



REFLEX KLYSTRON

oscillator
VA-6314*
 8.5 - 10.5 kmc

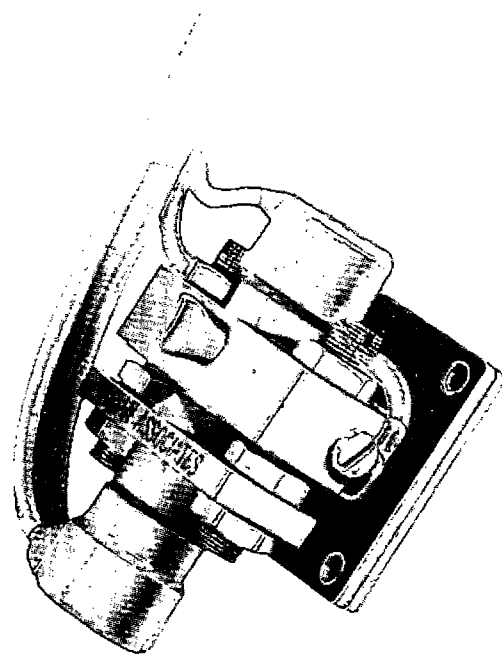
DATA SHEET

APPLICATION

The VA-6314 is intended for radar application particularly under rugged service conditions. It will operate from conventional power supplies and with conventional crystal mixers, greatly increasing the ruggedness and reliability of any radar system to which it may be applied. It will operate at much lower resonator voltages than most local oscillator-klystrons, producing adequate power output and electronic tuning range with resonator voltage as low as 150 volts.

FEATURES

Extremely rugged construction . . . Low microphonics . . . Lock-nut tuning . . . Matched load operation without matching sections . . . Waveguide output . . . Rapid warm-up . . . Negligible barometric frequency coefficient . . . Removable inserts in flange holes simplify insulation when required . . . Molded leads and base permitting high altitude operation without pressurization.



GENERAL CHARACTERISTICS

Frequency Range 8.5 to 10.5 kMc
 Heater Voltage 6.3 volts
 Heater Current 1.2 A

MAXIMUM RATINGS

Resonator Voltage 385 volts
 Resonator Current 74 Ma
 Reflector Voltage 0 to -1000 volts

MECHANICAL CHARACTERISTICS

Cathode Oxide coated, unipotential
 Maximum Dimensions 3 x 1-15/16 x 1-3/4 in.
 Weight 7 oz
 Output Connector Bolts to UG-39/U flange
 or UG-40A/U choke for
 1 x 0.5 x 0.050 in. waveguide
 Base Molded, flexible leads, 18 inches long
 Mounting position Any
 Cooling Convection¹
 Shock Withstands up to 250 G
 Tuner Lock-nut²
 Microphonics Less than 500 kc³

ELECTRICAL CHARACTERISTICS

*Operation between 8500 and 10,500 Mc, Matched Load,
 Ef=6.3 volts*

	Resonator Voltage 350 volts			Mode 4 $\frac{3}{4}$
	Min.	Avg.	Max.	
Resonator Current	52	60		mA
Reflector Voltage (at 9.3 kMc)	-150			volts
Power Output	50	120		mW
Electronic Tuning Range ⁴	40	65		Mc
Modulation Sensitivity	1.0			Mc/V
Temperature Coefficient	-200	-60	+200	kc/°C
Warm-Up Time ⁵	15			sec.

NOTES:

1. Forced-air cooling required above 10 watts resonator power input.
2. Stops provided on low-frequency end.
3. At resonant peaks, a 10 G audio-frequency vibration may produce frequency modulation of as much as 2 Mc.
4. Between half-power points.
5. Before oscillation begins.

* Formerly designated VA-6314/V-290

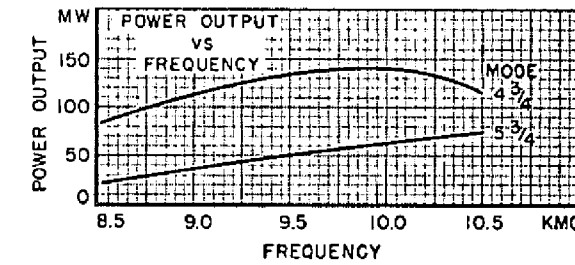
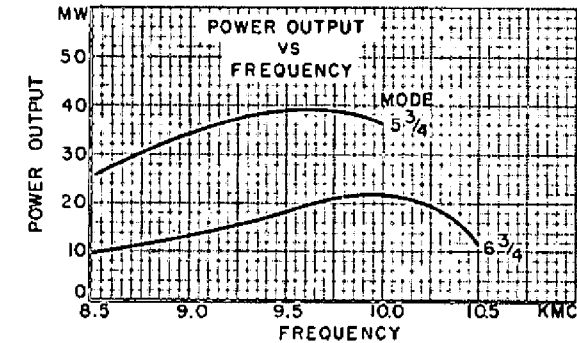
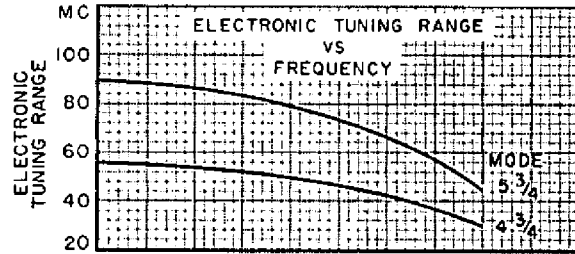
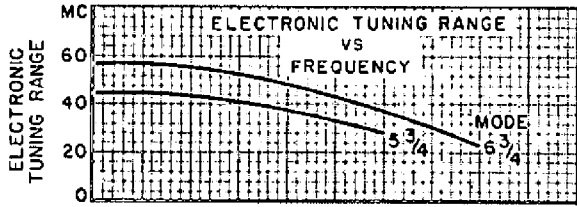
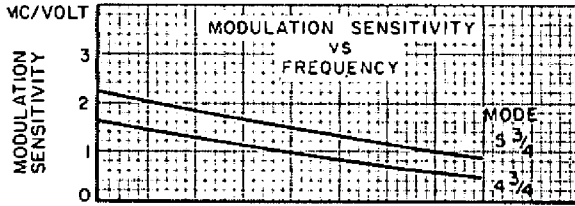
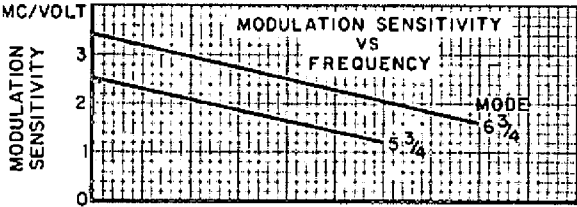
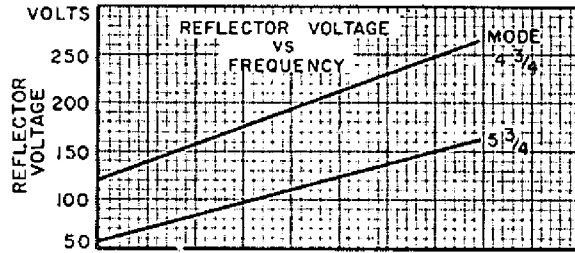
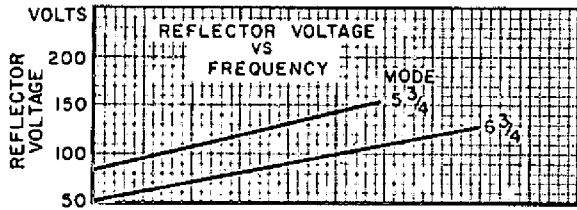
Additional operation and application information available upon request.

ALL CURVES ARE TYPICAL DATA

RESONATOR VOLTAGE = 200 V

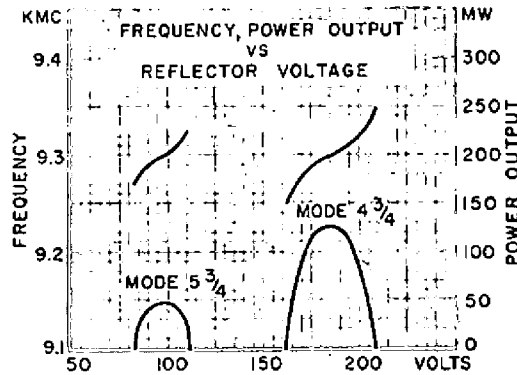
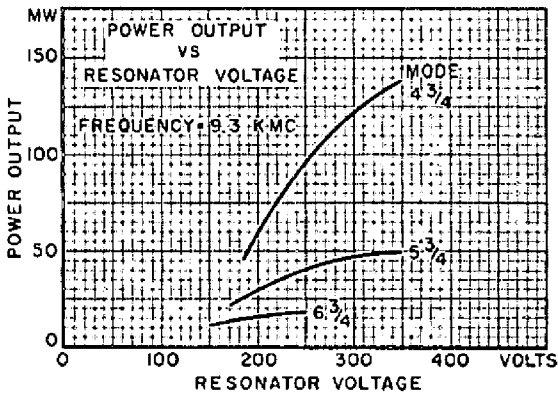
LOAD VSWR > 1.1

RESONATOR VOLTAGE = 300 V

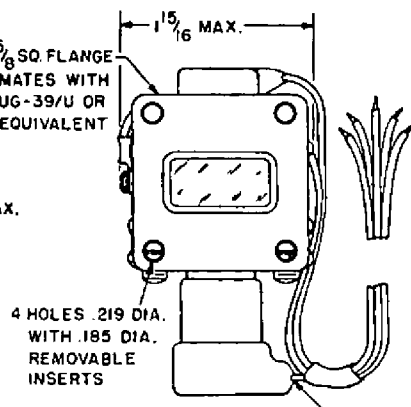
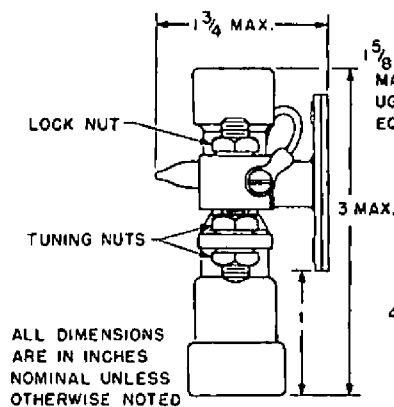


E_{RS} = 200 VOLTS

E_{RS} = 300 VOLTS



OUTLINE DRAWING
VA-6314
REFLEX KLYSTRON



- CABLE CONNECTIONS
- YELLOW - HEATER
 - WHITE - HEATER*
 - GREEN - CATHODE*
 - BROWN - BODY
 - GREY - REFLECTOR
 - *INTERNALLY CONNECTED



SPECIFICATION

VA-6313/V-280
 TYPE REFLEX KLYSTRON
 VA-6314/V-290

Description: Klystron, Integral Cavity, Tuner, Waveguide Output

Ratings:	Ef	Ers	Er	Ik	Tuner Plate Temp	Altitude Feet	Altitude Feet
Absolute	V	Vdc	Vdc	mAdc	°C	VA-6313/V-280	VA-6314/V-290
Maximum:	6.3+ 10%	385	0 to -1000	74	200	10,000	No Limit
Test Cond:	6.3	350	-50 to -300	----	Notes 1 & 2		
Dimensions:	As per outline				**Cathode: Coated Unipotential		

Ref.	Test	Conditions	Min.	Max.
3.1	Qualification Approval:	Required for JAN markings		
4.5	Holding Period:	t=168 hours		
4.9.5.1	*Torque:	Note 3		
4.9.18	*Carton Drop:	(d)Package Group 1 Carton Size N		
4.9.19	**Vibration(1):	Power Output (3) 10G; F=50 to 1000 cps t=5 min.		
4.9.19	Vibration(2):	Ers=200 Vdc; 10G; F=60 t=120; Note 4	Ir: 0	10 uAdc
4.9.20.5	**Shock:	Power Output(3) G=200		
4.10.8	*Heater Current:		If: 1.08	1.32 A
4.10.6.7.1	∕Total Reflector Current:	Notes 5 & 6	Ir: ----	3 uAdc
4.10.1.1	∕Emission:	Ef=5.7; Note 6	Δ Ik/Ik: ---	-15 %
4.10.4.6	Cathode Current:	Er(Mode 4)/max Po F=10,000 + .3% Mc	Ik: ----	60 mAdc
4.10.7.3.2	Tunable Frequency:		F; 8500	10,500 Mc
4.15.1	Power Output(1):	Er(Mode 4)/max Po F=8500 + .3%	Po: 50	---- mW

<u>Ref.</u>	<u>Test</u>	<u>Conditions</u>	<u>Min.</u>	<u>Max.</u>
4.15.1	Power Output(2):	Er(Mode 4)/max Po F=10,000 \pm .3% Mc	Po: 100	--- mW
4.15.1	*Power Output(3):	Ers=200 Vdc; Er (Mode 6)/max Po; F=9300 \pm .3% Mc	Po: 8	--- mW.
4.10.5.4	Reflector Voltage(1):	Power Output(1)	Er: -85	-145 Vdc
4.10.5.4	Reflector Voltage(2):	Power Output(2)	Er: -170	-255 Vdc
4.10.5.4	*Reflector Voltage(3):	Power Output(3)	Er: -40	-110 Vdc
4.15.3	*Electronic Tuning Range(1):	Mode 4; 50% max Po F=8500 to 10,000 Mc Note 7	ΔF : 40	--- Mc
4.15.3	*Electronic Tuning Range(2):	Mode 6; 50% max Po F=9300; Ers=200 v Note 7	ΔF : 35	--- Mc
--	*Modulation Sensitivity:	Power Output(3) $\Delta F = \pm 2.5$ Mc max	Coeff: 2.0	4.0 Mc/V
4.15.5	**Temperature Compensation:	Power Output(3) TA = -10 to +40°C	Coeff: --	.20 Mc/°C
--	**Frequency Modulation:	Power Output (2) Er=5.7 to 7.0 Vdc	ΔF : --	.1 Mc
4.11	Life Test:	Group C Power Output(3)	t: 500	--- hrs
4.11.4	Life Test End Point:	Power Output(1) Reflector Current t=5 min.	$\Delta P_o/P_o$: 0 Ir: --	-20 % 10 uAde

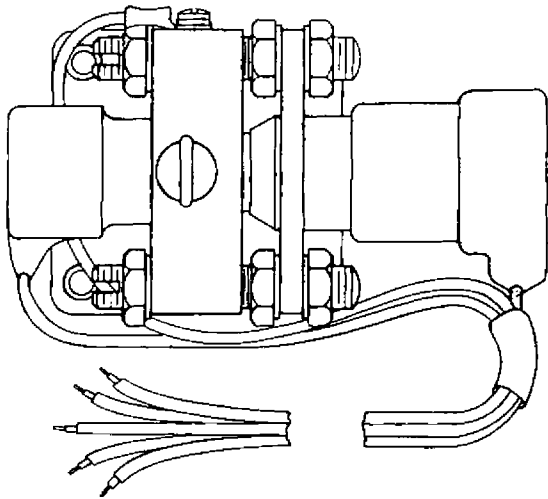
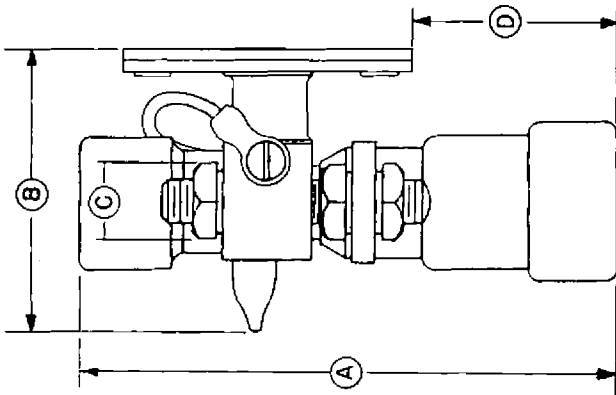
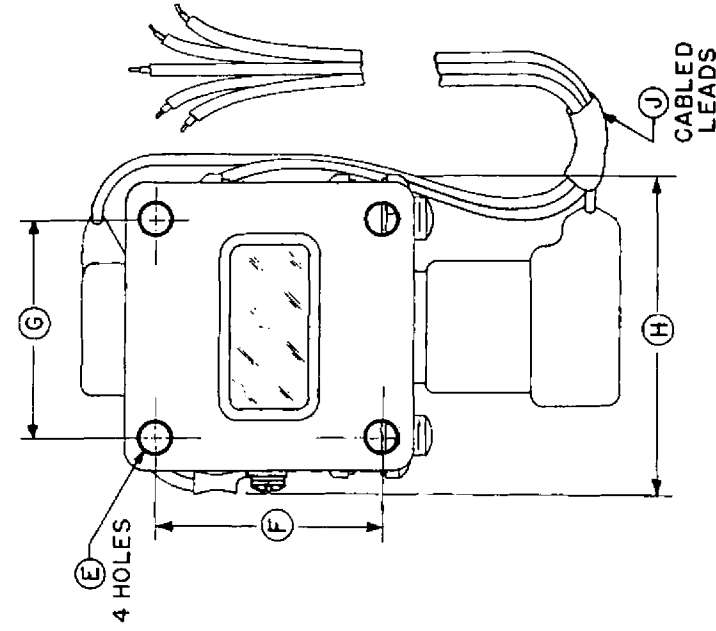
References are to paragraphs in "Military Specifications for Electron Tubes MIL-E-1B".

Note 1: All oscillation tests except vibration test shall be made with the tube rigidly connected to a UG39/U flange on appropriate RG52/U waveguide equipment and the load VSWR for the tube shall be less than 1.1. Forced air cooling is required for power inputs above 10 watts.

Note 2: Temperature of base and cap of VA-6313/V-280 should not exceed 120°C.

Note 3: Not applicable to VA-6314/V-290.

- Note 4: The reflector current shall be recorded with a Brush Model BL202 recorder or equivalent. There shall be no reflector current bursts greater than the limits shown.
- Note 5: After two minutes with all voltages applied, total reflector current shall not exceed the specified limits.
- Note 6: The tube shall not be oscillating during the test.
- Note 7: The power output shall have no discontinuities between half-power points for either direction of reflector voltage change.



CABLE CONNECTIONS

- YELLOW — HEATER
- WHITE — HEATER } INTERNALLY CONNECTED
- GREEN — CATHODE
- GREY — REFLECTOR
- BROWN — BODY

REF.	DIMENSIONS
*A	3.00 MAX.
B	1.813 MAX.
**C	.438 NOM.
**D	1.00 MAX.
*E	.219 DIA. NOM. WITH .185 DIA. NOM. REMOVABLE INSERTS
F	1.284 MAX. 1.276 MIN.
G	1.224 MAX. 1.216 MIN.
**H	1.9 MAX.
*J	18 NOM.

NOTE: Eyelet-type inserts in the flange mounting holes are 0.219 O.D., 0.185 I.D., nominal, and are easily removable from rear of flange. With inserts in place, the mounting holes provide clearance for #8 screws. With inserts removed, the mounting holes permit use of insulating bushings where d-c isolation between tube flange and waveguide system is desired.

SPECIFICATION DRAWING VA-6314/V-290 REFLEX KLYSTRON