

# ETTEL-MCCULLOUGH, INC.

# X850 X - BAND 20 KW CW POWER AMPLIFIER KLYSTRON

The X850 is the most recent product of the Eimac High Power Microwave Tube Laboratory. It is the first of a series of Eimac X-band power klystrons which will ultimately include tubes at all commonly used power levels.

Four integral cavities are used in the X850. Each tube is pretuned at the laboratory to the frequency chosen by the user, within the 7.125 to 8.5 kMc band.

The X850 is intended especially for use in space age applications including missile and satellite tracking systems, radar astronomy, and space communications.

The electron gun of the X850 utilizes a convergent confined flow field which results in non-critical focusing adjustments and produces a stable, quiet beam. This electron gun is rugged in structure and completely enclosed in a metal shield with integral, shielded, connecting leads, to reduce the high-voltage hazard to a minimum.

Fixed input and output couplings are used in the X850. The output window is a thick beryllium oxide disc. Unusual stability, for this power and frequency, is achieved through the use of improved body cooling.

The superior bandwidth of this klystron, 35 Mc minimum, and low beam voltage are due to high perveance design. Exceptionally high convergence of the electron gun, 50:1, means very low cathode emission density resulting in long life expectancy.

A focusing electromagnet and klystron supporting structure, Catalog Number H-160, has been designed for use with the X850. Only one power supply is required for the electromagnet.

### **CHARACTERISTICS**

### ELECTRICAL

Heater:	Voltage		-,	•	10	volts						
	Current	-	•	٠, •	3.0	amperes						
	Maximun	n Star	ting	Currer	t 6.0	amperes						
Cathode:	Impregna	gnated, Unipotential										
	Heating	Time	-	•	5	minutes						
Power Ga	in -	-		-	43	decibels						
Output Po	wer -	-	-	-	20	kilowatts						
Frequency	Range	-	•	•	7.125 to 8.5	kilomegacycles						

X-850



(Effective 3-5-62) Copyright 1962 by Eitel-McCullough, Inc.





## MECHANICAL (continued)

Operating Position RF Coupling:	-	-	-	-	-	•		•	-	Any
Input	-		_		_		_			\\/D 112 \\/
Output -	-	_		_			_	_	_	WR-112 Waveguide WR-112 Waveguide
Dimensions:								- - -		WK-112 Waveguide
Klystron only	-	-	-	-	-	-	-		6x7x25	inches
H-160 Electroma	agnet:									inches
Length -	-	-	-	-			•	N	17	inches
Width -	-	-	-	-	-		-		18	inches
Depth -	•	•	-	-	<b>.</b> '	••	-	-	12	inches
Weight:										
Klystron only	•	-	-	-	-	-	-	•	20	lbs
H-160 Electroma		-	-	•	<b>-</b>	•	-	-	200	lbs
Cooling: Water and	Forced	Air								
Signate of the state of the sta								FI	ow Rate	Pressure Drop
Cathode -	• •	-	-,	-	-	-	•	_	5 cfm	free
Klystron Body a		troma	gnet	-	-	•	•	_	2 gpm	100 psi
Klystron Collect	for	•	-	-	<b>-</b> 2	•	<u>.</u> * , ·	- 8	.5 gpm	45 psi
	ELECTR	OMA	GNET	POV	VER-S	UPPL	Y RE	QUIR	EMENTS	
Voltage								-		
Current	•	•	-	•	•	•	-	-	50	volts
Carron -	•	-	•	-	•	· · · · ·	•	-	25	amperes
			MA	XIMU	IM R	ATIN	GS			
DC BEAM VOLTAGE .									22	****
DC BEAM CURRENT .		-	_		•	•	•	•	22	KILOVOLTS
DC BODY CURRENT (with	RE de	ivel		_	•	•	•	•	3.5	AMPERES
COLLECTOR DISSIPATION			_	•	. •	•	•	-	80	MILLIAMPERES
INLET WATER PRESSURE		_	_	•	•	•	•	•	70	KILOWATTS
			_	•	•	•	•		120	PSI
			TVD	ICAL	OBE	DATI	<b>.</b>			
			111	IVAL	OFE	MAIN	N			
Frequency		-	•	•		-	-		7.6	kilomegacycles
Output Power	,	-	-,	-	24	-	. , .		22	kilowatts
Driving Power	•	-	•	•	-	-		_	1	watt
Power Gain	-	-	-		-	-	-	_	43	decibels
DC Beam Voltage		-	-	-				,	20	kilovolts
DC Beam Current	-	•	-	• ,			-		3.1	amperes
Beam Power Efficiency -	-	-	•	-				٠.	35.5	percent
DC Body Current	-		-	-	-				40	milliamperes
3 db bandwidth		-	•		-		•		35	and the second of the second o
								-	33	megacycles

The Eimac EM778 Traveling Wave Tube in recommended as a driver for this klystron.

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