

## Beam Power Tube

**FORCED-AIR COOLED  
INTEGRAL RADIATOR  
MATRIX-TYPE CATHODE**

**UHF GRID-DRIVE OPERATION  
300 WATTS UHF TV OUTPUT AT 890 Mc  
410 WATTS PEP OUTPUT AT 30 Mc  
DISTRIBUTED AMPLIFIER SERVICE TO 500 Mc**

For Use as an RF Power Amplifier in Television and Single-Sideband Suppressed-Carrier Service and as a Broadband UHF Amplifier in Mobile and Stationary Equipment.

**Electrical:**

Unipotential Cathode, Matrix-Type<sup>b</sup>:

Voltage (AC or DC) . . . . .	6.3	volts
Current at heater volts = 6.3 . . . . .	3.5	amp
Minimum heating time . . . . .	60	sec

Mu-Factor, Grid No.2 to Grid No.1 for plate volts = 450, grid-No.2 volts = 325 and plate amperes = 1.2 . . . . .

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Direct Interelectrode Capacitances:

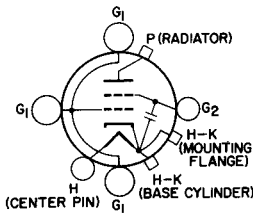
Grid No.1 to plate . . . . .	0.062 max.	pf
Grid No.1 to cathode . . . . .	20	pf
Plate to cathode . . . . .	6.2 max.	pf
Grid No.1 to grid No.2 . . . . .	19	pf
Grid No.2 to plate . . . . .	2.2	pf
Grid No.2 to cathode . . . . .	590 max.	pf

**Mechanical:**

Operating Position . . . . .		Any
Maximum Overall Length . . . . .		2.19"
Maximum Diameter . . . . .		2.262"
Weight (Approx.) . . . . .		4.5 oz
Radiator . . . . .		Integral part of tube

Terminal Connections (See *Dimensional Outline*):

- G<sub>1</sub> - Grid-No.1-  
Terminal  
Contact  
Surface
- G<sub>2</sub> - Grid-No.2-  
Terminal  
Contact  
Surface
- H - Heater-  
Terminal  
Contact  
Surface



- H-K - Heater- &  
Cathode-  
Terminal  
Contact  
Surface
- P - Plate-  
Terminal  
Contact  
Surface

**Thermal:**

Terminal Temperature (Plate, grid No.2, grid No.1, cathode-heater, and heater) . . . . .	250 max.	°C
Plate-Core Temperature . . . . .	250 max.	°C

Air Flow<sup>c</sup>:

*Through radiator* — Adequate air flow to limit the radiator core temperature to 250° C should be delivered by a blower through the radiator before and during the application of plate, grid-No.2, and grid-No.1 voltages.



*To Plate, Grid-No.2, Grid-No.1, Cathode, and Heater Terminals* — A sufficient quantity of air should be directed at the heater terminal and allowed to flow past each of these terminals so that their temperature does not exceed the specified maximum value of 250° C.

*During Standby Operation* — Cooling air is required when heater voltage is applied to the tube.

*During Shutdown Operation* — Air flow should continue for a few minutes after all electrode power is removed.

## RF POWER AMPLIFIER — Class B Television Service<sup>d</sup>

*Synchronizing-level conditions per tube unless otherwise specified*

### Maximum CCS Ratings, Absolute-Maximum Values:

DC Plate Voltage . . . . .	2200	volts
DC Grid-No.2 Voltage . . . . .	400	volts
DC Plate Current . . . . .	375	ma
DC Grid-No.1 Current . . . . .	100	ma
Grid-No.2 Input . . . . .	8	watts
Plate Dissipation . . . . .	400	watts

### Typical CCS Operation in Grid-Drive Circuit:

*For frequency of 890 Mc and Bandwidth of 8.5 Mc*

DC Plate Voltage . . . . .	2000	volts
DC Grid-No.2 Voltage . . . . .	400	volts
DC Grid-No.1 Voltage . . . . .	-55	volts
DC Plate Current:		
Synchronizing level . . . . .	350	ma
Pedestal level . . . . .	260	ma
DC Grid-No.2 Current:		
Synchronizing level . . . . .	1.3	ma
Pedestal level . . . . .	1	ma
DC Grid-No.1 Current:		
Synchronizing level . . . . .	0	ma
Pedestal level . . . . .	0	ma
Driver Power Output:		
Synchronizing level . . . . .	30	watts
Pedestal level . . . . .	17	watts
Output Circuit Efficiency . . . . .	80	%
Useful Power Output:		
Synchronizing level . . . . .	300	watts
Pedestal level . . . . .	170	watts

## LINEAR RF POWER AMPLIFIER<sup>d</sup>

### Single-Sideband Suppressed-Carrier Service

*Peak envelope conditions for a signal having a minimum peak-to-average power ratio of 2*

### Maximum CCS Ratings, Absolute-Maximum Values:

DC Plate Voltage . . . . .	2200	volts
DC Grid-No.2 Voltage . . . . .	400	volts
DC Grid-No.1 Voltage . . . . .	-100	volts



DC Plate Current at Peak of Envelope . . . . .	450 <sup>a</sup>	ma
DC Grid-No.1 Current . . . . .	100	ma
Grid-No.2 Input. . . . .	8	watts
Plate Dissipation. . . . .	400	watts

**Maximum Circuit Values:**

Grid-No.1 Circuit Resistance . . . . .	30000	ohms
Grid-No.2-Circuit Impedance. . . . .		See Note <sup>e</sup>
Plate-Circuit Impedance. . . . .		See Note <sup>f</sup>

**Typical CCS Operation with "Two-Tone Modulation":**

	<i>At 30 Mc</i>	
DC Plate Voltage . . . . .	2000	volts
DC Grid-No.2 Voltage . . . . .	400	volts
DC Grid-No.1 Voltage . . . . .	-44	volts
Zero-Signal DC Plate Current . . . . .	100	ma
Effective RF Load Resistance . . . . .	3200	ohms
DC Plate Current at Peak of Envelope . . . . .	335	ma
Average DC Plate Current . . . . .	250	ma
DC Grid-No.2 Current at Peak of Envelope . . . . .	20	ma
Average DC Grid-No.2 Current . . . . .	13	ma
DC Grid-No.1 Current . . . . .	0	ma
Peak-of-Envelope Driver Power Output (Approx.)	0.3	watt
Output-Circuit Efficiency (Approx.)	92	%
Distortion Products Level:		
Third order. . . . .	30	db
Fifth order. . . . .	34	db
Useful Power Output (Approx.):		
Average. . . . .	205	watts
Peak of envelope . . . . .	410	watts

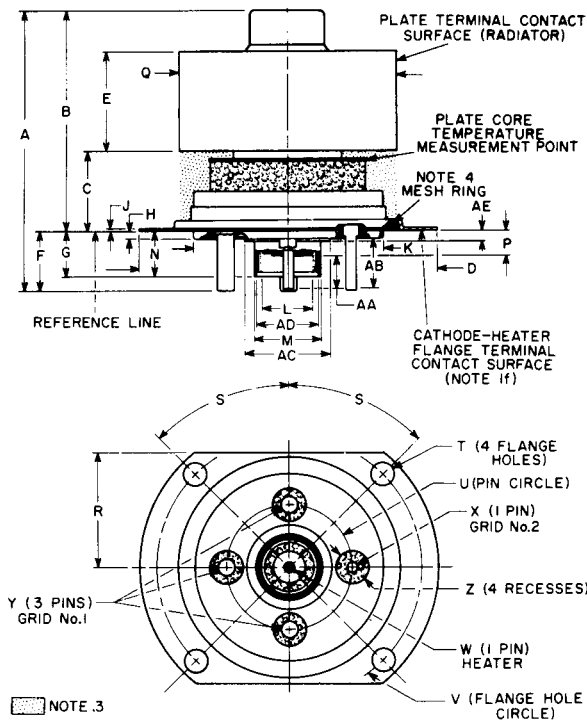
<sup>a</sup> The maximum rating for a signal having a minimum peak-to-average power ratio less than 2, such as is obtained in "Single-Tone" operation, is 300 ma. During short periods of circuit adjustment under "Single-Tone" conditions, the average plate current may be as high as 450 ma.

The following footnotes apply to the *RCA Transmitting Tube Operating Considerations* given at front of this section.

- <sup>b</sup> See *Electrical Considerations*—Filament or Heater
- <sup>c</sup> See *Cooling Considerations*—Forced-Air Cooling
- <sup>d</sup> See *Classes of Service*
- <sup>e</sup> See *Electrical Considerations*—Grid-No.2 Voltage Supply
- <sup>f</sup> See *Electrical Considerations*—Plate Voltage Supply



## DIMENSIONAL OUTLINE



NOTE .3

CERAMIC

92CS-12502

## DIMENSIONS IN INCHES

A - 2.19 max.	M - $0.500 \pm 0.010$	W - $0.081 \pm 0.002$ dia.
B - $1.660 \pm 0.060$	Note 1d	Note 2b
C - $0.610 \pm 0.040$	N - 0.300 max.	X - $0.081 \pm 0.002$ dia.
D - 2.262 max. dia.	P - 0.200 max.	Note 2c
E - 0.710 min.	Q - $1.625 \pm 0.015$ dia.	Y - $0.126 \pm 0.002$ dia.
F - 0.470 max.	Note 1e	Note 2a
G - 0.355 max.	R - 0.885 max.	Z - 0.245 min. dia.
H - 0.065 max.	S - $45^\circ \pm 5^\circ$	AA - 0.200 min.
J - 0.024 max.	T - $0.175 \pm 0.005$ dia.	AB - 0.325 min.
K - 1.435 max. dia.	U - 0.939 dia.	AC - Note 1b
Note 1a	V - 2.000 dia.	AD - Note 1c
L - 0.400 min. dia.		AE - 0.085 max.



**Note 1:** Concentricity between the various diameters on the major tube axis is such that the tube will enter a gauge having suitably spaced concentric apertures and posts of the following diameters:

- (a) Base seat—1.500
- (b) Flared flange of cathode-heater cylinder terminal—0.680
- (c) Cathode-heater cylinder terminal (ID)—0.400
- (d) Cathode-heater cylinder terminal (OD)—0.525
- (e) Radiator—1.660
- (f) Cathode-heater flange terminal contact surface—1.760

**Note 2:** Concentricity of the base pins is such that the tube will enter the gauge in Note 1 having suitably spaced apertures of the following diameters:

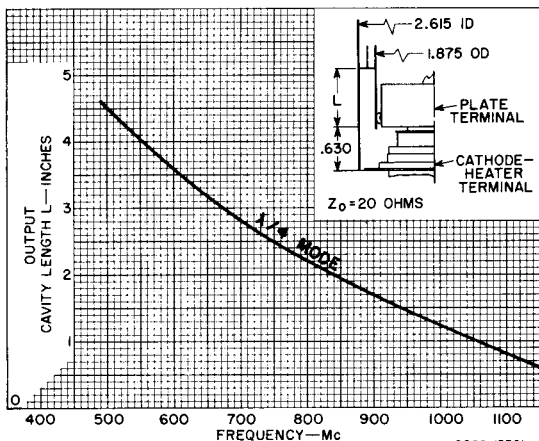
- (a) Grid-No. 1 pins—0.1450
- (b) Heater pin—0.0830 (1.123 Dia x 82° CSK.)
- (c) Grid-No. 2 pins—0.0930

**Note 3:** Keep all stippled regions clear. Do not allow contacts or circuit components to protrude into these annular regions.

**Note 4:** RF gasket, such as METEX\* No. A2733, or equivalent.

\* Metex Electronics Corp., Walnut Ave., Clark, N.J.

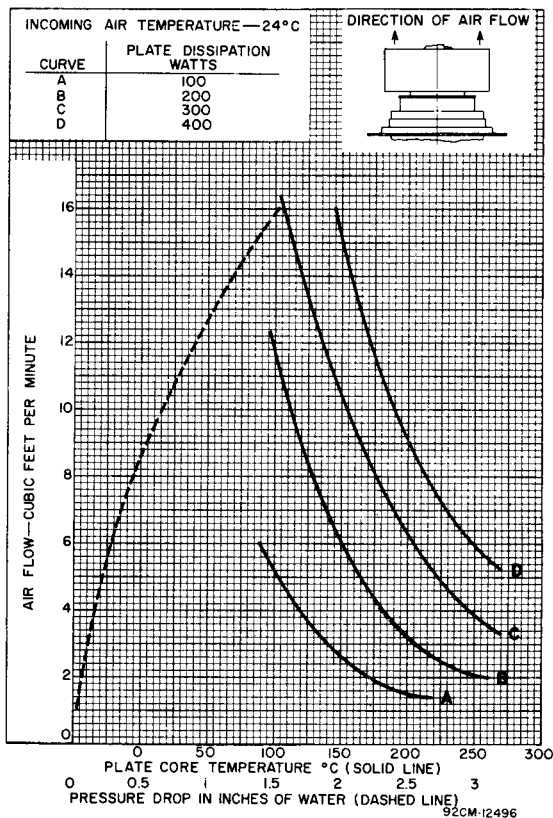
## TYPICAL OUTPUT CAVITY TUNING CHARACTERISTICS



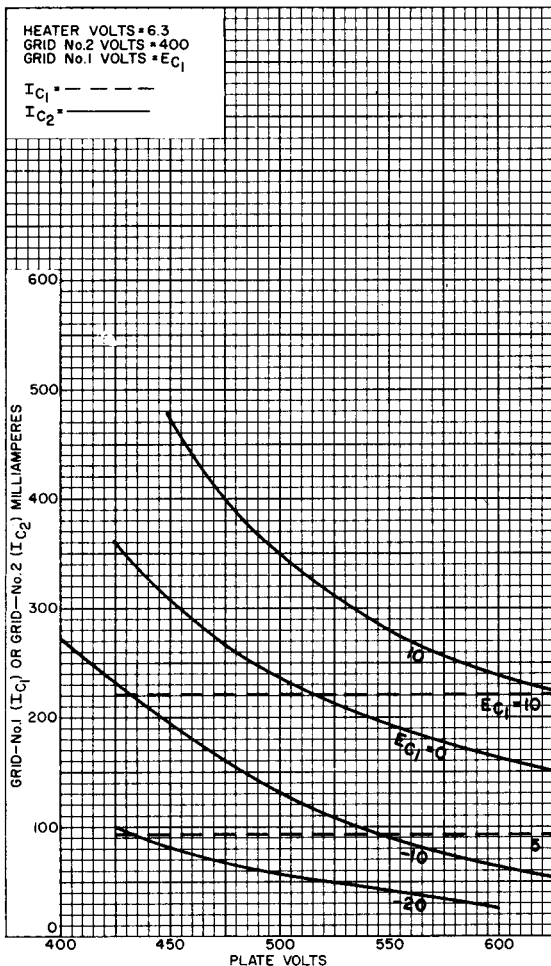
92CS-12501



## TYPICAL COOLING CHARACTERISTICS



## TYPICAL CHARACTERISTICS



92CM-12504



## TYPICAL PLATE CHARACTERISTICS

