

TYPE: V243A/2FS (CV5463) – S.T.C.

PROVISIONAL
DATA.



GENERAL

The V243A/2FS is a coaxial line type velocity-modulated oscillator developed for use in a system with ± 50 Mc/s mechanical frequency modulation and a mid-frequency in the band 4.2 Gc/s to 4.4 Gc/s. The electrical characteristics are similar to those of the V243A/1K and it can be operated in a waveguide circuit over the frequency range 4.1 Gc/s to 4.6 Gc/s. The valve is designed to withstand mechanical shock and vibration conditions and to operate in an ambient temperature of up to 100°C. It has a heat dissipating shield fitted closely to the bulb.

CATHODE

Indirectly-heated, oxide-coated		
Heater voltage	6.3	V
Nominal heater current	0.25	A
Cathode heating time	30	sec

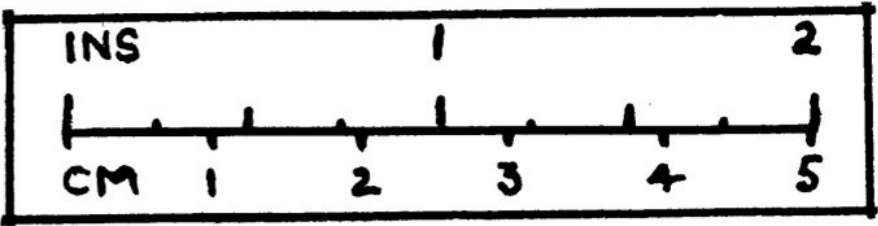
MECHANICAL DATA

Maximum overall length	3.19 in	81	mm
Maximum bulb diameter	0.79 in	20.1	mm
Base	STC type FF*		
Net weight	1.4 oz	38	g

MOUNTING

The valve is designed to mount by means of the resonator disc so that the antenna couples into a suitable tuning circuit.

* B7G/F base fitted with P.T.F.E. wiring-in adaptor.



OSCILLATORS, VELOCITY-MODULATED.

MAXIMUM RATINGS

Maximum mean input power to all electrodes other than the heater	18	W
Maximum resonator dissipation	10	W
Maximum screen dissipation	1.5	W
Maximum bulb temperature	300	°C

The screen voltage should not exceed the resonator voltage.

TYPICAL OPERATING CONDITIONS

Oscillator in the frequency range	4.2 to 4.4	Gc/s
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Grid Voltage (V_{g1})

40 volts negative with respect to cathode. The use of bias improves the proportion of cathode current which passes through the resonator and reaches the anode.

Resonator Voltage (V_{res})

235 to 275 volts.

Screen Voltage (V_{g2})

130 volts to resonator voltage. Adjusted to obtain the appropriate value of cathode current.

Screen Current (I_{g2})

Not greater than 1 mA.

Anode Voltage (V_a)

20 volts positive with respect to resonator.

Cathode Current (I_k)

65 mA.

Anode Current (I_a)

Greater than 35 mA.

Output Power (P_o)

At the frequency 4.3 Gc/s an output of at least 750 mW should be obtained from the circuit shown in Fig. 2 when the load and resonator voltage have been properly adjusted and the cathode current is 65 mA. About 850 mW is usually obtained.

The output power is controlled by varying the cathode current by the screen grid voltage.

CIRCUIT

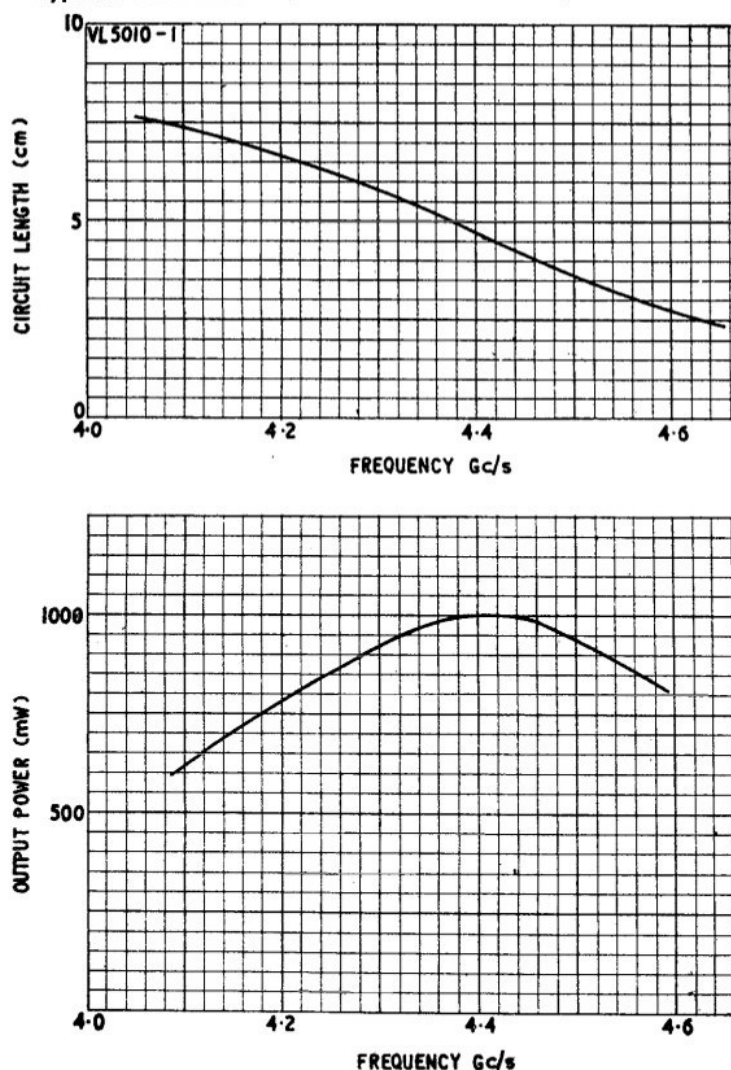
Fig. 2 shows a sketch of a suitable circuit for operation at 4.3 Gc/s. Waveguide cavity 495-LVA-251 can be used for operation on the range 4.1 Gc/s to 4.6 Gc/s. Curves of tuner position and power output as functions of frequency are shown in Fig. 1. The valve will operate satisfactorily in other types of circuit, with certain differences in performance.

MAGNET AND MAGNET ALIGNMENT

A permanent magnet is used to focus the electron beam. The recommended magnet is Magloy P.231677 (Preformations, Ltd.), but any magnet giving a uniform field of approximately 1 200 oersteds over a 22 mm gap can be used. The magnet must be aligned so that the best ratio of anode current to cathode current is obtained. Three holes are punched in the valve resonator disc and locate on pins fixed to the valve clamping plate. Once the magnet has been aligned, and has been securely clamped with respect to the locating pins, no further adjustment will be necessary when replacing valves. It is recommended that at least three, and preferably six, valves are used to establish the initial alignment of the magnet.

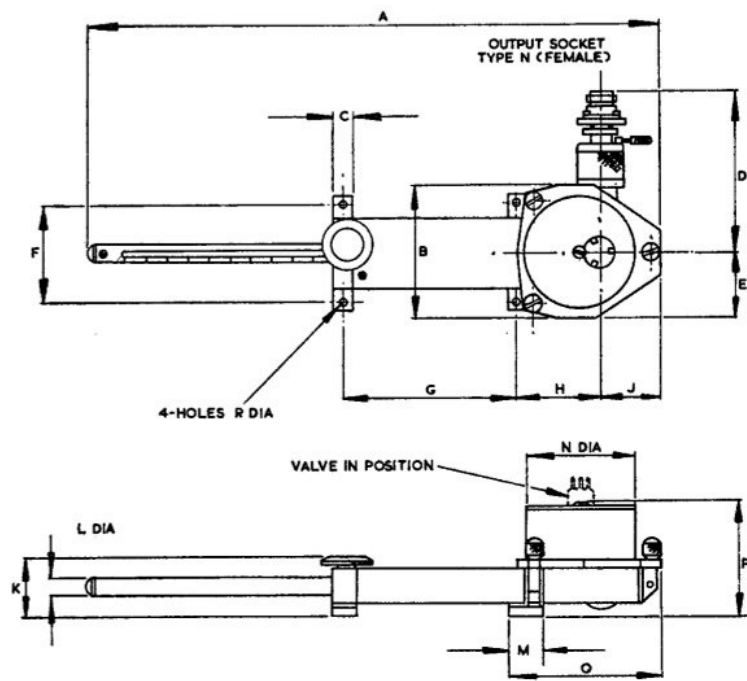
Alternatively, special valves can be supplied for magnet alignment.

Typical Performance Curves of a Tube in the Cavity 495-LVA-251.



TYPE: V243A/2FS – S.T.C. DATA CONTINUED.

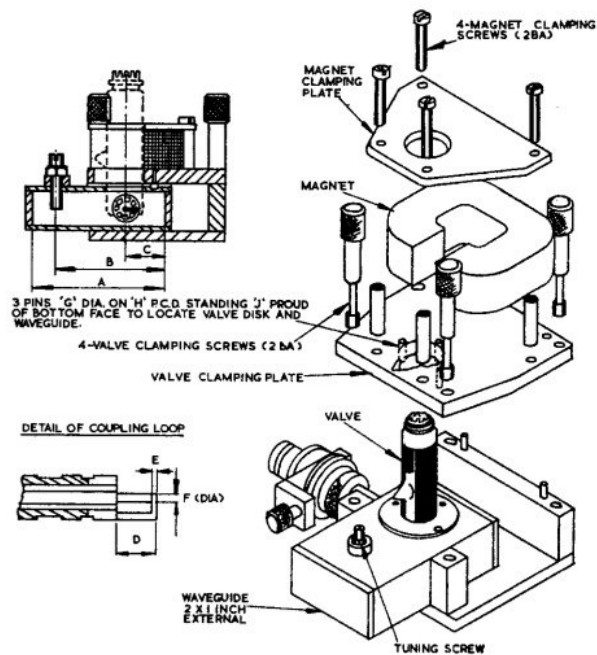
Fig. 3.—Waveguide Cavity 495-LVA-251 Outline



DIM.	INCHES	MILLIMETRES	DIM.	INCHES	MILLIMETRES
A	16½ MAX.	425,5 MAX.	J	1½ APPROX.	41,3 APPROX.
B	3½ MAX.	98,4 MAX.	K	1½ APPROX.	46,0 APPROX.
C	½ MAX.	19,1 MAX.	L	½ APPROX.	12,7 APPROX.
D	5 ± ⅛	127,0 ± 1,6	M	1 APPROX.	25,4 APPROX.
E	1½ MAX.	49,2 MAX.	N	3½ APPROX.	88,9 APPROX.
F	2.750 ± 0.020	69,85 ± 0,51	P	3½ MAX.	88,9 MAX.
G	4½ ± ⅛	119,1 ± 1,6	Q	4½ MAX.	120,7 MAX.
H	2½ ± ⅜	69,9 ± 0,8	R	½ APPROX.	6,4 APPROX.

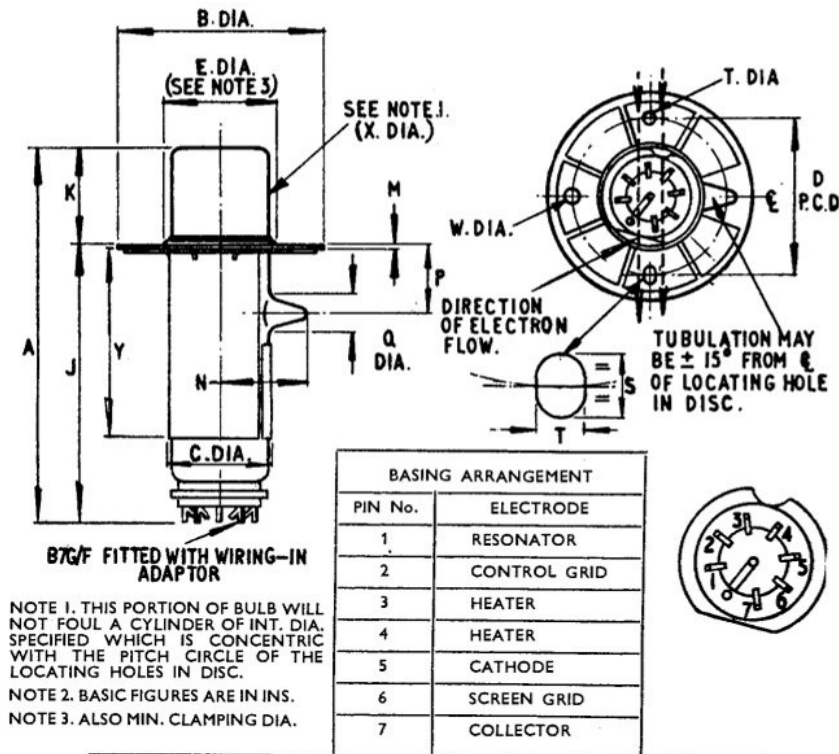
NOTE:
BASIC UNITS ARE METRIC.

Fig. 2.—Waveguide Cavity for Operation at 4.3 Gc/s.



DIM.	MILLIMETRES	INCHES	DIM.	MILLIMETRES	INCHES
A	84	3.307	G	2,4	0.093
B	62,5	2.46	H	31	1.218
C	23	0.906	J	1,6	⅙
D	11,4	0.45			
E	1,5	0.059			
F	1,5	0.059			

DIMENSIONS AND CONNECTIONS.



DIM.	MILLIMETRES	INCHES	DIM.	MILLIMETRES	INCHES
A	81,0 MAX.	3 ¹ / ₁₆ MAX.	Q	8,5 MAX.	0.33 MAX.
B	42 MAX.	1.65 MAX.	S	3,2 +0,13 -0,00	0.125 +0.005 -0.000
C	21,08 MAX.	0.830 MAX.	T	2,36 +0,06 -0,00	0.093 +0.002 -0.000
D	30,96 ± 0,06	1.218 ± 0.002	W	2,79 +0,13 -0,00	0.110 +0.005 -0.000
E	24 MAX.	0.94 MAX.	X	21,59 MIN.	0.850 MIN.
J	55,6 ± 4,8	2 ¹ / ₁₆ ± 1/16	Y	38,1 ± 1,6	1 ¹ / ₂ ± 1/16
K	15,88 MIN. 20,63 MAX.	0.625 MIN. 0.812 MAX.			
M	0,3 MAX.	0.012 MAX.			
N	18 MAX.	0.710 MAX.			
P	13,5 ± 4,0	0.53 ± 0.16			