8811

C Band Klystron

- Gang Tuned Cavities
- Air Cooled
- High Efficiency
- High Power Gain
- Compact
- Sturdy

Frequency	4.4 to 5.0 GHz

Electrical:

Cathode	Indirectly-heated Tungsten Dispenser Cathode	
Filament:		
Voltage	6.5 ± 0.5	V
Current at 6.5 V	7.6	A
Maximum current	8.2	A
Warmup time (min.)	180	s

Mechanical:

Mounting Position			Any
Length (max.)	(393 mm)	15.5	in
Width (max.)	(267 mm)	10.5	in
Weight (approx.)	(17.2 kg)	38	lb
In commercial pack	(18.1 kg)	40	lb
In military pack	(22.5 kg)	50	lb

Thermal:

Collector Temperature (max.)	260	°C
Body Temperature (max.)	150	°C
Tuner Fin Temperature (max.)	150	°C
Electron Gun Potting		
Insulation temperature (max.)	250	°C
Storage temperature (min.)	-65	°C

Cooling

Forced air flow across the collector, body, and tuner, is required.

Typical air requirements for operation with 20° C ambient air temperature at sea level are:

	Min Reg Air Flow lb/min	kg/min	Max Press-Drop in H_2O	cm H_2O
Collector	7.5	3.4	2.0	5.1
Body & Tuners	0.85	0.38	0.75	1.9

Performance

Maximum CW Ratings, Absolute-Maximum Values:

DC Beam Voltage	8.5	kV
DC Beam Current	600	mA
DC Body Current	60	mA
Surge Current	25	A
Load VSWR	2.0:1	
Input VSWR	2.0:1	

Typical CW Operation:

High Efficiency Tuned

Frequency	**4.4 GHz**	**5.0 GHz**	
DC Beam Voltage	8.0	8.0	kV
DC Beam Current	520.0	520.0	mA

Typical CW Operation (cont'd.)

High Efficiency Tuned

Frequency	**4.4 GHz**	**5.0 GHz**	
DC Body Current	10.0	10.0	mA
RF Power Output	1.60	1.45	kW
Bandwidth (3 dB)	8.0	10.0	MHz
Efficiency	39.0	35.0	%
Gain	45.0	45.0	dB
Drive	50.0	50.0	mW
Load VSWR	1.05:1	1.05:1	
Input VSWR	1.3:1	1.3:1	

High Gain Tuned

Frequency	**4.4 GHz**	**5.0 GHz**	
DC Beam Voltage	8.0	8.0	kV
DC Beam Current	520.0	520.0	mA
DC Body Current	10.0	10.0	mA
RF Power Output	1.45	1.30	kW
Bandwidth (3 dB)	6.0	8.0	MHz
Efficiency	35.0	31.0	%
Gain	52.0	52.0	dB
Drive	10.0	10.0	mW
Load VSWR	1.05:1	1.05:1	--
Input VSWR	1.3:1	1.3:1	--

Broadband Tuned

Frequency	4.4 GHz	5.0 GHz	
DC Beam Voltage	8.0	8.0	kV
DC Beam Current	520.0	520.0	mA
DC Body Current	10.0	10.0	mA
RF Power Output	1.5	1.4	kW
Bandwidth (3 dB)	13.0	19.0	MHz
Efficiency	36.0	33.0	%
Gain	42.0	42.0	dB
Drive	100.0	100.0	mW
Load VSWR	1.05:1	1.05:1	–
Input VSWR	1.3:1	1.3:1	–

General Information

Installation and Operation

No installation or operation should be attempted without first consulting the Installation and Operating Instructions shipped with each tube or available on request from Super Power Marketing, RCA, Lancaster, PA.

RCA reference publications required for the installation and operation of this device include the following:

Data Sheet – RCA-8811
Application Note AN 4213
Application Guide 1CE-279A

These publications are available as a complete packet – request PWR 542 "Applications Information for the RCA-8811 klystron."

Personnel Safety

The high voltages and microwave radiations from this device can be dangerous to life. High voltage shielding and interlock precautions must be taken and all rf connections must be tightly closed and rf terminals shielded.

Packaging

Two types of packaging are available with these tubes; Commercial Pack and Military Pack. The customer specifies the desired type.

The Commercial Pack is made of nesting carboard cartons with the inner carton shock-mounted. The Military Pack complies with MIL-S-4473C for air shipment. It uses a hermetically-sealed metal container which protects the tube and serves to shield the area surrounding the pack from stray magnetic fields set up by the klystron focusing magnet.

In shipment, the tube is enclosed in a polyethylene bag to prevent dust and other particles from collecting in the waveguide or tuning system. It is recommended that the tube be stored in the bag and in the shipping container when not in use. Dust or other unwanted particles in the waveguide can cause arcing during operation and subsequent tube destruction.

Cooling

Air ducts must be provided to connect to the top of the collector and the tuner cooling duct. See Outline Drawing.

Mounting

Four holes are provided in the gun-end of the focusing magnet for mounting purposes. Only non-magnetic studs should be used.

Thermocouple

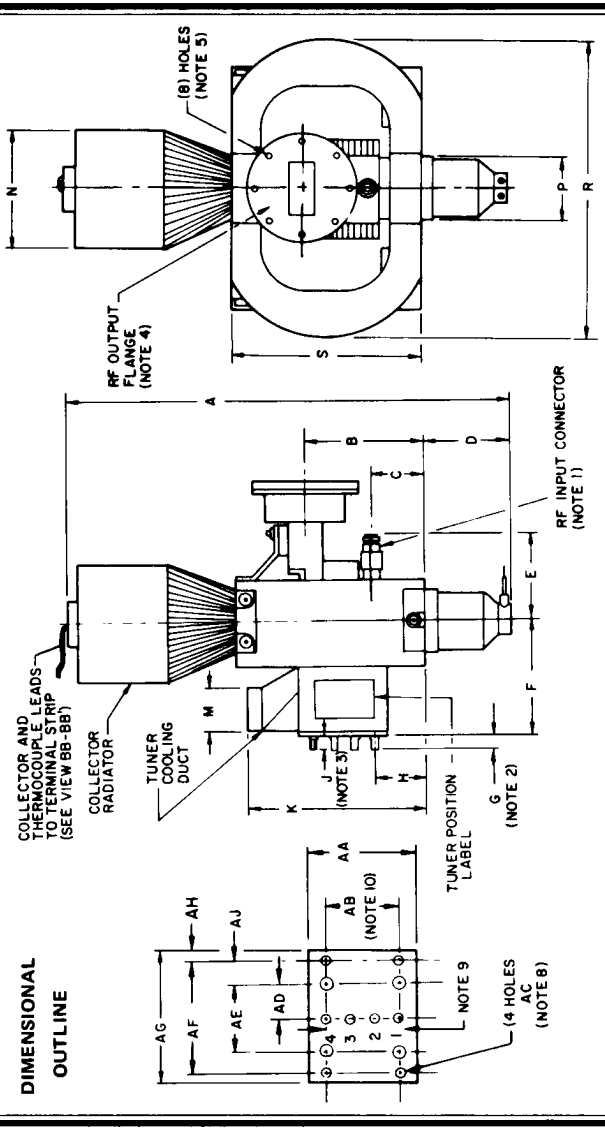
A thermocouple mounted on the collector provides a signal output for excessive collector temperature. This output is used to operate protective circuitry.

Tuning

Tuning is accomplished by a single knob which "gang-tunes" all four cavities simultaneously. The second, third and output cavities may be individually trimmed for optimizing the tube performance at any frequency within the tube operating band. See Outline Drawing.

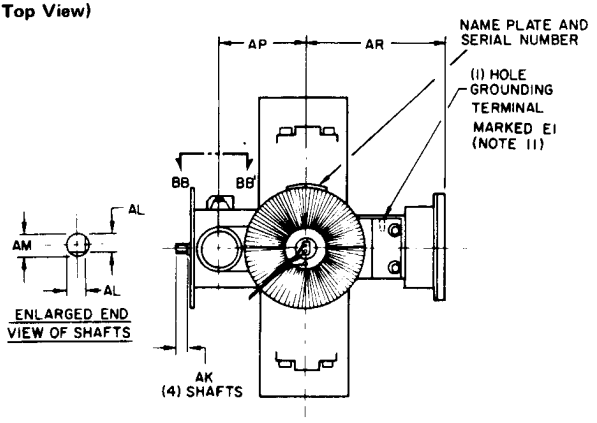
Protection Circuits

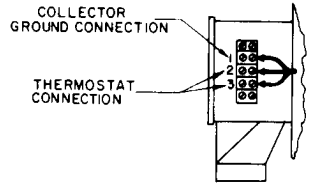
Protection circuits serve a threefold purpose: safety of personnel, protection of the tube and protection of tube circuits. Consult Application Guide 1CE-279A for complete information on protection circuits.


DIMENSIONAL OUTLINE
(8) HOLES (NOTE 5)
RF OUTPUT FLANGE (NOTE 4)
N
S
P
R
A
B
C
D
E
F
G (NOTE 2)
H
J (NOTE 3)
K
M
COLLECTOR AND THERMOCOUPLE LEADS TO TERMINAL STRIP (SEE VIEW BB-BB')
COLLECTOR RADIATOR
TUNER COOLING DUCT
RF INPUT CONNECTOR (NOTE 1)
TUNER POSITION LABEL
AA
AB (NOTE 10)
AG
AF
AE
AD
AH
AJ
NOTE 9
(4 HOLES AC (NOTE 8)
1
2
3
4

DIMENSIONAL OUTLINE

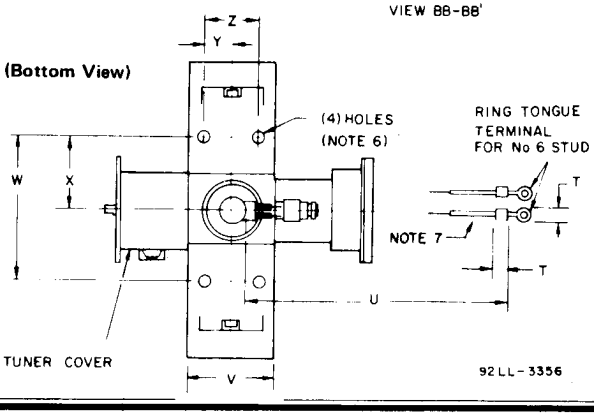
(Top View)





VIEW BB-BB'

(Bottom View)



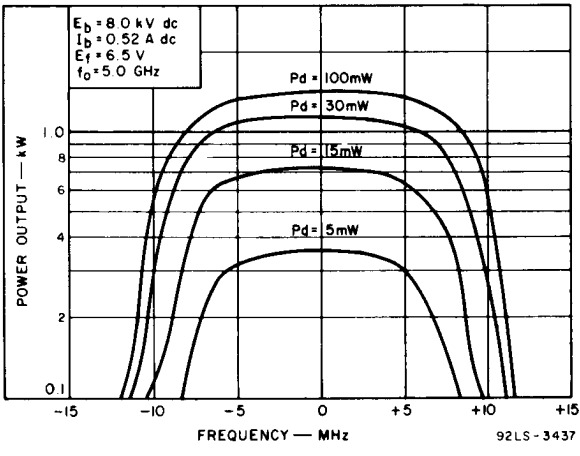
Tabulated Dimensions for the Dimensional Outline

Dimension Reference	Specified Values Inches	Millimeters
A	15.5 max.	393.7 max.
B	4.06 ±.12	103.1 ±3.0
C	1.80 ±.12	45.7 ±3.0
D	3.5 max.	88.9 max.
E	3.00 ±.06	76.2 ±1.5
F	3.80 ±.12	96.5 ±3.0
G	0.68 ±.05	17.3 ±1.3
H	1.80 ±.09	45.7 ±2.3
J	0.68 +.15 -.10	17.3 +3.8 -2.5
K	6.25 max.	158.8 max.
M	1.50 ±.03	38.1 ±.8
N Dia.	4.12 ±.03	101.6 ±.8
P Dia.	2.130 ±.015	54.10 ±.38
R	10.5 max.	266.7 max.
S	6.5 ±.5	165.0 ±13.0
T Dia.	0.250 ±.015	6.35 ±.38
U	13.50 ±.25	343.0 ±6.0
V	3.25 max.	82.55 max.
W	5.00 ±.06	127.0 ±1.5
X	2.50 ±.06	63.5 ±1.5
Y	1.00 ±.06	25.4 ±1.5
Z	2.00 ±.06	50.8 ±1.5
AA	3.00 ±.06	76.2 ±1.5
AB	2.10 ±.02	53.34 ±.51
AC	0.201 ±.010	5.11 ±.25
AD	1.00 ±.03	25.4 ±.8
AE	2.00 ±.03	50.8 ±.8
AF	3.25 ±.02	82.55 ±.51
AG	3.75 ±.03	95.3 ±.8
AH	0.25 ±.03	6.4 ±.8
AJ	0.62 ±.03	15.8 ±.8
AK	0.440 ±.010	11.18 ±.25
AL	0.230 ±.005	5.84 ±.13
AM Dia.	0.249 ±.002	6.325 ±.051
AN	0.125 ±.030	3.2 ±.8
AP	3.00 ±.06	76.2 ±1.5
AR	4.75 ±.12	120.6 ±3.0

Notes for Dimensional Outline

1. Mates with Type "N" Connector UG-21 B/U or equivalent.
2. Dimension applies to Shaft No.1 only.
3. Dimension applies to Shafts No,'s 2, 3, and 4 only.
4. Mates with UG-149 A/U or equivalent.
5. Holes 10-32 UNF-2B equally spaced on 3.250 ±.032 (82.6 ± .8 mm) dia. circle.
6. Holes 0.437 ± .062 (11.1 ± 1.6 mm) thru (One side only).
7. High-Voltage Lead Designation : Heater Lead – Yellow
   Heater-Cathode Lead – White
8. Thru-holes checked with gauge.
9. Three spaces between shafts are 0.70 ± .03 (17.8 ± .8 mm) and add to 2.100 (53.34 mm). Shafts are numbered as shown. (1) Gang tuner, (2) Cavity two, (3) Cavity three, (4) Output cavity.
10. Tolerance for this dimension applies to location of four 0.201 (5.11 mm) holes.
11. Hole No.6-32 UNC-2B, 0.25 (6.35 mm) minimum depth.

BANDWIDTH CHARACTERISTIC CURVE



The *Beam Current Characteristic, Gain Characteristic, and Output Characteristic* curves shown under Type 4658 also apply to Type 8811.