RCA TUBE HANDBOOK HB-3

RECEIVING TUBE SECTION — Part 1

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.

VOLTAGE AMPLIFIERS

LOW-MU TRIODES

Single Unit

•12B4A 27

With Twin Diodes

•12FK6

With Medium-Mu Triode

•12AE7

With Pentode

⊛6AD7G 6F7

MEDIUM-MU TRIODES

Single Unit

1LE3	•3BN4A	•6BN4A	⊛6J5GT
•2BN4	•6BC4	⊛6C5	7A4
•2BN4A	•6BN4	⊛6J5	⊛12J5GT
•3BN4			

Twin Unit

•4BC8	•6BS8	⊛6SN7GTB	•12AV7
•4BQ7A	•6BZ7	7AF7	•12AY7
•4BS8	•6BZ8	•7AU7	⊛12BH7A
•4BZ7	⊛6C8G	7F8	⊛12SN7GT
•5BK7A	•6CG7	7N7	⊛12SN7GTA
•5BQ7A	⊛6F8G	•8CG7	⊛12U7
•5J6	•6FQ7	•8FQ7	14AF7
•6BC8	•6FW8	•9AU7	14F8
•6BK7B	•6J6	⊛12AH7GT	•19J6
•6BQ7A	•6J6A	•12AU7A	

With Twin Diodes

•6BF6	⊛6R7	•12AE6A	•12FM6
•6BJ8	⊛6SR7	•12BF6	⊛12SR7
•6BV8			

With Low-Mu Triode

•12AE7

With High-Mu Triode

•12DW7 •7247

With Tetrode

•5CL8A	•6CL8A	•9CL8	•19CL8A
•5CQ8	•6CQ8	•12DY8	

• Miniature ⊛ Octal ★ Nuvistor

VOLTAGE AMPLIFIERS

With Pentode

•5AT8	•6AN8	•6BR8A	•8AU8
•5AV8	•6AN8A	•6CG8A	•8BA8A
•5B8	•6AT8A	•6CH8	•8BH8
•5BE8	•6AU8	•6CU8	•8CX8
•5BR8	•6AU8A	•6CX8	•9U8A
•5CG8	•6AX8	•6EA8	•12CT8
•5EA8	•6AZ8	•6EH8	•12EC8
•5EU8	•6BA8A	•6EU8	•19EA8
•5U8	•6BH8	•6U8A	•7199
•5X8	•6BR8	•6X8	

With Pentode and Diode

•12FR8

HIGH-MU TRIODES

Single Unit

★2CW4	•6AN4	•6ES5	⊛6SF5
•2ER5	★6CW4	⊛6F5	⊛6SF5GT
•6AB4	★6DS4	•6FH5	7B4
•6AM4	•6ER5	•6GK5	⊛12SF5

Twin Unit

•6AQ8	7F7	•12AZ7A	14F7
•6DT8	•12AT7	•12BZ7	•20EZ7
•6EU7	•12AX7	•12DT8	•7025
⊛6SC7	•12AX7A	⊛12SC7	
⊛6SL7GT	•12AZ7	⊛12SL7GT	

Triple Unit

•6EZ8 •6GY8

With Diode

⊛1H5GT 1LH4

With Twin Diodes

•3AV6	•6Q7	•8BN8	⊛12Q7GT
•4AV6	⊛6Q7GT	•8CN7	⊛12SQ7
•6AQ6	⊛6SQ7	•9BR7	⊛12SQ7GT
⊛6AQ7GT	⊛6SQ7GT	•12AJ6	14B6
•6AT6	7B6	•12AT6	•14GT8
•6AV6	7C6	•12AV6	•18FY6
•6BN8	7K7	•12BR7	•18FY6A
•6CN7	7X7	•12EL6	75
•6FM8			

With Triple Diodes

•5T8	⊛6S8GT	•6T8A	•19T8

Selection Guide for RCA RECEIVING TUBES

VOLTAGE AMPLIFIERS

With Medium-Mu Triode

•12DW7	•7247		

With Pentode

•5CM8	•6EB8	•8AW8A	•10C8
•5DH8	•6GN8	•8EB8	•10HF8
•6AW8A	•6HF8	•8GN8	•35DZ8
•6CM8			

VARIABLE-MU TRIODES

Twin Unit

•4ES8	•6ES8		

SHARP-CUTOFF TETRODES

Single Unit

•2CY5	•4CY5	•6EA5	•6FV6
•3CY5	•6CY5	•6EV5	24A
•3EA5			

With Triode

•5CL8A	•6CL8A	•9CL8	•19CL8A
•5CQ8	•6CQ8		

SHARP-CUTOFF PENTODES

Single Unit

1LN5	•5EW6	•6CF6	7V7
⊕1N5GT	⊕6AB7	•6DC6	7W7
•1U4	⊕6AC7	•6DE6	•12AU6
•3AU6	•6AG5	•6DK6	•12AW6
•3BC5	•6AH6	•6EW6	•12BV7
•3CB6	•6AK5	⊕6J7	•12BY7A
•3CE5	•6AU6	⊕6J7GT	⊕12J7GT
•3CF6	•6AU6A	⊕6SH7	⊕12SJ7
•3DK6	•6BC5	⊕6SJ7	⊕12SH7
•4AU6	•6BH6	⊕6SJ7GT	14C7
•4BC5	6C6	7AG7	•18GD6A
•4CB6	•6CB6	7AH7	•5879
•4DE6	•6CB6A	7C7	•7543
•4EW6	•6CE5	7G7	

Twin Unit

•3BU8	•4GS8/4BU8	•6BU8	•6HS8
•4BU8			

• Miniature ⊕ Octal

VOLTAGE AMPLIFIERS

With Diode

1LD5	•1U5	•5AS8	•6AS8
•1S5	•5AM8	•6AM8A	•6BY8

With Twin Diodes

•5BT8	•5BW8	•6BW8	•8ET7

With Triode

•5AN8	•5X8	•6CH8	•8AU8
•5AT8	•6AN8	•6CM8	•8AW8A
•5AV8	•6AN8A	•6CU8	•8BA8A
•5B8	•6AT8A	•6CX8	•8BH8
•5BE8	•6AU8	•6EA8	•8CX8
•5BR8	•6AU8A	•6EB8	•8EB8
•5CG8	•6AW8A	•6EH8	•8GN8
•5CM8	•6AZ8	•6EU8	•9U8A
•5DH8	•6BA8A	•6FV8	•10C8
•5EA8	•6BH8	•6GN8	•10HF8
•5EU8	•6BR8	•6HF8	•12CT8
•5FV8	•6BR8A	•6U8A	•19EA8
•5U8	•6CG8A	•6X8	•7199

SEMIREMOTE-CUTOFF PENTODES

Single Unit

•3BZ6	•6BZ6	⊕6SG7	•12BZ6
•4BZ6	•6GM6	7H7	⊕12SG7
•5GM6			

With Diode

•1DN5			

With Twin Diodes

⊕6B8	⊕12C8		

With Triode

•6AX8	•12EC8		

REMOTE-CUTOFF PENTODES

Single Unit

1LG5	⊕6K7GT	•12AF6	•12EK6
•1T4	⊕6S7	•12BA6	⊕12K7GT
•3BA6	⊕6SK7	•12BD6	⊕12SK7
•6BA6	⊕6SK7GT	•12BL6	⊕12SK7GT
•6BD6	⊕6SS7	•12CN5	14A7
•6BJ6	7A7	•12CX6	•18FW6
6D6	7B7	•12DZ6	•18FW6A
⊕6K7	•12AC6	•12EA6	78

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

Selection Guide for RCA RECEIVING TUBES

VOLTAGE AMPLIFIERS

With Diode

•6CR6	•6SF7	•12DE8	•12SF7
•6EQ7	•12CR6	•12EQ7	•20EQ7

With Twin Diodes

7E7	7R7	•12F8	14R7

With Triode

6F7

With Triode and Diode

•12FR8

PENTAGRID

•12EG6

BEAM TUBES

Single Unit

•3BN6	•4BN6	•6BN6

POWER AMPLIFIERS

LOW-MU TRIODES

Single Unit

2A3

MEDIUM-MU TRIODES

Single Unit

•6C4

Twin Unit

•6J6	•6J6A	⊛6N7	⊛6N7GT

HIGH-MU TRIODES

Single Unit

⊛6AC5GT

TETRODES

Single Unit

•12K5

POWER AMPLIFIERS

With Diode

•12EM6

With Twin Diode

•12DK7	•12DS7	•12DV8	•12J8
•12DL8	•12DU7		

With Triode

•12AL8

BEAM POWER TUBES

Single Unit

3LF4	⊛6FE5	•12BK5	•34GD5A
⊛3Q5GT	⊛6L6	•12CA5	35A5
•5AQ5	⊛6L6GB	•12CU5/12C5	•35B5
⊛5V6GT	⊛6L6GC	•12DB5	•35C5
•6AQ5A	⊛6V6	•12ED5	•35GL6
•6AS5	⊛6V6GT	⊛12L6GT	⊛35L6GT
•6BF5	⊛6V6GTA	⊛12V6GT	50A5
•6BK5	⊛6W6GT	⊛12W6GT	•50B5
•6CA5	⊛6Y6G	•25BK5	•50C5
•6CM6	⊛6Y6GA	•25C5	⊛50FE5
•6CU5	7A5	•25CA5	⊛50L6GT
•6DB5	7C5	⊛25L6	⊛5881
⊛6DG6GT	•12AB5	⊛25L6GT	•6973
•6DS5	•12AQ5	•34GD5	⊛7027A

With Diode

⊛70L7GT	⊛117L7GT/ 117M7GT	⊛117N7GT	⊛117P7GT

PENTODES

Single Unit

⊛1A5GT	•6BQ5	7B5	42
⊛1C5GT	•6CL6	•8BQ5	43
1LB4	•6EH5	•12DQ7	47
•1S4	⊛6F6	•12EH5	•50EH5
•3Q4	⊛6F6G	•25EH5	•50FK5
•3S4	⊛6F6GT	•32ET5	•60FX5
•3V4	⊛6G6G	•35EH5	•7189
⊛6AG7	⊛6K6GT	41	▲7868
•6AR5			

Twin Unit

⊛6DZ7

With Triode

⊛6AD7G	•35DZ8

• Miniature ⊛ Octal ▲ Novar

CONVERTERS

PENTAGRID

Single Unit

●1A7GT	●6A8	●6SB7Y	●12GA6
●1L6	●6A8G	7B8	●12SA7
1LA6	●6A8GT	7Q7	●12SA7GT
1LC6	●6BA7	●12A8GT	14Q7
●1R5	●6BE6	●12AD6	●18FX6
●3BE6	●6SA7	●12BA7	●18FX6A
6A7	●6SA7GT	●12BE6	

With Triode

●12FX8

OCTODE

7A8

MIXER-OSCILLATORS

TRIODE-TETRODES

●5CL8A	●6CL8A	●9CL8	●19CL8A
●5CQ8	●6CQ8		

TRIODE-PENTODES

●5AT8	●5EU8	●6CG8A	●6X8
●5B8	●5U8	●6EA8	●9U8A
●5BE8	●5X8	●6EH8	●12EC8
●5BR8	●6AT8A	●6EU8	●19EA8
●5CG8	●6BR8	6F7	●19X8
●5EA8	●6BR8A	●6U8A	

TRIODE-HEXODES

●6K8 ●12K8

TRIODE-HEPTODES

7J7

UHF OSCILLATORS

TRIODES

Single Unit

●2AF4A	●3AF4A	●6AF4A	●6T4
●2AF4B	●6AF4		

● Octal ● Miniature

HF OSCILLATORS

TRIODES

Single Unit

●6C4

Twin Unit

●6J6 ●6J6A

MIXERS

TWIN TRIODES

●19J6

PENTAGRID

●6L7

ELECTRON-RAY TUBES

SINGLE INDICATOR

With Triode

6AB5/6N5 6E5 6U5 ●EM84/6FG6

TWIN INDICATOR

●6AF6G

TRIPLE INDICATOR

●6AL7GT

GATED AMPLIFIERS

PENTODE

●6GY6

PENTAGRID

●3BY6	●4CS6	●6BY6	●6CS6
●3CS6			

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

COMPLEX-WAVE-GENERATOR TYPES

DIODE—SHARP-CUTOFF TWIN-PLATE TETRODE
- •6FA7

MEDIUM-MU TRIODE—THREE-PLATE TETRODE
- •6FH8

HIGH-MU TWIN DOUBLE-PLATE TRIODE
- •12FQ8

REGULATOR TUBE

BEAM TRIODE
- ⊛6BK4 (High-Voltage, Low-Current)

FM DETECTORS

PENTODES

•3DT6	•4DT6	•6DT6	•6GX6
•3DT6A	•4DT6A	•6DT6A	

RELAY-CONTROL TUBES

TWIN TRIODE
- •6EV7

TETRODE With Triode
- •12DY8

TELEVISION DEFLECTION TUBES

HORIZONTAL-DEFLECTION OSCILLATORS

Medium-Mu Twin Triodes

•6CG7	•7AU7	•9AU7	•12BH7A
•6FQ7	⊛8CG7	•12AU7A	⊛12SN7GTA
⊛6SN7GTB	⊛8FQ7		

Medium-Mu Triode—Sharp-Cutoff Pentode

•5GH8	•6GH8

• Miniature ⊛ Octal ▲ Novar

TELEVISION DEFLECTION TUBES

HORIZONTAL-DEFLECTION AMPLIFIERS

Beam Power Tubes — Single Unit

⊛6AU5GT	⊛6DQ6A	⊛12DQ6B	⊛17GW6
⊛6AV5GA	⊛6DQ6B	⊛12GC6	⊛18A5
⊛6BG6G	⊛6EX6	▲12GJ5	⊛19BG6GA
⊛6BG6GA	▲6GJ5	▲12GT5	⊛21EX6
⊛6BQ6GTB/ 6CU6	▲6GT5	⊛12GW6	⊛25AV5GA
	⊛6GW6	⊛17BQ6GTB	⊛25BQ6GTB/ 25CU6
⊛6CB5A	⊛12AV5GA	⊛17DQ6A	
⊛6CD6GA	⊛12BQ6GTB/ 12CU6	⊛17DQ6B	⊛25CD6GB
		▲17GJ5	⊛25DN6
⊛6DN6			
⊛6DQ5	⊛12DQ6A	▲17GT5	⊛25EC6

VERTICAL-DEFLECTION OSCILLATORS AND AMPLIFIERS

Medium-Mu Twin Triodes

⊛6BL7GTA	⊛6SN7GTB	•9AU7	•12BH7A
⊛6BX7GT	•7AU7	•12AU7A	⊛12SN7GTA

Medium-Mu Dual Triodes

•6CM7	•6CS7	⊛6DN7	•8CM7

Medium-Mu Triode—Low-Mu Triode

•6DE7	•10DE7	10EW7	•13DE7
6EW7	•10EG7		

High-Mu Triode—Low-Mu Triode

•6CY7	⊛6EM7	⊛10EM7	•13DR7
•6DR7	•10DR7	•11CY7	⊛13EM7
•6EA7			

High-Mu Triode—Sharp-Cutoff Pentode
- •10C8

VERTICAL-DEFLECTION OSCILLATORS

Triode With Pentode

•5FV8	•6FV8

Medium-Mu Twin Triodes

•6CG7	•6FQ7	•8CG7	•8FQ7

VERTICAL-DEFLECTION AMPLIFIERS

Low-Mu Triodes

⊛6AH4GT	⊛6CK4	•12B4A

Medium-Mu Triode
- •6S4A

TELEVISION DEFLECTION TUBES

Medium-Mu Triode With Twin Diodes

- •6BJ8

Beam Power Tubes — Single Unit

•5CZ5	•6DB5	•6EZ5	•12DB5
•6AQ5A	•6DT5	•6V6GTA	•12DT5
•6BF5	•6DW5	•7EY6	•12EN6
•6CM6	•6EM5	•8EM5	•12R5
•6CZ5	•6EY6		

Pentode

- •6K6GT

POWER-SUPPLY RECTIFIERS

HALF-WAVE VACUUM TYPES

Single Unit

1v	35Z3	•36AM3	•50DC4
•35W4	•35Z4GT	•36AM3A	•117Z3
35Y4	•35Z5GT	•36AM3B	

With Beam Power Tube

•70L7GT	•117L7GT/ 117M7GT	•117N7GT	•117P7GT

FULL-WAVE VACUUM TYPES

•3DG4	•5V3	•6AX5GT	•12X4
•5AS4A	•5V3A	•6BW4	25Z5
•5AU4	•5V4GA	•6BY5GA	•25Z6GT
•5AW4	•5X4G	•6CA4	50X6
5AZ4	•5Y3GT	•6X4	•50Y6GT
▲5BC3	•5Y4GA	•6X5GT	•50Y7GT
•5DJ4	•5Y4GT	7Y4	80
•5T4	5Z3	7Z4	84/6Z4
•5U4G	•5Z4	•12BW4	•117Z6GT
•5U4GB			

VOLTAGE-DOUBLER TYPES

25Z5	50X6	•50Y7GT	•117Z6GT
•25Z6GT	•50Y6GT		

FULL-WAVE GAS TYPES

•0Z4	•0Z4A	•0Z4G

• Miniature • Octal ▲ Novar

HIGH-VOLTAGE RECTIFIERS

HALF-WAVE VACUUM TYPES#

•1AX2	•1J3	•1V2	•3A2
•1B3GT	•1K3	•1X2A	•3A3
•1G3GT/ 1B3GT	•1N2A	•1X2B	•3B2

DAMPER TUBES

HALF-WAVE VACUUM TYPES

•6AF3	•6DM4	•12DM4	•17H3
•6AU4GTA	•6V3A	•17AX4GT	•19AU4
•6AX4GT	•6W4GT	•17AX4GTA	•19AU4GTA
•6AX4GTB	•12AF3	▲17AY3	▲22BH3
▲6AY3	•12AX4GTA	▲17BH3	•22DE4
▲6BH3	•12AX4GTB	•17D4	•25AX4GT
•6DA4	▲12AY3	•17DE4	•25W4GT
•6DE4	•12D4	•17DM4	

FULL-WAVE VACUUM TYPE

- •6BY5GA

DETECTOR DIODES

VACUUM TYPES*

Single Unit

- •1A3

Twin Unit

•2EN5	•6AL5	7A6	•12H6
•3AL5	•6H6	•12AL5	

Triple Unit

•6BC7	•6BJ7

For low-current pulsed- or rf-rectifier applications.

* For diode detectors with amplifier units, see VOLTAGE AMPLIFIERS and POWER AMPLIFIERS.

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

OA2

150

VOLTAGE REGULATOR

MINIATURE GLOW-DISCHARGE TYPE

GENERAL DATA

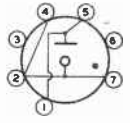
Electrical:

Cathode. . . . . Cold

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"
Weight (Approx.) . . . . . 0.3 oz ←
Bulb T-5-1/2
Base . . . . . Small-Button Miniature 7-Pin (JETEC No. E7-1) ←
Basing Designation for BOTTOM VIEW 5B0

Pin 1 – Anode
Pin 2 – Cathode
Pin 3 – Internal Connection – Do Not Use
Pin 4 – Cathode



Pin 5 – Anode
Pin 6 – Internal Connection – Do Not Use
Pin 7 – Cathode

Maximum and Minimum Ratings, *Absolute Values*:

AVERAGE STARTING CURRENT♦	75 max.	ma
DC CATHODE CURRENT	30 max.	ma
	5 min.	ma
FREQUENCY.	0 max.	cps ←
AMBIENT-TEMPERATURE RANGE.	-55 to +90	°C

Circuit Values:

Shunt Capacitor. . . . . 0.1 max. μμf
Series Resistor. . . . . *See Operating Considerations*

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN ←

	Min.	*Av.*	*Max.*	
DC Anode-Supply Voltage.	185■	–	–	volts
Anode Breakdown Voltage.	–	156	185*	volts
Anode Voltage Drop	140●	151	168*	volts
Regulation (5 to 30 ma).	–	2	6*	volts

♦ Averaged over starting period not exceeding 10 seconds. This starting period must be followed by a steady-state operating condition of at least 20 minutes, or tube performance will be impaired.

■ Not less than indicated supply voltage should be provided to insure "starting" throughout tube life.

* Maximum individual tube value during useful life.

● Minimum individual tube value during useful life.

←Indicates a change.

OA2

OA2
VOLTAGE REGULATOR

OPERATING CONSIDERATIONS

Sufficient resistance must always be used in series with the OA2 to limit the current through the tube. The value for the series resistor is dependent on the maximum anode-supply voltage and the ratio of the current through the load to the operating current of the OA2, and should be chosen to limit the operating current through the tube to 30 milliamperes at all times after the starting period.

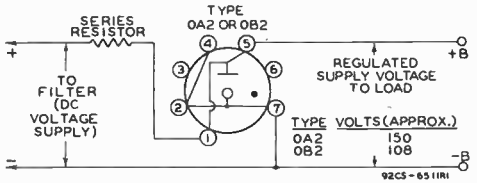
The maximum load current that can be regulated by the OA2 is determined by the minimum and maximum values of the supply voltage. After the value of series resistor for the maximum supply voltage has been calculated as indicated above, it is then in order to determine if this value will permit adequate starting voltage when the supply voltage falls to its minimum value. If adequate starting voltage is not obtained, a new load current of lower value must be used and the calculations repeated. It will be apparent from such calculations that the higher the minimum supply voltage and the smaller the difference between its minimum and maximum values, the higher will be the load current that can be regulated.

When equipment utilizing the OA2 is "turned on", a starting current in excess of the average operating current is permissible as indicated under Maximum Ratings. When the tube is subjected to such high starting currents, the regulated voltage may require up to 20 minutes to drop to its normal operating value. This performance is characteristic of voltage-regulator tubes of the glow-discharge type. Similarly, the regulation is affected by changes in current within the operating current range. For example, the regulation of a tube operated for a protracted period at 5 milliamperes and then changed to 25 milliamperes, may be somewhat different from the value that will be obtained after a long period of operation at 25 milliamperes. Likewise, the regulation may change somewhat after a long idle period.

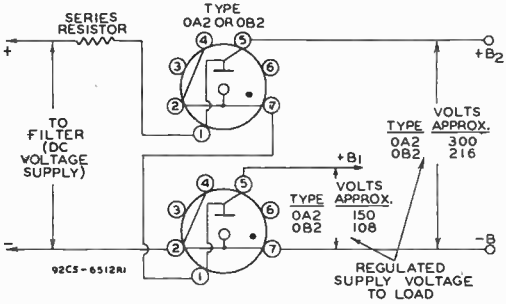
In order to handle more load current, two or more OA2's may be operated in parallel, but such parallel operation requires that a resistance of approximately 100 ohms be used in series with each OA2 in order to equalize division of the current between the paralleled tubes. The disadvantage of this method, of course, is that the use of resistors impairs the regulation which can be obtained.

If the associated circuit has a capacitor in shunt with the OA2, the capacitor should be limited in value to 0.1 μf. A larger value may cause the OA2 to oscillate and thus give unstable regulation performance.

OA2
VOLTAGE REGULATOR



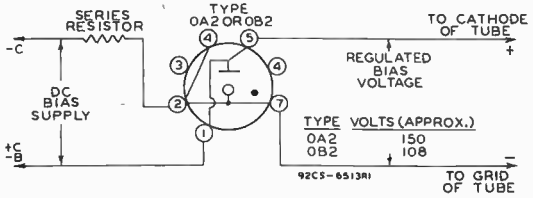
Typical circuit to provide regulated supply voltage of approximately 150 or 108 volts to load. Removal of tube from socket removes voltage from load.



Typical circuit using two OA2's or two OB2's to provide regulated supply voltages of approximately 300 or 216 volts and 150 or 108 volts to load. Socket connections are so made that voltage on load is removed when either tube is taken from its socket.

CIRCUIT FOR BIAS-SUPPLY REGULATION IS SHOWN ON NEXT PAGE.

OA2
VOLTAGE REGULATOR



Typical circuit for bias-supply regulation. Removal of tube from socket opens B-supply circuit of regulated tubes.

OA3

VOLTAGE REGULATOR

GLOW-DISCHARGE TYPE

GENERAL DATA

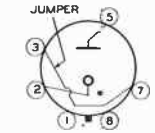
Electrical:

Cathode . . . . . Cold

Mechanical:

Mounting Position . . . . . Any
Maximum Overall Length . . . . . 4-1/8"
Seated Length . . . . . 3-3/8" ± 3/16" ←
Maximum Diameter . . . . . 1-9/16"
Dimensional Outline . . . . . *See General Section*
Weight (Approx.) . . . . . 1.3 oz ←
Bulb ST-12
Base . . . . . Small-Shell Octal 6-Pin (JETEC No. B6-3) ←
Basing Designation for BOTTOM VIEW 4AJ

Pin 1 – No Connection
Pin 2 – Cathode
Pin 3 – Jumper▲



Pin 5 – Anode
Pin 7 – Jumper▲
Pin 8 – No Connection

Maximum and Minimum Ratings, *Absolute Values:*

AVERAGE STARTING CURRENT♦	100 max.	ma
DC CATHODE CURRENT	40 max. 5 min.	ma ma
FREQUENCY	0 max,	cps ←
AMBIENT-TEMPERATURE RANGE	-55 to +90	°C

Circuit Values: ←

Shunt Capacitor	0.1 max.	μf
Series Resistor	*See Operating Considerations*	

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN ←

	Min.	*Av.*	*Max.*	
DC Anode-Supply Voltage	105■	–	–	volts
Anode Breakdown Voltage	–	100	105*	volts
Anode Voltage Drop	68●	75	85*	volts
Regulation (5 to 40 ma)	–	5	6.5*	volts

▲ With suitable socket connections, jumper within base acts as a switch to open power-supply circuit when voltage regulator tube is removed from socket.

♦ Averaged over starting period not exceeding 10 seconds. This starting period must be followed by a steady-state operating condition of at least 20 minutes, or tube performance will be impaired.

■ Not less than indicated supply voltage should be provided to insure "starting" throughout tube life.

* Maximum individual tube value during useful life.

● Minimum individual tube value during useful life.

← Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

OA3

VOLTAGE REGULATOR

OPERATING CONSIDERATIONS

Sufficient resistance must always be used in series with the OA3 to limit the current through the tube. The value for the series resistor is dependent on the maximum anode-supply voltage and the ratio of the current through the load to the operating current of the OA3, and should be chosen to limit the operating current through the tube to 40 milliamperes at all times after the starting period.

The maximum load current that can be regulated by the OA3 is determined by the minimum and maximum values of the supply voltage. After the value of series resistor for the maximum supply voltage has been calculated as indicated above, it is then in order to determine if this value will permit adequate starting voltage when the supply voltage falls to its minimum value. If adequate starting voltage is not obtained, a new load current of lower value must be used and the calculations repeated. It will be apparent from such calculations that the higher the minimum supply voltage and the smaller the difference between its minimum and maximum values, the higher will be the load current that can be regulated.

When equipment utilizing the OA3 is "turned on", a starting current in excess of the average operating current is permissible as indicated under Maximum Ratings. When the tube is subjected to such high starting currents, the regulated voltage may require up to 20 minutes to drop to its normal operating value. This performance is characteristic of voltage-regulator tubes of the glow-discharge type. Similarly, the regulation is affected by changes in current within the operating-current range. For example, the regulation of a tube operated for a protracted period at 5 milliamperes and then changed to 35 milliamperes, may be somewhat different from the value that will be obtained after a long period of operation at 35 milliamperes. Likewise, the regulation may change somewhat after a long idle period.

In order to handle more load current, two or more OA3's may be operated in parallel, but such parallel operation requires that a resistance of approximately 100 ohms be used in series with each OA3 in order to equalize division of the current between the paralleled tubes. The disadvantage of this method, of course, is that the use of resistors impairs the regulation which can be obtained.

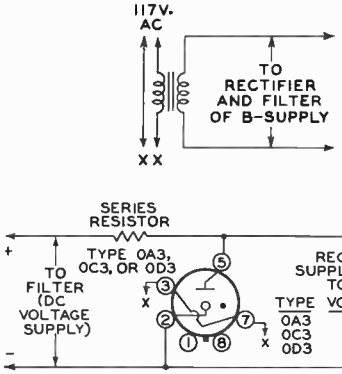
If the associated circuit has a capacitor in shunt with the OA3, the capacitor should be limited in value to 0.1 μf. A larger value may cause the OA3 to oscillate and thus give unstable regulation performance.

→ Indicates a change.

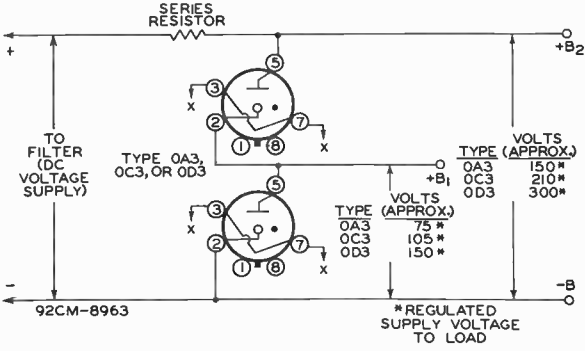
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

OA3

VOLTAGE REGULATOR



Typical circuit to provide regulated supply voltage of approximately 75, 105, or 150 volts to load. Removal of tube from socket removes voltage from load.



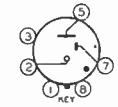
Typical circuit using two OA3's, two OC3's, or two OD3's to provide regulated supply voltages of approximately 150, 210, or 300 volts and 75, 105, or 150 volts to load. Socket connections are so made that voltage on load is removed when either tube is taken from its socket.

0A4-G

GAS-TRIODE

COLD-CATHODE STARTER-ANODE TYPE

Maximum Overall Length	4-1/8"
Maximum Diameter	1-9/16"
Bulb	ST-12
Base	Small Shell Octal 6-Pin
Pin 1 – No Connection	Pin 5 – Anode
Pin 2 – Cathode	Pin 7 – Starter-Anode
Pin 3 – No Connection	Pin 8 – No Connection



BOTTOM VIEW

CHARACTERISTICS

Peak Anode Breakdown Voltage (Starter anode tied to cathode)	225 min.	volts
Peak Positive Starter-Anode Breakdown Voltage	70 min. 90 max.	volts volts
Starter-Anode Current (For transition of discharge to anode at 140 volts peak)	100 max.	μamp.
Starter-Anode Drop	60 approx.	volts
Anode Drop	70 approx.	volts

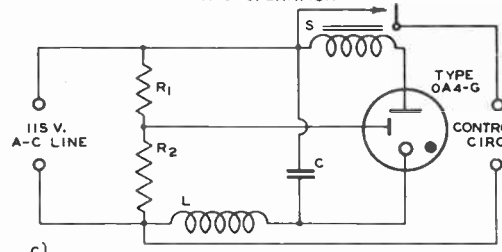
MAXIMUM RATINGS and TYPICAL OPERATING CONDITIONS

Relay Service

Peak Cathode Current	100 max.	ma.
D-C Cathode Current	25 max.	ma.
Typical Operation with A-C Supply:		
Anode-Supply Voltage (RMS)	105 – 130	volts
A-C Starter-Anode Voltage (peak)	70 max.	volts
R-F Starter-Anode Voltage (peak)	55 min.	volts
Sum of A-C and R-F Starter-Anode Voltages (peak)	110 min.	volts

SCHEMATIC RELAY CIRCUIT USING TYPE 0A4-G

A-C OPERATION



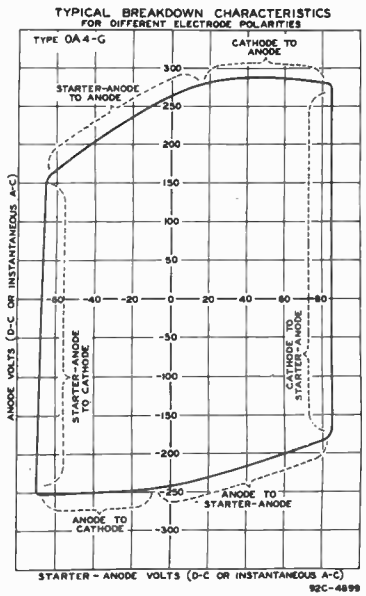
C, L = HIGH-Q TUNED CIRCUIT FOR R-F SIGNAL

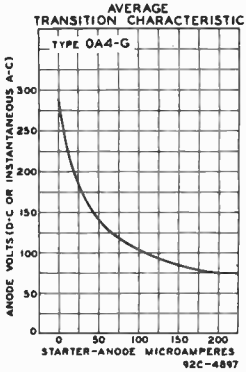
R_1 = 15000 OHMS (½ WATT)

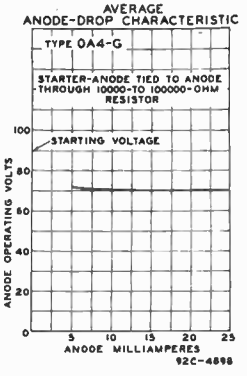
R_2 = 10000 OHMS (½ WATT)

S = RELAY – CHOSEN FOR DESIGN REQUIREMENTS

0A4-G
GAS-TRIODE







OB2

OB2

VOLTAGE REGULATOR

MINIATURE GLOW-DISCHARGE TYPE

GENERAL DATA

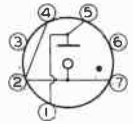
Electrical:

Cathode . . . . . Cold

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"
Weight (Approx.) . . . . . 0.3 oz ←
Bulb T-5-1/2
Base . . . . . Small-Button Miniature 7-Pin (JETEC No.E7-1) ←
Basing Designation for BOTTOM VIEW 5BO

Pin 1 – Anode
Pin 2 – Cathode
Pin 3 – Internal Connection–Do Not Use
Pin 4 – Cathode



Pin 5 – Anode
Pin 6 – Internal Connection–Do Not Use
Pin 7 – Cathode

Maximum and Minimum Ratings, *Absolute Values*:

AVERAGE STARTING CURRENT♦	75 max.	ma
DC CATHODE CURRENT	30 max.	ma
	5 min.	ma
FREQUENCY	0 max.	cps ←
AMBIENT-TEMPERATURE RANGE	-55 to +90	°C

Circuit Values:

Shunt Capacitor	0.1 max.	μμf
Series Resistor	*See note below*	

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN ←

	Min.	*Av.*	*Max.*	
DC Anode-Supply Voltage . . .	133■	–	–	volts
Anode Breakdown Voltage . . .	–	115	133*	volts
Anode Voltage Drop	101●	108	114*	volts
Regulation (5 to 30 ma.) . . .	–	1	4*	volts

♦ Averaged over starting period not exceeding 10 seconds. This starting period must be followed by a steady-state operating condition of at least 20 minutes, or tube performance will be impaired.

■ Not less than indicated supply voltage should be provided to insure "starting" throughout tube life.

* Maximum individual tube value during useful life.

● Minimum individual tube value during useful life.

The operating considerations and circuit information shown under Type OA2 also apply to Type OB2

←Indicates a change.

RCA

OC2

VOLTAGE REGULATOR

7-PIN MINIATURE, 75-VOLT, GLOW-DISCHARGE TYPE

GENERAL DATA

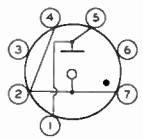
Electrical:

Cathode . . . . . Cold

Mechanical:

Operating Position . . . . . Any
Maximum Overall Length . . . . . 2.63"
Maximum Seated Length . . . . . 2.38"
Length, Base Seat to Bulb Top (Excluding tip). 2.00" ± 0.09"
Maximum Diameter . . . . . 0.75"
Dimensional Outline . . . . . *See General Section*
Bulb T5-1/2
Base . . . . . Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW 5B0

Pin 1 – Anode
Pin 2 – Cathode
Pin 3 – Internal Connection—Do Not Use
Pin 4 – Cathode



Pin 5 – Anode
Pin 6 – Internal Connection—Do Not Use
Pin 7 – Cathode

Maximum and Minimum Ratings, *Absolute Values:*

AVERAGE STARTING CURRENT▲	75 max.	ma
DC CATHODE CURRENT	30 max.	ma
	5 min.	ma
FREQUENCY	0 max.	cps
AMBIENT-TEMPERATURE RANGE	-55 to +90	°C

Maximum Circuit Values:

Shunt Capacitance	0.1 max.	μf

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Min.	*Av.*	*Max.*	
DC Anode-Supply Voltage	*	–	–	volts
Anode Breakdown Voltage:				
Under total darkness	–	–	145**	volts
Under normal ambient light conditions	–	105	115**	volts
Anode Voltage Drop	68●	75	83	volts
Regulation (5 to 30 ma.)	–	3	4.5	volts

▲ Averaged over starting period not exceeding 10 seconds. This starting period must be followed by a steady-state operating condition of at least 20 minutes, or tube performance will be impaired.

* The minimum value to insure "starting" throughout tube life must be equal to the anode breakdown voltage plus the voltage drop across the series resistor at the maximum value of the load current.

** Maximum individual tube value during useful life.

● Minimum individual tube value during useful life.

TENTATIVE DATA

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

RCA

OC2

VOLTAGE REGULATOR

OPERATING CONSIDERATIONS

Sufficient resistance must always be used in series with the OC2 to limit the current through the tube.

The value for the series resistor is dependent on the dc supply voltage, anode voltage drop, load current, and cathode current and should be chosen to limit the operating current through the tube to 30 milliamperes at all times after the starting period.

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

OC3

VOLTAGE REGULATOR

GLOW-DISCHARGE TYPE

GENERAL DATA

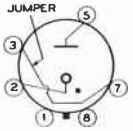
Electrical:

Cathode . . . . . Cold

Mechanical:

Mounting Position . . . . . Any
Maximum Overall Length. . . . . 4-1/8"
Seated Length . . . . . 3-3/8" ± 3/16" ←
Maximum Diameter. . . . . 1-9/16"
Dimensional Outline . . . . . *See General Section*
Weight (Approx.). . . . . 1.3 oz ←
Bulb. ST-12
Base. . . . . Small-Shell Octal 6-Pin (JETEC No. B6-3) ←
Basing Designation for BOTTOM VIEW. 4AJ

Pin 1 – No Connection
Pin 2 – Cathode
Pin 3 – Jumper▲



Pin 5 – Anode
Pin 7 – Jumper▲
Pin 8 – No Connection

Maximum and Minimum Ratings, *Absolute Values:*

AVERAGE STARTING CURRENT♦	100 max.	ma
DC CATHODE CURRENT	40 max.	ma
	5 min.	ma
FREQUENCY	0 max.	cps ←
AMBIENT-TEMPERATURE RANGE	-55 to +90	°C

Circuit Values: ←

Shunt Capacitor	0.1 max.	μf
Series Resistor	*See note below*	

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN ←

	Min.	*Av.*	*Max.*	
DC Anode-Supply Voltage	133■	–	–	volts
Anode Breakdown Voltage	–	115	133*	volts
Anode Voltage Drop	103●	108	116*	volts
Regulation (5 to 40 ma)	–	2	4*	volts

▲ With suitable socket connections, jumper within base acts as a switch to open power-supply circuit when voltage regulator tube is removed from socket.

♦ Averaged over starting period not exceeding 10 seconds. This starting period must be followed by a steady-state operating condition of at least 20 minutes, or tube performance will be impaired.

■ Not less than indicated supply voltage should be provided to insure "starting" throughout tube life.

* Maximum individual tube value during useful life.

● Minimum individual tube value during useful life.

The operating considerations and circuit information shown under Type OA3 also apply to Type OC3

← Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

OD3
VOLTAGE REGULATOR

GLOW-DISCHARGE TYPE

GENERAL DATA

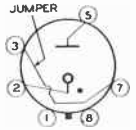
Electrical:

Cathode . . . . . Cold

Mechanical:

Mounting Position . . . . . Any
Maximum Overall Length. . . . . 4-1/8"
→ Seated Length . . . . . 3-3/8" ± 3/16"
Maximum Diameter. . . . . 1-9/16"
Dimensional Outline . . . . . *See General Section*
→ Weight (Approx.). . . . . 1.3 oz
Bulb ST-12
→ Base . . . . . Small-Shell Octal 6-Pin (JETEC No. B6-3)
Basing Designation for BOTTOM VIEW. 4AJ

Pin 1 – No Connection
Pin 2 – Cathode
Pin 3 – Jumper▲



Pin 5 – Anode
Pin 7 – Jumper▲
Pin 8 – No Connection

Maximum and Minimum Ratings, *Absolute Values:*

AVERAGE STARTING CURRENT♦	100 max.	ma
DC CATHODE CURRENT.	40 max. 5 min.	ma ma
→ FREQUENCY	0 max.	cps
AMBIENT-TEMPERATURE RANGE	-55 to +90	°C

→ **Circuit Values:**

Shunt Capacitor	0.1 max.	μf
Series Resistor	*See note below*	

→ **CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN**

	Min.	*Av.*	*Max.*	
DC Anode-Supply Voltage	185■	–	–	volts
Anode Breakdown Voltage	–	160	185*	volts
Anode Voltage Drop.	142●	153	165*	volts
Regulation (5 to 40 ma)	–	4	5.5*	volts

▲ With suitable socket connections, jumper within base acts as a switch to open power-supply circuit when voltage regulator tube is removed from socket.

♦ Averaged over starting period not exceeding 10 seconds. This starting period must be followed by a steady state operating condition of at least 20 minutes, or tube performance will be impaired.

■ Not less than indicated supply voltage should be provided to insure "starting" throughout tube life.

* Maximum individual tube value during useful life.

● Minimum individual tube value during useful life.

The operating considerations and circuit information shown under Type OA3 also apply to Type OD3

→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

Full-Wave Gas Rectifier

METAL TYPE HAVING IONICALLY HEATED CATHODE

GENERAL DATA

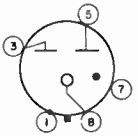
Electrical:

Cathode . . . . . Ionically Heated Type

Mechanical:

Operating Position. . . . . Any
Maximum Overall Length. . . . . 2-5/8"
Maximum Seated Length . . . . . 2-1/16"
Maximum Diameter. . . . . 1-5/16"
Dimensional Outline . . . . . See *General Section*
Envelope. . . . . .Metal Shell MT8G
Base. . . .Small-Wafer Octal 5-Pin (JEDEC Group 1, No.B5-215)
Basing Designation for BOTTOM VIEW. 4R

Pin 1 - Shell
Pin 3 - Plate No.2
Pin 5 - Plate No.1



Pin 7 - No Connection
Pin 8 - Cathode

FULL-WAVE RECTIFIER

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

PEAK INVERSE PLATE VOLTAGE PER PLATE. . . .	880 max.	volts
PEAK STARTING SUPPLY VOLTAGE PER PLATE. . .	300▲ min.	volts
PEAK PLATE CURRENT PER PLATE.	270 max.	ma
DC OUTPUT CURRENT	90 max.	ma
	30▲ min.	ma

Typical Operation:

With vibrator-type power supply and capacitor input to filter

Peak Plate Supply Voltage Per Plate●	380	volts
Filter-Input Capacitor.	8	μf
Total Effective Plate Supply Impedance Per Plate.	800	ohms
DC Output Voltage at input to filter.	275	volts
DC Output Current	65	ma

Characteristics:

Tube Voltage Drop for plate ma. =90 (Per plate). .	24	volts

Minimum Circuit Value:

Total Effective Plate Supply Impedance Per Plate	300 min.	ohms

▲ Absolute value. Under no circumstances should the tube be operated with less than this value.

● Open-circuit voltage—flat portion of transformer voltage wave.

← Indicates a change.

Full-Wave Gas Rectifier

METAL TYPE HAVING IONICALLY HEATED CATHODE

GENERAL DATA

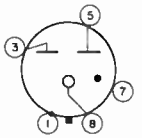
Electrical:

Cathode . . . . . Ionically Heated Type

Mechanical:

Operating Position. . . . . Any
Maximum Overall Length. . . . . 2-5/8"
Maximum Seated Length . . . . . 2-1/16"
Maximum Diameter. . . . . 1-5/16"
Dimensional Outline . . . . . See *General Section*
Envelope. . . . . .Metal Shell MT8G
Base. . . .Small-Wafer Octal 5-Pin (JEDEC Group 1, No.B5-215)
Basing Designation for BOTTOM VIEW. 4R

Pin 1 - Shell
Pin 3 - Plate No.2
Pin 5 - Plate No.1



Pin 7 - No Connection
Pin 8 - Cathode

FULL-WAVE RECTIFIER

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

PEAK INVERSE PLATE VOLTAGE PER PLATE. . . .	880	max.	volts
PEAK STARTING-SUPPLY VOLTAGE PER PLATE. . .	300▲	min.	volts
PEAK PLATE CURRENT PER PLATE.	330	max.	ma
DC OUTPUT CURRENT	110	max.	ma
	30▲	min.	ma

Typical Operation:

With vibrator-type power supply and capacitor input to filter

Peak Plate Supply Voltage Per Plate●.	440	volts
Filter-Input Capacitor.	8	μf
Total Effective Plate Supply Impedance Per Plate .	600	ohms
DC Output Voltage at input to filter.	310	volts
DC Output Current	100	ma

Characteristics:

Tube Voltage Drop for plate ma. = 110 (Per plate) .	24	volts

Minimum Circuit Value:

Total Effective Plate Supply Impedance Per Plate.	300 min.	ohms

▲ Absolute value. Under no circumstances should the tube be operated with less than this value.

● Open-circuit voltage—flat portion of transformer voltage wave.

Full-Wave Gas Rectifier

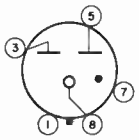
IONICALLY HEATED CATHODE TYPE

The OZ4-G is the same as the OZ4 except for the following items:

Mechanical:

Operating Position. . . . . Any
Maximum Overall Length. . . . . 2-5/8"
Maximum Seated Length . . . . . 2-1/16"
Maximum Diameter. . . . . 1-1/16"
Bulb. T7
Base. . . . Dwarf-Shell Octal 5-Pin (JEDEC Group 1, No.B5-45)
Basing Designation for BOTTOM VIEW. 4R

Pin 1 – No Connection
Pin 3 – Plate No.2
Pin 5 – Plate No.1



Pin 7 – No Connection
Pin 8 – Cathode

1A3

H-F DIODE
MINIATURE TYPE

Heater	Coated Unipotential Cathode	
Voltage	1.4	a-c or d-c volts
Current	0.15	amp.
Direct Interelectrode Capacitances (Approx.):°		
Plate to Cathode	0.4	μμf
Plate to Heater	0.8	μμf
Heater to Cathode	0.6	μμf
Maximum Overall Length		2-1/8"
Maximum Seated Height		1-7/8"
Length from Base Seat to Bulb Top (excluding tip)		1-1/2" ± 3/32"
Maximum Diameter		3/4"
Bulb		T-5-1/2
Base▲		Miniature Button 7-Pin
Pin 1-Heater		Pin 5 {Internal Con. / Do Not Use
Pin 2-Plate		Pin 6-Plate
Pin 3-Cathode		Pin 7-Heater
Pin 4-No Connection		

BOTTOM VIEW ($5AP_2$)

RCA Socket	Stock No.9914
Mounting Position	Any

Maximum Ratings Are Design-Center Values

RECTIFIER

Peak Inverse Plate Voltage	330 max.	volts
Peak Plate Current	5 max.	ma.
D-C Output Current	0.5 max.	ma.
D-C Heater-Cathode Potential	140 max.	volts
Typical Operation with Condenser-Input Filter:		
A-C Plate Supply Voltage (RMS)	117	volts
Filter Input Condenser	2	μf
Min. Total Effective Plate-Supply Impedance	0	ohms

The resonant frequency of the 1A3 is approximately 1000 Mc.
°With no external shield.

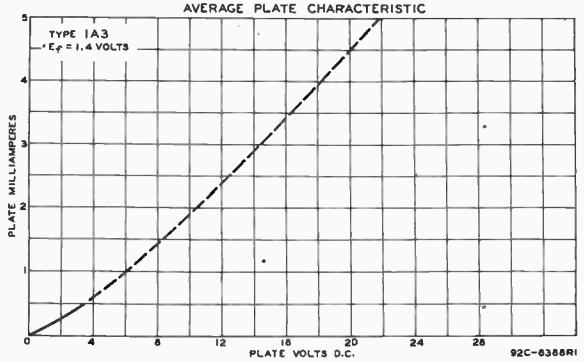
▲ *The center hole in sockets designed for this base provides for the possibility that this tube type may be manufactured with the exhaust-tube tip at the base end. For this reason, it is recommended that in equipment employing this tube type, no material be permitted to obstruct the socket hole.*

◄ Indicates a change

1A3

H-F DIODE

AVERAGE PLATE CHARACTERISTIC



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

RCA

1A4-P

SUPER-CONTROL R-F AMPLIFIER PENTODE

Filament	Coated		
Voltage	2.0		d-c volts
Current	0.060		amp.
Direct Interelectrode Capacitances:			
Grid to Plate (with shield-can)		0.007 max.	μμf
Input		5	μμf
Output		11	μμf
Overall Length		4-9/32" to 4-17/32"	
Maximum Diameter		1-9/16"	
Bulb		ST-12	
Cap	② ③	Small Metal	
Base		Small 4-Pin	
Pin 1-Filament +		Pin 4-Filament -	
Pin 2-Plate	① ④	Cap -Grid	
Pin 3-Screen			

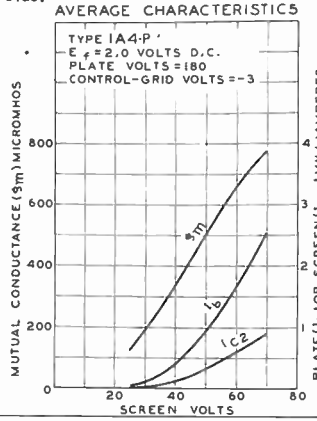
BOTTOM VIEW

AMPLIFIER - Class A

Operating Conditions and Characteristics:			
Filament	2.0	2.0	d-c volts
Plate	90	180 max.	volts
Screen	67.5	67.5 max.	volts
Grid	-3	-3	min.volts
Amp. Fact.	425	750	
Plate Res.	0.6	1.0	approx.megohm
Mut. Cond.	720	750	μmhos
Mut. Cond. *	15	15	μmhos
Plate Cur.	2.2	2.3	ma.
Screen Cur.	0.9	0.8	ma.

* At -15 volts bias.

AVERAGE CHARACTERISTICS



92C-4655

SEPT. 30, 1936

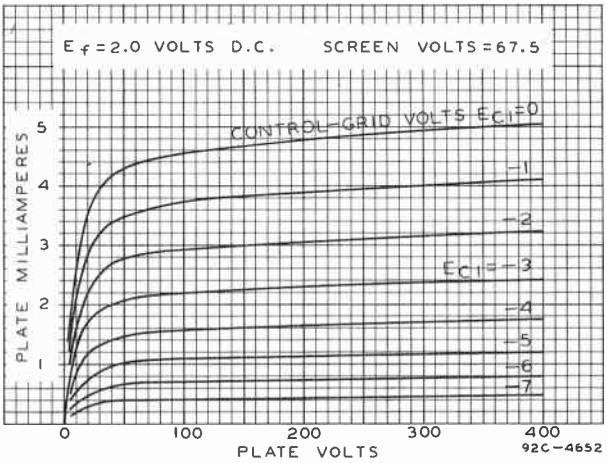
TENTATIVE DATA

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC

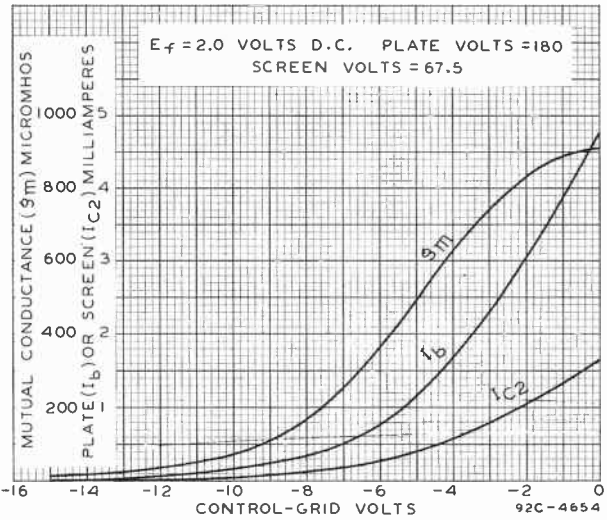
RCA

1A4-P

AVERAGE PLATE CHARACTERISTICS



AVERAGE CHARACTERISTICS



AUG. 21, 1936

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4665

1A5-GT/1A5-G

POWER AMPLIFIER PENTODE

Filament	Coated	
Voltage	1.4	d-c volts
Current	0.05	amp.
Maximum Overall Length		3-5/16"
Maximum Seated Height		2-3/4"
Maximum Diameter		1-5/16"
Bulb		T-9
Base	Intermediate Shell Octal 7-Pin	
Pin 1 - No Connection	Pin 5 - Grid	
Pin 2 - Filament +	Pin 7 - Filament -	
Pin 3 - Plate	Pin 8 - No Connection	
Pin 4 - Screen		
Mounting Position		Any

BOTTOM VIEW (G-6X)

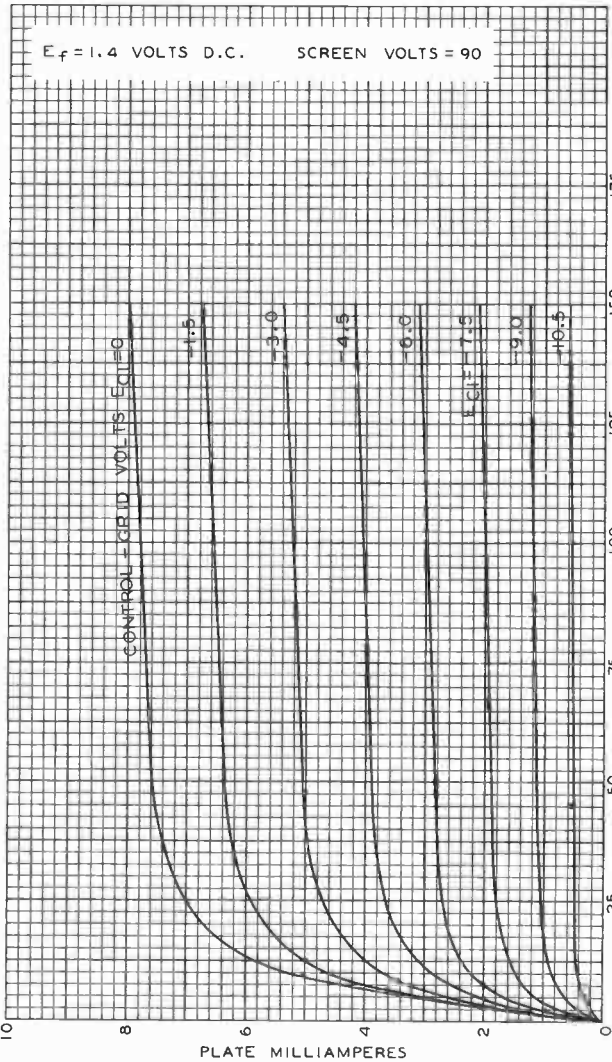
AMPLIFIER

Plate Voltage		110 max.	volts
Screen Voltage		110 max.	volts
Total Zero-Sig. Cathode Current		6 max.	ma.
Typical Operation and Characteristics - Class A_1 Amplifier:			
Plate	85	90	volts
Screen	85	90	volts
Grid *	-4.5	-4.5	volts
Peak A-F Grid Volt.	4.5	4.5	volts
Zero-Sig. Plate Cur.	3.5	4.0	ma.
Max.-Sig. Plate Cur.	3.5	4.0	ma.
Zero-Sig. Screen Cur.	0.7	0.8	ma.
Max.-Sig. Screen Cur.	1.0	1.1	ma.
Plate Res.	0.3	0.3	approx. ohms
Transcond.	800	850	μmhos
Load Res.	25000	25000	ohms
Total Harmonic Dist.	10	7	%
Max.-Sig. Power Output	100	115	mw

* Self-bias is recommended so that grid bias will be proportionately less as the B-supply voltage falls off during battery life.

1A5-GT

AVERAGE PLATE CHARACTERISTICS



NOV. 10, 1938

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4998

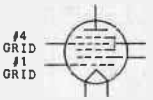
RCA Cunningham Radiotron RADIO TUBES

RCA-1A6

PENTAGRID CONVERTER

Filament Voltage	Coated 2.0	d-c volts
Current	0.060	amp.

Direct Interelectrode Capacitances (approx.):



C_{g_4p}	0.25[⊙]	μμf
$C_{g_4g_2}$	0.2[⊙]	μμf
$C_{g_4g_1}$	0.1[⊙]	μμf
$C_{g_1g_2}$	0.8	μμf
$C_{g_4(k+g_1+g_2+g_3+g_5+p)}$ = R-F Input	10.5	μμf
$C_{g_2(k+g_1+g_3+g_4+g_5+p)}$ = Osc. Output	6	μμf
$C_{g_1(k+g_2+g_3+g_4+g_5+p)}$ = Osc. Input	5	μμf
$C_{p(k+g_1+g_2+g_3+g_4+g_5)}$ = Mixer Output	9	μμf

Overall Length	4-9/32" to 4-17/32"
Maximum Diameter	1-9/16"
Bulb	ST-12
Cap	Small Metal
Base	Small 6-Pin

BOTTOM VIEW

Pin 1-Filament+
Pin 2-Plate
Pin 3-Grid #2
Pin 4-Grid #1
Pin 5-Grids #3 & #5
Pin 6-Filament-
Cap -Grid #4

CONVERTER SERVICE

Plate Voltage	180 max.	volts
Screen (Grids #3 & #5) Voltage	67.5 max.	volts
Anode-Grid (Grid #2) Voltage	135 max.	volts
Anode-Grid Voltage Supply*	180 max.	volts
Control-Grid (Grid #4) Voltage	-3 min.	volts
Total Cathode Current	9 max.	ma.

Typical Operation:

Filament	2.0	2.0	d-c volts
Plate	135	180	volts
Screen	67.5	67.5	volts
Anode-Grid	135	135	volts
Anode-Grid Supply	135	180*	volts
Control-Grid	-3	-3	volts
Oscillator-Grid (Grid #1) Res.	50000	50000	ohms
Plate Resistance	0.4	0.5	megohm
Conversion Cond.	275	300	μmhos
Conversion Cond. at -22.5 volts on Grid #4	4	4	μmhos
Plate Current	1.2	1.3	ma.
Screen Current	2.5	2.4	ma.
Anode-Grid Current	2.3	2.3	ma.
Oscillator-Grid Cur.	0.2	0.2	ma.
Total Cathode Current	6.2	6.2	ma.

* Applied through a 20000-ohm voltage-dropping resistor, by-passed by 0.1 μf condenser. ←

The mutual conductance of the oscillator portion (not oscillating) of the 1A6 is 425 micromhos under the following conditions: plate voltage, 135 to 180 volts; screen voltage, 67.5 volts; anode-grid voltage (no voltage-dropping resistor), 135 volts; and oscillator-grid voltage, 0 volts. Under these same conditions, the anode-grid current is 2.3 milliamperes.

⊙ With shield-can.

← Indicates a change

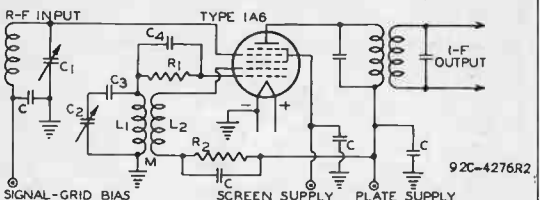
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

RCA Cunningham Radiotron RADIO TUBES

RCA-1A6

PENTAGRID CONVERTER

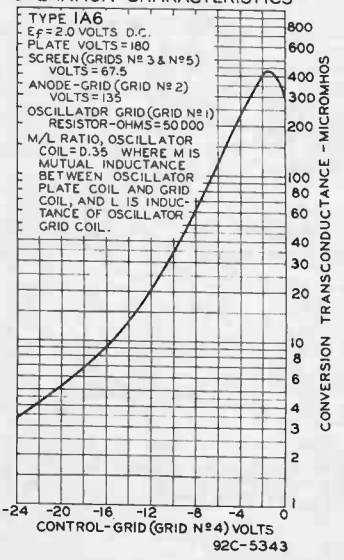
TYPICAL PENTAGRID CONVERTER CIRCUIT



C = 0.1 μf
C1, C2 } GANGED VARIABLE CONDENSERS
C2 = PADDING CONDENSER
C3 = GRID CONDENSER OF 200 μμf
L1 = OSCILLATOR GRID INDUCTANCE } COUPLED
L2 = OSCILLATOR PLATE INDUCTANCE }

M = MUTUAL INDUCTANCE OF L_1 AND L_2
R_1 = OSCILLATOR GRID LEAK
R_2 = VOLTAGE DROPPING RESISTOR OF 20000 OHMS
GRID #2 VOLTS SHOULD BE HIGHER THAN SCREEN VOLTS

OPERATION CHARACTERISTICS



RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

1A7-GT/G

PENTAGRID CONVERTER

Filament Voltage	Coated 1.4	d-c volts
Current	0.05	amp.
Direct Interelectrode Capacitances:°		
Grid #4 to Plate	0.5 max.	μμf
Grid #4 to Grid #2	0.4 max.	μμf
Grid #4 to Grid #1	0.2 max.	μμf
Grid #1 to Grid #2	0.9	μμf
Grid #4 to All Other Electrodes (R-F Input)	7.0	μμf
Grid #2 to All Other Electrodes Except Grid #1 (Osc. Output)	4.4	μμf
Grid #1 to All Other Electrodes Except Grid #2 (Osc. Input)	3.4	μμf
Plate to All Other Electrodes (Mixer Output)	10	μμf
Maximum Overall Length		3-5/16"
Maximum Seated Height		2-3/4"
Maximum Diameter		1-5/16"
Bulb		T-9
Cap		Skirted Miniature
Base		Small Wafer Octal 8-Pin, Sleeve

Pin 1 - Base Sleeve
Pin 2 - Filament +
Pin 3 - Plate
Pin 4 - Grids #3 & #5
Pin 5 - Grid #1
Pin 6 - Grid #2
Pin 7 - Filament -
Pin 8 - No Connection
Cap - Grid #4

Mounting Position: Any

BOTTOM VIEW (GT-7Z)

Maximum Ratings Are Design-Center Values

CONVERTER SERVICE

Plate Voltage	110 max.	volts
Screen (Grids #3 & #5) Voltage	60 max.	volts
Screen Supply Voltage	110 max.	volts
Anode-Grid (Grid #2) Voltage	110 max.	volts
Total Zero-Sig. Cathode Current	4 max.	ma.
Typical Operation:		
Plate	90	volts
Screen **	45	volts
Anode-Grid	90	volts
Control-Grid (Grid #4)*	0	volts
Oscillator-Grid (Grid #1) Resistor	200000	ohms
Plate Res.	0.6	megohm
Conversion Transcond.	250	μmhos
Conversion Transcond. with Grid #4 bias of -3 volts	5 approx.	μmhos
Plate Cur.	0.6	ma.
Screen Cur.	0.7	ma.
Anode-Grid Cur.	1.2	ma.
Oscillator-Grid Cur.	0.035	ma.
Total Cathode Cur.	2.5	ma.

NOTE: The transconductance of the oscillator portion (not oscillating) is 550 micromhos under the following conditions: plate volts, 90; screen volts, 45; control-grid volts, 0; anode-grid volts, 90; and oscillator-grid volts, 0.

° With external shield connected to negative filament terminal.

** Obtained preferably by using a properly by-passed 45000- to 75000-ohm voltage-dropping resistor in series with the 90-volt supply.

* A resistance of at least 1.0 megohm should be in the grid return to negative filament pin.

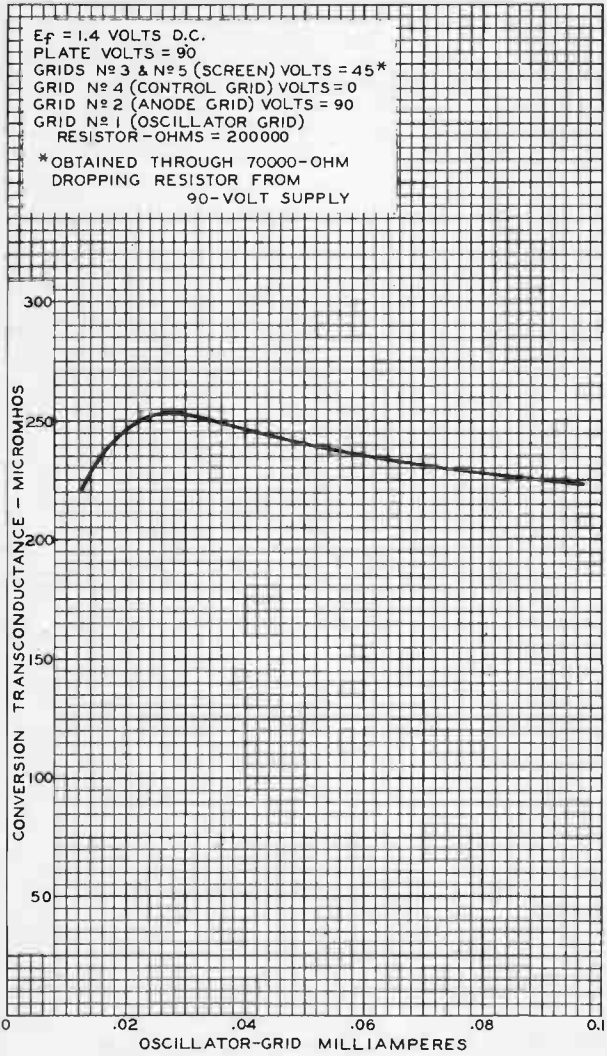
-← indicates a change.

Typical Pentagrid Converter Circuit is shown under Type 1A6.

1A7-GT/G

1A7-GT/G

OPERATION CHARACTERISTIC



1AC5

POWER PENTODE

SUBMINIATURE TYPE

GENERAL DATA

Electrical:

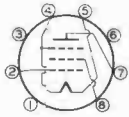
Filament, Coated:		
Voltage	1.25	dc volts
Current	0.04	amp

Mechanical:

Mounting Position	Any
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (excluding tip)	1.200" ±0.060"
Maximum Diameter	0.4"
Bulb	T-3
Base	Small-Button Sub-minar 8-Pin

BOTTOM VIEW

Pin 1 – No Connection
Pin 2 – Grid No.1
Pin 3 – No Connection
Pin 4 – Filament (–), Grid No.3



Pin 5 – Filament (+)
Pin 6 – No Connection
Pin 7 – Plate
Pin 8 – Grid No.2

AMPLIFIER – Class A_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	67.5 max.	volts
GRID-No. 2 (SCREEN) VOLTAGE	67.5 max.	volts
TOTAL CATHODE CURRENT	4.0 max.	ma

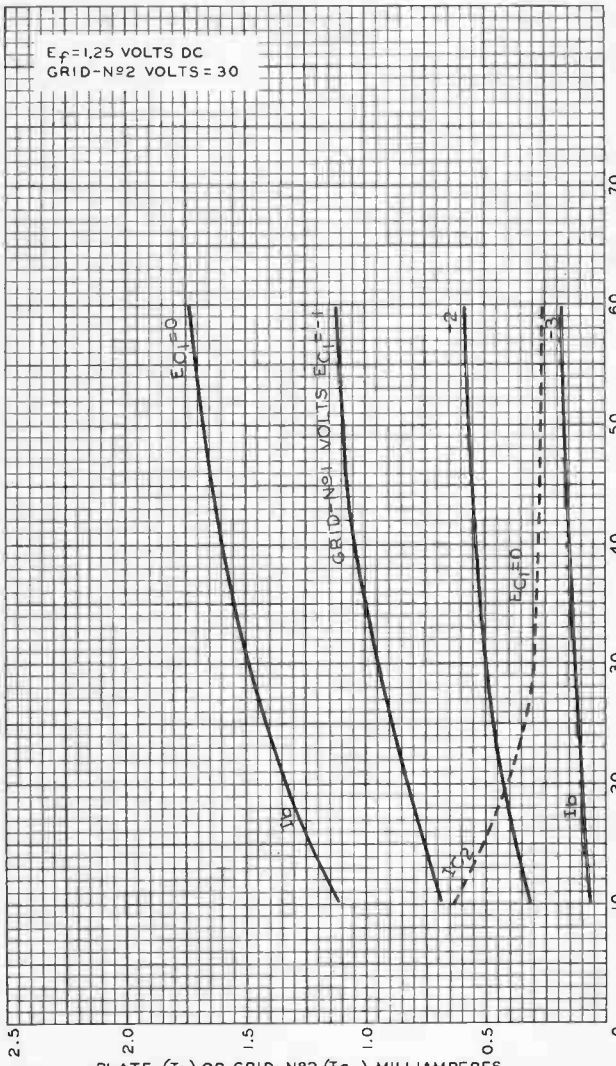
Typical Operation and Characteristics:

Plate Voltage	30	45	67.5	volts
Grid-No.2 Voltage	30	45	67.5	volts
Grid-No.1 (Control-Grid) Voltage	-2	-3	-4.5	volts
Peak AF Grid-No.1 Voltage	2	3	4.5	volts
Zero-Signal Plate Current	0.5	1.0	2.0	ma
Zero-Signal Grid-No.2 Current	0.1	0.2	0.4	ma
Plate Resistance	0.2	0.17	0.15	megohm
Transconductance	450	600	750	μmhos
Load Resistance	50000	40000	25000	ohms
Total Harmonic Distortion	10	10	10	%
Max.-Signal Power Output	5	15	50	mw

RCA

IAC5

AVERAGE PLATE CHARACTERISTICS



APRIL 12,1949

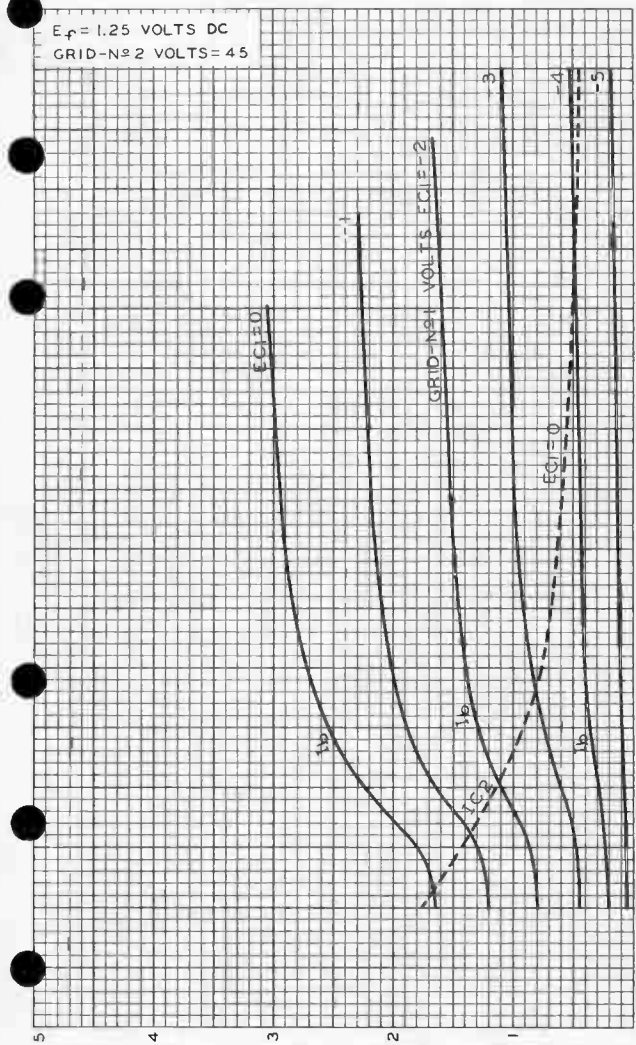
TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7245

1AC5

AVERAGE PLATE CHARACTERISTICS

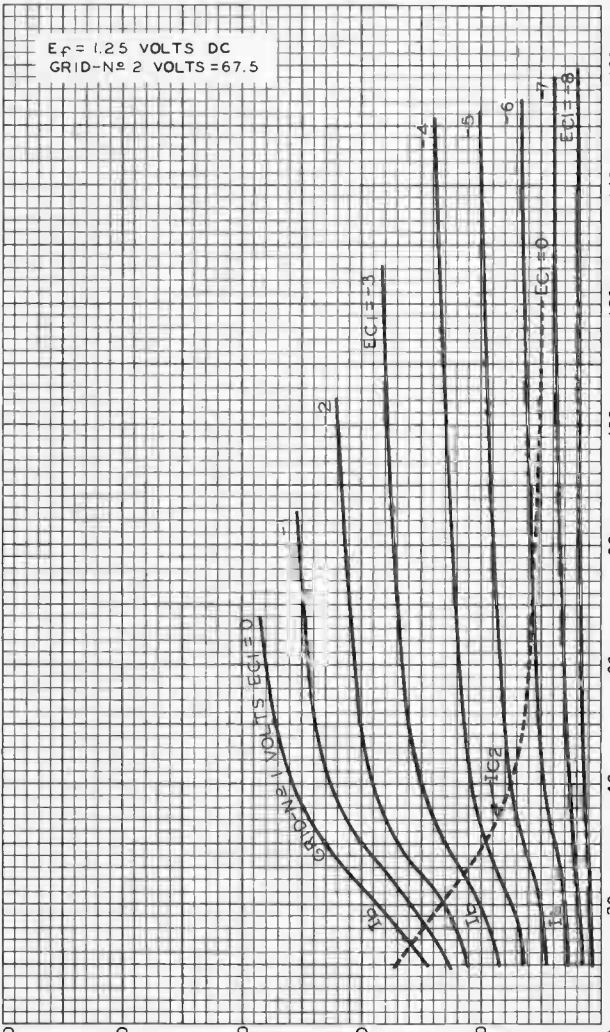


APRIL 26, 1949 TUBE DEPARTMENT 92CM-7261
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

1AC5

AVERAGE PLATE CHARACTERISTICS



APRIL 13, 1949

TUBE DEPARTMENT

92CM-7247

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

1AD5

SHARP-CUTOFF PENTODE

SUBMINIATURE TYPE

GENERAL DATA

Electrical:

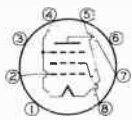
Filament, Coated:			
Voltage	1.25		dc volts
Current	0.04		amp
Direct Interelectrode Capacitances:[o]			
Grid No.1 to Plate	0.010	max.	μμf
Input	1.8		μμf
Output	2.8		μμf

[o] With no external shield.

Mechanical:

Mounting Position	Any
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (excluoing tip)	1.200 ± 0.060"
Maximum Diameter	0.4"
Bulb	T-3
Base	Small-Button Sub-minar 8-Pin

BOTTOM VIEW



Pin 1 - No Connection
Pin 2 - Grid No.1
Pin 3 - No Connection
Pin 4 - Filament (-), Grid No.3
Pin 5 - Filament (+)
Pin 6 - No Connection
Pin 7 - Plate
Pin 8 - Grid No.2

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	67.5	max.	volts
GRID-No.2 (SCREEN) VOLTAGE	67.5	max.	volts
TOTAL CATHODE CURRENT	4.0	max.	ma

Typical Operation and Characteristics:

Plate Voltage	30	45	67.5	volts
Grid-No.2 Voltage	30	45	67.5	volts
Grid-No.1 (Control-Grid) Voltage	0	0	0	volts
Plate Resistance (Approx.)	0.7	0.7	0.7	megohm
Transconductance	430	580	735	μmhos
Grid-No.1 Bias (Approx.) for plate current of 10 μamp	-3	-4	-6	volts
Plate Current	0.45	0.9	1.85	ma
Grid-No.2 Current	0.16	0.35	0.75	ma

RCA

1AD5

AVERAGE PLATE CHARACTERISTICS

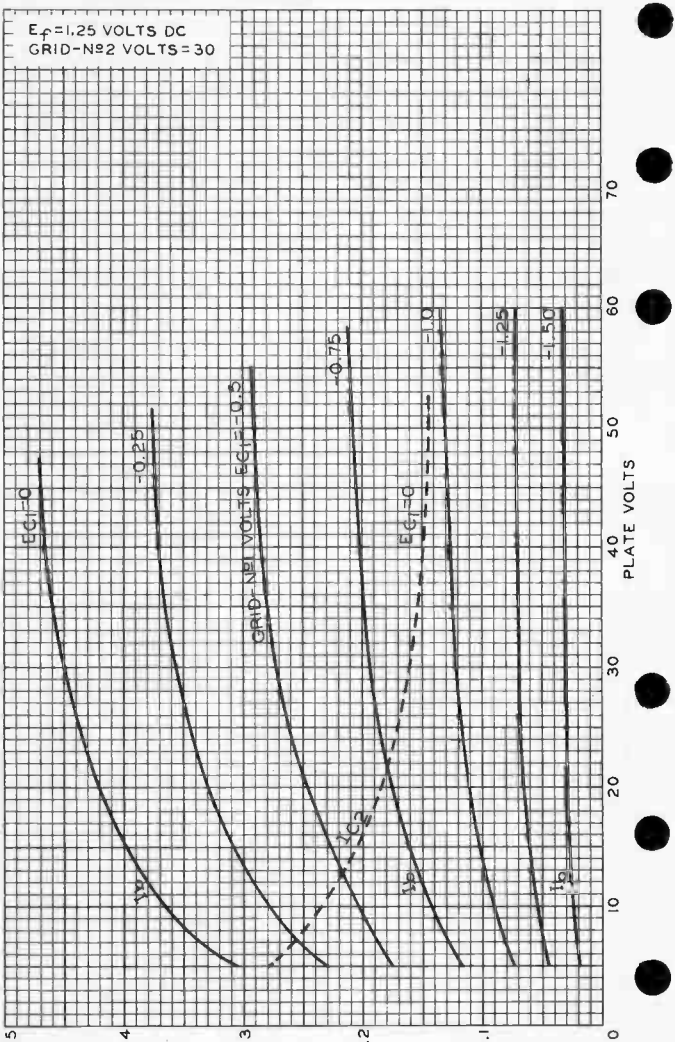


PLATE (I_b) OR GRID-№2 (I_{c2}) MILLIAMPERES

APRIL 19, 1949 TUBE DEPARTMENT 92CM-7253

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

1AD5

AVERAGE PLATE CHARACTERISTICS

APRIL 19, 1949

TUBE DEPARTMENT

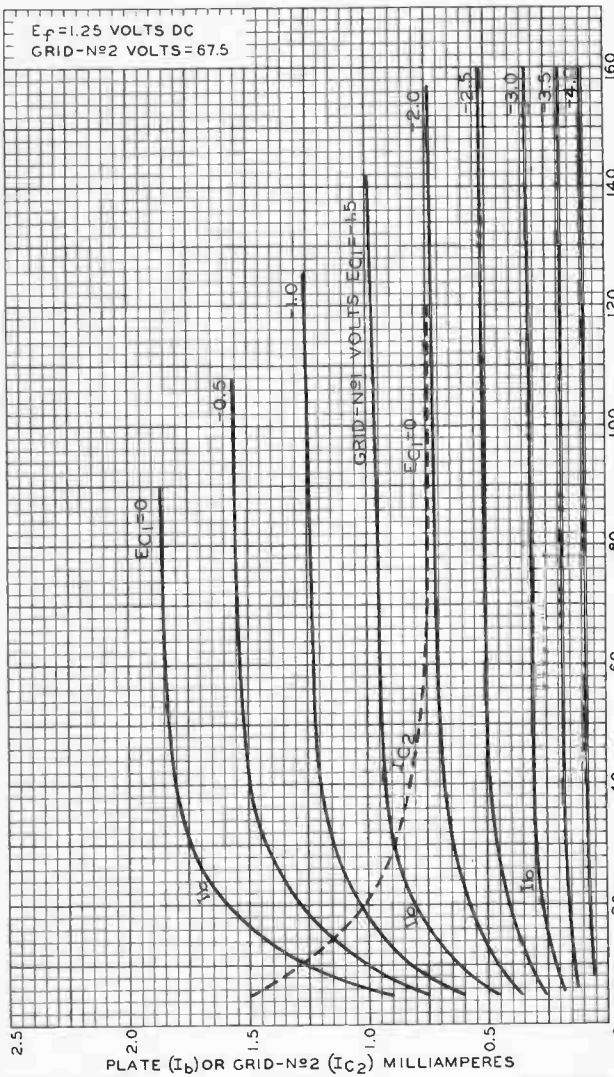
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7251

RCA

1AD5

AVERAGE PLATE CHARACTERISTICS



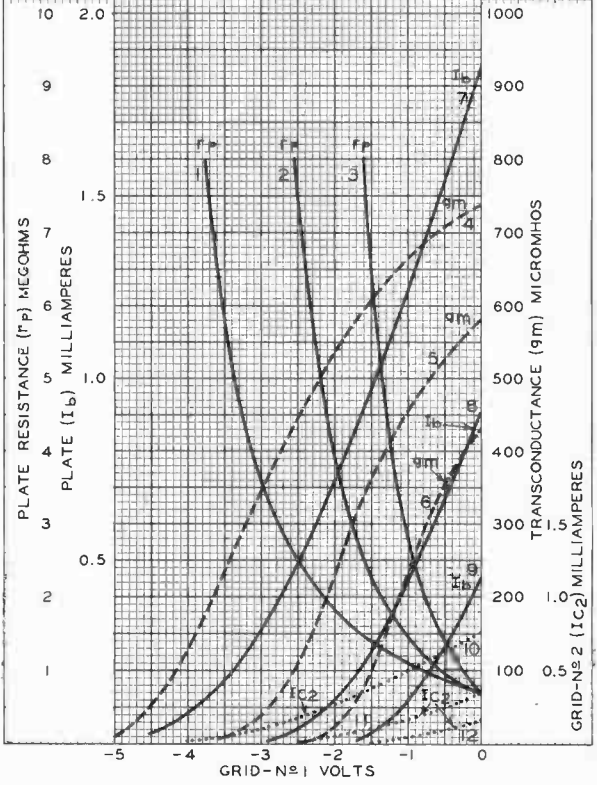
RCA

1AD5

AVERAGE CHARACTERISTICS

E_f = 1.25 VOLTS DC

CURVE	PLATE VOLTS	GRID-Nº2 VOLTS
1, 2, 3 } r_p	67.5 45 30	67.5 45 30
4, 5, 6 } g_m	67.5 45 30	67.5 45 30
7, 8, 9 } I_b	67.5 45 30	67.5 45 30
10, 11, 12 } I_{c_2}	67.5 45 30	67.5 45 30



1AX2
HALF-WAVE VACUUM RECTIFIER

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Filament, Coated:		
Voltage	1.4	ac volts
Current	0.65	amp
Direct Interelectrode Capacitance:[o]		
Plate to filament	0.7 max.	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-27/32"
Seated Length	2-7/16" ± 1/8"
Maximum Diameter	7/8"
Dimensional Outline	*See General Section*
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	9Y

Pin 1 – Filament, Internal Shield
Pin 2 – Filament
Pin 3 – No Connection♦
Pin 4 – Same as Pin 1

Pin 5 – Same as Pin 2
Pin 6 – Same as Pin 1
Pin 7 – Same as Pin 3
Pin 8 – Same as Pin 2
Pin 9 – Same as Pin 1
Cap – Plate

PULSED-RECTIFIER SERVICE

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

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

PEAK INVERSE PLATE VOLTAGE (Absolute maximum)	25000■ max.	volts
PEAK PLATE CURRENT	11 max.	ma
AVERAGE PLATE CURRENT	1 max.	ma

Typical Operation:

Peak Plate Supply Voltage:		
Positive pulse value	20000	volts
Negative pulse value	5000	volts
DC Output Voltage (Approx.)	20000	volts
DC Output Current (Approx.)	300	μamp

[o] Without external shield.

♦ May be connected to one side of filament, or used as a tie point for filament dropping resistor; otherwise do not use.

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

■ Under no circumstances should this absolute value be exceeded.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

1AX2

HALF-WAVE VACUUM RECTIFIER

OPERATING CONSIDERATIONS

Filament Voltage Adjustment. When the filament is supplied from an rf source and is at a high dc potential above ground, adjustment of the filament voltage by direct measurement is impractical. To insure that the rated voltage is applied to the filament, a simple method utilizing a visual color match of two incandescent filaments in a darkened room may be used. In this method, the rf filament voltage, obtained from a pulse-power source, is adjusted until the color of this filament matches that of the filament of another 1AX2 operated from a dc or low-frequency ac supply of 1.4 volts.

X-rays. The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier tubes may produce X-rays which can constitute a health hazard unless such tubes are adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.

TENTATIVE DATA

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

Half-Wave Vacuum Rectifier

GENERAL DATA

Electrical:

Filament, Coated:

	Min.	Av.	Max.	
Voltage (AC)	1.05	1.25	1.45	volts
Current at 1.25 volts	–	0.2	–	amp

Direct Interelectrode Capacitance (Approx.):[a]

Plate to filament & internal shield	1.3	μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	4-1/16"
Seated Length	3-1/8" to 3-1/2"
Maximum Diameter	1-9/32"
Bulb	T9
Cap	Small with Tubular Support (JEDEC No.C1-34)

Bases (Alternates):

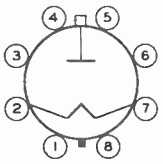
Intermediate-Shell Octal:
- 8 - Pin (JEDEC Group 1, No.B8-6)
- 7 - Pin, Arrangement 2 (JEDEC Group 1, No.B7-166)
- 6 - Pin, Arrangement 1 (JEDEC Group 1, No.B6-8)
- 5 - Pin, Arrangement 2 (JEDEC Group 1, No.B5-82)

Intermediate-Shell Octal with External Barriers:
- 6 - Pin, Arrangement 1 (JEDEC Group 1, No.B6-144)

Short Intermediate-Shell Octal with External Barriers:
- 8 - Pin (JEDEC Group 1, No.B8-58)
- 7 - Pin, Arrangement 2 (JEDEC Group 1, No.B7-211)
- 6 - Pin, Arrangement 1 (JEDEC Group 1, No.B6-60)

Basing Designation for BOTTOM VIEW 3C

Pin 1[b] - Limited Connection[c]
Pin 2 - Filament
Pin 3 - Same as Pin 1
Pin 4[b] - Same as Pin 1
Pin 5 - Same as Pin 1



Pin 6[b] - Same as Pin 1
Pin 7 - Filament, Internal Shield
Pin 8 - Same as Pin 1
Cap - Plate

PULSED-RECTIFIER SERVICE

Maximum Ratings, *Design-Maximum Values:*

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

INVERSE PLATE VOLTAGE:		
Total dc and peak[e]	26000 max.	volts
DC	22000 max.	volts
PEAK PLATE CURRENT	50 max.	ma
AVERAGE PLATE CURRENT	0.5 max.	ma

← Indicates a change.

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma. = 7. . . .	100	volts

RADIO-FREQUENCY RECTIFIER SERVICE

Maximum Ratings, *Design-Maximum Values:*

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

PEAK INVERSE PLATE VOLTAGE	33000 max.	volts
PEAK PLATE CURRENT	35 max.	ma
AVERAGE PLATE CURRENT.	1.1 max.	ma
FREQUENCY RANGE OF SUPPLY VOLTAGE.	1.5 to 100	kc

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma = 7	100	volts

[a] Without external shield.

[b] On the 7-pin bases, pin 4 is omitted.
On the 6-pin bases, pin 6 as well as pin 4 is omitted.
On the 5-pin base, pins 1 and 6 as well as pin 4 are omitted.

[c] See *Operating Considerations*.

[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.

OPERATING CONSIDERATIONS

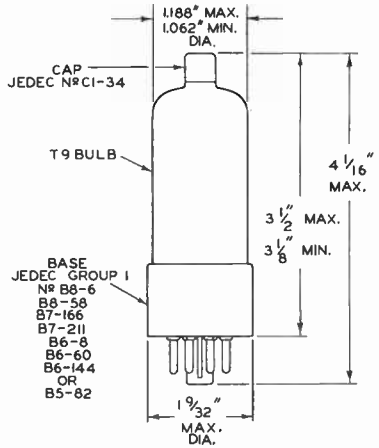
Socket Connections. Socket terminals 1, 3, 4, 5, 6, and 8 may be connected to socket terminal 7 or to a corona shield which is connected to socket terminal 7. Socket terminals 4 and 6 may be used as tie points for components at or near filament potential. Otherwise, do not use.

Measurement of Filament Voltage. To measure the filament voltage when the filament is at a high dc potential with respect to ground, it is recommended that a simple method utilizing visual comparison of the filament temperature be used. The color temperature of the filament, operating from a pulse- or rf-power source, may be checked by observing in a darkened room the reflection of the incandescent filament upon the surface of the internal shield. A visual comparison of this color temperature with that obtained when the filament of another 1B3GT is operated from a dc or low-frequency ac supply of 1.25 volts, provides a convenient means for adjusting the amount of excitation to produce 1.25 volts (rms) at the filament terminals.

The high voltages at which the 1B3GT is operated are very dangerous. Great care should be taken in the design of apparatus to prevent the operator from coming in contact with these high voltages. Particular care against fatal shock should be taken in the measurement of filament voltage. Under all circumstances, circuit parts which may be at high potentials should be enclosed or adequately insulated.

→ Indicates a change.

X rays. The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier tubes may produce *X rays* which can constitute a health hazard unless such tubes are adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.



92CS-6760R2

Half-Wave Vacuum Rectifier

The 1G3GT/1B3GT is the same as the 1B3GT except for the following items:

Mechanical:

Operating Position	Any
Maximum Overall Length	3-9/16"
Seated Length	2-13/16" ± 3/16"
Maximum Diameter	1-9/32"
Bulb	T9
Cap	Small with Tubular Support (JEDEC No. C1-34)

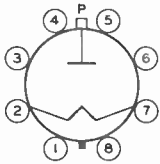
Bases (Alternates):

Intermediate-Shell Octal:
- 3-Pin (JEDEC Group 1, No. B6-6)
- 7-Pin, Arrangement 2 (JEDEC Group 1, No. B7-166)
- 6-Pin, Arrangement 1 (JEDEC Group 1, No. B6-8)
- 5-Pin, Arrangement 2 (JEDEC Group 1, No. B5-82)

Short Intermediate-Shell Octal
- 7-Pin (JEDEC Group 1, No. B7-47)

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 3C



Pin 1[a] – Limited Connection[b]
Pin 2 – Filament
Pin 3 – Same as Pin 1
Pin 4[c] – Same as Pin 1
Pin 5 – Same as Pin 1
Pin 6[d] – Same as Pin 1
Pin 7 – Filament, Internal Shield
Pin 8 – Same as Pin 1
Cap – Plate

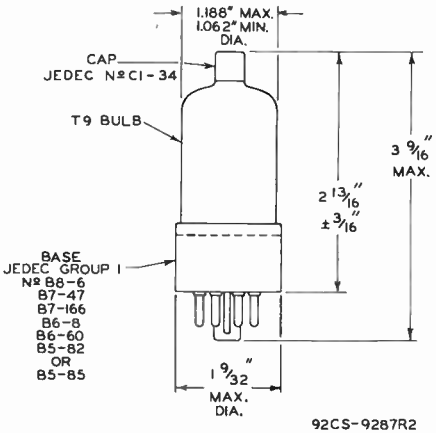
[a] On the 5-pin bases, pin 1 is omitted.

[b] See *Operating Considerations* shown under type 1B3GT.

[c] On the 5-pin bases, the 6-pin bases, and the 7-pin base JEDEC No. B7-166, pin 4 is omitted.

[d] On the 5-pin bases, the 6-pin bases, and the 7-pin base JEDEC No. B7-47, pin 6 is omitted.

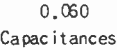
1G3GT/1B3GT



IB4-P

R-F AMPLIFIER PENTODE

Filament	Coated	
Voltage	2.0	d-c volts
Current	0.060	amp.
Direct Interelectrode Capacitances:		
Grid to Plate (with shield-can)		0.007 max. μμf
Input		5 μμf
Output		11 μμf
Overall Length		4-9/32" to 4-17/32"
Maximum Diameter		1-9/16"
Bulb		ST-12
Cap		Small Metal
Base		Small 4-Pin
Pin 1-Filament +		Pin 4-Filament -
Pin 2-Plate		Cap -Grid
Pin 3-Screen		



BOTTOM VIEW

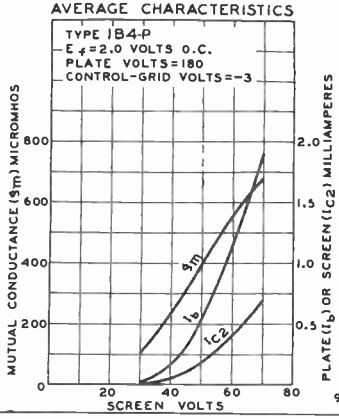
AMPLIFIER - Class A

Operating Conditions and Characteristics:

Filament	2.0	2.0	d-c volts
Plate	90	180 max.	volts
Screen	67.5	67.5 max.	volts
Grid	-3	-3	volts
Amp. Fact.	550	1000	
Plate Res.	1.0	1.5	megohms
Mut. Cond.	600	650	μmhos
Grid Bias†	-8	-8	volts
Plate Cur.	1.6	1.7	ma.
Screen Cur.	0.7	0.6	ma.

† For plate current cut-off.

AVERAGE CHARACTERISTICS



SEPT. 30, 1936

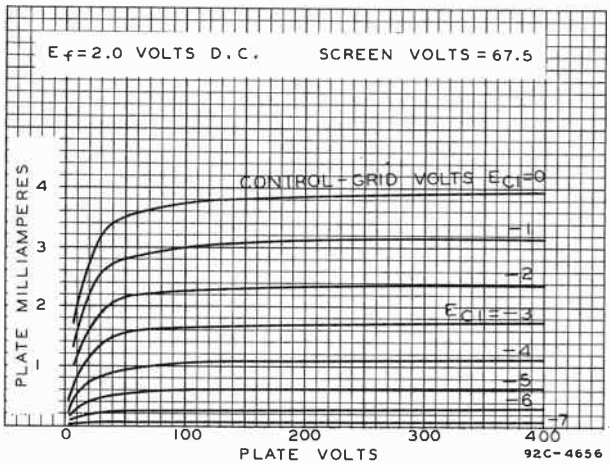
TENTATIVE DATA

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

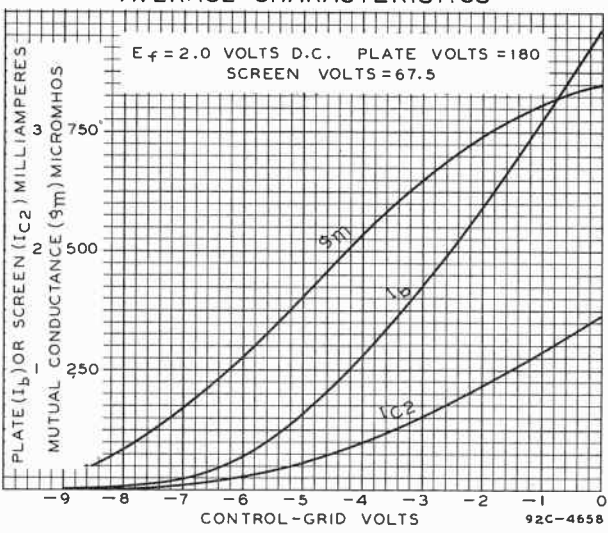
RCA

1B4-P

AVERAGE PLATE CHARACTERISTICS



AVERAGE CHARACTERISTICS

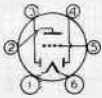


RCA MANUFACTURING COMPANY, INC.

1B5/25S

DUPLEX-DIODE TRIODE

Filament	Coated	
Voltage	2.0	d-c volts
Current	0.06	amp.
Direct Interelectrode Capacitances - Triode Unit:		
Grid to Plate	3.6	μμf
Grid to Filament	1.6	μμf
Plate to Filament	1.9	μμf
Maximum Overall Length		4-3/16" ←
Maximum Diameter		1-9/16"
Bulb		ST-12
Base		Small 6-Pin
Pin 1-Filament +		Pin 4-Diode Plate #1*
Pin 2-Triode Plate		Pin 5-Triode Grid
Pin 3-Diode Plate #2*		Pin 6-Filament -
Mounting Position	BOTTOM VIEW	Vertical, Base Down◊ ←

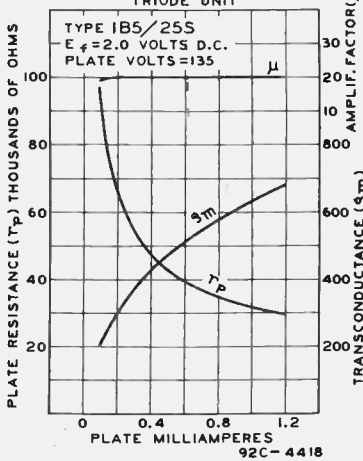


* *Diode Plate #2 is at positive end of filament; Diode Plate #1 is at negative end of filament.*

◊ Horizontal operation permitted if plane of filament is vertical.

For additional data and curves, refer to type 1H6-G. The 1B5/25S and the 1H6-G are identical electrically. ←

AVERAGE CHARACTERISTICS
TRIODE UNIT

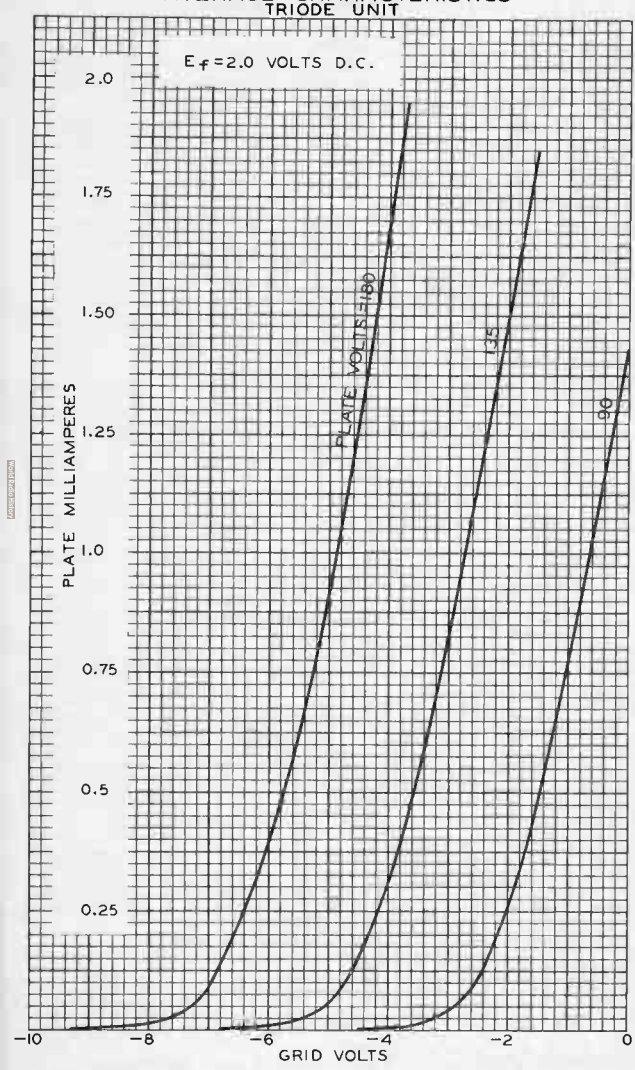


←Indicates a change.

RCA MANUFACTURING COMPANY, INC.

1B5

AVERAGE CHARACTERISTICS
TRIODE UNIT



* IC5-GT/IC5-G

POWER AMPLIFIER PENTODE

Filament	Coated	
Voltage	1.4	d-c volts
Current	0.10	amp.
Maximum Overall Length		3-5/16"
Maximum Seated Height		2-3/4"
Maximum Diameter		1-5/16"
Bulb		T-9
Base	Intermediate Shell Octal 7-Pin	
Pin 1 - No Connection	Pin 5 - Grid	
Pin 2 - Filament +	Pin 7 - Filament -	
Pin 3 - Plate	Pin 8 - No Connection	
Pin 4 - Screen		
Mounting Position		Any

BOTTOM VIEW (C-6X)

AMPLIFIER

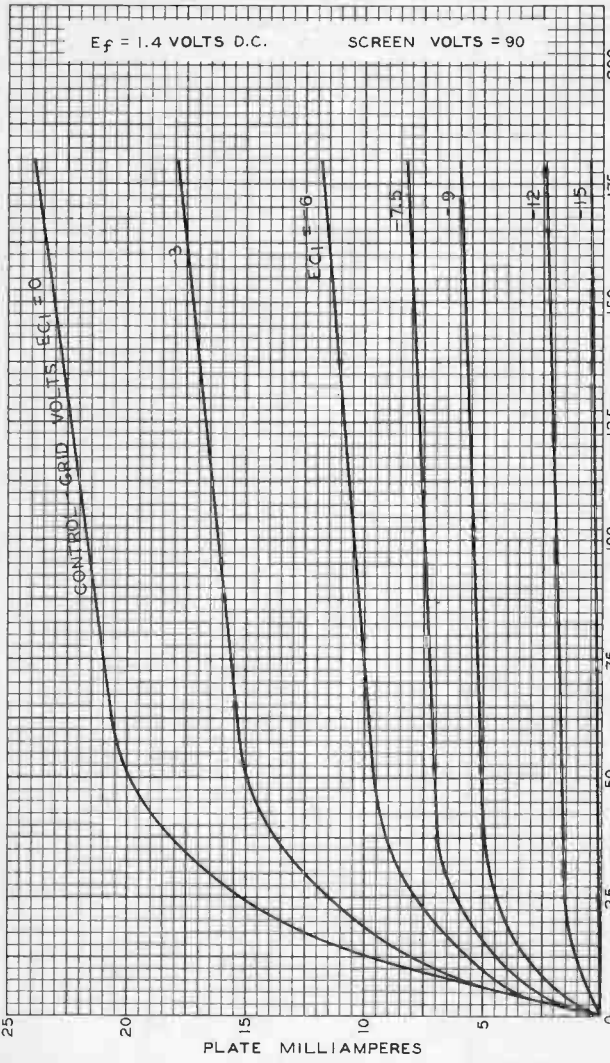
Plate Voltage		110 max.	volts
Screen Voltage		110 max.	volts
Total Zero-Sig. Cathode Current		12 max.	ma.
Typical Operation and Characteristics - Class A$_1$ Amplifier:			
Plate	83	90	volts
Screen	83	90	volts
Grid *	-7.0	-7.5	volts
Peak A-F Grid Volt.	7.0	7.5	volts
Zero-Sig. Plate Cur.	7.0	7.5	ma.
Max.-Sig. Plate Cur.	7.3	7.8	ma.
Zero-Sig. Screen Cur.	1.6	1.6	ma.
Max.-Sig. Screen Cur.	3.5	3.5	ma.
Plate Res.	110000	115000 approx.	ohms
Transcond.	1500	1550	μmhos
Load Res.	9000	8000	ohms
Total Harmonic Dist.	10	10	%
Max.-Sig. Power Output	200	240	mw

* Self-bias is recommended so that grid bias will be proportionately less as the B-supply voltage falls off during battery life.

1C5-GT

1C5-GT

AVERAGE PLATE CHARACTERISTICS



NOV. 10, 1938

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4997

RCA

ID8-GT

DIODE-TRIODE-POWER AMPLIFIER PENTODE

Filament	Coated	
Voltage	1.4	d-c volts
Current	0.1	amp.
Maximum Overall Length		3-5/16"
Maximum Seated Height		2-3/4" ←
Maximum Diameter		1-5/16"
Bulb		T-9
Cap		Skirted Miniature - Style C
Base		Intermediate Shell Octal 8-Pin
Pin 1 - No Connection		Pin 6 - Triode Plate
Pin 2 - Filament +		Pin 7 - Filament -
Pin 3 - Pentode Plate		Pin 8 - Diode Plate
Pin 4 - Pentode Screen		Cap - Triode Grid
Pin 5 - Pentode Grid		
Mounting Position		Any

BOTTOM VIEW (G-8AJ)

TRIODE UNIT

Plate Voltage			110 max.	volts
Typical Operation and Characteristics - Class A_1 Amplifier:				
Plate Voltage	45	67.5	90	volts
Grid Voltage	0	0	0	volts
Amplification Factor	25	25	25	
Plate Resistance	7700Ω	5550Ω	4350Ω	approx. ohms
Transconductance	325	450	575	μmhos
Plate Current	0.3	0.6	1.1	ma.

PENTODE UNIT

Plate Voltage				110 max.	volts
Screen Voltage				110 max.	volts
Total Zero-Sig. Cathode Current				6 max.	ma.
Typical Operation and Characteristics - Class A_1 Amplifier:					
Plate Voltage	45	62.5	67.5	90	volts
Screen Voltage	45	62.5	67.5	90	volts
Grid Voltage	-4.5	-5	-6	-9	volts
Peak A-F Grid Volt.	4.5	5	6	9	volts
Plate Current	1.6	3.8	3.8	5	ma.
Screen Current	0.3	0.8	0.8	1.0	ma.
Plate Resistance	0.3	0.2	0.2	0.2	approx. megohm
Transconductance	650	875	875	925	μmhos
Load Resistance	20000	16000	16000	12000	ohms
Total Harmonic Dist.	10	10	10	10	%
Power Output	35	90	100	200	mw.

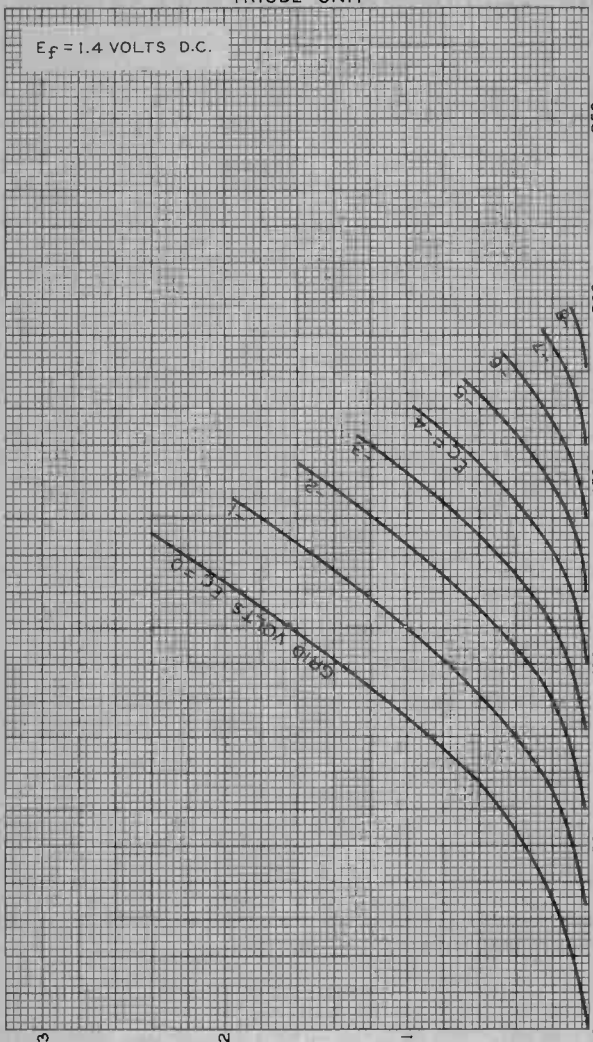
DIODE UNIT

The diode is located at the negative end of the filament, and is independent of the triode unit and of the pentode unit except for the common filament.

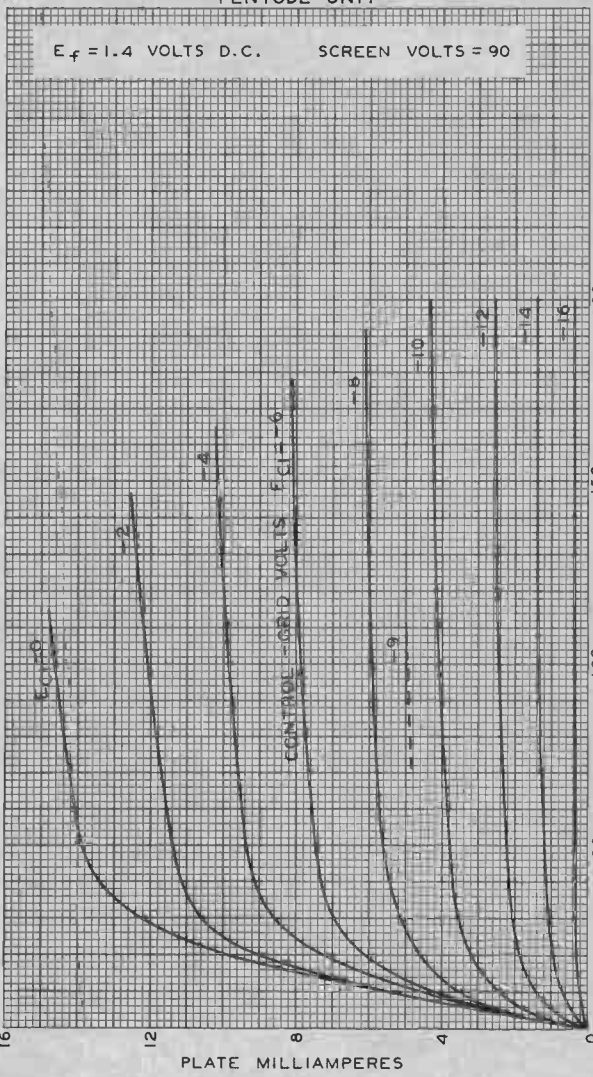
← Indicates a change.

ID8-GT

AVERAGE PLATE CHARACTERISTICS
TRIODE UNIT



1D8-GT
AVERAGE PLATE CHARACTERISTICS
PENTODE UNIT



RCA

IDN5

DIODE–REMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

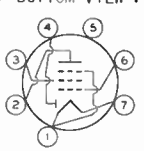
Filament, Coated:		
Voltage	1.4	dc volts
Current	0.05	amp
Direct Interelectrode Capacitance (Approx.):[o]		
Diode plate to pentode grid No.1	0.04	μμf

Characteristics, Class A_1 Amplifier (Pentode Unit):

Plate Voltage	67.5	volts
Grid-No.2 (Screen-Grid) Voltage	67.5	volts
Grid-No.1 (Control-Grid) Voltage	0	volts
Plate Resistance (Approx.)	0.6	megohm
Transconductance	630	μmhos
Plate Current	2.1	ma
Grid-No.2 Current	0.55	ma
Grid-No.1 Voltage (Approx.) for transconductance of 10 μmhos	-11.5	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	T5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	6BW



Pin 1 – Filament (–), Pentode Grid No.3
Pin 2 – Pentode Plate
Pin 3 – Pentode Grid No.2
Pin 4 – Diode Plate
Pin 5 – No Connection
Pin 6 – Pentode Grid No.1
Pin 7 – Filament (+)

PENTODE UNIT – Class A_1 Amplifier

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	90 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	90 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative bias value	50 max.	volts
Positive bias value	0 max.	volts
CATHODE CURRENT	3 max.	ma

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	3.3 max.	megohms

[o] Without external shield.

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

TENTATIVE DATA

IDN5

DIODE—REMOTE-CUTOFF PENTODE

DIODE UNIT

Maximum Ratings, *Design-Center Values:*

PLATE CURRENT	0.25 max.	ma

Characteristics:

Average Plate Current with dc plate voltage of 10 volts	1	ma

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

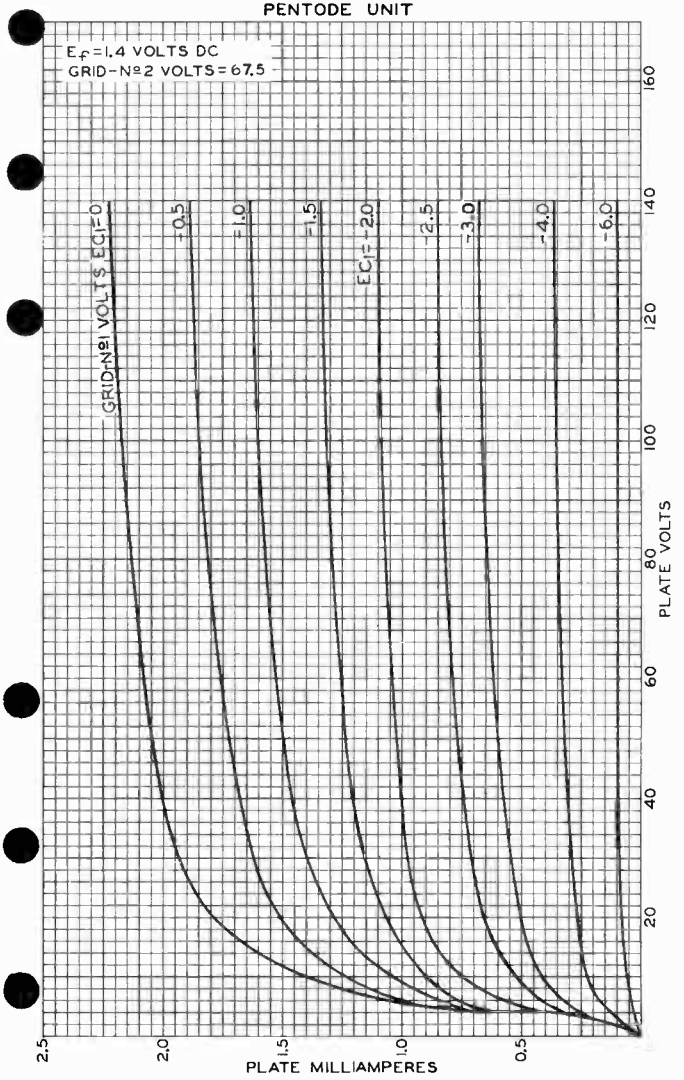
TENTATIVE DATA

RCA

IDN5

AVERAGE PLATE CHARACTERISTICS

PENTODE UNIT



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

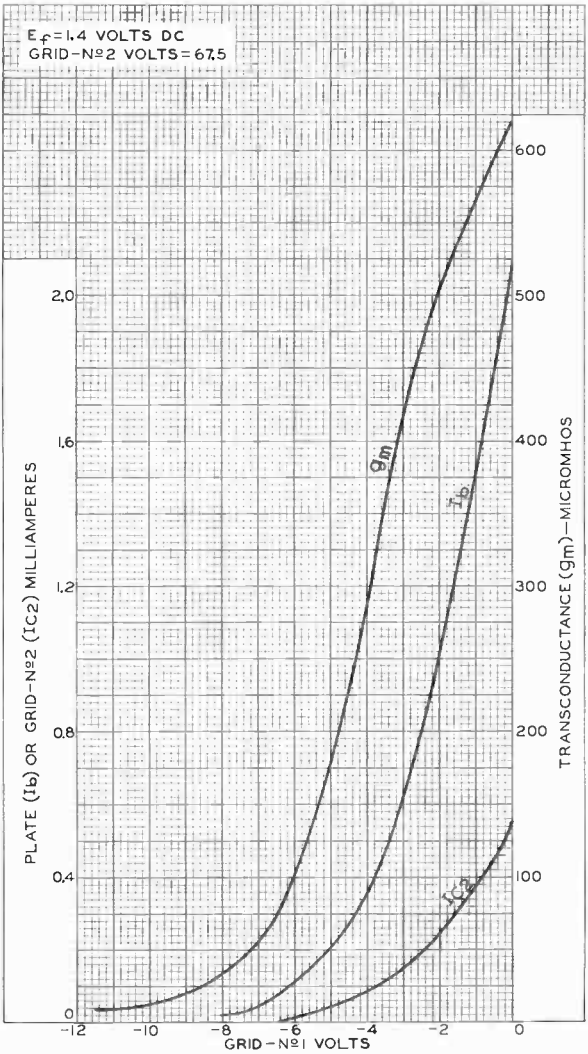
92CM-9348

RCA

IDN5

AVERAGE CHARACTERISTICS

PENTODE UNIT



RCA

IE8

PENTAGRID CONVERTER

SUBMINIATURE TYPE

GENERAL DATA

Electrical:

Filament, Coated:			
Voltage	1.25		dc volts
Current	0.04		amp
Direct Interelectrode Capacitances:[o]			
Grid No.3 to All Other Electrodes (RF Input).	6		μμf
Plate to All Other Electrodes (Mixer Input) .	5		μμf
Grid No.1 to All Other Electrodes (Osc.Input)	2.4		μμf
Grid No.3 to Plate . . .	0.4	max.	μμf
Grid No.3 to Grid No.1 .	0.2	max.	μμf

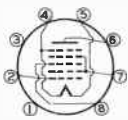
[o] With no external shield.

Mechanical:

Mounting Position	Any
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (excluding tip)	1.200" ± 0.060"
Maximum Diameter	0.4"
Bulb	T-3
Base	Small-Button Sub-minar 8-Pin

BOTTOM VIEW

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



Pin 4 - Filament (-), Grid No.5
Pin 5 - Filament (+)
Pin 6 - Plate
Pin 7 - Grid No.2, Grid No.4
Pin 8 - Grid No.3

CONVERTER

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	67.5 max.	volts
GRIDS-No.2 & No.4 (SCREEN) VOLTAGE . . .	45 max.	volts
GRIDS-No.2 & No.4 SUPPLY VOLTAGE	67.5 max.	volts
TOTAL CATHODE CURRENT	4.0 max.	ma

Characteristics — *Separate Excitation*:#

Plate Voltage	30	45	67.5	volts
Grids-No.2 & No.4 Supply Voltage	30	45	67.5	volts
Grids-No.2 & No.4 Resistor . . .	10000	15000	20000	ohms

The characteristics shown under separate excitation approximate those obtained in a self-excited oscillator operating with zero bias.

RCA

IE8

PENTAGRID CONVERTER

Grid-No.3 (Control-Grid) Voltage	0	0	0	volts
Grid-No.1 (Oscillator-Grid) Resistor	0.1	0.1	0.1	megohm
Plate Resistance (Approx.)	0.3	0.4	0.4	megohm
Conversion Transconductance	115	140	150	μmhos
Grid-No.3 Voltage (Approx.) for conversion transconductance of 5 μmhos	-7	-8	-9	volts
Plate Current	0.3	0.6	1.0	ma
Grids-No.2 & No.4 Current	0.8	1.1	1.5	ma
Grid-No.1 Current	30	50	70	μamp
Total Cathode Current	1.1	1.7	2.5	ma

NOTE: The transconductance between grid No.1 and grids No.2 & No.4 connected to plate (not oscillating) is approximately 730 micromhos under the following conditions: Signal applied to grid No.1 at zero bias; grids No.2 & No.4 and plate at 30 volts; and grid No.3 grounded. Under the same conditions, the total cathode current is 3 milliamperes and the amplification factor is 3.9.

RCA

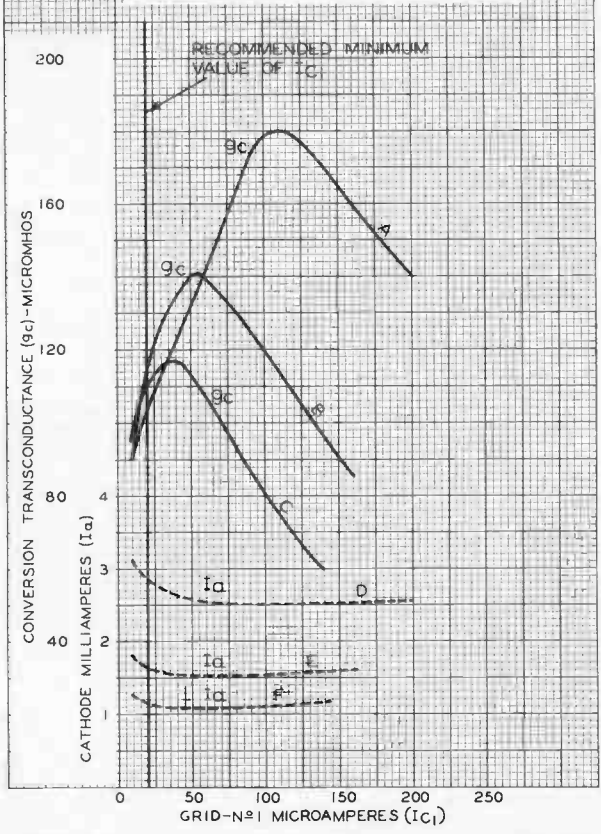
IE8

OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION

E_f = 1.25 VOLTS DC

CURVE	PLATE VOLTS	GRIDS Nº 2 & Nº 4 SUPPLY VOLTS[D]	GRIDS Nº 2 & Nº 4 SERIES RESISTOR OHMS	GRID-Nº 1 RESISTOR MEGOHMS
A,D	67.5	67.5	20000	0.1
B,E	45	45	15000	0.1
C,F	30	30	10000	0.1

[D] APPLIED THROUGH SERIES RESISTOR OF VALUE INDICATED



1E8

RCA

1E8

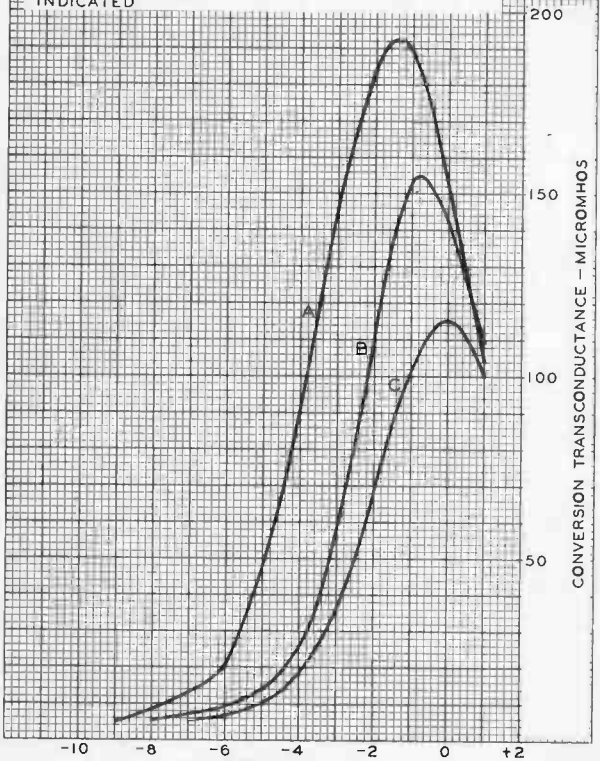
OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION

E_f=1.25 VOLTS D C

CURVE	PLATE VOLTS	GRIDS №2 & №4 SUPPLY VOLTS□	GRIDS №2 & №4 SERIES RESISTOR OHMS	GRID-№1 RESISTOR MEGOHMS	GRID-№1 CURRENT μAMP*
A	30	30	10000	0.1	30
B	45	45	15000	0.1	50
C	67.5	67.5	20000	0.1	70

*OBTAINED BY ADJUSTMENT OF OSCILLATOR GRID VOLTAGE TO GIVE INDICATED VALUES

□APPLIED THROUGH SERIES RESISTOR OF VALUE INDICATED



JAN. 25, 1949

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7166

IG3-GT/IB3-GT

HALF-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

Filament, Coated:

	Min.	Av.	Max.	
Voltage	1.05	1.25	1.45	ac volts
Current at 1.25 volts	–	0.2	–	amp

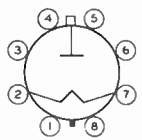
Direct Interelectrode Capacitance (Approx.):○

Plate to filament & internal shield	1.3	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-9/16"
Seated Length	2-13/16" ± 3/16"
Maximum Diameter	1-9/32"
Bulb	T9
Cap	Small with Tubular Support (JETEC No.C1-34)
Base	Intermediate-Shell Octal 7-Pin (JETEC No.B7-166), Short Intermediate-Shell Octal 7-Pin (JETEC No.B7-47), Intermediate-Shell Octal 6-Pin (JETEC No.B6-8), Short Intermediate-Shell Octal 6-Pin with External Barriers (JETEC No.B6-60), Intermediate-Shell Octal 5-Pin (JETEC No.B5-82), or Short Intermediate-Shell Octal 5-Pin with External Barriers (JETEC No.B5-85)
Basing Designation for BOTTOM VIEW	3C

Pin 1◆ – Internal Connection—Do Not Use■
Pin 2 – Filament
Pin 3 – Same as Pin 1
Pin 4▲ – No Connection
Pin 5 – Same as Pin 1
Pin 6● – No Connection
Pin 7 – Filament, Internal Shield
Pin 8 – Same as Pin 1
Cap – Plate



PULSED-RECTIFIER SERVICE

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

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

INVERSE PLATE VOLTAGE:		
Total dc and peak (Absolute maximum)*	26000◆ max.	volts
DC	21000 max.	volts

○ Without external shield.

◆ On the 5-pin bases, pin 1 is omitted.

■ *See Operating Considerations.*

▲ On the 5-pin bases, the 6-pin bases, and the 7-pin base JETEC No.B7-166, pin 4 is omitted.

● On the 5-pin bases, the 6-pin bases, and the 7-pin base JETEC No.B7-47, pin 6 is omitted.

□, *, ◆: See next page.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

1G3-GT/1B3-GT

HALF-WAVE VACUUM RECTIFIER

PEAK PLATE CURRENT	50 max.	ma
DC PLATE CURRENT	0.5 max.	ma

RADIO-FREQUENCY RECTIFIER SERVICE

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

PEAK INVERSE PLATE VOLTAGE (Absolute maximum)	33000♦ max.	volts
PEAK PLATE CURRENT	30 max.	ma
DC PLATE CURRENT	1 max.	ma
FREQUENCY RANGE OF SUPPLY VOLTAGE	1.5 to 100	kc

© 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.

OPERATING CONSIDERATIONS

Socket Connections. Socket terminals Nos.1,3,4,5,6, and 8 may be connected to socket terminal No.7 or to a corona shield which is connected to socket terminal No.7. Socket terminals Nos.4 and 6 may be used as tie points for components at or near filament potential.

Measurement of Filament Voltage. To measure the filament voltage when the filament is at a high dc potential with respect to ground, it is recommended that a simple method utilizing visual comparison of the filament temperature be used. The color temperature of the filament, operating from a pulse- or rf-power source, may be checked by observing in a darkened room the reflection of the incandescent filament upon the surface of the internal shield. A visual comparison of this color temperature with that obtained when the filament of another 1G3-GT/1B3-GT is operated from a dc or low-frequency ac supply of 1.25 volts, provides a convenient means for adjusting the amount of excitation to produce 1.25 volts (rms) at the filament terminals.

The high voltages at which the 1G3-GT/1B3-GT is operated are very dangerous. Great care should be taken in the design of apparatus to prevent the operator from coming in contact with these high voltages. Particular care against fatal shock should be taken in the measurement of filament voltage. Under all circumstances, circuit parts which may be at high potentials should be enclosed or adequately insulated.

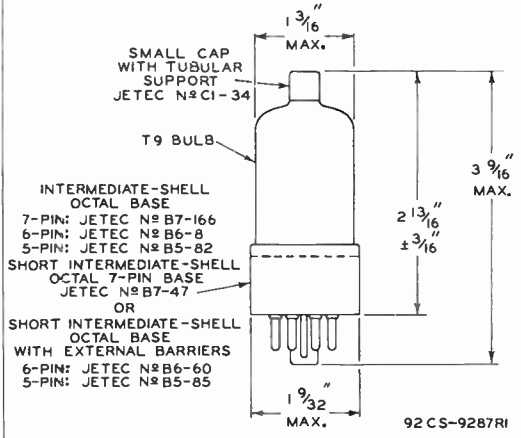
X rays. The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier tubes may produce *X rays* which can constitute a health hazard unless such tubes are adequately

TUBE DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

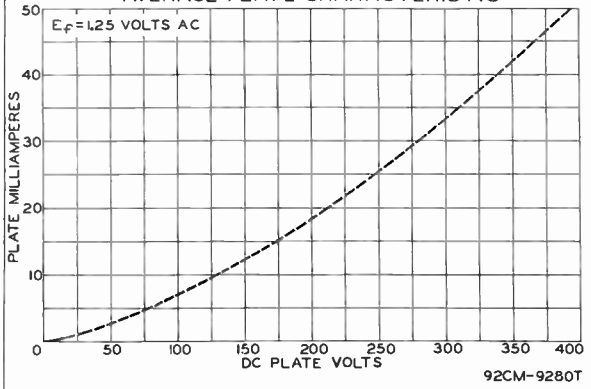
1G3-GT/1B3-GT

HALF-WAVE VACUUM RECTIFIER

shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.



AVERAGE PLATE CHARACTERISTIC

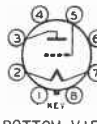


RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

1H4-C

DETECTOR AMPLIFIER TRIODE

Filament	Coated	
Voltage	2.0	d-c volts
Current	0.06	amp.
Maximum Overall Length		4-1/8"
Maximum Diameter		1-9/16"
Bulb		ST-12
Base		Small Shell Octal 7-Pin
Pin 1-No Connection		Pin 5-Grid
Pin 2-Filament +		Pin 7-Filament -
Pin 3-Plate		Pin 8-No Connection
Pin 4-No Connection		
Mounting Position	BOTTOM VIEW	Vertical, Base Down◊ ←



AMPLIFIER - Class A

Operating Conditions and Characteristics:

Filament	2.0	2.0	2.0	d-c volts
Plate	90	135	180 max.	volts
Grid *	-4.5	-9	-13.5	volts
Amp. Fact.	9.3	9.3	9.3	
Plate Res.	11000	10300	10300	ohms
Transcond.	850	900	900	μmhos
Plate Cur.	2.5	3.0	3.1	ma.

* The d-c resistance in the grid circuit should not exceed 2 megohms.

AMPLIFIER - Class B

Plate Voltage	180 max. volts
Peak Plate Current	50 max. ma.
Zero-Signal Plate Current	1.5 max. ma.

Typical Operating Conditions:

Unless otherwise specified, values are for 2 tubes.

Filament	2.0 d-c	volts
Plate	157.5	volts
Grid	-15	volts
Zero-Signal D-C Plate Current	1.0	ma.
Load Resistance (per tube)	2000	ohms
Effective Load Res. (plate to plate)	8000	ohms
Maximum-Signal Driving Power	260	mw.
Power Output #	2.1	watts

With one Type 1H4-G as driver operated at plate volts of 157.5, grid volts of -11.3, and with plate load of approximately 18000 ohms: input transformer ratio, primary to one-half secondary, is 1.165: total distortion is 6 to 7%.

DETECTOR

Typical Operation:	*Biased*			*Grid-Leak*	
Filament	2.0	2.0	2.0	2.0 d-c	volts
Plate	90	135	180 max.	45 max.	volts
Grid	-9°	-13.5°	-18°	Return to (+) Fil.	volts
Plate Cur.	Adjusted to 0.2 ma. with no input signal.§			-	
Grid Leak	-	-	-	1 to 5	megohms
Grid Condenser	-	-	-	0.00025	μf

§ Max.-signal d-c plate current should be limited to 2.0 ma.

° Approximate.

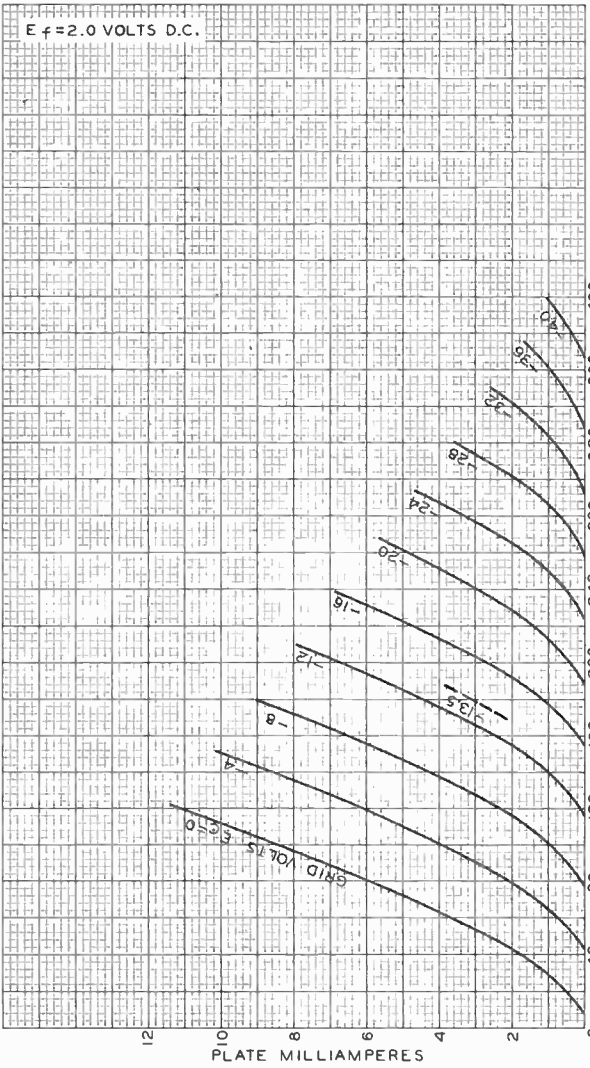
◊ Horizontal operation permitted if plane of filament is vertical.

← Indicates a change.

1H4-G

1H4-G

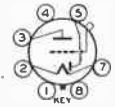
AVERAGE PLATE CHARACTERISTICS



1H5-GT/G

DIODE HIGH-MU TRIODE

Filament	Coated	
Voltage	1.4	a-c or d-c volts
Current	0.05	amp.
Direct Interelectrode Capacitances (Approx.):°		
Triode Unit		
Grid to Plate	1.0	μμf
Grid to Filament	1.1	μμf
Plate to Filament	4.6	μμf
Maximum Overall Length		3-5/16"
Maximum Seated Height		2-3/4"
Maximum Diameter		1-5/16"
Bulb		T-9
Cap		Skirted Miniature
Base		Sm. Wafer Octal 7-Pin, Sleeve
Pin 1 - Base Sleeve		Pin 7 - Filament -, Diode Shield
Pin 2 - Filament +		
Pin 3 - Triode Plate		Pin 8 - No Connection
Pin 4 - No Connection		Cap - Triode Grid
Pin 5 - Diode Plate		
Mounting Position		Any



BOTTOM VIEW (GT-5Z)

Maximum Ratings Are Design-Center Values

TRIODE UNIT

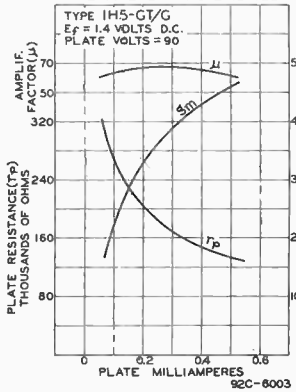
Plate Voltage	110 max.	volts
Characteristics — Class A_1 Amplifier:		
Plate	90	volts
Grid	0	volts
Amp. Fact.	65	
Plate Res.	240000	ohms
Transcond.	275	μmhos
Plate Cur.	0.15	ma.

DIODE UNIT

The diode is located at the negative end of the filament, and is independent of the triode unit except for the common filament.

° With external shield connected to negative filament terminal.

AVERAGE CHARACTERISTICS

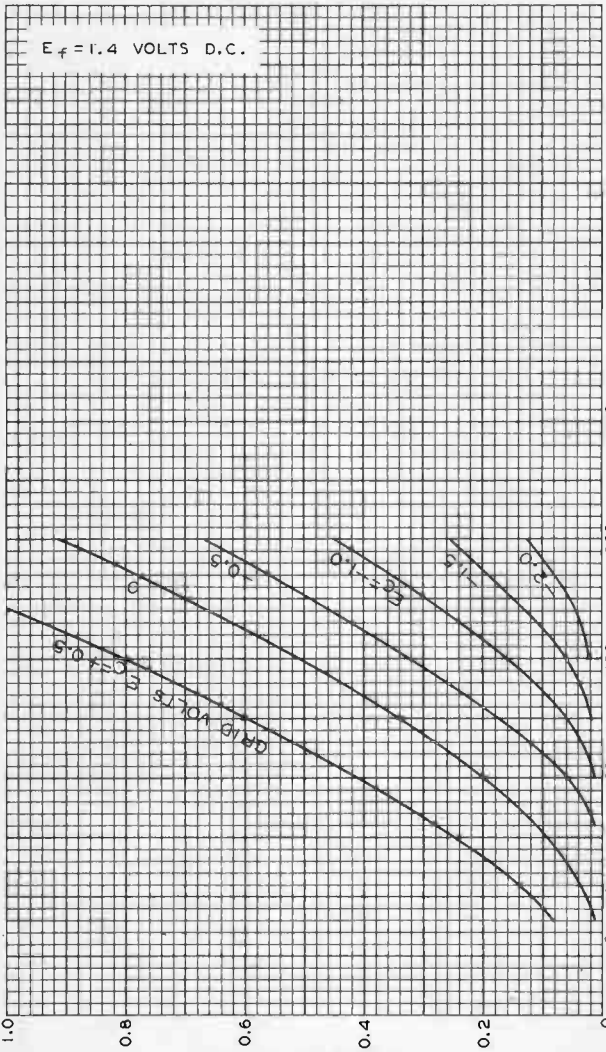


← Indicates a change.

1H5-GT/G

1H5-GT/G

AVERAGE PLATE CHARACTERISTICS



DEC. 28, 1942

RCA VICTOR DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

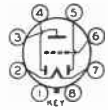
92C-6001R1

1H6-G

DUPLEX-DIODE TRIODE

For Diode Curves, refer to Type 6B7.

Filament	Coated	
Voltage	2.0	d-c volts
Current	0.06	amp.
Maximum Overall Length		4-1/8"
Maximum Diameter		1-9/16"
Bulb		ST-12
Base		Small Shell Octal 8-Pin
Pin 1-No Connection		Pin 5-Diode Plate #1*
Pin 2-Filament +		Pin 6-Triode Grid
Pin 3-Triode Plate		Pin 7-Filament -
Pin 4-Diode Plate #2*		Pin 8-No Connection
Mounting Position	BOTTOM VIEW	Vertical, Base Down◊ ←



* *Diode Plate #2 is at positive end of filament; Diode Plate #1 is at negative end of filament.*

TRIODE UNIT - Class A Amplifier

Operating Conditions and Characteristics:		
Filament	2.0	d-c volts
Plate	135 maximum	volts
Grid	-3	volts
Amp. Fact.	20	
Plate Res.	35000	ohms
Transcond.	575	μmhos
Plate Cur.	0.8	ma.

DIODE UNITS - Two

One diode unit is located at each end of the filament. The two diodes are independent of each other and of the triode unit except for the common filament. When the diodes are used for separate applications, diode plate #1 should be used for detection to avoid signal-delay effects.

For additional curves, refer to Type 1B5/25S. The 1H6-G and the 1B5/25S are identical electrically.

← Indicates a change.

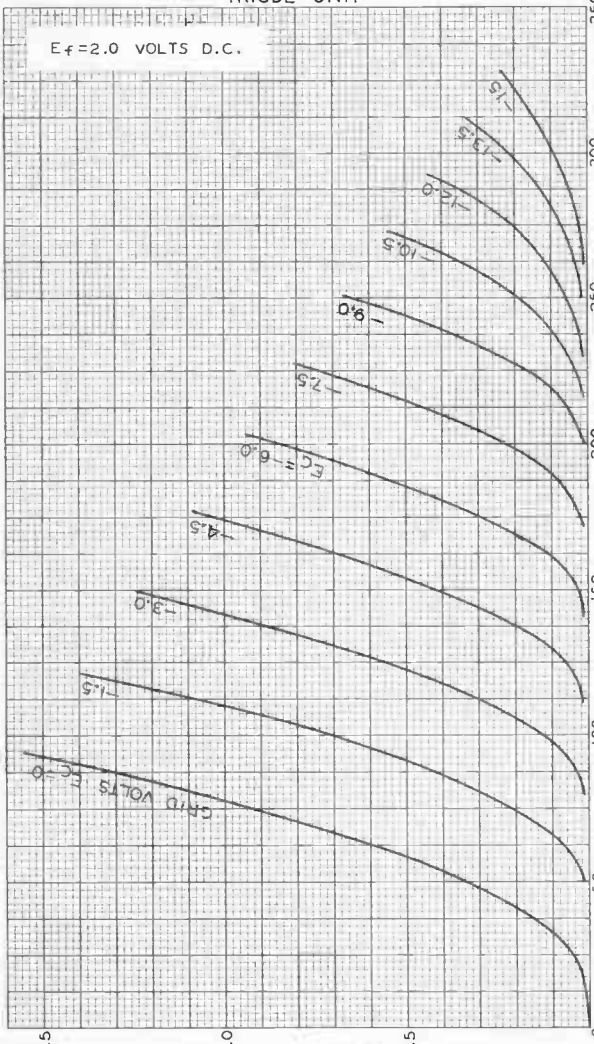
◊ Horizontal operation permitted if plane of filament is vertical.

RCA MANUFACTURING COMPANY, INC.

1H6-G

1H6-G

AVERAGE PLATE CHARACTERISTICS
TRIODE UNIT



MARCH 2, 1938

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4886

1J5-G

POWER AMPLIFIER PENTODE

Filament	Coated	
Voltage	2.0	d-c volts
Current	0.12	amp.
Maximum Overall Length		4-5/8"
Maximum Seated Height		4-1/16"
Maximum Diameter		1-13/16"
Bulb		ST-14
Base		Medium Shell Octal 7-Pin
Pin 1 - No Connection		Pin 5 - Grid
Pin 2 - Filament +		Pin 7 - Filament -
Pin 3 - Plate		Pin 8 - No Connection
Pin 4 - Screen		
Mounting Position		Vertical, Base Down◊

BOTTOM VIEW (G-6X)

AMPLIFIER

Plate Voltage	135 max.	volts
Screen Voltage	135 max.	volts
Typical Operation and Characteristics - Class A_1 Amplifier:		
Plate	135	volts
Screen	135	volts
Grid	-16.5	volts
Plate Cur.	7.0	ma.
Screen Cur.	2.0	ma.
Plate Res.	105000 approx.	ohms
Transcond.	950	μmhos
Load Res.	135000	ohms
Power Output	0.45	watt

◊ Horizontal operation permitted if plane of filament is vertical.

IL4

R-F AMPLIFIER PENTODE

MINIATURE TYPE

Filament	Coated	
Voltage	1.4	d-c volts
Current	0.05	amp.
Direct Interelectrode Capacitances:°		
Grid to Plate	0.008 max.	μμf
Input	3.6	μμf
Output	7.5	μμf
Maximum Overall Length		2-1/8"
Maximum Seated Height		1-7/8"
Maximum Diameter		3/4"
Bulb		T-5-1/2
Base ▲		Miniature Button 7-Pin
Pin 1	Filament -, Internal Shield	
Pin 2	Plate	
Pin 3	Screen	
Pin 4	No Connection	
Pin 5	Filament -, Internal Shield	
Pin 6	Grid	
Pin 7	Filament +	
RCA Socket		Stock No. 9914
Mounting Position		Any

BOTTOM VIEW (6AR)

Maximum And Minimum Ratings Are Design-Center Values

AMPLIFIER

Plate Voltage	110 max.	volts
Screen Voltage	90 max.	volts
Screen Supply Voltage	110 max.	volts
Grid Voltage	0 min.	volts
Total Cathode Current	6.5 max.	ma.

Typical Operation and Characteristics - Class A_1 Amplifier

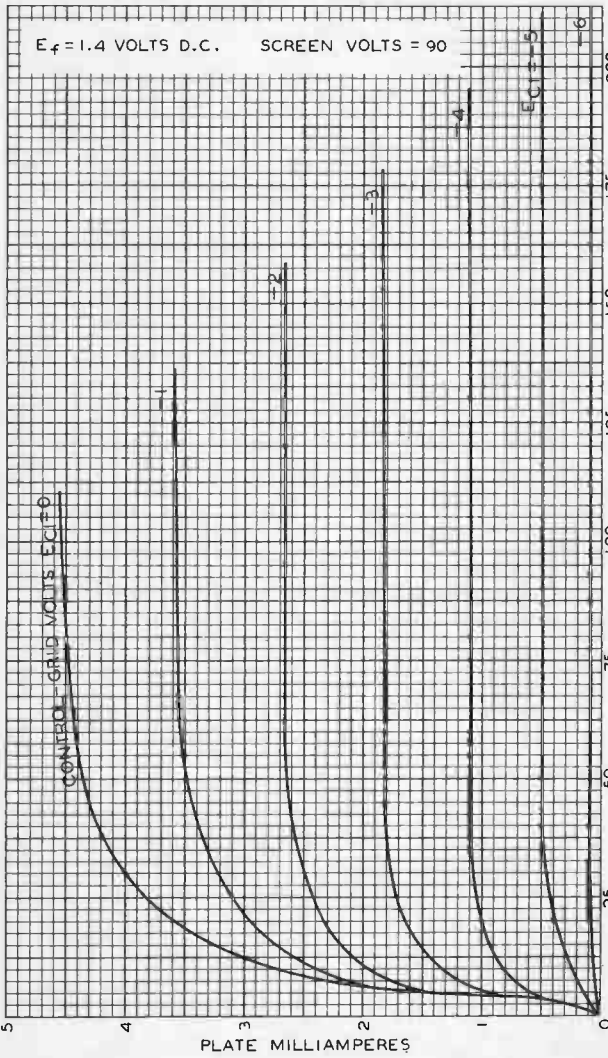
Plate Voltage	90	90	volts
Screen Voltage	67.5	90	volts
Grid Voltage	0	0	volts
Plate Resistance	0.6	0.35	megohm
Transconductance	925	1025	μmhos
Grid Bias for Plate Current = 10 μ amp.	-6	-8	volts
Plate Current	2.9	4.5	ma.
Screen Current	1.2	2.0	ma.

° With no external shield.

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

1L4

AVERAGE PLATE CHARACTERISTICS



IL6

PENTAGRID CONVERTER

MINIATURE TYPE

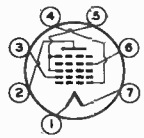
GENERAL DATA

Electrical:

Filament, Coated:			
Voltage	1.4		dc volts
Current	0.050		amp
Direct Interelectrode Capacitances:	*With External Shield*[▲]	*Without External Shield*	
Grid No.4 to All Other Electrodes (RF Input)	7.5	7.5	μμf
Plate to All Other Electrodes (Mixer Output)	12	7	μμf
Grid No.1 to All Other Electrodes Except Grid No.2 (Osc. Input)	2.2	2.2	μμf
Grid No.2 to All Other Electrodes Except Grid No.1 (Osc. Output)	2.6	2.6	μμf
Grid No.4 to Plate	0.36 max.	0.46 max.	μμf
Grid No.4 to Grid No.2	0.24	0.24	μμf
Grid No.4 to Grid No.1	0.19	0.19	μμf
Grid No.2 to Grid No.1	0.80	0.80	μμf
Grid No.1 to Plate	0.10 max.	0.15 max.	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length from Base Seat to Bulb Top (excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base — Small-Button Miniature 7-Pin (JETEC No.E7-1)	
Basing Designation for BOTTOM VIEW	7DC



Pin 1 – Filament (–)
Pin 2 – Plate
Pin 3 – Grid No.2
Pin 4 – Grid No.1
Pin 5 – Grid No.3, Grid No.5
Pin 6 – Grid No.4
Pin 7 – Filament (+)

CONVERTER

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	110 max.	volts
GRIDS-No.3 & No.5 (SCREEN) VOLTAGE	65 max.	volts

[▲] External shield #316 connected to pin 1.

IL6

IL6

PENTAGRID CONVERTER

GRIDS-No.3 & No.5 SUPPLY VOLTAGE	110 max.	volts
GRID-No.2 (OSCILLATOR-PLATE) VOLTAGE	110 max.	volts
TOTAL CATHODE CURRENT	4 max.	ma

Characteristics - *Separate Excitation:#*

Plate Voltage	90	volts
Grids-No.3-and-No.5 Voltage	45	volts
Grid-No.2 (Oscillator-Plate) Voltage	90	volts
Grid-No.4 (Mixer-Grid) Voltage	0	volts
Grid-No.1 (Oscillator-Grid) Resistor	0.2	megohm
Plate Resistance (Approx.)	0.65	megohm
Conversion Transconductance	300	μmhos
Grid-No.4 Voltage for Conversion Transconductance of 10 μmhos	-3.5	volts
Grid-No.4 Voltage for Conversion Transconductance of 100 μmhos	-1.3	volts
Plate Current	0.5	ma
Grids-No.3-and-No.5 Current	0.6	ma
Grid-No.2 Current	1.2	ma
Grid-No.1 Current	0.035	ma
Total Cathode Current	2.35	ma

Maximum Circuit Values:

Grid-No.4-Circuit Resistance	1.0 max.	megohm

NOTE: The transconductance between grid No.1 and grid No.2 connected to plate (not oscillating) is approximately 550 μmhos under the following conditions: signal applied to grid No.1 at zero bias; grid No.2 and plate at 90 volts; grids No.3 and No.5 at 45 volts; grid No.4 grounded. Under the same conditions, the total cathode current is 5 milliamperes, and the amplification factor is 40.

The characteristics shown under separate excitation approximate those obtained in a self-excited oscillator operating with zero bias.

ILA4

POWER AMPLIFIER PENTODE

Filament	Coated	
Voltage	1.4	d-c volts
Current	0.05	amp.
Maximum Overall Length		2-25/32"
Maximum Seated Height		2-1/4"
Maximum Diameter		1-3/16"
Bulb		T-9
Base		Lock-in 8-Pin
Pin 1 - Filament +		Pin 5 - No Connection
Pin 2 - Plate		Pin 6 - Grid
Pin 3 - Screen		Pin 7 - No Connection
Pin 4 - No Connection		Pin 8 - Filament -
Mounting Position		Any

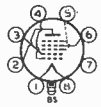
BOTTOM VIEW (5AD1)

For curve and additional data, refer to type 1A5GT/1A5G. The 1LA4 and the 1A5GT/1A5G are identical electrically.

ILA6

PENTAGRID CONVERTER

Filament	Coated	
Voltage	1.4	d-c volts
Current	0.05	amp.
Direct Interelectrode Capacitances:°		
Grid #4 to Plate		0.4 μμf
Gric #4 to Grid #2		0.3 μμf
Gric #4 to Grid #1		0.15 μμf
Grid #1 to Grid #2		0.6 μμf
Gric #4 to All Other Electrodes (R-F Input)		7.7 μμf
Grid #2 to All Other Electrodes Except Grid #1 (Osc. Output)		3.3 μμf
Gric #1 to All Other Electrodes Except Grid #2 (Osc. Input)		2.9 μμf
Plate to All Other Electrodes (Mixer Output)		8.0 μμf
Maximum Overall Length		2-25/32"
Maximum Seated Height		2-1/4"
Maximum Diameter		1-3/16"
Bulb		T-9
Base		Lock-in 8-Pin
Pin 1 - Filament +		Pin 5 - Grids #3 & #5
Pin 2 - Plate		Pin 6 - Grid #4
Pin 3 - Grid #2		Pin 7 - No Connection
Pin 4 - Grid #1		Pin 8 - Filament -
Mounting Position		Any



BOTTOM VIEW (7AK)

° with close-fitting shield connected to negative filament terminal.

(continued on next page)

1LA6

PENTAGRID CONVERTER

(continued from preceding page)

CONVERTER SERVICE

Plate Voltage	90	max.	volts
Screen (Grids #3 & #5) Voltage▲	55	max.	volts
Screen Supply Voltage	90	max.	volts
Anode-Grid (Grid #2) Voltage	90	max.	volts
Total Zero-Sig. Cathode Current	3	max.	ma.
Typical Operation and Characteristics:			
Plate	90		volts
Screen	45		volts
Anode-Grid	90		volts
Control-Grid (Grid #4)▲▲	0		volts
Oscillator-Grid (Grid #1) Resistor	200000		ohms
Plate Res.	0.75	approx.	ohms
Conversion Transcond.	250		μmhos
Conversion Transcond. with Grid #4 Bias of -3 volts	10	approx.	μmhos
Plate Cur.	0.55		ma.
Screen Cur.	0.6		ma.
Anode-Grid Cur.	1.2		ma.
Oscillator-Grid Cur.	0.035		ma.
Total Cathode Cur.	2.4		ma.

NOTE: The transconductance of the oscillator portion (not oscillating) is approximately 550 μmhos, and the anode grid current 2.2 ma. under the following conditions: plate volts, 90; screen volts, #5; control-grid volts, 0; anode-grid volts, 90; and oscillator-grid volts, 0.

▲ Obtained preferably by using a properly by-passed #5000 to 75000-ohm voltage-dropping resistor in series with a 90-volt supply.

▲▲ A resistance of at least 1.0 megohm should be in the grid return to negative filament pin.

A Typical Pentagrid Circuit is shown under Type 1A6.

1LB4
POWER PENTODE

GENERAL DATA

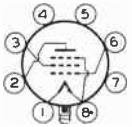
Electrical:

Filament, Coated:		
Voltage	1.4	dc volts
Current	0.05	amp

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-25/32"
Maximum Seated Length	2-1/4"
Maximum Diameter	1-3/16"
Bulb	T-9
Base	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW	5AD2

Pin 1 - Filament (+)
Pin 2 - Plate
Pin 3 - Grid No.2
Pin 4 - Internal Connection —Do Not Use



Pin 5 - No Connection
Pin 6 - Grid No.1
Pin 7 - No Connection
Pin 8 - Filament (-), Grid No.3
Plug - Base Shell

Maximum Ratings and Typical Operating Conditions for the 1LB4 are the same as for the Pentode Unit of Type 1D8-GT.

RCA

ILC5

SHARP-CUTOFF PENTODE

GENERAL DATA

Electrical:

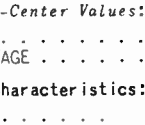
Filament, Coated:		
Voltage	1.4	dc volts
Current	0.05	amp
Direct Interelectrode Capacitances:[o]		
Grid No.1 to Plate	0.007 max.	μμf
Input	3.2	μμf
Output	7.0	μμf

[o] With external shield connected to negative filament terminal.

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-25/32"
Maximum Seated Length	2-1/4"
Maximum Diameter	1-3/16"
Bulb	T-9
Base	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW	7AO

Pin 1 - Filament (+)
Pin 2 - Plate
Pin 3 - Grid No.2
Pin 4 - Grid No.3
Pin 5 - Filament (-), Internal Shield



Pin 6 - Grid No.1
Pin 7 - No Connection
Pin 8 - Filament (-), Internal Shield
Plug - Base Shell

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	110 max. volts
GRID-No.2 (SCREEN) VOLTAGE	45 max. volts

Typical Operation and Characteristics:

Plate Voltage	45	90	volts
Grid No.3	Connected to negative filament terminal at socket		
Grid-No.2 Voltage	45	45	volts
Grid-No.1 (Control-Grid) Supply Voltage	0	0	volts
Min. Grid-No.1 Resistor	1	1	megohm
Plate Resistance (Approx.)	0.7	1.5	megohms
Transconductance	750	775	μmhos
Plate Current	1.1	1.15	ma
Grid-No.2 Current	0.35	0.30	ma

ILC6
PENTAGRID CONVERTER

GENERAL DATA

Electrical:

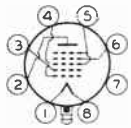
Filament, Coated:		
Voltage	1.4	dc volts
Current	0.05	amp
Direct Interelectrode Capacitances:[o]		
Grid No.4 to Plate	0.28	μμf
Mixer Input	9.0	μμf
Mixer Output	5.5	μμf
Oscillator Input	2.4	μμf
Oscillator Output	4.8	μμf

[o] With external shield connected to negative filament terminal.

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-25/32"
Maximum Seated Length	2-1/4"
Maximum Diameter	1-3/16"
Bulb	T-9
Base	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW	7AK

Pin 1 - Filament (+)
Pin 2 - Plate
Pin 3 - Grid No.2
Pin 4 - Grid No.1
Pin 5 - Grid No.3, Grid No.5



Pin 6 - Grid No.4
Pin 7 - No Connection
Pin 8 - Filament (-)
Plug - Base Shell

CONVERTER

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	110 max.	volts
GRIDS-No.3 & No.5 (SCREEN) VOLTAGE	45 max.	volts
GRIDS-No.3 & No.5 SUPPLY VOLTAGE	110 max.	volts
GRID-No.2 (ANODE-GRID) VOLTAGE	50 max.	volts
GRID-No.2 SUPPLY VOLTAGE	110 max.	volts
TOTAL CATHODE CURRENT	3.0 max.	ma

Typical Operation:

Plate Voltage	45	90	volts
Grids-No.3 & No.5 Voltage[□]	35	35	volts
Grid-No.2 Voltage	45	45	volts
Grid-No.4 (Control-Grid) Supply Voltage	0	0	volts
Min. Grid-No.4 Resistor	1	1	megohm
Grid-No.1 (Oscillator-Grid) Resistor	0.2	0.2	megohm
Plate Resistance	0.3	0.65	megohm
Conversion Transconductance	250	275	μmhos
Conversion Transconductance (Approx.)[#]	5	5	μmhos

[□],[#]: See next page.

ILC6

ILC6
PENTAGRID CONVERTER

Plate Current.	0.70	0.75	ma
Grids-No.3 & No.5 Current.	0.75	0.70	ma
Grid-No.2 Current.	1.4	1.4	ma
Grid-No.1 Current.	0.035	0.035	ma
Total Cathode Current.	2.9	2.9	ma

□ Obtained preferably by using a properly bypassed voltage-dropping resistor in series with the plate voltage supply. To avoid oscillation difficulties, the voltage of grids No.3 & No.5 must be at least 10 volts lower than the grid-No.2 voltage.

\# For grid-No.4 bias of -3 volts.

NOTE: The characteristics of the oscillator section (not oscillating) are: transconductance = approx. 550 μmhos; μ = 14; and grid-No.2 current = 2.7 ma. under the following conditions: plate volts = 90; grids No.3 & No.5 volts = 45; grid-No.4 volts = 0; grid-No.2 volts = 90; grid-No.1 volts = 0.

ILD5

DIODE—SHARP-CUTOFF PENTODE

GENERAL DATA

Electrical:

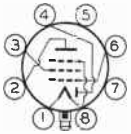
Filament, Coated:		
Voltage	1.4	dc volts
Current	0.05	amp
Direct Interelectrode Capacitances:[o]		
Pentode Unit:		
Grid No.1 to Plate	0.18	μμf
Input	3.2	μμf
Output	6.0	μμf

[o] With external shield connected to negative filament terminal.

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-25/32"
Maximum Seated Length	2-1/4"
Maximum Diameter	1-3/16"
Bulb	T-9
Base	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW	6AX

Pin 1 – Filament (+)
Pin 2 – Pentode Plate
Pin 3 – Pentode Grid No.2
Pin 4 – Diode Plate
Pin 5 – No Connection



Pin 6 – Pentode Grid No.1
Pin 7 – No Connection
Pin 8 – Filament (–), Pentode Grid No.3
Plug – Base Shell

PENTODE UNIT
AMPLIFIER – Class A_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	110 max.		volts
GRID-No.2 (SCREEN) VOLTAGE	50 max.		volts

Typical Operation and Characteristics:

Plate Voltage	45	90	volts
Grid-No.2 Voltage	45	45	volts
Grid-No.1 Voltage	0	0	volts
Plate Resistance (Approx.)	0.9	0.75	megohm
Transconductance	550	575	μmhos
Plate Current	0.55	0.6	ma
Grid-No.2 Current	0.12	0.1	ma

DIODE UNIT

The diode is located at the negative end of the filament and is independent of the pentode unit except for the common filament.

1LE3

1LE3
MEDIUM-MU TRIODE

GENERAL DATA

Electrical:

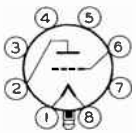
Filament, Coated:		
Voltage	1.4	dc volts
Current	0.05	amp
Direct Interelectrode Capacitances – Triode Unit:*		
Grid to Plate	1.7	μμf
Grid to Cathode	1.7	μμf
Plate to Cathode	3.0	μμf

* with external shield connected to negative filament terminal.

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-25/32"
Maximum Seated Length	2-1/4"
Maximum Diameter	1-3/16"
Bulb	T-9
Base	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW	4AA

Pin 1 – Filament (+)
Pin 2 – Plate
Pin 3 – No Connection
Pin 4 – No Connection
Pin 5 – Internal Connection – Do Not Use



Pin 6 – Grid
Pin 7 – No Connection
Pin 8 – Filament (–)
Plug – Base Shell

AMPLIFIER – Class A_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	110 max.	volts

Typical Operation and Characteristics:

Plate Voltage	90	90	volts
Grid Voltage	0	–3	volts
Amplification Factor	14.5	14.5	
Plate Resistance	11200	19000	ohms
Transconductance	1300	760	μmhos
Plate Current	4.5	1.4	ma

RCA

ILG5

REMOTE-CUTOFF PENTODE

GENERAL DATA

Electrical:

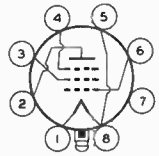
Filament, Coated:			
Voltage	1.4		dc volts
Current	0.05		amp
Direct Interelectrode Capacitances:[o]			
Grid No.1 to Plate	0.007 max.		μμf
Input	3.2		μμf
Output	7.0		μμf

[o] With external shield connected to negative filament terminal.

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-25/32"
Maximum Seated Length	2-1/4"
Maximum Diameter	1-3/16"
Bulb	T-9
Base	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW	7A0

Pin 1 - Filament(+)
Pin 2 - Plate
Pin 3 - Grid No.2
Pin 4 - Grid No.3
Pin 5 - Filament(-) Internal Shield



Pin 6 - Grid No.1
Pin 7 - No Connection
Pin 8 - Filament(-) Internal Shield
Plug - Base Shell

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	110 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	110 max.	volts

Typical Operation and Characteristics:

Plate Voltage	90	90	volts
Grid No.3 (Suppressor)	Connected to negative filament terminal at socket		
Grid-No.2 Voltage	45	90	volts
Grid-No.1 (Control-Grid) Voltage	0	-1.5	volts
Plate Resistance (Approx.)	1.0	0.5	megohm
Transconductance	800	1150	μmhos
Grid-No.1 Bias (Approx.) for transconductance of 10 μmhos	-10	-19	volts
Plate Current	1.7	3.7	ma
Grid-No.2 Current	0.4	0.9	ma

1LH4

DIODE – HIGH-MU TRIODE

GENERAL DATA

Electrical:

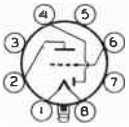
Filament, Coated:

Voltage	1.4	dc volts
Current	0.05	amp

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-25/32"
Maximum Seated Length	2-1/4"
Maximum Diameter	1-3/16"
Bulb	T-9
Base	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW	5AG

Pin 1 – Filament (+)
Pin 2 – Triode Plate
Pin 3 – No Connection
Pin 4 – Diode Plate
Pin 5 – No Connection



Pin 6 – Triode Grid
Pin 7 – No Connection
Pin 8 – Filament (–)
Plug – Base Shell

Maximum Ratings and Characteristics for Type 1LH4 are the same as those shown for the 1H5-GT.

ILN5
SHARP-CUTOFF PENTODE

GENERAL DATA

Electrical:

Filament, Coated:		
Voltage	1.4	dc volts
Current	0.05	amp
Direct Interelectrode Capacitances:[o]		
Grid No.1 to Plate	0.007 max.	μμf
Input	3.0	μμf
Output	8.0	μμf

[o] With external shield connected to negative filament terminal.

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-25/32"
Maximum Seated Length	2-1/4"
Maximum Diameter	1-3/16"
Bulb	T-9
Base	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW	7A0

Pin 1 - Filament (+)
Pin 2 - Plate
Pin 3 - Grid No.2
Pin 4 - Grid No.3
Pin 5 - Filament (-)

Pin 6 - Grid No.1
Pin 7 - No Connection
Pin 8 - Filament (-)
Plug - Base Shell

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	110 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	110 max.	volts

Typical Operation and Characteristics:

Plate Voltage	90	volts
Grid-No.3 (Suppressor)	Connected to cathode at socket	
Grid-No.2 Voltage	90	volts
Grid-No.1 (Control-Grid) Voltage	0	volts
Plate Resistance (Approx.)	1.1	megohms
Transconductance	800	μmhos
Grid-No.1 Bias (Approx.) for transconductance of 10 μmhos	-4.5	volts
Plate Current	1.6	ma
Grid-No.2 Current	0.35	ma

Half-Wave Vacuum Rectifier

GENERAL DATA

Electrical:

Filament, Coated:

	Min.	Av.	Max.	
Voltage (AC)	1.05	1.25	1.45	volts
Current at 1.25 volts	–	0.2	–	amp

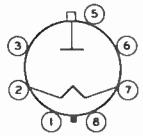
Direct Interelectrode Capacitance (Approx.):▲

Plate to filament & internal shield	1.4	μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	3.562"
Seated Length	2.624" to 3.000"
Diameter	1.438" to 1.562"
Bulb	T12
Cap	Small with Tubular Support (JEDEC No.C1-34)
Base	Short Medium-Shell Octal 7-Pin with External Barriers, Style B (JEDEC Group 1, No.B7-227)
Basing Designation for BOTTOM VIEW	3C

Pin 1 – Limited Connection●
Pin 2 – Filament
Pin 3 – Same as Pin 1
Pin 5 – Same as Pin 1



Pin 6 – No Connection
Pin 7 – Filament, Internal Shield
Pin 8 – Same as Pin 1
Cap – Plate

PULSED-RECTIFIER SERVICE

Maximum Ratings, *Design-Maximum Values:*

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

INVERSE PLATE VOLTAGE:			
Total dc and peak♦	28000	max.	volts
DC	24000	max.	volts
PEAK PLATE CURRENT	50	max.	ma
AVERAGE PLATE CURRENT	0.5	max.	ma

Characteristics:

Plate Current for plate volts = 100	7♦	ma

▲ Without external shield.

● See *Operating Considerations.*

★ 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.

♦ Instantaneous test value.

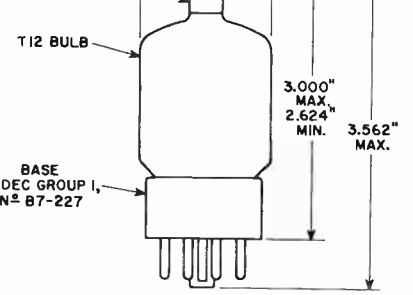
OPERATING CONSIDERATIONS

Socket Connections. Socket terminals 1, 3, 4, 5, 6, and 8 may be connected to socket terminal 7 or to a corona shield which is connected to socket terminal 7. Socket terminals 4 and 6 may be used as tie points for components at or near filament potential.

Measurement of Filament Voltage. To measure the filament voltage when the filament is at a high dc potential with respect to ground, it is recommended that a simple method utilizing visual comparison of the filament temperature be used. The color temperature of the filament, operating from a pulse-or-rf-power source, may be checked by observing in a darkened room the reflection of the incandescent filament upon the surface of the internal shield. A visual comparison of this color temperature with that obtained when the filament of another 1N2-A is operated from a dc or low-frequency ac supply of 1.25 volts, provides a convenient means for adjusting the amount of excitation to produce 1.25 volts (rms) at the filament terminals.

The high voltages at which the 1N2-A is operated are very dangerous. Great care should be taken in the design of apparatus to prevent the operator from coming in contact with these high voltages. Particular care against fatal shock should be taken in the measurement of filament voltage. Under all circumstances, circuit parts which may be at high potentials should be enclosed or adequately insulated.

X-rays. The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier tubes may produce *X-rays* which can constitute a health hazard unless such tubes are adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.

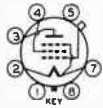


92CS-10925

1N5-GT/G

R-F AMPLIFIER PENTODE

Filament	Coated	
Voltage	1.4	d-c volts
Current	0.05	amp.
Direct Interelectrode Capacitances:°		
Grid to Plate	0.007 max.	μμf
Input	3	μμf
Output	10	μμf
Maximum Overall Length		3-5/16"
Maximum Seated Height		2-3/4"
Maximum Diameter		1-5/16"
Bulb		T-9
Cap		Skirted Miniature
Base		Small Wafer Octal 7-Pin, Sleeve
Pin 1 - Base Sleeve		Pin 5 - No Connection
Pin 2 - Filament +		Pin 7 - Filament -
Pin 3 - Plate		Pin 8 - No Connection
Pin 4 - Screen		Cap - Grid
Mounting Position		Any



BOTTOM VIEW (GT-5Y)

Maximum Ratings Are Design-Center Values

AMPLIFIER

Plate Voltage	110 max.	volts
Screen Voltage	110 max.	volts
Typical Operation and Characteristics - Class A_1 Amplifier:		
Plate	90	volts
Screen	90	volts
Grid	0	volts
Plate Res.	1.5 approx.	megohms
Transcond.	750	μmhos
Grid Bias for Transcond. of approx. 5 μmhos	-4	volts
Plate Cur.	1.2	ma.
Screen Cur.	0.3	ma.

° With shield connected to negative filament terminal.

1N5-GT/G

1N5-GT/G

AVERAGE PLATE CHARACTERISTICS

DEC. 29, 1942

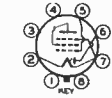
RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92C-6000R1

IN6-G

DIODE – POWER AMPLIFIER PENTODE

Filament	Coated	
Voltage	1.4	d-c volts
Current	0.05	amp.
Maximum Overall Length		4"
Maximum Seated Height		3-7/16"
Maximum Diameter		1-3/16"
Bulb		T-9
Base		Small Shell Octal 8-Pin
Pin 1 – No Connection		Pin 5 – Pentode Grid
Pin 2 – Filament +		Pin 6 – Diode Plate
Pin 3 – Pentode Plate		Pin 7 – Filament –
Pin 4 – Pentode Screen		Pin 8 – No Connection
Mounting Position		Any



BOTTOM VIEW (G-7AM)

AMPLIFIER

Plate Voltage	110 max.	volts
Screen Voltage	110 max.	volts
Zero-Sig. Cathode Current (Pentode Unit)	6 max.	ma.
Typical Operation and Characteristics - Class A_1 Amplifier:		
Plate	90	volts
Screen	90	volts
Grid	-4.5	volts
Peak A-F Grid Voltage	-4.9	volts
Zero-Signal Plate Cur.	3.4	ma.
Max.-Signal Plate Cur.	3.4	ma.
Zero-Signal Screen Cur.	0.7	ma.
Max.-Signal Screen Cur.	1.2	ma.
Plate Res. (Approx.)	0.3	megohm
Transconductance	800	μmhos
Load Resistance	25000	ohms
Total Harmonic Distortion	7	%
Max.-Signal Power Output	100	mw

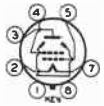
DIODE UNIT

The diode is located at the negative end of the filament, and is independent of the pentode unit except for the common filament.

1Q5-GT/1Q5-G

BEAM POWER AMPLIFIER

Filament	Coated	
Voltage	1.4	d-c volts
Current	0.1	amp.
Maximum Overall Length		3-5/16"
Maximum Seated Height		2-3/4" ←
Maximum Diameter		1-5/16"
Bulb		T-9
Base		Intermediate Shell Octal 7-Pin
Pin 1 - No Connection		Pin 5 - Grid
Pin 2 - Filament +		Pin 7 - Filament -
Pin 3 - Plate		Pin 8 - No Connection
Pin 4 - Screen		
Mounting Position		Any



BOTTOM VIEW (G-6AF)

AMPLIFIER

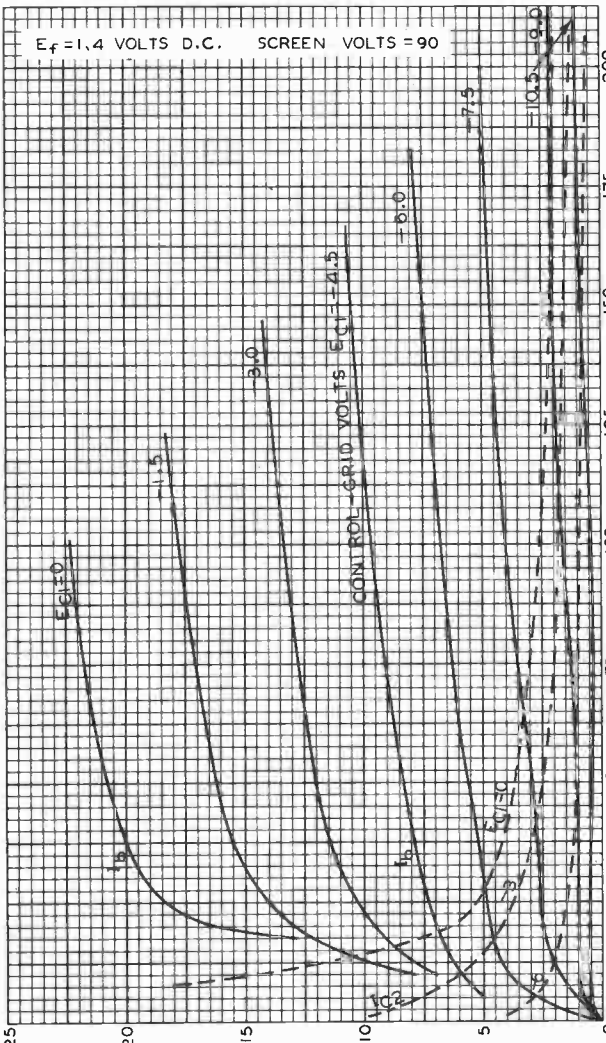
Plate Voltage		110 max.	volts
Screen Voltage		110 max.	volts
Zero-Signal Cathode Current		12 max.	ma.
Typical Operation and Characteristics - Class A_1 Amplifier:			
Plate	85	90	volts
Screen	85	90	volts
Grid	-5	-4.5	volts
Peak A-F Grid Voltage	5	4.5	volts
Zero-Sig. Plate Cur.	7.0	9.5	ma.
Zero-Sig. Screen Cur.	0.8	1.3	approx. ma.
Plate Resistance	70000	75000	approx. ohms
Transconductance	1950	2200	μmhos
Load Resistance	9000	8000	ohms
Total Harmonic Dist.	5.5	6.0	%
Max.-Sig. Power Output	250	270	mw.

← Indicates a change.

RCA MANUFACTURING COMPANY, INC

1Q5-GT

AVERAGE PLATE CHARACTERISTICS



IR5

PENTAGRID CONVERTER

MINIATURE TYPE

Filament	Coated	
Voltage	1.4	d-c volts
Current	0.05	amp.
Direct Interelectrode Capacitances:°		
Grid #3 to All Other Electrodes (R-F Input)	7.0	μμf
Plate to All Other Electrodes (Mixer Output)	7.5	μμf ←
Grid #1 to All Other Electrodes (Osc. Input)	3.8	μμf
Grid #3 to Plate	0.4 max.	μμf
Grid #3 to Grid #1	0.2 max.	μμf
Grid #1 to Plate	0.1 max.	μμf
Maximum Overall Length	2-1/8"	
Maximum Seated Height	1-7/8"	
Maximum Diameter	3/4"	
Bulb	T-5-1/2	
Base▲	Miniature Button 7- Pin	
Pin 1 - Filament -	Pin 5 - Filament -	
Pin 2 - Plate	Pin 6 - Grid #3	
Pin 3 - Grids #2 & #4	Pin 7 - Filament +	
Pin 4 - Grid #1		
Mounting Position	BOTTOM VIEW (7AT)	Any

Maximum and Minimum Ratings Are Design-Center Values

CONVERTER SERVICE

Plate Voltage	90 max.	volts
Grids #2 & #4 Voltage	67.5 max.	volts
Grids #2 & #4 Supply Voltage	90 max.	volts
Grid #3 Voltage	0 min.	volts
Total Zero-Sig. Cathode Current	5.5 max.	ma.

Typical Operation and Characteristics:

Plate Voltage	45	67.5	90	90	volts
Grids #2 & #4 Voltage	45	67.5	45	67.5	volts
Grid #3 Voltage	0	0	0	0	volts
Grid #1 Resistor	0.1	0.1	0.1	0.1	megohm
Plate Resistance	0.6	0.5	0.8	0.6	approx. megohm
Conversion Transcond.	235	280	250	300	μmhos
Grid #3 Bias for Conver. Transcond. of approx. 5 μmhos	-9	-14	-9	-14	volts
Plate Current	0.7	1.4	0.8	1.6	ma.
Grids #2 & #4 Current	1.9	3.2	1.9	3.2	ma.
Grid #1 Current	0.15	0.25	0.15	0.25	ma.
Total Cathode Current	2.75	5	2.75	5	ma.

NOTE: The transconductance between Grid #1 and Grids #2 & #4 tied to plate (not oscillating) is approximately 1400 μmhos under the following conditions: Grid #1 & #3 at 0 volts; Grids #2 & #4 and plate at 67.5 volts.

° With no external shield.

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

← Indicates a change.

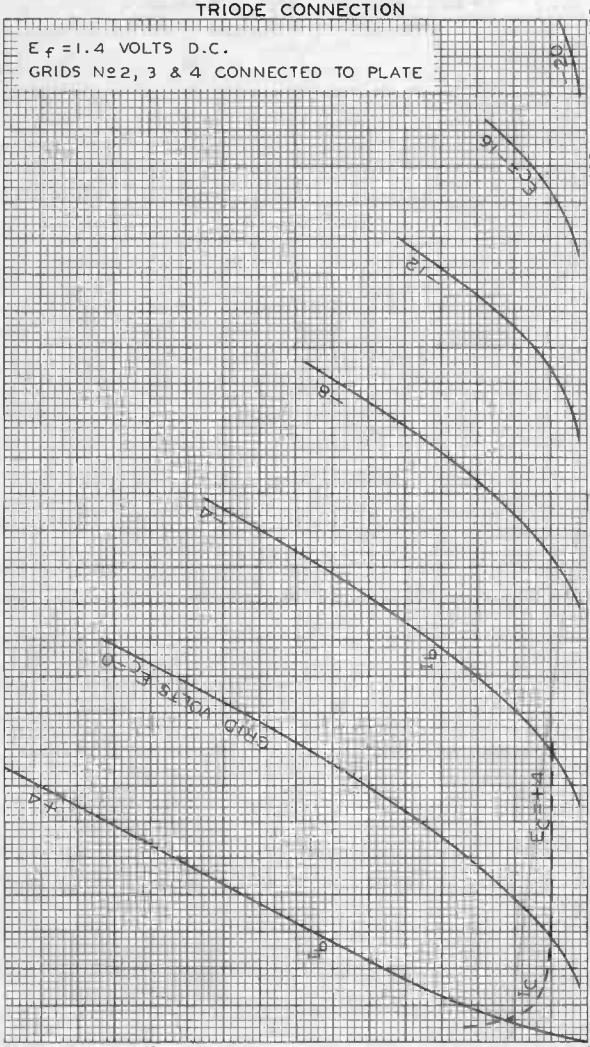
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

IR5

IR5

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION

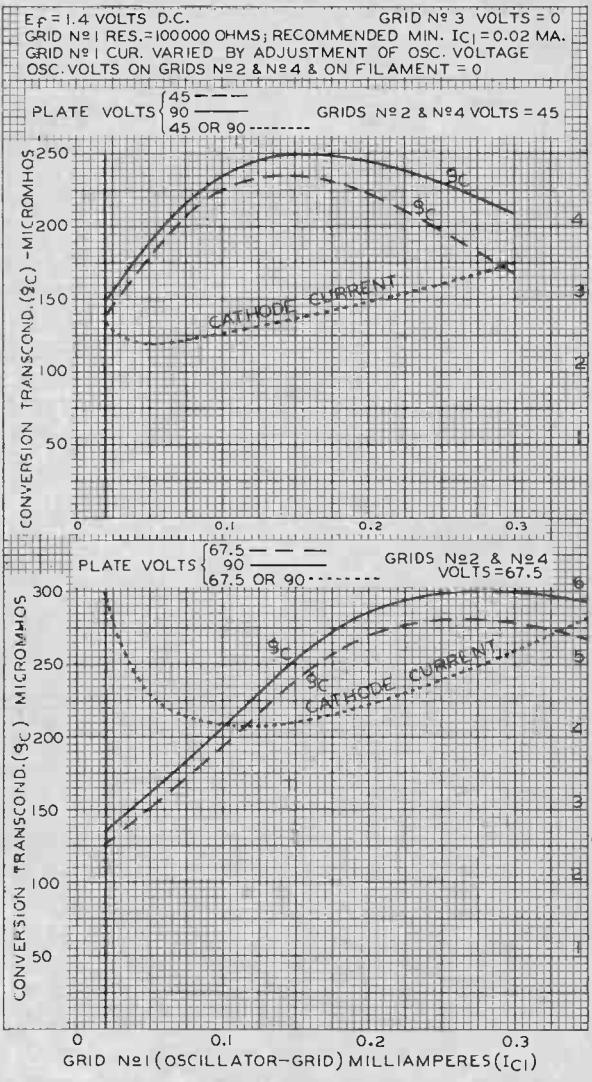


RCA

IR5

OPERATION CHARACTERISTICS

E_f = 1.4 VOLTS D.C. GRID Nº 3 VOLTS = 0
GRID Nº 1 RES. = 100000 OHMS; RECOMMENDED MIN. I_{C1} = 0.02 MA.
GRID Nº 1 CUR. VARIED BY ADJUSTMENT OF OSC. VOLTAGE
OSC. VOLTS ON GRIDS Nº 2 & Nº 4 & ON FILAMENT = 0



MAY 30, 1940 RCA RADIOTRON DIVISION RCA MANUFACTURING COMPANY, INC 92C-6098R1

RCA

IR5

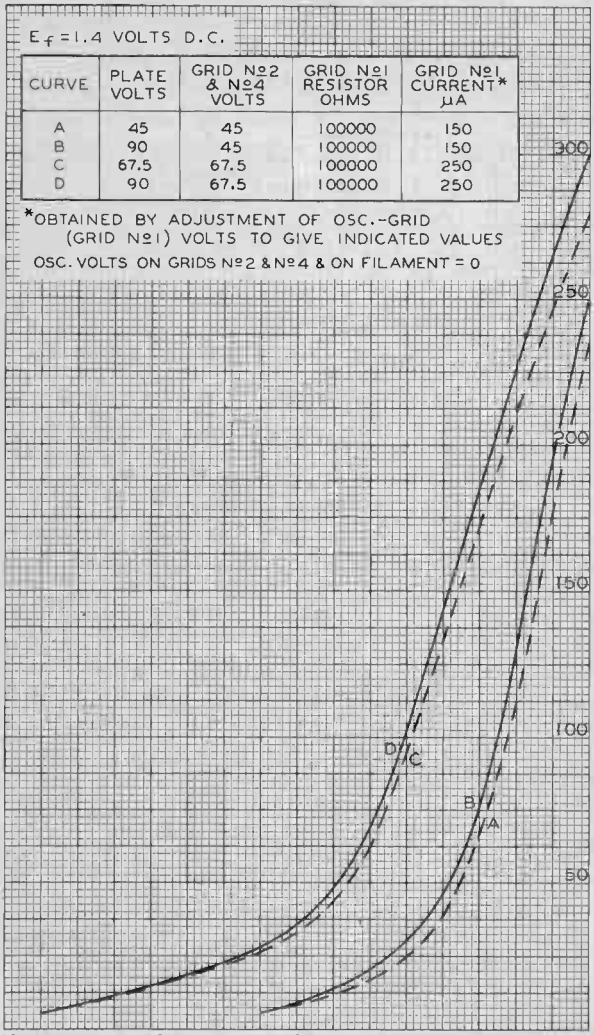
OPERATION CHARACTERISTICS

E_f = 1.4 VOLTS D.C.

CURVE	PLATE VOLTS	GRID №2 & №4 VOLTS	GRID №1 RESISTOR OHMS	GRID №1 CURRENT* μA
A	45	45	100000	150
B	90	45	100000	150
C	67.5	67.5	100000	250
D	90	67.5	100000	250

*OBTAINED BY ADJUSTMENT OF OSC.-GRID (GRID №1) VOLTS TO GIVE INDICATED VALUES

OSC. VOLTS ON GRIDS №2 & №4 & ON FILAMENT = 0



RCA

1S4

POWER AMPLIFIER PENTODE

MINIATURE TYPE

Filament	Coated	
Voltage	1.4	d-c volts
Current	0.1	amp.
Maximum Overall Length		2-1/8"
Maximum Seated Height		1-7/8"
Maximum Diameter		3/4"
Bulb		T-5-1/2
Base△		Miniature Button 7-Pin
Pin 1 - Filament -		Pin 5 - Filament -
Pin 2 - Plate		Pin 6 - Plate
Pin 3 - Grid		Pin 7 - Filament +
Pin 4 - Screen		
Mounting Position		Any

BOTTOM VIEW (7AV)

AMPLIFIER

Plate Voltage	90 max. volts
Screen Voltage	67.5 max. volts
Total Max.-Signal Cathode Current	11 max. ma.
Total Zero-Signal Cathode Current	9 max. ma.

Typical Operation and Characteristics - Class A_1 Amplifier:

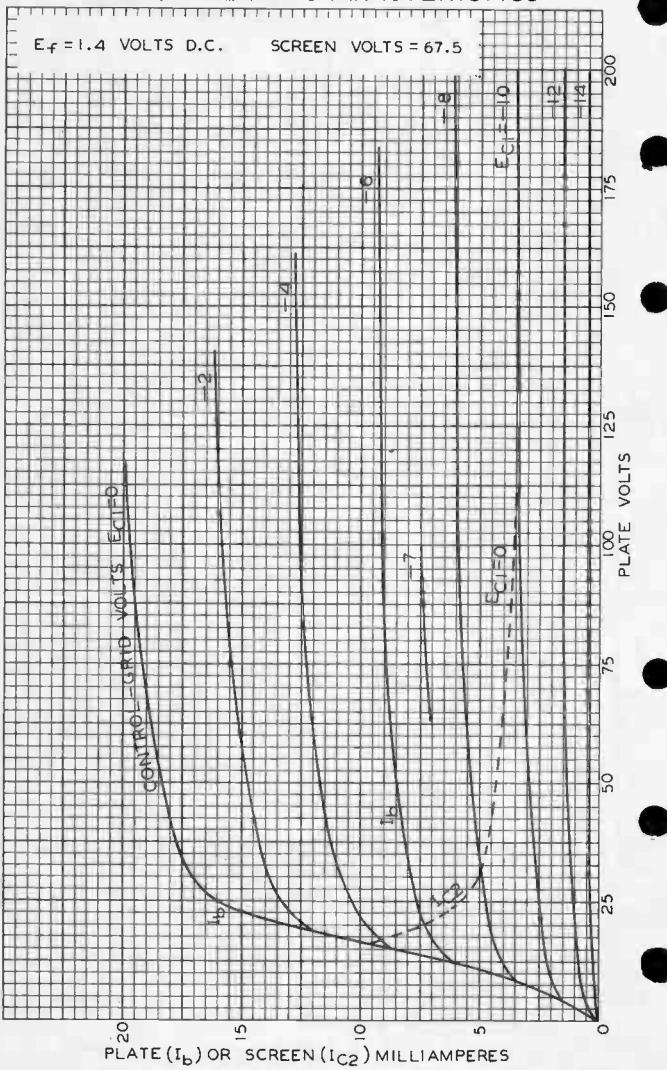
Filament	1.4	1.4	1.4	d-c volts
Plate	45	67.5	90	volts
Screen	45	67.5	67.5	volts
Grid	-4.5	-7	-7	volts
Peak A-F Grid Voltage	4.5	7	7	volts
Zero-Signal Plate Cur.	3.8	7.2	7.4	ma.
Zero-Signal Screen Cur.	0.8	1.5	1.4	ma.
Plate Res. (Approx.)	0.1	0.1	0.1	megohm
Transcond.	1250	1550	1575	μmhos
Load Res.	8000	5000	8000	ohms
Total Harmonic Distortion	12	10	12	%
Max.-Sig. Power Output	65	180	270	mw

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

RCA

1S4

AVERAGE PLATE CHARACTERISTICS



JAN. 26, 1942

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

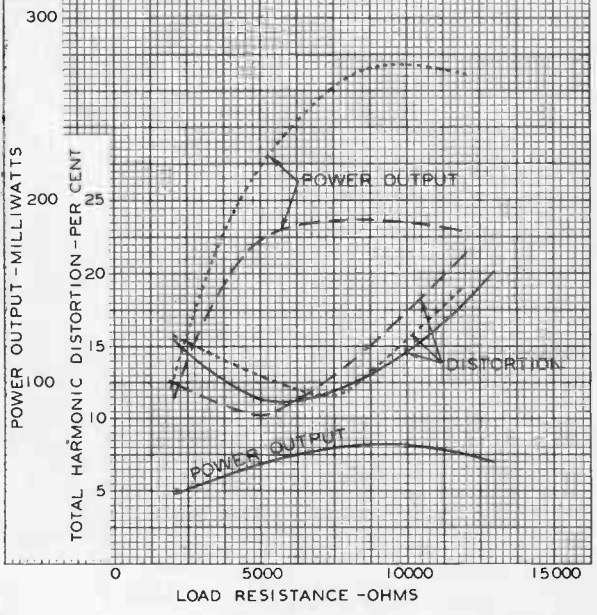
92C-6157R1

IS4

OPERATION CHARACTERISTICS

E_f = 1.4 VOLTS D.C.

CURVE	PLATE VOLTS	SCREEN VOLTS	GRID VOLTS	SIGNAL VOLTS RMS
———	45	45	-4.5	3.2
— — —	67.5	67.5	-7	4.95
·····	90	67.5	-7	4.95

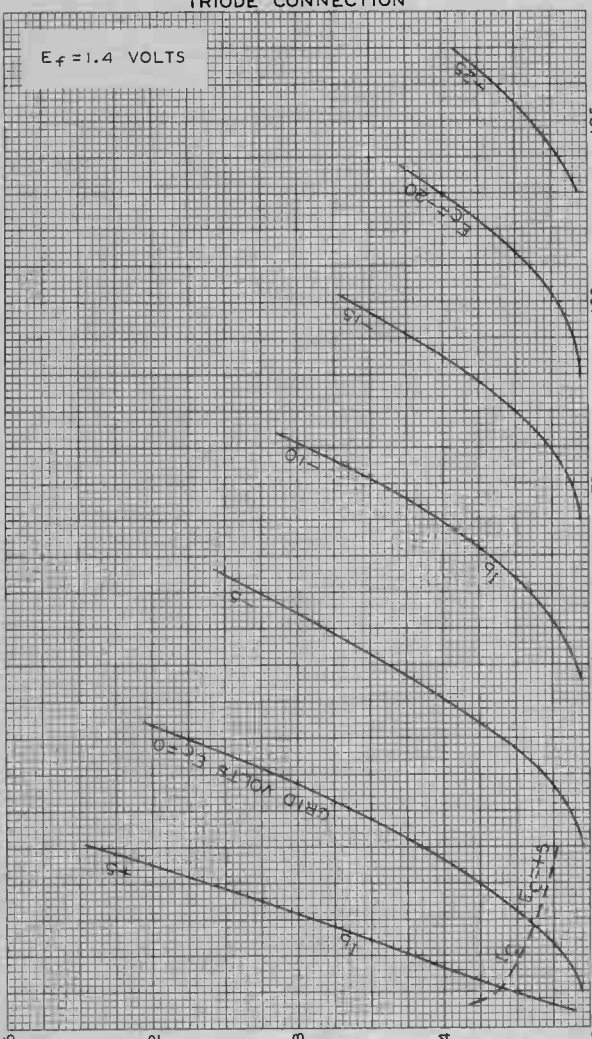


1S4

1S4

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION



DEC. 26, 1941

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6348

1S5
DIODE–PENTODE
MINIATURE TYPE

GENERAL DATA

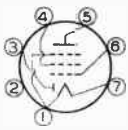
Electrical:

Filament, Coated:		
Voltage	1.4	dc volts
Current	0.05	amp

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin
Basing Designation for BOTTOM VIEW	6AU

Pin 1 – Filament (–), Grid No.3
Pin 2 – No Connection
Pin 3 – Diode Plate



Pin 4 – Pentode Grid No.2
Pin 5 – Pentode Plate
Pin 6 – Pentode Grid No.1
Pin 7 – Filament (+)

Maximum Ratings, Characteristics, and Typical Operating Conditions for Type 1S5 are the same as those shown for the 1U5.

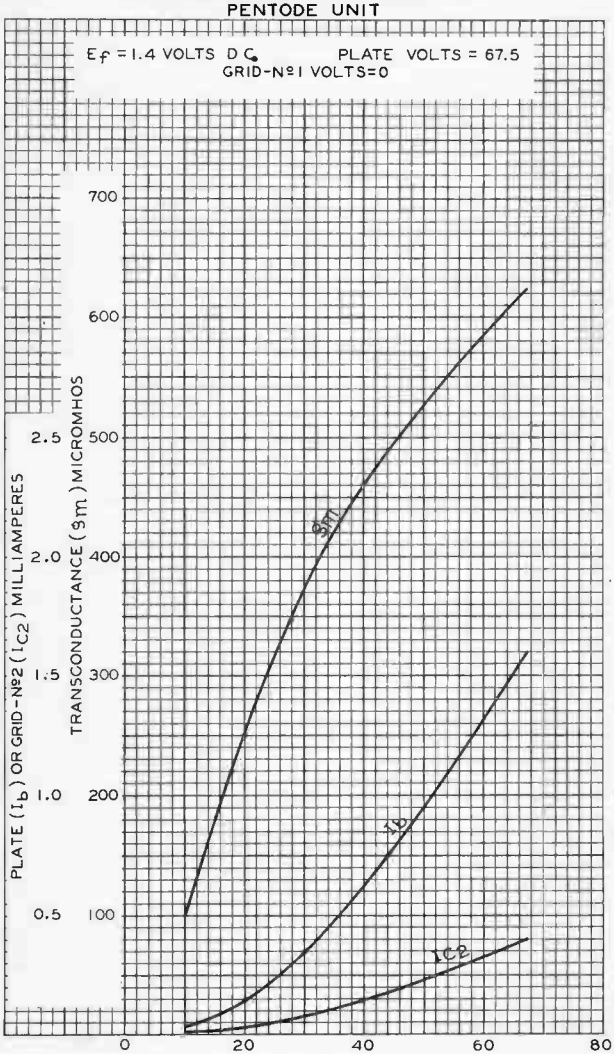
Curves shown under Type 1U5 also apply to the 1S5.

RCA

1S5

AVERAGE CHARACTERISTICS

PENTODE UNIT



IT4

REMOTE-CUTOFF PENTODE

MINIATURE TYPE

GENERAL DATA

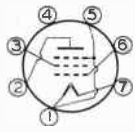
Electrical:

Filament, Coated:		
Voltage	1.4	dc volts
Current	0.05	amp
Direct Interelectrode Capacitances:[o]		
Grid No.1 to plate	0.01	μμf
Grid No.1 to filament (-) & grid No.3 & internal shield, and grid No.2	3.6	μμf
Plate to filament (-) & grid No.3 & internal shield, and grid No.2	7.5	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)	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	6AR

Pin 1 - Filament (-), Grid No.3, Int. Shield
Pin 2 - Plate
Pin 3 - Grid No.2
Pin 4 - No Connection - Do Not Use



Pin 5 - Filament (-), Grid No.3, Int. Shield
Pin 6 - Grid No.1
Pin 7 - Filament (+)

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	90 max.	volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE	90 max.	volts
GRID-No.2 VOLTAGE	67.5 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
TOTAL CATHODE CURRENT	5.5 max.	ma

Typical Operation and Characteristics:

Plate Voltage	45	67.5	90	90	volts
Grid-No.2 Voltage	45	67.5	45	67.5	volts
Grid-No.1 Voltage	0	0	0	0	volts
Plate Resistance (Approx.)	0.35	0.25	0.8	0.5	megohm
Transconductance	700	875	750	900	μmhos
Plate Current	1.7	3.4	1.8	3.5	ma
Grid-No.2 Current	0.7	1.5	0.65	1.4	ma
Grid-No.1 Voltage for transconductance of 10 μmhos	-10	-16	-10	-16	volts

[o] With or without external shield JETEC No.316 connected to pin No.1.

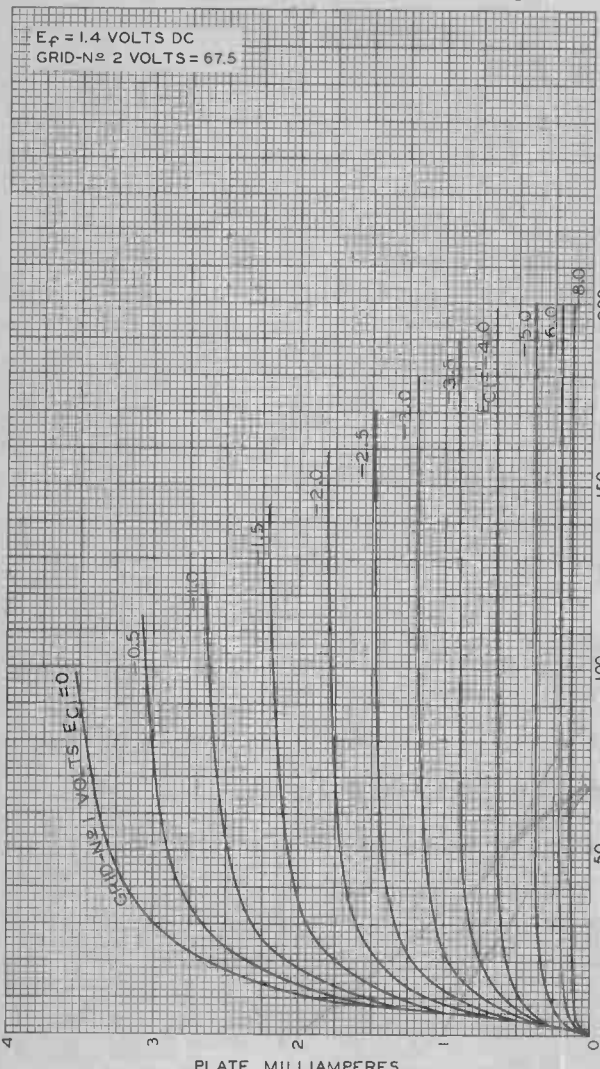
→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

1T4

AVERAGE PLATE CHARACTERISTICS



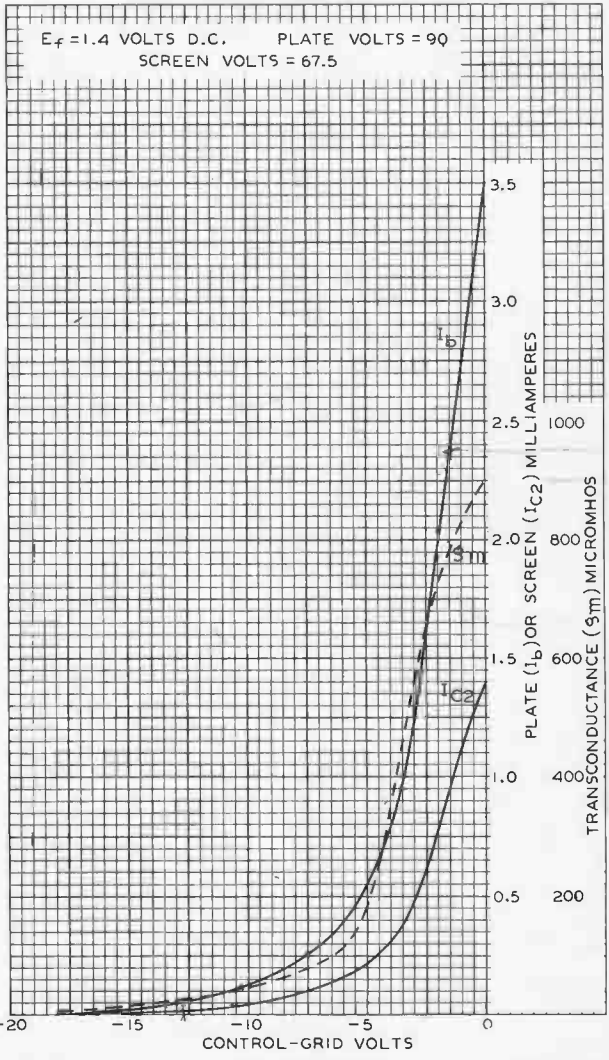
DEC. 27, 1954

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM - 6101R2

IT4

AVERAGE CHARACTERISTICS



1T4

1T4

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION

FEB. 16, 1943

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

92C-6352R1

IT6

DIODE—SHARP-CUTOFF PENTODE

SUBMINIATURE TYPE

GENERAL DATA

Electrical:

Filament, Coated:		
Voltage	1.25	dc volts
Current	0.04	amp

Mechanical:

Mounting Position	Any
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (excluding tip)	1.200 ±0.060"
Maximum Diameter	0.4"
Bulb	T-3
Base	Small-Button Sub-minar 8-Pin

BOTTOM VIEW

Pin 1 - Pentode Plate
Pin 2 - No Connection
Pin 3 - Grid No.1
Pin 4 - Filament (-), Grid No.3
Pin 5 - Filament (+)
Pin 6 - Diode Plate
Pin 7 - No Connection
Pin 8 - Grid No.2

PENTODE UNIT

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	67.5 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	67.5 max.	volts
TOTAL CATHODE CURRENT	2.0 max.	ma

Typical Operation and Characteristics:

Plate Voltage	30	45	67.5	volts
Grid-No.2 Voltage	30	45	67.5	volts
Grid-No.1 (Control-Grid) Voltage	0	0	0	volts
Plate Resistance (Approx.)	0.5	0.5	0.4	megohm
Transconductance	330	475	600	μmhos
Plate Current	0.33	0.75	1.6	ma
Grid-No.2 Current	0.10	0.21	0.4	ma

DIODE UNIT

Maximum Ratings, *Design-Center Values*:

PLATE CURRENT	0.25 max.	ma

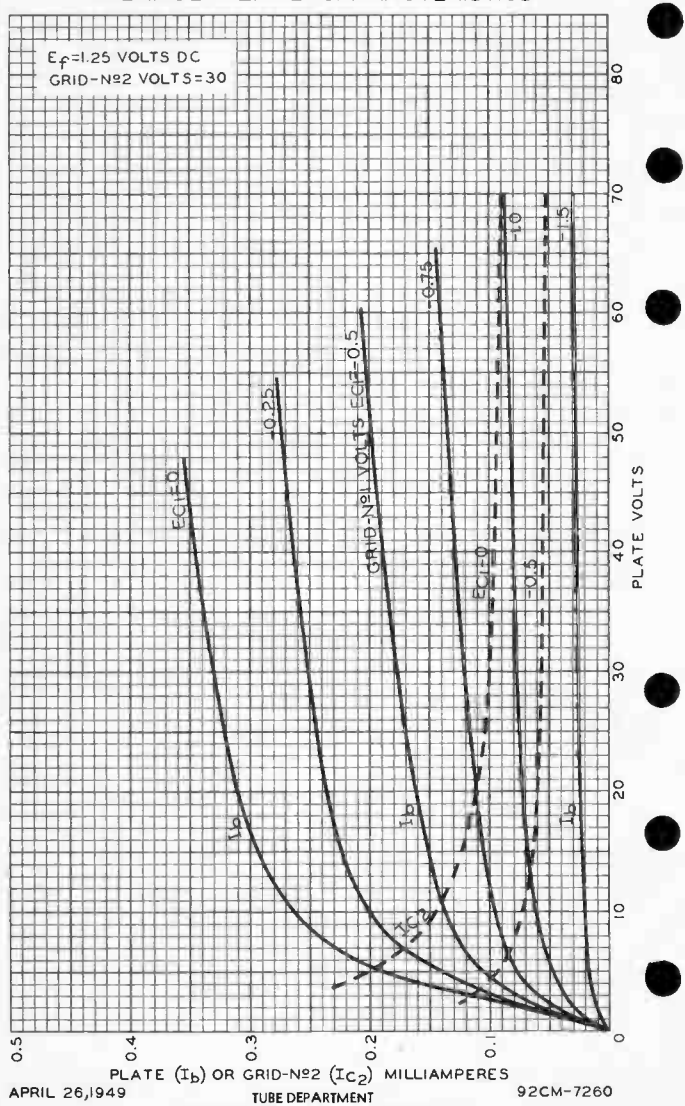
Diode Considerations:

The diode is located at the negative end of the filament and is independent of the pentode unit except for the common filament.

RCA

1T6

AVERAGE PLATE CHARACTERISTICS



APRIL 26,1949

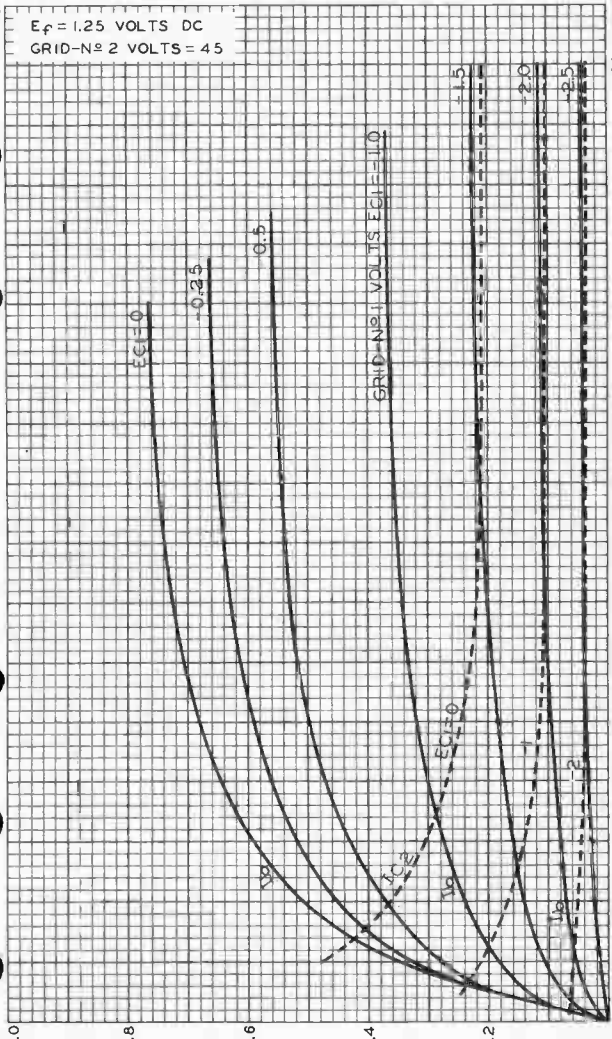
TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7260

1T6

AVERAGE PLATE CHARACTERISTICS



APRIL 21,1949 TUBE DEPARTMENT 92CM-7257

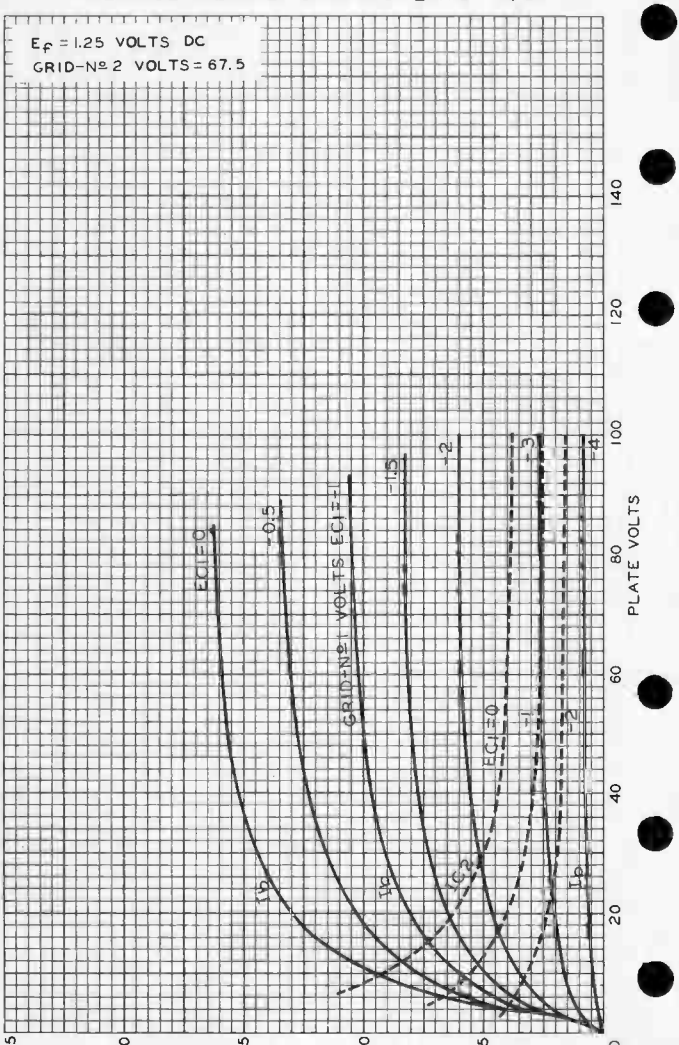
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

1T6

RCA

1T6

AVERAGE PLATE CHARACTERISTICS

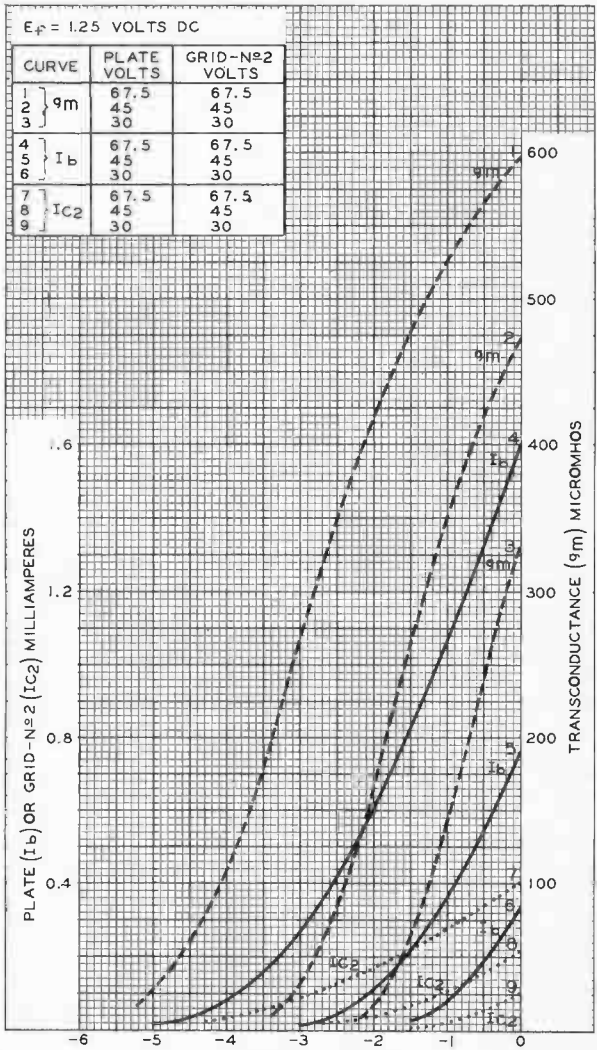


APRIL 20, 1949 TUBE DEPARTMENT 92CM-7256

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

1T6

AVERAGE CHARACTERISTICS



1U4

SHARP-CUTOFF PENTODE

MINIATURE TYPE

GENERAL DATA

Electrical:

Filament, Coated:		
Voltage	1.4	dc volts
Current	0.05	amp
Direct Interelectrode Capacitances:		
Grid No.1 to plate°	0.01 max.	μμf
Grid No.1 to filament (–) & grid No.3 & internal shield, and grid No.2•	3.6	μμf
Plate to filament (–) & grid No.3 & internal shield, and grid No.2•	7.5	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	90	volts
Grid-No.2 Voltage	90	volts
Grid-No.1 Voltage	0	volts
Plate Resistance (Approx.)	1	megohm ←
Transconductance	900	μmhos
Plate Current	1	ma ←
Grid-No.2 Current	0.5	ma ←
Grid-No.1 Voltage (Approx.) for transconductance of 10 μmhos	–4	volts ←

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	6AR

Pin 1 – Filament (–), Grid No.3, Internal Shield
Pin 2 – Plate
Pin 3 – Grid No.2
Pin 4 – No Connection
Pin 5 – Filament (–), Grid No.3, Internal Shield
Pin 6 – Grid No.1
Pin 7 – Filament (+)

AMPLIFIER – Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	110 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	110 max.	volts

° Without external shield.

• With external shield JETEC No.316 connected to pin No.1 or pin No.5.

←Indicates a change.

RCA

1U4

SHARP-CUTOFF PENTODE

GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
→TOTAL CATHODE CURRENT	6 max.	ma

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART No.3 at front of this Section

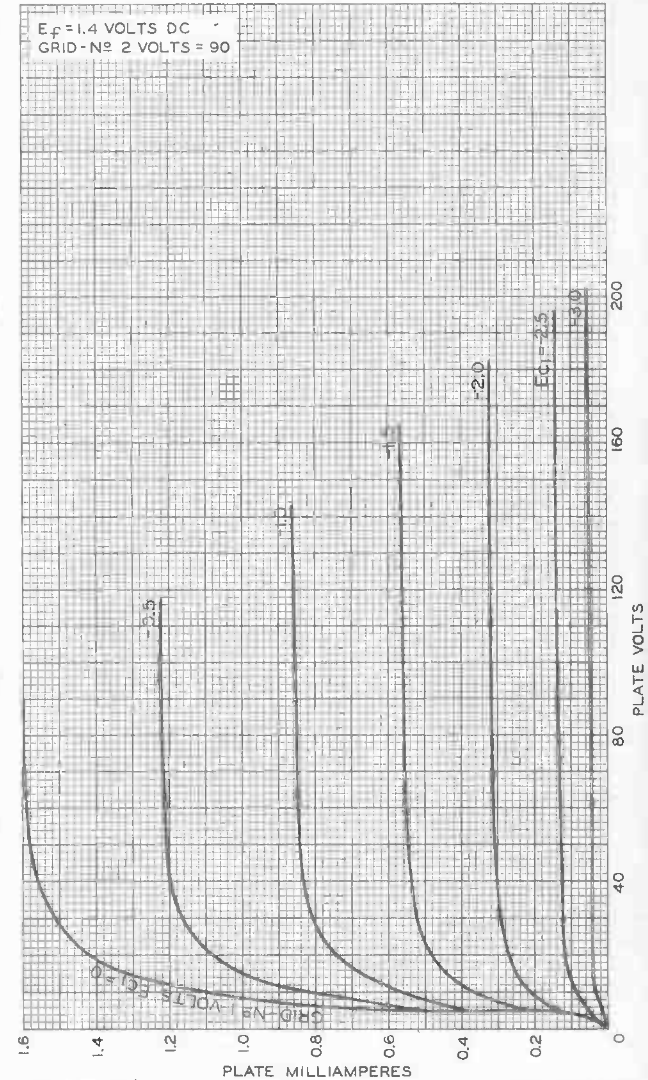
→Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

1U4

1U4

AVERAGE PLATE CHARACTERISTICS



FEB. 6, 1946

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

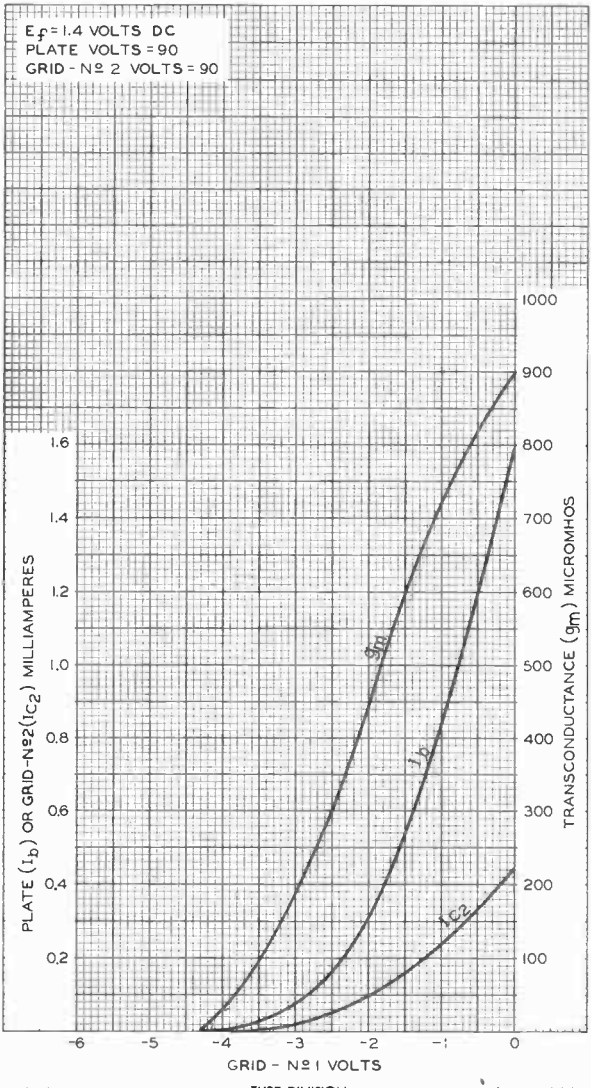
92CM-6669R1

1U4

RCA

1U4

AVERAGE CHARACTERISTICS



FEB. 6, 1946

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6668R1

1U5
DIODE–PENTODE

MINIATURE TYPE

GENERAL DATA

Electrical:

Filament, Coated:		
Voltage	1.4	dc volts
Current	0.05	amp

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin
Basing Designation for BOTTOM VIEW	6BW

Pin 1 – Filament (–), Pentode Grid No.3
Pin 2 – Pentode Plate
Pin 3 – Pentode Grid No.2
Pin 4 – Diode Plate
Pin 5 – No Connection
Pin 6 – Pentode Grid No.1
Pin 7 – Filament (+)

PENTODE UNIT

AMPLIFIER – Class A_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	90 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	90 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Negative bias value	50 max.	volts
Positive bias value	0 max.	volts
TOTAL MAX.-SIGNAL CATHODE CURRENT	3 max.	ma.

Characteristics:

Plate Voltage	67.5	volts
Grid-No.2 Voltage	67.5	volts
Grid-No.1 Voltage	0	volts
Plate Resistance (Approx.)	0.6	megohm
Transconductance	625	μmhos
Plate Current	1.6	ma.
Grid-No.2 Current	0.4	ma.

Typical Operation as Resistance-Coupled Amplifier:

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

DIODE UNIT

The diode is located at the negative end of the filament and is independent of the pentode unit except for the common filament.

Curve shown under Type 1S5 also applies to the 1U5.

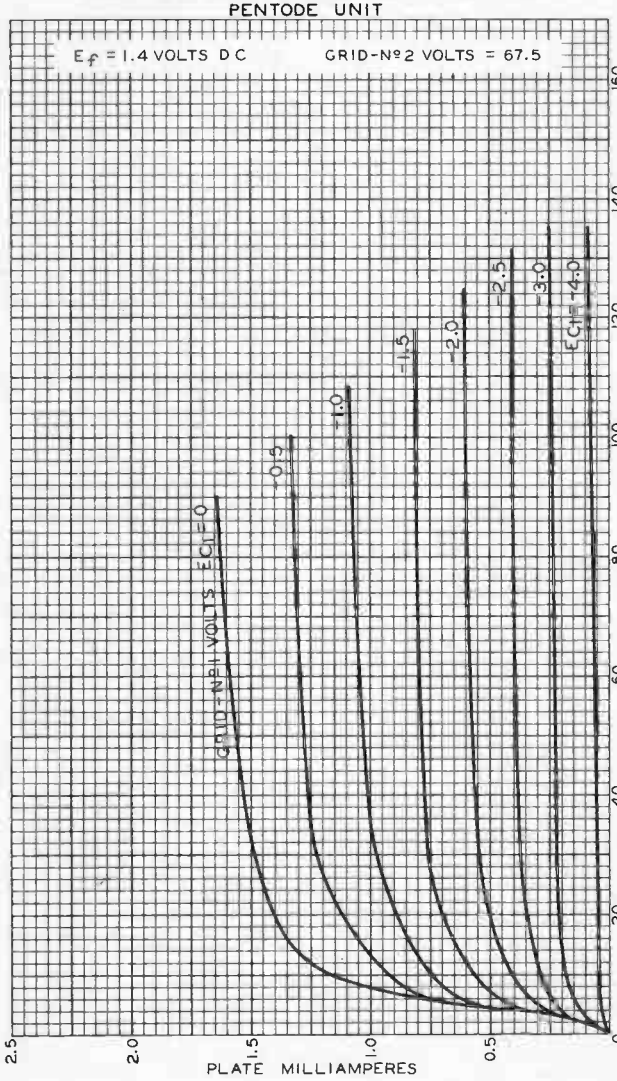
1U5

RCA

1U5

AVERAGE PLATE CHARACTERISTICS

PENTODE UNIT



JUNE 12, 1941

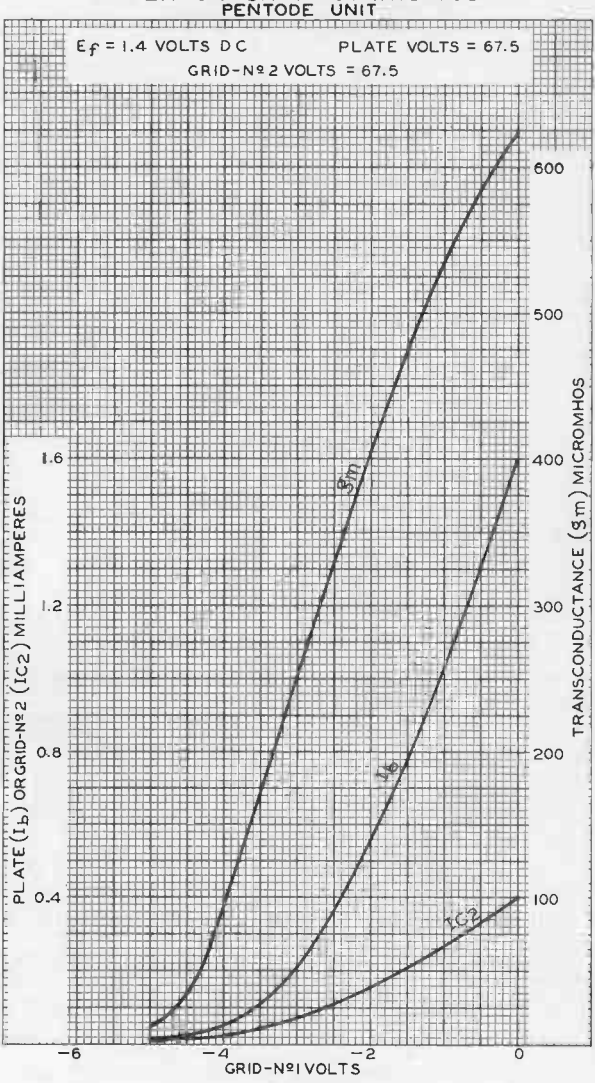
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6158RI

RCA

1U5

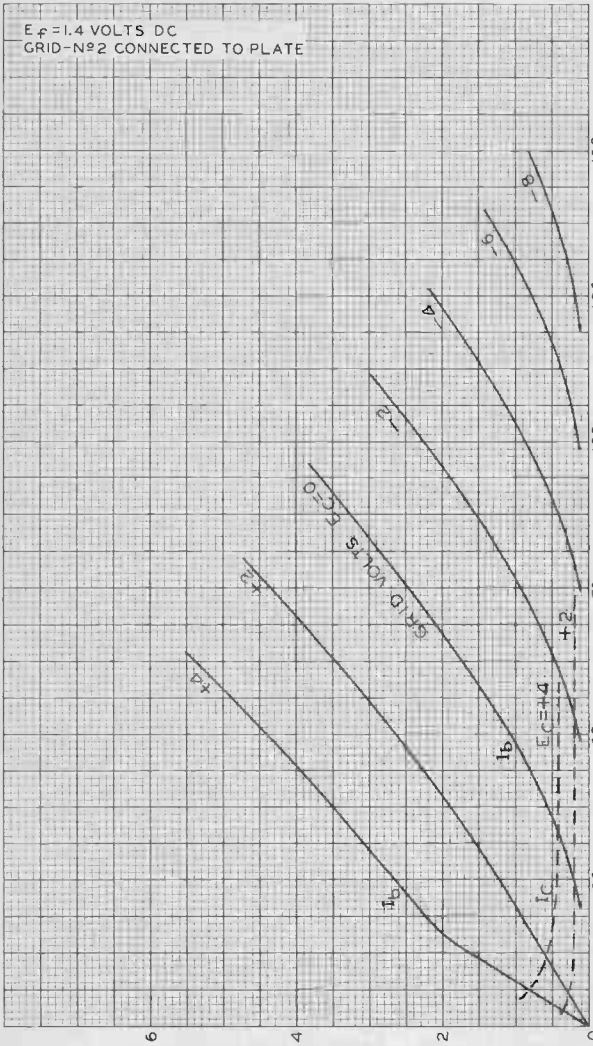
AVERAGE CHARACTERISTICS
PENTODE UNIT



1U5

RCA

1U5
AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION OF PENTODE UNIT



I-V

HALF-WAVE HIGH-VACUUM RECTIFIER

The I-V supersedes the mercury-vapor type 1 and is interchangeable with it.

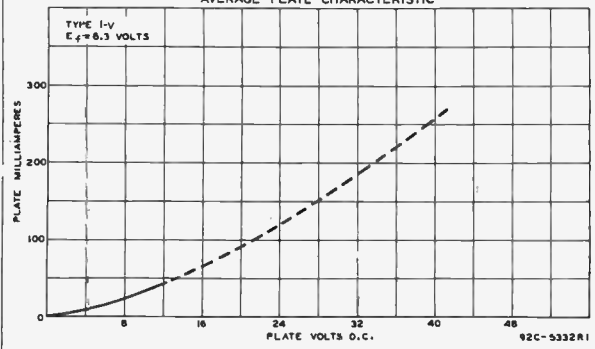
Heater	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Maximum Overall Length		4-3/16"
Maximum Diameter		1-9/16"
Bulb		ST-12
Base		Small 4-Pin
Pin 1 - Heater		Pin 3 - Cathode
Pin 2 - Plate		Pin 4 - Heater
Mounting Position	BOTTOM VIEW (4G)	Any

HALF-WAVE RECTIFIER

Peak Inverse Voltage				1000 max. volts
Peak Plate Current				270 max. ma.
D-C Heater-Cathode Potential				500 max. volts
Typical Operation with Condenser-Input Filter:				
A-C Plate Voltage (RMS)	117	150		325 max. volts
Total Effective Plate-Supply Impedance ▲	0 min.	30 min.	75 min.	ohms
D-C Output Current	45 max.	45 max.	45 max.	ma.

■ Under no condition of operation should the normal operating heater voltage of 6.3 volts ever fluctuate to exceed a maximum of 7.5 volts.
▲ When a filter-input condenser larger than 40 μf is used, it may be necessary to use more plate-supply impedance than the minimum value shown to limit the peak plate current to the rated value.

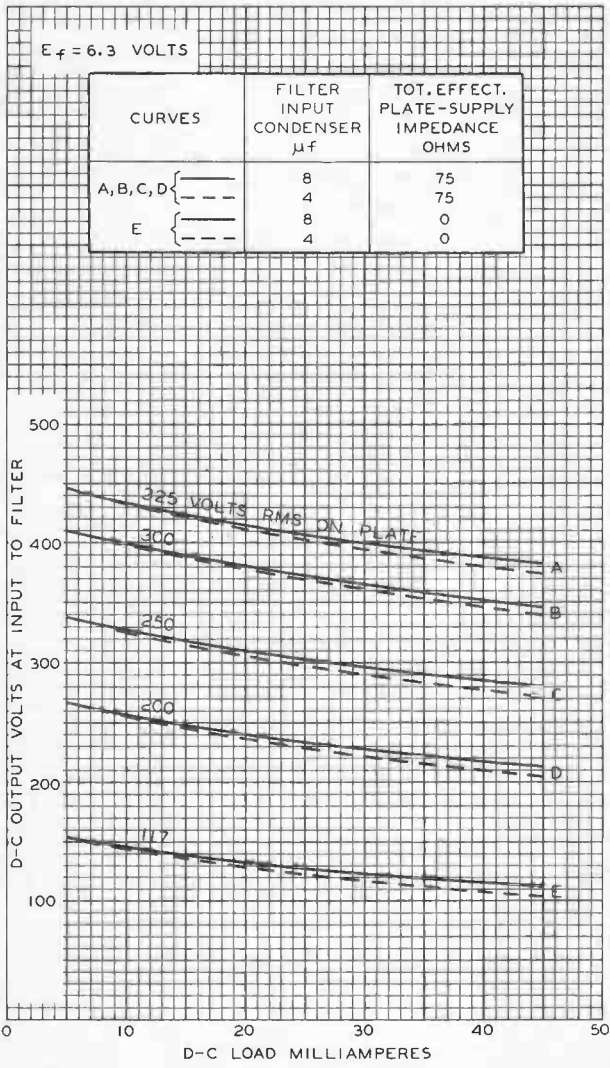
AVERAGE PLATE CHARACTERISTIC



RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

I-V

OPERATION CHARACTERISTICS



IV2

HALF-WAVE VACUUM RECTIFIER

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Filament, Coated:		
Voltage*	0.625	ac volt
Current	0.3	amp
Direct Interelectrode Capacitance (Approx.):°		
Plate to filament	0.8	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"
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	9U ←

Pin 1 – Plate
Pin 2 – Internal Connection – Do Not Use
Pin 3 – Same as Pin 2
Pin 4 – Filament
Pin 5 – Filament
Pin 6 – No Connection♦
Pin 7 – Same as Pin 2
Pin 8 – Same as Pin 2
Pin 9 – Plate

PULSED-RECTIFIER SERVICE

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

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

INVERSE PLATE VOLTAGE:			
Total dc and peak (Absolute maximum)⊕	8250■	max.	volts ←
DC	6600	max.	volts ←
PEAK PLATE CURRENT	10	max.	ma
AVERAGE PLATE CURRENT	0.5	max.	ma

* Under no circumstances should the filament voltage be less than 0.525 volt or more than 0.725 volt.

° Without external shield.

♦ May be used for a tie point for components at or near filament potential; otherwise do not use.

□ 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.

←Indicates a change.

1V2

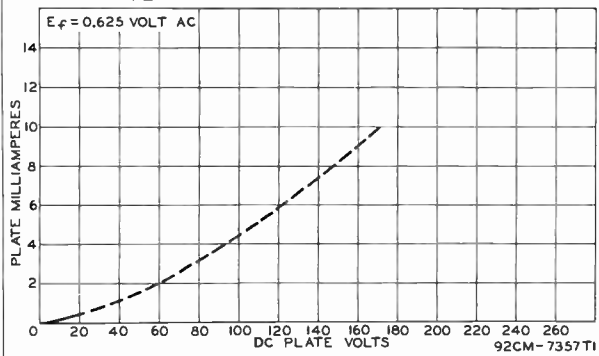
HALF-WAVE VACUUM RECTIFIER

OPERATING CONSIDERATIONS

When the *filament voltage* is measured, it is recommended that a thermal rms voltmeter be used. The meter and its leads must be insulated to withstand 15,000 volts and the stray capacitances to ground should be minimized.

→ To provide the required insulation in Noval sockets designed with a cylindrical center shield, it is necessary to remove the center shield.

AVERAGE PLATE CHARACTERISTIC



→ Indicates a change.

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

Half-Wave Vacuum Rectifier

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

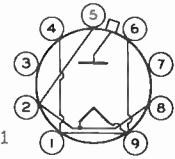
Filament, Coated:

	Min.	Av.	Max.	
Voltage (AC)	1.05	1.25	1.45	volts
Current at 1.25 volts	-	0.2	-	amp
Direct Interelectrode Capacitances (Approx.):[a]				
Plate to filament & internal shield		1		μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	2-27/32" ←
Seated Length	2-7/16" ± 1/8"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Cap	Skirted Miniature (JEDEC No.C1-2 or C1-33)
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9Y

Pin 1 – Filament, Internal Shield
Pin 2 – Filament
Pin 3 – Limited Connection[b]
Pin 4 – Same as Pin 1



Pin 5 – Same as Pin 2
Pin 6 – Same as Pin 1
Pin 7 – Same as Pin 3
Pin 8 – Same as Pin 2
Pin 9 – Same as Pin 1
Cap – Plate

PULSED-RECTIFIER SERVICE ←

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

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

INVERSE PLATE VOLTAGE:			
Total dc and peak (Absolute maximum)[d]	20000[e]	max.	volts
DC	16000	max.	volts
PEAK PLATE CURRENT	45	max.	ma
AVERAGE PLATE CURRENT	0.5	max.	ma

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma. = 7	100	volts

[a] Without external shield.

[b] See *Operating Considerations*.

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

[d] 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.

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

← Indicates a change.

OPERATING CONSIDERATIONS

Socket Connections. Socket terminals 3 and 7 may be used as tie points for components at or near filament potential; otherwise, do not use.

Measurement of Filament Voltage. To measure the filament voltage when the filament is at a high dc potential with respect to ground, it is recommended that a simple method utilizing visual comparison of the filament temperature be used. The color temperature of the filament, operating from a pulse-or-rf-power source, may be checked by observing in a darkened room the reflection of the incandescent filament upon the surface of the internal shield. A visual comparison of this color temperature with that obtained when the filament of another 1X2A is operated from a dc or low-frequency ac supply of 1.25 volts, provides a convenient means for adjusting the amount of excitation to produce 1.25 volts (rms) at the filament terminals.

The high voltages at which the 1X2A is operated are very dangerous. Great care should be taken in the design of apparatus to prevent the operator from coming in contact with these high voltages. Particular care against fatal shock should be taken in the measurement of filament voltage. Under all circumstances, circuit parts which may be at high potentials should be enclosed or adequately insulated.

X rays. The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier tubes may produce *X rays* which can constitute a health hazard unless such tubes are adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.

Half-Wave Vacuum Rectifier

9-PIN MINIATURE TYPE

GENERAL DATA

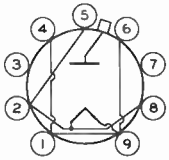
Electrical:

Filament, Coated:

	Min.	Av.	Max.	
Voltage (AC)	1.05	1.25	1.45	volts
Current at 1.25 volts	–	0.2	–	amp
Direct Interelectrode Capacitance (Approx.):[a]				
Plate to filament & internal shield		1		μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	2-27/32"
Seated Length	2-7/16" ± 1/8"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Cap	Skirted Miniature (JEDEC No.C1-2 or C1-33)
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9Y



Pin 1 – Filament, Internal Shield
Pin 2 – Filament
Pin 3 – Limited Connection[b]
Pin 4 – Same as Pin 1
Pin 5 – Same as Pin 2
Pin 6 – Same as Pin 1
Pin 7 – Same as Pin 3
Pin 8 – Same as Pin 2
Pin 9 – Same as Pin 1
Cap – Plate

PULSED-RECTIFIER SERVICE

Maximum Ratings, *Design-Maximum Values:*

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

INVERSE PLATE VOLTAGE:		
Total dc and peak[d]	22000 max.	volts
DC	18000 max.	volts
PEAK PLATE CURRENT	45 max.	ma
AVERAGE PLATE CURRENT	0.5 max.	ma

Characteristics, Instantaneous Value:

Tube Voltage Drop for plate ma. = 7	100	volts

[a] Without external shield.

[b] See *Operating Considerations*.

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

[d] 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.

← Indicates a change.

OPERATING CONSIDERATIONS

Socket Connections. Socket terminals 3 and 7 may be used as tie points for components at or near filament potential; otherwise, do not use.

Measurement of Filament Voltage. To measure the filament voltage when the filament is at a high dc potential with respect to ground, it is recommended that a simple method utilizing visual comparison of the filament temperature be used. The color temperature of the filament, operating from a pulse-or-rf-power source, may be checked by observing in a darkened room the reflection of the incandescent filament upon the surface of the internal shield. A visual comparison of this color temperature with that obtained when the filament of another 1X2B is operated from a dc or low-frequency ac supply of 1.25 volts, provides a convenient means for adjusting the amount of excitation to produce 1.25 volts (rms) at the filament terminals.

The high voltages at which the 1X2B is operated are very dangerous. Great care should be taken in the design of apparatus to prevent the operator from coming in contact with these high voltages. Particular care against fatal shock should be taken in the measurement of filament voltage. Under all circumstances, circuit parts which may be at high potentials should be enclosed or adequately insulated.

X rays. The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier tubes may produce *X rays* which can constitute a health hazard unless such tubes are adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.

1X2-A
HALF-WAVE VACUUM RECTIFIER

9-PIN MINIATURE TYPE

Supersedes Type 1X2

GENERAL DATA

Electrical:

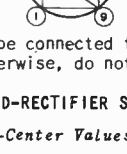
Filament, Coated:		
Voltage	1.25	ac volts
Current	0.2	amp
Direct Interelectrode Capacitance (Approx.):[o]		
Plate to Filament	1	μμf

[o] With no external shield.

Mechanical:

Mounting Position	Any
Overall Length	2-11/16 ± 1/8"
Maximum Diameter	7/8"
Bulb	T-6-1/2
Cap	Skirted Miniature, JETEC C1-33
Base	Small-Button Noval 9-Pin
Basing Designation for BOTTOM VIEW	9Y

Pin 1 – Filament, Internal Shield
Pin 2 – Filament
Pin 3 – See NOTE
Pin 4 – Same as Pin 1



Pin 5 – Same as Pin 2
Pin 6 – Same as Pin 1
Pin 7 – Same as Pin 3
Pin 8 – Same as Pin 2
Pin 9 – Same as Pin 1
Cap – Plate

NOTE: May be connected to filament; otherwise, do not use.

PULSED-RECTIFIER SERVICE

Maximum Ratings, *Design-Center Values*:

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

PEAK INVERSE PLATE VOLTAGE	18000 max.	volts
DC OUTPUT VOLTAGE	16000 max.	volts
PEAK PLATE CURRENT	10 max.	ma
AVERAGE PLATE CURRENT	1 max.	ma

Typical Operation:

Peak Positive-Pulse Plate Supply Voltage*	14000	volts
Peak Negative-Pulse Plate Supply Voltage*	3500	volts
Peak Inverse Plate Voltage	17500	volts
DC Output Voltage	14000	volts
DC Output Current	175	μa

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

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

1X2-A

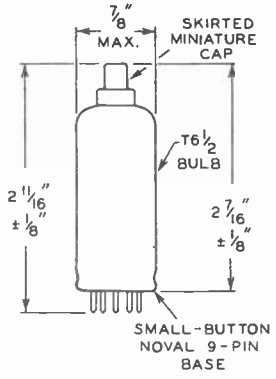
HALF-WAVE VACUUM RECTIFIER

OPERATING NOTES

When the filament is supplied from an rf power source which is at a high dc potential above ground, adjustment of the filament voltage by direct measurement is usually impractical. However, a simple method utilizing visual comparison of filament temperatures can be used for adjustment of filament power. The color temperature of the filament operating from an rf power source may be checked visually by observing in a darkened room the reflection of the incandescent filament upon the surface of the internal shield. A visual comparison of this color temperature with that obtained when the filament of another 1X2-A is operated from a dc or low-frequency ac supply of 1.25 volts, provides a convenient means for adjusting the amount of rf excitation to produce 1.25 volts (rms) at the filament terminals.

The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier tubes may produce x-rays which can constitute a health hazard, unless such tubes are adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.

The AVERAGE PLATE CHARACTERISTIC curve shown for type 1B3-GT also applies to the 1X2-A within ratings



1X2-B

HALF-WAVE VACUUM RECTIFIER

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

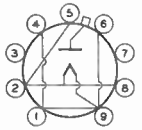
Filament, Coated:		
Voltage	1.25	ac volts
Current	0.2	amp
Direct Interelectrode Capacitance (Approx.):°		
Plate to Filament	1	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-27/32"
Seated Length	2-7/16" ± 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)

BOTTOM VIEW

Pin 1 – Filament, Int. Shield
Pin 2 – Filament
Pin 3 – No. Conn.– Do Not Use
Pin 4 – Filament, Int. Shield
Pin 5 – Filament



Pin 6 – Filament, Int. Shield
Pin 7 – No. Conn.– Do Not Use
Pin 8 – Filament
Pin 9 – Filament, Int. Shield
Cap – Plate

PULSED-RECTIFIER SERVICE

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

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

PEAK INVERSE PLATE VOLTAGE (Absolute Maximum)■	22000● max.	volts
PEAK PLATE CURRENT	45 max.	ma
AVERAGE PLATE CURRENT	0.5 max.	ma

Typical Operation:

Peak Plate Supply Voltage:		
Positive Pulse Value	18000	volts
Negative Pulse Value	2000	volts
DC Output Voltage (Approx.)	18000	volts
DC Output Current (Approx.)	100	μamp

° With no external shield.

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

● Under no circumstances should this absolute value be exceeded.

■ The dc component must not exceed 18000 volts.

1X2-B

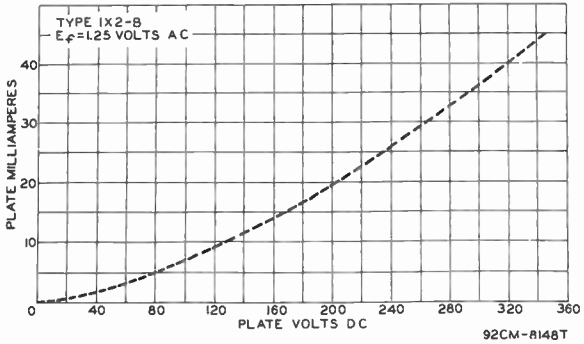
HALF-WAVE VACUUM RECTIFIER

OPERATING NOTES

When the *filament* is operated on rf, the color temperature of the filament operating from a pulse-operated or rf power source may be checked usually by observing in a darkened room the reflection of the incandescent filament upon the surface of the internal shield. A visual comparison of this color temperature with that obtained when the filament of another 1X2-B is operated from a dc or low-frequency ac supply of 1.25 volts, provides a convenient means for adjusting the amount of rf excitation to produce 1.25 volts (rms) at the filament terminals.

The voltages employed in some television receivers and other high-voltage equipment is sufficiently high that high-voltage rectifier tubes may produce *x-rays* which constitute a hazard unless such tubes are adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.

AVERAGE PLATE CHARACTERISTIC



2A3
POWER TRIODE

GENERAL DATA

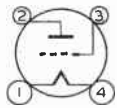
Electrical:

Filament, Coated:		
Voltage	2.5	ac or dc volts
Current	2.5	amp
Direct Interelectrode Capacitances (Approx.):*		
Grid to Plate	16.5	μμf
Grid to Cathode	7.5	μμf
Plate to Cathode	5.5	μμf

* With no external shield.

Mechanical:

Mounting Position	Any ←
Maximum Overall Length	5-3/8"
Maximum Seated Length	4-3/4"
Maximum Diameter	2-1/16"
Bulb	ST-16
Base	Medium-Shell Small 4-Pin
Basing Designation for BOTTOM VIEW	4D



Pin 1 – Filament
Pin 2 – Plate
Pin 3 – Grid
Pin 4 – Filament

AMPLIFIER – Class A_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	300 max.	volts
PLATE DISSIPATION	15 max.	watts

Typical Operation and Characteristics:

Plate Voltage	250	volts
Grid Voltage#▲	-45	volts
Amplification Factor	4.2	
Plate Resistance	800	ohms
Transconductance	5250	μmhos
Plate Current	60	ma.
Load Resistance	2500	ohms
Second Harmonic Distortion	5	%
Power Output	3.5	watts

Maximum Circuit Values:□

Grid-Circuit Resistance	fixed bias	0.05 max. megohm
	cathode bias	0.5 max. megohm

#.▲.□: See next page.
← Indicates a change.

2A3
POWER TRIODE

PUSH-PULL AMPLIFIER – Class AB_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300 max.	volts
PLATE DISSIPATION	15 max.	watts

Typical Operation:

Values are for 2 tubes

	Fixed Bias	*Cathode Bias*	
Plate Voltage	300	300 ●	volts
Grid Voltage#	-62	–	volts
Cathode-Bias Resistor	–	780	ohms
→ Peak AF Grid-to-Grid Voltage	124	156	volts
Zero-Signal Plate Current	80	80	ma.
→ Max.-Signal Plate Current	147	100	ma.
Effective Load Resistance (plate to plate)	3000	5000	ohms
Total Harmonic Distortion	2.5	5.0	%
Power Output	15	10	watts

Maximum Circuit Values:▫

Grid-Circuit Resistance	fixed bias	0.05 max. megohm
	cathode bias	0.5 max. megohm

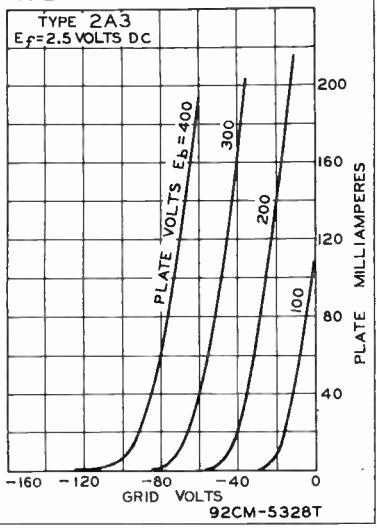
\# Grid voltage referred to mid-point of ac-operated filament.

▲ When a single 2A3 is operated cathode-biased, the cathode-biasing resistor value should be 750 ohms.

▫ The type of coupling used should not introduce too much resistance in the grid circuit. Transformer or impedance-coupling devices are recommended.

● For zero-signal conditions.

AVERAGE CHARACTERISTICS

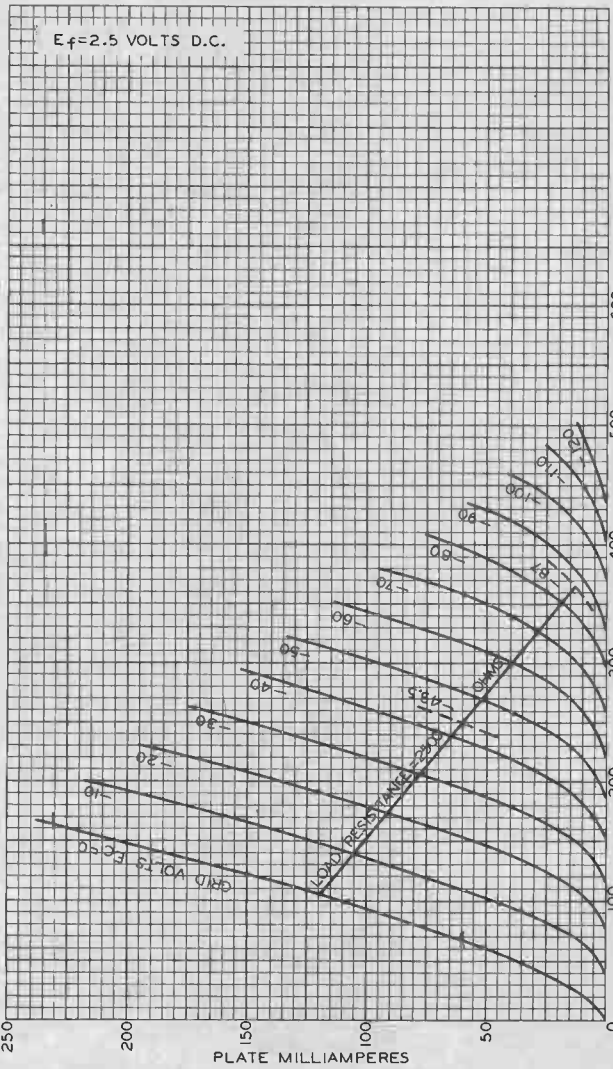


→ Indicates a change.

RCA Cunningham Radiotron RADIO TUBES

RCA-2A3

AVERAGE PLATE CHARACTERISTICS



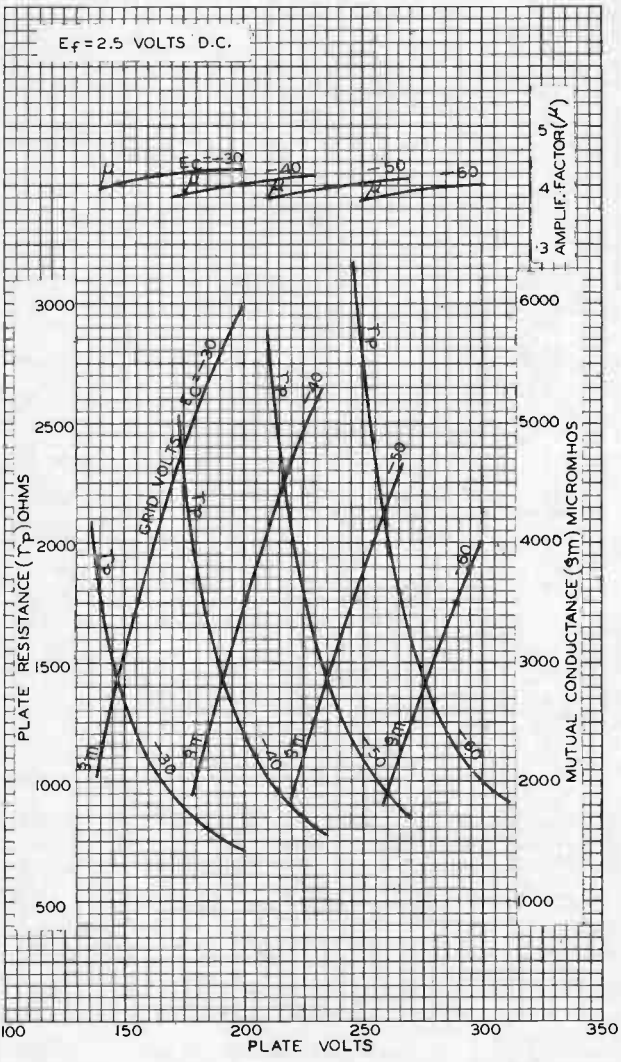
MARCH 9,1933

2A3

RCA Cunningham Radiotron RADIO TUBES

RCA-2A3

AVERAGE CHARACTERISTICS



JUNE 12, 1933

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92S-5326R1

RCA Cunningham Radiotron RADIO TUBES

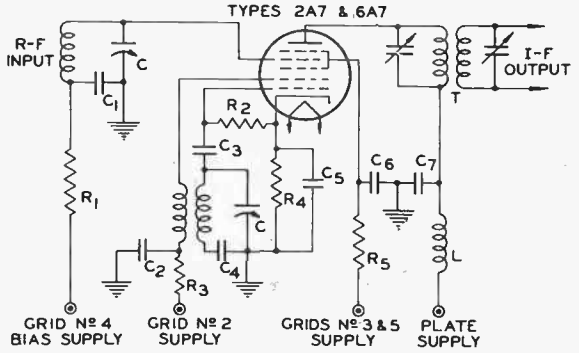
RCA-2A7

PENTAGRID CONVERTER

Heater	Coated Unipotential Cathode	
Voltage	2.5	a-c or d-c volts
Current	0.8	amp.

For further data, see Type 6A7. The 6A7 and 2A7 are identical except for heater rating.

TYPICAL PENTAGRID CONVERTER CIRCUIT



C = GANGED TUNING GONDENSER (40 TO 350 μμf)

C_1, C_2, C_5, C_6, C_7 = 0.1 μf

C_3 = 0.00025 μf

C_4 = SEE TABLE BELOW

R_1 = 250 000 OHMS, 0.1 WATT

R_2 = 10 000 - 50 000 OHMS, 0.1 WATT

R_3 = OSCILLATOR-ANODE (GRID Nº 2) VOLTAGE-DROPPING RESISTOR

R_4 = 150 - 300 OHMS, 0.1 WATT

R_5 = SCREEN (GRIDS Nº 3 & 5) FILTER RESISTOR

L = 60-MILLIHENRY R-F CHOKE

T = 465-KC I-F TRANSFORMER

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

Cunningham Radiotron (RCA RADIO TUBES)

TYPES 2A7 AND 6A7

TYPICAL PENTAGRID CONVERTER CIRCUIT

COIL DESIGN DETAILS

(continued from preceding page)

FREQUENCY BAND MEGACYCLES	0.15 TO 0.40		0.55 TO 1.5				1.5 TO 4.0		4.0 TO 10		10 TO 25	
ASSEMBLY Nº	1		1		2		2		3		3	
	TURNS	WIRE *	TURNS	WIRE *	TURNS	WIRE *	TURNS	WIRE *	TURNS	WIRE *	TURNS	WIRE *
R-F COIL (L_1)	422	36 SSE	116	30 SSE	146	32 ENAM	36.2	30 ENAM	10.1	30 ENAM	4.4	20 ENAM
OSC. GRID COIL (L_2)	198	36 SSE	80	30 SSE	92	32 ENAM	30.9	30 ENAM	9.7	30 ENAM	4.3	20 ENAM
OSC. PLATE COIL (L_3)	60	36 SSE	30	30 SSE	20	32 ENAM	12	30 ENAM	12	36 ENAM	6	36 ENAM
OSC. TRACKING COND. (C_4)	117 μμf		400 μμf				1070 μμf		2900 μμf		7300 μμf	

Nº 1	Nº 2	Nº 3
MULTI-LAYER COILS	SINGLE-LAYER COILS	SINGLE-LAYER COILS

2AF4A

Medium-Mu Triode

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

The 2AF4A is the same as the 6AF4A except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	2.35	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

Typical Operation:

At frequency of 1000 Mc

Plate Supply Voltage	100	volts
Plate Resistor	220	ohms
Grid Resistor	10000	ohms
Plate Current	17.5	ma
Grid Current (Approx.)	700	μa

2AF4B

Medium-Mu Triode

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

The 2AF4B is the same as the 6AF4A except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	2.35	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	180 max.	volts
Heater positive with respect to cathode	180[a] max.	volts

Typical Operation:

At frequency of 1000 Mc

Plate Supply Voltage	100	volts
Plate Resistor	220	ohms
Grid Resistor	10000	ohms
Plate Current	17.5	ma
Grid Current (Approx.)	700	μa

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

2BN4

Medium-Mu Triode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 2BN4 is the same as the 6BN4 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	2.3	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

2BN4A

Medium-Mu Triode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 2BN4A is the same as the 6BN4A except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	2.35	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

2CW4

High-Mu Triode

NUVISTOR TYPE

With Heater Having Controlled Warm-Up Time

The 2CW4 is the same as the 6CW4 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	2.1	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

2AF4-A

MEDIUM-MU TRIODE

MINIATURE TYPE

Intended for use in UHF TV equipment having series heater-string arrangement

The 2AF4-A is the same as the 6AF4-A except for the following items:

Heater, for Unipotential Cathode:

Voltage	2.35	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.

2B7

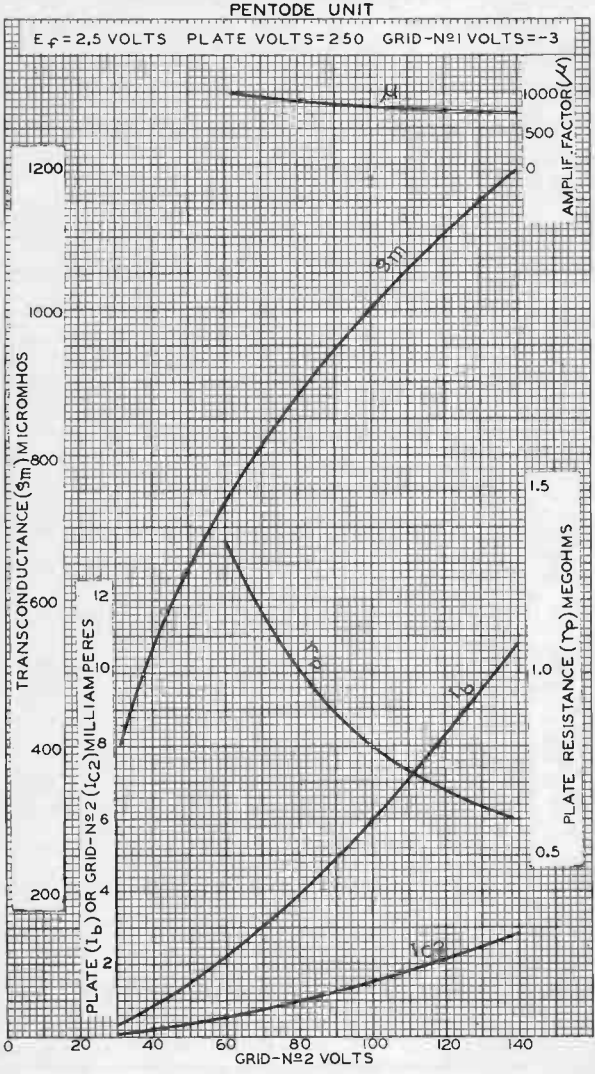
TWIN DIODE—REMOTE-CUTOFF PENTODE

Heater, for Unipotential Cathode:		
Voltage	2.5	ac or dc volts
Current	0.8	amp

The 2B7 is the same as the 6B7 except for heater rating.

RCA

2B7
AVERAGE CHARACTERISTICS
PENTODE UNIT



2BN4
MEDIUM-MU TRIODE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 2BN4 is the same as the 6BN4 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	2.3	ac or dc volts
Current	0.6	amp
Warm-up time (Average)*	11	sec

2CY5
SHARP-CUTOFF TETRODE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 2CY5 is the same as the 6CY5 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	2.4	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.*

2C21/1642

TWIN-TRIODE AMPLIFIER

Heater ■	Coated Unipotential Cathodes		
Voltage	6.3		a-c or d-c volts
Current	0.6		amp.
Direct Interelectrode Capacitances: ○	*Triode Unit T_1*	*Triode Unit T_2*	
Grid to Plate	2.4	1.8	μμf
Grid to Cathode	2.6	1.6	μμf
Plate to Cathode	1.4	2.0	μμf
Overall Length		4-9/32" to 4-17/32"	
Seated Height		3-21/32" to 3-29/32"	
Maximum Diameter		1-9/16"	
Bulb		ST-12	
Cap		Small Metal	
Base		Small 7-Pin, Micanol	
Pin 1 - Heater		Pin 5 - Plate T_1	
Pin 2 - Cathode T_2		Pin 6 - Cathode T_1	
Pin 3 - Plate T_2		Pin 7 - Heater	
Pin 4 - Grid T_1		Cap - Grid T_2	
RCA Socket		Stock No.9922	
Mounting Position		Any	

BOTTOM VIEW (7BH)

Maximum Ratings Are Design-Center Values

AMPLIFIER - Each Unit

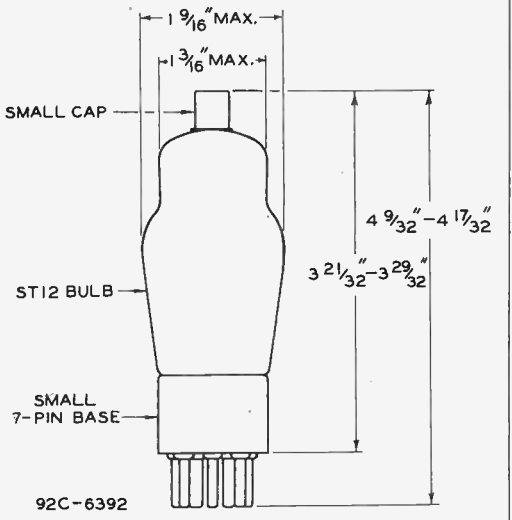
Plate Voltage	250 max.	volts
Plate Dissipation	2.1 max.	watts
Characteristics - Class A_1 Amplifier:		
Plate Voltage	250	volts
Grid Voltage	-16.5	volts
Amplification Factor	10.4	
Plate Resistance	7600	ohms
Transconductance	1375	μmhos
Plate Current	8.3	ma.

■ 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 no external shield.

2C21

TWIN-TRIODE AMPLIFIER

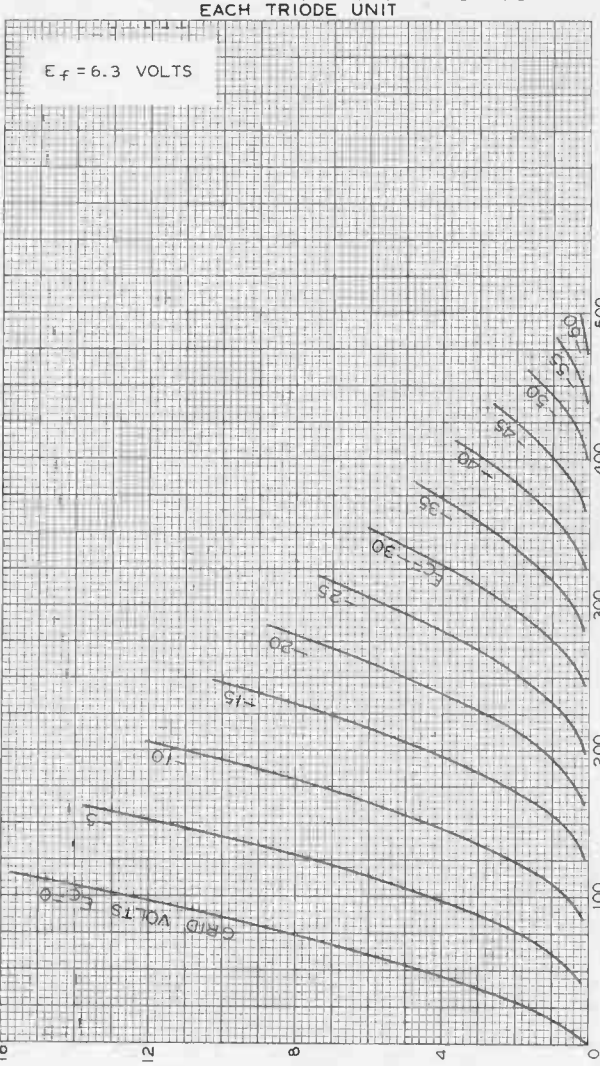


Mar. 20, 1943

TENTATIVE DATA

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

2C21
AVERAGE PLATE CHARACTERISTICS
EACH TRIODE UNIT



DEC. 1, 1943

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

92CM-6385RI

Sharp-Cutoff Tetrode

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

The 2CY5 is the same as the 6CY5 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	2.4	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

2CY5

SHARP-CUTOFF TETRODE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	2.4	ac or dc volts
Current	0.6	amp
Warm-up time (Average)	11	sec

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

Direct Interelectrode Capacitances (Approx.):°

Grid No.1 to plate	0.03	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

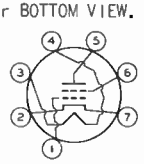
Characteristics, Class A_1 Amplifier:

Plate Voltage	125	volts
Grid-No.2 (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 current of 20 μa	-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"
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	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



°: See next page.

TENTATIVE DATA

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

RCA

2CY5

SHARP-CUTOFF TETRODE

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	150 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	150 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	15 max.	ma
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 75 volts	0.4 max.	watt
For grid-No.2 voltages between 75 and 150 volts	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PLATE DISSIPATION	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

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	0.5 max.	megohm

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

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

Lighthouse Triode

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 5%	volts
Current at 6.3 volts	0.75	amp
Heater heating time[a]	6	sec
Cathode heating time	See *Operating Considerations*	
Direct Interelectrode Capacitances (Approx.):		
Grid to plate	1.3	μμf
Grid to cathode for heater volts =		
0	2.2	μμf
6.3	2.8	μμf
Plate to cathode for heater volts = 0	0.02	μμf
Cathode rf terminal to cathode	100	μμf

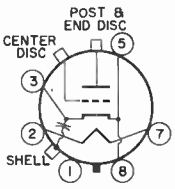
Characteristics, Class A_1 Amplifier:

Plate Voltage	250	volts
Cathode Resistor	200	ohms
Cathode Capacitor	1000	μf
Amplification Factor	35	
Plate Resistance (Approx.)	6860	ohms
Transconductance	5100	μmhos
Plate Current	17	ma

Mechanical:

Operating Position	Any
Maximum Overall Length	2-9/16"
Maximum Seated Length	1.973"
Maximum Diameter	1.312"
Weight (Approx.)	1.2 oz
Base	Small H-Wafer 6-Pin (JEDEC Group 1, No. B6-108)
Basing Designation for BOTTOM VIEW	6BY

Pin 1 - Internal Connection—Do Not Use
Pin 2 - Heater
Pin 3 - Cathode
Pin 5 - Cathode
Pin 7 - Heater



Pin 8 - Cathode
Shell - Cathode RF Terminal
Center Disc - Grid Terminal
Post & End Disc - Plate Terminal

Thermal:

Cooling	Convection and Conduction	
Seal Temperature	175 max.	°C

RF POWER AMPLIFIER & OSCILLATOR — Class C Telegraphy

Maximum CCS[b] Ratings, *Absolute-Maximum Values:*

For frequencies up to 3370 Mc

DC PLATE VOLTAGE	500 max.	volts
DC GRID VOLTAGE:		
Negative-bias value	50 max.	volts
DC PLATE CURRENT	25 max.	ma
DC GRID CURRENT	8 max.	ma
PLATE DISSIPATION	6.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts
PEAK CATHODE-SHELL VOLTAGE:		
Shell negative with respect to cathode	90 max.	volts
Shell positive with respect to cathode	90 max.	volts

PLATE-PULSED POWER OSCILLATOR

Maximum CCS[b] Ratings, *Absolute-Maximum Values:*

For frequencies up to 3370 Mc, maximum "on" time[c] of 10 microseconds, and maximum pulse duration of 1.5 microseconds

PEAK PLATE VOLTAGE	1400 max.	volts
GRID VOLTAGE:		
Peak-negative value	100 max.	volts
DC positive-bias value	0 max.	volts
PLATE CURRENT:		
Peak	2 max.	amp
Average	3 max.	ma
GRID CURRENT:		
Peak	1 max.	amp
Average	1.5 max.	ma
PLATE DISSIPATION	4 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts
PEAK CATHODE-SHELL VOLTAGE:		
Shell negative with respect to cathode	90 max.	volts
Shell positive with respect to cathode	90 max.	volts

GRID-PULSED POWER OSCILLATOR

Grid-pulsed operation is limited to the Maximum Ratings shown under the heading RF POWER AMPLIFIER & OSCILLATOR — Class C Telegraphy

[a] All other tubes in the same heater string should have the same heater heating time.

[b] Continuous Commercial Service.

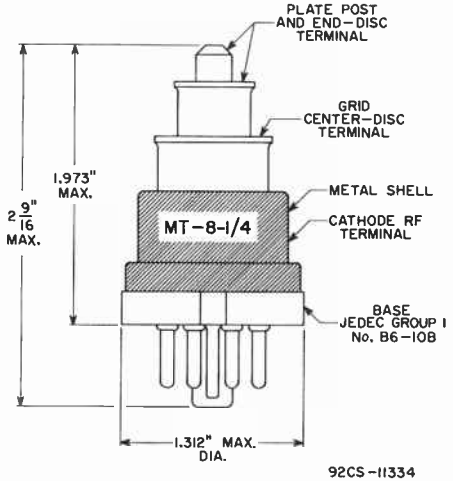
[c] *"On" time* is defined as the sum of the durations of all the individual pulses which occur during any 5000-microsecond interval.

OPERATING CONSIDERATIONS

In *Plate-Pulsed Power Oscillator Service*, the plate voltage must not be applied until a minimum of 1 minute after the application of the heater voltage.

In *RF Power Amplifier & Oscillator — Class C Telegraphy Service* or *Grid-Pulsed Power Oscillator Service*, with dc plate voltages of 250 volts or less, the plate voltage and the heater voltage may be applied simultaneously.

In *RF Power Amplifier & Oscillator — Class C Telegraphy Service*, where long and reliable operation are important, the maximum ratings should be reduced by 25 per cent.



RCA

2X2-A

HALF-WAVE VACUUM RECTIFIER

For applications critical as to severe shock and vibration

GENERAL DATA

Electrical:

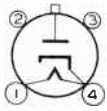
Heater, for Unipotential Catnode:

	Min.	Av.	Max.	
Voltage	2.25	2.50	2.75	ac volts
Current at 2.50 volts	1.55	1.75	1.95	amp

Mechanical:

Mounting Position	Any
Maximum Overall Length	4-17/32"
Seated Length	3-25/32" ± 1/8"
Maximum Diameter	1-9/16"
Dimensional Outline	*See General Section*
Weight (Approx.)	1.3 oz
Bulb	ST-12
Cap	Small (JETEC No.C1-1)
Base	Small-Shell Small 4-Pin (JETEC No.A4-5)
Basing Designation for BOTTOM VIEW	4AB

Pin 1 - Heater
Pin 2 - No Connection
Pin 3 - No Connection



Pin 4 - Heater, Cathode
Cap - Plate

HALF-WAVE RECTIFIER

Maximum Ratings, *Design-Center Values:*

PEAK INVERSE PLATE VOLTAGE	12500 max.	volts
PEAK PLATE CURRENT	60 max.	ma
DC OUTPUT CURRENT	7.5 max.	ma
HOT-SWITCHING TRANSIENT CURRENT, for duration of 0.2 second max.	100 max.	ma
AMBIENT TEMPERATURE	70 max.	°C

Typical Operation:

AC Plate-Supply Voltage (RMS)	5500	volts
Total Effective Plate-Supply Impedance	0.3	megohm
Filter Input Capacitor	0.1	μf
DC Output Current	2	ma
DC Output Voltage (At input to filter)	4500	volts

SHOCK TEST DATA

Impact Acceleration	250 max.	g

This test is performed on a sample lot of tubes from each production run to determine ability of tube to withstand the specified impact acceleration. The tubes are subjected to a total of 3 blows in each of the 3 primary mutually

← Indicates a change.

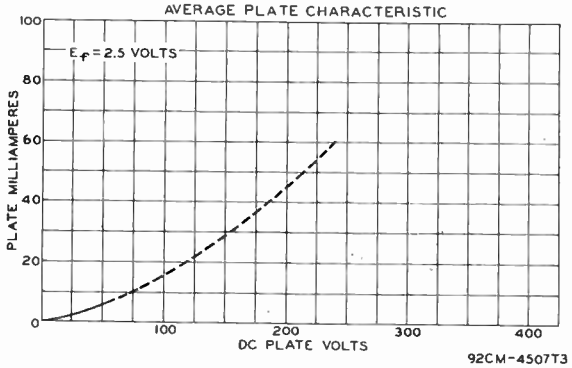
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

2X2-A

HALF-WAVE VACUUM RECTIFIER

perpendicular tube planes when tested in the Navy Type, High-Impact (flyweight) Shock Machine. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and will not be inoperative.



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

3A2

HALF-WAVE VACUUM RECTIFIER

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:
- Voltage . . . . 3.15 . . . . ac volts
- Current . . . . 0.22 . . . . amp

Direct Interelectrode Capacitance (Approx.):*
- Plate to heater, cathode, and internal shield . . . . 1.0 μμf

Mechanical:

Mounting Position . . . . Any
Maximum Overall Length . . . . 2-13/16"
Seated Length . . . . 2-7/16" ± 1/8"
Maximum Diameter . . . . 7/8"
Bulb T-6-1/2
Cap . . . . Skirted Miniature (JETEC No.C1-33)
Base . . . . Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW 9DT

Pin 1 - Heater, Cathode, Int. Shield
Pin 2 - Heater
Pin 3 - No Connection- Do Not Use
Pin 4 - Heater, Cathode, Int. Shield
Pin 5 - Heater

Pin 6 - Heater, Cathode, Int. Shield
Pin 7 - No Connection- Do Not Use
Pin 8 - Heater
Pin 9 - Heater, Cathode, Int. Shield

PULSED-RECTIFIER SERVICE

Maximum Ratings, *Design-Center Values:*

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

PEAK INVERSE PLATE VOLTAGE	18000 max.	volts
PEAK PLATE CURRENT	80 max.	ma
AVERAGE PLATE CURRENT	1.5 max.	ma

* with no external shield.

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

OPERATING NOTES

Measurement of Heater Voltage. To measure the heater voltage when the heater is at a high dc potential with respect to ground, it is recommended that a voltmeter of the thermocouple type calibrated in rms volts be used. The meter and its leads must be insulated to withstand the dc output voltage. In some circuit designs, particularly in voltage-multiplier circuits where the heater

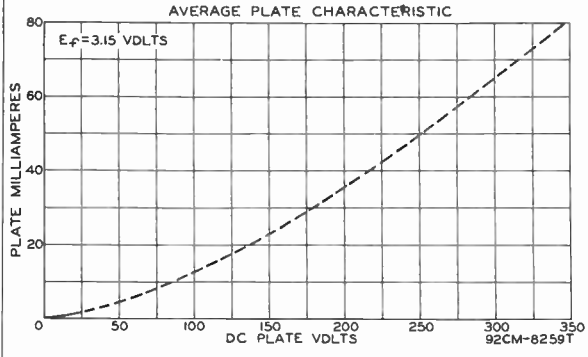
RCA

3A2

HALF-WAVE VACUUM RECTIFIER

of a rectifier tube may be at a high ac potential with respect to ground, measurement of the heater voltage of this tube with a thermocouple meter is not practical because the capacitances of the meter and the meter leads will load the circuit and affect circuit operation. Therefore, a simple method utilizing visual comparison of heater temperatures can be used for adjustment of heater power. The color temperature of the heater operating from a pulse-operated power source may be checked visually by observing in a darkened room the reflection of the incandescent heater upon the surface of the internal shield. A visual comparison of this color temperature with that obtained when the heater of another 3A2 is operated from a dc or low-frequency ac supply of 3.15 volts, provides a convenient means for adjusting the heater voltage to the proper rms value.

The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier tubes may produce *x-rays* which can constitute a health hazard unless such tubes are adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.



RCA

3A3

HALF-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

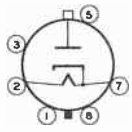
Heater, for Unipotential Cathode:		
Voltage	3.15	ac volts
Current	0.22	amp
Direct Interelectrode Capacitance (Approx.):●		
Plate to Heater, Cathode, and Internal Shield	1.5	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	4-1/16"
Seated Length	3-5/16" ± 3/16"
Maximum Diameter	1-9/32"
Bulb	T-9
Cap	Small (JETEC No.C1-1)
Base . . . . Intermediate-Shell Octal 6-Pin (JETEC No.B6-8)	

BOTTOM VIEW

Pin 1 – Int. Conn.– Do Not Use
Pin 2 – Heater
Pin 3 – Int. Conn.– Do Not Use
Pin 5 – Int. Conn.– Do Not Use



Pin 7 – Heater, Cathode, Int. Shield
Pin 8 – Int. Conn.– Do Not Use
Cap – Plate

PULSED-RECTIFIER SERVICE

Maximum Ratings, *Design-Center Values:*

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

PEAK INVERSE PLATE VOLTAGE	30000 max.	volts
PEAK PLATE CURRENT	80 max.	ma
AVERAGE PLATE CURRENT	1.5 max.	ma

● With no external shield.

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

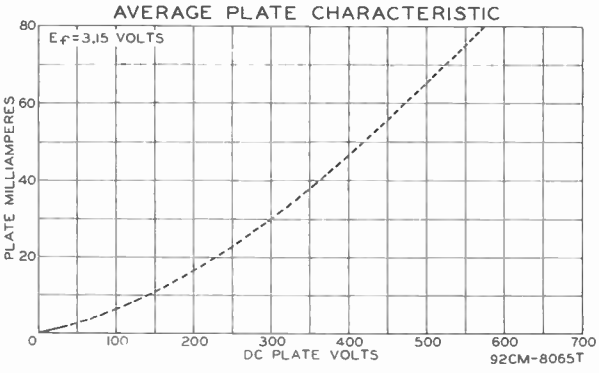
OPERATING NOTES

Measurement of Heater Voltage. To measure the heater voltage when the heater is at a high dc potential with respect to ground, it is recommended that a voltmeter of the thermocouple type calibrated in rms volts be used. The meter and its leads must be insulated to withstand 20000 volts and the stray capacitances to ground should be minimized.

3A3

HALF-WAVE VACUUM RECTIFIER

The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier tubes may produce *x-rays* which can constitute a health hazard unless such tubes are adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.



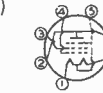
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

3A4

POWER AMPLIFIER PENTODE

MINIATURE TYPE

Filament	Coated		
Filament Arrangement	*Series* *	*Parallel***	
Voltage	2.8	1.4	d-c volts
Current	0.1	0.2	amp.
Direct Interelectrode Capacitances:°			
Grid to Plate	0.34 max.		μμf
Input	4.8		μμf
Output	4.2		μμf
Maximum Overall Length			2-1/8"
Maximum Seated Height			1-7/8"
Maximum Diameter			3/4"
Bulb			T-5-1/2
Base▲			Miniature Button 7-Pin
Pin 1 - Fil.(- series)			Pin 5 {Fil. Mid-Tap (- parallel)
Pin 2 - Plate			Pin 6 - Plate
Pin 3 - Screen			Pin 7 - Filament +
Pin 4 - Grid			
RCA Socket			Stock No.9914
Mounting Position	BOTTOM VIEW (7BB)		Any



Maximum Ratings Are Design-Center Values

A-F POWER AMPLIFIER

Plate Voltage	150 max. volts
Screen Voltage	90 max. volts
Plate Dissipation	2.0 max. watts
Screen Dissipation	0.4 max. watt
Total Zero-Sig. Cathode Current■	18 max. ma.

Typical Operation and Characteristics-Class A1 Amplifier:●

Filament Arrangement	*Parallel* **		
Plate Voltage	135	150	volts
Screen Voltage	90	90	volts
Grid Voltage	-7.5	-8.4	volts
Peak A-F Grid Voltage	7.5	8.4	volts
Zero-Sig. Plate Current	14.8	13.3	ma.
Max.-Sig. Plate Current	14.9	14.1	ma.
Zero-Sig. Screen Current	2.6	2.2	ma.
Max.-Sig. Screen Current	3.5	3.5	ma.
Plate Resistance	90000	100000	ohms
Transconductance	1900	1900	μmhos
Load Resistance	8000	8000	ohms
Total Harmonic Distortion	5	6	%
Max.-Sig. Power Output	600	700	mw

R-F POWER AMPLIFIER

D-C Plate Voltage	150 max. volts
D-C Screen Voltage	135 max. volts
D-C Grid Voltage	-30 max. volts
D-C Plate Current	20 max. ma.
D-C Grid Current	0.25 max. ma.
Total D-C Cathode Current ■	25 max. ma.
Plate Input	3 max. watts
Screen Input	0.9 max. watt
Plate Dissipation	2 max. watts

*, **, °, ▲, ■, ●: See next page.

← Indicates a change.

3A4

POWER AMPLIFIER PENTODE

(continued from preceding page)

*Typical Operation at 10 Mc with Parallel Filament Arrangement:***

D-C Plate Voltage	150	volts
D-C Screen Voltage	135	volts
Grid Resistor	0.2	megohm
D-C Plate Current	18.3	ma.
D-C Screen Current	6.5	ma.
D-C Grid Current	0.13	ma.
Power Output (approx.)	1.2	watts

* Filament voltage applied across the two sections in series between pins No.1 and No.7. Grid voltage is referred to pin No.1.

** Filament voltage applied across the two sections in parallel between pin No.5 and pins No.1 and No.7 connected together. Grid voltage is referred to pin No.5.

° With no external shield.

■ For series-filament operation. A shunting resistor must be connected across the section between pins No.1 and No.5 to by-pass excess cathode current in this section. The value of the shunting resistor should be adjusted to make the voltage across the shunted section equal to the voltage across the section between pins No.5 and No.7. When other tubes in series-filament arrangement contribute to the filament current of the 3A4, an additional shunting resistor may be required between pins No.1 and No.7.

● Typical operating values for the 3A4 with filament sections in series will be approximately the same as those shown for parallel-filament operation.

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

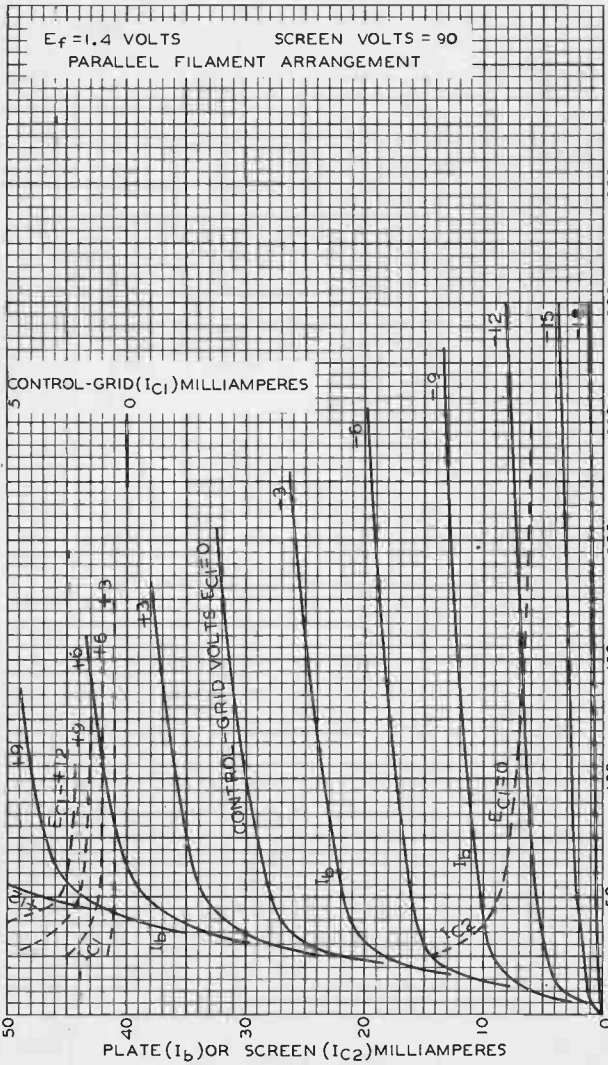
← Indicates a change.

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

RCA

3A4

AVERAGE PLATE CHARACTERISTICS



FEB. 19 1942

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6370

RCA

3A5

H-F TWIN TRIODE

MINIATURE TYPE

Filament	Coated		
Filament Arrangement	*Series**	*Parallel***	
Voltage	2.8	1.4	d-c volts
Current	0.11	0.22	amp.

Direct Interelectrode Capacitances:°

	Triode Unit T_1	*Triode Unit T_2*	
Grid to Plate	3.2	3.2	μμf
Grid to Filament	0.9	0.9	μμf
Plate to Filament	1.0	1.0	μμf
Plate to Plate	0.32		μμf

Maximum Overall Length	2-1/8"
Maximum Seated Height	1-7/8"
Maximum Diameter	3/4"
Bulb	T-5-1/2"

Base▲ — Miniature Button 7-Pin

Pin 1 - Filament -
Pin 2 - Plate T_2
Pin 3 - Grid T_2
Pin 4 - {Fil. Mid-Tap ((+ parallel)
Pin 5 - Grid T_1
Pin 6 - Plate T_1
Pin 7 - Fil.(+ Series)

BOTTOM VIEW (7BC)

RCA Socket — Stock No.9914

Mounting Position — Any

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

Maximum Ratings Are Design-Center Values

A-F POWER AMPLIFIER

Plate Voltage	135 max.	volts
Plate Current	5 max.	ma.
Plate Dissipation	0.5 max.	watt
Characteristics - Class A, Amplifier:		
Plate Voltage	90	volts
Grid Voltage	-2.5	volts
Amplification Factor	15	
Plate Resistance	8300	ohms
Transconductance	1800	μmhos
Plate Current	3.7	ma.

R-F POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

Key-down conditions per tube without modulation

D-C Plate Voltage	135 max.	volts
D-C Grid Voltage	-30 max.	volts
D-C Plate Current (per unit)	15 max.	ma.
D-C Grid Current (per unit)	2.5 max.	ma.
Plate Input (per unit)	2.0 max.	watts
Plate Dissipation (per unit)	1.0 max.	watt
Typical Operation At 40 Mc With Both Units In Push-Pull:		
D-C Plate Voltage	135	volts
D-C Grid Voltage •	-20	volts
	4000	ohms
	570	ohms
Peak R-F Grid-to-Grid Voltage	90	volts
D-C Plate Current	30	ma.
D-C Grid Current (approx.)	5	ma.
Driving Power (approx.)	0.2	watt
Power Output (approx.)	2	watts

*, **, °, •, ▲, :see next page

3A5

H-F TWIN TRIODE

(continued from preceding page)

* Filament voltage applied across the two sections in series between pins No.1 and No.7. Grid voltage is referred to Pin No.1. For series filament operation, a shunting resistor must be connected across the section between pins No.1 and No.4, to by-pass excess cathode current in this section. The value of the shunting resistor should be adjusted to make the voltage across the shunted section equal to the voltage across the section between pins No.4 and No.7. When other tubes in series-filament arrangement contribute to the filament current of the 3A5, an additional shunting resistor may be required between pins No.1 and No.7.

** Filament voltage applied across the two sections in parallel between pin No.4 and pins No.1 and No.7 connected together. Grid voltage is referred to pins No.1 and No.7 tied together.

o With no external shield

● Obtained by grid resistor (4000), cathode resistor (570), or fixed supply.

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

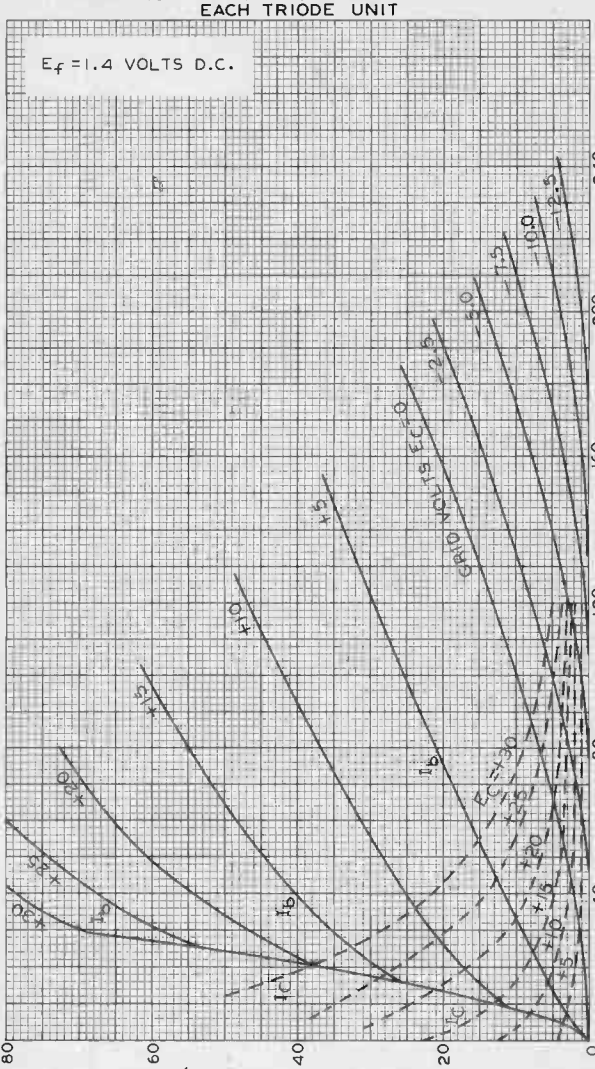
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

RCA

3A5

AVERAGE PLATE CHARACTERISTICS

EACH TRIODE UNIT



3AF4-A
MEDIUM-MU TRIODE

7-PIN MINIATURE TYPE

Intended for use in UHF TV equipment having series heater-string arrangement

The 3AF4-A is the same as the 6AF4-A except for the following items:

Heater, for Unipotential Cathode:		
Voltage	3.15	ac or dc volts
Current	0.45	amp
Warm-up time (Average)*	11	sec

3AL5
TWIN DIODE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 3AL5 is the same as the 6AL5 except for the following items:

Heater, for Unipotential Cathodes:		
Voltage	3.15	ac or dc volts
Current	0.6	amp
Warm-up time (Average)*	11	sec

3AU6
SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 3AU6 is the same as the 6AU6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	3.15	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.

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

3AV6
TWIN DIODE—HIGH-MU TRIODE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 3AV6 is the same as the 6AV6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	3.15	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

RCA

3B2

HALF-WAVE VACUUM RECTIFIER

GENERAL DATA

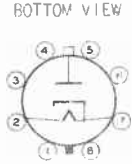
Electrical:

Heater, for Unipotential Cathode:		
Voltage	3.15	ac volts
Current	0.22	amp
Direct Interelectrode Capacitance (Approx.):[O]		
Plate to cathode & internal shield & heater	1.8	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	5-7/32"
Seated Length	4-1/2" ± 3/16"
Maximum Diameter	1-23/32"
Bulb	T-12
Cap	Small (JETEC No.C1-1)
Base	Short Jumbo-Shell Octal 8-Pin with External Barriers (JETEC No.B8-71)
Basing Designation for BOTTOM VIEW	8GH

Pin 1 – Internal Connection–Do Not Use
Pin 2 – Heater
Pin 3 – Same as Pin 1
Pin 4 – No Connection♦
Pin 5 – Same as Pin 1



Pin 6 – Same as Pin 1
Pin 7 – Heater, Cathode, Internal Shield
Pin 8 – Same as Pin 1
Cap – Plate

PULSED-RECTIFIER SERVICE

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

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

INVERSE PLATE VOLTAGE:		
Total dc and peak (Absolute maximum)	35000■ max.	volts
DC	25000 max.	volts
PEAK PLATE CURRENT	80 max.	ma
AVERAGE PLATE CURRENT	1.1 max.	ma

O Without external shield.

♦ *See Operating Considerations.*

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

■ Under no circumstances should this absolute value be exceeded.

OPERATING CONSIDERATIONS

Socket Connections. Low-potential circuits should not be connected to any of the socket terminals. Any or all of the following socket terminal connections are permissible

RCA

3B2

HALF-WAVE VACUUM RECTIFIER

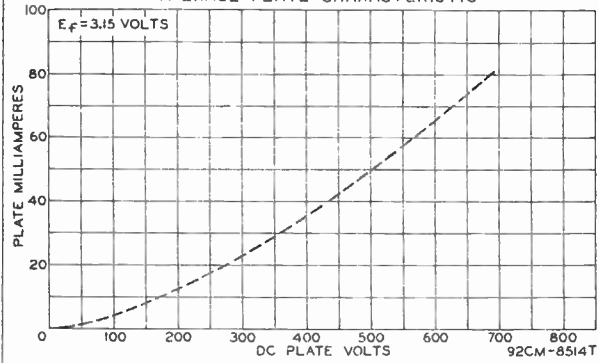
and may aid in corona reduction.

1. Pins 1,3,5, and 7 may be connected together.
2. Pins 2,6, and 8 may be connected together.
3. Pin 4 may be connected to either pin 2 or pin 7, or may be used as a tie point for a heater-voltage dropping resistor. Do not use pin 4 as a low-potential tie point.

Measurement of Heater Voltage. To measure the heater voltage when the heater is at a high dc potential with respect to ground, it is recommended that a simple method utilizing visual comparison of the cathode and heater temperatures be used. The color temperature of the cathode and heater, with the heater operating from a pulse-power source, may be checked visually by comparing in a darkened room this color temperature with that obtained when the heater of another 3B2 is operated from a dc or low-frequency ac supply of 3.15 volts.

X-rays. The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier tubes may produce *X-rays* which can constitute a health hazard unless such tubes are adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.

AVERAGE PLATE CHARACTERISTIC



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

3B25

HALF-WAVE GAS RECTIFIER

GENERAL DATA

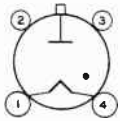
Electrical:

Filament, Coated:		
Voltage	2.5 ± 5%	ac volts
Current at 2.5 volts	5	amp
Minimum heating time at rated voltage	15	sec ←

Mechanical:

Operating Position	Any
Maximum Overall Length	6-5/16"
Seated Length	5-1/4" ± 7/16"
Maximum Diameter	2-1/16"
Weight (Approx.)	3 oz ←
Bulb	T16
Cap	Medium (JETEC No.C1-5) ←
Base	Medium-Shell Small 4-Pin with Bayonet (JETEC No.A4-10) ←
Basing Designation for BOTTOM VIEW	4P

Pin 1 – Filament
Pin 2 – No Connection
Pin 3 – No Connection



Pin 4 – Filament, Cathode Shield
Cap – Anode

HALF-WAVE RECTIFIER

Maximum Ratings, *Absolute Values:*

For anode-supply frequencies up to 500 cps

PEAK INVERSE ANODE VOLTAGE	4500 max.	volts
ANODE CURRENT:		
Peak	2 max.	amp
Average*	0.5 max.	amp
Fault, for duration of 0.1 second maximum	20 max.	amp
AMBIENT-TEMPERATURE RANGE	-75 to +90	°C

CHARACTERISTICS RANGE VALUES# FOR EQUIPMENT DESIGN ←

	Note	Min.	Max.	
Filament Current	1	4.6	5.4	amp
Critical Anode Voltage	2	–	110	volts
Peak Tube Voltage Drop	3	–	14	volts

Note 1: With 2.5 volts rms on filament.

Note 2: With 2.38 volts rms on filament.

Note 3: With 2.5 volts rms on filament, peak anode current of 2 amperes provided by half-cycle pulse from a 60-cps sine wave and recurring approximately once a second. Tube drop is measured by an oscilloscope connected between anode and center-tap of filament transformer.

*, #: See next page.

← Indicates a change.

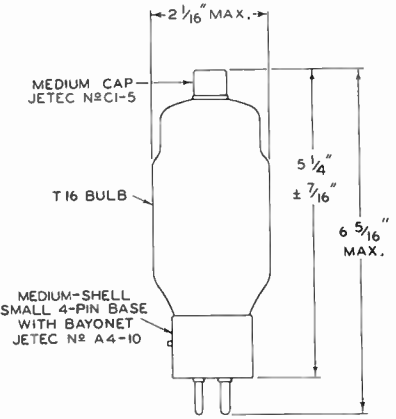
3B25

HALF-WAVE GAS RECTIFIER

* Averaged over any period of 30 seconds maximum.
\# Throughout tube life.

OPERATING CONSIDERATIONS

If the *anode return* of each tube is not connected to the center-tap of the filament-supply winding, the return should be made to that side of the filament to which the cathode shield is connected.



92CM-6555R3

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

3B25

HALF-WAVE GAS RECTIFIER

For Circuit Figures, see Front of this Section

CIRCUIT	MAX. TRANS. SEC. VOLTS (RMS) E	APPROX. DC OUTPUT VOLTS TO FILTER E_{av}	MAX. DC OUTPUT AMPERES I_{av}		MAX. DC OUTPUT KW TO FILTER Pdc	
Fig. 1 Half-Wave Single-Phase In-Phase Operation	3100	1400	0.5		0.7	
Fig. 2 Full-Wave Single-Phase In-Phase Operation	1500	1400	1.0		1.4	
Fig. 3 Series Single-Phase In-Phase Operation	3100	2900	1.0		2.9	
Fig. 4 Half-Wave Three-Phase In-Phase Operation	1800	2200	1.5		3.3	
Fig. 5 Parallel Three-Phase Quadrature Operation	1800	2200	3.0		6.6	
Fig. 6 Series Three-Phase Quadrature Operation	1800	4300	1.5		6.4	
Fig. 7 Half-Wave Four-Phase Quadrature Operation	1500	2000	*Resistive Load* 1.8	*Inductive Load* 2.0	*Resistive Load* 3.6	*Inductive Load* 4.0
Fig. 8 Half-Wave Six-Phase Quadrature Operation	1500	2200	*Resistive Load* 1.9	*Inductive Load* 2.0	*Resistive Load* 4	*Inductive Load* 4.4

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

3BA6

Remote-Cutoff Pentode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 3BA6 is the same as the 6BA6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

3BC5

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 3BC5 is the same as the 6BC5 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 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[a] max.	volts

3BE6

Pentagrid Converter

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 3BE6 is the same as the 6BE6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

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

3BN4

Medium-Mu Triode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 3BN4 is the same as the 6BN4 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

3BN4A

Medium-Mu Triode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 3BN4A is the same as the 6BN4A except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec.

3BC5
SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 3BC5 is the same as the 6BC5 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	3.15	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

3BN6
BEAM TUBE

7-PIN MINIATURE TYPE

Intended for limiter & discriminator service in FM & TV equipment having series heater-string arrangement

The 3BN6 is the same as the 6BN6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	3.15	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

3BU8
SHARP-CUTOFF TWIN PENTODE
With Common Cathode, Grid No. 1, and Grid No. 2

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 3BU8 is the same as the 6BU8 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	3.15	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.*

▲ The dc component must not exceed 100 volts.

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

3BY6

PENTAGRID AMPLIFIER

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 3BY6 is the same as the 6BY6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	3.15	ac or dc volts
Current	0.6	amp
Warm-up time (Average)*	11	sec

3BZ6

SEMIREMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 3BZ6 is the same as the 6BZ6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	3.15	ac or dc volts
Current	0.6	amp
Warm-up time (Average)*	11	sec

3CB6

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 3CB6 is the same as the 6CB6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	3.15	ac or dc volts
Current	0.6	amp
Warm-up time (Average)*	11	sec
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	300 max.	volts
Heater positive with respect to cathode	200▲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.

3BN6

Beam Tube

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 3BN6 is the same as the 6BN6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

3BU8

Sharp-Cutoff Twin Pentode

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

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 3BU8 is the same as the 6BU8 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Currert	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

3BY6

Pentagrid Amplifier

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 3BY6 is the same as the 6BY6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

3BC5

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 3BC5 is the same as the 6BC5 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 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

3BN4

Medium-Mu Triode

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 3BN4 is the same as the 6BN4 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

3BN6

Beam Tube

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 3BN6 is the same as the 6BN6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

▲ The dc component must not exceed 100 volts.

3BU8

Sharp-Cutoff Twin Pentode

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

9-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 3BU8 is the same as the 6BU8 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

3BY6

Pentagrid Amplifier

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 3BY6 is the same as the 6BY6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

3BZ6

Semiremote-Cutoff Pentode

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 3BZ6 is the same as the 6BZ6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	300▲ max.	volts
Heater positive with respect to cathode	200● max.	volts

▲ The dc component must not exceed 200 volts.

● The dc component must not exceed 100 volts.

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

3BZ6

Semiremote-Cutoff Pentode

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 3BZ6 is the same as the 6BZ6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	300[a] max.	volts
Heater positive with respect to cathode	200[b] max.	volts

3CB6

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 3CB6 is the same as the 6CB6-A except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 6%	amp
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	300 max.	volts
Heater positive with respect to cathode	200[b] max.	volts

3CE5

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 3CE5 is the same as the 6CE5 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 6%	amp

[a] The dc component must not exceed 200 volts.
[b] The dc component must not exceed 100 volts.

3CF6

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 3CF6 is the same as the 6CF6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	300 max.	volts
Heater positive with respect to cathode	200[a] max.	volts

3CS6

Pentagrid Amplifier

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 3CS6 is the same as the 6CS6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

3CY5

Sharp-Cutoff Tetrode

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 3CY5 is the same as the 6CY5 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	2.9	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

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

3CF6
SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 3CF6 is the same as the 6CF6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	3.15	ac or dc volts
Current	0.6	amp
Warm-up time (Average)*	11	sec
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	300 max.	volts
Heater positive with respect to cathode	200▲max.	volts

3CS6
PENTAGRID AMPLIFIER

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 3CS6 is the same as the 6CS6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	3.15	ac or dc volts
Current	0.6	amp
Warm-up time (Average)*	11	sec

3DT6
SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 3DT6 is the same as the 6DT6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	3.15	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.*

▲ The dc component must not exceed 100 volts.

Full-Wave Vacuum Rectifier

GENERAL DATA

Electrical:

Filament, Coated:		
Voltage (AC or DC)	3.3 ± 10%	volts
Current at 3.3 volts	3.8	amp

Mechanical:

Operating Position	Any
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 A (JEDEC Group 1, No.B5-234) or Short Medium-Shell Octal 5-Pin with External Barriers, Style B (JEDEC Group 1, No.B5-239)
Basing Designation for BOTTOM VIEW	5DE

Pin 1 - Filament
Pin 2 - Internal Connection—Do Not Use
Pin 3 - Filament
Pin 5 - Plate No.2
Pin 7 - Plate No.1

FULL-WAVE RECTIFIER

Maximum Ratings, *Design-Maximum Values:*

PEAK INVERSE PLATE VOLTAGE	1050 max.	volts
AC PLATE SUPPLY VOLTAGE PER PLATE (RMS)	See *Rating Chart I*	
PEAK PLATE CURRENT PER PLATE	1.2 max.	amp
HOT-SWITCHING TRANSIENT PLATE CURRENT PER PLATE[a]	6.5 max.	amp
DC OUTPUT CURRENT	See *Rating Chart I*	
BULB TEMPERATURE (At hottest point on bulb surface)	200 max.	°C

Typical Operation:

With capacitor input to filter

AC Plate-to-Plate Supply Voltage (RMS)	550	volts
Filter-Input Capacitor[b]	40	μf
Total Effective Plate Supply Impedance Per Plate	32	ohms
DC Output Voltage (Approx.) at input to filter at full-load current of 350 ma.	300	volts

Characteristics:

Tube-Voltage Drop for plate ma. = 350 (Per plate). . . . . 25 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 6.5 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 to filters. This graphical presentation gives the equipment designer considerable latitude in choice of operating conditions.

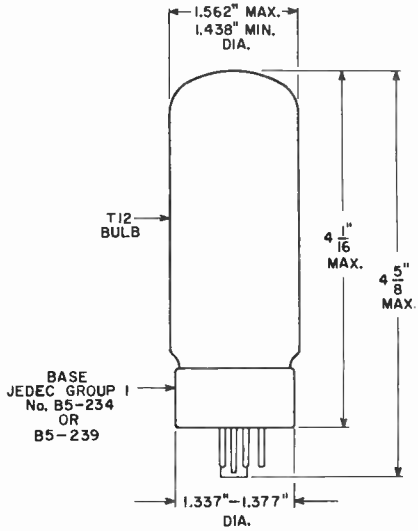
Rating Chart II represents graphically the relationship between maximum rectification efficiency and maximum dc output current per plate for conditions of capacitor input to filter.

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 to 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 6.5 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, a value of series plate supply resistance per plate should be chosen such that it is equal to or greater than the minimum value indicated by the curve.

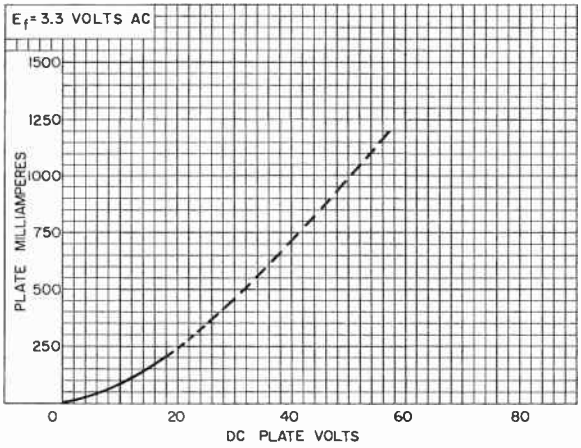
If appreciable series inductance is present in the plate supply, a value of series plate supply resistance smaller than that indicated by the curve may be employed provided it is experimentally determined that the combined effect of inductance and plate supply resistance used are adequate to limit the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



92CS-10983RI

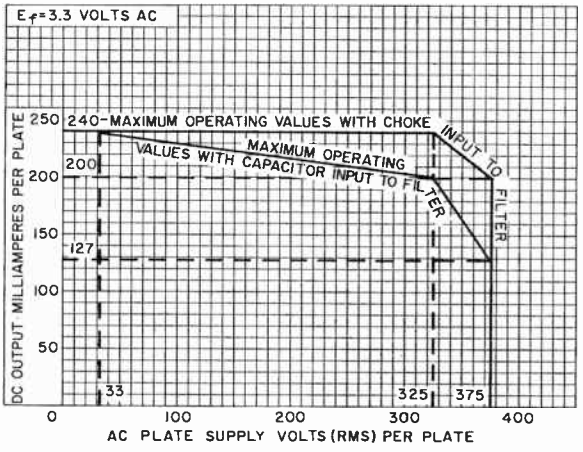
3DG4

AVERAGE PLATE CHARACTERISTIC
Each Plate



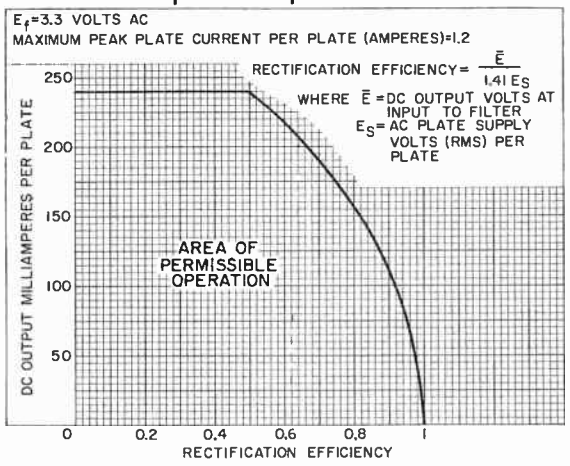
92CS-10980

RATING CHART I



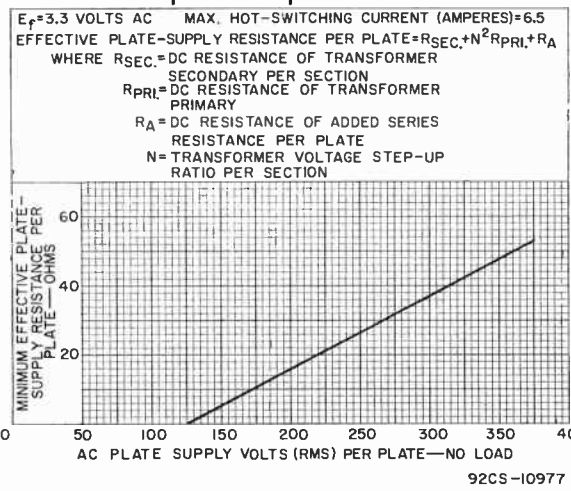
92CS-10982RI

RATING CHART II
Capacitor Input to Filter



92CS-10978

RATING CHART III
Capacitor Input to Filter



92CS-10977

3DK6

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 3DK6 is the same as the 6DK6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	300 max.	volts
Heater positive with respect to cathode	200[a] max.	volts

3DT6

Sharp-Cutoff Pentode

With Two Independent Control Grids

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 3DT6 is the same as the 6DT6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

3DT6-A

Sharp-Cutoff Pentode

With Two Independent Control Grids

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 3DT6-A is the same as the 6DT6-A except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	3.15	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

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

3EA5

Sharp-Cutoff Tetrode

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 3EA5 is the same as the 6EA5 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	2.9	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

High-Mu Triode

7-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

The 3GK5 is the same as the 6GK5 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	2.8	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

3LF4
BEAM POWER AMPLIFIER

GENERAL DATA

Electrical:

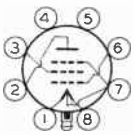
Filament, Coated:

Filament Arrangement	*Series**	*Parallel***	
Voltage	2.8	1.4	dc volts
Current	0.05	0.1	amp

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-25/32"
Maximum Seated Length	2-1/4"
Maximum Diameter	1-3/16"
Bulb	T-9
Base	Lock-in 8-Pin
Basing Designation for BOTTOM VIEW	6BB

Pin 1 – Filament
Pin 2 – Plate
Pin 3 – Grid No.2
Pin 4 – No Connection
Pin 5 – No Connection



Pin 6 – Grid No.1
Pin 7 – Filament Mid-Tap, Grid No.3
Pin 8 – Filament
Plug – Base Shell

AF POWER AMPLIFIER – Class A1

Maximum Ratings, *Design-Center Values:*

Filament Arrangement	*Series**	*Parallel***	
PLATE VOLTAGE	110 max.	110 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	110 max.	110 max.	volts
TOTAL CATHODE CURRENT	6 max.	12 max.	ma

Typical Operating Conditions and Characteristics are the same as those for Type 3Q5-GT.

Curves shown under Type 1Q5-GT also apply to the 3LF4 with filaments connected in parallel.

* A resistor of 270 ohms must be used in parallel with the negative section of the filament (Pins 7 and 8) in order to insure that the value of 6.0 Ma. total cathode current for each 1.4-volt section of the filament is not exceeded. When other tubes in series filament circuits contribute to the filament current of the 3LF4, an additional shunt resistor between pins 1 and 8 will be required.

** For parallel operation, connect pins 1 and 8 to the positive of the voltage supply and pin 7 to the negative.

3Q4

POWER AMPLIFIER PENTODE

MINIATURE TYPE

Filament	Coated		
Filament Arrangement	*Series**	*Parallel**	
Voltage	2.8	1.4	d-c volts
Current	0.05	0.1	amp.
Maximum Overall Length			2-1/8"
Maximum Seated Height			1-7/8"
Maximum Diameter			3/4"
Bulb			T-5-1/2
Base ▲			Miniature Button 7-Pin
Pin 1 - Fil.(-series)			Pin 5 - Filament Mid-Tap (-parallel)
Pin 2 - Plate			
Pin 3 - Grid			Pin 6 - Plate
Pin 4 - Screen			Pin 7 - Filament+
Mounting Position			Any

BOTTOM VIEW (7BA)

AMPLIFIER

	*Series**	*Parallel**	
Filament Arrangement			
Plate Voltage	90 max.	90 max.	volts
Screen Voltage	90 max.	90 max.	volts
Total Cathode Current	6# max.	12 max.	ma.
Typical Operation and Characteristics - Class A_1 Amplifier:			
Plate Voltage	90	85	90 volts
Screen Voltage	90	85	90 volts
Grid Voltage	-4.5	-5	-4.5 volts
Peak A-F Grid Volt.	4.5	5	4.5 volts
Zero-Sig. Plate Cur.	7.7	6.9	9.5 ma.
Zero-Sig. Screen Cur.	1.7	1.5	2.1 ma.
Plate Res. (approx.)	0.12	0.12	0.1 megohm
Transconductance	2000	1975	2150 μmhos
Load Resistance	10000	10000	10000 ohms
Total Harmonic Dist.	7	10	7 %
Max.-Sig. Power Output	0.24	0.25	0.27 watt

* For series filament arrangement, filament voltage is applied between pins No.1 and No.7. The grid voltage is referred to pin No.1. For parallel filament arrangement, filament voltage is applied between pin No.5 and pins No.1 and No.7 connected together. The grid voltage is referred to pin No.5.

\# For each 1.4-volt filament section. For series operation of the sections, a shunting resistor must be connected across the section between pins No.1 and No.5 to by-pass any cathode current in this section which is in excess of the rated maximum per section. When other tubes in a series-filament arrangement contribute to the filament current of the 3Q4, an additional shunting resistor may be required between pins No.1 and No.7.

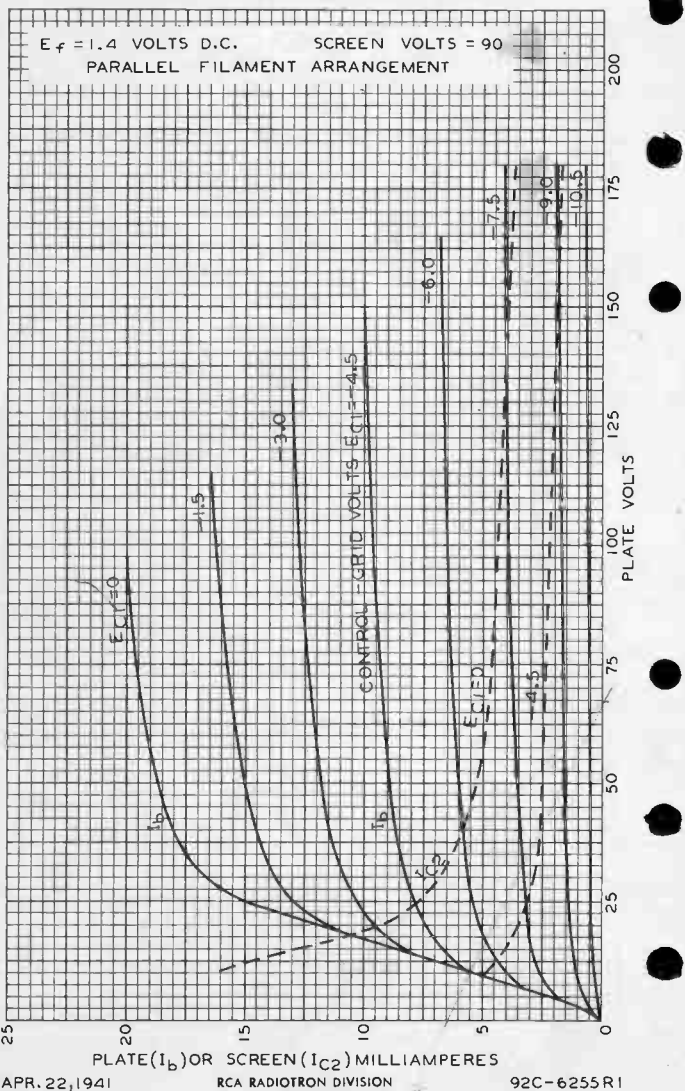
▲ *The center hole in sockets designed for this base provides for the possibility that this tube type may be manufactured with the exhaust-tube tip at the base end. For this reason, it is recommended that in equipment employing this tube type, no material be permitted to obstruct the socket hole.*

3Q4

RCA

3Q4

AVERAGE PLATE CHARACTERISTICS



APR. 22, 1941

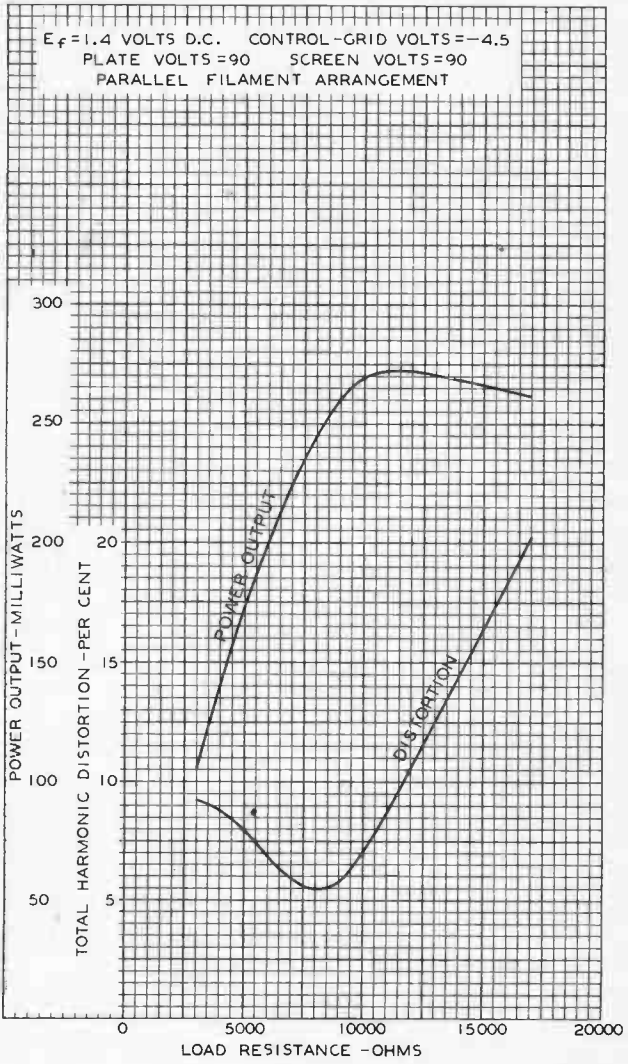
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6255R1

3Q4

OPERATION CHARACTERISTICS

E_f = 1.4 VOLTS D.C. CONTROL-GRID VOLTS = −4.5
PLATE VOLTS = 90 SCREEN VOLTS = 90
PARALLEL FILAMENT ARRANGEMENT



RCA MANUFACTURING COMPANY, INC.

3Q5-GT/G

3Q5-GT/G

BEAM POWER AMPLIFIER

Filament	Coated		
Filament Arrangement	*Series**	*Parallel***	
Voltage	2.8	1.4	d-c volts
Current	0.05	0.1	amp.

Direct Interelectrode Capacitances (Approx.):°

Grid to Plate	0.6	μμf
Input	8.0	μμf
Output	6.5	μμf

Maximum Overall Length	3-5/16"
Maximum Seated Height	2-3/4"
Maximum Diameter	1-5/16"
Bulb	T-9
Base	Intermediate Shell Octal 7-Pin
Pin 1 - No Connection	Pin 5 - Grid
Pin 2 - Filament	Pin 7 - Fil.(-,series)
Pin 3 - Plate	Pin 8 - Fil.(-,parallel)
Pin 4 - Screen	
Mounting Position	Any

BOTTOM VIEW (G-7AP)

Maximum Ratings Are Design-Center Values

AMPLIFIER

Filament Arrangement	*Series**		*Parallel***			
Plate Voltage	110 max.		110 max.			volts
Screen Voltage	110 max.		110 max.			volts
Total Zero-Sig. Cath. Cur.	6# max.		12 max.			ma.
Typical Operation and Characteristics-Class A_1 Amplifier:						
Plate	90	110	85	90	110	volts
Screen	90	110	85	90	110	volts
Grid ▲	-4.5	-6.6	-5	-4.5	-6.6	volts
Peak A-F Grid Voltage	4.5	5.1	5	4.5	5.4	volts
Plate Cur.	8.0	8.5	7.0	9.5	10	ma.
Screen Cur. (approx.)	1.0	1.1	0.8	1.3	1.4	ma.
Plate Res. (approx.)	80000	110000	70000	90000	100000	ohms
Transcond.	2000	2000	1950	2200	2200	μmhos
Load Res.	8000	8000	9000	8000	8000	ohms
Tot. Harm. Dist.	8.5	8.5	5.5●	6.0	6.0	%
Max.-Sig.Power Output	230	330	250	270	400	mw.

* Filament voltage applied across the two sections in series between pins No.2 and No.7. Grid voltage is referred to pin No.7.

** Filament voltage applied across the two sections in parallel between pin No.8 and pins No.2 and No.7 connected together. Grid voltage is referred to pin No.8.

\# For each 1.4-volt filament section. For series operation of the sections, a shunting resistor must be connected across the section between pins No.7 and No.8 to by-pass any cathode current in excess of the rated maximum per section. When other tubes in series-filament arrangement contribute to the filament current of the 3Q5-GT/G, an additional shunting resistor may be required between pins No.2 and No.7.

▲ The grid circuit resistance should not exceed 1.0 megohm for either cathode bias or fixed bias operation.

● With a peak a-f grid voltage equal to the grid bias, the power output for the 110-volt condition is: 500 mw at 10% total harmonic distortion for parallel filament operation; and 400 mw at 10% total harmonic distortion for series filament operation.

° With no external shield.

Curves shown under type 1Q5-GT/G also apply to the 3Q5-GT/G with the filaments connected in parallel.

→ Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

3S4

POWER PENTODE

MINIATURE TYPE

GENERAL DATA

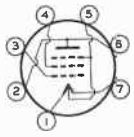
Electrical:

	*Series**	*Parallel***	
Filament, Coated:			
Filament arrangement			
Voltage	2.8	1.4	volts
Current	0.05	0.1	amp
Direct Interelectrode Capacitances:°			
Grid No.1 to plate	0.3		μμf
Grid No.1 to filament (mid-tap) & grid No.3, and grid No.2.	4.8		μμf
Plate to filament (mid-tap) & grid No.3, and grid No.2.	4		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	7BA

Pin 1 – Filament (–series)
Pin 2 – Plate
Pin 3 – Grid No.1
Pin 4 – Grid No.2



Pin 5 – Filament Mid-Tap (–parallel), Grid No.3
Pin 6 – Plate
Pin 7 – Filament (+)

AMPLIFIER – Class A_1

Maximum Ratings, *Design-Center Values:*

	*Series**	*Parallel***	
PLATE VOLTAGE	90 max.	90 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	67.5 max.	67.5 max.	volts
TOTAL MAXIMUM-SIGNAL CATHODE CURRENT	6# max.	12 max.	ma
TOTAL ZERO-SIGNAL CATHODE CURRENT	4.5# max.	9 max.	ma

Typical Operation and Characteristics:

	*Series**		*Parallel***		
Plate Voltage	67.5	90	67.5	90	volts
Grid-No.2 Voltage	67.5	67.5	67.5	67.5	volts

° Without external shield.

\# For each 1.4-volt filament section. For series operation of the sections, a shunting resistor must be connected across the section between pins No.1 and No.5 to bypass any cathode current in excess of the rated maximum per section. When other tubes in series filament arrangement contribute to the filament current of the 3S4, an additional shunting resistor may be required between pins No.1 and No.7.

*,**: See next page.

← Indicates a change.

3S4

3S4

POWER PENTODE

	*Series**		*Parallel***		
→ Grid-No.1 (Control-Grid) Voltage	−7	−7	−7	−7	volts
Peak AF Grid-No.1 Voltage	7	7	7	7	volts
Zero-Sig. Plate Current	6	6.1	7.2	7.4	ma
Zero-Sig. Grid-No.2 Current	1.2	1.1	1.5	1.4	ma
Plate Resistance (Approx.)	0.1	0.1	0.1	0.1	megohm
Transconductance	1400	1425	1550	1575	μmhos
Load Resistance	5000	8000	5000	8000	ohms
Total Harmonic Distortion	12	13	10	12	%
Max.-Sig. Power Output	160	235	180	270	mw

→ **Maximum Circuit Values (For maximum rated conditions):**

Grid-No.1-Circuit Resistance:

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

→ **Typical Operation with Single Filament Section:•**

Filament Voltage	1.4	volts
Filament Current	0.05	amp
Plate Voltage	90	volts
Grid-No.2 Voltage	67.5	volts
Grid-No.1 Voltage	−7	volts
Peak AF Grid-No.1 Voltage	7	volts
Zero-Signal Plate Current	3.7	ma
Zero-Signal Grid-No.2 Current	0.7	ma
Plate Resistance (Approx.)	0.2	megohm
Transconductance	800	μmhos
Load Resistance	16000	ohms
Total Harmonic Distortion	12	%
Maximum-Signal Power Output	145	mw

→ **Maximum Circuit Values (For maximum rated conditions):**

Grid-No.1-Circuit Resistance:

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

* Filament voltage applied across the two sections in series between pins No.1 and No.7. Grid-No.1 voltage is referred to pin No.1.

** Filament voltage applied across the two sections in parallel between pin No.5 and pins No.1 and No.7 connected together. Grid-No.1 voltage is referred to pin No.5.

• Either filament section may be operated singly with the other section floating. It is to be noted, however, that such operation may impair the emission capabilities of the unused section. Although in subsequent operation the unused section may be operated in series with the used section, it should not be operated singly.

Curves shown under Type 1S4 also apply to the 3S4 with the filaments connected in parallel

→ Indicates a change.

3V4
POWER PENTODE

MINIATURE TYPE

GENERAL DATA

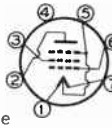
Electrical:

Filament, Coated:	*Series**	*Parallel***	
Filament arrangement			
Voltage	2.8	1.4	volts
Current	0.05	0.1	amp
Direct Interelectrode Capacitances (Approx.)[o]			
Grid No.1 to plate		0.20	μμf
Grid No.1 to filament (mid-tap) & grid No.3, and grid No.2		5.5	μμf
Plate to filament (mid-tap) & grid No.3, and grid No.2		3.8	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	6BX

Pin 1 – Filament (-series)
Pin 2 – Plate
Pin 3 – Grid No.2
Pin 4 – No Connection-Do Not Use



Pin 5 – Filament Mid-Tap (-parallel), Grid No.3
Pin 6 – Grid No.1
Pin 7 – Filament (+)

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values*:

	*Series**	*Parallel***	
PLATE VOLTAGE	90 max.	90 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	90 max.	90 max.	volts
TOTAL MAXIMUM-SIGNAL CATHODE CURRENT	6# max.	12 max.	ma
TOTAL ZERO-SIGNAL CATHODE CURRENT	6# max.	12 max.	ma

Typical Operation and Characteristics:

	*Series**	*Parallel***		
Plate Voltage	90	85	90	volts
Grid-No.2 Voltage	90	85	90	volts

[o] Without external shield.

\# For each 1.4-volt filament section. For series operation of the sections, a shunting resistor must be connected across the section between pins No.1 and No.5 to bypass any cathode current in excess of the rated maximum per section. When other tubes in series filament arrangement contribute to the filament current of the 3V4, an additional shunting resistor may be required between pins No.1 and No.7.

*, **: see next page.

← Indicates a change.

3V4

3V4

POWER PENTODE

	*Series**	*Parallel***		
Grid-No.1 (Control-Grid) Voltage	-4.5	-5	-4.5	volts
Peak AF Grid-No.1 Voltage	4.5	5	4.5	volts
Zero-Sig. Plate Current	7.7	6.9	9.5	ma
Zero-Sig. Grid-No.2 Current	1.7	1.5	2.1	ma
Plate Resistance (Approx.)	0.12	0.12	0.1	megohm
Transconductance	2000	1975	2150	μmhos
Load Resistance	10000	10000	10000	ohms
Total Harmonic Distortion	7	10	7	%
Max.-Signal Power Output	240	250	270	mw

→ **Maximum Circuit Values (For maximum rated conditions):**

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

→ **Typical Operation with Single Filament Section:•**

Filament Voltage	1.4	volts
Filament Current	0.05	amp
Plate Voltage	90	volts
Grid-No.2 Voltage	90	volts
Grid-No.1 Voltage	-4.5	volts
Peak AF Grid-No.1 Voltage	4.5	volts
Zero-Signal Plate Current	4.8	ma
Zero-Signal Grid-No.2 Current	1.1	ma
Plate Resistance (Approx.)	0.2	megohm
Transconductance	1100	μmhos
Load Resistance	20000	ohms
Total Harmonic Distortion	7	%
Maximum-Signal Power Output	135	mw

→ **Maximum Circuit Values (For maximum rated conditions):**

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

* Filament voltage applied across the two sections in series between pins No.1 and No.7. Grid-No.1 voltage is referred to pin No.1.

** Filament voltage applied across the two sections in parallel between pin No.5 and pins No.1 and No.7 connected together. Grid-No.1 voltage is referred to pin No.5.

• Either filament section may be operated singly with the other section floating. It is to be noted, however, that such operation may impair the emission capabilities of the unused section. Although in subsequent operation the unused section may be operated in series with the used section, it should not be operated singly.

Curves shown under Type 3Q4 also apply to the 3V4

→Indicates a change.

4AU6

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 4AU6 is the same as the 6AU6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	4.2	ac or dc volts
Current	0.45	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

4BC8

MEDIUM-MU TWIN TRIODE

With Semiremote-Cutoff Characteristic

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 4BC8 is the same as the 6BC8 except for the following items:

Heater, for Unipotential Cathodes:		
Voltage	4.2	ac or dc volts
Current	0.6	amp
Warm-up time (Average)*	11	sec

4BN6

BEAM TUBE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 4BN6 is the same as the 6BN6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	4.2	ac or dc volts
Current	0.45	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.

4BQ7-A
MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 4BQ7-A is the same as the 6BQ7-A except for the following items:

Heater, for Unipotential Cathodes:		
Voltage	4.2	ac or dc volts
Current	0.6	amp
Warm-up time (Average)*	11	sec

4BS8
MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

For use in cascode-type circuits of VHF TV tuners in equipment having series heater-string arrangement

The 4BS8 is the same as the 6BS8 except for the following items:

Heater, for Unipotential Cathodes:		
Voltage	4.5	ac or dc volts
Current	0.6	amp
Warm-up time (Average)*	11	sec

4BU8
SHARP-CUTOFF TWIN PENTODE
With Common Cathode, Grid No. 1, and Grid No. 2

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 4BU8 is the same as the 6BU8 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	4.2	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.*

Sharp-Cutoff Twin Pentode

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

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage	4.2		volts
Current	0.45 ± 6%		amp
Warm-up time (Average)	11		sec
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 to all other electrodes (Each unit)	3.8		μμf
Plate to all other electrodes (Each unit)	3.2		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	ma
Grid-No.2 Current	6	3.6	ma
Cathode Current	6.1	7.7	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	−	270	μmhos
Grid-No.1-to-Plate Transconductance	1200	−	μmhos
Plate Current	−	2	ma
Grid-No.3 Voltage (Approx.) for plate μa = 100	−	−3.7	volts
Grid-No.1 Voltage (Approx.) for plate μa = 100	−	−2	volts

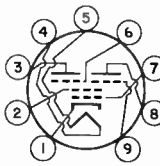
Mechanical:

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

4GS8/4BU8

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:*

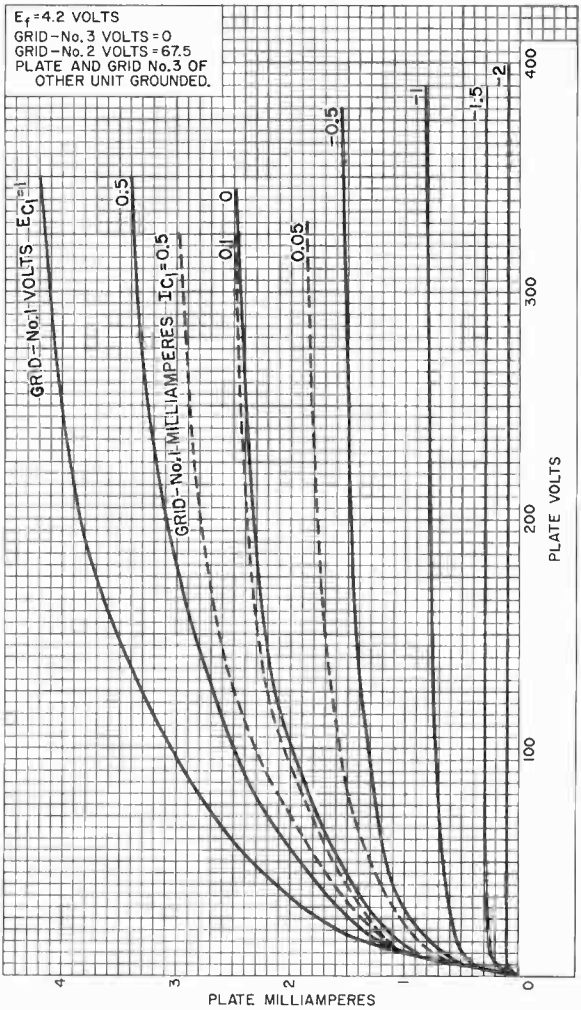
PLATE VOLTAGE (Each unit).	300	max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE (Each unit):			
Peak positive value.	50	max.	volts
DC negative value.	50	max.	volts
DC positive value.	3	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE.	150	max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Negative-bias value.	50	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[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.

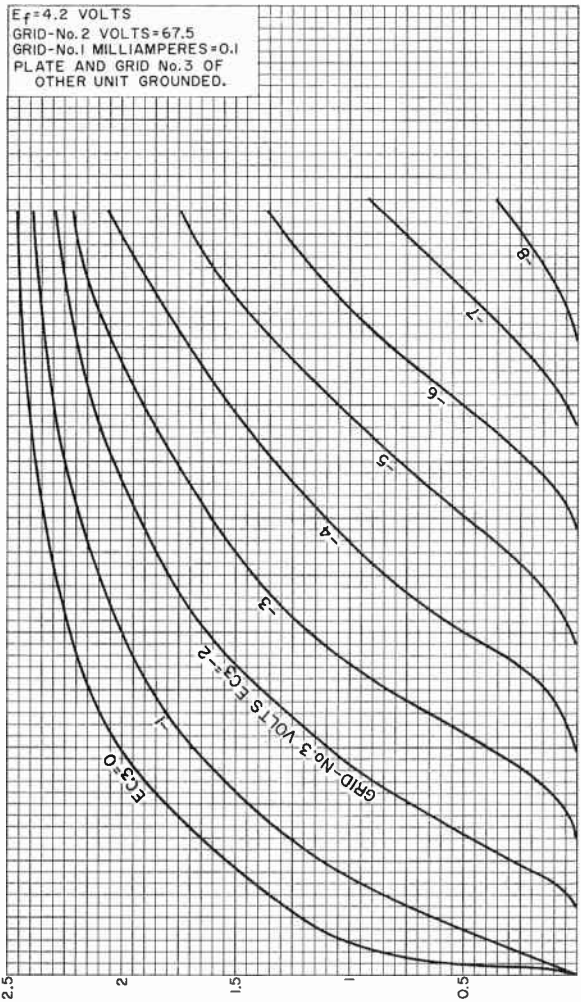
AVERAGE PLATE CHARACTERISTICS
Each Unit



92CM-11218

4GS8/4BU8

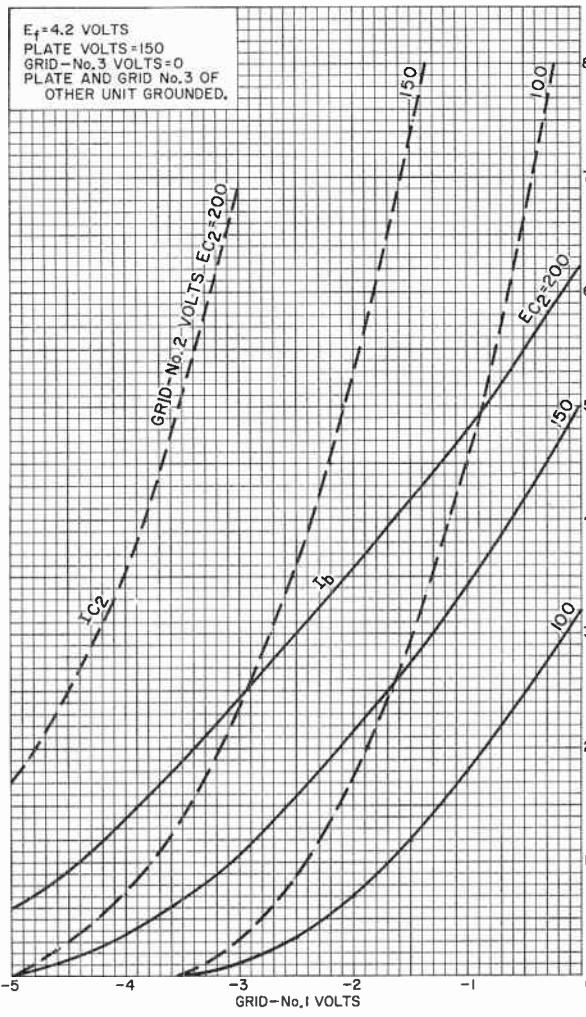
AVERAGE PLATE CHARACTERISTICS
Each Unit



92CM-11219

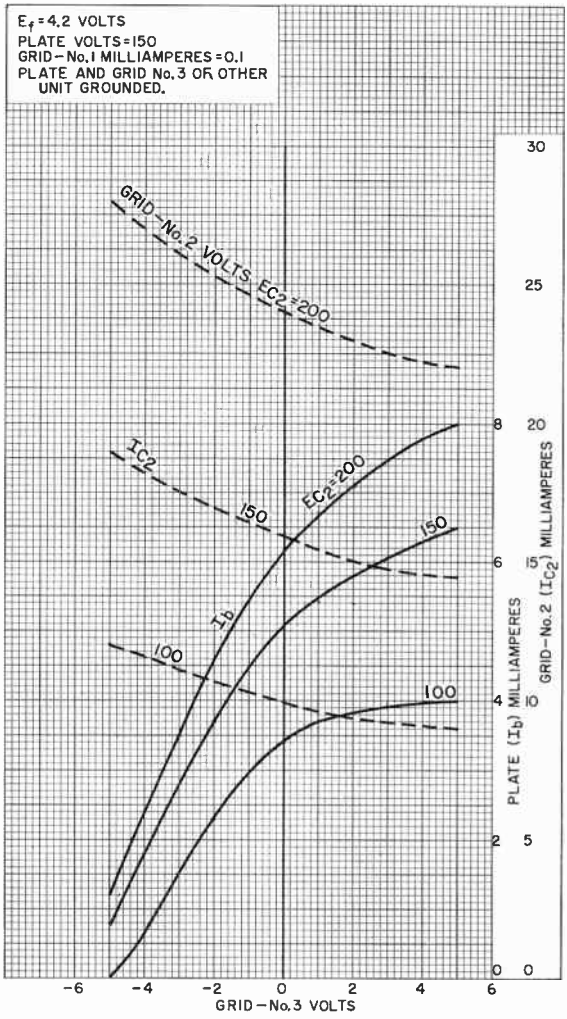
RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

AVERAGE CHARACTERISTICS
Each Unit



92CM-11220

AVERAGE CHARACTERISTICS
Each Unit



92CM–11221

4CY5

Sharp-Cutoff Tetrode

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 4CY5 is the same as the 6CY5 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	4.5	volts
Current	0.3 ± 6%	amp
Warm-up time (Average)	11	sec

4DE6

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 4DT6 is the same as the 6DT6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	4.2	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

4DT6

Sharp-Cutoff Pentode

With Two Independent Control Grids

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 4DT6 is the same as the 6DT6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	4.2	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

4DT6A

Sharp-Cutoff Pentode

With Two Independent Control Grids

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 4DT6A is the same as the 6DT6A except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	4.2	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

4ES8

Variable-Mu Twin Triode

9-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 4ES8 is the same as the 6ES8 except for the following items:

Heater, for Unipotential Cathodes:		
Voltage (AC or DC)	4	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

4EW6

Sharp-Cutoff Pentode

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 4EW6 is the same as the 6EW6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	4.2	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec

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

4BZ7

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 4BZ7 is the same as the 6BZ7 except for the following items:

Heater, for Unipotential Cathodes:		
Voltage	4.2	ac or dc volts
Current	0.6	amp
Warm-up time (Average)*	11	sec

4CB6

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 4CB6 is the same as the 6CB6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	4.2	ac or dc volts
Current	0.45	amp
Warm-up time (Average)*	11	sec
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	300■ max.	volts
Heater positive with respect to cathode	200▲ max.	volts

4DT6

SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 4DT6 is the same as the 6DT6 except for the following items:

Heater, for Unipotential Cathode:		
Voltage	4.2	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.*

■ The dc component must not exceed 200 volts.

▲ The dc component must not exceed 100 volts.

5AM8
DIODE—SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 5AM8 is the same as the 6AM8 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.

RCA

5AS4

FULL-WAVE VACUUM RECTIFIER

GENERAL DATA

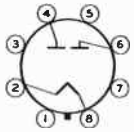
Electrical:

Filament, Coated:
Voltage. . . . . 5 . . . . . .ac volts
Current. . . . . 3 . . . . . amp

Mechanical:

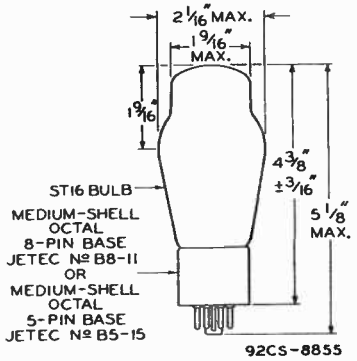
Mounting Position. . . . . Vertical, base up or down, or Horizontal with pins 1 and 4 in vertical plane
Maximum Overall Length . . . . . 5-1/8"
Maximum Seated Length. . . . . 4-9/16"
Maximum Diameter . . . . . 2-1/16"
Bulb ST-16
Base . . . . . Medium-Shell Octal 8-Pin (JETEC No.B8-11), or Medium-Shell Octal 5-Pin (JETEC No.B5-15)
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 are the same as those shown for Type 5U4-GB



TENTATIVE DATA

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

5AS4-A

FULL-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

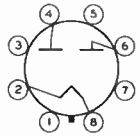
Filament, Coated:

Voltage	5	ac volts
Current	3	amp

Mechanical:

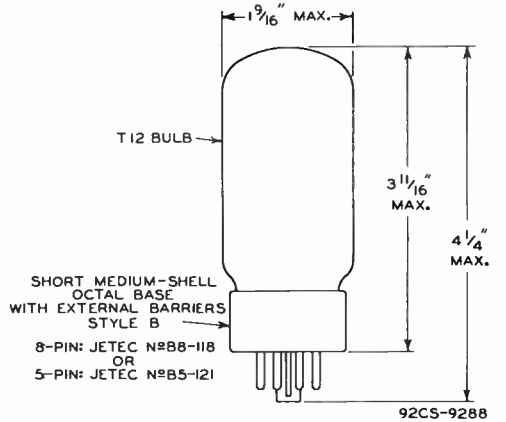
Mounting Position	Vertical, base up or down, or Horizontal with pins 1 and 4 in vertical plane
Maximum Overall Length	4-1/4"
Maximum Seated Length	3-11/16"
Maximum Diameter	1-9/16"
Bulb	T12
Base	Short Medium-Shell Octal 8-Pin with External Barriers, Style B (JETEC No.B8-118), or Short Medium-Shell Octal 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

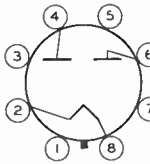
GENERAL DATA

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

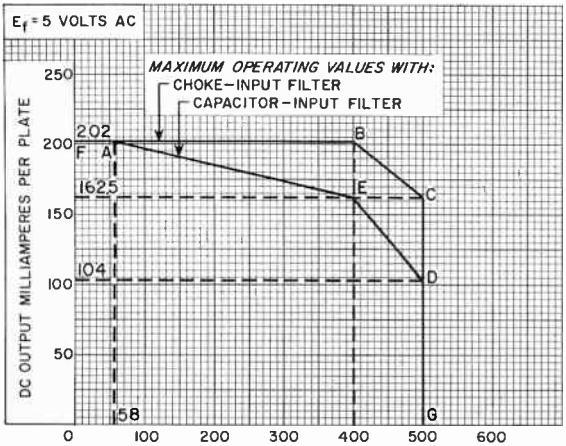
DC Output Voltage at input to filter . . .	275	395	395	volts
DC Output Current . . .	350	325	325	ma

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



5AS8

DIODE–SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 5AS8 is the same as the 6AS8 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

5AT8

TRIODE-PENTODE CONVERTER

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 5AT8 is the same as the 6AT8 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.

5AV8

MEDIUM-MU TRIODE – SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 5AV8 is the same as the 6AN8 except for the following items:

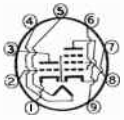
Heater, for Unipotential Cathodes:

Voltage	4.7	ac or dc volts
Current	0.6	amp
Warm-up time (Average)	11	sec

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

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

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)	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

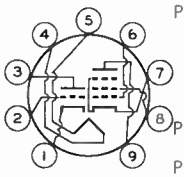
Mechanical:

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.

Full-Wave Vacuum Rectifier

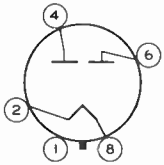
GENERAL DATA

Electrical:

Filament, Coated:		
Voltage (AC or DC)	5	volts
Current	3.7	amp

Mechanical:

Operating Position	Any
Maximum Overall Length	5-3/16"
Maximum Seated Length	4-5/8"
Diameter	1.438" to 1.562"
Bulb	T12
Base	Medium-Shell Octal 5-Pin, Arrangement 1 (JEDEC Group 1, No.B5-15)
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:*

PEAK INVERSE PLATE VOLTAGE	1550 max.	volts
AC PLATE SUPPLY VOLTAGE PER PLATE (RMS, without load)	See *Rating Chart*	
STEADY-STATE PEAK PLATE CURRENT PER PLATE	750 max.	ma
TRANSIENT PEAK PLATE CURRENT PER PLATE for duration of 0.2 second maximum	4 max.	amp
DC OUTPUT CURRENT	See *Rating Chart*	

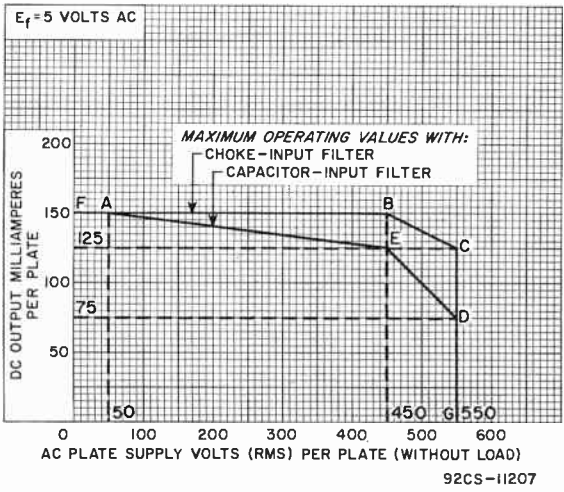
Typical Operation:

	With capacitor-input filter	*With choke-input filter*	
AC Plate-to-Plate Supply Voltage (RMS, without load)	900	1100	volts
Filter-Input Capacitor	10	–	μf
Filter-Input Choke	–	10	henrys
Total Effective Plate Supply Impedance Per Plate	153	–	ohms
DC Output Voltage at input to filter	422	440	volts
DC Output Current	250	250	ma

Characteristics:

Tube-Voltage Drop for plate ma. = 250
(Per plate). . . . . 46 volts

RATING CHART



92CS-11207

Full-Wave Vacuum Rectifier

NOVAR TYPE

For Power Supplies Having High DC Output

GENERAL DATA

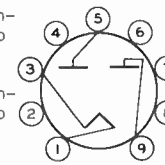
Electrical:

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 7 in vertical plane
Maximum Overall Length	4.14"
Maximum Seated Length	3.76"
Length, Base Seat to Bulb Top (Excluding tip)	3.20" ± 0.09"
Diameter	1.438" to 1.562"
Bulb	T12
Socket	.Cinch Mfg. Corp. No.149 19 00 024, or equivalent
Base	Large-Button Novar 9-Pin (JEDEC No.E9-76)
Basing Designation for BOTTOM VIEW	9NT

Pin 1 - Filament
Pin 2 - Internal Connection—Do Not Use
Pin 3 - Filament
Pin 4 - Internal Connection—Do Not Use
Pin 5 - Plate No.2



Pin 6 - Internal Connection—Do Not Use
Pin 7 - Internal Connection—Do Not Use
Pin 8 - Internal Connection—Do Not Use
Pin 9 - Plate No.1

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*	

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 not-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.

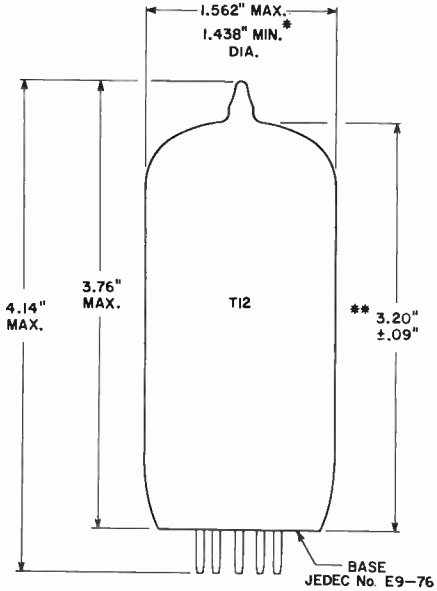
Rating Chart III represents graphically the relationships between minimum effective plate supply resistance per plate and maximum ac plate supply voltage per plate under no-load

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

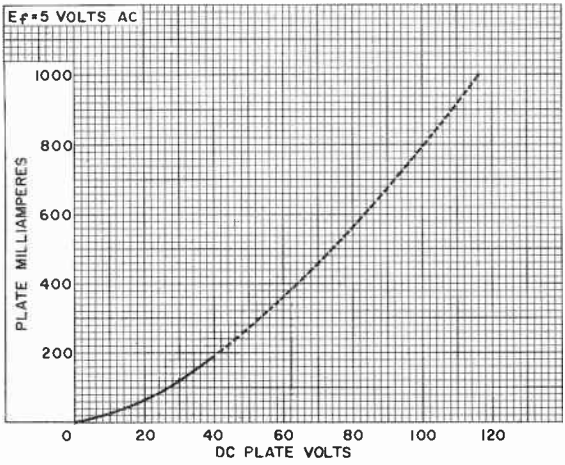


92CS-11130

* APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.

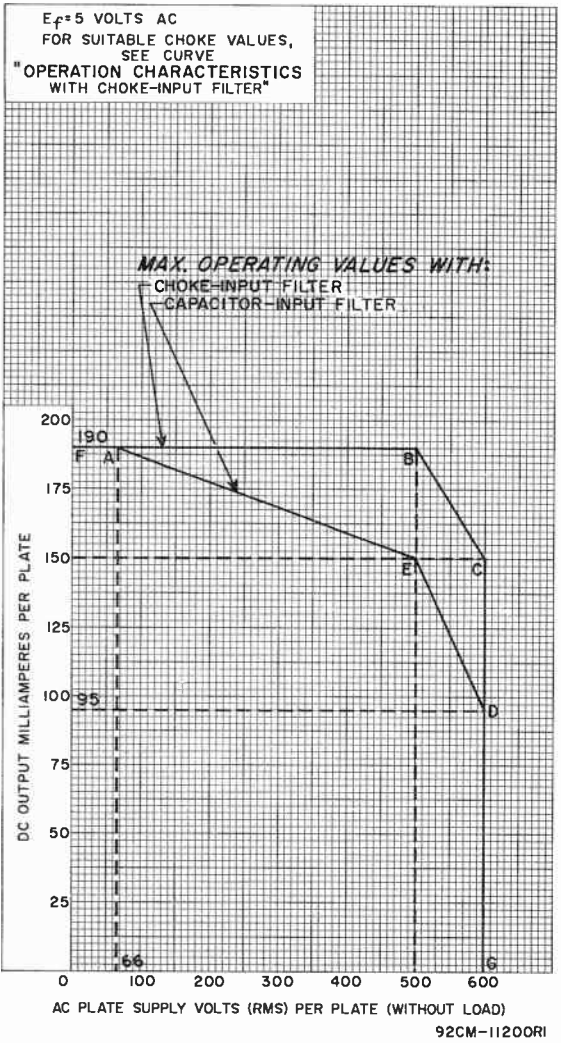
** MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY A RING GAUGE OF 0.600" INSIDE DIAMETER.

AVERAGE PLATE CHARACTERISTIC
Each Plate



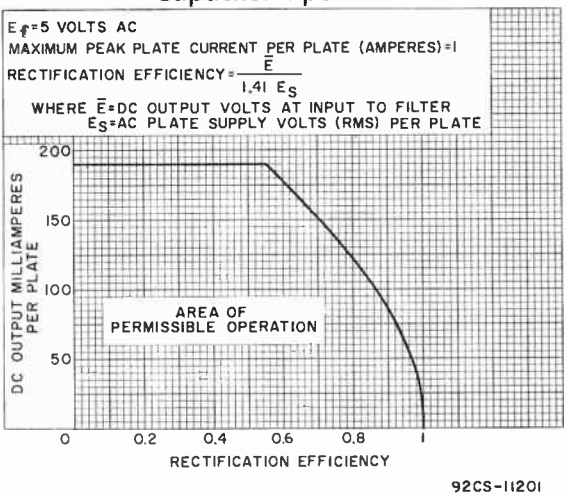
92CS-8440RI

RATING CHART I



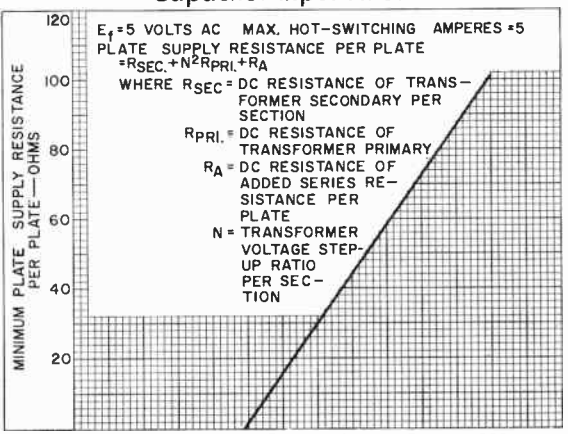
92CM-11200RI

RATING CHART II
Capacitor-Input Filter



92CS-11201

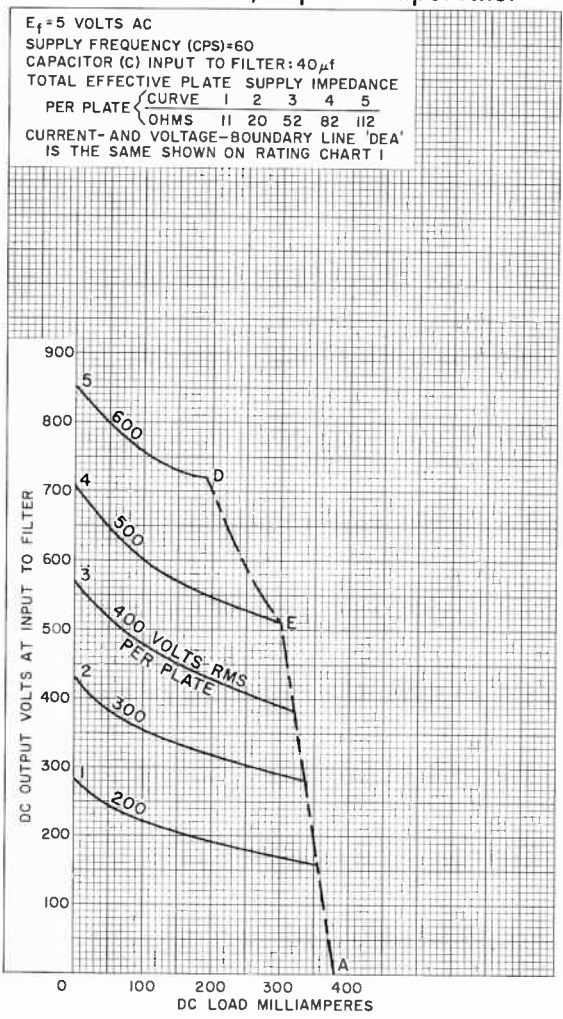
RATING CHART III
Capacitor-Input Filter



92CS-11194

5BC3

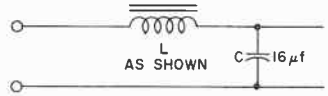
OPERATION CHARACTERISTICS
Full-Wave Circuit, Capacitor-Input Filter

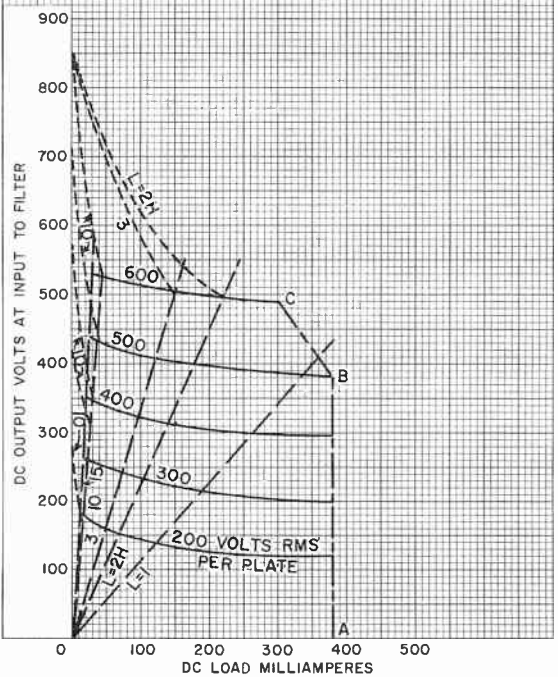


92CM-11197

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

RCA

5BK7-A

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 5BK7-A is the same as the 6BK7-A 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

5BQ7-A

MEDIUM-MU TWIN TRIODE

LOW-NOISE 9-PIN MINIATURE TYPE

Intended for use 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.*

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

5BT8

TWIN 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	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:°

Diode Unit (Each unit):		
Plate to cathode and heater	1.3	μμf
Cathode to plate and heater	3	μμf
Pentode Unit:		
Grid No.1 to plate	0.04 max.	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	7	μμf
Plate to cathode & grid No.3, grid No.2, and heater	2.3	μμf
Pentode grid No.1 to either diode plate	0.005	μμf
Pentode plate to either diode plate	0.02	μμf

Characteristics, Class A_1 Amplifier (Pentode Unit):

Plate-Supply Voltage	200	volts
Grid-No.2 (Screen-Grid) Supply Voltage	150	volts
Cathode Resistor	180	ohms
Plate Resistance (Approx.)	0.3	megohm
Transconductance	6200	μmhos
Plate Current	9.5	ma
Grid-No.2 Current	2.8	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 μa	-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"
Maximum Diameter	7/8"
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

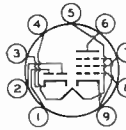
5BT8

5BT8

TWIN DIODE–SHARP-CUTOFF PENTODE

Basing Designation for BOTTOM VIEW 9FE

Pin 1 – Diode Plate No.2
Pin 2 – Diode Plate No.1
Pin 3 – Cathode of Diode Units No.1 & No.2
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



PENTODE UNIT — AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300	max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	300	max.	volts
GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*		
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive bias value	0	max.	volts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts	0.5	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	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 UNITS — Two

Maximum Ratings, *Design-Center Values:*

Values are for Each Unit

PLATE CURRENT	1	max.	ma
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts

Characteristics:

Plate Current for plate volts = 10	8	ma

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

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

TENTATIVE DATA

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

5CG8

TRIODE-PENTODE CONVERTER

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 5CG8 is the same as the 6CG8 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

5CQ8

MEDIUM-MU TRIODE— SHARP-CUTOFF TETRODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

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

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

5CZ5

BEAM POWER TUBE

9-PIN MINIATURE TYPE

For vertical-deflection amplifier service in 110° systems having series heater-string arrangement

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

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

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

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)	5.2	volts
Current	0.6 ± 6%	amp
Warm-up time (Average)	11	sec
Direct Interelectrode Capacitances:[a]		
Triode Unit:		
Grid to plate	1.6	μμf
Grid to cathode & pentode grid No.3 & internal shield, and heater	2.4	μμf
Plate to cathode & pentode grid No.3 & internal shield, and heater	1.4	μμf
Pentode Unit:		
Grid No.1 to plate	0.03 max.	μμf
Grid No.1 to cathode, grid No.2, and heater	6.5	μμf
Plate to cathode, grid No.3 & triode cathode & internal shield, grid No.2, and heater	2.2	μμf
Plate to cathode, grid No.2, and heater	4.2	μμf
Tricde grid to pentode plate	0.005	μμf
Pentode grid No.1 to triode plate	0.008	μμf
Tricde plate to pentode plate	0.04	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Plate Supply Voltage	250	125	volts
Grid-No.2 Supply Voltage	–	125	volts
Cathode Resistor	390	56	ohms
Amplification Factor	53	–	
Plate Resistance (Approx.)	0.012	0.15	megohm
Transconductance	4400	8600	μmhos
Plate Current	7.3	13.5	ma
Grid-No.2 Current	–	3.8	ma
Grid-No.1 Voltage (Approx.) for plate μa =			
10	-10	–	volts
20	–	-6	volts

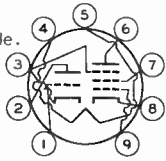
Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"

5DH8

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. 9EG

Pin 1 - Triode Grid
Pin 2 - Triode Plate
Pin 3 - Triode 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 - Pentode Cathode
Pin 9 - Pentode Grid No.1

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE.	300 max.	300 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	-	300 max.	volts
GRID-No.2 VOLTAGE.	-	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE: Positive-bias value.	0 max.	0 max.	volts
GRID-No.2 INPUT: For grid-No.2 voltages up to 150 volts	-	0.55 max.	watt
For grid-No.2 voltages between 150 and 300 volts.	-	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
PLATE DISSIPATION.	2 max.	2.2 max.	watts
PEAK HEATER-CATHODE VOLTAGE: Heater negative with respect to cathode	200 max.	200 max.	volts
Heater positive with respect to cathode	200[b] max.	200[b] 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

VERTICAL-DEFLECTION OSCILLATOR

Triode Unit

Maximum Ratings, *Design-Maximum Values:*

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

DC PLATE VOLTAGE	300	max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	400	max.	volts
CATHODE CURRENT:			
Peak	35	max.	ma
Average	12	max.	ma
PLATE DISSIPATION	1	max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[b]	max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance:			
For fixed-bias, cathode-bias, or grid-resistor-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.

Full-Wave Vacuum Rectifier

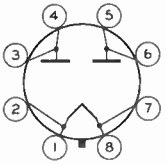
GENERAL DATA

Electrical:

Filament, Coated:
Voltage (AC or DC). . . . . 5 ± 10% volts
Current at 5 volts. . . . . 3[a] 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)
Basing Designation for BOTTOM VIEW. 8KS



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

FULL-WAVE RECTIFIER

Maximum Ratings, *Design-Maximum Values:*

For power-supply frequencies of 25 to 1000 cps

PEAK INVERSE PLATE VOLTAGE. . . . . 1700 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*). . . . . 5 max. amp
DC OUTPUT CURRENT . . . . . See *Rating Chart I*

Typical Operation:

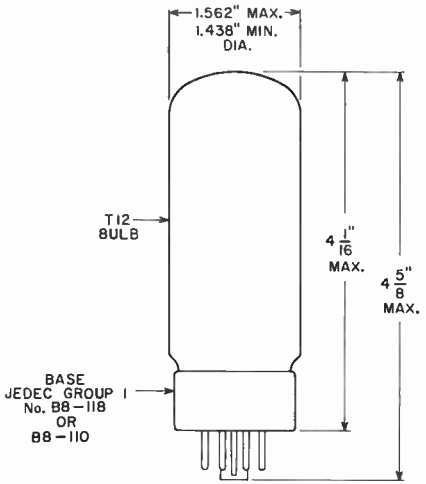
	With capacitor-input filter		*With choke-input filter*	
AC Plate-to-Plate Supply Voltage (RMS, without load) . .	600	900	1100	volts
Filter-Input Capacitor[b] .	40	40	–	μf
Filter-Input Choke. . . .	–	–	10	henrys
Total Effective Plate Supply Impedance Per Plate	21	67	–	ohms

5DJ4

DC Output Voltage at input to filter	290	460	420	volts
DC Output Current	300	275	275	ma

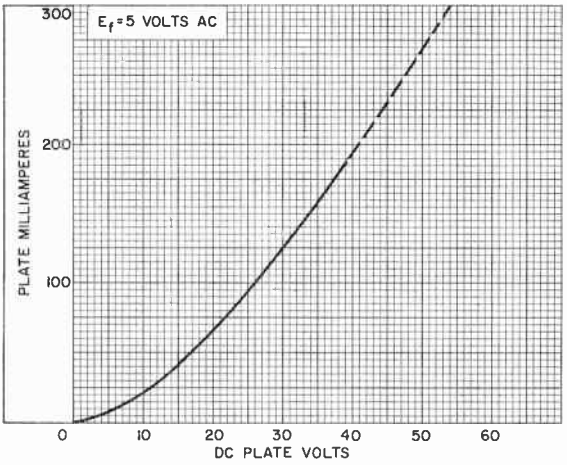
[a] Or 1.5 amperes per base pin.

[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



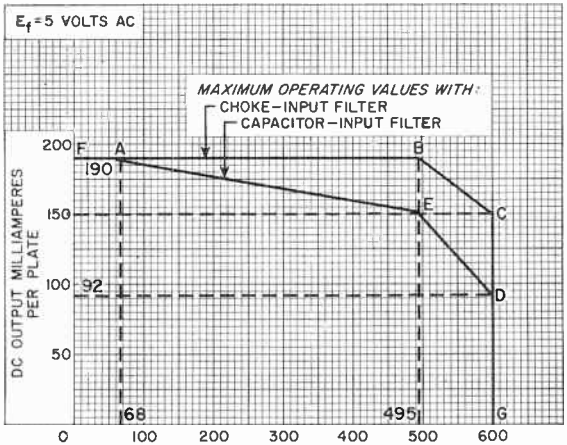
92CS-11211

AVERAGE PLATE CHARACTERISTIC
Each Plate



92CS-11214

RATING CHART I



92CS-11215

RATING CHART II
Capacitor-Input Filter

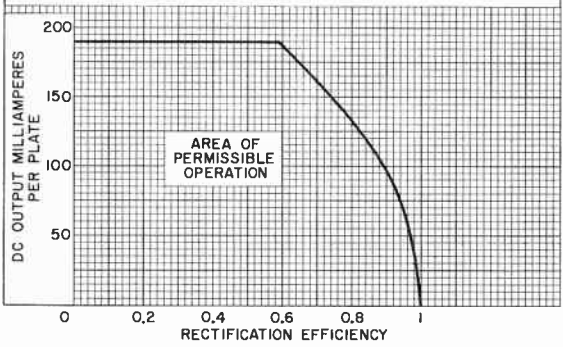
E_f = 5 VOLTS AC

MAXIMUM STEADY-STATE PEAK PLATE CURRENT PER PLATE (AMPERES) = 1

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-11216

RATING CHART III
Capacitor-Input Filter

E_f = 5 VOLTS AC

MAXIMUM TRANSIENT PEAK PLATE CURRENT PER PLATE (AMPERES) = 5

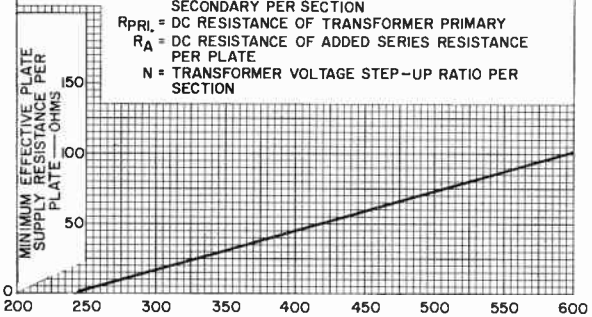
EFFECTIVE PLATE SUPPLY RESISTANCE PER PLATE = $R_{SEC.} + N^2 R_{PRI.} + R_A$

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-11217

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

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, for Unipotential Cathodes:		
Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp
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, for Unipotential Cathode:		
Voltage (AC or DC)	5.6	volts
Current	0.45 ± 6%	amp
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.

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, for Unipotential Cathodes:

Voltage (AC or DC)	4.7	volts
Current	0.6 ± 6%	amp

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

5GH8

Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

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

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

5GM6

Semiremote-Cutoff Pentode

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

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

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	5.6	volts
Current	0.45 ± 6%	amp
Warm-up time (Average)	11	sec

5J6

Medium-Mu Twin Triode

7-PIN MINIATURE TYPE

For Equipment Having Series Heater-String Arrangement

The 5J6 is the same as the 6J6 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

For Industrial & Military Applications

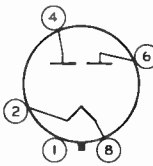
GENERAL DATA

Electrical:

Filament, Coated:[a]	
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	4-1/4"
Maximum Seated Length	3-11/16"
Diameter	1.438" to 1.562"
Bulb	T12
Base	Short Medium-Shell Octal 5-Pin Micanol 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 4 - Plate No. 2
Pin 6 - Plate No. 1
Pin 8 - Filament

FULL-WAVE RECTIFIER

Maximum Ratings, *Absolute-Maximum Values:*

For altitudes up to	*40000*	*20000*	*feet*
PEAK INVERSE PLATE VOLTAGE	2650 max.	3100 max.	volts
AC PLATE SUPPLY VOLTAGE PER PLATE (RMS, without load)	See *Rating Chart I*		
PEAK PLATE CURRENT PER PLATE	715 max.	715 max.	ma
DC OUTPUT CURRENT PER PLATE	See *Rating Chart I*		
HOT-SWITCHING TRANSIENT PLATE CURRENT PER PLATE	[b]	[b]	
BULB TEMPERATURE (At hottest point on bulb surface)	230 max.	230 max.	°C

Typical Operation:

With capacitor-input filter

For altitudes up to	*40000*		*20000*	*feet*
AC-Plate-to-Plate Supply Voltage (RMS, without load)	1400	1500	2000	volts
Filter-Input Capacitor	20	20	20	μf
Total Effective Plate Supply Impedance Per Plate[c]	225	250	375	ohms

DC Output Voltage (Approx.) at Input to Filter:				
At half-load ma. =				
75	–	910	1210	volts
125	750	–	–	volts
At full-load ma. =				
150	–	800	1040	volts
250	605	–	–	volts
Voltage Regulation (Approx.): Half-load to full-load current	145	110	170	volts
DC Output Current	250	150	150	ma

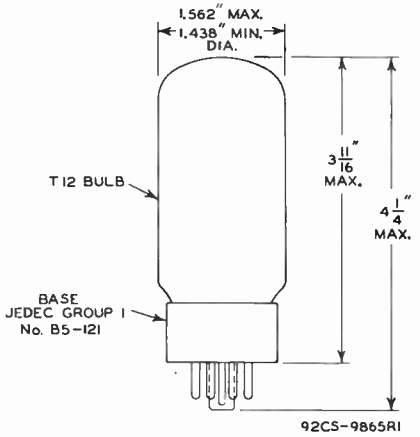
With choke-input filter

For altitudes up to	*40000*	*20000*	*feet*
AC Plate-to-Plate Supply Voltage (RMS, without load)	1500	1900	volts
Filter-Input Choke	5	10	henrys
DC Output Voltage (Approx.) at Input to Filter for dc output ma. =			
87.5	–	800	volts
125	600	–	volts
175	–	760	volts
250	560	–	volts
Voltage Regulation (Approx.): Half-load to full-load current	40	40	volts
DC Output Current	250	175	ma

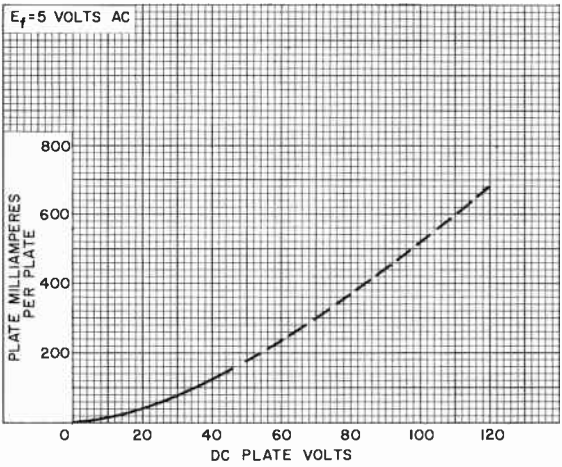
[a] See accompanying chart *Operating Areas for Simultaneous and Delayed Application of Plate Voltage* for conditions necessitating delay in application of plate voltage until filament has reached operating temperature.

[b] If hot-switching is required in operation, choke-input circuits are 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 value of 3 amperes should not be exceeded.

[c] Indicated values for conditions shown will limit peak plate current to the maximum-rated value. When a filter-input capacitor larger than 20 μf is used, it may be necessary to increase plate-supply impedance to a higher value than that shown in the data to limit the peak plate current to the maximum-rated value.



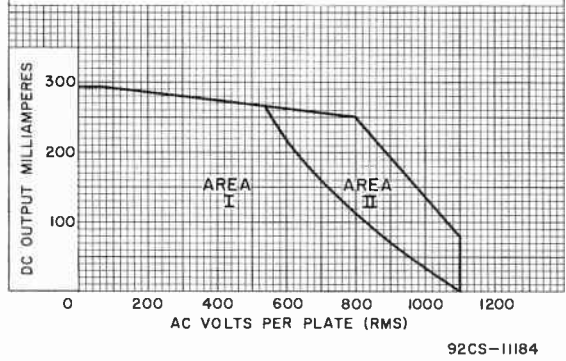
AVERAGE PLATE CHARACTERISTIC



92CS-11183

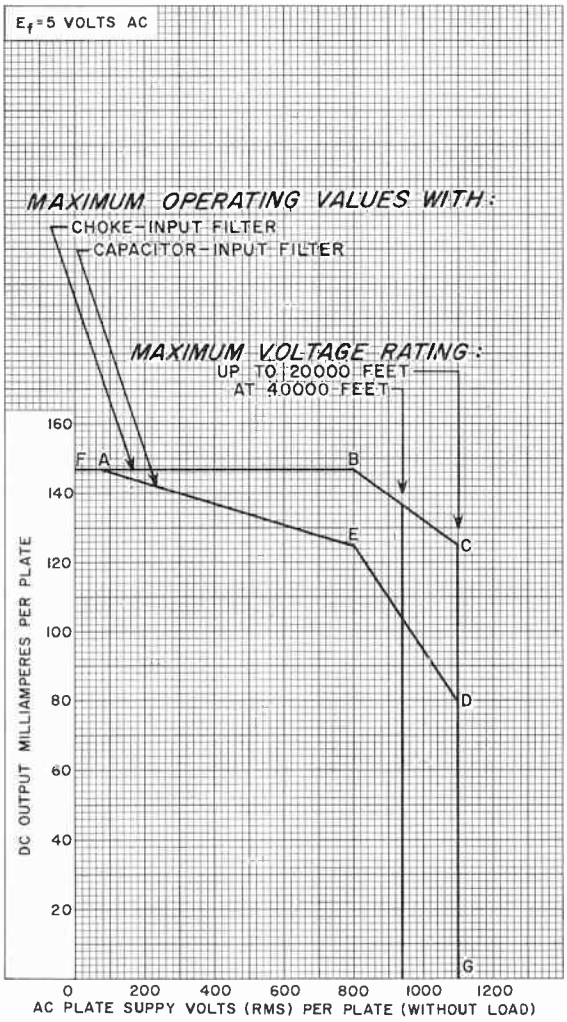
OPERATING AREAS FOR SIMULTANEOUS AND DELAYED APPLICATION OF PLATE VOLTAGE

FULL-WAVE RECTIFIER SERVICE WITH CAPACITOR-INPUT FILTER.
AREA I — FILAMENT AND PLATE VOLTAGE MAY BE APPLIED SIMULTANEOUSLY.
AREA II — FILAMENT SHOULD BE ALLOWED TO REACH OPERATING TEMPERATURE BEFORE PLATE VOLTAGE IS APPLIED. FOR AVERAGE CONDITIONS, THE DELAY IS APPROXIMATELY 10 SECONDS.



92CS-11184

RATING CHART I

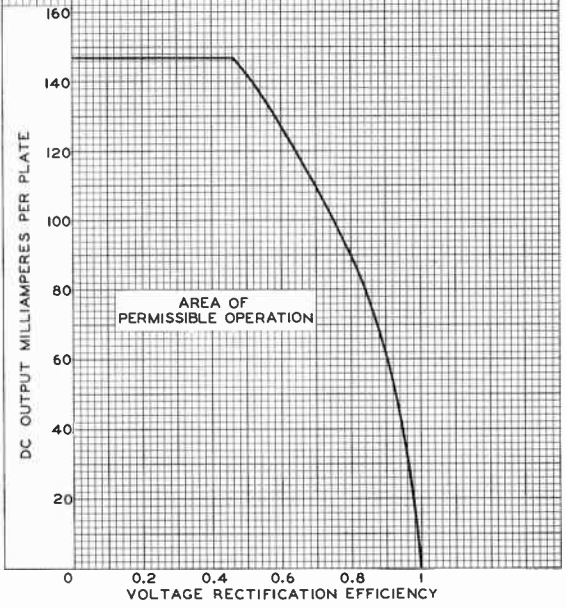


92CM-9943RI

5R4GYB

RATING CHART II
With Capacitor-Input Filter

E_f = 5 VOLTS AC
MAXIMUM PEAK PLATE CURRENT PER PLATE = 715 MA.
VOLTAGE 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



92CM-9953RI

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

RATING CHART III
With Capacitor-Input Filter

E_f = 5 VOLTS AC

MAXIMUM HOT-SWITCHING AMPERES = 3

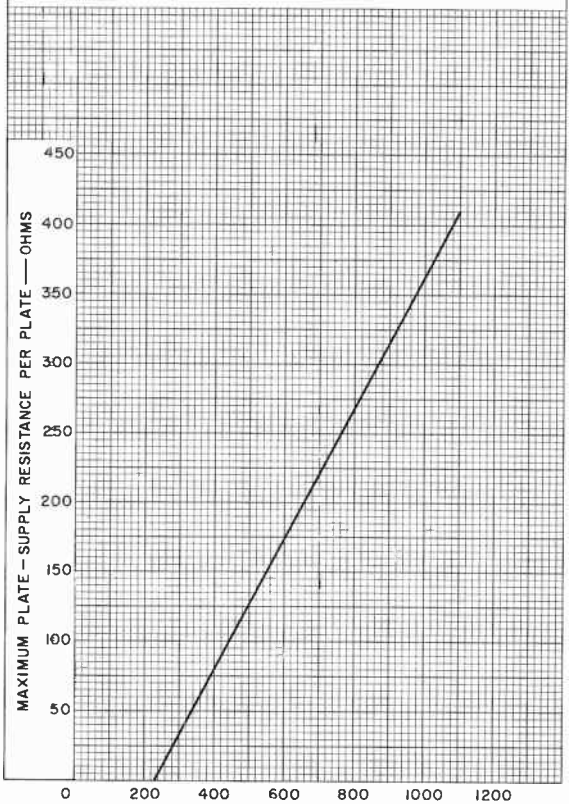
PLATE-SUPPLY RESISTANCE PER PLATE = $R_{SEC.} + N^2R_{PRI.} + R_A$

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



92CM-6416R4

175 ma

5R4-GY

5R4-GY
FULL-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

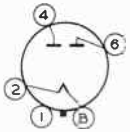
Filament, Coated:*

Voltage	5	ac or dc volts
Current	2	amp

Mechanical:

Mounting Position	Vertical, or Horizontal with pins 1 and 4 in vertical plane
Maximum Overall Length	5-5/16"
Maximum Seated Length	4-3/4"
Maximum Diameter	2-1/16"
Bulb	ST-16
Base	Medium-Shell Octal 5-Pin, Micanol
Basing Designation for BOTTOM VIEW	G-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 Altitudes up to 40000 ft.		*For Altitudes up to 20000 ft.*	
PEAK INVERSE PLATE VOLT. (No Load)	2100 max.	2400 max.	2800 max.	volts
PEAK PLATE CURRENT PER PLATE	650 max.	650 max.	650 max.	ma
DC OUTPUT CURRENT:				
With capacitor input to filter	250 max.	175 max.	150 max.	ma
With choke input to filter	250 max.	250 max.°	175 max.•	ma

Typical Operation with Capacitor-Input Filter: ←

	For Altitudes up to 40000 ft.		*For Altitudes up to 20000 ft.*	
AC Plate-to-Plate Supply Voltage (RMS):				
Full Load	1400	1500	1800	volts
No Load	1500	1700	2000	volts
Filter Input Capacitor	4	4	4	μf

* See curve for conditions necessitating delay in application of plate voltage until filament has reached operating temperature.

°, •: See next page.

← Indicates a change.

5R4-GY

5R4-GY
FULL-WAVE VACUUM RECTIFIER

	For Altitudes up to 40000 ft.		*For Altitudes up to 20000 ft.*	
Total Effect. Plate-Supply Impedance per Plate▲	125	500	575	ohms
DC Output Current	250	150	150	ma
DC Output Volt. at Input to Filter:				
At Half Load	790*	900*	1060*	volts
At Full Load	700*	810*	950*	volts
Voltage Regulation, Half-Load to Full-Load Current	90*	90*	110*	volts

→ **Typical Operation with Choke-Input Filter:**

	For Altitudes up to 40000 ft.	*For Altitudes up to 20000 ft.*	
AC Plate-to-Plate Supply Voltage (RMS):			
Full Load	1500	1900	volts
No Load	1700	2000	volts
Filter Input Choke	5	10	henries
DC Output Current	250	175	ma
DC Output Voltage at Input to Filter:			
At Half Load	590*	810*	volts
At Full Load	550*	750*	volts
Voltage Regulation, Half-Load to Full-Load Current	40*	60*	volts

o For choke not less than 5 henries.

● For choke not less than 10 henries.

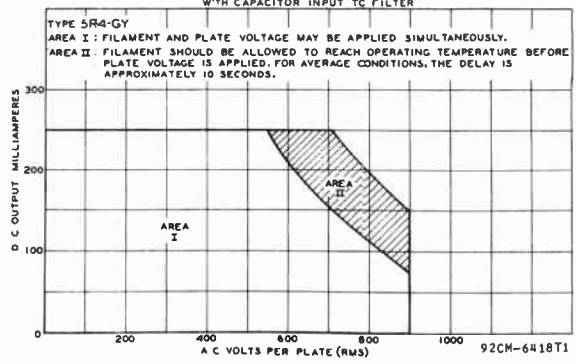
▲ Indicated values for conditions shown will limit peak plate current to max. rated value. When a filter-input capacitor larger than 4 μf is used, it may be necessary to use more plate-supply impedance than the value shown to limit the peak plate current to the rated value.

* Values are approximate.

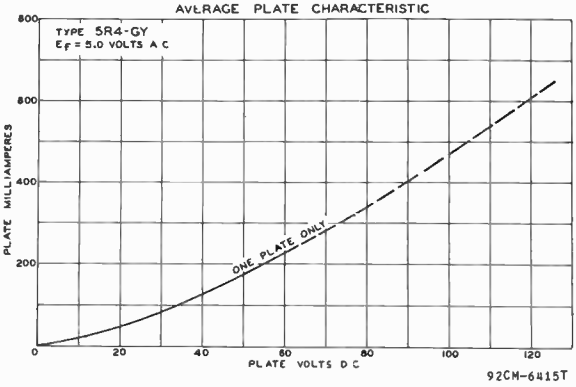
→ Indicates a change.

5R4-GY
FULL-WAVE VACUUM RECTIFIER

OPERATION CHARACTERISTICS
WITH CAPACITOR INPUT TO FILTER



AVERAGE PLATE CHARACTERISTIC

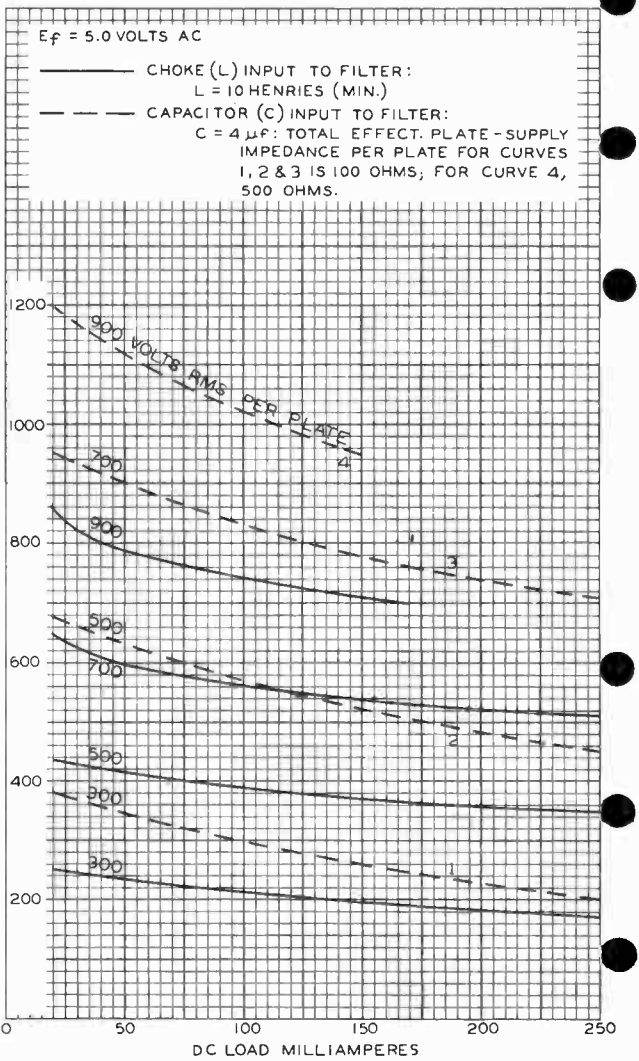


TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

5R4-GY

OPERATION CHARACTERISTICS



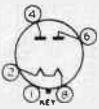
225 ma

5T4

5T4

FULL-WAVE HIGH-VACUUM RECTIFIER

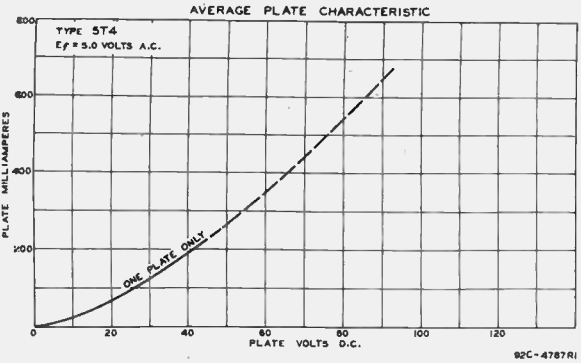
Filament	Coated	
Voltage	5.0	a-c volts
Current	2.0	amp.
Maximum Overall Length		4-5/16"
Maximum Diameter		1-5/8"
Bulb		Metal Shell, MT-10
Base		Small Wafer Octal 5-Pin
Pin 1 - Shell		Pin 6 - Plate #1
Pin 2 - Filament		Pin 8 - Filament
Pin 4 - Plate #2		
Mounting Position	BOTTOM VIEW (5T)	Vertical◊



FULL-WAVE RECTIFIER

Peak Inverse Voltage	1550 max. volts
Peak Plate Current per Plate	675 max. ma.
Typical Operation with Condenser-Input Filter:	
A-C Plate Voltage per Plate (RMS)	450 max. volts
Total Effective Plate-Supply Impedance per Plate ▲	150 min. ohms
D-C Output Current	225 max. ma.
Typical Operation with Choke-Input filter:	
A-C Plate Voltage per Plate (RMS)	550 max. volts
Input-Choke Inductance	3 min. henries
D-C Output Current	225 max. ma.

◊ Horizontal operation permitted if pins 2 and 4 are in vertical plane.
▲ 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.

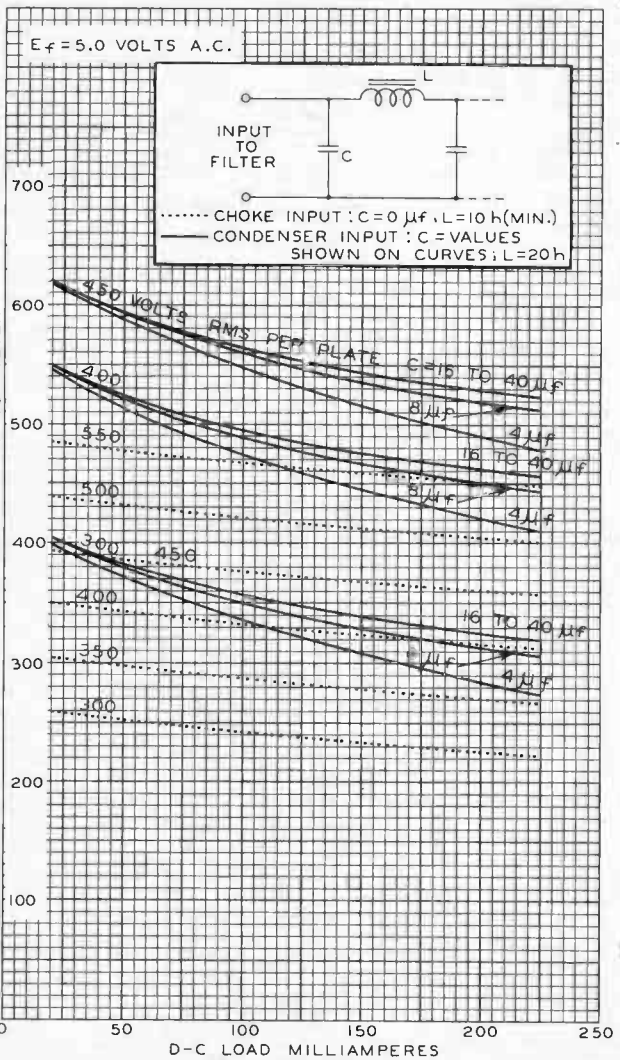


RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

5T4

5T4

OPERATION CHARACTERISTICS



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.

250 ma 5U4-G

5U4-G

FULL-WAVE VACUUM RECTIFIER

GENERAL DATA

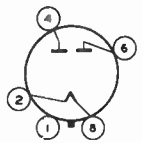
Electrical:

Filament, Coated:		
Voltage	5	ac volts
Current	3	amp

Mechanical:

Mounting Position	Vertical, or Horizontal with pins 1 and 4 in vertical plane
Maximum Overall Length	5-5/16"
Maximum Seated Length	4-3/4"
Maximum Diameter	2-1/16"
Bulb	ST-16
Base	Medium-Shell Octal 5-Pin
Basing Designation for BOTTOM VIEW	G-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*: ←

PEAK INVERSE PLATE VOLTAGE	1550 max.	volts
PEAK PLATE CURRENT PER PLATE	675 max.	ma
AC PLATE SUPPLY VOLTAGE (RMS) PER PLATE	See Rating Chart	
DC OUTPUT CURRENT PER PLATE	See Rating Chart	
HOT-SWITCHING TRANSIENT PLATE CURRENT PER PLATE For duration of 0.2 second maximum	2.35 max.	amp

Typical Operation with Capacitor-Input Filter: ←

AC Plate-to-Plate Supply Voltage (RMS)	900	1100	volts
Filter-Input Capacitor°	10	10	μf
Total Effect. Plate-Supply Impedance Per Plate	170	230	ohms
DC Output Voltage at Input to Filter (Approx.):			
At Half-Load Cur. of 112.5 ma.	510	–	volts
At Half-Load Cur. of 78 ma.	–	660	volts
At Full-Load Cur. of 225 ma.	430	–	volts
At Full-Load Cur. of 156 ma.	–	590	volts
Voltage Regulation, Half-Load to Full-Load Current (Approx.)	80	70	volts

° When a filter input capacitor larger than 10 μf is used, it may be necessary to increase the effective plate-supply impedance in order not to exceed the hot-switching transient plate current.

← Indicates a change.

5U4-G

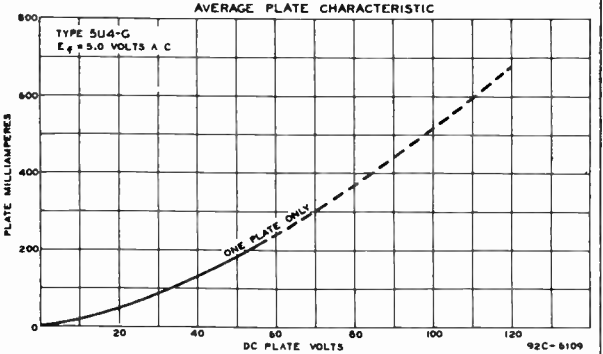
FULL-WAVE VACUUM RECTIFIER

→ **Typical Operation with Choke-Input Filter:**

AC Plate-to-Plate Supply Voltage (RMS)	900	1100	volts
Filter-Input Choke	10*	10**	henries
DC Output Voltage at Input to Filter (Approx.):			
At Half-Load Cur. of 135 ma.	365	–	volts
At Half-Load Cur. of 112.5 ma.	–	460	volts
At Full-Load Cur. of 270 ma.	345	–	volts
At Full-Load Cur. of 225 ma.	–	440	volts
Voltage Regulation, Half-Load to Full-Load Current (Approx.)	20	20	volts

* This value is adequate to maintain optimum regulation in the region to the right of line L=10H on curve OPERATION CHARACTERISTICS with Choke-input to Filter, provided the load current is not less than 35 ma. For load currents less than 35 ma., a larger value of inductance is required for optimum regulation.

** This value is adequate to maintain optimum regulation in the region to the right of line L=10H on curve OPERATION CHARACTERISTICS with Choke-input to Filter, provided the load current is not less than 45 ma. For load currents less than 45 ma., a larger value of inductance is required for optimum regulation.



→ ## 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.

→ Indicates a change.

RCA

5U4-G

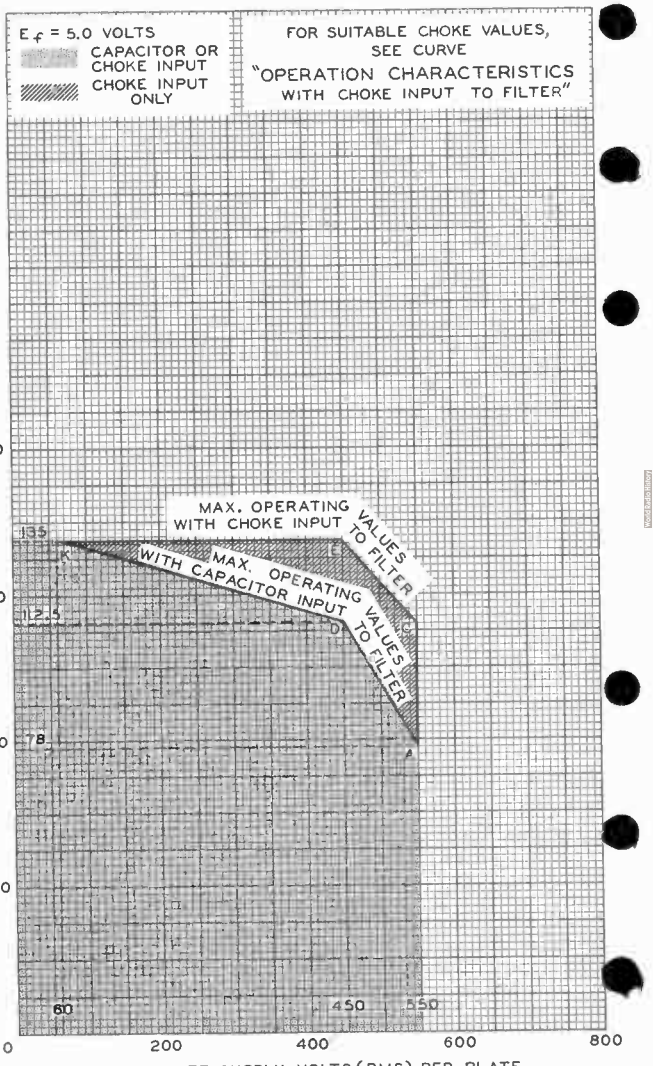
FULL-WAVE VACUUM RECTIFIER

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 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.

5U4-G

RCA

5U4-G
RATING CHART



MAY 25, 1950 TUBE DEPARTMENT 92CM-7494

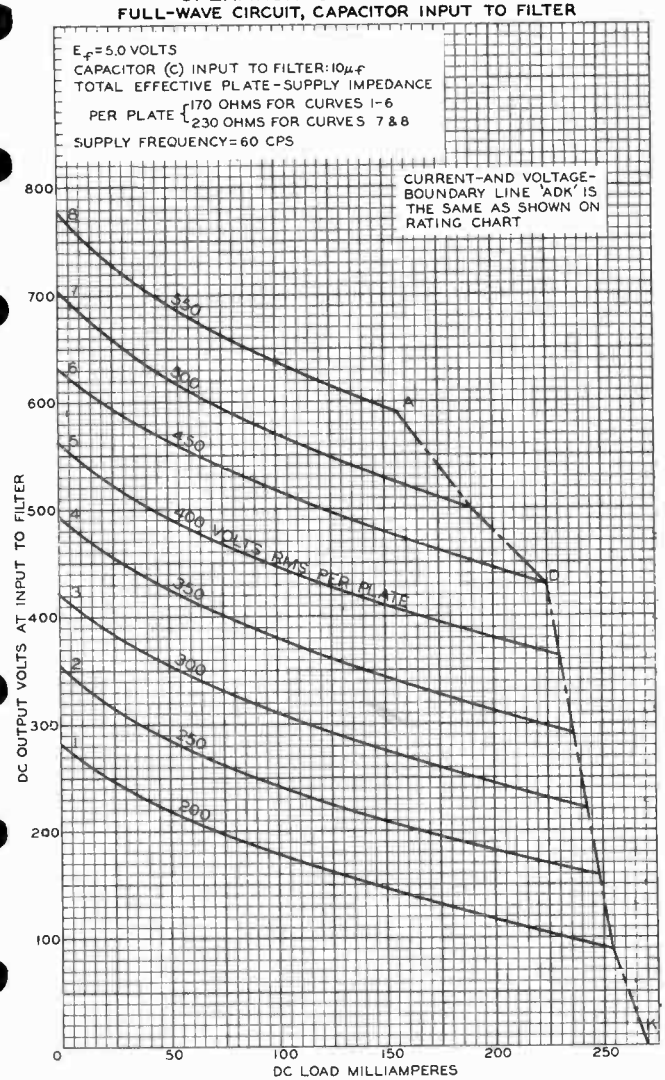
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

5U4-G

OPERATION CHARACTERISTICS

FULL-WAVE CIRCUIT, CAPACITOR INPUT TO FILTER



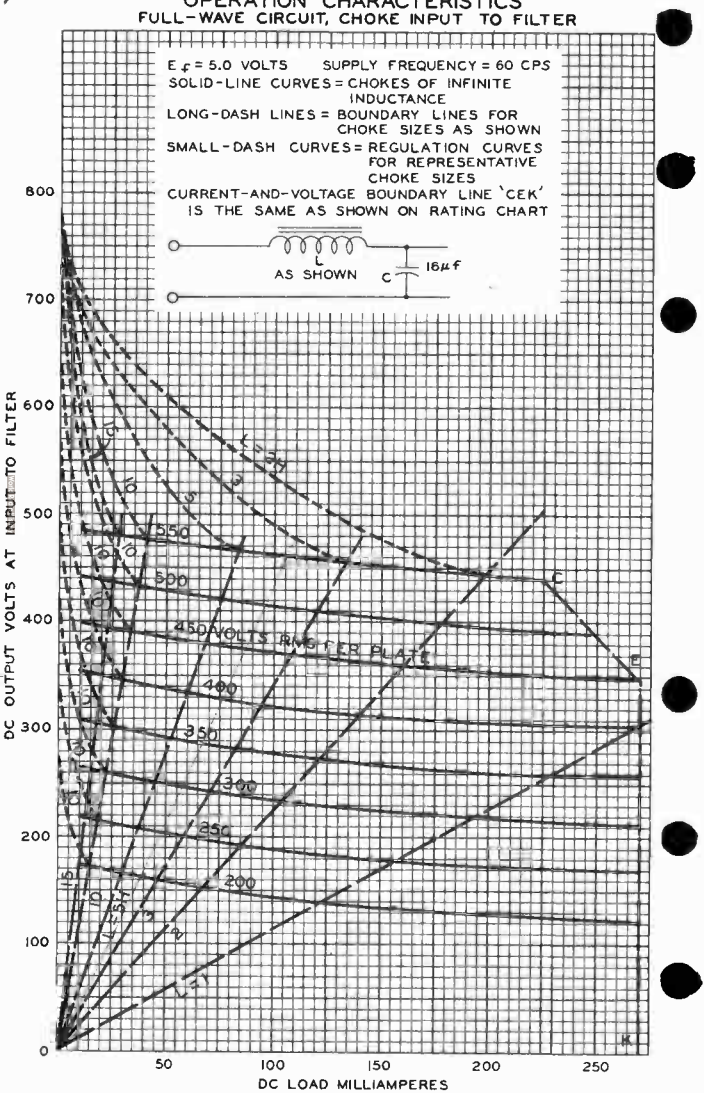
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

5U4-G

OPERATION CHARACTERISTICS

FULL-WAVE CIRCUIT, CHOKE INPUT TO FILTER



Full-Wave Vacuum Rectifier

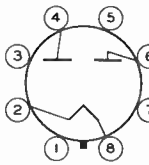
GENERAL DATA

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.

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

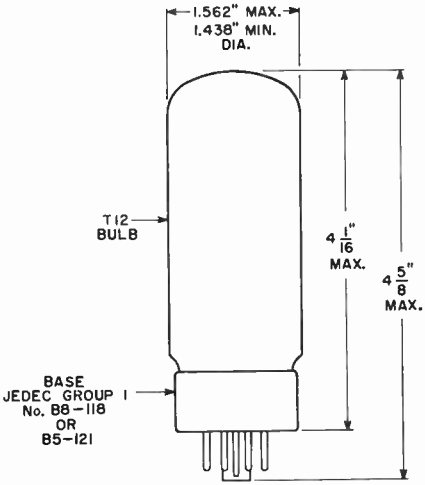
Characteristics:

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.

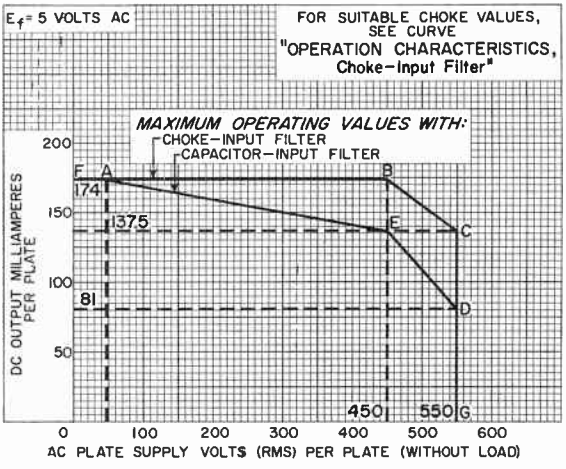
[b] Values of capacitance greater than 40 μf may be used, provided the plate supply impedance is increased to prevent exceeding the maximum peak-plate-current rating.

→ Indicates a change.



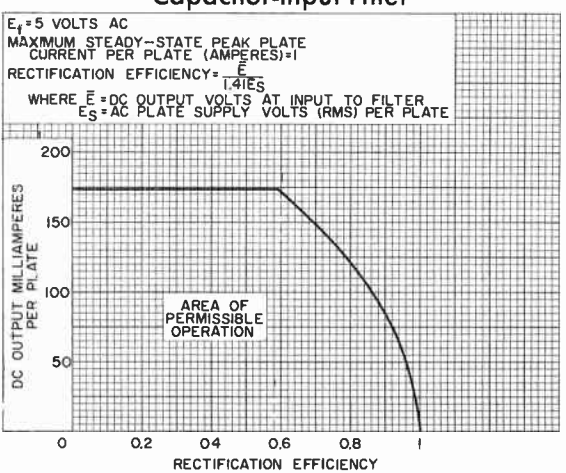
92CS-8444R2

RATING CHART I



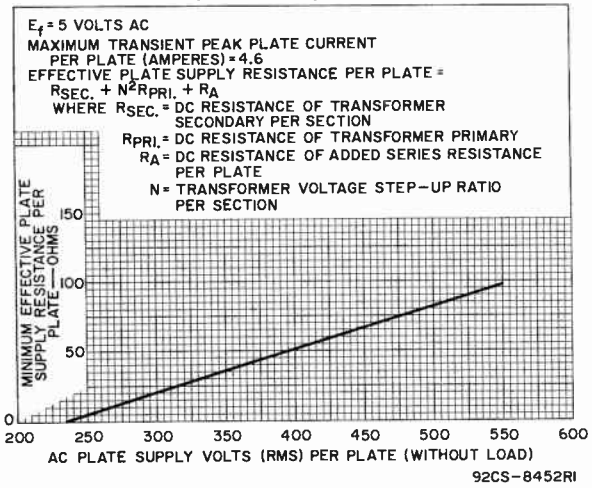
92CS-8450RI

RATING CHART II
Capacitor-Input Filter



92CS-8451RI

RATING CHART III
Capacitor-Input Filter

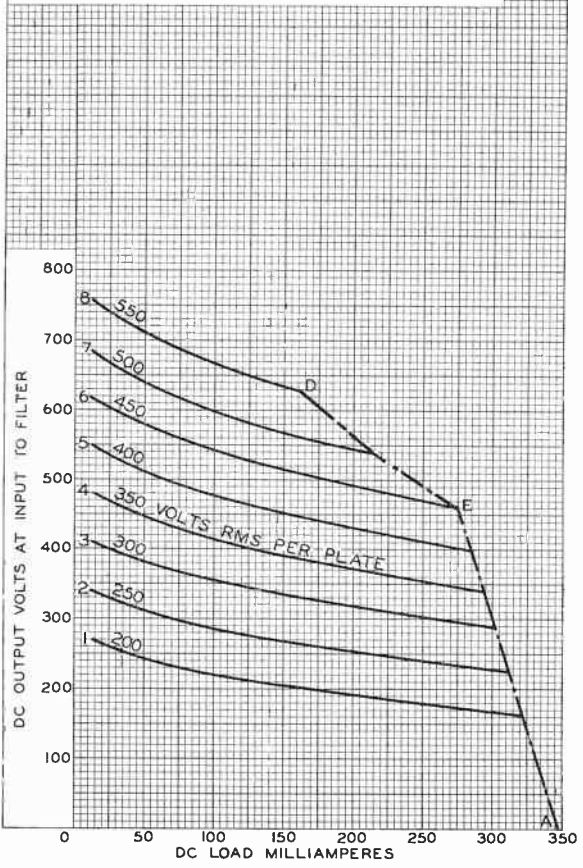


OPERATION CHARACTERISTICS
Full-Wave Circuit, Capacitor-Input Filter

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

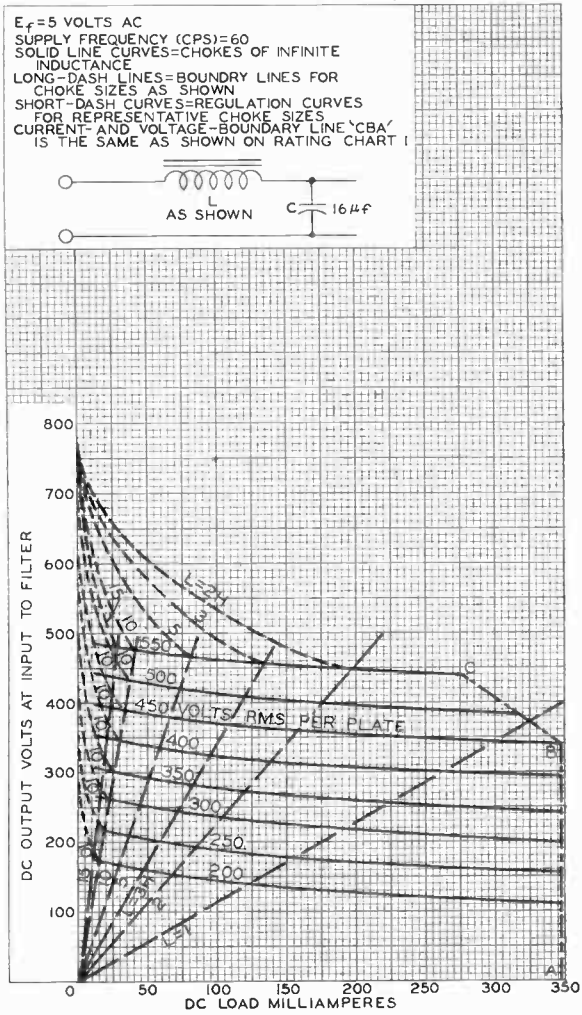
CURRENT- AND VOLTAGE-BOUNDARY LINE 'DEA' IS THE SAME AS SHOWN ON RATING CHART I



92CM-8446RI

5U4GB

OPERATION CHARACTERISTICS
Full-Wave Circuit, Choke-Input Filter



92CM-8447RI

RCA

5U4-GB

FULL-WAVE VACUUM RECTIFIER

GENERAL DATA

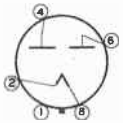
Electrical:

Filament, Coated:		
Voltage	5	ac volts
Current	3	amp

Mechanical:

Mounting Position	Vertical, base up or down, or Horizontal with pins 2 and 4 in vertical plane
Maximum Overall Length	4-3/4"
Maximum Seated Length	4-3/16"
Maximum Diameter	1-23/32"
Bulb	T-12
Base	Flared Medium-Shell Octal 5-Pin with External Barriers (JETEC No.B5-127) or Short Medium-Shell Octal 5-Pin with External Barriers (JETEC No.B5-121)
Basing Designation for BOTTOM VIEW	G-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:*

PEAK INVERSE PLATE VOLTAGE	1550 max. volts
PEAK PLATE CURRENT PER PLATE	1 max. amp
AC PLATE SUPPLY VOLTAGE (RMS) PER PLATE	*See Rating Chart I*
DC OUTPUT CURRENT PER PLATE	*See Rating Chart I*
HOT-SWITCHING TRANSIENT PLATE CURRENT PER PLATE	*See Operating Considerations*

Typical Operation with Capacitor-Input to Filter:

AC Plate-to-Plate Supply Voltage (RMS)	600	900	1100	volts
Filter-Input Capacitor▲	40	40	40	μf
Total Effective Plate-Supply Impedance Per Plate	21	67	97	ohms
DC Output Voltage at Input to Filter (Approx.):				
At full-load current of 300 ma	290	–	–	volts
275 ma	–	460	–	volts
162 ma	–	–	630	volts

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

5U4-GB

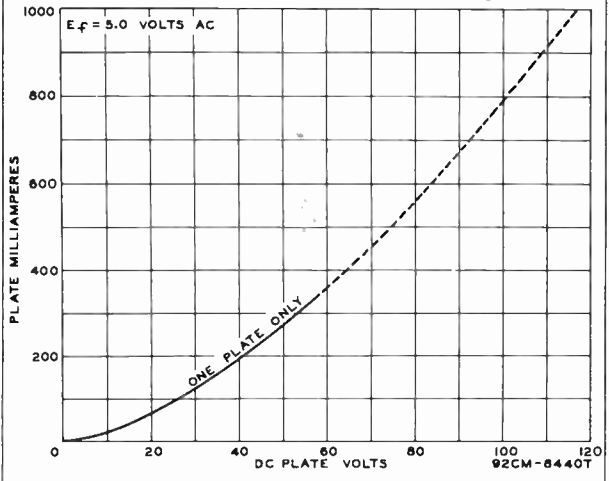
FULL-WAVE VACUUM RECTIFIER

DC Output Voltage at Input to Filter (Approx.):				
At half-load current of 150 ma.	335	–	–	volts
137.5 ma.	–	520	–	volts
81 ma.	–	–	680	volts
Voltage Regulation (Approx.):				
Half-load to full-load current.	45	60	50	volts

Typical Operation with Choke-Input to Filter:

AC Plate-to-Plate Supply Voltage (RMS)	900	1100	volts
Filter-Input Choke	10	10	henries
DC Output Voltage at Input to Filter (Approx.):			
At full-load current of 348 ma	340	–	volts
275 ma	–	440	volts
At half-load current of 174 ma	355	–	volts
137.5 ma	–	455	volts
Voltage Regulation (Approx.):			
Half-load to full-load current	15	15	volts

AVERAGE PLATE CHARACTERISTIC



OPERATING CONSIDERATIONS

Even occasional *hot-switching* with capacitor-input circuits permits the flow of plate current having magnitudes which can adversely affect tube life and reliability. If

5U4-GB

FULL-WAVE VACUUM RECTIFIER

capacitor-input circuits are to be used, it is essential that the tube be protected against the possible adverse effects of hot-switching. The tube can be protected by circuits, designed to incorporate sufficient plate-supply resistance, as determined from Rating Chart III, to limit the maximum peak current value per plate to 4.6 amperes during the initial cycles of hot-switching operation. For applications in which hot-switching is required, choke-input circuits are recommended. Such circuits limit the hot-switching current to a value no higher than that of the peak plate current.

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.

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 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 by either 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 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 magnitude in excess of the maximum permissible hot-switching current of 4.6 amperes. To limit the hot-switching current, adequate series plate-supply resistance per plate is necessary. The minimum value of this resistance may be determined from Rating Chart III. If the transformer windings do not provide this minimum value of resistance, then additional dc series resistance is required. The value of this dc resistance, R_A, may be determined from the relationship shown in the legend for Rating Chart III.

5U4-GB

FULL-WAVE VACUUM RECTIFIER

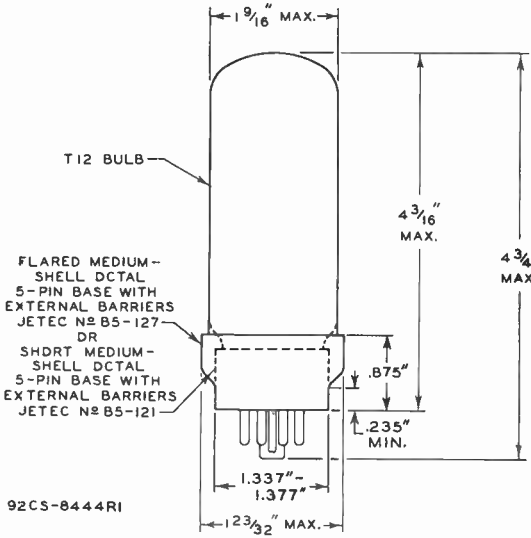
If appreciable series inductance is present in the plate supply, a value of series plate-supply resistance smaller than that indicated by the curve may be employed provided it is experimentally determined that the combined effect of inductance and plate-supply resistance used are adequate to limit the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

The *Operation Characteristics for Full-Wave Circuit with Capacitor-Input to Filter* show the usual typical operating curves for a full-wave rectifier with capacitor-input filter. In addition, they show by means of the boundary line "AED" the limiting current and voltage relationships presented in Rating Chart I. A choice of operating values to the left of the boundary line should be made such that the operation of the tube at these values will insure that the maximum ratings will not be exceeded.

The *Operation Characteristics for Full-Wave Circuit with Choke-Input to Filter* show the usual typical operating curves for a full-wave rectifier with choke-input filter. They not only show by means of boundary line "ABC" the limiting current and voltage relationships presented in Rating Chart I, but also give information as to the effect of various sizes of chokes on regulation. 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. It will be noted that regulation improves with an increase in value of choke inductance, but for cost reasons, the value of inductance is usually held to the smallest value which will give the desired regulation over the operating current range. It is also to be noted that at the lower load currents, higher values of inductance are required to maintain good regulation. A choice of operating values to the left of the boundary line "ABC" should be made such that operation of the tube at these values will insure that the maximum ratings are not exceeded.

5U4-GB

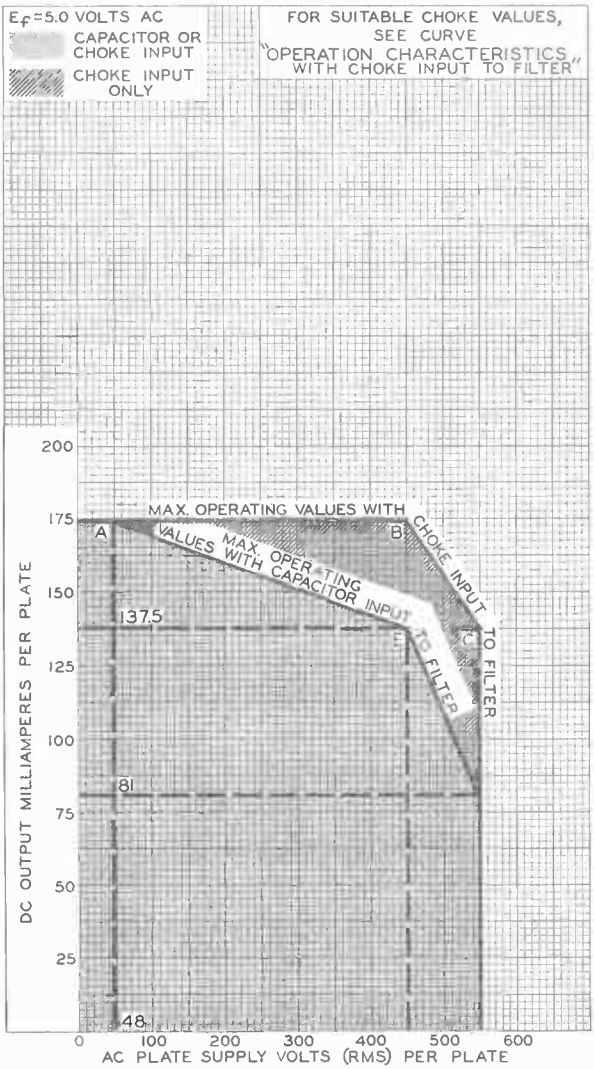
FULL-WAVE VACUUM RECTIFIER



RCA

5U4-GB

RATING CHART I



RCA

5U4-GB

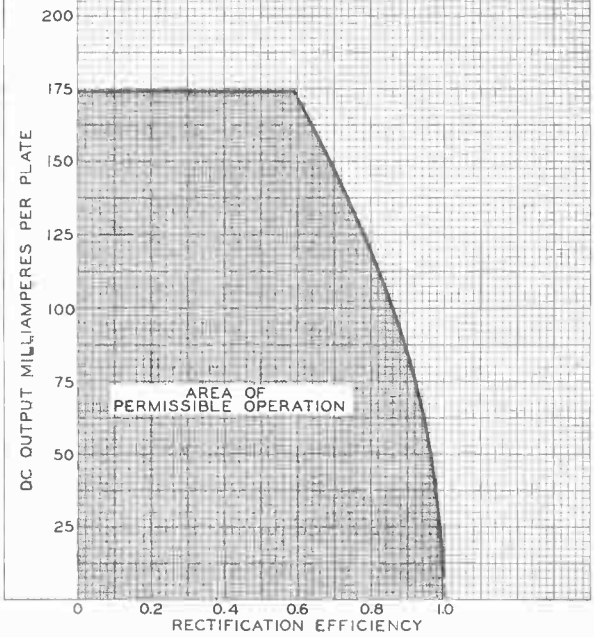
RATING CHART II
CAPACITOR INPUT TO FILTER

E_f = 5.0 VOLTS AC

MAX. PEAK PLATE CURRENT PER PLATE = 1 AMP.

RECTIFICATION EFFICIENCY = $\frac{\overline{E}}{\sqrt{2}\,E_S}$

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



RCA

5U4-GB

RATING CHART III
CAPACITOR INPUT TO FILTER

E_f = 5.0 VOLTS AC MAX. HOT-SWITCHING CUR. = 4.6 AMP.

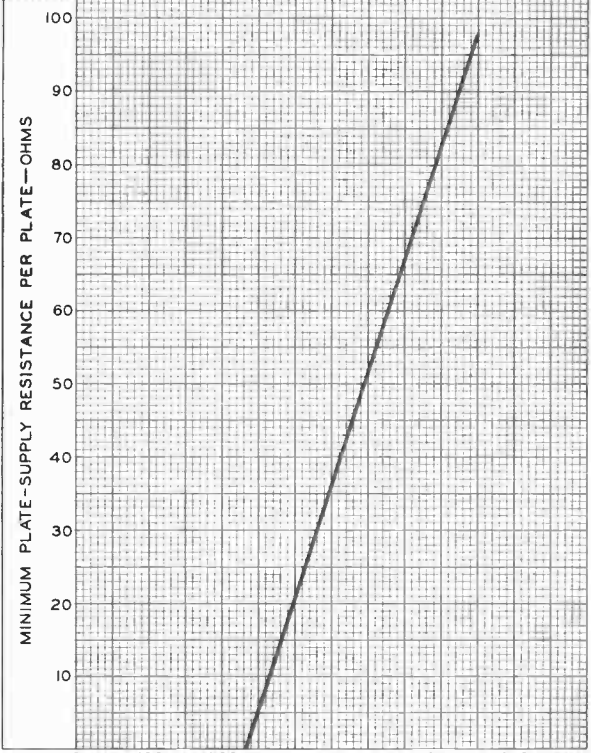
PLATE-SUPPLY RESISTANCE PER PLATE = $R_{SEC.} + N^2 R_{PRI.} + R_A$

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



RCA

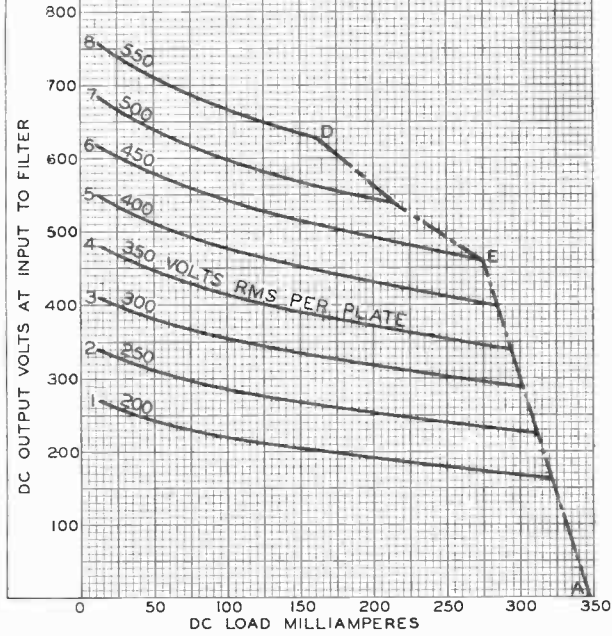
5U4-GB

OPERATION CHARACTERISTICS
FULL-WAVE CIRCUIT, CAPACITOR INPUT TO FILTER

E_f = 5.0 VOLTS AC
SUPPLY FREQUENCY = 60 CPS
CAPACITOR (C) INPUT TO FILTER: 40 μf
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

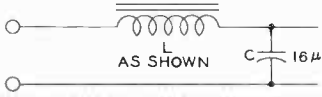


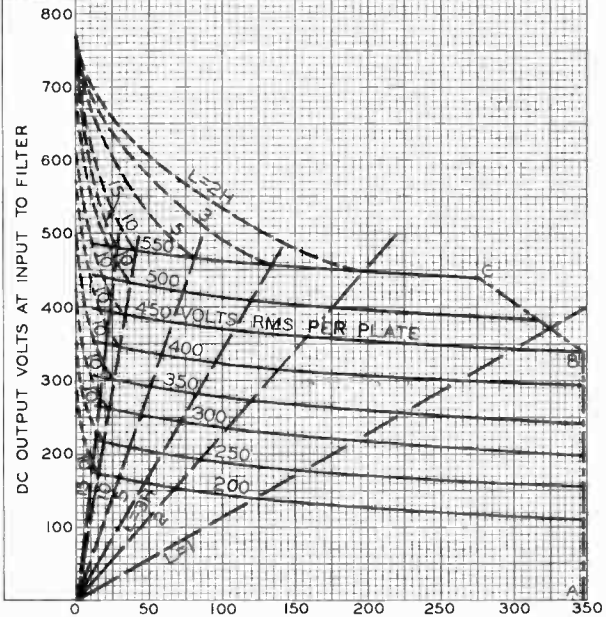
RCA

5U4-GB

OPERATION CHARACTERISTICS
FULL-WAVE CIRCUIT, CHOKE INPUT TO FILTER

E_f = 5.0 VOLTS AC SUPPLY FREQUENCY = 60 CPS
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





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

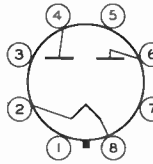
GENERAL DATA

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-GA

FULL-WAVE VACUUM RECTIFIER

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

GENERAL DATA

Electrical:

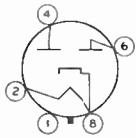
Heater, for Unipotential Cathode:

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.

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

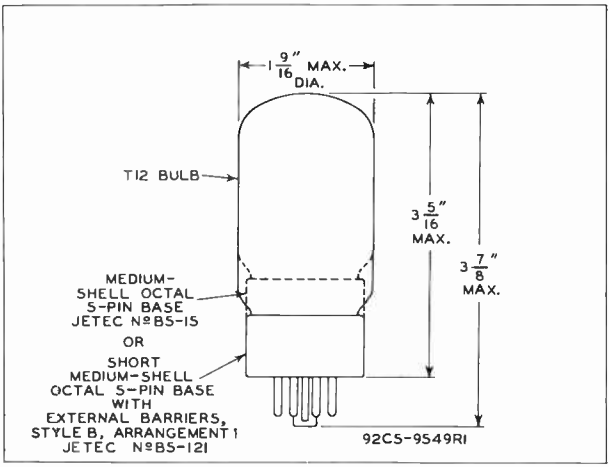
* Higher values of capacitance than indicated may be used, but the effective plate-supply impedance should be increased to prevent exceeding the maximum rating for peak plate current.

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

TENTATIVE DATA

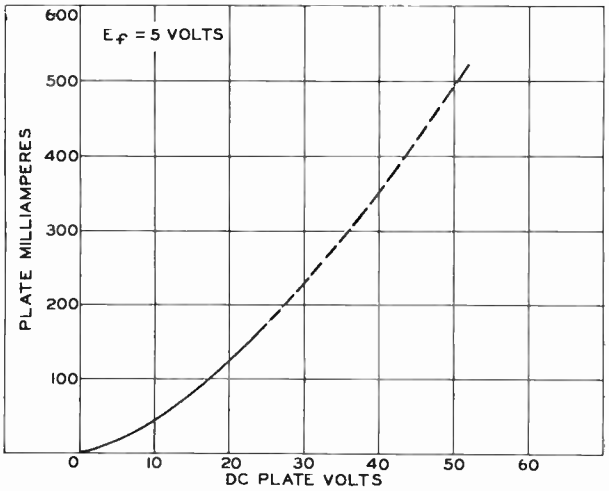
5V4-GA

FULL-WAVE VACUUM RECTIFIER



CF.-9549R1

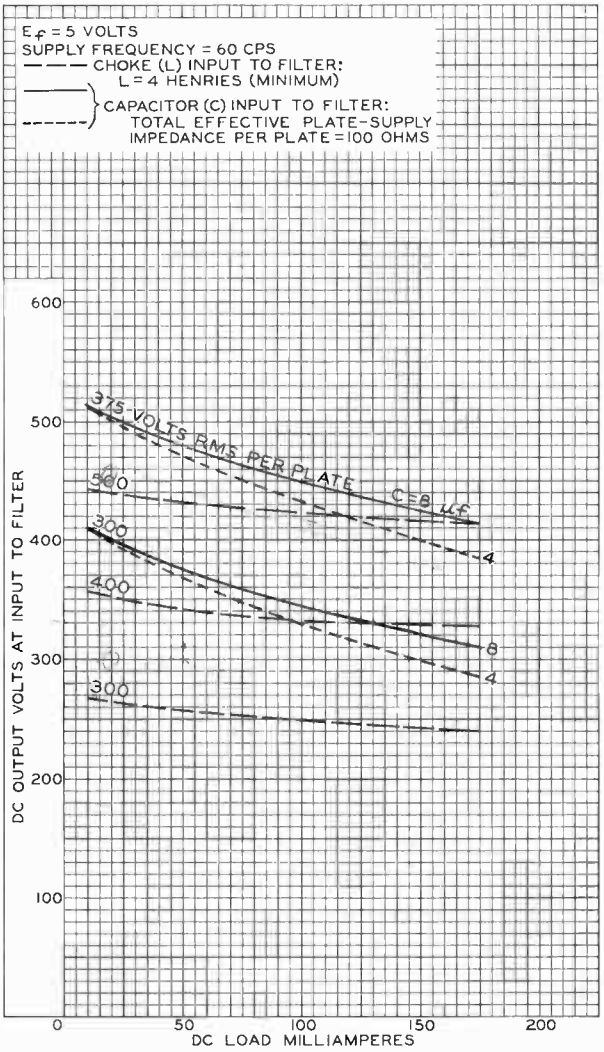
AVERAGE PLATE CHARACTERISTIC
EACH UNIT



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.

100 ma

5W4
5W4-GT/G

5W4, 5W4-GT/G

FULL-WAVE HIGH-VACUUM RECTIFIER

Filament	Coated	
Voltage	5.0	a-c volts
Current	1.5	amp.
	5W4	*5W4-GT/G*
Maximum Overall Length	3-1/4"	3-3/8"
Maximum Seated Height	2-11/16"	2-13/16"
Maximum Diameter	1-5/16"	1-5/16"
Bulb	Metal Shell, MT-8	T-9
Base	Small Wafer Octal 5-Pin	Intermed. Sh. Octal 5-Pin G-5T
Basing Designation	5T	
Pin 1 (5W4, Shell; 5W4-GT/G, No Con.)		Pin 4 - Plate #2
Pin 2 - Filament		Pin 6 - Plate #1
		Pin 8 - Filament
Mounting Position		Vertical◊

BOTTOM VIEW

Maximum Ratings Are Design-Center Values

FULL-WAVE RECTIFIER

Peak Inverse Plate Voltage	1400 max. volts
Peak Plate Current per Plate	300 max. ma.
D-C Output Current:	
With condenser input to filter	100 max. ma.
With choke input to filter	100● max. ma.

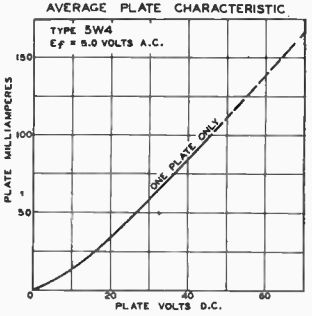
Typical Operation:	*Condenser-Input Filter*	*Choke-Input Filter*	
A-C Plate-to-Plate Supply Voltage (RMS)	700	1000	volts
Filter Input Condenser	4	–	µf
Min. Total Effect. Plate-Supply Imped. per Plate	50	–	ohms
Filter Input Choke	–	6	henries
D-C Output Current	100	100	ma.
D-C Voltage (At input to filter):*			
At half-load current (50 ma.)	410	420	volts
At full-load current (100 ma.)	360	405	volts
Difference (Voltage Regulation)	50	15	volts
Percentage Regulation	12	3.5	%

◊ Horizontal operation of the 5W4 permitted if pins 2 and 8 are in a vertical plane. Horizontal operation of the 5W4-GT/G permitted if pins 2 and 8 are in a horizontal plane.

● For choke not less than 6 henries.

* Approximate values.

AVERAGE PLATE CHARACTERISTIC



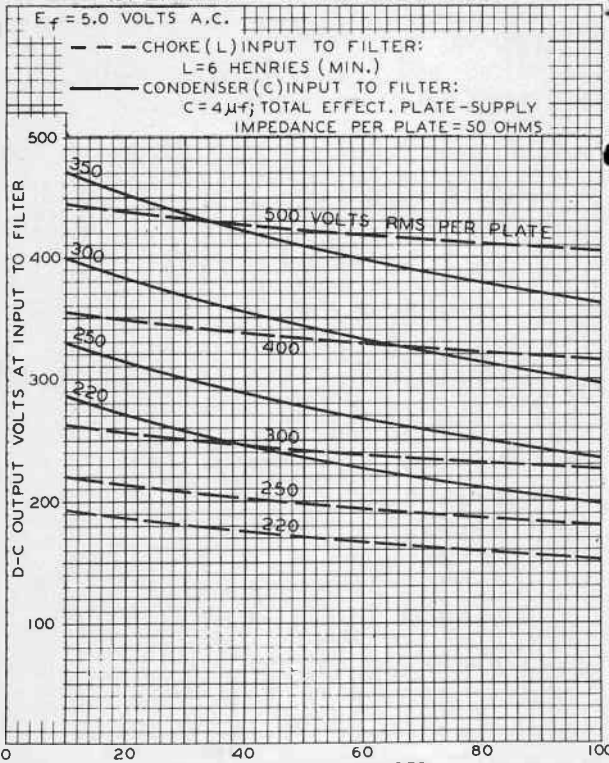
92C-6008R1

← Indicates a change.

5W4
5X4-G

5W4

OPERATION CHARACTERISTICS



5X4-G

FULL-WAVE HIGH-VACUUM RECTIFIER

Filament	Coated	
Voltage	5.0	a-c volts
Current	3.0	amp.
Maximum Overall Length		5-5/16"
Maximum Seated Height		4-3/4"
Maximum Diameter		2-1/16"
Bulb		ST-16
Base		Medium Shell Octal 8-Pin
Pin 1 - No Connection		Pin 5 - Plate #1
Pin 2 - No Connection		Pin 6 - No Connection
Pin 3 - Plate #2		Pin 7 - Filament
Pin 4 - No Connection		Pin 8 - Filament
Mounting Position		Vertical◊

BOTTOM VIEW (G-50)

◊ Horizontal operation permitted if pins 2 and 7 are in horizontal plane.

Maximum Ratings, Operating Conditions, and Curves for the 5X4-G are the same as those for Type 5U4-G.

125-150 ma

5Y3-G
5Y3-GT

5Y3-G, 5Y3-GT

FULL-WAVE VACUUM RECTIFIER

GENERAL DATA

Electrical:

Filament, Coated:		
Voltage	5	ac volts
Current	2	amp

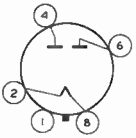
Mechanical:

Mounting Position . . . . Vertical, or Horizontal with pins 2 and 8 in horizontal plane

	5Y3-G	5Y3-GT
Maximum Overall Length	4-5/8"	3-3/8"
Maximum Seated Length	4-1/16"	2-13/16"
Maximum Diameter	1-13/16"	1-5/16"
Bulb	ST-14	T-9
Base	Med.-Shell, Octal 5-Pin	Inter.-Shell, Octal 5-Pin

Basing Designation for BOTTOM VIEW G-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*

PEAK INVERSE PLATE VOLTAGE	1400 max.	volts
PEAK PLATE CURRENT PER PLATE	400 max.	ma
AC PLATE SUPPLY VOLTAGE (RMS) PER PLATE	See Rating Chart	
DC OUTPUT CURRENT PER PLATE	See Rating Chart	
HOT-SWITCHING TRANSIENT PLATE CURRENT PER PLATE For duration of 0.2 second maximum	2.2 max.	amp

Typical Operation with Capacitor-Input Filter:

AC Plate-to-Plate Supply Voltage (RMS)	700	1000	volts
Filter-Input Capacitor	10	10	μf
Total Effect. Plate-Supply Impedance Per Plate	50	140	ohms
DC Output Voltage at Input to Filter (Approx.):			
At Half-Load Cur. of 62.5 ma.	390	–	volts
At Half-Load Cur. of 42 ma.	–	610	volts
At Full-Load Cur. of 125 ma.	350	–	volts
At Full-Load Cur. of 84 ma.	–	560	volts
Voltage Regulation, Half-Load to Full-Load Current (Approx.)	40	50	volts

5Y3-G, 5Y3-GT

FULL-WAVE VACUUM RECTIFIER

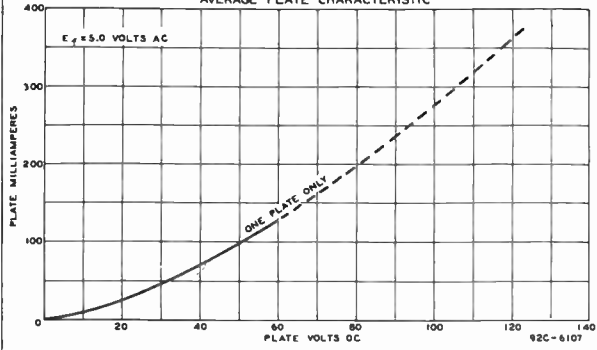
Typical Operation with Choke-Input Filter:

AC Plate-to-Plate Supply Voltage (RMS)	700	1000	volts
Filter-Input Choke	10*	10**	henries
DC Output Voltage at Input to Filter (Approx.):			
At Half-Load Cur. of 75 ma.	270		volts
At Half-Load Cur. of 62.5 ma.	–	405	volts
At Full-Load Cur. of 150 ma.	245		volts
At Full-Load Cur. of 125 ma.	–	390	volts
Voltage Regulation, Half-Load to Full-Load Current (Approx.)	25	15	volts

* This value is adequate to maintain optimum regulation in the region to the right of line L=10H on curve OPERATION CHARACTERISTICS With Choke-Input to Filter, provided the load current is not less than 35 ma. For load currents less than 35 ma., a larger value of inductance is required for optimum regulation.

** This value is adequate to maintain optimum regulation in the region to the right of line L=10H on curve OPERATION CHARACTERISTICS With Choke-Input to Filter, provided the load current is not less than 50 ma. For load currents less than 50 ma., a larger value of inductance is required for optimum regulation.

AVERAGE PLATE CHARACTERISTIC



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 relation-

5Y3-G, 5Y3-GT

FULL-WAVE VACUUM RECTIFIER

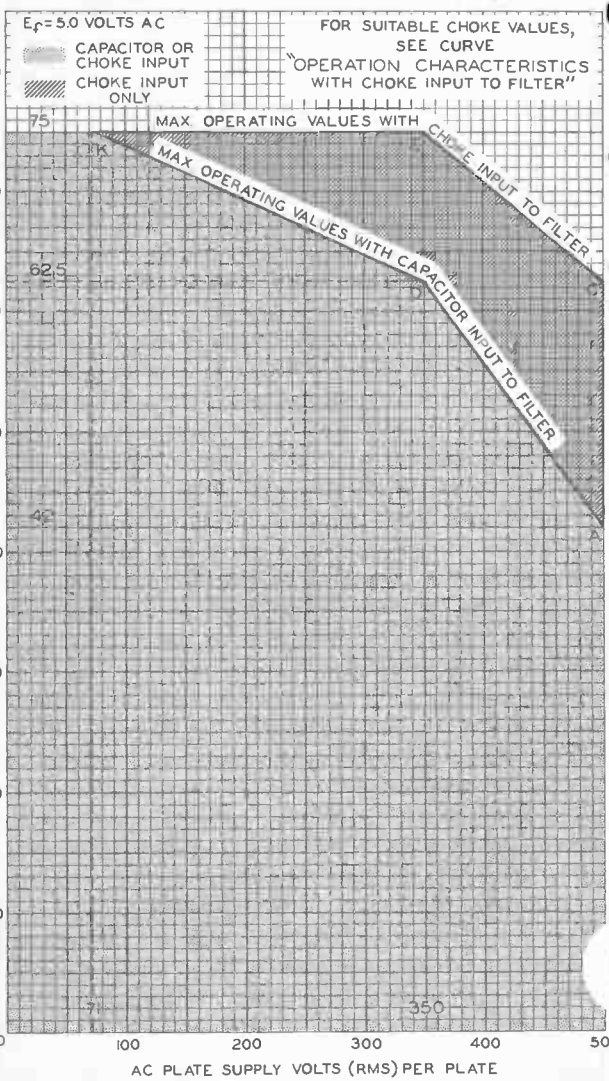
ships presented on the Rating Chart.

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 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.

RCA

5Y3-GT

RATING CHART



Full-Wave Vacuum Rectifier

GENERAL DATA

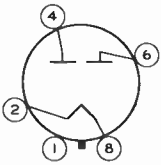
Electrical:

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.

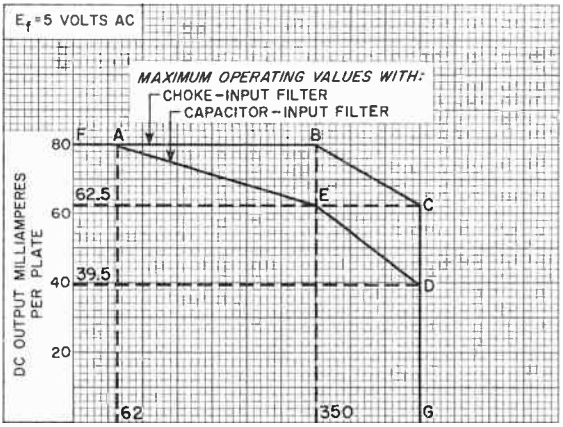
Filter-Input Choke. . . .	–	10	henrys
Total Effective Plate Supply Impedance Per Plate	50	–	ohms
DC Output Voltage at input to filter	360	380	volts
DC Output Current	125	125	ma

→**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.

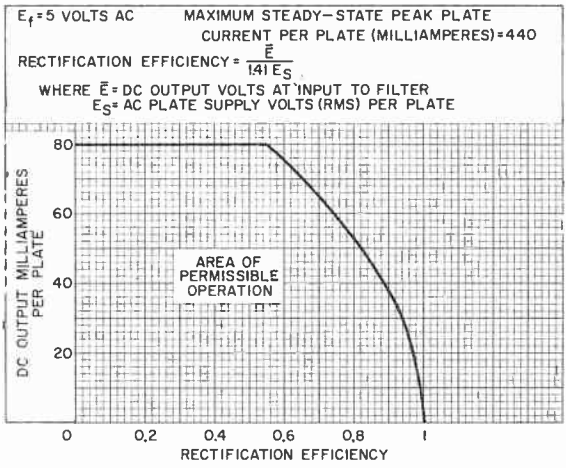
RATING CHART I



92CS-7396RI

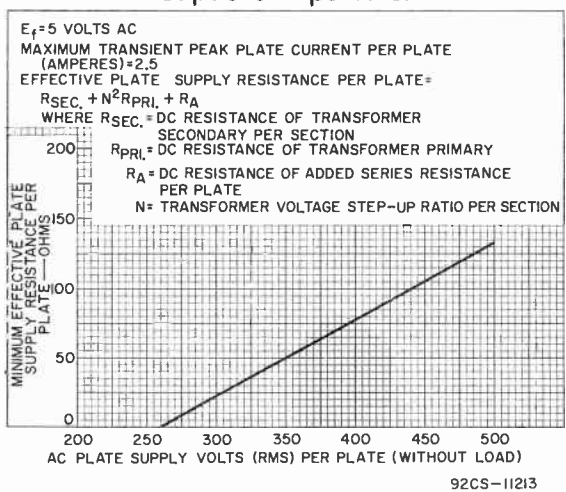
→ Indicates a change.

RATING CHART II
Capacitor-Input Filter



92CS-11212

RATING CHART III
Capacitor-Input Filter



92CS-11213

6U5

ELECTRON-RAY TUBE

INDICATOR TYPE WITH REMOTE-CUTOFF TRIODE UNIT

GENERAL DATA

Electrical:

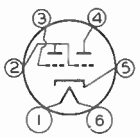
Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.3	amp

Mechanical:

Mounting Position	Any
Maximum Overall Length	4-3/16"
Seated Length	3-3/8 ± 3/16"
Maximum Diameter	1-3/16"
Bulb	T-9
Base	Small-Shell Small 6-Pin (JETEC No. A6-7)
Basing Designation for BOTTOM VIEW	6R

Pin 1 - Heater
Pin 2 - Triode Plate, Ray-Control Electrode
Pin 3 - Triode Grid
Pin 4 - Target
Pin 5 - Cathode
Pin 6 - Heater



INDICATOR SERVICE

Maximum Ratings, *Design-Center Values:*

TRIODE-PLATE SUPPLY VOLTAGE	285 max.	volts
TARGET VOLTAGE	285 max.	volts
	125 min.	volts ←
TRIODE-PLATE DISSIPATION	1.0 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Typical Operation:

Plate Supply and Target Voltage	200	250	volts
Series Triode-Plate Resistor	1	1	megohm
Target Current† for zero grid voltage	3	4	ma
Triode-Plate Current for zero grid voltage	0.19	0.24	ma
Triode-Grid Voltage (Approx.):			
For 0° shadow angle	-18.5	-22	volts
For 90° shadow angle	0	0	volts

† Subject to wide variations.

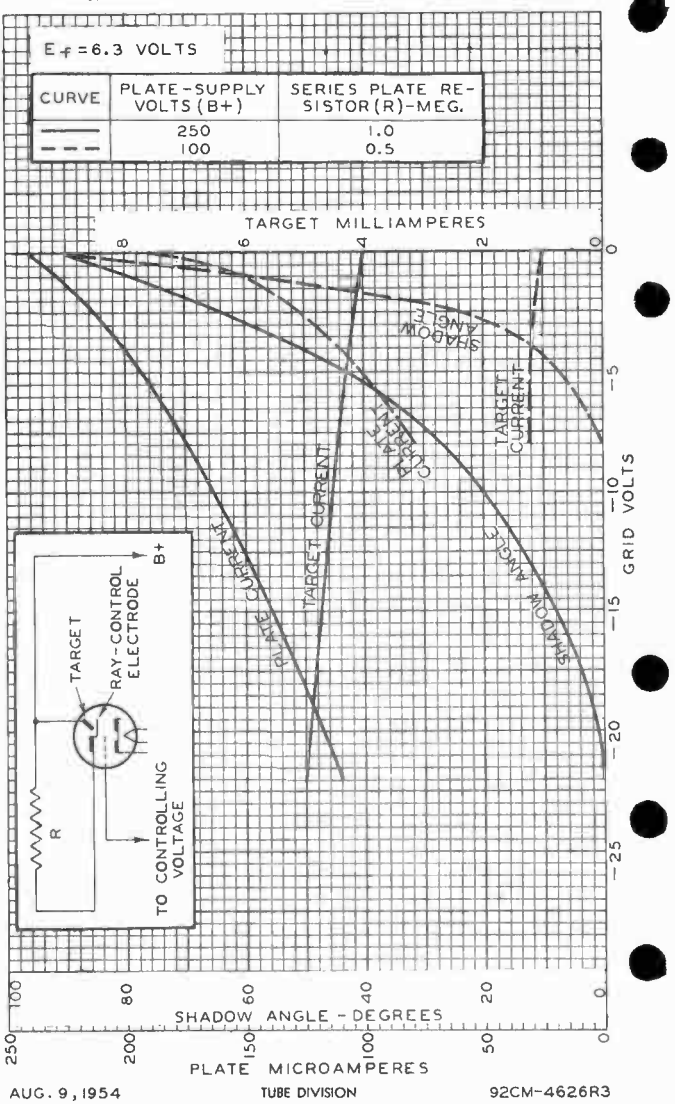
Refer to Type 6E5 for a discussion of the operation of the tube and also for the fundamental circuit.

← Indicates a change.

RCA

6U5

AVERAGE CONTROL CHARACTERISTICS



5Y4-G

FULL-WAVE VACUUM RECTIFIER

The 5Y4-G is the same as the 5Y3-G except for the following items:

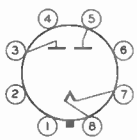
Mechanical:

Mounting Position . . . . . Vertical, base up or down, or Horizontal with pins 2 and 7 in horizontal plane

Base . . . . . Medium-Shell Octal 8-Pin (JETEC No.B8-11)

Basing Designation for BOTTOM VIEW. 5Q

Pin 1 – No Connection
Pin 2 – No Connection
Pin 3 – Plate No.2
Pin 4 – No Connection



Pin 5 – Plate No.1
Pin 6 – No Connection
Pin 7 – Filament
Pin 8 – Filament

5Y4-GT

FULL-WAVE VACUUM RECTIFIER

The 5Y4-GT is the same as the 5Y3-GT except for the following items:

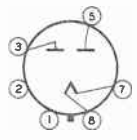
Mechanical:

Mounting Position . . . . . Vertical, base up or down, or Horizontal with pins 2 and 7 in horizontal plane

Base . . . . Intermediate-Shell Octal 6-Pin (JETEC No.B6-8), or Short Intermediate-Shell Octal 6-Pin (JETEC No.B6-48)

Basing Designation for BOTTOM VIEW 5Q

Pin 1 – No Connection
Pin 2 – No Connection



Pin 3 – Plate No.2
Pin 5 – Plate No.1
Pin 7 – Filament
Pin 8 – Filament

5Z3

5Z3

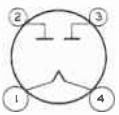
FULL-WAVE VACUUM RECTIFIER

The 5Z3 is the same as the 5U4-G except for the following items:

Mechanical:

Mounting Position. . . . . .Vertical, base up or down, or Horizontal with pins 1 and 4 in horizontal plane
Maximum Overall Length . . . . . 5-3/8"
Base . . . . . Medium-Shell Small 4-Pin (JETEC No.A4-9)
Basing Designation for BOTTOM VIEW 4C

Pin 1 - Filament
Pin 2 - Plate No.2



Pin 3 - Plate No.1
Pin 4 - Filament

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

Full-Wave Vacuum Rectifier

GENERAL DATA

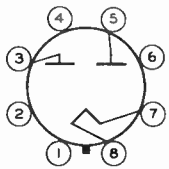
Electrical:

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

Mechanical:

Operating Position. . . . . Vertical, base down or up, or Horizontal with pins 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 8-Pin with External Barriers, Style B (JEDEC Group 1, No.88-118), or Style A (JEDEC Group 1, No.88-110)
Basing Designation for BOTTOM VIEW. 5Q

Pin 1 – No Connection
Pin 2 – No Connection
Pin 3 – Plate No.2
Pin 4 – No Connection



Pin 5 – Plate No.1
Pin 6 – No Connection
Pin 7 – Filament
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 . . . . . 400 max. ma
TRANSIENT PEAK PLATE CURRENT PER PLATE. . . 2.2 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).	700	1000	volts
Filter-Input Capacitor[a].	10	–	μf
Filter-Input Choke . . .	–	10	henrys
Total Effective Plate Supply Impedance Per Plate.	50	–	ohms

5Y4GA

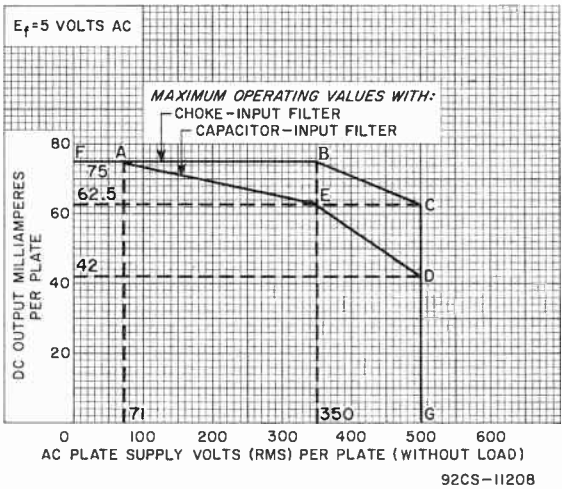
DC Output Voltage at input to filter	350	390	volts
DC Output Current	125	125	ma

Characteristics, Instantaneous Test Condition:

Tube-Voltage Drop for plate ma. = 125 (Per plate)		60	volts

[a] Values of capacitance greater than 10 μf may be used, provided the plate supply impedance is increased to prevent exceeding the maximum peak-plate-current rating.

RATING CHART



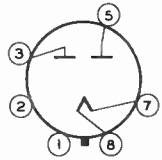
5Y4GT

Full-Wave Vacuum Rectifier

The 5Y4GT is the same as the 5Y4GA except for the following items:

Mechanical:

Operating Position. . . . . Vertical, base down or up, or Horizontal with pins 2 and 3 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 6-Pin, Arrangement 1 (JEDEC Group 1, No.B6-8), or Short Intermediate-Shell Octal 6-Pin with External Barriers, Arrangement 1 (JEDEC Group 1, No.B6-60)
Basing Designation for BOTTOM VIEW. 5Q



Pin 1 - No Connection
Pin 2 - No Connection
Pin 3 - Plate No.2
Pin 5 - Plate No.1
Pin 7 - Filament
Pin 8 - Filament

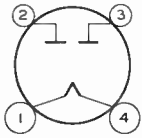
5Z3

Full-Wave Vacuum Rectifier

The 5Z3 is the same as the 5U4G except for the following items:

Mechanical:

Operating Position. . . . . Vertical, base down or up, or Horizontal with pins 1 and 4 in horizontal plane
Maximum Overall Length. . . . . 5-3/8"
Base. . . . . Medium-Shell Small 4-Pin (JEDEC No.A4-9)
Basing Designation for BOTTOM VIEW. 4C

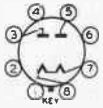


Pin 1 - Filament
Pin 2 - Plate No.2
Pin 3 - Plate No.1
Pin 4 - Filament

5Y4-G

FULL-WAVE HIGH-VACUUM RECTIFIER

Filament	Coated	
Voltage	5.0	a-c volts
Current	2.0	amp.
Maximum Overall Length		4-5/8"
Maximum Diameter		1-13/16"
Bulb		ST-14
Base		Medium Shell Octal 8-Pin
Pin 1 - No Connection		Pin 5 - Plate #1
Pin 2 - No Connection		Pin 6 - No Connection
Pin 3 - Plate #2		Pin 7 - Filament
Pin 4 - No Connection		Pin 8 - Filament
Mounting Position		Vertical◊



BOTTOM VIEW (G-5Q)

◊ Horizontal operation permitted if pins 2 and 7 are in horizontal plane.

Maximum Ratings, Typical Operating Conditions, and Curves are the same as those for Type 5Y3-G.

5Z3

FULL-WAVE HIGH-VACUUM RECTIFIER

Filament	Coated	
Voltage	5.0	a-c volts
Current	3.0	amp.
Maximum Overall Length		5-3/8"
Maximum Diameter		2-1/16"
Bulb		ST-16
Base		Medium 4-Pin
Pin 1 - Filament		Pin 3 - Plate
Pin 2 - Plate		Pin 4 - Filament
Mounting Position		Vertical◊

BOTTOM VIEW (4C)

◊ Horizontal operation permitted if pins 1 and 4 are in horizontal plane.

Maximum Ratings, Typical Operating Conditions, and Curves are the same as those for Type 5U4-G.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

125ma.

5Z4

5Z4

FULL-WAVE HIGH-VACUUM RECTIFIER

Heater	Coated Unipotential Cathode	
Voltage	5.0	a-c volts
Current	2.0	amp.
Maximum Overall Length		3-1/4"
Maximum Seated Height		2-11/16" ←
Maximum Diameter		1-5/16"
Bulb		Metal Shell, MT-8
Base		Small Wafer Octal 5-Pin
Pin 1 - Shell		Pin 6 - Plate #1
Pin 2 - Heater		Pin 8 - Heater &
Pin 4 - Plate #2		Cathode
Mounting Position	BOTTOM VIEW (5L)	Any

FULL-WAVE RECTIFIER

Peak Inverse Voltage	1400 max. volts
Peak Plate Current per Plate	375 max. ma.
With Condenser-Input Filter:	
A-C Plate Voltage per Plate (RMS)	350 max. volts
Total Effective Plate-Supply Impedance per Plate ▲	50 min. ohms ←
D-C Output Current	125 max. ma.
With Choke-Input Filter:	
A-C Plate Voltage per Plate (RMS)	500 max. volts
Input-Choke Inductance	5 min. henries
D-C Output Current	125 max. ma.

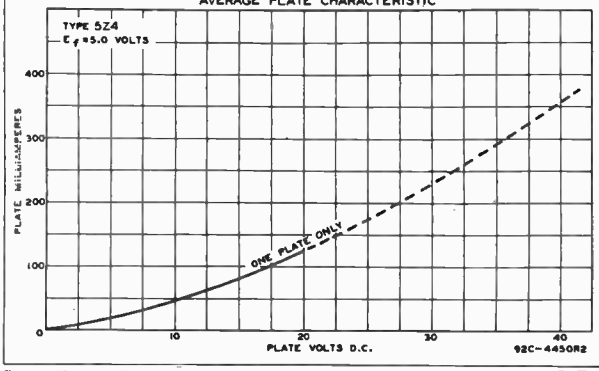
▲ When a filter-input condenser larger than 40 μf is used, it may be necessary to use more plate-supply impedance than the minimum value shown to limit the peak plate current to the rated value.

HALF-WAVE RECTIFIER

As a half-wave rectifier, the 5Z4 may be operated with plates connected in parallel at the socket. Two 5Z4's so connected in a full-wave circuit will deliver twice the d-c output current obtainable from one tube. In this service the allowable voltage and load conditions per tube are the same as for full-wave service.

← Indicates a change.

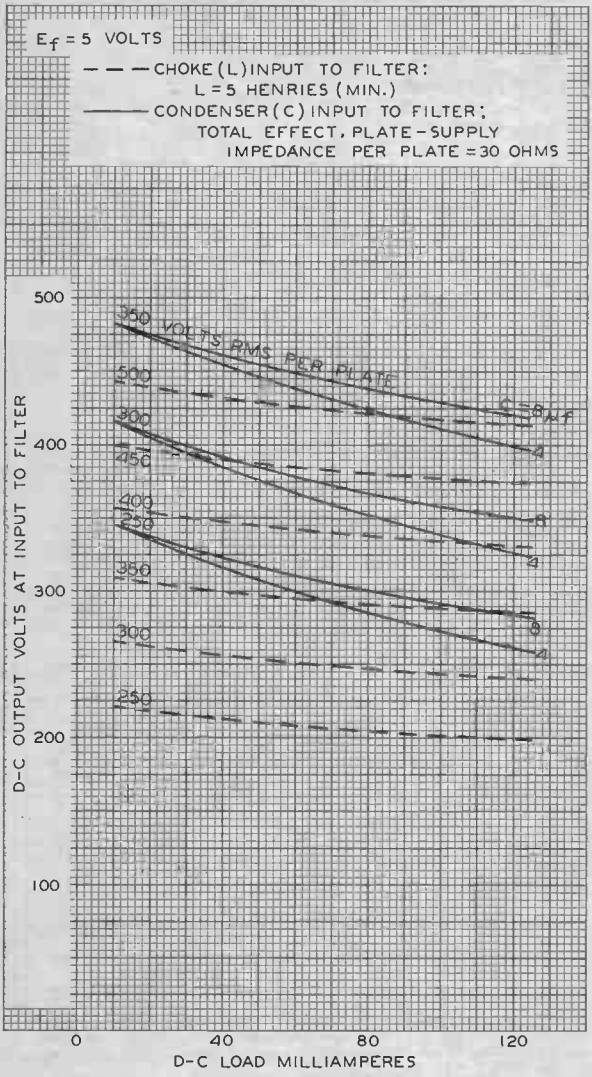
AVERAGE PLATE CHARACTERISTIC



RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

5Z4

OPERATION CHARACTERISTICS



6A3

POWER AMPLIFIER TRIODE

Filament	Coated	
Voltage	6.3	a-c or d-c volts
Current	1.0	amp.
Maximum Overall Length		5-3/8"
Maximum Seated Height		4-3/4"
Maximum Diameter		2-1/16"
Bulb		ST-16
Base		Medium 4-Pin
Pin 1 - Filament		Pin 3 - Grid
Pin 2 - Plate		Pin 4 - Filament
Mounting Position		Any

BOTTOM VIEW (4D)

SINGLE-TUBE AMPLIFIER

Typical Operation and Characteristics - Class A_1 Amplifier:

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

PUSH-PULL AMPLIFIER

Unless otherwise specified, values are for two tubes

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

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

The type of coupling used should not introduce too much resistance in the grid circuit. Transformer- or impedance-coupling devices are recommended. When the grid circuit has a resistance not higher than 0.05 megohm, fixed bias may be used; for higher values, cathode bias is required. With cathode bias, the grid circuit may have a resistance not to exceed 0.5 megohm.

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

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

RCA Cunningham Radiotron (RADIO TUBES)

RCA-6A6

CLASS B TWIN AMPLIFIER

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

Pin 1-Heater
Pin 2-Plate (Triode T_2)
Pin 3-Grid (Triode T_2)
Pin 4-Cathode
Pin 5-Grid (Triode T_1)
Pin 6-Plate (Triode T_1)
Pin 7-Heater

BOTTOM VIEW

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

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

← Indicates a change

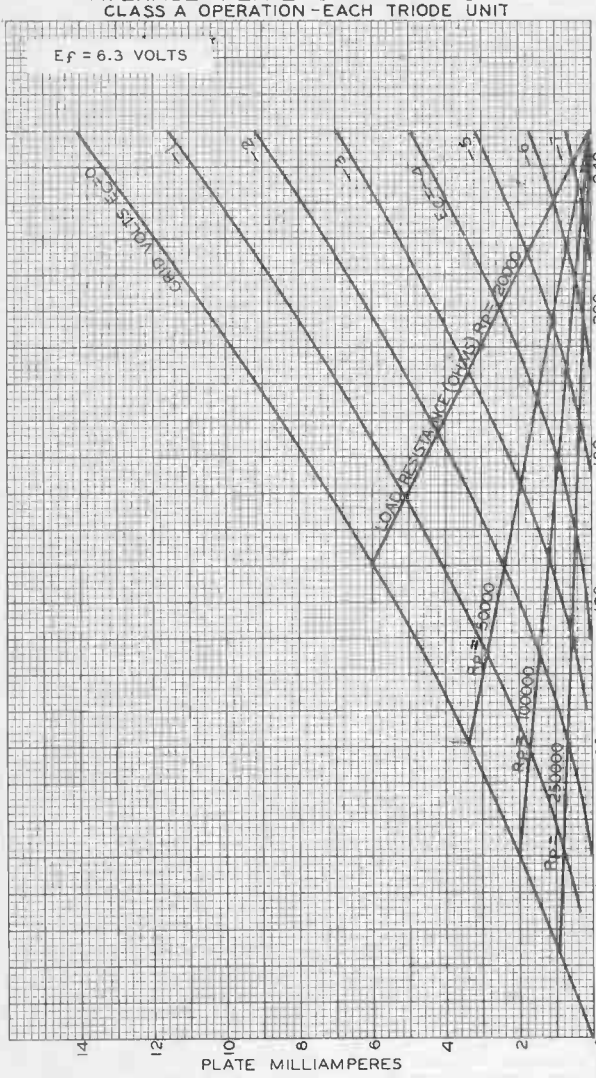
6A6

RCA Cunningham Radiotron RADIO TUBES

RCA-6A6

AVERAGE PLATE CHARACTERISTICS

CLASS A OPERATION - EACH TRIODE UNIT



6A7

PENTAGRID CONVERTER

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances:		
Grid #4 to Plate	0.3°	μμf
Grid #4 to Grid #2	0.15°	μμf
Grid #4 to Grid #1	0.15°	μμf
Grid #1 to Grid #2	1.0	μμf
Grid #4 to All Other Electrodes (R-F Input)	8.5	μμf
Grid #2 to All Other Electrodes (Osc. Output)	5.5	μμf
Grid #1 to All Other Electrodes (Osc. Input)	7.0	μμf
Plate to All Other Electrodes (Mixer Output)	9.0	μμf
Overall Length	4-9/32" to 4-17/32"	
Seated Height	3-21/32" to 3-29/32"	◄
Maximum Diameter	1-9/16"	
Bulb	ST-12	
Cap	Small Metal	
Base	Small 7-Pin▲	
Pin 1 - Heater	Pin 5 - Grid #1	
Pin 2 - Plate	Pin 6 - Cathode	
Pin 3 - Grids #3 & #5	Pin 7 - Heater	
Pin 4 - Grid #2	Cap - Grid #4	
Mounting Position	Any	

BOTTOM VIEW (7C)

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

■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
° With shield-can connected to cathode.
▲ Requires different socket than medium 7-pin base.

◄ Indicates a change.

6A7S

PENTAGRID CONVERTER

RENEWAL TYPE FOR MAJESTIC RECEIVERS

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

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

▲ Requires a different socket than the medium 7-pin base.

* Basing arrangement is the same as for the 6A7, except that the external shield on the 6A7S is connected to cathode.

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

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

PENTAGRID CONVERTER

Heater ■	Coated Unipotential Cathode		
Voltage	6.3		a-c or d-c volts
Current	0.3		amp.
Direct Interelectrode Cap.°	*6A8*	*6A8-G*	*6A8-GT*
Grid #4 to Plate	0.06	0.26	0.26 μμf
Grid #4 to Grid #2	0.1	0.19	0.19 μμf
Grid #4 to Grid #1	0.09	0.16	0.16 μμf
Grid #1 to Grid #2	0.8	1.1	1.1 μμf
Grid #4 to All Other Electrodes (R-F Input)	12	9.5	9.5 μμf
Grid #2 to All Other Electrodes Except Grid #1 (Osc. Output)	5	4.6	4.6 μμf
Grid #1 to All Other Electrodes Except Grid #2 (Osc. Input)	6.5	6	6 μμf
Plate to All Other Electrodes (Mixer Output)	12	12	12 μμf
Overall Length	3-1/8" max.	4-7/32" to 4-15/32"	3-5/16" max.
Seated Height	2-9/16" max.	3-21/32" to 3-29/32"	2-3/4" max.
Maximum Diameter	1-5/16"	1-9/16"	1-5/16"
Bulb	Metal Shell, MT-8	ST-12	T-9 ←
Cap	Miniature	Skirted Min.	Skirted Min, Style C

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

° With shell of 6A8 connected to cathode, and with close-fitting shield on 6A8-G and 6A8-GT connected to cathode.

← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

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

PENTAGRID CONVERTER

(continued from preceding page)

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

Pin 1 — 6A8, Shell; 6A8-G, No Con.; 6A8-GT, Base Sleeve
Pin 2 — Heater
Pin 3 — Plate
Pin 4 — Grids #3 & #5
Mounting Position — Any

Pin 5 — Grid #1
Pin 6 — Grid #2
Pin 7 — Heater
Pin 8 — Cathode
Cap — Grid #4

BOTTOM VIEW

CONVERTER SERVICE

Plate Voltage		300 max.	volts
Screen (Grids #3 & #5) Voltage		100 max.	volts
Screen Supply Voltage		300 max.	volts
Anode-Grid (Grid #2) Voltage		200 max.	volts
Anode-Grid Supply Voltage *		300 max.	volts
Control-Grid (Grid #4) Voltage		0 min.	volts
Plate Dissipation		1.0 max.	watt
Screen Dissipation		0.3 max.	watt
Anode-Grid Dissipation		0.75 max.	watt
Total Cathode Current		14 max.	ma.
Typical Operation:			
Plate Voltage	100	250	volts
Screen Voltage	50	100	volts
Anode-Grid Voltage	100	–	volts
Anode-Grid Supply Voltage	–	250*	volts
Control-Grid Voltage	-1.5	-3	volts
Osc.-Grid (Grid #1) Resistor	50000	50000	ohms
Plate Resistance	0.6	0.36 approx.	ohms
Conversion Transconductance	360	550	μmhos
Conver. Transcond. (approx.) with Control-Grid Bias of -20 volts	3	–	μmhos
Conver. Transcond. (approx.) with Control-Grid Bias of -35 volts	–	6	μmhos
Plate Current	1.1	3.5	ma.
Screen Current	1.3	2.7	ma.
Anode-Grid Current	2	4	ma.
Oscillator-Grid Current	0.25	0.4	ma.
Total Cathode Current	4.6	10.6	ma.

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

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

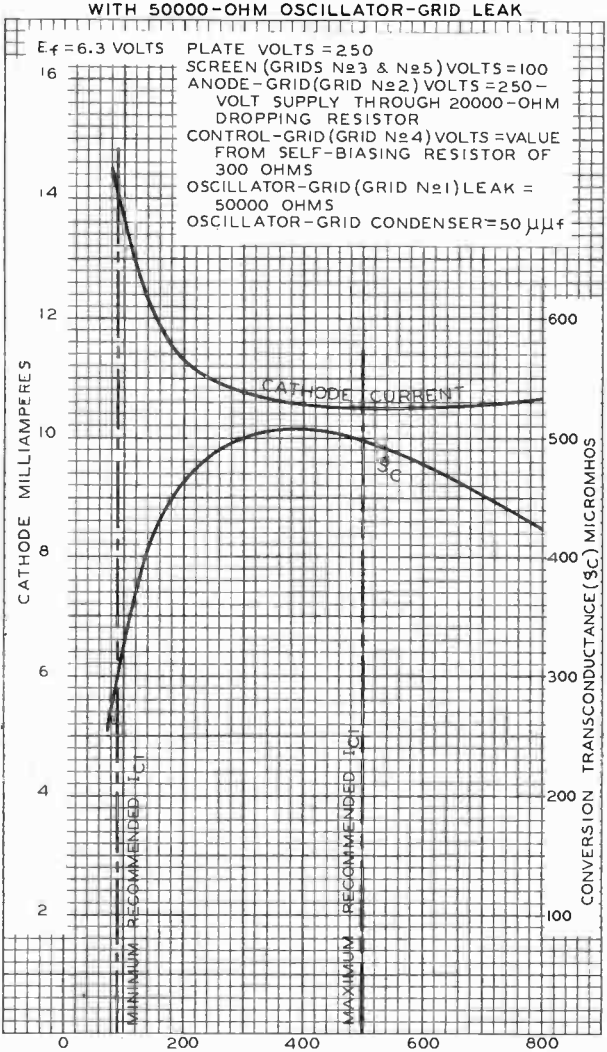
For Typical Circuit and Coil Design Details, refer to Type 2A7.

← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6A8

OPERATION CHARACTERISTICS
WITH 50000-OHM OSCILLATOR-GRID LEAK



6AB4

HIGH-MU TRIODE

MINIATURE TYPE PARTICULARLY SUITABLE FOR CATHODE-DRIVE CIRCUITS

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

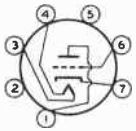
Voltage	6.3	ac or dc volts
Current	0.15	amp

Direct Interelectrode Capacitances:	*Without External Shield*	*With External Shield No. 316 Tied to Cathode*	
Grid to Plate	1.5	1.5	μμf
Grid to Heater and Cathode.	2.2	2.2	μμf
Plate to Heater and Cathode.	0.5	1.4	μμf
Heater to Cathode	2.9	2.9	μμf
Plate to Cathode.	0.24	0.2	μμf
Cathode to Heater and Grid.	5.0	5.2	μμf
Plate to Heater and Grid.	1.7	2.6	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base — Small-Button Miniature 7-Pin	(JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	5CE

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



AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	300 max.	volts
GRID VOLTAGE:		
Negative bias value	50 max.	volts
Positive bias value	0 max.	volts
PLATE DISSIPATION	2.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Characteristics:

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

← Indicates a change

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AB4

6AB4

HIGH-MU TRIODE

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

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

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AB5/6N5

ELECTRON-RAY TUBE

INDICATOR TYPE WITH TRIODE UNIT

Heater■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.15	amp.
Overall Length		3-13/16" to 4-3/16"
Maximum Seated Height		3-9/16" ←
Maximum Diameter		1-3/16" ←
Bulb		T-9 ←
Base		Small 6-Pin
Pin 1 - Heater		Pin 4 - Target
Pin 2 - Plate		Pin 5 - Cathode
Pin 3 - Grid		Pin 6 - Heater
Mounting Position	BOTTOM VIEW (6R)	Any

MAXIMUM RATINGS and TYPICAL OPERATING CONDITIONS

Plate-Supply Voltage		180 max.	volts
Target Voltage		180 max. 100 min.	volts
Typical Operation:			
Plate and Target Supply	135	135	volts
Series Triode-Plate Resistor□	0.25	1.0	megohm
Target Current †△	2	1.9	ma.
Triode-Plate Current△	0.5	0.13	ma.
Triode-Grid Voltage (approx.)			
For shadow angle of 0°	-10	-15.5	volts ←
For shadow angle of 90°	0	0	volts

■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
□ Designated as R in circuit diagram under Type 6E5.
† Subject to wide variations.
△ For triode-grid bias of 0 volts.
← Indicates a change.

RCA MANUFACTURING COMPANY, INC.

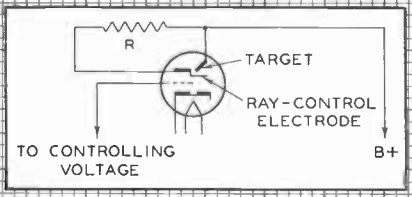
RCA

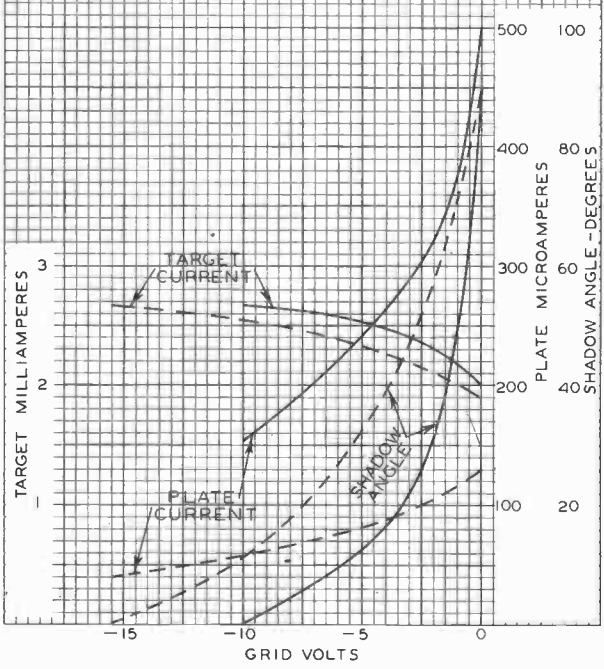
6AB5

AVERAGE CONTROL CHARACTERISTICS

E_f = 6.3 VOLTS

CURVE	PLATE-SUPPLY VOLTS (B+)	SERIES PLATE RESISTOR (R) -MEG.
———	135	0.25
– – –	135	1.0





6AB7/1853

TELEVISION AMPLIFIER PENTODE

SINGLE-ENDED METAL TYPE

Heater★	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.45	amp.
Direct Interelectrode Capacitances:°		
Grid to Plate	0.015 max.	μμf
Input	8	μμf
Output	5	μμf
Maximum Overall Length		2-5/8"
Maximum Seated Height		2-1/16"
Maximum Diameter		1-5/16"
Bulb		Metal Shell, MT-8
Base		Small Wafer Octal 8-Pin
Pin 1 - Shell		Pin 5 - Cathode
Pin 2 - Heater		Pin 6 - Screen
Pin 3 - Suppressor		Pin 7 - Heater
Pin 4 - Grid		Pin 8 - Plate
Mounting Position	BOTTOM VIEW (8N)	Any

AMPLIFIER

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

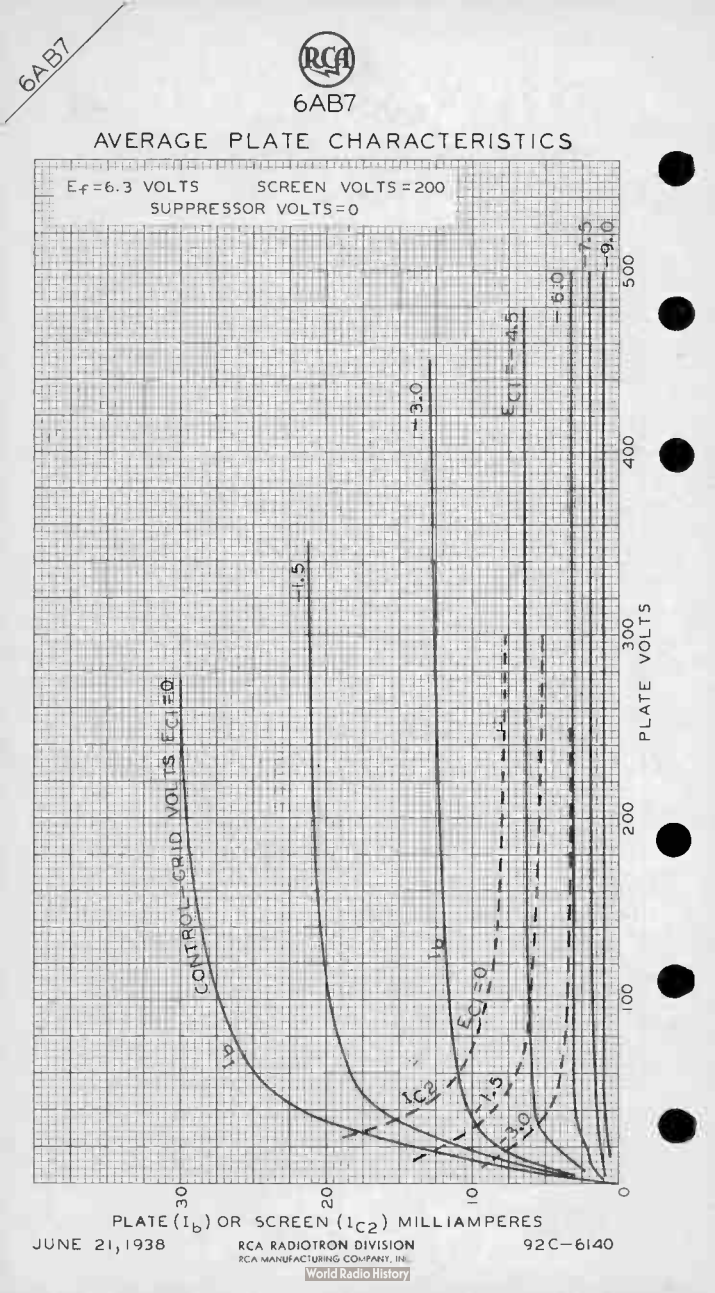
Typical Operation and Characteristics - Class A_1 Amplifier:

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

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

← indicates a change.

6AB7



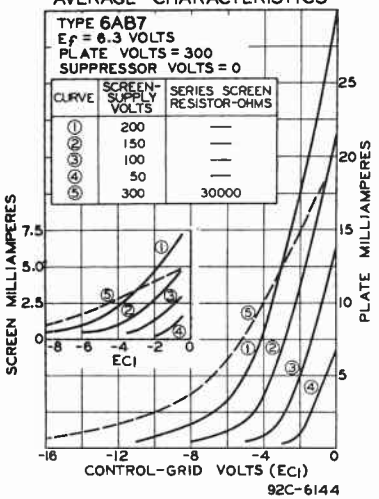
JUNE 21, 1938

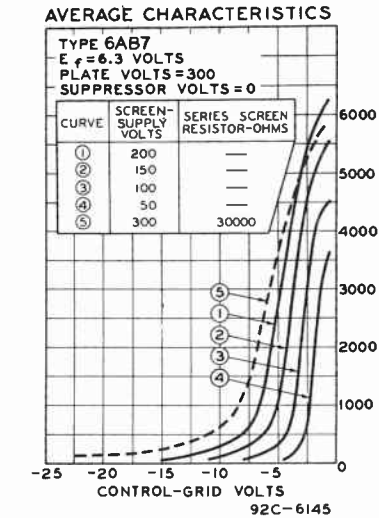
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6140

6AB7

TELEVISION AMPLIFIER PENTODE

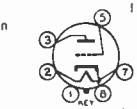




6AC5-GT/6AC5-G

HIGH-MU POWER AMPLIFIER TRIODE

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



BOTTOM VIEW (G-6Q)

Characteristics

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

Amplifier

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

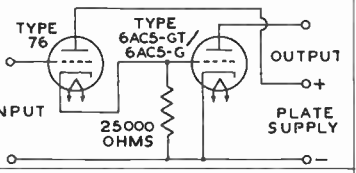
■ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.

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

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

←Indicates a change.

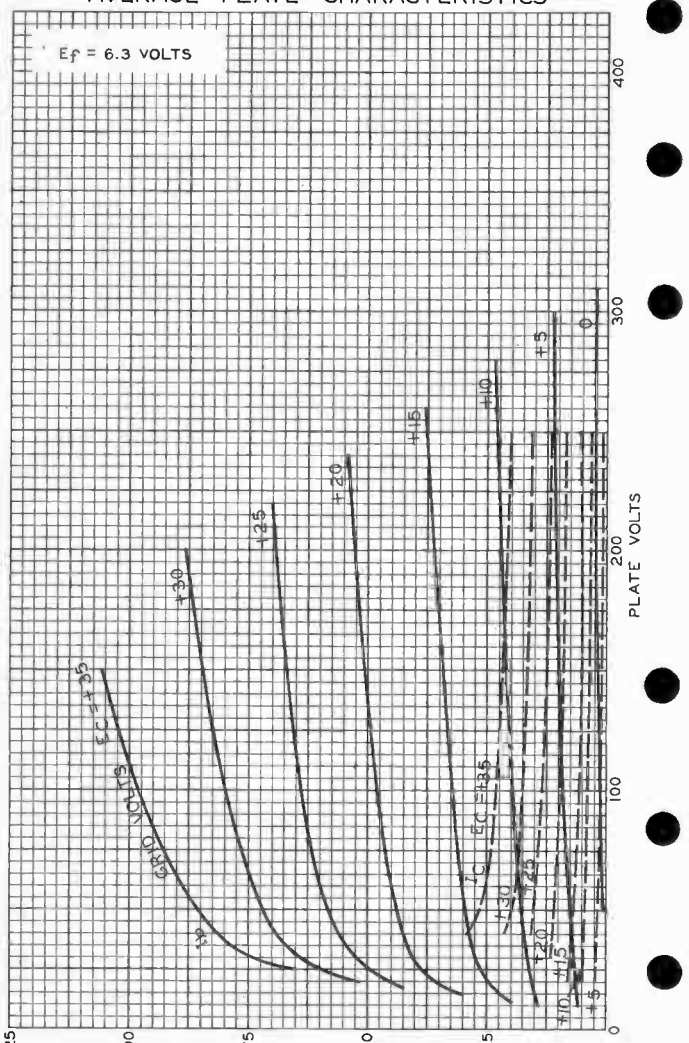
DYNAMIC-COUPLED CONNECTION



RCA MANUFACTURING COMPANY, INC.

6AC5-GT

AVERAGE PLATE CHARACTERISTICS



OCT. 18, 1937

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

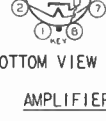
92C-4840

6AC7/1852

TELEVISION AMPLIFIER PENTODE

SINGLE-ENDED METAL TYPE

Heater★	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.45	amp.
Direct Interelectrode Capacitances:°		
Grid to Plate	0.015 max.	μμf
Input	11	μμf
Output	5	μμf
Maximum Overall Length		2-5/8"
Maximum Seated Height		2-1/16"
Maximum Diameter		1-5/16"
Bulb		Metal Shell, MT-8
Base		Small Wafer Octal 8-Pin
Pin 1 - Shell		Pin 5 - Cathode
Pin 2 - Heater		Pin 6 - Screen
Pin 3 - Suppressor		Pin 7 - Heater
Pin 4 - Grid		Pin 8 - Plate
Mounting Position	BOTTOM VIEW (8N)	Any



AMPLIFIER

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

Typical Operation and Characteristics - Class A_1 Amplifier:

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

° With shell connected to cathode.

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

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

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

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

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

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

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

←Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6AC7

6AC7

AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$ VOLTS SCREEN VOLTS = 150
SUPPRESSOR VOLTS = 0

CONTROL-GRID VOLTS E_{C1}

PLATE VOLTS

PLATE (I_b) OR SCREEN (I_{C2}) MILLIAMPERES

JUNE 17, 1938

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6139

6AC7

RCA

6AC7

AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$ VOLTS CONTROL-GRID VOLTS = 0
SUPPRESSOR VOLTS = 0

PLATE VOLTS
100 200 300 400 500

PLATE MILLIAMPERES
0 10 20 30 40

SCREEN VOLTS E_{c2}=150
125
100
E_{c2}=75
50

DEC. 5 1942

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

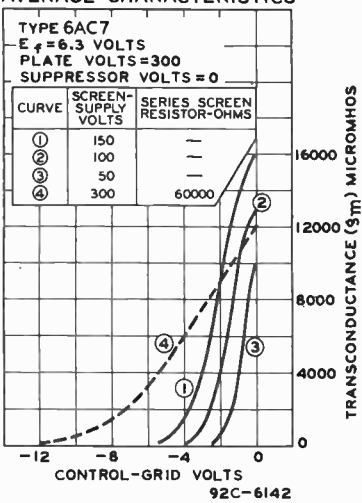
92C-6146R1

6AC7

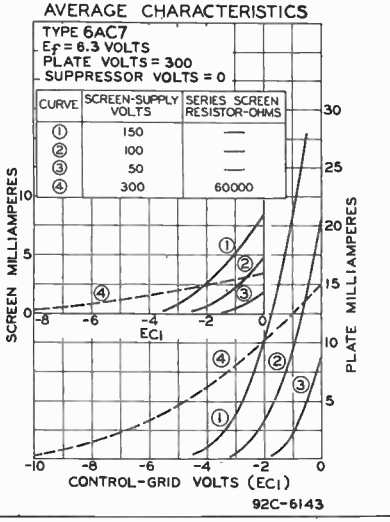
6AC7

TELEVISION AMPLIFIER PENTODE

AVERAGE CHARACTERISTICS



AVERAGE CHARACTERISTICS



6AD7-G

TRIODE–POWER AMPLIFIER PENTODE

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

BOTTOM VIEW (8AY)

TRIODE UNIT

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

PENTODE UNIT

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

PUSH-PULL AMPLIFIER ←

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

Plate Voltage	375 max.	volts

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

← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY INC.

6AD7-G

TRIODE–POWER AMPLIFIER PENTODE

(continued from preceding page)

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

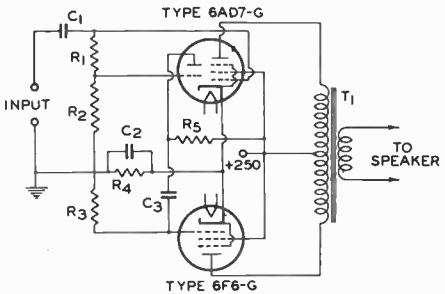
→ *Typical Operation with Cathode Bias – Class AB_1 Amplifier:*

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

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

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

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



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

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

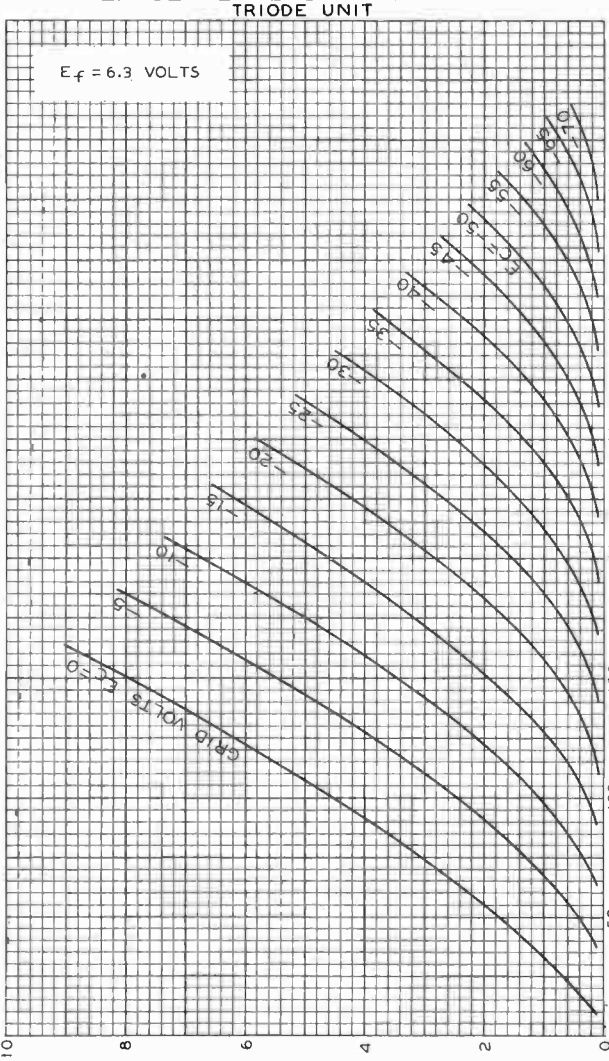
← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6AD7-G

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



APRIL 17, 1940

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-6153

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:

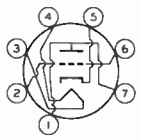
Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.225	amp
Direct Interelectrode Capacitance (Approx.):[a]		
Grid to plate	1.9	μμf
Grid to cathode and heater	2.2	μμf
Plate to cathode and heater	1.4	μμf
Heater to cathode	2.2[b]	μμf

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.

6AF4A

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.

6AF4-A
MEDIUM-MU TRIODE

MINIATURE TYPE

For UHF TV service

GENERAL DATA

Electrical:

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

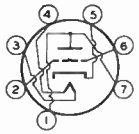
Characteristics - Class A_1 Amplifier:

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

Mechanical:

Mounting Position	Any
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/8" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base — Small-Button Miniature 7-Pin (JETEC No. E7-1)	
Basing Designation for BOTTOM VIEW	7DK

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



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

OSCILLATOR IN UHF TELEVISION RECEIVERS

Maximum Ratings, *Design-Center Values*:

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

▲, ♦: See next page.

6AF4-A

MEDIUM-MU TRIODE

Typical Operation as Oscillator at 950 Mc:

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

Maximum Circuit Values:

Grid-Circuit Resistance:

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

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

▲ The dc component must not exceed 25 volts.

OPERATING CONSIDERATIONS

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

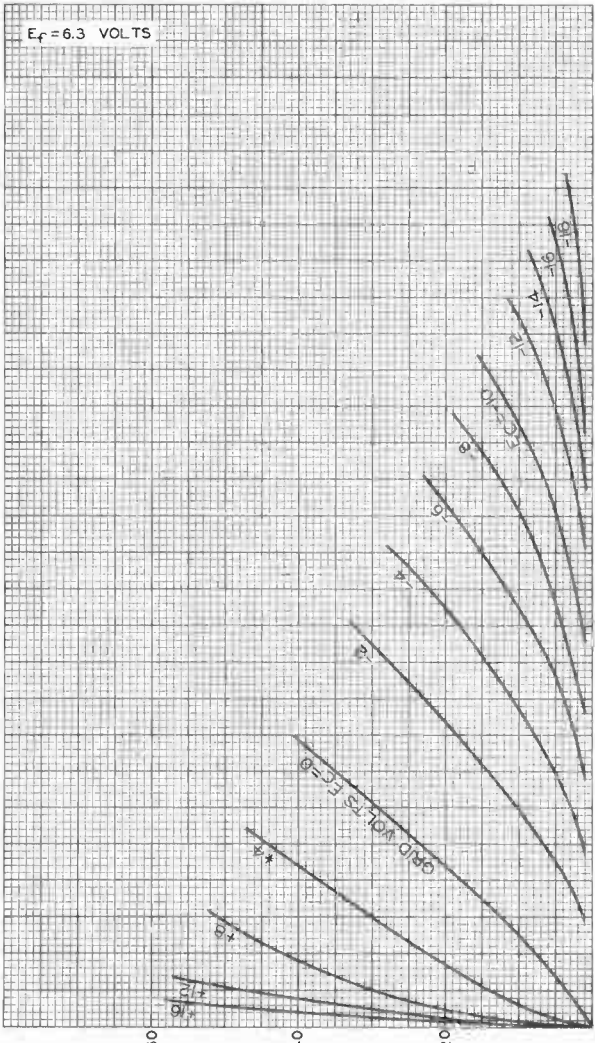
The *base pins* of the 6AF4-A fit the miniature 7-contact socket. The *socket* should be of the mica-filled, rubber, or ceramic type

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6AF4-A

AVERAGE PLATE CHARACTERISTICS



FEB. 20, 1952

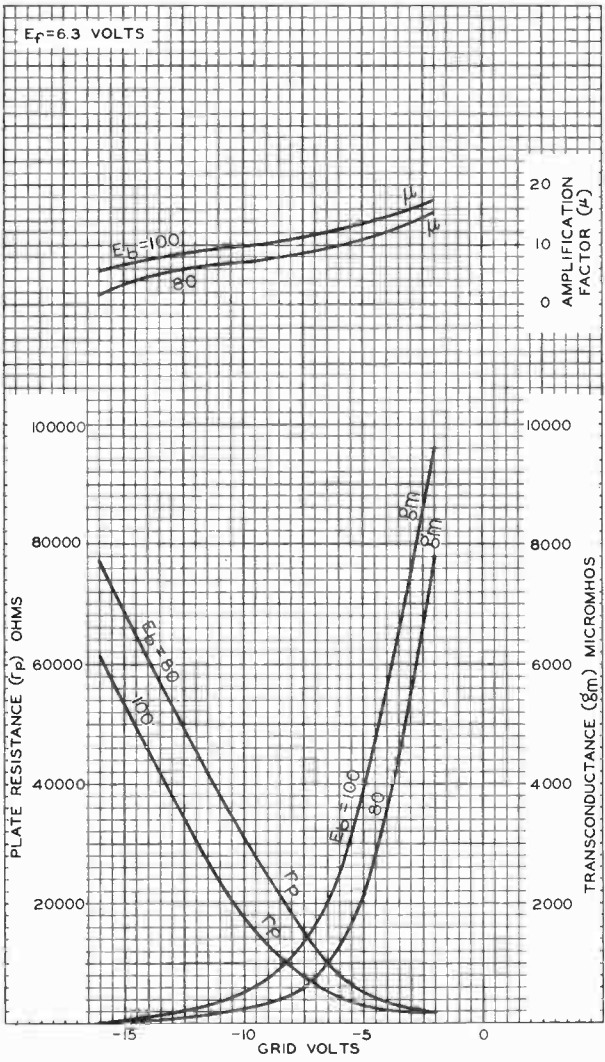
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7756

RCA

6AF4-A

AVERAGE CHARACTERISTICS



FEB. 26, 1952

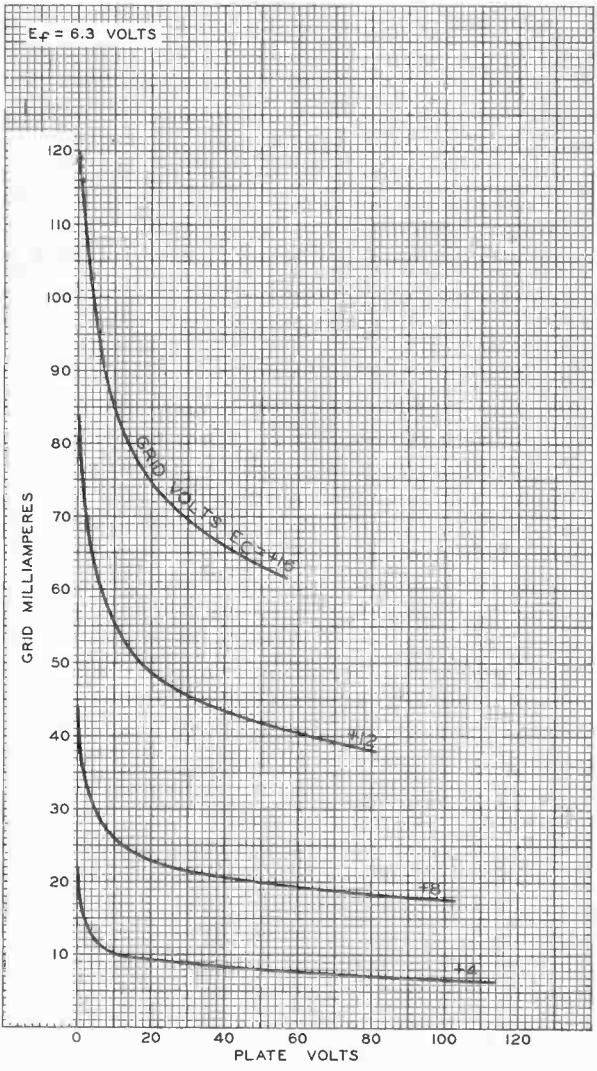
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7758

RCA

6AF4-A

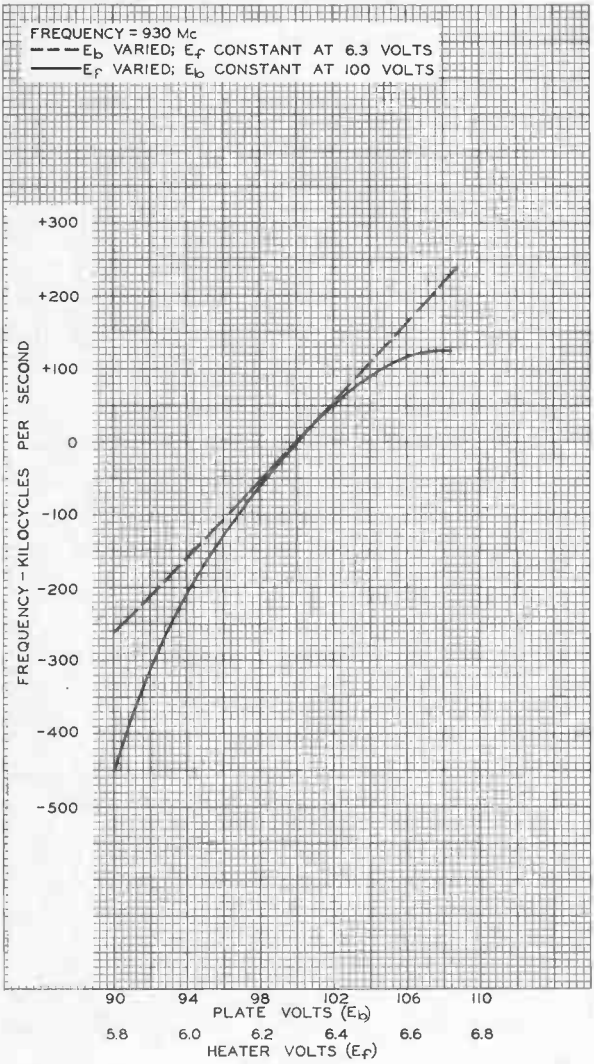
AVERAGE CHARACTERISTICS



RCA

6AF4-A

FREQUENCY SHIFT CHARACTERISTICS

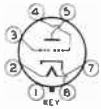


6AF6-G

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

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

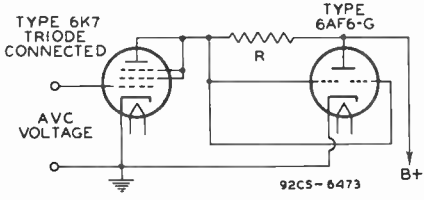
□ Designated R in circuit diagram below.

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

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

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

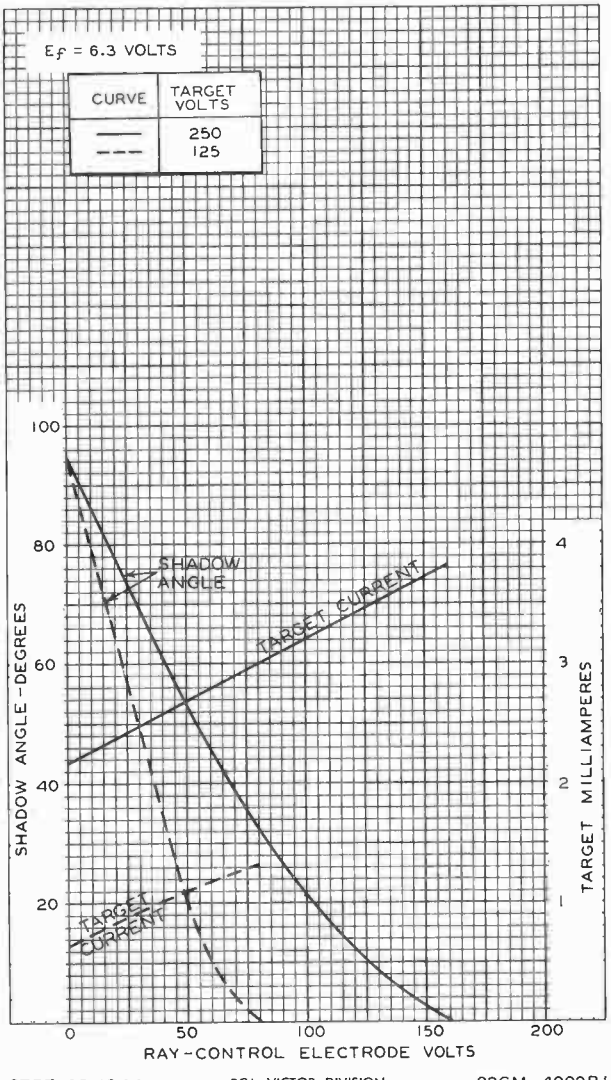
TYPICAL CIRCUIT USING TYPE 6AF6-G
WITH RAY-CONTROL ELECTRODES IN PARALLEL



 ← Indicates a change.

6AF6-G

AVERAGE CHARACTERISTICS



6AG5

SHARP-CUTOFF PENTODE

MINIATURE TYPE

Useful at Frequencies up to 400 Mc

GENERAL DATA

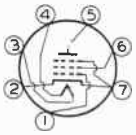
Electrical:

Heater, for Unipotential Cathode:			
Voltage	6.3		ac or dc volts
Current	0.3		amp
Direct Interelectrode Capacitances:	*Without Shield*	*With Shield°*	
Pentode Connection:			
Grid No.1 to plate	0.030 max.	0.020 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	6.5	6.6	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	1.8	3.1	μμf
Triode Connection, Grid No.2 tied to Plate:			
Grid No.1 to plate and grid No.2	2.5	2.5	μμf
Grid No.1 to cathode & grid No.3 & internal shield, and heater	3.6	3.6	μμf
Plate and grid No.2 to cathode & grid No.3 & internal shield, and heater	3	4.3	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	7BD

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



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

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

←Indicates a change.

6AG5

SHARP-CUTOFF PENTODE

AMPLIFIER - Class A_1

Pentode Connection

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300 max.	volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE	300 max.	volts
GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
PLATE DISSIPATION	2 max.	watts
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 150 volts	0.5 max.	watt
For grid-No.2 voltages between 150 and 300 volts	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Typical Operation and Characteristics:

Plate Voltage	100	125	250	volts
Grid-No.2 Voltage	100	125	150	volts
Cathode-Bias Resistor	180	100	180	ohms
Plate Resistance (Approx.)	0.6	0.5	0.8	megohm
Transconductance	4500	5100	5000	μmhos
Plate Current	4.5	7.2	6.5	ma
Grid-No.2 Current	1.4	2.1	2.0	ma
Grid-No.1 Voltage (Approx.) for plate current = 10 μamp	-5	-6	-8	volts

AMPLIFIER - Class A_1

Triode Connection - Grid No.2 Connected to Plate

Maximum Ratings, *Design-Center Values:*

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

Typical Operation and Characteristics:

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

→Indicates a change.

6AG5

6AG5

AVERAGE PLATE CHARACTERISTICS

DEC. 27, 1954

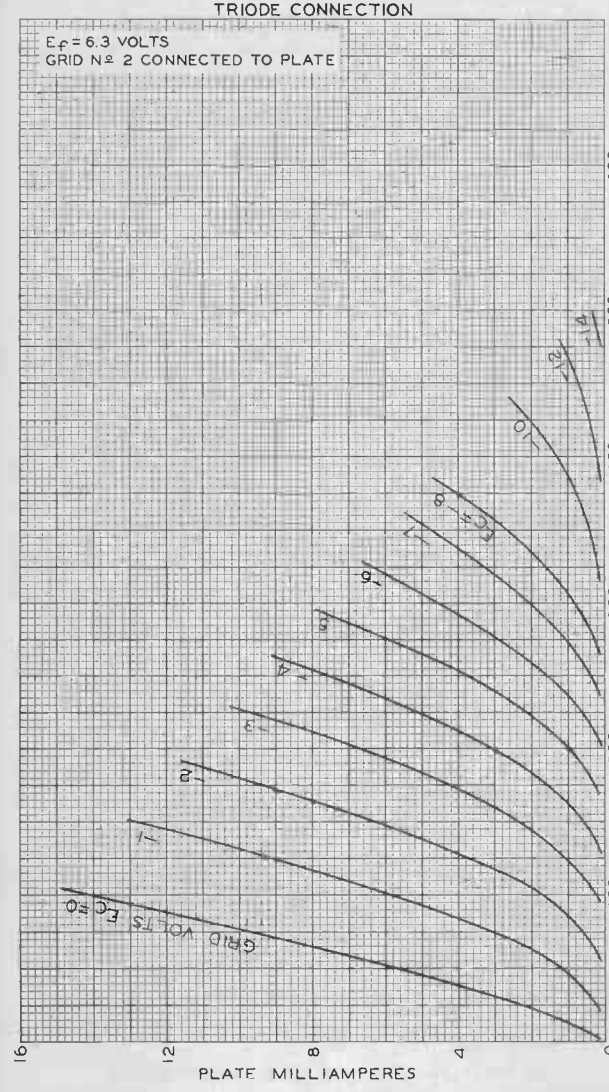
TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6399R2

RCA

6AG5
AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



6AG7

VIDEO POWER AMPLIFIER PENTODE

SINGLE-ENDED METAL TYPE

Heater *	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.65	amp.
Direct Interelectrode Capacitances: □		
Grid to Plate	0.06 max.	μμf
Input	13	μμf
Output	7.5	μμf
Grid to Screen	5.8 approx.	μμf
Grid to Cathode	5.2 approx.	μμf
Heater to Cathode	10.7 approx.	μμf
Maximum Overall Length		3-1/4"
Maximum Seated Height		2-11/16"
Maximum Diameter		1-5/16"
Bulb		Metal Shell, MT-8
Base		Small Wafer Octal 8-Pin
Pin 1 - Shell		Pin 5 - Cathode
Pin 2 - Heater		Pin 6 - Screen
Pin 3 - Interlead Shield		Pin 7 - Heater
Pin 4 - Grid		Pin 8 - Plate
Mounting Position	BOTTOM VIEW (8Y)	Vertical#

Maximum and Minimum Ratings Are Design-Center Values

AMPLIFIER

Plate Voltage	300 max.	volts
Screen Voltage	300 max.	volts
Grid Voltage	0 min.	volts
Plate Dissipation	9.0 max.	watts ←
Screen Dissipation	1.5 max.	watts ←
Typical Operation and Characteristics - Class A_1 Amplifier:		
Plate	300	volts
Screen	150	volts
Grid *	-3	volts
Peak A-F Grid	3	volts
Zero-Sig. Plate Cur.	30	ma.
Max.-Sig. Plate Cur.	30.5	ma.
Zero-Sig. Screen Cur.	7	ma.
Max.-Sig. Screen Cur.	9	ma.
Plate Res.	0.13	megohm
Transcond.	11000	μmhos
Load Res.	10000	ohms
Total Harmonic Distortion	7	%
Max-Sig. Power Output	3	watts

Typical Operation in 4 Mc Bandwith Video Voltage Amplifier (Class A_1):

	Grid-Leak Bias ▽	Cathode Bias	
Plate-Supply	300	300	volts
Screen	115 □ ▲	125 □□	volts
Grid	0	-2	volts

* The heater voltage should not deviate more than 10% from 6.3 volts. In circuits where the cathode is not connected directly to the heater, the potential difference between heater and cathode should be kept as low as possible.

□ With shell and interlead shield connected to cathode.

\# Horizontal operation permitted if pins #2 and #7 are in a vertical plane.

* When the grid circuit has a resistance not higher than 0.25 megohm, fixed bias may be used; for higher values cathode bias is required. With cathode bias, the grid circuit may have a resistance not to exceed 1.0 megohm.

▽ Intended for use where d-c restoration is accomplished in the grid circuit of the 6AG7.

▲ Zero-signal value.

□ Obtained from supply having good regulation.

□□ Obtained preferably from the 300-volt plate supply through a 25000-ohm series screen resistor.

← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6AG7

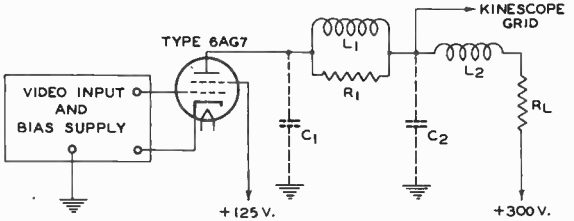
VIDEO POWER AMPLIFIER PENTODE

(continued from preceding page)

Grid Resistor	0.25–0.5	–	megohm
Cathode Resistor##	–	57	ohms
Interlead Shield	Connected to ground		
Grid Signal Swing (peak to peak)	4	4	volts
Zero-Sig. Plate Cur.	45	28	ma.
Zero-Sig. Screen Cur.	13	7	ma.
Load Resistance	3500	3500	ohms
Voltage Output(peak to peak)	135	140	volts

By-passed by 250 μf approx.

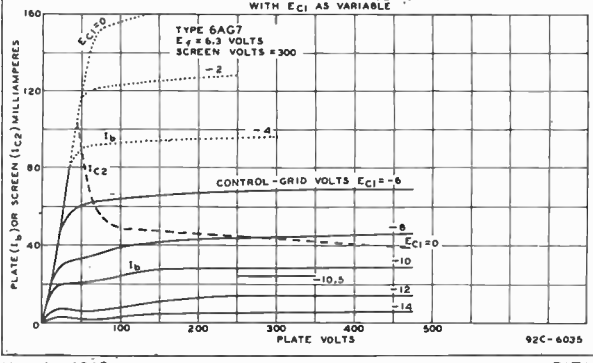
TYPICAL VIDEO VOLTAGE AMPLIFIER
HAVING BANDWIDTH OF 4 MEGACYCLES



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

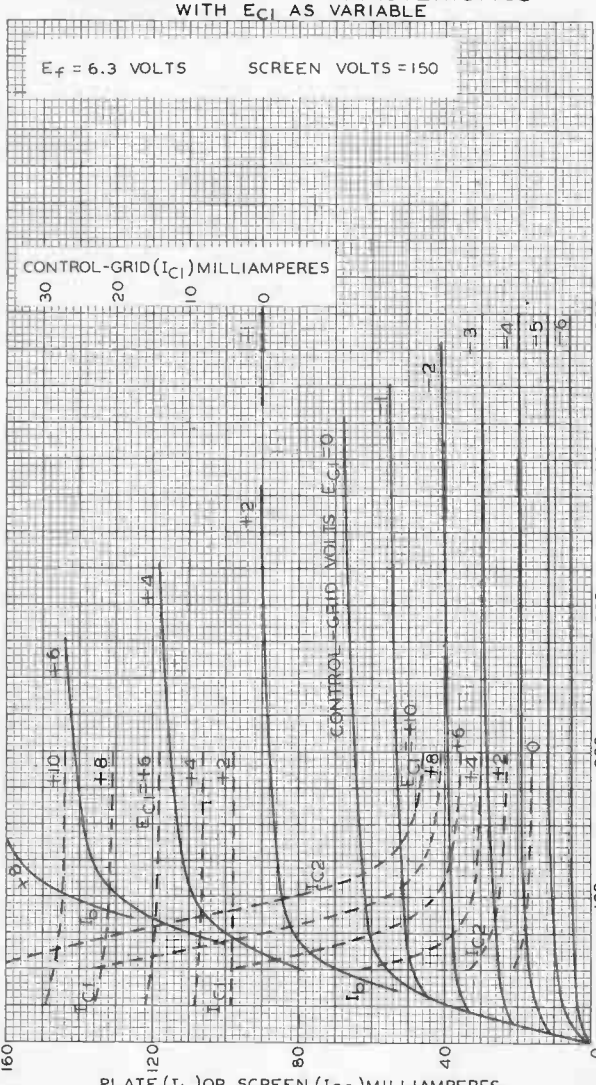
The license extended to the purchaser of tubes appears in the License Notice accompanying them. Information contained herein is furnished without assuming any obligations.

AVERAGE PLATE CHARACTERISTICS
WITH E_{C1} AS VARIABLE



RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

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

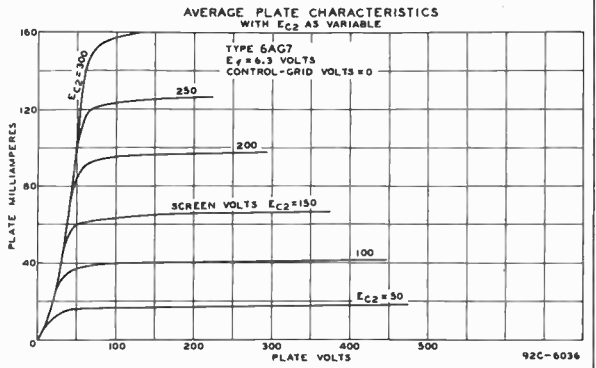


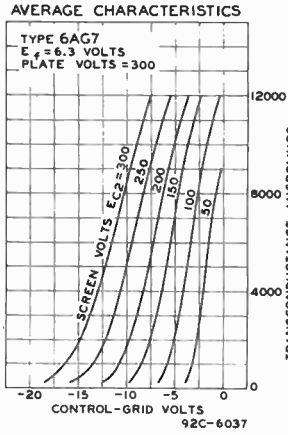
JAN. 19 1942
RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.
92C-6034RI

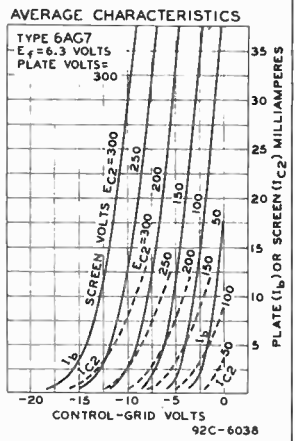
6AG7

6AG7

VIDEO POWER AMPLIFIER PENTODE







6AH4-GT

MEDIUM-MU TRIODE

GENERAL DATA

Electrical:

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

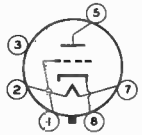
Characteristics, Amplifier Class A_1:

Plate Voltage	250	volts
Grid Voltage	-23	volts
Amplification Factor	8	
Plate Resistance	1780	ohms
Transconductance	4500	μmhos
Plate Current	30	ma
Grid Volts (Approx.) for plate current of 0.5 ma	-40	volts

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-5/16"
Maximum Seated Length	2-3/4"
Maximum Diameter	1-9/32"
Bulb	T-9
Base	Short Intermediate-Shell Octal 6-Pin (JETEC No.B6-60)
Basing Designation for BOTTOM VIEW	8EL

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



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

VERTICAL DEFLECTION AMPLIFIER

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

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

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

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

* The duration of the voltage pulse must not exceed 15% of one vertical scanning cycle. In a 525-line, 30-frame system, 15% of one vertical scanning cycle is 2.5 milliseconds.

♦ Under no circumstances should this absolute value be exceeded.

6AH4-GT

MEDIUM-MU TRIODE

CATHODE CURRENT:		
DC	180 max.	ma
Peak	60 max.	ma
PLATE DISSIPATION	7.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance	2.2 max.	megohms

▲ The dc component must not exceed 100 volts.

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*[c]	
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

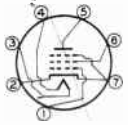
Characteristics, Class A_1 Amplifier:

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

With external shield JETEC No.316 connected to cathode.

→ Indicates a change.

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AK5

6AK5

SHARP-CUTOFF PENTODE

AMPLIFIER - Class A_1

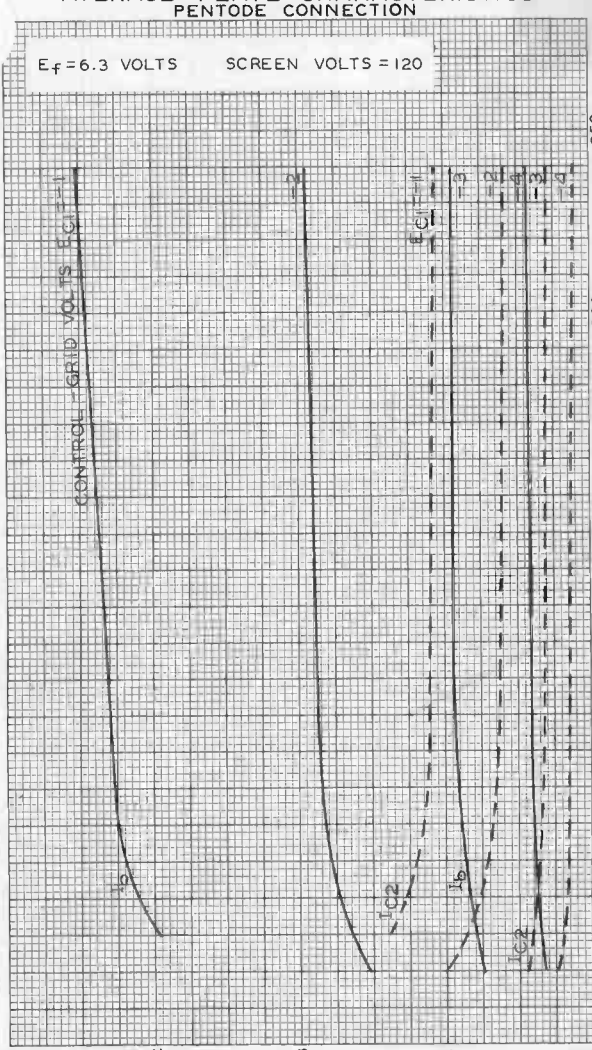
→ **Maximum Ratings,** *Design-Center Values:*

PLATE VOLTAGE	180 max.	volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE	180 max.	volts
GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
PLATE DISSIPATION	1.7 max.	watts
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 90 volts	0.5 max.	watt
For grid-No.2 voltages between 90 and 180 volts	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
CATHODE CURRENT	18 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	120 max.	volts
Heater positive with respect to cathode	120 max.	volts

→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AK5
AVERAGE PLATE CHARACTERISTICS
PENTODE CONNECTION

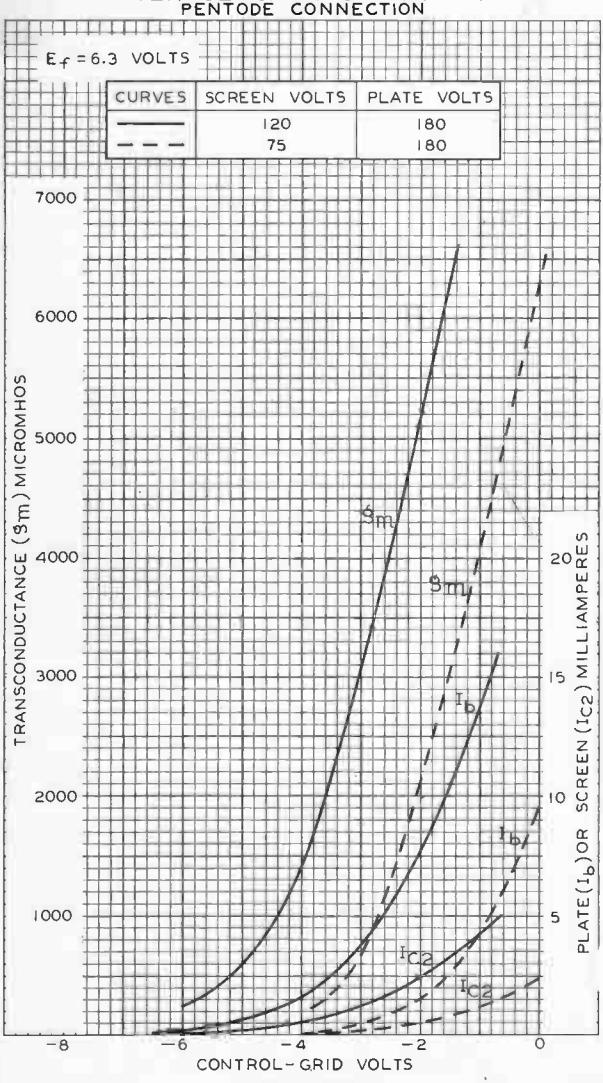


RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AK5

6AK5

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



FEB. 19, 1945

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

92CM-6505

6AK6

POWER AMPLIFIER PENTODE

MINIATURE TYPE

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

Maximum Ratings Are Design-Center Values

A-F AMPLIFIER

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

* With no external shield.

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

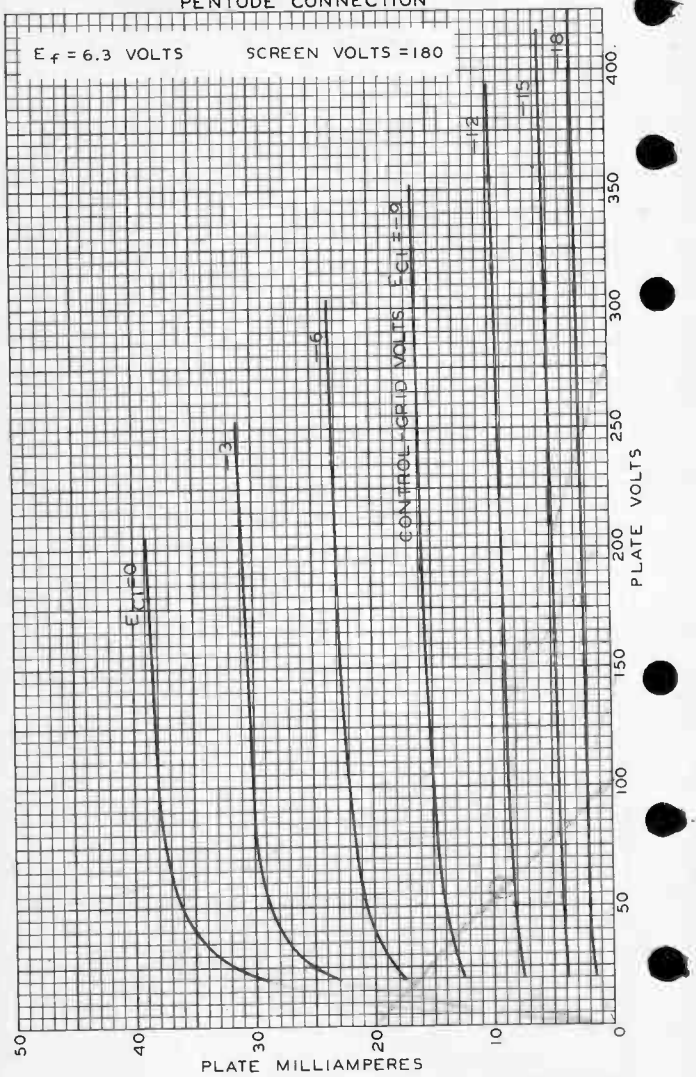
▲ *The center hole in sockets designed for this base provides for the possibility that this tube type may be manufactured with the exhaust-tube tip at the base end. For this reason, it is recommended that in equipment employing this tube type, no material be permitted to obstruct the socket hole.*

6AK6

6AK6

AVERAGE PLATE CHARACTERISTICS

PENTODE CONNECTION



AUG. 11, 1943

RCA VICTOR DIVISION

RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92C-6450

6AK6

AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION

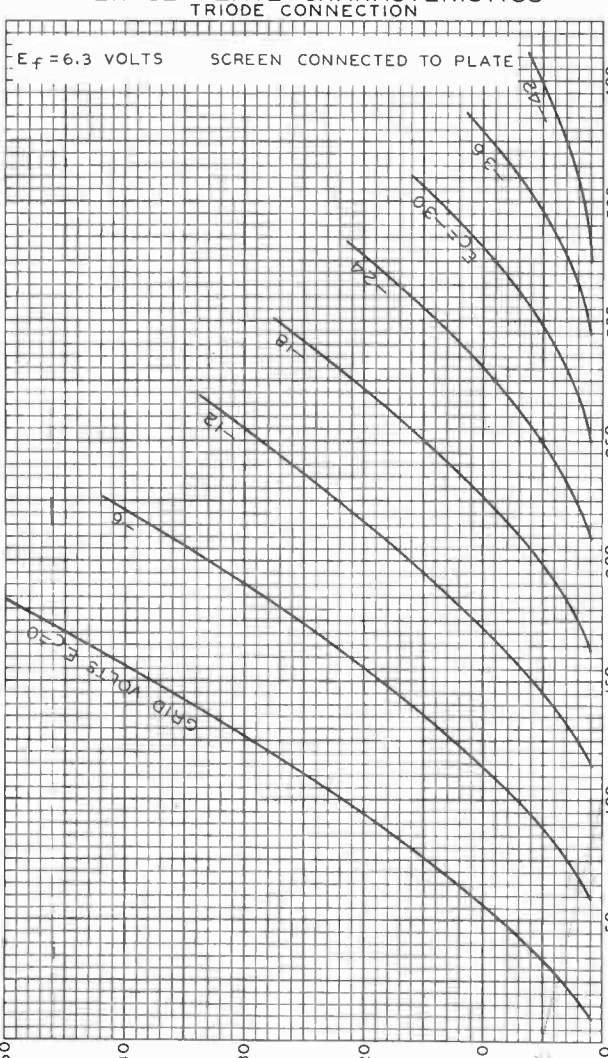


PLATE MILLIAMPERES

AUG. 11, 1943

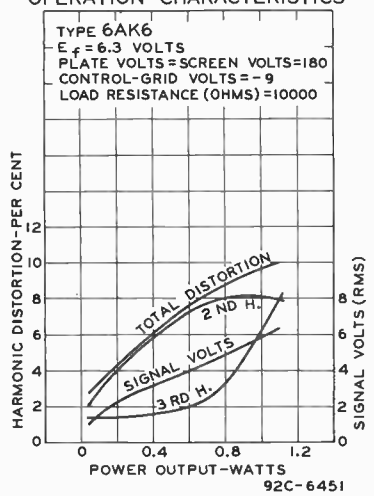
RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92C-6449

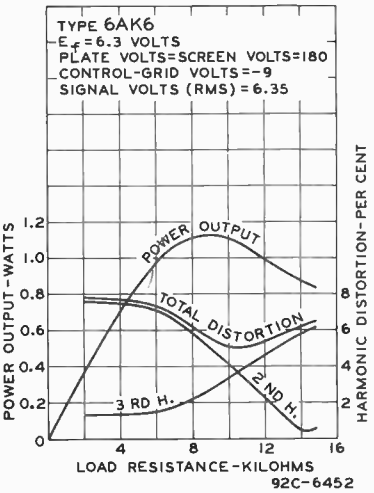
6AK6

POWER AMPLIFIER PENTODE

OPERATION CHARACTERISTICS



OPERATION CHARACTERISTICS



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

6AL5

TWIN DIODE

MINIATURE TYPE

GENERAL DATA

Electrical:

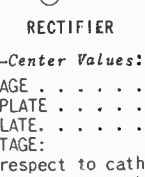
Heater, for Unipotential Cathodes:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances (Approx.):[o]		
Plate No. 1 to Cathode No. 1, Heater, and Internal Shield[*]	2.5	μμf
Plate No. 2 to Cathode No. 2, Heater, and Internal Shield[●]	2.5	μμf
Cathode No. 1 to Plate No. 1, Heater,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

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

Mechanical:

Mounting Position	Any
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/8" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	6BT

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



RECTIFIER

Maximum Ratings, *Design-Center Values*:

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

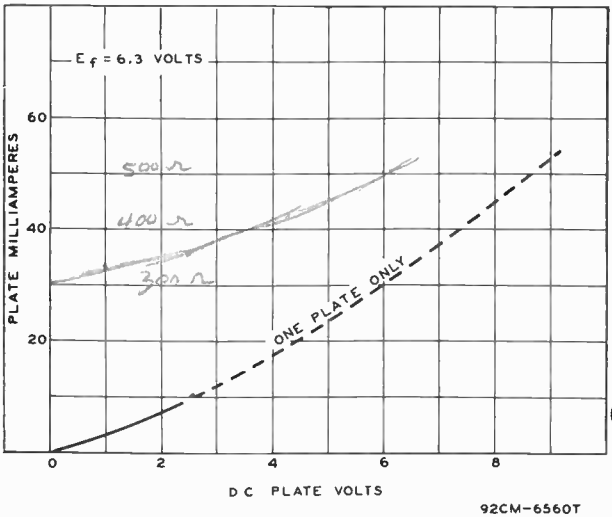
← Indicates a change.

6AL5

TWIN DIODE

Typical Operation as Half-Wave Rectifier:		
The Two Units May Be Used Separately or in Parallel		
AC Plate Voltage per Plate (RMS)	117	volts
Min. Total Effect. Plate-Supply Impedance per Plate	300	ohms
DC Output Current per Plate	9	ma

AVERAGE PLATE CHARACTERISTIC

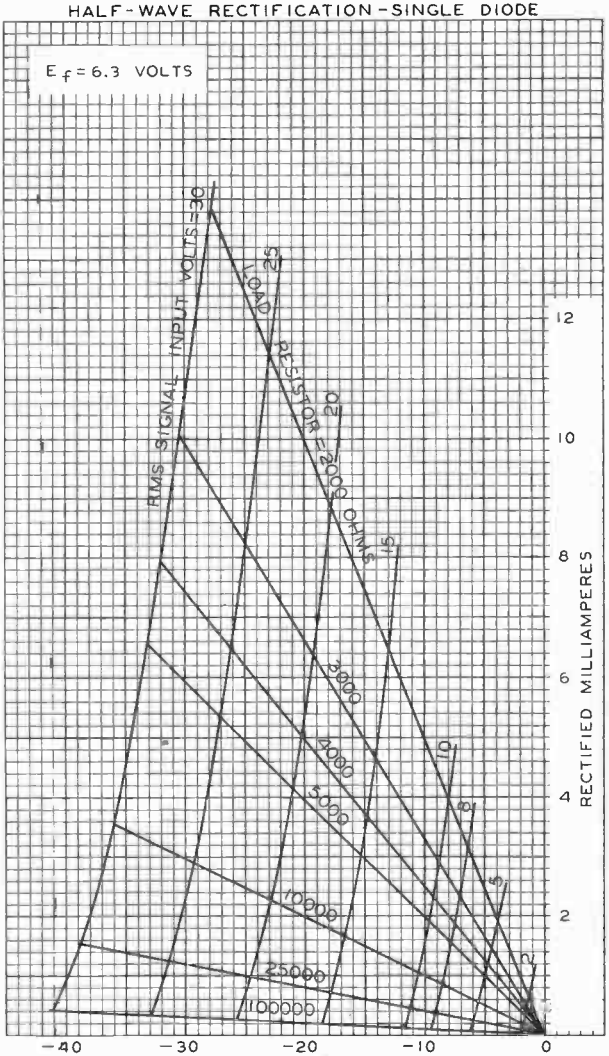


92CM-6560T

6AL5

AVERAGE CHARACTERISTICS

HALF-WAVE RECTIFICATION - SINGLE DIODE



JUNE 7, 1944 RCA VICTOR DIVISION 92CM-6561
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AL7-GT
ELECTRON-RAY TUBE

INDICATOR TYPE

GENERAL DATA

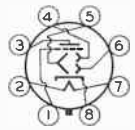
Electrical:

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

Mechanical:

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

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



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

INDICATOR SERVICE

Maximum Ratings, *Design-Center Values*:

TARGET VOLTAGE	365 max. 220 min.	volts volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Typical Operation and Characteristics:

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

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

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

6AL7-GT
ELECTRON-RAY TUBE

PATTERN SEQUENCE DURING TUNING

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

FEB. 2, 1949

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CS-7171

6AL7-GT
ELECTRON-RAY TUBE

TYPICAL CIRCUITS

FIG. 1

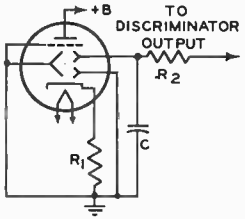


FIG. 2

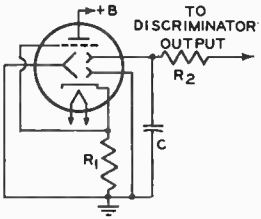


FIG. 3

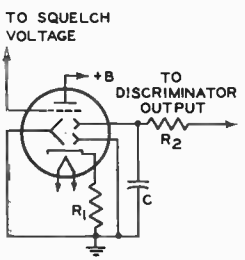


FIG. 4

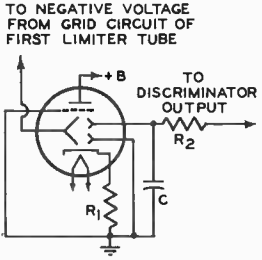
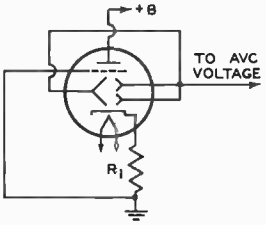


FIG. 5



+B = 315 VOLTS APPROX.
C = 0.05 μf

R1 = 3300 OHMS
R2 = 1.0 MEGOHM

92CS-7169

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AM4

HIGH-MU TRIODE

9-PIN MINIATURE TYPE

For use as mixer and rf amplifier in cathode-drive circuits of UHF TV tuners

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.225	amp

Direct Interelectrode Capacitances (Approx.):

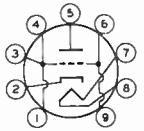
	Without External Shield	*With External Shield°*	
Plate to cathode	0.16	0.16	μμf
Cathode to grid and heater	4.4	4.6	μμf
Plate to grid and heater	2.4	2.8	μμf
Heater to cathode	1.8	1.8	μμf

Characteristics, Class A_1 Amplifier:

Plate-Supply Voltage	200	volts
Cathode Resistor#	100	ohms
Amplification Factor	85	
Plate Resistance (Approx.)	8700	ohms
Transconductance	9800	μmhos
Plate Current	10	ma
Grid Voltage (Approx.) for plate current of 10 μa	-6.5	volts

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"
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	9BX



Pin 1 - Grid
Pin 2 - Cathode
Pin 3 - Grid
Pin 4 - Grid
Pin 5 - Plate
Pin 6 - Grid
Pin 7 - Heater
Pin 8 - Heater
Pin 9 - Grid

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Center Values.*

PLATE VOLTAGE	200 max.	volts
GRID VOLTAGE:		
Positive bias value	0 max.	volts

°,#: See next page.

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

TENTATIVE DATA

6AM4

HIGH-MU TRIODE

PLATE DISSIPATION.	2 max.	watts
PEAK HEATER–CATHODE VOLTAGE:		
Heater negative with respect to cathode.	80■ max.	volts
Heater positive with respect to cathode.	80 max.	volts

o With external shield JETEC No.315 connected to grid.

\# Fixed-bias operation is not recommended.

■ Under cutoff conditions in cascode-type circuits with direct-coupled drive, it is permissible for this voltage to be as high as 250 volts.

OPERATING CONSIDERATIONS

When the 6AM4 is used in cathode-drive operation at high frequencies, all 5 grid terminals should be connected to ground to minimize the effects of grid-lead inductance.

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

6AM8

DIODE—SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage	6.3	ac or dc volts
Current	0.45	amp

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield**	
Diode Unit:			
Plate to cathode, internal shield, and heater	1.7	2.3	μμf
Cathode to plate, internal shield, and heater	4	4	μμf
Pentode Unit:			
Grid No.1 to plate	0.015 max.	0.015 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	6	6	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	2.6	3.4	μμf
Pentode grid No.1 to diode plate	0.006 max.	0.005 max.	μμf
Pentode plate to diode cathode	0.15 max.	0.15 max.	μμf
Pentode plate to diode plate	0.1 max.	0.035 max.	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ±3/32"
Maximum Diameter	7/8"
Bulb	T-6-1/2
Base	Small-Button Noval 9-Pin (JETEC No.E1-9)
Basing Designation for BOTTOM VIEW	9CY

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

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

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

6AM8

6AM8

DIODE—SHARP-CUTOFF PENTODE

PENTODE UNIT - Class A_1 Amplifier

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	300	max.	volts
GRID-No.3 (SUPPRESSOR) VOLTAGE	0	max.	volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE	300	max.	volts
GRID-No.2 VOLTAGE. . . . . *See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*			
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive bias value	0	max.	volts
PLATE DISSIPATION	2.8	max.	watts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts	0.5	max.	watt
For grid-No.2 voltages between 150 and 300 volts. . . . . *See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*			
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts

Typical Operation and Characteristics:

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

Maximum Circuit Values:

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

DIODE UNIT

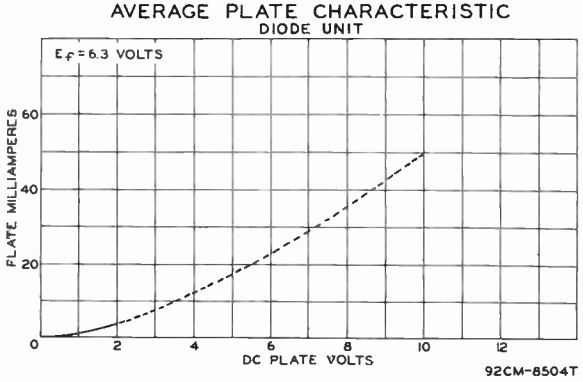
Maximum Ratings, *Design-Center Values*:

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

▲ The dc component must not exceed 100 volts.

6AM8

DIODE–SHARP-CUTOFF PENTODE



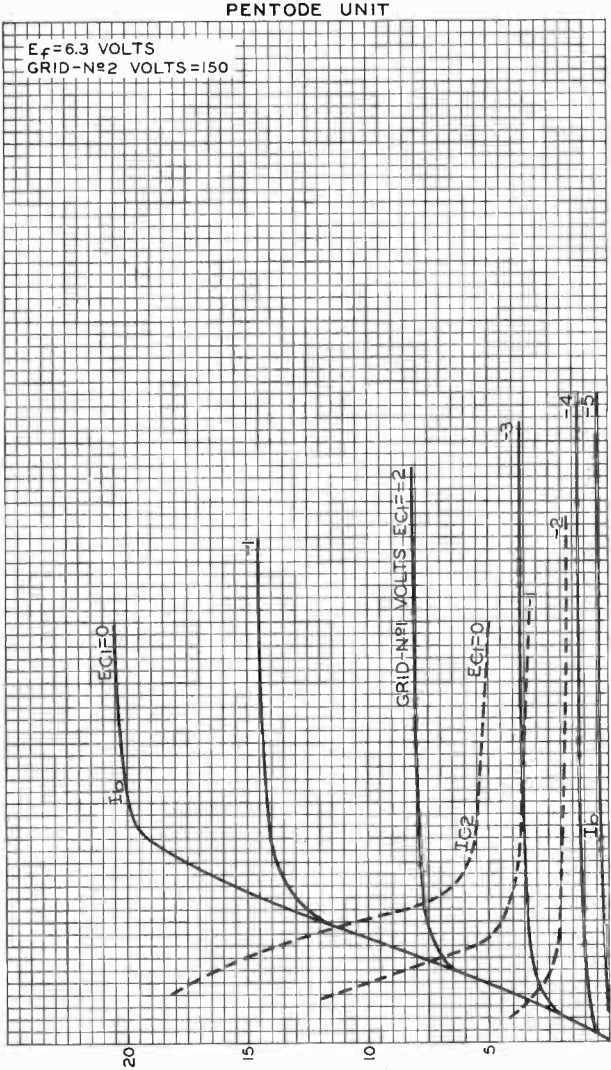
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AM8

RCA

6AM8

AVERAGE PLATE CHARACTERISTICS
PENTODE UNIT



JAN. 14, 1954

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8505

6AM8-A

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	0.45	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°*	
Diode Unit:			
Plate to cathode, internal shield, and heater	1.7	2.3	μμf
Cathode to plate, internal shield, and heater	3	3	μμf
Pentode Unit:			
Grid No.1 to plate	0.015 max.	0.015 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	6	6	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	2.6	3.4	μμf
Pentode grid No.1 to diode plate	0.006 max.	0.005 max.	μμf
Pentode plate to diode cathode	0.15 max.	0.15 max.	μμf
Pentode plate to diode plate	0.1 max.	0.035 max.	μμf

Mechanical:

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

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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AM8-A

DIODE—SHARP-CUTOFF PENTODE

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-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:			
Positive bias value	0	max.	volts
PLATE DISSIPATION	2.8	max.	watts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts	0.5	max.	watt
For grid-No.2 voltages between 150 and 300 volts	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*		
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts

Typical Operation and Characteristics:

Plate-Supply Voltage	200	volts
Grid No.3	*Connected to cathode at socket*	
Grid-No.2 Supply Voltage	150	volts
Cathode Resistor	120	ohms
Plate Resistance (Approx.)	0.6	megohm
Transconductance	7000	μmhos
Plate Current	11.5	ma
Grid-No.2 Current	2.7	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp	-8	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

DIODE UNIT

Maximum Ratings, *Design-Center Values:*

DC PLATE CURRENT	5	max.	ma

▲: See next page.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AM8-A

DIODE—SHARP-CUTOFF PENTODE

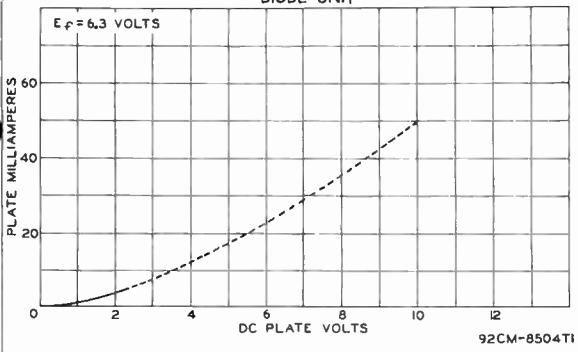
PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200▲ max.	volts

▲ The dc component must not exceed 100 volts.

AVERAGE PLATE CHARACTERISTICS

DIODE UNIT



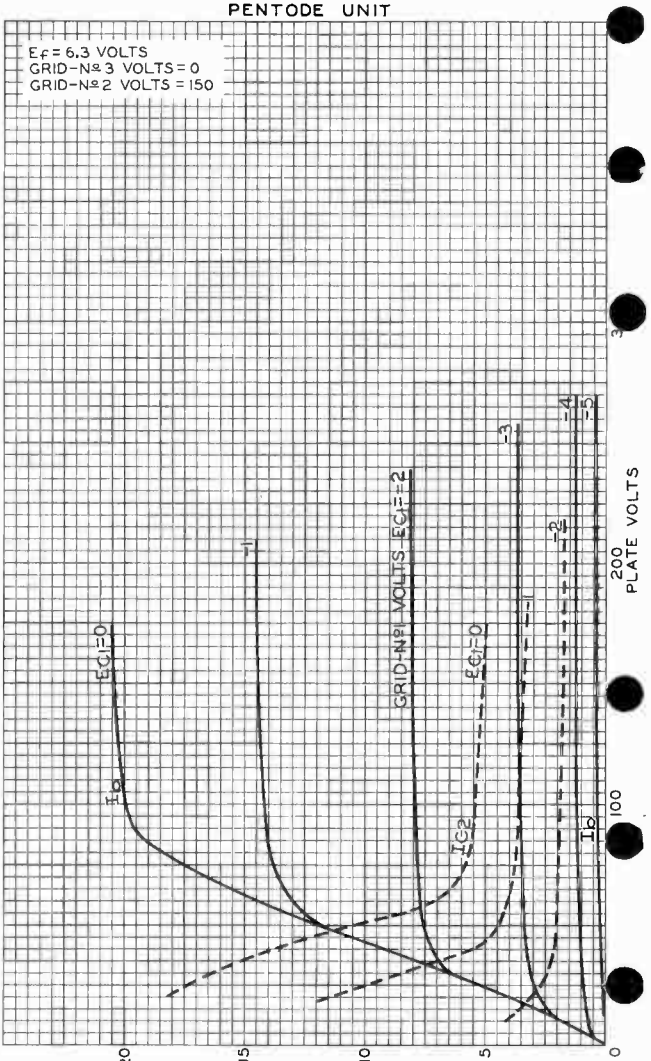
92CM-8504TI

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6AM8-A

AVERAGE CHARACTERISTICS
PENTODE UNIT



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8505

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°*	
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

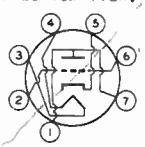
Characteristics, Class A_1 Amplifier:

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

RCA

6AN8

MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage	6.3	ac or dc volts
Current	0.45	amp
Direct Interelectrode Capacitances:[o]		
Triode Unit:		
Grid to plate	1.5	μμf
Grid to cathode and heater	2	μμf
Plate to cathode and heater	0.27	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	2.3	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 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 current of 10 μa	-19	-8	volts

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 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)

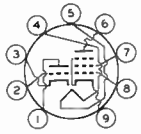
[o] Without external shield.

6AN8

MEDIUM-MU TRIODE—SHARP-CUTOFF PENTODE

→ 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-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.	2.6	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

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.

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

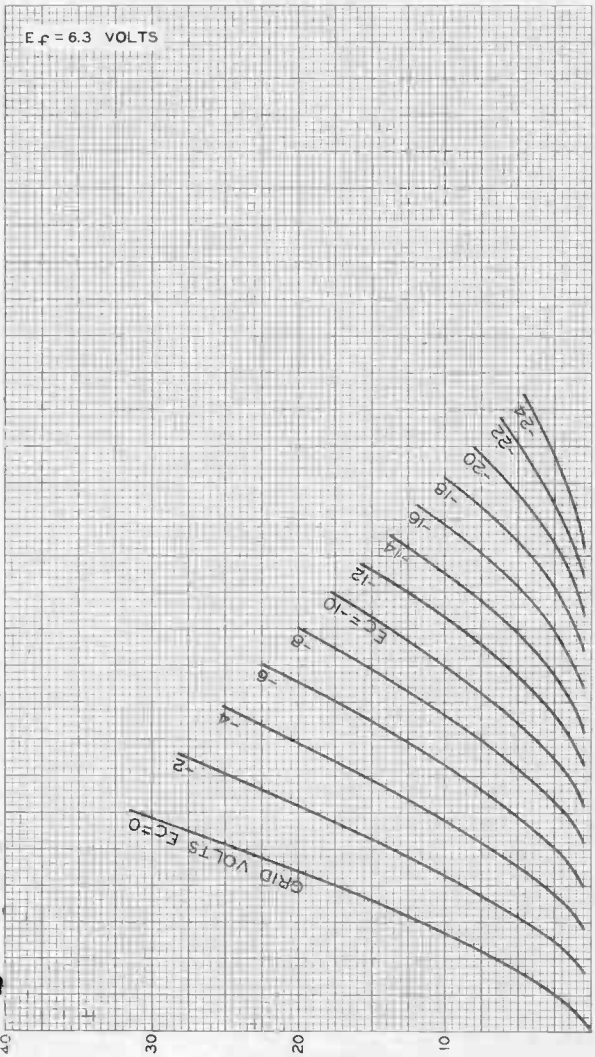
→ Indicates a change.

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

6AN8

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



DEC. 23, 1953

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

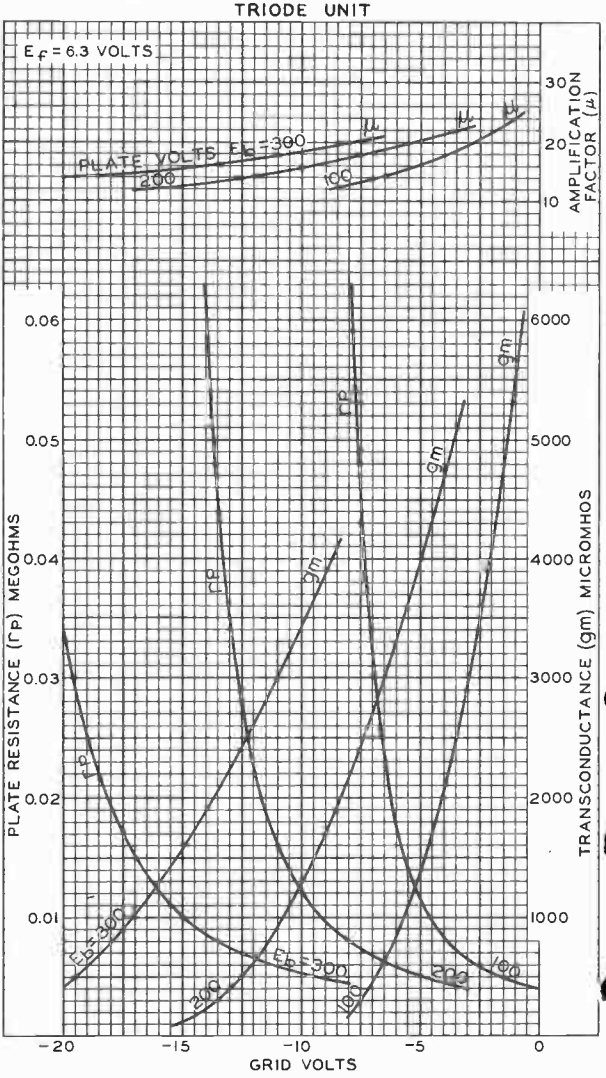
92CM-8209

RCA

6AN8

AVERAGE CHARACTERISTICS

TRIODE UNIT



DEC. 23, 1953 TUBE DEPARTMENT 92CM-8207
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6AN8

AVERAGE PLATE CHARACTERISTICS

PENTODE UNIT

DEC. 23, 1953

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

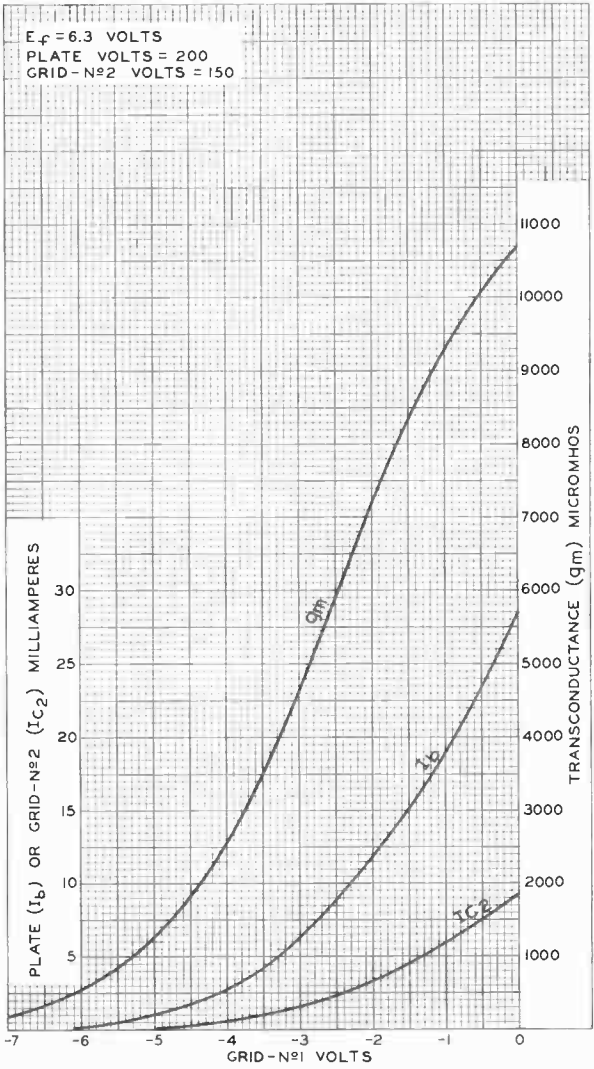
92CM-8206

RCA

6AN8

AVERAGE CHARACTERISTICS

PENTODE UNIT



6AQ5
BEAM POWER AMPLIFIER

MINIATURE TYPE

GENERAL DATA

Electrical:

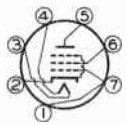
Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.45	amp
Direct Interelectrode Capacitances (Approx.):**		
Grid No.1 to Plate	0.35	μμf
Input	8.3	μμf
Output	8.2	μμf

** With no external shield.

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length from Base Seat to Bulb Top (Excluding tip)	2" ±3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	7BZ

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



Pin 4 - Heater
Pin 5 - Plate
Pin 6 - Grid No.2
Pin 7 - Grid No.1

AF POWER AMPLIFIER - Class A1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	250 max.	volts
GRID-No.2 VOLTAGE	250 max.	volts
PLATE DISSIPATION	12 max.	watts
GRID-No.2 INPUT	2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts
BULB TEMPERATURE (At hottest point)*	250 max.	°C ←

Typical Operation and Characteristics:

Plate Voltage	180	250	volts
Grid-No.2 (Screen) Voltage	180	250	volts
Grid-No.1 (Control-Grid) Voltage	-8.5	-12.5	volts
Peak AF Grid-No.1 Voltage	8.5	12.5	volts

* High ambient temperature and shielding may necessitate a reduction in operating dissipation. When tube shields are used, it is advisable to paint the inside and outside surfaces of the tube shield a dull black and to provide ventilation slots to reduce operating temperature.

← Indicates a change

6AQ5

BEAM POWER AMPLIFIER

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

Maximum Circuit Values (for maximum rated conditions):

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

AF POWER AMPLIFIER - Class AB_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	250 max.	volts
GRID-No.2 VOLTAGE	250 max.	volts
PLATE DISSIPATION	12 max.	watts
GRID-No.2 DISSIPATION	2 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts
→ BULB TEMPERATURE (At hottest point)●	250 max.	°C

Typical Operation and Characteristics:

Unless otherwise specified, values are for 2 tubes

Plate Voltage	250	volts
Grid-No.2 (Screen) Voltage	250	volts
Grid-No.1 (Control-Grid) Voltage	-15	volts
Peak AF Grid-to-Grid Voltage	30	volts
Zero-Signal Plate Current	70	ma.
Max.-Signal Plate Current	79	ma.
Zero-Signal Grid-No.2 Current	5	ma.
Max.-Signal Grid-No.2 Current	13	ma.
Plate Resistance (per tube)	60000	ohms
Transconductance (per tube)	3750	μmhos
Effective Load Resistance (Plate to plate)	10000	ohms
Total Harmonic Distortion	5	%
Max.-Signal Power Output	10	watts

Maximum Circuit Values (for maximum rated conditions):

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

Curves for the 6AQ5, within its ratings, are the same as those shown for type 6V6.

● See preceding page.

→ Indicates a change

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AQ5-A

BEAM POWER TUBE

7-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

GENERAL DATA

Electrical:

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

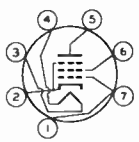
For definition of heater warm-up time and method of determining it, see sheet HEATER WARM-UP TIME MEASUREMENT at front of this Section.

Direct Interelectrode Capacitances (Approx.):[o]		
Grid No.1 to plate	0.35	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	8.3	μμf
Plate to cathode & grid No.3, grid No.2, and heater	8.2	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.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] without external shield.

▲: See next page.

RCA

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

▲ The dc component must not exceed 100 volts.

†: See next page.

TUBE DIVISION
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

† 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.

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

6AQ6

DUPLEX-DIODE HIGH-MU TRIODE

MINIATURE TYPE

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

BOTTOM VIEW (7BT)

Maximum Ratings Are Design-Center Values

TRIODE UNIT

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

Typical Operation with Resistance Coupling:
Same as for Type 6T7-G in RESISTANCE-COUPLED AMPLIFIER CHART.

DIODE UNITS – Two

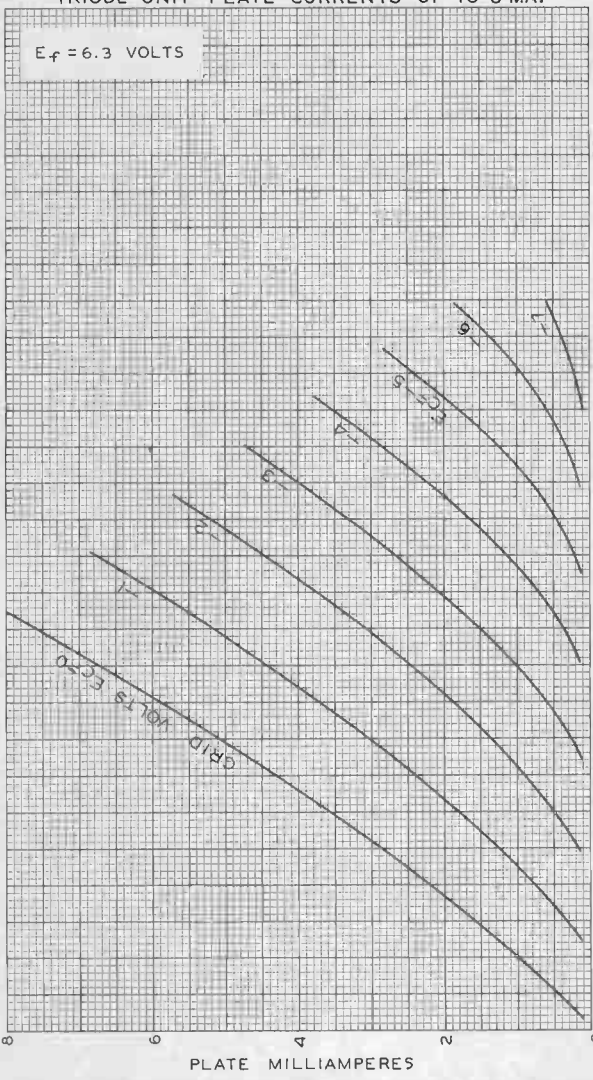
For consideration of these units, see Type 6ST7.

° With close-fitting shield connected to cathode.

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

6AQ6

6AQ6
AVERAGE PLATE CHARACTERISTICS
TRIODE UNIT—PLATE CURRENTS UP TO 8 MA.

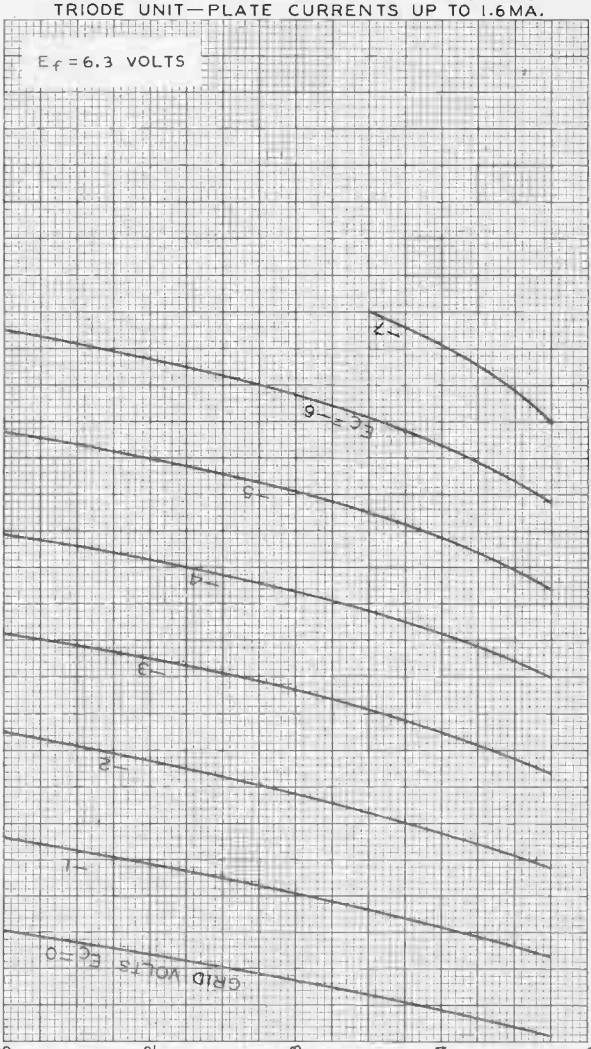


APR. 7, 1944

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

92CM-6551

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



APR. 8, 1944
RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM—6552

6AQ7-GT
TWIN DIODE—HIGH-MU TRIODE

GENERAL DATA

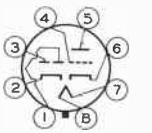
Electrical:

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

[o] With external shield No.308 connected to Pin No.6.
[*] With external shield No.308 connected to Pin No.2.

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-5/16"
Maximum Seated Length	2-3/4"
Maximum Diameter	1-9/32"
Bulb	T-9
Base	Intermediate-Shell Octal 8-Pin
Basing Designation for BOTTOM VIEW	8CK



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

TRIODE UNIT
AMPLIFIER - Class A$_1$

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	250 max.	volts
GRID VOLTAGE:		
Positive bias value	0 max.	volts
PLATE DISSIPATION	1 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Typical Operation and Characteristics:

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

6AQ7-GT
TWIN DIODE—HIGH-MU TRIODE

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

Typical Operation as Resistance-Coupled Amplifier:

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

DIODE UNITS - Two

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

PLATE CURRENT (For Each Diode)	0.9 max.	ma

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

High-Mu Twin Triode

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:			
Voltage (AC or DC)	6.3		volts
Current	0.435		amp
Direct interelectrode Capacitances:[a]			
Grid to plate (Each unit)	1.5		μμf
Cathode to plate (Each unit)	0.18		μμf
Grid to cathode, internal shield, and heater (Each unit)	3		μμf
Plate to cathode, internal shield, and heater (Each unit)	1.2		μμf
Plate to cathode, internal shield, and heater (Each unit)	1.9[b]		μμf
Plate of unit No.1 to plate of unit No.2	0.04	max.	μμf
Plate of unit No.1 to plate of unit No.2	0.008[b]	max.	μμf
Grid of unit No.1 to grid of unit No.2.	0.003	max.	μμf
Plate of unit No.1 to grid of unit No.2.	0.008	max.	μμf
Plate of unit No.2 to grid of unit No.1.	0.008	max.	μμf
Plate of unit No.1 to cathode of unit No.2	0.008	max.	μμf
Plate of unit No.2 to cathode of unit No.1	0.008	max.	μμf
Grid of unit No.1 to cathode of unit No.2	0.003	max.	μμf
Grid of unit No.2 to cathode of unit No.1	0.003	max.	μμf

Characteristics, Class A_1 Amplifier (Each Unit):

Plate Voltage	250	volts
Grid Voltage	-2.3	volts
Amplification Factor	57	
Plate Resistance (Approx.)	9700	ohms
Transconductance	5900	μmhos
Plate Current	10	ma

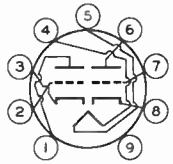
Mechanical:

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)

6AQ8

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

Values are for Each Unit

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

PLATE VOLTAGE with plate current = 0.	550 max.	volts
PLATE VOLTAGE	300 max.	volts
GRID VOLTAGE:		
Negative-bias value	100 max.	volts
CATHODE CURRENT	15 max.	ma
PLATE DISSIPATION:		
Either plate.	2.5 max.	watts
Both plates (Both units operating).	4.5 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:

As radio-frequency amplifier

Plate Supply Voltage.	250	volts
Plate Voltage	230	volts
Plate Resistor.	1800	ohms
Grid Voltage.	−2	volts
Cathode Resistor.	200	ohms
Plate Resistance (Approx.).	9700	ohms
Transconductance.	6000	μmhos
Plate Current	10	ma
Input Resistance at frequency (Mc) = 100. . . .	6000	ohms
Equivalent Noise Resistance	500	ohms

As converter

Plate Supply Voltage.	250	volts
Plate Resistor.	12000	ohms
Grid Resistor	1	megohm
RMS Oscillator Voltage.	3	volts
Plate Resistance (Approx.).	22000	ohms
Conversion Transconductance	2300	μmhos
Input Resistance at frequency (Mc) = 100. . . .	15000	ohms
Plate Current	5.2	ma

Maximum Circuit Values:

Grid-Circuit Resistance	1 max.	megohm
Resistance between Cathode and Heater . .	20000 max.	ohms

[a] Without external shield except as noted.
[b] With special external shield having an inside diameter of 0.886".

6AR5

POWER PENTODE

MINIATURE TYPE

GENERAL DATA

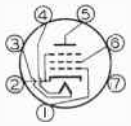
Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.4	amp

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (excluding tip)	2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin
Basing Designation for BOTTOM VIEW	6CC

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



Pin 5 – Plate
Pin 6 – Grid No.2
Pin 7 – No Connection

AF POWER AMPLIFIER – Class A_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	250 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	250 max.	volts
PLATE DISSIPATION	8.5 max.	watts
GRID-No.2 DISSIPATION	2.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Typical Operation and Characteristics:

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

(continued on next page)

6AR5
POWER PENTODE

Maximum Circuit Values (for maximum rated conditions):

Grid-No.1-Circuit Resistance:

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

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

6AS5
BEAM POWER AMPLIFIER

MINIATURE TYPE

GENERAL DATA

Electrical:

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

[o] With no external shield.

Mechanical:

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

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

Pin 4 - Heater
Pin 5 - Grid No.1
Pin 6 - Grid No.2
Pin 7 - Plate

AF POWER AMPLIFIER - Class A_1

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

PLATE VOLTAGE	150 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	117 max.	volts
PLATE DISSIPATION	5.5 max.	watts
GRID-No.2 DISSIPATION	1 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Typical Operation and Characteristics:

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

RCA

6AS5
BEAM POWER AMPLIFIER

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

Maximum Circuit Values (for maximum rated conditions):

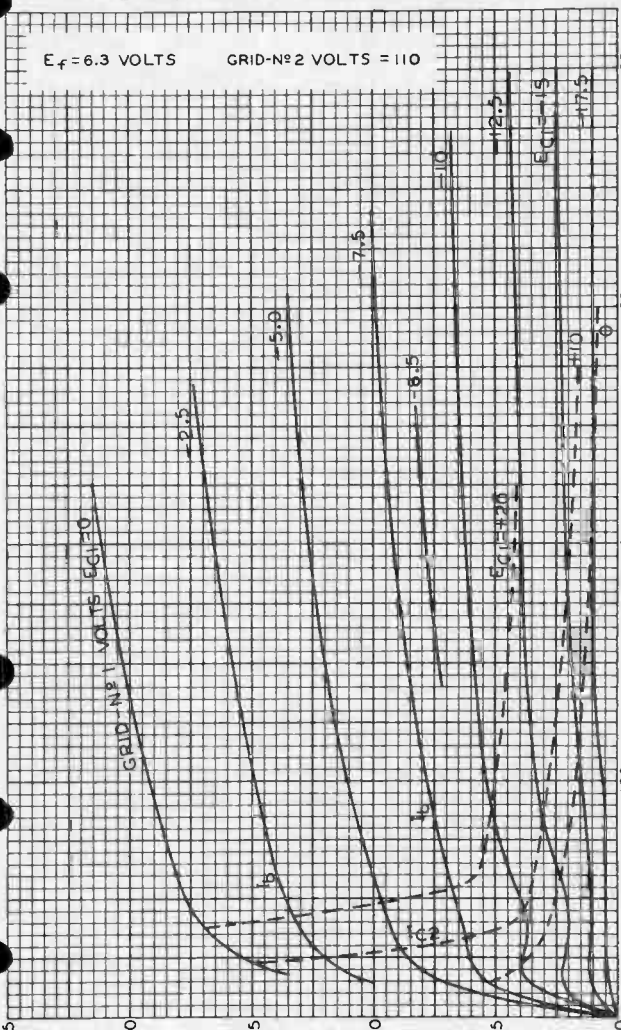
Grid-No.1-Circuit Resistance:		
For fixed bias	0.1 . .	megohm
For cathode bias	0.5 . .	megohm

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6AS5

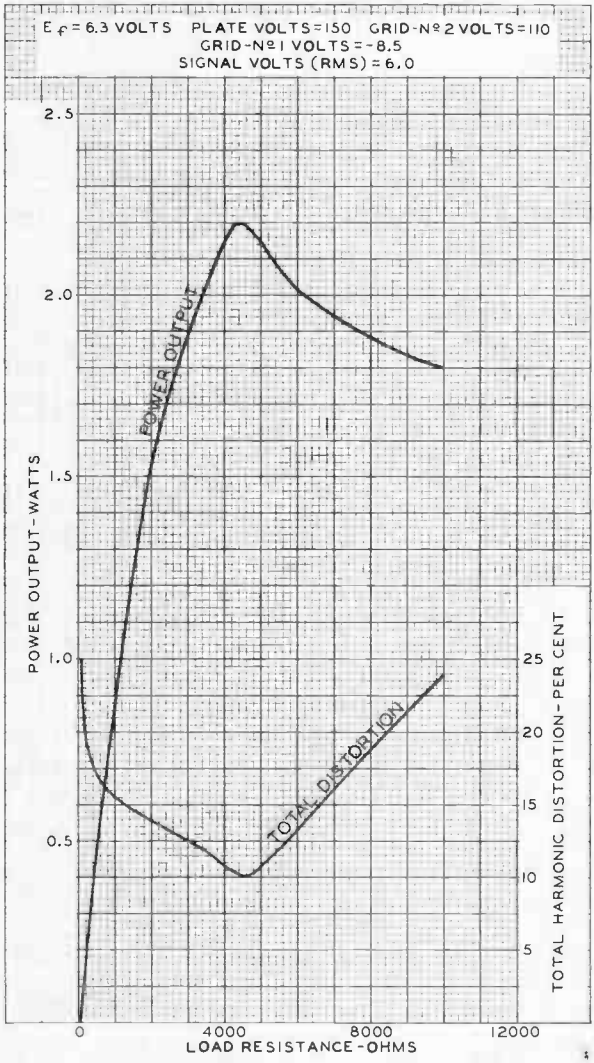
AVERAGE PLATE CHARACTERISTICS



RCA

6AS5

OPERATION CHARACTERISTICS

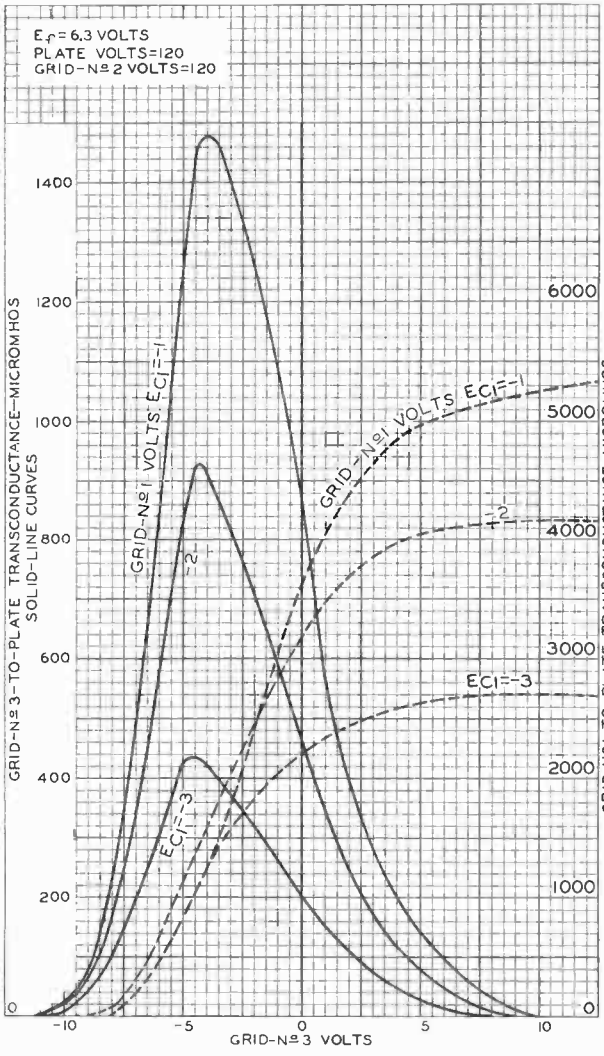


RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

RCA

6AS6

AVERAGE CHARACTERISTICS



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7404RI

6AS7-G

LOW-MU TWIN POWER TRIODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage	6.3	ac or dc volts
Current	2.5	amp
Direct Interelectrode Capacitances (Approx., each unit):[o]		
Grid to plate	10.5	μμf
Grid to heater and cathode	6.8	μμf
Plate to heater and cathode	2.3	μμf
Heater to cathode	11.0	μμf
Grid of unit No.1 to grid of unit No.2	0.70	μμf
Plate of unit No.1 to plate of unit No.2	1.65	μμf

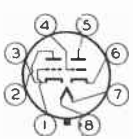
Characteristics, Class A_1 Amplifier (Each unit):

Plate-Supply Voltage	135	volts
Cathode-Bias Resistor■	250	ohms
Amplification Factor	2	
Plate Resistance (Approx.)	280	ohms
Transconductance	7000	μmhos
Plate Current	125	ma

Mechanical:

Mounting Position	Any
Maximum Overall Length	5-5/16"
Maximum Seated Length	4-3/4"
Maximum Diameter	2-1/16"
Bulb	ST-16
Base	Medium-Shell Octal 8-Pin (JETEC No.B8-11)
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

DC AMPLIFIER

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	250 max.	volts
PLATE CURRENT	125 max.	ma
PLATE DISSIPATION	13 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	300 max.	volts
Heater positive with respect to cathode	300 max.	volts

[o] Without external shield.
■ Operation with fixed bias is not recommended.

→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AS7-G

LOW-MU TWIN POWER TRIODE

Maximum Circuit Values (For maximum rated conditions):

Grid-Circuit Resistance:

For cathode-bias operation	1.0 max.	megohm
For fixed-bias operation	Not recommended	

BOOSTER SCANNING SERVICE

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

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

PEAK NEGATIVE-PULSE PLATE VOLTAGE●	1700 max.	volts
DC PLATE CURRENT	125 max.	ma
PLATE DISSIPATION	13 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	300 max.	volts
Heater positive with respect to cathode	300 max.	volts

Maximum Circuit Values (For maximum rated conditions):

Grid-Circuit Resistance:

For cathode-bias operation	1.0 max.	megohm
For fixed-bias operation	Not recommended	

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

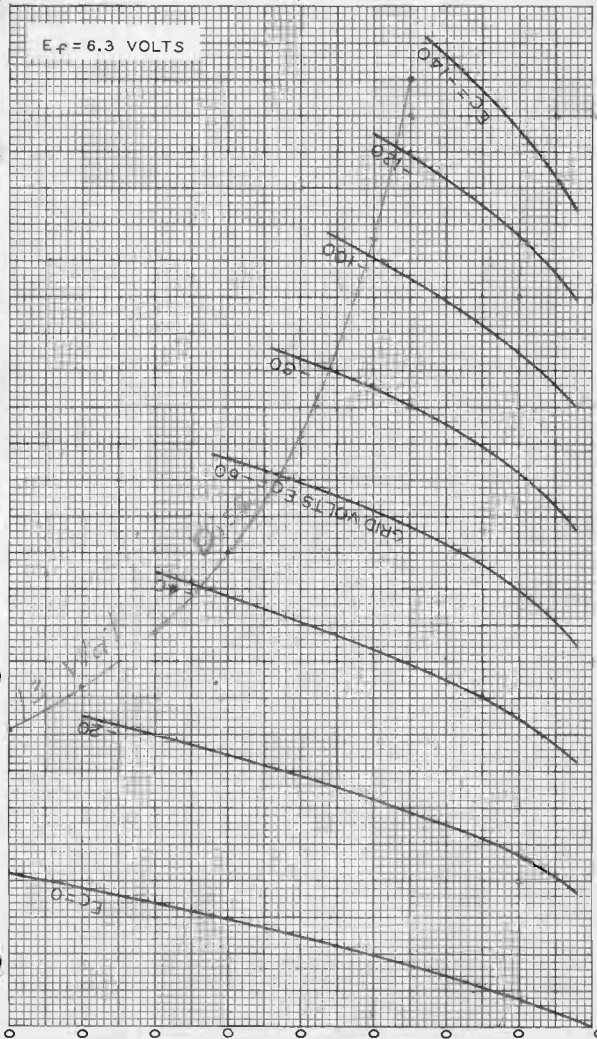
● The duration of the voltage pulse must not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AS7-G

AVERAGE PLATE CHARACTERISTICS

EACH TRIODE UNIT



NOV. 6, 1945

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

92CM-6618

6AS8

DIODE-SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage	6.3	ac or dc volts
Current	0.45	amp
Direct Interelectrode Capacitances (Approx.):*		
Diode Unit:		
Plate to heater and cathode and internal shield	3.0	μμf
Pentode Unit:		
Grid No.1 to plate	0.04 max.	μμf
Input	7	μμf
Output	2.2	μμf
Pentode grid to diode plate	0.005 max.	μμf
Pentode plate to diode cathode	0.15 max.	μμf
Pentode plate to diode plate	0.10 max.	μμf

Characteristics, Class A_1:

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

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding Tip)	1-9/16" ± 3/32"
Maximum Diameter	7/8"
Bulb	T-6-1/2
Base	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW	9DS

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

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

* With no external shield.

6AS8

6AS8

DIODE–SHARP-CUTOFF PENTODE

PENTODE UNIT – Class A_1 Amplifier

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	300 max.	volts
GRID-No.3 (SUPPRESSOR) VOLTAGE	0 max.	volts
GRID-No.2 SUPPLY VOLTAGE	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	*See Rating Curve at front of this Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
PLATE DISSIPATION	2.5 max.	watts
GRID-No.2 INPUT	0.5 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200• max.	volts

Maximum Circuit Values (For maximum rated conditions):

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

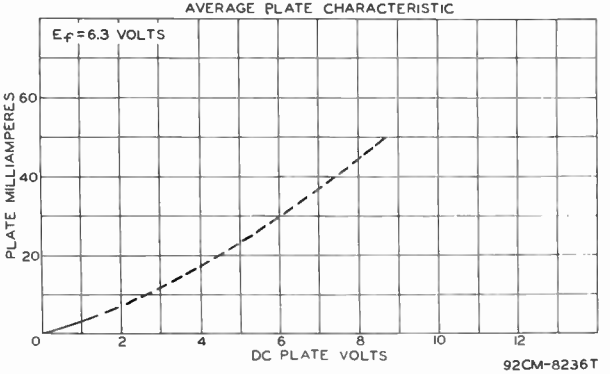
DIODE UNIT

Maximum Ratings, *Design-Center Values*:

PEAK INVERSE PLATE VOLTAGE	330 max.	volts
PEAK PLATE CURRENT	50 max.	ma
DC PLATE CURRENT	5 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200• max.	volts

• The dc component must not exceed 100 volts.

AVERAGE PLATE CHARACTERISTIC



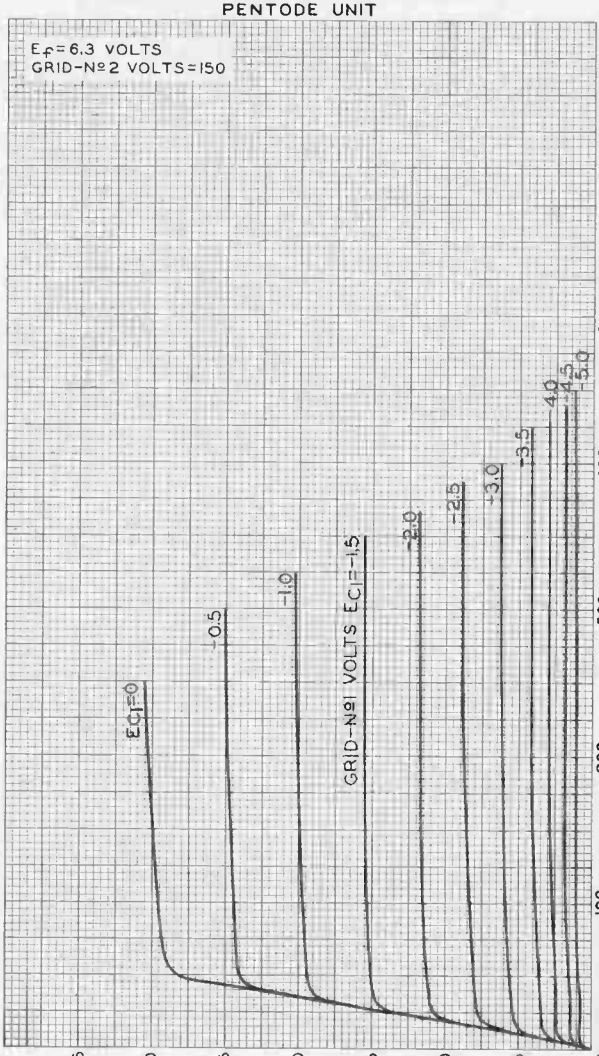
92CM-8236T

RCA

6AS8

AVERAGE PLATE CHARACTERISTICS

PENTODE UNIT

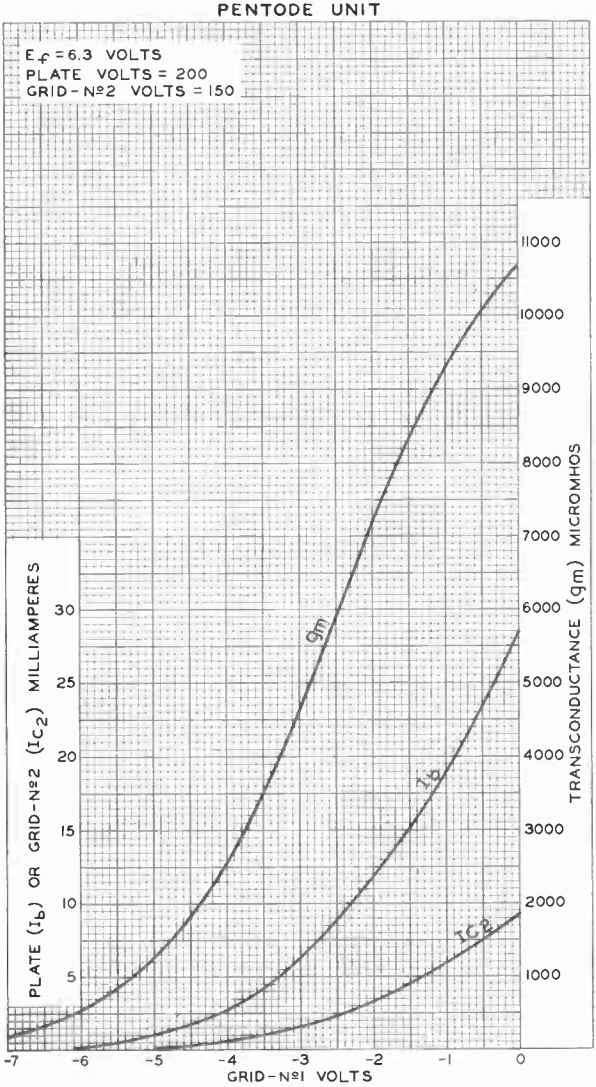


6AS8

6AS8

AVERAGE CHARACTERISTICS

PENTODE UNIT



6AT6
TWIN DIODE—HIGH-MU TRIODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage	6.3		ac or dc volts
Current	0.3		amp
Direct Interelectrode Capacitances:			
	Without External Shield	*With External Shield°*	
Grid to triode plate	2.0	2.0	μμf
Grid to cathode and heater	2.2	2.2	μμf
Plate to cathode and heater	0.8	1.2	μμf
Plate of diode unit No.2 to triode grid	0.04 max.		μμf

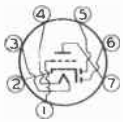
Characteristics, Class A_1 Amplifier (Triode Unit):

Plate Voltage	100	250	volts
Grid Voltage	−1	−3	volts
Amplification Factor	70	70	
Plate Resistance (Approx.)	54000	58000	ohms
Transconductance	1300	1200	μmhos
Plate Current	0.8	1	ma

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Dimensional Outline	*See General Section*
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	7BT

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



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

TRIODE UNIT—AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300 max.	volts
GRID VOLTAGE:		
Positive bias value	0 max.	volts
PLATE DISSIPATION	0.5 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

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

← Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AT6

TWIN DIODE—HIGH-MU TRIODE

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

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

→ **DIODE UNITS**

Maximum Ratings, *Design-Center Values:*

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

Diode Considerations:

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

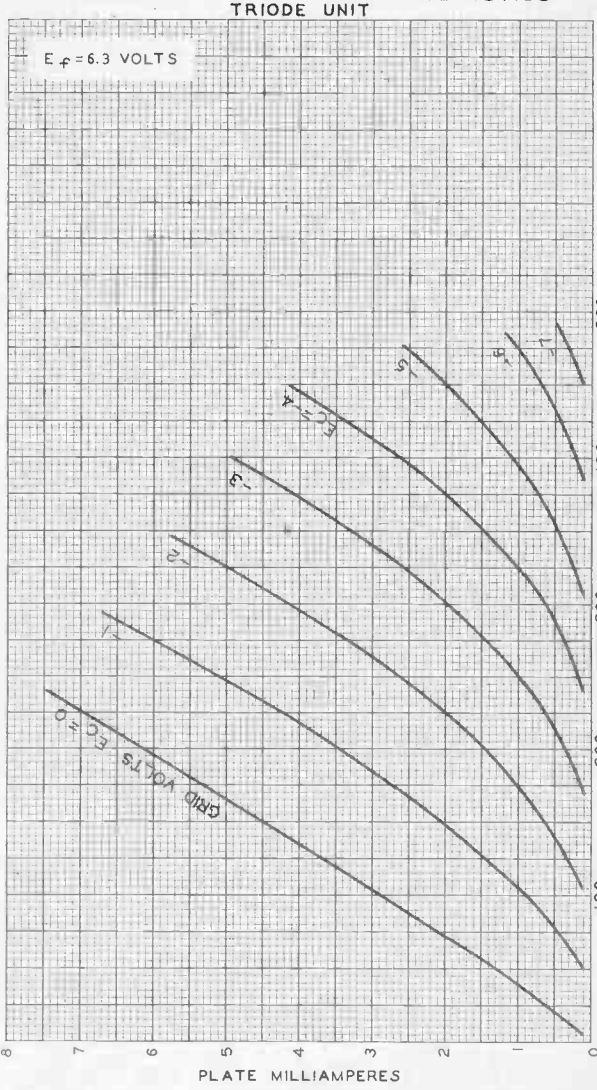
→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AT6

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



OCT. 19, 1945

RCA VICTOR DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6610

6AT8
TRIODE-PENTODE CONVERTER

9-PIN MINIATURE TYPE

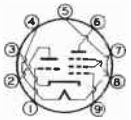
The 6AT8 is the same as the 6X8 except for the following items:

Direct Interelectrode Capacitances:

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

Basing Designation for BOTTOM VIEW 9DW

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



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

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

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

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

← Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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-GT

HALF-WAVE VACUUM RECTIFIER

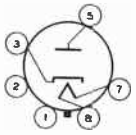
GENERAL DATA

Electrical:

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

Mechanical:

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



Pin 1: No Connection—Do Not Use; or Omitted
Pin 2: No Connection—Do Not Use
Pin 3: Cathode
Pin 5: Plate
Pin 7: Heater
Pin 8: Heater

DAMPER SERVICE

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

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

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

° With no external shield.

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

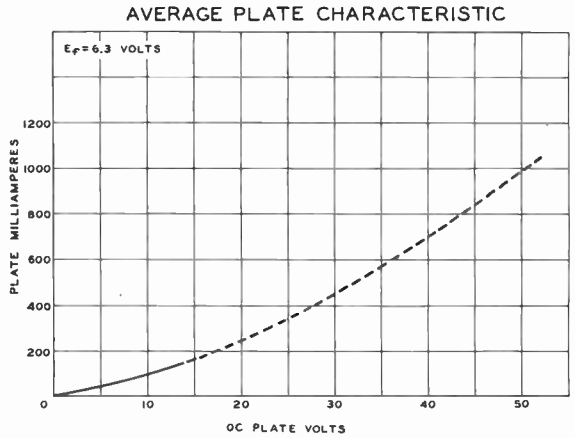
This rating is applicable where the duty cycle of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

● Under no circumstances should this absolute value be exceeded.

* The dc component must not exceed 900 volts.

† The dc component must not exceed 100 volts.

6AU4-GT
HALF-WAVE VACUUM RECTIFIER



6AU5-GT

BEAM POWER TUBE

GENERAL DATA

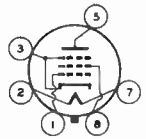
Electrical:

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 = -4.5.

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

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

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

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

← Indicates a change.

6AU5-GT

BEAM POWER TUBE

PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE	-300 max.	volts
CATHODE CURRENT:		
Peak	400 max.	ma
Average	110 max.	ma
GRID-No.2 INPUT	2.5 max.	watts
PLATE DISSIPATION◇	10 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200♦max.	volts
BULB TEMPERATURE (At hottest point)▲	210 max.	°C

Maximum Circuit Values:

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

VOLTAGE REGULATOR SERVICE

Triode Connection--Grid No.2 Connected to Plate

Maximum Ratings, *Design-Center Values:*

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

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

♦ The dc component must not exceed 100 volts.

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

→ Indicates a change.

6AU5-GT

AVERAGE PLATE CHARACTERISTICS

6AU5-GT

RCA

E_f=6.3 VOLTS

GRID-N#1 VOLTS=0

GRID-N#2 VOLTS=100

50

75

125

150

175

PLATE VOLTS

0 100 200 300 400 500

PLATE MILLIAMPERES

0 100 200 300 400

SEPT. 8, 1949

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7355

6AU5-GT

AVERAGE PLATE CHARACTERISTICS

Ef=6.3 VOLTS
GRID-No2 VOLTS=150

AUG. 29, 1949

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7349

6AU4-GTA
HALF-WAVE VACUUM RECTIFIER

For Television Damper Service

GENERAL DATA

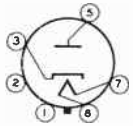
Electrical:

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

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-13/16"
Maximum Seated Length	3-1/4"
Maximum Diameter	1-9/32"
Bulb	T-9
Base	Short Intermediate-Shell Octal 5-Pin with External Barriers (JETEC No.B5-85), or Short Intermediate-Shell Octal 6-Pin with External Barriers (JETEC No.B6-60)
Basing Designation for BOTTOM VIEW	4CG

Pin 1♦ - Same as Pin 2
Pin 2 - No Connection - Do Not Use●



Pin 3 - Cathode
Pin 5 - Plate
Pin 7 - Heater
Pin 8 - Heater

DAMPER SERVICE

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

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

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

° Without external shield.

♦ On the 5-pin base, pin 1 as well as pins 4 and 6 is omitted.

● Socket terminals 1, 2, 4, and 6 should not be used as tie points.

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

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

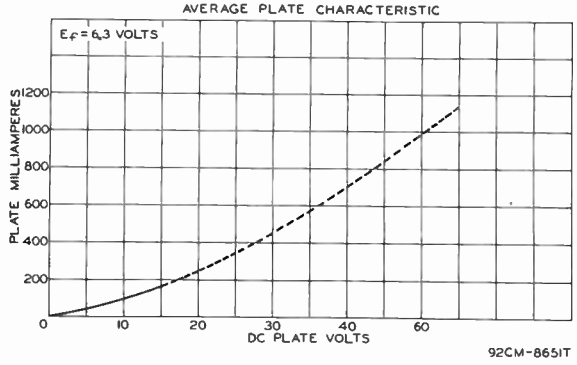
■, ▲, #: See next page.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AU4-GTA

HALF-WAVE VACUUM RECTIFIER

■ Under no circumstances should this absolute value oe exceeded.
▲ The dc component must not exceed 900 volts (ABsolute maximum).
The dc component must not exceed 100 volts.



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

Sharp-Cutoff Pentode

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*▲	
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 & Internal Shield	*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

Tricde Connection

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

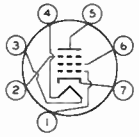
← Indicates a change.

6AU6

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

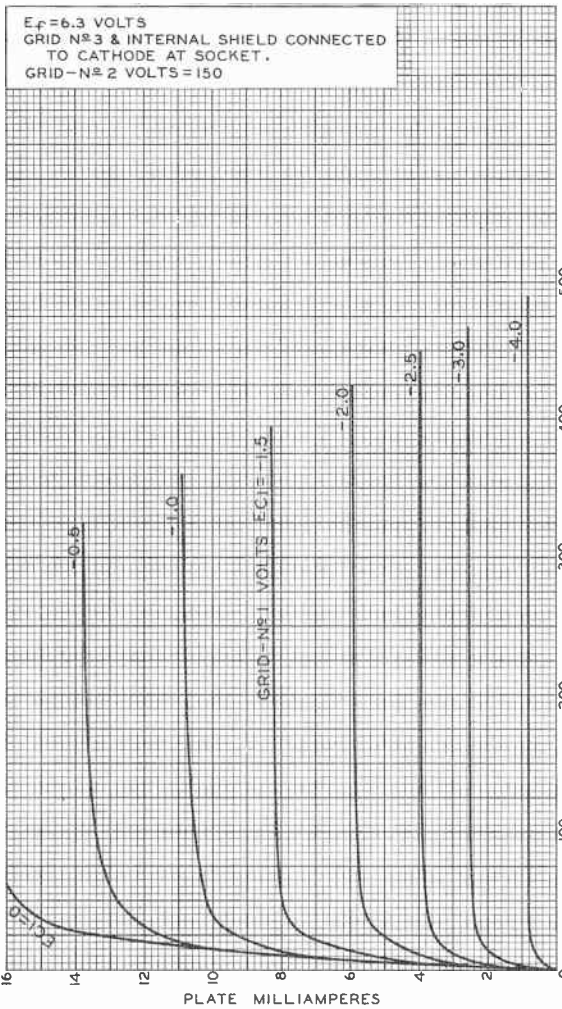
Typical Operation as Resistance-Coupled Amplifier:

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

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

→Indicates a change.

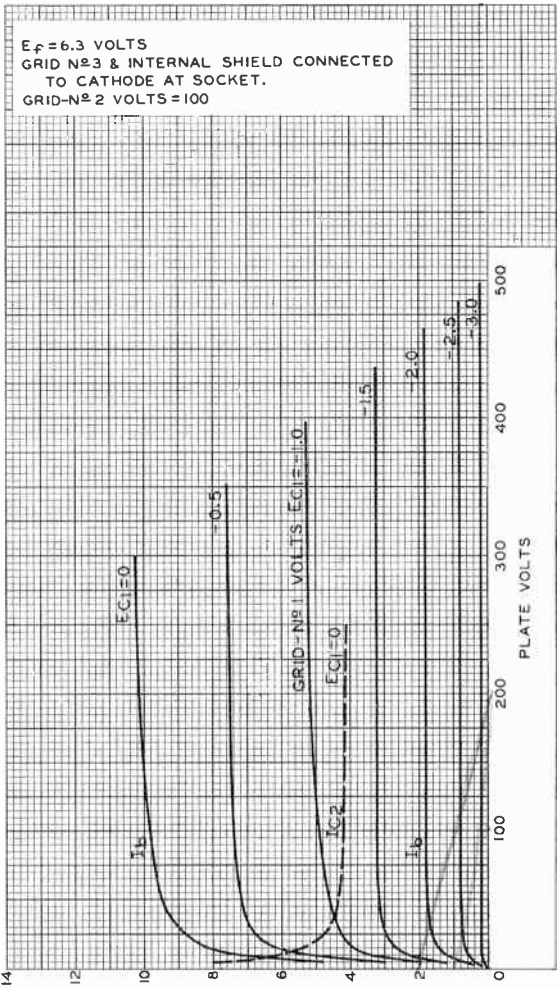
AVERAGE PLATE CHARACTERISTICS
Pentode Connection



92CM-6613R2

6AU6

AVERAGE CHARACTERISTICS
Pentode Connection

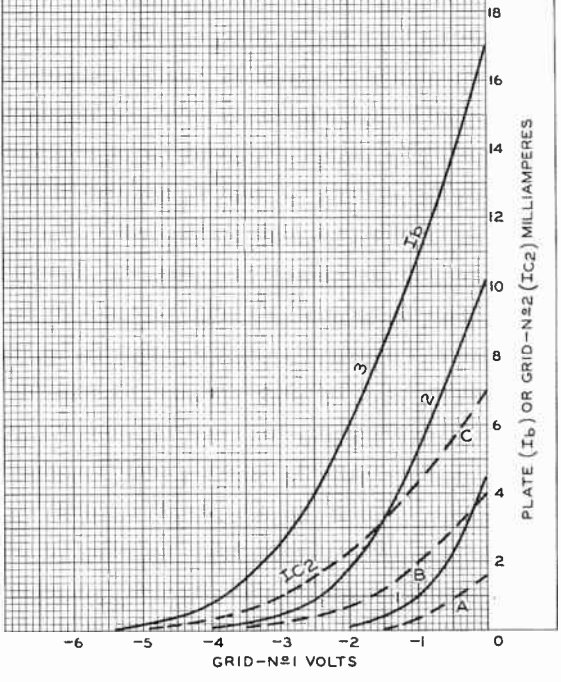


92CM-6611R2

AVERAGE CHARACTERISTICS
Pentode Connection

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

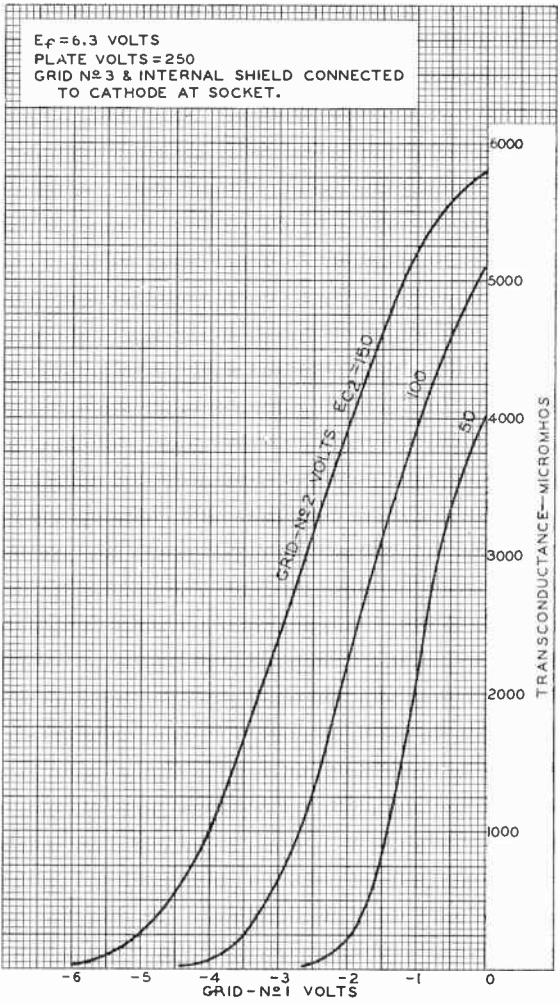
CURVES		GRID—№2 VOLTS
I_b—	I_{C2}--	
1	A	50
2	B	100
3	C	150



92CM-6623R2

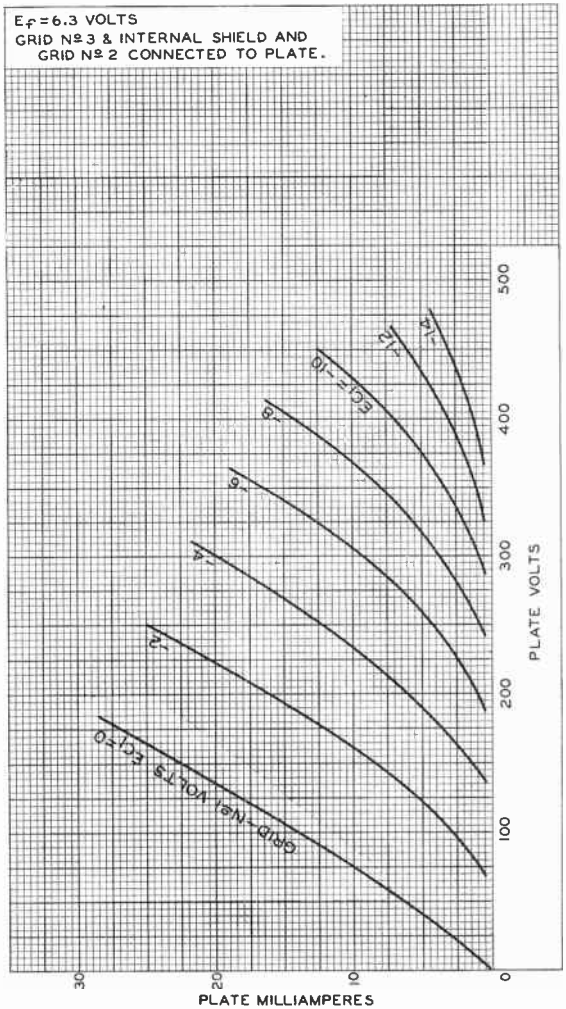
6AU6

AVERAGE CHARACTERISTICS
Pentode Connection



92CM-6614R2

AVERAGE PLATE CHARACTERISTICS
Triode Connection



92CM-6854

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

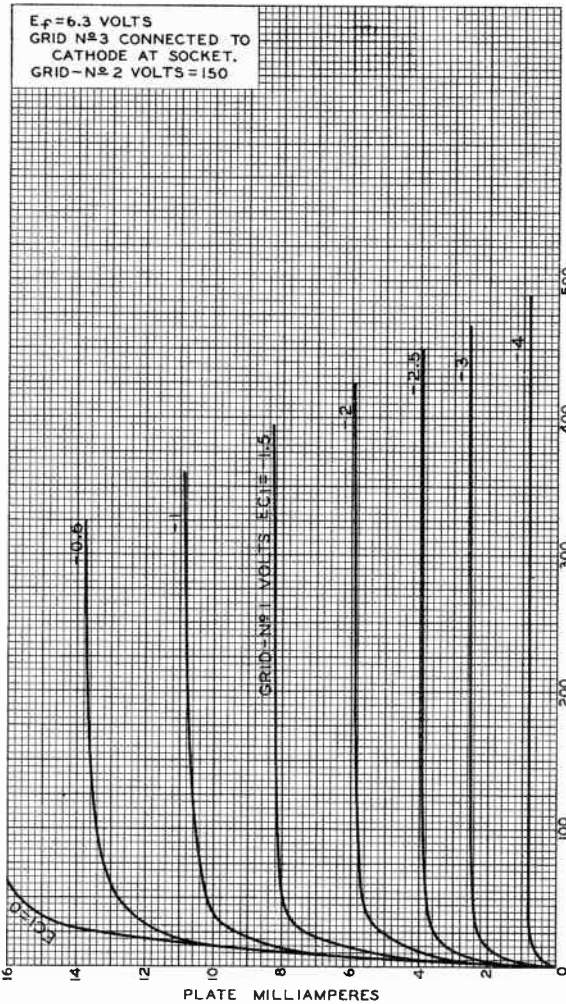
Typical Operation as Resistance-Coupled Amplifier:

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

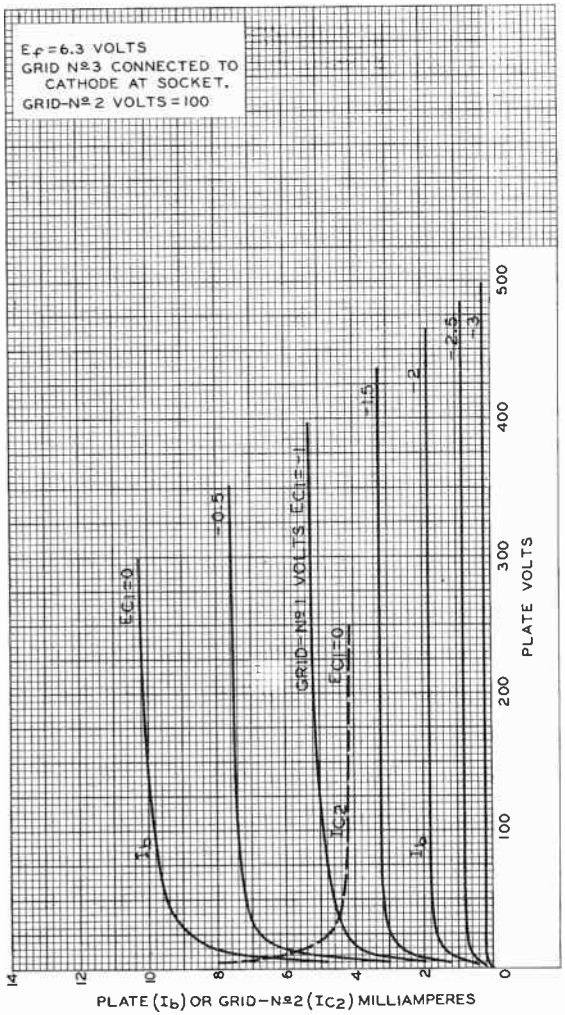
AVERAGE PLATE CHARACTERISTICS
Pentode Connection



92CM-6613R3

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

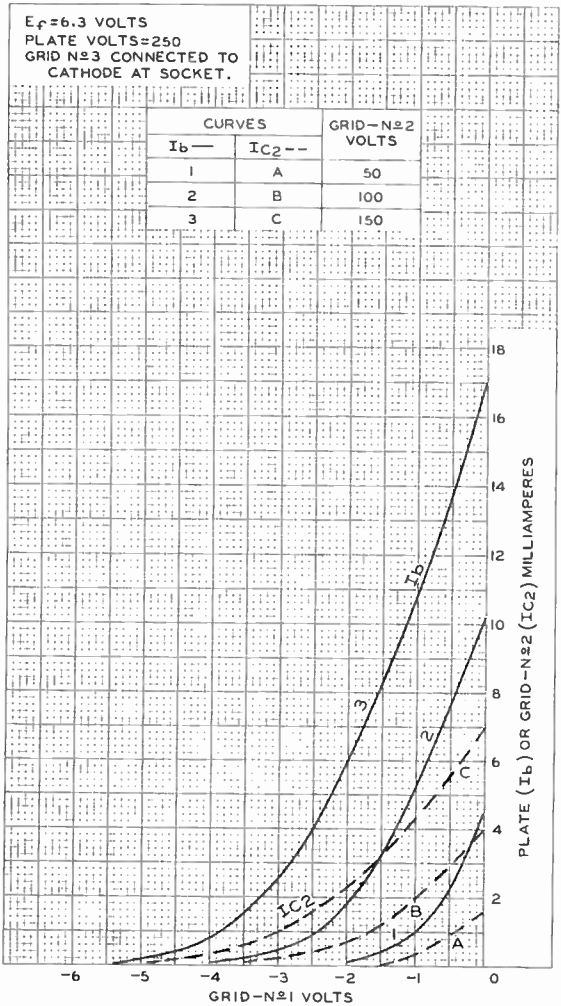
AVERAGE CHARACTERISTICS
Pentode Connection



92CM-6611R3

6AU6-A

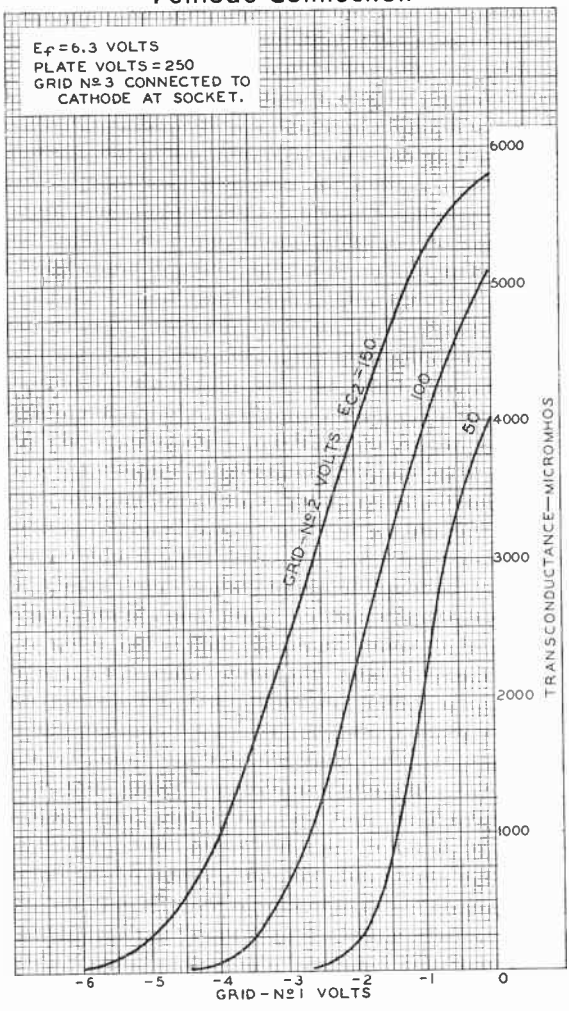
AVERAGE CHARACTERISTICS
Pentode Connection



92CM-6623R3

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

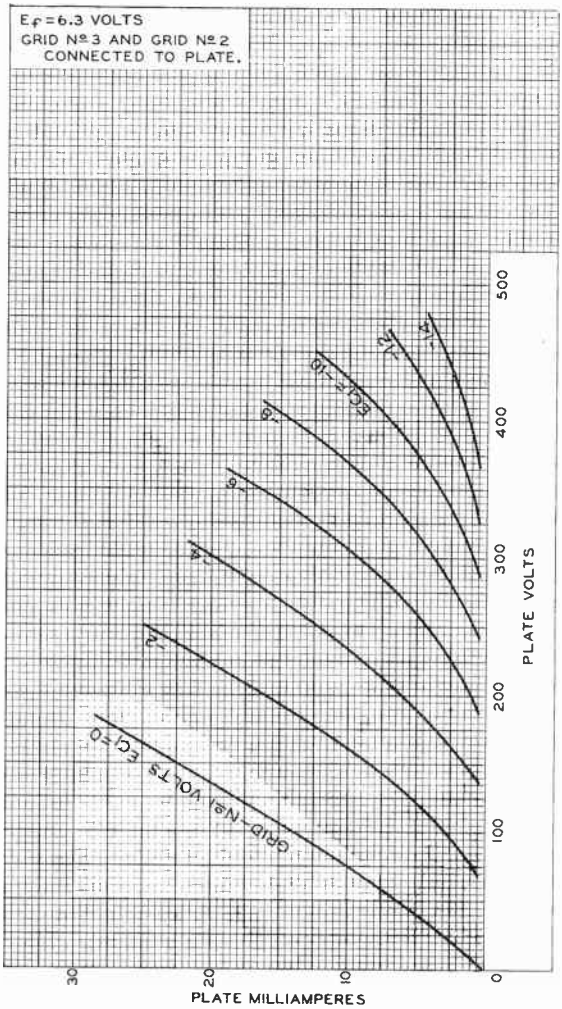
AVERAGE CHARACTERISTICS
Pentode Connection



92CM-6614R3

6AU6-A

AVERAGE PLATE CHARACTERISTICS
Triode Connection



92CM-6854RI

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 ± 6%	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.)	6100	–	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

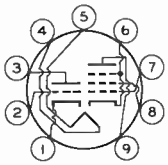
Mechanical:

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

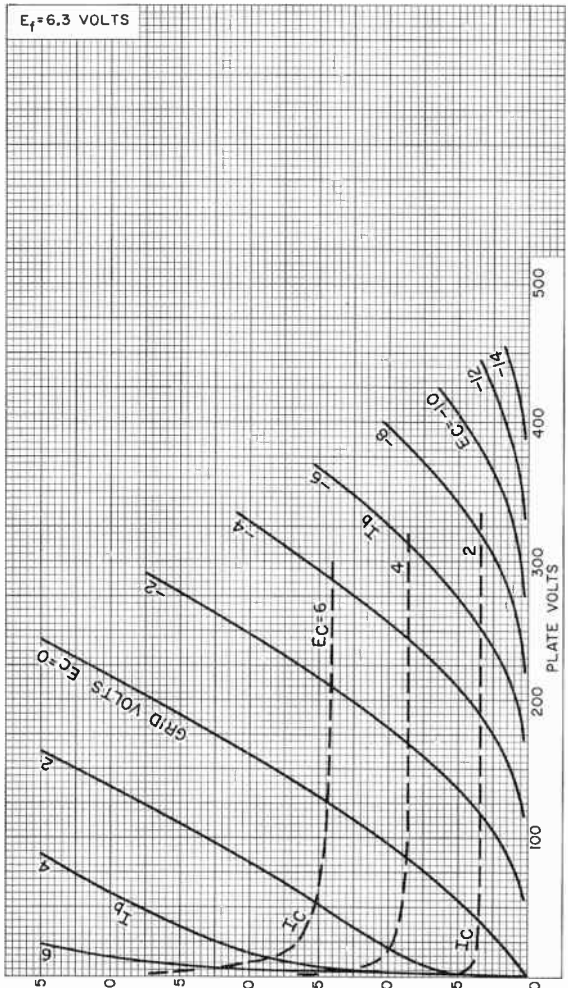
Because the *internal shield* is connected to the cathode and grid No.3, the impedance in the cathode circuit should be kept as low as possible to minimize cross-coupling effects.

[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.

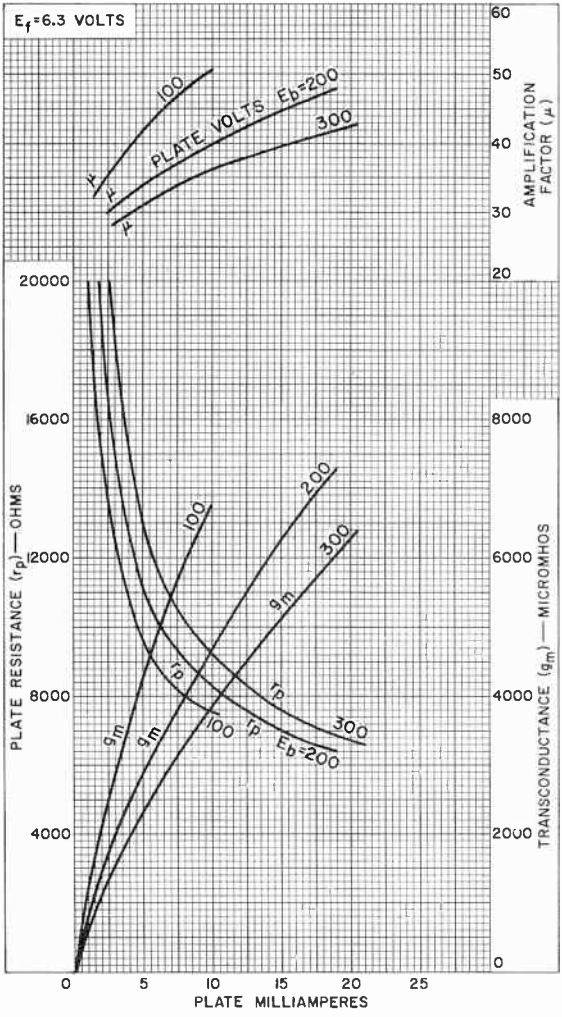
AVERAGE CHARACTERISTICS
Triode Unit



92CM-11140

6AU8A

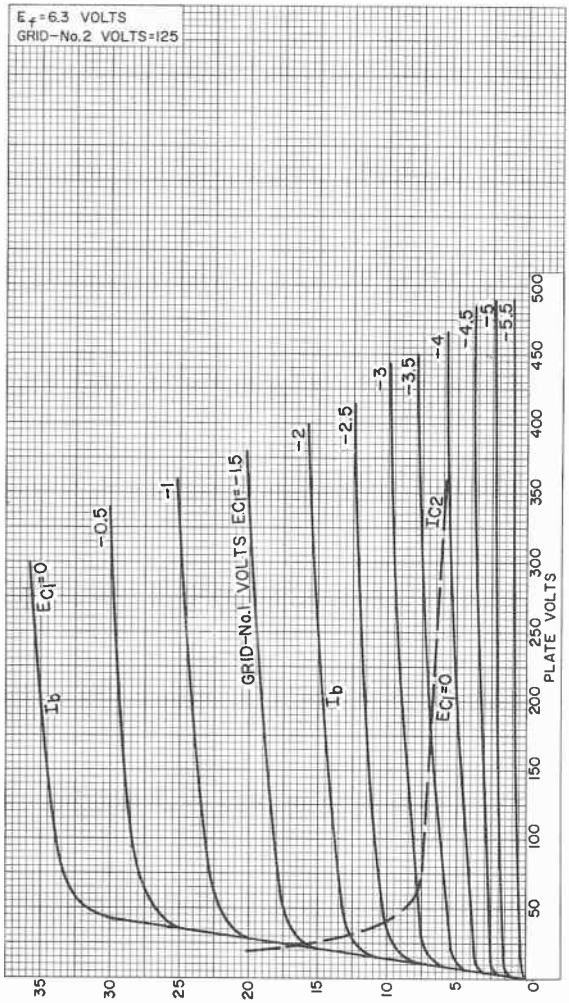
AVERAGE CHARACTERISTICS
Triode Unit



92CM-11144RI

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

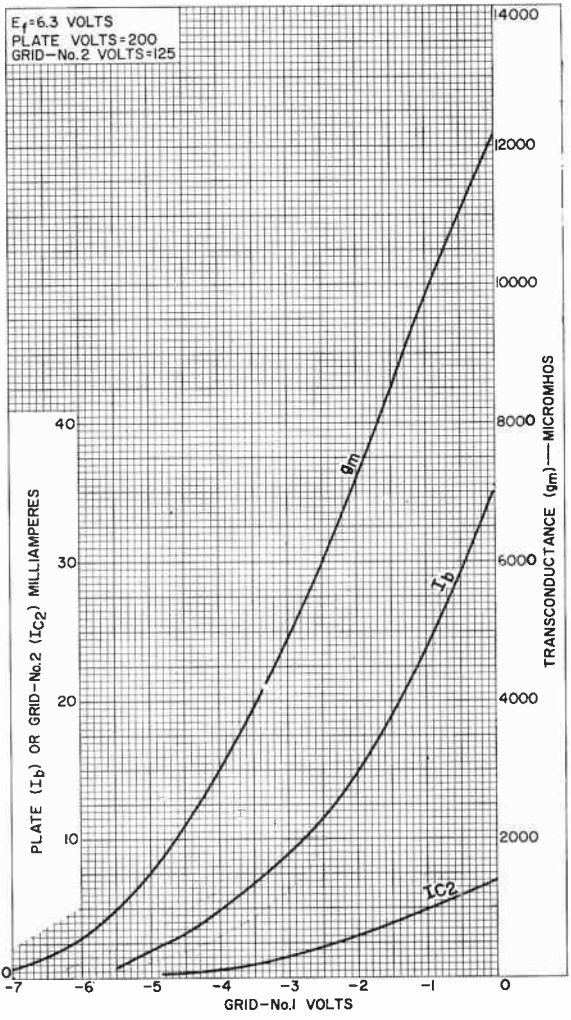
AVERAGE CHARACTERISTICS
Pentode Unit



92CM-11141

6AU8A

AVERAGE CHARACTERISTICS
Pentode Unit



92CM-11142

6AU8
MEDIUM-MU TRIODE–SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

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

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

Direct Interelectrode Capacitances:[o]

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

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Plate-Supply Voltage	150	200	volts
Grid-No.2-Supply Voltage	–	125	volts
Cathode Resistor	150	82	ohms
Amplification Factor	40	–	
Plate Resistance (Approx.)	8200	150000	ohms
Transconductance	4900	7000	μmhos
Plate Current	9	15	ma
Grid-No.2 Current	–	3.4	ma
Grid-No.1 Voltage (Approx.) for plate current of 100 μamp	-6.5	-8	volts

Mechanical:

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

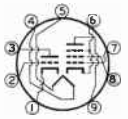
[o] Without external shield.

6AU8

MEDIUM-MU TRIODE – SHARP-CUTOFF PENTODE

Maximum Diameter	7/8"
Dimensional Outline	*See General Section*
Bulb	T-6-1/2
Base	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW	9DX

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



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

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE	300 max.	300 max.	volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE	–	300 max.	volts
GRID-No.2 VOLTAGE	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive bias value	0 max.	0 max.	volts
PLATE DISSIPATION	2.5 max.	3 max.	watts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts	–	1 max.	watt
For grid-No.2 voltages between 150 and 300 volts	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200 max.	200 max.	volts
Heater positive with respect to cathode	200▲max.	200▲max.	volts

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AU8

MEDIUM-MU TRIODE — SHARP-CUTOFF PENTODE

Maximum Circuit Values:

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

OPERATING CONSIDERATIONS

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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AU8

RCA

6AU8

AVERAGE CHARACTERISTICS
TRIODE UNIT

E_f = 6.3 VOLTS

PLATE (I_b) OR GRID (I_c) MILLIAMPERES

PLATE VOLTS

GRID VOLTS

92CM-8796

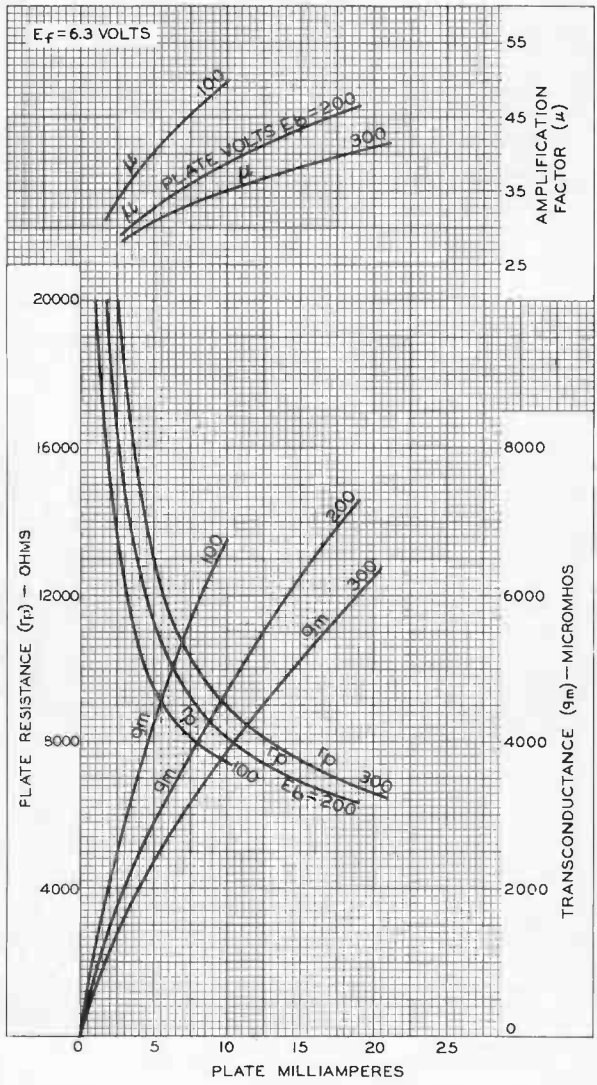
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6AU8

AVERAGE CHARACTERISTICS

TRIODE UNIT



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8801RI

6AU8

RCA

6AU8

AVERAGE CHARACTERISTICS

PENTODE UNIT

E_f=6.3 VOLTS
GRID-№2 VOLTS=125

GRID-№1 VOLTS: E_{C1}=-1.5

E_{C1}=0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-6

I_b
I_{c2}
I_{c1}=0

PLATE VOLTS
0 100 200 300 400 500

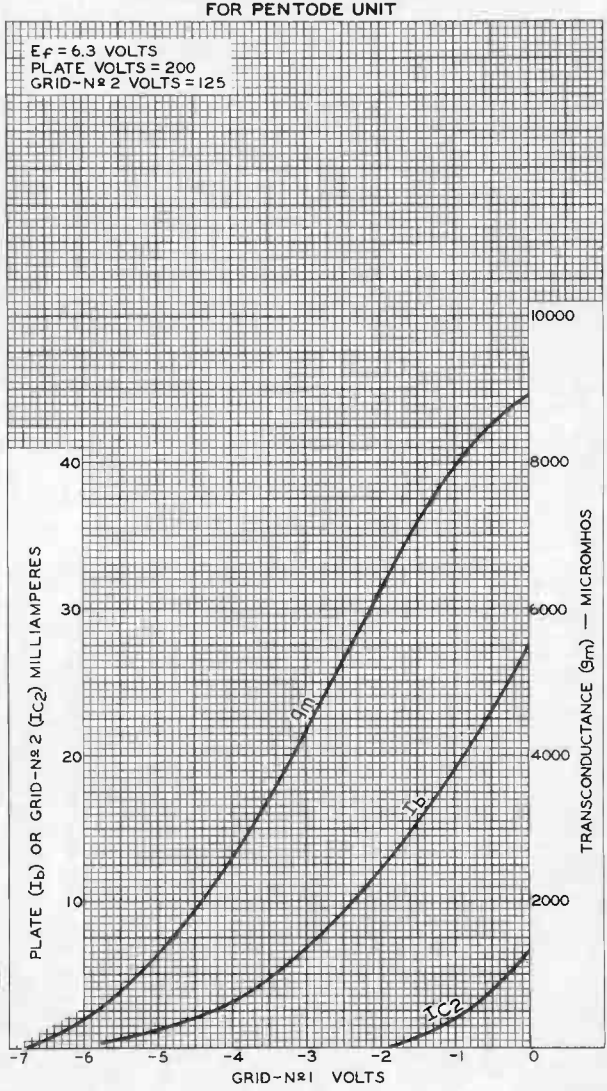
PLATE (I_b) OR GRID-№2 (I_{c2}) MILLIAMPERES
0 5 10 15 20 25 30 35 40

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-8804

RCA

6AU8

AVERAGE CHARACTERISTICS
FOR PENTODE UNIT



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8803

6AV5-GA

BEAM POWER TUBE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:				
Voltage	6.3			ac or dc volts
Current	1.2			amp
Direct Interelectrode Capacitances (Approx.):[o]				
Grid No.1 to plate			0.5	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater			14	μμf
Plate to cathode & grid No.3, grid No.2, and heater			7	μμf

Characteristics, Class A_1 Amplifier:				
Plate Voltage	60	150	250	volts
Grid-No.2 Voltage	150	150	150	volts
Grid-No.1 Voltage	0	-22.5	-22.5	volts
Mu-Factor, Grid No.2 to Grid No.1	-	4.3	-	
Plate Resistance (Approx.)	-	-	14500	ohms
Transconductance	-	-	5900	μmhos
Plate Current	260*	-	57	ma
Grid-No.2 Current	26*	-	2.1	ma
Grid-No.1 Voltage (Approx.) for plate current of 1 ma.	-	-	-43	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	4"
Maximum Seated Length	3-7/16"
Maximum Diameter	1-9/16"
Bulb	T11, or T12
Base:	
For T11 bulb	Short Medium-Shell Octal 6-Pin with External Barriers, Style A (JETEC No.B6-112)
For T12 bulb	Short Medium-Shell Octal 6-Pin with External Barriers, Style B (JETEC No.B6-120)
Basing Designation for BOTTOM VIEW	6CK

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

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

[o] without external shield.

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

→ Indicates a change.

6AV5-GA

BEAM POWER TUBE

HORIZONTAL-DEFLECTION AMPLIFIER

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

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

DC PLATE VOLTAGE	550	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)⊕	5500■	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1250	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	175	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE	300	max.	volts
CATHODE CURRENT:			
Peak	400	max.	ma
DC	110	max.	ma
GRID-No.2 INPUT	2.5	max.	watts
PLATE DISSIPATION†	11	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	210	max.	°C

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:			
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.

6AV5-GT

BEAM POWER AMPLIFIER

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	1.2	amp
Direct Interelectrode Capacitances:°		
Grid No.1 to Plate	0.7	μμf
Input	14	μμf
Output	7	μμf

° With no external Shield.

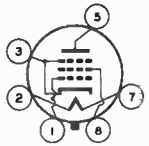
Characteristics, Amplifier Class A1:

Plate Voltage	60*	150	250	volts
Grid-No.2 (Screen) Voltage	150*	150	150	volts
Grid-No.1 (Control-Grid) Voltage	0	-22.5	-22.5	volts
Mu-Factor, Grid No.2 to Grid No.1	-	4.3	-	
Plate Resistance	-	-	20000	ohms
Transconductance	-	-	5500	μmhos
Plate Current	225	-	55	ma
Grid-No.2 Current	25	-	2.1	ma
Grid-No.1 Voltage (Approx.) for plate current of 1 ma	-	-	-46	volts

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-5/16"
Maximum Seated Length	2-3/4"
Maximum Diameter	1-9/32"
Bulb	T-9
Base	Intermediate-Shell Octal 6-Pin (JETEC No. B6-8) or Short Intermediate-Shell Octal 6-Pin (JETEC No. B6-60)
Basing Designation for BOTTOM VIEW	6CK

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



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

HORIZONTAL DEFLECTION AMPLIFIER

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

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

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

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

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

6AV5-GT

BEAM POWER AMPLIFIER

PEAK POSITIVE-PULSE PLATE VOLTAGE*	5500♦ max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE*	1250 max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE	175 max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE*	300 max.	volts
CATHODE CURRENT:		
Peak	400 max.	ma
DC	110 max.	ma
GRID-No.2 INPUT	2.5 max.	watts
PLATE DISSIPATION#	11 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲ max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	210 max.	°C

Maximum Circuit Values:

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

♦ Under no circumstances should this absolute value be exceeded.

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

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

▲ The dc component must not exceed 100 volts.

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AV5-GT

RCA

6AV5-GT

AVERAGE PLATE CHARACTERISTICS

E_f=6.3 VOLTS
GRID-№2 VOLTS=115

PLATE (Ib) OR GRID-№2 (I_{C2}) MILLIAMPERES

PLATE VOLTS

GRID №1 VOLTS E_{C1}=-5

E_{C1}=+5

I_b

I_{C2}

0

-10

-15

-20

E_{C1}=-25

MAR. 10, 1953

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7941

6AV6

TWIN DIODE—HIGH-MU TRIODE

MINIATURE TYPE

GENERAL DATA

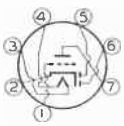
Electrical:

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

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ±3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	7BT

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



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

TRIODE UNIT — AMPLIFIER – Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300 max.	volts
GRID VOLTAGE:		
Positive bias value	0 max.	volts ←
PLATE DISSIPATION	0.5 max.	watt ←
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Typical Operation and Characteristics:

Plate Voltage	100	250	volts
Grid Voltage	-1	-2	volts
Amplification Factor	100	100	
Plate Resistance	80000	62500	ohms
Transconductance	1250	1600	μmhos
Plate Current	0.5	1.2	ma

← Indicates a change

6AV6

TWIN DIODE—HIGH-MU TRIODE

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART at front of this Section

DIODE UNITS

Maximum Ratings, *Design-Center Values:*

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

Diode Considerations:

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

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

6AW8

HIGH-MU TRIODE—SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

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

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

Direct Interelectrode Capacitances:

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

Mechanical:

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

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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AW8

HIGH-MU TRIODE—
SHARP-CUTOFF PENTODE

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

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

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

TRIODE UNIT – Class A_1 Amplifier

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300	max.	volts
PLATE DISSIPATION	1	max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts

Typical Operation and Characteristics:

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

Maximum Circuit Values:

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

PENTODE UNIT – Class A_1 Amplifier

Maximum Ratings, *Design-Center Values:*

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

▲: See next page.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AW8

HIGH-MU TRIODE—
SHARP-CUTOFF PENTODE

GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts .	1	max.	watt
For grid-No.2 voltages between 150 and 300 volts.	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*		
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts

Typical Operation and Characteristics:

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

Maximum Circuit Values:

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

▲ The dc component must not exceed 100 volts.

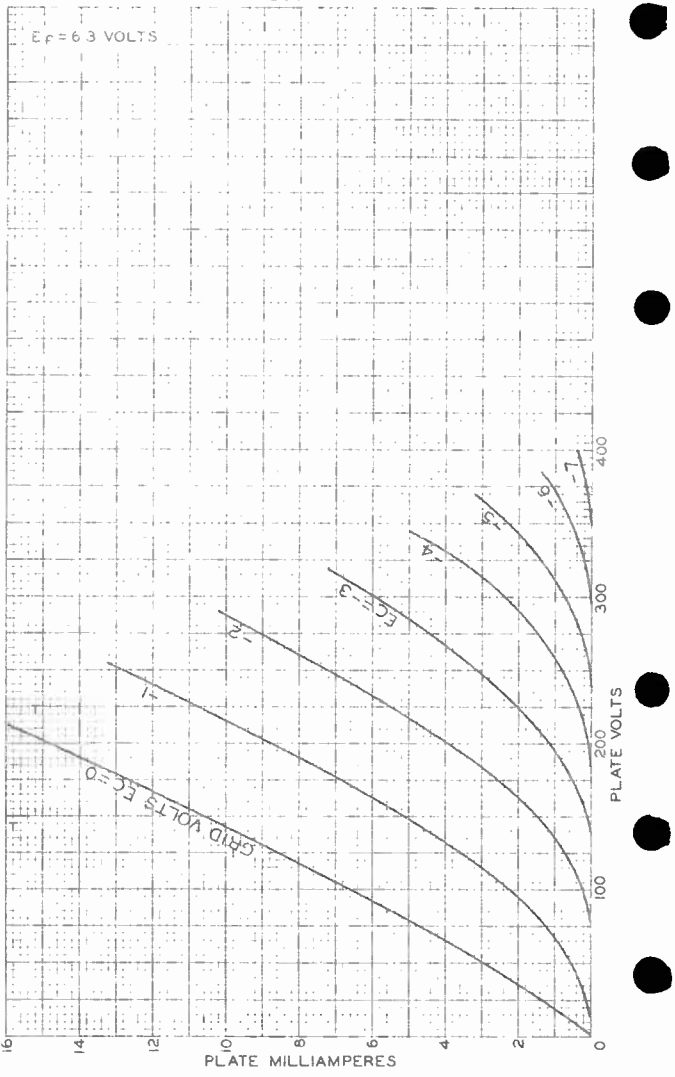
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6AW8

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



6AW8

HIGH-MU TRIODE—
SHARP-CUTOFF PENTODE

GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts	50	max.	volts
For grid-No.2 voltages between 150 and 300 volts	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*		
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts

Typical Operation and Characteristics:

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

Maximum Circuit Values:

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

▲ The dc component must not exceed 100 volts.

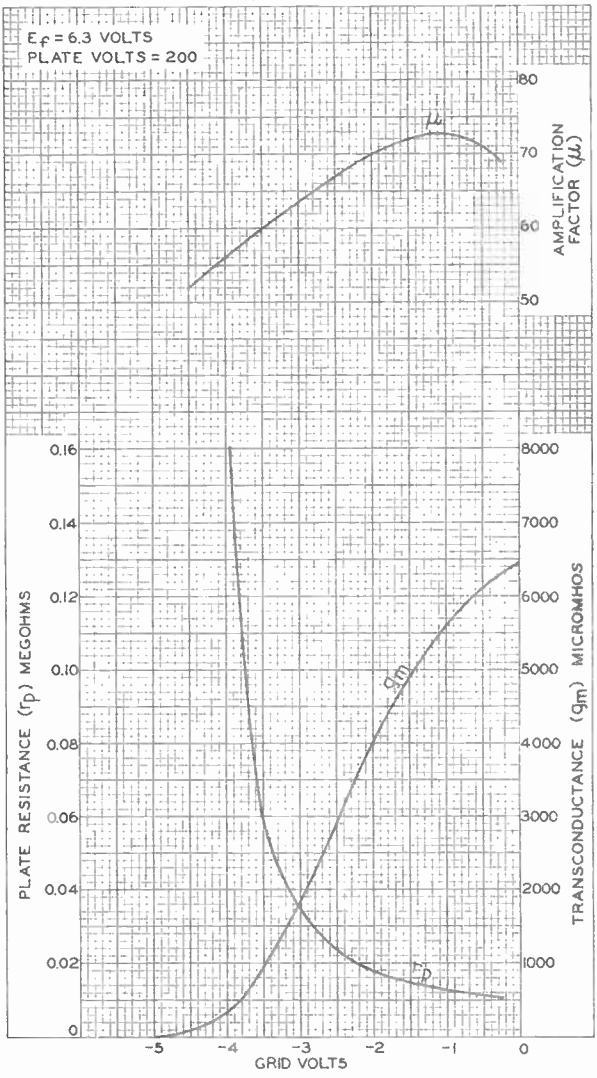
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6AW8

AVERAGE CHARACTERISTICS

TRIODE UNIT



6AW8

RCA

6AW8

AVERAGE CHARACTERISTICS

PENTODE UNIT

JUNE 14, 1955

TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

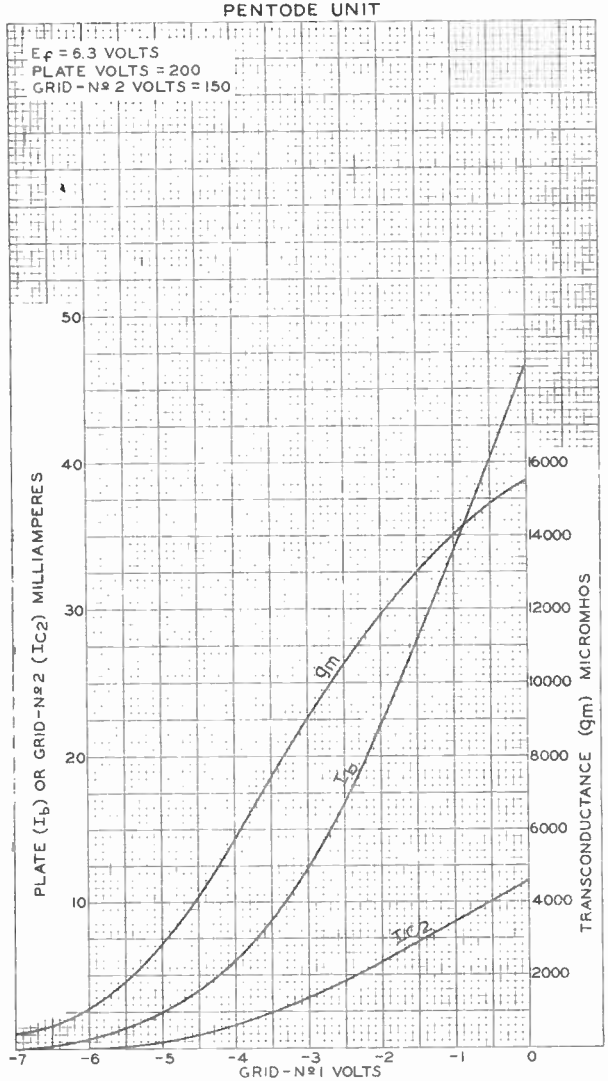
92CM-8645

RCA

6AW8

AVERAGE CHARACTERISTICS

PENTODE UNIT



6AW8A

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.

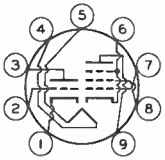
6AW8A

	Triode Unit	*Pentode Unit*	
Transconductance	4000	9500	μmhos
Plate Current	4	15	ma
Grid-No.2 Current	–	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.

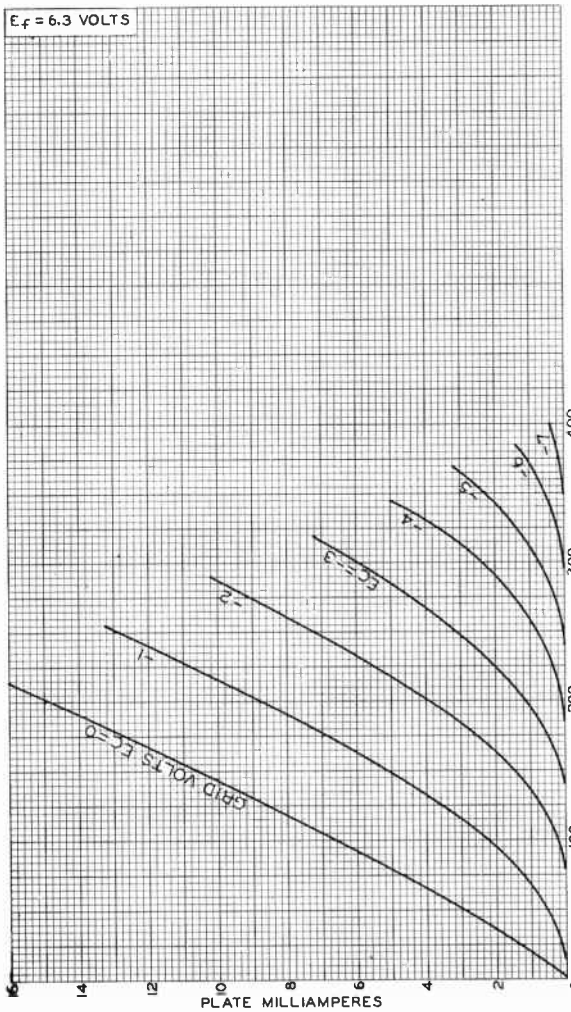
[d] The dc component must not exceed 100 volts.

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

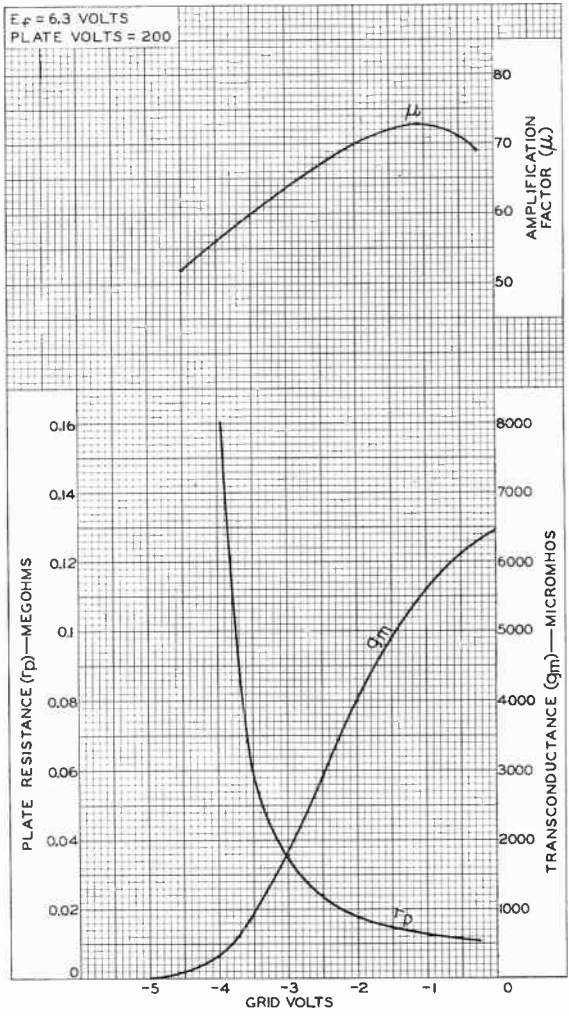
AVERAGE PLATE CHARACTERISTICS
Triode Unit



92CM-8644

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

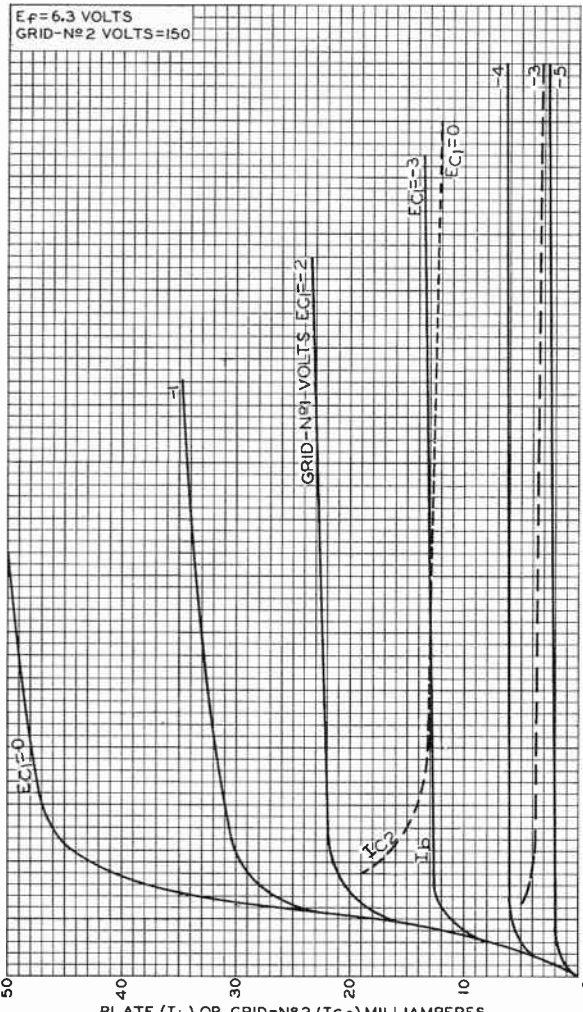
AVERAGE CHARACTERISTICS
Triode Unit



92CM-8647

6AW8A

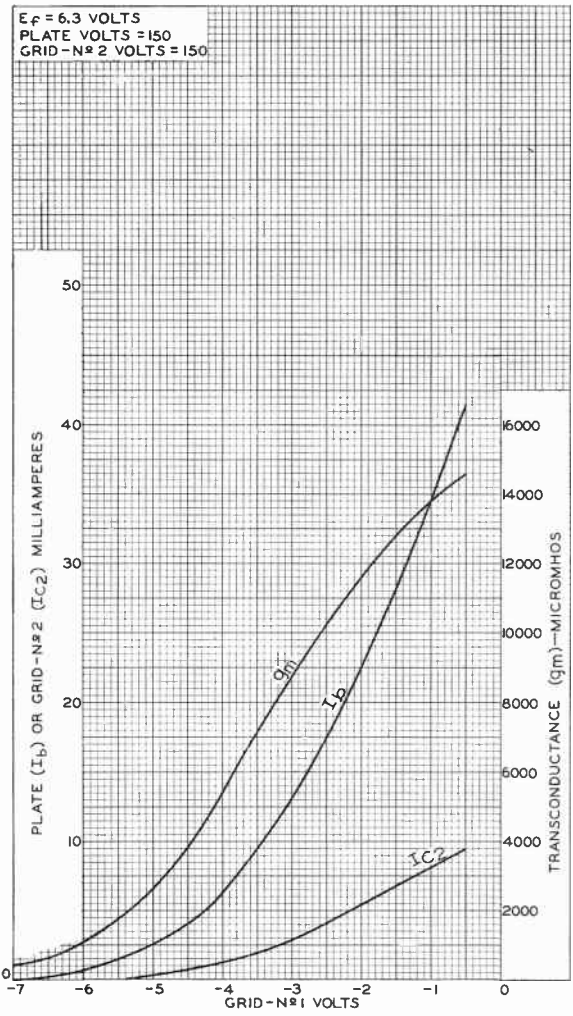
AVERAGE CHARACTERISTICS
Pentode Unit



92CM-9173RI

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

AVERAGE CHARACTERISTICS
Pentode Unit



92CS-8646RI

6AW8-A
HIGH-MU TRIODE — SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

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

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

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	*With External Shield°*	
Triode Unit:			
Grid to plate	2.2	2.2	μμf
Grid to cathode and heater	3.2	3.4	μμf
Plate to cathode and heater	0.32	1.7	μμf
Pentode Unit:			
Grid No.1 to plate	0.04	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	0.150	0.023	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*		
Plate Voltage	200	65	200	volts
Grid-No.2 Voltage	–	150	150	volts
Grid-No.1 Voltage	-2	0	0	volts
Cathode Resistor	–	–	180	ohms
Amplification Factor	70	–	–	
Plate Resistance (Approx.)	17500	–	400000	ohms

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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6AW8-A

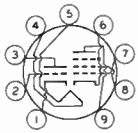
HIGH-MU TRIODE — SHARP-CUTOFF PENTODE

	Triode Unit	Pentode Unit		
Transconductance	4000	-	9000	μmhos
Plate Current	4	42*	13	ma
Grid-No.2 Current	-	12.5*	3.5	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp	-5	-	-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	1 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.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6AW8-A

HIGH-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.

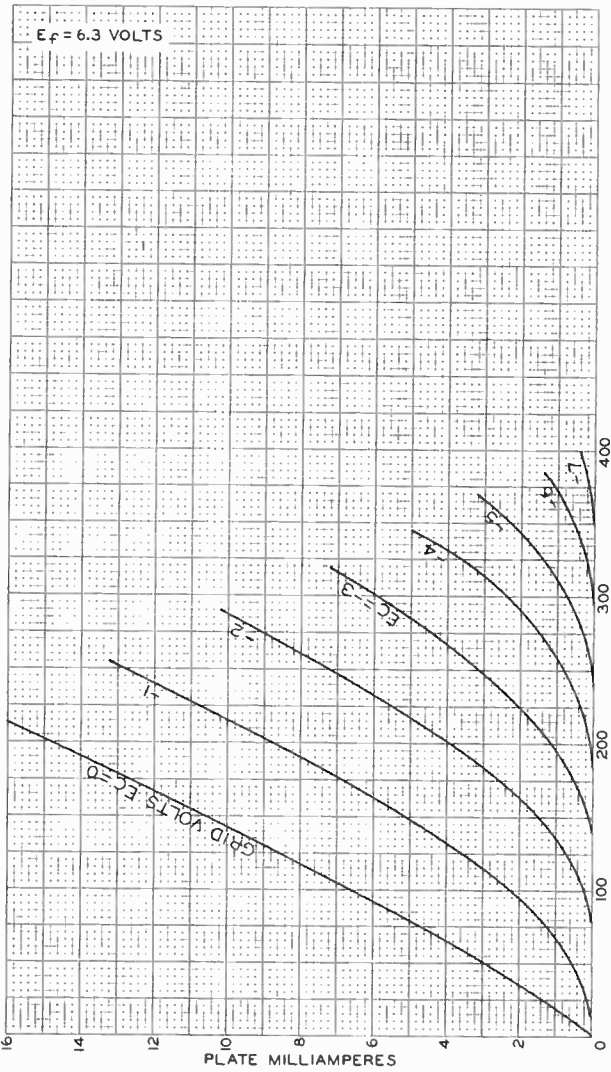
TUBE DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

RCA

6AW8-A

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

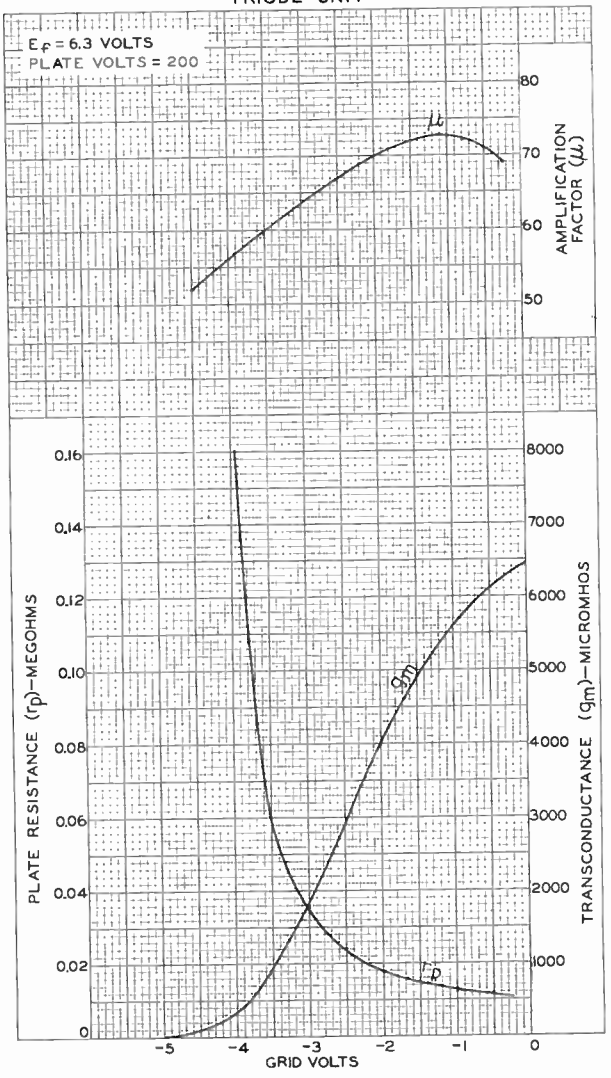
92CM-8644

RCA

6AW8-A

AVERAGE CHARACTERISTICS

TRIODE UNIT



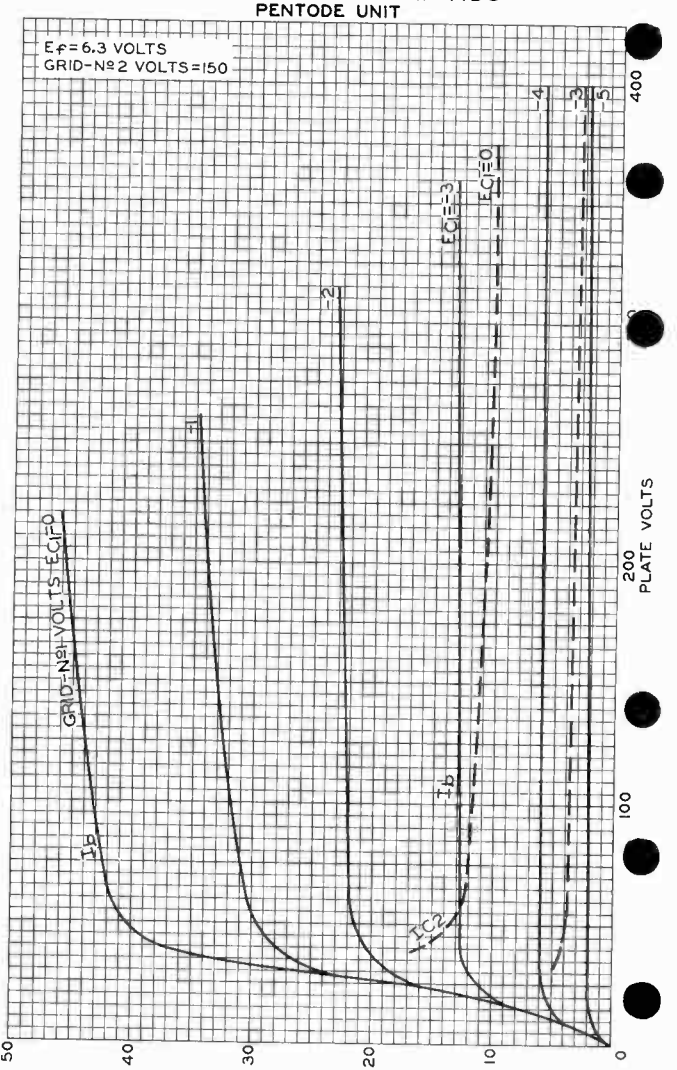
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8647

RCA

6AW8-A

AVERAGE CHARACTERISTICS
PENTODE UNIT



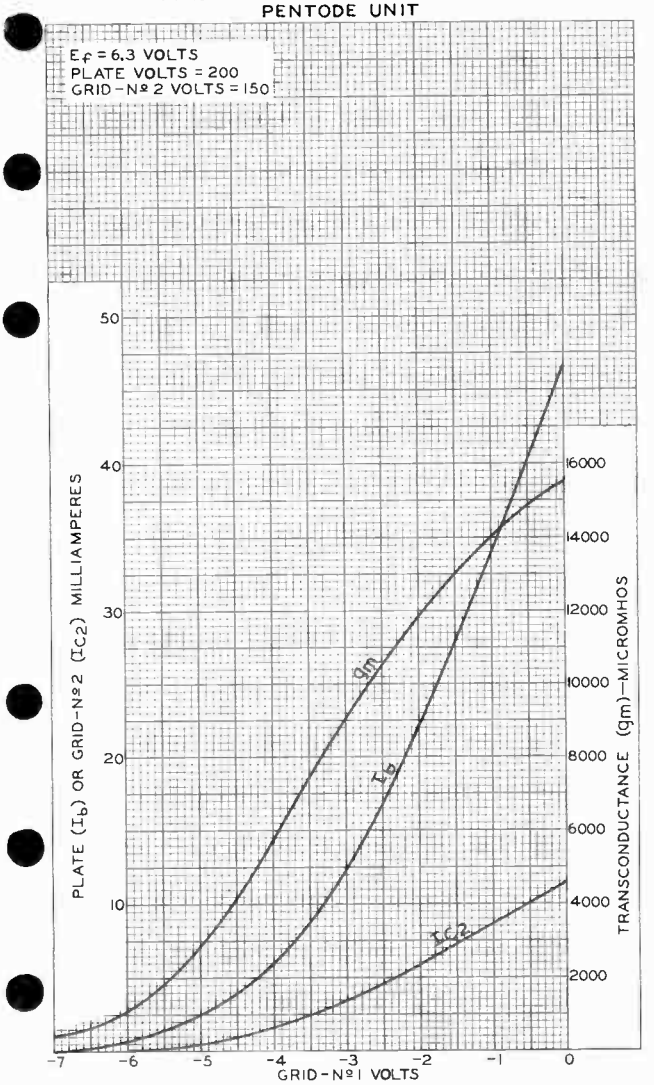
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9173

RCA

6AW8-A

AVERAGE CHARACTERISTICS
PENTODE UNIT



6AX4-GT

Half-Wave Vacuum Rectifier

For Television Damper Service

GENERAL DATA

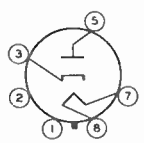
Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	1.2	amp
Direct Interelectrode Capacitances (Approx.):[a]		
Plate to cathode and heater	5	μμf
Cathode to plate and heater	8.5	μμf
Heater to cathode	4	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 5-Pin with External Barriers, Arrangement 2 (JEDEC Group 1, No.B5-147), 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[b] – Same as Pin 2
Pin 2 – Internal Connection—Do Not Use[c]



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[d]

PEAK INVERSE PLATE VOLTAGE[e]	4400	max.	volts
PEAK PLATE CURRENT	825	max.	ma
DC PLATE CURRENT	137	max.	ma
PLATE DISSIPATION	5	max.	watts

← Indicates a change.

6AX4-GT

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode.	4400[f] max.	volts
Heater positive with respect to cathode.	300[g] max.	volts

→**Characteristics, Instantaneous Test Condition:**

Tube Voltage Drop for plate ma. = 250. . .	32	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.

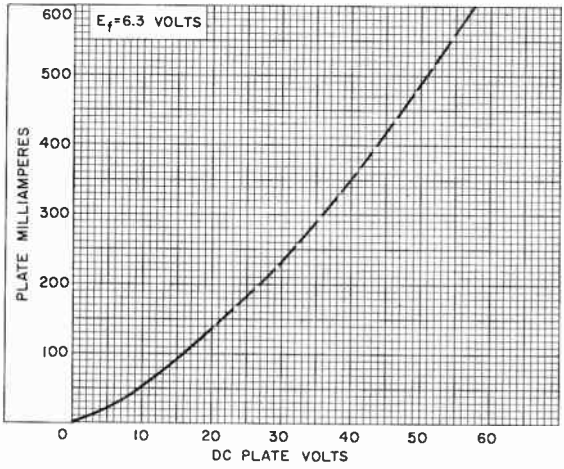
[e] This rating is applicable when the duty cycle of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

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

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

→Indicates a change.

AVERAGE PLATE CHARACTERISTIC



92CS-7829

Half-Wave Vacuum Rectifier

For Television Damper Service

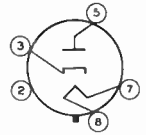
GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	1.2	amp
Direct Interelectrode Capacitances (Approx.):[a]		
Plate to cathode and heater	5	μμf
Cathode to plate and heater	8.5	μμf
Heater to cathode	4	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)
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]	5000	max.	volts
PEAK PLATE CURRENT	1000	max.	ma
DC PLATE CURRENT	165	max.	ma
PLATE DISSIPATION	5.3	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	5000[e]	max.	volts
Heater positive with respect to cathode	300[f]	max.	volts

Characteristics, Instantaneous Test Condition:

Tube Voltage Drop for plate ma. = 250	32	volts

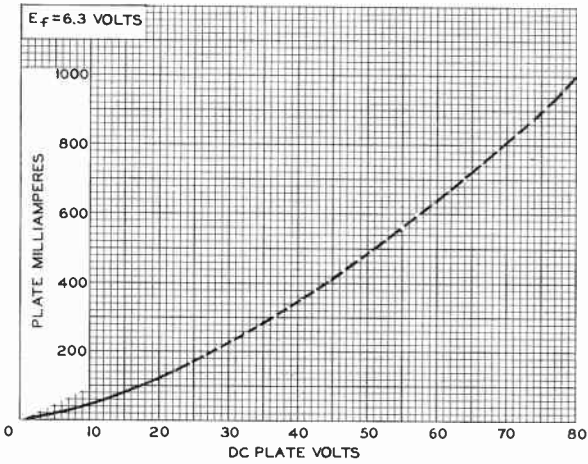
[a] Without external shield.
[b] Socket terminals 1,2,4 and 6 should not be used as tie points.
[c] As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

[d] 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.

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

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

AVERAGE PLATE CHARACTERISTIC



92CS-10850

6AX5-GT

FULL-WAVE VACUUM RECTIFIER

GENERAL DATA

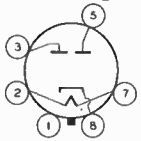
Electrical:

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

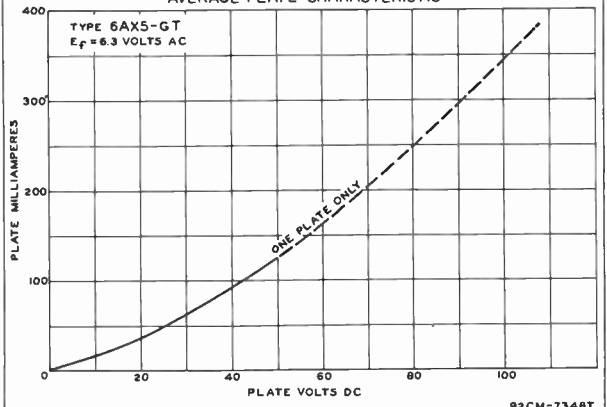
6AX5 - GT

FULL-WAVE VACUUM RECTIFIER

Typical Operation with Choke-Input Filter:

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

AVERAGE PLATE CHARACTERISTIC



92CM-7348T

RATING CHART and OPERATION CHARACTERISTICS

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

The *Operation Characteristics for Full-Wave Circuit with Capacitor-Input Filter* show not only the typical operating curves for such a circuit, but also show by means of boundary lines "ADK" the limiting current and voltage relationships presented on the Rating Chart.

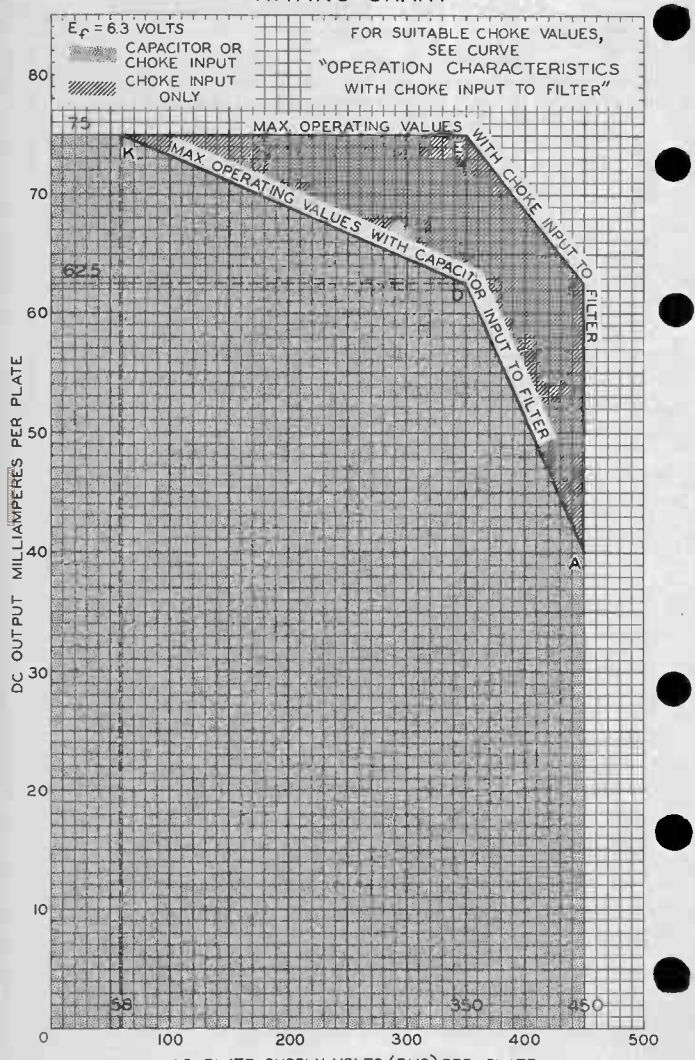
6AX5-GT

FULL-WAVE VACUUM RECTIFIER

The *Operation Characteristics for Full-Wave Circuit with Choke-Input Filter* show the typical operating curves for such a circuit. They not only show by means of boundary line "CEK" the limiting current and voltage relationships presented on the *Rating Chart*, but also give information as to the effect on regulation of various sizes of chokes. The solid-line curves show the dc voltage outputs which would be obtained if the filter chokes had infinite inductance. The long-dash lines radiating from the zero position are boundary lines for various sizes of chokes as indicated. The intersection of one of these lines with a solid-line curve indicates the point on the curve at which the choke no longer behaves as though it has infinite inductance. To the left of the choke boundary line, the regulation curves depart from the solid-line curves as shown by the representative short-dash regulation curves.

6AX5-GT

RATING CHART



OCT. 7, 1949

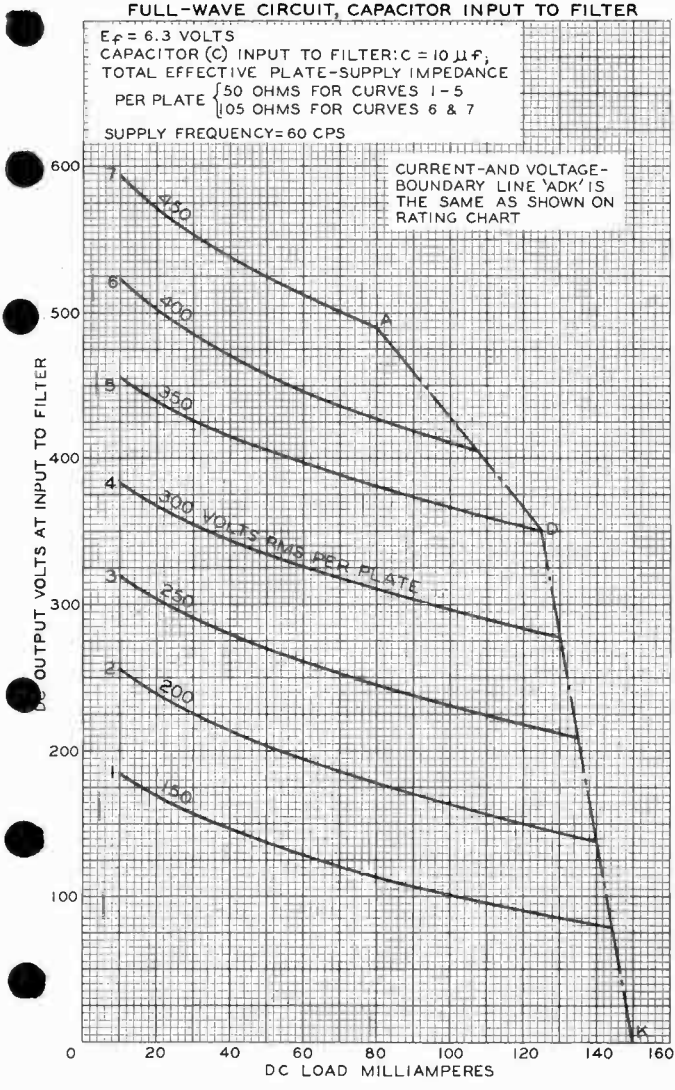
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7383

6AX5-GT

OPERATION CHARACTERISTICS

FULL-WAVE CIRCUIT, CAPACITOR INPUT TO FILTER



RCA

6AX5-GT

OPERATION CHARACTERISTICS

FULL-WAVE CIRCUIT, CHOKE INPUT TO FILTER

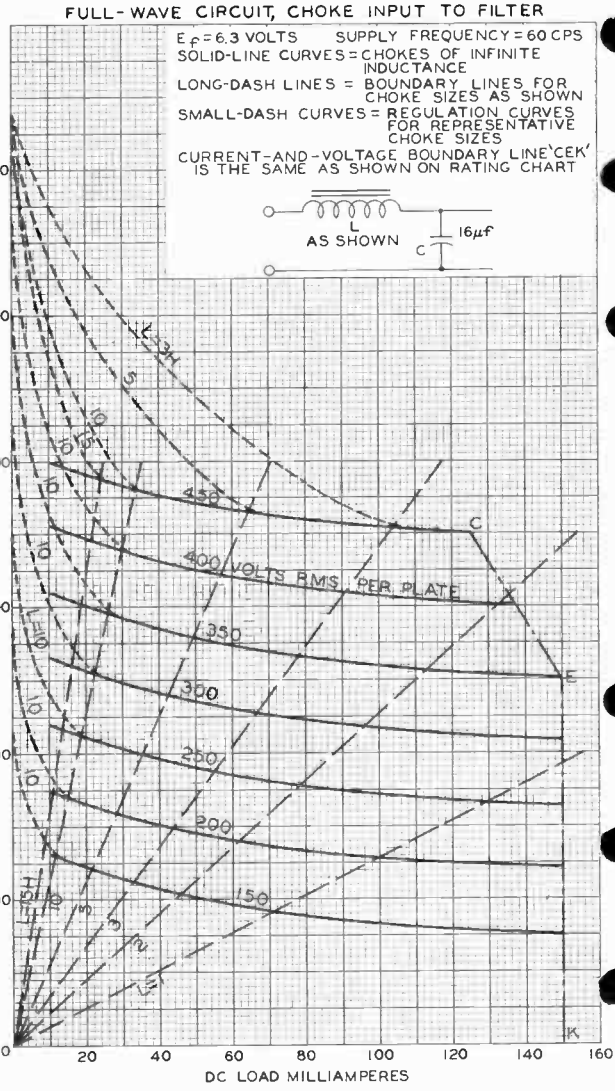
E_f = 6.3 VOLTS SUPPLY FREQUENCY = 60 CPS

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



RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

Half-Wave Vacuum Rectifier

NOVAR TYPE

For Television Damper Service

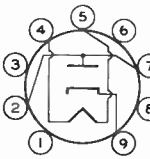
GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	1.2	amp
Direct Interelectrode Capacitances (Approx.):[a]		
Plate to cathode and heater	6.5	μμf
Cathode to plate and heater	9	μμf
Heater to cathode	2.8	μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	3.84"
Maximum Seated Length	3.46"
Length, Base Seat to Bulb Top (Excluding tip)	2.90" ± 0.09"
Diameter	1.062" to 1.188"
Bulb	T9
Socket	Cinch Mfg. Corp. No.149 19 00 024, or equivalent
Base	Small-Button Novar 9-Pin (JEDEC No.E9-75)
Basing Designation for BOTTOM VIEW	9HP



Pin 1 – Internal Connection—Do Not Use[b]
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 – Cathode

DAMPER SERVICE

Maximum Ratings, *Design-Maximum Values:*

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

PEAK INVERSE PLATE VOLTAGE[d]	5000 max.	volts
PEAK PLATE CURRENT	1100 max.	ma
DC PLATE CURRENT	175 max.	ma
PLATE DISSIPATION	6.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode[d]	5000[e] max.	volts
Heater positive with respect to cathode	300[f] max.	volts

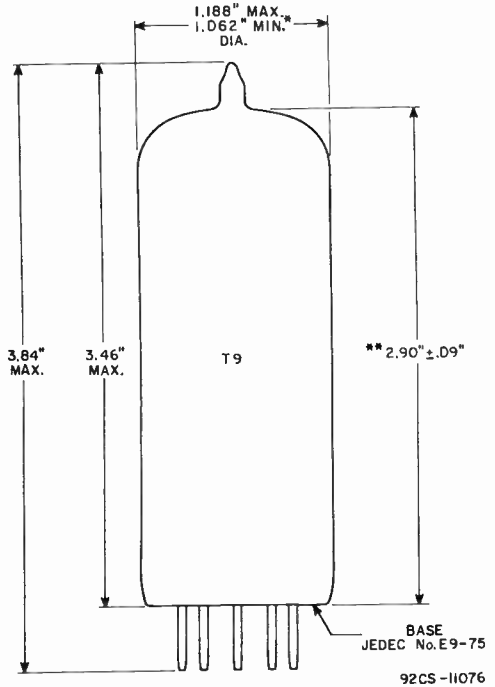
[a] Without external shield.

[b] Socket terminals 1, 3, 6, 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 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.

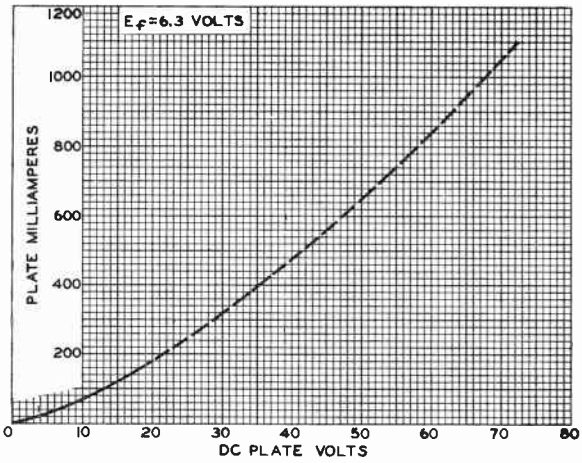
[e] The dc component must not exceed 900 volts.
[f] The dc component must not exceed 100 volts.



* 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

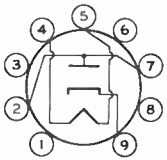
GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	1.6	amp
Direct Interelectrode Capacitances:[a]		
Plate to cathode and heater	6.5	μμf
Cathode to plate and heater	9	μμf
Heater to cathode	2.8	μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	3.84"
Maximum Seated Length	3.46"
Length, Base Seat to Bulb Top (Excluding Tip)	2.90" ± 0.09"
Diameter	1.062" to 1.188"
Bulb	T9
Socket	Cinch Mfg. Corp. No.149 19 00 024, or equivalent
Base	Small-Button Novar 9-Pin (JEDEC No.E9-75)
Basing Designation for BOTTOM VIEW	9HP



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

[a] Without external shield.

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

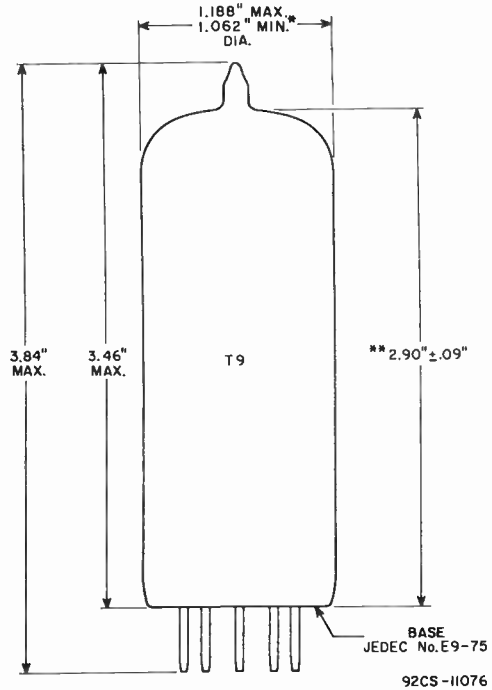
[c] As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

[d] This rating is applicable 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.

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

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

6BH3



* 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.

6AZ8
MEDIUM-MU TRIODE—
SEMIREMOTE-CUTOFF PENTODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage	6.3	ac or dc volts
Current	0.45	amp
Direct Interelectrode Capacitances:°		
Triode Unit:		
Grid to plate	1.7	μμf
Grid to cathode, internal shield & heater	2	μμf
Plate to cathode, internal shield & heater	1.7	μμf
Pentode Unit:●		
Grid No.1 to plate	0.02	μμf
Grid No.1 to cathode, grid No.2, grid No.3 & internal shield & heater	6.5	μμf
Plate to cathode, grid No.2, grid No.3 & internal shield & heater	2.2	μμf
Triode grid to pentode plate	0.027 max.	μμf
Pentode grid No.1 to triode plate	0.020 max.	μμf
Pentode plate to triode plate	0.045 max.	μμf

Characteristics, Class A_1 Amplifier:

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

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"

° Without external shield.

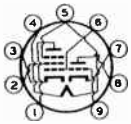
●: See next page.

6AZ8

MEDIUM-MU TRIODE—
SEMIREMOTE-CUTOFF PENTODE

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

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



AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values*:

	Triode Unit	*Pentode Unit*●	
PLATE VOLTAGE.	300 max.	300 max.	volts
GRID-No.3 (SUPPRESSOR) VOLTAGE.	–	*See Operating Considerations*	
GRID-No.2 (SCREEN) SUPPLY VOLTAGE.	–	300 max.	volts
GRID-No.2 VOLTAGE. . . .	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive bias value. .	0 max.	0 max.	volts
PLATE DISSIPATION. . . .	2.5 max.	2 max.	watts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts. . .	–	0.5 max.	watt
For grid-No.2 voltages between 150 and 300 volts.	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode .	200 max.	▲	volts
Heater positive with respect to cathode .	200#max.	▲	volts

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

\# The dc component must not exceed 100 volts.

▲: See next page.

6AZ8
MEDIUM-MU TRIODE—
SEMIREMOTE-CUTOFF PENTODE

Maximum Circuit Values:

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

OPERATING CONSIDERATIONS

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

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

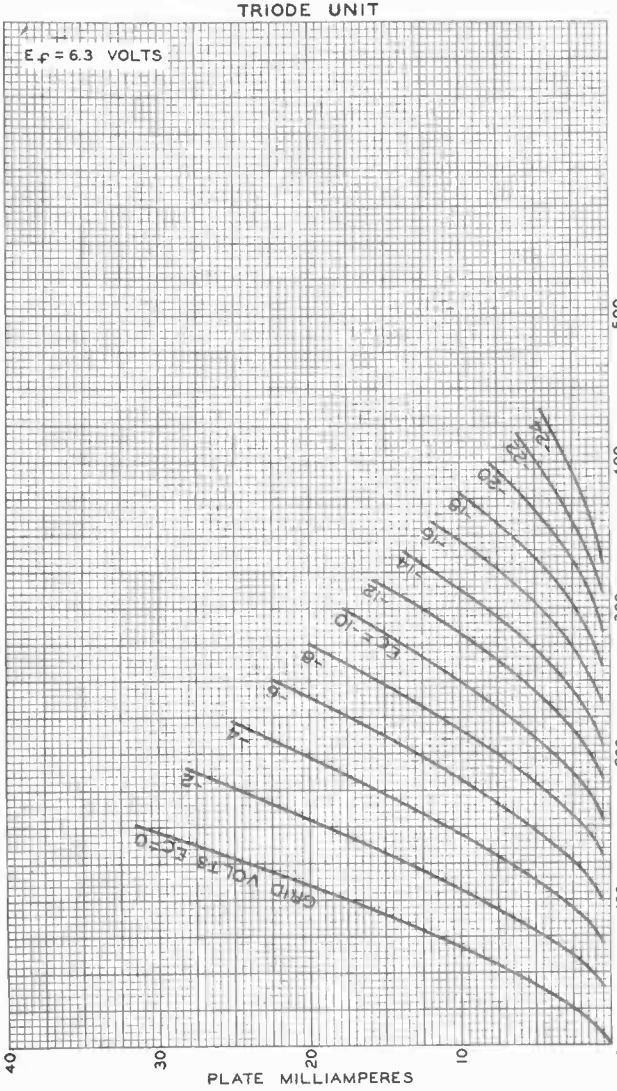
* If either unit is operated at maximum rated conditions, grid-No.1-circuit resistances for both units should not exceed the stated values.

6AZ8

6AZ8

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



FEB. 2, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

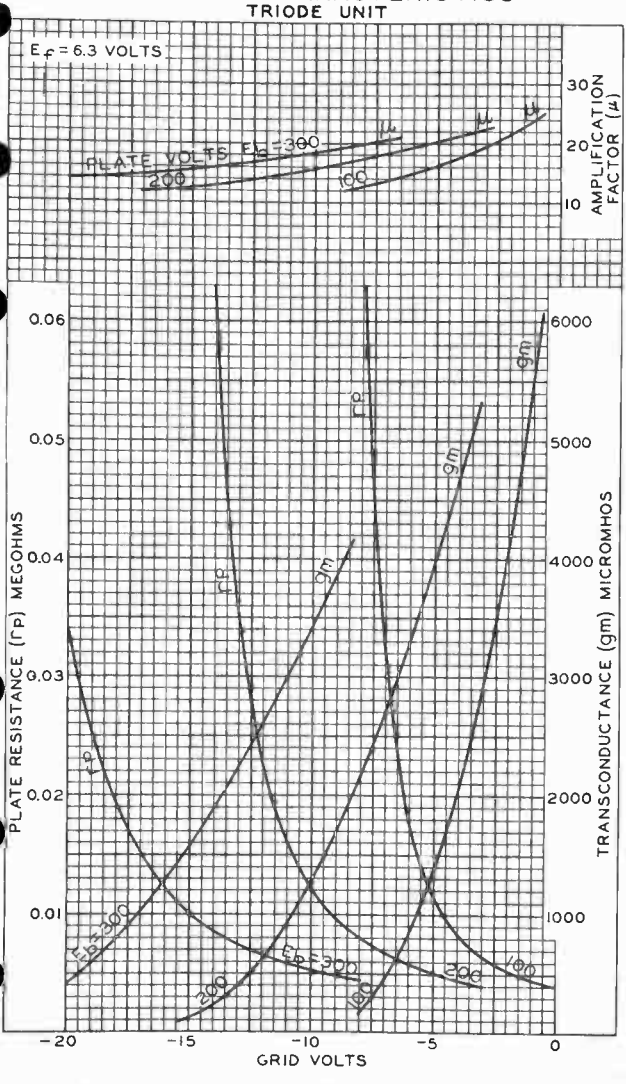
92CM-8520

RCA

6AZ8

AVERAGE CHARACTERISTICS

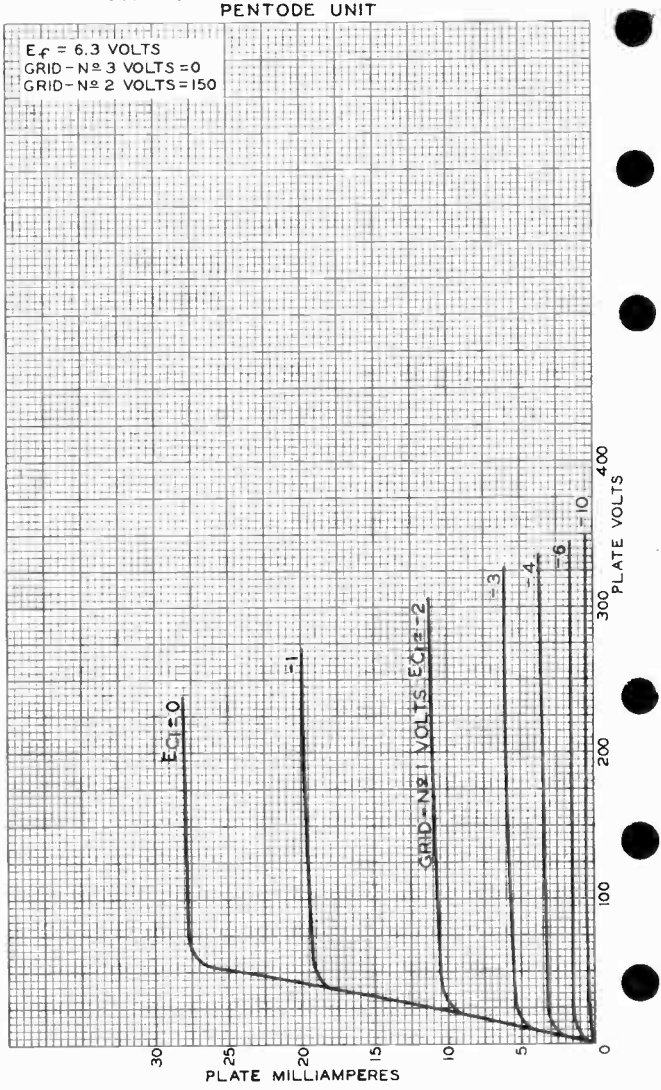
TRIODE UNIT



6AZ8

AVERAGE PLATE CHARACTERISTICS

PENTODE UNIT



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6B8

DUPLEX-DIODE PENTODE

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

BOTTOM VIEW (8E)

PENTODE UNIT

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

DIODE UNITS - Two

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

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

○ With shell connected to cathode.

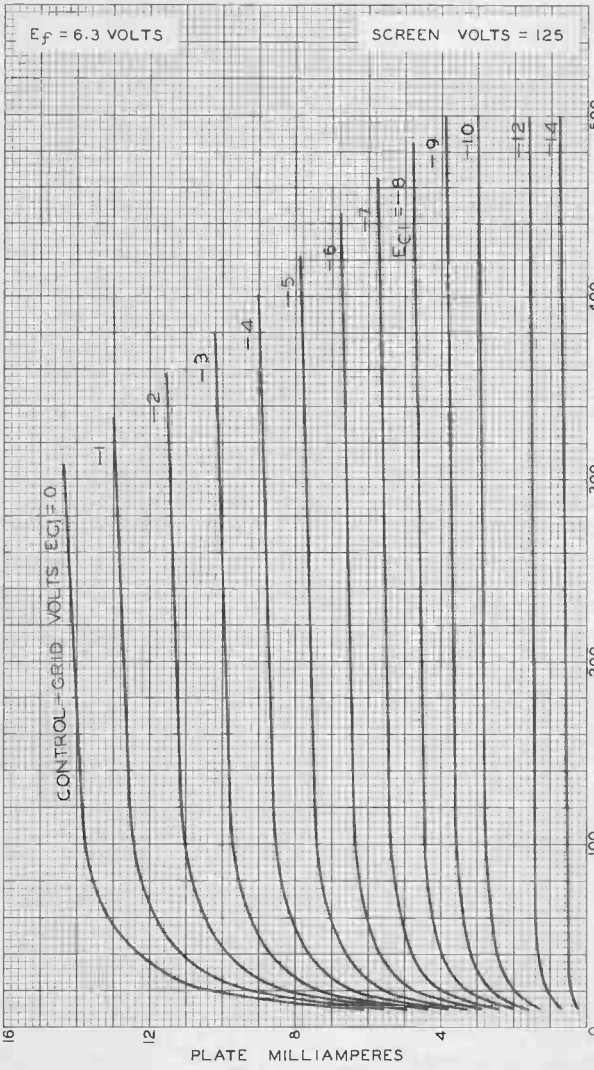
For Diode Curves, see Type 6B7. For additional data, see RESISTANCE-COUPLED AMPLIFIER CHART.

← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6B8

AVERAGE PLATE CHARACTERISTICS



AUG. 14, 1936

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

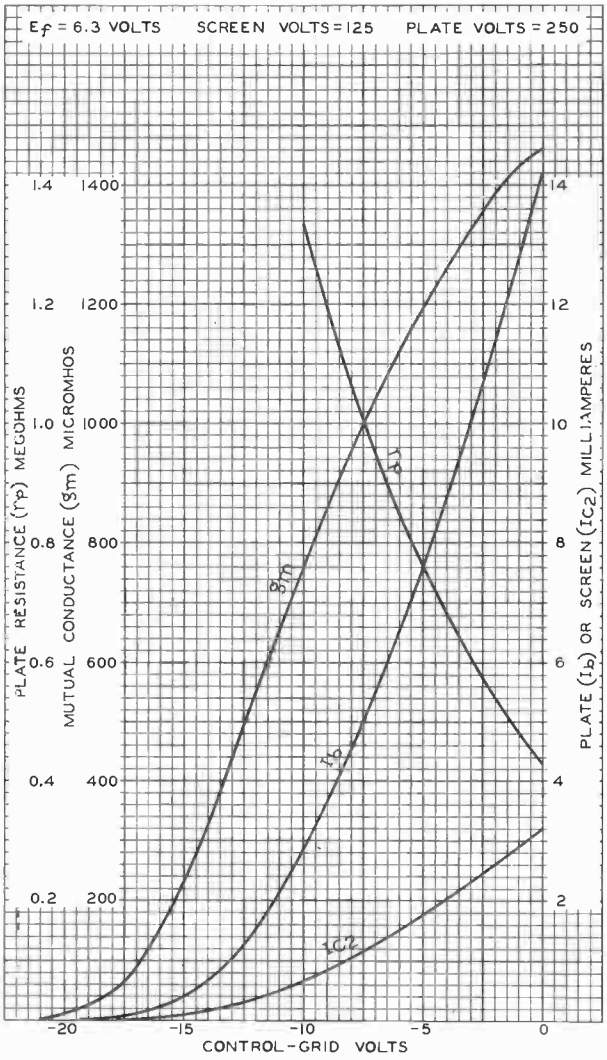
92C-4657

RCA Cunningham Radiotron RADIO TUBES

6B8

RCA-6B8

AVERAGE CHARACTERISTICS



AUG. 18, 1936

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

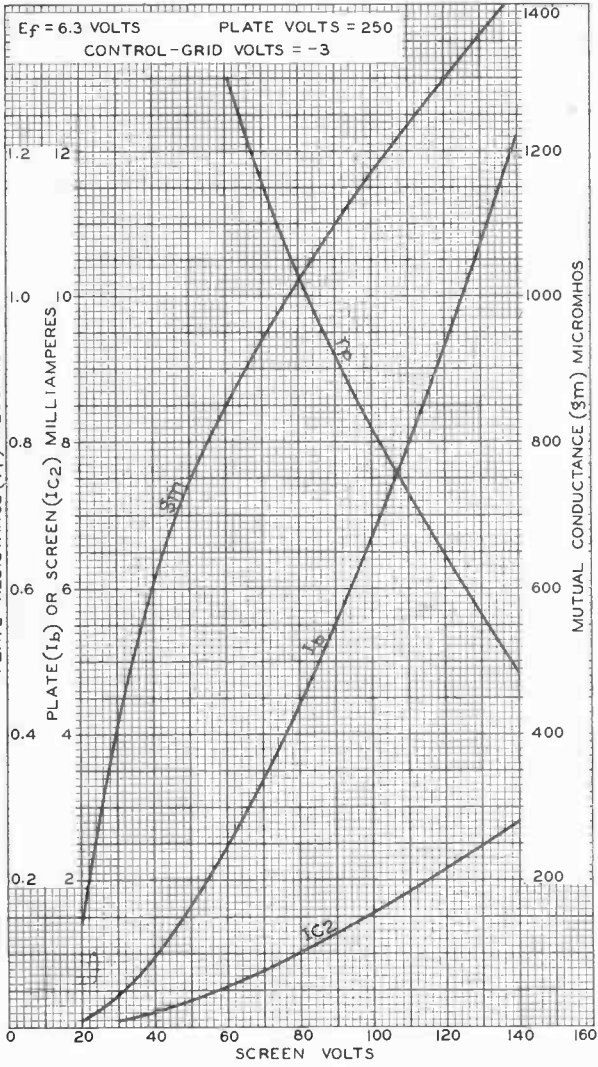
92C-4660

6B8

RCA Cunningham Radiotron RADIO TUBES

RCA-6B8

AVERAGE CHARACTERISTICS



AUG. 18, 1936

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4661

Remote-Cutoff Pentode

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*▲	
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	5.5	μμf
Characteristics, Class A_1 Amplifier:			
Plate Supply Voltage	100	250	volts
Grid No.3	*Connected to cathode at socket*		
Grid-No.2 Supply Voltage	100	100	volts
Cathode Resistor	68	68	ohms
Plate Resistance (Approx.)	0.25	1	megohm
Transconductance	4300	4400	μmhos
Plate Current	10.8	11	ma
Grid-No.2 Current	4.4	4.2	ma
Grid-No.1 Voltage (Approx.) for transconductance (μmhos) = 40	-20	-20	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Diameter	0.650" to 0.750" ←
Dimensional Outline	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

← Indicates a change.

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:		
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	0.7 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	3.4 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200● max.	volts

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

● The dc component must not exceed 100 volts.

→ Indicates a change.

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	0	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.

RCA

6BA8-A

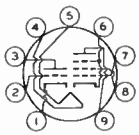
MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

	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

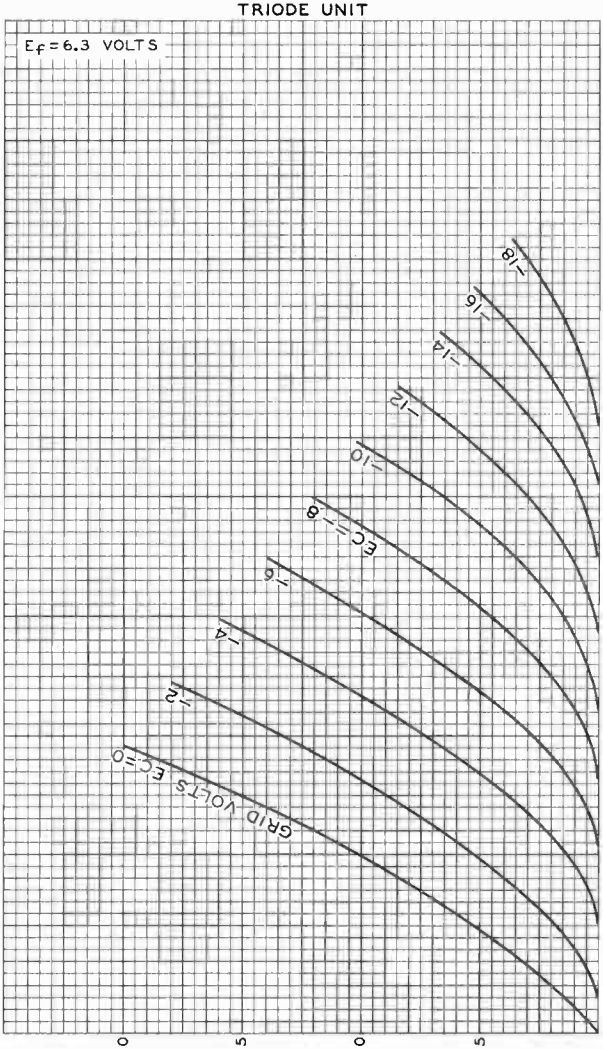
Because the internal shield is connected to the cathode and grid No.3, the impedance in the cathode circuit should be kept as low as possible to minimize cross-coupling effects.

6BA8-A

6BA8-A

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



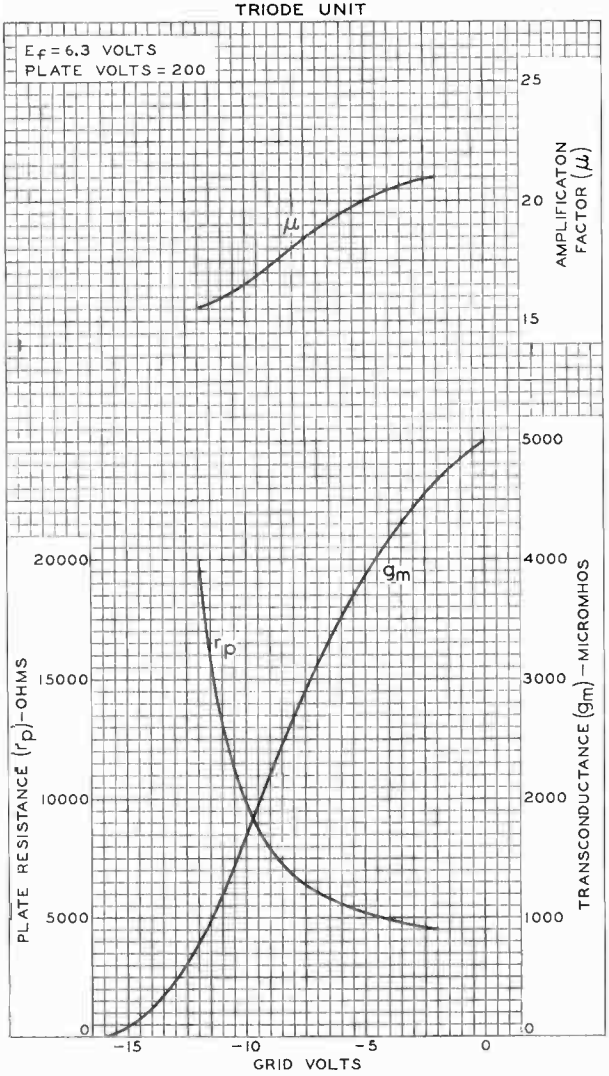
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9338

6BA8-A

AVERAGE CHARACTERISTICS

TRIODE UNIT



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

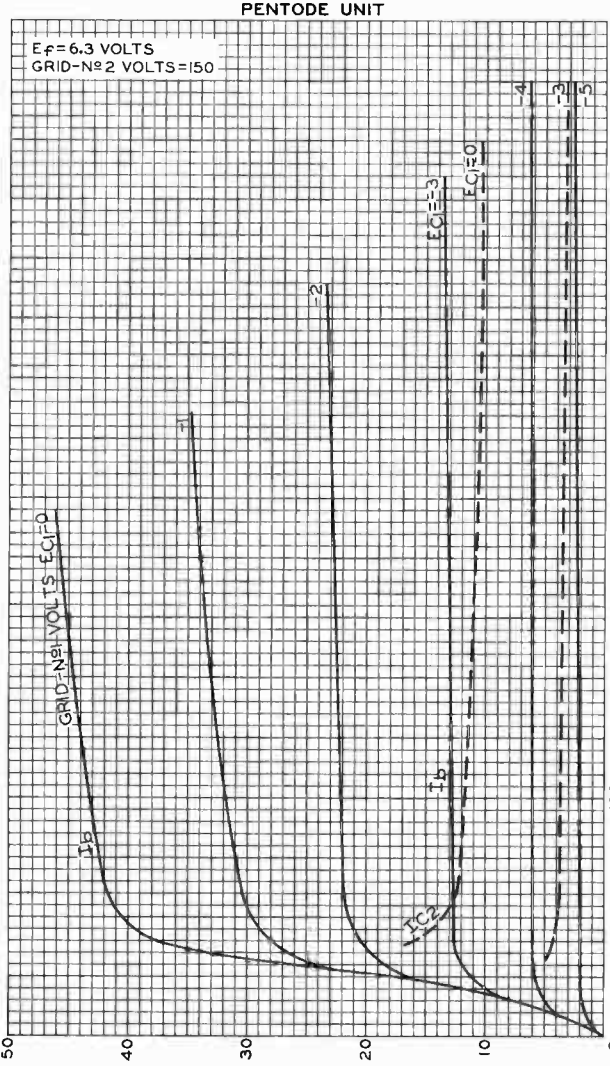
92CM-9339

RCA

6BA8-A

AVERAGE CHARACTERISTICS

PENTODE UNIT



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

92CM-9173

RCA

6BC4

MEDIUM-MU TRIODE

9-PIN MINIATURE TYPE

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

GENERAL DATA

Electrical:

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

Characteristics - Class A_1 Amplifier:

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

Mechanical:

Mounting Position	Any
Maximum Overall Length	1-3/4"
Maximum Seated Length	1-1/2"
Length, Base Seat to Bulb Top (Excluding Tip)	1-1/8" ± 3/32"
Maximum Diameter	7/8"
Bulb	T-6-1/2
Base	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW	9DR

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

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

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

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

* With no external shield.

6BC4

MEDIUM-MU TRIODE

Maximum Circuit Values (For maximum rated conditions):

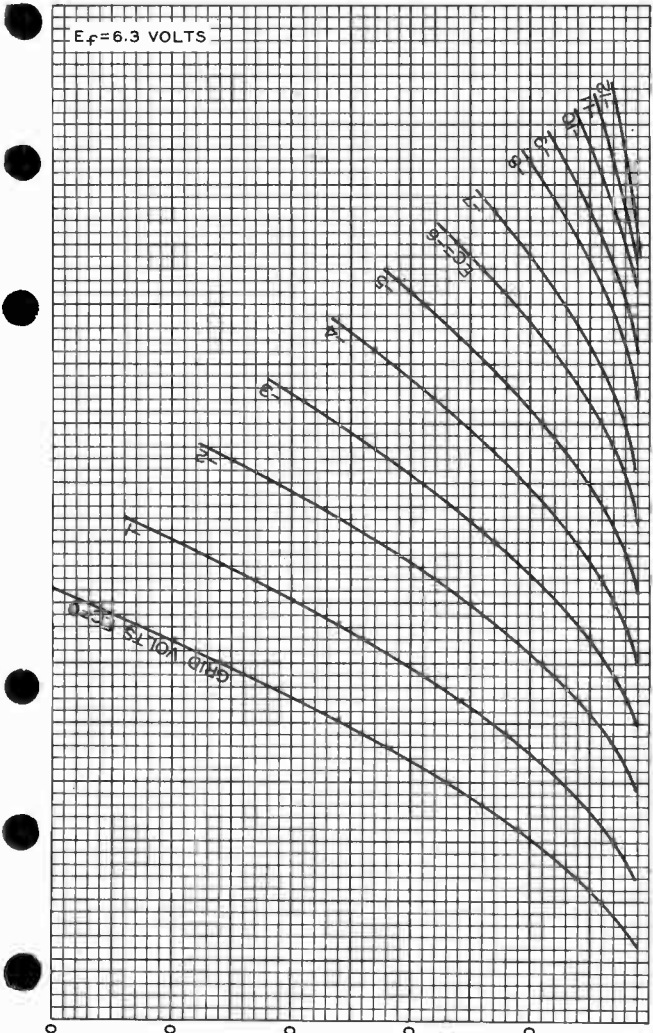
Grid-Circuit Resistance:

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

RCA

6BC4

AVERAGE PLATE CHARACTERISTICS



FEB.12,1954

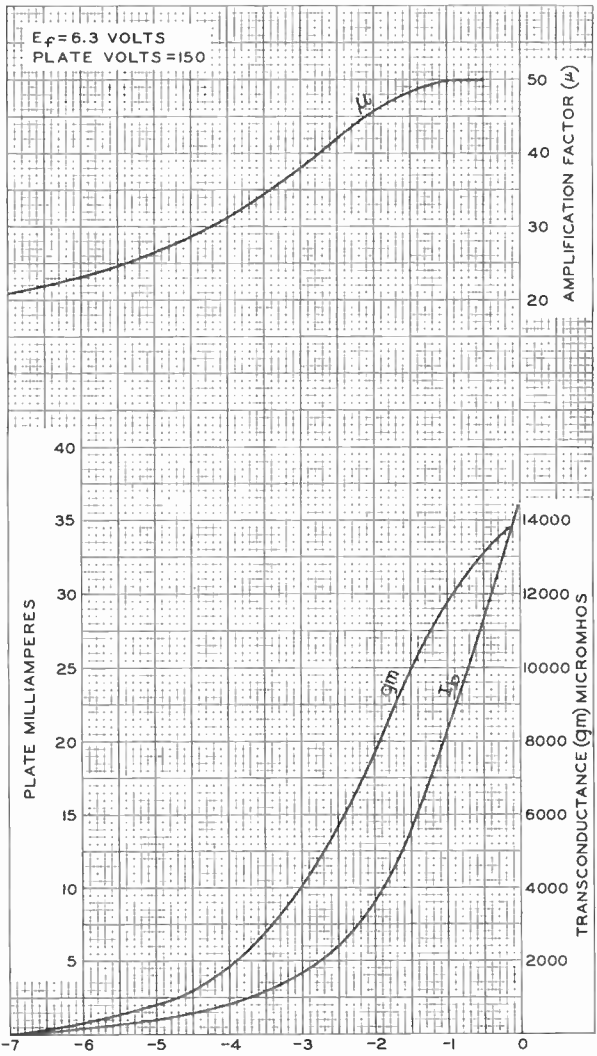
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8241

RCA

6BC4

AVERAGE CHARACTERISTICS



FEB. 12, 1954

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8240

6BD6

REMOTE-CUTOFF PENTODE

MINIATURE TYPE

GENERAL DATA

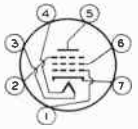
Electrical:

Heater, for Unipotential Cathode:			
Voltage	6.3		ac or dc volts
Current	0.3		amp
Direct Interelectrode Capacitances:	*Without External Shield*	*With External Shield No.316*	
Grid No.1 to Plate	0.005 max.	0.004 max.	μμf
Input	4.3	4.3	μμf
Output	5.0	5.0	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin
Basing Designation for BOTTOM VIEW	7BK1

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



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

AMPLIFIER – Class A_1

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	125 max.	volts
PLATE DISSIPATION	3 max.	watts
GRID-No.2 INPUT	0.65 max.	watt
TOTAL CATHODE CURRENT	14 max.	ma
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Typical Operation and Characteristics:

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

6BD6

REMOTE-CUTOFF PENTODE

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

Pentagrid Converter

7-PIN MINIATURE TYPE

GENERAL DATA

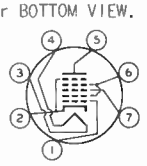
Electrical:

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 [a]	200	max.	volts
Heater positive with respect to cathode [a]	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
Cathode Current	25	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10.	-11	volts

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

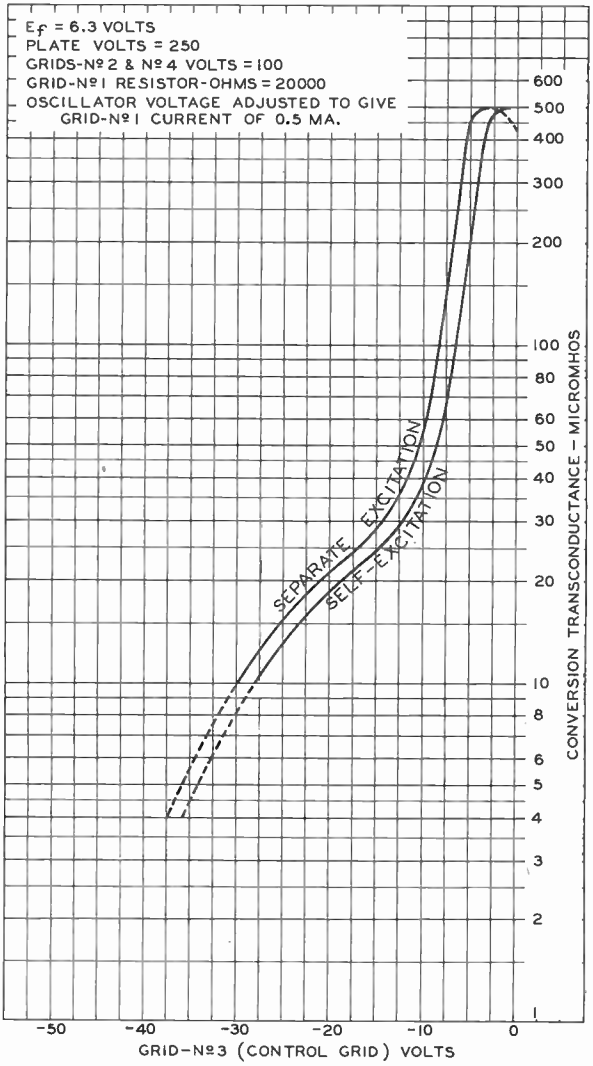
[b] The dc component must not exceed 100 volts.

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

RCA

6BE6

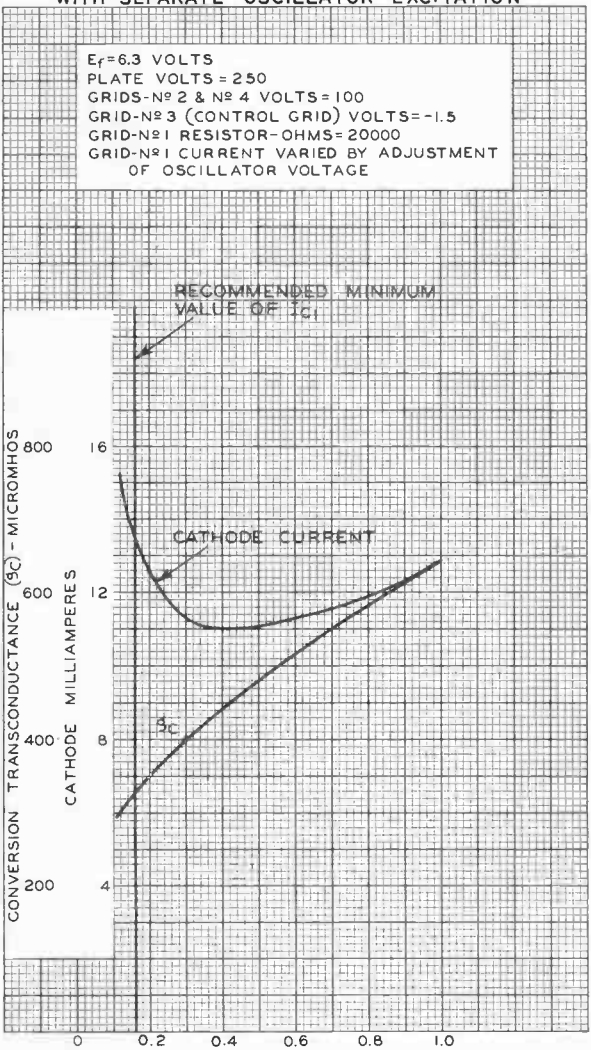
OPERATION CHARACTERISTICS



6BE6

OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION

E_f = 6.3 VOLTS
PLATE VOLTS = 250
GRIDS-№ 2 & № 4 VOLTS = 100
GRID-№ 3 (CONTROL GRID) VOLTS = -1.5
GRID-№ 1 RESISTOR-OHMS = 20000
GRID-№ 1 CURRENT VARIED BY ADJUSTMENT OF OSCILLATOR VOLTAGE



6BD4-A

SHARP-CUTOFF BEAM TRIODE

HIGH-VOLTAGE, LOW-CURRENT, REGULATOR TYPE

Supersedes Type 6BD4

GENERAL DATA

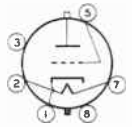
Electrical:

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

Mechanical:

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

BOTTOM VIEW



Pin 1 - Cathode
Pin 2 - Heater
Pin 3 - No Connection
Pin 5 - Grid
Pin 7 - Heater
Pin 8 - No Connection
Cap - Plate

VOLTAGE-CONTROL SERVICE

Maximum Ratings, *Design-Center Values:*

DC PLATE VOLTAGE	27000 max.	volts
UNREGULATED DC SUPPLY VOLTAGE	55000 max.	volts
GRID VOLTAGE:		
DC value	-125 max.	volts
Peak value	-550 max.	volts
DC PLATE CURRENT	1.5 max.	ma
PLATE DISSIPATION	25 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	180 max.	volts
Heater positive with respect to cathode	180 max.	volts

Typical Operation As Shunt Voltage-Regulator Tube In Accompanying Circuit:

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

6BD4-A

SHARP-CUTOFF BEAM TRIODE

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

Maximum Circuit Values:

Grid-Circuit Resistance:

With unregulated supply having an equivalent resistance of at least 8 megohms . . . . . 4 max. megohms

With unregulated supply having an equivalent resistance less than 8 megohms . . *See accompanying curve*

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

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

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

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

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

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

OPERATING NOTES

Operation of the 6BD4-A with a plate voltage above approximately 16000 volts (absolute value) results in the production of x-rays which can constitute a health hazard on prolonged exposure at close range unless the tube is adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.

6BF5
BEAM POWER AMPLIFIER

MINIATURE TYPE

GENERAL DATA

Electrical:

Heater for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	1.2	amp
Direct Interelectrode Cap. (Approx.; no external shield):		
As Beam Power Amplifier:		
Grid No.1 to Plate	0.65	μμf
Input	14	μμf
Ouput	6	μμf

Characteristics as Beam Power Amplifier:
See AMPLIFIER--Class A_1

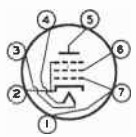
Characteristics as Triode-Connected Amplifier - Class A_1:
(Grid No.2 connected to plate)

Plate Voltage	225	volts
Grid Voltage	-30	volts
Amplification Factor	6.7	
Plate Resistance	2500	ohms
Transconductance	2700	μmhos
Plate Current	10	ma
Grid Voltage (Approx.) for plate current of 0.5 ma	-40	volts

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	7BZ

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



Pin 4 - Heater
Pin 5 - Plate
Pin 6 - Grid No.2
Pin 7 - Grid No.1

AMPLIFIER--Class A_1

Maximum Ratings, *Design-Center Values:*

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

6BF5

BEAM POWER AMPLIFIER

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

Typical Operation and Characteristics:

Plate Voltage	110	volts
Grid-No.2 (Screen) Voltage	110	volts
Grid-No.1 (Control-Grid) Voltage	-7.5	volts
Peak AF Grid-No.1 Voltage	7.5	volts
Zero-Signal Plate Current	36	ma
Maximum-Signal Plate Current	39	ma
Zero-Signal Grid-No.2 Current	4	ma
Maximum-Signal Grid-No.2 Current	10.5	ma
Plate Resistance (Approx.)	12000	ohms
Transconductance	7500	μmhos
Plate Load Resistance	2500	ohms
Total Harmonic Distortion	10	per cent
Maximum-Signal Power Output	1.9	watts

VERTICAL DEFLECTION AMPLIFIER

Triode Connected--Grid No.2 Connected to Plate

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

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

DC PLATE VOLTAGE	250 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE†	900○ max.	volts
CATHODE CURRENT:		
DC	40 max.	ma
Peak	120 max.	ma
PLATE DISSIPATION††	5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200■ max.	volts

Maximum Circuit Values:

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

■ The dc component must not exceed 100 volts.

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

† The duration of the voltage pulse must not exceed 7 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 7 per cent of one vertical scanning cycle is 1.2 milliseconds.

○ under no circumstances should this absolute value be exceeded.

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

6BF6
DUPLEX-DIODE TRIODE

MINIATURE TYPE

GENERAL DATA

Electrical:

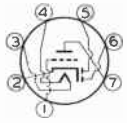
Heater, for Unipotential Cathode:			
Voltage	6.3		ac or dc volts
Current	0.3		amp
Direct Interelectrode Capacitances – Triode Unit:			
Grid to Plate	2.0*	2.0**	μμf
Grid to Cathode	1.8*	1.8**	μμf
Plate to Cathode	1.1*	1.4**	μμf

* With no external shield.
** With external shield connected to cathode.

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length from Base Seat to Bulb Top (excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Miniature Button 7-Pin
Basing Designation for BOTTOM VIEW	7BT

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



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

TRIODE UNIT – Class A_1 Amplifier

Maximum Ratings, *Design-Center Values*:

PLATE VOLTAGE	300 max.	volts
PLATE DISSIPATION	2.5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Typical Operation and Characteristics:

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

6BF6
DUPLEX-DIODE TRIODE

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

DIODE UNITS – Two

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

6BG6-G

BEAM POWER TUBE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.9	amp
Direct Interelectrode Capacitances (Approx.):[D]		
Grid No.1 to plate	0.34	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	12	μμf
Plate to cathode & grid No.3, grid No.2, and heater	6.5	μμf

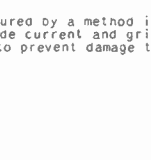
Characteristics, Class A$_1$ Amplifier:

Plate Voltage	60	250	volts
Grid-No.2 (Screen) Voltage	250	250	volts
Grid-No.1 (Control-Grid) Voltage	0	−15	volts
Mu-Factor, Grid No.2 to Grid No.1	−	8	
Plate Resistance (Approx.)	−	25000	ohms
Transconductance	−	6000	μmhos
Plate Current	180*	75	ma
Grid-No.2 Current	18*	4	ma
Grid-No.1 Voltage (Approx.) for plate current of 1 ma	−	−45	volts

Mechanical:

Mounting Position	Vertical, base up or down, or Horizontal with pins 2 and 7 in vertical plane
Maximum Overall Length	5-11/16"
Seated Length	4-31/32" ± 5/32"
Maximum Diameter	2-1/16"
Dimensional Outline	*See General Section*
Bulb	ST-16
Cap	Small (JETEC No.C1-1)
Base	Medium-Shell Octal 6-Pin (JETEC No.B6-13)
Basing Designation for BOTTOM VIEW	5BT

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



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

[D] Without external shield.

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

→ Indicates a change.

6BG6-G

BEAM POWER TUBE

HORIZONTAL DEFLECTION AMPLIFIER

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

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

DC PLATE VOLTAGE	700	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)[●]	6600[■]	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500	max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE	350	max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-50	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE	300	max.	volts
CATHODE CURRENT:			
Peak	400	max.	ma
Average	110	max.	ma
GRID-No.2 INPUT	3.2	max.	watts
PLATE DISSIPATION[†]	20	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[▲]	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	210	max.	°C

Maximum Circuit Values:

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

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

■ Under no circumstances should this absolute value be exceeded.

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

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

▲ The dc component must not exceed 100 volts.

→ indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BG6-G

AVERAGE PLATE CHARACTERISTICS

6BG6-G

RCA

E_f=6.3 VOLTS
GRID-№2 VOLTS=250

PLATE VOLTS

0 100 200 300 400 500 600

PLATE MILLIAMPERES

0 100 200 300 400

GRID-№1 VOLTS=EC1=0

EC1=+10
+5
-5
-10
-15
EC1=-20
-25
-30

JUNE 18,1947

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6774R1

6BG6-G

RCA

6BG6-G

AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$ VOLTS

GRID-No 1 VOLTS = 0

GRID-No 2 VOLTS E_{C_2}=150

E_{C_2}=100

E_{C_2}=50

E_{C_2}=200

E_{C_2}=250

E_{C_2}=300

PLATE VOLTS

0 100 200 300 400 500

PLATE MILLIAMPERES

0 50 100 150 200 250 300 350 400

JUNE 25, 1947

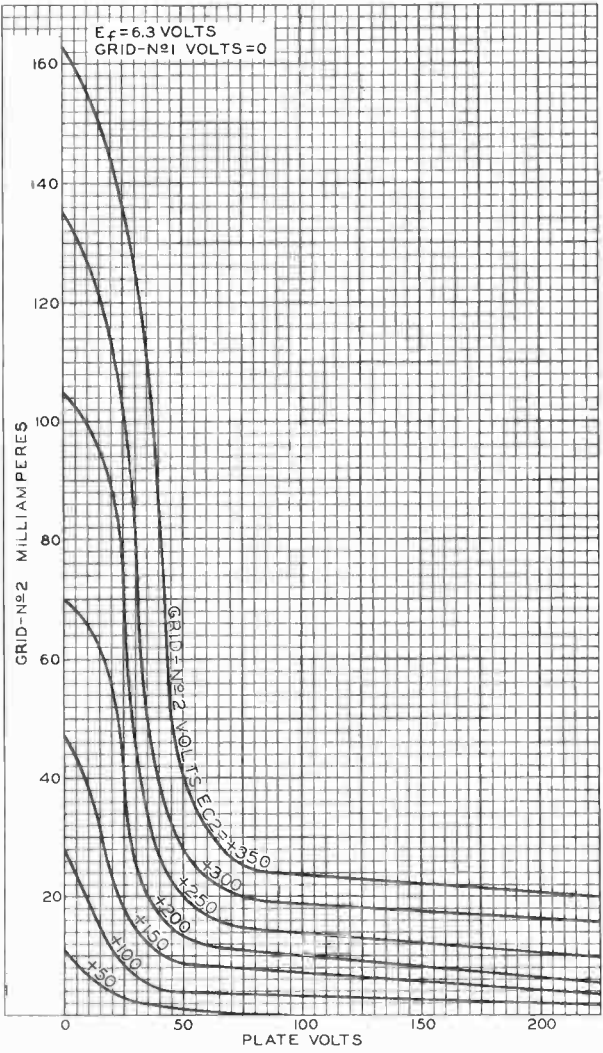
TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6775RI

6BG6-G

AVERAGE CHARACTERISTICS



6BG6-GA

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.):[o]		
Grid No.1 to plate	0.8	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	11	μμf
Plate to cathode & grid No.3, grid No.2, and heater	6	μμf

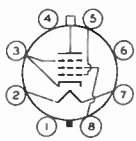
Characteristics, Class A_1 Amplifier:

Plate Voltage	60	250	volts
Grid-No.2 (Screen-Grid) Voltage	250	250	volts
Grid-No.1 (Control-Grid) Voltage	0	-15	volts
Mu-Factor, Grid No.2 to Grid No.1	-	8	
Plate Resistance (Approx.)	-	25000	ohms
Transconductance	-	6000	μmhos
Plate Current	180*	75	ma
Grid-No.2 Current	18*	4	ma
Grid-No.1 Voltage (Approx.) for plate current of 1 ma	-	-45	volts

Mechanical:

Mounting Position . . . . . Vertical, base up or down, or Horizontal with pins 2 and 7 in vertical plane
Maximum Overall Length . . . . . 5"
Seated Length . . . . . 4-1/4" ± 3/16"
Maximum Diameter . . . . . 1-9/16"
Bu'b. T12
Cap . . . . . Small (JETEC No.C1-1)
Base . . . . . Short Medium-Shell Octal 6-Pin with External Barriers, Style B (JETEC No.B6-120), 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



[o] Without external shield.

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

♦ On the 6-pin base, pins 4 and 6 are omitted.

TENTATIVE DATA

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BG6-GA

BEAM POWER TUBE

HORIZONTAL DEFLECTION AMPLIFIER

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

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

DC PLATE VOLTAGE	700	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)[⊛]	6600[■]	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE[⊛]	1500	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	350	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 (CONTROL-GRID) VOLTAGE	300	max.	volts
CATHODE CURRENT:			
Peak	400	max.	ma
DC	110	max.	ma
GRID-No.2 INPUT	3.2	max.	watts
PLATE DISSIPATION[†]	20	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[▲]	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	210	max.	°C

Maximum Circuit Values:

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

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

■ Under no circumstances should this absolute value be exceeded.

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

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

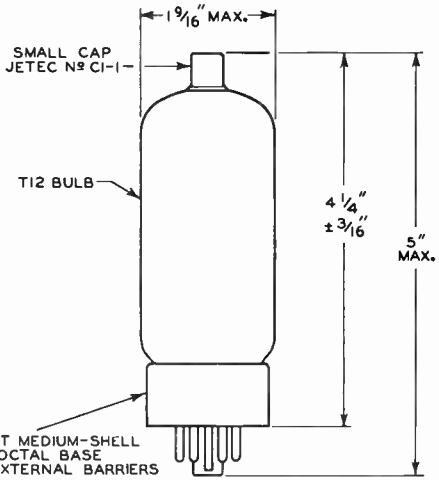
▲ The dc component must not exceed 100 volts.

TENTATIVE DATA

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BG6-GA

BEAM POWER TUBE



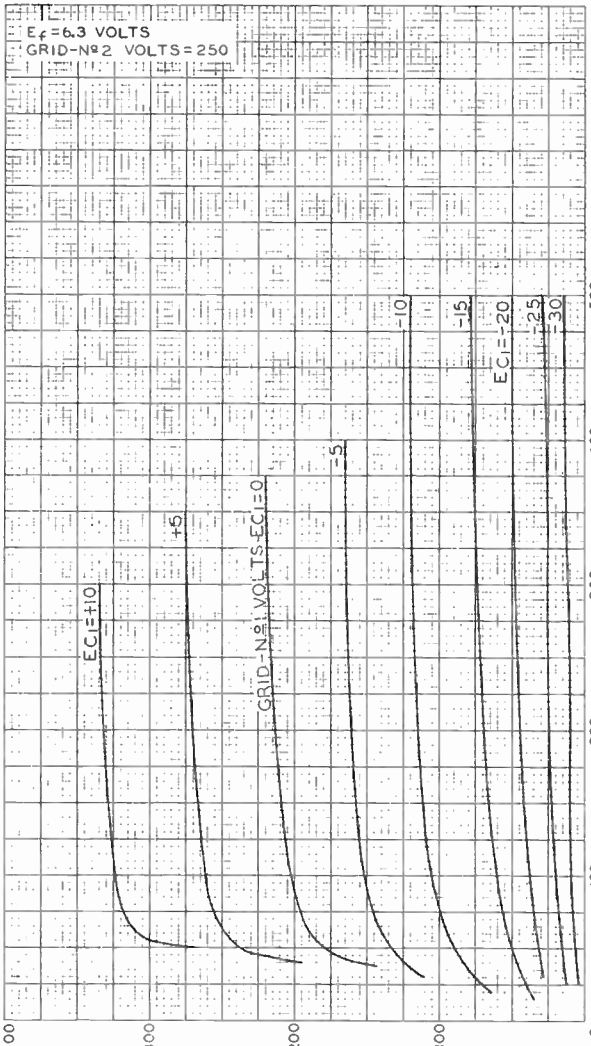
6-PIN, STYLE B: JETEC Nº B6-120
8-PIN, STYLE A: JETEC Nº B8-110
8-PIN, STYLE B: JETEC Nº B8-118

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BG6-GA

6BG6-GA

AVERAGE PLATE CHARACTERISTICS



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6774RI

RCA

6BG6-GA

AVERAGE PLATE CHARACTERISTICS

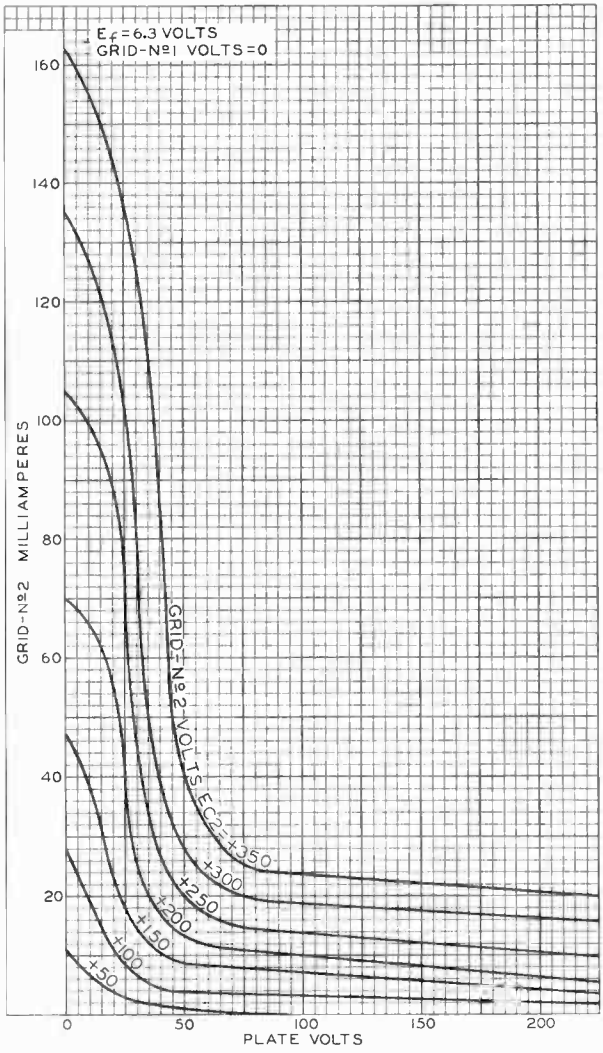
TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

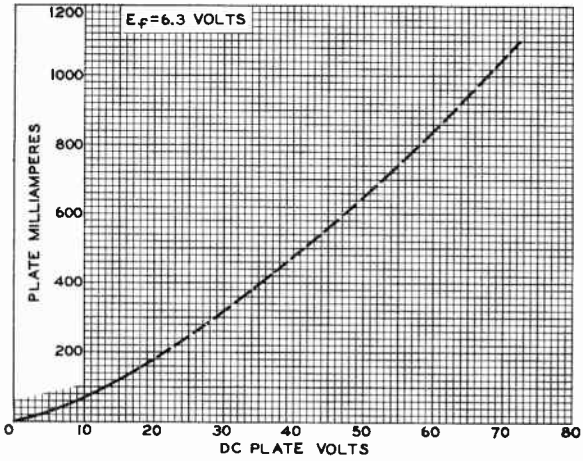
92CM-6775RI

6BG6-GA

AVERAGE CHARACTERISTICS



AVERAGE PLATE CHARACTERISTIC



92CS-9884

6BH6
SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:
Voltage . . . . . 6.3 . . . . . ac or dc volts
Current . . . . . 0.45 . . . . . amp

Direct Interelectrode Capacitances:

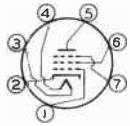
	Without External Shield	With External Shield°	
Grid No.1 to plate	0.0035 max.	0.0035 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	5.4	5.4	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	4.4	4.4	μμf

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

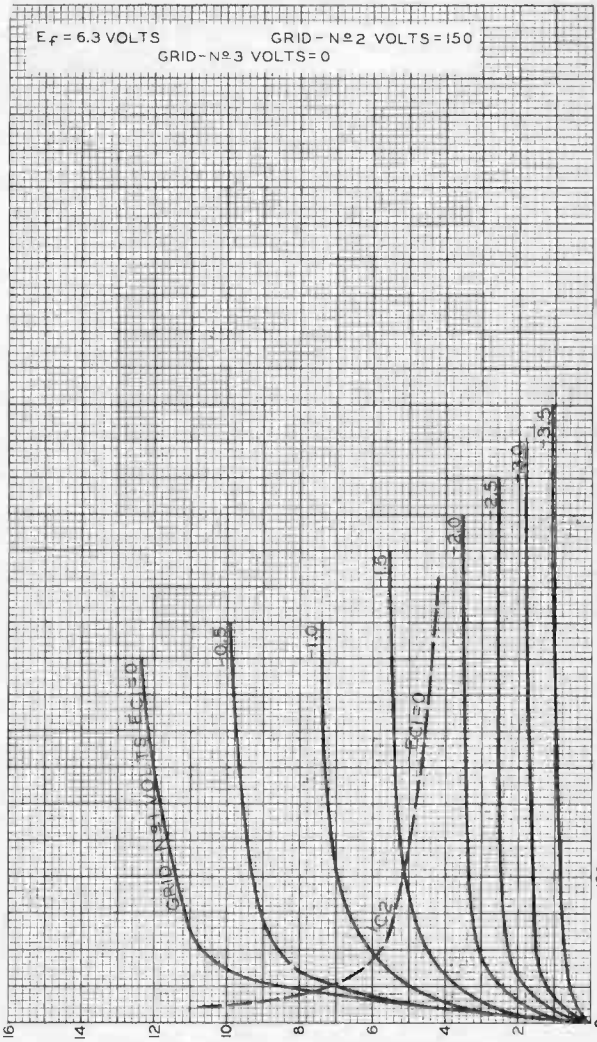
→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6BH6

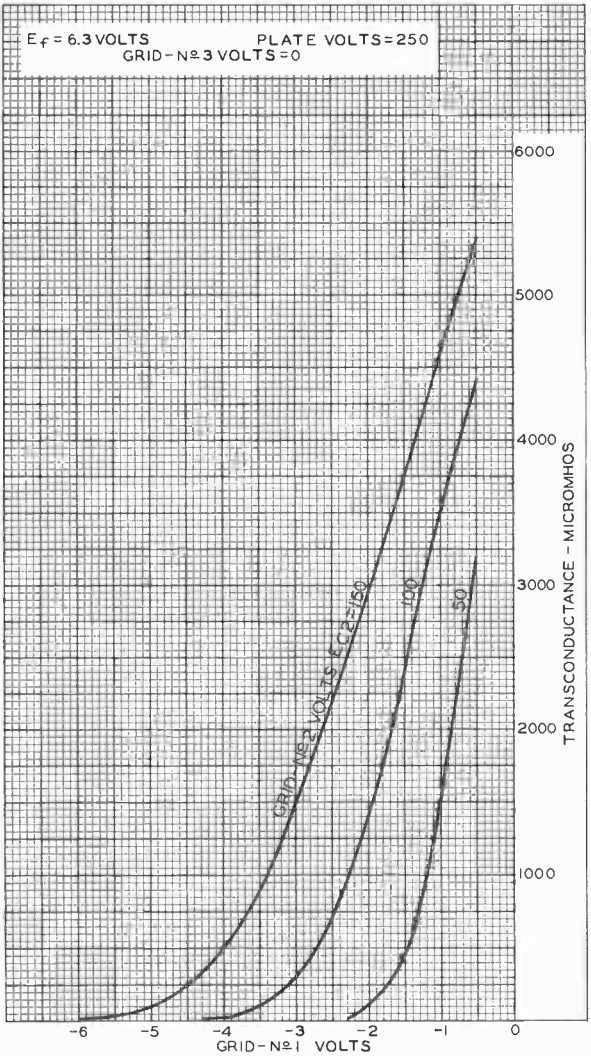
AVERAGE PLATE CHARACTERISTICS



RCA

6BH6

AVERAGE CHARACTERISTICS

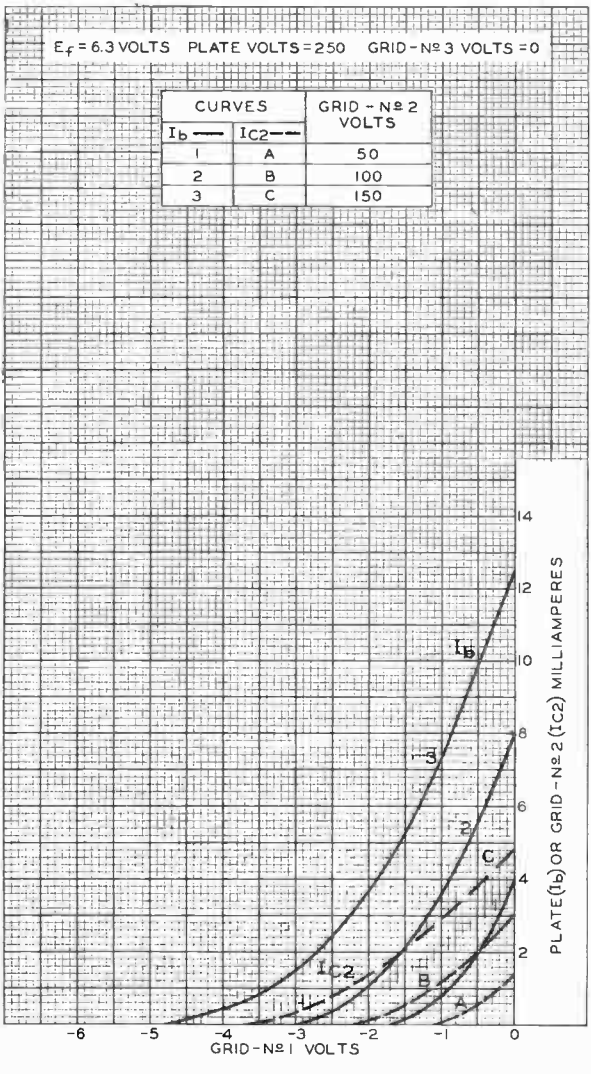


TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

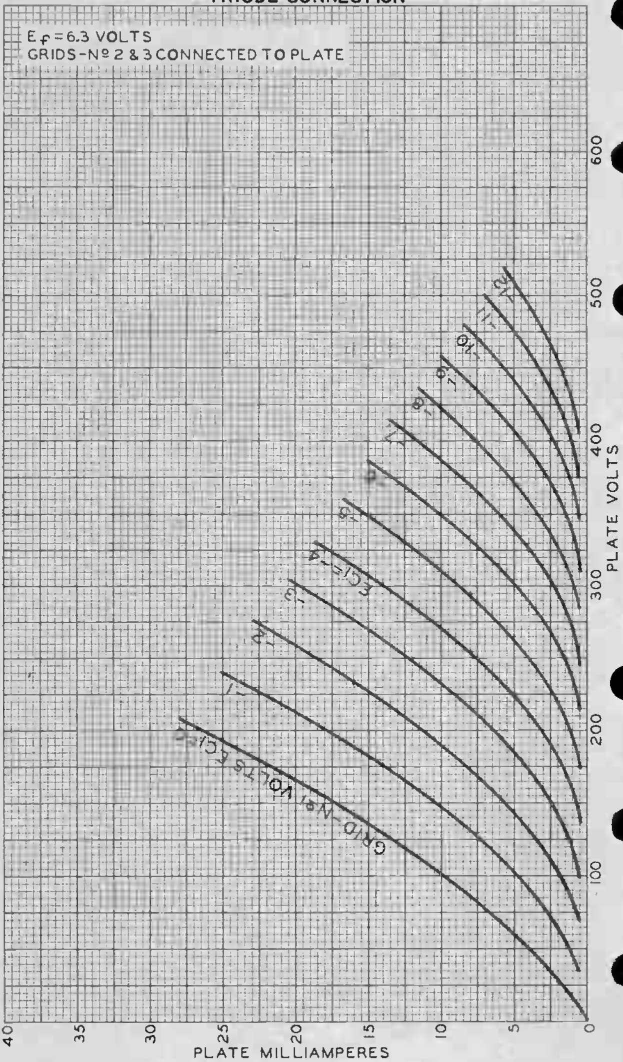
6BH6

AVERAGE CHARACTERISTICS



6BH6

AVERAGE PLATE CHARACTERISTICS
TRIODE CONNECTION



DEC.10,1947 | TUBE DEPARTMENT | 92CM-6896

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6BH8

MEDIUM-MU TRIODE — SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

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

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

Direct Interelectrode Capacitances (Approx.):[o]

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

Characteristics, Class A_1 Amplifier:

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

Mechanical:

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

[o] Without external shield.

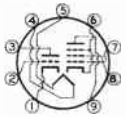
RCA

6BH8

MEDIUM-MU TRIODE–SHARP-CUTOFF PENTODE

Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Maximum Diameter	7/8"
Dimensional Outline	*See General Section*
Bulb	T-6-1/2
Base	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW	9DX

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



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

AMPLIFIER – Class A_1

Maximum Ratings, *Design-Center Values:*

	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE	300 max.	300 max.	volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE	–	300 max.	volts
GRID-No.2 VOLTAGE	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive bias value	0 max.	0 max.	volts
PLATE DISSIPATION	2.5 max.	3 max.	watts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts	–	1 max.	watt
For grid-No.2 voltages between 150 and 300 volts	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200 max.	200 max.	volts
Heater positive with respect to cathode	200▲max.	200▲max.	volts

▲ The dc component must not exceed 100 volts

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BH8

MEDIUM-MU TRIODE – SHARP-CUTOFF PENTODE

Maximum Circuit Values:

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

OPERATING CONSIDERATIONS

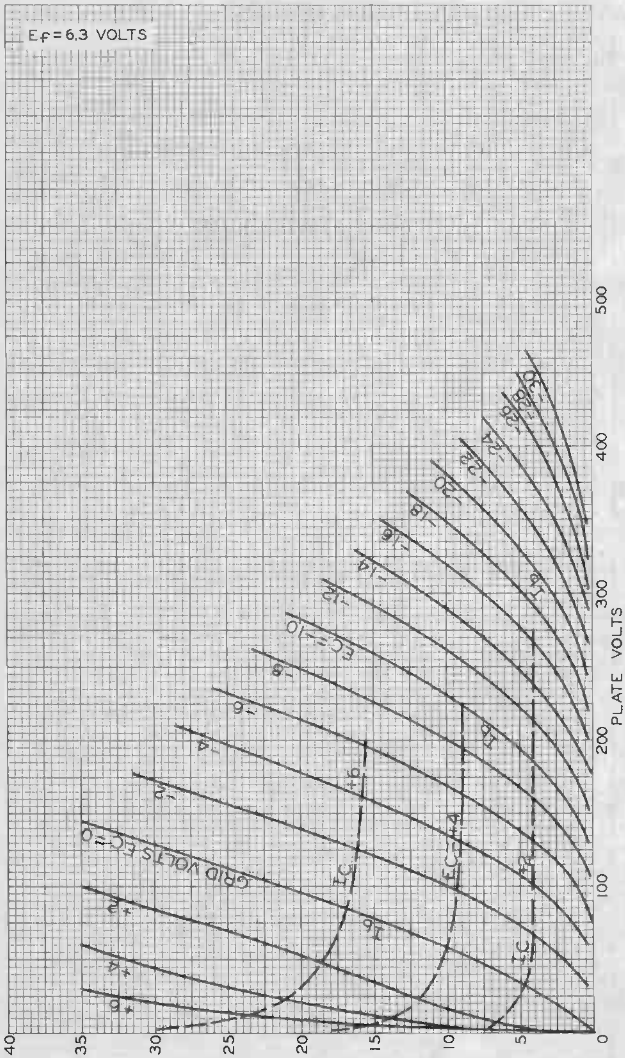
Because the *internal shield* is connected to the cathode and grid No.3, the impedance in the cathode circuit should be kept as low as possible to minimize cross-coupling effects.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BH8

6BH8

AVERAGE CHARACTERISTICS
TRIODE UNIT



TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

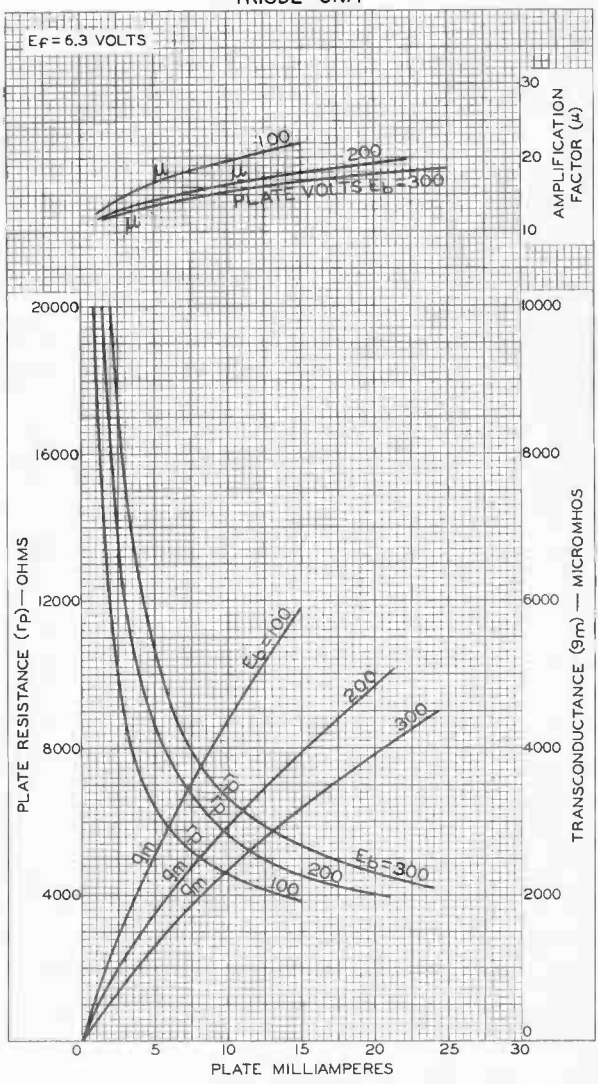
92CM-8799

RCA

6BH8

AVERAGE CHARACTERISTICS

TRIODE UNIT



RCA

6BH8

AVERAGE CHARACTERISTICS
PENTODE UNIT

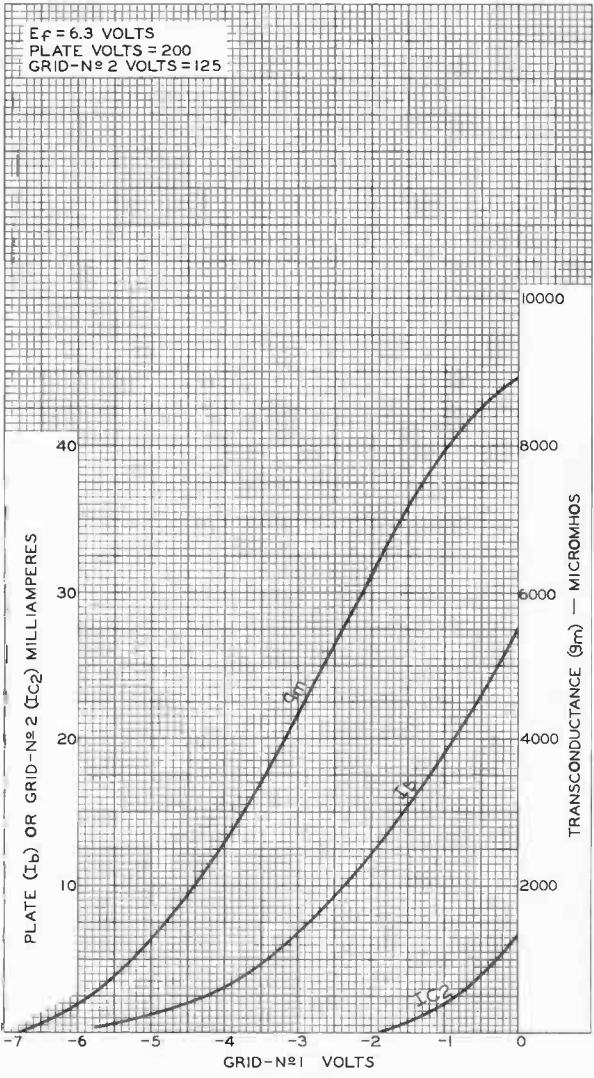
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8797

RCA

6BH8

AVERAGE CHARACTERISTICS
PENTODE UNIT



6BJ6
REMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.15	amp

Direct Interelectrode Capacitances:

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

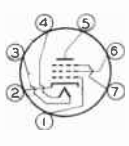
Characteristics, Class A_1 Amplifier:

Plate Voltage	100	250	volts
Grid No.3 (Suppressor)	*Connected to cathode at socket*		
Grid-No.2 Voltage	100	100	volts
Grid-No.1 Voltage	-1	-1	volt
Plate Resistance (Approx.)	0.25	1.3	megohm
Transconductance	3650	3600	μmhos
Plate Current	9	9.2	ma
Grid-No.2 Current	3.5	3.3	ma
Grid-No.1 Voltage (Approx.) for transconductance of 10 μmhos	-20	-20	volts

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Dimensional Outline	*See General Section*
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	7CM

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



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

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

← Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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

6BJ6

AVERAGE PLATE CHARACTERISTICS

PENTODE CONNECTION

RCA

6BJ6

E_f = 6.3 VOLTS
GRID-№ 2 VOLTS = 100
GRID-№ 3 VOLTS = 0

GRID-№1 VOLTS E_{C1} = -2

E_{C1} = 0

-0.5

-1

-1.5

-2

-2.5

-3

PLATE MILLIAMPERES

15.0
12.5
10.0
7.5
5.0
2.5
0

PLATE VOLTS

100
200
300
400
500

MAY 29, 1947

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92CM-6867

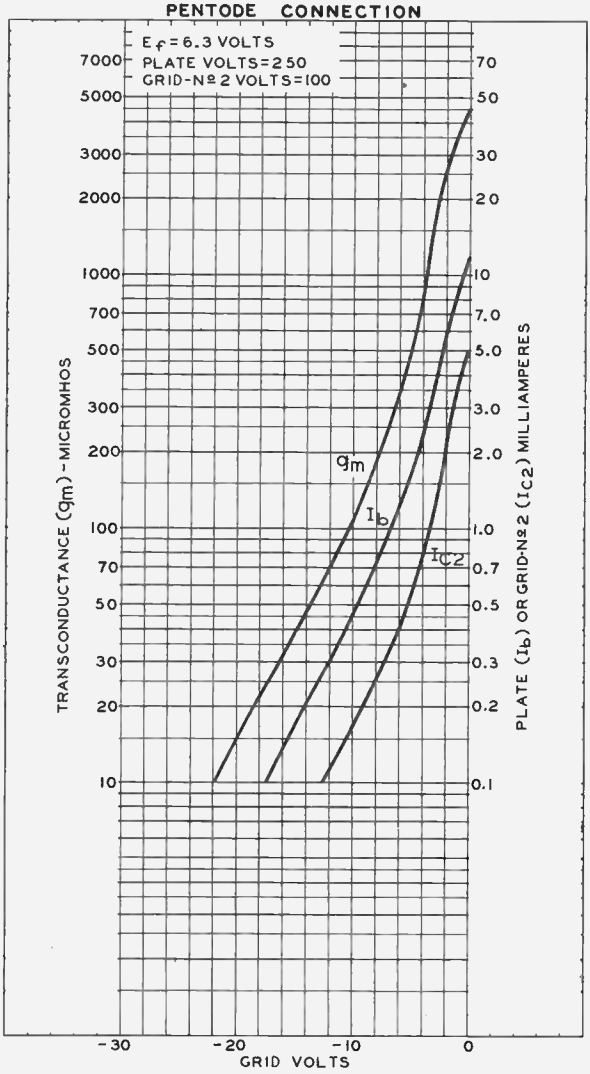
6BJ6

RCA

6BJ6

AVERAGE CHARACTERISTICS

PENTODE CONNECTION



JUNE 2,1947

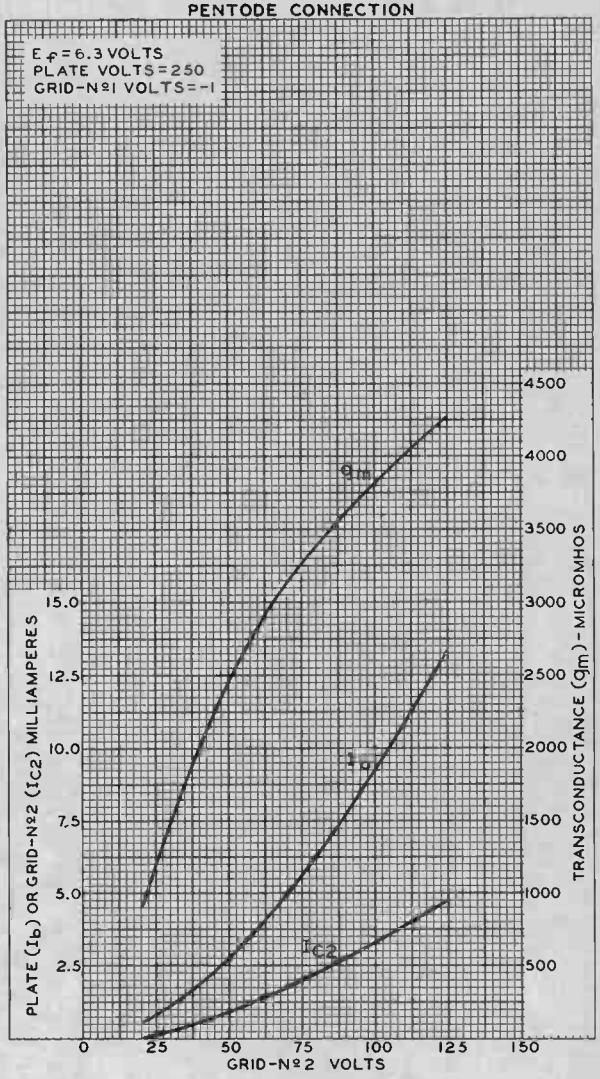
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6868

RCA

6BJ6

AVERAGE CHARACTERISTICS
PENTODE CONNECTION



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:[c]

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

[c]: See next page.

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

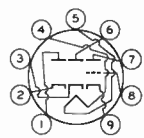
6BJ8

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

o, ▲, □, #, ■: 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

o Without external shield.

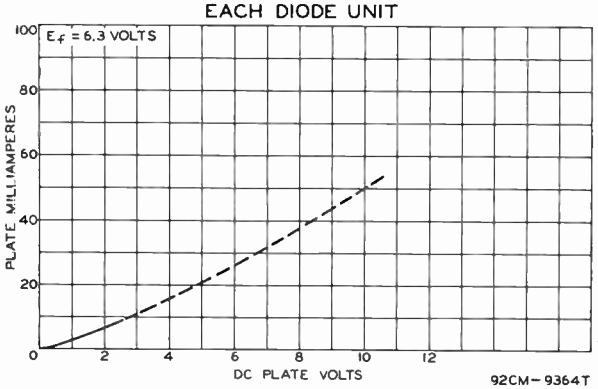
▲ The dc component must not exceed 100 volts.

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

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

■ Under no circumstances should this absolute value be exceeded.

AVERAGE PLATE CHARACTERISTIC
EACH DIODE UNIT

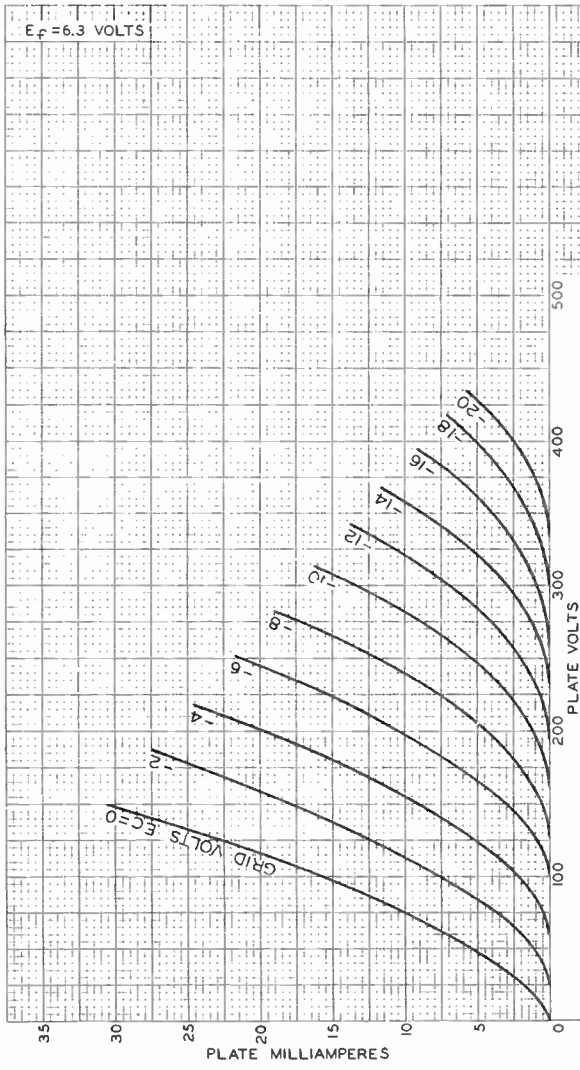


6BJ8

6BJ8

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



ELECTRON TUBE DIVISION

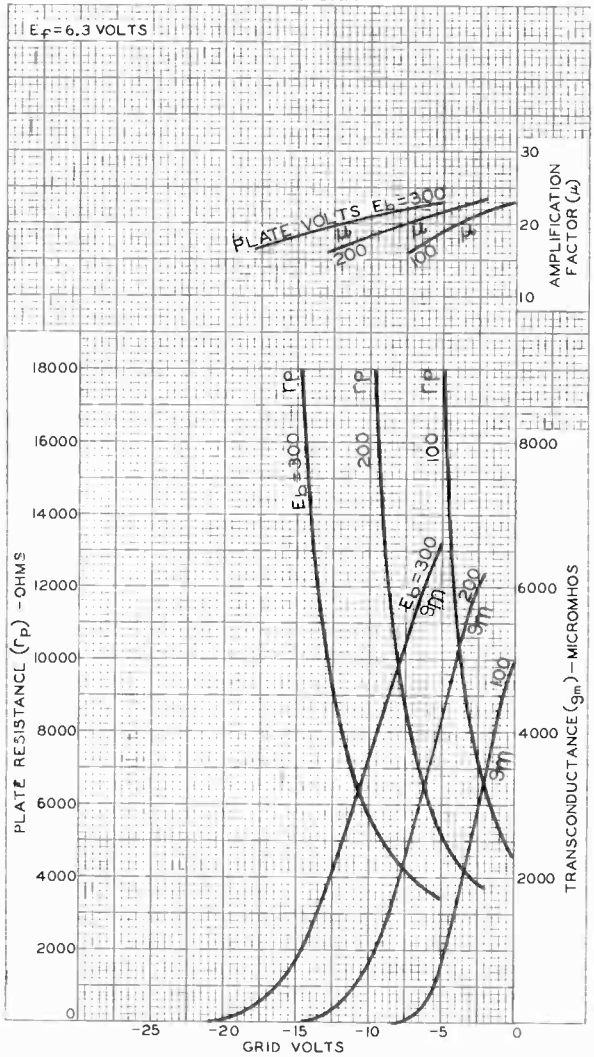
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9531

RCA

6BJ8

AVERAGE CHARACTERISTICS
TRIODE UNIT



ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-9535

RCA

6BK4

SHARP-CUTOFF BEAM TRIODE

HIGH-VOLTAGE, LOW-CURRENT, REGULATOR TYPE

GENERAL DATA

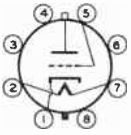
Electrical:

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

Mechanical:

Mounting Position	Any
Maximum Overall Length	5-7/32"
Seated Length	4-1/2" ± 3/16"
Maximum Diameter	1-23/32"
Bulb	T-12
Cap	Small (JETEC No.C1-1)
Base	Short Jumbo-Shell Octal 8-Pin with External Barriers (JETEC No.B8-71)
Basing Designation for Bottom View	8GC

Pin 1 – Cathode
Pin 2 – Heater
Pin 3 – Internal Connection–Do Not Use
Pin 4 – Same As Pin 3



Pin 5 – Grid
Pin 6 – Same as Pin 3
Pin 7 – Heater
Pin 8 – Same as Pin 3
Cap – Plate

VOLTAGE-CONTROL SERVICE

Maximum Ratings, *Design-Center Values*:

DC PLATE VOLTAGE	25000 max.	volts
UNREGULATED DC SUPPLY VOLTAGE	55000 max.	volts
GRID VOLTAGE:		
DC value	−125 max.	volts
Peak value■	−400 max.	volts
DC PLATE CURRENT	1.5 max.	ma
PLATE DISSIPATION	25 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	225 max.	volts
Heater positive with respect to cathode	Not Recommended	

Typical Operation As Shunt Voltage-Regulator Tube In Accompanying Circuit:

Unregulated Supply:		
DC voltage	36000	volts
Equivalent resistance	11	megohms

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

6BK4

SHARP-CUTOFF BEAM TRIODE

Voltage Divider Values:		
R_1 (5 watts)	220	megohms
R_2 (2 watts)	1	megohm
R_3 (1/2 watt)	820000	ohms
Reference Voltage Supply:		
DC value	200	volts
Equivalent resistance	1000	ohms
Effective Grid-Plate Transconductance	200	μmhos
DC Plate Current:		
For load current of 0 ma	1000	μamp
For load current of 1 ma	45	μamp
Regulated DC Output Voltage:		
For load current of 0 ma	25000	volts
For load current of 1 ma	24500	volts

Maximum Circuit Values:

Grid-Circuit Resistance:		
For use with "Flyback Transformer" high-voltage supply	.3 max.	megohms

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

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

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

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

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

OPERATING CONSIDERATIONS

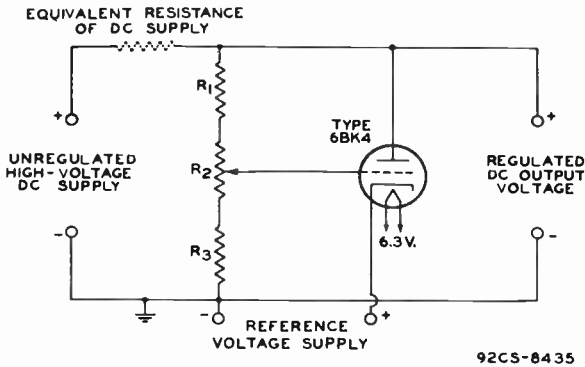
Operation of the 6BK4 with a plate voltage above approximately 16000 volts (absolute value) results in the production of X-rays which can constitute a health hazard on prolonged exposure at close range unless the tube is adequately shielded. Relatively simple shielding should prove adequate, but the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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BK4

SHARP-CUTOFF BEAM TRIODE

SHUNT VOLTAGE-REGULATOR CIRCUIT



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

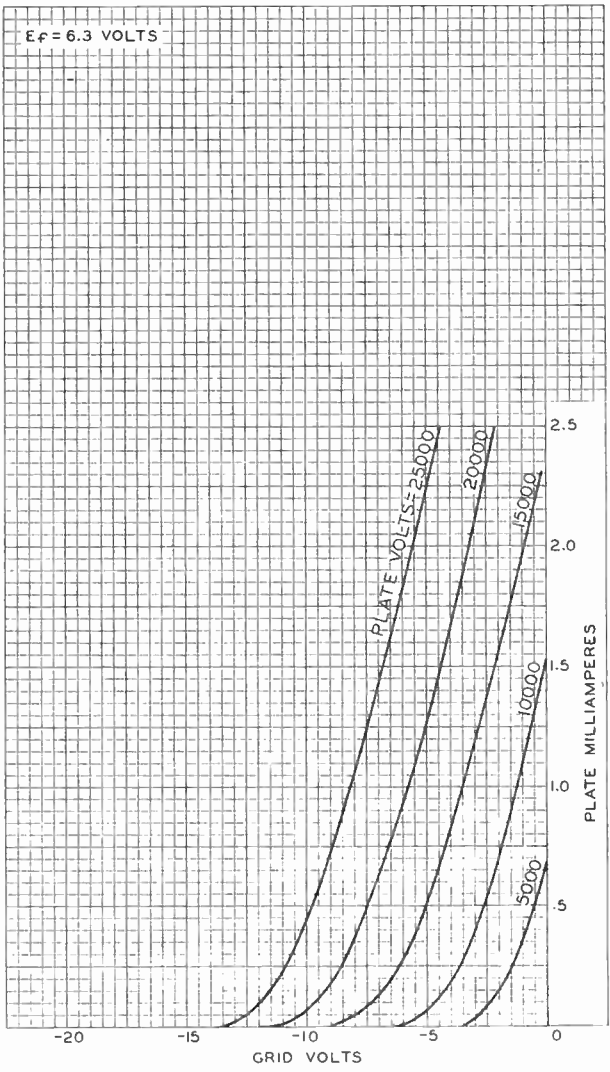
TUBE DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

6BK4

RCA

6BK4

AVERAGE TRANSFER CHARACTERISTICS



OCT. 18, 1954

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8432RI

6BK5
BEAM POWER TUBE

9-PIN MINIATURE TYPE

GENERAL DATA

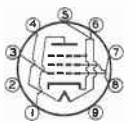
Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	1.2	amp
Direct Interelectrode Capacitances:°		
Grid No.1 to plate	0.6	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	13	μμf
Plate to cathode & grid No.3, grid No.2, and heater	5	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Maximum Diameter	7/8"
Bulb	T-6-1/2
Base	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW	9BQ

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



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

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values*:

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

Typical Operation and Characteristics:

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

° Without external shield.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BK5
BEAM POWER TUBE

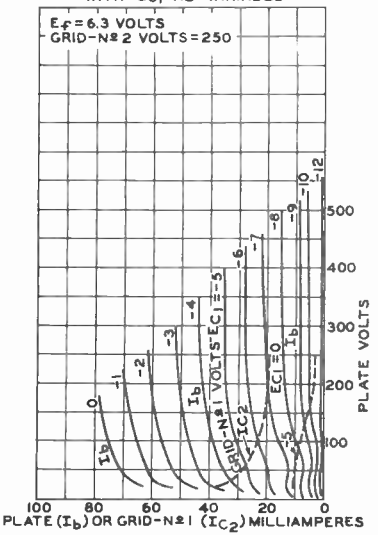
Max.-Signal Grid-No.2 Current (Approx.)	10	ma
Plate Resistance (Approx.)	0.1	megohm
Transconductance	8500	μmhos
Load Resistance	6500	ohms
Total Harmonic Distortion (Approx.)	7	%
Power Output	3.5	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

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

AVERAGE PLATE CHARACTERISTICS
WITH E_{C1} AS VARIABLE



92CS-8611T

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

6BK7-A

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:
Voltage . . . . . 6.3 . . . . . ac or dc volts
Current . . . . . 0.45 . . . . . amp ←

Direct Interelectrode Capacitances:°

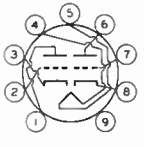
	Unit No.1	Unit No.2	
Grid to plate	1.8	1.8	μμf
Grid to cathode, internal shield, and heater	3	3	μμf
Plate to cathode, internal shield, and heater	1	0.9	μμf
Heater to cathode	2.8	3	μμf
Plate to cathode	0.22	0.22	μμf
Cathode to grid, internal shield, and heater	6	6	μμf
Plate to grid, internal shield, and 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 current of 10 μamp	−11	volts

Mechanical:

Mounting Position . . . . . Any
Maximum Overall Length . . . . . 2-3/16"
Maximum Seated Length . . . . . 1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) 1-9/16" ± 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 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

° Without external shield.

← Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BK7-A

MEDIUM-MU TWIN TRIODE

AMPLIFIER - Class A_1

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

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

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

▲ The dc component must not exceed 100 volts.

→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BK7-B

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

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

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.

6BL4
HALF-WAVE VACUUM RECTIFIER

For Television Damper Service

GENERAL DATA

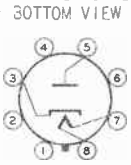
Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	3.0	amp
Direct Interelectrode Capacitances (Approx.):○		
Plate to heater and cathode	11.5	μμf
Cathode to heater and plate	16	μμf
Heater to cathode	5	μμf

Mechanical:

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

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



Pin 4 – Same as Pin 1
Pin 5 – Plate
Pin 6 – Same as Pin 1
Pin 7 – Heater
Pin 8 – Heater

DAMPER SERVICE

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

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

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

○ Without external shield.

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

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

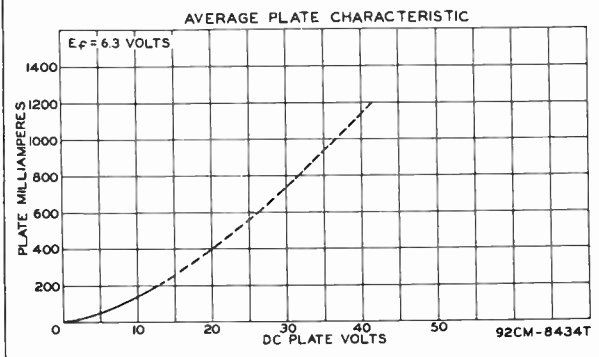
● Under no circumstances should this absolute value be exceeded.

▲ The dc component must not exceed 900 volts.

■ The dc component must not exceed 100 volts.

6BL4

HALF-WAVE VACUUM RECTIFIER



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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

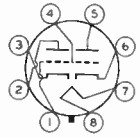
Characteristics, Class A_1 Amplifier (Each Unit):

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	40	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

6BL7-GT

MEDIUM-MU TWIN TRIODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:			
Voltage	6.3		ac or dc volts
Current	1.5		amp
Direct Interelectrode Capacitances:	*Without External Shield*	*With External Shield No. 308 Tied to Cathode*	
Unit No. 1:			
Grid to Plate	4.2	4.2	μμf
Input	4.4	5.0	μμf
Output	1.1	3.4	μμf
Unit No. 2:			
Grid to Plate	4.0	4.0	μμf
Input	4.8	5.0	μμf
Output	1.2	3.2	μμf
Grid of Unit No. 1 to Grid of Unit No. 2	0.11	0.10	μμf
Plate of Unit No. 1 to Plate of Unit No. 2	1.5	1.2	μμf

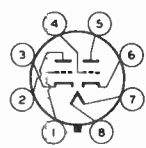
Characteristics, Amplifier Class A_1 (Each Unit):

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

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-5/16"
Maximum Seated Length	2-3/4"
Maximum Diameter	1-9/32"
Bulb	T-9
Base	Short Intermediate-Shell Octal 8-Pin (JETEC No. B8-46)
Basing Designation for BOTTOM VIEW	8BD

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



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

← Indicates a change

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BL7-GT

MEDIUM-MU TWIN TRIODE

VERTICAL DEFLECTION AMPLIFIER

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

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

DC PLATE SUPPLY VOLTAGE	600 max.	volts
DC PLATE VOLTAGE	500 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE°	1800 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE	500 max.	volts
DC CATHODE CURRENT	60 max.	ma
PLATE DISSIPATION	10 max.	watts
Total for Both Units	12 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200 max.	volts

Typical Operation in a Vertical Deflection Circuit:

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

Maximum Circuit Values:

Grid-Circuit Resistance	4.7 max.	megohms

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

° The duration of the voltage pulse must not exceed 15 per cent of one scanning cycle. In a 525-line, 30-frame system, 15 per cent of one scanning cycle is 2.5 milliseconds.

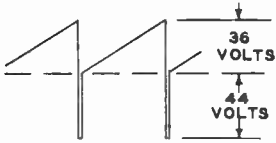


Fig. 1 - Waveform at Grid of 6BL7-GT

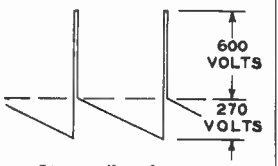


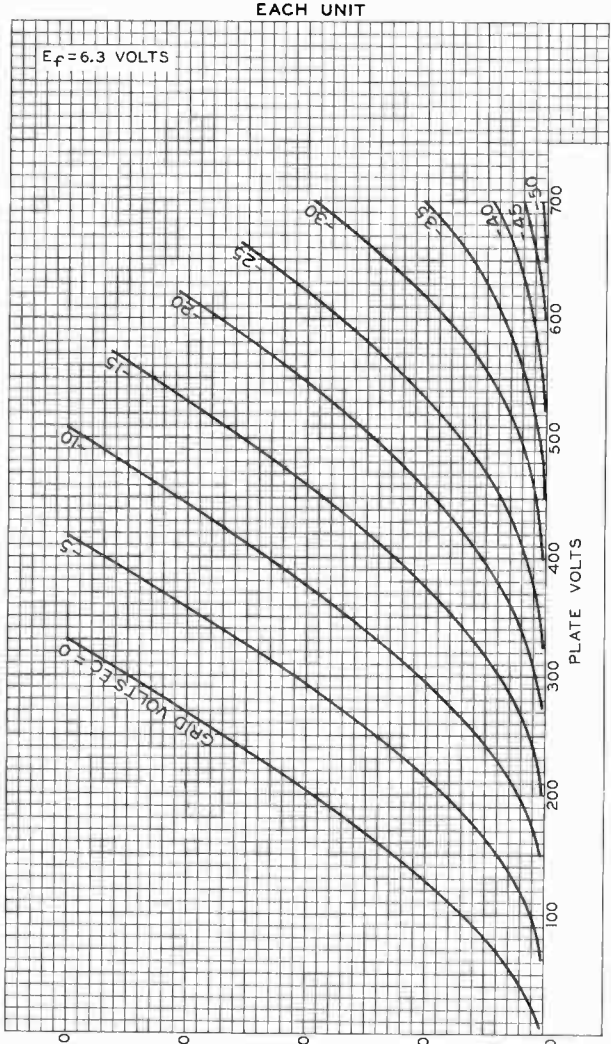
Fig. 2 - Waveform at Plate of 6BL7-GT

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BL7-GTA

AVERAGE PLATE CHARACTERISTICS

EACH UNIT



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

92CM-9526

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

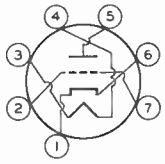
Characteristics, Class A_1 Amplifier:

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
GR'D 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.

6BN6

Beam Tube

7-PIN MINIATURE TYPE

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

GENERAL DATA

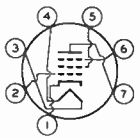
Electrical:

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.

6BN6

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.

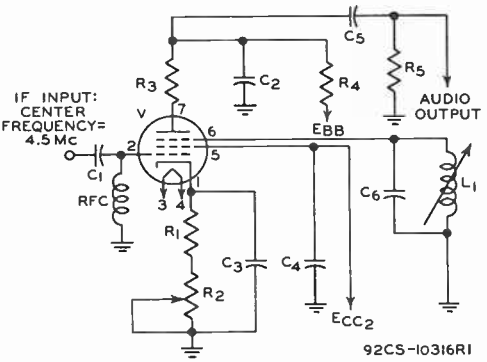
To obtain a symmetrical discriminator-response curve, the plate currents for no input signal and for unmodulated

→ 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



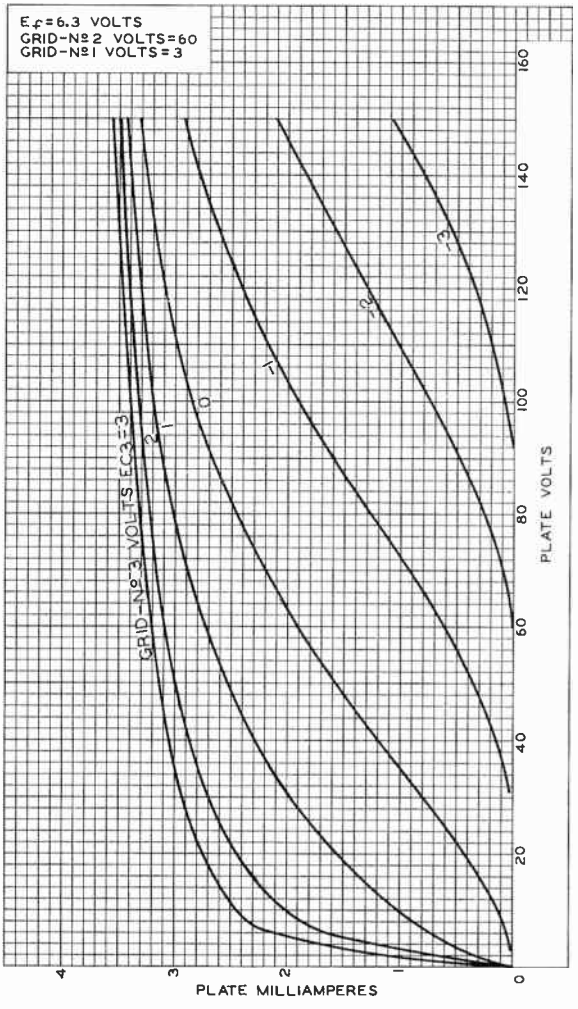
C_1: 100 $\mu\mu$f
C_2: Integrating capacitor, 0.001 μf
C_3 C_4: 0.01 μf
C_5: 0.25 μf
C_6: 10 $\mu\mu$f•
L_1: •
R_1: 200 ohms
R_2: Cathode-bias potentiometer, 200 ohms
R_3: Linearity resistor, 1000 ohms
R_4: Plate-load resistor, 0.33 megohm
R_5: 0.47 megohm
V: Electron-tube-type 6BN6

• 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

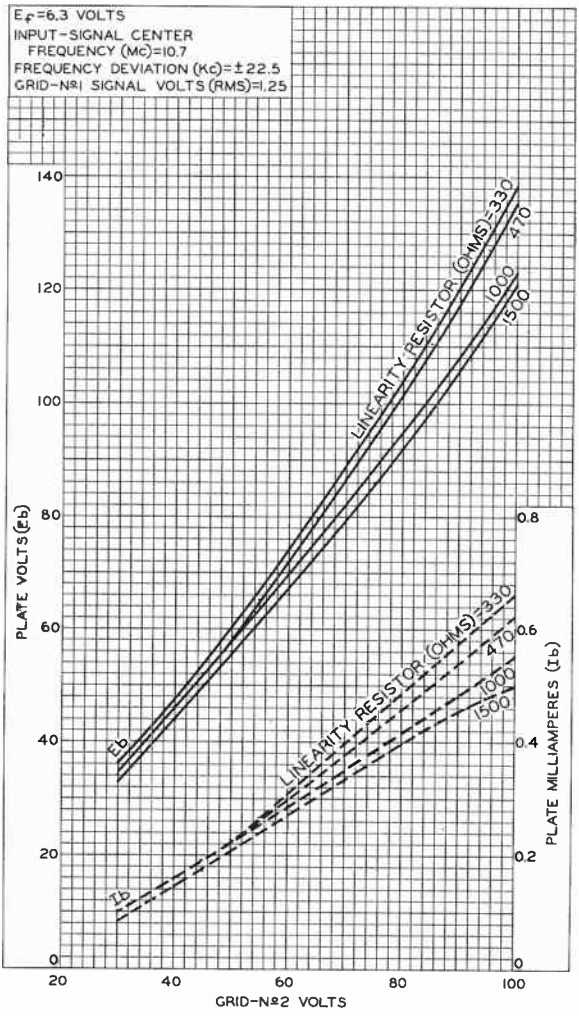
AVERAGE PLATE CHARACTERISTICS



92CM-10319

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

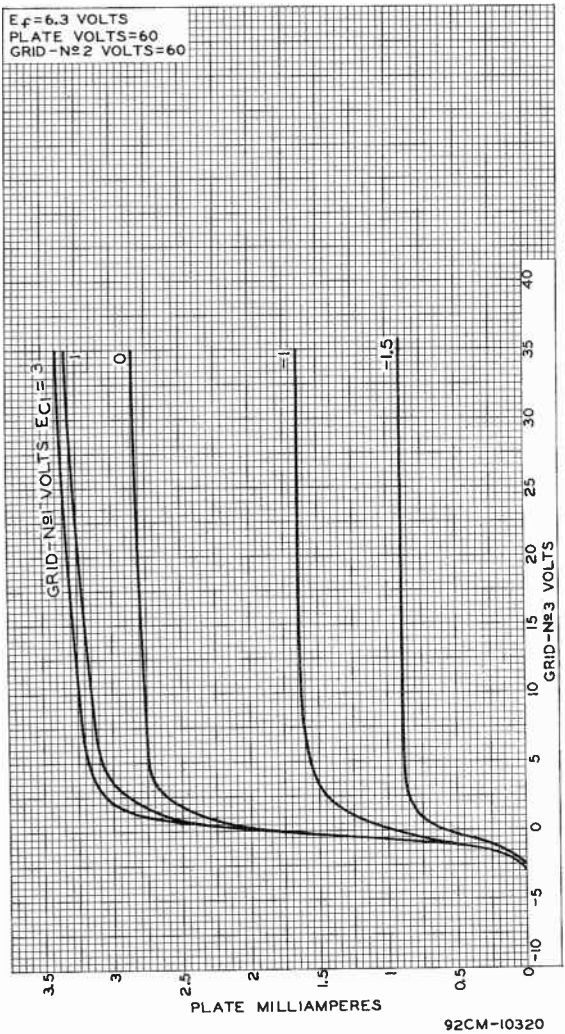
OPERATION CHARACTERISTICS



92CM-10321

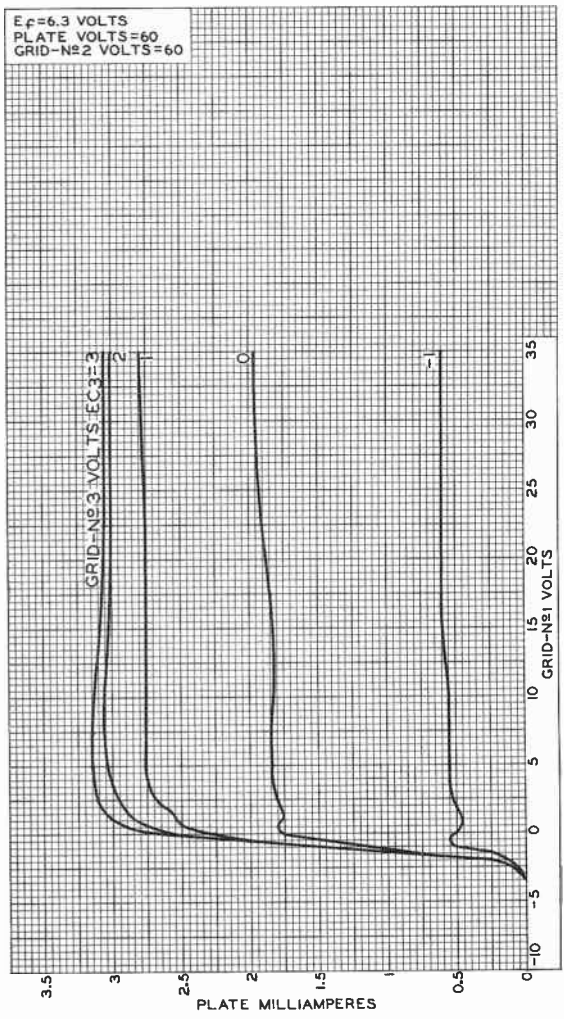
6BN6

AVERAGE CHARACTERISTICS



92CM-10320

AVERAGE CHARACTERISTICS



92CM-10322

6BQ6-GTB/6CU6
BEAM POWER TUBE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	1.2	amp
Direct Interelectrode Capacitances (Approx.):°		
Grid No.1 to plate	0.6	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	15	μμf
Plate to cathode & grid No.3, grid No.2, and heater	7.5	μμf

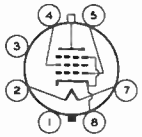
Characteristics, Class A_1 Amplifier:

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

Mechanical:

Mounting Position	Any
Maximum Overall Length	3-7/8"
Seated Length	3-5/32" ± 5/32"
Maximum Diameter	1-9/32"
Bulb	T-9
Cap	Skirted Miniature (JETEC No.C1-3)
Base	Intermediate-Shell Octal 7-Pin (JETEC No.B7-7), Intermediate-Shell Octal 6-Pin (JETEC No.B6-81), Short Intermediate-Shell Octal 7-Pin with External Barriers (JETEC No.B7-59), or Short Intermediate-Shell Octal 6-Pin with External Barriers (JETEC No.B6-84)
Basing Designation for BOTTOM VIEW	6AM

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



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

° Without external shield.

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

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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BQ6-GTB

BEAM POWER TUBE

HORIZONTAL DEFLECTION AMPLIFIER

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

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

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

Maximum Circuit Values:

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

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

■ Under no circumstances should this absolute value be exceeded.

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

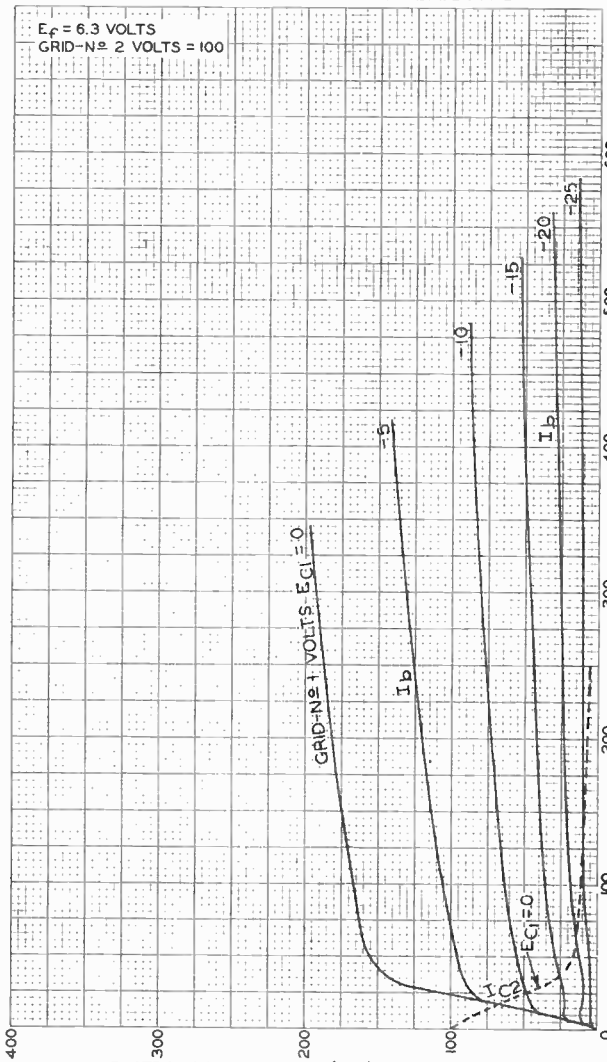
† It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value should be employed.

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BQ6-GTB

AVERAGE PLATE CHARACTERISTICS



JAN. 11, 1955

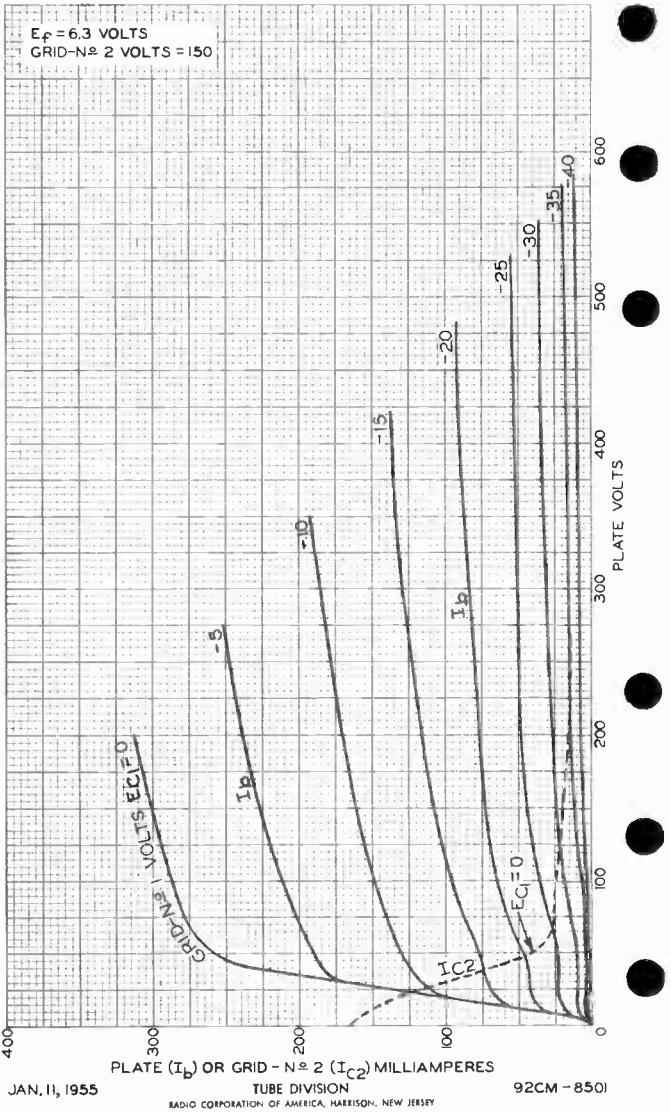
TUBE DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8500

6BQ6-GTB

AVERAGE PLATE CHARACTERISTICS



JAN. 11, 1955

TUBE DIVISION

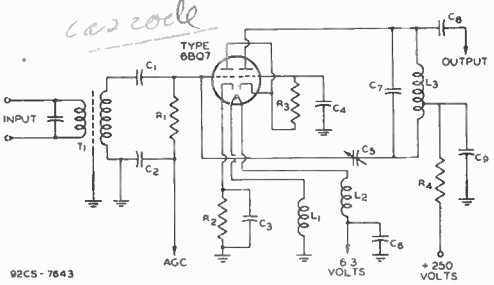
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM - 8501

6BQ7

MEDIUM-MU TWIN TRIODE

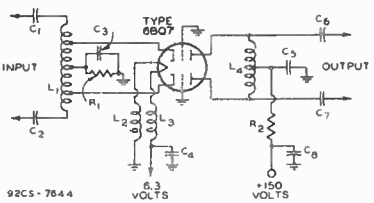
RCA-6BQ7 in Driven Grounded-Grid Amplifier Circuit with Direct-Coupled Drive.



C1: 33 μμf, 400 volts
C2: 1000 μμf, 400 volts
C3: 1000 μμf, 400 volts
C4: 1000 μμf, 400 volts
C5: 0.5 to 1.5 μμf, 400 volts
C6: 1000 μμf, 400 volts
C7: 2 μμf, 400 volts
C8: 33 μμf, 400 volts
C9: 1000 μμf, 400 volts
R1: 10000 ohms, 0.5 watt
R2: 100 ohms, 0.5 watt
R3: 500000 ohms, 0.5 watt
R4: 100 ohms, 0.5 watt

L1, L2: Bifilar chokes, each 10 turns No.18 enamel wire, 1/4" coil form
L3: Tuned circuit element of tuner. Value depends on distributed circuit capacitances. To determine tap point, tap down to 80 to 90% of total number of turns
T1: Tuned circuit element of tuner. Value depends on distributed circuit capacitances.

RCA-6BQ7 in Push-Pull Grounded-Grid Circuit.



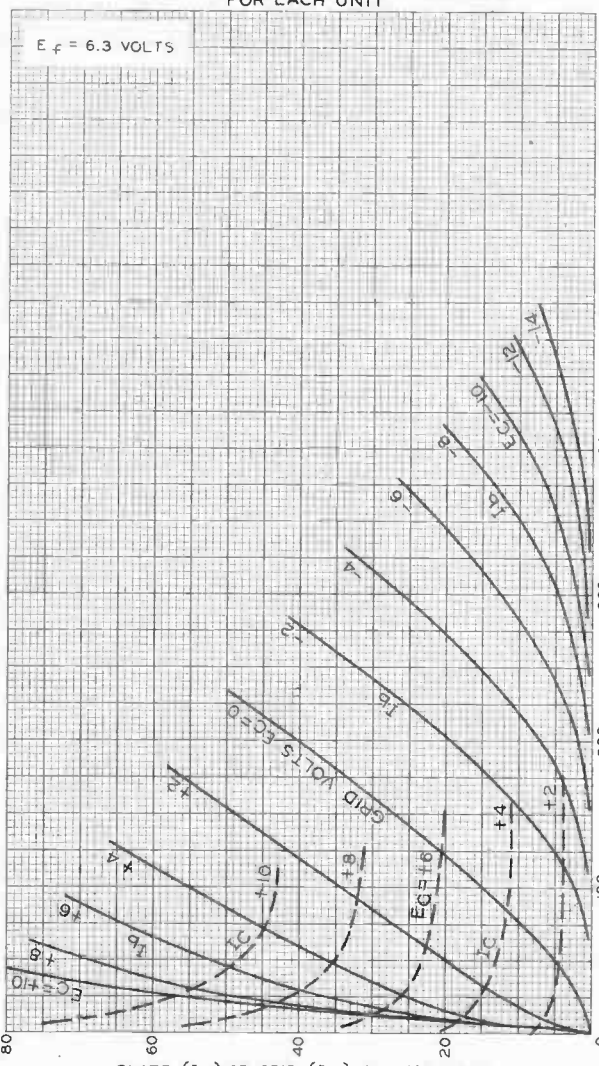
C1 & 2 C3 C4 C5: 1000 μμf, 400 volts
C6 & 7: 100 μμf, 400 volts
C8: 1000 μμf, 400 volts
R1 R2: 100 ohms, 0.5 watt

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

6BQ7

6BQ7

AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT



SEPT. 6, 1950

TUBE DEPARTMENT

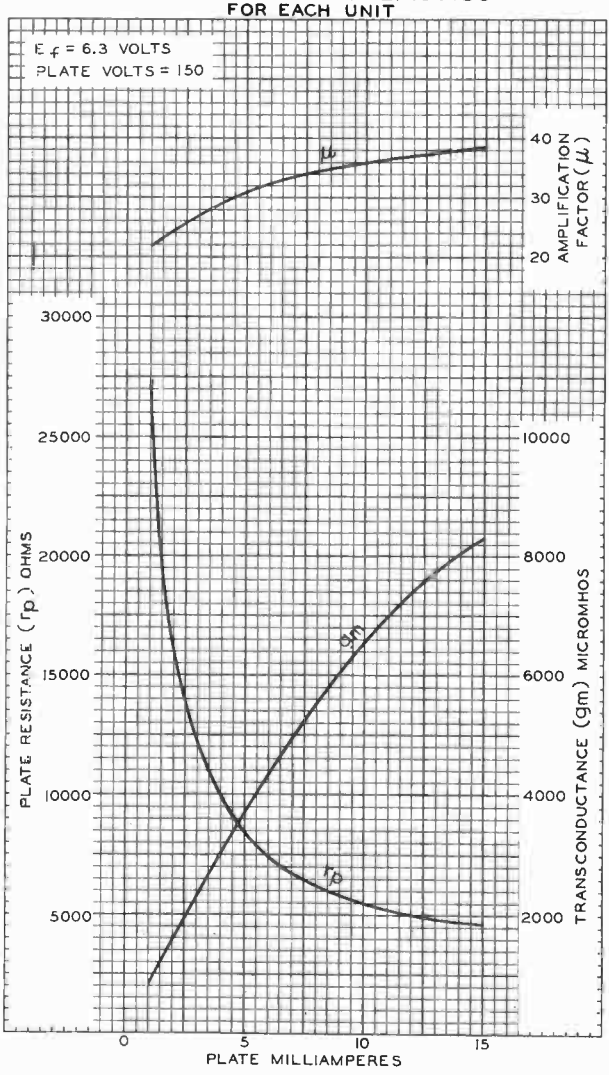
92CM-7536

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6BQ7

AVERAGE CHARACTERISTICS
FOR EACH UNIT



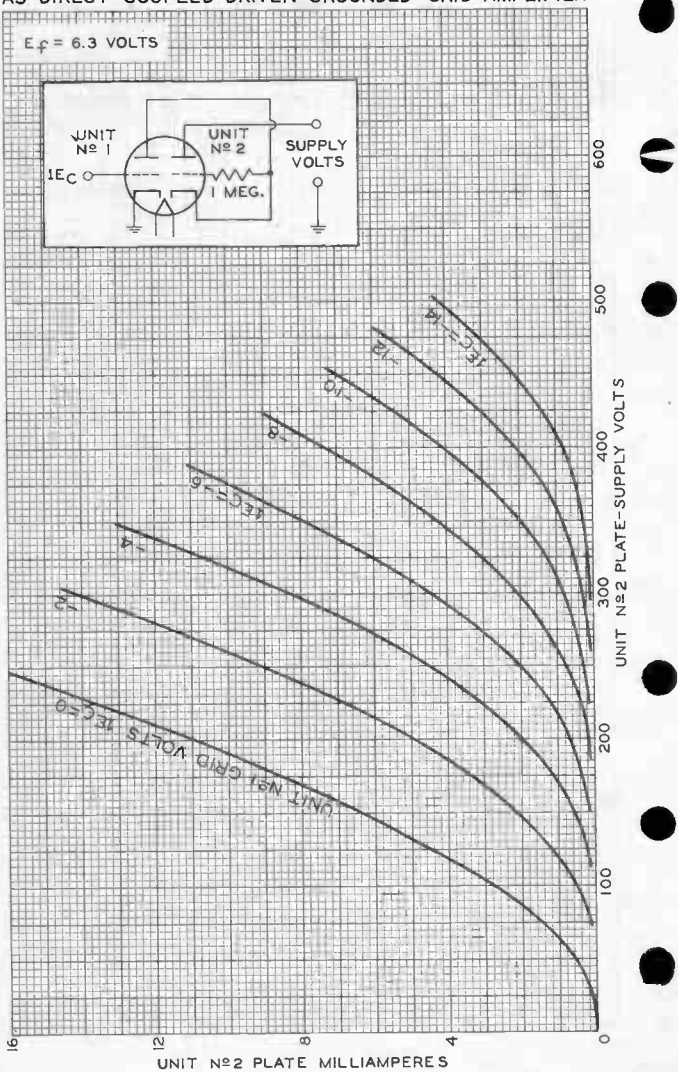
6BQ7

RCA

6BQ7

AVERAGE PLATE CHARACTERISTICS

AS DIRECT-COUPLED DRIVEN GROUNDED-GRID AMPLIFIER



OCT. 3, 1950 TUBE DEPARTMENT 92CM-7549

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BQ7

MEDIUM-MU TWIN TRIODE

LOW-NOISE 9-PIN MINIATURE TYPE

For Driven Grounded-Grid Circuits

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage	6.3	ac or dc volts
Current	0.4	amp

Direct Interelectrode Capacitances (According to RTMA Standard ET-109-A with external shield No.315):

	Unit No.1	*Unit No.2*	
Grid to Plate	1.15	1.15	μμf
Input	2.85	–	μμf
Input *(Grounded Grid)*	–	4.95	μμf
Output	1.35	–	μμf
Output *(Grounded Grid)*	–	2.27	μμf
Plate to Cathode	0.15 max.	0.15 max.	μμf
Heater to Cathode	2.20	2.30	μμf
Plate of Unit No.1 to Plate of Unit No.2	0.010 max.		μμf
Plate of Unit No.2 to Plate & Grid of Unit No.1	0.024 max.		μμf

Characteristics, Amplifier Class A:

Plate Voltage	150	volts
Cathode-Bias Resistor	220	ohms
Amplification Factor	35	
Plate Resistance	5800	ohms
Transconductance	6000	μmhos
Plate Current	9	ma
Grid Volts (Approx.) for plate current of 10 μamp	-10	volts

Mechanical:

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

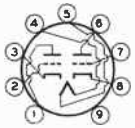
Pin 1 – Plate of Triode No.2

Pin 2 – Grid of Triode No.2

Pin 3 – Cathode of Triode No.2

Pin 4 – Heater

Pin 5 – Heater



Pin 6 – Plate of Triode No.1

Pin 7 – Grid of Triode No.1

Pin 8 – Cathode of Triode No.1

Pin 9 – Internal Shield

RCA

6BQ7

MEDIUM-MU TWIN TRIODE

AMPLIFIER - Class A

Values are for Each Unit

Maximum Ratings, *Design-Center Values*:

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

Typical Operation in Push-Pull Grounded-Grid Circuit:

Values are for Each Unit

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

Typical Operation in Grounded-Grid Circuit with Direct-Coupled Drive:

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

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

Maximum Circuit Values (Each Unit):

Grid–Circuit Resistance	0.5 max.	megohm

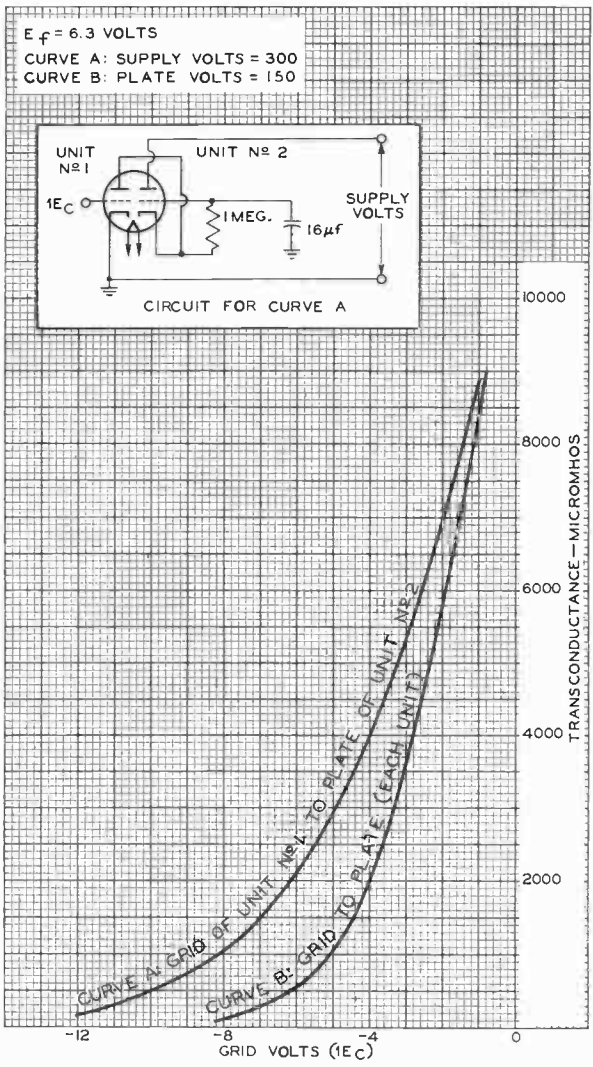
* Obtained from cathode resistor.

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

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BQ7

AVERAGE CHARACTERISTICS



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 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	38	
Plate Resistance (Approx.)	5900	ohms
Transconductance	6400	μmhos
Plate Current	9	ma
Grid Voltage (Approx.) for plate μa = 100	-6.5	volts

Mechanical:

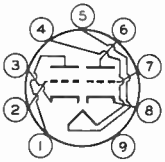
Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)

← 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

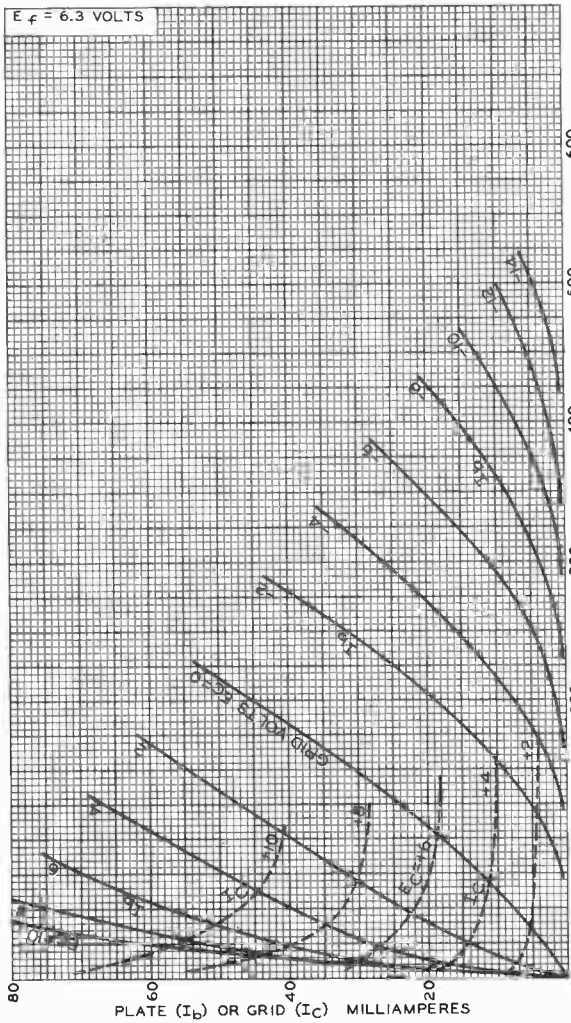
[a] With external shield JEDEC No.315 connected to internal shield.

[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.

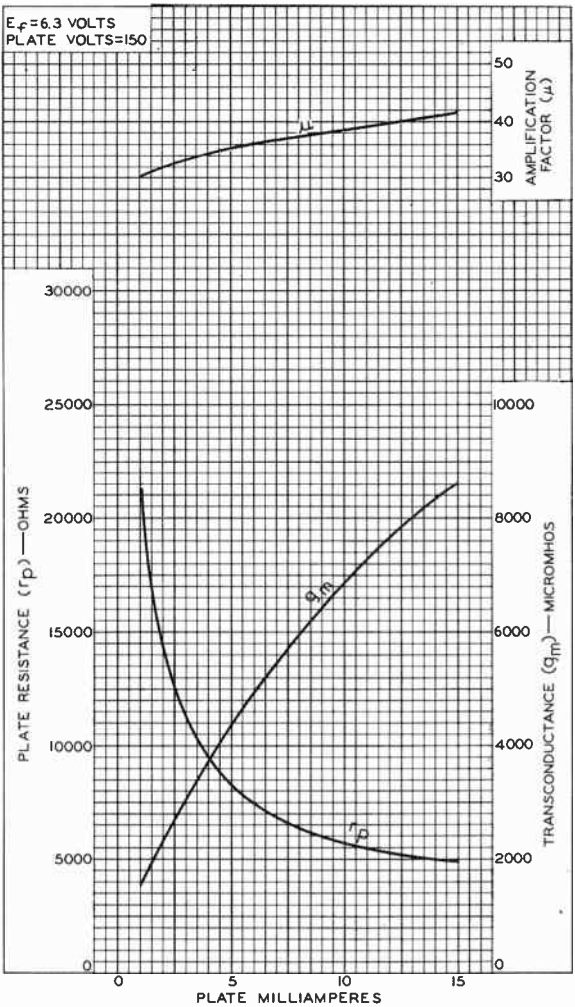
→ Indicates a change.

AVERAGE CHARACTERISTICS
Each Unit



6BQ7A

AVERAGE CHARACTERISTICS
Each Unit



92CM-7538R2

6BN4
MEDIUM-MU TRIODE

7-PIN MINIATURE TYPE

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

GENERAL DATA

Electrical:

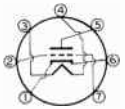
Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.2	amp
Direct Interelectrode Capacitances (Approx.):[o]		
Grid to plate	1.2	μμf
Grid to cathode and heater	3.2	μμf
Plate to cathode and heater	1.4	μμf
Heater to cathode	2.8	μμf

Characteristics, Class A_1 Amplifier:		
Plate-Supply Voltage	150	volts
Cathode Resistor	220	ohms
Amplification Factor	43	
Plate Resistance (Approx.)	6300	ohms
Transconductance	6800	μmhos
Plate Current	9	ma
Grid Voltage (Approx.) for plate current of 100 μamp.	-6	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)

BOTTOM VIEW



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	250 max.	volts
GRID VOLTAGE:		
Positive bias value	0 max.	volts
CATHODE CURRENT	20 max.	ma
PLATE DISSIPATION	2 max.	watts

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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

6BN4

MEDIUM-MU TRIODE

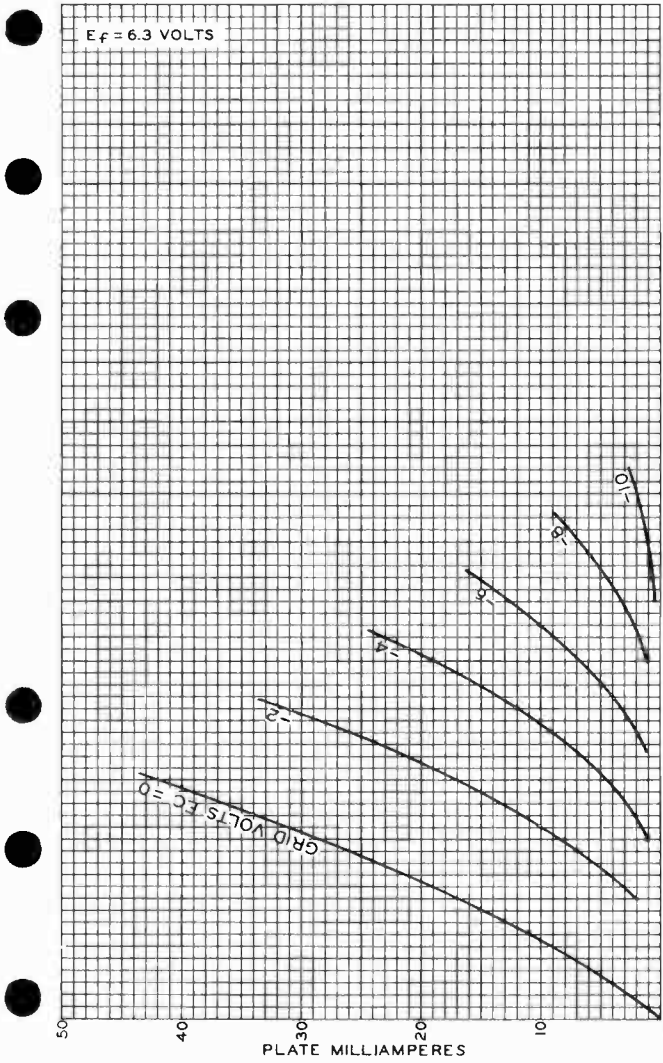
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode. .	90 max.	volts
Heater positive with respect to cathode. .	90 max.	volts
Maximum Circuit Values:		
Grid-Circuit Resistance	0.5 max.	megohm

TENTATIVE DATA

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BN4

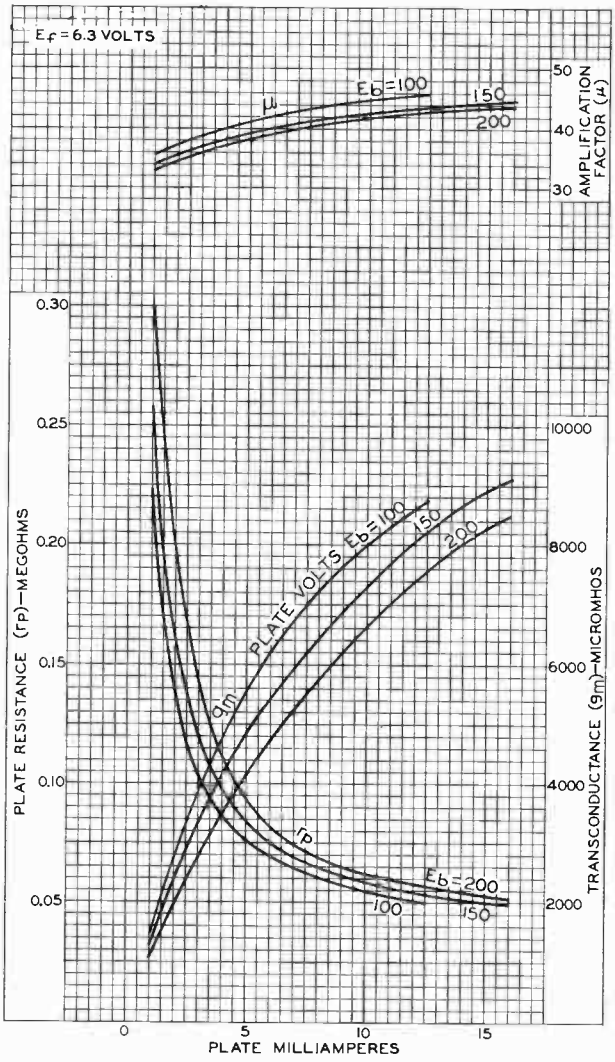
AVERAGE PLATE CHARACTERISTICS



6BN4

6BN4

AVERAGE CHARACTERISTICS



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8934RI

6BN8

TWIN DIODE—HIGH-MU TRIODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

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

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

Direct Interelectrode Capacitances:°

Triode Unit:		
Grid to plate	2.5	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 current of 10 μa	−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"

°: see next page.

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

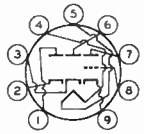
TENTATIVE DATA

6BN8

TWIN DIODE—HIGH-MU TRIODE

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
PLATE DISSIPATION	1.5	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts

Maximum Circuit Values:

Grid-Circuit Resistance	1	max.	megohm

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

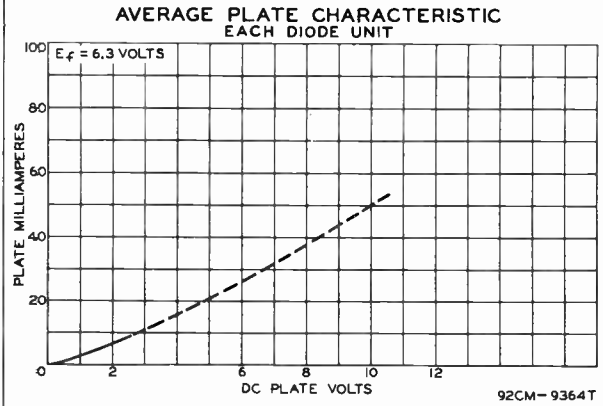
○ Without external shield.
▲ The dc component must not exceed 100 volts.

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

TENTATIVE DATA

6BN8

TWIN DIODE—HIGH-MU TRIODE



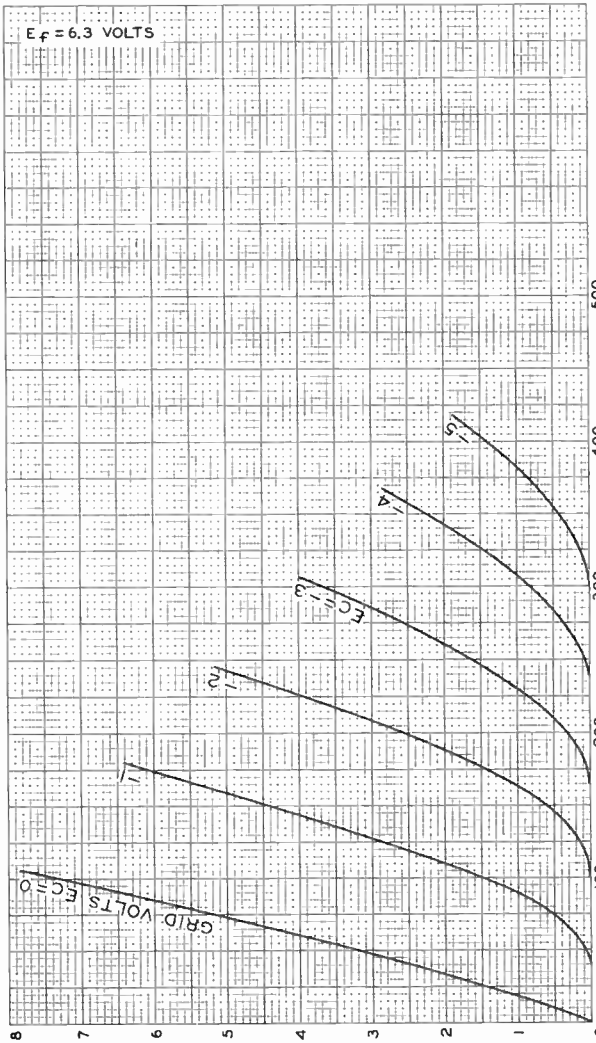
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BN8

6BN8

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



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

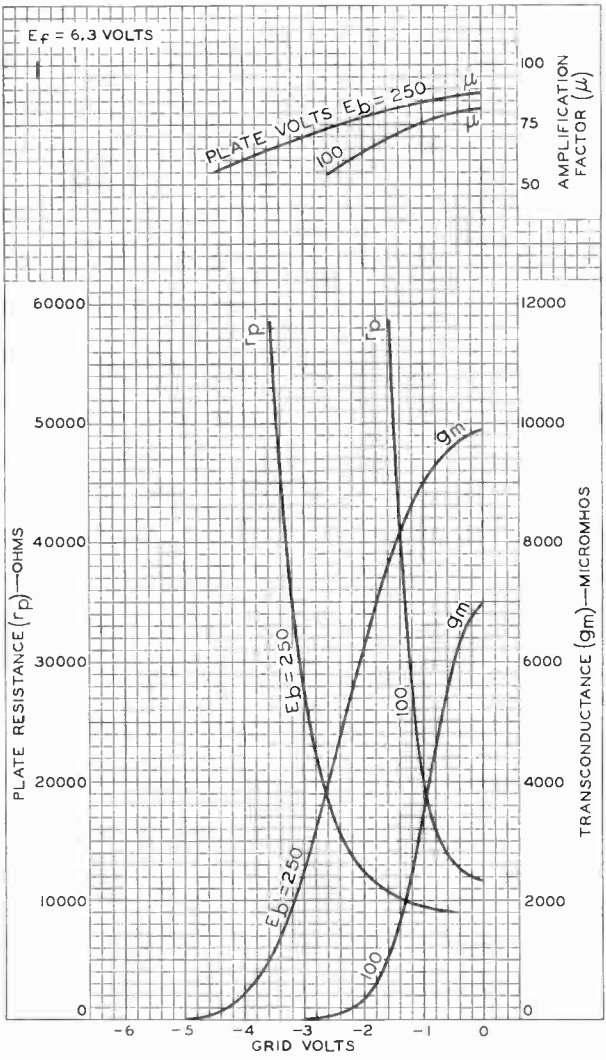
92CM-9363

RCA

6BN8

AVERAGE CHARACTERISTICS

TRIODE UNIT



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

92CM – 9365

6BR8

MEDIUM-MU TRIODE—SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:
Voltage. . . . . 6.3 . . . . . ac or dc volts
Current. . . . . 0.45 . . . . . amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield[o]	
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 current of 10 μa .	-12	-10	volts

Mechanical:

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

o,•: See next page.

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

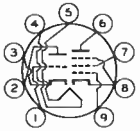
TENTATIVE DATA

6BR8

MEDIUM-MU TRIODE—SHARP-CUTOFF PENTODE

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

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



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

CONVERTER SERVICE

Maximum Ratings, *Design-Center Values:*

	Triode Unit as Osc.		*Pentode Unit as Mixer*		
PLATE VOLTAGE	300	max.	300	max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE.	–		300	max.	volts
GRID-No.2 VOLTAGE	–		*See Grid-No.2 Input 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 JETEC No.315 connected tc cathode of unit under test except as noted.
• With external shield JETEC No.315 connected to ground.
▲ The dc component must not exceed 100 volts.

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

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

6BS8

MEDIUM-MU TWIN TRIODE

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:°	*Unit No.1*	*Unit No.2*	
Grid to plate	1.15	1.15	μμf
Grid to cathode, internal shield, and heater	2.6	–	μμf
Plate to cathode, internal shield, and heater	1.2	–	μμf
Plate to cathode	0.15 max.	0.15 max.	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 Except as Noted):

Plate-Supply Voltage	150	volts
Cathode Resistor	220	ohms
Amplification Factor	36	
Plate Resistance (Approx.)	5000	ohms
Transconductance	7200	μmhos
Plate Current	10	ma
Grid Voltage (Approx.) for plate current of 10 μamp†	−7	volts

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 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)

° with external shield JETEC No.315 connected to pin 9.

† This value applies to unit No.2 only.

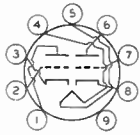
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BS8

MEDIUM-MU TWIN TRIODE

Basing Designation for BOTTOM VIEW 9AJ

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



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

AMPLIFIER – Class A_1

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

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

Typical Operation and Characteristics with Cascode-Type Circuit:

Plate-Supply Voltage	250	volts
Grid Voltage	−1	volt
Transconductance	10000	μmhos
Plate Current	16	ma
Grid Voltage (Approx.) for transconductance of 50 μmhos	−6	volts

Maximum Circuit Values:

Grid-Circuit Resistance	0.5 max.	megohm

TENTATIVE DATA

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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

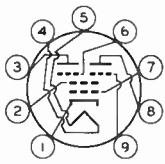
Mechanical:

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.

6BU8

SHARP-CUTOFF TWIN PENTODE

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

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances:[o]		
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 (Suppressor-Grid) Voltage (Each unit)	-10	0	volts
Grid-No.2 (Screen-Grid) Voltage	67.5	67.5	volts
Grid-No.1 (Control-Grid) Voltage	♦	♦	volts
Plate Current (Each unit)	–	2.2	ma
Grid-No.2 Current	6.5	3.3	ma
Cathode Current	6.6	7.8	ma
With One Unit Operating■			
Plate Voltage	100	100	volts
Grid-No.3 Voltage	0	0	volts
Grid-No.2 Voltage	67.5	67.5	volts
Grid-No.1 Voltage	0	♦	volts
Grid-No.3-to-Plate Transconductance	–	180	μmhos
Grid-No.1-to-Plate Transconductance	1500	–	μmhos
Plate Current	–	2.2	ma
Grid-No.3 Voltage (Approx.) for plate current of 100 μa	–	-4.5	volts
Grid-No.1 Voltage (Approx.) for plate current of 100 μa	–	-2.3	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Maximum Diameter	7/8"
Dimensional Outline	*See General Section*

o, ♦, ■: See next page.

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

TENTATIVE DATA

6BU8

SHARP-CUTOFF TWIN PENTODE

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

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

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

o Without external shield.
♦ Adjusted to give a dc grid-No.1 current of 100 microamperes.
■ With plate and grid No.3 of the other unit connected to ground.
▲ The dc component must not exceed 100 volts.

6BU8

RCA

6BU8

AVERAGE PLATE CHARACTERISTICS
EACH UNIT

E_F = 6.3 VOLTS
GRID-N°3 VOLTS = 0
GRID-N°2 VOLTS = 67.5
PLATE AND GRID N°3 OF
OTHER UNIT GROUNDED.

GRID-N°1 VOLTS E$_{C1}$=1.0
GRID-N°1 MILLIAMPERES I$_{C1}$= 0.5
0.5
0.10
0.01
0
−0.5
−1.0
−1.5
−2.0

PLATE MILLIAMPERES
0
1
2
3
4
5

PLATE VOLTS
0
100
200
300
400

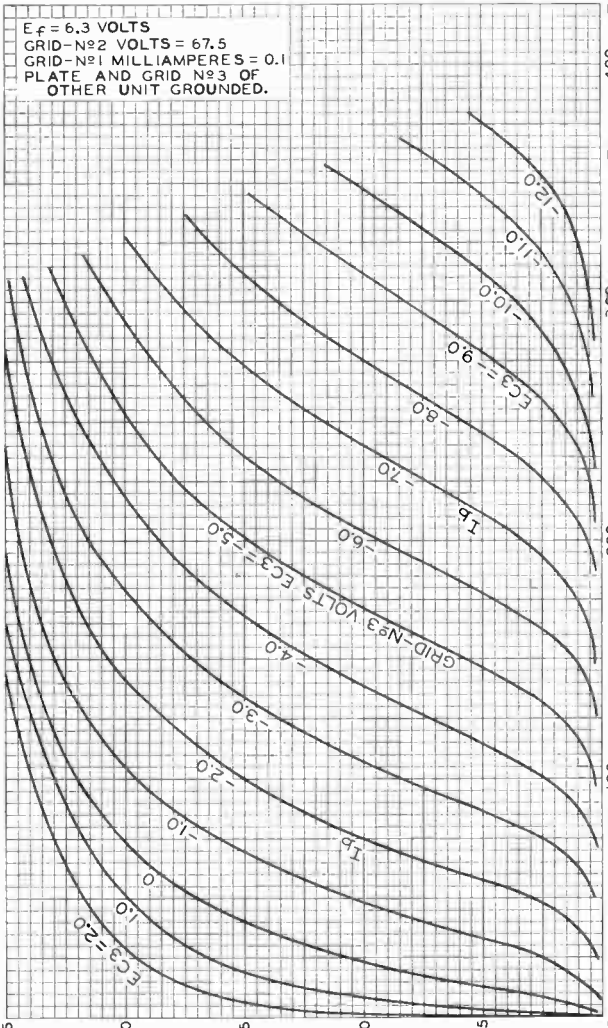
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-9428

RCA

6BU8

AVERAGE PLATE CHARACTERISTICS

EACH UNIT

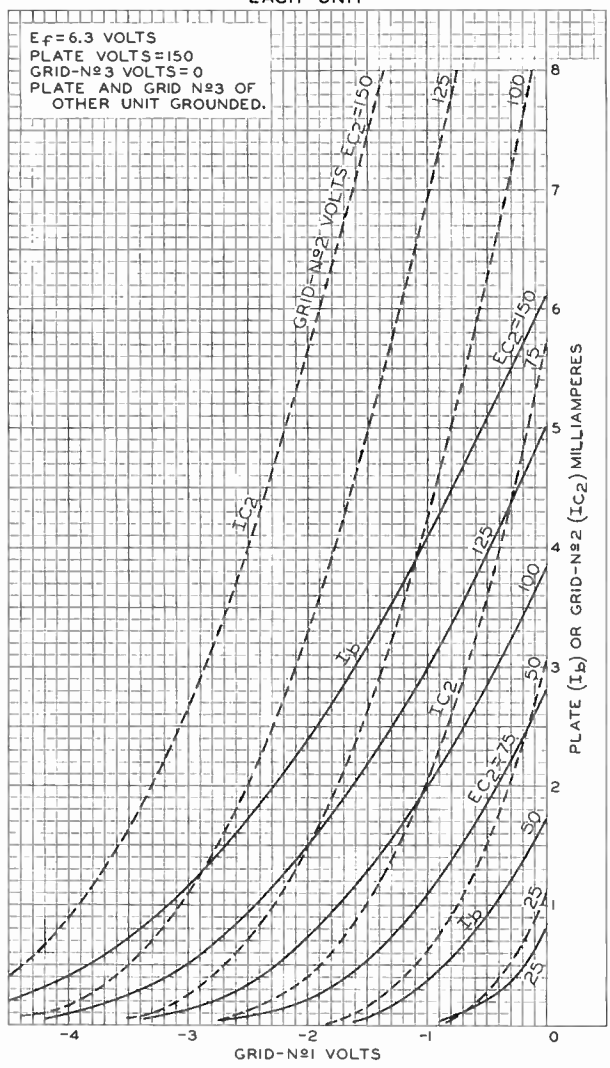


ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9429

6BU8

AVERAGE CHARACTERISTICS
EACH UNIT



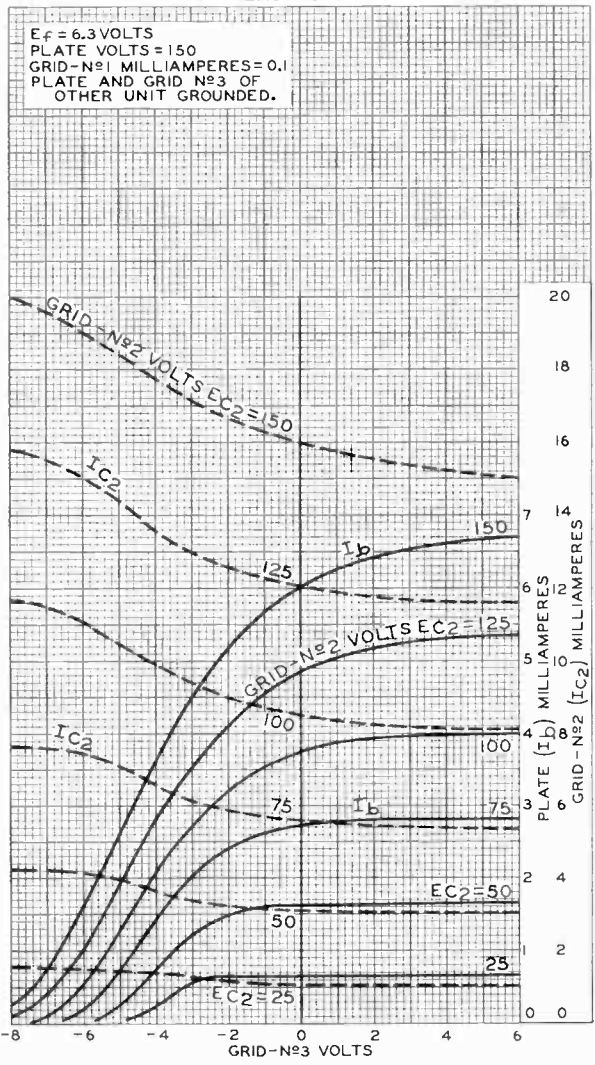
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9433

RCA

6BU8

AVERAGE CHARACTERISTICS
EACH UNIT



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

92CM-9434

Twin Diode—Medium-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 at 6.3 volts	0.6 ± 6%		amp
Warm-up time (Average)	11		sec
Direct Interelectrode Capacitances:[a]			
Triode Unit:			
Grid to plate	2		μμf
Grid to cathode and heater	3.6		μμf
Plate to cathode and heater	0.4		μμf
Diode Units:			
Plate of diode unit No.1 to triode grid	0.03 max.		μμf
Plate of diode unit No.2 to triode grid	0.07 max.		μμf
Diode plate to cathode and heater (Each unit)	2.4		μμf

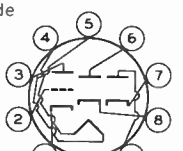
Characteristics, Class A_1 Amplifier (Triode Unit):

Plate Voltage	75	200	volts
Grid Voltage	0	–	volts
Cathode Resistor	–	330	ohms
Amplification Factor	–	33	
Plate Resistance (Approx.)	–	5900	ohms
Transconductance	–	5600	μmhos
Plate Current	14	11	ma
Grid Voltage (Approx.) for plate μa = 100	–	-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
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9FJ

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



TRIODE UNIT — AMPLIFIER — Class A1

Maximum Ratings, *Design-Maximum Values:*

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

Maximum Circuit Values:

Grid-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	10	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	23	ma

[a] Without external shield.

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

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
Catnode 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

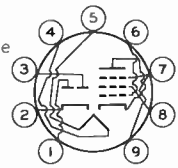
Mechanical:

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 = 5	20	ma

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

6BX7-GT

MEDIUM-MU TWIN TRIODE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

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

Direct Interelectrode Capacitances (Approx.):

	Without External Shield	*With External Shield°*	
Unit No. 1:			
Grid to plate	4.2	4.2	μμf
Grid to cathode and heater.	4.4	5.0	μμf
Plate to cathode and heater.	1.1	3.4	μμf
Unit No. 2:			
Grid to plate	4.0	4.0	μμf
Grid to cathode and heater.	4.8	5.0	μμf
Plate to cathode and heater.	1.2	3.2	μμf
Grid to grid.	0.11	0.10	μμf
Plate to plate.	1.5	1.2	μμf

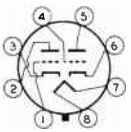
Characteristics, Class A₁ Amplifier (Each Unit):

Plate Voltage	100	250	volts
Grid Voltage.	0	–	volts
Cathode Resistor.	–	390	ohms
Amplification Factor.	–	10	
Plate Resistance (Approx.).	–	1300	ohms
Transconductance.	–	7600	μmhos
Plate Current	80	42	ma
Grid Voltage (Approx.) for plate current of 50 μamp.	–	-40	volts

Mechanical:

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

° With external shield JETEC No.308 connected to cathode of unit under test.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

RCA

6BX7-GT

MEDIUM-MU TWIN TRIODE

VERTICAL DEFLECTION OSCILLATOR♦

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

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

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

Maximum Circuit Values:

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

Maximum Circuit Values:

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

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

□ 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.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BY5-GA
FULL-WAVE VACUUM RECTIFIER

For Television Damper Service

GENERAL DATA

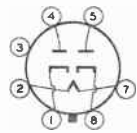
Electrical:

Heater, for Unipotential Cathodes:
Voltage . . . . . 6.3 . . . . . .ac or dc volts
Current . . . . . 1.6 . . . . . amp

Mechanical:

Mounting Position . . . . . Any
Maximum Overall Length. . . . . 3-7/8"
Maximum Seated Length . . . . . 3-5/16"
Maximum Diameter. . . . . 1-9/16"
Bulb. T-12
Base. . . . . Medium-Shell Octal 7-Pin (JETEC No.B7-12), or Short-Medium-Shell Octal 7-Pin with External Barriers (JETEC No.B7-119)
Basing Designation for BOTTOM VIEW 6CN

Pin 1 – Cathode of Unit No.2
Pin 2 – Heater
Pin 3 – No Connection – Do Not Use●



Pin 4 – Plate of Unit No.2
Pin 5 – Plate of Unit No.1
Pin 7 – Heater
Pin 8 – Cathode of Unit No.1

DAMPER SERVICE

Values are for Each Unit

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

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

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

● Socket terminal No.3 should not be used as tie point.

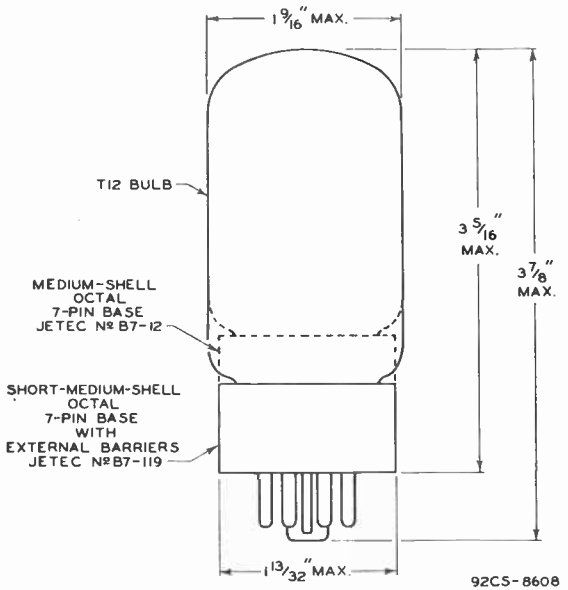
□ As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission.

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

■ Under no circumstances should this absolute value be exceeded.

6BY5-GA

FULL-WAVE VACUUM RECTIFIER



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BY6
PENTAGRID AMPLIFIER

MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances:*		
Grid No.1 to Plate	0.08 max.	μμf
Grid No.3 to Plate	0.35 max.	μμf
Grid No.1 to Grid No.3	0.15 max.	μμf
Grid No.1 to All Other Electrodes and Heater	5.4	μμf
Grid No.3 to All Other Electrodes and Heater	6.9	μμf
Plate to All Other Electrodes and Heater	7.6	μμf

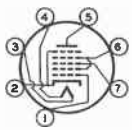
Characteristics, Class A_1 Amplifier:

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

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length from Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)

BOTTOM VIEW



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

*: With no external shield.

6BY6

PENTAGRID AMPLIFIER

GATED AMPLIFIER SERVICE

Maximum Ratings, *Design-Center Values:*

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

Characteristics as Sync Separator and Sync Clipper:

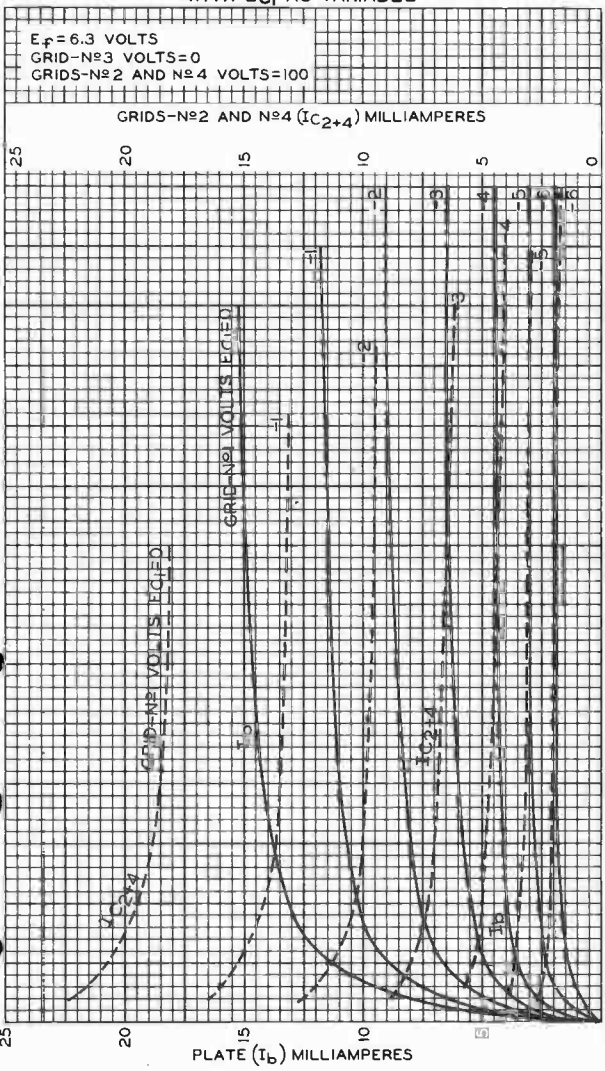
Plate Voltage	10	volts
Grid-No.3 Voltage	0	volts
Grids-No.2-and-No.4 Voltage	25	volts
Grid-No.1 Voltage	0	volts
Plate Current	1.4	ma
Grids-No.2-and-No.4 Current	3.5	ma
Grid-No.3 Bias Volts (Approx.) for plate voltage of 25 volts, grids-No.2-and-No.4 voltage of 25 volts, grid-No.1 voltage of 0 volts,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

Maximum Circuit Values:

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

The dc component must not exceed 100 volts.

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



NOV. 5, 1953

TUBE DEPARTMENT

92CM-8140

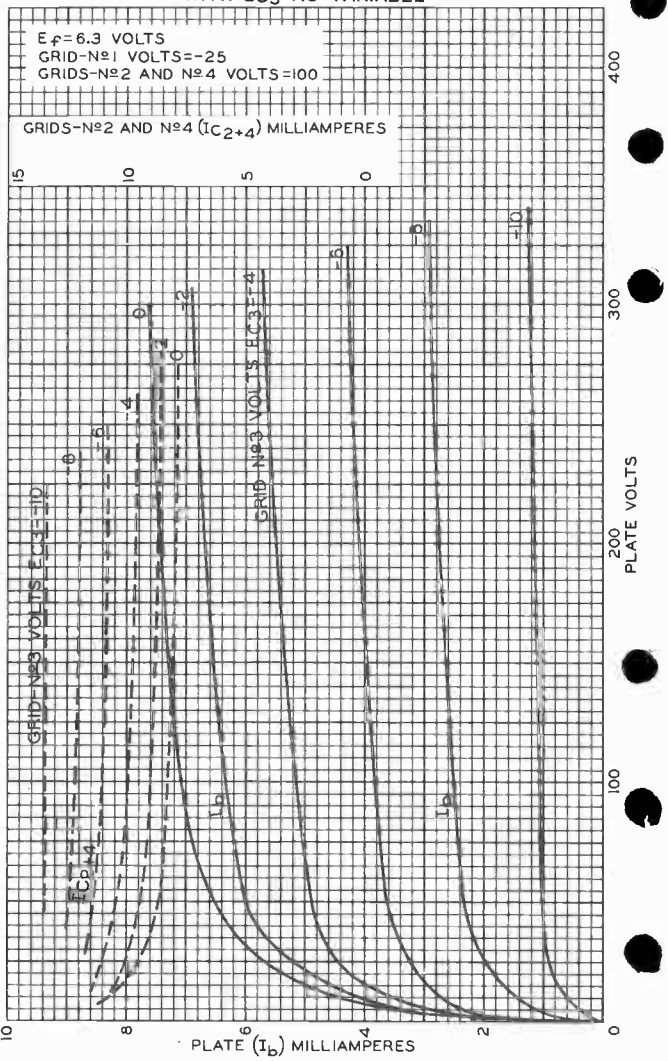
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BY6

RCA

6BY6

AVERAGE OPERATION CHARACTERISTICS
WITH EC_3 AS VARIABLE



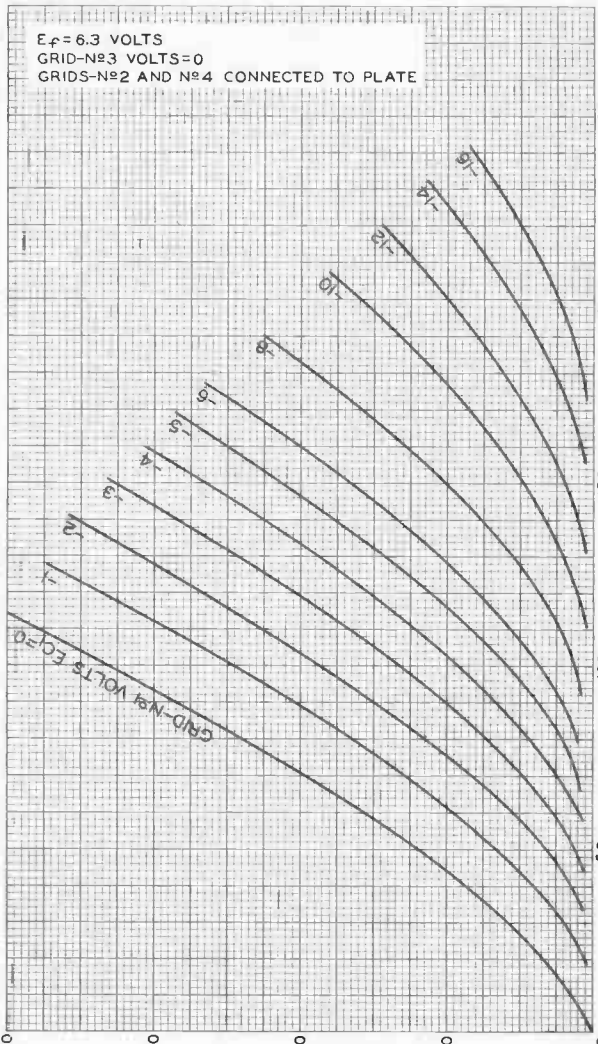
NOV.5,1953

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8139

6BY6

AVERAGE PLATE CHARACTERISTICS



NOV. 5, 1953

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8138

6BZ6

SEMIREMOTE-CUTOFF PENTODE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3		ac or dc volts
Current	0.3		amp

Direct Interelectrode Capacitances:

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

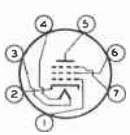
Characteristics, Class A_1 Amplifier:

Plate Voltage	200	volts
Grid No.3	*Connected to cathode at socket*	
Grid-No.2 Voltage	150	volts
Cathode-Bias Resistor	180	ohms
Plate Resistance (Approx.)	0.6	megohm
Transconductance	6100	μmhos
Plate Current	11	ma
Grid-No.2 Current	2.6	ma
Grid-No.1 Voltage (Approx.) for transconductance of 50 μmhos	-23	volts

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	7CM

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



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

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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BZ6

SEMIREMOTE-CUTOFF PENTODE

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300	max.	volts
GRID-No.3 (SUPPRESSOR) VOLTAGE	0	max.	volts
GRID-No.2 (SCREEN) SUPPLY VOLTAGE	300	max.	volts
GRID-No.2 VOLTAGE. . . . . *See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*			
GRID-No.1 (CONTROL-GRID) VOLTAGE:			
Positive bias value	0	max.	volts
PLATE DISSIPATION	2.5	max.	watts
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts	0.5	max.	watt
For grid-No.2 voltages between 150 and 300 volts. . . . . *See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*			
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts

Maximum Circuit Values:

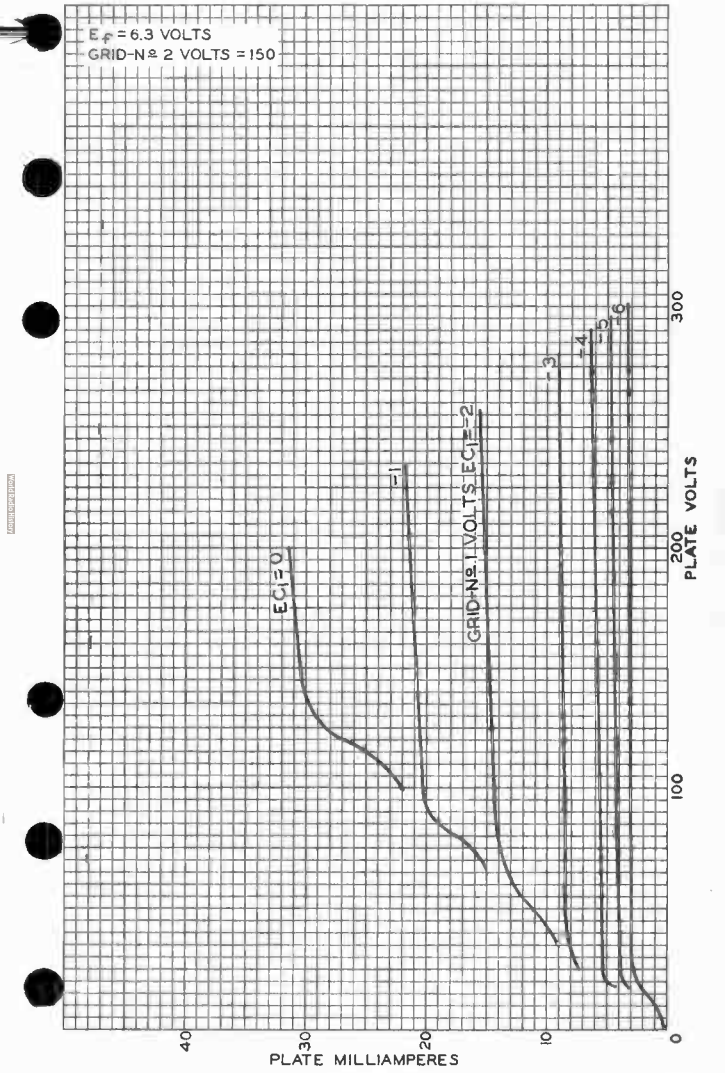
Grid-No.1-Circuit Resistance:			
For fixed-bias operation	0.25	max.	megohm
For cathode-bias operation	1.0	max.	megohm

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6BZ6

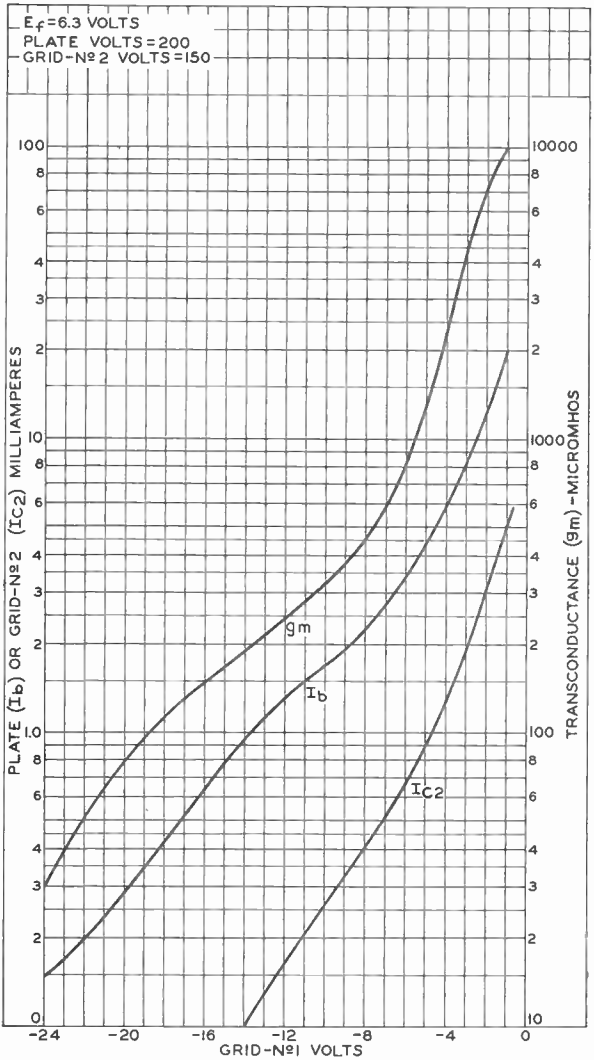
AVERAGE PLATE CHARACTERISTICS



RCA

6BZ6

AVERAGE CHARACTERISTICS



JAN. 26, 1955 TUBE DIVISION 92CM-8509
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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:

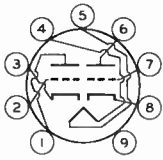
Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)

← 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

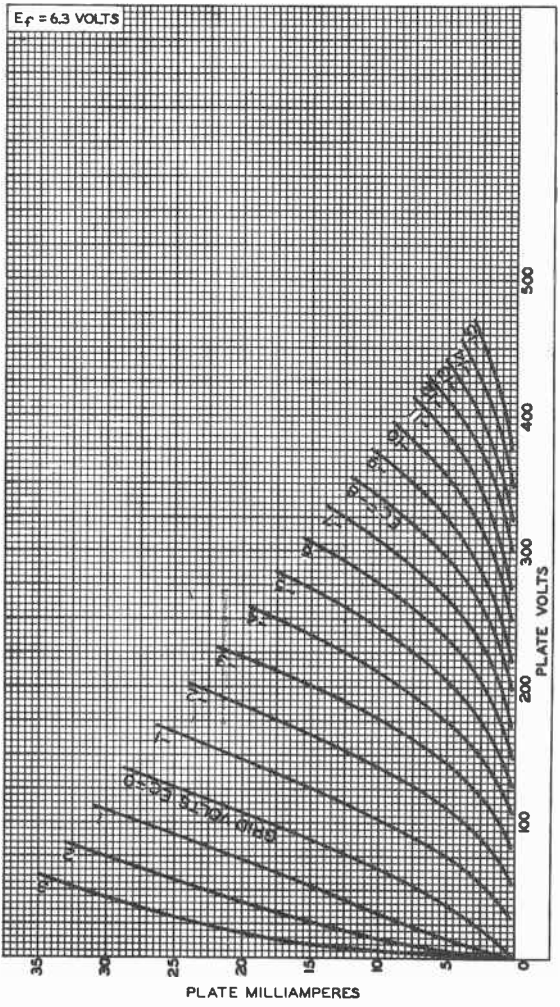
[a] With external shield JEDEC No.315 connected to internal shield.

[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.

AVERAGE PLATE CHARACTERISTICS
Each Unit



92CM-9231

RCA

6BZ7

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage	6.3	ac or dc volts
Current	0.4	amp

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

	Unit No.1	*Unit No.2*	
Grid to plate	1.15	1.15	μμf
Grid to cathode, heater, and internal shield	2.5	–	μμf
Plate to cathode	0.15 max.	0.15 max.	μμf
Plate to cathode, heater, and internal shield	1.35	–	μμf
Plate to grid, heater, and internal shield	–	2.27	μμf
Cathode to grid, heater, and internal shield	–	4.95	μμf
Cathode to heater	2.6	2.7	μμf
Plate of unit No.1 to plate of unit No.2	0.010 max.		μμf
Plate of unit No.2 to plate & grid of unit No.1	0.024 max.		μμf

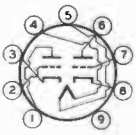
Characteristics, Class A_1 Amplifier (Each Unit):

Plate Supply Voltage	150	volts
Cathode-Bias Resistor	220	ohms
Amplification Factor	38	
Plate Resistance	5600	ohms
Transconductance	6800	μmhos
Plate Current	10	ma
Grid Volts (Approx.) for plate current of 10 μamp	-11	volts

Mechanical:

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

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



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

6BZ7

6BZ7

MEDIUM-MU TWIN TRIODE

AMPLIFIER - Class A_1

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

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

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

6C4

MEDIUM-MU TRIODE

For use in FM and other HF circuits

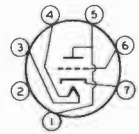
GENERAL DATA

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.

6C5, 6C5-GT/G

DETECTOR AMPLIFIER TRIODE

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

	6C5	6C5-GT/G	
Direct Interelectrode Cap.	▲	▲▲	
Grid to Plate	2.0	2.2	μμf
Grid to Cathode	3.0	4.4	μμf
Plate to Cathode	11	12	μμf
Maximum Overall Length	2-5/8"	3-5/16"	
Maximum Seated Height	2-1/16"	2-3/4"	
Maximum Diameter	1-5/16"	1-5/16"	
Bulb	Metal Shell, MT-8	T-9	
Base	Small Wafer, Octal 6-Pin	Small Wafer, Octal 6-Pin, Sleeve	
Basing Designation	6Q	GT-6Q	

Pin 1 { 6C5, Shell; 6C5-GT/G, Sleeve }
Pin 2 - Heater
Pin 3 - Plate
Pin 5 - Grid
Pin 7 - Heater
Pin 8 - Cathode

BOTTOM VIEW

Mounting Position: Any

Maximum And Minimum Ratings Are Design-Center Values

AMPLIFIER

Plate Voltage	300 max.	volts
Grid Voltage	0 min.	volts
Plate Dissipation	2.5 max.	watts
Characteristics - Class A_1 Amplifier:		
Plate Voltage	250	volts
Grid Voltage *	-8	volts
Amplification Factor	20	
Plate Resistance	10000	ohms
Transconductance	2000	μmhos
Plate Current	8	ma.

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

DETECTOR

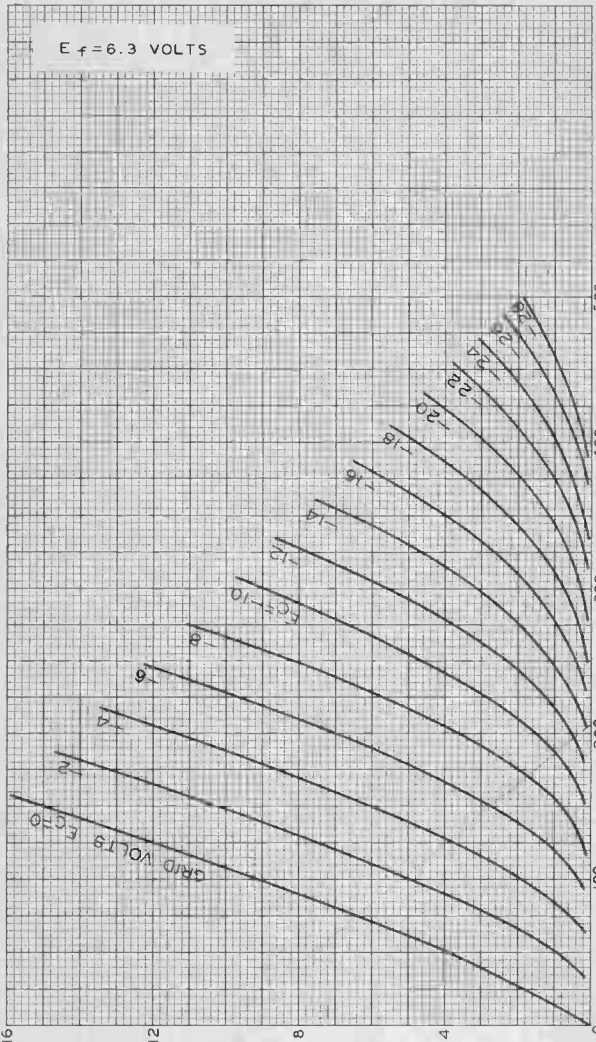
Typical Operation:	*Biased*	*Grid Leak*	
Plate Voltage	250	45 to 100	volts
Grid Voltage	-17 approx.	Return to cathode	volts
Plate Current	Adjusted to 0.2 ma. with no input signal	-	
Grid Leak	-	0.1 to 1.0	megohm
Grid Condenser	-	0.00005 to 0.0005	μf

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

6C5

6C5

AVERAGE PLATE CHARACTERISTICS

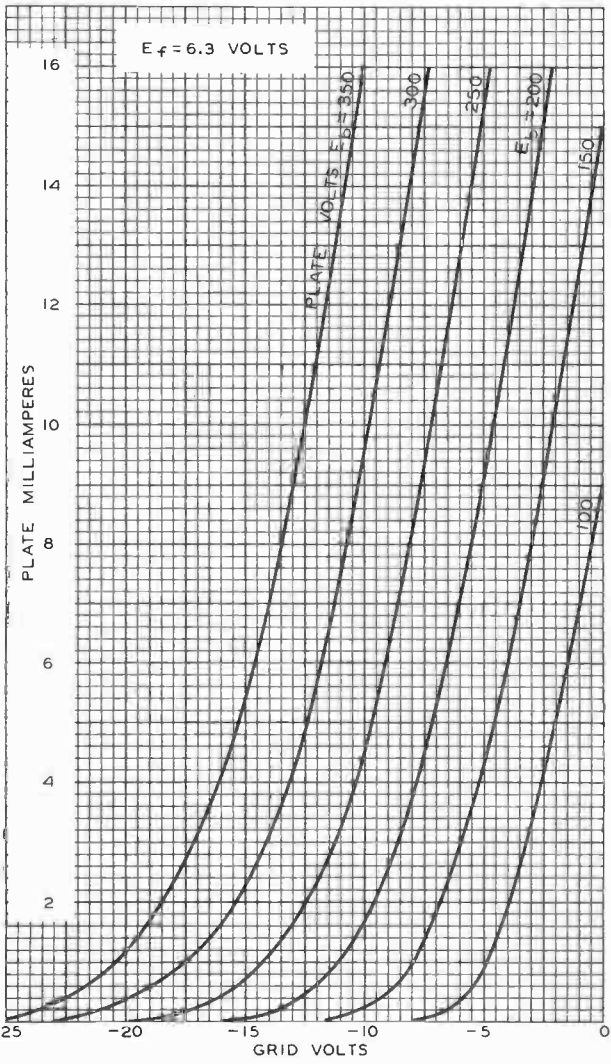


JULY 23, 1935

RCA VICTOR DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

92C-4441

AVERAGE CHARACTERISTICS

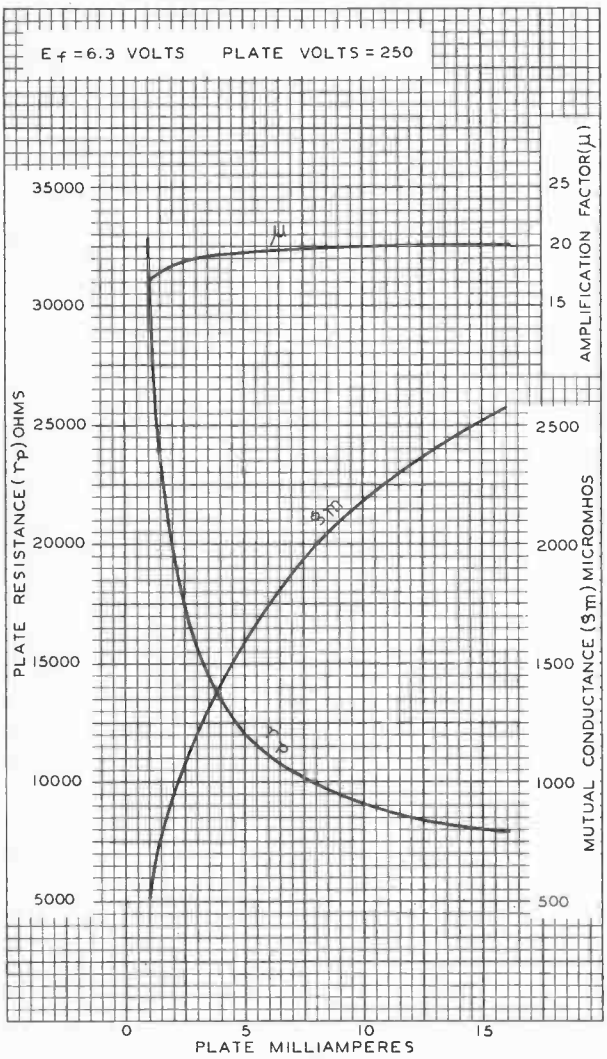


6C5

RCA Cunningham Radiotron RADIO TUBES

RCA-6C5

AVERAGE CHARACTERISTICS



6C6
SHARP-CUTOFF PENTODE

GENERAL DATA

Electrical:

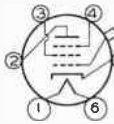
Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances:		
Pentode Connection:		
Grid No.1 to Plate[o]	0.007 max.	μμf
Input[oo]	5	μμf
Output[oo]	6.5	μμf
Triode Connection*[oo]:		
Grid No.1 to Plate	2	μμf
Grid No.1 to Cathode	3	μμf
Plate to Cathode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

[o] With external shield connected to cathode.
[oo] With no external shield.
* With grid No.2 and grid No.3 connected to plate.

Mechanical:

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

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



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

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

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

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

6C8-G

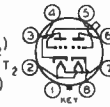
TWIN-TRIODE AMPLIFIER

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

Direct Interelectrode Capacitances (Approx.):

	Triode Unit T_1		*Triode Unit T_2*	
Grid to Plate	2.6		1.8	μμf
Grid to Cathode	2.6		1.3	μμf
Plate to Cathode	2.0		2.2	μμf
Grid to Grid		0.1		μμf
Plate to Plate		2.0		μμf

Overall Length	4-7/32" to 4-15/32"	
Seated Height	3-21/32" to 3-29/32"	←
Maximum Diameter	1-9/16"	
Bulb	ST-12	
Cap	Skirted Miniature, Style A	
Base	Small Shell Octal 8-Pin	
Pin 1 – No Connection	Pin 6 – Plate (Triode T_1)	
Pin 2 – Heater	Pin 7 – Heater	
Pin 3 – Plate (Triode T_2)	Pin 8 – Cathode (Triode T_1)	
Pin 4 – Cathode (Triode T_2)	Cap – Grid (Triode T_2)	
Pin 5 – Grid (Triode T_1)		
Mounting Position	Any	



BOTTOM VIEW (G-8G)

EACH TRIODE UNIT

Plate Voltage	250 max.	volts
Grid Voltage	0 min.	volts ←
Plate Dissipation	1.0 max.	watt ←
Characteristics - Class A_1 Amplifier:		
Plate	250	volts
Grid	-4.5	volts
Amp. Fact.	36	
Plate Res.	22500	ohms
Transcond.	1600	μmhos
Plate Cur.	3.2	ma.

Typical Operation - Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART.

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

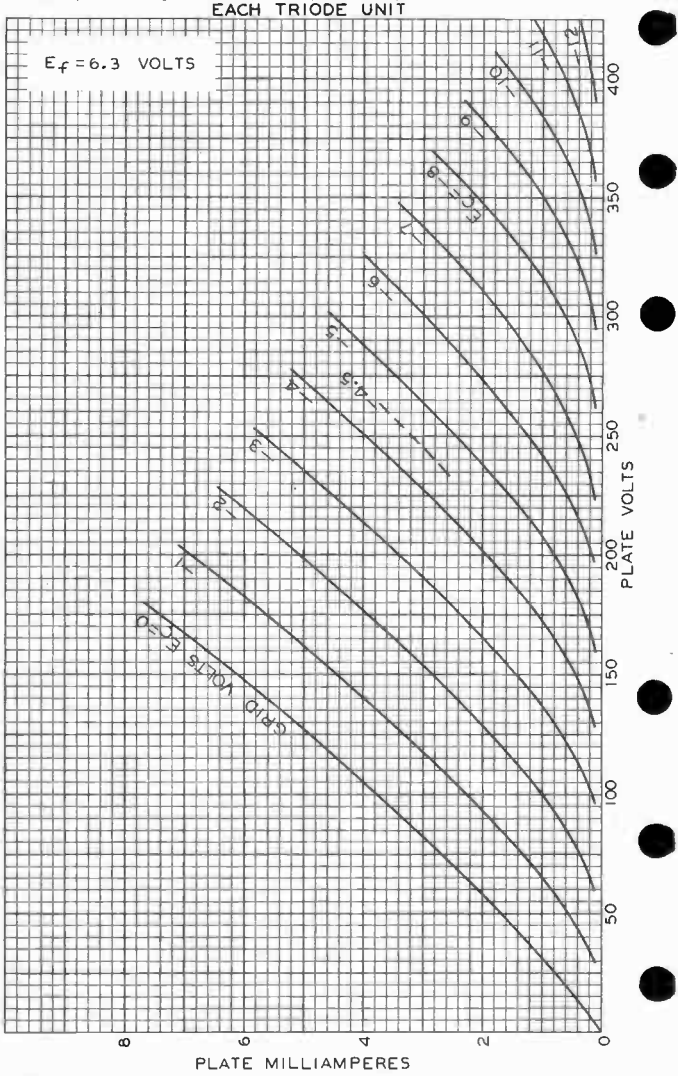
← Indicates a change.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

6C8-G

6C8-G

AVERAGE PLATE CHARACTERISTICS
EACH TRIODE UNIT



SEPT. 18, 1941

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4957R1

Full-Wave Vacuum Rectifier

9-PIN MINIATURE TYPE

GENERAL DATA

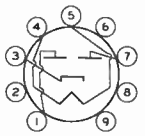
Electrical:

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:

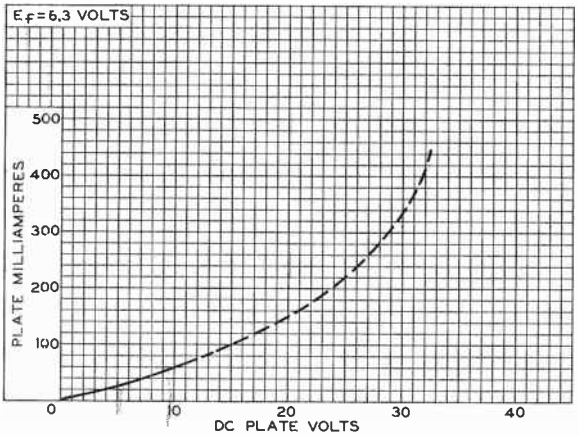
Even occasional hot-switching with capacitor-input circuits permits the flow of plate current having magnitudes which can adversely affect the life and reliability of tubes. If capacitor-input circuits are to be used, protect the circuits against possible adverse effects of hot-switching by the use of 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:

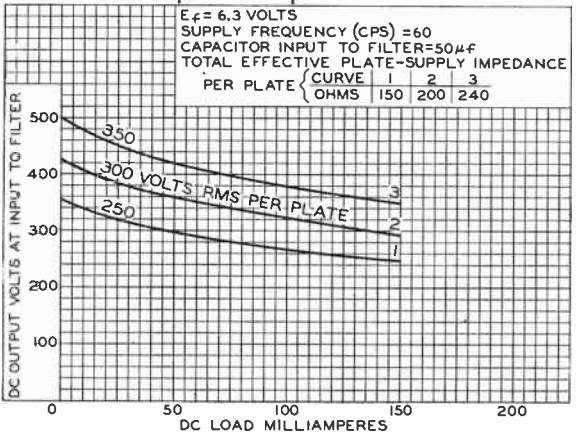
	With capacitor input to filter			
AC Plate-To-Plate Supply Voltage (RMS)	500	600	700	volts
Filter-Input Capacitor	50	50	50	μf
Total Effective Plate-Supply Impedance Per Plate	150	200	240	ohms
DC Output Voltage at Input to Filter (Approx.) for dc output ma. = 150	245	293	347	volts

AVERAGE PLATE CHARACTERISTIC
Each Unit



92CS-10378

OPERATION CHARACTERISTICS
Capacitor Input to Filter



92C5-10379

Beam Power Tube

7-PIN MINIATURE TYPE

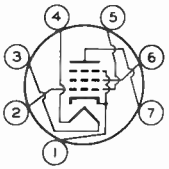
GENERAL DATA

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

BEAM POWER TUBE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	2.5	amp
Direct Interelectrode Capacitances (Approx.):[D]		
Grid No.1 to plate	0.8	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	24	μμf
Plate to cathode & grid No.3, grid No.2, and heater	10	μμf

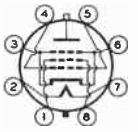
Characteristics, Class A_1 Amplifier:

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

Mechanical:

Mounting Position	Any
Maximum Overall Length	5-1/8"
Seated Length	4-7/16" ± 5/32"
Maximum Diameter	2-1/16"
Bulb	ST-16
Cap	Small (JETEC No.C1-1)
Base	Short Jumbo-Shell Octal 8-Pin with External Barriers (JETEC No.B8-71)
Basing Designation for BOTTOM VIEW	8GD

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



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

[D] without external shield.

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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CB5

6CB5
BEAM POWER TUBE

HORIZONTAL DEFLECTION AMPLIFIER

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

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

DC PLATE VOLTAGE	700	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute Value)#	6800®	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500	max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE	200	max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-50	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE	200	max.	volts
DC PLATE CURRENT	200	max.	ma
GRID-No.2 INPUT	3.6	max.	watts
PLATE DISSIPATION†	23	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	210	max.	°C

Maximum Circuit Values:

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

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

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

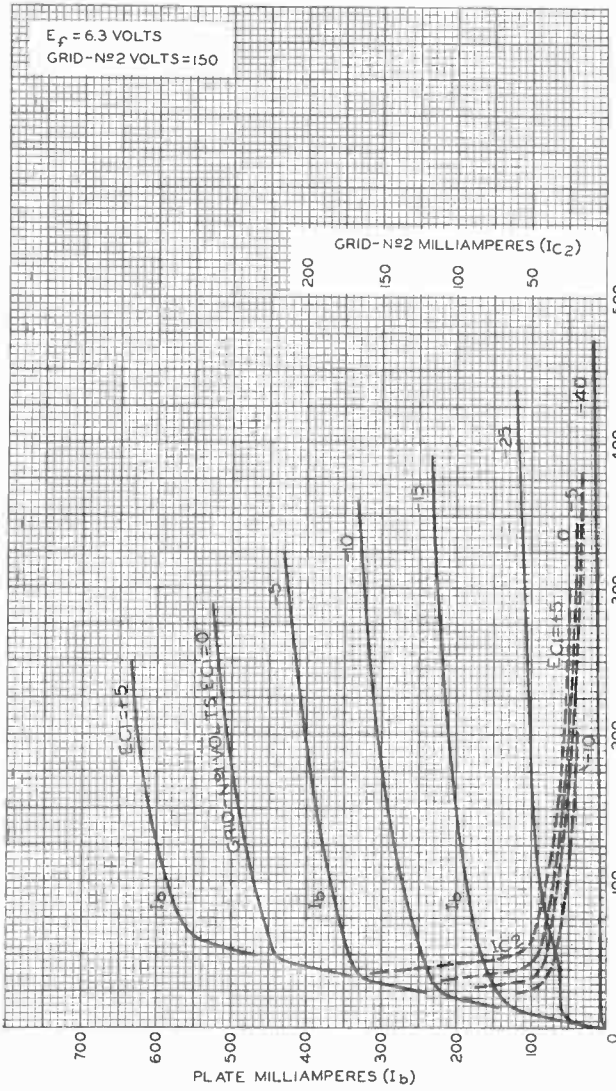
® Under no circumstances should this absolute value be exceeded.

▲ The dc component must not exceed 100 volts.

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

6CB5

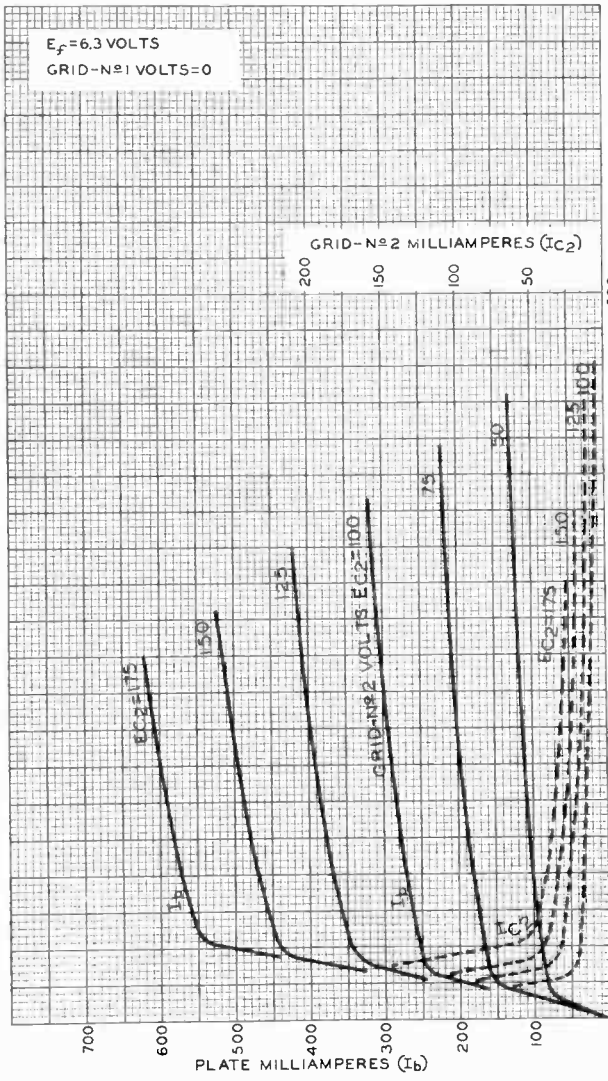
AVERAGE PLATE CHARACTERISTICS



RCA

6CB5

AVERAGE PLATE CHARACTERISTICS



6CB5-A

BEAM POWER TUBE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage	6.3		ac or dc volts
Current	2.5		amp
Direct Interelectrode Capacitances (Approx.):°			
Grid No.1 to plate		0.4	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

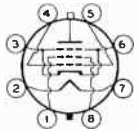
Characteristics, Class A_1 Amplifier:

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

Mechanical:

Mounting Position	Any
Maximum Overall Length	5"
Seated Length	4-1/4" ± 3/16"
Maximum Diameter	1-23/32"
Bulb	T-12
Cap	Small (JETEC No.C1-1)
Base	Short Jumbo-Shell Octal 8-Pin with External Barriers (JETEC No.B8-71), or Short Medium-Shell Octal 8-Pin with External Barriers, Style B (JETEC No.B8-118)
Basing Designation for BOTTOM VIEW	8GD

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



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

° Without external shield.

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

TENTATIVE DATA

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CB5-A

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	800 max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute value)#	6800⊕ max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	200 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	770 max.	ma
Average	220 max.	ma
GRID-No.2 INPUT	3.6 max.	watts
PLATE DISSIPATION†	23 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲ max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	220 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.

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

⊕ Under no circumstances should this absolute value be exceeded.

▲ The dc component must not exceed 100 volts.

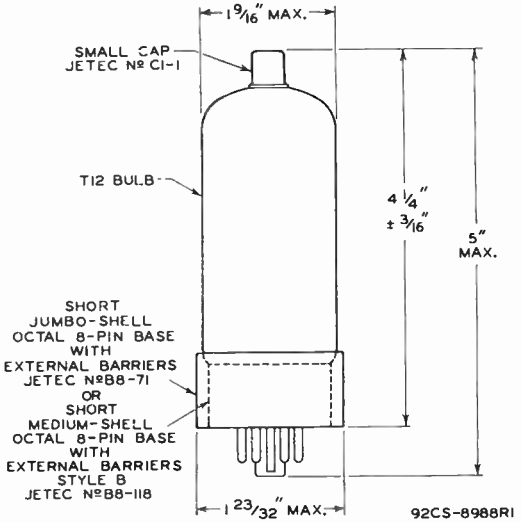
† It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value be employed.

TENTATIVE DATA

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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

RCA

6CB5-A

AVERAGE CHARACTERISTICS

E_f = 6.3 VOLTS
GRID-№2 VOLTS=150

GRID-№2 MILLIAMPERES (I_{C_2})

PLATE MILLIAMPERES (I_b)

PLATE VOLTS

92CM-8436

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
TUBE DIVISION

6CB6
SHARP-CUTOFF PENTODE

MINIATURE TYPE

GENERAL DATA

Electrical:

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

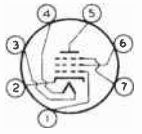
Direct Interelectrode Capacitances:

	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.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CB6

SHARP-CUTOFF PENTODE

→ PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode .	200 max.	volts
Heater positive with respect to cathode .	200▲max.	volts
Typical Operation and Characteristics:		
Plate Voltage	200	volts
Grid No.3 (Suppressor).	*Connected to cathode at socket*	
Grid-No.2 Voltage	150	volts
Cathode-Bias Resistor	180	ohms
Plate Resistance (Approx.).	0.6	megohm
Transconductance.	6200	μmhos
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp.	−8	volts
Plate Current	9.5	ma
Grid-No.2 Current	2.8	ma

▲ The dc component must not exceed 100 volts.

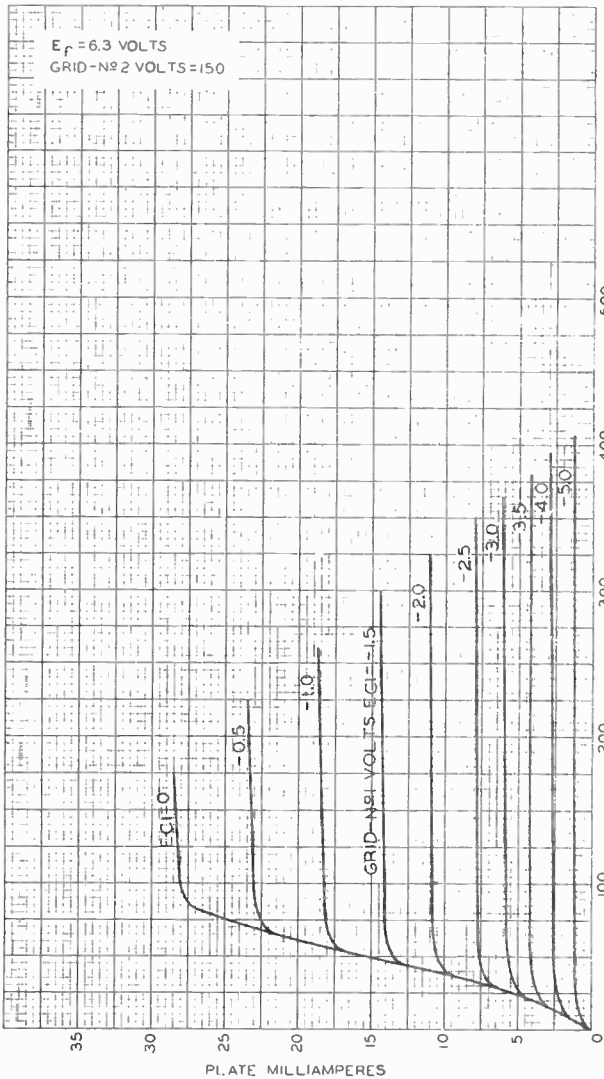
→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6CB6

AVERAGE PLATE CHARACTERISTICS

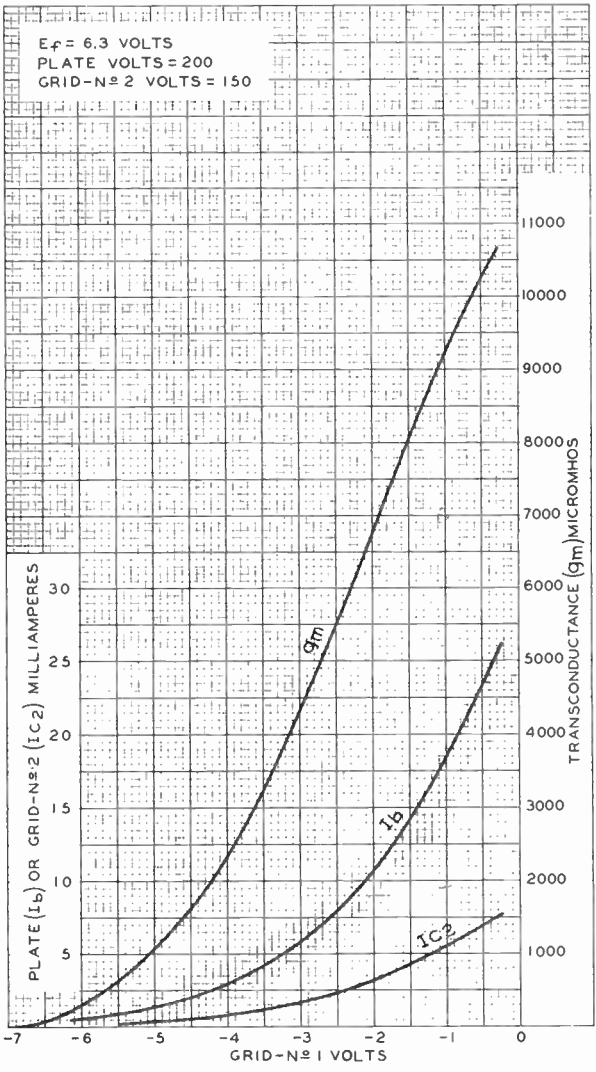


TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6CB6

AVERAGE CHARACTERISTICS



6CD6-G

BEAM POWER TUBE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage	6.3		ac or dc volts
Current	2.5		amp
Direct Interelectrode Capacitances (Approx.):[o]			
Grid No.1 to plate		0.8	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater		24	μμf
Plate to cathode & grid No.3, grid No.2, and heater		9.5	μμf

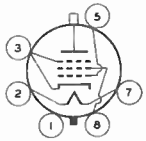
Characteristics, Class A_1 Amplifier:

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

Mechanical:

Mounting Position	Vertical, base up or down, or Horizontal with pins 2 and 7 in vertical plane
Maximum Overall Length	5-11/16"
Seated Length	4-31/32" ± 5/32"
Maximum Diameter	2-1/16"
Dimensional Outline	*See General Section*
Bulb	ST-16
Cap	Small (JETEC No.C1-1)
Base	Medium-Shell Octal 6-Pin (JETEC No.B6-13)
Basing Designation for BOTTOM VIEW	5BT

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



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

[o] Without external shield.

* These values can be measured by a method involving a recurrent wave form such that the cathode current will be kept within ratings in order to prevent damage to the tube.

← Indicates a change.

RCA

6CD6-G

BEAM POWER TUBE

HORIZONTAL DEFLECTION AMPLIFIER

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

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

DC PLATE VOLTAGE	700	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)[⊕]	6600[■]	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500	max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE	175	max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-50	max.	volts
PEAK NEGATIVE-PULSE GRID-No.1 VOLTAGE	200	max.	volts
CATHODE CURRENT:			
Peak	700	max.	ma
Average	200	max.	ma
GRID-No.2 INPUT	3	max.	watts
PLATE DISSIPATION†	15	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[▲]	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	210	max.	°C

→ **Maximum Circuit Values:**

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

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

■ Under no circumstances should this absolute value oe exceeded.

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

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

▲ The dc component must not exceed 100 volts.

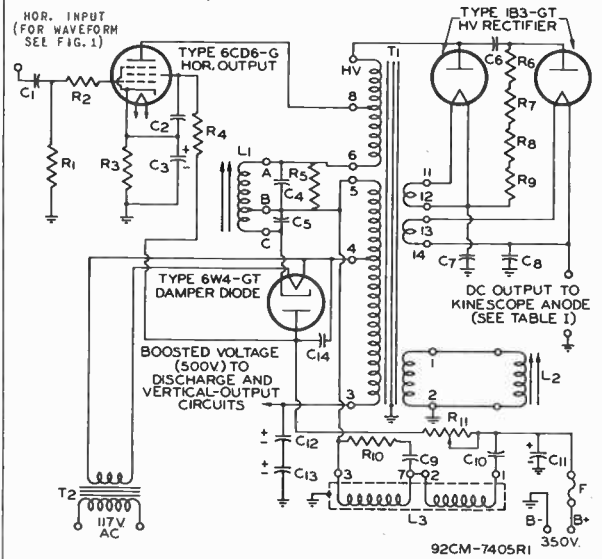
→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CD6-G

BEAM POWER AMPLIFIER

Horizontal-Deflection Circuit and Pulse-Operated High-Voltage Supply for RCA-16GP4 Kinescope



C1: 0.01 μf, 600 volts
C2: 0.25 μf, 400 volts
C3: 4 μf, 50 volts, electrolytic
C4: 0.03 μf, 400 volts
C5: 0.1 μf, 400 volts
C6 C7: 500 μμf, 10 kilovolts
C8: 500 μμf, 20 kilovolts
C9: 47 μμf, 1500 volts
C10: 0.1 μf, 400 volts
C11: 20 μf, 400 volts, electrolytic
C12 C13: 20 μf, 300 volts, electrolytic
C14: 100 μμf rated for 2500 peak pulse volts. Specific value should be selected to give retrace time of about 7.5 microseconds.
F: Fuse, 1/4 A, 500 volts

L1: Horizontal Linearity Control, RCA-209R1
L2: Width Control, RCA-206R1
L3: Horizontal Deflecting Coils of Deflecting Yoke RCA-206D1
R1: 250000 ohms, 1/2 watt
R2: 100 ohms, 1/2 watt
R3: 300 ± 5% ohms, 10 watts
R4: 10000 ohms approx., 3 watts. Value should be sufficient to limit grid-No.2 input of 6CD6-G to 3 watts.
R5: 1000 ohms, 1 watt
R6 R7 R8 R9: 500000 ohms, 1 watt
R10: 1000 ohms, 1/2 watt
R11: 200 ohms, 10 watts
T1: Horizontal-Deflection-Output and High-Voltage Transformer, RCA-216T1
T2: Heater Transformer insulated for 3 kilovolts.

6CD6-G

BEAM POWER AMPLIFIER

Fig. 1 - Waveform of Input to Grid-No.1 Circuit of RCA-6CD6-G Measured Across R_1 in Accompanying Circuit

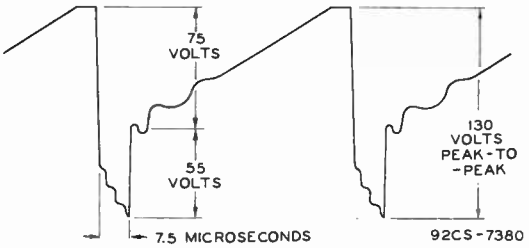


Table I

Available dc output voltage for kinescope when 6CD6-G is operated under conditions shown in tabulated data.

Kinescope Anode Microamperes	*DC Output Volts for Kinescope Anode (Approx.)*
0	*14000*
140	*12300*

RCA

6CD6-G

AVERAGE PLATE CHARACTERISTICS

OCT. 26, 1949

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7393

6CD6-G

RCA

6CD6-G

AVERAGE PLATE CHARACTERISTICS

OCT. 25, 1949

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7392

6CD6-GA
BEAM POWER TUBE

Supersedes Type 6CD6-G

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage	6.3		ac or dc volts
Current	2.5		amp
Direct Interelectrode Capacitances (Approx.):[c]			
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

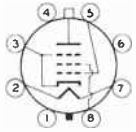
Characteristics, Class A_1 Amplifier:

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

[c] 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[O]

DC PLATE VOLTAGE	700	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)[®]	7000[■]	max.	volts
PEAK NEGATIVE-PULSE PLATE VOLTAGE	1500	max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	175	max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-50	max.	volts
PEAK NFGATIVE-PULSE GRID-No.1 VOLTAGE	200	max.	volts
CATHODE CURRENT:			
Peak	700	max.	ma
Average	200	max.	ma
GRID-No.2 INPUT	3	max.	watts
PLATE DISSIPATION†	20	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[▲]	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	225	max.	°C

Maximum Circuit Values:

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

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

■ Under no circumstances should this absolute value be exceeded.

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

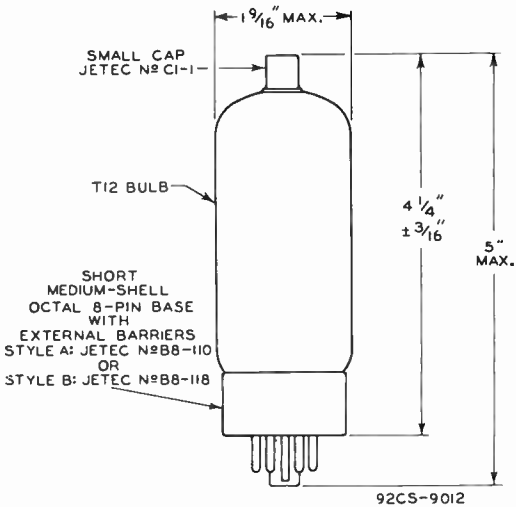
† It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value should be employed.

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CD6-GA

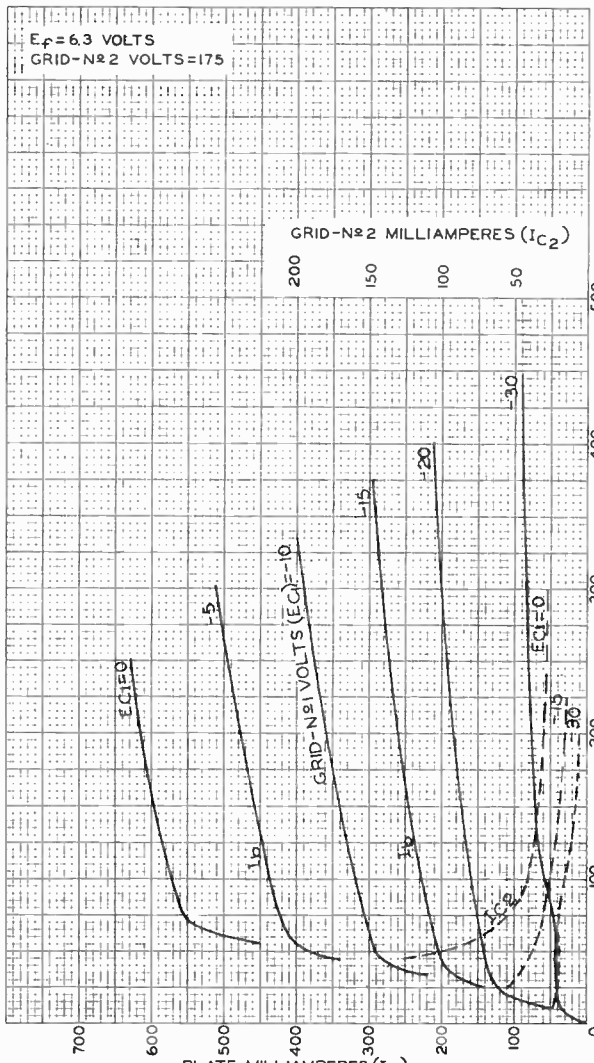
BEAM POWER TUBE



6CD6-GA

6CD6-GA

AVERAGE CHARACTERISTICS

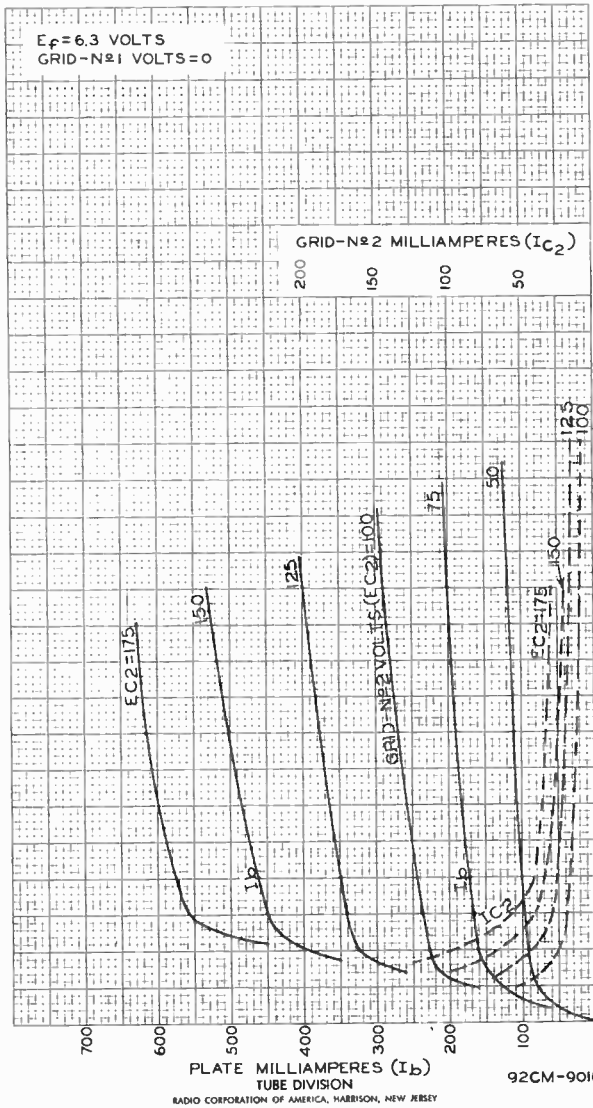


92CM-9017

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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

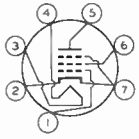
Characteristics, Class A_1 Amplifier:

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

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

MINIATURE TYPE

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

GENERAL DATA

Electrical:

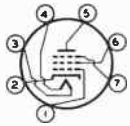
Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances:°		
Grid No.1 to Plate	0.020 max.	μμf
Input	6.3	μμf
Output	1.9	μμf

° With no external shield.

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ±3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base — Small-Button Miniature 7-Pin (JETEC No.E7-1)	
Basing Designation for BOTTOM VIEW	7CM

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



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

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	150 max.	volts
PLATE DISSIPATION	2.0 max.	watts
GRID-No.2 INPUT	0.5 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	90 max.	volts
Heater positive with respect to cathode	90 max.	volts

Typical Operation and Characteristics:

Plate Voltage	200	volts
Grid No.3 (Suppressor)	Connected to cathode at socket	
Grid-No.2 Voltage	150	volts
Cathode-Bias Resistor	180	ohms
Plate Resistance (Approx.)	0.6	megohm
Transconductance	6200	μmhos
Grid-No.1 Bias (Approx.) for plate current of 35 μamp	-6.5	volts

6CF6

SHARP-CUTOFF PENTODE

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

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

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CG7

MEDIUM-MU TWIN TRIODE

9-PIN MINIATURE TYPE

Intended for use in equipment with series heater-string arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

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

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

Direct Interelectrode Capacitances (Approx.):[a]

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

Characteristics, Class A_1 Amplifier (Each Unit):

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

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Maximum Diameter	7/8"
Bulb	T-6-1/2
Base	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW	9AJ

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

[a] Without external shield.

6CG7

MEDIUM-MU TWIN TRIODE

AMPLIFIER - Class A_1

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300 max.	volts
GRID VOLTAGE:		
Positive bias value	0 max.	volts
CATHODE CURRENT	20 max.	ma
PLATE DISSIPATION:		
Either plate	3.5 max.	watts
Both plates (Both units operating)	5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲ max.	volts

Maximum Circuit Values:

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

Typical Operation as Resistance-Coupled Amplifier:

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

HORIZONTAL DEFLECTION OSCILLATOR

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

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

DC PLATE VOLTAGE	300 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE♦	600 max.	volts
CATHODE CURRENT:		
Peak	300 max.	ma
Average	20 max.	ma
PLATE DISSIPATION:		
Either plate	3.5 max.	watts
Both plates (Both units operating)	5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲ max.	volts

Maximum Circuit Values:

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

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

▲,□: See next page.

6CG7

MEDIUM-MU TWIN TRIODE

VERTICAL DEFLECTION OSCILLATOR

Values are for Each Unit

Maximum Ratings, *Design-Center Values:*

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

DC PLATE VOLTAGE	300 max.	volts
PEAK NEGATIVE-PULSE GRID VOLTAGE#	400 max.	volts
CATHODE CURRENT:		
Peak	70 max.	ma
Average	20 max.	ma
PLATE DISSIPATION:		
Either plate	3.5 max.	watts
Both plates (Both units operating)	5 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode.	200 max.	volts
Heater positive with respect to cathode.	200▲max.	volts

Maximum Circuit Values:

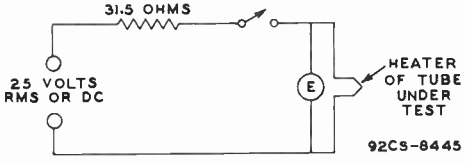
Grid-Circuit Resistance:		
For fixed-bias, grid-resistor bias, or cathode-bias operation	2.2 max.	megohms

▲ The dc component must not exceed 100 volts.

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

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

TEST CIRCUIT FOR DETERMINING HEATER WARM-UP TIME

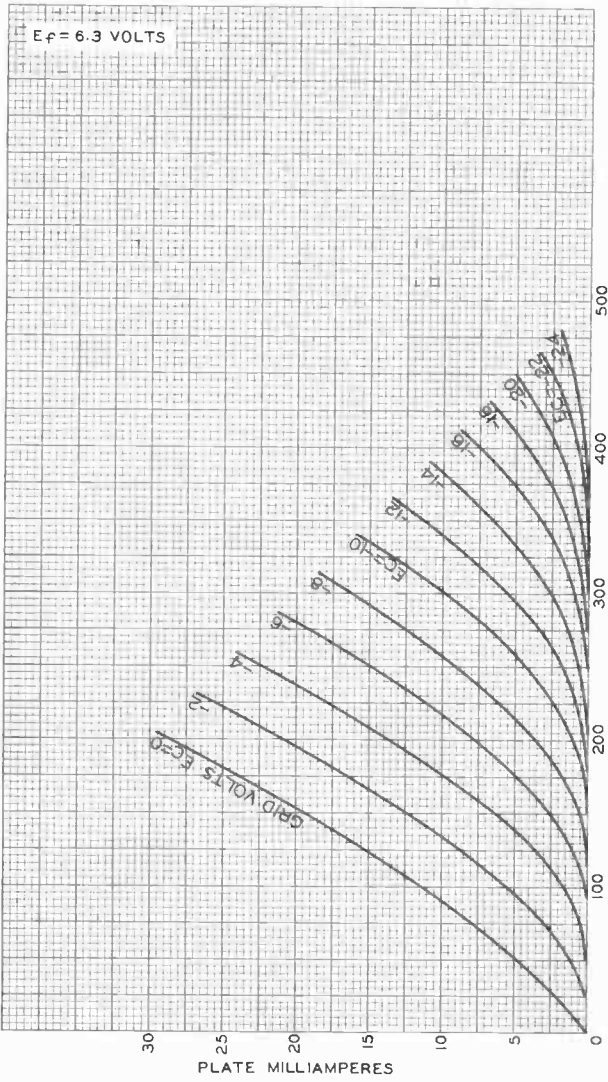


6CG7

RCA

6CG7

AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT

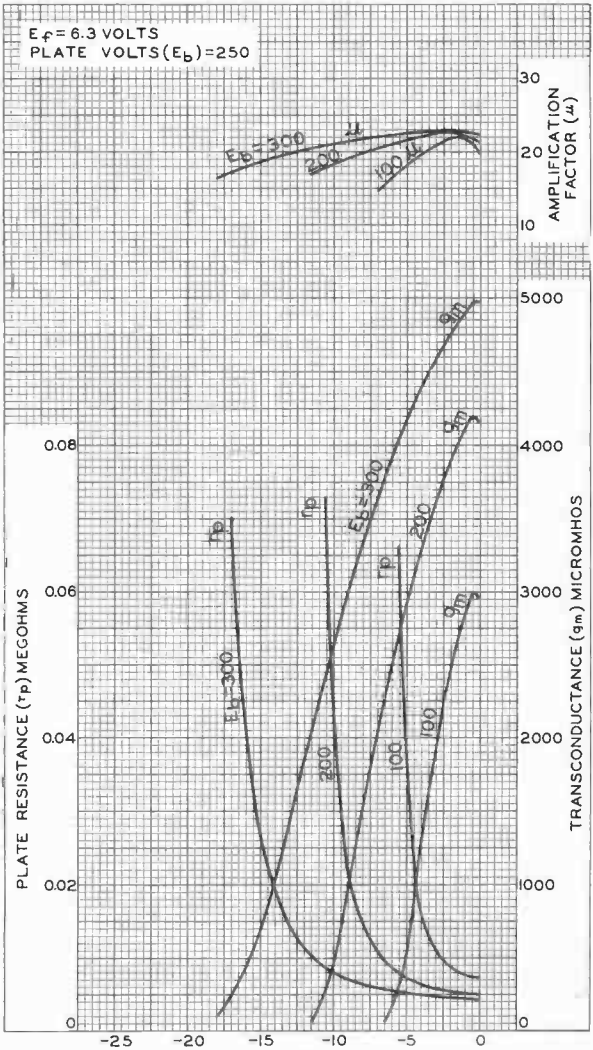


SEPT. 27, 1954

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8442

6CG7
AVERAGE CHARACTERISTICS
FOR EACH UNIT



6CG8

TRIODE-PENTODE CONVERTER

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3	ac or dc volts
Current	0.45	amp

Direct Interelectrode Capacitances:

	Without External Shield	*With External Shield°*	
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.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

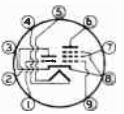
6CG8

TRIODE-PENTODE CONVERTER

Mechanical:

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

Pin 1 – Triode Grid
Pin 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 150 volts	–	0.5 max.	watt
For grid-No.2 voltages between 150 and 300 volts	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 INPUT	0.5 max.	–	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200 max.	200 max.	volts
Heater positive with respect to cathode	200▲max.	200▲max.	volts

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CG8

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.

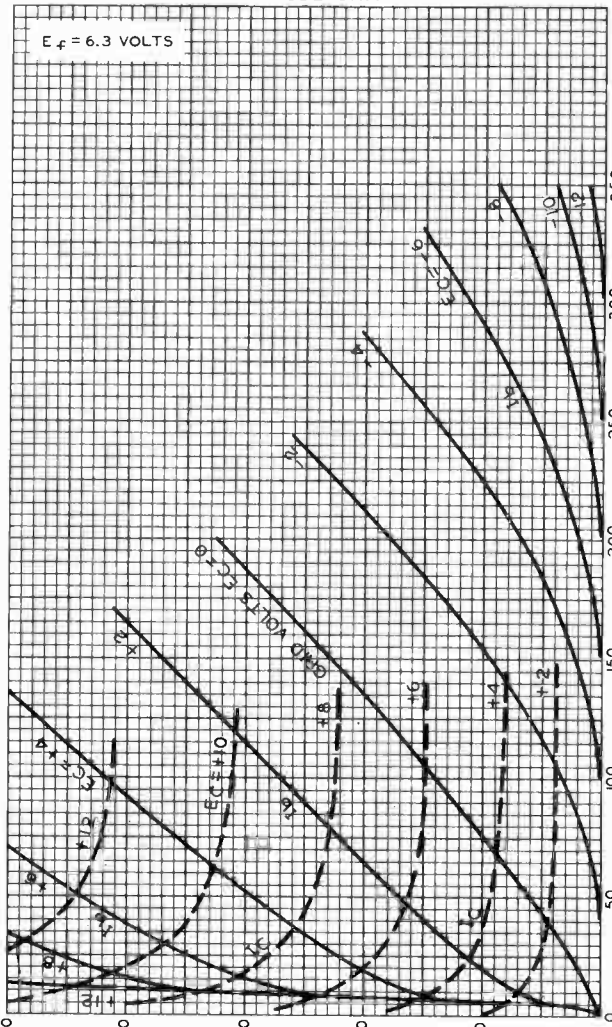
* With separate excitation and triode unit connected to ground.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CG8

6CG8

AVERAGE CHARACTERISTICS
TRIODE UNIT



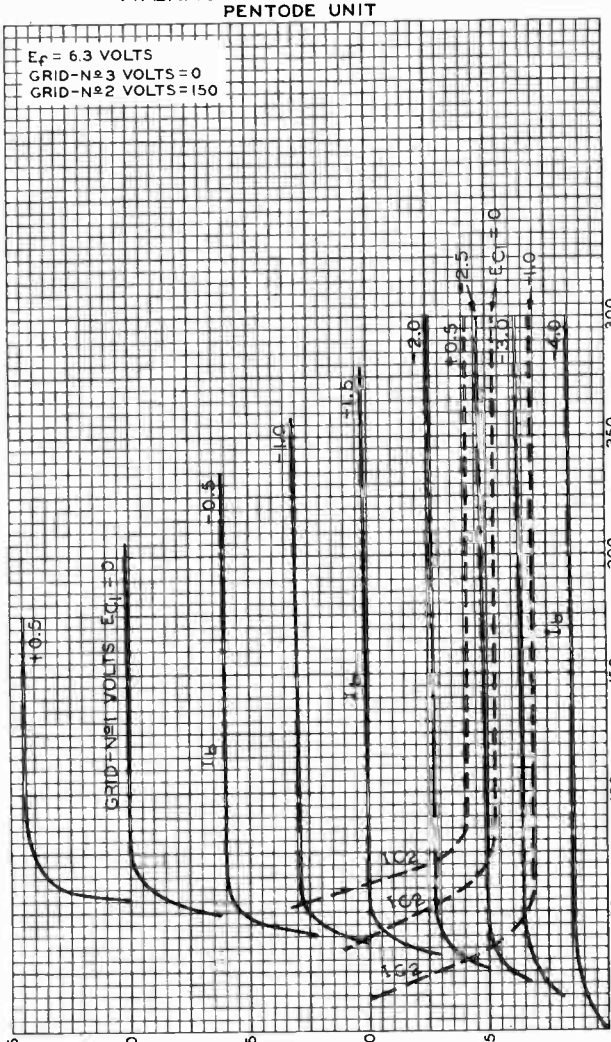
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7531

RCA

6CG8

AVERAGE CHARACTERISTICS
PENTODE UNIT



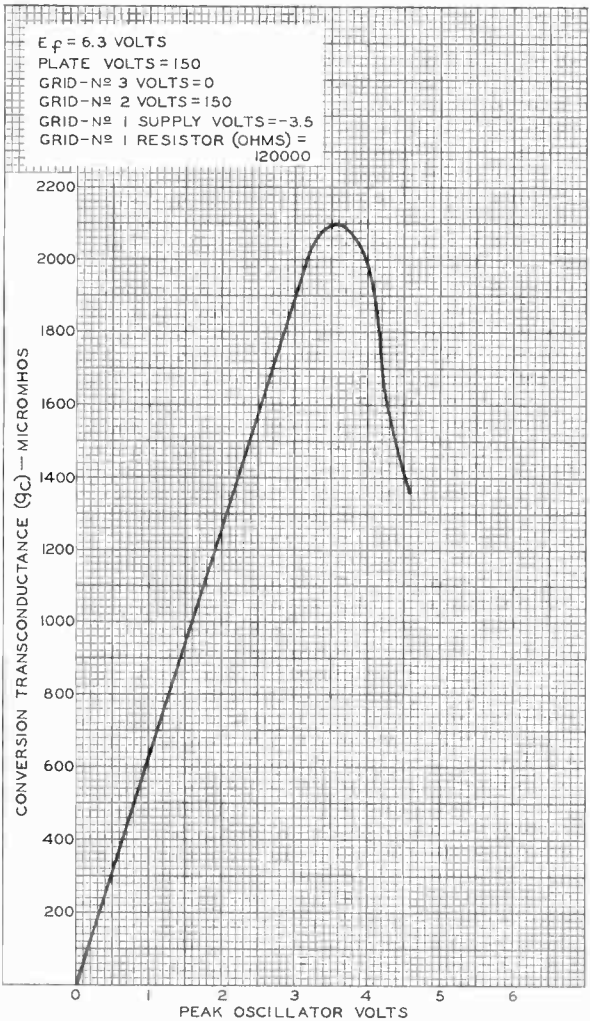
92CM-7532

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

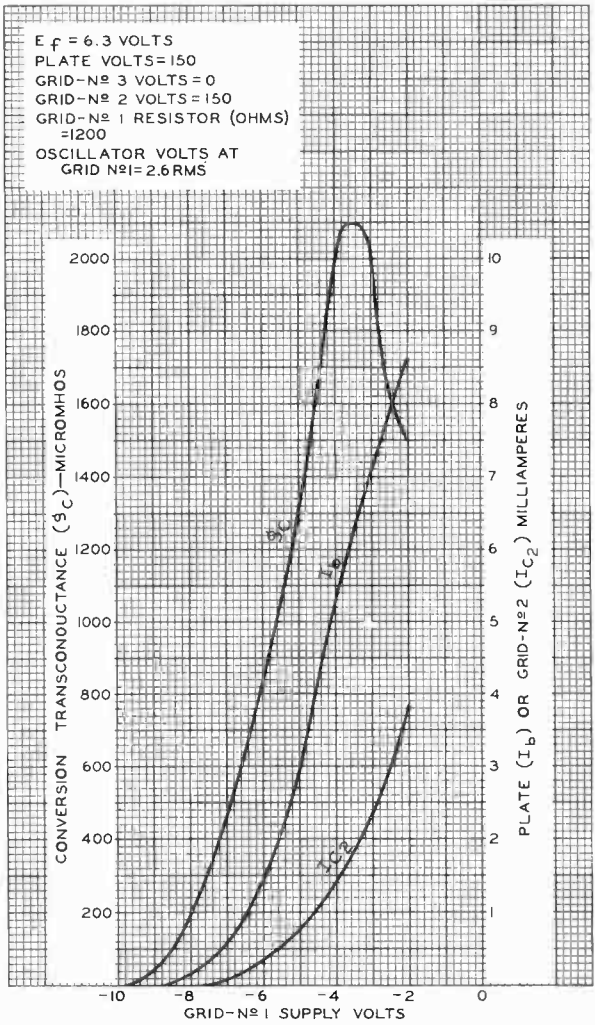
6CG8

OPERATION CHARACTERISTIC
WITH SEPARATE OSCILLATOR EXCITATION
PENTODE UNIT



6CG8

OPERATION CHARACTERISTICS
WITH SEPARATE OSCILLATOR EXCITATION
PENTODE UNIT



Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:			
Voltage (AC or DC)	6.3		volts
Current	0.45 ± 6%		amp
Warm-up time (Average)	11		sec
Direct Interelectrode Capacitances:	*Without External Shield*	*With External Shield*	
Triode Unit:			
Grid to plate	1.5	1.5	μμf
Grid to cathode & pentode grid No.3, and heater	2	2.4	μμf
Plate to cathode & pentode grid No.3, 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.

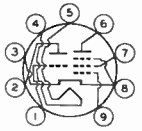
RADIO CORPORATION OF AMERICA
Electron Tube Division Harrison, N. J.

6CG8-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	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

→ **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.

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

→ Indicates a change.

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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CH8
MEDIUM-MU TRIODE—SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:		
Voltage	6.3	ac or dc volts
Current	0.45	amp
Direct Interelectrode Capacitances:[o]		
Triode Unit:		
Grid to plate	1.6	μμf
Grid to cathode, heater & pentode grid No.3 & internal shield	1.9	μμf
Plate to cathode, heater & pentode grid No.3 & internal shield	1.6	μμf
Pentode Unit:		
Grid No.1 to plate	0.025 max.	μμf
Grid No.1 to cathode, grid No.2, heater & grid No.3 & internal shield	7	μμf
Plate to cathode, grid No.2, heater & grid No.3 & internal shield	2.25	μμf
Triode grid to pentode plate	0.005	μμf
Pentode grid No.1 to triode plate	0.02	μμf
Pentode plate to triode plate	0.04	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*	
Plate-Supply Voltage	200	200	volts
Grid-No.3 Supply Voltage	–	0	volts
Grid-No.2 Supply Voltage	–	150	volts
Grid-No.1 Voltage	-6	–	volts
Cathode Resistor	–	180	ohms
Amplification Factor	19	–	
Plate Resistance (Approx.)	5750	300000	ohms
Transconductance	3300	6200	μmhos
Plate Current	13	9.5	ma
Grid-No.2 Current	–	2.8	ma
Grid-No.1 Voltage (Approx.) for plate current of 10 μamp	-19	-8	volts

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 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)

[o] Without external shield.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CH8
MEDIUM-MU TRIODE–SHARP-CUTOFF PENTODE

Basing Designation for BOTTOM VIEW 9FT

Pin 1 – Triode Cathode
Pin 2 – Pentode Plate
Pin 3 – Pentode Grid No.2
Pin 4 – Heater
Pin 5 – Heater, Pentode Grid No.3, Internal Shield
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-Center Values:*

	Triode Unit		*Pentode Unit*		
PLATE VOLTAGE	300	max.	300	max.	volts
GRID-No.3 (SUPPRESSOR-GRID) VOLTAGE	–		0	max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	–		300	max.	volts
GRID-No.2 VOLTAGE	–		*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*		
GRID-No.1 (CONTROL-GRID) VOLTAGE:					
Positive bias value	0	max.	0	max.	volts
PLATE DISSIPATION	2.6	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.	0	max.	volts

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

The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CH8
MEDIUM-MU TRIODE – SHARP-CUTOFF PENTODE

Maximum Circuit Values:

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

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

OPERATING CONSIDERATIONS

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

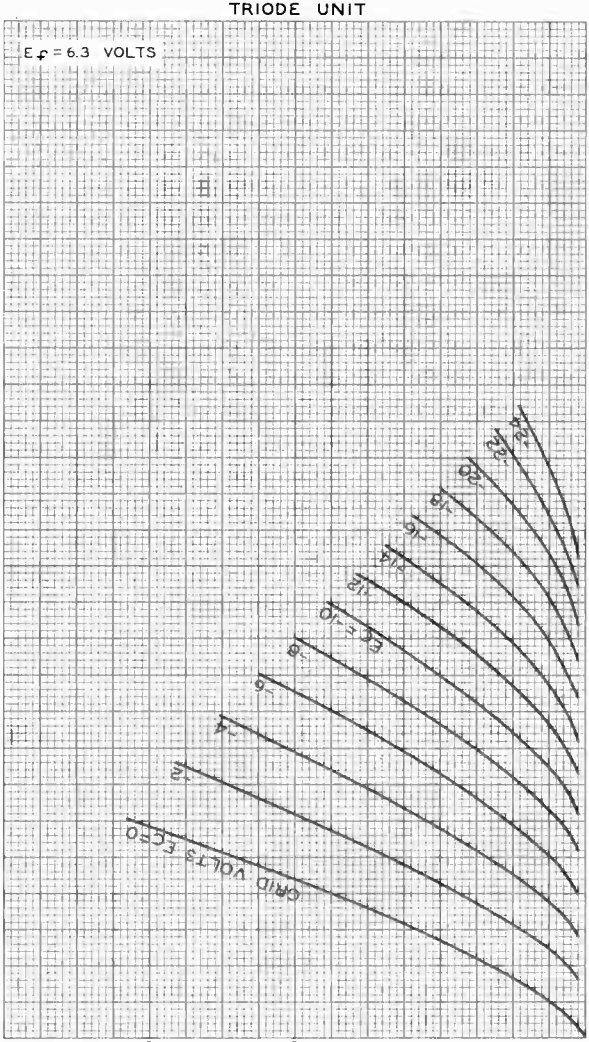
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CH8

6CH8

AVERAGE PLATE CHARACTERISTICS

TRIODE UNIT



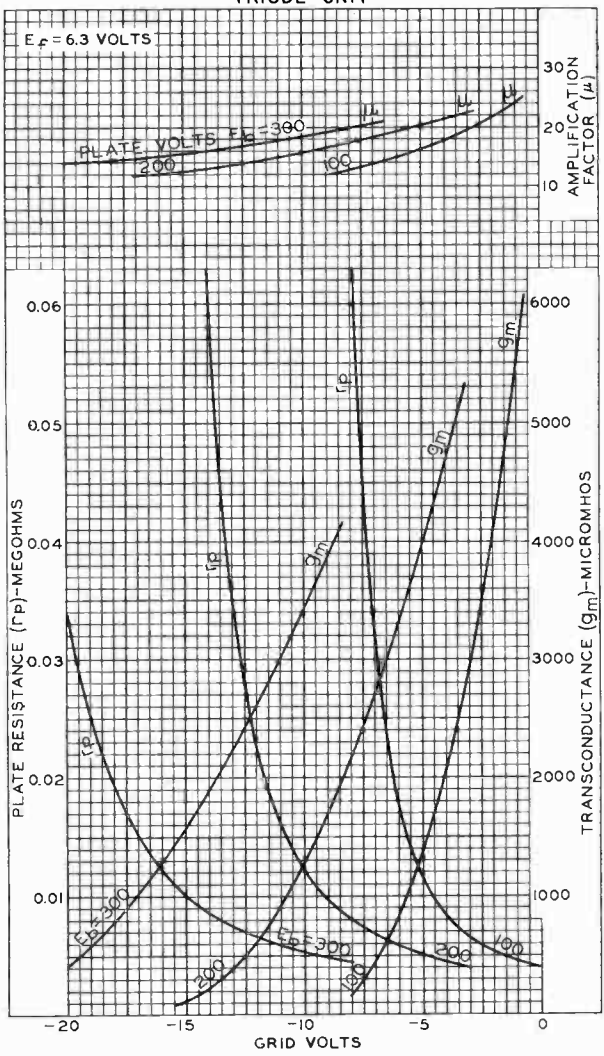
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8209

RCA

6CH8

AVERAGE CHARACTERISTICS
TRIODE UNIT



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8207

6CH8

RCA

6CH8

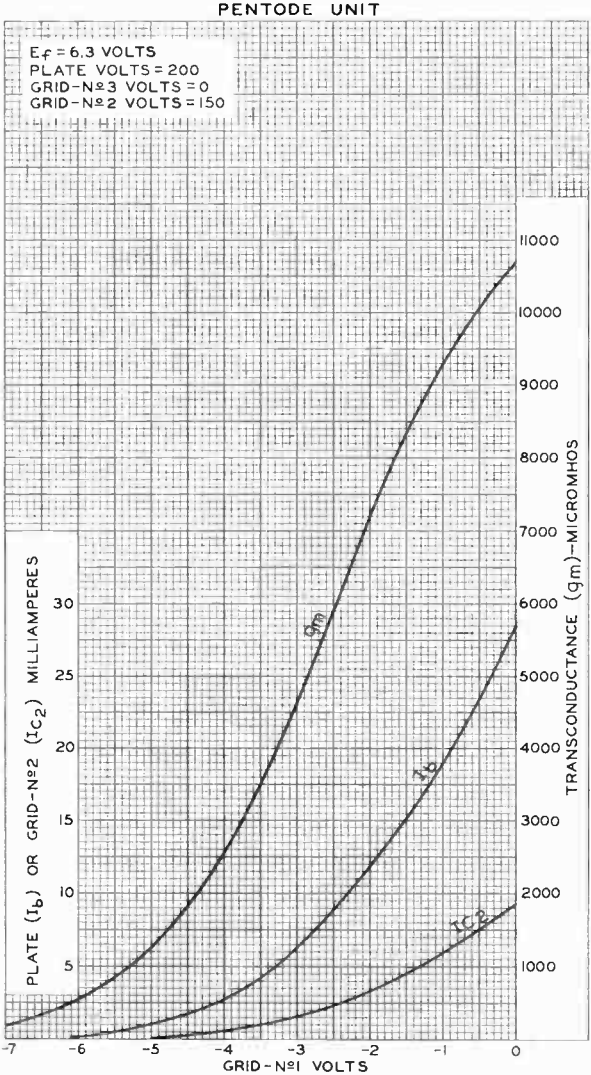
AVERAGE PLATE CHARACTERISTICS
PENTODE UNIT

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8206RI

6CH8

AVERAGE CHARACTERISTICS
PENTODE UNIT



6CL8
MEDIUM-MU TRIODE—SHARP-CUTOFF TETRODE

9-PIN MINIATURE TYPE

Intended for use as VHF oscillator and mixer in TV receivers 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°*	
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	0.028 max.	0.016 max.	μμf
Grid No.1 to cathode, grid No.2, and heater	5	5	μμf
Plate to cathode, grid No.2, and heater	2	3	μμf
Heater to cathode	2.5	2.5•	μμf

Characteristics, Class A_1 Amplifier:

	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	100000	ohms
Transconductance	8000	5800	μmhos
Plate Current	15	12	ma
Grid-No.2 Current	–	4	ma
Grid-No.1 Voltage (Approx.) for plate μa. = 10	-9	-10	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"

°, •: See next page.

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

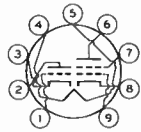
RCA

6CL8

MEDIUM-MU TRIODE—
SHARP-CUTOFF TETRODE

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 9FX

Pin 1 – Triode Grid
Pin 2 – Triode Plate
Pin 3 – Triode Cathode
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Tetrode Plate
Pin 7 – Tetrode Grid No.2
Pin 8 – Tetrode Cathode
Pin 9 – Tetrode Gr'd No.1



CONVERTER SERVICE

Maximum Ratings, *Design-Center Values:*

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

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

○, ●, ▲: See next page.

RCA

6CL8

MEDIUM-MU TRIODE—SHARP-CUTOFF TETRODE

° 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.

▲ The dc component must not exceed 100 volts.

6CM7

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

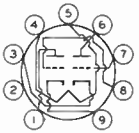
Characteristics, Class A_1 Amplifier: ←

	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. F9-1)
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.

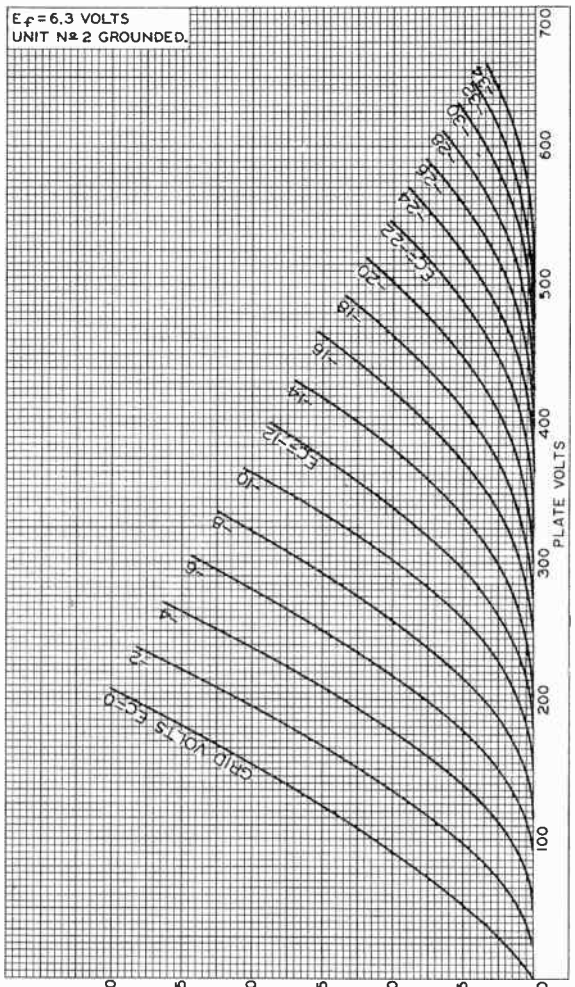
[b] As described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission.

[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.

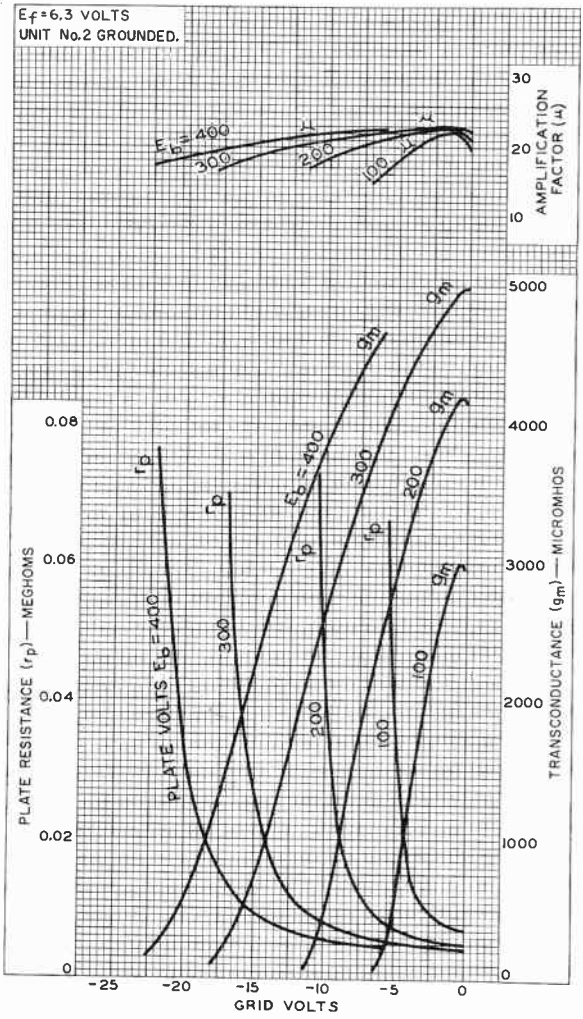
AVERAGE PLATE CHARACTERISTICS
Unit No.1



92CM-8617

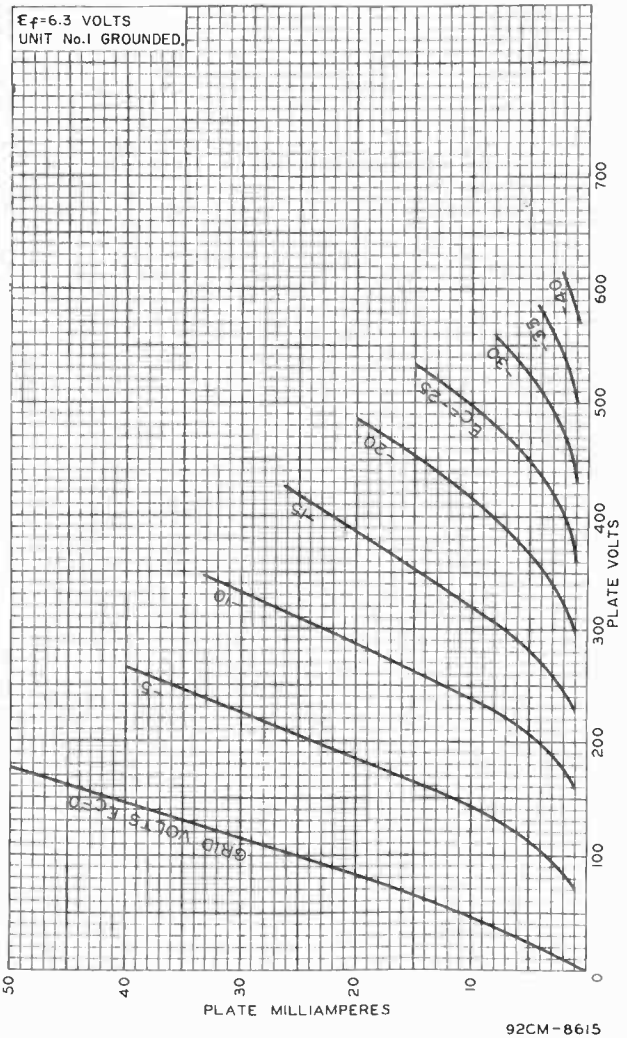
6CM7

AVERAGE CHARACTERISTICS
Unit No.1



92CM-8616RI

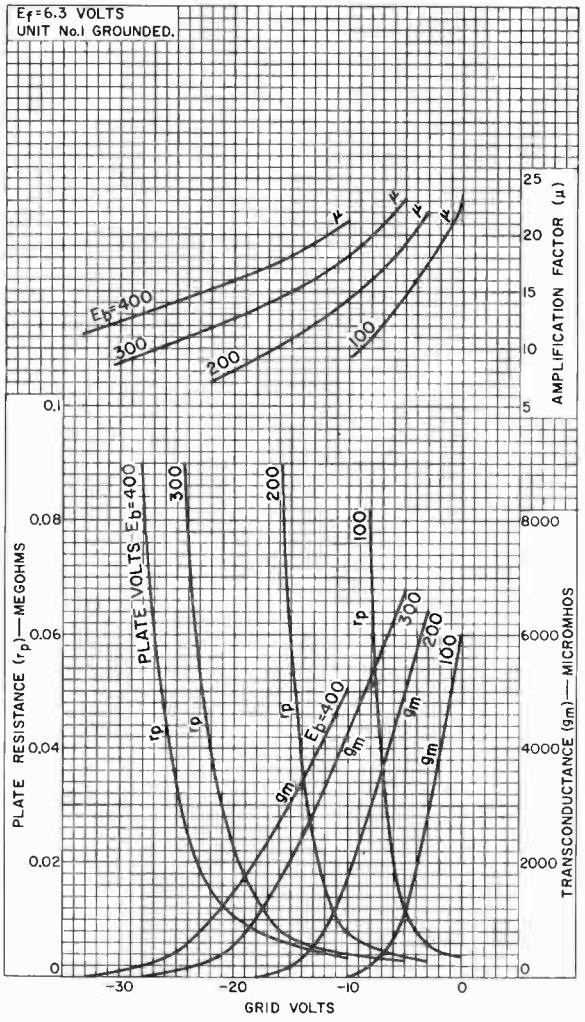
AVERAGE PLATE CHARACTERISTICS
Unit No.2



92CM-8615

6CM7

AVERAGE CHARACTERISTICS
Unit No.2



92CM-8613R1

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

RCA

6CM7

MEDIUM-MU DUAL TRIODE

With Dissimiliar 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.):[1]

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

Characteristics, Class A_1 Amplifier:

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

Mechanical:

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

[1] Without external shield.

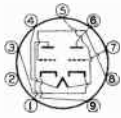
6CM7

6CM7

MEDIUM-MU DUAL TRIODE
With Dissimiliar Units

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

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



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

VERTICAL DEFLECTION OSCILLATOR

Values are for Unit No. 1

Maximum Ratings, *Design-Center Values:*

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

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

Maximum Circuit Values:

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

VERTICAL DEFLECTION AMPLIFIER

Values are for Unit No. 2

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

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

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

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

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6CM7

MEDIUM-MU DUAL TRIODE
With Dissimilar Units

Maximum Circuit Values:

Grid-Circuit Resistance:

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

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

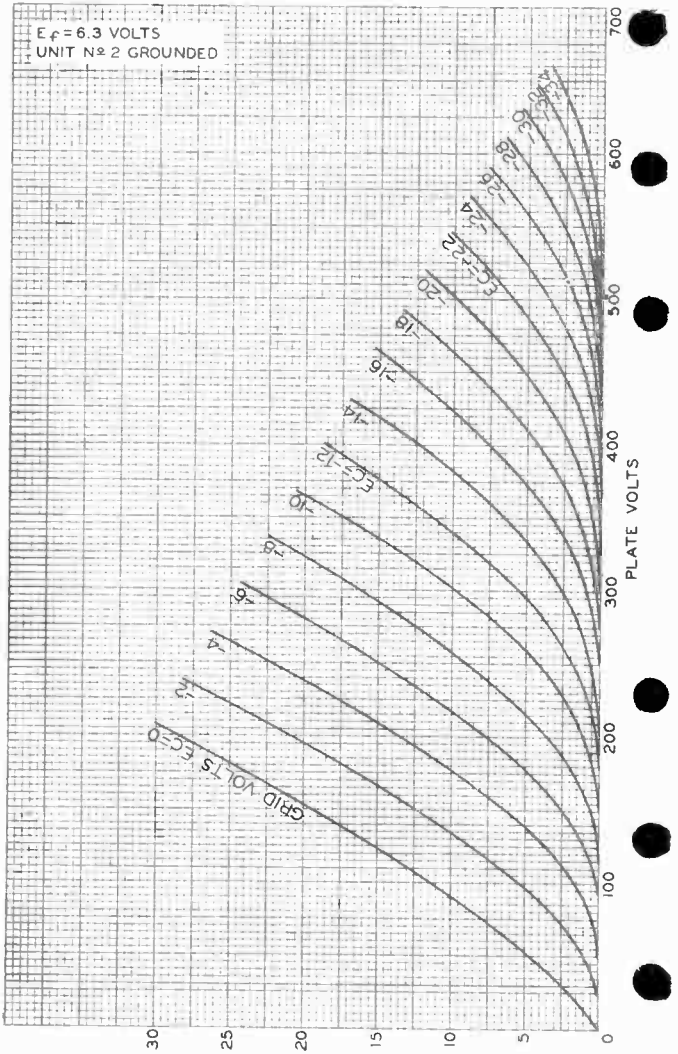
This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one vertical scanning cycle. In a 525-line, 30-frame system, 15 per cent of one vertical scanning cycle is 2.5 milliseconds.

■ Under no circumstances should this absolute value be exceeded.

6CM7

AVERAGE PLATE CHARACTERISTICS

UNIT Nº 1



MAY 17, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

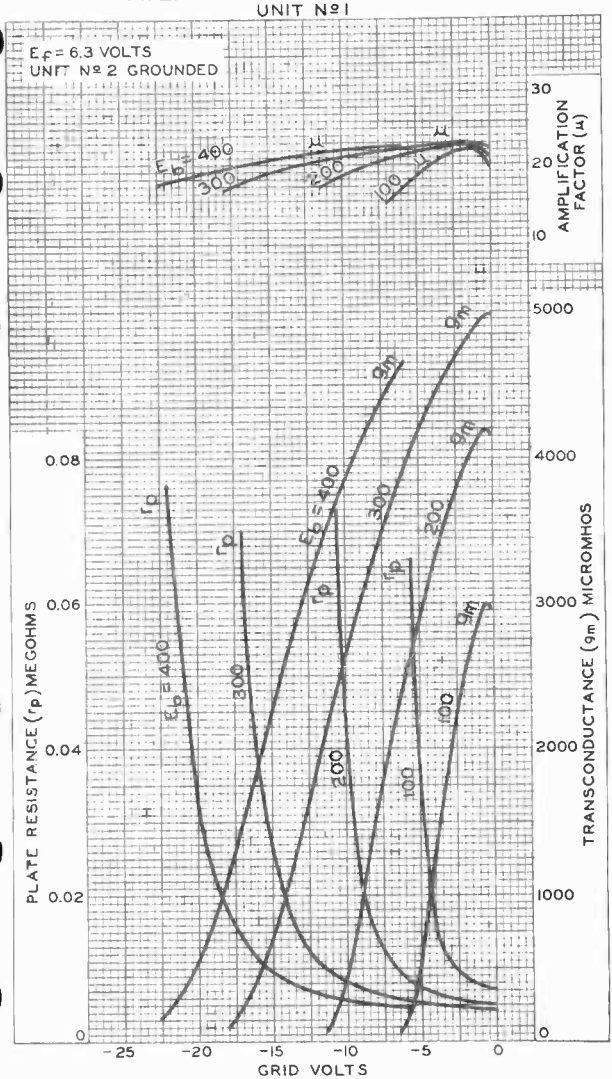
92CM-8617

RCA

6CM7

AVERAGE CHARACTERISTICS

UNIT Nº1

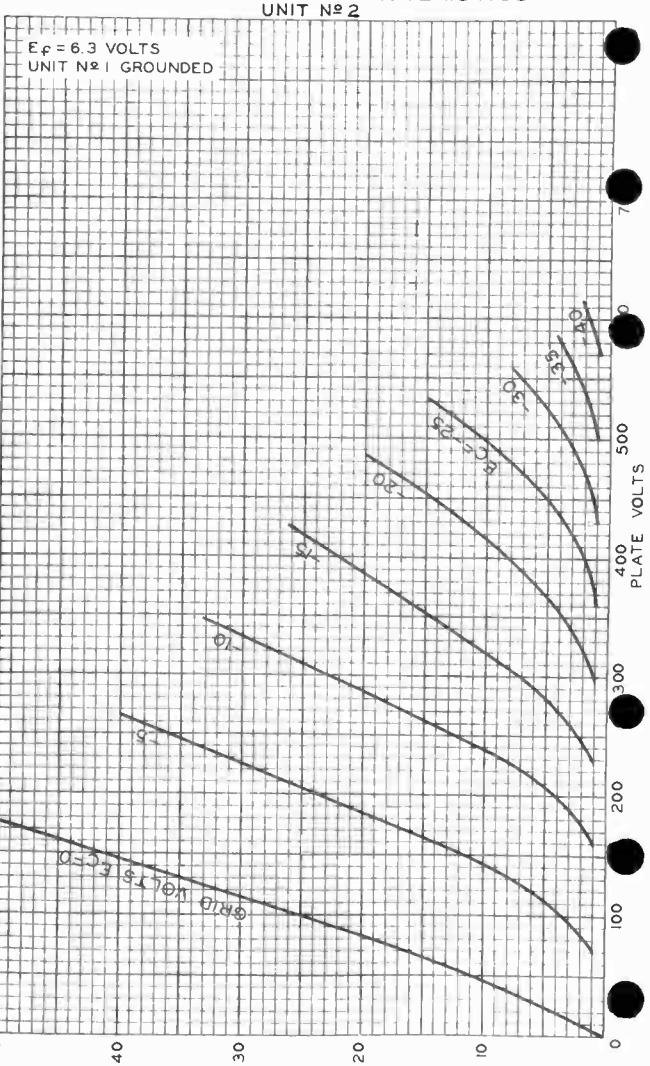


6CM7

6CM7

AVERAGE PLATE CHARACTERISTICS

UNIT Nº 2



MAY 16, 1955

TUBE DIVISION

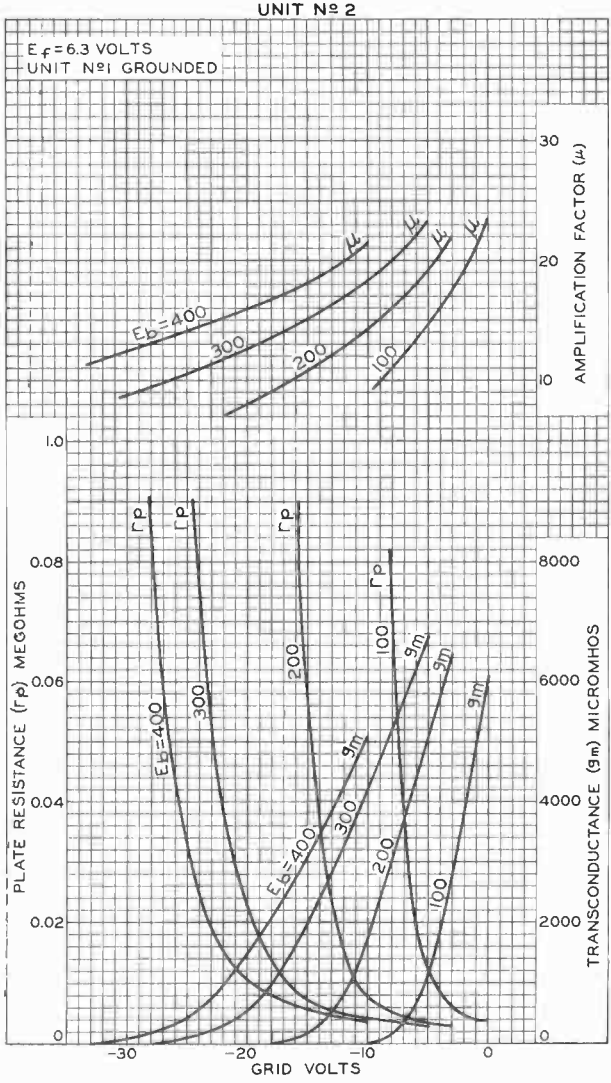
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8615

6CM7

AVERAGE CHARACTERISTICS

UNIT Nº 2



MAY 16, 1955

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8613

Twin Diode—High-Mu Triode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

	Series	*Parallel*	
Heater arrangement			
Voltage (AC or DC)	6.3 ± 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

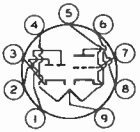
Characteristics, Class A_1 Amplifier (Triode Unit):

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.

6CN7

TWIN DIODE—HIGH-MU TRIODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Heater arrangement	*Series*	*Parallel*	
Voltage	6.3	3.15	ac or dc volts
Current	0.3	0.6	amp
Warm-up time (Average)	–	11	sec

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

Direct Interelectrode Capacitances (Approx.):[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-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:

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	9EN

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

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

[a] Without external shield.

TUBE DIVISION
RADIO CORPORATION OF AMERICA HARRISON NEW JERSEY

6CN7

TWIN DIODE—HIGH-MU TRIODE

TRIODE UNIT — AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300	max.	volts
GRID VOLTAGE:			
Positive bias value	0	max.	volts
PLATE DISSIPATION	1	max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with resoect 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.7 at front of this Section

DIODE UNITS - Two

Maximum Ratings, *Design-Center Values:*

Values are for Each Unit

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

▲ The dc component must not exceed 100 volts.

Curve shown under Type 6T8 also applies to the 6CN7

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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 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 (Each unit)	3	3●	μμf

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Tetrode Unit*	
Plate Supply Voltage	125	125	volts
Grid-No.2 Supply Voltage	–	125	volts
Grid-No.1 Supply 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 μa = 100	−7	−7	volts

Mechanical:

Operating Position . . . . . Any

← Indicates a change.

6CQ8

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. 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

AMPLIFIER — Class A_1

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

	Triode Unit	*Tetrode 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	–	0.7 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	
GRID INPUT.	0.55 max.	–	watt
PLATE DISSIPATION	3.1 max.	3.2 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

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

→ Indicates a change.

▲ 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.

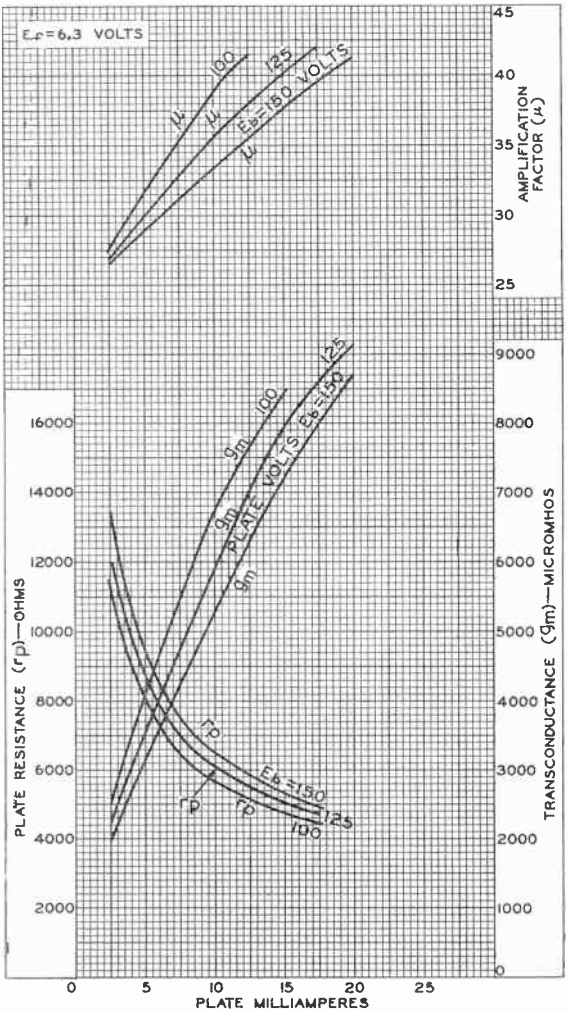
6CQ8

AVERAGE CHARACTERISTICS
Triode Unit

92CM-9190RI

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

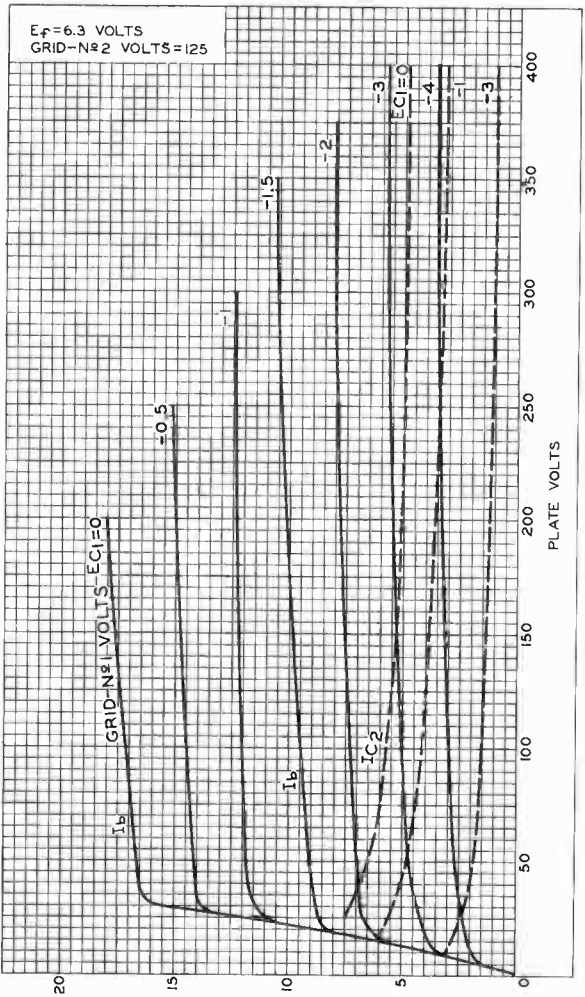
AVERAGE CHARACTERISTICS
Triode Unit



92CM-7871R1

6CQ8

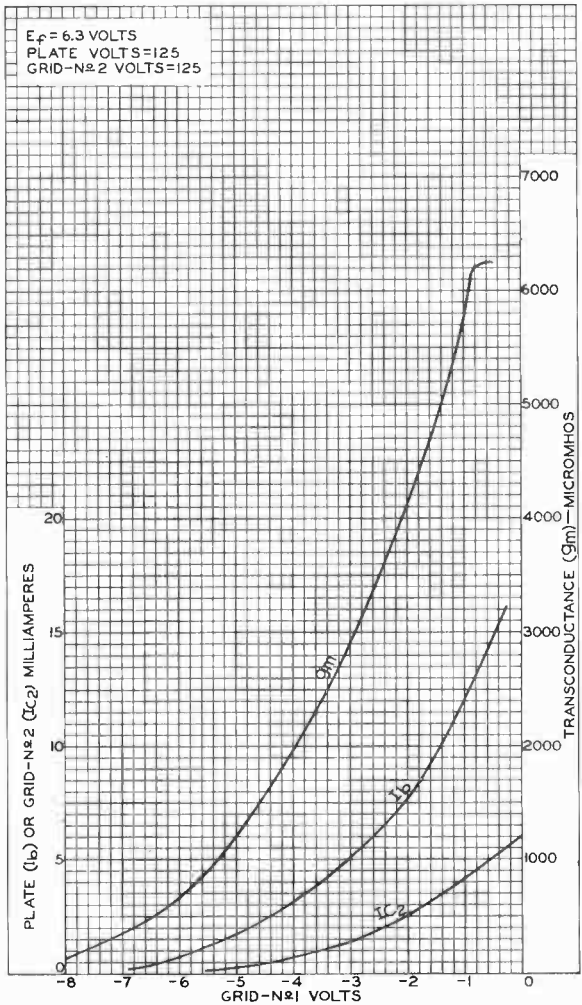
AVERAGE CHARACTERISTICS
Tetrode Unit



92CM-9197

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

AVERAGE CHARACTERISTICS
Tetrode Unit



92CM-9195

RCA

6CS6

PENTAGRID AMPLIFIER

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

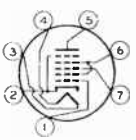
Heater, for Unipotential Cathode:			
Voltage	6.3		ac or dc volts
Current	0.3		amp
Direct Interelectrode Capacitances (Approx.):[a]			
Grid No.1 to plate		0.07 max.	μμf ←
Grid No.3 to plate		0.36 max.	μμf
Grid No.1 to grid No.3		0.22 max.	μμf ←
Grid No.1 to cathode & grid No.5, grid No.4 & grid No.2, 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

RCA

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

6CS6

RCA

6CS6

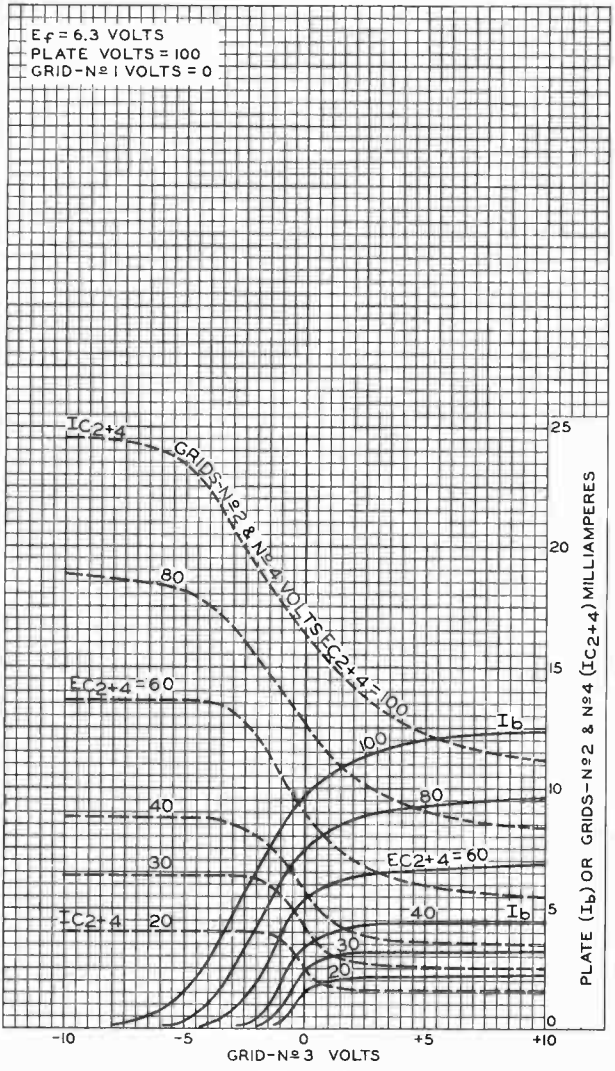
AVERAGE CHARACTERISTICS

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8922

6CS6

AVERAGE CHARACTERISTICS



6CU5

BEAM POWER TUBE

7-PIN MINIATURE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	1.2	amp
Direct Interelectrode Capacitances (Approx.):[o]		
Grid No.1 to plate	0.7	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	13.2	μμf
Plate to cathode & grid No.3, grid No.2, and heater	8.6	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Maximum Diameter	3/4"
Dimensional Outline	*See General Section*
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)
Basing Designation for BOTTOM VIEW	7CV

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

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	135 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	117 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
PLATE DISSIPATION	6 max.	watts
GRID-No.2 INPUT	1.25 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	220 max.	°C

Typical Operation and Characteristics:

Plate Voltage	120	volts
Grid-No.2 Voltage	110	volts
Grid-No.1 Voltage	-8	volts
Peak AF Grid-No.1 Voltage	8	volts

[o] Without external shield.

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

RCA

6CU5

BEAM POWER TUBE

Zero-Signal Plate Current	49	ma
Max.-Signal Plate Current	50	ma
Zero-Signal Grid-No.2 Current	4	ma
Max.-Signal Grid-No.2 Current	8.5	ma
Plate Resistance (Approx.)	10000	ohms
Transconductance	7500	μmhos
Load Resistance	2500	ohms
Total Harmonic Distortion	10	%
Max.-Signal Power Output	2.3	watts

Maximum Circuit Values:

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

TENTATIVE DATA

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

Beam Power Tube

7-PIN MINIATURE TYPE

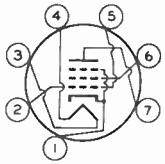
GENERAL DATA

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.

6CU5

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.

RCA

6CU5

AVERAGE CHARACTERISTICS

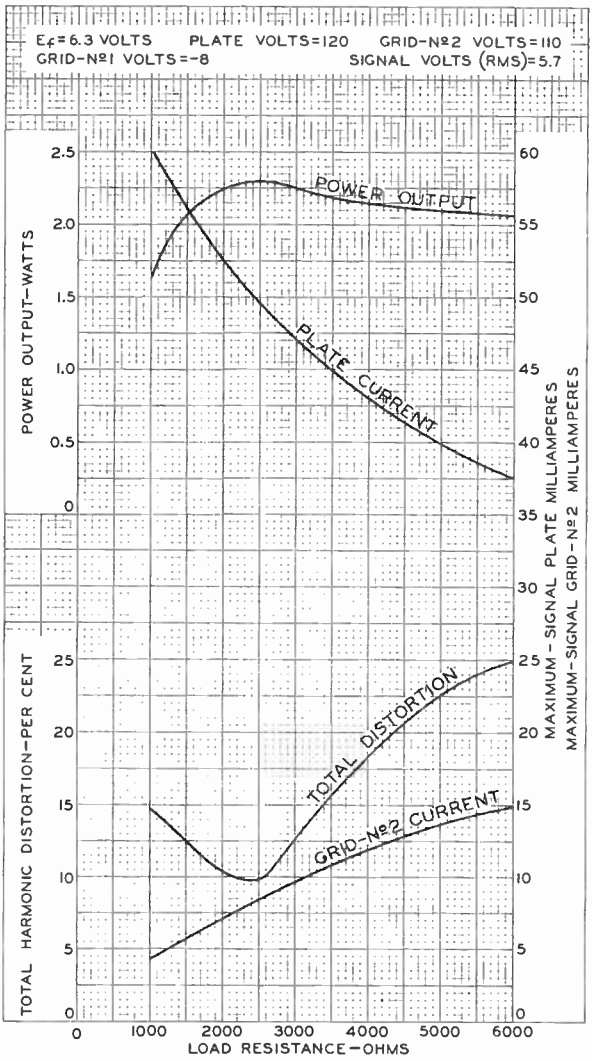
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8908RI

RCA

6CU5

OPERATION CHARACTERISTICS



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8918

6BQ6GTB/6CU6

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: ←

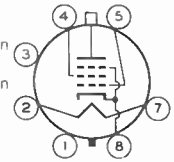
Plate Voltage	60	150	250	volts
Grid-No.2 Voltage	150	150	150	volts
Grid-No.1 Voltage	0	-22.5	-22.5	volts
Mu-Factor, Grid No.2 to Grid No.1	-	4.3	-	
Plate Resistance (Approx.)	-	-	14500	ohms
Transconductance	-	-	5900	μmhos
Plate Current	260[b]	-	57	ma
Grid-No.2 Current	26[b]	-	2.1	ma
Grid-No.1 Voltage (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.

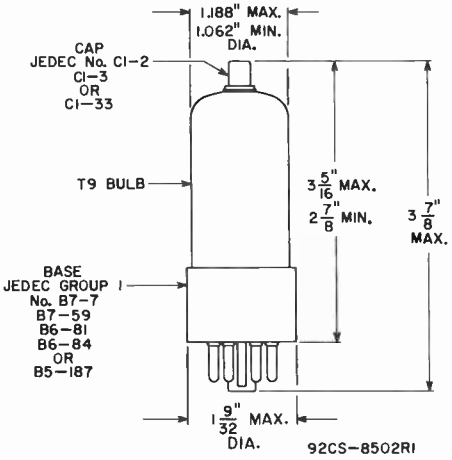
[e] This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

[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.

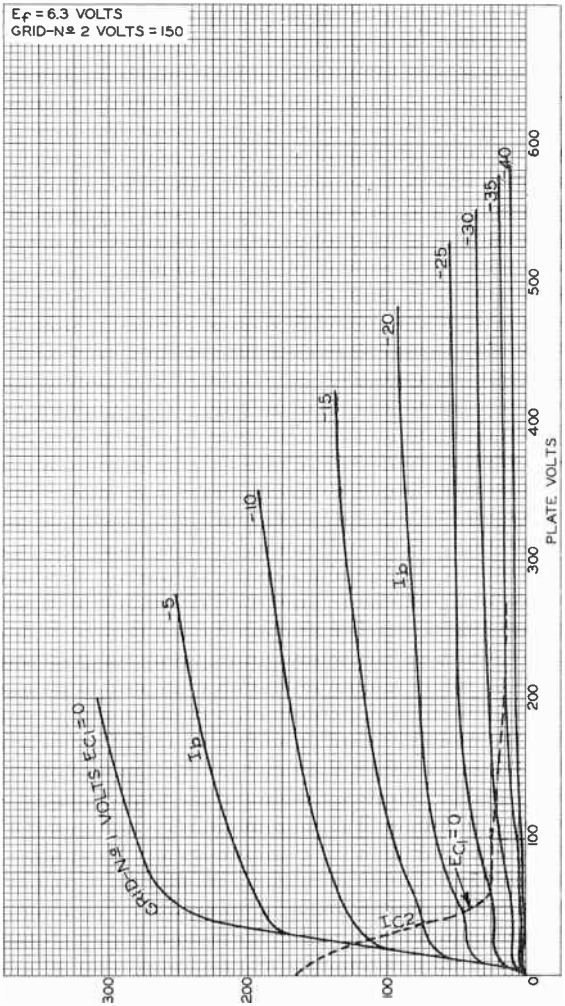
[h] The dc component must not exceed 100 volts.

→ Indicates a change.



6BQ6GTB/6CU6

AVERAGE CHARACTERISTICS



92CM-8501R1

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

6CU8

MEDIUM-MU TRIODE—
SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

Intended for use in equipment having series heater-string arrangement

The 6CU8 is the same as the 6AN8 except for the following items:

Electrical:

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

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

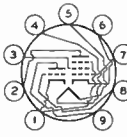
Direct Interelectrode Capacitances:[o]

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 to 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
Triode grid to pentode plate	0.005	μμf
Pentode grid No.1 to triode plate	0.02	μμf
Pentode plate to triode plate	0.04	μμf

Mechanical:

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

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



[o] without external shield.

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

6CW4

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 Unipotential 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

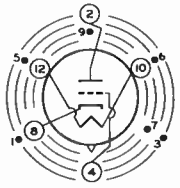
Characteristics, Class A_1 Amplifier:

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:

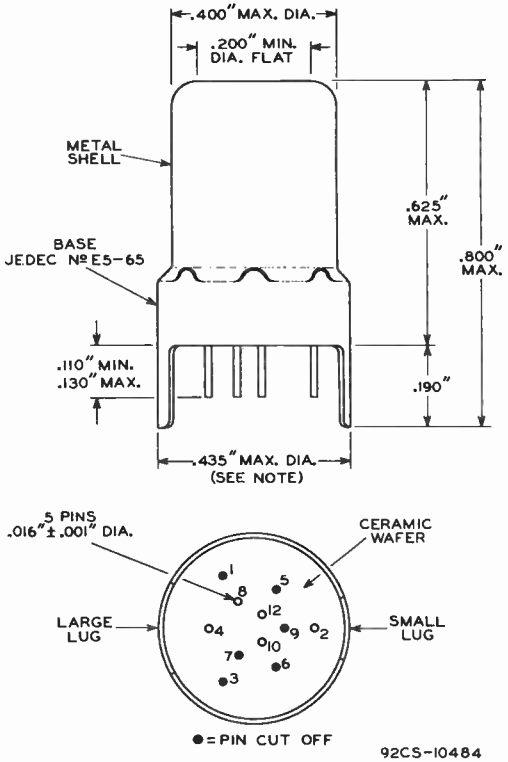
Grid-Circuit Resistance:★

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.

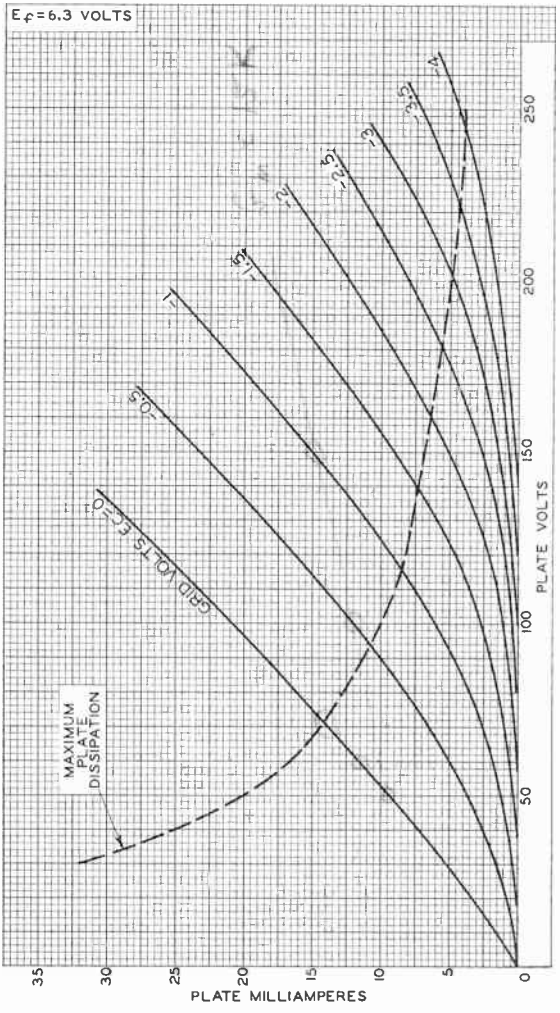
★ For operation at metal-shell temperatures up to 125° C.



NOTE: MAXIMUM OUTSIDE DIAMETER OF 0.440" IS PERMITTED ALONG 0.190" LUG LENGTH.

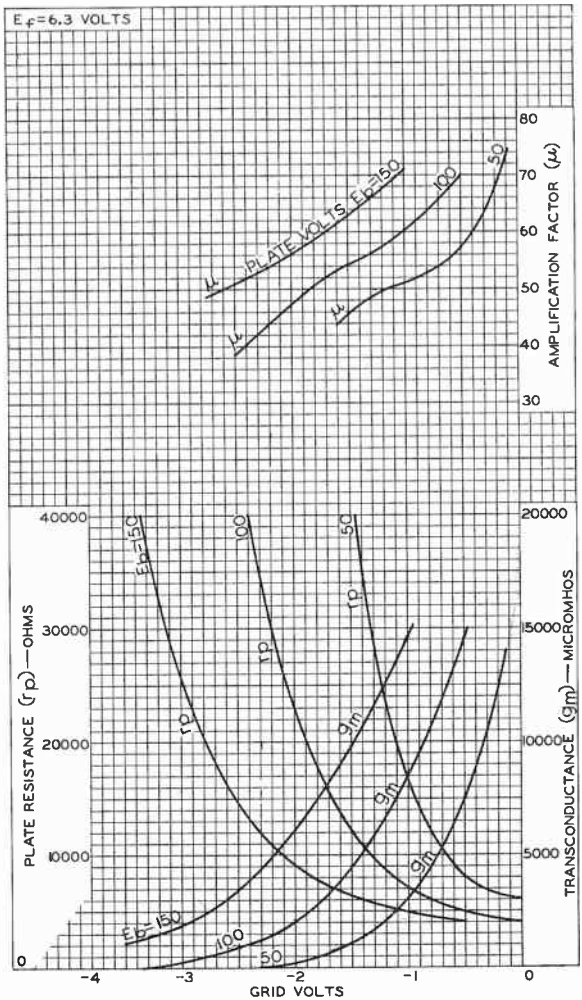
6CW4

AVERAGE PLATE CHARACTERISTICS



92CM-10524

AVERAGE CHARACTERISTICS



92CM-10520

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	6.3	ac or dc volts
Current	0.2	amp
Direct Interelectrode Capacitances (Approx.):°		
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

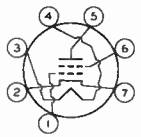
Characteristics, Class A_1 Amplifier:

Plate Voltage	125	volts
Grid-No.2 (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 current of 20 μa	-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"
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	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-Center Values:*

PLATE VOLTAGE	150 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	150 max.	volts
GRID-No.2 VOLTAGE	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	

°: See next page.

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

TENTATIVE DATA

RCA

6CY5

SHARP-CUTOFF TETRODE

GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
CATHODE CURRENT	18 max.	ma
GRID-No.2 INPUT:		
For grid-No.2 voltages up to 75 volts	0.4 max.	watt
For grid-No.2 voltages between 75 and 150 volts	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
PLATE DISSIPATION	1.7 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 JETEC No.316 connected to cathode.

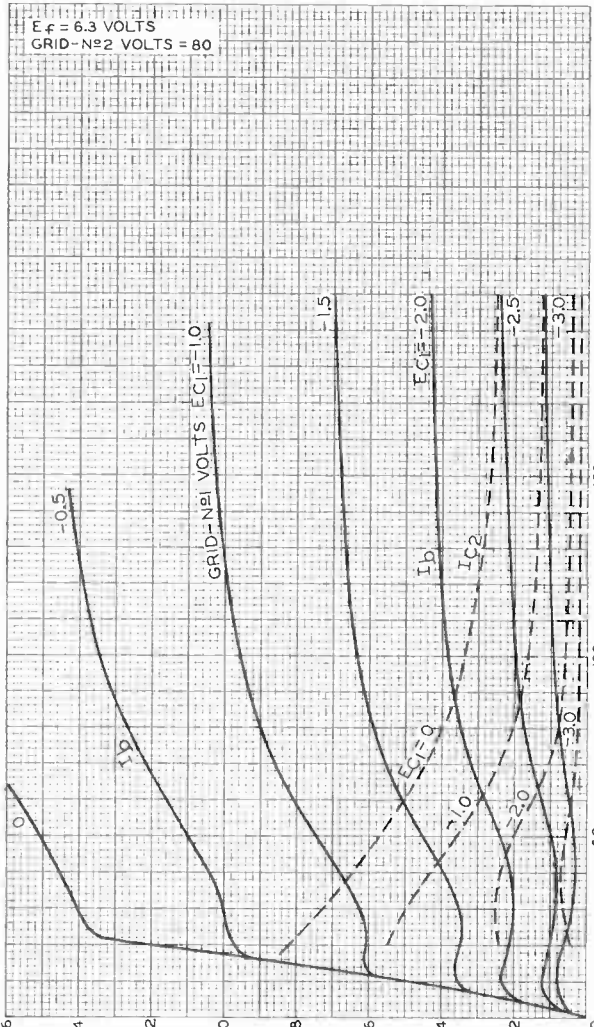
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

TENTATIVE DATA

RCA

6CY5

AVERAGE CHARACTERISTICS



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

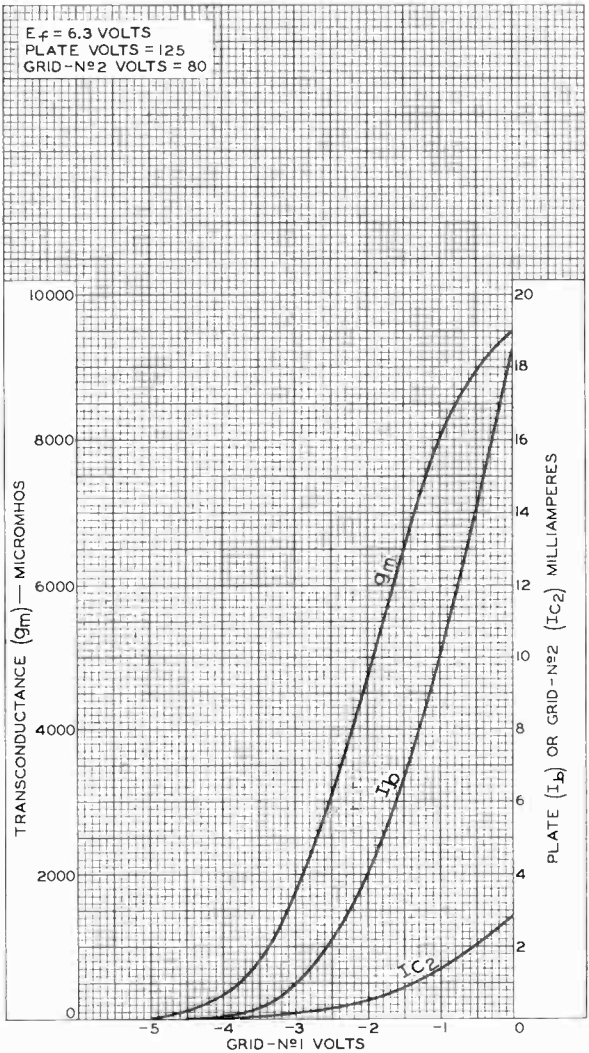
92CM-9518

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

For vertical-deflection amplifier service in 110° systems having series heater-string arrangement

GENERAL DATA

Electrical:

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

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

Direct Interelectrode Capacitances:[D]		
Grid No.1 to plate	0.7 max.	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	8	μμf
Plate to cathode & grid No.3, grid No.2, and heater	8.5	μμf

Characteristics, Class A_1 Amplifier:

Plate Voltage	75	250	volts
Grid-No.2 (Screen-Grid) Voltage	250	250	volts
Grid-No.1 (Control-Grid) Voltage	0	-14	volts
Plate Resistance (Approx.)	-	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 current of 100 μamp	-	-35	volts

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-5/8"
Maximum Seated Length	2-3/8"
Length, Base Seat to Bulb Top (Excluding tip)	2" ± 3/32"
Maximum Diameter	7/8"
Dimensional Outline	*See General Section*
Bulb	T9-1/2
Base	Small-Button Noval 9-Pin (JETEC No.E9-1)
Basing Designation for BOTTOM VIEW	9HN

Pin 1 - Grid No.2
Pin 2 - No Connection
Pin 3 - Grid No.1
Pin 4 - Heater
Pin 5 - Heater
Pin 6 - Grid No.1

Pin 7 - Cathode, Grid No.3
Pin 8 - Internal Connection-Do not Use
Pin 9 - Plate

[D] Without external shield.

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

TUBE DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

RCA

6CZ5

BEAM POWER TUBE

VERTICAL DEFLECTION AMPLIFIER

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

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

DC PLATE VOLTAGE	315	max.	volts
PEAK POSITIVE-PULSE PLATE VOLTAGE (Absolute maximum)⊕	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
CATHODE CURRENT:			
Peak	140	max.	ma
Average	40	max.	ma
GRID-No.2 INPUT	2	max.	watts
PLATE DISSIPATION	10	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	250	max.	°C

Maximum Circuit Values:

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

AF POWER AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	350	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	285	max.	volts
GRID-No.2 INPUT	2	max.	watts
PLATE DISSIPATION	12	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200▲	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	250	max.	°C

Typical Operation and Characteristics:

Plate Voltage	250	volts
Grid-No.2 Voltage	250	volts
Grid-No.1 (Control-Grid) Voltage	-14	volts
Peak AF Grid-No.1 Voltage	13	volts
Zero-Signal Plate Current	46	ma

□ 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.

▲: See next page.

TUBE DIVISION
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY

6CZ5

BEAM POWER TUBE

Max.-Signal Plate Current	48	ma
Zero-Signal Grid-No.2 Current	4.6	ma
Max.-Signal Grid-No.2 Current	8	ma
Plate Resistance (Approx.)	73000	ohms
Transconductance	4800	μmhos
Load Resistance	5000	ohms
Total Harmonic Distortion	10	%
Max.-Signal Power Output	5.4	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.1 max.	megohm
For cathode-bias operation	1.0 max.	megohm

PUSH-PULL AF POWER AMPLIFIER - Class AB_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	350 max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	285 max.	volts
GRID-No.2 INPUT	2 max.	watts
PLATE DISSIPATION	12 max.	watts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲ max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	250 max.	°C

Typical Operation:

Values are for 2 tubes

Plate Voltage	350	volts
Grid-No.2 Voltage	280	volts
Grid-No.1 (Control-Grid) Voltage●	-23.5	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage	47	volts
Zero-Signal Plate Current	46	ma
Max.-Signal Plate Current	103	ma
Zero-Signal Grid-No.2 Current	3	ma
Max.-Signal Grid-No.2 Current	13	ma
Effective Load Resistance (Plate to plate)	7500	ohms
Total Harmonic Distortion	1	%
Max.-Signal Power Output	21.5	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.1 max.	megohm
For cathode-bias operation	1.0 max.	megohm

▲ The dc component must not exceed 100 volts.

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

6CZ5

RCA

6CZ5

AVERAGE PLATE CHARACTERISTICS

E_f=6.3 VOLTS
GRID-№1 VOLTS=0

(GRID-№2-VOLTS E_{C2}=250

200

E_{C2}=150

100

I_b

I_b

PLATE MILLIAMPERES

0 25 50 75 100 125 150 175 200

50 100 150 200 250 300

PLATE VOLTS

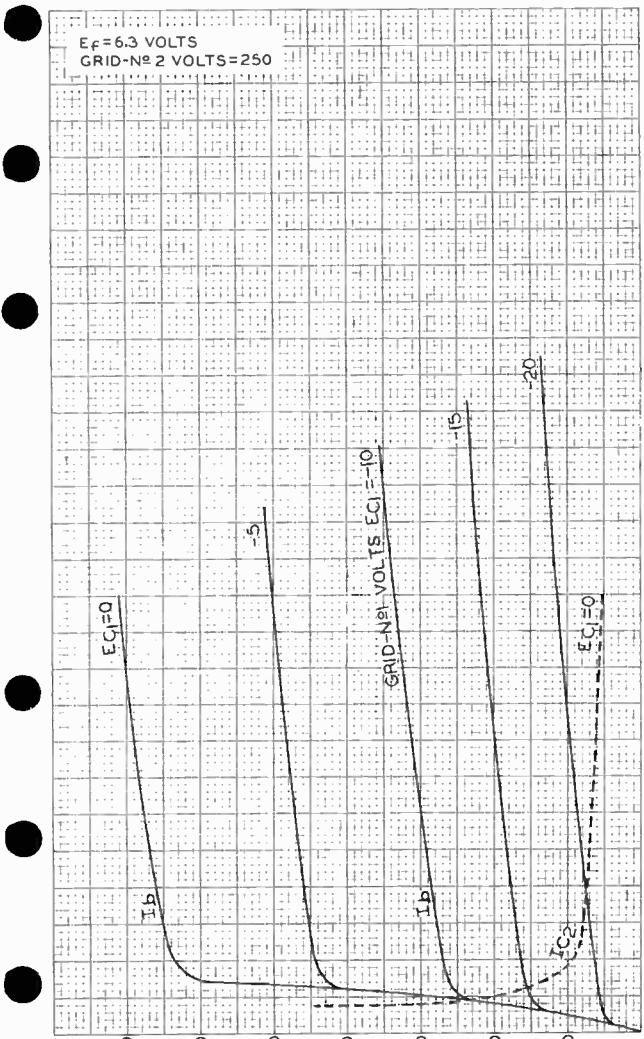
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9155

RCA

6CZ5

AVERAGE CHARACTERISTICS

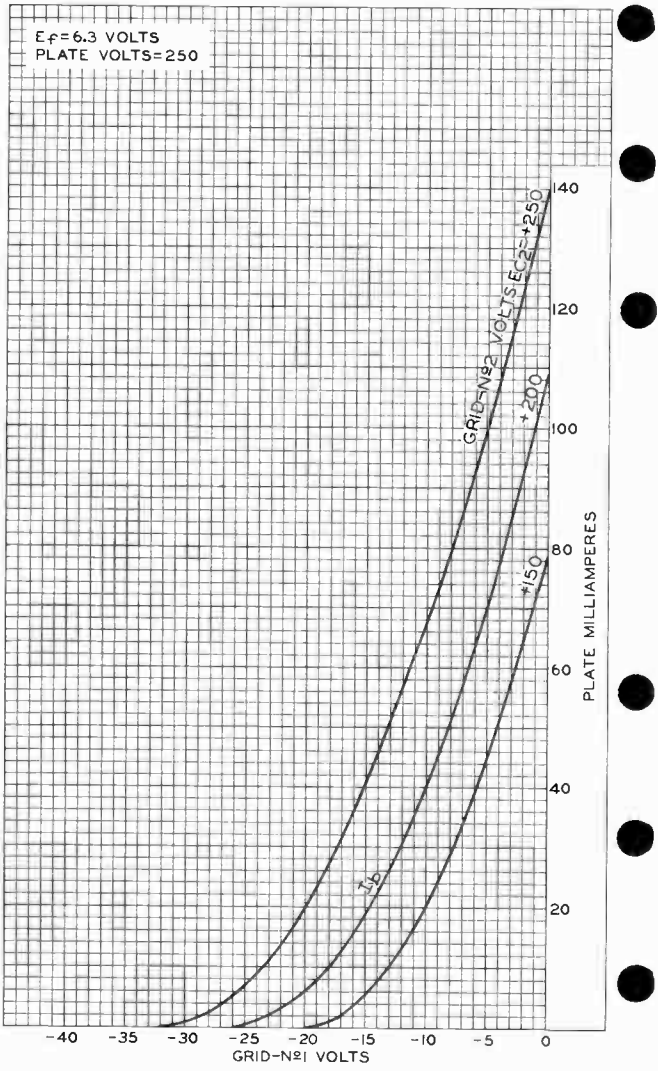


TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-9157

6CZ5

6CZ5

AVERAGE CHARACTERISTICS



TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-9156

6D6

TRIPLE-GRID SUPER-CONTROL AMPLIFIER

Heater ■	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances:		
Grid to Plate	0.007 max. °	μμf
Input	4.7	μμf
Output	6.5	μμf
Overall Length		4-11/16" to 4-15/16"
Seated Height		4-1/16" to 4-5/16"
Maximum Diameter		1-9/16"
Bulb		ST-12
Cap		Small Metal
Base		Small 6-Pin
Pin 1 - Heater		Pin 5 - Cathode
Pin 2 - Plate		Pin 6 - Heater
Pin 3 - Screen		Cap - Grid
Pin 4 - Suppressor		
Mounting Position		Any

BOTTOM VIEW (6F)

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

° With close-fitting shield connected to cathode

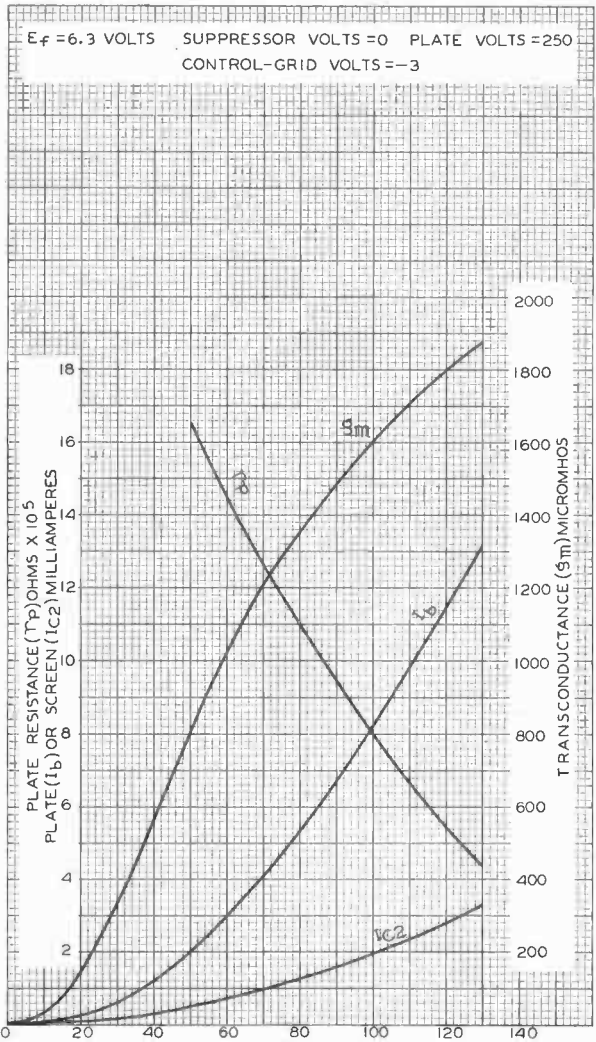
Maximum Ratings, Typical Operating Conditions and Curves are the same as for Type 6U7-G.

→ Indicates a change.

RCA

6D6

AVERAGE CHARACTERISTICS



6D7

TRIPLE-GRID DETECTOR AMPLIFIER

RENEWAL TYPE FOR MAJESTIC RECEIVERS

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

BOTTOM VIEW (7H)

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

▲ Requires a different socket than the medium 7-pin base.

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

6DB5

Beam Power Tube

9-PIN MINIATURE TYPE

GENERAL DATA

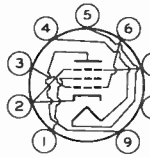
Electrical:

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

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.

RCA

6DC6

SEMIREMOTE-CUTOFF PENTODE

MINIATURE TYPE

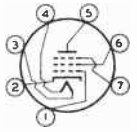
GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances (No external shield):		
Grid No.1 to plate	0.02 max.	μμf
Input	6.5	μμf
Output	2	μμf

Mechanical:

Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base — Small-Button Miniature 7-Pin (JETEC No.E7-1)	
Basing Designation for BOTTOM VIEW	7CM



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

AMPLIFIER - Class A_1

Maximum Ratings, *Design-Center Values:*

PLATE VOLTAGE	300 max.	volts
GRID-No.3 (SUPPRESSOR) VOLTAGE	0 max.	volts
GRID-No.2 SUPPLY VOLTAGE	300 max.	volts
GRID-No.2 (SCREEN) VOLTAGE	See Rating Curve at front of this Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Positive bias value	0 max.	volts
PLATE DISSIPATION	2 max.	watts
GRID-No.2 INPUT	0.5 max.	watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	200 max.	volts
Heater positive with respect to cathode	200▲ max.	volts

Typical Operation and Characteristics:

Plate Supply Voltage	200	volts
Grid No.3	Connected to cathode at socket	
Grid-No.2 Voltage	150	volts
Cathode-Bias Resistor	180	ohms
Plate Resistance (Approx.)	0.5	megohm

▲ The dc component must not exceed 100 volts.

6DC6

SEMIREMOTE-CUTOFF PENTODE

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

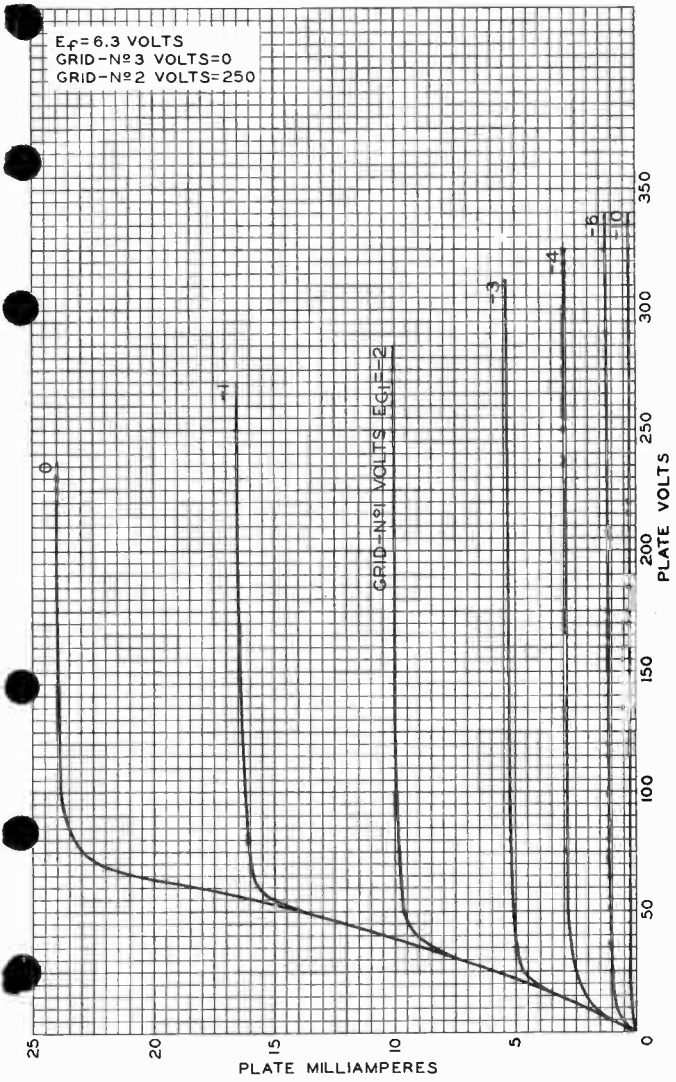
Maximum Circuit Values (For maximum rated conditions):

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

RCA

6DC6

AVERAGE PLATE CHARACTERISTICS



MAY. 26, 1954

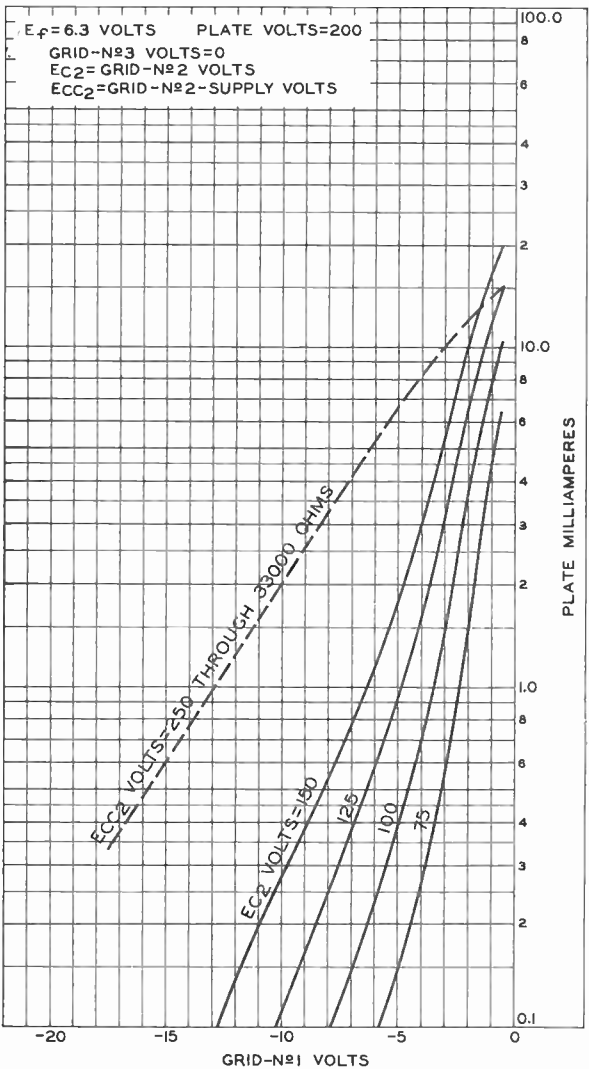
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8330

RCA

6DC6

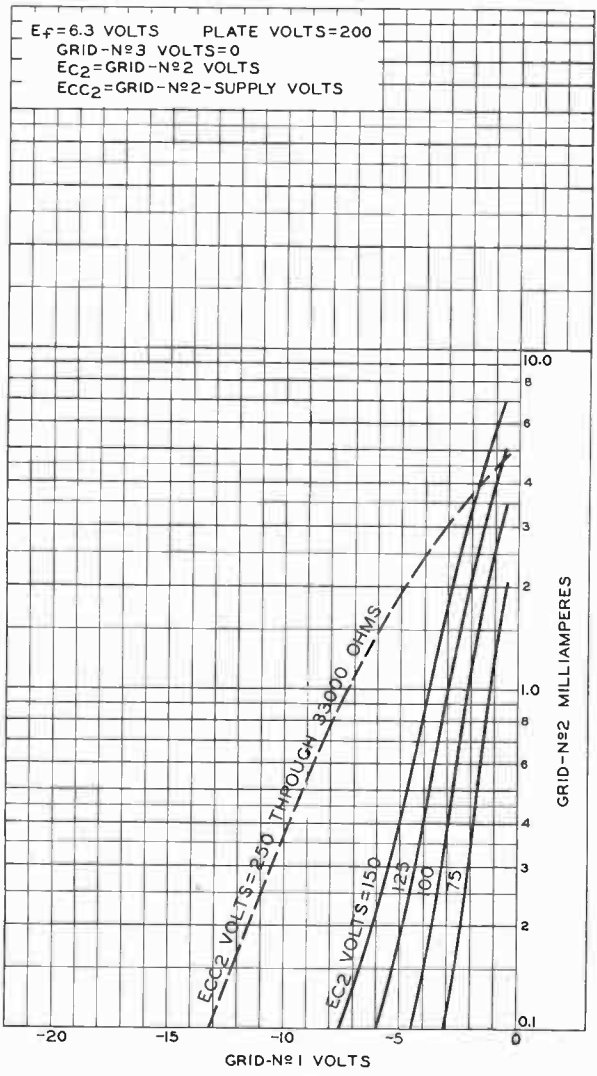
AVERAGE CHARACTERISTICS



RCA

6DC6

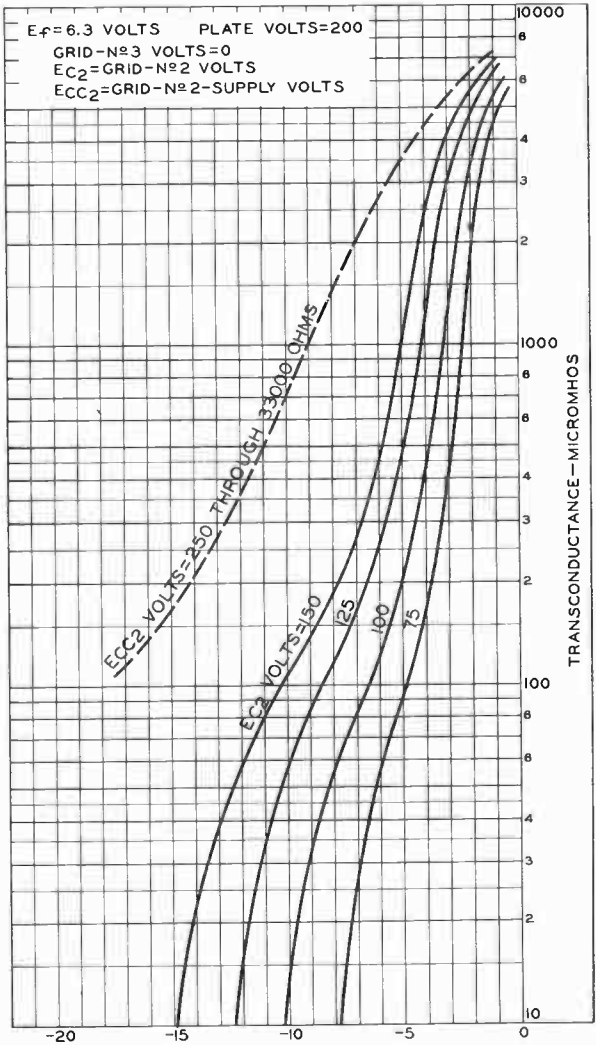
AVERAGE CHARACTERISTICS



RCA

6DC6

AVERAGE CHARACTERISTICS



JUNE 15, 1954 TUBE DIVISION 92CM-8336
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

Half-Wave Vacuum Rectifier

For Television Damper Service

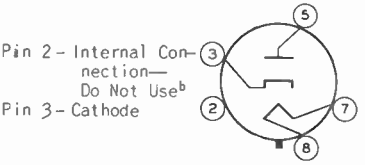
GENERAL DATA

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



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.

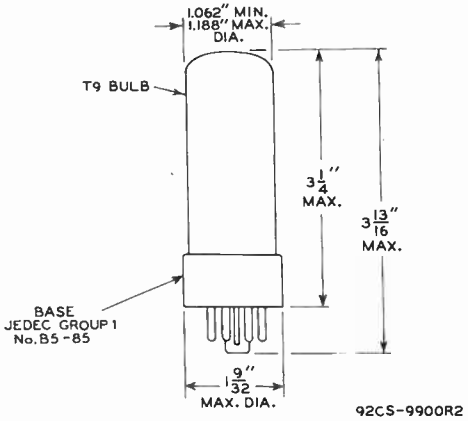
[d] This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle. In a 525-line, 30-frame system, 15 per cent of one horizontal scanning cycle is 10 microseconds.

[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.



6DE6
SHARP-CUTOFF PENTODE

7-PIN MINIATURE TYPE

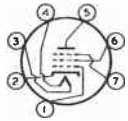
GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3	ac or dc volts
Current	0.3	amp
Direct Interelectrode Capacitances:[a]		
Grid No.1 to plate	0.020 max.	μμf
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater	6.3	μμf
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater	1.9	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Dimensional Outline	*See General Section*
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No E7-1)
Basing Designation for BOTTOM VIEW	7CM



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

AMPLIFIER-Class A1

Maximum Ratings, *Design-Center Values*

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

[a] Without external shield.

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6DE6

6DE6

SHARP-CUTOFF PENTODE

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

Typical Operation and Characteristics:

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

▲ The dc component must not exceed 100 volts.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

6DE6

RCA

6DE6

AVERAGE PLATE CHARACTERISTICS

E_f=6.3 VOLTS
GRID-№2 VOLTS=150

PLATE VOLTS
100
200
300
400
500

PLATE MILLIAMPERES
0
5
10
15
20
25
30
35

APRIL 2, 1955

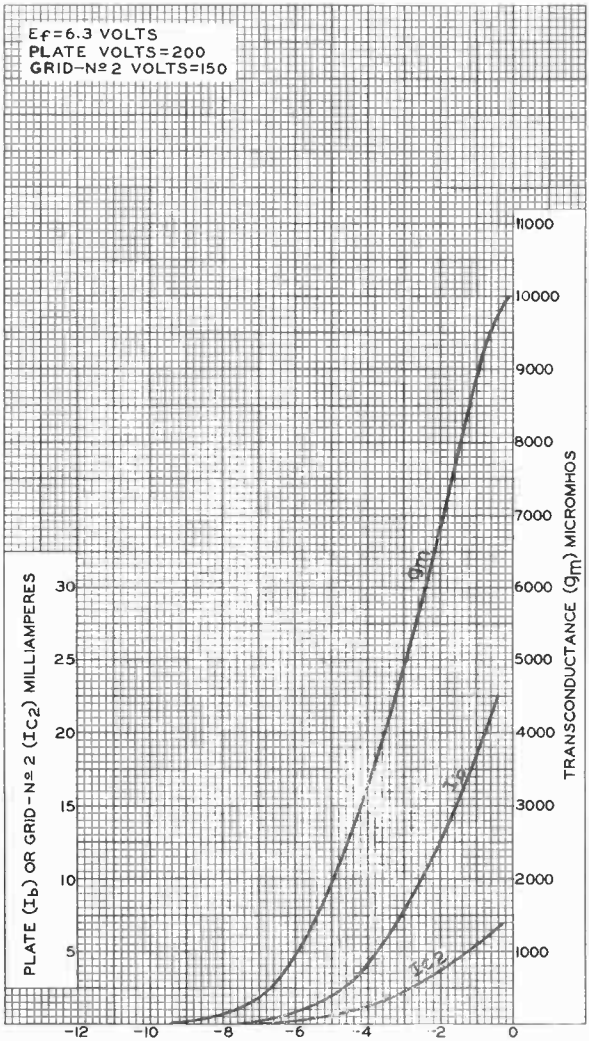
TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8578

RCA

6DE6

AVERAGE CHARACTERISTICS



6DG6-GT

BEAM POWER TUBE

GENERAL DATA

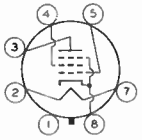
Electrical:

Heater, for Unipotential Cathode:			
Voltage	6.3		ac or dc volts
Current	1.2		amp
Direct Interelectrode Capacitances (Approx.):[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.

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

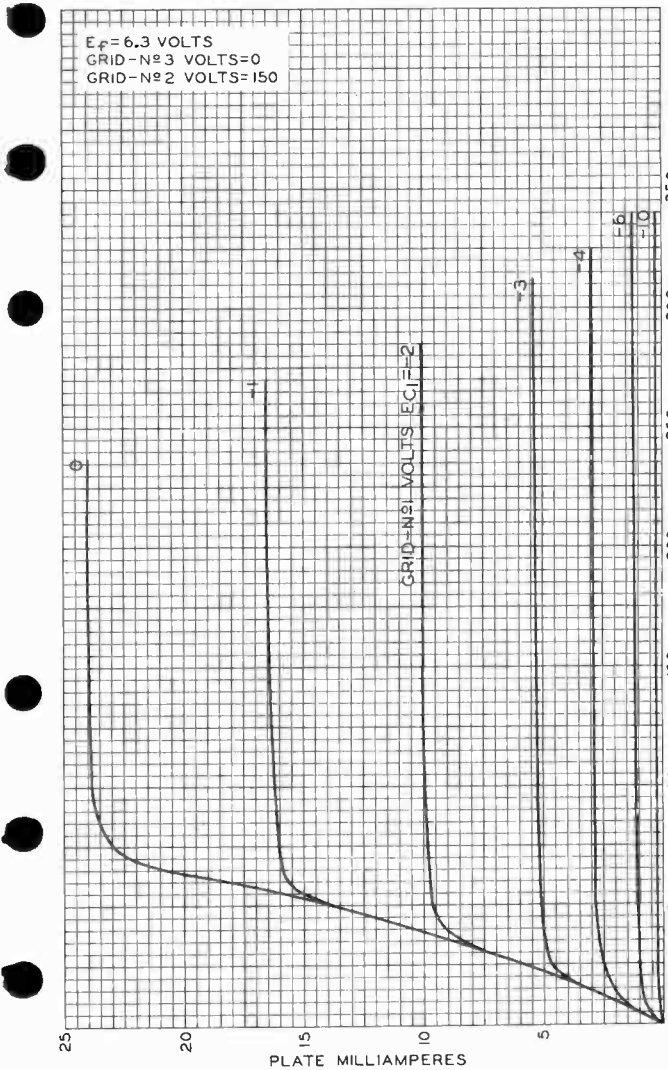
Curves shown under Type 50L6-GT also apply to the 6DG6-GT

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

RCA

6DC6

AVERAGE PLATE CHARACTERISTICS



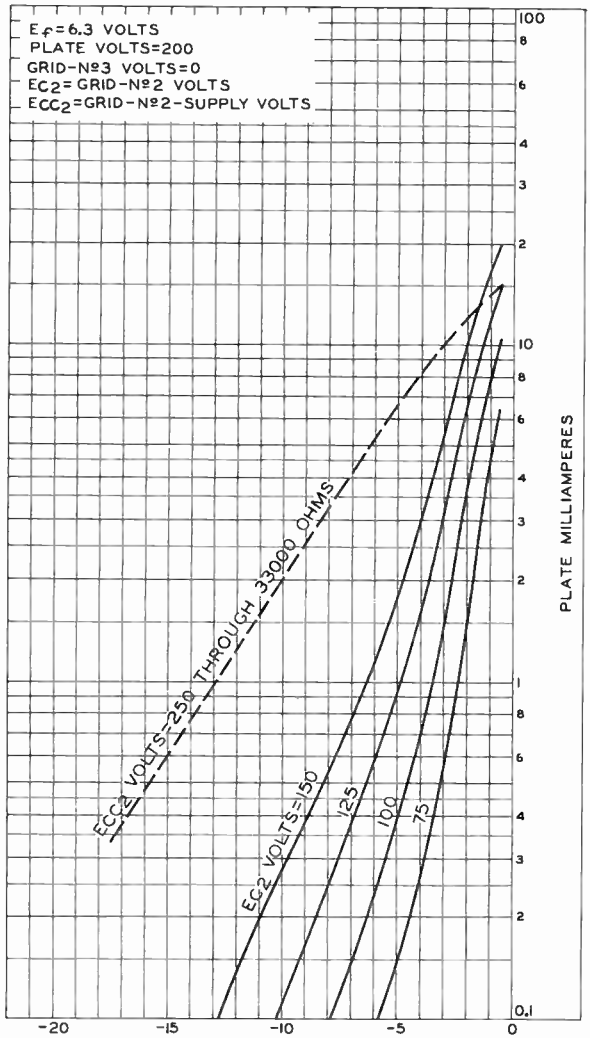
ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8330RI

RCA

6DC6

AVERAGE CHARACTERISTICS



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

92CM-8337