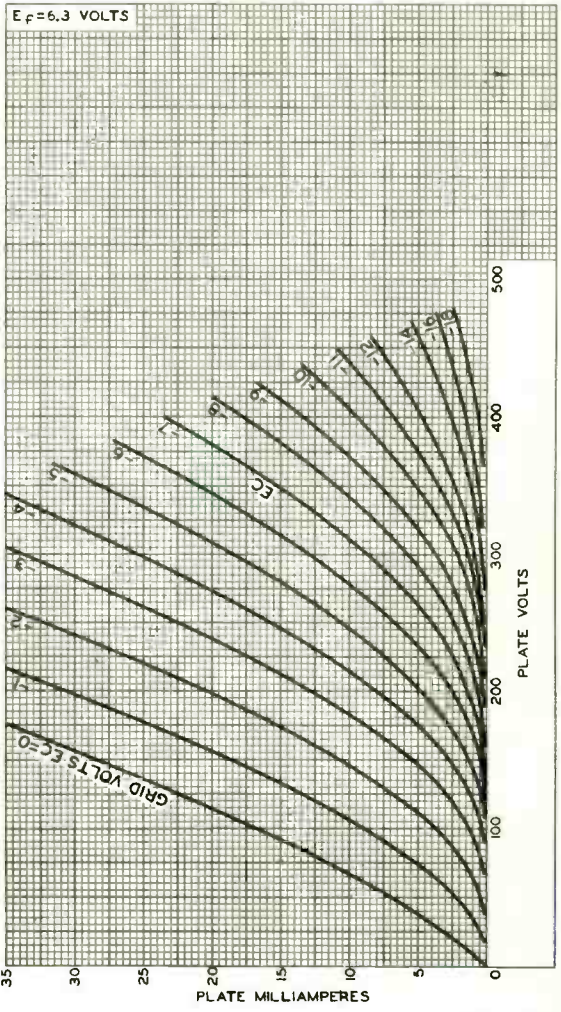
AMPLIFIER — Class A[1]

	Triode Unit	*Pentode Unit*	
Characteristics:			
Plate Voltage	125	125	volts
Grid-No.2 Voltage	–	125	volts
Grid-No.1 Voltage	-1	-2	volts
Amplification Factor	46	–	
Plate Resistance (Approx.)	5400	150000	ohms
Transconductance	8500	6000	μmhos
Plate Current	13.5	12	ma
Grid-No.2 Current	–	4	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-8	-14	volts
Maximum Ratings, *Design-Maximum Values:*			
Plate Voltage	330 max.	350 max.	volts
Grid-No.2 (Screen-Grid) Supply Voltage	–	330 max.	volts
Grid-No.2 Voltage	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section		
Grid-No.1 (Control-Grid) Voltage: Positive-bias value	0 max.	0 max.	volts
Grid-No.2 Input: For grid-No.2 voltages up to 165 volts	–	0.55 max.	watt
For grid-No.2 voltages between 165 and 330 volts	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section		
Plate Dissipation	2.5 max.	2.5 max.	watts
Maximum Circuit Values:			
Grid-No.1-Circuit Resistance: For fixed-bias operation	0.5 max.	0.25 max.	megohm
For cathode-bias operation	1 max.	0.5 max.	megohm

[a] The dc component must not exceed 100 volts.

[b] With external shield JEDEC No.315 measured in accordance with EIA Standard RS-191-A.

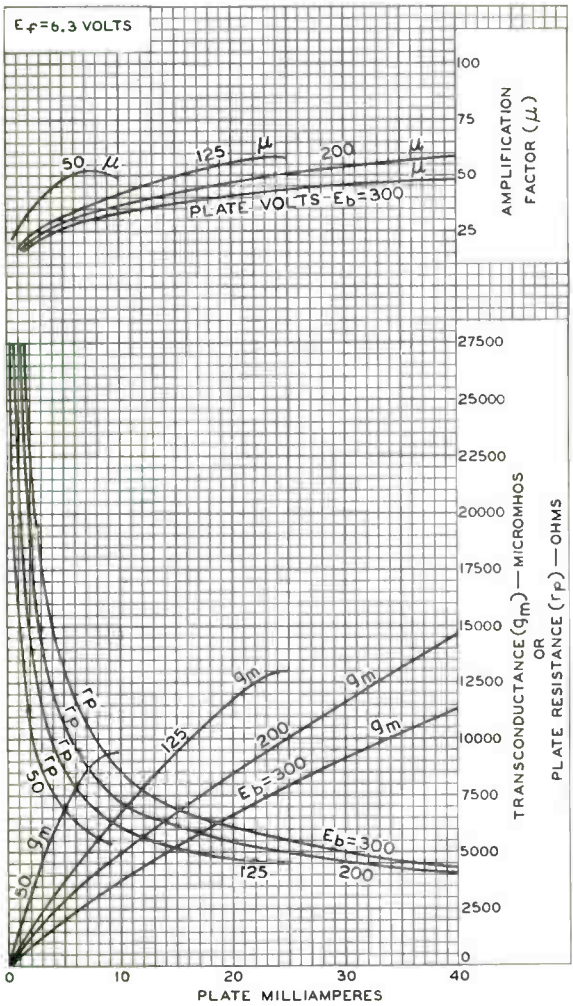
AVERAGE PLATE CHARACTERISTICS
Triode Unit



92CM-10421R1

6LM8

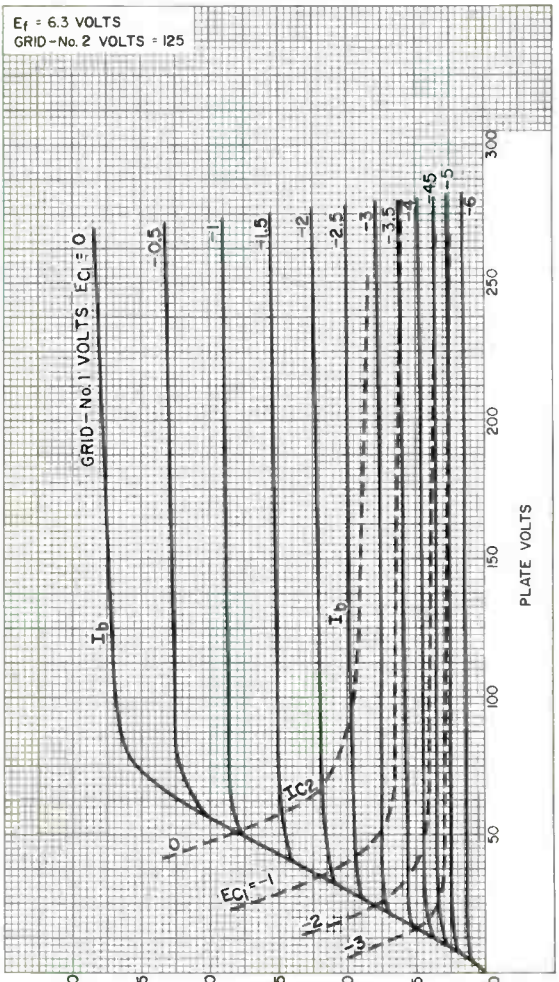
AVERAGE CHARACTERISTICS
Triode Unit



92CM—10428

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

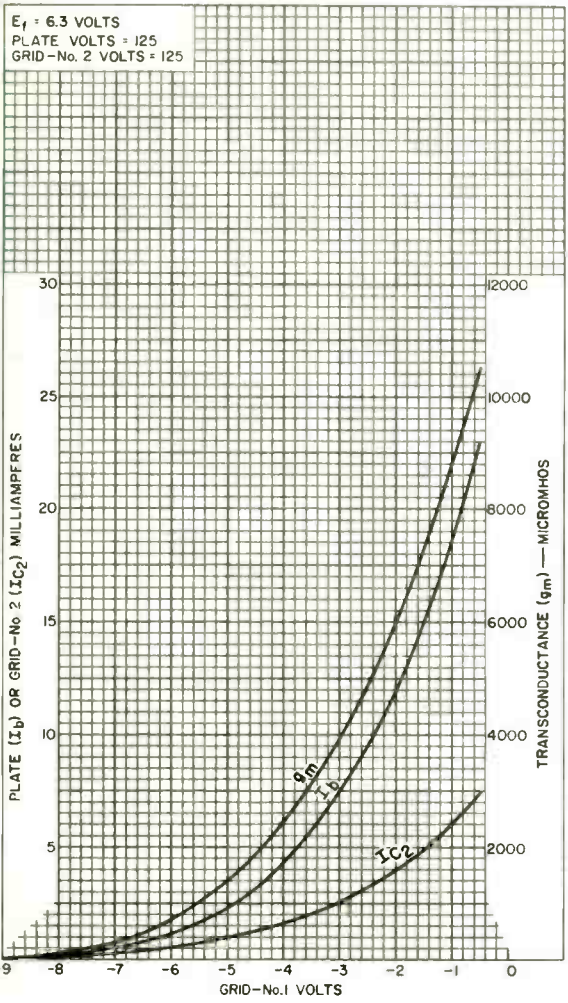
AVERAGE CHARACTERISTICS
Pentode Unit



92CM-12560

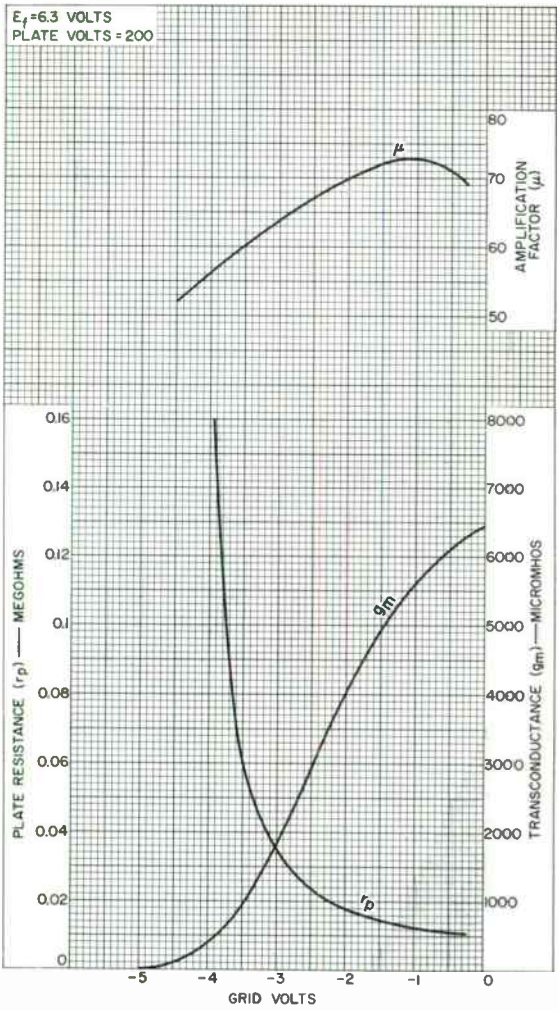
6LM8

AVERAGE CHARACTERISTICS
Pentode Unit



92CM-12558

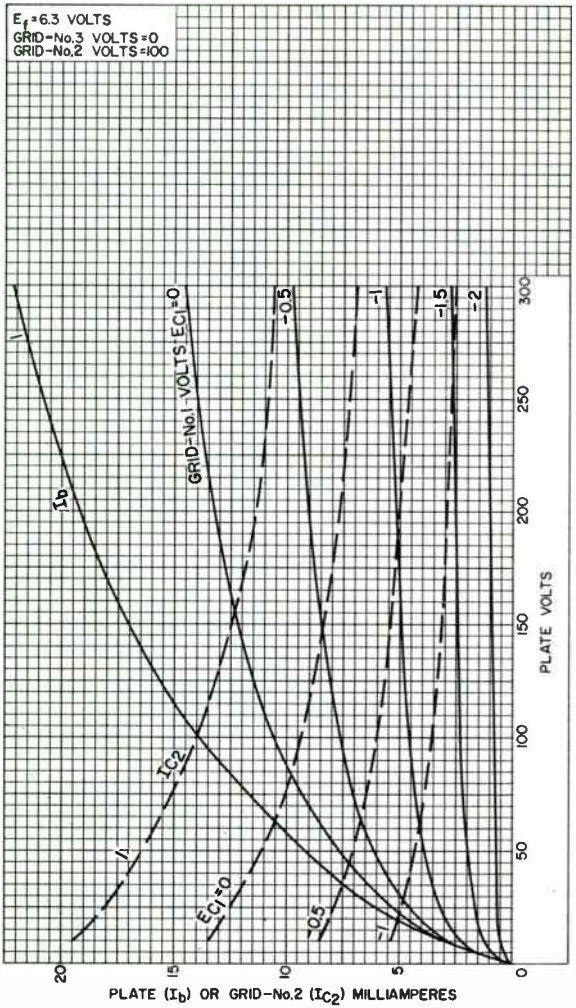
AVERAGE CHARACTERISTICS
Triode Unit



92CM-8647

6LC8

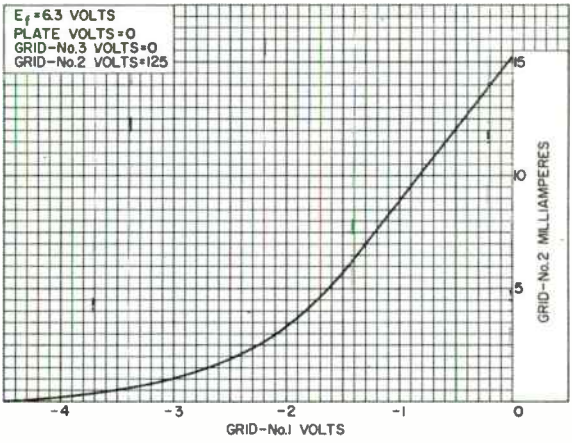
AVERAGE CHARACTERISTICS
Pentode Unit



92CM-11594

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

AVERAGE CHARACTERISTICS
Pentode Unit



92CS-11603

Twin Dual-Control Pentodes

9-PIN MINIATURE TYPE

COMMON-CATHODE, GRID No.1 & GRID No.2 · DARK HEATER

For Combined Color Demodulator and Matrix Amplifier Applications in Color TV Receivers Having High-Level Demodulation Systems

ELECTRICAL CHARACTERISTICS

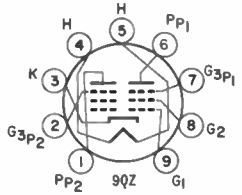
		Bogey Values	
Heater Voltage, AC or DC	E_f	6.3	V
Heater Current	I_f	760	mA
Direct Interelectrode Capacitances			
Without external shield			
G3 to P (each unit, with other unit connected to ground)	c_{g3-p}	2.7	pF
G1 to (K, P_{P2}, P_{P1}, $G3_{P2}$, $G3_{P1}$, G2, H)	c_{g1-all}	15.5	pF
$G3_{P1}$ to (K, P_{P2}, P_{P1}, $G3_{P2}$, G2, G1, H)			
$G3_{P2}$ to (K, P_{P2}, P_{P1}, $G3_{P1}$, G2, G1, H)	c_{g3-all}	6.0	pF
P_{P1} to (K, P_{P2}, $G3_{P2}$, $G3_{P1}$, G2, G1, H)			
P_{P2} to (K, P_{P1}, $G3_{P2}$, $G3_{P1}$, G2, G1, H)	c_{p-all}	3.7	pF
$G3_{P1}$ to $G3_{P2}$	c_{g3-g3}	0.10	pF
For the following characteristics, with both units operating, see Conditions			
Plate Resistance, Approx., each unit	r_p	50000	Ω
Grid-No.1-to-Plate Transconductance, Each unit	$g_{m(g1p)}$	5800	μmhos
Grid-No.3-to-Plate Transconductance, Each unit	$g_{m(g3p)}$	350	μmhos
DC Plate Current, Each unit	I_b	7.6	mA
DC Grid-No.2 Current[a]	I_{c2}	14.5	mA
Cutoff DC Grid-No.1 Voltage, Approx., each unit, For I_b = 100 μA	$E_{c1(co)}$	-6.3	V
Cutoff DC Grid-No.3 Voltage[b], Approx., each unit, For I_b = 100 μA	$E_{c3(co)}$	-16.5	V
		Conditions	
Heater Voltage	E_f	6.3	V
DC Plate Voltage, Each unit	E_b	100	V
DC Grid-No.3 (Control-Grid) Voltage, Each unit	E_{c3}	0	V
DC Grid-No.2 (Screen-Grid) Voltage	E_{c2}	100	V
DC Grid-No.1 (Control-Grid) Voltage	E_{c1}	-2.5	V

MECHANICAL CHARACTERISTICS

Operating Position. . . . . Any
Type of Cathode . . . . . Coated Unipotential
Maximum Overall Length. . . . . 3-1/16 in
Maximum Seated Length . . . . . 3-13/16 in
Length, Base Seat to Bulb Top . . . . . 2-7/16 ± 3/32 in
Excluding tip
Diameter. . . . . 0.750 to 0.875 in
Envelope. . . . . JEDEC T6-1/2
Dimensional Outline (JEDEC 6-4) . . . . . See *General Section*
Base. . . . . Small-Button Noval 9-Pin (JEDEC E9-1)

TERMINAL DIAGRAM (Bottom View)

Pin 1 – Plate of Unit No.2
Pin 2 – Grid No.3 of Unit No.2
Pin 3 – Cathode
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Plate of Unit No.1
Pin 7 – Grid No.3 of Unit No.1
Pin 8 – Grid No.2
Pin 9 – Grid No.1



DESIGN MAXIMUM RATINGS

DC Plate Voltage (Each unit).	E_b	300	V
DC Grid-No.2 Voltage.	E_{c2}	150	V
Heater-Cathode Voltage			
Peak.	e_{hkm}	+200	V
		-300	V
Average[c].	$E_{hk(av)}$	100	V
Heater Voltage, AC or DC.	E_f	5.7 to 6.9	V
Grid-No.2 Input	P_{g2}	2	W
Plate Dissipation (Each unit)	P_b	2	W

[a] Units in parallel (P_{P1} connected to P_{P2}; $G3_{P1}$ connected to $G3_{P2}$).

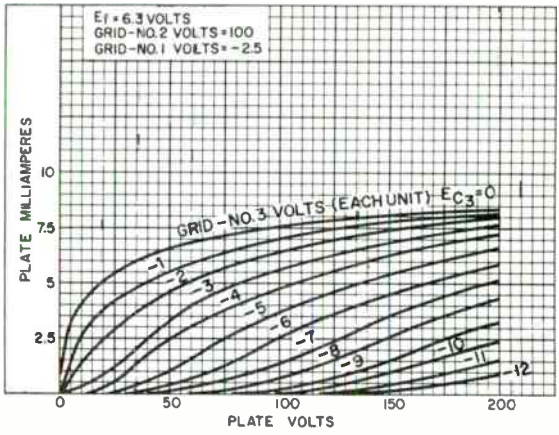
[b] For this test, E_{c1} = -3 V so that the Grid-No.2 Input rating will not be exceeded.

[c] Measured with a dc meter.

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

Typical Plate Characteristics

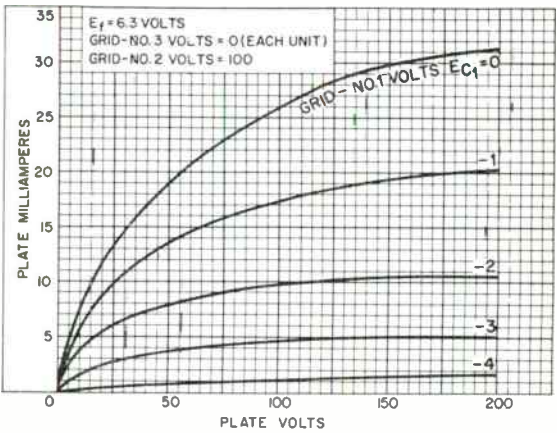
Each Unit, with Both Units Operating



92KS-13459

Typical Plate Characteristics

Each Unit, with Both Units Operating



92CS-13460

Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For Use in Low-B+ Black-and-White TV Receivers Having Low-Voltage Power Supplies

ELECTRICAL CHARACTERISTICS

Bogey Values[a]

Heater Voltage (AC or DC)	E_h	6.3	V
Heater Current	I_h	0.775	A
Direct Interelectrode Capacitances			
Without external shield			
Triode Unit:			
Grid to plate	C_{g-p}	2.8	pF
Input: G1 to (K_T, Kp + G3p + IS, H)	C_i	4.2	pF
Output: P_T to (K_T, Kp + G3p + IS, H)	C_o	2.4	pF
Pentode Unit:			
Grid No.1 to plate	C_{g1-p}	0.12 max	pF
Input: G2P to (Kp + G3p + IS, G2p, H)	C_i	14	pF
Output: Pp to (Kp + G3p + IS, G2p, H)	C_o	4.8	pF
Triode grid to pentode plate	-	0.015 max	pF
Pentode plate to triode plate	-	0.17 max	pF

For the following characteristics, see Conditions

		Triode Unit	*Pentode Unit*		
Amplification Factor	μ	46	-	-	
Plate Resistance (Approx.)	r_p	4400	55000	75000	Ω
Transconductance	g_m	10400	21000	23000	μmho
DC Plate Current	I_b	15	16.5	20	mA
DC Grid-No.2 Current	I_{c2}	-	3.1	3.5	mA
Cutoff DC Grid-No.1 Voltage (Plate μA = 100)	$E_{c1(co)}$	-6	-4.2	-4.2	V

Conditions

Heater Voltage	E_h	Bogey value			V
DC Plate Supply Voltage	E_{bb}	125	125	200	V
DC Grid-No.2 Supply Voltage	E_{cc2}	-	125	125	V
Grid No.1	-	Connected to negative end of R_k			
Cathode Resistor	R_k	68	82	68	Ω

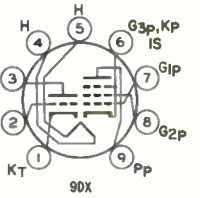
MECHANICAL CHARACTERISTICS

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2.625 in
Maximum Seated Length	2.375 in
Maximum Diameter	0.875 in
Dimensional Outline	See *General Section*
Envelope	JEDEC T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC E9-1)

6LQ8

TERMINAL DIAGRAM (Bottom View)

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



DESIGN-MAXIMUM RATINGS

For operation as a Class A1 Amplifier Tube

		Triode Unit	*Pentode Unit*	
DC Plate Voltage	E_b	300	300	V
DC Grid-No.2 (Screen-Grid) Supply Voltage	E_{cc2}	-	300	V
DC Grid-No.2 Voltage	E_{c2}	-	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
DC Grid-No.1 (Control-Grid) Voltage				
Positive-bias value	E_{c1}	0	0	V
Heater-Cathode Voltage				
Peak	e_{hkm}	±200		V
Average[b]	$E_{hk(av)}$	100		V
Heater Voltage (AC or DC)	E_h	5.7 to 6.9		V
Grid-No.2 Input	P_{g2}			
For $E_{c2} \leq 150$ V		-	1	W
For $E_{c2} \geq 150$ V and ≤ 300 V		-	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
Plate Dissipation	P_b	2	5	W

MAXIMUM CIRCUIT VALUES

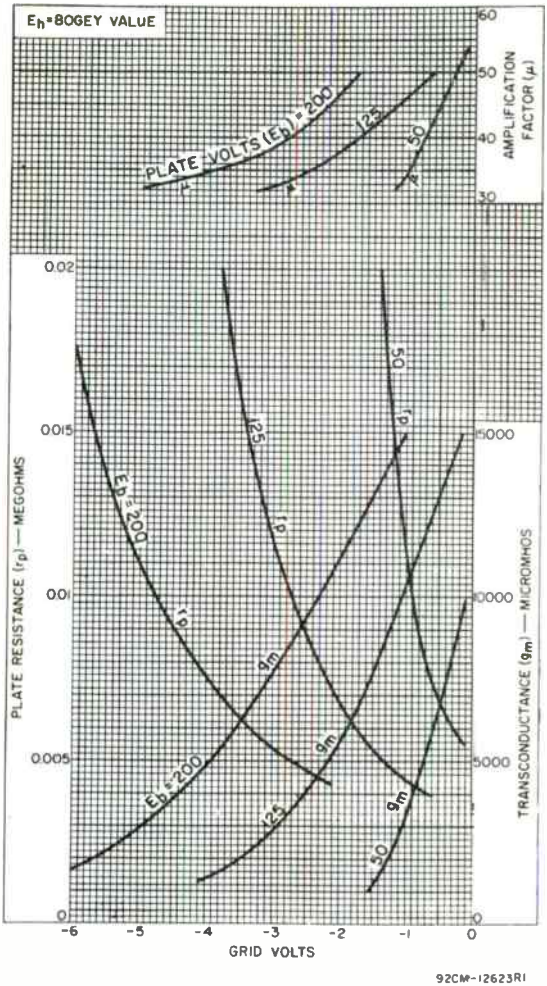
		Triode Unit	*Pentode Unit*	
Grid-No.1 Circuit Resistance	$R_{g1(ckt)}$			
For fixed-bias operation	-	0.5	0.1	MΩ
For cathode-bias operation	-	1	0.25	MΩ

[a] Unless otherwise specified.
[b] Measured with a dc meter.

RADIO CORPORATION OF AMERICA
Electronic Components and Devices Harrison, N. J.

Typical Characteristics

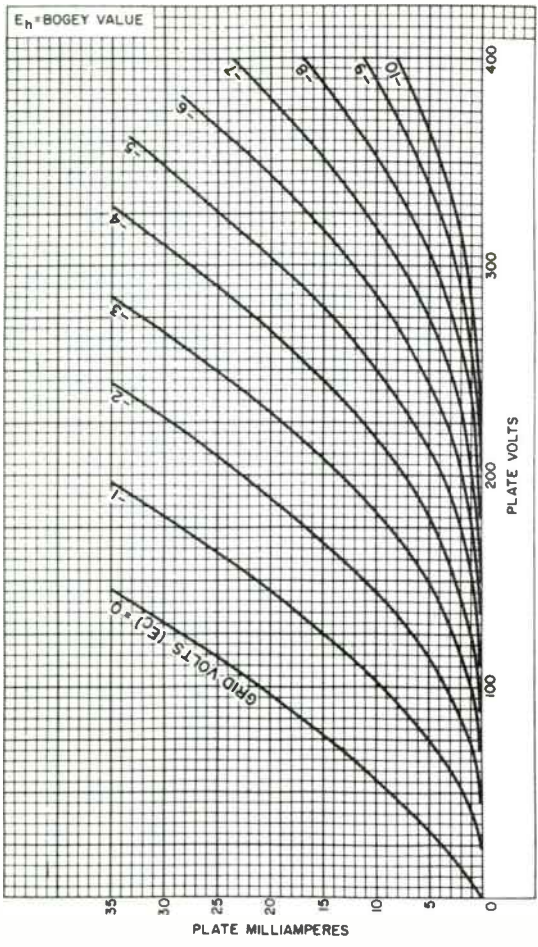
Triode Unit



92CM-12623RI

Typical Plate Characteristics

Triode Unit

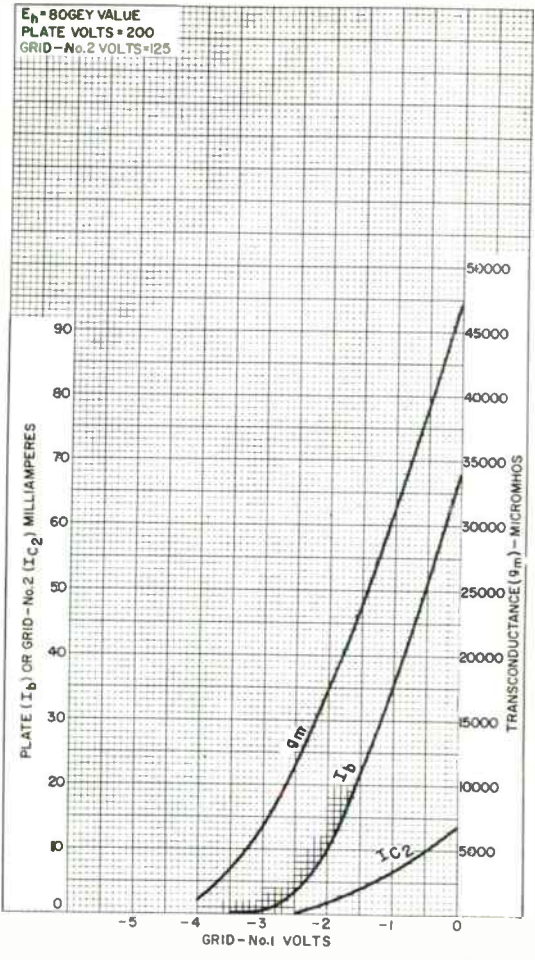


92CM-12616RI

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

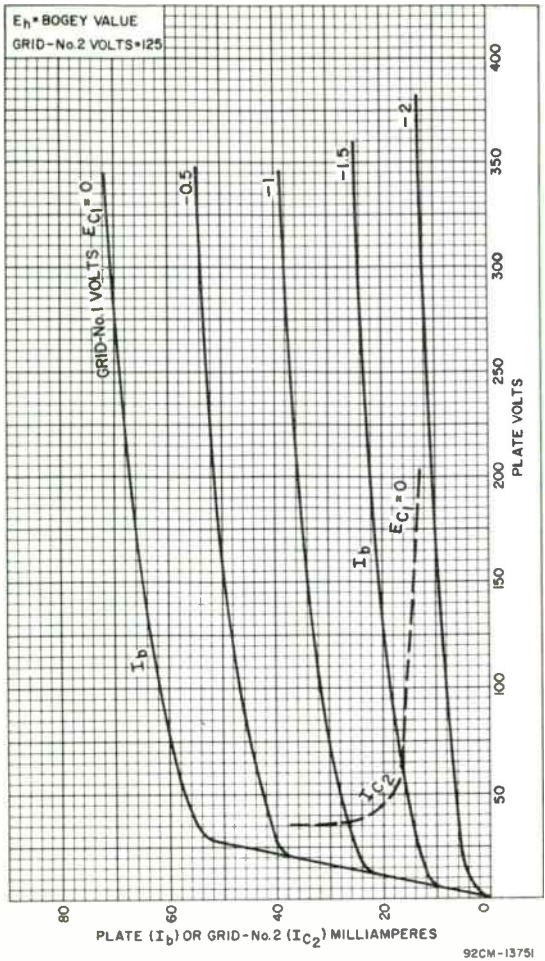
Typical Characteristics

Pentode Unit



Typical Plate Characteristics

Pentode Unit



RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

6MD8

Medium-Mu Triple Triode

NOVAR TYPE

For Matrix-Amplifier Applications in Color-TV Receivers

ELECTRICAL

Heater Characteristics and Ratings		
Voltage (AC or DC)	6.3 ± 0.6	V
Current at 6.3 V	0.900	A
Maximum heater-cathode voltage (Each unit):		
Heater negative with respect to cathode:		
Peak	200	V
Heater positive with respect to cathode:		
Peak	200	V
DC Component	100	V

Direct Interelectrode Capacitances (Approx.)[a]

	Unit No.1	*Unit No.2*	*Unit No.3*	
Grid to plate	3.0	3.0	3.0	pF
Input: G to (K, H)	3.6	3.6	3.4	pF
Output: P to (K, H)	0.48	0.48	0.36	pF

MECHANICAL

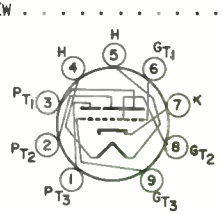
Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	2.960 in
Maximum Seated Length	2.580 in
Length, Base Seat to Bulb Top (Excluding tip)	2.060 to 2.240 in
Diameter	1.062 to 1.188 in
Bulb	T9

Bases (Alternates)

Small-Button Novar 9-Pin (JEDEC No.E9-75)
Small-Button Novar 9-Pin with Exhaust Tip 9-Pin (JEDEC No.E9-89)

Basing Designation for BOTTOM VIEW 9RQ

Pin 1 - Plate of Unit No.3
Pin 2 - Plate of Unit No.2
Pin 3 - Plate of Unit No.1
Pin 4 - Heater
Pin 5 - Heater
Pin 6 - Grid of Unit No.1
Pin 7 - Cathode
Pin 8 - Grid of Unit No.2
Pin 9 - Grid of Unit No.3



CHARACTERISTICS, CLASS A_1 AMPLIFIER

Values are for Each Unit

Plate Voltage	250	V
Grid Voltage	-10.5	V
Amplification Factor	17	
Plate Resistance (Approx.)	5500	Ω
Transconductance	3100	μmho

Plate Current	11.5	mA
Plate Current for grid volts = -14	4	mA
Grid Voltage (Approx.) for plate μA = 50	-23	V

AMPLIFIER — CLASS A_1

Values are for Each Unit

Maximum Ratings, Design-Maximum Values

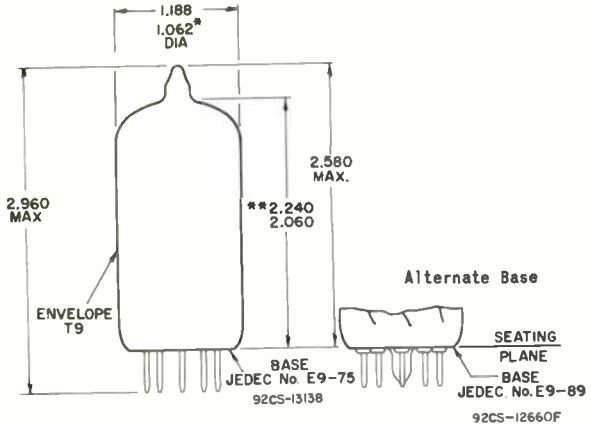
Plate Voltage	330	V
Grid Voltage		
Positive-bias value	0	V
Plate Dissipation	3	W

MAXIMUM CIRCUIT VALUE

Grid-Circuit Resistance		
For fixed-bias operation	1	MΩ

[a] Without external shield.

DIMENSIONAL OUTLINE



DIMENSIONS IN INCHES

Bottom-exhaust version has the same dimensions for maximum overall length and seated length as the top-exhaust outline shown.

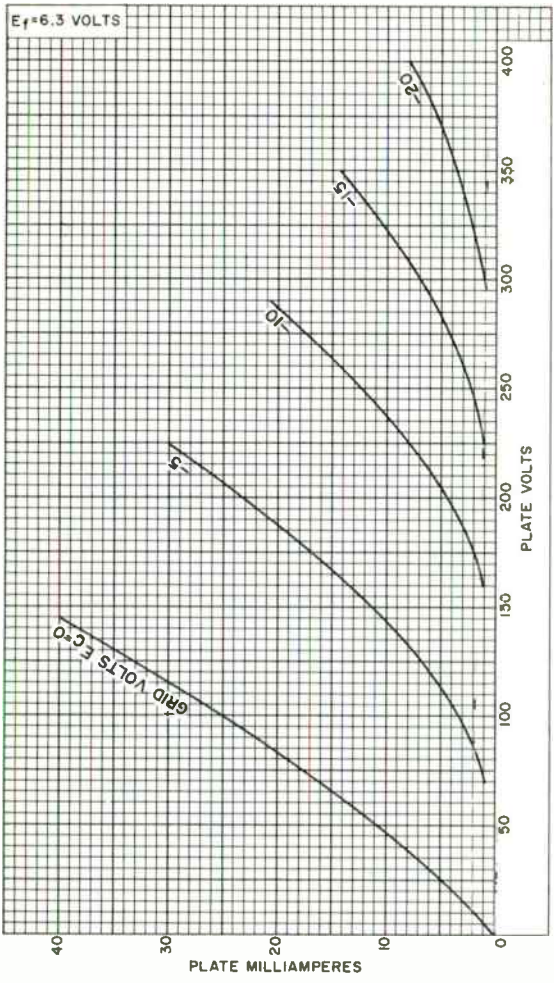
* Applies to the minimum diameter except in the area of the seal.

** Measured from the base seat to bulb-top line as determined by arcing gauge of 0.600" I.D.

RADIO CORPORATION OF AMERICA
Electronic Components and Devices
Harrison, N. J.

Average Plate Characteristics

EACH UNIT



92CM-11966

6S4

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.

Obsolete Type

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

Medium-Mu Triode

9-PIN MINIATURE TYPE
With Heater Having Controlled Warm-Up Time

GENERAL DATA

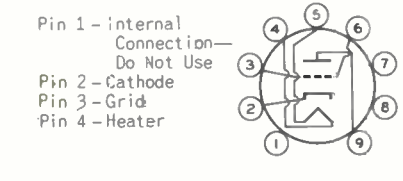
Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec
Direct Interelectrode Capacitances (Approx.):[a]		
Grid to plate	2.4	μμf
Grid to cathode and heater	4.2	μμf
Plate to cathode and heater	0.6	μμf

Characteristics, Class A_1 Amplifier:		
Plate Voltage	250	volts
Grid Voltage	−8	volts
Amplification Factor	16.5	
Plate Resistance (Approx.)	3700	ohms
Transconductance	4500	μmhos
Plate Current	24	ma
Plate Current for grid volts = −15	4	ma
Grid Voltage (Approx.) for plate μa = 50	−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	0.750" 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	9AC



VERTICAL-DEFLECTION AMPLIFIER

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[b]

DC PLATE VOLTAGE	550 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[c]	2200 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	250 max.	volts

◄ Indicates a change.

CATHODE CURRENT:			
Peak	105	max.	ma
Average	30	max.	ma
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[d]	max.	volts

Maximum Circuit Values:

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

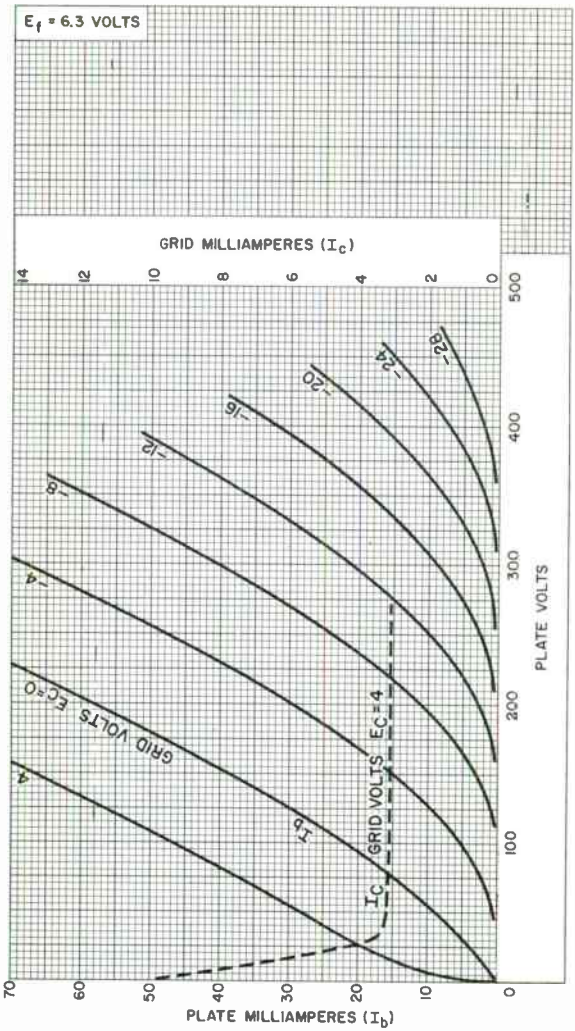
[a] Without external shield.

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

[c] 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.

[d] The dc component must not exceed 100 volts.

AVERAGE CHARACTERISTICS



92CM-7373RI

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	
Mounting Position		Any

BOTTOM VIEW (8R)

BOTTOM VIEW (G-HAD)

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)

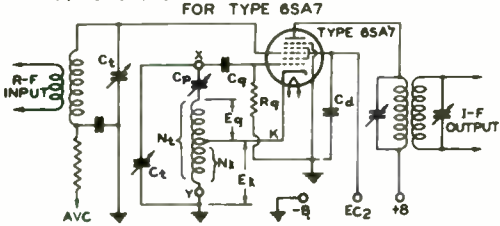
Characteristics:	*Self-excitation**		*Separate Excitation*		
Plate Voltage	100	250	100	250	volts
Grids #2 & #4 Volt.	100	100	100	100	volts
Grid #3 (Control) Volt.	0	0	−2	−2	volts
Grid #1 Resistor	20000	20000	20000	20000	ohms
Plate Res. (Approx.)	0.5	1.0	0.5	1.0	megohm
Conversion Transcond.	425	450	425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

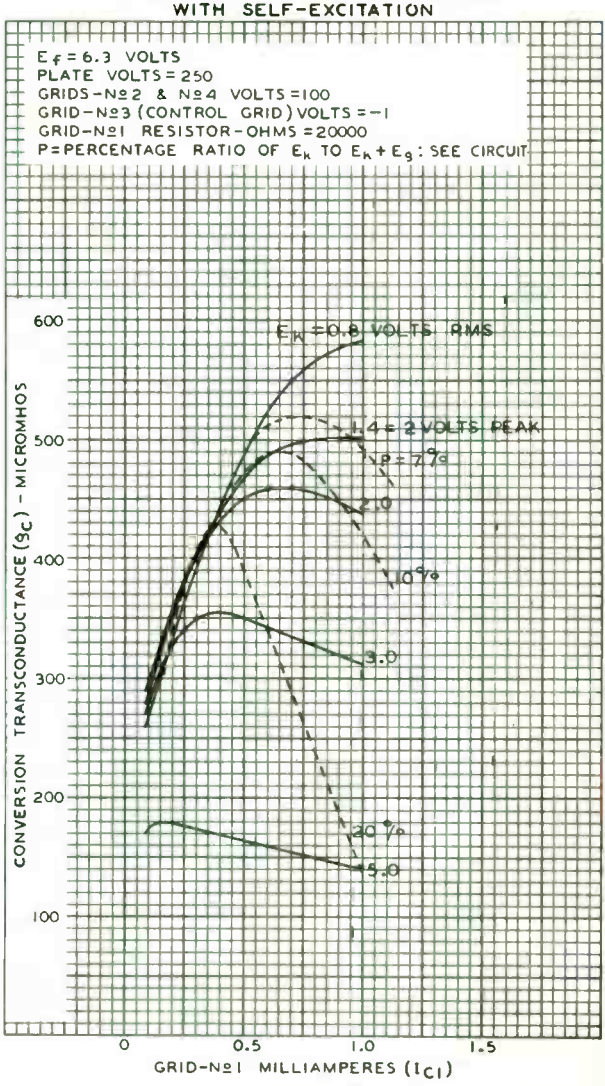
N_t = TOTAL TURNS IN OSC. COIL
N_k = TURNS IN CATHODE SECTION OF OSC. COIL
R_g = 20000 OHMS

CE-8992

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

6SA7

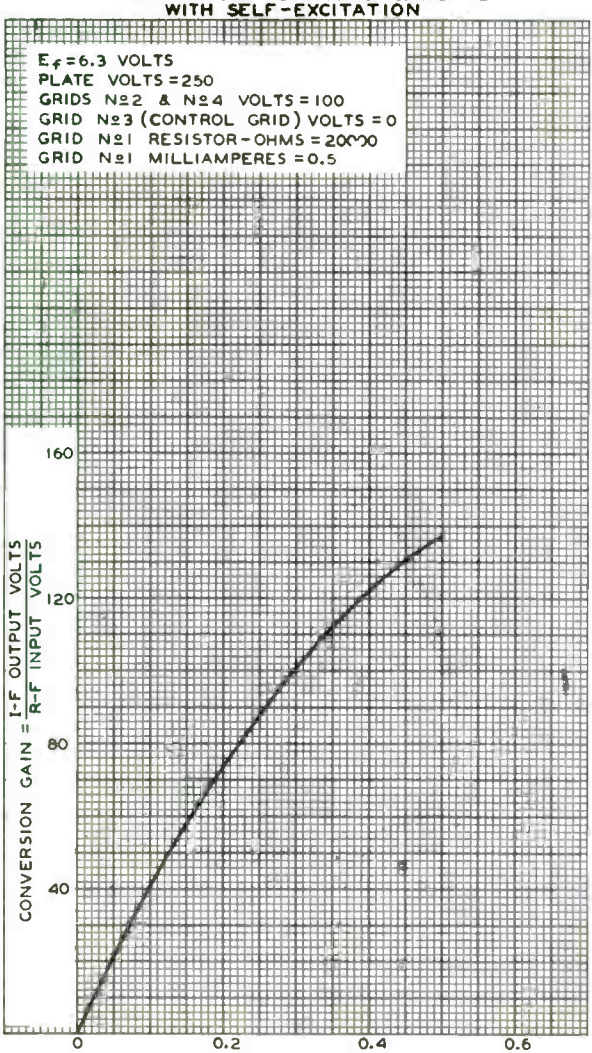
OPERATION CHARACTERISTICS
WITH SELF-EXCITATION



6SA7

6SA7

OPERATION CHARACTERISTIC
WITH SELF-EXCITATION



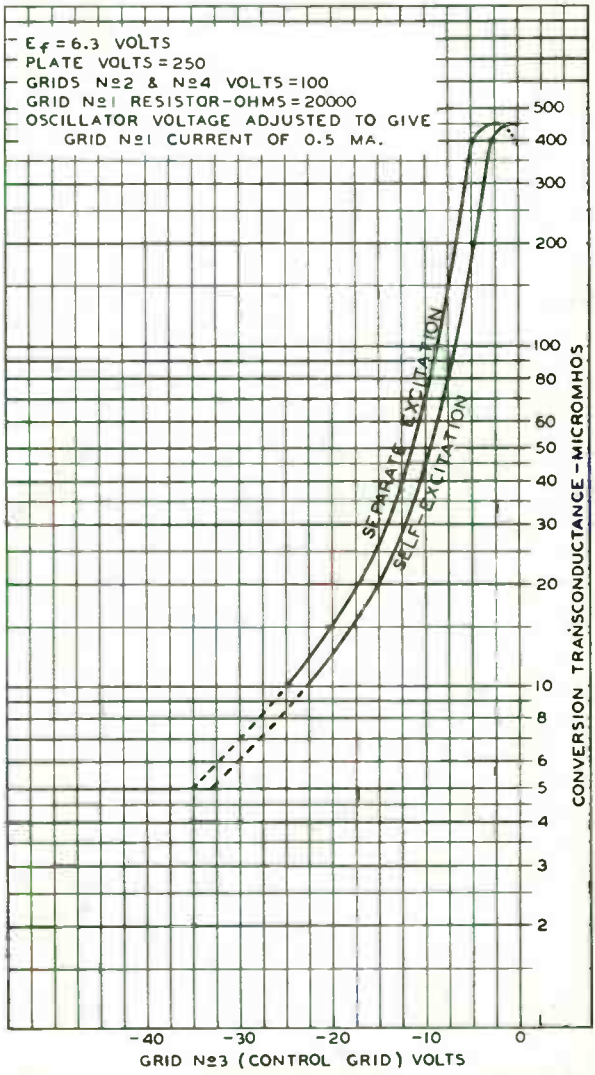
APR. 25, 1941

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

CE-4994

6SA7

OPERATION CHARACTERISTICS

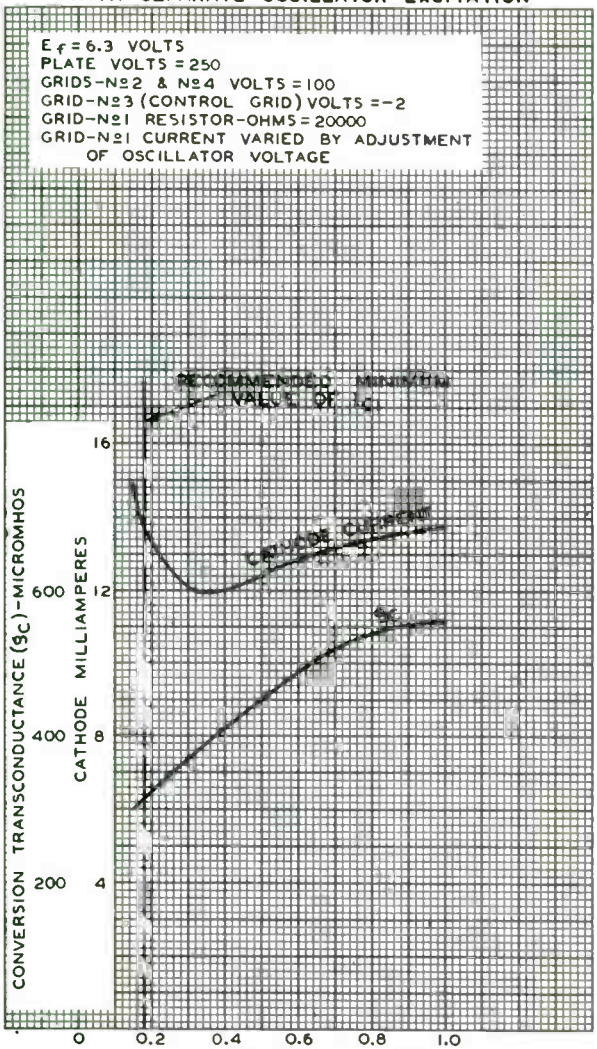


6SA7

6SA7

OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION

E_f = 6.3 VOLTS
PLATE VOLTS = 250
GRIDS-№2 & №4 VOLTS = 100
GRID-№3 (CONTROL GRID) VOLTS = -2
GRID-№1 RESISTOR-OHMS = 20000
GRID-№1 CURRENT VARIED BY ADJUSTMENT OF OSCILLATOR VOLTAGE



APR. 24, 1941

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4990R1

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

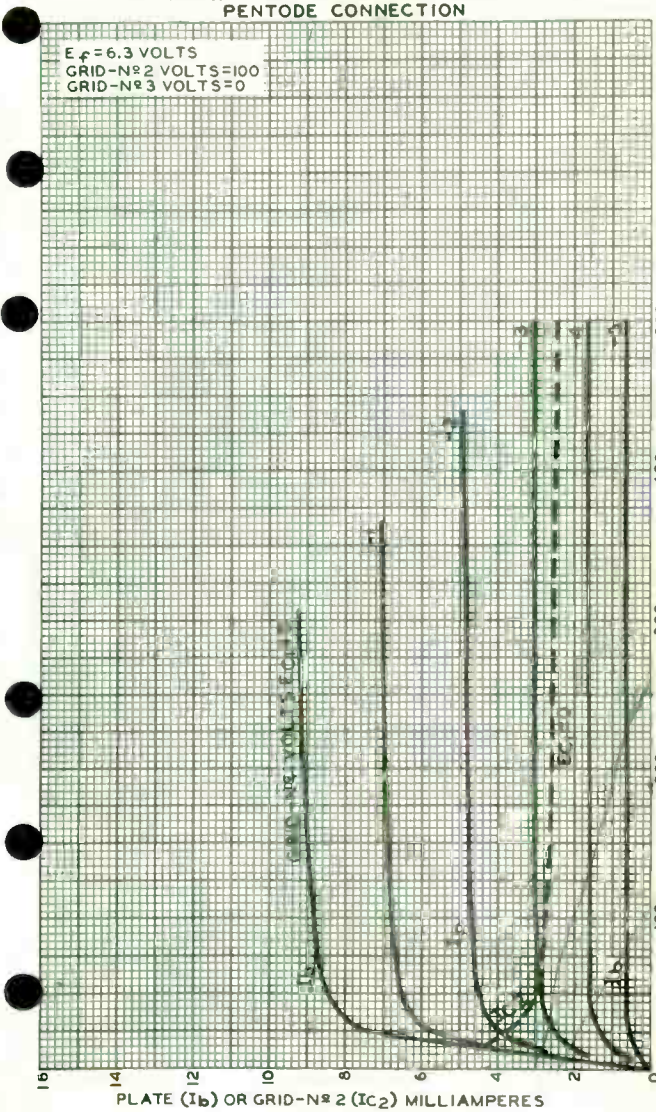
→Indicates a change.

RCA

6SJ7

AVERAGE PLATE CHARACTERISTICS

PENTODE CONNECTION



6SJ7

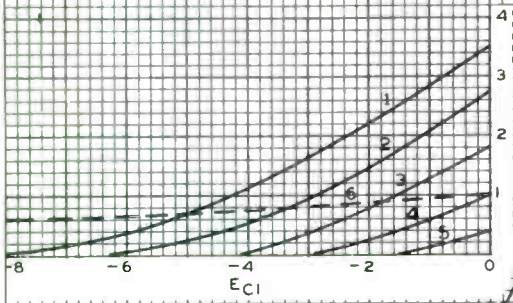
RCA

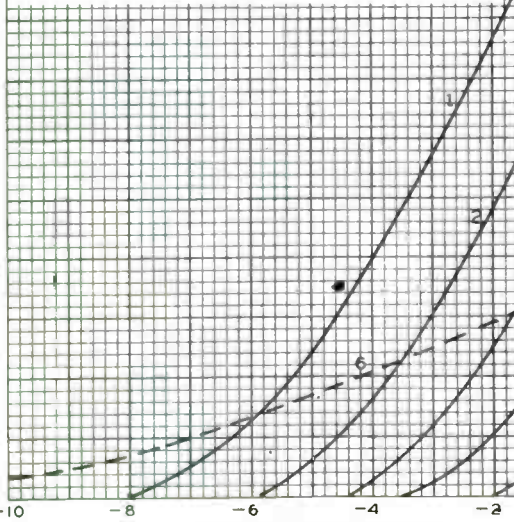
6SJ7

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





MARCH 5,1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-6443R1

RCA

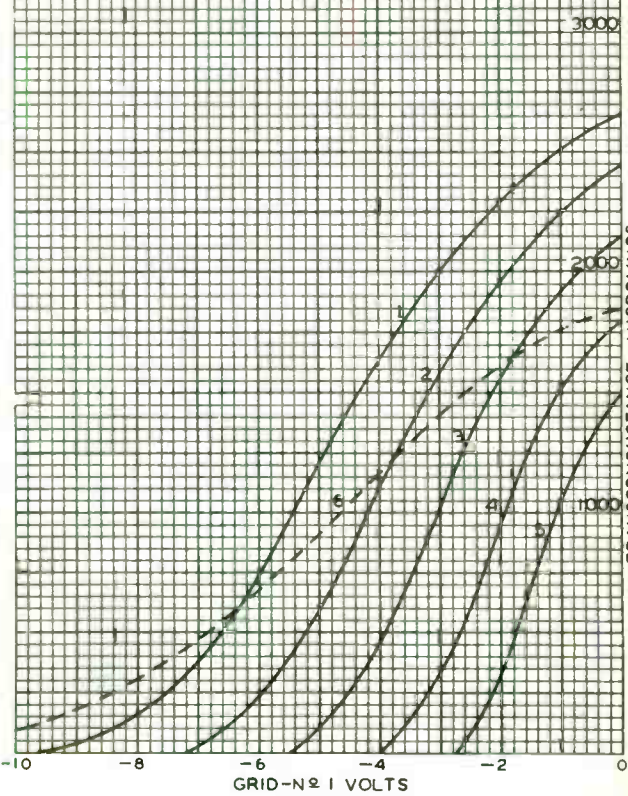
6SJ7

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

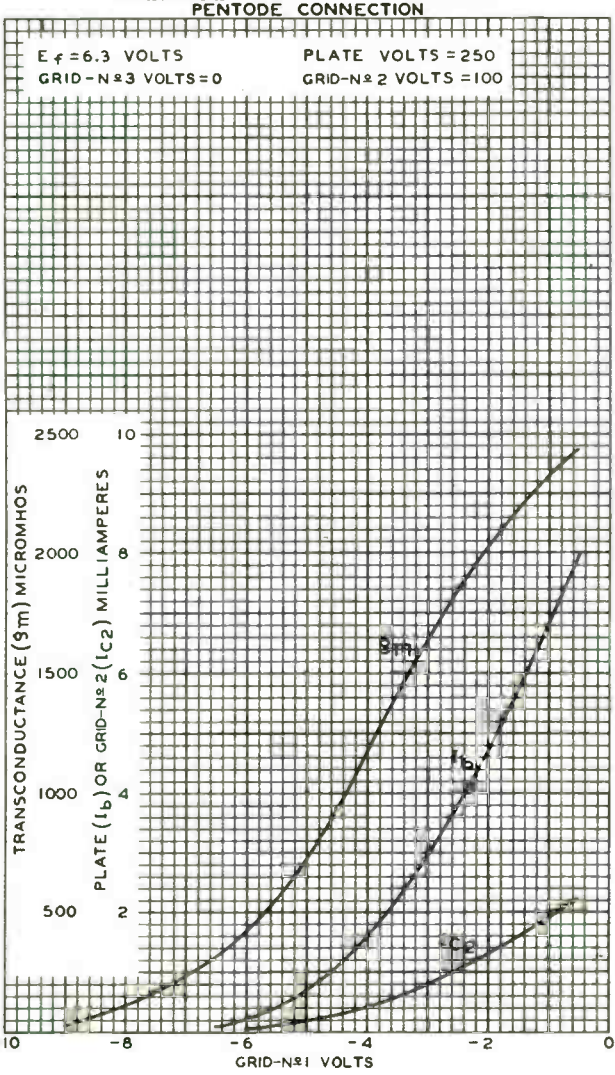


6SJ7

RCA

6SJ7

AVERAGE CHARACTERISTICS
PENTODE CONNECTION

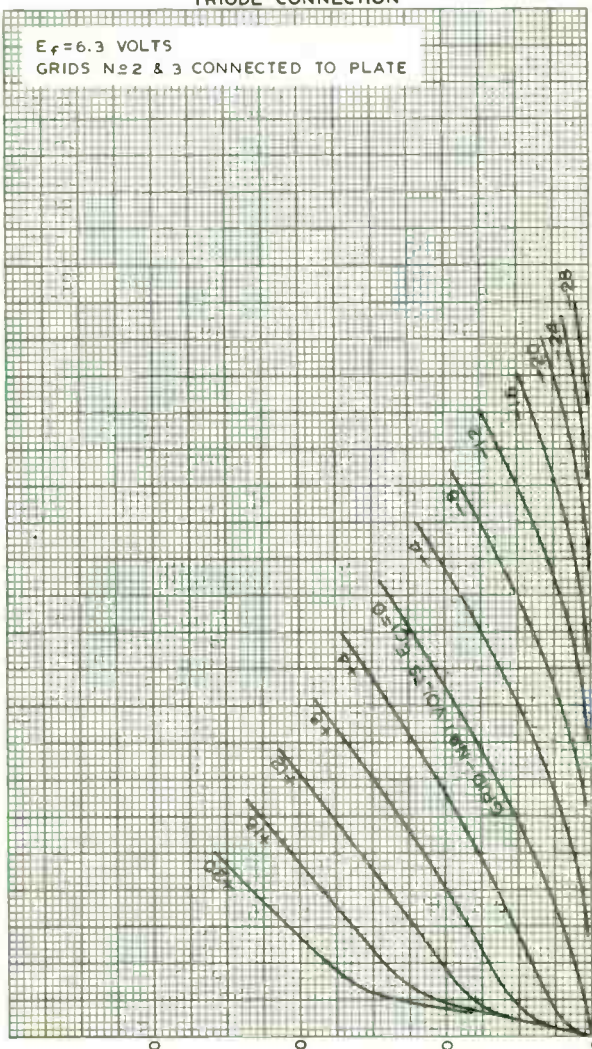


MARCH 5 1948

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-4937RI

6SJ7
AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



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.):[a]

	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.88-6) ←
or Short Intermediate-Shell Octal 8-Pin (JETEC No.88-46)
Basing Designation for BOTTOM VIEW 88D

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

[a] With close-fitting shield (JETEC No.3C8) 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:**

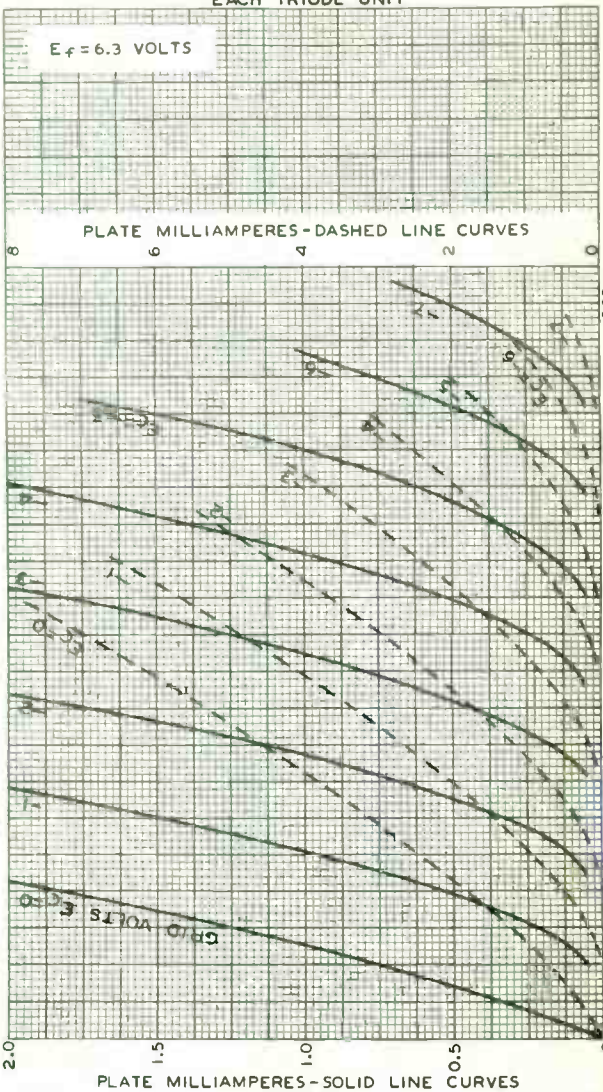
See RESISTANCE-COUPLED AMPLIFIER CHART No.7 at front of this Section

→Indicates a change.

6SL7-GT

AVERAGE PLATE CHARACTERISTICS

EACH TRIODE UNIT



JUNE 16, 1941

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6298

RCA

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

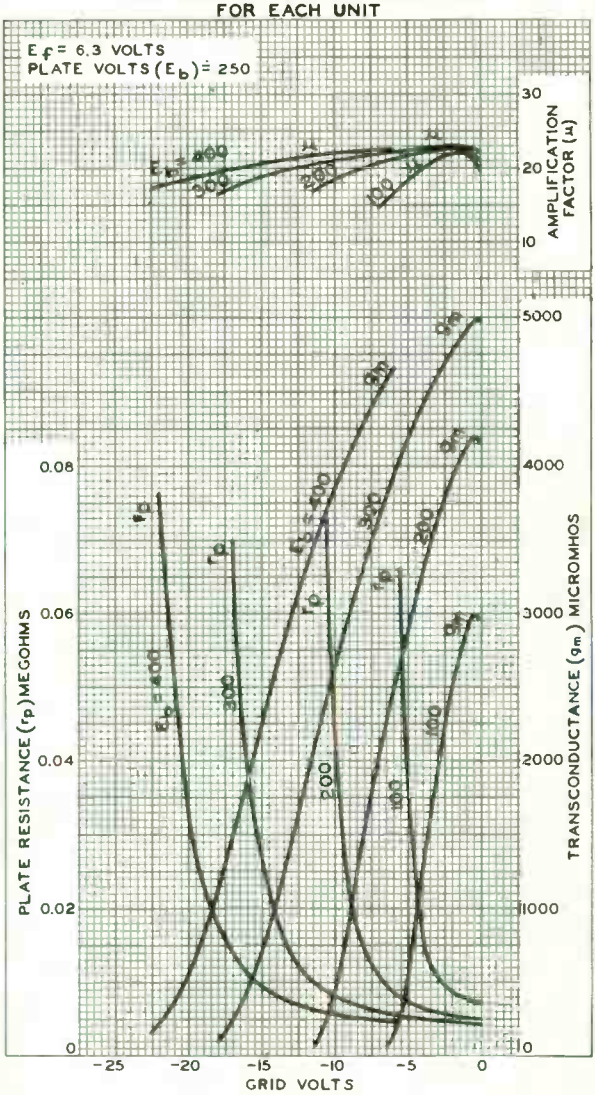
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8322

RCA

6SN7-GTA

AVERAGE CHARACTERISTICS
FOR EACH UNIT



RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

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	
Mounting Position			Any

BOTTOM VIEW

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 587 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.

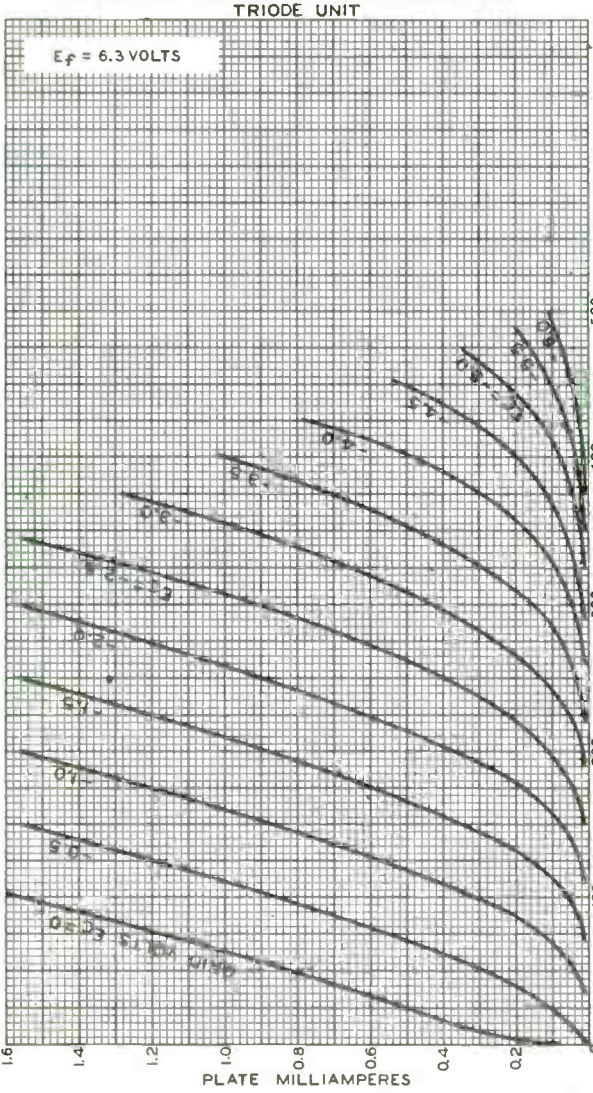
←Indicates a change.

6SQ7

6SQ7

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



DEC. 14, 1943

RCA VICTOR DIVISION

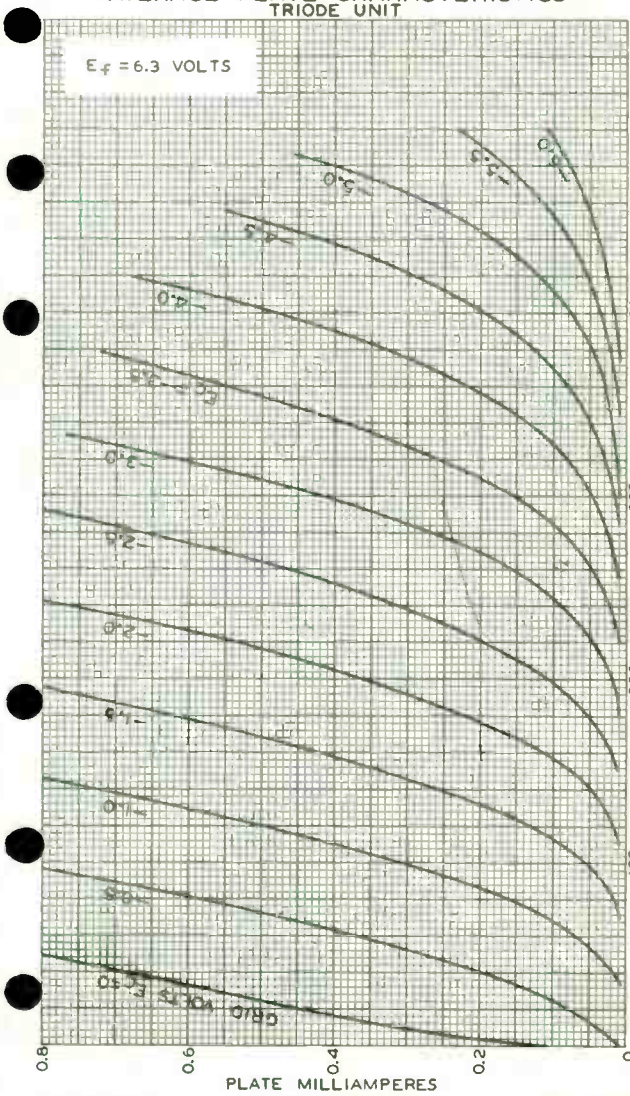
RADIO CORPORATION OF AMERICA, CAMDEN, NEW JERSEY

92CM-4975R2

6SQ7

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



AUG. 13, 1941

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6310

RCA

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 - Catnode		Pin 7 - Heater
Pin 4 - Diode Plate #2		Pin 8 - Heater
Mounting Position		Any

BOTTOM VIEW (8Q)

TRIODE UNIT

Plate Voltage	250 max.	volts
Plate Dissipation	2.5 max.	watts
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.

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.

6ST7

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT

E_f = 6.3 VOLTS

PLATE VOLTS

100 200 300 400 500

PLATE MILLIAMPERES

0 5 10 15 20

DEC. 4, 1941

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6342

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.

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

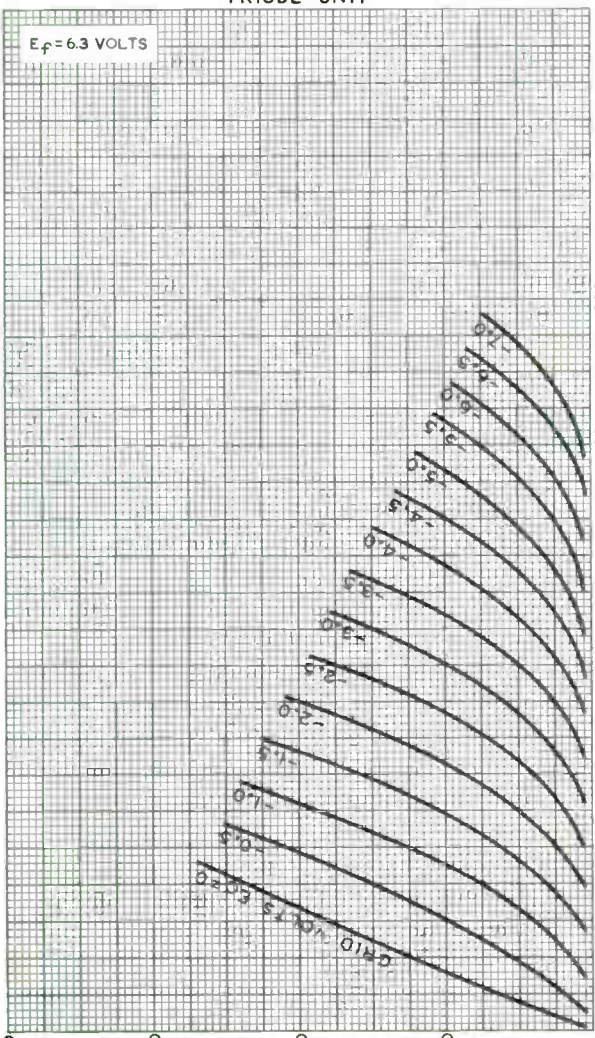
TRIPLE DIODE—HIGH-MU TRIODE

• 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

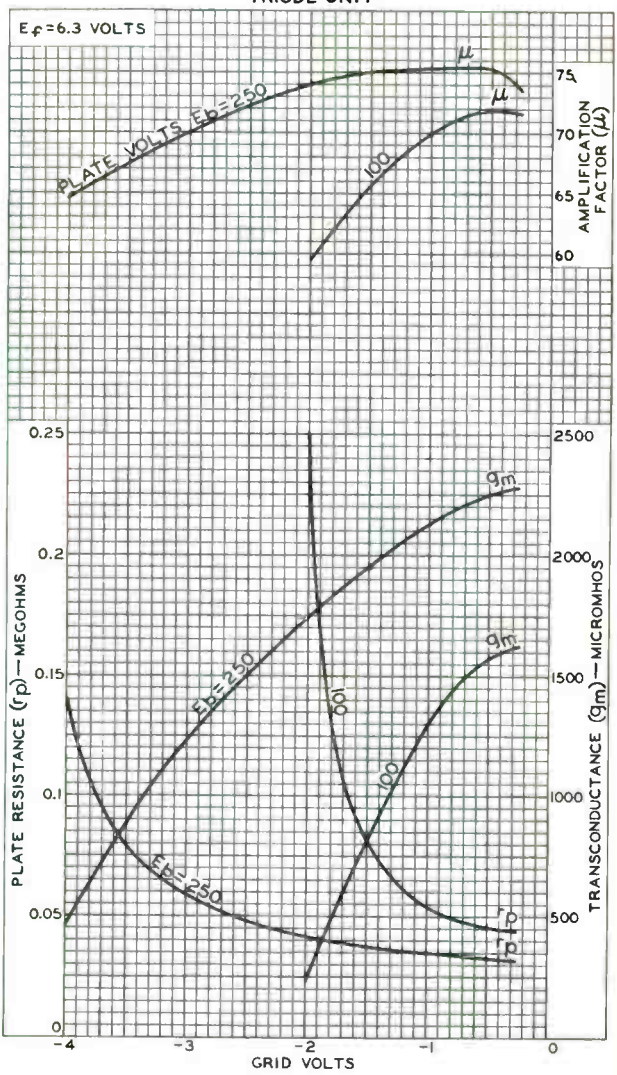
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6T8-A

AVERAGE CHARACTERISTICS

TRIODE UNIT



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

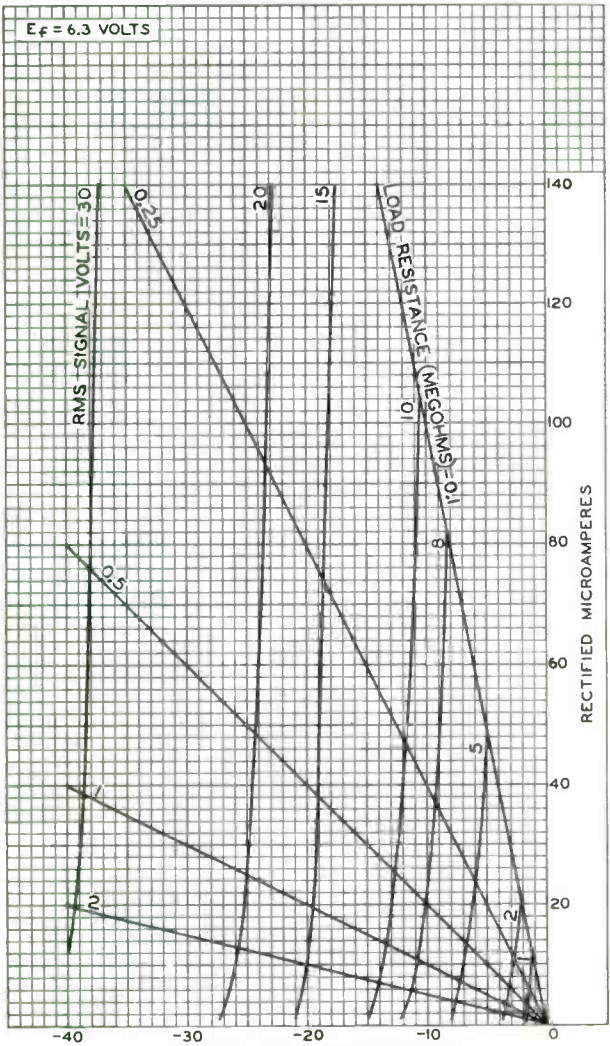
92CM-9611RI

RCA

6T8-A

AVERAGE CHARACTERISTICS

HALF-WAVE CIRCUIT—EACH DIODE UNIT



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

92CM-9610

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 (AC or DC)	6.3		volts
Current	0.45 ± 6%		amp
Warm-up time (Average)	11		sec
Direct Interelectrode Capacitances:	*Without External Shield*	*With External Shield▲*	
Triode Unit:			
Grid to plate	1.8	1.8	μμf
Grid to cathode and heater	2.8	2.8	μμf
Plate to cathode and heater	1.5	2	μμf
Pentode Unit:			
Grid No.1 to plate	0.015 max.	0.007 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
Pentode grid No.1 to triode plate	0.2 max.	0.2 max.	μμf
Pentode plate to triode plate	0.1 max.	0.02 max.	μμf
Heater to cathode (Each unit)	3	3●	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*		
Plate Voltage	125	100	125	volts
Grid-No.2 Voltage	–	70	110	volts
Grid-No.1 Voltage	−1	–	−1	volt
Amplification Factor	40	–	–	
Plate Resistance (Approx.)	5400	–	200000	ohms
Transconductance	7500	5500	5000	μmhos
Plate Current	13.5	–	9.5	ma
Grid-No.2 Current	–	–	3.5	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	−9	–	−8	volts

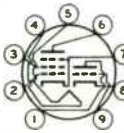
← Indicates a change.

6U8-A

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	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

→ **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
GRID-No.2 INPUT: For grid-No.2 voltages up to 165 volts	–	0.55 max.	watt
For grid-No.2 voltages between 165 and 330 volts	–	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
PLATE DISSIPATION	2.5 max.	3 max.	watts
PEAK HEATER-CATHODE VOLTAGE: Heater negative with respect to cathode	200 max.	200* max.	volts
Heater positive with respect to cathode	200 max.	200* max.	volts

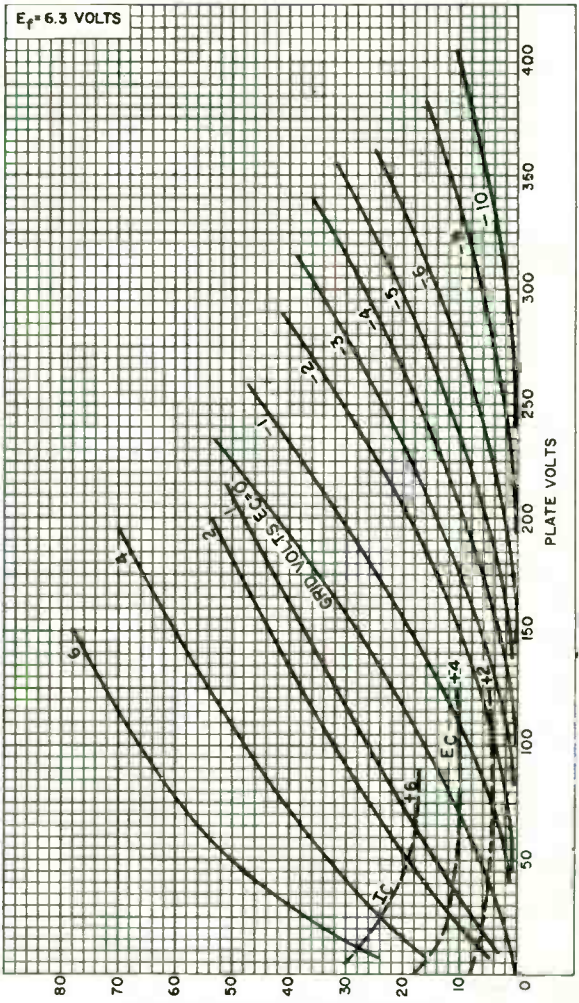
Maximum Circuit Values:	*Triode Unit*	*Pentode Unit*	
Grid-No.1-Circuit Resistance: For fixed-bias operation	–	0.5 max.	megohm
For cathode-bias operation	–	1 max.	megohm

▲ With external shield JEDEC No.315 connected to pin 8 except as noted.
● With external shield JEDEC No.315 connected to pin 6.
★ The dc component must not exceed 100 volts.

→ Indicates a change.

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

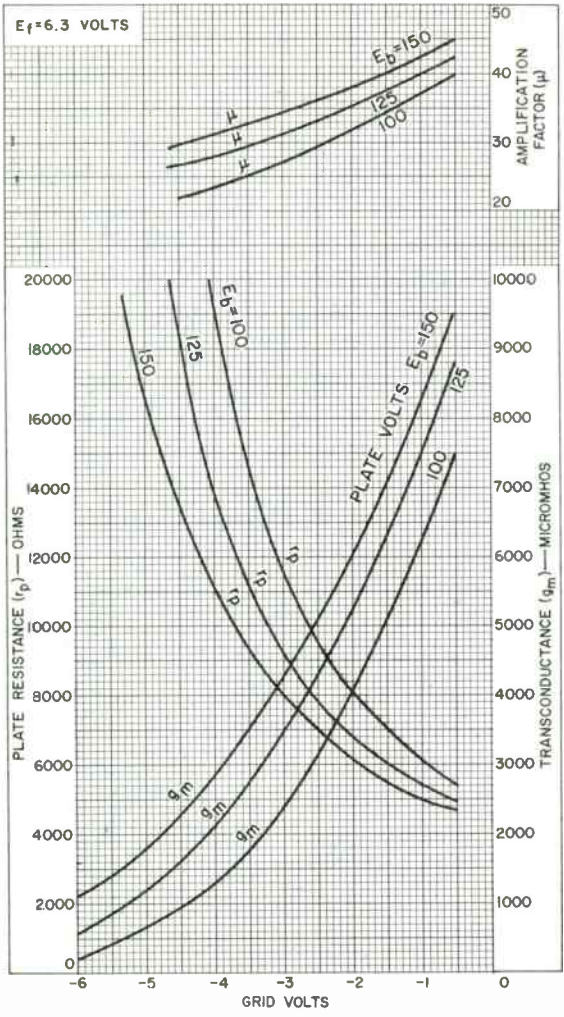
AVERAGE CHARACTERISTICS
Triode Unit



92CM-7873R2

6U8-A

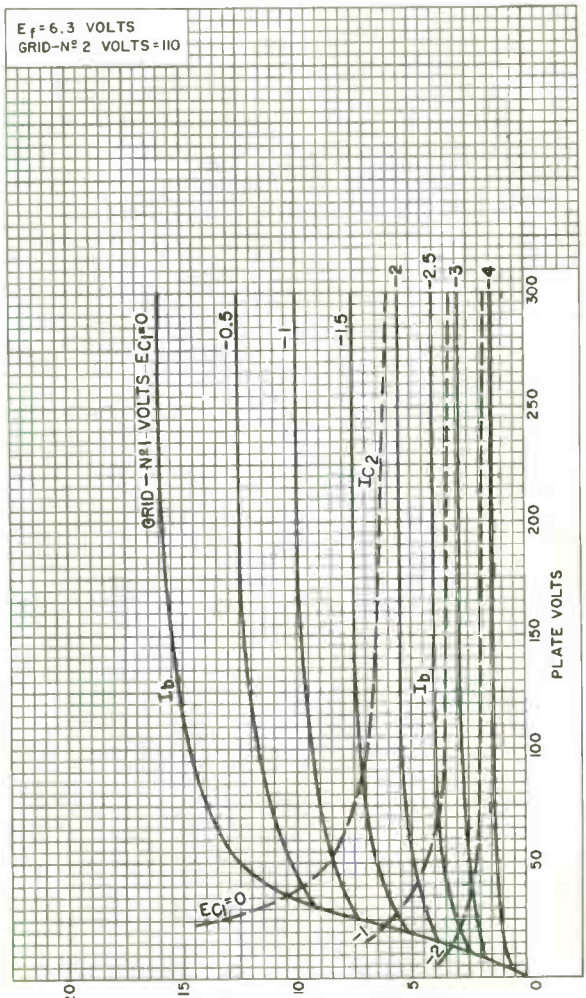
AVERAGE CHARACTERISTICS
Triode Unit



92CM-10900

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

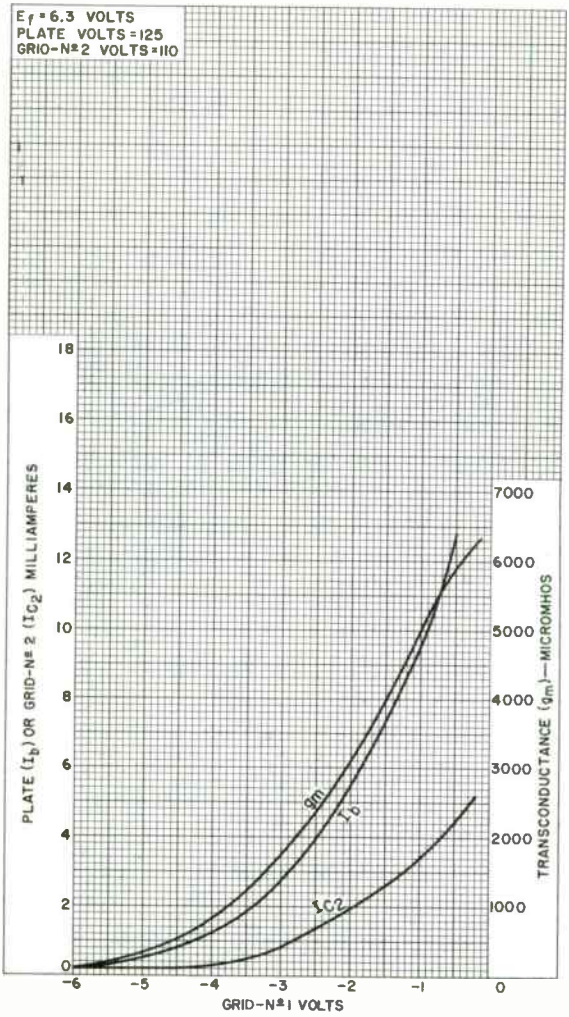
AVERAGE CHARACTERISTICS
Pentode Unit



92CM-7869RI

6U8-A

AVERAGE CHARACTERISTICS
Pentode Unit



92CM-10902

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

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.

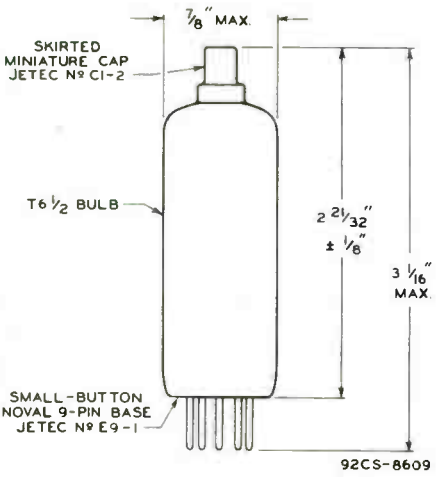
▲ The dc component must not exceed 750 volts.

● The dc component must not exceed 100 volts.

RCA

6V3-A

HALF-WAVE VACUUM RECTIFIER



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

Beam Power Tube

The 6V6 is the same as the 6V6GTA except for the following items:

Electrical:

Heater, for Unipotential Cathode:		
Warm-up time (Average)	[a]	sec
Direct Interelectrode Capacitances (Approx.):[b]		
Grid No.1 to plate	0.3	μμf
Grid No.1 to cathode & grid No.3, metal shell, grid No.2, and heater	10	μμf
Plate to cathode & grid No.3, metal shell, grid No.2, and heater	11	μμf

Mechanical:

Maximum Overall Length	3-1/4"
Maximum Seated Length	2-11/16"
Maximum Diameter	1-5/16"
Dimensional Outline	See *General Section*
Bulb	Metal Shell MT8B
Base	Small-Wafer Octal 7-Pin (JEDEC Group 1, No.B7-22)
Basing Designation for BOTTOM VIEW	7AC

Pin 1 – Shell
Pin 2 – Heater
Pin 3 – Plate
Pin 4 – Grid No.2

Pin 5 – Grid No.1
Pin 7 – Heater
Pin 8 – Cathode, Grid No.3

6V6GT

Beam Power Tube

The 6V6GT is the same as the 6V6GTA except for the following items:

Heater, for Unipotential Cathode:		
Warm-up time (Average)	[a]	sec

[a] The heater for this type does not have controlled warm-up time.
[b] Without external shield.

6V6GTA

Beam Power Tube

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	6.3	volts
Current	0.45 ± 5%	amp
Warm-up time (Average)	11	sec
Direct Interelectrode Capacitances (Approx.):[a]		
Grid-No.1 to plate	0.7	μμf
Grid-No.1 to cathode & grid No.3, grid No.2, and heater	9	μμf
Plate to cathode & grid No.3, grid No.2, and heater	7.5	μμf

Characteristics, Class A_1 Amplifier:

		Triode Connection[b]	
Plate Voltage	250	250	volts
Grid-No.2 Voltage	250	–	volts
Grid-No.1 Voltage	-12.5	-12.5	volts
Amplification Factor	–	9.8	
Plate Resistance (Approx.)	50000	1960	ohms
Transconductance	4100	5000	μmhos
Plate Current	45	49.5	ma
Grid-No.2 Current	4.5	–	ma
Grid-No.1 Voltage (Approx.) for plate ma. = 0.5	–	-36	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	3-5/16"
Maximum Seated Length	2-3/4"
Maximum Diameter	1-9/32"
Dimensional Outline	See *General Section*
Bulb	T9
Bases (Alternates):	
Intermediate-Shell Octal:	
7-Pin, Arrangement 1, (JEDEC Group 1, No.B7-7)	
6-Pin, Arrangement 2, (JEDEC Group 1, No.B6-81)	
Short Intermediate-Shell Octal with External Barriers:	
7-Pin, (JEDEC Group 1, No.B7-59)	
6-Pin, Arrangement 2, (JEDEC Group 1, No.B6-84)	

6V6GTA

Basing Designation for BOTTOM VIEW. 7AC

Pin 1[c] – 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-Maximum Values:*

PLATE VOLTAGE	350	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	315	max.	volts
GRID-No.2 INPUT	2.2	max.	watts
PLATE DISSIPATION	14	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200[d]	max.	volts

Typical Operation and Characteristics:

Plate Voltage	180	250	315	volts
Grid-No.2 Voltage	180	250	225	volts
Grid-No.1 (Control-Grid) Voltage.	-8.5	-12.5	-13	volts
Peak AF Grid-No.1 Voltage	8.5	12.5	13	volts
Zero-Signal Plate Current	29	45	34	ma
Max.-Signal Plate Current	30	47	35	ma
Zero-Signal Grid-No.2 Current	3	4.5	2.2	ma
Max.-Signal Grid-No.2 Current	4	7	6	ma
Plate Resistance (Approx.).	50000	50000	80000	ohms
Transconductance.	3700	4100	3750	μmhos
Load Resistance	3500	5000	8500	ohms
Total Harmonic Distortion	8	8	12	%
Max.-Signal Power Output.	2	4.5	5.5	watts

Maximum Circuit Values:

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

PUSH-PULL AF POWER AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

PLATE VOLTAGE	350	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	315	max.	volts
GRID-No.2 INPUT	2.2	max.	watts
PLATE DISSIPATION	14	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200[d]	max.	volts

Typical Operation and Characteristics:

Values are for two tubes

Plate Voltage	250	285	volts
Grid-No.2 Voltage	250	285	volts
Grid-No.1 (Control-Grid) 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-Signal Grid-No.2 Current	5	4	ma
Max.-Signal Grid-No.2 Current	13	13.5	ma
Effective Load Resistance (Plate to plate)	10000	8000	ohms
Total Harmonic Distortion	5	3.5	%
Maximum-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

VERTICAL-DEFLECTION AMPLIFIER

Triode Connection — Grid No.2 Connected to Plate

Maximum Ratings, *Design-Maximum Values:*

For operation in a 525-line, 30-frame system[e]

DC PLATE VOLTAGE	350	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE[f]	1200	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE	275	max.	volts
CATHODE CURRENT:			
Peak	115	max.	ma
Average	40	max.	ma
PLATE DISSIPATION	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[d]	max.	volts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For cathode-bias operation	2.2 max.	megohms

[a] Without external shield.

[b] Grid No.2 connected to plate.

[c] On the 6-pin bases, pin 1 as well as pin 6 is omitted.

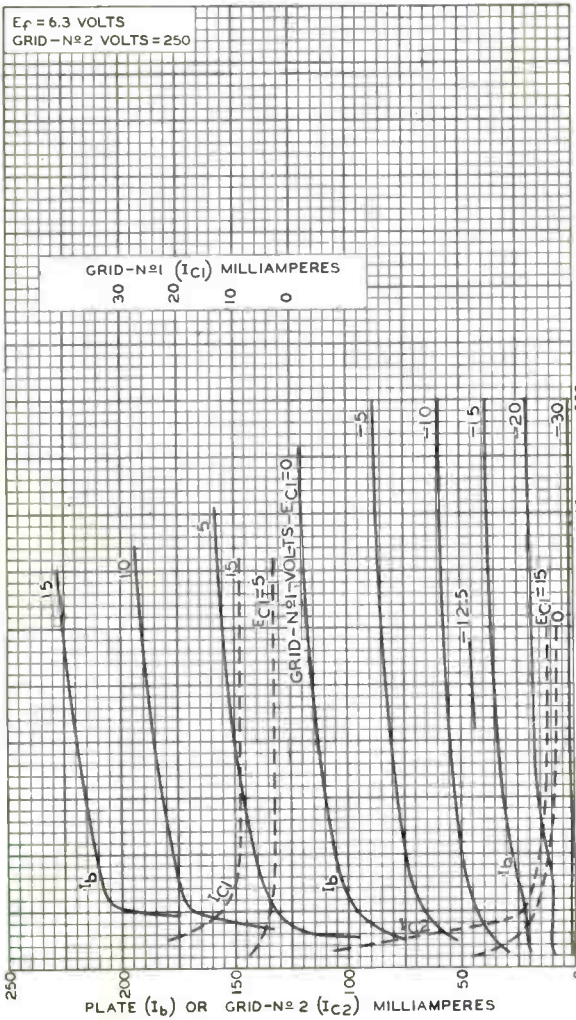
[d] The dc component must not exceed 100 volts.

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

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

6V6GTA

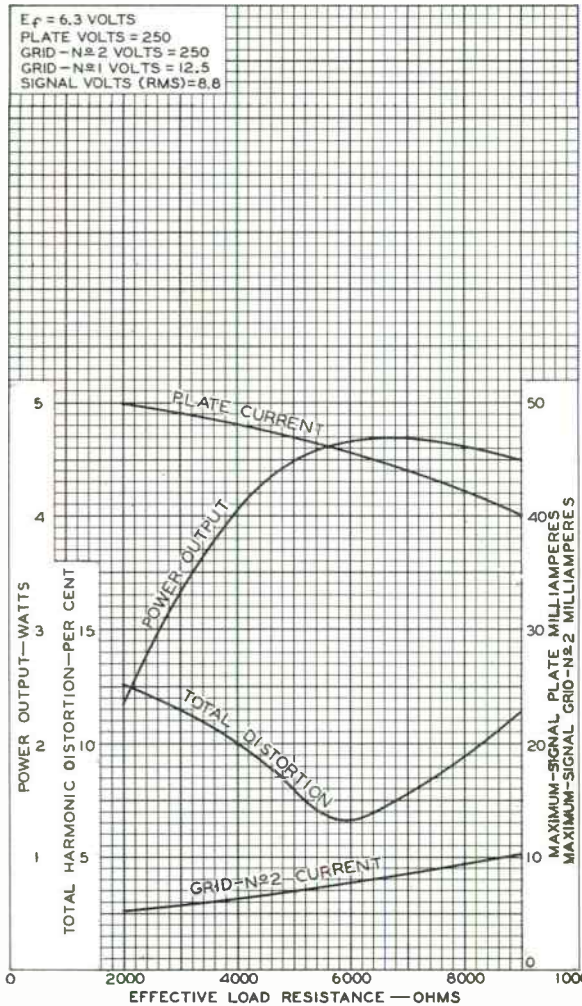
AVERAGE CHARACTERISTICS



92CM-4807R2

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

OPERATION CHARACTERISTICS



92CM-6339R2

Half-Wave Vacuum Rectifier

For Television Damper Service

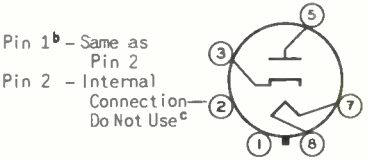
GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	1.2	amp
Direct Interelectrode Capacitances (Approx.):[a]		
Plate to cathode and heater	6	μμf
Cathode to plate and heater	13	μμf
Heater to cathode	7	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
Bases (Alternates):	
Intermediate-Shell Octal:	
6-Pin, Arrangement 1 (JEDEC Group 1, No.B6-8)	
5-Pin, Arrangement 2 (JEDEC Group 1, No.B5-82)	
Short Intermediate-Shell Octal with External Barriers:	
6-Pin, Arrangement 1 (JEDEC Group 1, No.B6-60)	
5-Pin, Arrangement 2 (JEDEC Group 1, No.B5-85)	
Basing Designation for BOTTOM VIEW	4CG



DAMPER SERVICE

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

For operation in a 525-line, 30-frame system[d]

PEAK INVERSE PLATE VOLTAGE (Absolute maximum)[e]	3850[f]	max.	volts
PEAK PLATE CURRENT	750	max.	ma
DC PLATE CURRENT	125	max.	ma
PLATE DISSIPATION	3.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	2300[g]	max.	volts
Heater positive with respect to cathode	300[h]	max.	volts

→ Indicates a change.

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma. = 250. . . . 21 volts

[a] Without external shield.

[b] On the 5-pin bases, pin 1 as well as pins 4 and 6 is omitted.

[c] Socket terminals 1, 2, 4 and 6 should not be used as tie points.

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

[e] 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.

[f] Under no circumstances should this absolute-maximum value be exceeded.

[g] The dc component (Absolute maximum) must not exceed 500 volts.

[h] The dc component must not exceed 100 volts.

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

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.

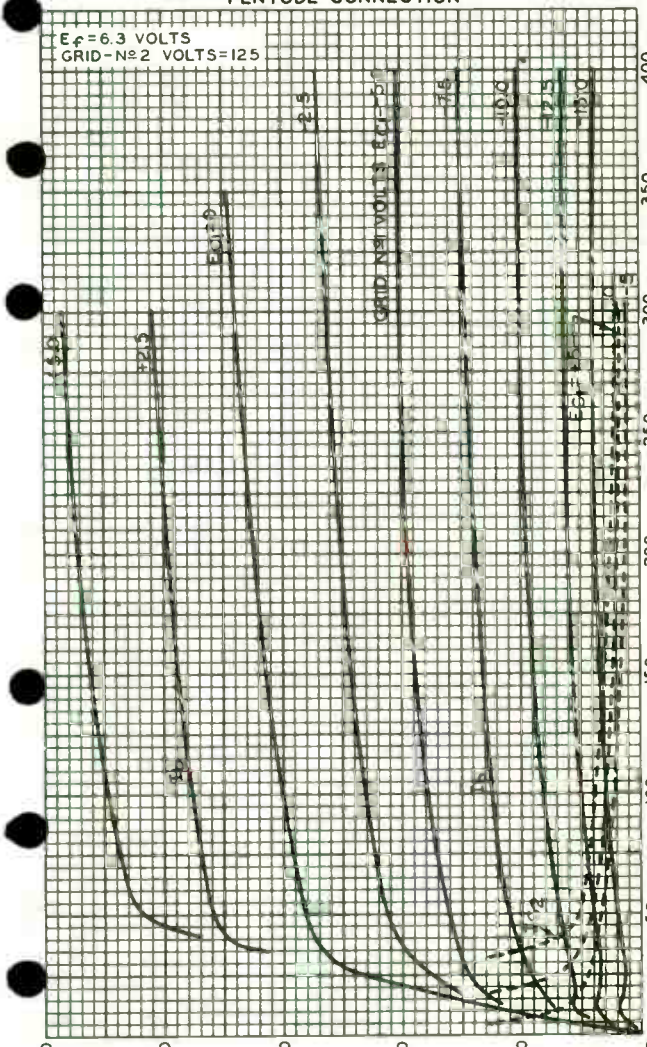
♦ Under no circumstances should this absolute value be exceeded.

RCA

6W6-GT

AVERAGE PLATE CHARACTERISTICS

PENTODE CONNECTION



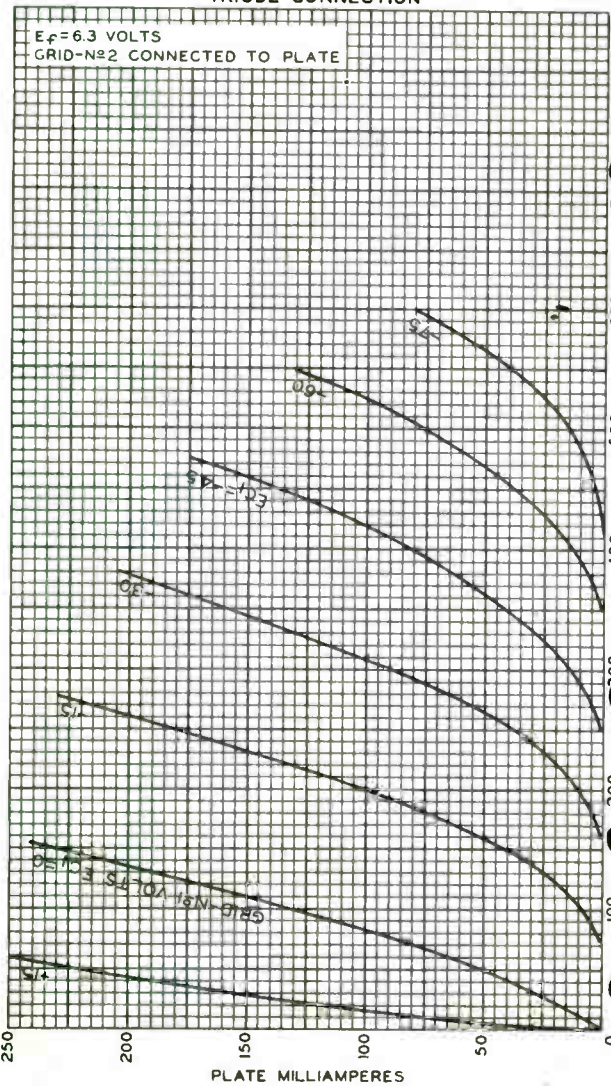
MAR. 20. 1953

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7942

6W6-GT
AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



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)	650	volts
Filter Input Capacitor	10	μf
Effective Plate-Supply Impedance per Plate*	520	ohms

* Higher values of capacitance than indicated may be used but the effective plate-supply impedance should be increased to prevent exceeding the maximum rating for peak plate current.

← Indicates a change

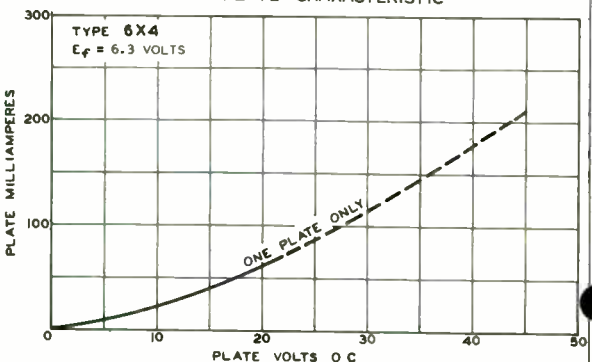
6X4

6X4

FULL-WAVE VACUUM RECTIFIER

DC Output Voltage at Input to Filter (Approx.):		
At half-load current of 35 ma.	360	volts
At full-load current of 70 ma.	300	volts
Voltage Regulation (Approx.):		
Half-load to full-load current	60	volts
→ **Typical Operation as Full-Wave Rectifier with Choke-Input to Filter:**		
AC Plate-to-Plate Supply Voltage (RMS) . . .	900	volts
Minimum Filter Input Choke	10	henries
DC Output Voltage at Input to Filter (Approx.):		
At half-load current of 35 ma.	385	volts
At full-load current of 70 ma.	370	volts
Voltage Regulation (Approx.):		
Half-load to full-load current	15	volts

AVERAGE PLATE CHARACTERISTIC



92CM-6106TI

RATING CHARTS AND OPERATION CHARACTERISTICS

Rating Chart I represents graphically the relationships between maximum ac voltage input and maximum dc output current derived from the fundamental ratings for conditions of capacitor-input and choke-input filters. This graphical presentation gives the equipment designer considerable latitude in choice of operating conditions.

Rating Chart II represents graphically the relationship between maximum rectification efficiency and maximum dc output current per plate for conditions of capacitor input to filter.

→Indicates a change

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.*

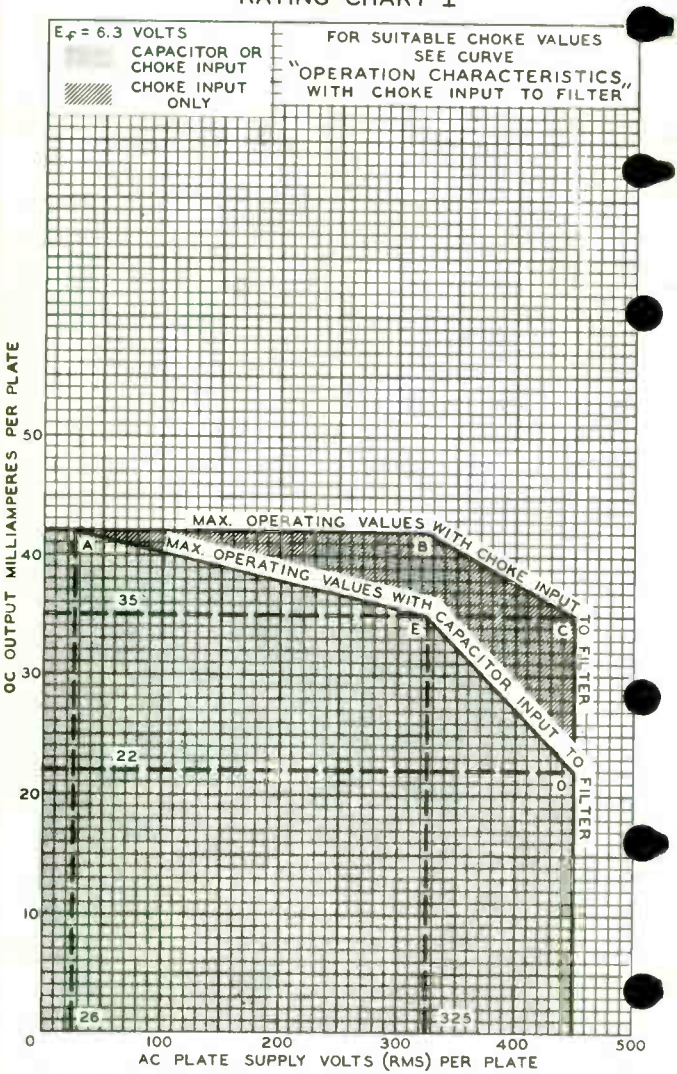
The *Operation Characteristics for Full-Wave Circuit with Choke-Input Filter* show the typical operating curves for such a circuit. They not only show by means of boundary line "ABC" the limiting current and voltage relationships presented on *Rating Chart I*, but also give information as to the effect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

RCA

6X4

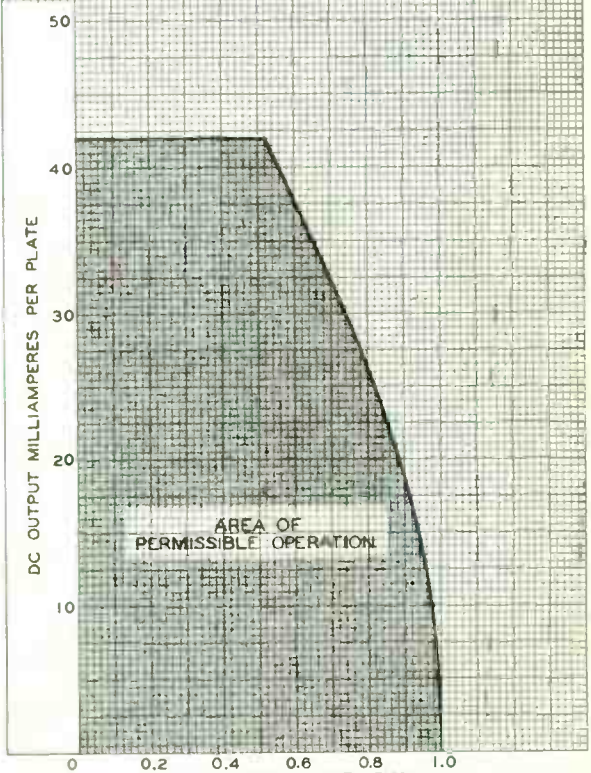
RATING CHART I



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

RCA

6X4

RATING CHART III

CAPACITOR INPUT TO FILTER

E_f = 6.3 VOLTS MAX. HOT SWITCHING CUR. = 1 AMP.

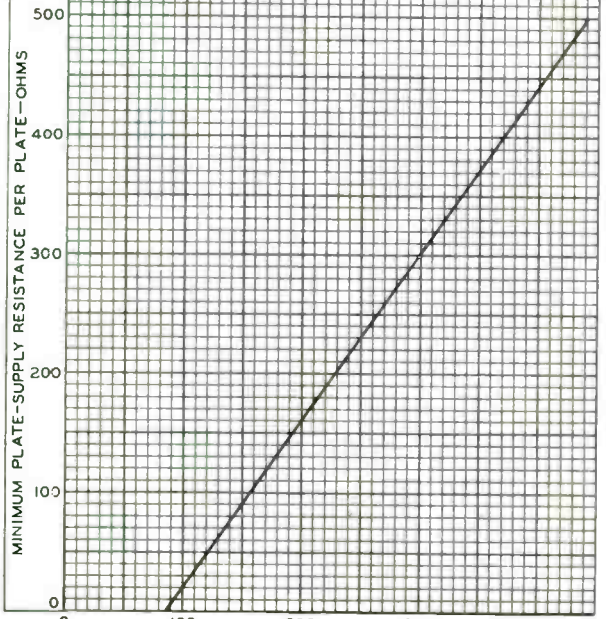
PLATE-SUPPLY RESISTANCE PER PLATE = $R_{SEC} + N^2 R_{PRI} + R_A$

WHERE R_{SEC} = DC RESISTANCE OF TRANSFORMER SECONDARY PER SECTION

R_{PRI} = DC RESISTANCE OF TRANSFORMER PRIMARY

R_A = DC RESISTANCE OF ADDED SERIES RESISTANCE PER PLATE

N = TRANSFORMER VOLTAGE STEP-UP RATIO PER SECTION



JUNE 29, 1953

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8026

RCA

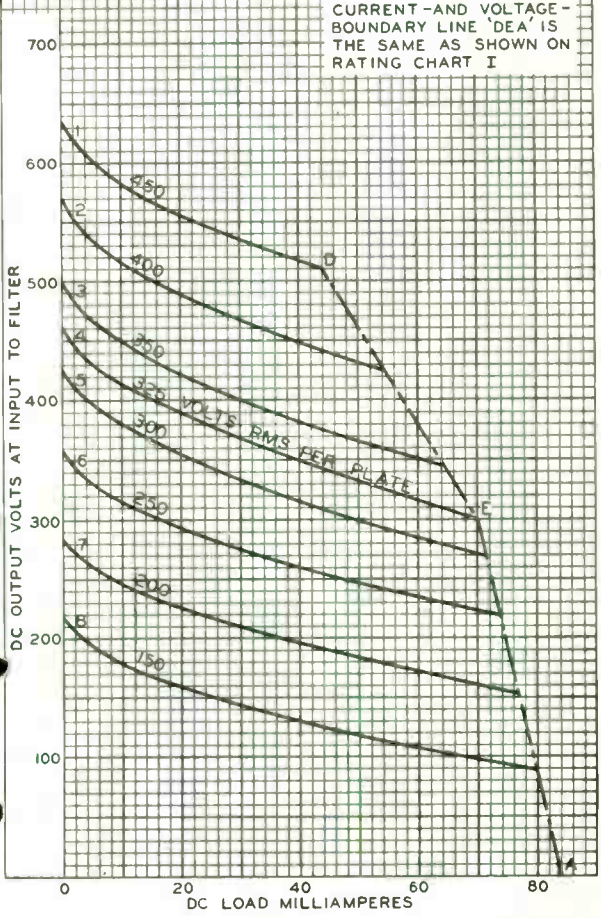
6X4

OPERATION CHARACTERISTICS

FULL-WAVE CIRCUIT, CAPACITOR INPUT TO FILTER

E_f = 6.3 VOLTS
CAPACITOR (C) INPUT TO FILTER: C = 10 μf
TOTAL EFFECTIVE PLATE-SUPPLY RESISTANCE PER PLATE {520 OHMS FOR CURVES 1-5 / 400 OHMS FOR CURVES 6-8
SUPPLY FREQUENCY = 60 CPS

CURRENT-AND VOLTAGE-BOUNDARY LINE 'DEA' IS THE SAME AS SHOWN ON RATING CHART I



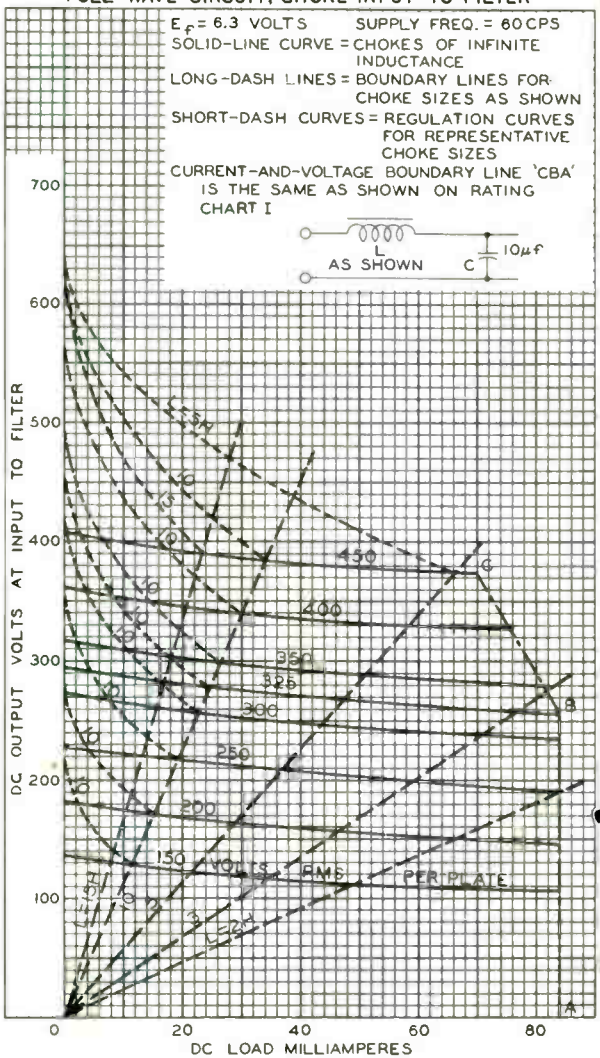
6X4

RCA

6X4

OPERATION CHARACTERISTICS

FULL-WAVE CIRCUIT, CHOKE INPUT TO FILTER

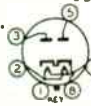


6X5
6X5-GT/G

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

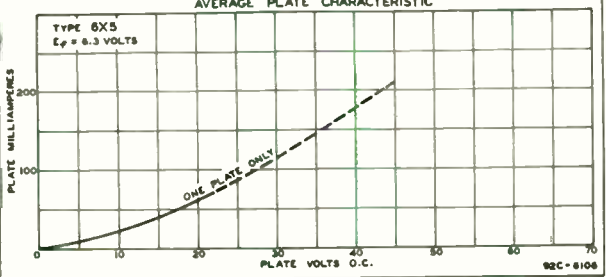
FULL-WAVE RECTIFIER

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 Inout 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.

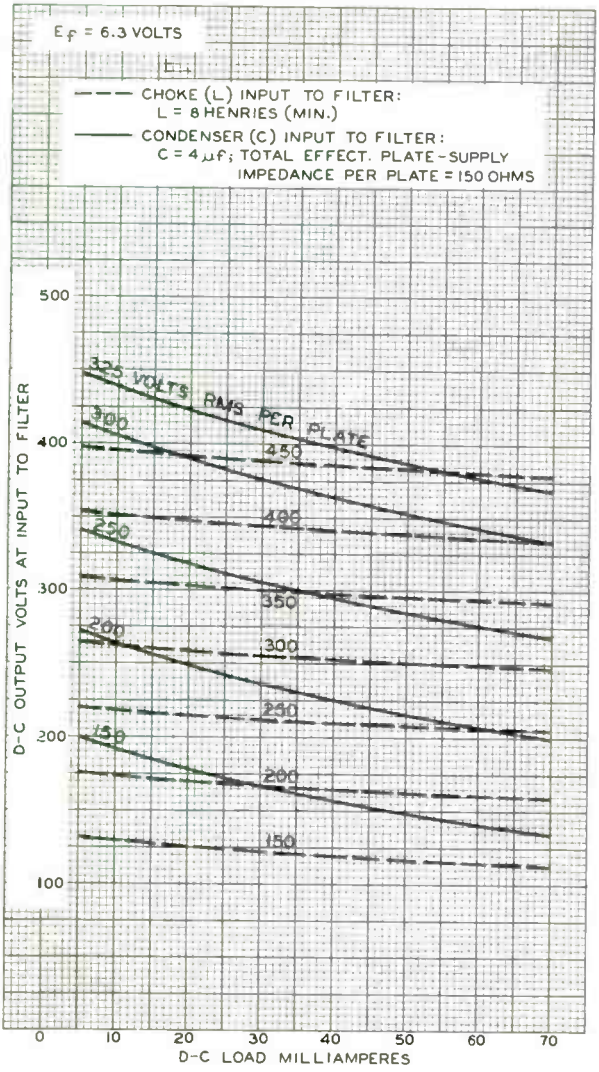
AVERAGE PLATE CHARACTERISTIC



6X5

6X5

OPERATION CHARACTERISTICS



Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage (AC or DC)	6.3 ± 10%		volts
Current at 6.3 volts	0.45		amp
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	0.09 max.	0.06 max.	μμf
Grid No.1 to cathode, grid No.3, grid No.2, and heater	4.6	4.8	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.	0.008 max.	μμf
Heater to cathode	6.5	6.5●	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*		
Plate Voltage	125	100	125	volts
Grid No.3	–	*Connected to cathode at socket*		
Grid-No.2 Voltage	–	70	125	volts
Grid-No.1 Voltage	-1	–	-1	volt
Amplification Factor	40	–	–	
Plate Resistance (Approx.)	6000	–	300000	ohms
Transconductance	6500	5700	5500	μmhos
Plate Current	12	–	9	ma
Grid-No.2 Current	–	–	2.2	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-7	–	-6.5	volts

← Indicates a change.

6X8

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	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

→ AMPLIFIER — Class A_1

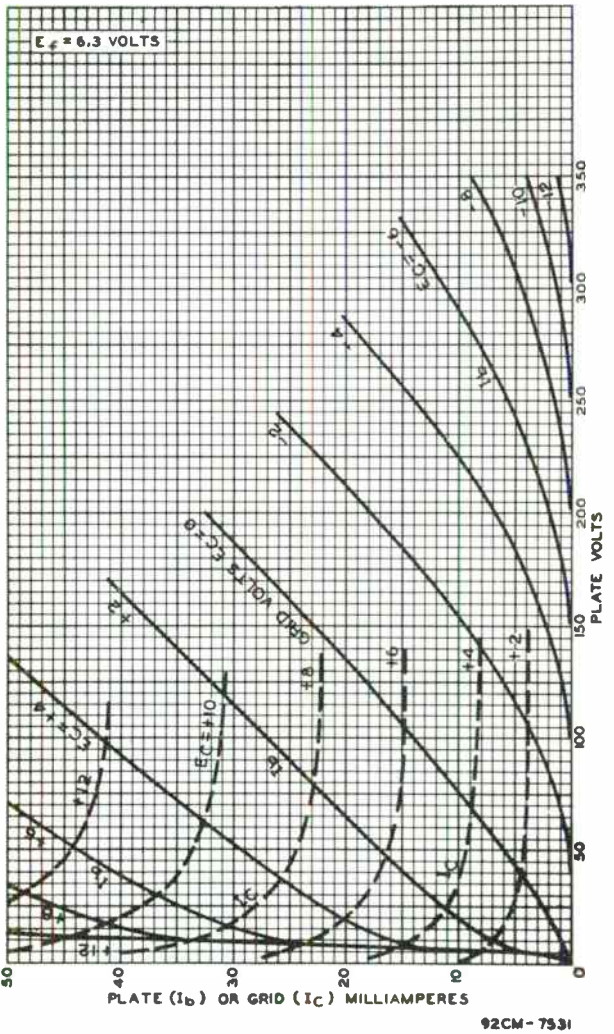
Maximum Ratings, *Design-Maximum Values:*

	Triode Unit	*Pentode Unit*
PLATE VOLTAGE	275 max.	275 max. volts
GRID No.3 (SUPPRESSOR GRID)	–	*Connect to cathode at socket*
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	–	275 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 137.5 volts	–	0.45 max. watt
For grid-No.2 voltages between 137.5 and 275 volts	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*
PLATE DISSIPATION	1.7 max.	2.3 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

▲ With external shield JEDEC NO.315 connected to cathode except as noted.
● With external shield JEDEC NO.315 connected to pentode plate.
★ The dc component must not exceed 100 volts.

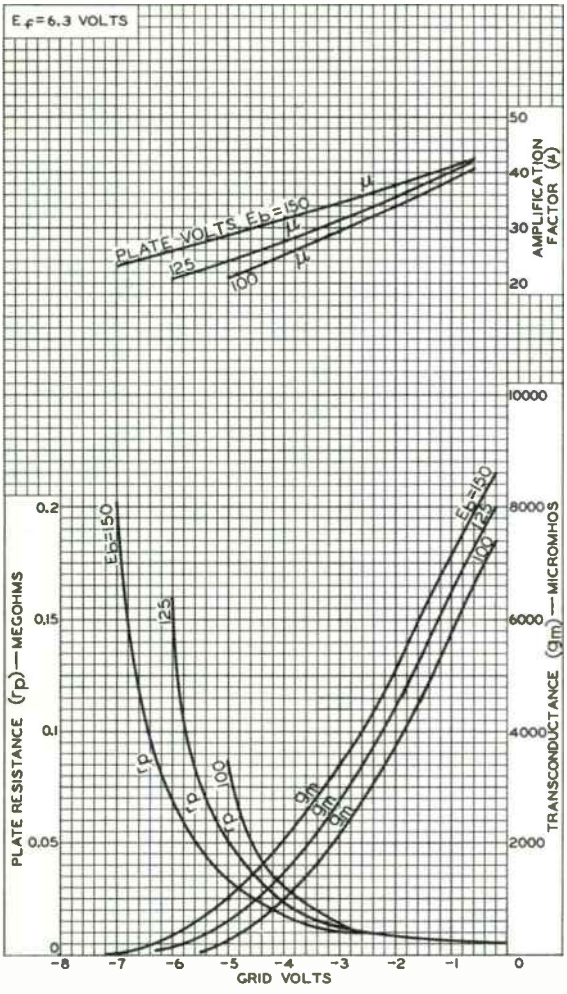
→Indicates a change.

AVERAGE CHARACTERISTICS
Triode Unit



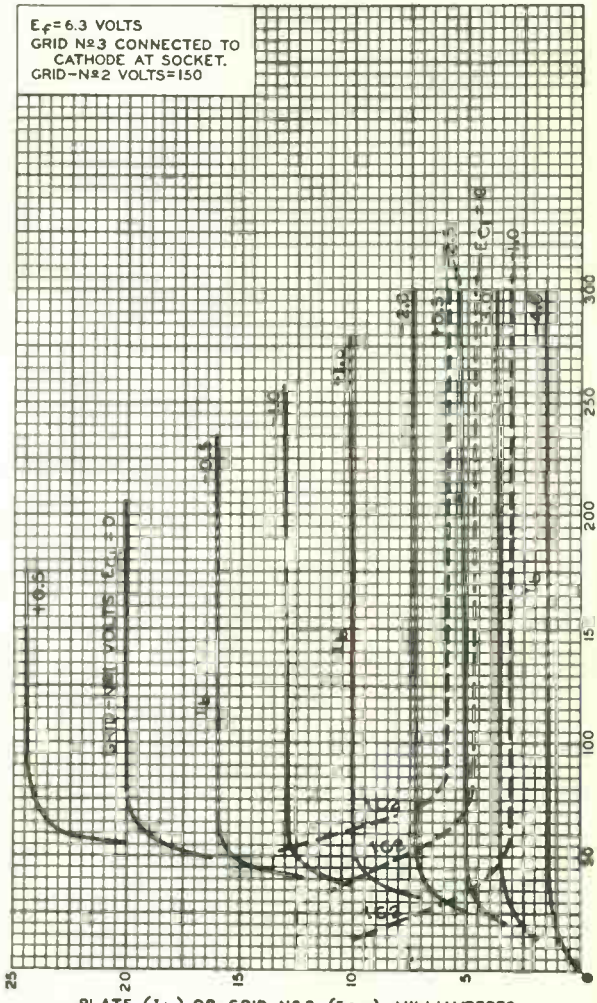
6X8

AVERAGE CHARACTERISTICS
Triode Unit



92CM-10809

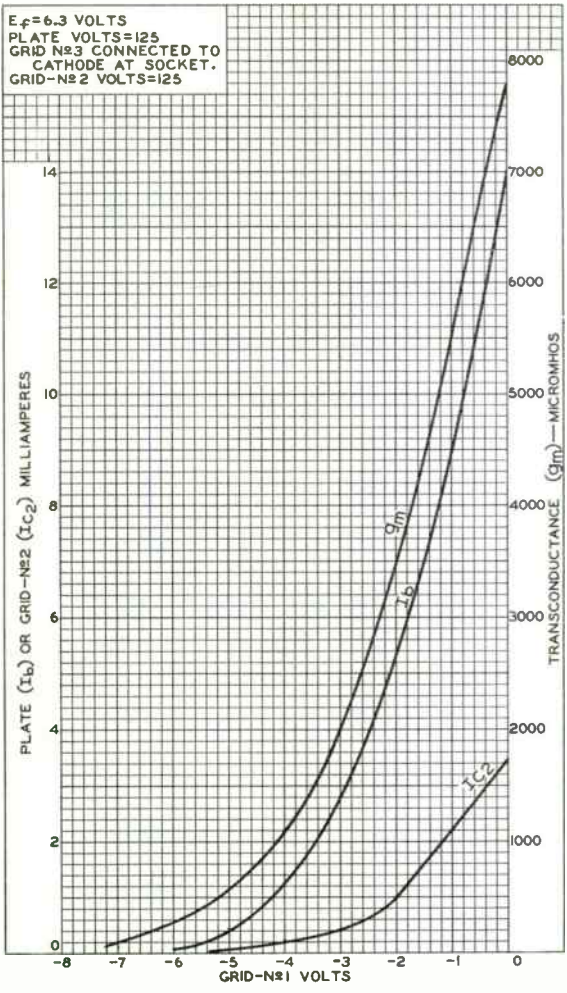
AVERAGE CHARACTERISTICS
Pentode Unit



92CM-7532R1

6X8

AVERAGE CHARACTERISTICS
Pentode Unit



92CM-10810

6Y6-GA
BEAM POWER TUBE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	1.25	amp
Direct Interelectrode Capacitances (Approx.):[o]		
Grid No.1 to plate	0.66	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	7.5	μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	3-7/8"
Maximum Seated Length	3-5/16"
Diameter	1.438" to 1.562"
Bulb	T12
Base. . . Medium-Shell Octal 7-Pin (JEDEC Group 1, No.B7-12), or Short Medium-Shell Octal 7-Pin with External Barriers, Style B (JEDEC Group 1, No.B7-119)	
Basing Designation for BOTTOM VIEW	7S

Pin 1 – No Connection
Pin 2 – Heater
Pin 3 – Plate
Pin 4 – Grid No.2

Pin 5 – Grid No.1
Pin 7 – Heater
Pin 8 – Cathode, Grid No.3

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	200 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	200 max.	volts
GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 100 volts	1.75 max.	watts
For grid-No.2 voltages between 100 and 200 volts	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PLATE DISSIPATION	12.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	180 max.	volts
Heater positive with respect to cathode	180 max.	volts

[o] Without external shield.

6Y6-GA

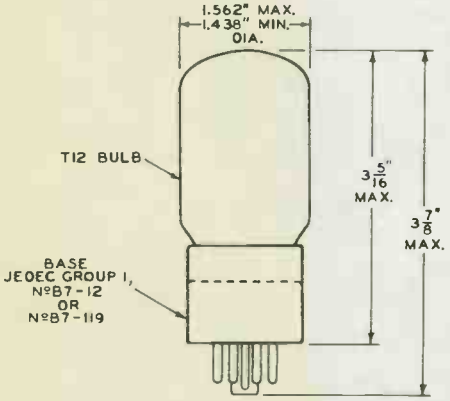
BEAM POWER TUBE

Maximum Circuit Values:

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

Typical Operation and Characteristics:

Plate Voltage	135	200	volts
Grid-No.2 Voltage	135	135	volts
Grid-No.1 Voltage	-13.5	-14	volts
Peak AF Grid-No.1 Voltage	13.5	14	volts
Zero-Signal Plate Current	58	61	ma
Max.-Signal Plate Current	60	66	ma
Zero-Signal Grid-No.2 Current . . .	3.5	2.2	ma
Max.-Signal Grid-No.2 Current . . .	11.5	9	ma
Plate Resistance (Approx.).	9300	18300	ohms
Transconductance.	7000	7100	μmhos
Load Resistance	2000	2600	ohms
Total Harmonic Distortion	10	10	%
Max.-Signal Power Output.	3.6	6	watts



92CS-10248

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