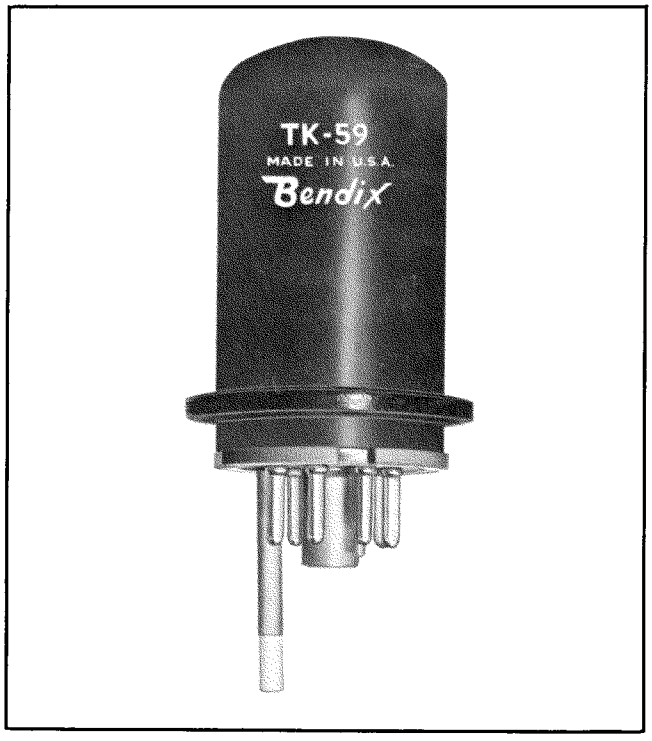
6845
Bendix Type TK-59

REFLEX KLYSTRON

(THERMALLY TUNED)



MAXIMUM RATINGS

(ABSOLUTE VALUES)

Resonator Voltage	350 volts D.C.
Reflector Voltage	—350 volts D.C.
Filament Voltage	6.3 ± 8% volts
Gun Cathode Current	32 ma. D.C.
Diode Plate Dissipation	*see note below
Diode Voltage	—350 volts D.C.

*Note: Power inputs as high as 16.5 watts may be applied to the diode when the frequency of the klystron is above 8500. Tuner power in excess of 10 watts may permanently damage the tuning structure, if applied when the tube is tuned below 8500 Mc.

PHYSICAL CHARACTERISTICS

- *Base:* Small octal 8-pin, B8-21, Low Loss Phenolic Wafer, Modified for coaxial output lead as shown on outline drawing.
- *Coupling to Wave Guide:* Fits standard JAN 2K25 transducer.
- *Cooling:* Convection.
- *Mounting Position:* Any.
- *Cavity:* Integral with tube.
- *Bulb:* Metal.
- Externally biased reflector shield allowing tube to be pulsed with minimum frequency modulation.

DESCRIPTION

The 6845 (Bendix® Type TK-59) tube is a ruggedized, low voltage, thermally tuned X-band reflex klystron, designed for use over a frequency range of 8500 to 9660 Mc/sec. Thermal tuning of the klystron is accomplished by means of a diode included within the vacuum envelope, the plate of which comprises one wall of the klystron cavity. As diode voltage, and hence current, is increased, expansion of the plate results in corresponding changes in the klystron cavity gap space causing the tube to tune.

With the exception of the diode tuner, the 6845 may be considered as a ruggedized version of the 2K45. It is also similar in electrical characteristics to the type 6116 (Bendix Type TK-39) with the exception that it is capable of pulse operation with minimum frequency modulation. Physical dimensions are comparable to those of the 6116 and 2K45.

The ruggedization feature of the tube permits it to be operated under severe vibration environments without sacrifice of frequency stability. Under vibration conditions of 10g acceleration at 50 cycles, the maximum frequency variation is ± 1.3 Mc./sec.

The tube has coaxial output as shown in the accompanying photograph and outline drawing, and is coupled to the waveguide circuit through a transducer identical to that used for the type 2K45, 2K25 and 6116 klystrons. Details of this transducer can be found in the Military Number 227 JAN specification sheet.

TYPICAL OPERATING CONDITIONS

Frequency	8500 to 9660 Mc./sec.
Resonator Voltage	300 volts D.C.
Reflector Voltage @ 9660 Mc./sec.	—95 to —145 volts D.C.
Filament Voltage	6.3 ± 8% volts
Gun Cathode Current	32 mA D.C. (max.)
Tuner Diode Current	5 to 36 ma (D.C.)
Tuner Diode Voltage	170 to 275 volts D.C.

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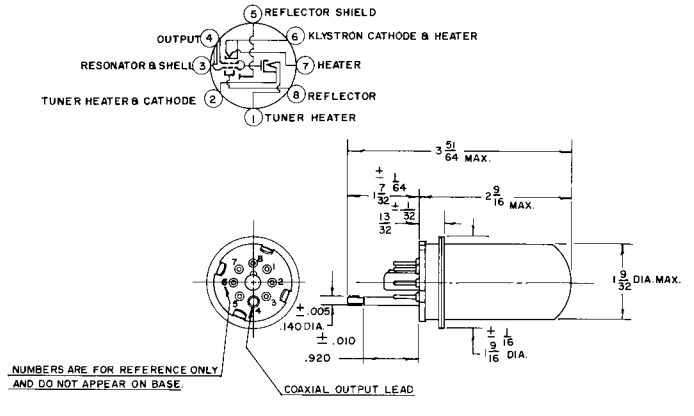
Bendix Type TK-59

6845

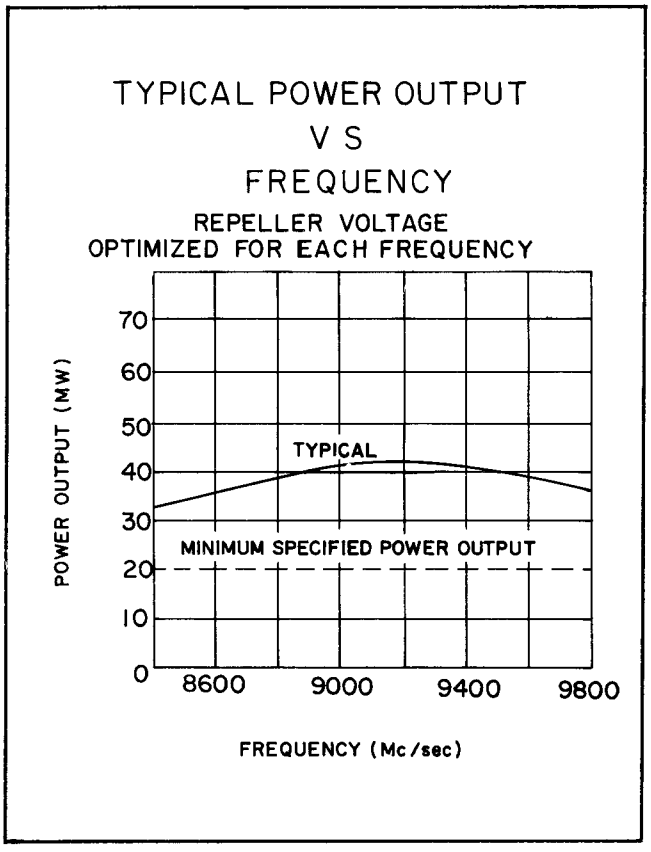
ELECTRICAL CHARACTERISTICS & TEST CONDITIONS

Test Conditions and Specification Limits

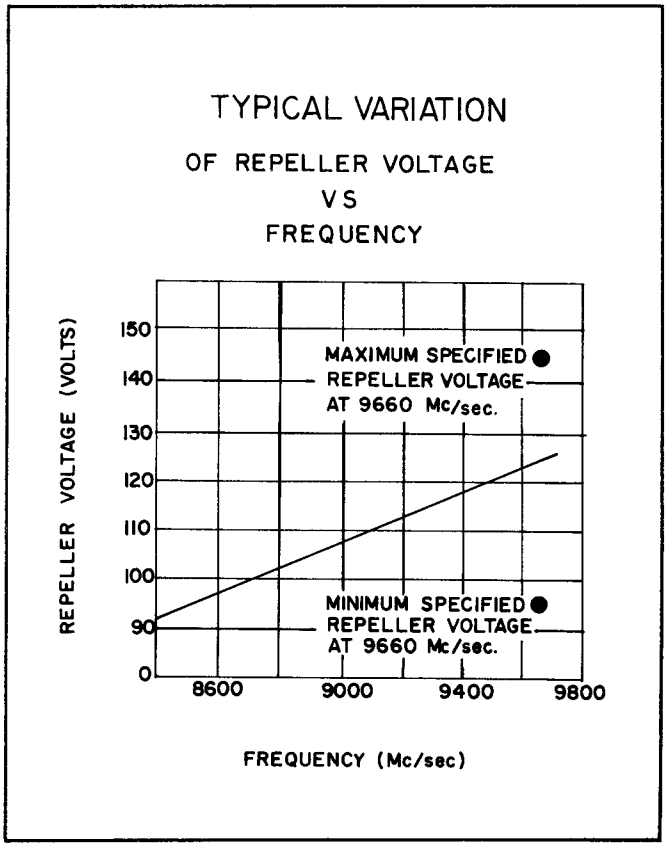
TEST	CONDITIONS	SYMBOL	LIMITS MIN.	LIMITS MAX.	UNITS
PRODUCTION TESTS:					
Total Reflector Current	Er = −150 Vdc t = 120 sec. (min)	Ir:	—	5.0	μAdc
Reflector Leakage:	Er = −150 Vdc	Ir:	—	3.0	μAdc
Reflector Gas Current:	Er = −150 Vdc	Ir:	—	2.0	μAdc
Cathode Current (1):	Er = −150 Vdc	Ikl:	—	32	mAdc
Reflector Voltage:	Er (Mode A)/Max. Po @ 9660 ± 0.3% Mc.	Er:	−95	−145	Vdc
Thermal Tuning Range:	Ef = 5.8 V				
	Er (Mode A)/Max. Po	Max. F:	9660	—	Mc
	Pp = 1.0 to 9.0 watts	Min. F:	—	8500	Mc
Bump:	Ef = 5.8; Er (Mode A)/Max. Po @ 9660 ± 0.3% Mc.	△Po/Po:	—	0.10	
Emission (1):	Ef = 5.8; Er = −150 Vdc	△Ik1/Ik1:	—	0.15	
Emission (2):	Ef = 5.8; Ik2 = 20 mA	△Ik2/Ik2:	—	0.10	
Thermal Tuning Time (1):	F = 9660 to 8500 Mc.	t:	0.7	3.0	sec.
Thermal Tuning Time (2):	F = 8500 to 9660 Mc.	t:	0.7	3.0	sec.
Vibration:	Er (Mode A)/Max. Po at 9080 Mc; Total displacement = 0.080" F = 50 cps, Position Y1 only	F:	—	±1300	Kc
Power Output:	Ef = 5.8; F from 8500 to 9660 Mc.	Po:	20	—	mW
DESIGN TESTS:					
Electrode Insulation:	300 Vdc Tube Cold	Rk1-rs:	2.0	—	Meg.
		Rk2-rs:	2.0	—	Meg.
Heater Current (1):		If1:	465	570	mA
Heater Current (2):		If2:	720	880	mA
Tuner Diode Voltage Drop (1):	Ik2 = 10 mAdc	ED:	170	218	Vdc
Tuner Diode Voltage Drop (2):	Ik2 = 28 mAdc	ED:	225	274	Vdc
Tuner Diode Voltage (1):	F = 9660 ±0.3% Mc. Er (Mode A)/Max. Po	ED:	170	230	Vdc
Tuner Diode Voltage (2):	F = 9080 ±0.3% Mc. Er (Mode A)/Max. Po	ED:	200	260	Vdc
Tuner Diode Voltage (3):	F = 8500 ±0.3% Mc. Er (Mode A)/Max. Po	ED:	220	275	Vdc
Tuner Diode Current (1):	F = 9660 ±0.3% Mc. Er (Mode A)/Max. Po	Ik2:	5	19	mA
Tuner Diode Current (2):	F = 9080 ±0.3% Mc. Er (Mode A)/Max. Po	Ik2:	13	28	mA
Tuner Diode Current (3):	F = 8500 ±0.3% Mc. Er (Mode A)/Max. Po	Ik2:	20	36	mA
Electrical Tuning Range:	Er (Mode A)/50% Max. Po: F from 8500 to 9660 Mc.	F:	45	—	Mc.



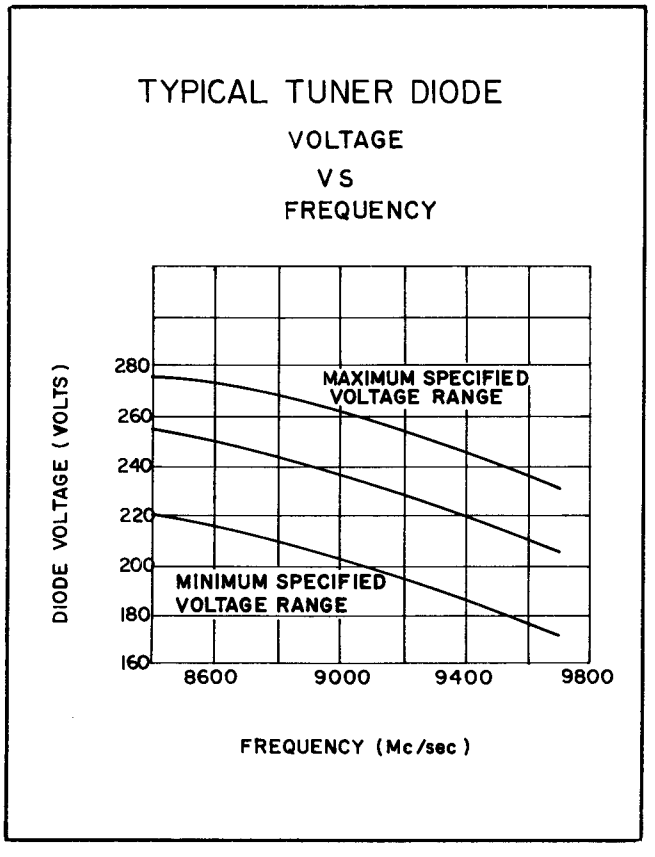
AVERAGE CHARACTERISTICS



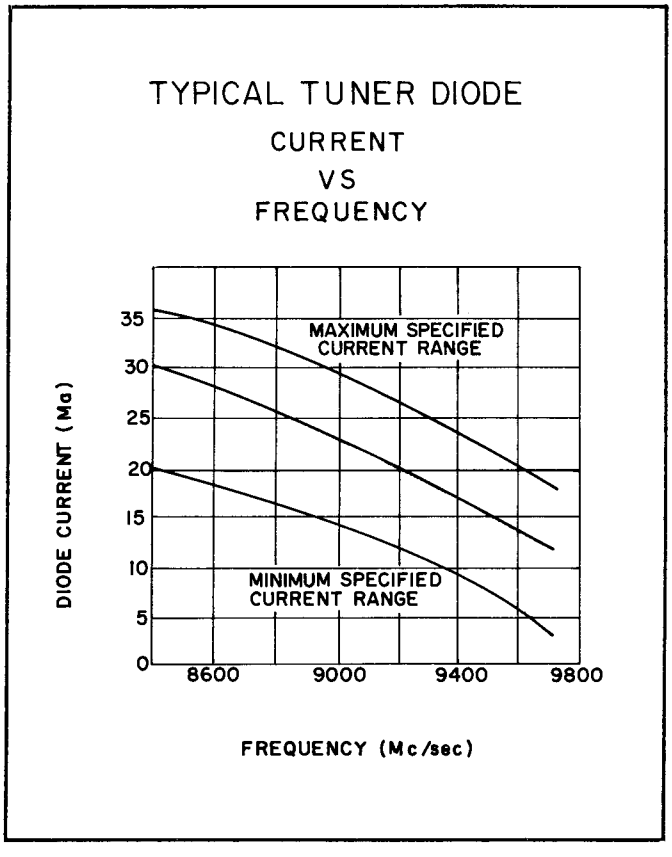
POWER OUTPUT VS FREQUENCY
REPELLER VOLTAGE OPTIMIZED FOR EACH FREQUENCY



REPELLER VOLTAGE VS FREQUENCY

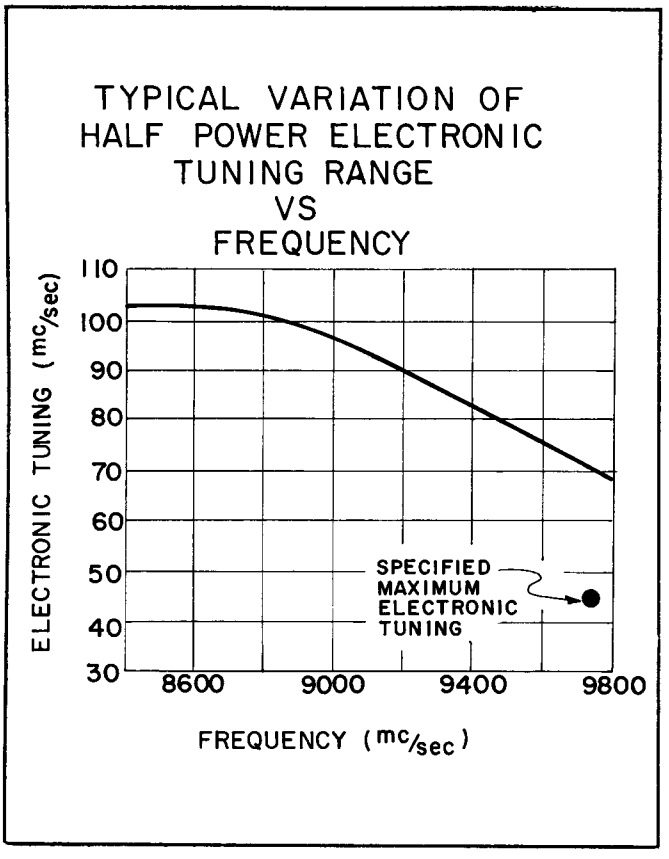


TUNER DIODE VOLTAGE VS FREQUENCY

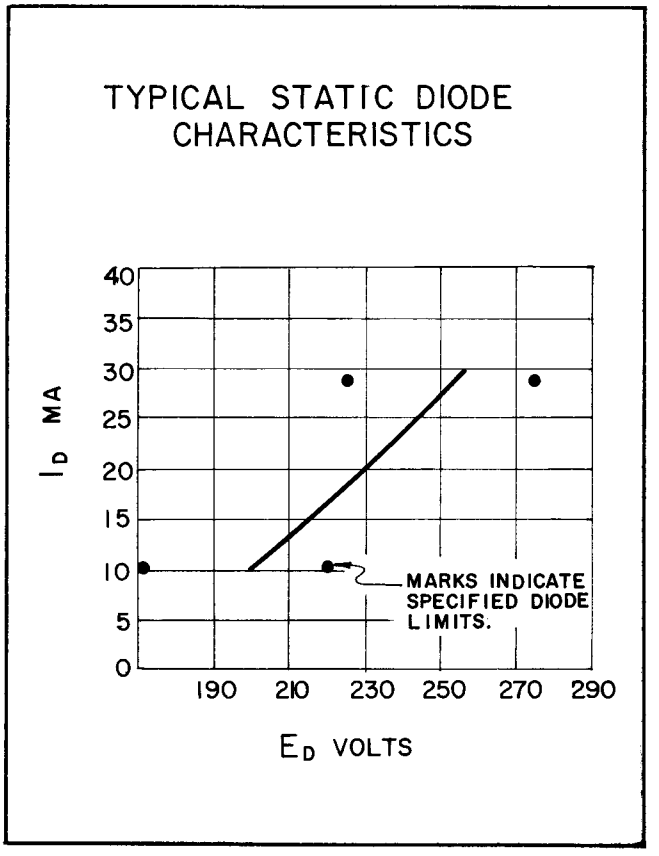


TUNER DIODE CURRENT VS FREQUENCY

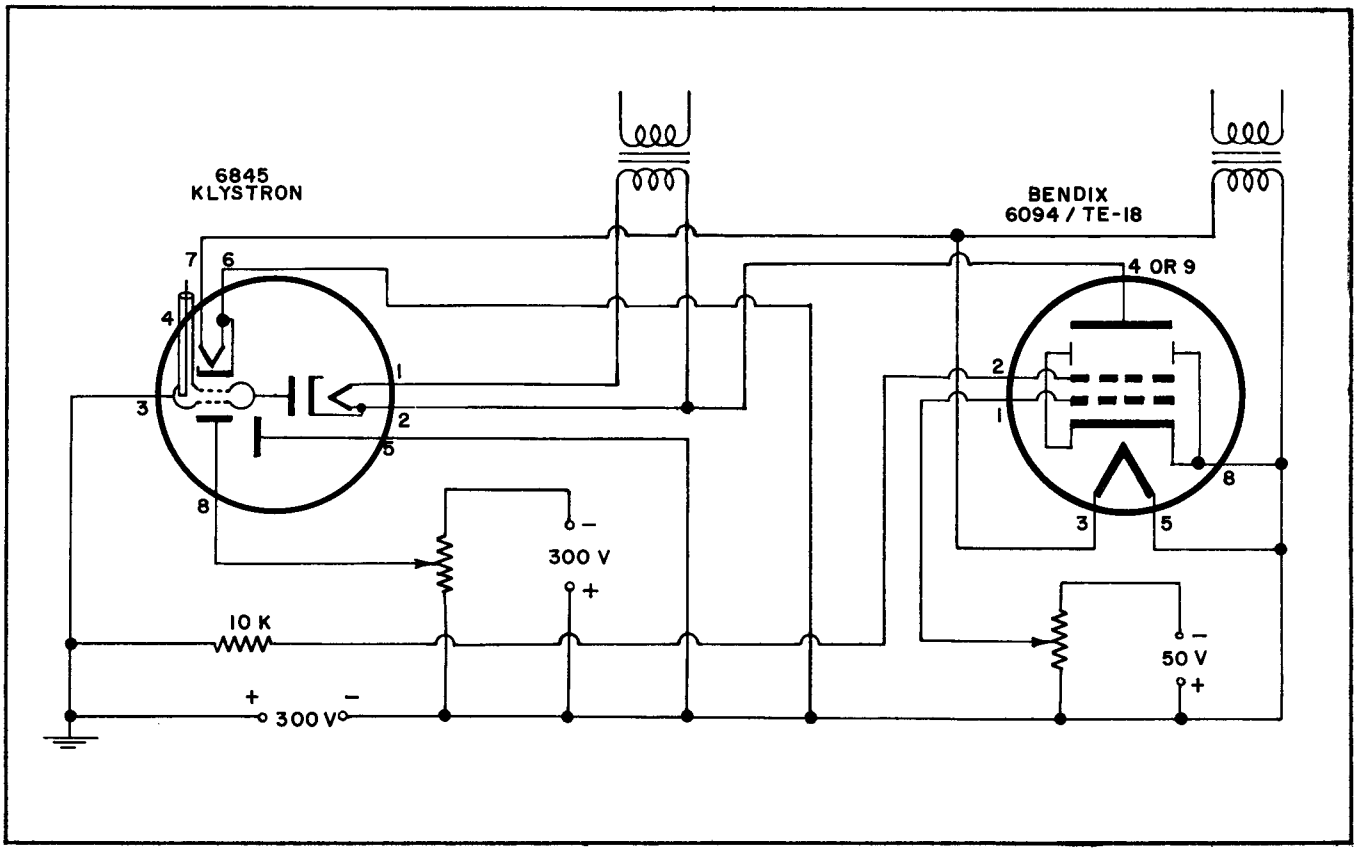
AVERAGE CHARACTERISTICS



HALF POWER ELECTRONIC TUNING RANGE VS FREQUENCY



STATIC DIODE CHARACTERISTICS



CONTROL CIRCUIT FOR TUNING DIODE