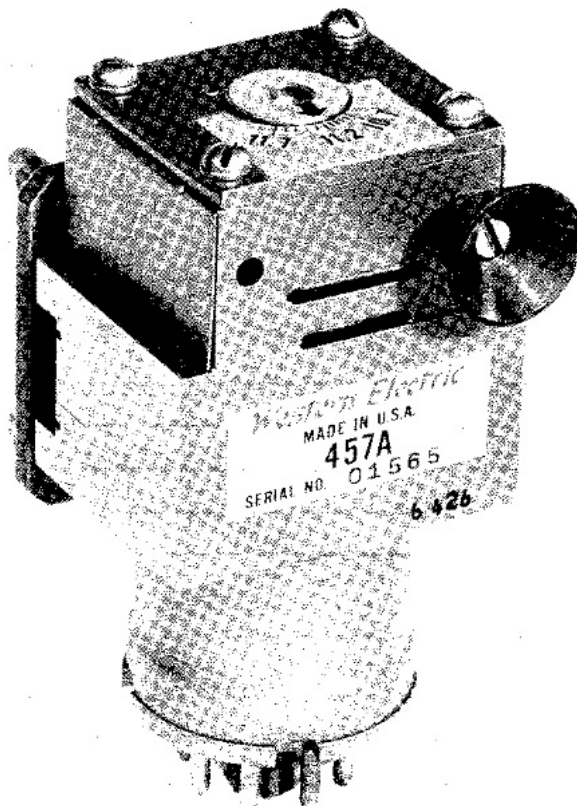


ELECTRON TUBE DATA SHEET
WESTERN ELECTRIC 457 A ELECTRON TUBE



DESCRIPTION

The 457A is a reflex klystron designed to operate as the transmitting microwave power source or as the receiver local oscillator in short haul radio relay systems in the 10.7 Gc to 11.7 Gc common carrier band. The tube has a waveguide output system and is designed to be cooled with a liquid-vapor cooling system.

CHARACTERISTICS

Heater Voltage	6.3 V
Resonator Voltage	400 Vdc
Reflector Voltage	-100 Vdc
Power Output (Min.)	100 mW

MAXIMUM RATINGS, Absolute System

	Symbol	Min.	Max.	Units
Heater Voltage	E_h	5.8	6.8	V
Resonator Voltage	E_{rs}	-	600	Vdc
Reflector Voltage	E_r	-50	-400	Vdc
Cathode Current	I_k	-	75	mAdc
Heater-Cathode Voltage	E_{hk}	-	±50	v
Body Temperature	T_E	-	130	C
Reflector Circuit Resistance	R_r	-	5×10^5	ohm

MECHANICAL DATA

Cathode	Unipotential
Mounting Position	Any
Output	0.400" x 0.900" Waveguide
Dimensions and Pin Connections	See Outline Drawing

ELECTRICAL CHARACTERISTICSOperating Conditions (See Notes 1, 2 & 3)

	Symbol	Nominal	Units
Heater Voltage	E_h	6.3	V
Resonator Voltage	E_{rs}	400	Vdc
Reflector Voltage (See Note 4)	E_r	-80 to -165	Vdc

Operating Characteristics

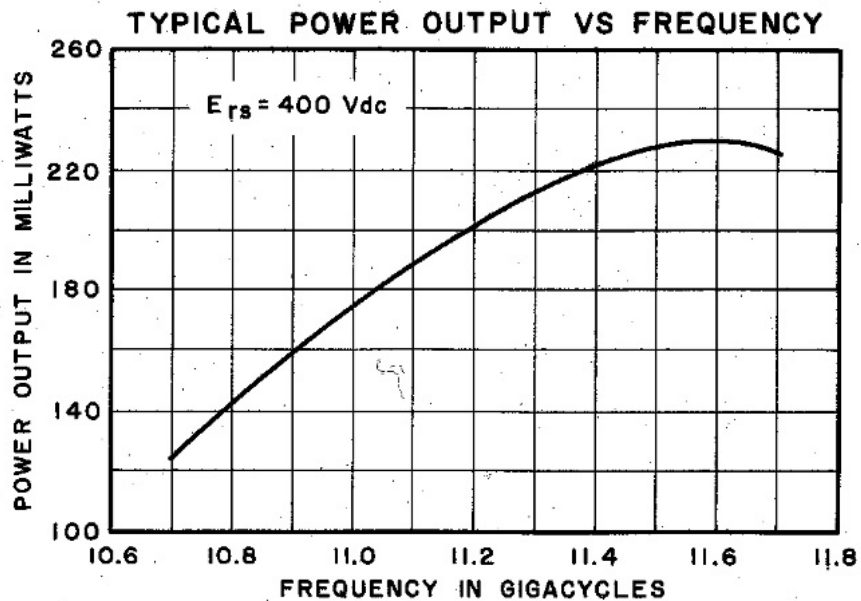
	Symbol	Min.	Typ.	Max.	Units	
Heater Current	I_h	0.82	0.88	0.94	A	
Cathode Current	I_k	34	41.5	47	mAdc	
Power Output (See Note 5)	P_o	100	Fig.1	-	mW	
Electronic Tuning Range @	10.7 Gcs	ΔF	80	115	155	Mc
	11.7 Gcs	ΔF	50	80	115	Mc
Reflector Modulation Sensitivity @	10.7 Gcs	$\Delta F/\Delta E_r$	1.5	-	3.2	Mc/V
	11.7 Gcs	$\Delta F/\Delta E_r$	1.5	2.0	3.2	Mc/V
Thermal Coefficient (See Note 3)	$\Delta F/\Delta T$	-	-0.06	±0.15	Mc/F	

Note 1: Operation at or near maximum values will result in decreased life. Operation near typical values is recommended.

Note 2: The following turn-on procedure is recommended:

- a. Apply heater voltage and wait ten minutes.
- b. Apply reflector voltage.
- c. Apply resonator voltage.

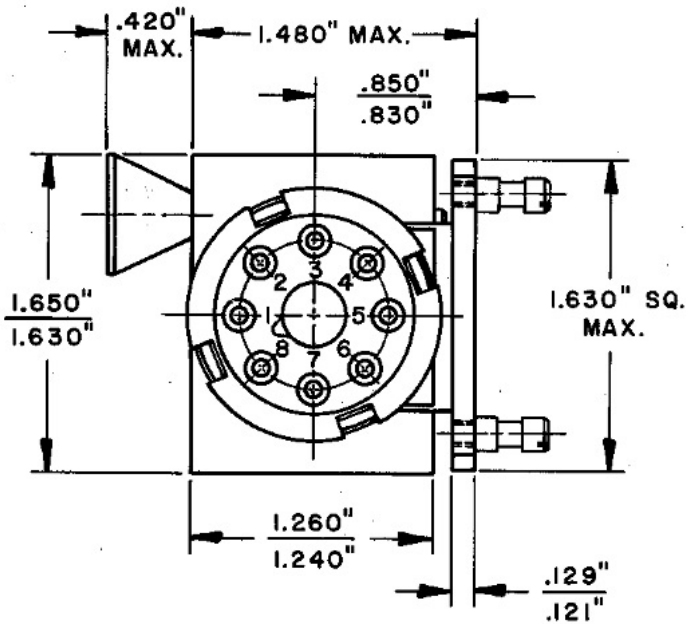
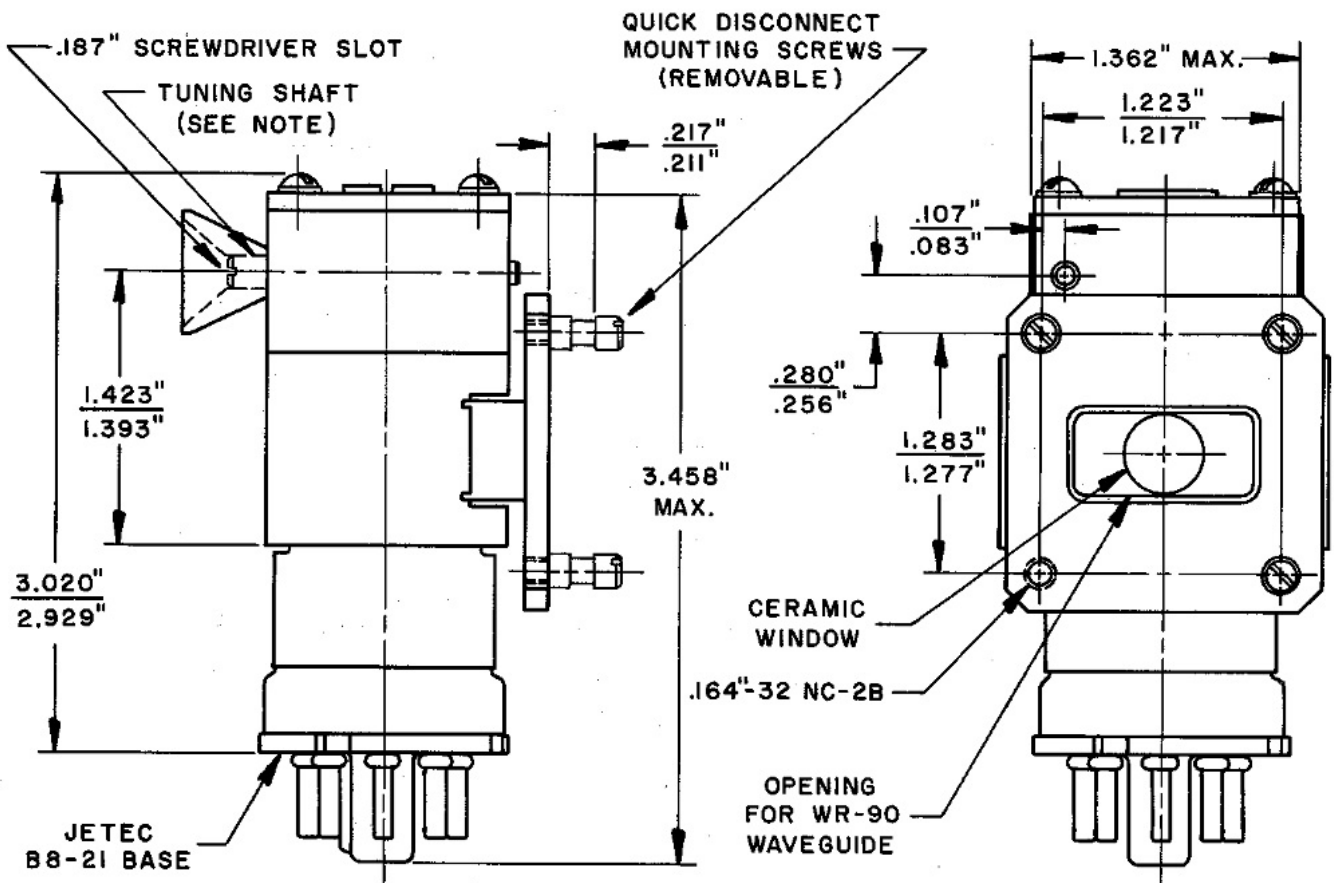
CAUTION-Resonator voltage must never be applied unless there is at least -50 volts on the reflector.



Note 3: This tube is designed to operate in conjunction with a liquid-vapor cooling system. A flat copper face is provided on both sides of the body so the tube may be clamped to either side of a cooling boiler. The thermal coefficient is defined as the change in frequency with respect to a change in body temperature.

Note 4: Reflector voltage is that voltage, measured from cathode to reflector, which produces maximum power at the frequency to which the tube is mechanically tuned.

Note 5: The tube to be operated into a load having a VSWR less than 1.05:1. Oscillation to be in the $3\frac{3}{4}$ mode with the reflector voltage peaked to produce optimum power output. Operation in the proper mode is assured when the reflector voltage has a value between -80 and -165 volts.



PIN CONNECTIONS

- | | |
|------------------|------------------|
| 1. RESONATOR | 5. NO CONNECTION |
| 2. HEATER | 6. NO CONNECTION |
| 3. REFLECTOR | 7. HEATER |
| 4. NO CONNECTION | 8. CATHODE |

NOTE:

APPROXIMATELY TEN TURNS OF TUNING SHAFT REQUIRED FOR FULL TUNING RANGE.

A development of Bell Telephone Laboratories, the research laboratories of the American Telephone and Telegraph Company and the Western Electric Company.