

EITEL-McCULLOUGH, INC.
SAN CARLOS, CALIFORNIA

4KM50SJ
POWER AMPLIFIER
KLYSTRON
12 kW
1.7 - 2.4 Gc

The 4KM50SJ is a four-cavity, power amplifier klystron intended primarily for use in tropospheric scatter communications systems. When tuned for maximum efficiency, it produces a minimum output power of 12 kilowatts, at frequencies from 1.7 to 2.4 gigacycles, with a minimum gain of 40 decibels.

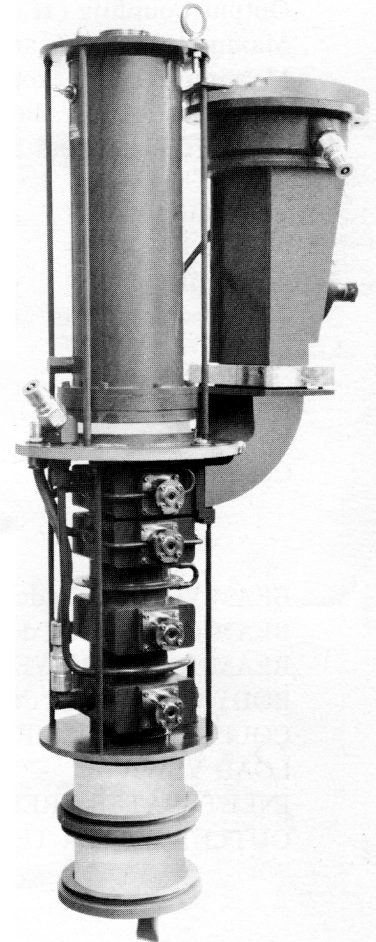
The electron gun of this klystron has a confined flow configuration which minimizes focusing adjustments and produces a stable beam. The current of the focusing electromagnet can be varied over a wide range without appreciably affecting rf output or body current. Only one electromagnet power supply is required. Cathode current loading is less than 200 milliamperes per square centimeter. This light cathode loading contributes to long life.

Both input and output couplings of the 4KM50SJ are fixed. The only adjustments required are therefore the tuning of the four integral cavities. The output window is a thick beryllium oxide disc which is protected by a photo-cell arc detector.

The 4KM50SJ incorporates a built-in vacuum pump in the form of a titanium getter which should be energized whenever heater power is applied. Effective protection against internal arcs is provided by the Eimac Modulating Anode.

A focusing electromagnet and klystron supporting structure, Catalog Number H-158, has been designed for use with the 4KM50SJ.

Eimac Water Load WL-202 is recommended for use with the 4KM50SJ.



CHARACTERISTICS

ELECTRICAL

Cathode: Unipotential	-	-	-	-	-	-	-	-	-	-	5 minutes
Heating time	-	-	-	-	-	-	-	-	-	-	
Heater: Voltage (±5%)	-	-	-	-	-	-	-	-	-	-	7.5 volts
Current	-	-	-	-	-	-	-	-	-	-	12 amperes
Getter: Voltage	-	-	-	-	-	-	-	-	-	-	4 volts ac
Amperes	-	-	-	-	-	-	-	-	-	-	24 amperes ac
Power Gain	-	-	-	-	-	-	-	-	-	-	40 decibels
Output Power	-	-	-	-	-	-	-	-	-	-	12 kilowatts
Frequency Range	-	-	-	-	-	-	-	-	-	-	1.7-2.4 gigacycles
Phase sensitivity to beam voltage	-	-	-	-	-	-	-	-	-	-	0.058 degrees/volt



MECHANICAL

Maximum Dimensions (4KM50SJ and H-158 Electromagnet)

Length	- - - - -	33 inches
Diameter	- - - - -	18 inches
Weight (4KM50SJ)	- - - - -	90 pounds
Weight (H-158 Electromagnet)	- - - - -	170 pounds
Input Coupling (rf)	- - - - -	Type N Coaxial
Output Coupling (rf)	- - - - -	UG435A/U Flange
Maximum Tuner Start Torque	- - - - -	70 in-oz
Maximum Tuner Stop Torque	- - - - -	30 in-lbs
Mounting Position Preferred	- - - - -	vertical, cathode down
Cooling: Water and Forced Air		

Flow Rate Pressure Drop

Cathode	- - - - -	20 cfm	free
Body	- - - - -	1.2 gpm	50 psi
Collector	- - - - -	18 gpm	30 psi
Electromagnet	- - - - -	1.5 gpm	15 psi

ELECTROMAGNET POWER SUPPLY REQUIREMENTS

Voltage	- - - - -	150 volts
Current	- - - - -	15 amperes

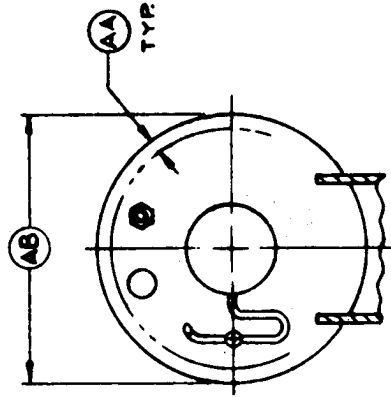
MAXIMUM RATINGS

BEAM VOLTAGE (dc)	- - - - -	20 KILOVOLTS
BEAM CURRENT (dc)	- - - - -	3 AMPERES
BEAM INPUT POWER	- - - - -	50 KILOWATTS
BODY CURRENT (dc)	- - - - -	75 MILLIAMPERES
COLLECTOR DISSIPATION	- - - - -	50 KILOWATTS
LOAD VSWR	- - - - -	1.5:1
INLET WATER PRESSURE	- - - - -	80 PSIG
OUTLET WATER TEMPERATURE	- - - - -	80 DEGREES C

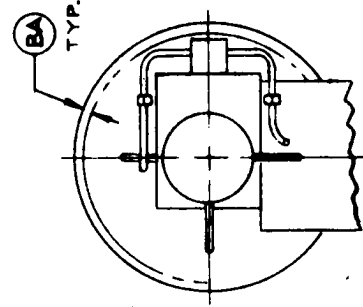
TYPICAL OPERATION

	<i>High Eff. Tuned</i>		<i>Broadband Tuned</i>		
Frequency	- - - - -	1.7	2.4	1.7	2.4 gigacycles
Output Power	- - - - -	14.5	12.3	12.1	10.5 kilowatts
Driving Power	- - - - -	1	1	1	1 watt
Gain	- - - - -	41.6	40.9	40.8	40.2 decibels
Beam Voltage	- - - - -	18	18	18	18 kilovolts dc
Beam Current	- - - - -	1.8	1.8	1.8	1.8 amperes dc
Modulating Anode Voltage (to cathode)	- - - - -	10.4	10.4	10.4	10.4 kilovolts dc
Beam Power Efficiency	- - - - -	44.5	38.0	37.2	32.4 percent
Half Power Bandwidth	- - - - -	5	8	10	12 megacycles
Body Current	- - - - -	65	50	55	35 milliamperes dc
Electromagnet Current	- - - - -	12.5	12.5	12.5	12.5 amperes

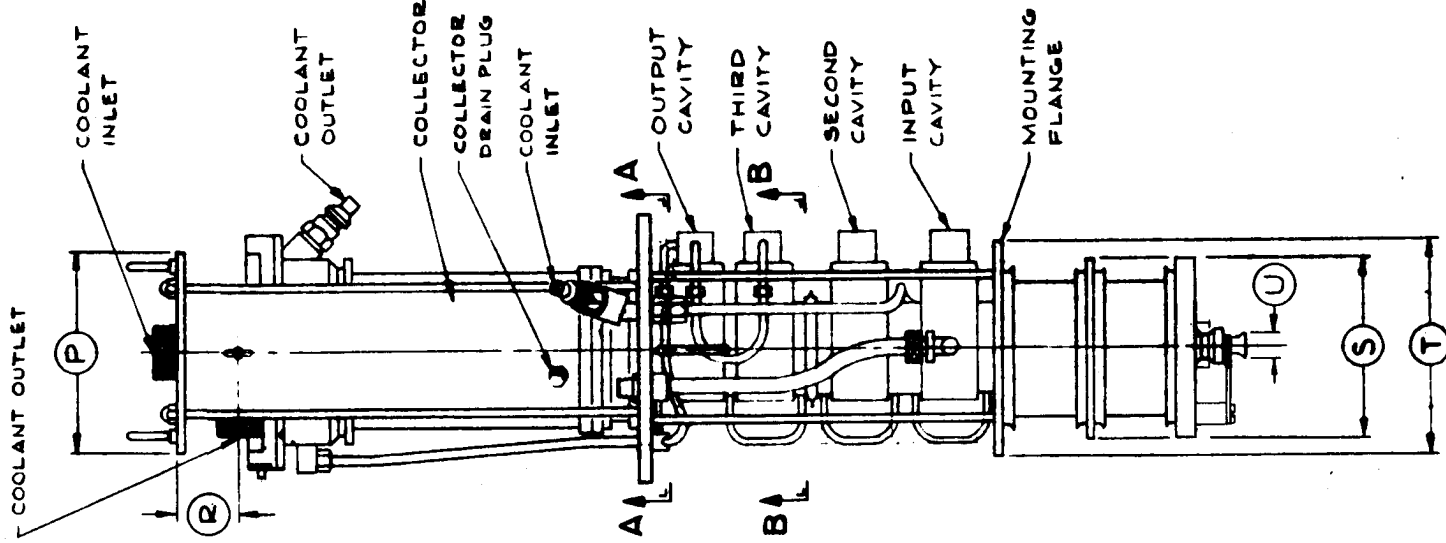
For additional information or information regarding a specific application, write to Eitel-McCullough, Inc., 301 Industrial Way, San Carlos, California.



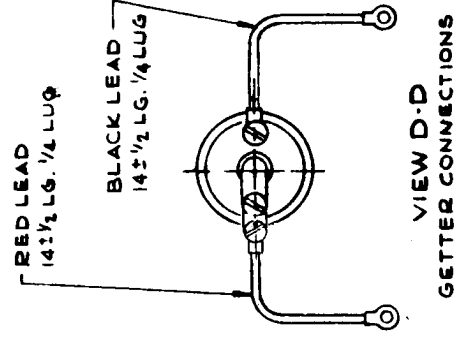
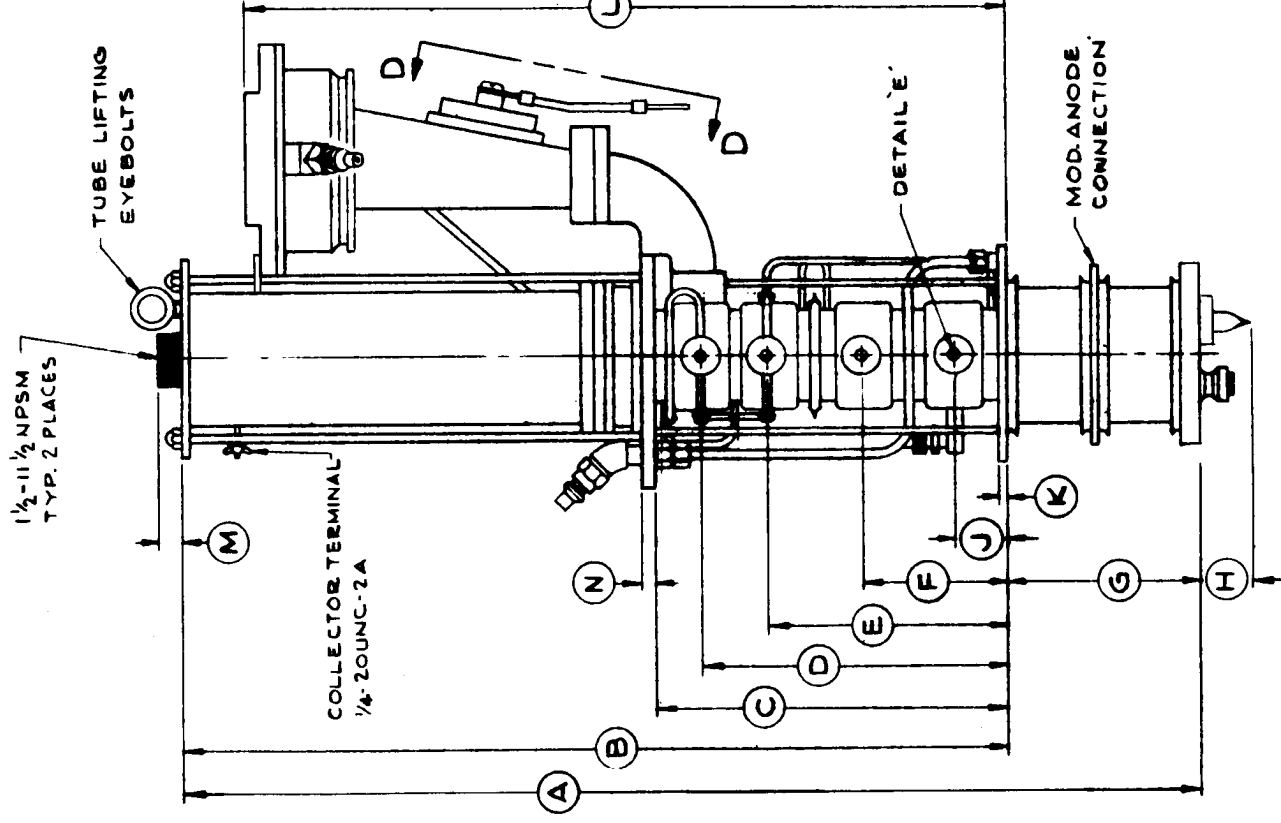
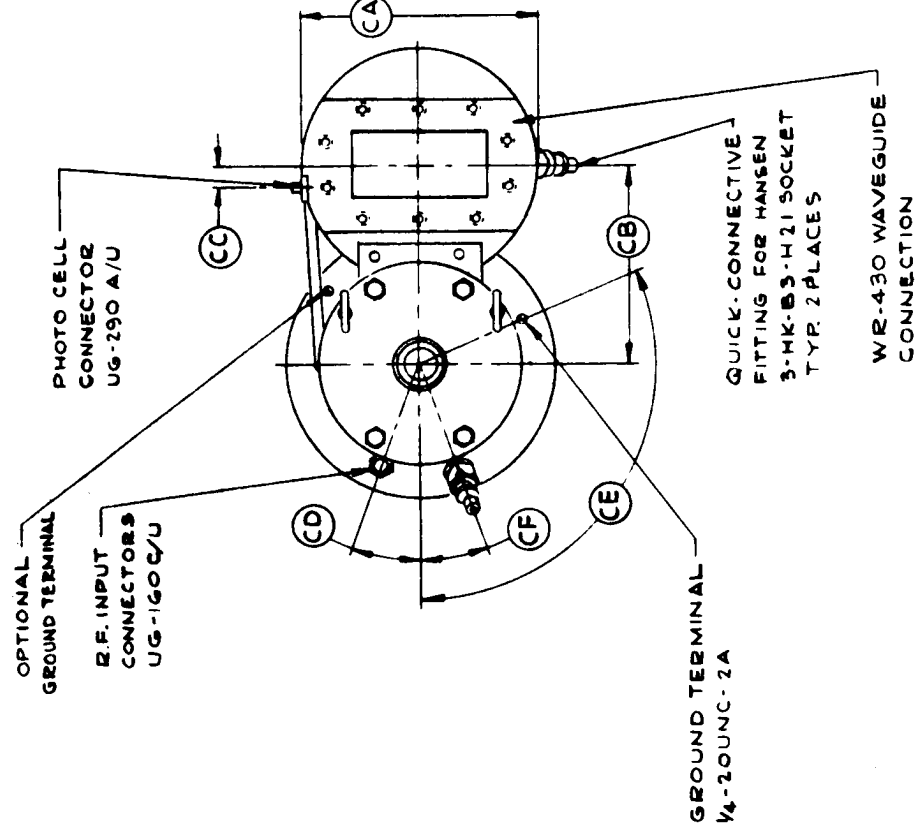
SECTION A-A



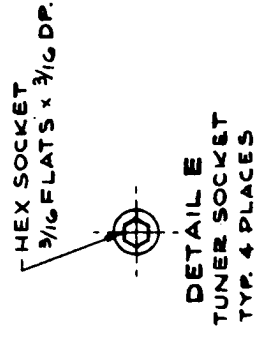
SECTION B-B
TUNER EXTENDED
TO MAX. LIMIT



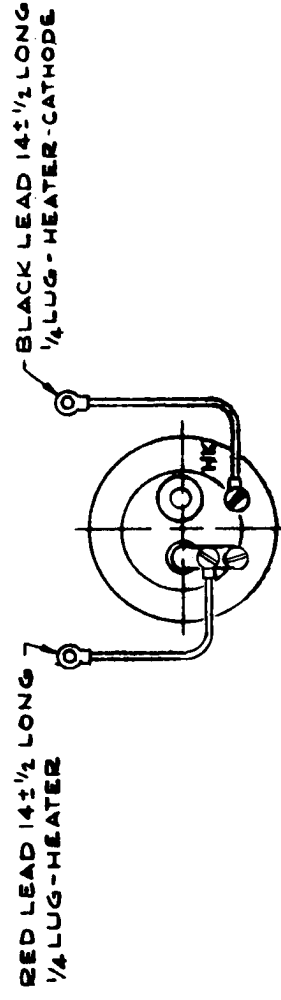
DIMENSIONAL DATA			
REF.	NOM.	MIN.	MAX.
A	30.366		
B	24.670		
C		10.325	10.525
D	9.125		
E	7.375		
F	4.388		
G	5.696		
H	2.188		
J	1.688		
K		.230	.270
L		23.600	24.000
M			1.000
N		.345	.405
P		5.950	6.050
R		1.470	1.720
S			5.280
T		6.490	6.500
U			1.188
AA		.437	
AB		7.990	8.000
BA		.380	
CA		6.970	7.030
CB		5.750	6.250
CC		.510	.610
CD		15°	25°
CE		110°	120°
CF		15°	25°



VIEW D-D
GETTER CONNECTIONS

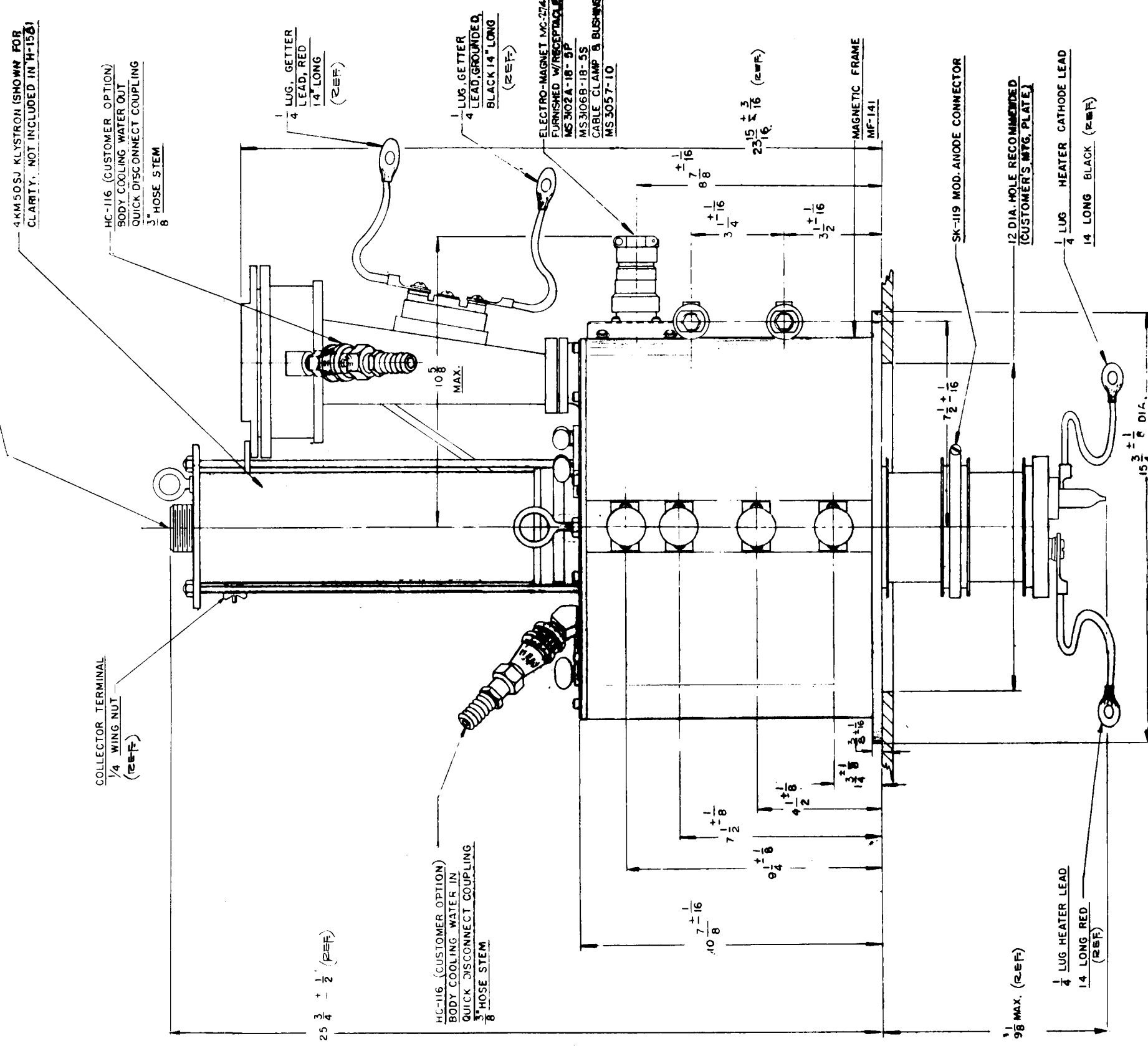
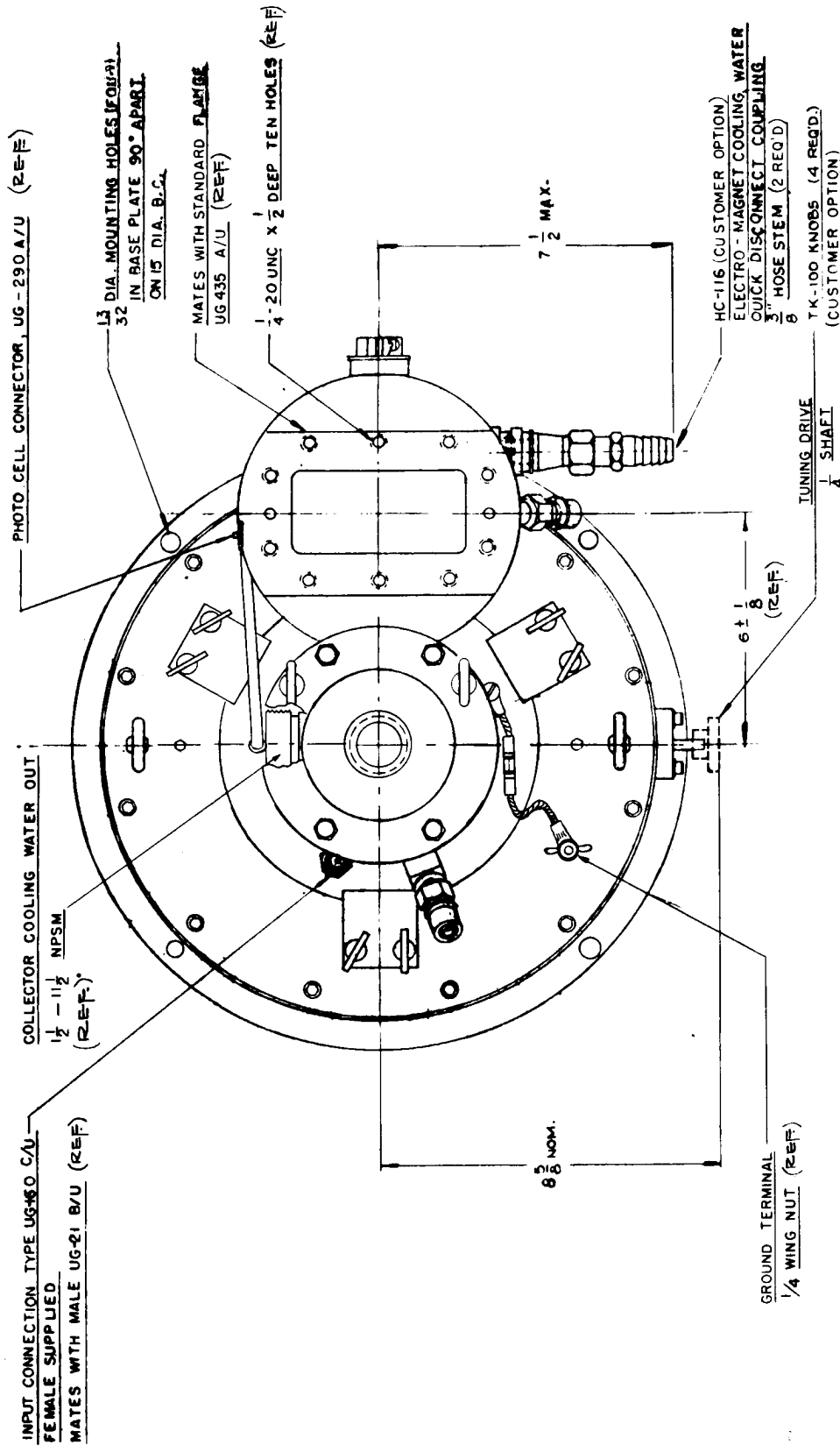


DETAIL E
TUNER SOCKET
TYP. 4 PLACES



FILAMENT CONNECTIONS

4KM505J KLYSTRON



H-158 ELECTROMAGNET AND KLYSTRON SUPPORTING STRUCTURE