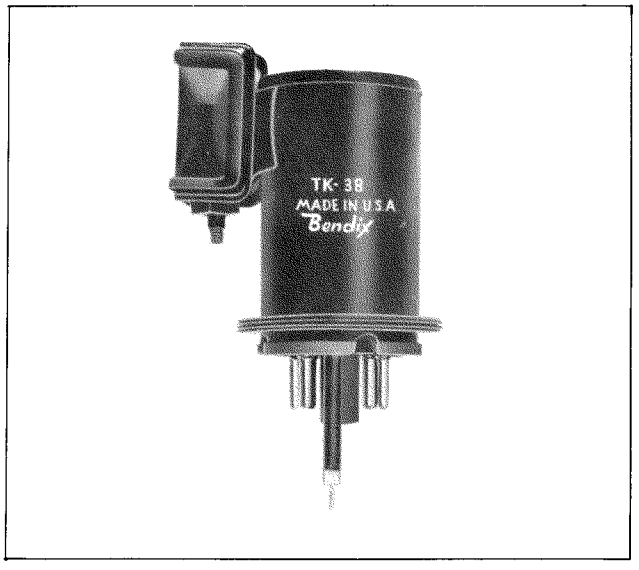
Bendix Type TK-38

REFLEX KLYSTRON

(MECHANICALLY TUNED)



MAXIMUM RATINGS

(ABSOLUTE VALUES)

Resonator Voltage	330 Vdc
Reflector Voltage	— 300 Vdc
Filament Voltage	6.3 ± 8% volts
Resonator Current	35 mAdc
Heater — Cathode Voltage	± 50 Vdc

PHYSICAL CHARACTERISTICS

- *Dimensions:* Refer to the outline drawing.
- *Base:* Modified Small Octal 8-Pin, B8-21, Low Loss Phenolic.
- *Output Coupling:* Coaxial. (See Typical Adapter Assembly Drawing.)
- *Cooling:* Convection.
- *Mounting Position:* Any.
- *Bulb:* Metal.
- *Tuner:* Allen Socket Screw for #8 Allen Wrench.

DESCRIPTION

The Bendix® Red Bank Type TK-38 Tube is a mechanically tuned C band reflex oscillator. The electrical characteristics of the TK-38 have been designed to be similar to the type 6115, with the exception that the repeller voltage variation with frequency has been reduced. The tube is designed for use as a CW oscillator over the range of 5100 Mc./sec. to 5900 Mc./sec. The tube is capacitively tuned over this frequency range by changing the interaction gap spacing.

The design is such as to exhibit no spurious oscillation modes when the output connecter is properly terminated.

The electron optics of the tube have been designed to reduce electrical hysteresis to a minimum.

The mechanical tuner design eliminates long mechanical and thermal paths external to the tube structure as well as the use of overstressed diaphragms; hence, mechanical tuning hysteresis is virtually eliminated. In addition, the cavity diaphragm is completely contained within the vacuum enclosure thus eliminating frequency sensitivity to atmospheric pressure as present in tubes having the diaphragm as a part of the vacuum enclosure.

Output coupling is accomplished by means of a coaxial output lead. The output line may be coupled into a coaxial system or directly into a waveguide mount by means of the Typical Adaptor Assembly drawing shown on the last page. This adaptor is the same as the one used for the JAN-2K29.

APPLICATION NOTES

This tube is designed to have improved temperature and altitude characteristics, fast warm-up, stabilized warm-up frequency drift, and reduced repeller voltage variation with frequency. The tube is applicable for use in equipments operating in widely varying ambient temperatures, varying atmospheric pressures and in intermittent operation. Such applications include airborne radar systems, telemetering and microwave relay links. In addition, the reduced repeller voltage vs. frequency characteristic makes possible savings in components for an afc system with given characteristics.

THE Bendix CORPORATION
Red Bank DIVISION, EATONTOWN, NEW JERSEY

Publication No. R811-19 (Supersedes No. R58-3)

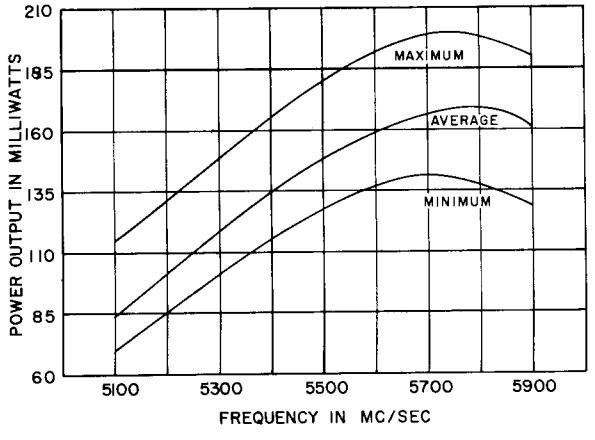
Printed in U.S.A.

REFLEX KLYSTRON
(MECHANICALLY TUNED)

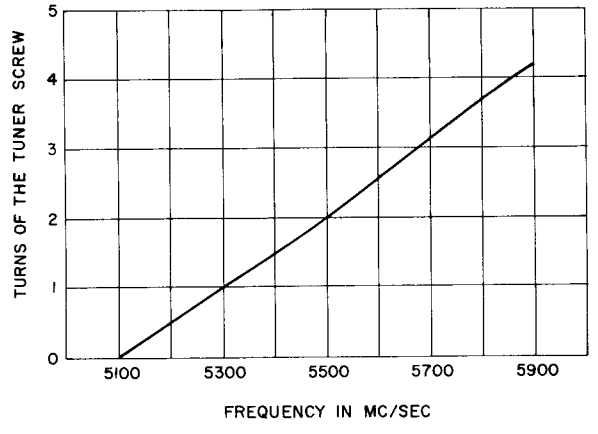
Bendix Type TK-38

AVERAGE CHARACTERISTICS

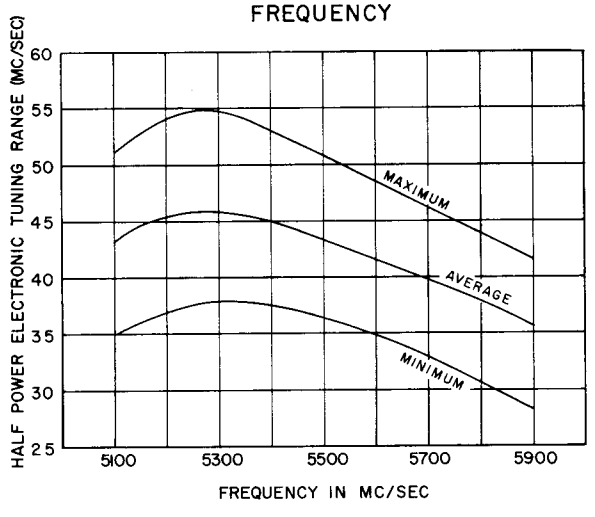
TYPICAL POWER OUTPUT
VS
FREQUENCY
(REPELLER VOLTAGE
OPTIMIZED FOR EACH FREQUENCY)



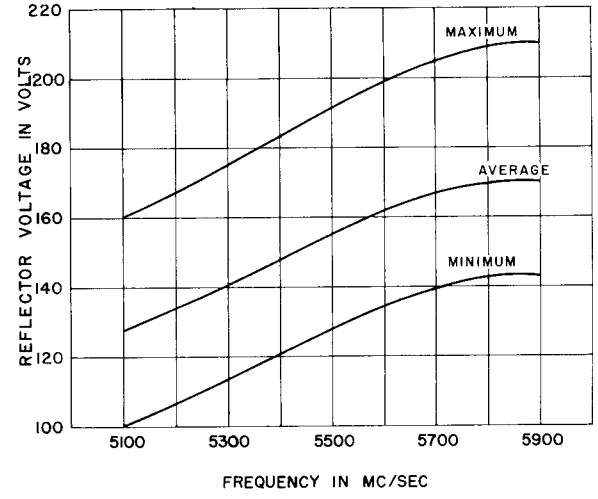
TURNS OF TUNER SCREW
VS
FREQUENCY



TYPICAL VARIATION OF HALF POWER
ELECTRONIC TUNING RANGE
WITH
FREQUENCY



TYPICAL VARIATION
OF REPELLER VOLTAGE
WITH FREQUENCY



REFLEX KLYSTRON
(MECHANICALLY TUNED)

Bendix Type TK-38

ELECTRICAL CHARACTERISTICS & TEST CONDITIONS

Test Conditions and Specification Limits

TEST	CONDITIONS	SYMBOL	LIMITS MIN.	LIMITS MAX.	UNITS
PRODUCTION TESTS					
Total Reflector Current	Er = −100 Vdc	Ir	—	7	uAdc
Reflector Leakage Current	Er = −100 Vdc	Ir	—	5	uAdc
Reflector Gas Current	Er = −100 Vdc	Ir	—	2	uAdc
Bump	Test Conditions; Er/max Po	△ Po/Po	—	0.10	
Resonator Current	Test Conditions; Er = −100 Vdc	Irs	—	32	mAdc
Mechanical Tuning Range	Er/max Po	F min	—	5100	Mc
		F max	5900	—	Mc
Power Output (1)	F = 5100 Mc; Er/max Po	Po	70	—	mW
Reflector Voltage (1)	F = 5100 Mc; Er/max Po	Er	−100	−160	Vdc
Reflector Voltage (2)	F = 5900 Mc; Er/max Po	Er	−140	−210	Vdc
Electronic Tuning (2)	F = 5900 Mc; Er/50% Po	△ F	28	—	Mc
Emission	Ef = 5.8 V	△ Ik/Ik	—	0.15	
Life Test	Test Conditions	t	500	—	hrs
Life Test End Points	Power Output; F = 5900; Er/max Po	Po	80	—	mW
DESIGN TESTS:					
Insulation	Ehk ±45 Vdc		—	100	uAdc
Electrode Insulation	500 Vdc; Tube Cold	Rk-rs	2	—	Meg
		Rk-rs	2	—	Meg
Vibration Non-Operating*	F = 10 −55 −10, Peak to Peak Excursion .065"				
	F = 55 −300 −55, G = 10				
Heater Current	Test Conditions		450	550	mA
Power Output (2)	F = 5900 Mc; Er/max Po	Po	120	—	mW
Electronic Tuning (1)	F = 5100 Mc; Er/50% Po	△ F	34	—	Mc
Hysteresis	Test Conditions; Er/max Po	Ratio	—	0.05	
Modulation Sensitivity	Test Conditions; Er/max Po; △ Er = ±3 V	△ F/△ Er	0.61	1.2	Mc/V
Resonator Voltage Sensitivity	Test Conditions; Er/max Po; △ Ers = 20v p to p ac	△ F/△ Ers	—	0.320	Mc/V

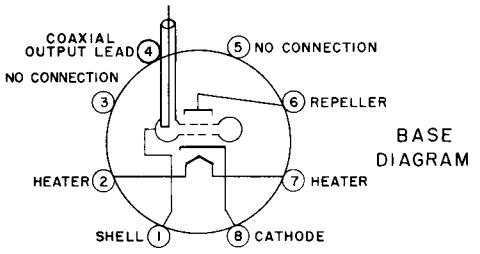
TEST CONDITIONS:

	Ef.	Eres.	Er	Irs	Ehk	F
	6.3 volts	300 Vdc	Adjust Vdc	25 mAdc	0	5500 Mc

*Tube is mechanically pretuned to 5100 Mc. Vibration tests are conducted on a cyclic basis for nine five minute periods in each of three mutually perpendicular planes. The tube must be capable of meeting all production tests after completion of the vibration tests.

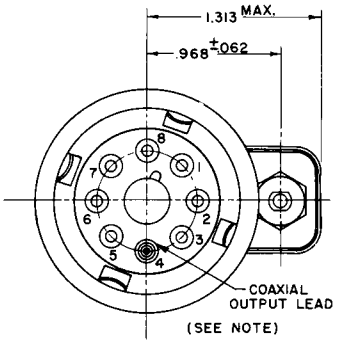
REFLEX KLYSTRON
(MECHANICALLY TUNED)

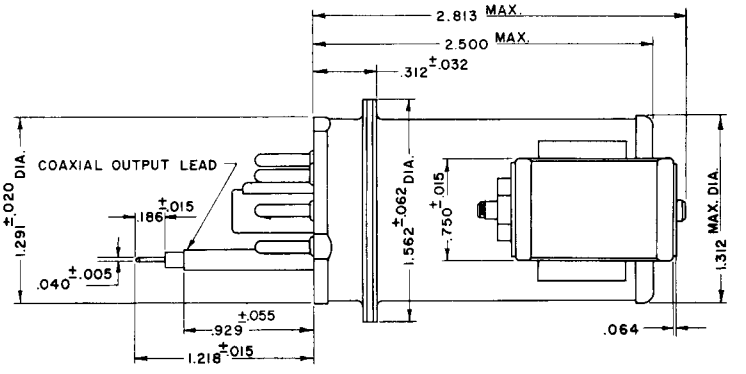
Bendix Type TK-38



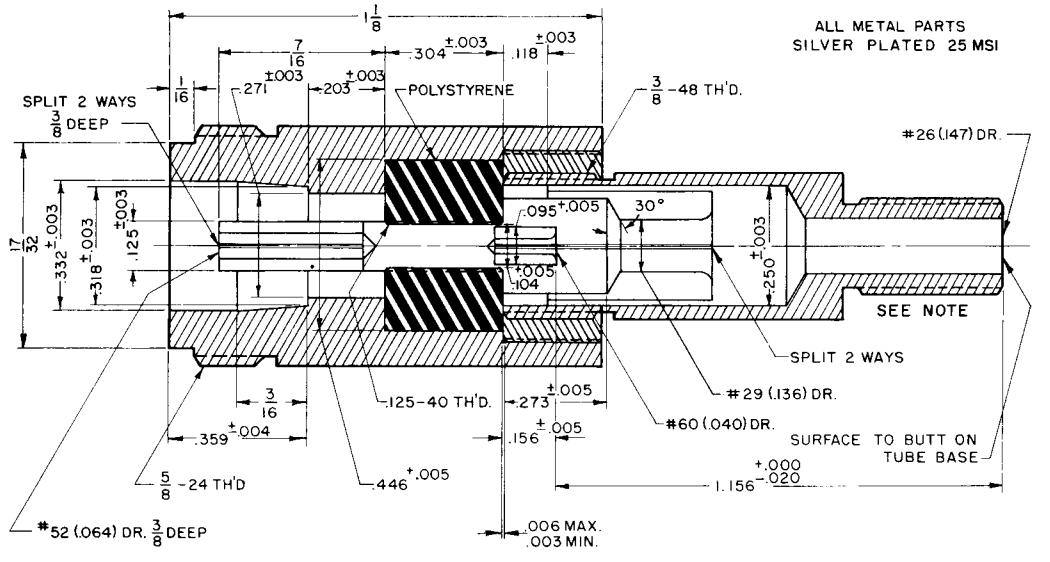
BASE DIAGRAM

NOTE:
NUMERALS ARE FOR REFERENCE ONLY AND DO NOT APPEAR ON TUBE BASE.





NOTE: SAME AS BENDIX RED BANK PART NO. RT-1738



ALL METAL PARTS
SILVER PLATED 25 MSI

COAXIAL OUTPUT ADAPTOR

THE **Bendix** CORPORATION
Red Bank Division, EATONTOWN, NEW JERSEY

West Coast Sales & Service: 117 E. Providencia Ave., Burbank, Calif.
Export Sales & Service: Bendix International Division,
205 E. 42nd St., New York 17, N.Y.
Canadian Distributor: Computing Devices of Canada, Ltd., P.O. Box 508,
Ottawa 4, Ontario