4624

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:

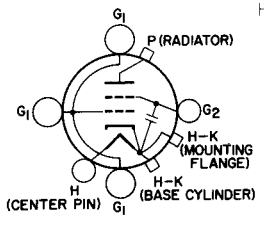
Unipotential Cathode, Matrix-Type[b]:		
Voltage (AC or DC)	6.3	volts
Current at heater volts = 6.3	3.5	amp
Minimum heating time	60	sec
Mu-Factor, Grid No.2 to Grid No.1 for plate volts = 450, grid-No.2 volts = 325 and plate amperes = 1.2	12	
Direct Interelectrode Capacitances:		
Grid No.1 to plate	0.062 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_1 – Grid-No.1–Terminal Contact Surface
G_2 – 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[c]:

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[d]

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[d]

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[a]	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* [e]	
Plate-Circuit Impedance	See *Note* [f]	

Typical CCS Operation with "Two-Tone Modulation":

	At 30 Mc	
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

[a] 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.

[b] See *Electrical Considerations*—Filament or Heater

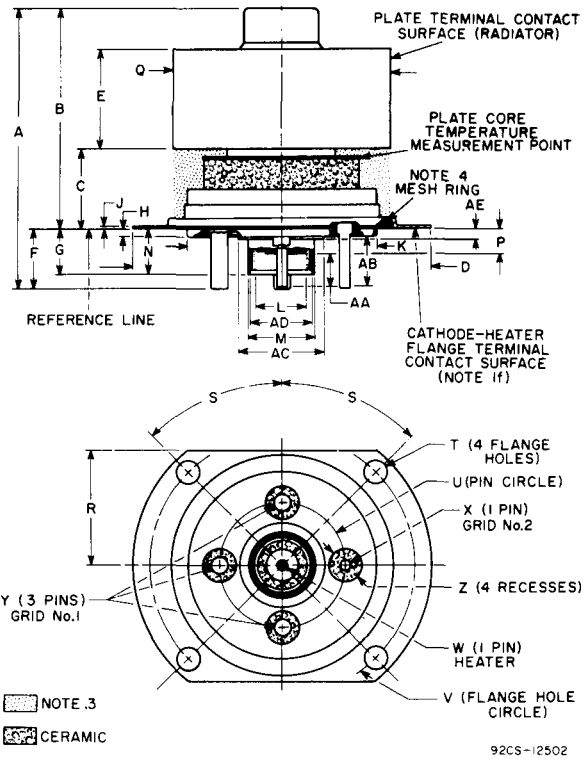
[c] See *Cooling Considerations*—Forced-Air Cooling

[d] See *Classes of Service*

[e] See *Electrical Considerations*—Grid-No.2 Voltage Supply

[f] See *Electrical Considerations*—Plate Voltage Supply

DIMENSIONAL OUTLINE



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DIMENSIONS IN INCHES

A – 2.19 max.
B – 1.660 ± 0.060
C – 0.610 ± 0.040
D – 2.262 max. dia.
E – 0.710 min.
F – 0.470 max.
G – 0.355 max.
H – 0.065 max.
J – 0.024 max.
K – 1.435 max. dia. Note 1a
L – 0.400 min. dia.
M – 0.500 ± 0.010 Note 1d
N – 0.300 max.
P – 0.200 max.
Q – 1.625 ± 0.015 dia. Note 1e
R – 0.885 max.
S – 45° ± 5'
T – 0.175 ± 0.005 dia.
U – 0.939 dia.
V – 2.000 dia.
W – 0.081 ± 0.002 dia. Note 2b
X – 0.081 ± 0.002 dia. Note 2c
Y – 0.126 ± 0.002 dia. Note 2a
Z – 0.245 min. dia.
AA – 0.200 min.
AB – 0.325 min.
AC – Note 1b
AD – Note 1c
AE – 0.085 max.

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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 (.123 Dia x 82° CSK.)

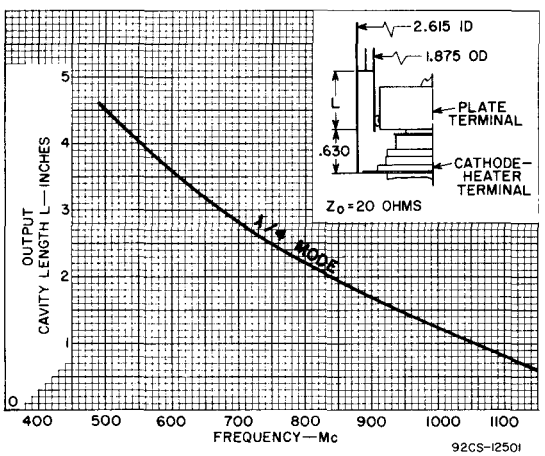
(c) Grid-No.2 pins—0.0930

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

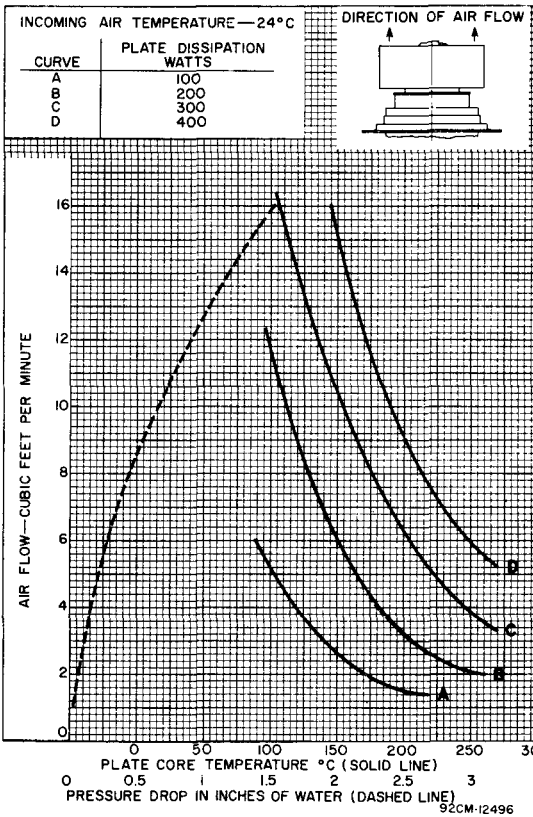
Note 4: RF gasket, such as METEX* No.A2733, or equivalent.

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

TYPICAL OUTPUT CAVITY TUNING CHARACTERISTICS



TYPICAL COOLING CHARACTERISTICS



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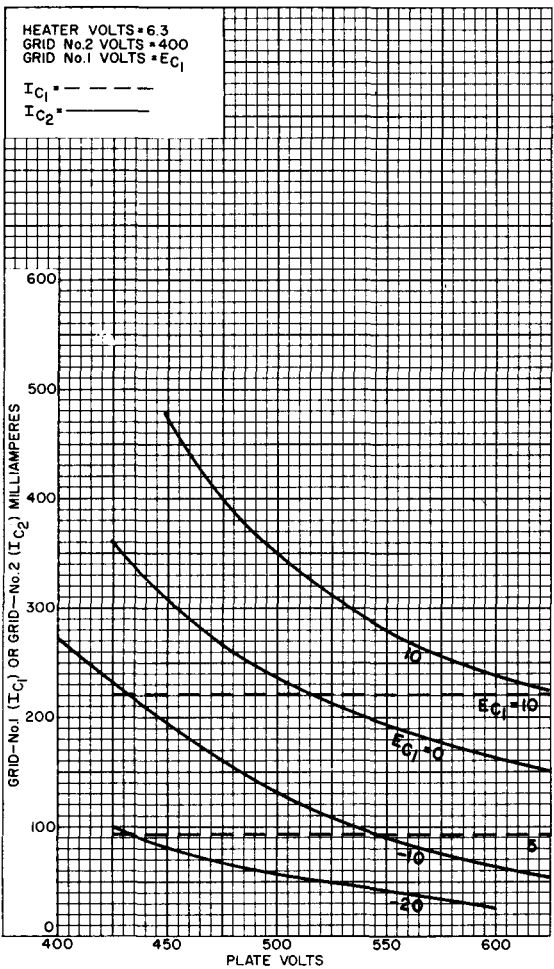
TYPICAL CHARACTERISTICS



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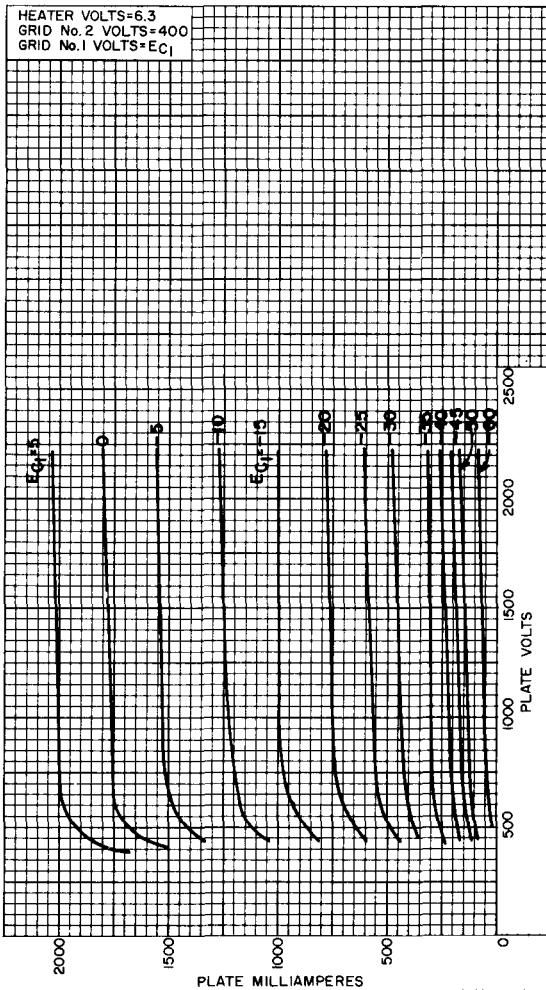
TYPICAL PLATE CHARACTERISTICS



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