



KLYSTRON

VA201B

A reflex Klystron designed for use as local oscillator in airborne applications. The very rugged construction and extreme frequency stability ensure reliability under the most severe environmental conditions.

PHYSICAL DATA.

Dimensions	...	...	See Drawings on Page 2.
Output Connection	...	...	Bolts to UG-39/U flange or UG40A/U chokes for lin. x 0.5in. x 0.05in. waveguide.
Mounting Position	...	...	Any.
Weight	...	...	6 oz. (180gm.) approx.
Base	...	...	Moulded with flying leads.
Top Cap	...	...	Moulded with flying lead.

COOLING.

Designed for cooling by conduction and free air circulation. Forced air cooling is not usually required but the Klystron body temperature should not be allowed to exceed 200°C.

HEATER.

Heater Voltage	6.3 volts.
Heater Current	1.2 ± 10% amps.

FREQUENCY.

Operating Range	8500-9600 Mc/s.
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TUNING.

The single screw tuner covers the frequency range in approximately $4\frac{1}{2}$ turns. Clockwise rotation reduces the frequency. The average tuner torque is 35in./oz. (maximum -50in./oz.).

RATINGS.

Max. Heater Voltage	...	...	...	6.9 volts.
Min. Heater Voltage	...	...	...	5.7 volts.
Max. Resonator Voltage	...	...	...	350 volts.
Max. Resonator Current	...	...	...	55 mA.
Max. V_{h-k}	...	...	...	45 volts.
Max. Body Temperature	...	...	...	200°C.
Reflector Voltage (negative)	...	...	...	0-500 volts.

CHARACTERISTICS AND TYPICAL OPERATION.

Frequency Range Heater Voltage Load Resonator Voltage Mode	8500-9600 6.3 Matched						Mc/s. volts. volts.
	250 6½			300 5½			
	Min.	Av.	Max.	Min.	Av.	Max.	
Reflector Voltage	-40	—	-120	-80	—	-200	volts.
Resonator Current	—	33	—	—	41	45	mA.
Reflector Current	—	—	5	—	—	5	µA.
Power Output ...	12	30	66	40	90	120	mW.
Electronic Tuning Range	30	45	—	20	40	—	Mc/s.
Modulation Sensi- tivity	1.0	3.0	—	.5	2.0	—	Mc/s / volt.
Temperature Coefficient	-100	-30	+50	-100	-30	+50	kc/s / °C.
Heater Voltage Coefficient ...	—	—	1.5	—	—	1.5	Mc/s / volt.
*Noise ... ..	...	...	...	...	...	<3 × 10 ⁻¹⁴	W / Mc/s / mW
†Tuner Resetting Accuracy (max. ΔF.)	...	...	...	...	...	1	Mc/s.
‡Tuner Side Thrust (max. ΔF.)	...	...	...	...	...	0.5	Mc/s.

Vibration.

The max. peak to peak frequency variation from vibration of 20-1000 c.p.s. at 10g is 0.2 Mc/s.

Shock.

The maximum frequency deviation due to shock of 150g. is 1.5 Mc/s.

NOTES ON OPERATION.

Mounting.

The klystron should be securely bolted to the mating waveguide flange. Normally the anode (tube body) is operated at earth potential; when operated with the anode above earth potential suitable insulation should be provided between the tube and waveguide flanges.**

Application of Voltages.

It is important that the circuit in which a new klystron is being installed be thoroughly checked before the application of any voltages. Under no circumstances should the applied voltages exceed the maximum published ratings.

Reflector Voltage.

The Reflector must never be operated at a potential positive with respect to that of the cathode nor should its power supply be disconnected during the time the resonator voltage is applied. When the reflector voltage is modulated the magnitude of the modulating voltage must be limited to the extent necessary to prevent positive excursions of the reflector voltage. A protective diode connected directly between the reflector and the cathode can be used to prevent the reflector from becoming positive. The performance of this diode should be checked regularly as it will normally be operated at zero current drain, an operating condition which materially reduces the life.

Load.

For correct functioning of the tube the load should meet the following conditions.

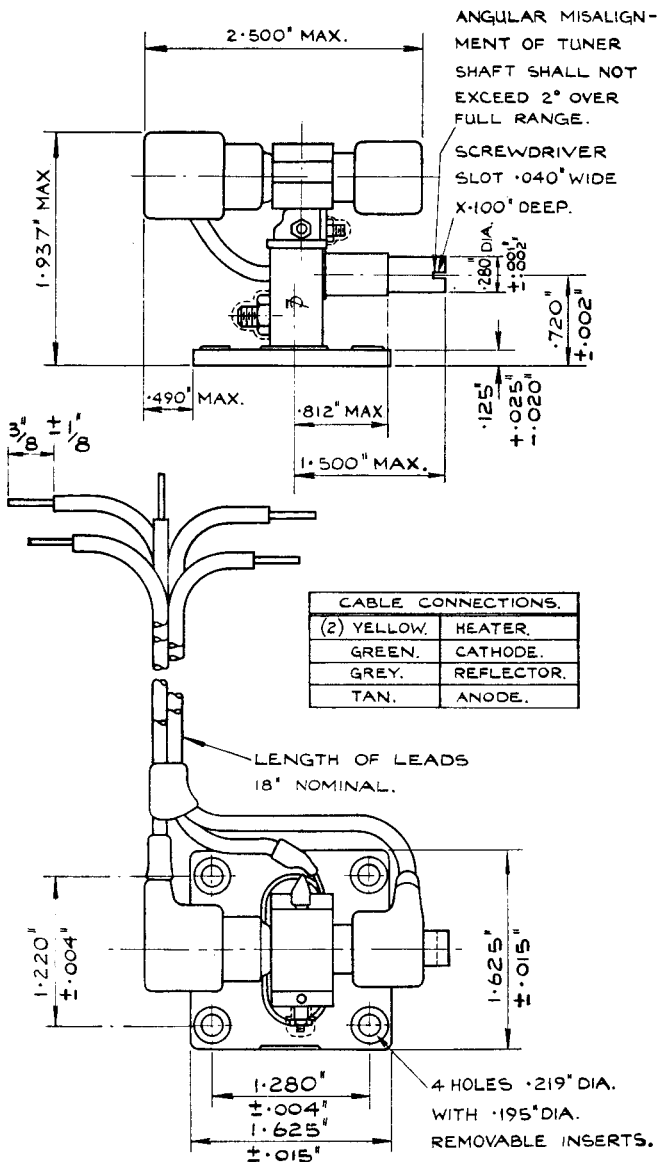
- At the frequency of operation the load should present a VSWR of less than 1.2 to the tube.
- Over the frequency ranges : 7,800 to 8,500 Mc. and 9,600 to 10,500 Mc. the load should present a VSWR of less than 1.5 to the tube. Failure to meet condition (b) may result in the occurrence of spurious modes.

*The R.F. noise is the sum of the R.F. noise power in two channels 40 Mc/s. above and below the frequency of oscillation, compared to normal noise at 290°K. in the same channels.
The noise standard used in these measurements is a CV1881 discharge tube. The noise power is expressed as Watts per Mc/s. of I.F. band width per milliwatt of R.F. output power.

†Resetting accuracy defines the frequency deviation which can result from turning the tuner screw through approximately half a turn in either direction, then returning it to its original position.

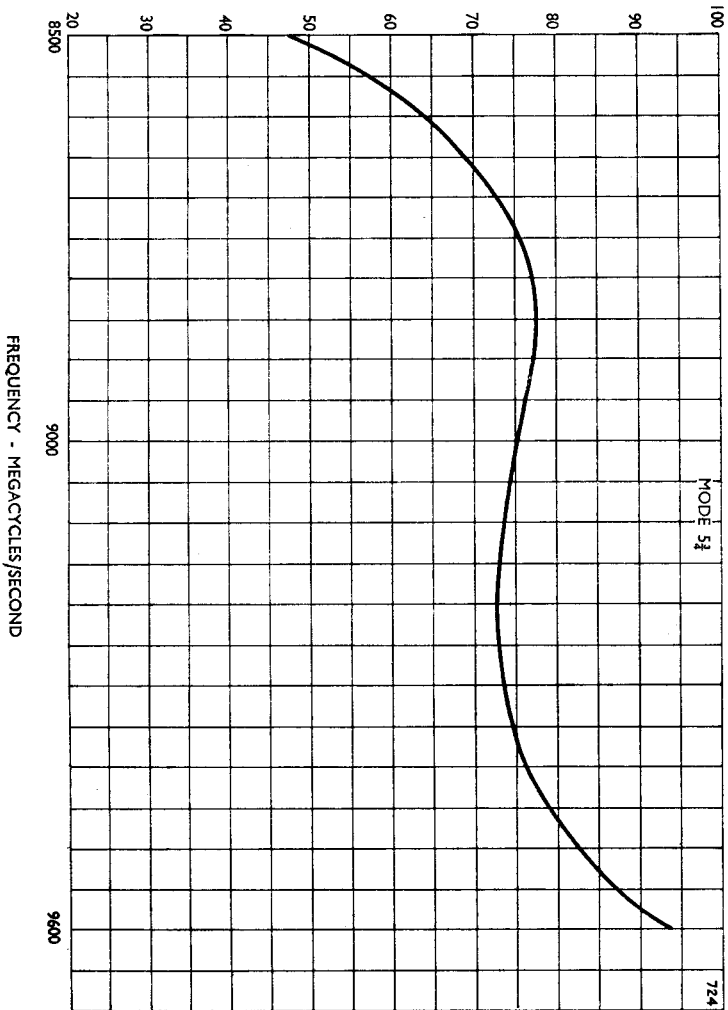
‡The frequency deviation, caused by side thrust due to the application a ½lb. weight to the top of the tuner spindle in each of two mutually perpendicular axes both of which are perpendicular to the spindle axis.

**To facilitate this the eyelets in the fixing bolt holes are removable.

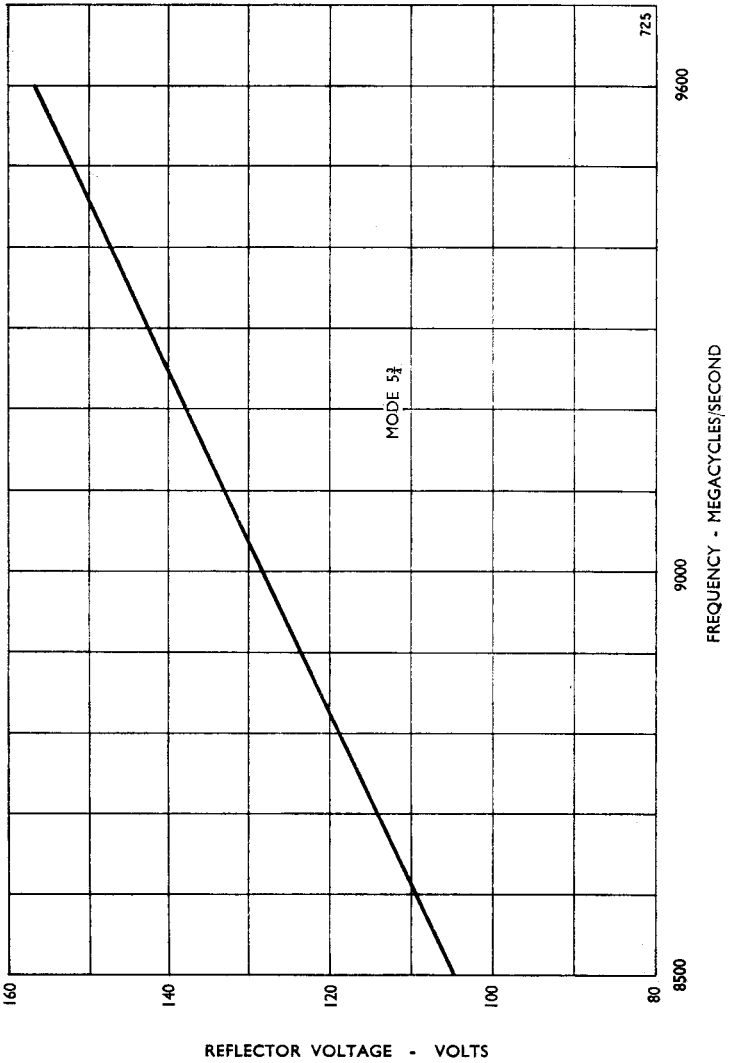


POWER OUTPUT/FREQUENCY CHARACTERISTIC

MATCHED LOAD POWER OUTPUT - MILLIWATTS



REFLECTOR VOLTS/FREQUENCY CHARACTERISTICS.
Reflector Voltage at Maximum Power Point.



REFLECTOR VOLTS/FREQUENCY CHARACTERISTICS.
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