JEDEC TYPE 7976
SPONSOR Western Electric Co.

JEDEC TYPE DESIGNATION
REGISTRATION FOR PULSED MAGNETRON

GENERAL CHARACTERISTICS

The 7976 is a pulsed magnetron oscillator tube which operates at a tunable frequency of 13600 to 15600 Mc. The peak power output is approximately 135 kilowatts and the tube is forced-air cooled. The tube uses an integral magnet. Special vibration resistant design features minimize vibration induced frequency modulation.

GENERAL ELECTRICAL DATA

Pre-heat Heater Voltage	12.6 ± 5% volts
Pre-heat Heater Current at 12.6 Volts	3.25 ± 0.25 amperes
Minimum Pre-heat Time	270 seconds
Heater Cold Resistance (approx.)	0.4 ohm
Anode-Cathode Capacitance (nominal)	14 μμf

RATINGS, ABSOLUTE SYSTEM

Heater Voltage (max).	13.9 volts
Heater Current (max).	3.5 amperes
Heater Surge Current (max).	13.6 amperes
Peak Anode Current . (max).	20 amperes
(min).	5 amperes
Peak Anode Voltage (max).	20 kilovolts
Average Power Input (max)	350 watts
Duty Cycle (max)	0.001
Pulse Duration . (max)	3.3 microseconds
(min)	0.20 microseconds
Rate of Rise of Anode Voltage	
Above 50% Point. . (max).	120 KV/μsec
(min).	60 KV/μsec
Output and Input Circuit	
Pressurization . . . (max)	45 psia
(min)	15 psia
Maximum Altitude without pressurization:	
Output Circuit	sea level
Input Terminals	sea level
Body Temperature (max)	150°C
Cathode Stem Temperature (max).	300°C
VSWR (Magnetron Load) (max)	1.5:1
Tuner Torque (max)	50 in. oz.

TYPICAL OPERATING VALUES

Frequency	13600 to 15600 Mc
Peak Anode Voltage at 15.6 kmc	17.5 kv
Pulling Figure (VSWR 1.5/1)	6 Mc

from JEDEC release #3533, Dec. 18, 1961

JEDEC TYPE 7976

Current Pulse Duration	Duty Factor	Peak Anode Current	Stability	Peak Power Output	Voltage Pulse Rate-of-Rise	RF Band width at 1/4 po pts.	Heater Voltage
µsec		Amperes	% Missing Pulses	Kilo-watts	KV per µsec (above 50 % point)	6'=1.5:1 worst phase Mc	Volts±5%
0.25	0.0007	19	0.01%	135	100	4.5 Mc	8.6
3	0.001	19	0.01%	135	100	0.45 Mc	6.8

GENERAL MECHANICAL CHARACTERISTICS

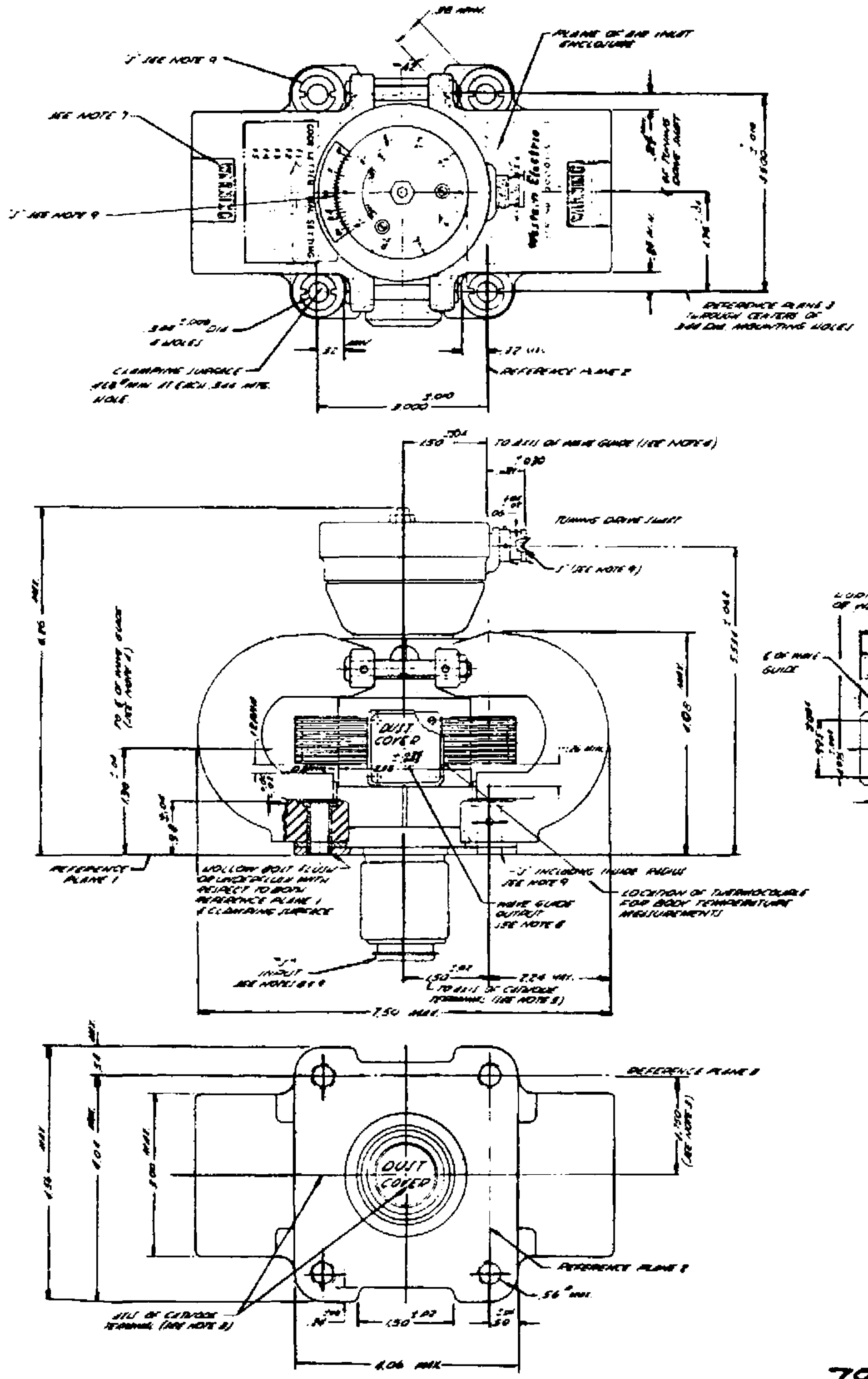
Mounting Position . . . . any
Mounting Support . . . . See 4 hole Mounting Plate in outline drawing
Weight . . . . 14 lbs. Max.

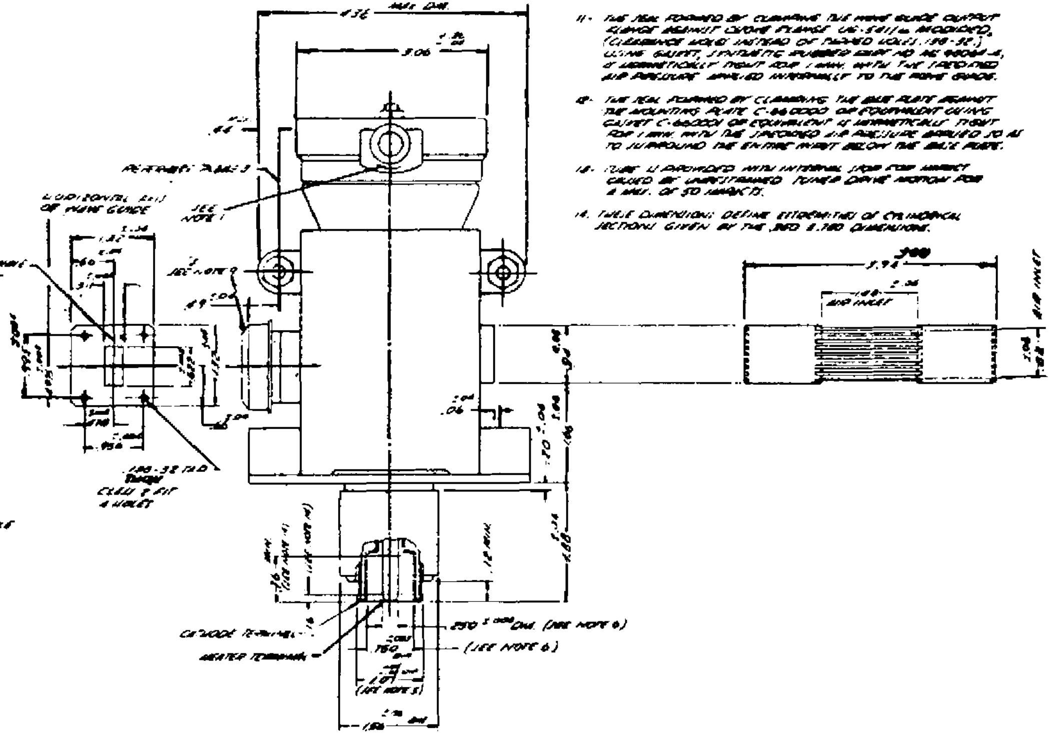
Coupling between Tube and Load:
Waveguide (RG91/U) per outline drawing. The mating flange may be UG419/U cover flange or a motified (clearance holes instead of tapped 6-32) UG541/U choke flange.

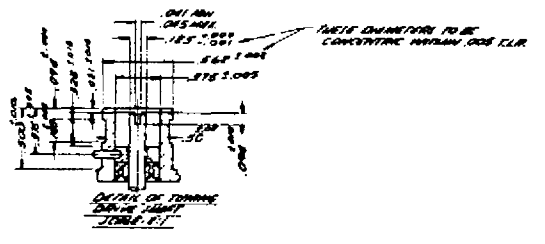
Cooling Data
To limit rise in body temperature to 100°C for a dissipation of 200 watts - 10 cfm, min.

Recommended cathode stem temperature 225°C ± 25°C.

Pressurization of Output Circuit:
The need for pressurization depends on the particular components used in the output circuit and on the pulse width. In general, it is recommended that the output circuit be pressurized for peak anode currents greater than 15 amperes.


.38 MAX.
PLANE OF AIR INLET ENCLOSURE
"J" SEE NOTE 9
SEE NOTE 7
"J" SEE NOTE 9
WARNING
Western Electric
CODE LETTER DIAL SETTING
OF TUNING DRIVE SHAFT
REFERENCE PLANE 3 THROUGH CENTERS OF .344 DIA. MOUNTING HOLES
.344 DIA 4 HOLES
CLAMPING SURFACE .468 MIN. AT EACH .344 MTG. HOLE
REFERENCE PLANE 2
3.000
2.000
TO AXIS OF WAVE GUIDE (SEE NOTE 4)
TUNING DRIVE SHAFT
"J" (SEE NOTE 9)
DUST COVER
TO ¢ OF WAVE GUIDE (SEE NOTE 4)
REFERENCE PLANE 1
HOLLOW BOLT FLUSH OR UNDERFLUSH WITH RESPECT TO BOTH REFERENCE PLANE 1 & CLAMPING SURFACE
"J" INCLUDING INSIDE RADIUS SEE NOTE 9
WAVE GUIDE OUTPUT SEE NOTE 8
LOCATION OF THERMOCOUPLE FOR BODY TEMPERATURE MEASUREMENTS
"J" INPUT SEE NOTES 8 & 9
TO AXIS OF CATHODE TERMINAL (SEE NOTE 3)
2.24 MAX.
7.54 MAX.
5.531
4.08 MAX.
6.90 MAX.
REFERENCE PLANE 8
REFERENCE PLANE 8
DUST COVER
.56 MAX.
AXIS OF CATHODE TERMINAL (SEE NOTE 3)
1.50
4.06 MAX.
4.01 MAX.
4.56 MAX.




THESE DIAMETERS TO BE CONCENTRIC WITHIN .005 T.I.R.
DETAIL OF TUNING DRIVE SHAFT SCALE 8:1

NOTES:

1- THE FREQUENCY INCREASES WHEN DRIVE SHAFT IS DRIVEN IN DIRECTION INDICATED BY THE ARROW.

2- THE TUNING MECHANISM OPERATES SMOOTHLY OVER THE ENTIRE MECHANICAL RANGE WHEN SUBJECTED TO A DYNAMIC TORQUE OF 10 OZ. INCHES MAX. APPLIED AT THE DRIVE SHAFT. IN EQUIPMENT, THE MAX. REST TORQUE SHALL NOT EXCEED 50 OZ INCHES. THE AXIAL AND RADIAL FORCE APPLIED TO THE DRIVE SHAFT SHALL NOT EXCEED ONE POUND. THE GEARS MUST BE FREE FROM CORROSION, PAINT AND OTHER IMPERFECTIONS.

3- THE AXIS OF THE CATHODE TERMINAL IS WITHIN A RADIUS OF .04 OF SPECIFIED LOCATION. (NOTE 4 APPLIES)

4- THE LIMITS ON LOCATION OF WAVE GUIDE OUTPUT AND CATHODE TERMINAL INCLUDE ANGULAR AS WELL AS LATERAL DEVIATIONS.

5- NO CLAMPING ON THIS DIAMETER.

6- THE HEATER TERMINAL IS CONCENTRIC WITH THE CATHODE TERMINAL WITHIN .010.

7- WARNING:
MAINTAIN MINIMUM CLEARANCE OF 2 INCHES BETWEEN THIS MAGNET AND MAGNETIC MATERIAL. (MAGNETS, STEEL TOOLS, PLATES, ETC.)

8- THE OPENINGS OF THE WAVE GUIDE AND THE INPUT SHALL BE ENCLOSED BY A DUST COVER WHEN TUBE IS NOT IN USE.

9- ALL METAL SURFACES COVERED BY GRAY ENAMEL EXCEPT THOSE MARKED "J"

10- PROTECTIVE COVER OVER TUNING HEAD MUST BE REMOVED BEFORE TUBE IS USED.

11- THE SEAL FORMED BY CLAMPING THE WAVE GUIDE OUTPUT FLANGE AGAINST CHOKE FLANGE UG-541/U MODIFIED, (CLEARANCE HOLES INSTEAD OF TAPPED HOLES .190-32.) USING GASKET, SYNTHETIC RUBBER GASKET NO. [illegible], IS HERMETICALLY TIGHT FOR 1 MIN. WITH THE SPECIFIED AIR PRESSURE APPLIED INTERNALLY TO THE WAVE GUIDE.

12- THE SEAL FORMED BY CLAMPING THE BASE PLATE AGAINST THE MOUNTING PLATE C-66000 OR EQUIVALENT USING GASKET C-66000 OR EQUIVALENT IS HERMETICALLY TIGHT FOR 1 MIN. WITH THE SPECIFIED AIR PRESSURE APPLIED SO AS TO SURROUND THE ENTIRE INPUT BELOW THE BASE PLATE.

13- TUBE IS PROVIDED WITH INTERNAL STOP FOR IMPACT CAUSED BY UNRESTRAINED TUNER DRIVE MOTION FOR A MAX. OF 50 IMPACTS.

14. THESE DIMENSIONS DEFINE EXTREMITIES OF CYLINDRICAL SECTIONS GIVEN BY THE .380 ± .180 DIMENSIONS.

7976 MAGNETRON