



EITEL-McCULLOUGH, INC.
S A N B R U N O · C A L I F O R N I A

TENTATIVE DATA
4K50,000LQ
POWER AMPLIFIER
L-BAND KLYSTRON

The Eimac 4K50,000LQ is a ceramic and metal, four-cavity, magnetically focused, power-amplifier klystron designed for use at frequencies between 600 and 985 megacycles. It will deliver a minimum CW output power of 10 kilowatts with a power gain of more than 55 db. In applications requiring a 6-megacycle bandwidth at the 0.5-db power points, the 4K50,000LQ will deliver 10 kilowatts output power with a power gain of 30 db.

The resonant cavities for the 4K50,000LQ are completed through the cylindrical ceramic windows of the klystron and all tuning is accomplished outside the vacuum envelope. This design permits a wide tuning range and allows repeated tuning cycling without damage to vacuum seals.

An Eimac Klystron Amplifier Circuit Assembly (Catalog Number H-101A) has been designed for use with this tube and covers the frequency range of 720 to 985 megacycles. Other frequency ranges can be provided if required. This assembly includes an electromagnetic frame and coils, external tuning boxes, an adjustable output coupler, and an Eimac SK-110 Air-System Socket.

CHARACTERISTICS

ELECTRICAL

Filament: Pure Tungsten

Voltage	-	-	-	8.0	volts
Current	-	-	-	40	amperes
Maximum Starting Current	-	-	-	80	amperes

Cathode: Unipotential, Bombardment Heated

Voltage	-	-	-	2250	volts
Current	-	-	-	0.71	ampere
Power	-	-	-	1600	watts

Power Gain:

Narrow Band	-	-	-	55	db
Broad Band (6 mc at 0.5-db points)*	-	-	-	30	db

Output Power - - - - 10,000 watts

Frequency Range (In H-101A Assembly) 720 to 985 mc

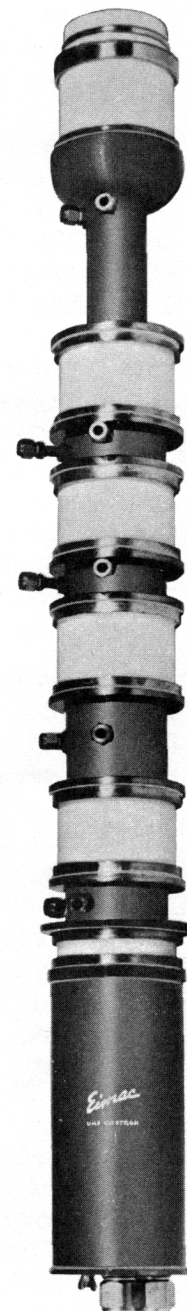
*(9 mc at 3-db points)

MECHANICAL

Operating Position	-	-	-	Vertical, cathode end up
R-F Input Coupling	-	-	-	Type "N" coaxial fitting
R-F Output Coupling	-	-	-	3 1/8-inch 50-ohm air line
Net Weight	-	-	-	53 pounds

Shipping Weight (approximate) - - 135 pounds

Cooling: Water and Forced Air	-	-	-	<u>Flow Rate</u>	-	<u>Pressure Drop</u>
Cathode (With SK-110)	-	-	-	52 cfm air	-	5 inches H ₂ O
Output Cavity	-	-	-	50 cfm air	-	1.5 inches H ₂ O
Body	-	-	-	1 gpm water	-	8 psi
Collector	-	-	-	25 gpm water	-	28 psi



MAGNETIC-COIL POWER-SUPPLY REQUIREMENTS

Prefocus-Coil Voltage	-	-	-	-	-	-	0 to 25	volts
Prefocus-Coil Current	-	-	-	-	-	-	0 to 1	ampere
Each of Three Body Coils:								
Voltage	-	-	-	-	-	-	0 to 175	volts
Current	-	-	-	-	-	-	0 to 3	amperes
Collector-Coil Voltage	-	-	-	-	-	-	0 to 50	volts
Collector-Coil Current	-	-	-	-	-	-	0 to 1.5	amperes

MAXIMUM RATINGS

D-C BEAM VOLTAGE	-	-	-	-	-	-	20 MAX.	KILOVOLTS
D-C BEAM CURRENT	-	-	-	-	-	-	2.5 MAX.	AMPERES
D-C BODY CURRENT (CONTINUOUS)	-	-	-	-	-	-	0.1 MAX.	AMPERE
D-C BODY CURRENT (TUNING ONLY)	-	-	-	-	-	-	0.15 MAX.	AMPERE
FOCUS-ELECTRODE VOLTAGE	-	-	-	-	-	-	-500 MAX.	VOLTS
BOMBARDED CATHODE:								
D-C VOLTAGE	-	-	-	-	-	-	2.4 MAX.	KILOVOLTS
D-C CURRENT	-	-	-	-	-	-	0.75 MAX.	AMPERE
D-C POWER	-	-	-	-	-	-	1.6 MAX.	KILOWATTS
COLLECTOR DISSIPATION	-	-	-	-	-	-	50 MAX.	KILOWATTS

TYPICAL OPERATION

Frequency	-	-	-	-	-	900	900	megacycles
Output Power	-	-	-	-	-	10.15	11.2	kilowatts
Bandwidth (0.5-db power points)	-	-	-	-	-	6.85	1.05	megacycles
Driving Power	-	-	-	-	-	5	0.02	watts
Power Gain	-	-	-	-	-	33	57.5	db
D-C Beam Voltage	-	-	-	-	-	17	16	kilovolts
D-C Beam Current	-	-	-	-	-	1.78	1.59	amperes
Beam Input Power	-	-	-	-	-	30.2	25.4	kilowatts
Beam Power Efficiency	-	-	-	-	-	33.6	44.1	percent
D-C Body Current	-	-	-	-	-	80	80	milliamperes
D-C Collector Current	-	-	-	-	-	1.7	1.51	amperes
Collector Dissipation*	-	-	-	-	-	11.51	12.92	kilowatts
Focus-Electrode Voltage	-	-	-	-	-	-200	-200	volts
Filament Voltage	-	-	-	-	-	8.0	8.0	volts
Filament Current	-	-	-	-	-	40	40	amperes
Bombarded Cathode:								
Voltage*	-	-	-	-	-	2250	2250	volts
Current*	-	-	-	-	-	0.71	0.71	ampere
Power	-	-	-	-	-	1600	1600	watts

Magnetic-Coil Currents:* (Using H-101A Components)

Prefocus	-	-	-	-	-	0.8	0.75	ampere
First Body	-	-	-	-	-	1.2	1.2	amperes
Second Body	-	-	-	-	-	1.9	1.8	amperes
Third Body	-	-	-	-	-	2.5	2.3	amperes
Collector	-	-	-	-	-	0.85	0.85	ampere

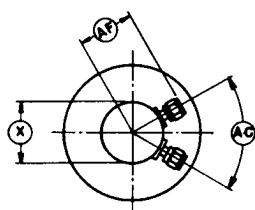
*Approximate values.

APPLICATION

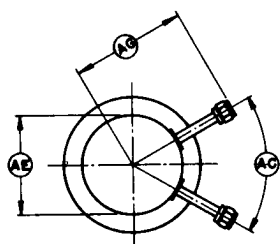
For additional information or information regarding any specific application, write to the Application Engineering Department, Eitel-McCullough, Inc., San Bruno, California. All such requests will be handled confidentially and without charge.



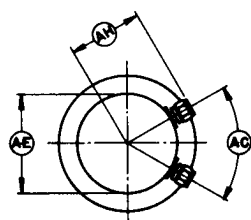
H-101A
KLYSTRON AMPLIFIER CIRCUIT ASSEMBLY



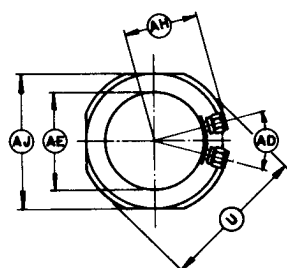
SECTION A-A



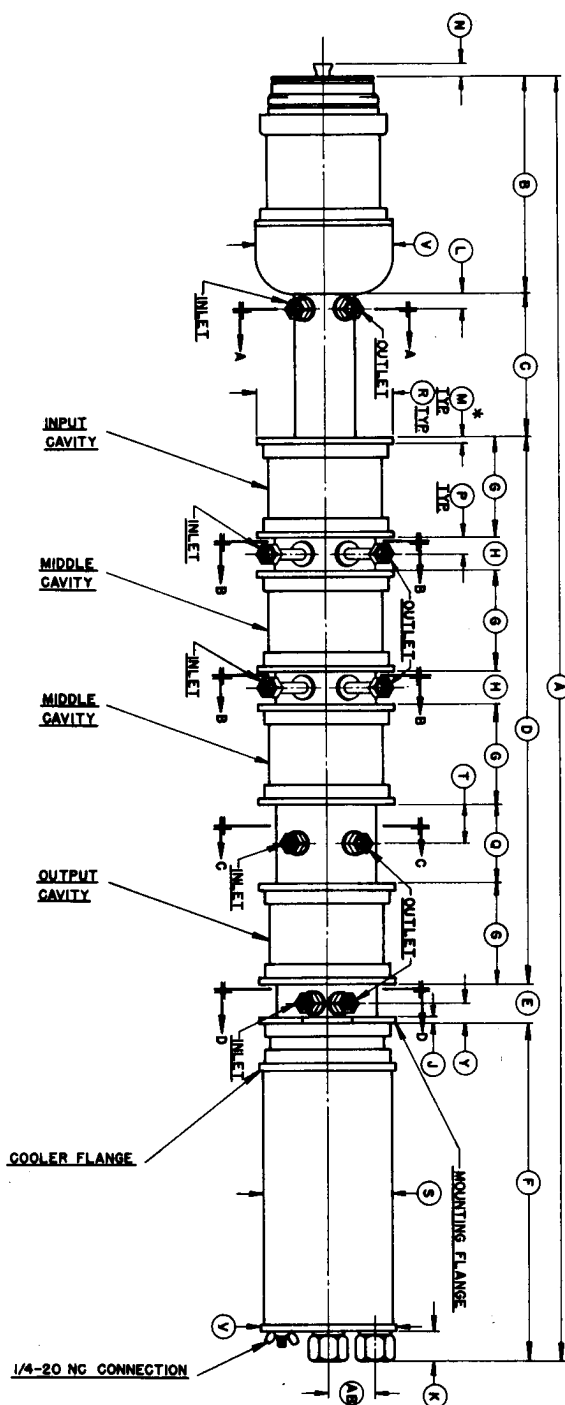
SECTION B-B



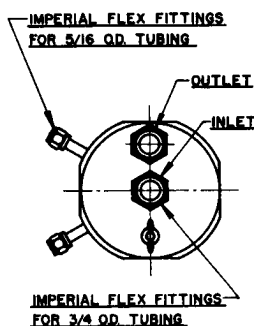
SECTION C-C



SECTION D-D



DIMENSION DATA			
REF	NOM.	MIN.	MAX.
A		44.560	44.690
B		7.470	7.510
C		4.985	5.040
D		19.994	20.064
E	626		
F		12.515	12.620
G		3.495	3.530
H		1.170	1.205
J		.230	.255
K		1.030	1.100
L		.515	.645
M		.187	
N		.750	
P		.560	.650
Q		2.735	2.770
R		4.610 D	4.630 D
S		4.490 D	4.510 D
T		1.320	1.425
U		5.115 D	5.130 D
V		4.610 D	4.640 D
X		2.120	2.140
Y		.645	.705
AB		1.585	1.630
AC	60°		
AD	30°		
AE		3.485	3.510
AF	1.875		
AG	4.000		
AH	2.563		
AJ		4.615	4.635



NOTES:

1. * MINIMUM CONTACT SURFACES FOR ALL CAVITY PLATES.
2. DIMENSIONS IN INCHES.
3. FOR ELECTRICAL CONTACT SURFACE DIMENSIONS SEE GUN NO. 2 OUTLINE, DRWG. NO. GUN NO. 2-6001.