EITEL-McCULLOUGH, INC.
SAN CARLOS, CALIFORNIA

TENTATIVE DATA

4CX35,000A/ 4CX35,000C

Radial-Beam

Power Tetrodes

The Eimac 4CX35,000A and 4CX35,000C ceramic-metal power tetrodes are intended for use at the fifty kilowatt output power level. The 4CX35,000A is recommended for use as a Class-C r-f amplifier or oscillator, Class-AB_1 r-f amplifier, or Class-AB_1 push-pull a-f amplifier or modulator. The 4CX35,000C is a special version with a longer screen-anode insulator intended specifically for use as a plate-and screen-modulated Class-C r-f amplifier. Both types carry full ratings to 110 megacycles.

GENERAL CHARACTERISTICS

ELECTRICAL

Filament: Thoriated Tungsten			
Voltage		10.0	Volts
Current		300	Amperes
Amplification Factor (Grid-Screen) (Average)		5.5	
Direct Interelectrode Capacitances, Grounded Cathode (Average):			
Tube Type:	4CX35,000A	4CX35,000C	
Input	415	445	μμf
Output	45	45	μμf
Feedback	2.3	2.3	μμf
Frequency for Maximum Ratings		110	Megacycles

MECHANICAL

Base		Special, graduated rings	
Recommended Socket		Eimac SK-1500	
Operating Position		Axis-vertical, base up or down	
Cooling		Forced air	
Maximum Seal Temperature		250°C	
Maximum Anode Core Temperature		250°C	
Maximum Over-all Dimensions:			
Tube Type:	4CX35,000A	4CX35,000C	
Height	13.5	15.5	Inches
Diameter	9.75	9.75	Inches
Net Weight	48	50	Pounds

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RADIO-FREQUENCY POWER AMPLIFIER OR OSCILLATOR

Class-C Telegraphy or FM Telephony

MAXIMUM RATINGS

D-C PLATE VOLTAGE	10,000	VOLTS
D-C SCREEN VOLTAGE	2500	VOLTS
D-C PLATE CURRENT	10.0	AMPERES
PLATE DISSIPATION	35,000	WATTS
SCREEN DISSIPATION	1500	WATTS
GRID DISSIPATION	450	WATTS

TYPICAL OPERATION

D-C Plate Voltage	10,000	Volts
D-C Screen Voltage	750	Volts
D-C Grid Voltage	-425	Volts
D-C Plate Current	6.80	Amperes
D-C Screen Current	925	Ma
D-C Grid Current	320	Ma
Peak R-F Grid Voltage	575	Volts
Driving Power	185	Watts
Plate Dissipation	11,700	Watts
Plate Output Power	56,500	Watts

PLATE-MODULATED RADIO-FREQUENCY POWER AMPLIFIER

(Applies Only to 4CX35,000C)

Class-C Telephony (Carrier conditions except where noted)

MAXIMUM RATINGS

D-C PLATE VOLTAGE	10,000	VOLTS
D-C SCREEN VOLTAGE	1250	VOLTS
D-C PLATE CURRENT	10.0	AMPERES
PLATE DISSIPATION	23,500	WATTS
SCREEN DISSIPATION	1500	WATTS
GRID DISSIPATION	450	WATTS

TYPICAL OPERATION

D-C Plate Voltage	10,000	Volts
D-C Screen Voltage	750	Volts
Peak A-F Screen Voltage (for 100-percent modulation)*	705	Volts
D-C Grid Voltage	-525	Volts
D-C Plate Current	6.70	Amperes
D-C Screen Current	1.05	Amperes
D-C Grid Current	315	Ma
Peak R-F Grid Voltage	680	Volts
Driving Power	215	Watts
Plate Dissipation (at 100% Modulation)*	17,100	Watts
Plate Output Power	55,600	Watts

* Approximate Value

RADIO-FREQUENCY LINEAR AMPLIFIER

Class-AB_1, Grid-Driven

MAXIMUM RATINGS (Single-Tone Conditions)

D-C PLATE VOLTAGE	10,000	VOLTS
D-C SCREEN VOLTAGE	2500	VOLTS
D-C PLATE CURRENT	10.0	AMPERES
PLATE DISSIPATION	35,000	WATTS
SCREEN DISSIPATION	1500	WATTS
GRID DISSIPATION	450	WATTS

TYPICAL OPERATION

D-C Plate Voltage	10,000	Volts
D-C Screen Voltage	1500	Volts
D-C Grid Voltage *	-290	Volts
Zero-Sig D-C Plate Current	2.00	Amperes
Max-Sig D-C Plate Current	8.75	Amperes
Max-Sig D-C Screen Current	270	Ma
Peak R-F Grid Voltage	265	Volts
Driving Power	0	Watts
Plate Dissipation	32,500	Watts
Max-Sig Plate Output Power	55,000	Watts
Resonant Load Impedance	590	Ohms

AUDIO-FREQUENCY AMPLIFIER OR MODULATOR

Class-AB_1

MAXIMUM RATINGS (Per Tube)

D-C PLATE VOLTAGE	10,000	VOLTS
D-C SCREEN VOLTAGE	2500	VOLTS
D-C PLATE CURRENT	10.0	AMPERES
PLATE DISSIPATION	35,000	WATTS
SCREEN DISSIPATION	1500	WATTS
GRID DISSIPATION	450	WATTS

TYPICAL OPERATION (Two Tubes, Sinusoidal Wave)

D-C Plate Voltage	10,000	Volts
D-C Screen Voltage	1500	Volts
D-C Grid Voltage *	-290	Volts
Zero-Sig D-C Plate Current	4.00	Amperes
Max-Sig D-C Plate Current	17.5	Amperes
Max-Sig D-C Screen Current	540	Ma
Peak A-F Driving Voltage (Per Tube)	265	Volts
Driving Power	0	Watts
Load Resistance, Plate-to-Plate	1180	Ohms
Plate Dissipation (Per Tube)	32,500	Watts
Max-Sig Plate Output Power	110,000	Watts

* Adjust grid voltage to obtain specified zero-signal plate current.

NOTE: In most cases, "TYPICAL OPERATION" data are obtained by calculation from published characteristic curves and confirmed by direct tests. No allowance for circuit losses, either input or output, has been made. Exceptions are distinquished by a listing of "Useful" output power as opposed to "Plate" output power. Values appearing in these groups have been obtained from existing equipment and the output power is that measured at the load.

APPLICATION

MECHANICAL

MOUNTING - The 4CX35,000A or 4CX35,000C must be operated with its axis vertical. The base of the tube be down or up.

SOCKET - The Eimac SK-1500 Socket is recommended for use with the 4CX35,000A and 4CX35,000C. The SK-1500 is not an air-system socket.*

COOLING - The maximum temperature rating for the external surfaces of the 4CX35,000A and the 4CX35,000C is 250°C. Sufficient forced-air cooling must be provided to keep the temperature of the anode core and the temperature of the ceramic-metal seals below 250°C. Tube life is usually prolonged if these areas are maintained at temperatures below this maximum rating. Estimated air-flow requirements to maintain anode-core and seal temperatures below 225°C with an inlet-air temperature of 50°C are tabulated below for operation below 30 Mc. These data are for air flowing in the anode-to-base direction. At higher altitudes, higher frequencies, or higher ambient temperatures the flow rate must be increased to obtain equivalent cooling.

	SEA LEVEL		10,000 FEET	
Plate Dissipation** (Watts)	Air Flow (CFM)	Pressure Drop (Inches of Water)	Air Flow (CFM)	Pressure Drop (Inches of Water)
15,000	545	1.5	795	2.2
20,000	800	2.5	1170	3.6
35,000	1760	7.0	2560	10.2

** Since the power dissipated by the filament represents about 3000 watts and since grid-plus-screen dissipation can, under some conditions, represent another 1950 watts, allowance has been made in preparing this tabulation for an additional 5000 watts dissipation.

ELECTRICAL

FILAMENT OPERATION - The rated filament voltage for the 4CX35,000A and the 4CX35,000C is 10.0 volts. Filament voltage, as measured at the socket, should be maintained at this value to obtain maximum tube life. In no case should it be allowed to deviate from the rated value by more than ± 5%.

SPECIAL APPLICATIONS - For additional data, write to Power Grid Tube Marketing, Eitel-McCullough, Inc., 301 Industrial Way, San Carlos, California.

* Separate base cooling is required.