

# Beam Power Tube

For Pulse-Modulator Service

## GENERAL DATA

### Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .  $6.3 \pm 10\%$  volts  
 Current at heater volts = 6.3 . . . . . 1.25 amp

Transconductance, for plate volts = 200,  
 grid-No.2 volts = 200, and plate  
 ma. = 100 . . . . . 7000  $\mu$ mhos

Mu-Factor, Grid No.2 to Grid No.1 for  
 plate volts = 200, grid-No.2 volts =  
 200, and plate ma. = 100. . . . . 4.5

Direct Interelectrode Capacitances:<sup>a</sup>

Grid No.1 to plate. . . . . 0.24 max. pf

Grid No.1 to cathode & grid No.3 &  
 internal shield, grid No.2, base  
 sleeve, and heater. . . . . 13.0 pf

Plate to cathode & grid No.3 & in-  
 ternal shield, grid No.2, base  
 sleeve, and heater. . . . . 8.5 pf

### Mechanical:

Operating Position. . . . . Any

Overall Length. . . . .  $3-13/16" \pm 1/8"$

Seated Length . . . . .  $3-1/8" \pm 1/8"$

Maximum Diameter. . . . .  $1-23/32"$

Weight (Approx.). . . . . 2.3 oz

Bulb . . . . . T12

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

Bases (Alternates):

Large-Wafer Octal with Sleeve:

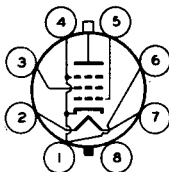
8-Pin Micanol (JEDEC Group 1, No.B8-86)

Large-Wafer Octal with External Barriers and Sleeve:

8-Pin Micanol (JEDEC Group 1, No.B8-98)

Basing Designation for BOTTOM VIEW. . . . . 7CK

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



Pin 4 - Same as Pin 1  
 Pin 5 - Grid No.1  
 Pin 6 - Same as Pin 1  
 Pin 7 - Heater  
 Pin 8 - Base Sleeve  
 Cap - Plate

### MODULATOR — Rectangular-Wave Modulation

Maximum and Minimum CCS<sup>b</sup> Ratings, Absolute-Maximum Values:

For Duty Factor<sup>c</sup> between 0.001 and 1 and maximum  
 averaging time of 10,000  $\mu$ sec in any interval

DC PLATE SUPPLY VOLTAGE<sup>d</sup>. . . . . See Rating Chart I

← Indicates a change.



INSTANTANEOUS PLATE VOLTAGE . . . . .	115% of DC Plate Supply Volts	
DC GRID-No.2 SUPPLY VOLTAGE <sup>d</sup> . . . . .	500 max.	volts
→ DC GRID-No.1 SUPPLY VOLTAGE <sup>d</sup> . . . . .	{ -300 max. volts { Minimum—See <i>Rating Chart I</i>	

**GRID-No.1 VOLTAGE:**

Instantaneous-negative value. . . . .	400 max.	volts
Peak-positive value . . . . .	100 max.	volts
PEAK PLATE CURRENT. . . . .	See <i>Rating Chart II</i>	
PEAK GRID-No.2 CURRENT. . . . .	0.75 max.	amp
PEAK GRID-No.1 CURRENT. . . . .	0.5 max.	amp
PLATE INPUT . . . . .	80 max.	watts
GRID-No.2 INPUT . . . . .	1.75 max.	watts
GRID-No.1 INPUT . . . . .	0.5 max.	watt
PLATE DISSIPATION <sup>e</sup> . . . . .	See <i>Rating Chart I</i>	
<b>PEAK HEATER-CATHODE VOLTAGE:</b>		
Heater negative with respect to cathode	135 max.	volts
Heater positive with respect to cathode	135 max.	volts
<b>BULB TEMPERATURE (At hottest point on bulb surface). . . . .</b>		
	200 max.	°C

**Typical Operation:**

DC Plate Supply Voltage . . . . .	3000	volts
DC Grid-No.2 Supply Voltage . . . . .	300	volts
DC Grid-No.1 Supply Voltage . . . . .	-175	volts
Peak Positive Grid-No.1 Voltage . . . . .	65	volts
<b>Plate Current:</b>		
Peak. . . . .	1.5	amp
Average . . . . .	0.015	amp
DC Grid-No.2 Current. . . . .	0.004	amp
DC Grid-No.1 Current. . . . .	0.0025	amp
<b>Load Resistance (R<sub>L</sub>), 100 watts,</b>		
non-inductive . . . . .	1500 ± 5%	ohms

**Maximum Circuit Values:**

Grid-No.1—Circuit Resistance. . . . .	30000 max.	ohms
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- <sup>a</sup> Without external shield and base sleeve connected to ground.
- <sup>b</sup> Continuous commercial service.
- <sup>c</sup> *Duty Factor* for the 6293 is defined as the "on" time in microseconds divided by 10,000 microseconds.  
*"On" Time* is defined as the sum of the durations of all the individual pulses which occur during any 10,000-microsecond interval.  
*"Pulse Duration"* is defined as the time interval between the two points on the pulse at which the instantaneous value is 70 per cent of the peak value. The peak value is defined as the maximum value of a smooth curve through the average of the fluctuations over the top portion of the pulse.
- <sup>d</sup> For tube protection, it is essential that sufficient resistance be used in the plate supply circuit, the grid-No.2 supply circuit, and the grid-No.1 supply circuit so that the short-circuit current is limited to 0.5 ampere in each circuit.
- <sup>e</sup> Averaged over any interval not exceeding 10,000 microseconds. Care should be used in determining the plate dissipation. A calculated value based on rectangular pulses can be considerably in error when the actual pulses have a finite rise and fall time. Plate dissipation should preferably be determined by measuring the bulb temperature under actual operating conditions; then, with the tube in the same socket and under the same ambient-temperature conditions, apply to the tube sufficient dc input to obtain the same bulb temperature. This value of dc input is a measure of the plate dissipation. → indicates a change.



## CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Heater Current . . . . .	1	1.175	1.325	amp
Grid No.1 to plate . . . . .	2	-	0.24	pf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, base sleeve, and heater . . . . .	2	12.0	15.0	pf
Plate to cathode & grid No.3 & internal shield, grid No.2, base sleeve, and heater . . . . .	2	7.3	9.5	pf
Plate Current . . . . .	3	46	94	ma
Grid-No.2 Current . . . . .	3	0	5.5	ma
Peak Plate Current . . . . .	1,4	2.4	-	amp

Note 1: With 6.3 volts ac on heater.

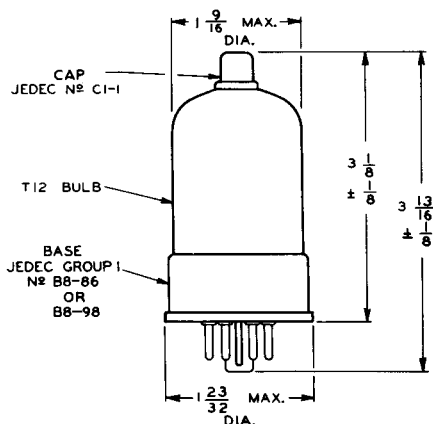
Note 2: With no external shield. Base sleeve (pin-No.8) is grounded.

Note 3: With 6.3 volts ac on heater, dc plate voltage of 300 volts, dc grid-No.2 voltage of 200 volts, and dc grid-No.1 voltage of -33 volts.

Note 4: With the tube in the test circuit (below) under the following conditions: rectangular-wave modulation applied to grid No.1 pulse duration of 1 microsecond approx.; pulse repetition rate of 3000 cps approx.; dc plate supply voltage of 2000 volts; dc grid No.2 supply voltage of 500 volts; dc grid-No.1 supply voltage of -300 volts; peak positive grid-No.1 swing of 100 volts; and load resistance ( $R_L$ ) of  $375 \pm 5\%$  ohms, 50 watts, non-inductive.

## OPERATING CONSIDERATIONS

Plate shows no color when tube is operated at maximum CCS ratings.

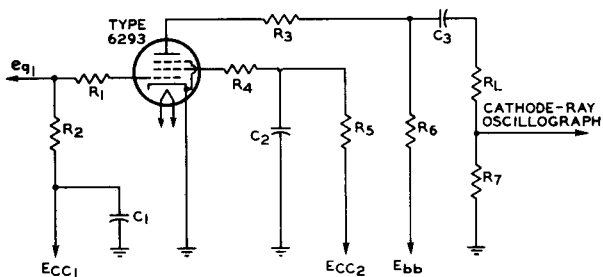


92CS-7700R5

ALL DIMENSIONS IN INCHES.



## TEST CIRCUIT



92CS-8015

$C_1$ : 0.1  $\mu$ f, 600 v dc

$C_2$ : 2  $\mu$ f, 600 v dc

$C_3$ : 0.25  $\mu$ f, 5000 v dc

Ecc1: Grid-No.1 Supply Volt.

Ecc2: Grid-No.2 Supply Volt.

Ebb: Plate Supply Voltage

Eq1: Rectangular-Wave  
Signal Voltage

$R_1$ : 20 ohms, 1 watt,  
non-inductive

$R_2$ : 3000 ohms, 1 watt

$R_3$ : 10 ohms, 5 watts,  
non-inductive

$R_4$ : 25 ohms, 1 watt,  
non-inductive

$R_5$ : 1000 ohms, 1 watt

$R_6$ : 10000 ohms, 50 watts

$R_7$ : 30  $\pm$  1% ohms,  
non-inductive

$R_L$ : For values, see Typical  
Operation and Charac-  
teristics Range Values  
(Note 4)

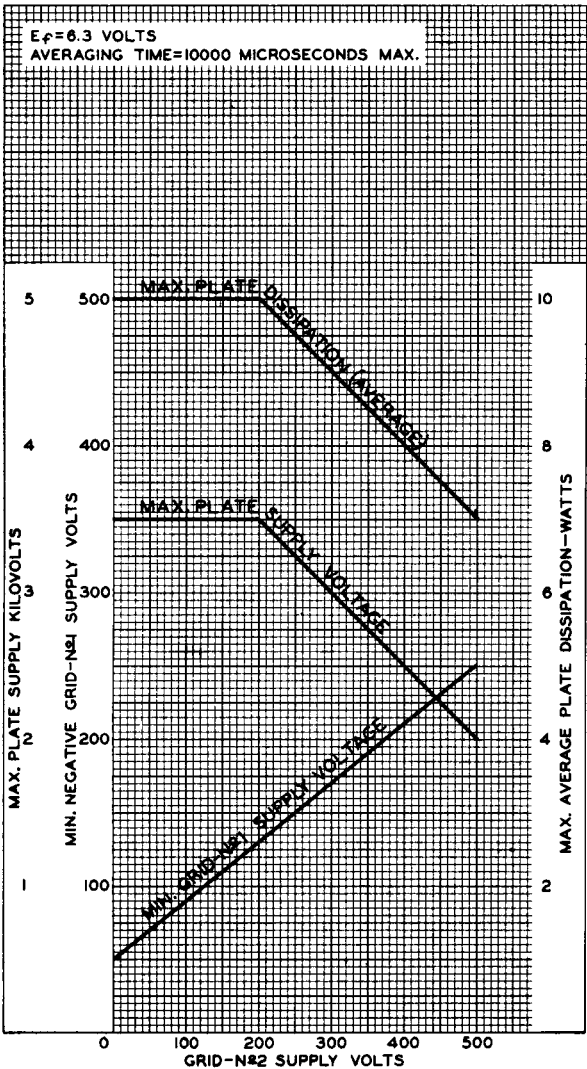
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# RATING CHART I



JUNE 5, 1953

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

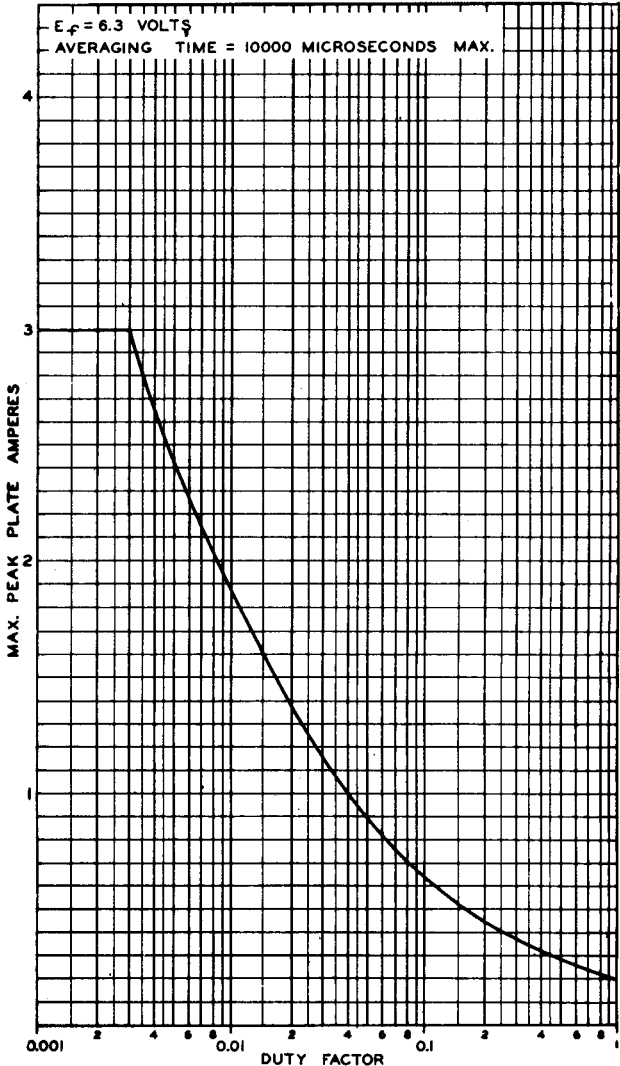
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### RATING CHART II



JUN. 8, 1953

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

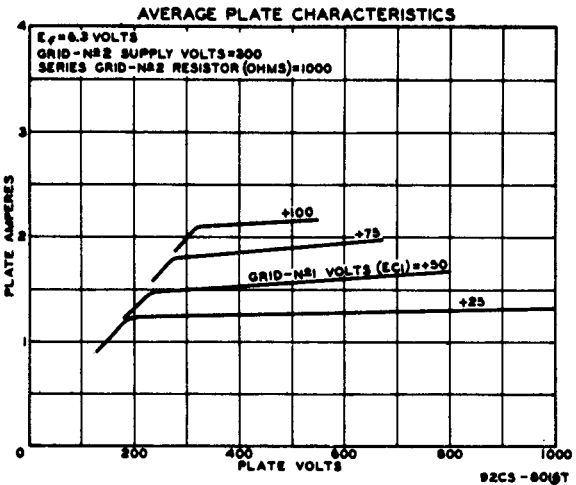
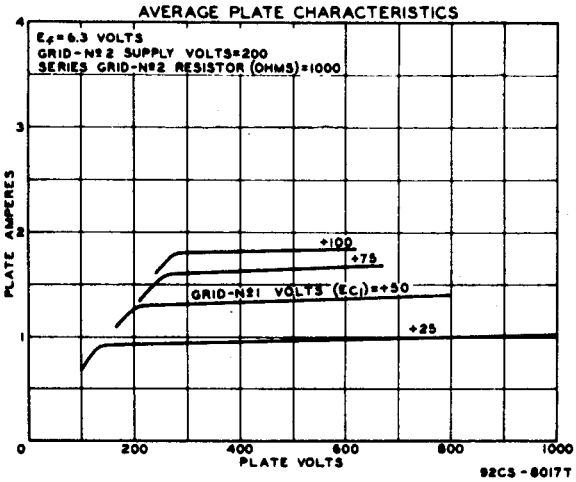
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# BEAM POWER AMPLIFIER

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OCT. 1, 1953

TUBE DEPARTMENT  
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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# BEAM POWER AMPLIFIER

